CERTIFICATE◆ CERTIFICATE◆ CERTIFICATE

CTB

CERTIFICATE OF CONFORMITY

EU - The Radio Equipment Directive (RED) -

No. : CTB230216021REX-ZS

Applicant	:	Dongguan Yingke Technology Co.,Ltd.
Address	:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Manufacturer	:	Dongguan Yingke Technology Co.,Ltd.
Address	:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Product	:	Projector
Trade Name	:	GJTOS, xinteprid, clokowe, ELEPHAS, GOODEE, Cibest, ARTSEA, YABER, WIMIUS, Uyole, Bacar, Lifegoods, BLAUPUNKT, EKO, VOLLPS, Auking, AngBeam, Thundeal
Model(s)	:	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8

The tests that base on the above designated product Complies with the essential requirements of Directive 2014/53/EU relating to Electrical Equipment designed for use within Radio and telecommunications terminal equipment.
The test results apply only to the particular sample tested and the applicative tests carried out.
The CE markings as shown below can be affixed on product after manufacturer carry out all stipulation activities integrally of above mentioned Regulation (Directive) and preparation of necessary technical documentation as well as the conformity declaration.
This statement is based on a single evaluation of sample of above mentioned product. It does not imply an assessment of the whole production process.
Other relevant Regulation (Directive) requirement have to be observed.

CE

TESTING TECHNOLOGY CTB INTERNATIONAL

Bin Mei

Bin Mei (Director)

Mar. 10, 2023

Shenzhen CTB Testing Technology Co., Ltd
Add: 1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China.
Web: http://www.ctb-lab.net Tel: 4008-707-283 Email: ctb@ctb-lab.net

CTB

CERTIFICATE OF CONFORMITY

EU - The Radio Equipment Directive (RED) -

No. : CTB230216021REX-ZS

Category	Test Standards	Test Report No.
Health and Safety (Article 3.1a)	EN IEC 62368-1:2020+A11:2020	CTB230224008RSX
	EN 62479:2010 EN 50663:2017	CTB230216026RHX
EMC (Article 3.1b)	ETSI EN 301 489-1 V2.2.3 (2019-11)	CTB230216021REX
	Draft ETSI EN 301 489-17 V3.2.5 (2022-08)	
	ETSI EN 301 489-3 V2.3.2 (2023-01)	
Radio Aspects (Article 3.2)	ETSI EN 300 328 V2.2.2 (2019-07)	CTB230216022RFX CTB230216023RFX
	ETSI EN 301 893 V2.1.1 (2017-05)	CTB230216024RFX
	ETSI EN 300 440 V2.2.1 (2018-07)	CTB230216025RFX

The tests that base on the above designated product Complies with the essential requirements of Directive 2014/53/EU relating to Electrical Equipment designed for use within Radio and telecommunications terminal equipment.

The test results apply only to the particular sample tested and the applicative tests carried out.

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Web: http://www.ctb-lab.net Tel: 4008-707-283 Email: ctb@ctb-lab.net

TEST REPORT

Product Name:	Projector
Trademark:	GJTOS, xinteprid, clokowe, ELEPHAS, GOODEE, Cibest, ARTSEA, YABER, WIMIUS, Uyole, Bacar, Lifegoods, BLAUPUNKT, EKO, VOLLPS, Auking, AngBeam, Thundeal
Model Number:	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Prepared For:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Manufacturer:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	Jan. 29, 2023
Sample tested Date:	Jan. 29, 2023 to Feb. 16, 2023
Issue Date:	Feb. 16, 2023
Report No.:	CTB230216021REX
Test Standards	ETSI EN 301 489-1 V2.2.3 (2019-11) Draft ETSI EN 301 489-17 V3.2.5 (2022-08) ETSI EN 301 489-3 V2.3.2 (2023-01)
Test Results	PASS
Remark:	This is RED EMC test report.

Compiled by:	Reviewed by:	Approved by:
ChenZheng	Arron Liu	Bin Mei
Chen Zheng	Arron Liu	Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

TABLE OF CONTENT

(NOTE: N/A MEANS NOT APPLICABLE)

1. VERSION

ReportNo.	Issue Date	Description	Approved
CTB230216021REX	Feb. 16, 2023	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

EMISSION		
Standard	**Test Item**	**Test result**
EN 55032	Conducted emissions from the AC mains power ports	Pass
EN 55032	Asymmetric mode conducted emissions	N/A[1]
EN 55032	Conducted differential voltage emissions	N/A[2]
EN 55032	Radiated emissions	Pass
EN 61000-3-2	Harmonic current emission(H)	N/A[3]
EN 61000-3-3	Voltage fluctuations & flicker(F)	Pass

IMMUNITY		
Standard	**Test Item**	**Test result**
IEC 61000-4-2	Electrostatic discharge (ESD)	Pass
IEC 61000-4-3	Continuous RF electromagnetic field disturbances(RS)	Pass
IEC 61000-4-4	Electrical fast transients/burst (EFT)	Pass
IEC 61000-4-5	Surges	Pass
IEC 61000-4-6	Radio frequency, common mode	Pass
IEC 61000-4-11	Voltage dips and interruptions (DIPS)	Pass

Remark:

1. Applicable to ports listed above and intended to connect to cables longer than 3 m.
2. The Product has no antenna port.
3. The Product belongs to Class A, and its power is less than 75W, so it deems to fulfil this standard without testing.

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted Emission (150KHz-30MHz)	3.2
Radiated Emission(30MHz ~1000MHz)	4.8
Radiated Emission(1GHz ~6GHz)	4.9

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: A6
WIFI Version:	IEEE 802.11a/b/g/n/ac
Bluetooth Version:	Bluetooth V5.1
Hardware Version:	PJ67V810
Software Version:	YKV01.20221123
Operation Frequency:	Bluetooth: 2402-2480MHz WiFi: IEEE 802.11b/g/n 20: 2412-2472MHz/ 13 channel IEEE 802.11n 40: 2422-2462MHz/ 9 channel IEEE 802.11a/n/ac(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11n/ac(40M): 5150MHz ~5250MHz/ 2 channel IEEE 802.11ac(80M): 5150MHz ~5250MHz/ 1 channel IEEE 802.11a/n (20M): 5725MHz ~5850MHz/ 5 channel IEEE 802.11n (40M): 5725MHz ~5850MHz/ 2 channel
Max. RF output power:	Bluetooth: 1.77dBm WiFi (2.4G) : 7.54dBm WiFi(5G): 6.72dBm WiFi(5.8G):6.99dBm
Type of Modulation:	Bluetooth: GFSK, π/4 DQPSK, 8DPSK WiFi: DSSS, OFDM, CCK
Antenna installation:	FPC antenna
Antenna Gain:	1.0dBi
Ratings:	AC 100-240V~50/60Hz

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

Item	Equipment	Mfr/Brand	Model/TypeNo.	SeriesNo.	Note

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer’s requirements and conditions for the intended use.

4.4 Test Mode

Test Mode	Description	Remark
Mode 1	Bluetooth	TR, CR, TT, CT for EMS testing
Mode 2	2.4G WIFI	TR, CR, TT, CT for EMS testing
Mode 3	5.1G WIFI	TR, CR, TT, CT for EMS testing
Mode 4	5.8G WIFI	TR, CR, TT, CT for EMS testing

NOTE: 1 The test modes were carried out for all operation modes. The final test mode of the EUT was the worst test mode for EMI, and its test data was showed.

2 “Link” is the connect horn alarm mode

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Continuous disturbance					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	ROHDE&SCHWARZ	ESH3-Z5	100318	2023.07.19
2	Pulse limiter	ROHDE&SCHWARZ	ESH3Z2	357881052	2023.07.19
3	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100428/003	2023.07.19
4	Coaxial cable	ZDECL	Z302S-NJ-SMA J-12M	18091905	2023.07.19
5	ISN	Schwarzbeck	NTFM8158	183	2023.07.19
6	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
7	Communication test set	R&S	CMW500	108058	2023.07.19
8	EZ-EMC	Frad	EMC-con3A1.1	/	/

Radiated emission					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	01911	2023.07.22
2	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2023.07.22
3	Amplifier	Agilent	8449B	3008A01838	2023.07.19
4	Amplifier	HP	8447E	2945A02747	2023.07.19
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100428/003	2023.07.19
6	Coaxial cable	ETS	RFC-SNS-100-NMS-80 NI	/	2023.07.19
7	Coaxial cable	ETS	RFC-SNS-100-NMS-20 NI	/	2023.07.19
8	Coaxial cable	ETS	RFC-SNS-100-SMS-20 NI	/	2023.07.19
9	Coaxial cable	ETS	RFC-NNS-100 -NMS-300 NI	/	2023.07.19
10	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
11	Communication test set	R&S	CMW500	108058	2023.07.19
12	EZ-EMC	Frad	EMC-con3A1.1	/	/

Harmonic current emission& Voltage changes, voltage fluctuations and flicker					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Flicker & Harmonic Tester	Laplace Instruments	AC2000A	311363	2023.07.19
2	AC Power source	HTEC Instruments	HPF5010	633088	2023.07.19
3	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19
5	TTI HA1600	/	Ver.3.01	/	/

Electrostatic discharges					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	ESD Simulator	TESTQ	NSG437	329	2023.07.25
2	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
3	Communication test set	R&S	CMW500	108058	2023.07.19

Surges & Fast transients					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Surge& Burst Generator	Lioncel	LSG-545CB	180602	2023.07.19
2	Capacitive coupling clamp	Lioncel	EFTC	18071801	2023.07.19
3	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19

Voltage dips					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Voltage dip simulator	Lioncel	VDS-1102	180902	2023.07.19
2	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
3	Communication test set	R&S	CMW500	108058	2023.07.19

Injected currents					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	C/S Test System	SKET	CITS-150K230M-75W	2106070108	2023.07.19
2	CDN	SKET	CDN-150K230M-M2/M3-16A	21302	2023.07.19
3	CDN	SKET	CDNT400	2106070110	2023.07.19
4	6dB 100Watt Attenuator	SKET	AP-DC01G-100W-N-6dB	2106070112	2023.07.19
5	Electromagnetic Injection Clamp	SKET	PECL-100	2106070111	2023.07.19
6	50Ω Load	SKET	TL-DC01G-2W-50 BNC	/	2023.07.19

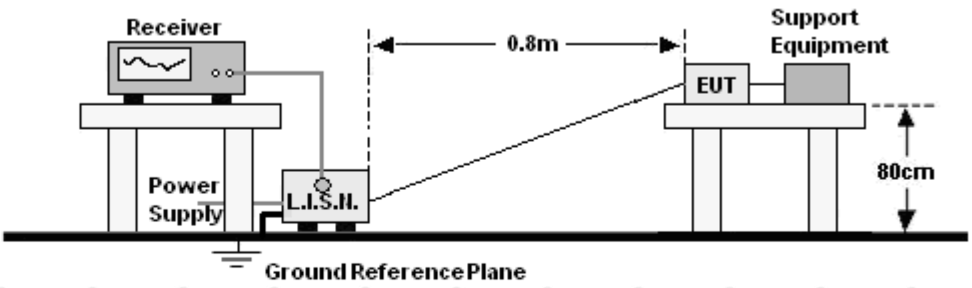
7	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
8	Communication test set	R&S	CMW500	108058	2023.07.19
9	Test Software	SKET	/	/	/

Disturbance power					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Power absorbing pliers	CYBERTEK	EM5018	EM185018100	2023.07.27
2	Attenuator	ZDECL	SMAJKS-06-2W-06-T	/	/
3	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19

Radio frequency electromagnetic field					
No.	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	Agilent	N5181A	2106070101	2023.07.19
2	Stacked Double Log.-Per. Antenna	SKET	STLP 9129 Plus	2106070106	2023.07.19
3	Switch Controller	SKET	RFSU-DC18G -4C	2106070105	2023.07.19
4	RF Power Meter	Agilent	U2001	2106070102	2023.07.19
5	E-Field Probe	Narda	EP-601	2106070107	2023.07.19
6	Power Amplifier	SKET	HAP-80M01G-250W	2106070103	2023.07.19
7	Power Amplifier	SKET	HAP-01G 06G-75W	2106070104	2023.07.19
8	Audio Analysis	R&S	UPV	2106070116	2023.07.24
9	Audio Output Matching Network	SKET	RCO Network	2106070117	2023.07.19
10	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
11	Communication test set	R&S	CMW500	108058	2023.07.19
12	Test Sofiware	SKET	/	/	/

6. CONDUCTED EMISSIONS

6.1 Block Diagram Of Test Setup



6.2 Limit

Limits for Conducted emissions at the mains ports of Class B MME

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56*	56 to 46*
0,50 to 5	56	46
5 to 30	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

6.3 Test procedure

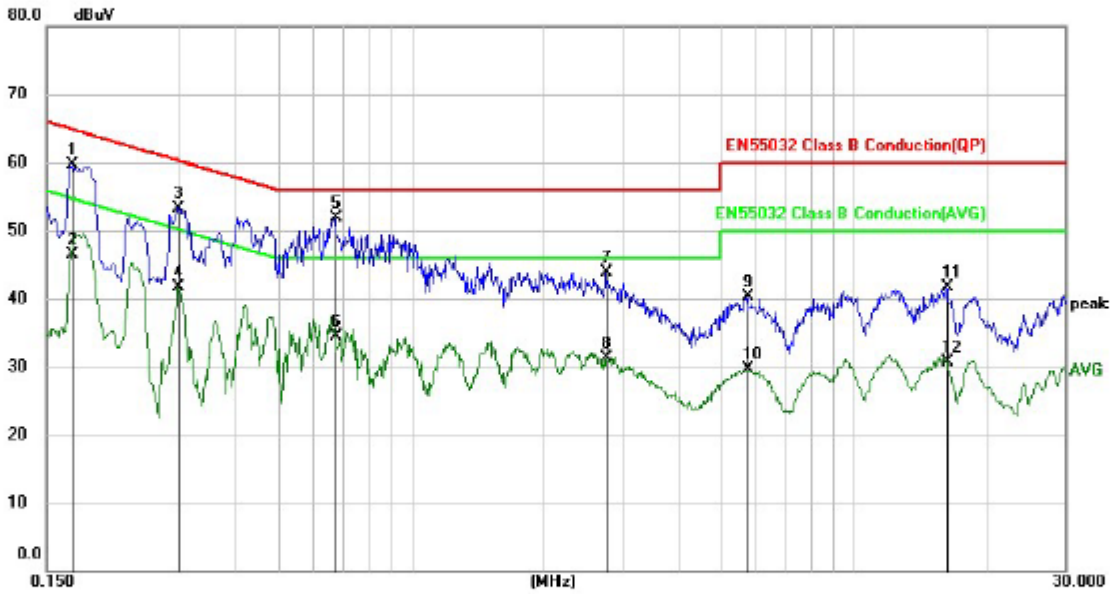
a. The Product was placed on a nonconductive table 0.8m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connectedto the main through Line Impedance Stability Network (L.I.S.N).

b. The RBW of the receiver was set at 9 kHz in150 kHz ~30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.

c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 Test Result

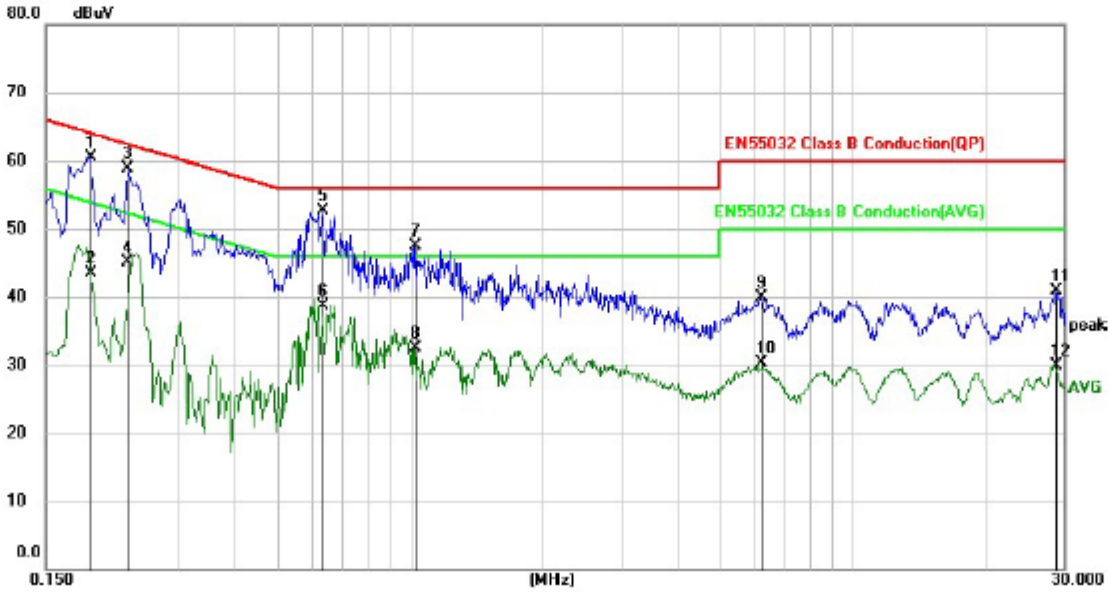
Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1720	49.73	10.01	59.74	64.86	-5.12	QP
2		0.1720	36.56	10.01	46.57	54.86	-8.29	AVG
3		0.2977	43.37	9.99	53.36	60.31	-6.95	QP
4		0.2977	31.63	9.99	41.62	50.31	-8.69	AVG
5	*	0.6740	41.93	9.97	51.90	56.00	-4.10	QP
6		0.6740	24.63	9.97	34.60	46.00	-11.40	AVG
7		2.7620	33.88	10.06	43.94	56.00	-12.06	QP
8		2.7620	21.15	10.06	31.21	46.00	-14.79	AVG
9		5.7579	30.20	10.20	40.40	60.00	-19.60	QP
10		5.7579	19.56	10.20	29.76	50.00	-20.24	AVG
11		16.1459	31.29	10.49	41.78	60.00	-18.22	QP
12		16.1459	20.17	10.49	30.66	50.00	-19.34	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Mode	1(the worst data)	Remark:	N/A



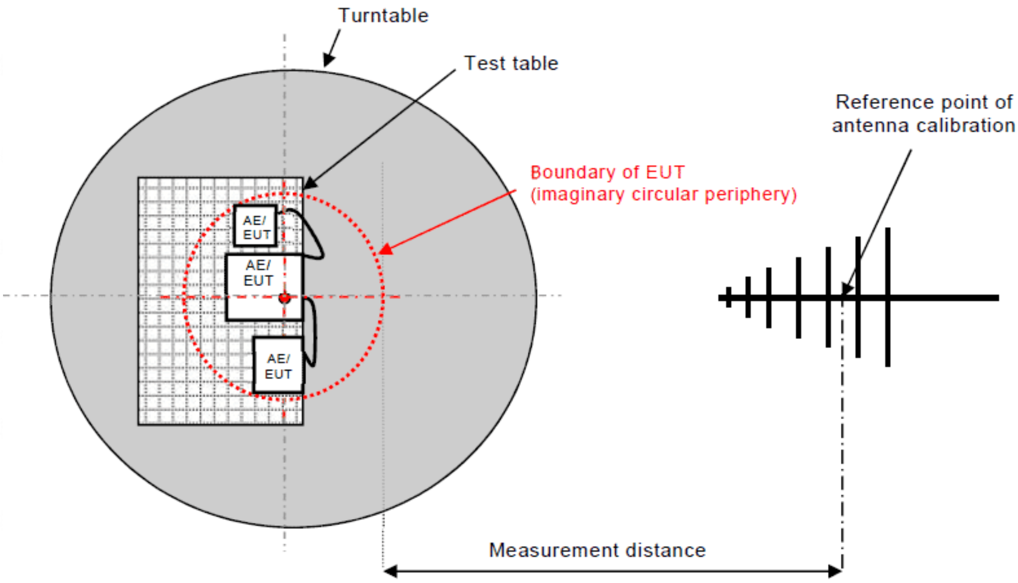
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1900	50.55	10.01	60.56	64.04	-3.48	QP
2		0.1900	33.47	10.01	43.48	54.04	-10.56	AVG
3		0.2300	48.94	10.00	58.94	62.45	-3.51	QP
4		0.2300	35.15	10.00	45.15	52.45	-7.30	AVG
5	*	0.6340	42.65	9.97	52.62	56.00	-3.38	QP
6		0.6340	28.81	9.97	38.78	46.00	-7.22	AVG
7		1.0260	37.44	9.98	47.42	56.00	-8.58	QP
8		1.0260	22.44	9.98	32.42	46.00	-13.58	AVG
9		6.2100	29.77	10.21	39.98	60.00	-20.02	QP
10		6.2100	20.04	10.21	30.25	50.00	-19.75	AVG
11		28.7100	30.27	10.64	40.91	60.00	-19.09	QP
12		28.7100	19.31	10.64	29.95	50.00	-20.05	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

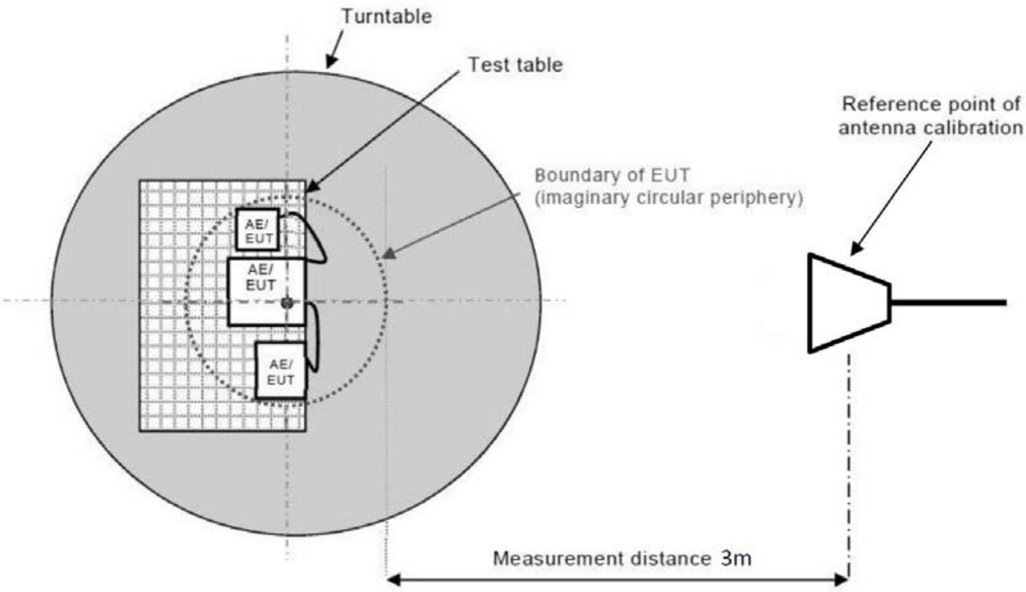
7. RADIATEDEMISSIONS TEST

7.1 Block Diagram Of Test Setup

30MHz ~ 1GHz:



Above 1GHz:



7.2 Limits

Limits for radiated disturbance of Class B MME

Frequency (MHz)	Quasi-peak limits at 3m dB(μV/m)
30-230	40
230-1000	47

Frequency (GHz)	limit above 1G at 3m dB(μV/m)	
	Average	peak
1-3	50	70
3-6	54	74

Note: The lower limit shall apply at the transition frequencies.

7.3 Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the nonconductive turntable 0.8mabove the ground in a semi anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable0.8m above the ground in a full anechoic chamber..

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is variedin both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

7.4 Test Results

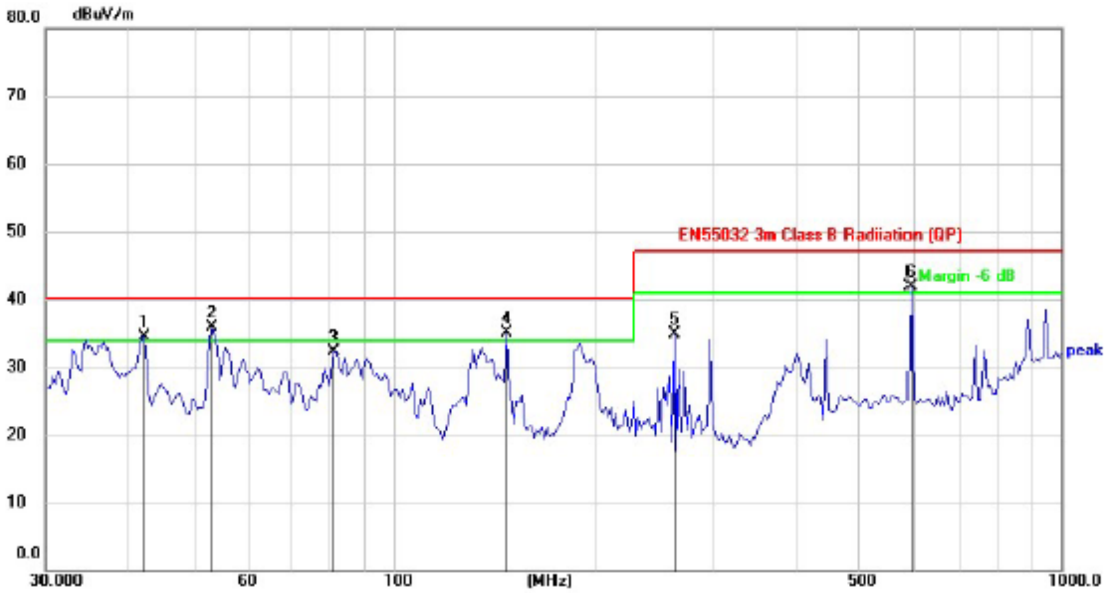
Below 1GHz

Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Horizontal
Test Mode	1(the worst data)	Remark:	N/A

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dB/m	dB	
1	!	45.6946	40.60	-6.56	34.04	40.00	-5.96	QP
2		89.7471	43.42	-10.21	33.21	40.00	-6.79	QP
3		147.9214	38.45	-5.47	32.98	40.00	-7.02	QP
4		263.8190	43.37	-7.17	36.20	47.00	-10.80	QP
5		446.4139	40.71	-1.40	39.31	47.00	-7.69	QP
6	*	596.1770	39.32	2.36	41.68	47.00	-5.32	QP

Remark: Result=Reading +Factor
Over Limit=Result -Limit

Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Vertical
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	!	42.2280	40.97	-6.50	34.47	40.00	-5.53	QP
2	*	53.5052	42.78	-6.95	35.83	40.00	-4.17	QP
3		81.4967	42.69	-10.46	32.23	40.00	-7.77	QP
4	!	147.9214	40.62	-5.47	35.15	40.00	-4.85	QP
5		263.8190	42.07	-7.17	34.90	47.00	-12.10	QP
6	!	596.1770	39.54	2.36	41.90	47.00	-5.10	QP

Remark: Result=Reading +Factor
Over Limit=Result -Limit

Above 1GHz

Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Horizontal
Test Mode	1(the worst data)	Remark:	N/A

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	1969.32	46.63	1.44	48.07	70.00	-21.93	peak
2	1965.45	29.17	1.44	30.61	50.00	-19.39	AVG
3	3774.85	44.57	5.76	50.33	74.00	-23.67	peak
4	3774.44	25.22	5.76	30.98	54.00	-23.02	AVG
5	4841.77	41.53	9.54	51.07	74.00	-22.93	peak
6	4843.66	25.57	9.54	35.11	54.00	-18.89	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

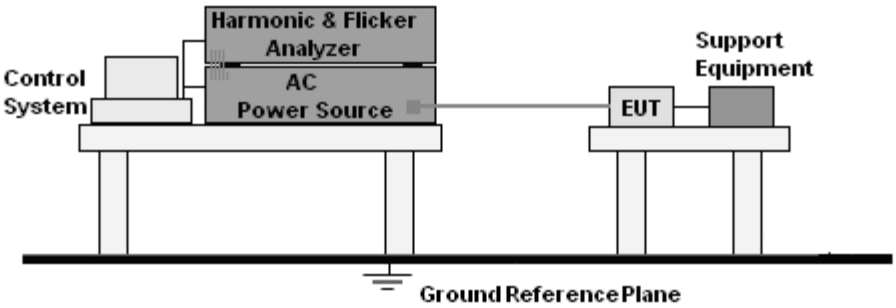
Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Vertical
Test Mode	1(the worst data)	Remark:	N/A

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	1997.58	46.91	1.50	48.40	70.00	-21.60	peak
2	1995.07	29.54	1.50	31.04	50.00	-18.96	AVG
3	3806.41	45.69	5.93	51.62	74.00	-22.38	peak
4	3810.25	28.20	5.93	34.13	54.00	-19.87	AVG
5	4773.12	44.51	9.35	53.86	74.00	-20.14	peak
6	4771.52	26.54	9.35	35.89	54.00	-18.11	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

8. HARMONIC CURRENT EMISSION(H)

8.1 Block Diagram of Test Setup



8.2 Limit

EN IEC 61000-3-2:2019 Clause 7.

8.3 Test Procedure

a. The Product was placed on the top of a non-conductive table above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

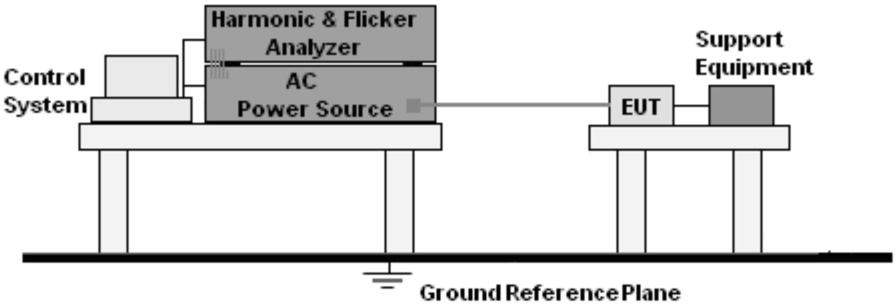
b. The correspondent test program of test instrument to measure the current harmonics emanated from Product was chosen. The measure time shall be not less than the time necessary for the Product to be exercised.8.4 Test Results

Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Mode	1(the worst data)
Remark:	N/A	Test results	N/A

Remark: No limits apply for equipment with an active input power up to and including 75W.

9. VOLTAGE FLUCTUATIONS & FLICKER(F)

9.1 Block Diagram of Test Setup



9.2 Limit

EN 61000-3-3:2013/A1:2019 Clause 5.

9.3 Test Procedure

a. The Product was placed on the top of a non-conductive table above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

b. During the flick test, the measure time shall include that part of whole operation cycle in which the Product produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

9.4 Test Results

Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Mode	1(the worst data)
Remark:	N/A	Test results	PASS

```
Voltage Variations
           Nominal Voltage: 230 Vrms
  Highest Half-cycle level:  -0.47%
   Lowest Half-cycle level:  -0.35%

                    d(max):   0.00%          Limit: 4%     PASS
                    t(max):   0.00seconds    Limit: 500ms  PASS

   Steady State definition: >1000ms within +/- 0.2%
  Largest d(c) change down:   0.00%
    Largest d(c) change up:  +0.00%
       Largest d(c) change:   0.00%          Limit: 3.3%   PASS

Flicker
```

Pst Classifier Duration	Flicker
0.1%	0.00
0.7%	0.00
1.0%	0.00
1.5%	0.00
2.2%	0.00
3%	0.00
4%	0.00
6%	0.00
8%	0.00
10%	0.00
13%	0.00
17%	0.00
30%	0.00
50%	0.00
80%	0.00

Plt Calculation Interval	Pst

10. IMMUNITY TEST OF GENERAL THE PERFORMANCE CRITERIA

Product Standard	ETSI EN 301 489-1
The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests. For the purpose of the present document two categories of performance criteria apply: • Performance criteria for continuous phenomena. • Performance criteria for transient phenomena. NOTE: Normally, the performance criteria depends upon the type of radio equipment and/or its intended application. Thus, the present document only contains general performance criteria commonly used for the assessment of radio equipment.	
Performance criteria for continuous phenomena	During the test, the equipment shall: • continue to operate as intended; • not unintentionally transmit; • not unintentionally change its operating state; • not unintentionally change critical stored data.
Performance criteria for transient phenomena	For all ports and transient phenomena with the exception described below, the following applies: • The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data. • After application of the transient phenomena, the equipment shall operate as intended. For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies: • For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. • For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

According To EN 301489 -17standard, The General Performance Criteria As Following:

General performance criteria
The performance criteria are:
• performance criteria A for immunity tests with phenomena of a continuous nature;
• performance criteria B for immunity tests with phenomena of a transient nature;
• performance criteria C for immunity tests with power interruptions exceeding a certain time.
The equipment shall meet the minimum performance criteria as specified in the following clauses.

Table 1: Performance criteria

Criteria	During the test	After test (i.e. as a result of the application of the test)
A	Shall operate as intended. (see note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.
NOTE: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.		

Minimum performance level
For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.
For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

Performance criteria for Continuous phenomena applied to Transmitters (CT)

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage The performance criteria A shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission

resulting from the application of the test is correctly interpreted.

Performance criteria for Transient phenomena applied to Transmitters (TT)

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Continuous phenomena applied to Receivers (CR)

The performance criteria A shall apply.

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Transient phenomena applied to Receivers (TR)

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms durationfor which performance criteria C shall apply.
Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. Insystems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

According To EN 301489 -3 standard, The General Performance Criteria As Following:

Table 1: Performance criteria

Criteria	During the test	After test (i.e. as a result of the application of the test)
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions
NOTE: Whether a phenomenon is considered transient, continuous or otherwise is indicated in the test proceduresfor the phenomenon in ETSI EN 301 489-1 [1], clause 9.		

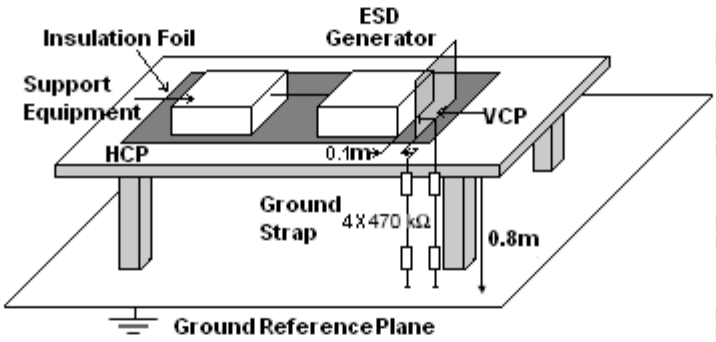
- performance criterion A applies for immunity tests with phenomena of a continuous nature;
- performance criterion B applies for immunity tests with phenomena of a transient nature.

11. ELECTROSTATIC DISCHARGE (ESD)

11.1 Test Specification

Test Port	:	Enclosure port
Discharge Impedance	:	330 ohm / 150 pF
Discharge Mode	:	Single Discharge
Discharge Period	:	one second between each discharge

11.2 Block Diagram of Test Setup



11.3 Test Procedure

a. Electrostatic discharges were applied only to those points and surfaces of theProduct that are accessible to users during normal operation.

b. The test was performed with at least ten single discharges on the pre-selectedpoints in the most sensitive polarity.

c. The time interval between two successive single discharges was at least 1second.

d. The ESD generator was held perpendicularly to the surface to which thedischarge was applied and the return cable was at least 0.2 meters from theProduct.

e. Contact discharges were applied to the non-insulating coating, with the pointedtip of the generator penetrating the coating and contacting the conductingsubstrate.

f. Air discharges were applied with the round discharge tip of the dischargeelectrode approaching the Product as fast as possible (without causing mechanicaldamage) to touch the Product. After each discharge, the ESD generator wasremoved from the Product and re-triggered for a new single discharge. The testwas repeated until all discharges were complete.

g. At least ten single discharges (in the most sensitive polarity) were applied to theHorizontal Coupling Plane at points on each side of the Product. The ESDgenerator was positioned vertically at a distance of 0.1 meters from the Productwith the discharge electrode touching the HCP.

h. At least ten single discharges (in the most sensitive polarity) were applied to thecenter of one vertical edge of the Vertical Coupling Plane in sufficiently differentpositions that the four faces of the Product were completely illuminated. The VCP(dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from theProduct.

.

11.4 Test Results

Temperature：	23℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1-4

Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	PerformanceCriterion
Contact Discharge	Conductive Surfaces	4	10	A
	Indirect Discharge HCP	4	10	A
	Indirect Discharge VCP	4	10	A
Air Discharge	Slots, Apertures, and Insulating Surfaces	8	10	A
Note: A: No performance degradation during test. B: During the test, the EUT shut down, after the test, it reset by itself. C: During the test, the EUT shut down, after the test, it reset by user.				

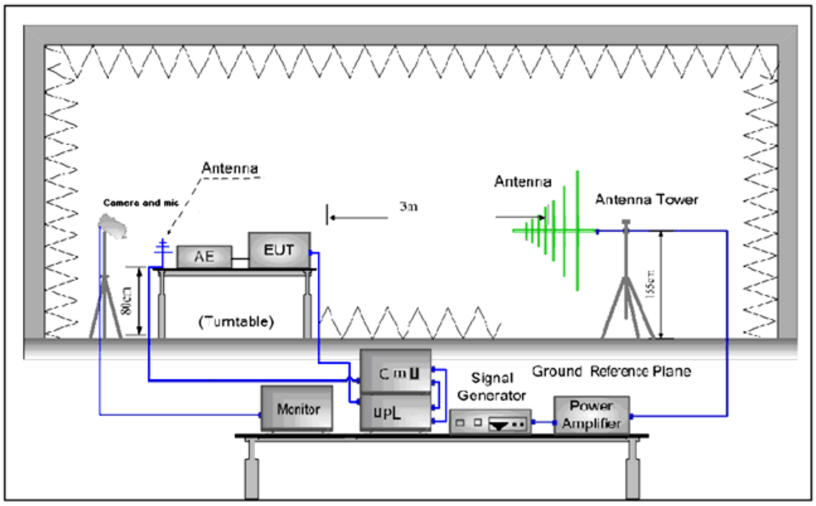
12. CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES(RS)

12.1 Test Specification

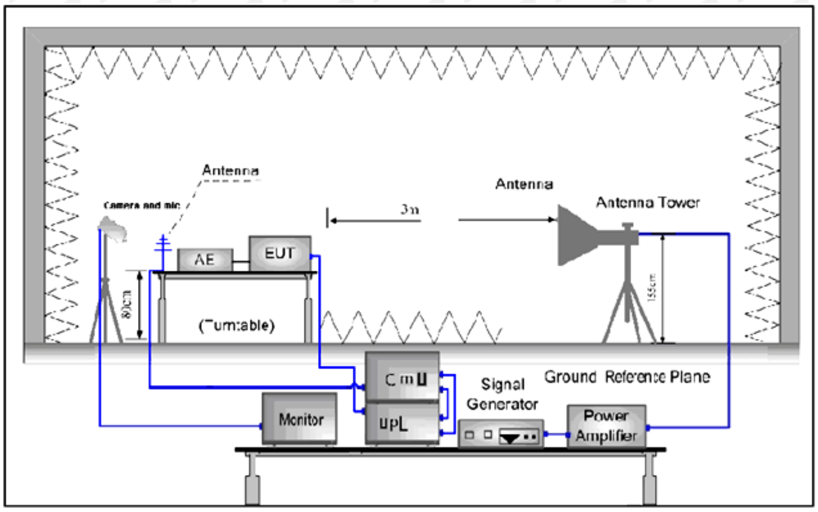
Test Port	:	Enclosure port
Step Size	:	1%
Modulation	:	1kHz, 80% AM
Dwell Time	:	1 second
Polarization	:	Horizontal & Vertical

12.2 Block Diagram of Test Setup

Below 1GHz:



Above 1GHz:



12.3 Test Procedure

a. The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the Product.

b. The frequency range is swept from 80MHz to 6000MHz,with the signal 80% amplitude modulated with a 1 kHz sine wave,and the step size was 1%.

c. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond, but should not exceed 5 s at each of the frequencies during the scan.

d. The test was performed with the Product exposed to both vertically and horizontally polarized fields on each of the four sides.

e. For Broadcast reception function:Group 2 not apply in this test.

12.4 Test Results

Temperature：	23 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1-4

Frequency	**Position**	**Field Strength**	**PerformanceCriterion**
80 - 6000MHz	Front, Right, Back, Left, Up, Down	3V/m	A
Note: A: No performance degradation during test.			

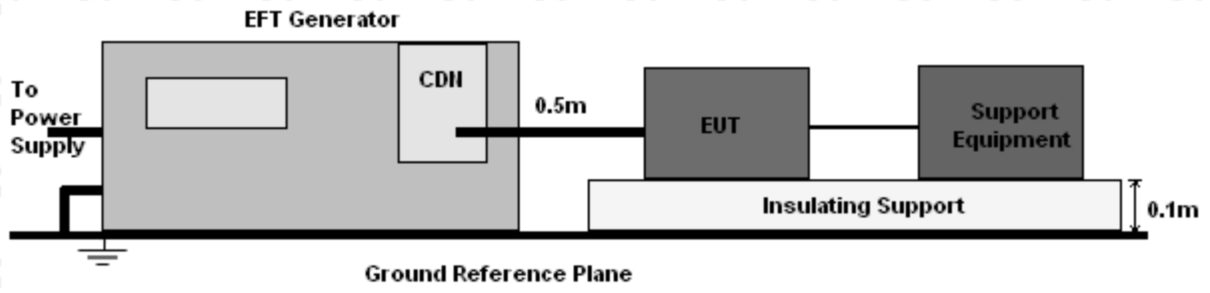
13. ELECTRICAL FAST TRANSIENTS/BURST (EFT)

13.1 Test Specification

Test Port	:	input a.c. power port
Impulse Frequency	:	5 kHz
Impulse Wave-shape	:	5/50 ns
Burst Duration	:	15 ms
Burst Period	:	300 ms
Test Duration	:	2 minutes per polarity

13.2 Block Diagram of EUT Test Setup

For input a.c.power port:



13.3 Test Procedure

a. The Product and support units were located on a non-conductive table above ground reference plane.

b. A 0.5m-long power cord was attached to Product during the test.

13.4 Test Results

Temperature：	23 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1-Mode 19

Coupling	Voltage (kV)	Polarity	PerformanceCriterion
AC MainsL-N	1.0	±	A
Signal Line	0.5	±	N/A
Telec Ports	0.5	±	N/A
DC Ports	0.5	±	N/A

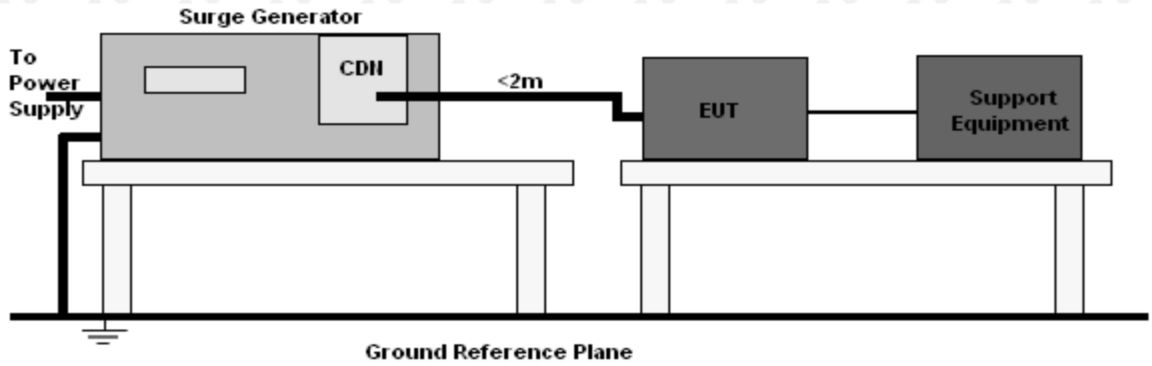
Note: A: No performance degradation during test.
B: During the test, the EUT shut down, after the test, it reset by itself.
C: During the test, the EUT shut down, after the test, it reset by user.

14. SURGES IMMUNITY TEST

14.1 Test Specification

Test Port	:	input a.c. power port
Wave-Shape	:	Open Circuit Voltage - 1.2 / 50 us Short Circuit Current - 8 / 20 us
Pulse Repetition Rate	:	1 pulse / min.
Phase Angle	:	0° / 90° / 180° / 270°
Test Events	:	5 pulses (positive & negative) for each polarity

14.2 Block Diagram of EUT Test Setup



14.3 Test Procedure

a. The surge is to be applied to the Product power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave.

b. The power cord between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter). Interconnection line between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter).

14.4 Test Result

Temperature :	23 ℃	Relative Humidity :	54%
Pressure :	101kPa	Test Mode :	Mode1-4

Coupling Line	Voltage (kV)	Polarity	PerformanceCriterion
L - N	1	±	A
L - PE	2	±	N/A
N - PE	2	±	N/A
LAN Ports	±1	/	N/A

Note: A: No performance degradation during test.
B: During the test, the EUT shut down, after the test, it reset by itself.
C: During the test, the EUT shut down, after the test, it reset by user.

Remark: No test shall be required where normal functioning cannot be achieved because of the impact of the CDN on the Product.

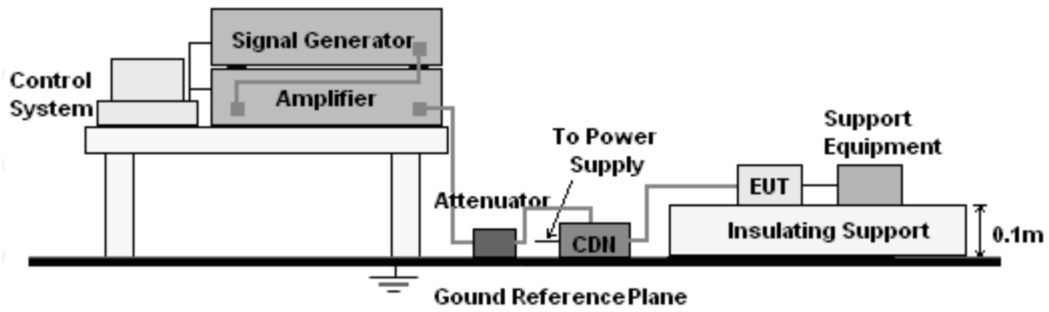
15. CONTINUOUS INDUCED RF DISTURBANCES (CS)

15.1 Test Specification

Test Port	:	input a.c.power port
Step Size	:	1%
Modulation	:	1kHz, 80% AM
Dwell Time	:	1 second

15.2 Block Diagram of EUT Test Setup

For input a.c. power port:



15.3 Test Procedure

For input a.c.power port:

a. The Product and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.

b. The frequency range is swept from 150 kHz to 10MHz, 10MHz to 30MHz, 30MHz to 80MHz with the signal 80% amplitude modulated with a 1 kHz sine wave, and the step size was 1% of fundamental.

c. The dwell time at each frequency shall be not less than the time necessary for the Product to be able to respond.

15.4 Test Result

Temperature：	23 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1-Mode 20

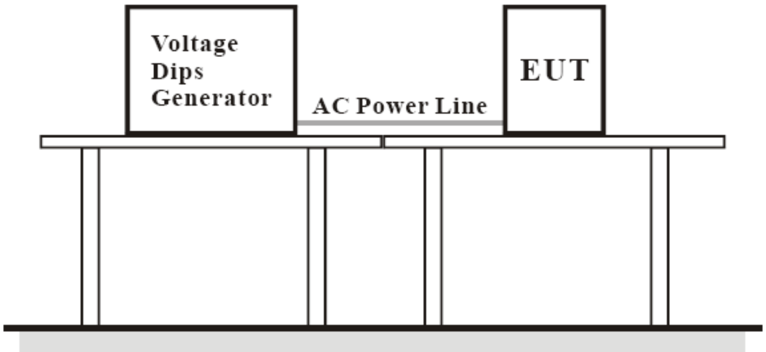
Inject Line	Frequency (MHz)	Voltage Level (V r.m.s.)	PerformanceCriterion
ac. port	0.15 - 80	3	A
Telec Ports	0.15 - 80	3	N/A
Note: A: No performance degradation during test.			

16. VOLTAGE DIPS AND INTERRUPTIONS (DIPS)

16.1 Test Specification

Test Port	:	input a.c. power port
Phase Angle	:	0°, 180°
Test cycle	:	3 times

16.2 Block Diagram of EUT Test Setup



16.3 Test Procedure

a. The Product and support units were located on a non-conductive table above ground floor.

b. Set the parameter of tests and then perform the test software of test simulator.

c. Conditions changes to occur at 0 degree crossover point of the voltage waveform.

16.4 Test Result

Temperature：	23 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1-4

Voltage Dips:			
Test Level % U_T	**Voltage dips in % U_T**	**Duration (ms)**	**PerformanceCriterion**
0	100	10	A
0	100	20	A
70	30	500	A
Voltage Interruptions:			
0	100	5000	C
Note: A: No performance degradation during test. B: During the test, the EUT shut down, after the test, it reset by itself. C: During the test, the EUT shut down, after the test, it reset by user.			

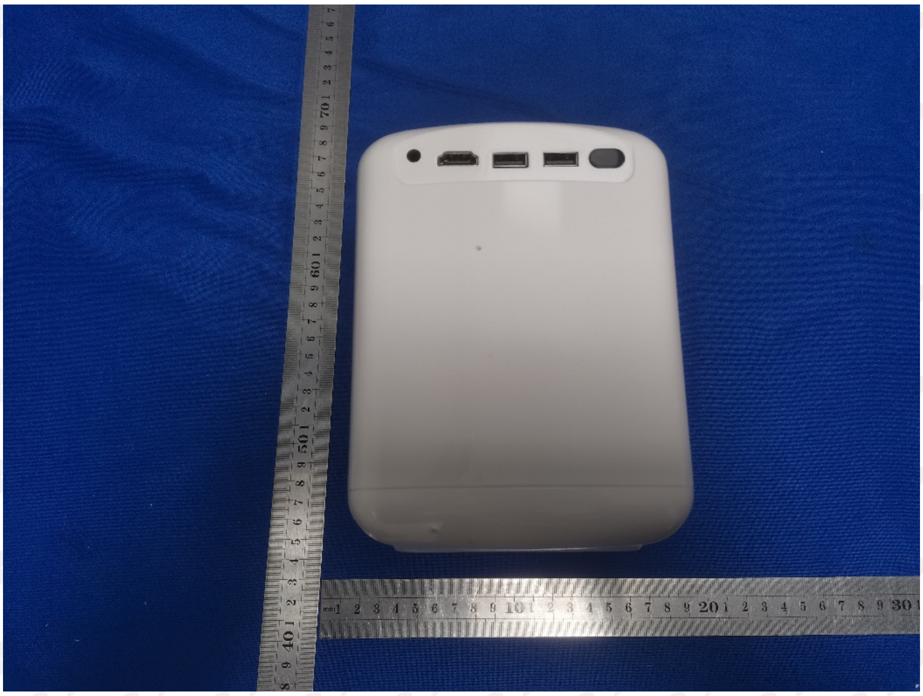
17. EUT PHOTOGRAPHS

External Photos

EUT Photo 1

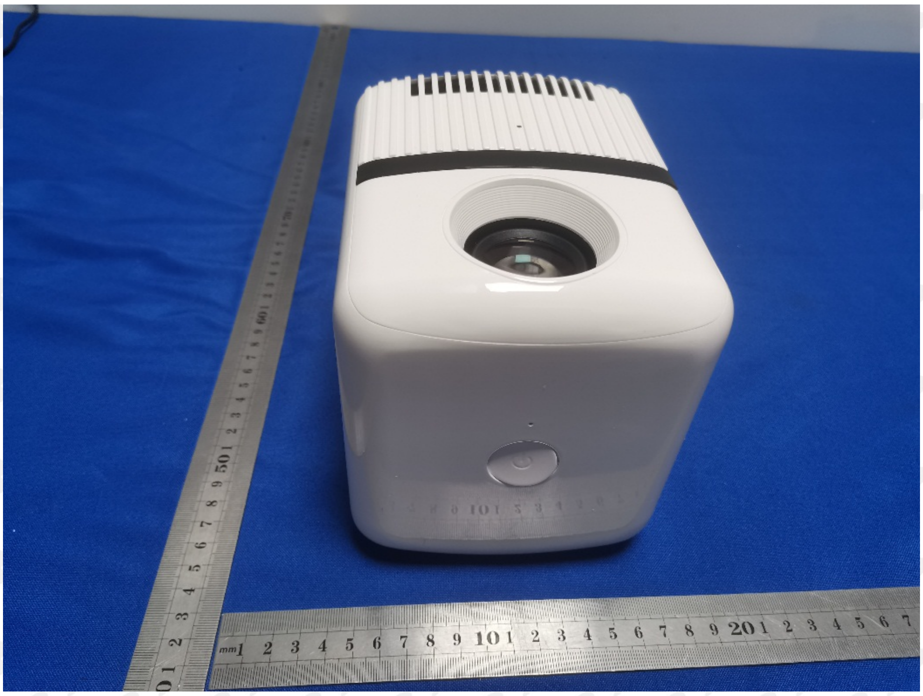
EUT Photo 2

EUT Photo 3

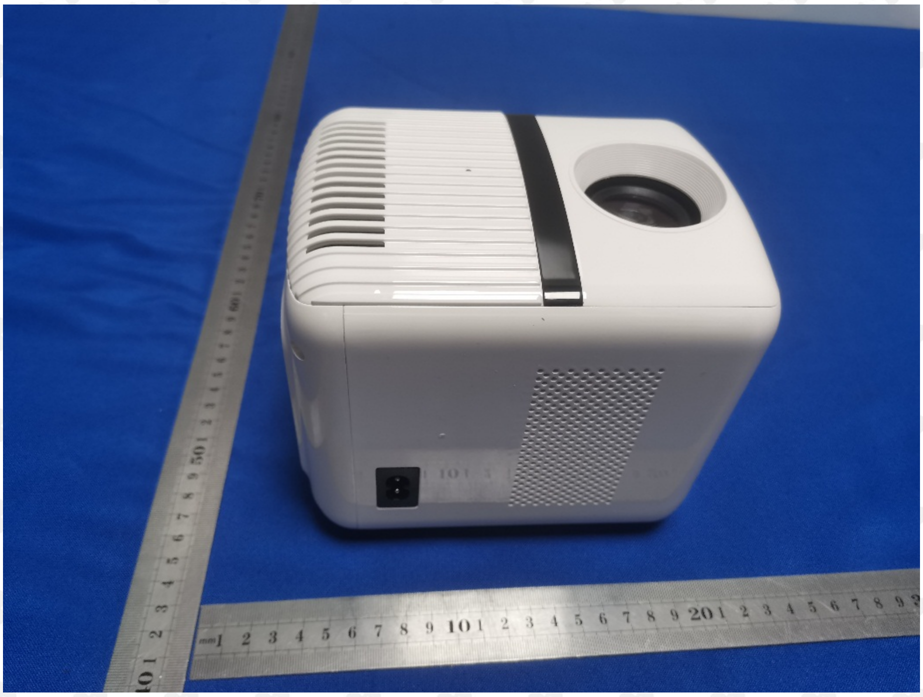


EUT Photo 4

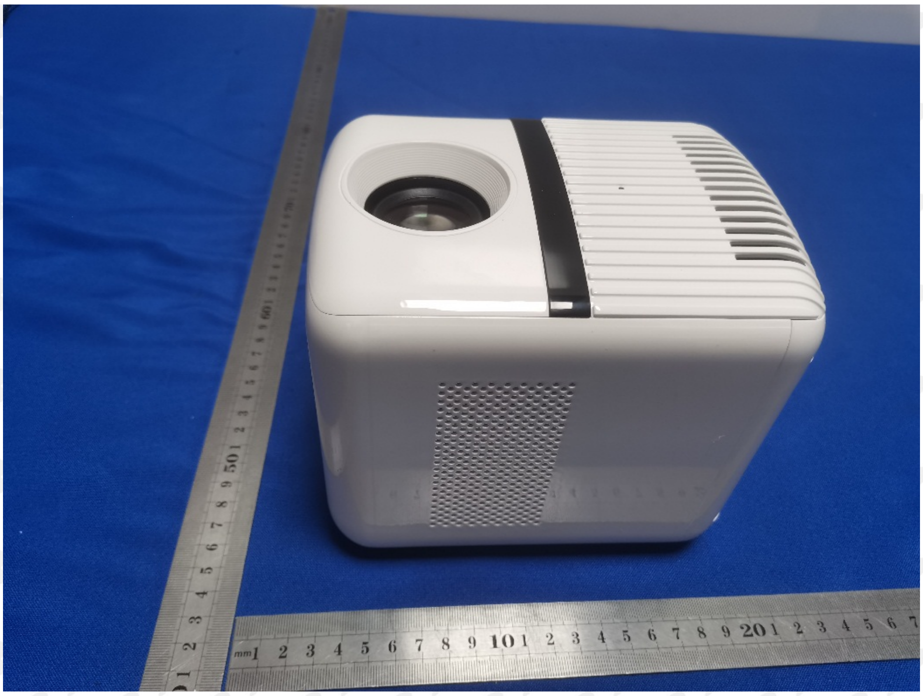
EUT Photo 5



EUT Photo 6

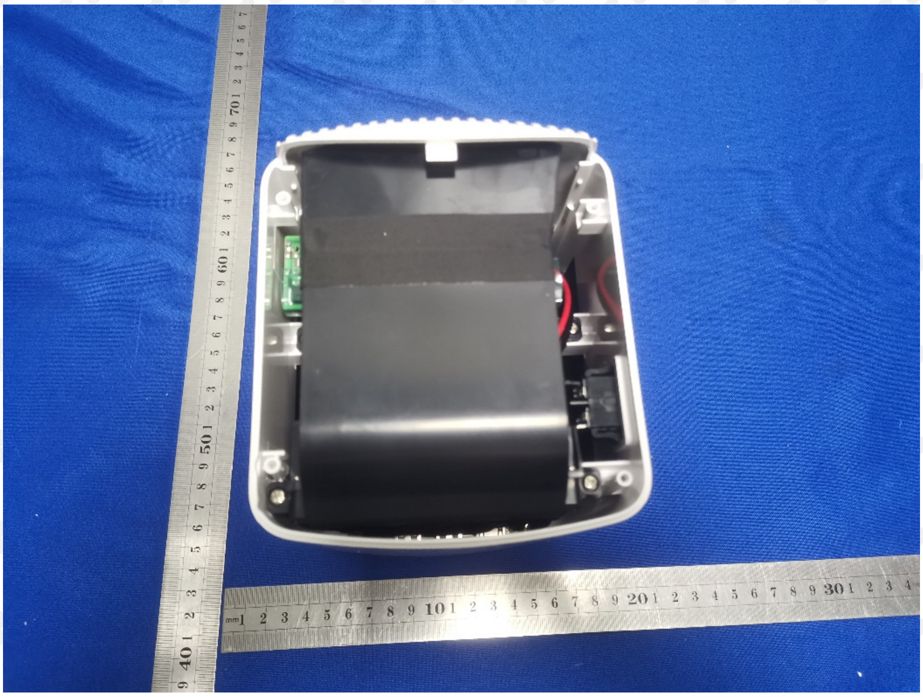


EUT Photo 7

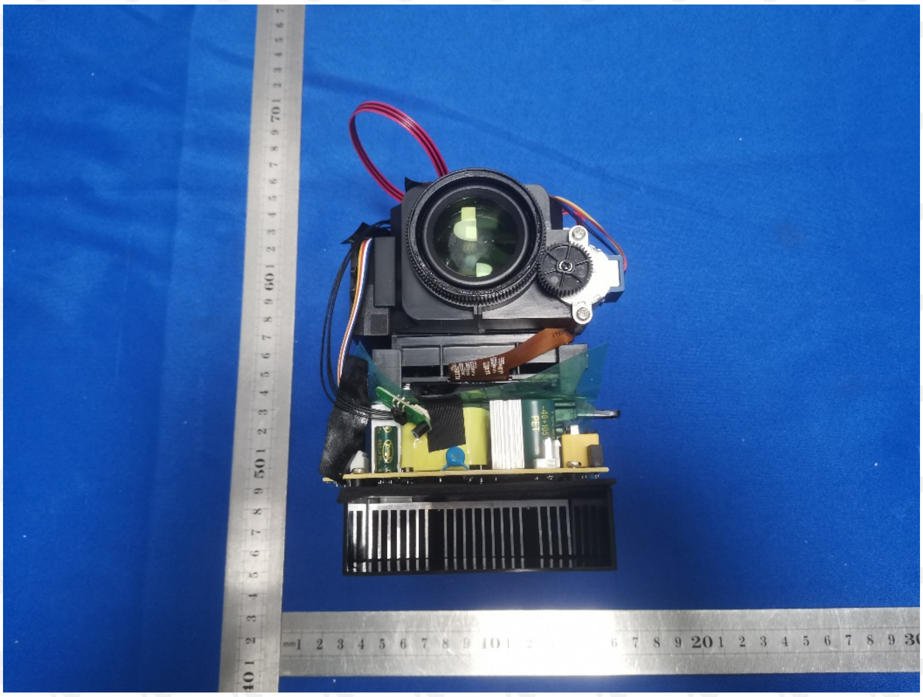


Internal Photos

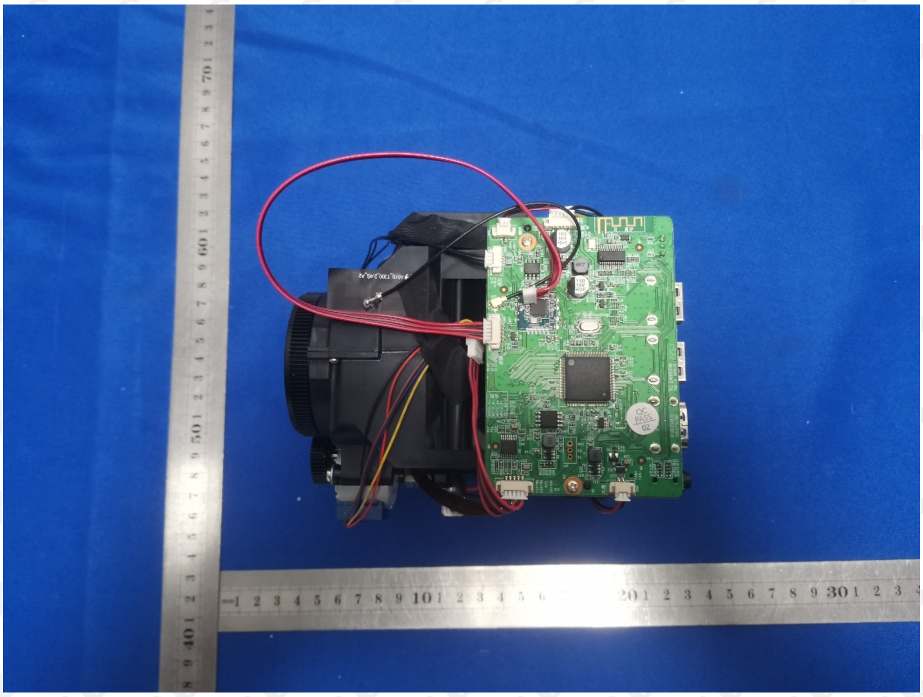
EUT Photo 1



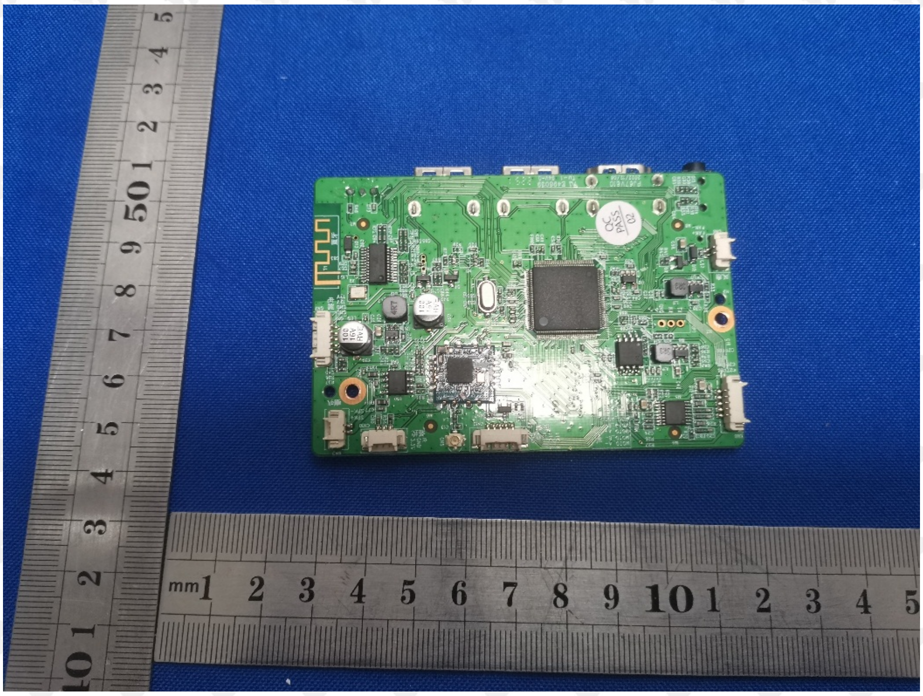
EUT Photo 2



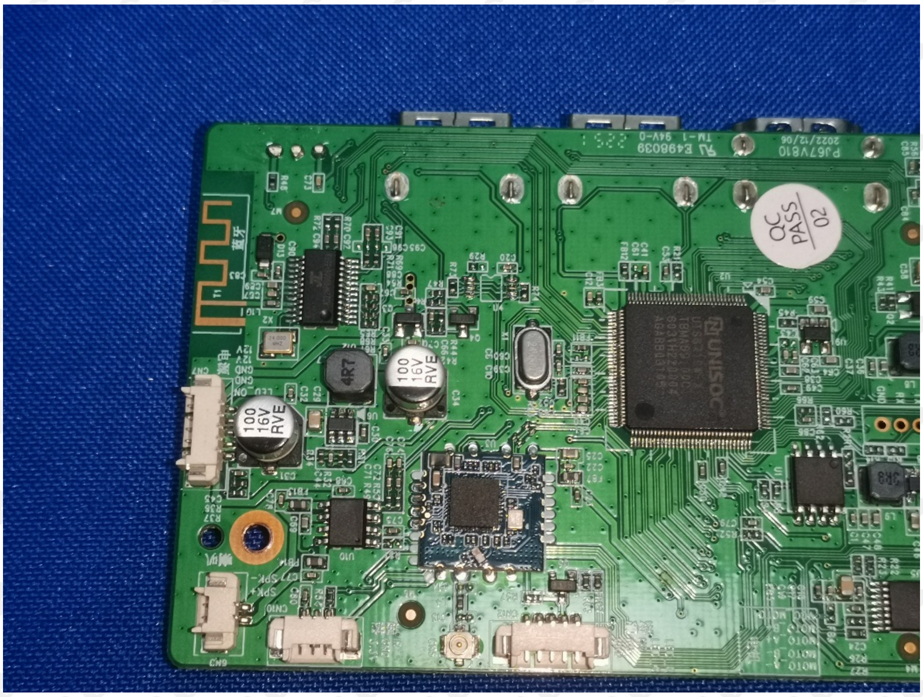
EUT Photo 3



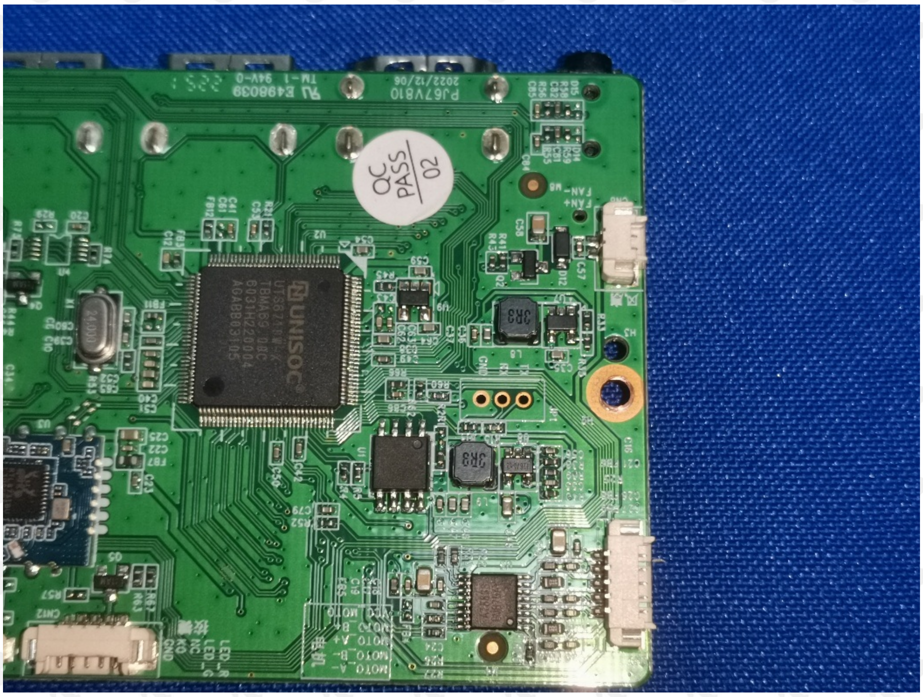
EUT Photo 4



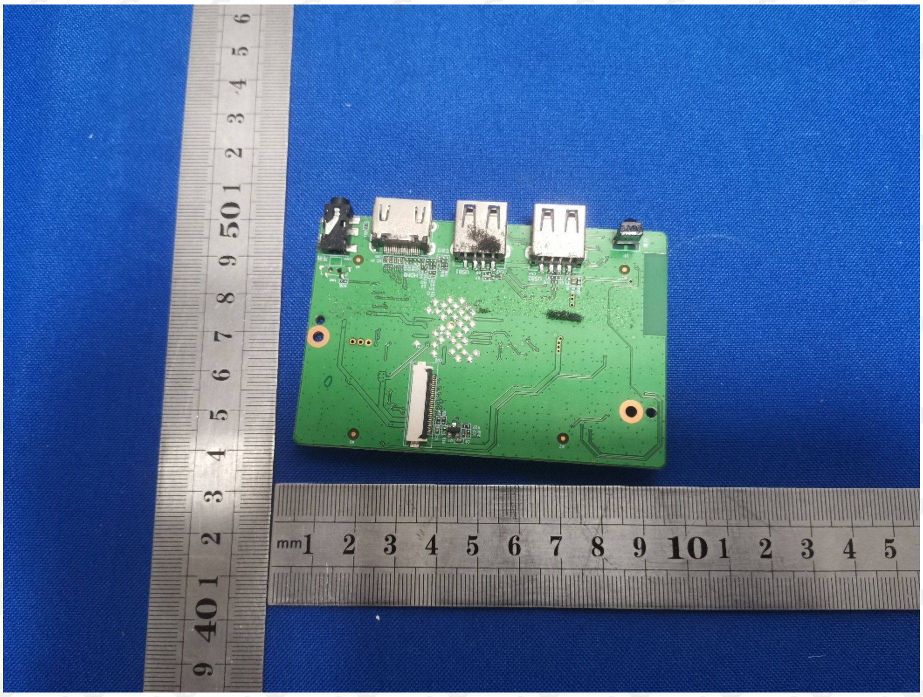
EUT Photo 5



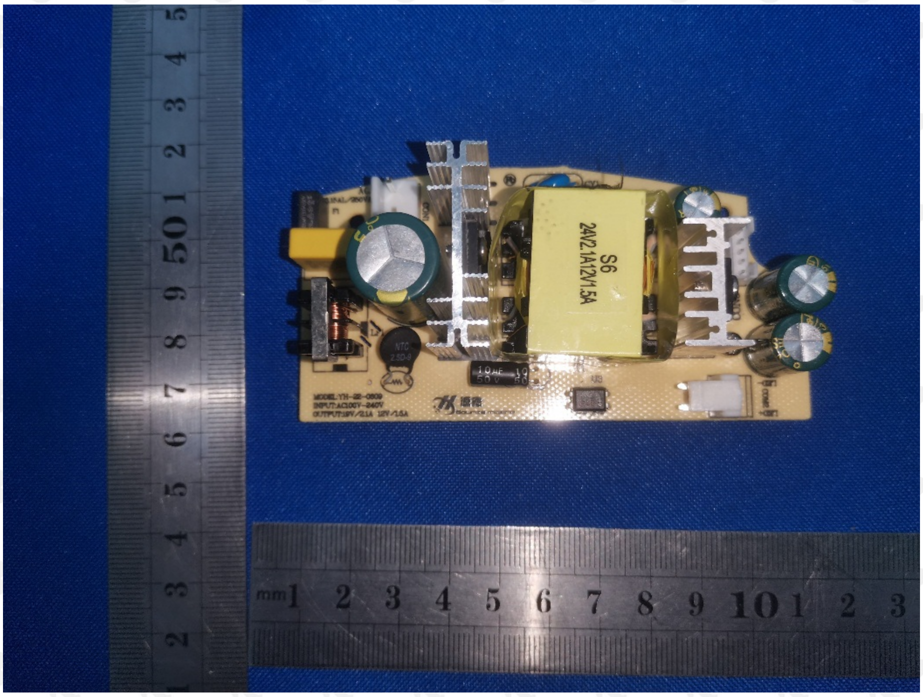
EUT Photo 6



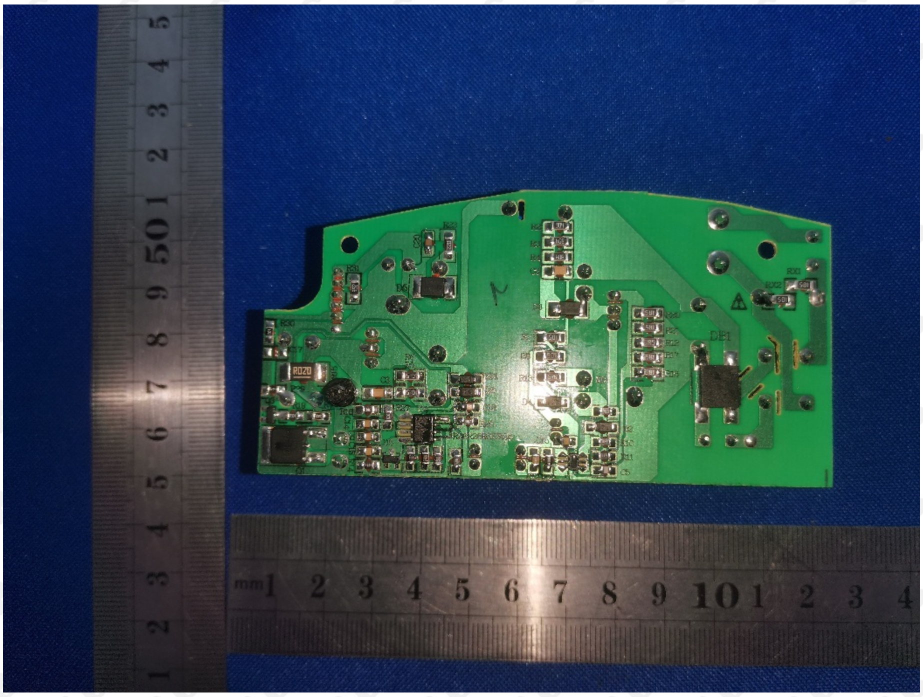
EUT Photo 7



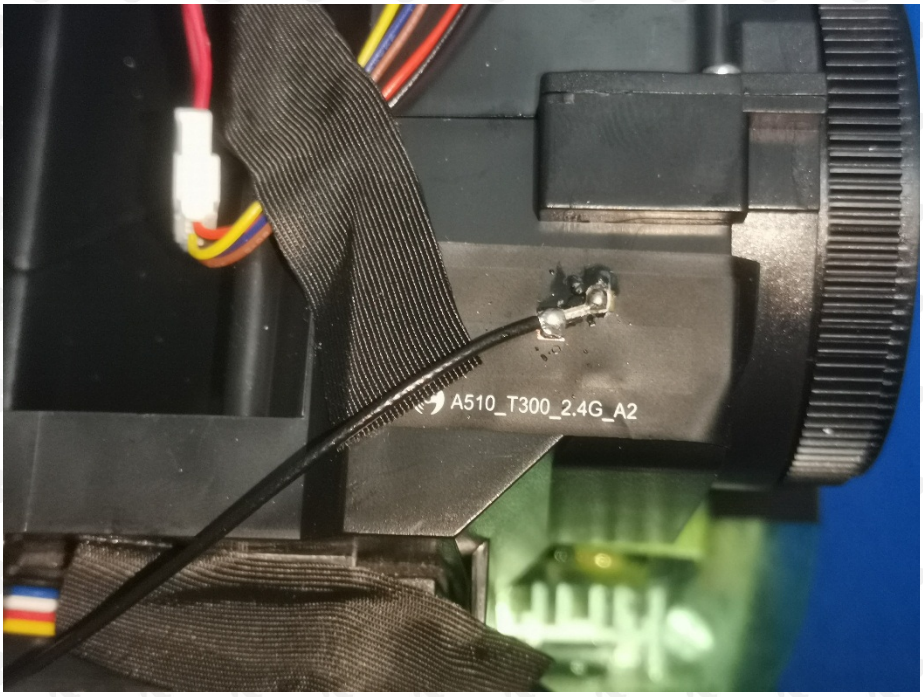
EUT Photo 8



EUT Photo 9

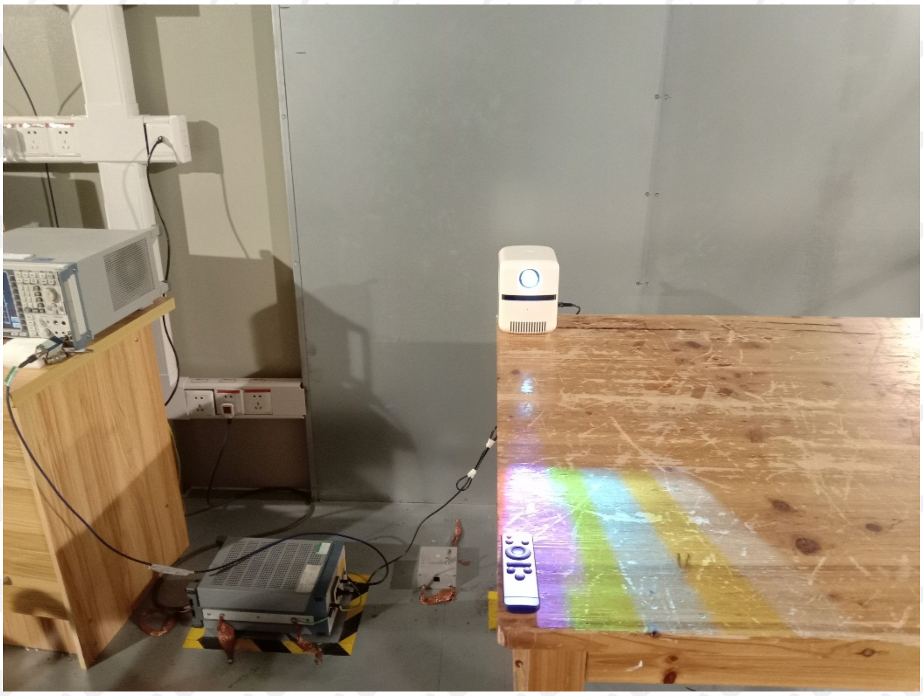


EUT Photo 10



18. EUT TEST SETUP PHOTOGRAPHS

Conducted emissions

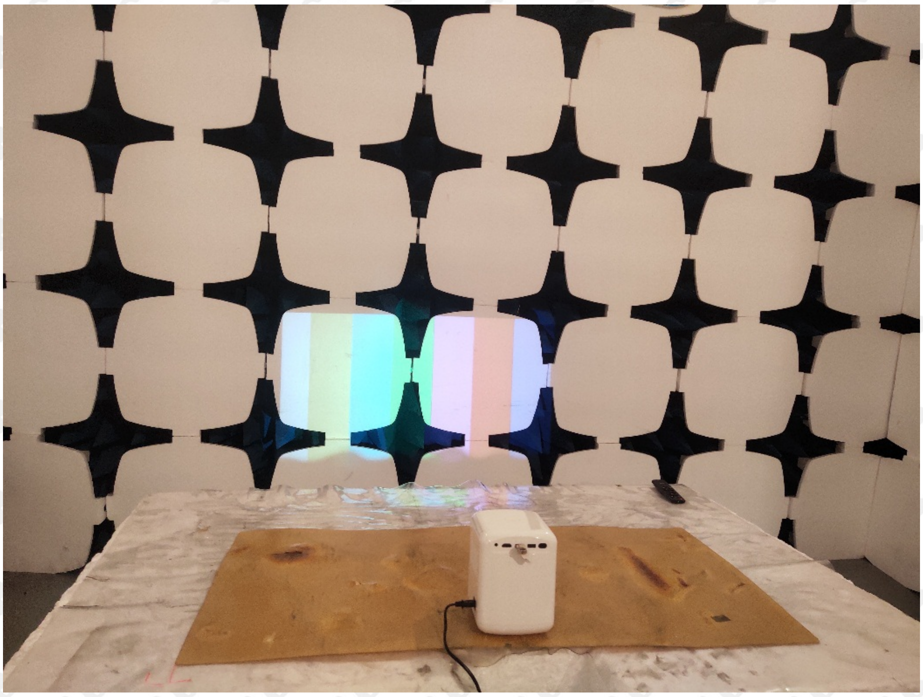


Radiated emissions below 1G

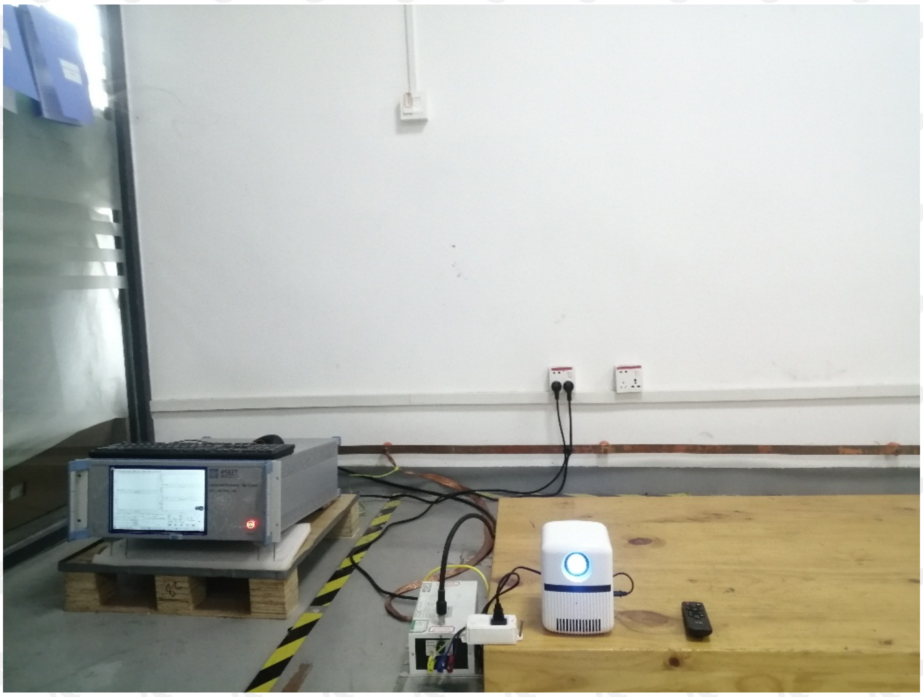
H/F

ESD

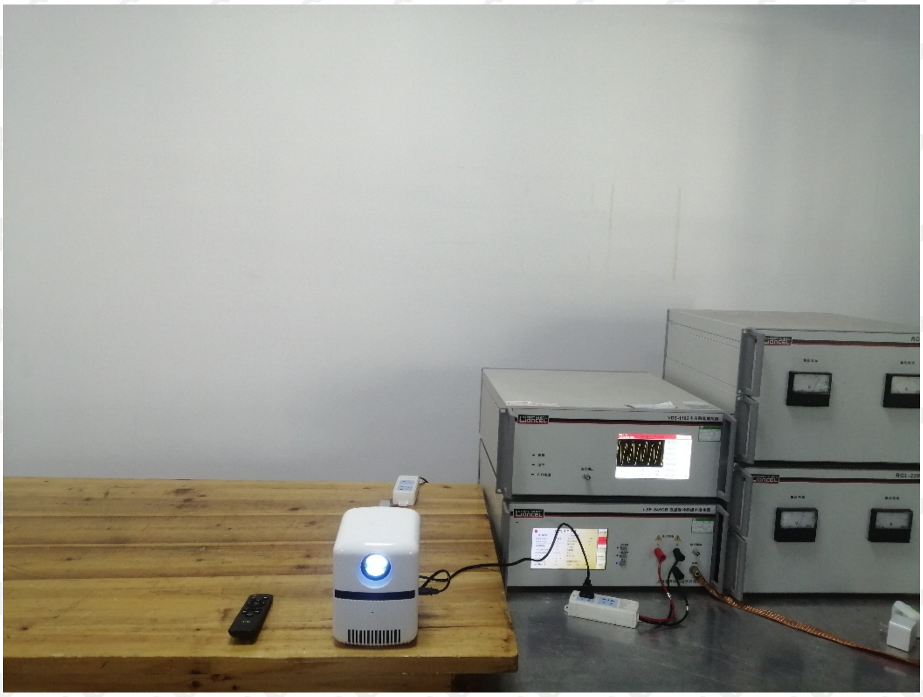
RS



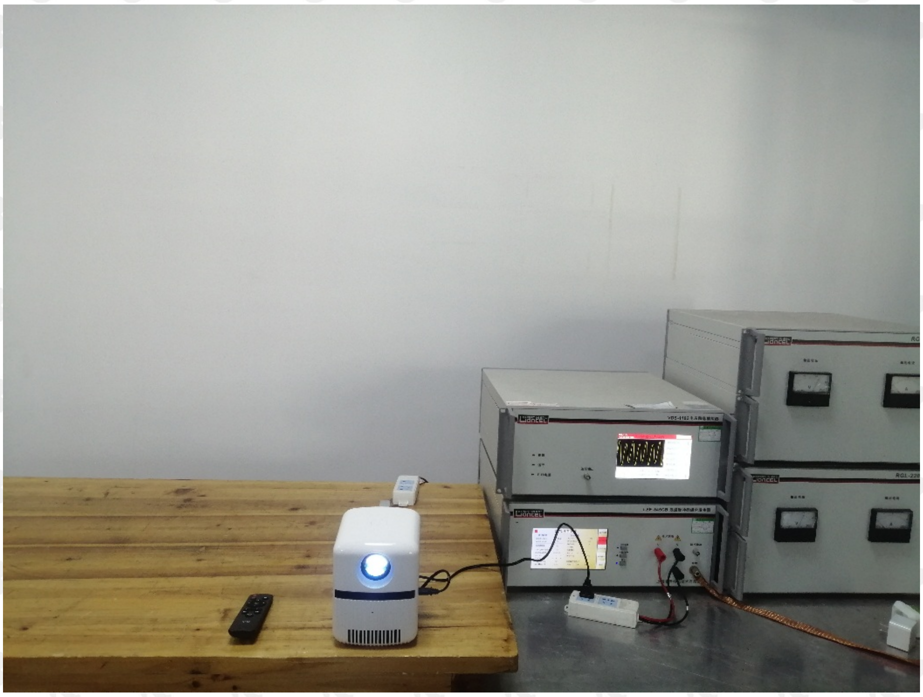
CS



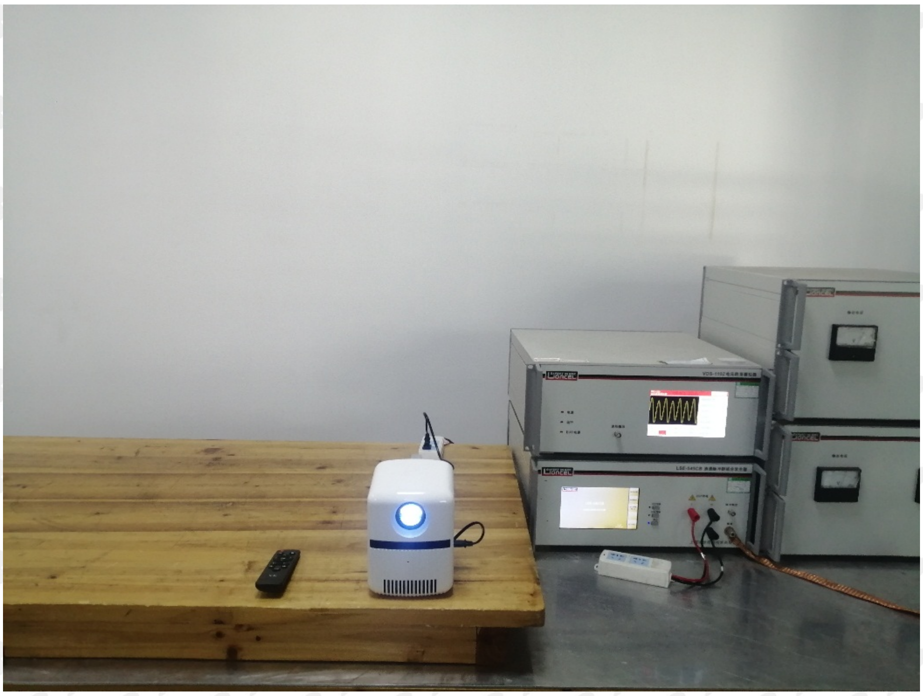
EFT



Surges



DIPS



※※※※※ END OF REPORT ※※※※※

TEST REPORT

Product Name:	Projector
Trademark:	GJTOS, xinteprid, clokowe, ELEPHAS, GOODEE, Cibest, ARTSEA, YABER, WIMIUS, Uyole, Bacar, Lifegoods, BLAUPUNKT, EKO, VOLLPS, Auking, AngBeam, Thundeal
Model Number:	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Prepared For:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Manufacturer:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	Jan. 29, 2023
Sample tested Date:	Jan. 29, 2023 to Feb. 16, 2023
Issue Date:	Feb. 16, 2023
Report No.:	CTB230216022RFX
Test Standards	ETSI EN 300 328 V2.2.2 (2019-07)
Test Results	PASS
Remark:	This is WIFI-2.4GHz band radio test report.

Compiled by:	Reviewed by:	Approved by:
ChenZheng	Arron Liu	CTB TESTING TECHNOLOGY INTERNATIONAL CTB Bin Mei
Chen Zheng	Arron Liu	Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

TABLE OF CONTENT

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB230216022RFX	Feb. 16, 2023	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	ETSI EN 300 328 V2.2.2		
Test Item	**Test Requirement**	**Test Method**	**Results**
Transmitter Parameters			
RF Output Power	Clause 4.3.2.2	Clause 5.4.2	PASS
Power Spectral Density	Clause 4.3.2.3	Clause 5.4.3	PASS
Duty cycle, Tx-Sequence, Tx-gap	Clause 4.3.2.4	Clause 5.4.4	N/A[1]
Medium Utilization (MU) factor	Clause 4.3.2.5	Clause 5.4.5	N/A[2]
Adaptivity (adaptive equipment using modulations other than FHSS)	Clause 4.3.2.6	Clause 5.4.6	N/A[3]
Occupied Channel Bandwidth	Clause 4.3.2.7	Clause 5.4.7	PASS
Transmitter unwanted emissions in the out-of-band domain	Clause 4.3.2.8	Clause 5.4.8	PASS
Transmitter unwanted emissions in the spurious domain	Clause 4.3.2.9	Clause 5.4.9	PASS
Receiver Parameters			
Receiver spurious emissions	Clause 4.3.2.10	Clause 5.4.10	PASS
Receiver Blocking	Clause 4.3.2.11	Clause 5.4.11	PASS
Geo-location capability	Clause 4.3.2.12	Clause 5.4.12	N/A[4]

Remark:

N/A[1]: Because these requirements apply to non-adaptive frequency hopping equipment mode and RF output power of greater than or equal to 10 dBm.

N/A[2]: Because these requirements apply to non-adaptive frequency hopping equipment mode and RF output power of greater than or equal to 10 dBm.

N/A[3]: Because these requirements apply to adaptive equipment mode and RF output power of greater than or equal to 10 dBm.

N/A[4]: Only for equipment with geo-location capability

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

CH:In this whole report CH means channel.

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated
for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Receiver Reference Sensitivity level	1.9dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63℃
frequency	1×10^{-7}

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: A6
Operation Frequency:	WiFi: IEEE 802.11b/g/n 20: 2412-2472MHz/ 13 channel IEEE 802.11n 40: 2422-2462MHz/ 9 channel
Hardware Version:	PJ67V810
Software Version:	YKV01.20221123
Max. RF output power:	WiFi (2.4G) : 7.54dBm
Type of Modulation:	WiFi: DSSS, OFDM, CCK
Antenna installation:	WiFi: FPC antenna
Antenna Gain:	WiFi (2.4G) : 1.0dBi
Ratings:	AC 100-240V~50/60Hz

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

Item	Equipment	Mfr /Brand	Model/Type No.	Series No.	Note
/	/	/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
1	2412	2	2417	3	2422	4	2427
5	2432	6	2437	7	2442	8	2447
9	2452	10	2457	11	2462	12	2467
13	2472						

4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Low channel	Middle channel	High channel
Transmitting(802.11b/g/n20)	2412MHz	2442MHz	2472MHz
Transmitting(802.11n40)	2422MHz	2442MHz	2462MHz
Receiving(802.11b/g/n20)	2412MHz	2442MHz	2472MHz
Receiving(802.11n40)	2422MHz	2442MHz	2462MHz

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(AC):	230V
Normal Temperature(℃)	23
Low Temperature(℃)	0
High Temperature(℃)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

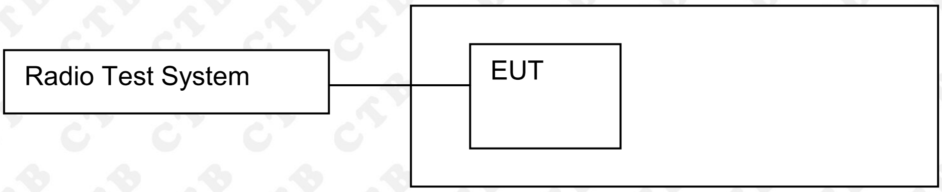
5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2023.07.19
2	Power Sensor	Agilent	U2021XA	MY56120032	2023.07.19
3	Power Sensor	Agilent	U2021XA	MY56120034	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2023.07.19
6	Signal Generator	Agilent	N5181A	MY50140365	2023.07.19
7	Vector signal generator	Agilent	N5182A	MY47420195	2023.07.19
8	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2023.07.19
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2023.07.19
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2023.07.19
12	BT&WI-FI Automatic test software	Micowave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2023.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2023.07.19
15	234G Automatic test software	Micowave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	2023.07.19
18	Amplifier	HP	8447E	2945A02747	2023.07.19
19	Amplifier	Agilent	8449B	3008A01838	2023.07.19
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2023.07.22

21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	2023.07.22
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	2023.07.23
24	loop antenna	ZHINAN	ZN30900A	GTS534	/
25	40G Horn antenna	A/H/System	SAS-574	588	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2024.10.30

6. RF OUTPUT POWER

6.1 Block Diagram Of Test Setup



6.2 Limit

For adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be 20 dBm.

The maximum RF output power for non-adaptive equipment shall be declared by the supplier and shall not exceed 20 dBm. See clause 5.3.1 m). For non-adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be equal to or less than the value declared by the supplier.

This limit shall apply for any combination of power level and intended antenna assembly.

Limit
20dBm

6.3 Test procedure

Step 1:

• Use a fast power sensor suitable for 2.4 GHz and capable of minimum 1 MS/s.

• Use the following settings:

- Sample speed 1 MS/s or faster.
- The samples shall represent the RMS power of the signal.
- Measurement duration: For non-adaptive equipment: equal to the observation period defined in clause 4.3.1.3.2 or clause 4.3.2.4.2. For adaptive equipment, the measurement duration shall be long enough to ensure a minimum number of bursts (at least 10) are captured.

NOTE 1: For adaptive equipment, to increase the measurement accuracy, a higher number of bursts may be used.

Step 2:

• For conducted measurements on devices with one transmit chain:

- Connect the power sensor to the transmit port, sample the transmit signal and store the raw data. Use these stored samples in all following steps.

• For conducted measurements on devices with multiple transmit chains:

- Connect one power sensor to each transmit port for a synchronous measurement on all transmit ports.
- Trigger the power sensors so that they start sampling at the same time. Make sure the time difference between the samples of all sensors is less than 500 ns.
- For each individual sampling point (time domain), sum the coincident power samples of all ports and store them. Use these summed samples in all following steps.

Step 3:

• Find the start and stop times of each burst in the stored measurement samples.

The start and stop times are defined as the points where the power is at least 30 dB below the highest value of the stored samples in step 2.

NOTE 2: In case of insufficient dynamic range, the value of 30 dB may need to be reduced appropriately.

Step 4:

• Between the start and stop times of each individual burst calculate the RMS power over the burst using the formula below. Save these Pburst values, as well as the start and stop times for each burst.

$$P_{burst} = \frac{1}{k}\sum_{n=1}^{k} P_{sample}(n)$$

with 'k' being the total number of samples and 'n' the actual sample number

Step 5:

• The highest of all Pburst values (value "A" in dBm) will be used for maximum e.i.r.p. calculations.

Step 6:

• Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.

• If applicable, add the additional beamforming gain "Y" in dB.

• If more than one antenna assembly is intended for this power setting, the maximum overall antenna gain (G or G + Y) shall be used.

• The RF Output Power (P) shall be calculated using the formula below:

P = A + G + Y

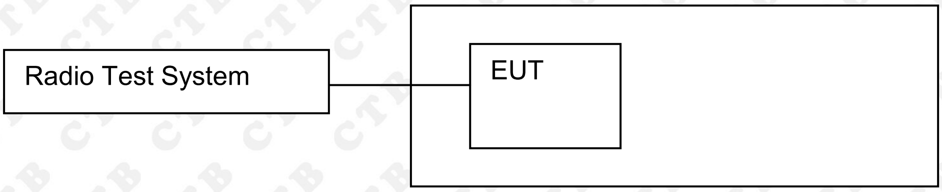
• This value, which shall comply with the limit given in clause 4.3.1.2.3 or clause 4.3.2.2.3, shall be recorded in the test report.

6.4 Test Result

Modulation	Test conditions (Temperature)	EIRP (dBm)		
		Low Channel	Middle Channel	High Channel
802.11b	Normal	7.54	7.45	6.99
	Lower	6.98	7.44	6.83
	Upper	6.66	6.88	6.34
802.11g	Normal	6.57	6.50	6.00
	Lower	6.51	6.44	5.79
	Upper	5.74	5.81	5.01
802.11n(HT20)	Normal	6.59	6.53	6.51
	Lower	6.15	5.87	6.40
	Upper	5.85	5.20	6.04
802.11n(HT40)	Normal	5.52	5.71	5.06
	Lower	5.37	5.55	4.94
	Upper	5.20	5.15	4.45
Limit		≤100mW (20dBm)		
Remark: P = A + G + Y, G=1dBi, x=100%				

7. POWER SPECTRAL DENSITY

7.1 Block Diagram Of Test Setup



7.2 Limit

For equipment using wide band modulations other than FHSS, the maximum Power Spectral Density is limited to 10 dBm per MHz.

Limit
10dBm/MHz

7.3 Test procedure

Step 1:

Connect the UUT to the spectrum analyser and use the following settings:

• Start Frequency: 2 400 MHz

• Stop Frequency: 2 483,5 MHz

• Resolution BW: 10 kHz

• Video BW: 30 kHz

• Sweep Points: > 8 350

NOTE: For spectrum analysers not supporting this number of sweep points, the frequency band may be segmented.

• Detector: RMS

• Trace Mode: Max Hold

• Sweep time: 10 s; the sweep time may be increased further until a value where the sweep time has no impact on the RMS value of the signal

For non-continuous signals, wait for the trace to stabilize.

Save the data (trace data) set to a file.

Step 2:

For conducted measurements on smart antenna systems using either operating mode 2 or operating mode 3 (see clause 5.1.3.2), repeat the measurement for each of the transmit ports. For each sampling point (frequency domain), add up the coincident power values (in mW) for the different transmit chains and use this as the new data set.

Step 3:

Add up the values for power for all the samples in the file using the formula below.

$$P_{Sum} = \sum_{n=1}^{k} P_{sample}(n)$$

with 'k' being the total number of samples and 'n' the actual sample number

Step 4:

Normalize the individual values for power (in dBm) so that the sum is equal to the RF Output Power (e.i.r.p.) measured in clause 5.3.2 and save the corrected data. The following formulas can be used:

$$C_{Corr} = P_{Sum} - P_{e.i.r.p.}$$

$$P_{Samplecorr}(n) = P_{Sample}(n) - C_{Corr}$$

with 'n' being the actual sample number

Step 5:

Starting from the first sample PSamplecorr(n) (lowest frequency), add up the power (in mW) of the following samples representing a 1 MHz segment and record the results for power and position (i.e. sample #1 to sample #100). This is the Power Spectral Density (e.i.r.p.) for the first 1 MHz segment which shall be recorded.

Step 6:

Shift the start point of the samples added up in step 5 by one sample and repeat the procedure in step 5 (i.e. sample #2 to sample #101).

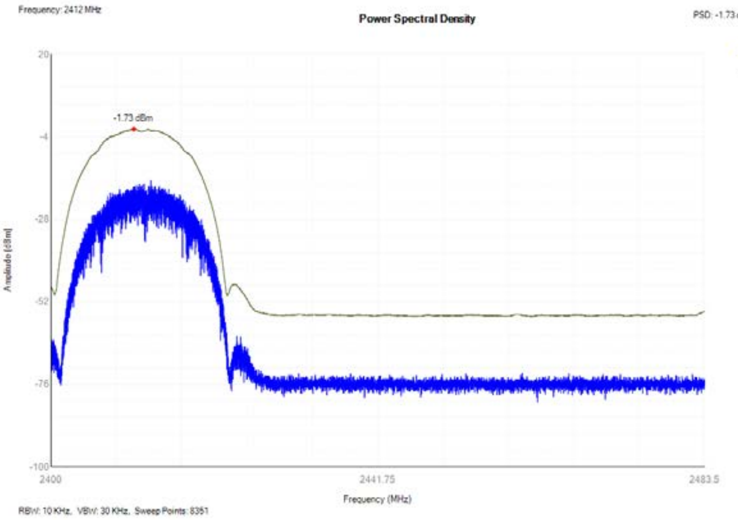
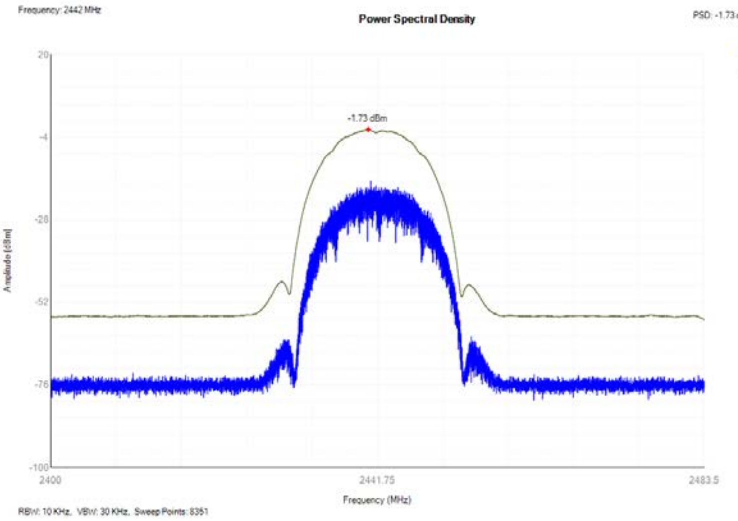
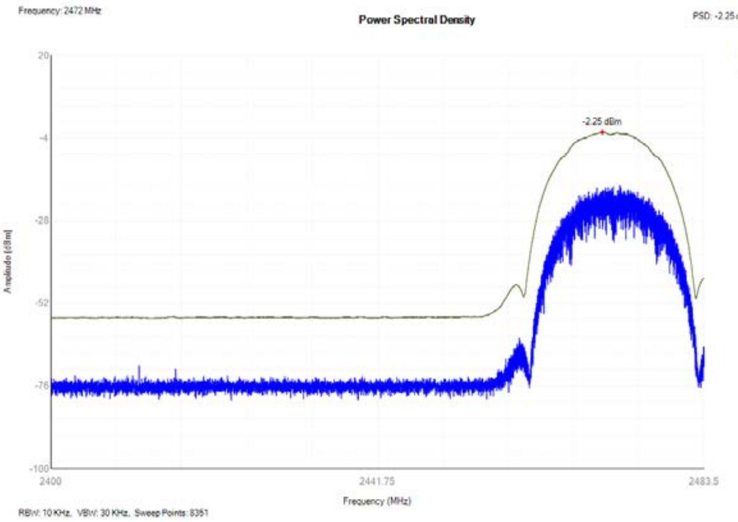
Step 7:

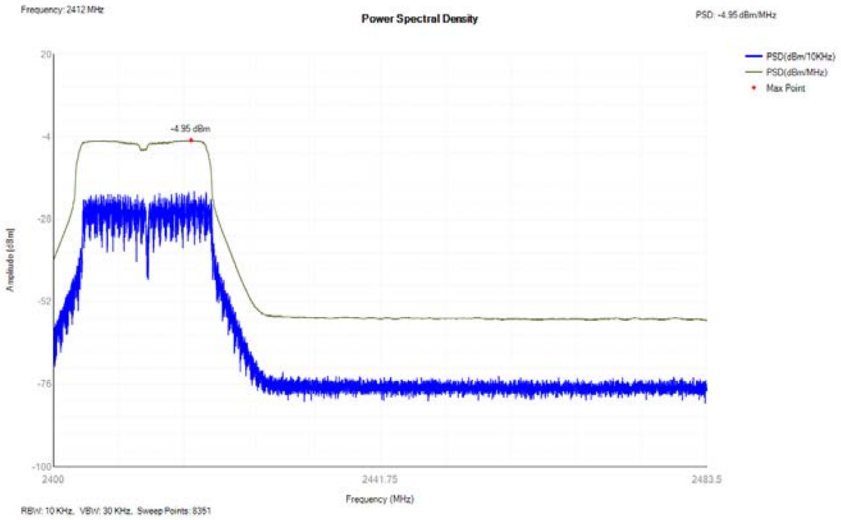
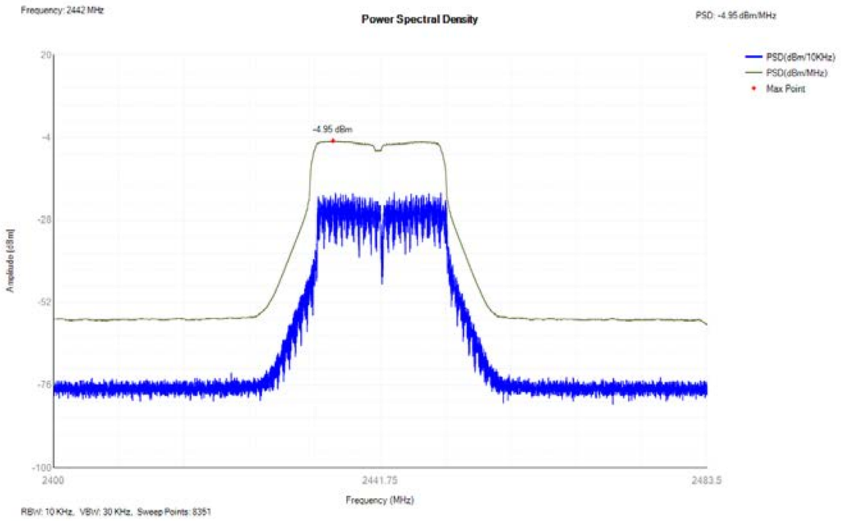
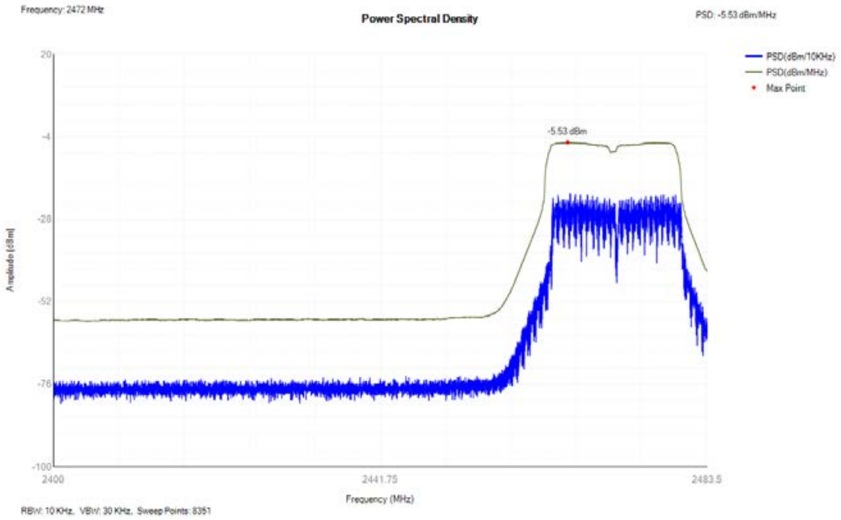
Repeat step 6 until the end of the data set and record the Power Spectral Density values for each of the 1 MHz segments.

From all the recorded results, the highest value is the maximum Power Spectral Density for the UUT. This value, which shall comply with the limit given in clause 4.3.2.3.3, shall be recorded in the test report.

7.4 Test Result

Modulation	Test conditions	Maximum e.i.r.p. Spectral Density (dBm/MHz)		
		Low Channel	Middle Channel	High Channel
802.11b	Normal	-1.73	-1.73	-2.25
802.11g	Normal	-4.95	-4.95	-5.53
802.11n20	Normal	-5.04	-5.00	-5.11
802.11n40	Normal	-9.25	-8.91	-9.50
Limit		≤10dBm/MHz		

802.11b Low Channel	
802.11b Mid Channel	
802.11b High Channel	

802.11g Low Channel	
802.11g Mid Channel	
802.11g High Channel	

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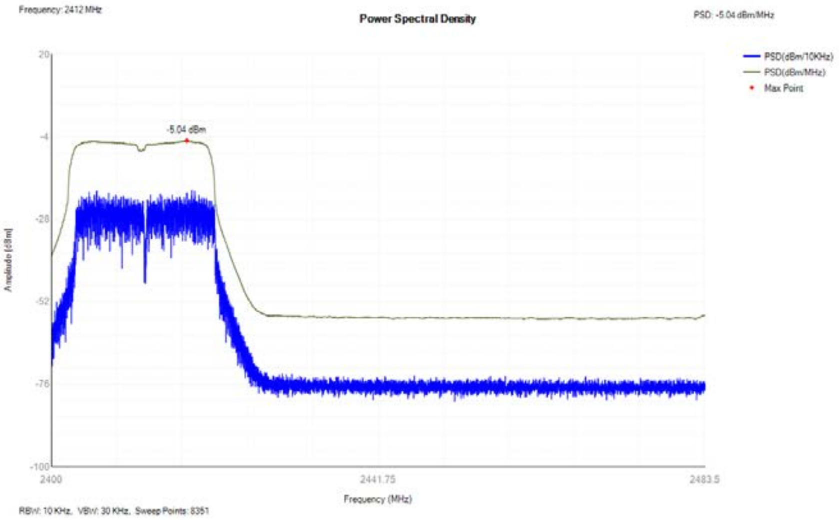
Low Channel</td><td>
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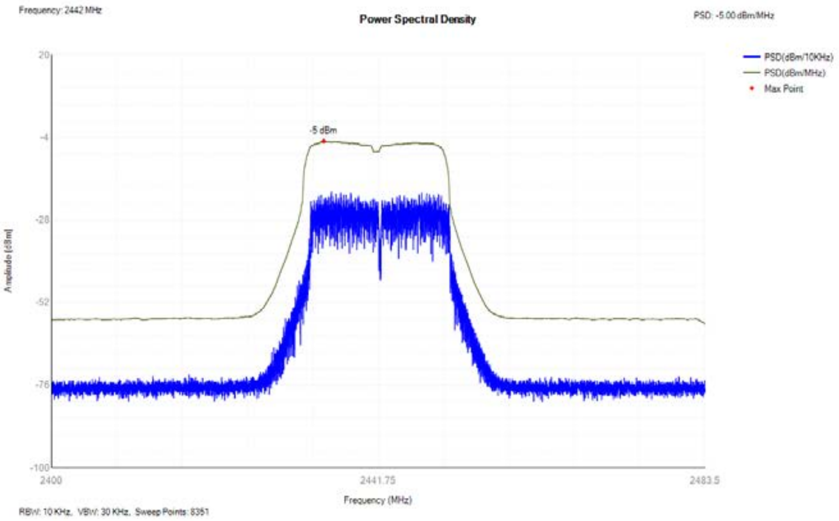
Mid Channel</td><td>
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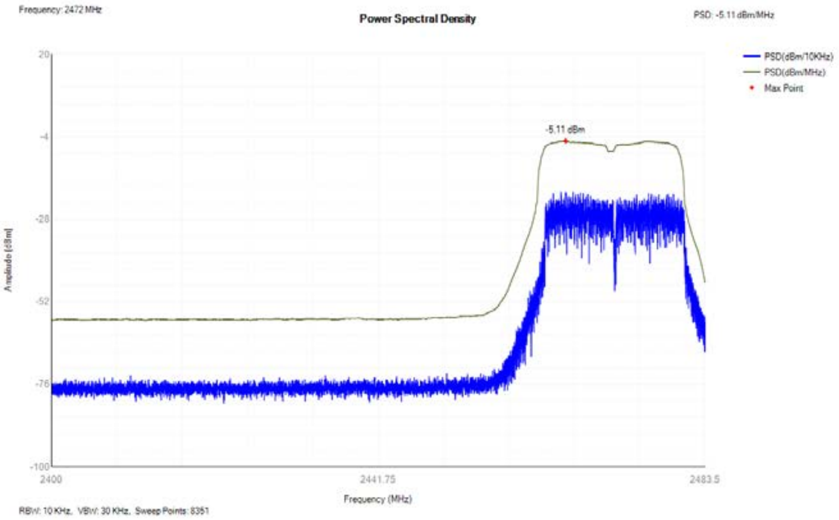
High Channel</td><td>
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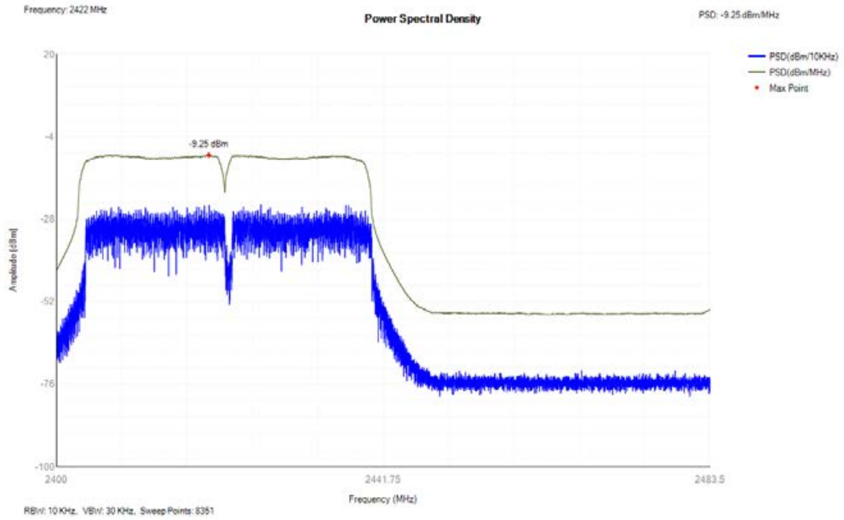
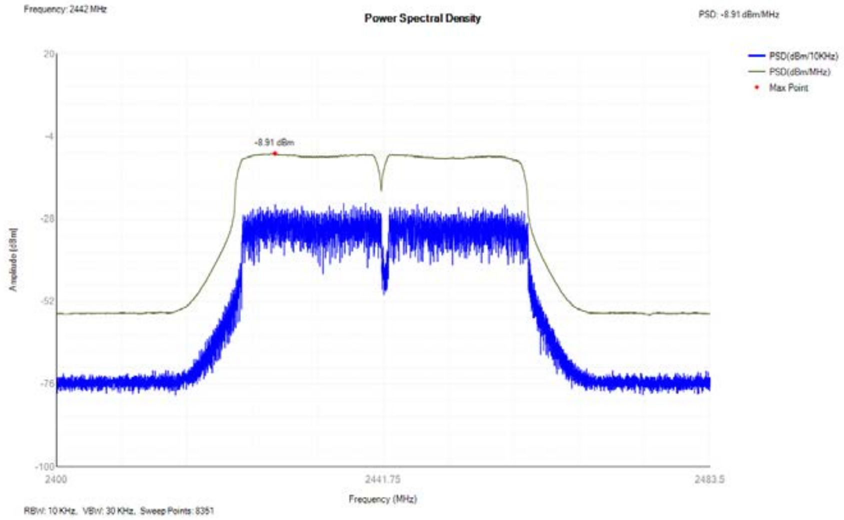
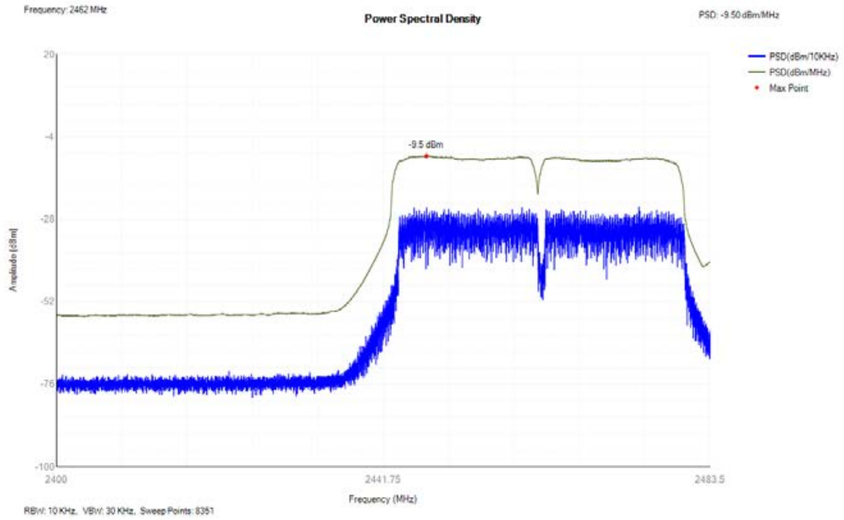
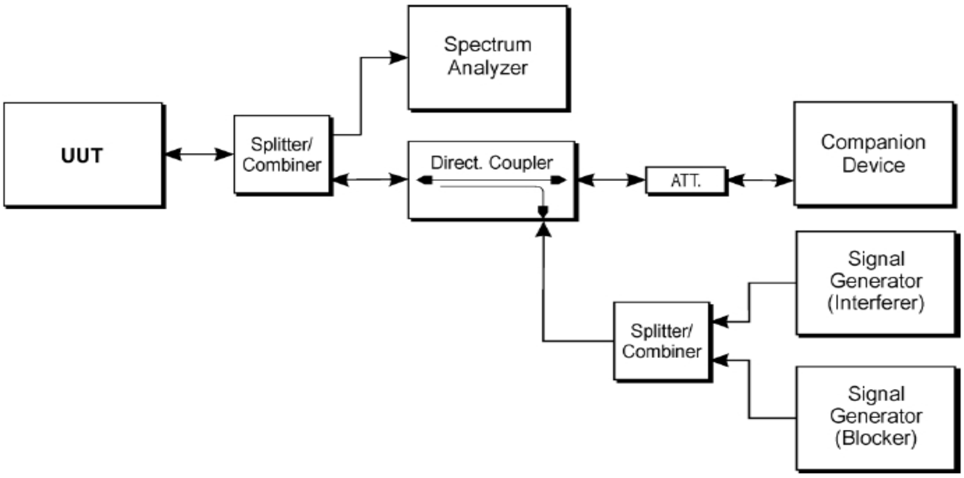
802.11n40 Low Channel	
802.11n40 Mid Channel	
802.11n40 High Channel	

8. ADAPTIVITY

8.1 Block Diagram Of Test Setup



8.2 Limit

The frequency range of the equipment is determined by the lowest and highest

Non-LBT based Detect and Avoid: 1 The frequency shall remain unavailable for a minimum time equal to 1 second after which the channel maybe considered again as an 'available' channel; 2 COT ≤ 40 ms; 3 Idle Period = 5% of COT; 4 Detection threshold level = -70dBm/MHz + 20 – Pout E.I.R.P (Pout in dBm);
LBT based Detect and Avoid (Frame Based Equipment): 1 Minimum Clear Channel Assessment (CCA) time = 20 us; 2 CCA observation time declared by the supplier; 3 COT = 1~10 ms; 4 Idle Period = 5% of COT; 5 Detection threshold level = -70dBm/MHz + 20 – Pout E.I.R.P (Pout in dBm);
LBT based Detect and Avoid (Load Based Equipment): 1 Minimum Clear Channel Assessment (CCA) time = 20 us; 2 CCA declared by the manufacturer; 3 COT ≤ (13 / 32) * q ms; q = [4~32]; 1.625ms~13ms; 4 Detection threshold level = -73dBm/MHz + 20 – Pout E.I.R.P (dBm);
Short Control Signalling Transmissions: Short Control Signalling Transmissions shall have a maximum duty cycle of 10% within an observation period of 50ms.

8.3 Test procedure

Step 1:

The UUT may connect to a companion device during the test. The interference signal generator, the blocking signal generator, the spectrum analyser, the UUT and the companion device are connected using a set-up equivalent to the example given by figure 5 although the interference and blocking signal generator do not generate any signals at this point in time. The spectrum analyser is used to monitor the transmissions of the UUT in response to the interfering and the blocking signals.

Adjust the received signal level (wanted signal from the companion device) at the UUT to the value defined in table 6

The analyzer shall be set as follows:

- RBW: ≥ Occupied Channel Bandwidth (if the analyser does not support this setting, the highest available setting shall be used)
- VBW: 3 × RBW (if the analyser does not support this setting, the highest available setting shall be used)
- Detector Mode: RMS
- Centre Frequency: Equal to the centre frequency of the operating channel
- Span: 0 Hz
- Sweep time: > Channel Occupancy Time of the UUT
- Trace Mode: Clear/Write
- Trigger Mode: Video

Step 2:

Configure the UUT for normal transmissions with a sufficiently high payload to allow demonstration of compliance of the adaptive mechanism on the channel being tested

Using the procedure defined in clause 5.3.7.2.1.4, it shall be verified that the UUT complies with the maximum Channel Occupancy Time and minimum Idle Period

Step 3: Adding the interference signal

A 100 % duty cycle interference signal is injected on the current operating channel of the UUT. This interference signal shall be a band limited noise signal which has a flat power spectral density, and shall have a bandwidth greater than the Occupied Channel Bandwidth of the UUT. The maximum ripple of this interfering signal shall be ±1,5 dB within the Occupied Channel Bandwidth and the power spectral density.

Step 4: Verification of reaction to the interference signal

The spectrum analyser shall be used to monitor the transmissions of the UUT on the selected operating channel with the interfering signal injected. This may require the spectrum analyser sweep to be triggered by the start of the interfering signal.

Using the procedure defined in clause 5.3.7.2.1.4, it shall be verified that:

The UUT shall stop transmissions on the current operating channel being tested.

Apart from Short Control Signalling Transmissions (see iii) below), there shall be no subsequent transmissions on this operating channel for a (silent) period defined in clause 4.3.2.5.1.2 step 2. After that, the UUT may have normal transmissions again for the duration of a single Channel Occupancy Time period. Because the interference signal is still present, another silent period as defined in clause 4.3.2.5.1.2 step 2 needs to be included. This sequence is repeated as long as the interfering signal is present.

The UUT may continue to have Short Control Signalling Transmissions on the operating channel while the interference signal is present. These transmissions shall comply with the limits

Alternatively, the equipment may switch to a non-adaptive mode

Step 5: Adding the blocking signal

With the interfering signal present, a 100 % duty cycle CW signal is inserted as the blocking signal

Repeat step 4 to verify that the UUT does not resume any normal transmissions

Step 6: Removing the interference and blocking signal

On removal of the interference and blocking signal the UUT is allowed to start transmissions again on this channel however, it shall be verified that this shall only be done after the period defined in clause 4.3.2.5.1.2 step 2.

Step 7:

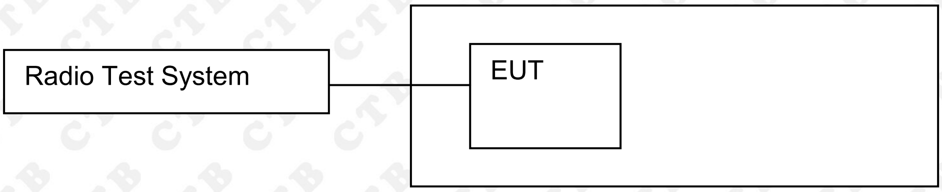
The steps 2 to 6 shall be repeated for each of the frequencies to be tested.

8.4 Test Result

Remark: this requirement does not apply for equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p.

9. OCCUPIED CHANNEL BANDWIDTH

9.1 Block Diagram Of Test Setup



9.2 Limit

The Occupied Channel Bandwidth shall fall completely within the band given in 2.4GHz to 2.4835GHz.
In addition, for non-adaptive systems using wide band modulations other than FHSS and with e.i.r.p greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

9.3 Test procedure

Step 1:

Connect the UUT to the spectrum analyser and use the following settings:

• Centre Frequency: The centre frequency of the channel under test

• Resolution BW: ~ 1 % of the span without going below 1 %

• Video BW: 3 × RBW

• Frequency Span: 2 × Nominal Channel Bandwidth

• Detector Mode: RMS

• Trace Mode: Max Hold

• Sweep time: 1 s

Step 2:

Wait for the trace to stabilize.

Find the peak value of the trace and place the analyser marker on this peak.

Step 3:

Use the 99 % bandwidth function of the spectrum analyser to measure the Occupied Channel Bandwidth of the UUT.

This value shall be recorded.

NOTE: Make sure that the power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals left and right from the power envelope being taken into account by this measurement.

9.4 Test Result

Modulation	Frequency (MHz)	Frequency Range (MHz)		Occupied Channel (MHz)
802.11b	Low	2412.015	/	14.868
	High	/	2471.983	14.897
802.11g	Low	2412.023	/	16.844
	High	/	2472.004	16.84
802.11n20	Low	2412.006	/	17.834
	High	/	2472.003	17.806
802.11n40	Low	2421.982	/	36.294
	High	/	2462.02	36.287

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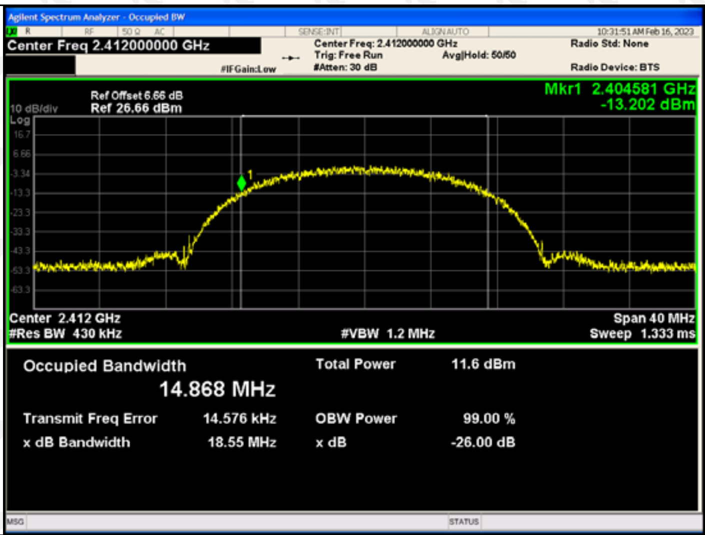
Low
Channel</td><td></td><td>
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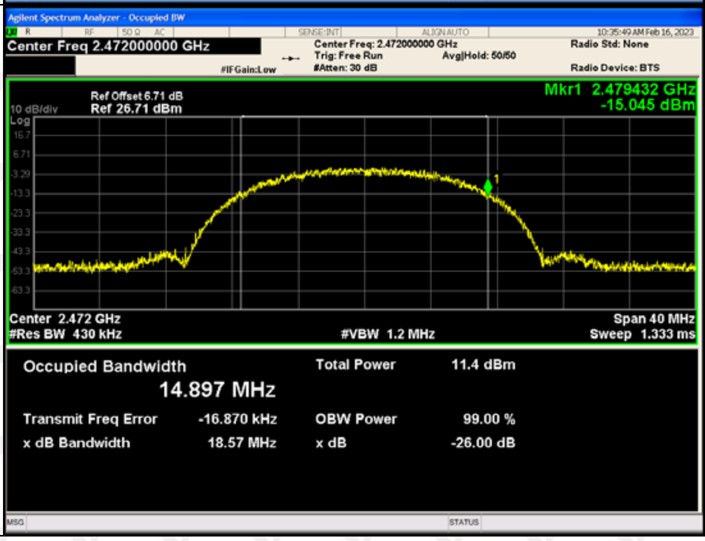
High
Channel</td><td></td><td>
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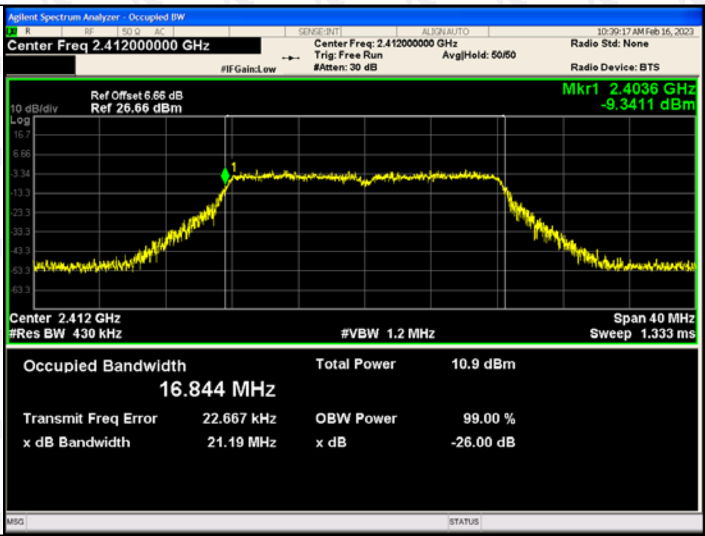
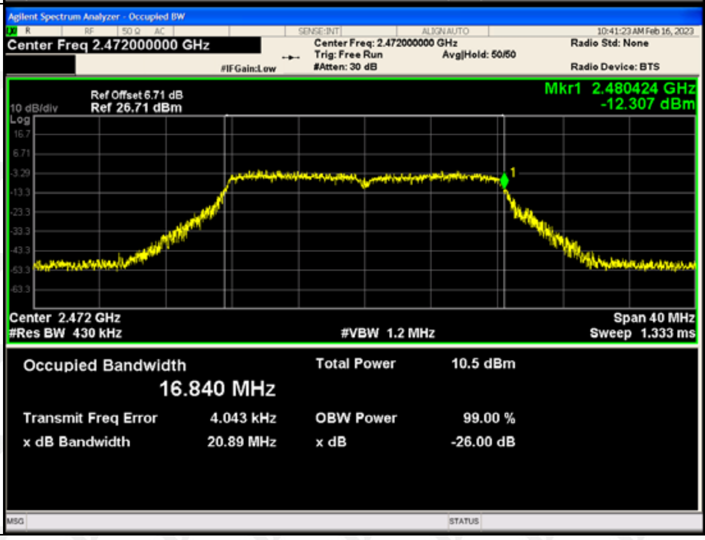
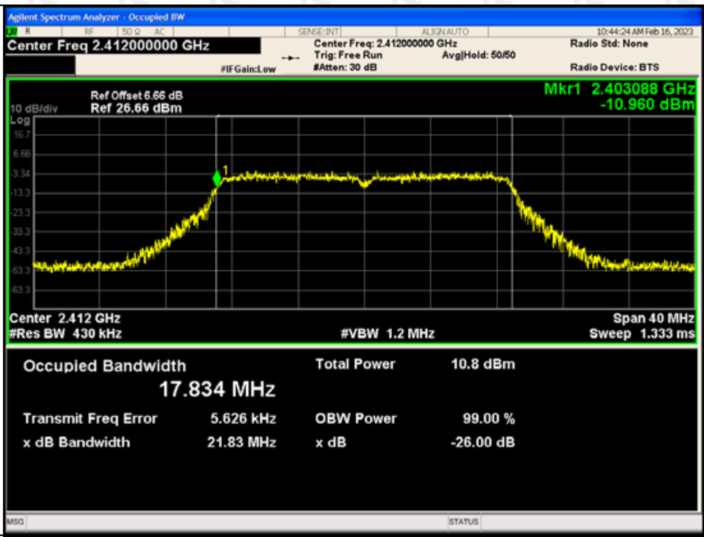
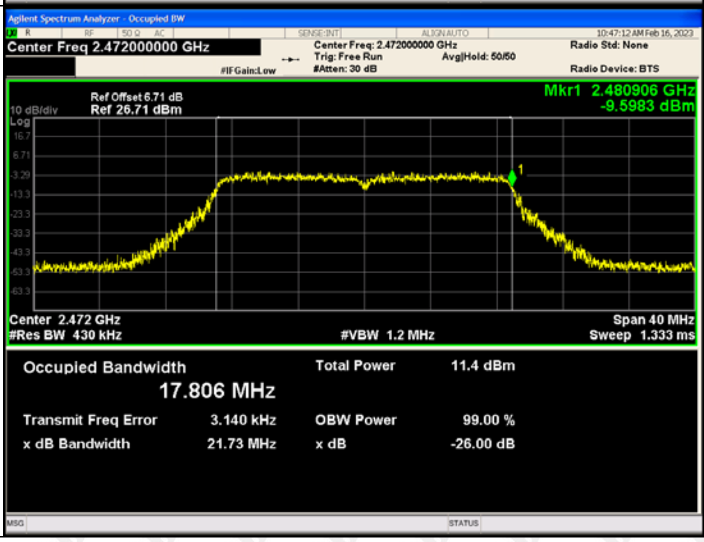
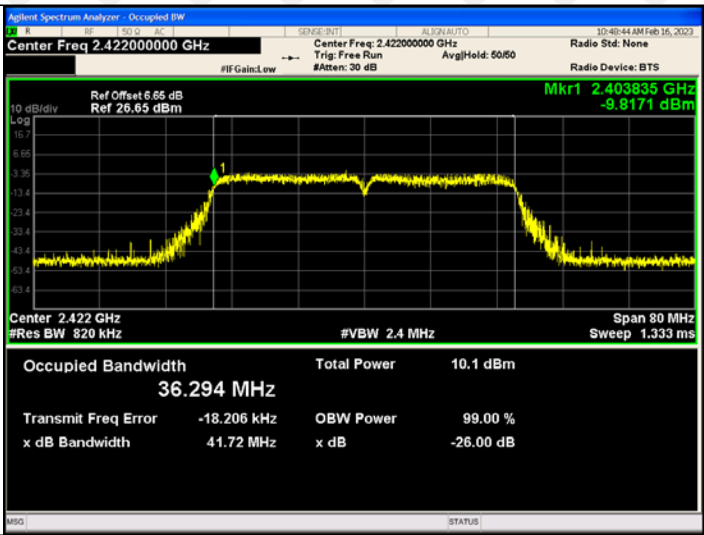
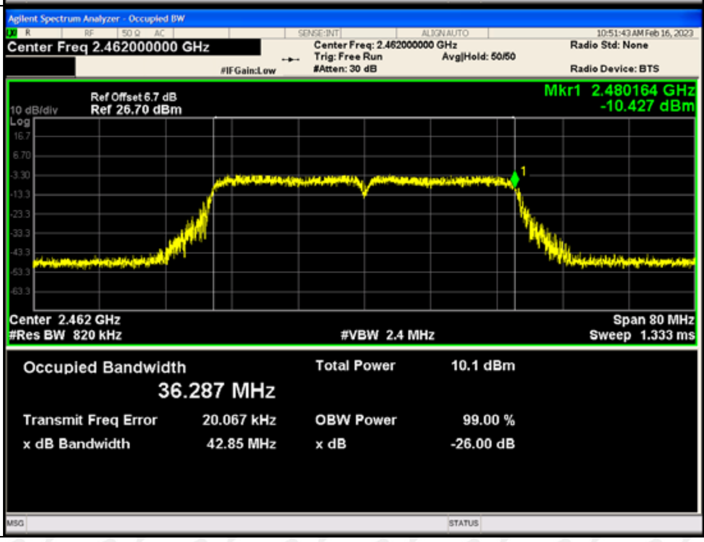
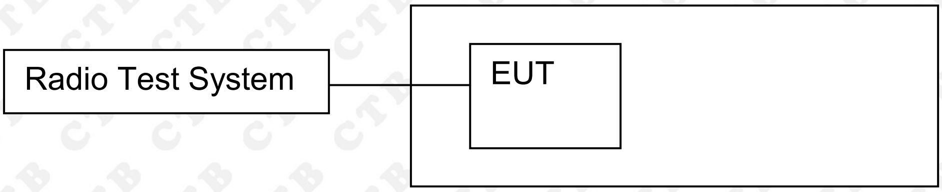
802.11g Low Channel		
802.11g High Channel		

802.11n20 Low Channel			
802.11n20 High Channel			

802.11n40 Low Channel			
802.11n40 High Channel			

10. TRANSMITTER UNWANTED EMISSIONS IN THE OUT-OF-BAND DOMAIN

10.1 Block Diagram Of Test Setup



10.2 Limit

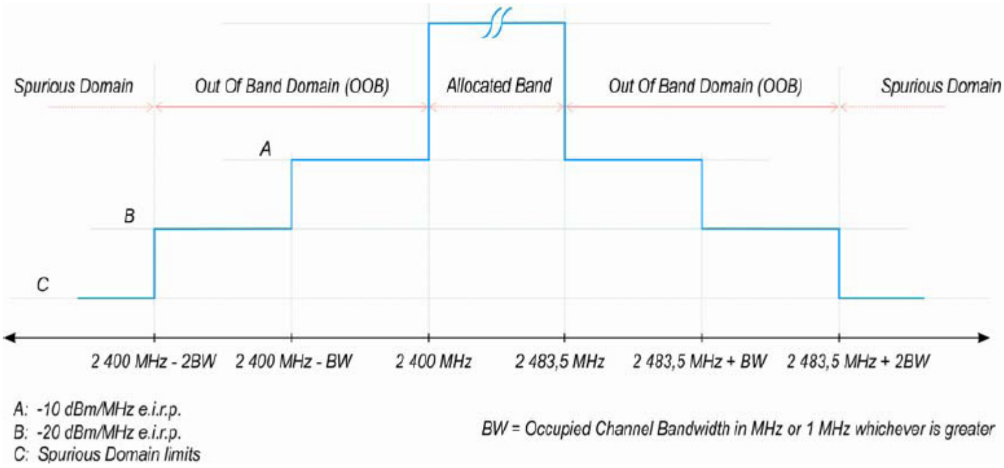


Figure 3: Transmit mask

10.3 Test procedure

The applicable mask is defined by the measurement results from the tests performed under clause 5.3.8 (Occupied Channel Bandwidth).

The test procedure is further as described under clause 5.3.9.2.1.

The Out-of-band emissions within the different horizontal segments of the mask provided in figures 1 and 3 shall be measured using the steps below. This method assumes the spectrum analyser is equipped with the Time Domain Power option.

Step 1:

• Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: 2 484 MHz
- Span: 0 Hz
- Resolution BW: 1 MHz
- Filter mode: Channel filter
- Video BW: 3 MHz
- Detector Mode: RMS
- Trace Mode: Max Hold
- Sweep Mode: Continuous

- Sweep Points: Sweep Time [s] / (1 μs) or 5 000 whichever is greater

- Trigger Mode: Video trigger

NOTE 1: In case video triggering is not possible, an external trigger source may be used.

- Sweep Time: > 120 % of the duration of the longest burst detected during the measurement of the RF Output Power

Step 2 (segment 2 483,5 MHz to 2 483,5 MHz + BW):

• Adjust the trigger level to select the transmissions with the highest power level.

• For frequency hopping equipment operating in a normal hopping mode, the different hops will result in signal bursts with different power levels. In this case the burst with the highest power level shall be selected.

• Set a window (start and stop lines) to match with the start and end of the burst and in which the RMS power shall be measured using the Time Domain Power function.

• Select RMS power to be measured within the selected window and note the result which is the RMS power within this 1 MHz segment (2 483,5 MHz to 2 484,5 MHz). Compare this value with the applicable limit provided by the mask.

• Increase the centre frequency in steps of 1 MHz and repeat this measurement for every 1 MHz segment within the range 2 483,5 MHz to 2 483,5 MHz + BW. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 3 (segment 2 483,5 MHz + BW to 2 483,5 MHz + 2BW):

• Change the centre frequency of the analyser to 2 484 MHz + BW and perform the measurement for the first 1 MHz segment within range 2 483,5 MHz + BW to 2 483,5 MHz + 2BW. Increase the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + 2 BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 4 (segment 2 400 MHz - BW to 2 400 MHz):

• Change the centre frequency of the analyser to 2 399,5 MHz and perform the measurement for the first 1 MHz segment within range 2 400 MHz - BW to 2 400 MHz Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - BW + 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 5 (segment 2 400 MHz - 2BW to 2 400 MHz - BW):

• Change the centre frequency of the analyser to 2 399,5 MHz - BW and perform the measurement for the first 1 MHz segment within range 2 400 MHz - 2BW to 2 400 MHz - BW. Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 6:

• In case of conducted measurements on equipment with a single transmit chain, the declared antenna assembly gain "G" in dBi shall be added to the results for each of the 1 MHz segments and compared with the limits

provided by the mask given in figure 1 or figure 3. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered.

• In case of conducted measurements on smart antenna systems (equipment with multiple transmit chains), the measurements need to be repeated for each of the active transmit chains. The declared antenna assembly gain "G" in dBi for a single antenna shall be added to these results. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered. Comparison with the applicable limits shall be done using any of the options given below:

- Option 1: the results for each of the transmit chains for the corresponding 1 MHz segments shall be added. The additional beamforming gain "Y" in dB shall be added as well and the resulting values compared with the limits provided by the mask given in figure 1 or figure 3.

- Option 2: the limits provided by the mask given in figure 1 or figure 3 shall be reduced by

10 × log10(Ach) and the additional beamforming gain "Y" in dB. The results for each of the transmit chains shall be individually compared with these reduced limits.

NOTE 2: Ach refers to the number of active transmit chains.

It shall be recorded whether the equipment complies with the mask provided in figure 1 or figure 3.

10.4 Test Result

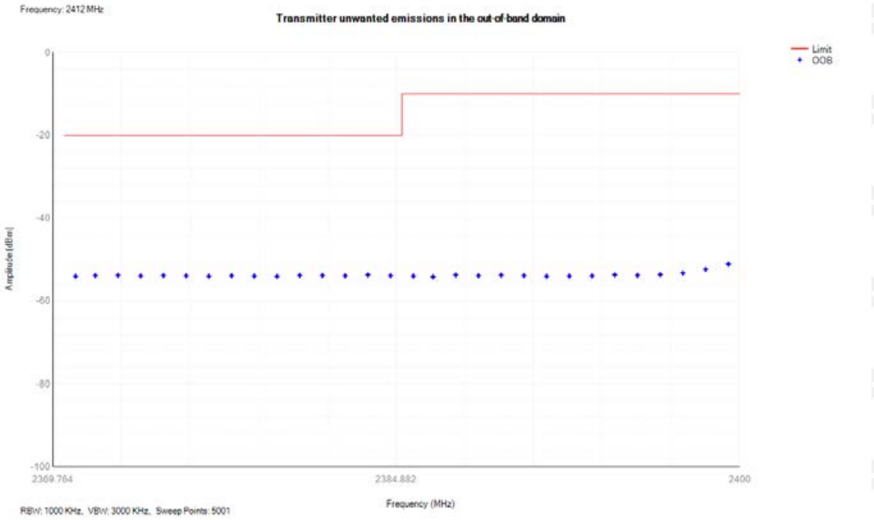
TEST CONDITIONS	IEEE 802.11b OUT-OF-BAND DOMAIN		
	Temp (Normal)	Temp (Low)°C	Temp (High)°C
CHANNEL	AC 230V	AC 230V	AC 230V
Low channel	PASS	PASS	PASS
High channel	PASS	PASS	PASS

TEST CONDITIONS	IEEE 802.11g OUT-OF-BAND DOMAIN		
	Temp (Normal)°C	Temp (Low)°C	Temp (High)°C
CHANNEL	AC 230V	AC 230V	AC 230V
Low channel	PASS	PASS	PASS
High channel	PASS	PASS	PASS

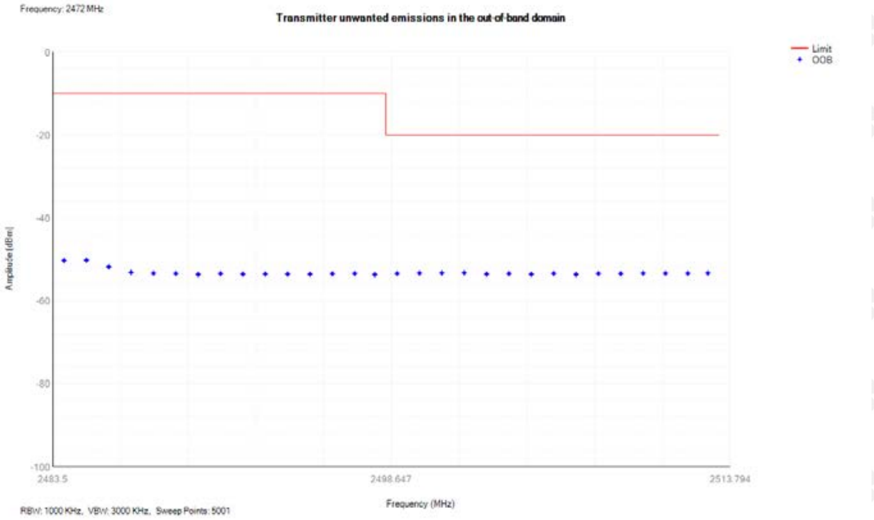
TEST CONDITIONS	IEEE 802.11n(20) OUT-OF-BAND DOMAIN		
	Temp (Normal)°C	Temp (Low)°C	Temp (High)°C
CHANNEL	AC 230V	AC 230V	AC 230V
Low channel	PASS	PASS	PASS
High channel	PASS	PASS	PASS

TEST CONDITIONS	IEEE 802.11(40) OUT-OF-BAND DOMAIN		
	Temp (Normal)°C	Temp (Low)°C	Temp (High)°C
CHANNEL	AC 230V	AC 230V	AC 230V
Low channel	PASS	PASS	PASS
High channel	PASS	PASS	PASS

CH Low-2412（802.11b）



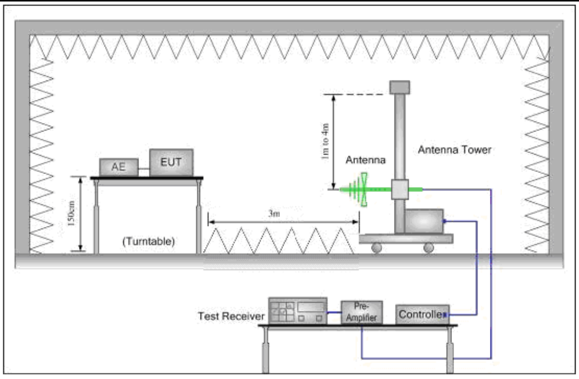
CH High-2472（802.11b）



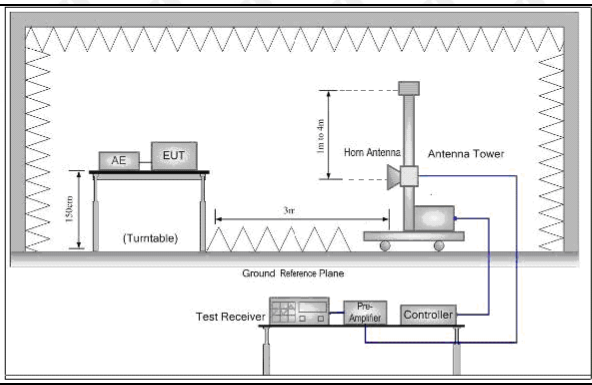
Note: All the modes had been tested, but only the worst data recorded in the report.
Condition: Normal

11. TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

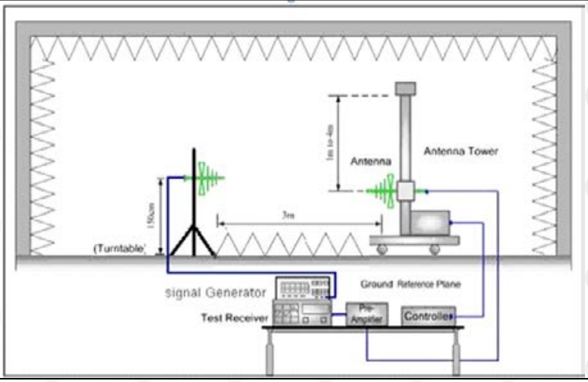
11.1 Block Diagram Of Test Setup



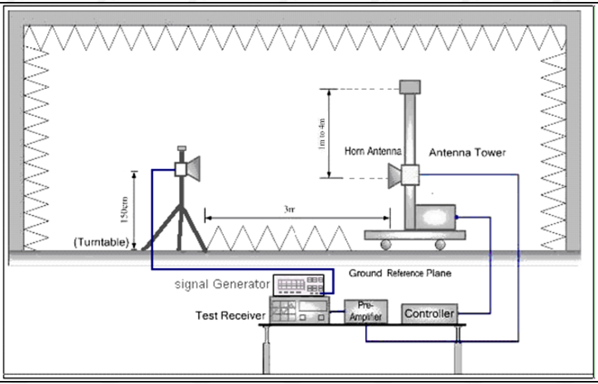
Below 1GHz



Above 1GHz



Below 1GHz



Above 1GHz

11.2 Limits

Frequency range	Maximum power, e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	RBW/VBW
30 MHz to 47 MHz	-36 dBm	100 kHz/300KHz
47 MHz to 74 MHz	-54 dBm	100 kHz/300KHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz/300KHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz/300KHz
118 MHz to 174 MHz	-36 dBm	100 kHz/300KHz
174 MHz to 230 MHz	-54 dBm	100 kHz/300KHz
230 MHz to 470 MHz	-36 dBm	100 kHz/300KHz
470 MHz to 694 MHz	-54 dBm	100 kHz/300KHz
694 MHz to 1 GHz	-36 dBm	100 kHz/300KHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz/3MHz

11.3 Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the nonconductive turntable 1.5m above the ground in a full anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna’s height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable 1.5 m above the ground in a full anechoic chamber..

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

11.4 Test Results

Modulation : 802.11b (the worst data)
Below 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
46.161	-54.90	-12.49	-67.39	-36.00	-31.39	peak	1.6	210	H
66.417	-55.30	-12.64	-67.95	-54.00	-13.95	peak	1.6	167	H
103.922	-56.28	-11.83	-68.10	-54.00	-14.10	peak	1.7	159	H
216.791	-53.14	-10.57	-63.71	-54.00	-9.71	peak	1.4	328	H
328.258	-53.45	-9.71	-63.16	-36.00	-27.16	peak	1.3	105	H
869.241	-52.52	-0.27	-52.80	-36.00	-16.80	peak	1.0	334	H
48.124	-55.35	-11.83	-67.18	-36.00	-31.18	peak	1.0	286	V
100.028	-55.30	-11.99	-67.29	-54.00	-13.29	peak	1.8	46	V
182.313	-55.76	-12.04	-67.80	-54.00	-13.80	peak	1.1	336	V
218.982	-53.04	-10.49	-63.53	-54.00	-9.53	peak	1.2	214	V
328.234	-53.14	-10.23	-63.37	-36.00	-27.37	peak	1.5	132	V
869.186	-52.37	-0.61	-52.98	-36.00	-16.98	peak	1.1	201	V
High Channel									
46.635	-54.88	-12.35	-67.23	-36.00	-31.23	peak	1.2	149	H
66.768	-54.62	-12.30	-66.91	-54.00	-12.91	peak	1.0	185	H
103.595	-55.82	-12.47	-68.29	-54.00	-14.29	peak	1.7	157	H
219.752	-53.36	-10.78	-64.14	-54.00	-10.14	peak	1.2	27	H
328.277	-52.72	-10.09	-62.81	-36.00	-26.81	peak	1.3	98	H
871.967	-52.13	-0.62	-52.76	-36.00	-16.76	peak	1.2	197	H
48.323	-54.94	-12.16	-67.10	-36.00	-31.10	peak	1.1	219	V
101.114	-54.95	-12.22	-67.17	-54.00	-13.17	peak	1.3	91	V
182.970	-55.47	-11.95	-67.42	-54.00	-13.42	peak	1.1	322	V
219.478	-53.54	-10.84	-64.38	-54.00	-10.38	peak	1.1	238	V
326.331	-53.13	-9.56	-62.69	-36.00	-26.69	peak	1.2	200	V
871.645	-51.98	-0.37	-52.36	-36.00	-16.36	peak	1.8	6	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

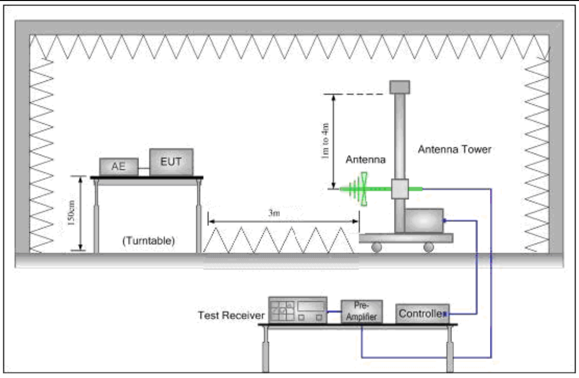
Above 1GHz

Freq	Rd_level	Factor	Level	Limit	Over	detector	Height	Degree	Antenna polarization
(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)				
Low Channel									
4824	-55.18	8.43	-46.75	-30.00	-16.75	peak	1.3	304	H
7236	-52.13	12.45	-39.68	-30.00	-9.68	peak	1.8	91	H
4824	-54.07	8.43	-45.64	-30.00	-15.64	peak	1.0	228	H
7236	-52.21	12.45	-39.76	-30.00	-9.76	peak	1.8	10	H
High Channel									
4944	-54.74	8.53	-46.21	-30.00	-16.21	peak	1.5	194	V
7416	-52.74	12.59	-40.15	-30.00	-10.15	peak	1.3	219	V
4944	-54.85	8.53	-46.32	-30.00	-16.32	peak	1.9	177	V
7416	-52.19	12.59	-39.60	-30.00	-9.60	peak	1.2	72	V

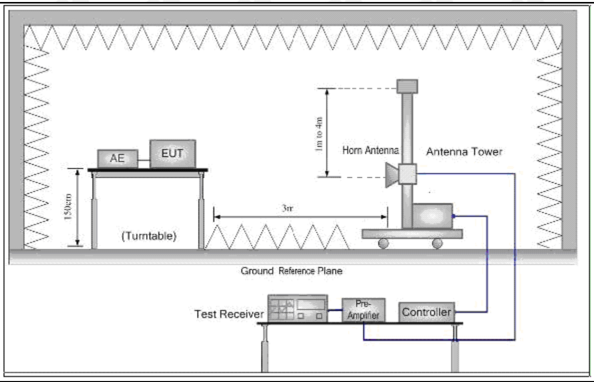
Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

12. RECEIVER SPURIOUS EMISSIONS

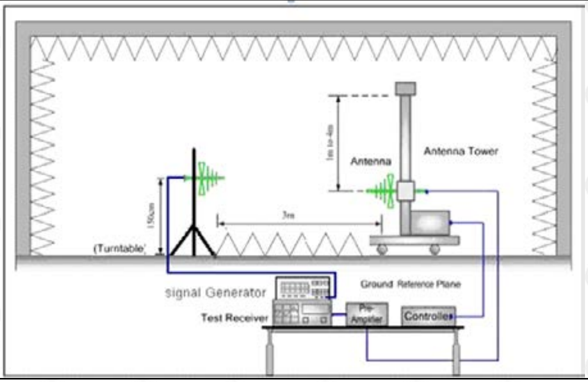
12.1 Block Diagram Of Test Setup



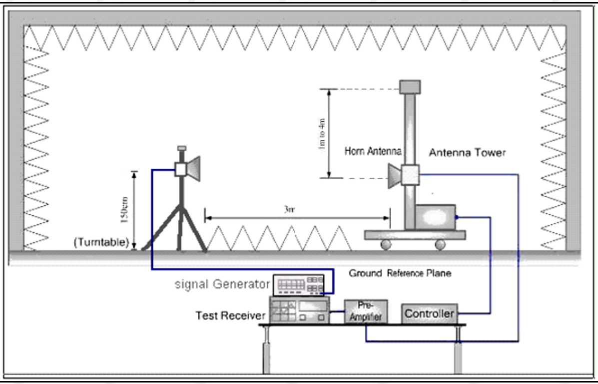
Below 1GHz



Above 1GHz



Below 1GHz



Above 1GHz

12.2 Limits

Frequency(MHz)	Limit
30-1000	-57dBm
1000-12750	-47dBm

12.3 Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the nonconductive turntable 1.5m above the ground in a full anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable 1.5 m above the ground in a full anechoic chamber..

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

12.4 Test Results

Modulation : 802.11b (the worst data)
Below 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
46.002	-60.79	-11.83	-72.61	-57.00	-15.61	peak	1.1	327	H
68.059	-60.37	-12.34	-72.71	-57.00	-15.71	peak	1.9	123	H
105.099	-60.84	-11.75	-72.59	-57.00	-15.59	peak	1.1	253	H
218.988	-62.69	-11.28	-73.97	-57.00	-16.97	peak	1.9	40	H
326.773	-61.58	-9.96	-71.54	-57.00	-14.54	peak	1.8	79	H
870.583	-69.39	-0.62	-70.01	-57.00	-13.01	peak	1.6	11	H
47.765	-60.68	-12.10	-72.79	-57.00	-15.79	peak	1.6	29	V
100.693	-60.75	-12.11	-72.85	-57.00	-15.85	peak	1.6	102	V
183.112	-62.30	-12.23	-74.53	-57.00	-17.53	peak	1.4	137	V
218.427	-60.91	-11.28	-72.18	-57.00	-15.18	peak	1.2	38	V
325.946	-59.85	-9.78	-69.63	-57.00	-12.63	peak	1.7	116	V
870.554	-69.86	0.11	-69.75	-57.00	-12.75	peak	1.3	31	V
High Channel									
46.856	-60.73	-12.00	-72.73	-57.00	-15.73	peak	1.6	300	H
68.179	-60.17	-12.06	-72.23	-57.00	-15.23	peak	1.5	95	H
103.639	-60.67	-12.12	-72.79	-57.00	-15.79	peak	1.1	311	H
217.718	-62.45	-10.70	-73.15	-57.00	-16.15	peak	1.5	221	H
327.800	-61.38	-9.69	-71.07	-57.00	-14.07	peak	1.4	218	H
870.779	-68.78	0.16	-68.63	-57.00	-11.63	peak	1.6	197	H
47.998	-60.95	-11.95	-72.90	-57.00	-15.90	peak	1.5	45	V
101.556	-60.74	-12.08	-72.82	-57.00	-15.82	peak	1.7	312	V
182.630	-62.39	-12.16	-74.55	-57.00	-17.55	peak	1.2	131	V
219.130	-61.18	-10.74	-71.92	-57.00	-14.92	peak	1.8	202	V
327.315	-59.79	-9.68	-69.47	-57.00	-12.47	peak	1.1	251	V
871.141	-69.42	0.05	-69.37	-57.00	-12.37	peak	1.1	325	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

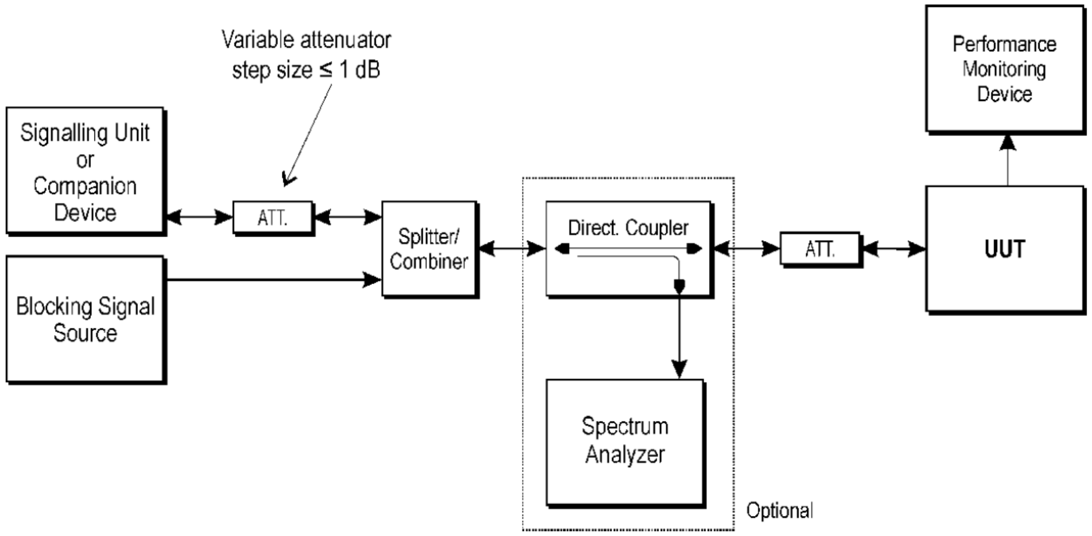
Above 1GHz

Freq	Rd_level	Factor	Level	Limit	Over	detector	Height	Degree	Antenna polarization
(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)				
Low Channel									
2248.46	-61.32	3.12	-58.20	-47.00	-11.20	peak	1.4	282	H
2248.79	-60.17	3.15	-57.03	-47.00	-10.03	peak	1.5	222	V
High Channel									
2443.35	-59.77	3.52	-56.25	-47.00	-9.25	peak	1.2	197	H
2443.70	-62.45	3.55	-58.91	-47.00	-11.91	peak	1.3	83	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

13. RECEIVER BLOCKING

13.1 Block Diagram Of Test Setup



13.2 Limit

Table 14: Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × $\log_{10}$(OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW
(-139 dBm + 10 × $\log_{10}$(OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674		

NOTE 1: OCBW is in Hz.

NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 20 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Table 15: Receiver Blocking parameters receiver Category 2 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

Table 16: Receiver Blocking parameters receiver Category 3 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 30 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

13.3 Test procedure

Refer to ETSI EN 300 328 V2.2.2 (2020-07) Clause 5.4.11.2.

13.4 Test Result

Modulation : 802.11b (the worst data)

Receiver Category 2					
Transmitting	P_{min}(dBm)	Blocking Frequency(MHz)	Blocking Power(dB)	Measured PER(%)	Limit (%)
2412	-64	2380	-34	0.56	10
2412	-64	2504	-34	0.63	10
2412	-64	2300	-34	0.37	10
2412	-64	2584	-34	0.25	10
2442	-64	2380	-34	0.59	10
2442	-64	2504	-34	0.55	10
2442	-64	2300	-34	0.50	10
2442	-64	2584	-34	0.41	10
2472	-64	2380	-34	0.47	10
2472	-64	2504	-34	0.40	10
2472	-64	2300	-34	0.56	10
2472	-64	2584	-34	0.52	10
Note:This report only shows the worst case test data.					

14. EUT PHOTOGRAPHS

Refer to Report No.: CTB230216021REX for EUT external and internal photos.

15. EUT TEST SETUP PHOTOGRAPHS

Spurious emission

※※※※※ **END OF REPORT** ※※※※※

TEST REPORT

Product Name:	Projector
Trademark:	GJTOS, xintepid, clokowe, ELEPHAS, GOODEE, Cibest, ARTSEA, YABER, WIMIUS, Uyole, Bacar, Lifegoods, BLAUPUNKT, EKO, VOLLPS, Auking, AngBeam, Thundeal
Model Number:	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Prepared For:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Manufacturer:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	Jan. 29, 2023
Sample tested Date:	Jan. 29, 2023 to Feb. 16, 2023
Issue Date:	Feb. 16, 2023
Report No.:	CTB230216023RFX
Test Standards	ETSI EN 300 328 V2.2.2 (2019-07)
Test Results	PASS
Remark:	This is Bluetooth radio test report.

Compiled by:	Reviewed by:	Approved by:
ChenZheng	Arron Liu	Bin Mei
Chen Zheng	Arron Liu	Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

TABLE OF CONTENT

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB230216023RFX	Feb. 16, 2023	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	ETSI EN 300 328 V2.2.2		
Test Item	**Test Requirement**	**Test Method**	**Results**
Transmitter Parameters			
RF Output Power	Clause 4.3.1.2	Clause 5.4.2	PASS
Power Spectral Density	Clause 4.3.2.3	Clause 5.4.3	N/A[1]
Duty cycle, Tx-Sequence, Tx-gap	Clause 4.3.1.3	Clause 5.4.2	N/A[2]
Accumulated Transmit time, Frequency Occupation & Hopping Sequence	Clause 4.3.1.4	Clause 5.4.4	PASS
Hopping Frequency Separation	Clause 4.3.1.5	Clause 5.4.5	PASS
Medium Utilization	Clause 4.3.1.6	Clause 5.4.2	N/A[2]
Adaptivity	Clause 4.3.1.7	Clause 5.4.6	N/A[3]
Occupied Channel Bandwidth	Clause 4.3.1.8	Clause 5.4.7	PASS
Transmitter unwanted emissions in the OOB domain	Clause 4.3.1.9	Clause 5.4.8	PASS
Transmitter unwanted emissions in the spurious domain	Clause 4.3.1.10	Clause 5.4.9	PASS
Receiver Parameters			
Receiver spurious emissions	Clause 4.3.1.11	Clause 5.4.10	PASS
Receiver Blocking	Clause 4.3.1.12	Clause 5.4.11	PASS
Geo-location capability	Clause 4.3.1.13	Clause 5.4.12	N/A[4]

Remark:
N/A[1]: Only for equipment using wide band modulations other than FHSS
N/A[2]: Only for non-Adaptive equipment.
N/A[3]:The maximum ouput power of EUT less than 10dBm, so not applicable
N/A[4]: Only for equipment with geo-location capability
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radiated Frequency.
CH:In this whole report CH means channel.

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3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Receiver Reference Sensitivity level	1.9dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63℃
frequency	1×10-7

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: A6
Bluetooth Version:	Bluetooth V5.1
Hardware Version:	PJ67V810
Software Version:	YKV01.20221123
Operation Frequency:	Bluetooth: 2402-2480MHz
Max. RF output power:	Bluetooth: 1.77dBm
Type of Modulation:	Bluetooth: GFSK, π/4 DQPSK, 8DPSK
Antenna installation:	Bluetooth: FPC antenna
Antenna Gain:	Bluetooth:1.0dBi
Ratings:	AC 100-240V~50/60Hz

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

Item	Equipment	Mfr /Brand	Model/Type No.	Series No.	Note
/	/	/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
0	2402	1	2403	2	2404	3	2405
4	2406	5	2407	6	2408	7	2409
8	2410	9	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	27	2429
28	2430	29	2431	30	2432	31	2433
32	2434	33	2435	34	2436	35	2437
36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445
44	2446	45	2447	46	2448	47	2449
48	2450	49	2451	50	2452	51	2453
52	2454	53	2455	54	2456	55	2457
56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465
64	2466	65	2467	66	2468	67	2469
68	2470	69	2471	70	2472	71	2473
72	2474	73	2475	74	2476	75	2477
76	2478	77	2479	78	2480	79	/

4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Low channel	Middle channel	High channel
Transmitting (GFSK/Π/4DQPSK/8DPSK)	2402MHz	2441MHz	2480MHz
Receiving (GFSK/Π/4DQPSK/8DPSK)	2402MHz	2441MHz	2480MHz

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(AC):	230V
Normal Temperature(℃)	23
Low Temperature(℃)	0
High Temperature(℃)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

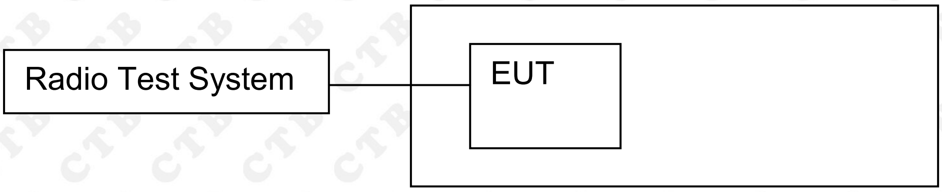
5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2023.07.19
2	Power Sensor	Agilent	U2021XA	MY56120032	2023.07.19
3	Power Sensor	Agilent	U2021XA	MY56120034	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2023.07.19
6	Signal Generator	Agilent	N5181A	MY50140365	2023.07.19
7	Vector signal generator	Agilent	N5182A	MY47420195	2023.07.19
8	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2023.07.19
10	5 GHz Filter	Shenxiang	MSF5150-5850MS-1155	20181015001	2023.07.19
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2023.07.19
12	BT&WI-FI Automatic test software	Micowave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2023.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2023.07.19
15	234G Automatic test software	Micowave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	2023.07.19
18	Amplifier	HP	8447E	2945A02747	2023.07.19
19	Amplifier	Agilent	8449B	3008A01838	2023.07.19
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2023.07.22

21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	2023.07.22
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	2023.07.23
24	loop antenna	ZHINAN	ZN30900A	GTS534	/
25	40G Horn antenna	A/H/System	SAS-574	588	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2024.10.30

6. RF OUTPUT POWER

6.1 Block Diagram Of Test Setup



6.2 Limit

For adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be 20 dBm.

The maximum RF output power for non-adaptive equipment shall be declared by the supplier and shall not exceed 20 dBm. See clause 5.3.1 m). For non-adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be equal to or less than the value declared by the supplier.

This limit shall apply for any combination of power level and intended antenna assembly.

Limit
20dBm

6.3 Test procedure

Step 1:

• Use a fast power sensor suitable for 2.4 GHz and capable of minimum 1 MS/s.
• Use the following settings:
- Sample speed 1 MS/s or faster.
- The samples shall represent the RMS power of the signal.
- Measurement duration: For non-adaptive equipment: equal to the observation period defined in clause 4.3.1.3.2 or clause 4.3.2.4.2. For adaptive equipment, the measurement duration shall be long enough to ensure a minimum number of bursts (at least 10) are captured.

NOTE 1: For adaptive equipment, to increase the measurement accuracy, a higher number of bursts may be used.

Step 2:

• For conducted measurements on devices with one transmit chain:
- Connect the power sensor to the transmit port, sample the transmit signal and store the raw data. Use these stored samples in all following steps.

• For conducted measurements on devices with multiple transmit chains:
- Connect one power sensor to each transmit port for a synchronous measurement on all transmit ports.
- Trigger the power sensors so that they start sampling at the same time. Make sure the time difference between the samples of all sensors is less than 500 ns.
- For each individual sampling point (time domain), sum the coincident power samples of all ports and store them. Use these summed samples in all following steps.

Step 3:

• Find the start and stop times of each burst in the stored measurement samples.
The start and stop times are defined as the points where the power is at least 30 dB below the highest value of the stored samples in step 2.
NOTE 2: In case of insufficient dynamic range, the value of 30 dB may need to be reduced appropriately.

Step 4:

• Between the start and stop times of each individual burst calculate the RMS power over the burst using the formula below. Save these Pburst values, as well as the start and stop times for each burst.

$$P_{burst} = \frac{1}{k}\sum_{n=1}^{k} P_{sample}(n)$$

with 'k' being the total number of samples and 'n' the actual sample number

Step 5:

• The highest of all Pburst values (value "A" in dBm) will be used for maximum e.i.r.p. calculations.

Step 6:

• Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.

• If applicable, add the additional beamforming gain "Y" in dB.

• If more than one antenna assembly is intended for this power setting, the maximum overall antenna gain (G or G + Y) shall be used.

• The RF Output Power (P) shall be calculated using the formula below:

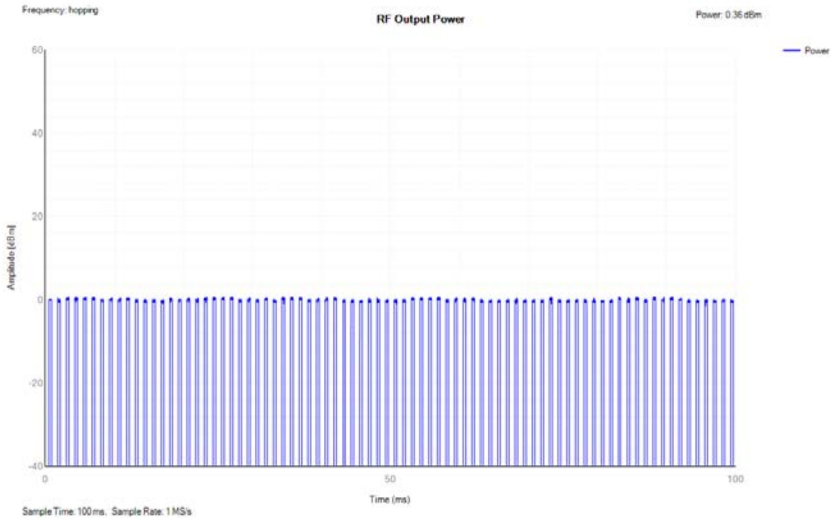
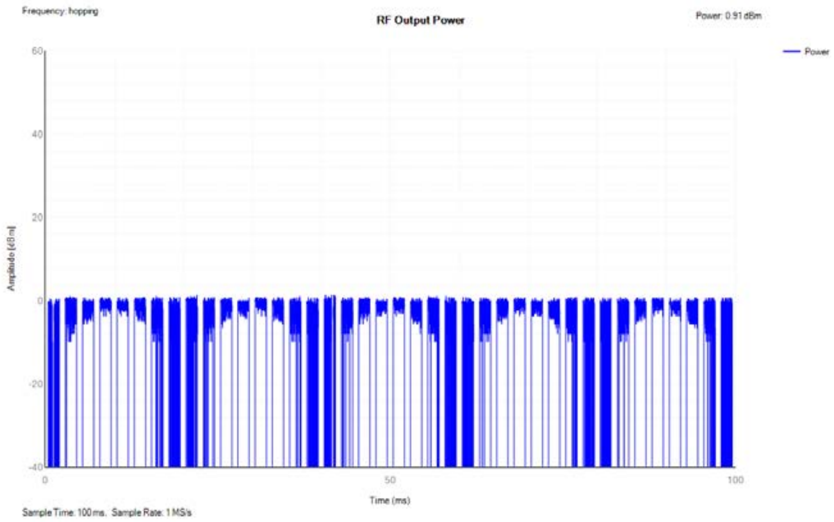
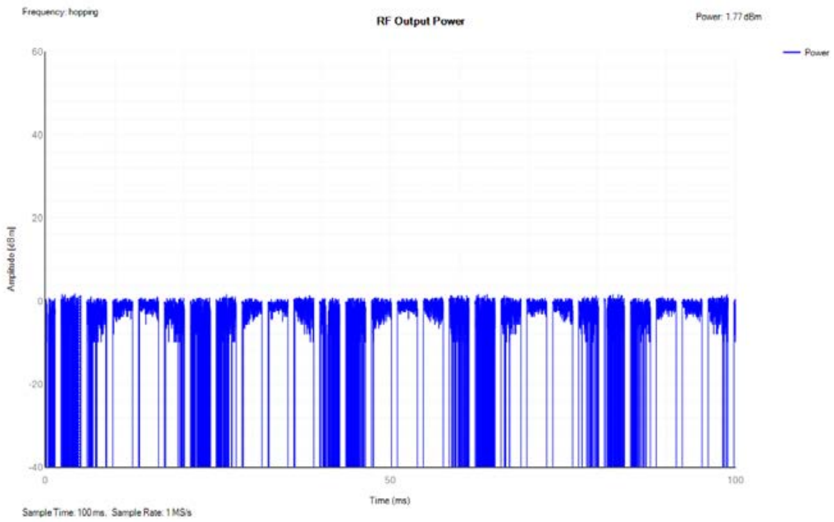
P = A + G + Y

• This value, which shall comply with the limit given in clause 4.3.1.2.3 or clause 4.3.2.2.3, shall be recorded in the test report.

6.4 Test Result

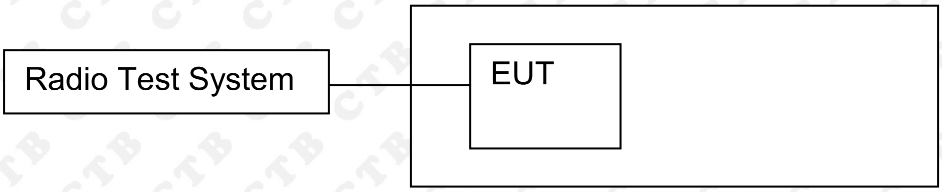
Modulation	Test conditions (Temperature)	EIRP (dBm) Hopping mode
GFSK	Normal	0.36
	Lower	0.2
	Upper	-0.06
π/4DQPSK	Normal	0.91
	Lower	0.75
	Upper	0.48
8DPSK	Normal	1.77
	Lower	1.51
	Upper	1.04
Limit		≤100mW (20dBm)
Remark: P = A + G + Y,G=1dBi,x=100%		

Remark: This Report only show the test plots of the worst case.

GFSK	
π/4 DQPSK	
8DPSK	

7. ACCUMULATED TRANSMIT TIME, MINIMUM FREQUENCY OCCUPATION AND HOPPING SEQUENCE

7.1 Block Diagram Of Test Setup



7.2 Limit

Adaptive Frequency Hopping equipment shall be capable of operating over a minimum of 70 % of the band specified in clause 1.
The Accumulated Transmit Time on any hopping frequency shall not be greater than 400 ms within any observation period of 400 ms multiplied by the minimum number of hopping frequencies (N) that have to be used. In order for the equipment to comply with the Frequency Occupation requirement, it shall meet either of the following two options:
Option 1: Each hopping frequency of the hopping sequence shall be occupied at least once within a period not exceeding four times the product of the dwell time and the number of hopping frequencies in use.
Option 2: The occupation probability for each frequency shall be between ((1 / U) × 25 %) and 77 % where U is the number of hopping frequencies in use.
The hopping sequence(s) shall contain at least N hopping frequencies at all times, where N is 15 or 15 divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

7.3 Test procedure

Step 1:

• The output of the transmitter shall be connected to a spectrum analyzer or equivalent.

• The analyzer shall be set as follows:

- Centre Frequency: Equal to the hopping frequency being investigated

- Frequency Span: 0 Hz

- RBW: ~ 50 % of the Occupied Channel Bandwidth

- VBW: ≥ RBW

- Detector Mode: RMS

- Sweep time: Equal to the applicable observation period (see clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2)

- Number of sweep points: 30 000

- Trace mode: Clear / Write

- Trigger: Free Run

Step 2:

• Save the trace data to a file for further analysis by a computing device using an appropriate software application or program.

Step 3:

• Identify the data points related to the frequency being investigated by applying a threshold.

The data points resulting from transmissions on the hopping frequency being investigated are assumed to have much higher levels compared to data points resulting from transmissions on adjacent hopping frequencies. If a clear determination between these transmissions is not possible, the RBW in step 1 shall be further reduced. In addition, a channel filter may be used.

• Count the number of data points identified as resulting from transmissions on the frequency being investigated and multiply this number by the time difference between two consecutive data points.

Step 4:

• The result in step 3 is the Accumulated Transmit Time which shall comply with the limit provided in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2 and which shall be recorded in the test report.

Step 5:

NOTE 1: This step is only applicable for equipment implementing Option 1 in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2 for complying with the Frequency Occupation requirement and the manufacturer decides to demonstrate compliance with this requirement via measurement.

• Make the following changes on the analyser and repeat step 2 and step 3.

Sweep time: 4 × Dwell Time × Actual number of hopping frequencies in use

The hopping frequencies occupied by the equipment without having transmissions during the dwell time (blacklisted frequencies) should be taken into account in the actual number of hopping frequencies in use. If this number cannot be determined (number of blacklisted frequencies unknown) it shall be assumed that the equipment uses the maximum possible number of hopping frequencies.

• The result shall be compared to the limit for the Frequency Occupation defined in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2. The result of this comparison shall be recorded in the test report.

Step 6:

• Make the following changes on the analyzer:

- Start Frequency: 2 400 MHz

- Stop Frequency: 2 483,5 MHz

- RBW: ~ 50 % of the Occupied Channel Bandwidth (single hopping frequency)

- VBW: ≥ RBW

- Detector Mode: RMS

- Sweep time: 1 s

- Trace Mode: Max Hold

- Trigger: Free Run

NOTE 2: The above sweep time setting may result in long measuring times. To avoid such long measuring times, an FFT analyser could be used.

• Wait for the trace to stabilize. Identify the number of hopping frequencies used by the hopping sequence.

• The result shall be compared to the limit (value N) defined in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2. This value shall be recorded in the test report.

For equipment with blacklisted frequencies, it might not be possible to verify the number of hopping frequencies in use. However they shall comply with the requirement for Accumulated Transmit Time and Frequency Occupation assuming the minimum number of hopping frequencies (N) defined in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2 is used.

Step 7:

• For adaptive equipment, using the lowest and highest -20 dB points from the total spectrum envelope obtained in step 6, it shall be verified whether the equipment uses 70 % of the band specified in clause 1. The result shall be recorded in the test report.

7.4 Test Result

Accumulated Transmit Time

Channel	Modulation	Accumulated Transmit Time (ms)	Limit (ms)	Result
LCH	GFSK	119.568	400	Pass
	π/4DQPSK	273.546	400	Pass
	8DPSK	308.909	400	Pass
HCH	GFSK	119.625	400	Pass
	π/4DQPSK	261.92	400	Pass
	8DPSK	320.568	400	Pass

Minimum Frequency Occupation

Channel	Modulation	Occupied period	Limit	Result
LCH	GFSK	1	4≥X≥1	Pass
	π/4DQPSK	3		Pass
	8DPSK	3		Pass
HCH	GFSK	2		Pass
	π/4DQPSK	3		Pass
	8DPSK	3		Pass

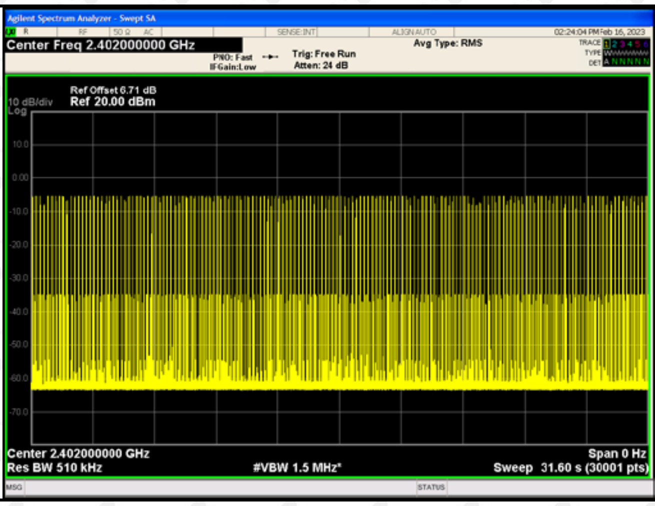
Hopping Sequence

Modulation	One pulse time (ms)	Number of Hopping Channel	Limit	-20 dB Bandwidth (%)	Limit	Result
GFSK	0.376	79	≥15	95.7	70 % of the band 2400MHz-2483.5MHz	Pass
π/4DQPSK	1.638	79		96.1		
8DPSK	2.887	79		96.1		

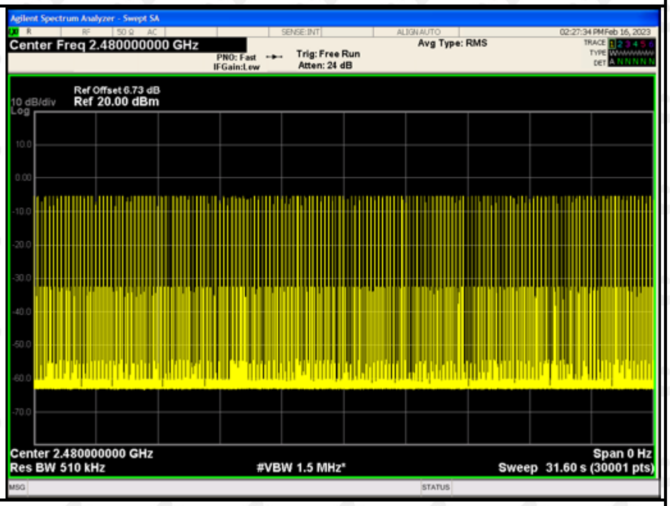
Test Graphs

Accumulated Transmit Time

GFSK

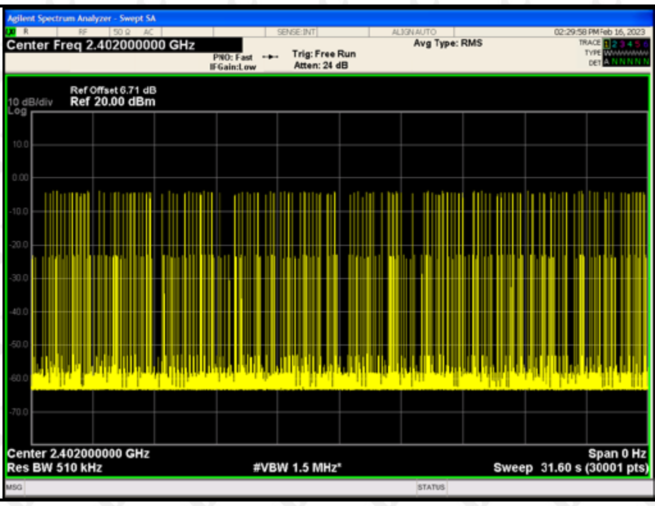


CH00

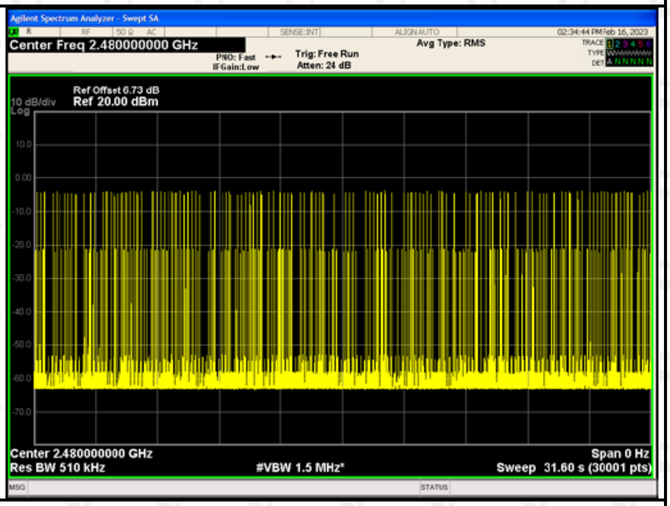


CH78

π/4DQPSK

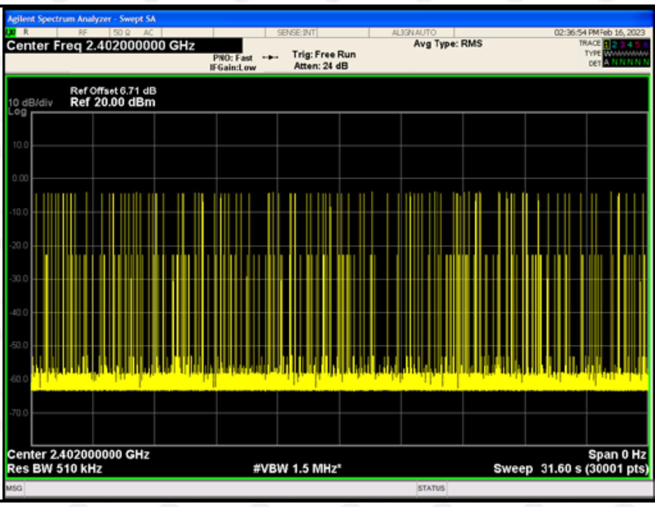


CH00

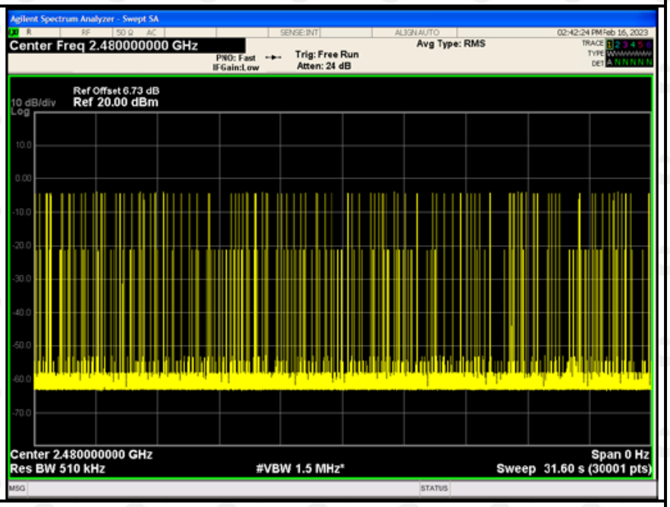


CH78

8DPSK



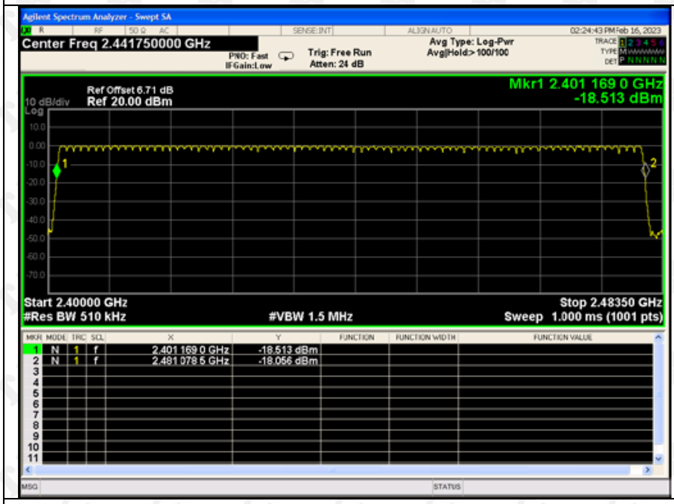
CH00



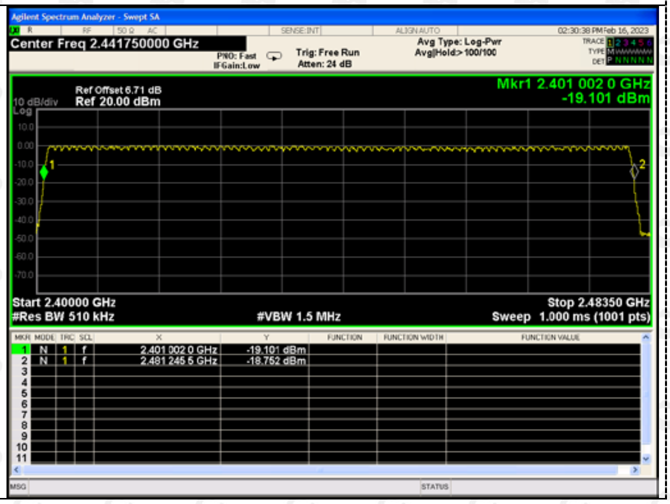
CH78

Hopping Sequence

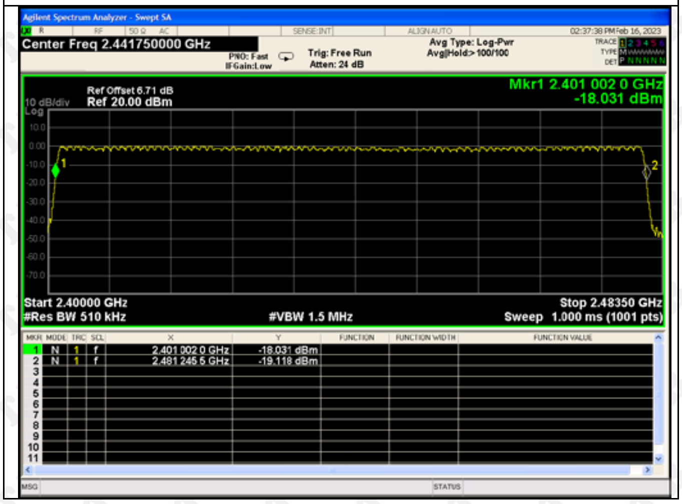
GFSK



π/4DQPSK

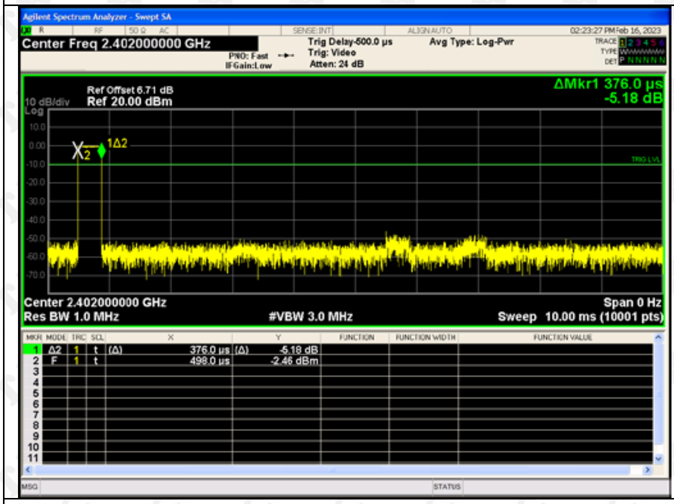


8DPSK

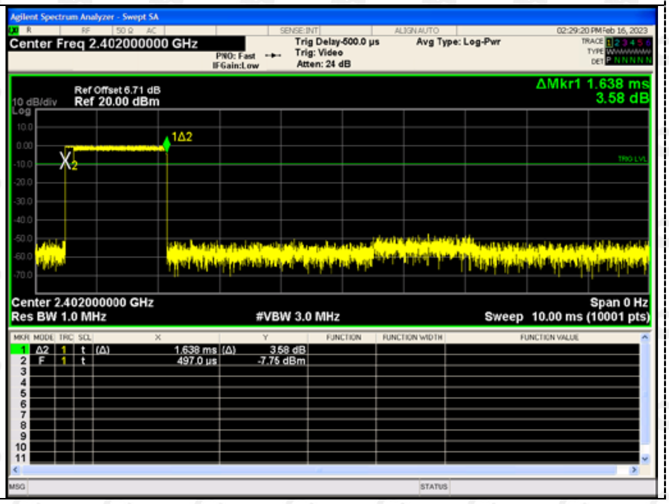


One pulse time

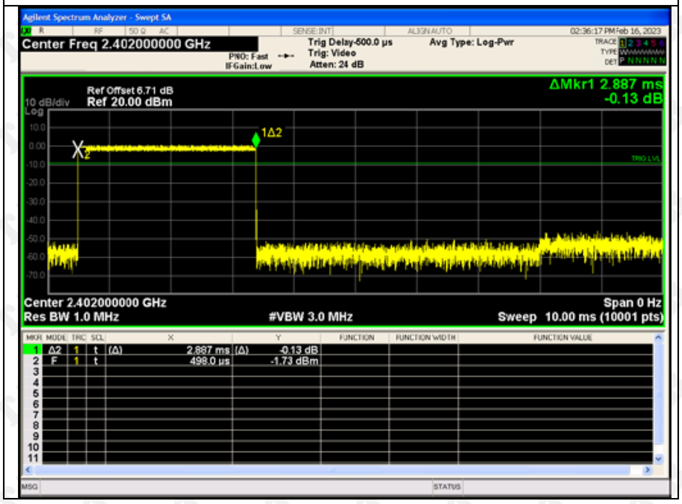
GFSK



π/4DQPSK

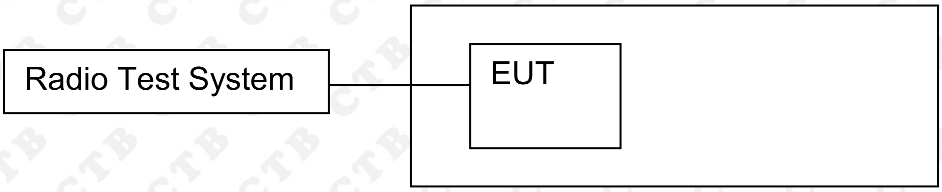


8DPSK



8. HOPPING FREQUENCY SEPARATION

8.1 Block Diagram Of Test Setup



8.2 Limit

For Non-adaptive frequency hopping systems
The minimum Hopping Frequency Separation shall be equal to Occupied Channel Bandwidth (see clause 5.3.1.5.3) of a single hop, with a minimum separation of 100 kHz.
For Adaptive frequency hopping systems
The minimum Hopping Frequency Separation shall be 100 kHz.

8.3 Test procedure

The Hopping Frequency Separation as defined in clause 4.3.1.5 shall be measured and recorded using any of the following options. The selected option shall be stated in the test report.

Option 1

Step 1:

• The output of the transmitter shall be connected to a spectrum analyser or equivalent.

• The analyser shall be set as follows:

- Centre Frequency: Centre of the two adjacent hopping frequencies
- Frequency Span: Sufficient to see the complete power envelope of both hopping frequencies
- RBW: 1 % of the span
- VBW: 3 × RBW
- Detector Mode: RMS
- Trace Mode: Max Hold
- Sweep time: 1 s

Step 2:

• Wait for the trace to stabilize.

• Use the marker function of the analyser to define the frequencies corresponding to the lower -20 dBr point and the upper -20 dBr point for both hopping frequencies F1 and F2. This will result in $F1_L$ and $F1_H$ for hopping frequency F1 and in $F2_L$ and $F2_H$ for hopping frequency F2. These values shall be recorded in the report.

Step 3:

• Calculate the centre frequencies $F1_C$ and $F2_C$ for both hopping frequencies using the formulas below. These values shall be recorded in the report.

$$F1_C = \frac{F1_L + F1_H}{2} \qquad F2_C = \frac{F2_L + F2_H}{2}$$

• Calculate the -20 dBr channel bandwidth (BW_{CHAN}) using the formula below. This value shall be recorded in the report.

$$BW_{CHAN} = F1_H - F1_L$$

• Calculate the Hopping Frequency Separation (FHS) using the formula below. This value shall be recorded in the report.

$$F_{HS} = F2_C - F1_C$$

• Compare the measured Hopping Frequency Separation with the limit defined in clause 4.3.1.5.3. In addition, for non-Adaptive Frequency Hopping equipment, the Hopping Frequency Separation shall be equal to or greater than Occupied Channel Bandwidth as defined in clause 4.3.1.8 or:

$$F_{HS} \geq \text{Occupied Channel Bandwidth}$$

• See figure 4:

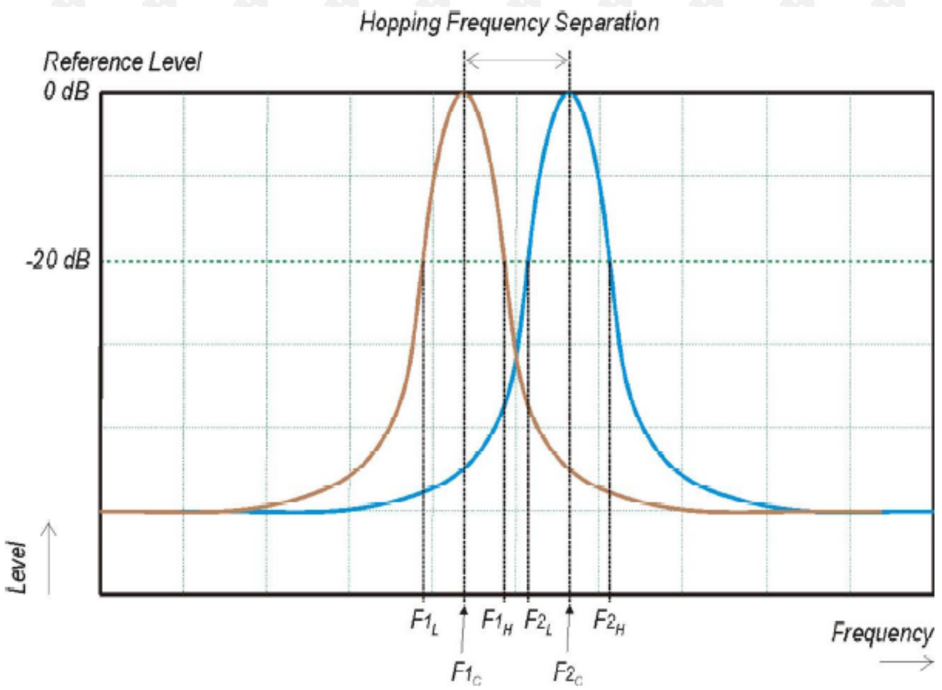


Figure 4: Hopping Frequency Separation

For adaptive equipment, in case of overlapping channels which will prevent the definition of the -20 dBr reference points $F1_H$ and $F2_L$, a higher reference level (e.g. -10 dBr or - 6 dBr) may be chosen to define the reference points $F1_L$; $F1_H$; $F2_L$ and $F2_H$.

Alternatively, special test software may be used to:

• force the UUT to hop or transmit on a single Hopping Frequency by which the -20 dBr reference points can be measured separately for the two adjacent Hopping Frequencies; and/or

• force the UUT to operate without modulation by which the centre frequencies F1C and F2C can be measured directly.

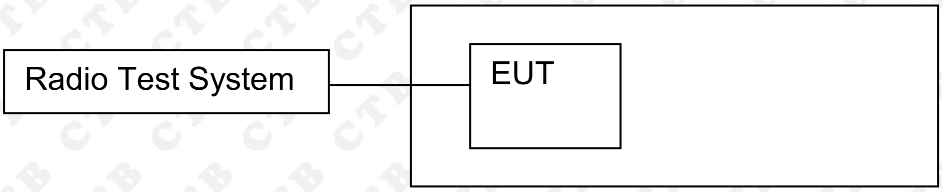
The method used to measure the Hopping Frequency Separation shall be documented in the test report.

8.4 Test Result

Mode		Measurement (MHz)	Limit (MHz)	Result
GFSK	DH1	0.9880	0.1	PASS
	DH3	0.9979	0.1	
	DH5	1.0101	0.1	

9. OCCUPIED CHANNEL BANDWIDTH

9.1 Block Diagram Of Test Setup



9.2 Limit

The Occupied Channel Bandwidth shall fall completely within the band given in 2.4GHz to 2.4835GHz.
In addition, for non-adaptive systems using wide band modulations other than FHSS and with e.i.r.p greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

9.3 Test procedure

Step 1:

Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test
- Resolution BW: ~ 1 % of the span without going below 1 %
- Video BW: 3 × RBW
- Frequency Span: 2 × Nominal Channel Bandwidth
- Detector Mode: RMS
- Trace Mode: Max Hold
- Sweep time: 1 s

Step 2:

Wait for the trace to stabilize.

Find the peak value of the trace and place the analyser marker on this peak.

Step 3:

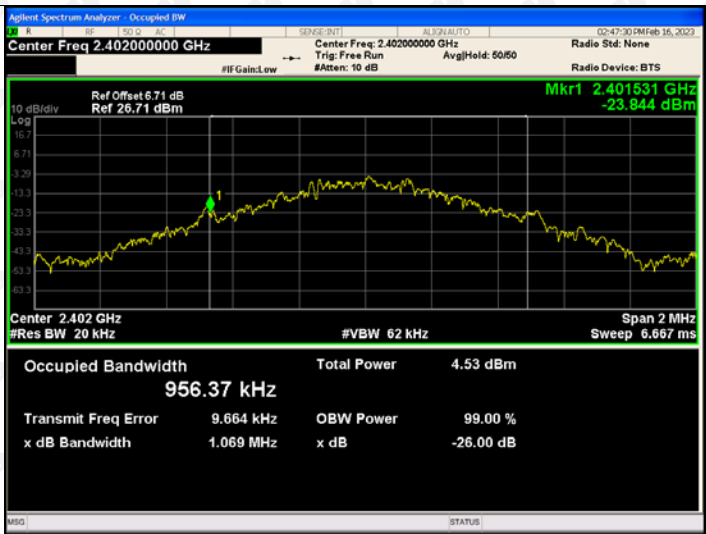
Use the 99 % bandwidth function of the spectrum analyser to measure the Occupied Channel Bandwidth of the UUT.

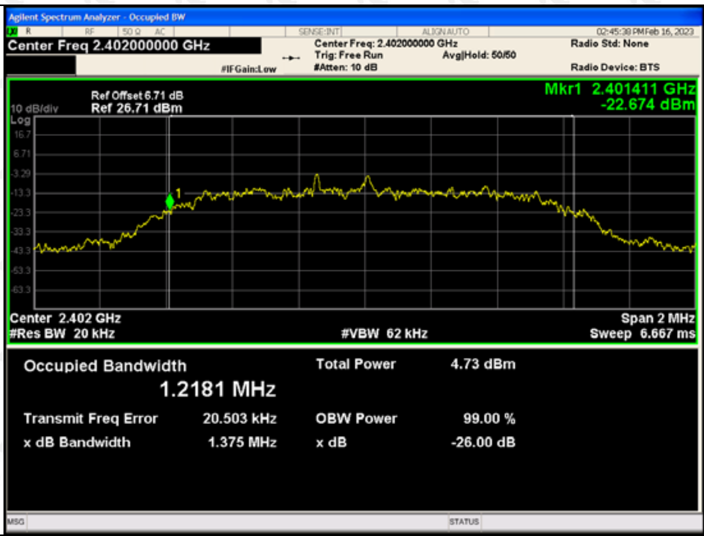
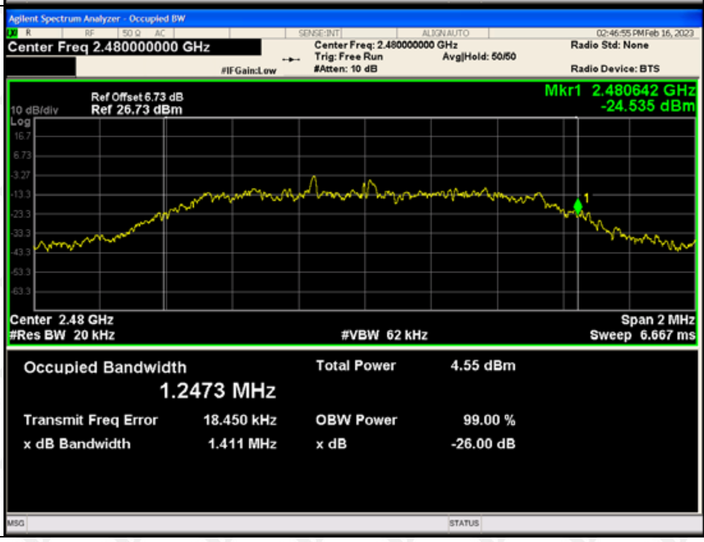
This value shall be recorded.

NOTE: Make sure that the power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals left and right from the power envelope being taken into account by this measurement.

9.4 Test Result

Modulation	Frequency (MHz)	Frequency Range (MHz)		Occupied Channel (MHz)
GFSK DH1	Low	2402.01	/	0.956
	High	/	2480.016	0.987
π/4-DQPSK 2DH3	Low	2402.021	/	1.218
	High	/	2480.018	1.247
8DPSK 3DH5	Low	2402.008	/	1.23
	High	/	2480.01	1.238

GFSK DH1 Low Channel			
GFSK DH1 High Channel			

<table>
<tr><td>π/4-DQPSK
2DH3
Low Channel</td><td></td><td>
</td><td></td></tr>
<tr><td>π/4-DQPSK
2DH3
High Channel</td><td></td><td>
</td><td></td></tr>
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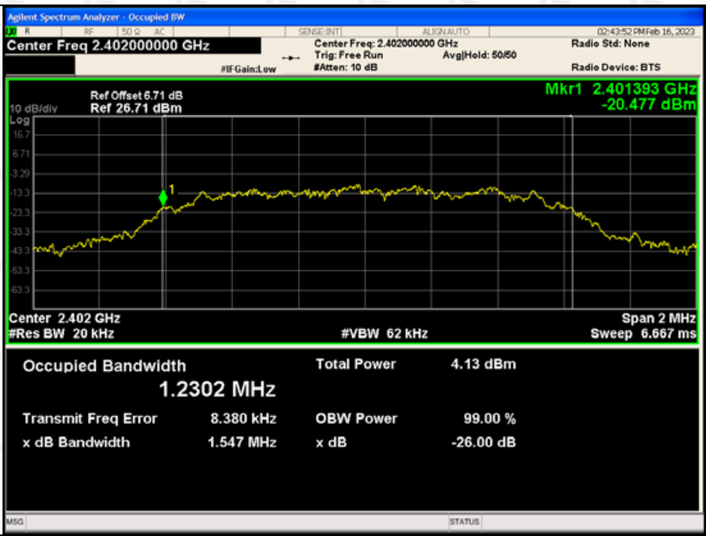
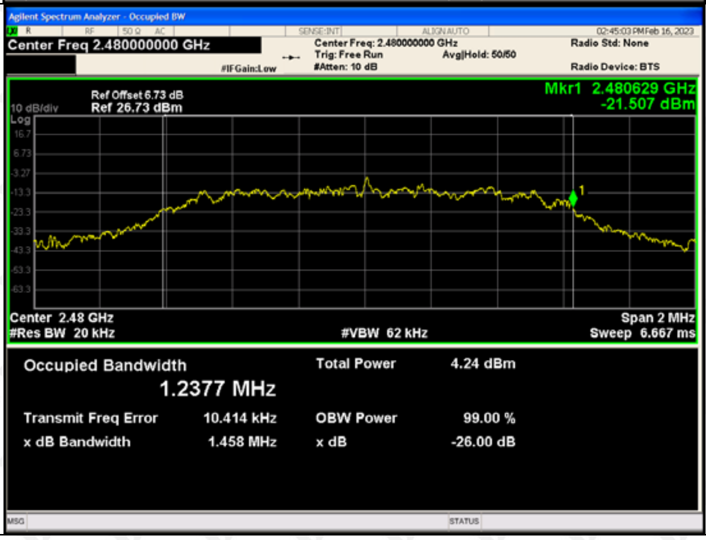
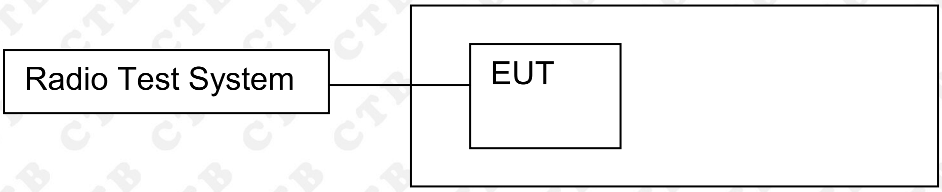
8DPSK 3DH5 Low Channel			
8DPSK 3DH5 High Channel			

10. TRANSMITTER UNWANTED EMISSIONS IN THE OUT-OF-BAND DOMAIN

10.1 Block Diagram Of Test Setup



10.2 Limit

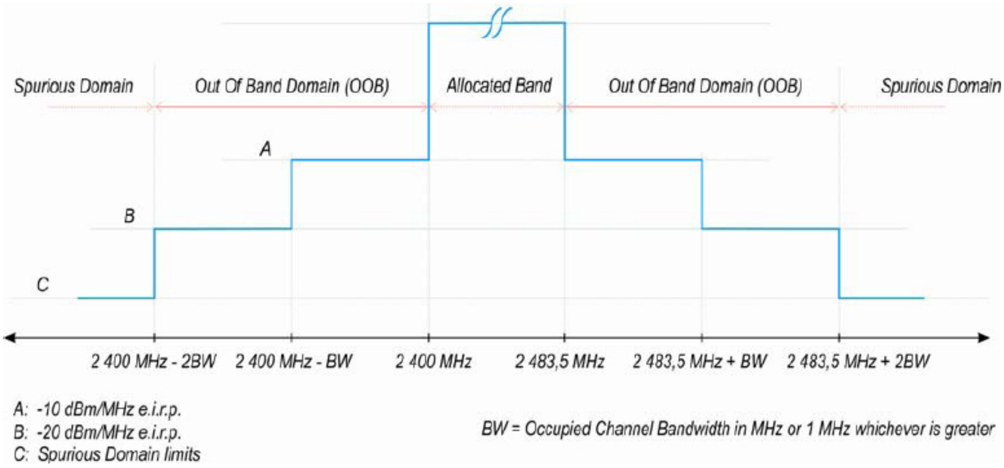


Figure 3: Transmit mask

10.3 Test procedure

The applicable mask is defined by the measurement results from the tests performed under clause 5.3.8 (Occupied Channel Bandwidth).

The test procedure is further as described under clause 5.3.9.2.1.

The Out-of-band emissions within the different horizontal segments of the mask provided in figures 1 and 3 shall be measured using the steps below. This method assumes the spectrum analyser is equipped with the Time Domain Power option.

Step 1:

• Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: 2 484 MHz
- Span: 0 Hz
- Resolution BW: 1 MHz
- Filter mode: Channel filter
- Video BW: 3 MHz
- Detector Mode: RMS
- Trace Mode: Max Hold
- Sweep Mode: Continuous

- Sweep Points: Sweep Time [s] / (1 μs) or 5 000 whichever is greater

- Trigger Mode: Video trigger

NOTE 1: In case video triggering is not possible, an external trigger source may be used.

- Sweep Time: > 120 % of the duration of the longest burst detected during the measurement of the RF Output Power

Step 2 (segment 2 483,5 MHz to 2 483,5 MHz + BW):

• Adjust the trigger level to select the transmissions with the highest power level.

• For frequency hopping equipment operating in a normal hopping mode, the different hops will result in signal bursts with different power levels. In this case the burst with the highest power level shall be selected.

• Set a window (start and stop lines) to match with the start and end of the burst and in which the RMS power shall be measured using the Time Domain Power function.

• Select RMS power to be measured within the selected window and note the result which is the RMS power within this 1 MHz segment (2 483,5 MHz to 2 484,5 MHz). Compare this value with the applicable limit provided by the mask.

• Increase the centre frequency in steps of 1 MHz and repeat this measurement for every 1 MHz segment within the range 2 483,5 MHz to 2 483,5 MHz + BW. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 3 (segment 2 483,5 MHz + BW to 2 483,5 MHz + 2BW):

• Change the centre frequency of the analyser to 2 484 MHz + BW and perform the measurement for the first 1 MHz segment within range 2 483,5 MHz + BW to 2 483,5 MHz + 2BW. Increase the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + 2 BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 4 (segment 2 400 MHz - BW to 2 400 MHz):

• Change the centre frequency of the analyser to 2 399,5 MHz and perform the measurement for the first 1 MHz segment within range 2 400 MHz - BW to 2 400 MHz Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - BW + 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 5 (segment 2 400 MHz - 2BW to 2 400 MHz - BW):

• Change the centre frequency of the analyser to 2 399,5 MHz - BW and perform the measurement for the first 1 MHz segment within range 2 400 MHz - 2BW to 2 400 MHz - BW. Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 6:

• In case of conducted measurements on equipment with a single transmit chain, the declared antenna assembly gain "G" in dBi shall be added to the results for each of the 1 MHz segments and compared with the limits

provided by the mask given in figure 1 or figure 3. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered.

• In case of conducted measurements on smart antenna systems (equipment with multiple transmit chains), the measurements need to be repeated for each of the active transmit chains. The declared antenna assembly gain "G" in dBi for a single antenna shall be added to these results. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered. Comparison with the applicable limits shall be done using any of the options given below:

- Option 1: the results for each of the transmit chains for the corresponding 1 MHz segments shall be added. The additional beamforming gain "Y" in dB shall be added as well and the resulting values compared with the limits provided by the mask given in figure 1 or figure 3.

- Option 2: the limits provided by the mask given in figure 1 or figure 3 shall be reduced by

10 × log10(Ach) and the additional beamforming gain "Y" in dB. The results for each of the transmit chains shall be individually compared with these reduced limits.

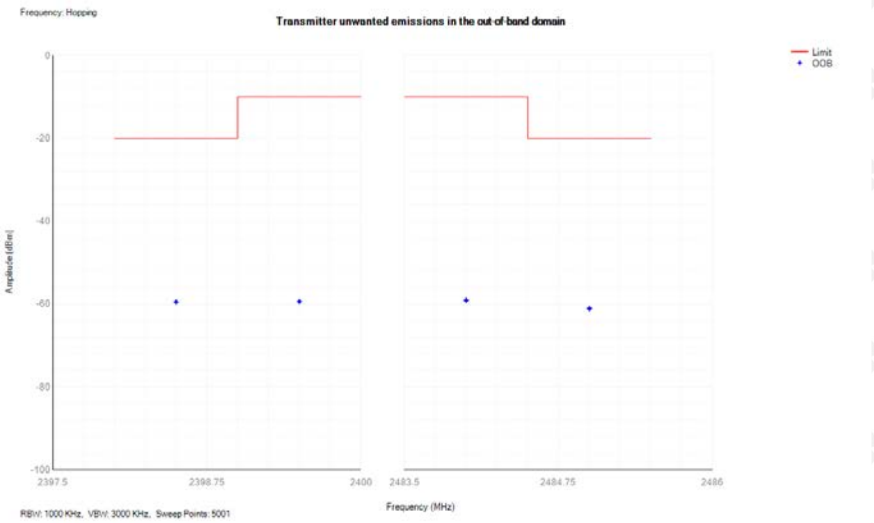
NOTE 2: Ach refers to the number of active transmit chains.

It shall be recorded whether the equipment complies with the mask provided in figure 1 or figure 3.

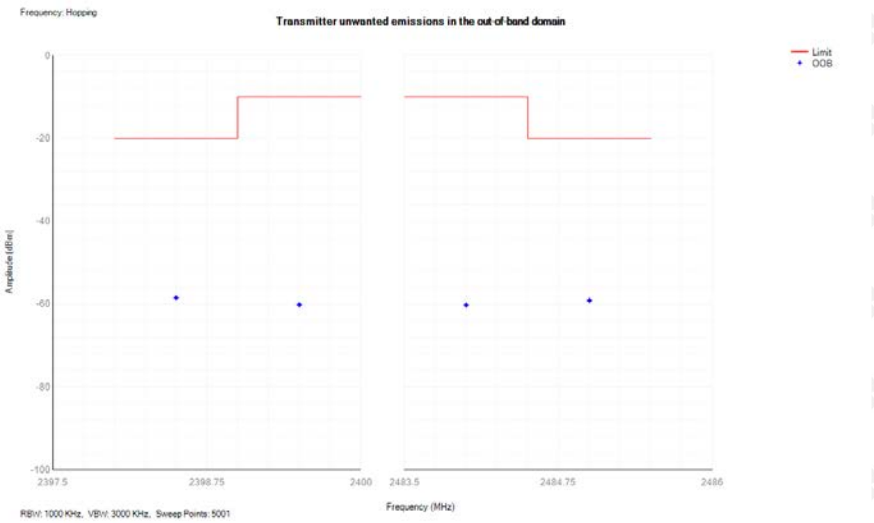
10.4 Test Result

Modulation : GFSK (the worst data) :

Low Channel				
Test Freq (MHz)	**Antenna**	**Freq(MHz)**	**Level**	**Limit**
2402	Antenna 1	2399.5	-59.41	-10
2402	Antenna 1	2398.5	-59.5	-20

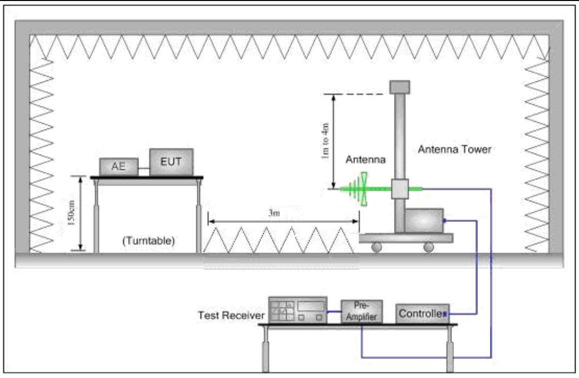


High Channel				
Test Freq (MHz)	**Antenna**	**Freq(MHz)**	**Level**	**Limit**
2480	Antenna 1	2484	-59.1	-10
2480	Antenna 1	2485	-61.12	-20

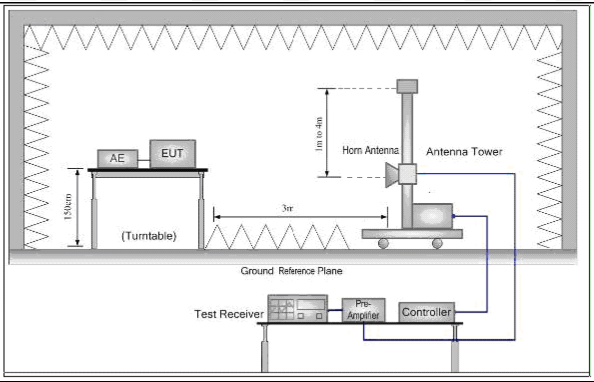


11. TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

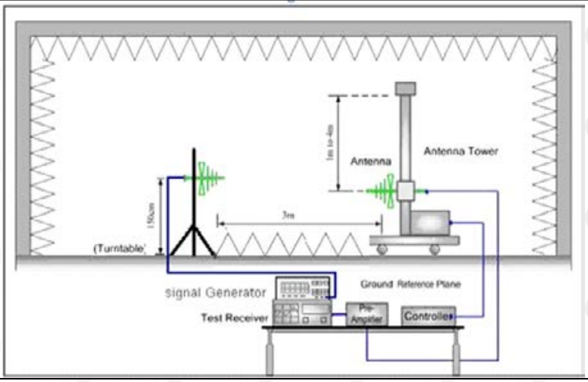
11.1 Block Diagram Of Test Setup



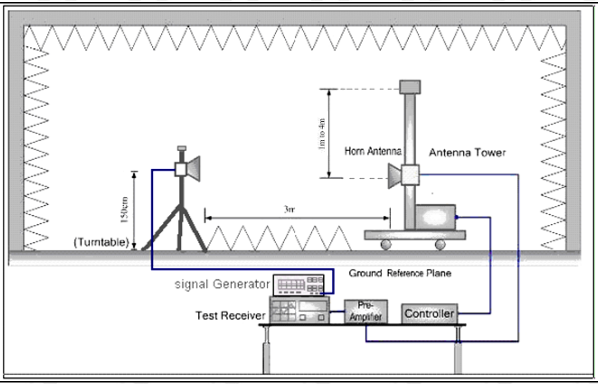
Below 1GHz



Above 1GHz



Below 1GHz



Above 1GHz

11.2 Limits

Frequency range	Maximum power, e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	RBW/VBW
30 MHz to 47 MHz	-36 dBm	100 kHz/300KHz
47 MHz to 74 MHz	-54 dBm	100 kHz/300KHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz/300KHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz/300KHz
118 MHz to 174 MHz	-36 dBm	100 kHz/300KHz
174 MHz to 230 MHz	-54 dBm	100 kHz/300KHz
230 MHz to 470 MHz	-36 dBm	100 kHz/300KHz
470 MHz to 694 MHz	-54 dBm	100 kHz/300KHz
694 MHz to 1 GHz	-36 dBm	100 kHz/300KHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz/3MHz

11.3 Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the nonconductive turntable 1.5m above the ground in a full anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable 1.5 m above the ground in a full anechoic chamber..

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

11.4 Test Results

Modulation : GFSK (the worst data) :

Below 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
44.499	-55.05	-12.30	-67.35	-36.00	-31.35	peak	1.9	6	H
67.041	-55.03	-12.19	-67.22	-54.00	-13.22	peak	1.5	35	H
103.961	-56.20	-12.23	-68.43	-54.00	-14.43	peak	1.6	107	H
219.500	-53.22	-11.00	-64.22	-54.00	-10.22	peak	1.8	311	H
327.654	-52.87	-9.52	-62.39	-36.00	-26.39	peak	1.5	320	H
869.299	-52.21	-0.01	-52.22	-36.00	-16.22	peak	1.3	291	H
48.166	-54.93	-12.04	-66.97	-36.00	-30.97	peak	1.4	213	V
99.686	-55.31	-11.98	-67.29	-54.00	-13.29	peak	1.0	346	V
182.422	-55.81	-12.00	-67.81	-54.00	-13.81	peak	1.5	24	V
219.757	-53.35	-11.20	-64.55	-54.00	-10.55	peak	1.0	138	V
326.544	-53.10	-10.21	-63.31	-36.00	-27.31	peak	1.1	293	V
869.955	-52.49	-0.13	-52.62	-36.00	-16.62	peak	1.3	75	V
High Channel									
46.785	-54.87	-12.50	-67.37	-36.00	-31.37	peak	1.7	331	H
67.326	-55.39	-12.24	-67.63	-54.00	-13.63	peak	1.5	115	H
103.869	-56.20	-12.27	-68.47	-54.00	-14.47	peak	1.3	46	H
217.228	-52.91	-10.52	-63.43	-54.00	-9.43	peak	1.3	116	H
327.979	-53.46	-9.81	-63.27	-36.00	-27.27	peak	1.5	149	H
871.386	-52.18	0.01	-52.18	-36.00	-16.18	peak	1.7	64	H
47.370	-54.90	-12.60	-67.50	-36.00	-31.50	peak	1.6	137	V
99.898	-55.26	-11.76	-67.02	-54.00	-13.02	peak	1.1	272	V
183.891	-55.95	-11.79	-67.74	-54.00	-13.74	peak	1.3	320	V
219.191	-53.56	-10.95	-64.51	-54.00	-10.51	peak	1.2	8	V
326.018	-53.55	-9.53	-63.07	-36.00	-27.07	peak	1.2	139	V
869.690	-52.44	-0.59	-53.04	-36.00	-17.04	peak	1.2	216	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

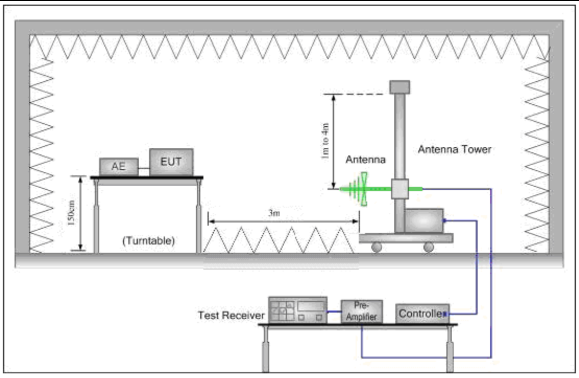
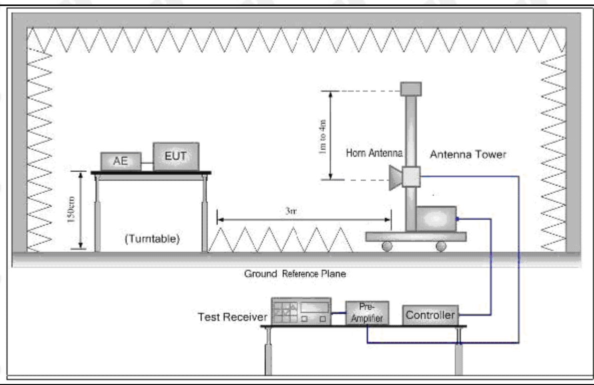
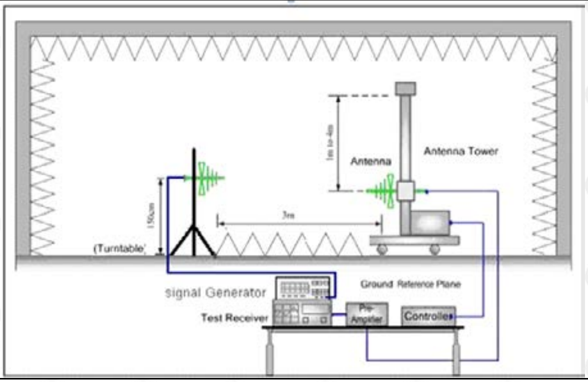
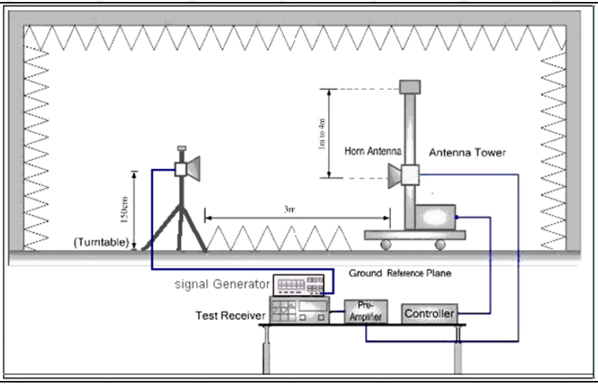
Above 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
4804	-54.26	8.41	-45.85	-30.00	-15.85	peak	1.1	171	H
7206	-52.58	12.55	-40.03	-30.00	-10.03	peak	1.7	220	H
4804	-54.64	8.41	-46.23	-30.00	-16.23	peak	1.4	337	V
7206	-51.72	12.55	-39.17	-30.00	-9.17	peak	1.6	21	V
High Channel									
4960	-54.95	8.51	-46.44	-30.00	-16.44	peak	1.0	122	H
7440	-52.99	12.69	-40.30	-30.00	-10.30	peak	1.8	78	H
4960	-54.99	8.51	-46.48	-30.00	-16.48	peak	1.3	92	V
7440	-52.30	12.69	-39.61	-30.00	-9.61	peak	1.6	17	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

12. RECEIVER SPURIOUS EMISSIONS

12.1 Block Diagram Of Test Setup

	
Below 1GHz	Above 1GHz
	
Below 1GHz	Above 1GHz

12.2 Limits

Frequency(MHz)	Limit
30-1000	-57dBm
1000-12750	-47dBm

12.3 Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the nonconductive turntable 1.5m above the ground in a full anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable 1.5 m above the ground in a full anechoic chamber..

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

12.4 Test Results

Modulation : GFSK (the worst data) :

Below 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
45.857	-60.36	-12.33	-72.70	-57.00	-15.70	peak	1.2	319	H
67.564	-60.28	-11.91	-72.20	-57.00	-15.20	peak	1.1	191	H
103.821	-60.67	-11.92	-72.59	-57.00	-15.59	peak	1.1	255	H
219.137	-62.60	-10.51	-73.11	-57.00	-16.11	peak	1.7	268	H
327.418	-61.72	-9.53	-71.25	-57.00	-14.25	peak	1.5	107	H
870.876	-69.18	-0.31	-69.49	-57.00	-12.49	peak	1.6	23	H
48.708	-60.12	-12.10	-72.23	-57.00	-15.23	peak	1.0	44	V
100.227	-61.11	-12.24	-73.36	-57.00	-16.36	peak	1.1	82	V
182.355	-62.85	-12.47	-75.32	-57.00	-18.32	peak	1.1	340	V
219.431	-61.31	-11.09	-72.39	-57.00	-15.39	peak	1.4	32	V
328.187	-59.37	-9.73	-69.10	-57.00	-12.10	peak	1.1	73	V
871.116	-69.52	-0.66	-70.18	-57.00	-13.18	peak	1.1	290	V
High Channel									
45.415	-60.49	-12.07	-72.57	-57.00	-15.57	peak	1.1	128	H
67.379	-60.92	-12.63	-73.54	-57.00	-16.54	peak	1.5	272	H
103.510	-60.34	-11.82	-72.16	-57.00	-15.16	peak	1.2	258	H
216.823	-62.30	-10.56	-72.85	-57.00	-15.85	peak	1.1	270	H
328.389	-61.92	-10.08	-72.00	-57.00	-15.00	peak	1.6	112	H
869.427	-69.28	-0.38	-69.66	-57.00	-12.66	peak	1.1	264	H
48.974	-60.07	-11.86	-71.93	-57.00	-14.93	peak	1.7	4	V
101.653	-61.22	-11.81	-73.03	-57.00	-16.03	peak	1.4	85	V
182.735	-62.70	-11.69	-74.39	-57.00	-17.39	peak	1.4	75	V
217.031	-61.31	-11.17	-72.48	-57.00	-15.48	peak	1.4	52	V
327.059	-59.77	-9.55	-69.32	-57.00	-12.32	peak	1.8	104	V
869.938	-70.18	-0.33	-70.51	-57.00	-13.51	peak	1.8	12	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

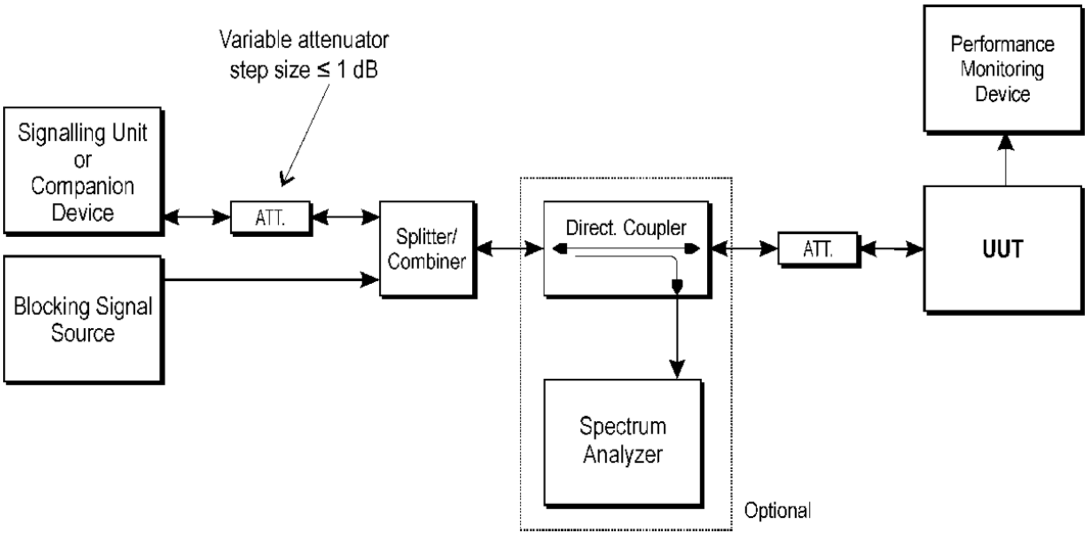
Above 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
2248.48	-61.28	3.12	-58.16	-47.00	-11.16	peak	1.8	291	H
2248.80	-60.18	3.13	-57.05	-47.00	-10.05	peak	1.7	25	V
High Channel									
2443.41	-59.70	3.52	-56.18	-47.00	-9.18	peak	1.6	134	H
2443.66	-62.46	3.53	-58.93	-47.00	-11.93	peak	1.3	25	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

13. RECEIVER BLOCKING

13.1 Block Diagram Of Test Setup



13.2 Limit

Table 14: Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × $\log_{10}$(OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW
(-139 dBm + 10 × $\log_{10}$(OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674		

NOTE 1: OCBW is in Hz.
NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.
NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 20 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.
NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Table 15: Receiver Blocking parameters receiver Category 2 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

Table 16: Receiver Blocking parameters receiver Category 3 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 30 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

13.3 Test procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.11.2.

13.4 Test Result

Modulation : 8DPSK (the worst data) :

Receiver Category 2					
8DPSK Transmitting	P_{min}(dBm)	Blocking Frequency(MHz)	Blocking Power(dB)	Measured PER(%)	Limit (%)
2402	-68	2380	-34	0.49	10
2402	-68	2504	-34	0.63	10
2402	-68	2300	-34	0.33	10
2402	-68	2584	-34	0.28	10
2441	-68	2380	-34	0.43	10
2441	-68	2504	-34	0.23	10
2441	-68	2300	-34	0.17	10
2441	-68	2584	-34	0.77	10
2480	-68	2380	-34	0.65	10
2480	-68	2504	-34	0.65	10
2480	-68	2300	-34	0.64	10
2480	-68	2584	-34	0.40	10
Note:This report only shows the worst case test data.					

14. EUT PHOTOGRAPHS

Refer to Report No.: CTB230216021REX for EUT external and internal photos.

15. EUT TEST SETUP PHOTOGRAPHS

Spurious emissions

※※※※※ END OF REPORT ※※※※※

TEST REPORT

Product Name:	Projector
Trademark:	GJTOS, xinteprid, clokowe, ELEPHAS, GOODEE, Cibest, ARTSEA, YABER, WIMIUS, Uyole, Bacar, Lifegoods, BLAUPUNKT, EKO, VOLLPS, Auking, AngBeam, Thundeal
Model Number:	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Prepared For:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Manufacturer:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	Jan. 29, 2023
Sample tested Date:	Jan. 29, 2023 to Feb. 16, 2023
Issue Date:	Feb. 16, 2023
Report No.:	CTB230216024RFX
Test Standards	ETSI EN 301 893 V2.1.1 (2017-05)
Test Results	PASS
Remark:	This is WIFI-5GHz band radio test report.

Compiled by:	Reviewed by:	Approved by:
ChenZheng	Arron Liu	Bin Mei
Chen Zheng	Arron Liu	Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

TABLE OF CONTENT

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB230216024RFX	Feb. 16, 2023	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Test Item	Test Requirement	Test Method	Limit	Result
Nominal Centre frequencies	ETSI EN 301 893 V2.1.1 Clause 4.2.1	ETSI EN 301 893 V2.1.1 Clause 5.4.2	± 20 ppm	PASS
Nominal Channel Bandwidth and Occupied Channel Bandwidth	ETSI EN 301 893 V2.1.1 Clause 4.2.2	ETSI EN 301 893 V2.1.1 Clause 5.4.3	Refer clause 4.2.2.2	PASS
RF output power, Transmit Power Control (TPC) and power density	ETSI EN 301 893 V2.1.1 Clause 4.2.3	ETSI EN 301 893 V2.1.1 Clause 5.4.4	Refer clause 4.3.3.2	PASS
Transmitter unwanted emissions outside the 5 GHz RLAN bands	ETSI EN 301 893 V2.1.1 Clause 4.2.4.1	ETSI EN 301 893 V2.1.1 Clause 5.4.5	Refer clause 4.2.4.1.2	PASS
Transmitter unwanted emissions within the 5 GHz RLAN bands	ETSI EN 301 893 V2.1.1 Clause 4.2.4.2	ETSI EN 301 893 V2.1.1 Clause 5.4.6	Refer clause 4.2.4.2.2	PASS
Receiver spurious emissions	ETSI EN 301 893 V2.1.1 Clause 4.2.5	ETSI EN 301 893 V2.1.1 Clause 5.4.7	Refer clause 4.2.5.2	PASS
Dynamic Frequency Selection (DFS)	ETSI EN 301 893 V2.1.1 Clause 4.2.6	ETSI EN 301 893 V2.1.1 Clause 5.4.8	Refer clause 4.2.6.2.2	N/A[1]
Adaptivity (channel access mechanism)	ETSI EN 301 893 V2.1.1 Clause 4.2.7	ETSI EN 301 893 V2.1.1 Clause 5.4.9	Refer clause 4.2.7.3	PASS
Receiver Blocking	ETSI EN 301 893 V2.1.1 Clause 4.2.8	ETSI EN 301 893 V2.1.1 Clause 5.4.10	Refer clause 4.2.8.4	PASS
User Access Restrictions	ETSI EN 301 893 V2.1.1 Clause 4.2.9	N/A	Refer clause 4.2.9.2	N/A[2]
Geo-location capability	ETSI EN 301 893 V2.1.1 Clause 4.2.10	N/A	Refer clause 4.2.10.3	N/A[3]

Remark:
N/A[1:] The product has no DFS function.
N/A[2:] The product should not allow the user to change.
N/A[3:] The product has no Geo-location capability.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radiated Frequency.
CH: In this whole report CH means channel.

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Receiver Reference Sensitivity level	1.9dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63℃
Frequency	1×10^{-7}

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: A6
WIFI Version:	IEEE 802.11a/b/g/n/ac
Hardware Version:	PJ67V810
Software Version:	YKV01.20221123
Operation Frequency:	IEEE 802.11a/n/ac(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11n/ac(40M): 5150MHz ~5250MHz/ 2 channel IEEE 802.11ac(80M): 5150MHz ~5250MHz/ 1 channel
Max. RF output power:	WiFi(5G): 6.72dBm
Type of Modulation:	WiFi: DSSS, OFDM
Antenna installation:	FPC antenna
Antenna Gain:	WiFi(5150MHz ~5250MHz): 1.0dBi
Ratings:	AC 100-240V~50/60Hz

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
/	/	/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

For 802.11a/n/ac(20M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz

For 802.11n/ac(40M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

For 802.11ac(80M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
42	5210MHz	NA	NA

4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test	Clause	Test channels		
		Lower sub-band (5 150 MHz to 5 350 MHz)		Higher sub-band 5 470 MHz to 5 725 MHz
		5 150 MHz to 5 250 MHz	5 250 MHz to 5 350 MHz	
Centre frequencies	5.4.2	C7 (see note 1)		C8 (see note 1)
Occupied Channel Bandwidth	5.4.3	C7		C8
Power, Power Density	5.4.4	C1	C2	C3, C4
Transmitter unwanted emissions outside the 5 GHz RLAN bands	5.4.5	C7 (see note 1)		C8 (see note 1)
Transmitter unwanted emissions within the 5 GHz RLAN bands	5.4.6	C1	C2	C3, C4
Receiver spurious emissions	5.4.7	C7 (see note 1)		C8 (see note 1)

Test	Clause	Test channels		
		Lower sub-band (5 150 MHz to 5 350 MHz)		Higher sub-band 5 470 MHz to 5 725 MHz
		5 150 MHz to 5 250 MHz	5 250 MHz to 5 350 MHz	
Transmit Power Control (TPC)	5.4.4	n.a. (see note 2)	C2 (see note 1)	C3, C4 (see note 1)
Dynamic Frequency Selection (DFS)	5.4.8	n.a. (see note 2)	C5	C6 (see note 3)
Adaptivity	5.4.9	C9		
Receiver Blocking	5.4.10	C7		C8

C1, C3: The lowest declared channel for every declared *Nominal Channel Bandwidth* within this band. For the Power Density testing, it is sufficient to only perform this test using the lowest *Nominal Channel Bandwidth*.

C2, C4: The highest declared channel for every declared *Nominal Channel Bandwidth* within this band. For the Power Density testing, it is sufficient to only perform this test using the lowest *Nominal Channel Bandwidth*.

C5, C6: One channel out of the declared channels for this frequency range. If more than one *Nominal Channel Bandwidth* has been declared for this sub-band, testing shall be performed using the lowest and highest *Nominal Channel Bandwidth*.

C7, C8: One channel out of the declared channels for this sub-band. For *Occupied Channel Bandwidth*, testing shall be repeated for every declared *Nominal Channel Bandwidth* within this sub-band.

C9: One channel (in case of single-channel testing) or a group of channels (in case of multi-channel testing) out of the declared channels.

NOTE 1: In case of more than one channel plan has been declared, testing of these specific requirements need only be performed using one of the declared channel plans.

NOTE 2: Testing is not required for *Nominal Channel Bandwidths* that fall completely within the frequency range 5 150 MHz to 5 250 MHz.

NOTE 3: Where the declared channel plan includes channels whose *Nominal Channel Bandwidth* falls completely or partly within the 5 600 MHz to 5 650 MHz band, the tests for the *Channel Availability Check* (and where implemented, for the *Off-Channel CAC)* shall be performed on one of these channels in addition to a channel within the band 5 470 MHz to 5 600 MHz or within the band 5 650 MHz to 5 725 MHz.

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(AC):	230V
Normal Temperature(℃):NT	23
Low Temperature(℃):LT	0
High Temperature(℃):HT	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

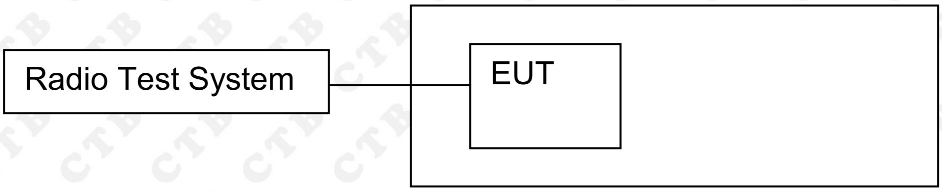
5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2023.07.19
2	Power Sensor	Agilent	U2021XA	MY56120032	2023.07.19
3	Power Sensor	Agilent	U2021XA	MY56120034	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2023.07.19
6	Signal Generator	Agilent	N5181A	MY50140365	2023.07.19
7	Vector signal generator	Agilent	N5182A	MY47420195	2023.07.19
8	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2023.07.19
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2023.07.19
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2023.07.19
12	BT&WI-FI Automatic test software	Micowave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2022.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2023.07.19
15	234G Automatic test software	Micowave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	2023.07.19
18	Amplifier	HP	8447E	2945A02747	2023.07.19
19	Amplifier	Agilent	8449B	3008A01838	2023.07.19
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2023.07.22
21	Double Ridged Broadband Horn	Schwarzbeck	BBHA9120D	01911	2023.07.22

	Antenna				
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	2023.07.23
24	loop antenna	ZHINAN	ZN30900A	GTS534	/
25	40G Horn antenna	A/H/System	SAS-574	588	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2024.10.30

6. NOMINAL CENTRE FREQUENCIES

6.1 Block Diagram Of Test Setup



6.2 Limit

The Nominal Centre Frequencies (fc) for a Nominal Channel Bandwidth of 20 MHz are defined by equation (1). See also figure 3.
fc = 5 160 + (g × 20) MHz, where $0 \le g \le 9$ or $16 \le g \le 27$ and where g shall be an integer.
A maximum offset of the Nominal Centre Frequency of ±200 kHz is permitted. Where the manufacturer decides to make use of this frequency offset, the manufacturer shall declare the actual centre frequencies used by the equipment.
See clause 5.4.1, item a).
The actual centre frequency for any given channel shall be maintained within the range fc ± 20 ppm.
Equipment may have simultaneous transmissions on more than one Operating Channel with a Nominal Channel Bandwidth of 20 MHz.

6.3 Test procedure

This method is an alternative to the above method in case the UUT cannot be operated in an un-modulated mode.

The UUT shall be connected to spectrum analyser.

Max Hold shall be selected and the centre frequency adjusted to that of the UUT.

The peak value of the power envelope shall be measured and noted. The span shall be reduced and the marker moved in a positive frequency increment until the upper, (relative to the centre frequency), -10 dBc point is reached. This value shall be noted as f1.

The marker shall then be moved in a negative frequency increment until the lower, (relative to the centre frequency), -10 dBc point is reached. This value shall be noted as f2.

The centre frequency is calculated as (f1 + f2) / 2.

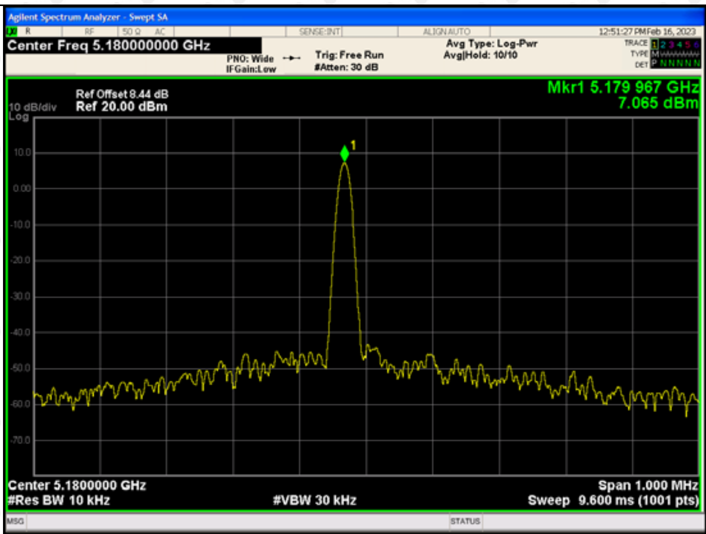
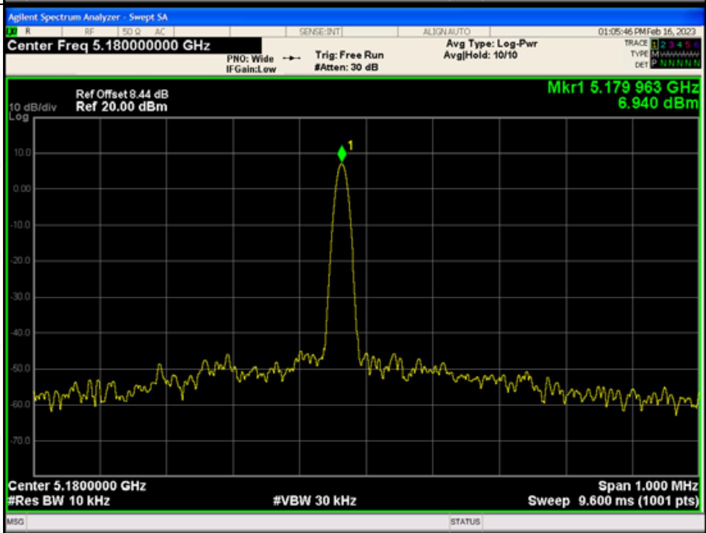
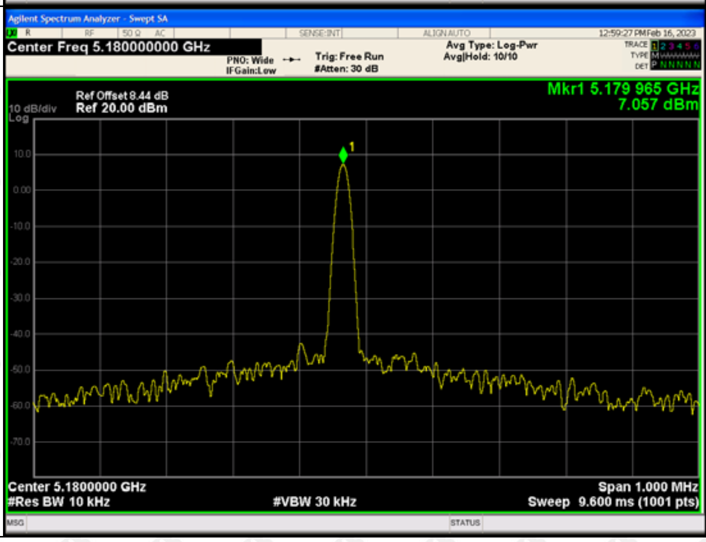
6.4 Test Result

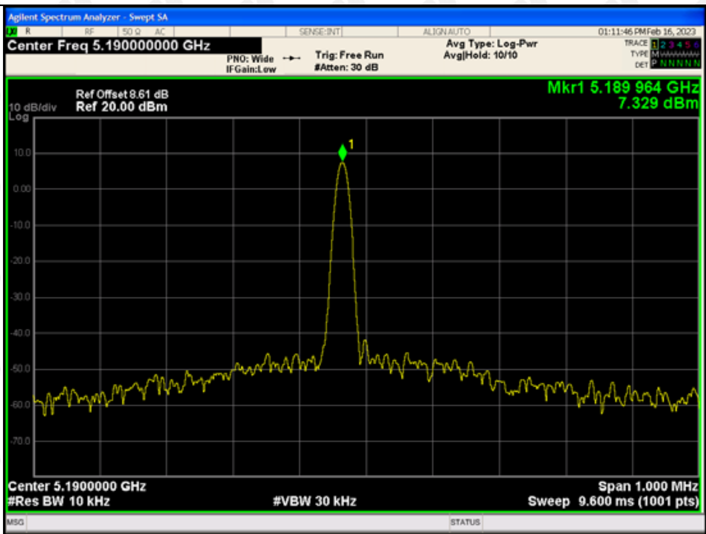
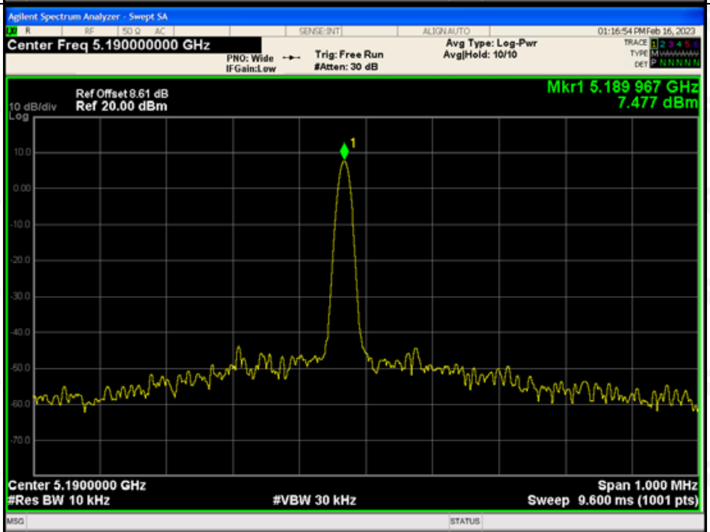
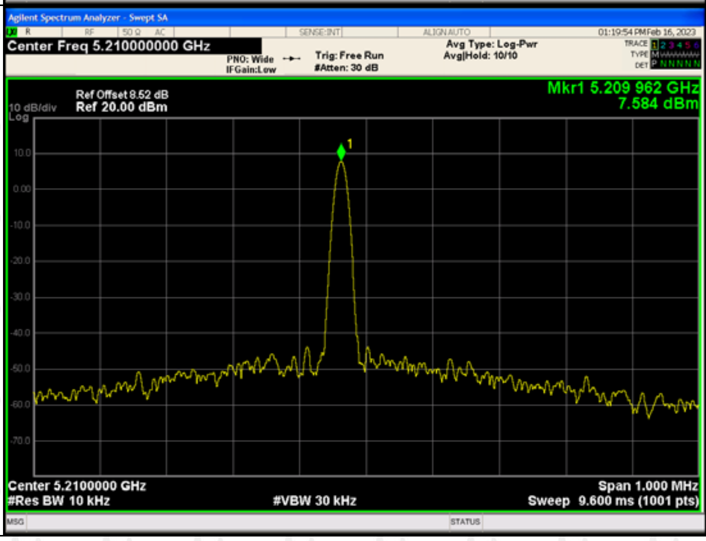
5150-5250MHz

Test conditions	Antenna	Modulation	Test Channel (MHz)	Frequency Measured (MHz)	Limit(ppm)	Result
NVNT	Ant1	802.11(a20)	5180	5179.967	±20	Pass
	Ant1	802.11(ac20)	5180	5179.963	±20	Pass
	Ant1	802.11(n20)	5180	5179.965	±20	Pass
	Ant1	802.11(n40)	5190	5189.964	±20	Pass
	Ant1	802.11(ac40)	5190	5189.967	±20	Pass
	Ant1	802.11(ac80)	5210	5209.962	±20	Pass

Remark: Pretest the EUT at Normal and extremes conditions, Find the worst condition is normal condition, only the worst condition date show the in the test report. Below test graph is the worst data.

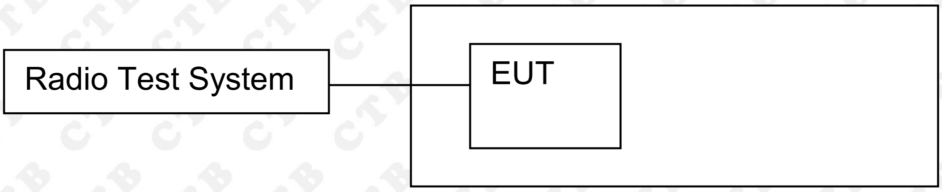
Test graph

Test conditions	Antenna	Test Channel (MHz)	5150-5250MHz
NVNT	Ant1	5180	
		5180	
		5180	

		5190			
		5190			
		5210			

7. NOMINAL CHANNEL BANDWIDTH AND OCCUPIED CHANNEL BANDWIDTH

7.1 Block Diagram Of Test Setup



7.2 Limit

The Nominal Channel Bandwidth for a single Operating Channel shall be 20 MHz.
Alternatively, equipment may implement a lower Nominal Channel Bandwidth with a minimum of 5 MHz, providing they still comply with the Nominal Centre Frequencies defined in clause 4.2.1 (20 MHz raster).
The Occupied Channel Bandwidth shall be between 80 % and 100 % of the Nominal Channel Bandwidth. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement.
The Occupied Channel Bandwidth might change with time/payload.

7.3 Test procedure

Step 1:

• Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test
- Resolution Bandwidth: 100 kHz
- Video Bandwidth: 300 kHz
- Frequency Span: 2 × Nominal Bandwidth (e.g. 40 MHz for a 20 MHz channel)
- Sweep time: > 1 s; for larger Nominal Bandwidths, the sweep time may be increased until a value where the sweep time has no impact on the RMS value of the signal
- Detector Mode: RMS
- Trace Mode: Max Hold

Step 2:

• Wait for the trace to stabilize.

Step 3:

• Make sure that the power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals left and right from the power envelope being taken into account by this measurement.

• Use the 99 % bandwidth function of the spectrum analyser to measure the Occupied Channel Bandwidth of the UUT. This value shall be recorded.

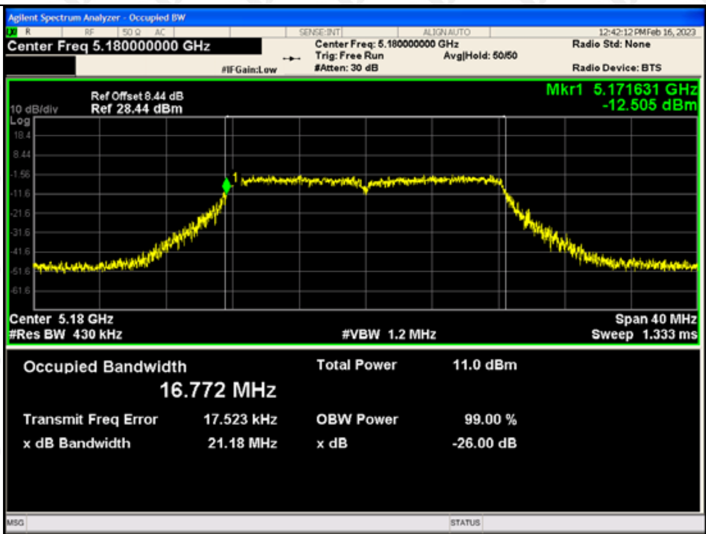
The measurement described in step 1 to step 3 above shall be repeated in case of simultaneous transmissions in non-adjacent channels.

7.4 Test Result

5150-5250MHz

Test conditions	Antenna	Modulation	Test Channel (MHz)	Occupied Channel Bandwidth(MHz)
NVNT	Ant1	802.11(a20)	5180	16.772
	Ant1	802.11(ac20)	5180	17.777
	Ant1	802.11(n20)	5180	17.789
	Ant1	802.11(n40)	5190	36.264
	Ant1	802.11(ac40)	5190	36.317
	Ant1	802.11(ac80)	5210	75.784

Test graph

<table>
<tr><th>Test conditions</th><th>Antenna</th><th>Test Channel (MHz)</th><th>5150-5250MHz</th></tr>
<tr><td rowspan="3">NVNT</td><td rowspan="3">Ant1</td><td>5180</td><td>
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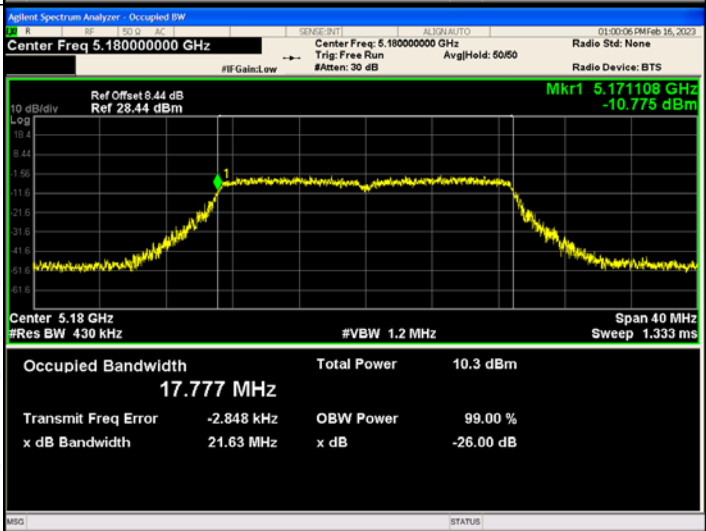
<tr><td>5180</td><td>
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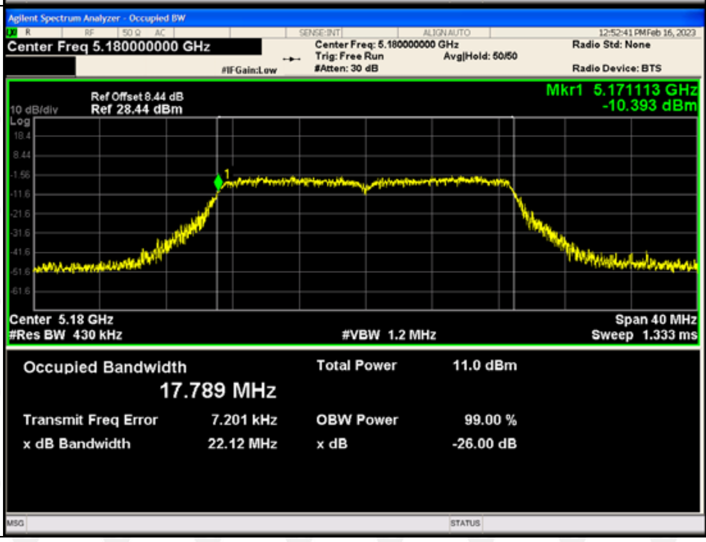
<tr><td>5180</td><td>
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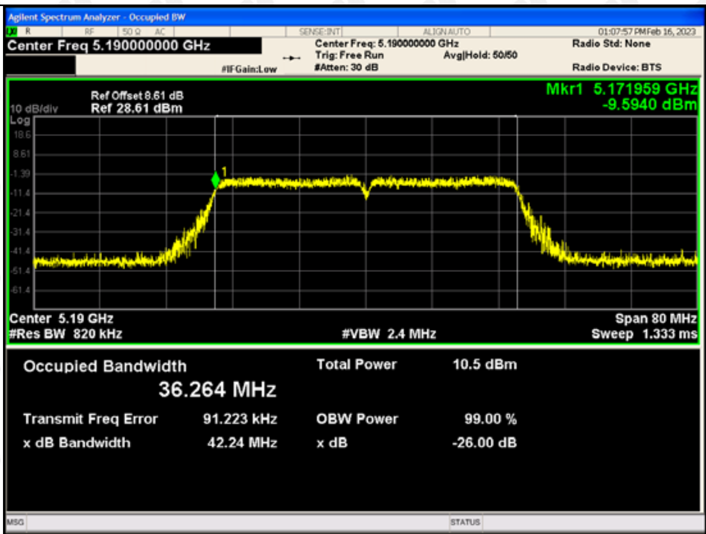
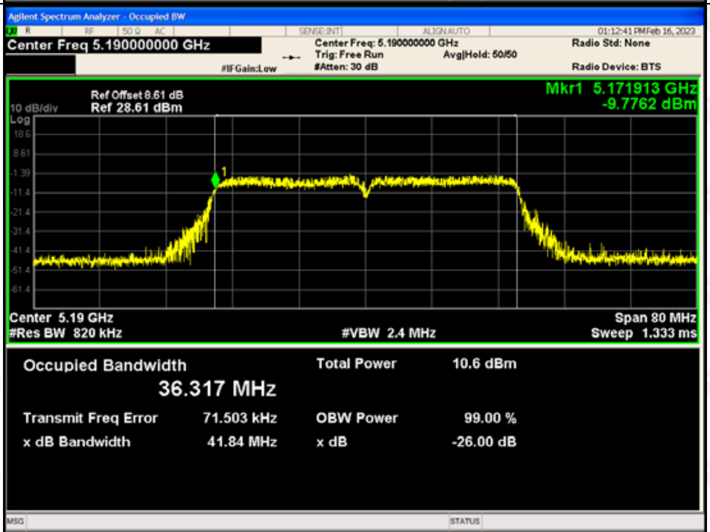
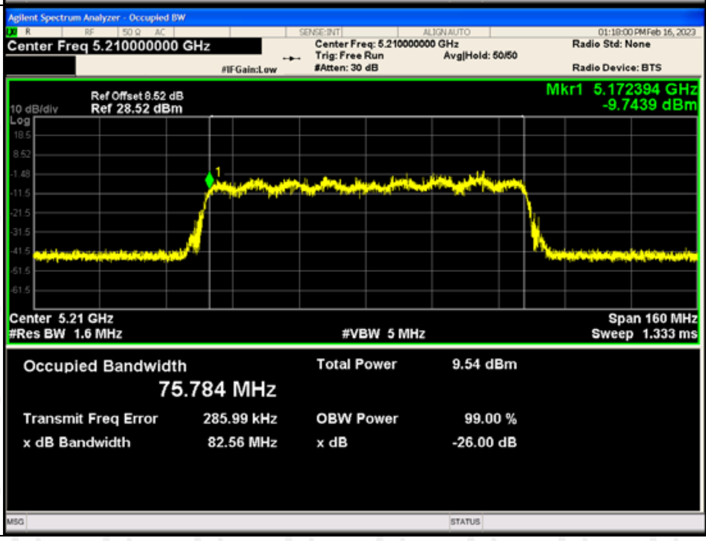
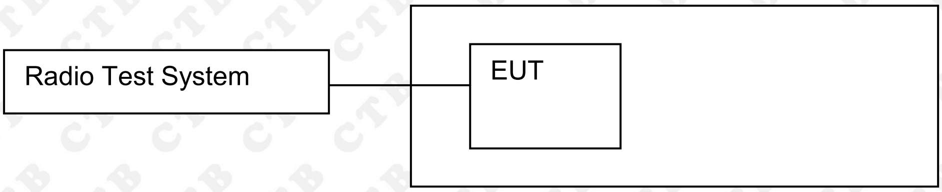
		5190			
		5190			
		5210			

8. RF OUTPUT POWER, TRANSMIT POWER CONTROL (TPC)

8.1 Block Diagram Of Test Setup



8.2 Limit

Frequency range (MHz)	Mean e.i.r.p. limit for P_H (dBm)		Mean e.i.r.p. density limit (dBm/MHz)	
	with TPC	without TPC	with TPC	without TPC
5 150 to 5 350	23	20/23 (see note 1)	10	7/10 (see note 2)
5 470 to 5 725	30 (see note 3)	27 (see note 3)	17 (see note 3)	14 (see note 3)

NOTE 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm.

NOTE 2: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.

NOTE 3: Slave devices without a *Radar Interference Detection* function shall comply with the limits for the frequency range 5 250 MHz to 5 350 MHz.

8.3 Test procedure

This option is for equipment that operates only in one sub-band or that is capable for operation in two sub-bands simultaneously but, for the purpose of the testing, the equipment can be configured to:

- operate in a continuous transmit mode or with a constant duty cycle (x), and
- operate only in one sub-band.

Step 1:

For equipment configured into a continuous transmit mode (x = 1), proceed immediately with step 2.

- The output power of the transmitter shall be coupled to a matched diode detector or equivalent thereof. The output of the diode detector shall be connected to the vertical channel of an oscilloscope.
- The combination of the diode detector and the oscilloscope shall be capable of faithfully reproducing the duty cycle of the transmitter output signal.
- The observed duty cycle of the transmitter (Tx on / (Tx on + Tx off)) shall be noted as x ($0 < x \leq 1$), and recorded in the test report.

Step 2:

- The RF output power shall be determined using a wideband RF power meter with a thermocouple detector or an equivalent thereof and with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be noted as A (in dBm).

• In case of conducted measurements on smart antenna systems operating in a mode with multiple transmit chains active simultaneously, the output power of each transmit chain shall be measured separately to calculate the total power (value A in dBm) for the UUT.

Step 3:

• The RF output power at the highest power level PH (e.i.r.p.) shall be calculated from the above measured power output A (in dBm), the observed duty cycle x, the stated antenna gain G in dBi and if applicable the beamforming gain Y in dB, according to the formula below. This value shall be recorded in the test report.

If more than one antenna assembly is intended for this power setting or TPC range, the gain of the antenna assembly with the highest gain shall be used.

$PH = A + G + Y + 10 \times \log (1 / x)$ (dBm). (5)

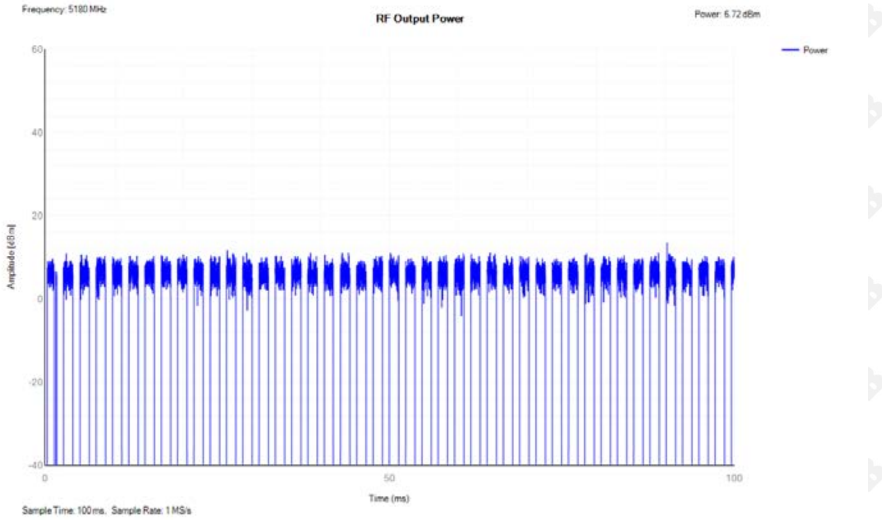
• This value PH shall be compared to the applicable limit contained in table 2 of clause 4.2.3.2.2.

8.4 Test Result

5150-5250MHz

Test conditions	Antenna	Modulation	Test Channel (MHz)	EIRP(dBm)	Result
NVNT	Ant1	802.11(a20)	5180	6.72	Pass
	Ant1	802.11(ac20)	5180	6.46	Pass
	Ant1	802.11(n20)	5180	6.64	Pass
	Ant1	802.11(n40)	5190	5.91	Pass
	Ant1	802.11(ac40)	5190	5.84	Pass
	Ant1	802.11(ac80)	5210	5.13	Pass

Test graph

<table>
<tr><th>Test conditions</th><th>Antenna</th><th>Test Channel (MHz)</th><th>5150-5250MHz</th></tr>
<tr><td rowspan="3">NVNT</td><td rowspan="3">Ant1</td><td>5180</td><td>
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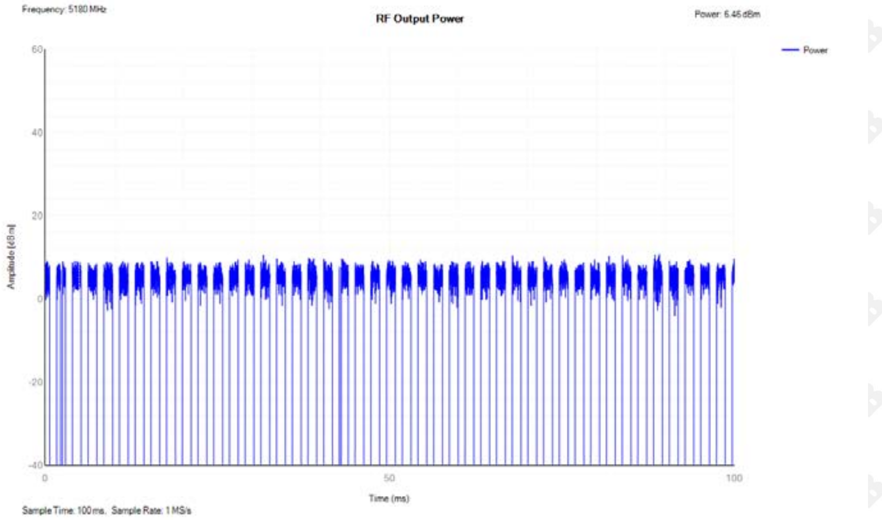
<tr><td>5180</td><td>
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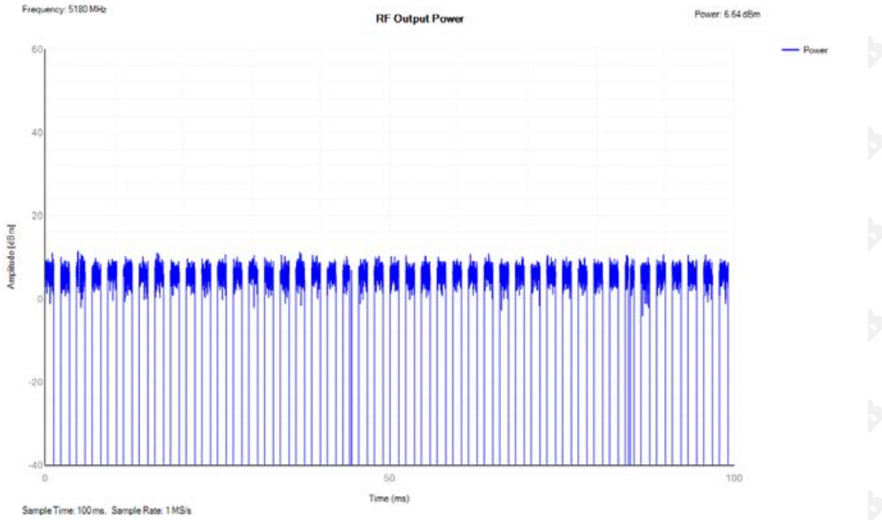
<tr><td>5180</td><td>
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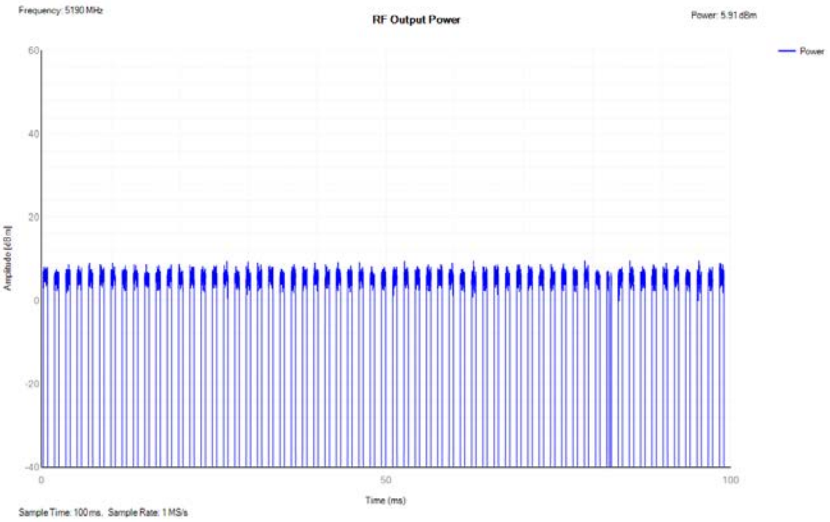
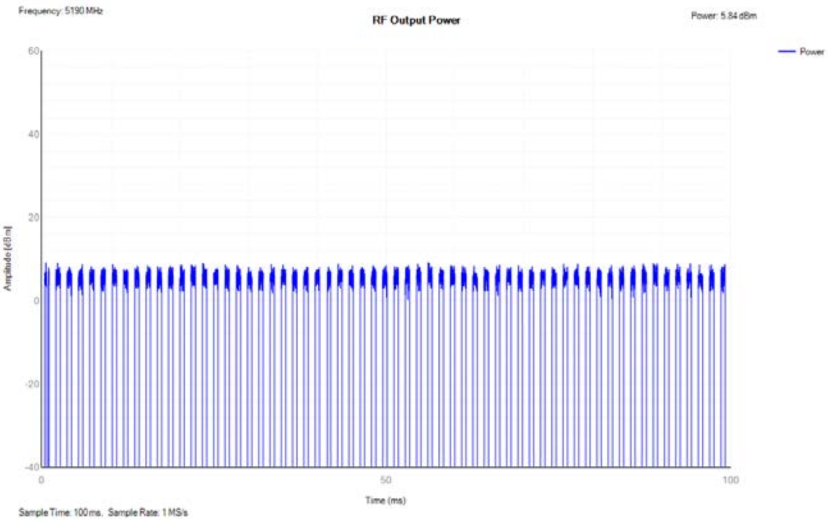
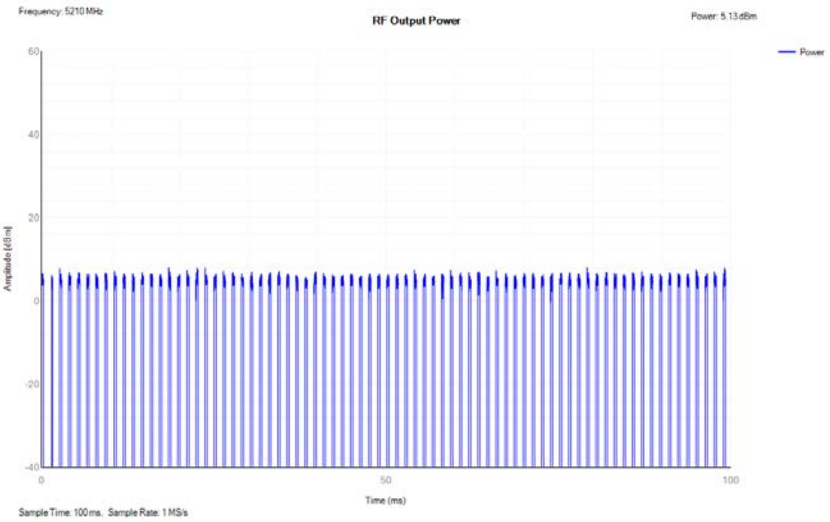
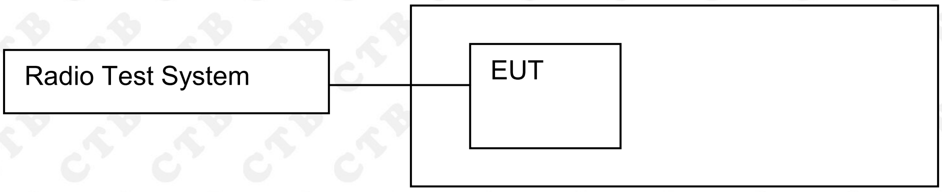
		5190	
		5190	
		5210	

9. POWER DENSITY

9.1 Block Diagram Of Test Setup



9.2 Limit

Frequency range (MHz)	Mean e.i.r.p. limit for P_H (dBm)		Mean e.i.r.p. density limit (dBm/MHz)	
	with TPC	without TPC	with TPC	without TPC
5 150 to 5 350	23	20/23 (see note 1)	10	7/10 (see note 2)
5 470 to 5 725	30 (see note 3)	27 (see note 3)	17 (see note 3)	14 (see note 3)
NOTE 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm.				
NOTE 2: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.				
NOTE 3: Slave devices without a *Radar Interference Detection* function shall comply with the limits for the frequency range 5 250 MHz to 5 350 MHz.				

9.3 Test procedure

This option is for equipment that can be configured to operate in a continuous transmit mode or with a constant duty cycle (x).

Step 1:

• Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test

- RBW: 1 MHz

- VBW: 3 MHz

- Frequency Span: 2 × Nominal Bandwidth (e.g. 40 MHz for a 20 MHz channel)

- Detector Mode: Peak

- Trace Mode: Max Hold

Step 2:

• When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

• Make the following changes to the settings of the spectrum analyser:

- Centre Frequency: Equal to the frequency recorded in step 2

- Frequency Span: 3 MHz

- RBW: 1 MHz

- VBW: 3 MHz

- Sweep Time: 1 minute
- Detector Mode: RMS
- Trace Mode: Max Hold

Step 4:

• When the trace is complete, the trace shall be captured using the "Hold" or "View" option on the spectrum analyser.

• Find the peak value of the trace and place the analyser marker on this peak. This level is recorded as the highest mean power (Power Density) D in a 1 MHz band.

• Alternatively, where a spectrum analyser is equipped with a function to measure spectral Power Density, this function may be used to display the Power Density D in dBm / MHz.

• In case of conducted measurements on smart antenna systems operating in a mode with multiple transmit chains active simultaneously, the Power Density of each transmit chain shall be measured separately to calculate the total Power Density (value D in dBm / MHz) for the UUT.

Step 5:

• The maximum spectral Power Density e.i.r.p. is calculated from the above measured Power Density D, the observed duty cycle x (see clause 5.4.4.2.1.1.2, step 1), the applicable antenna assembly gain G in dBi and if applicable the beamforming gain Y in dB, according to the formula below. This value shall be recorded in the test report. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the highest gain shall be used:

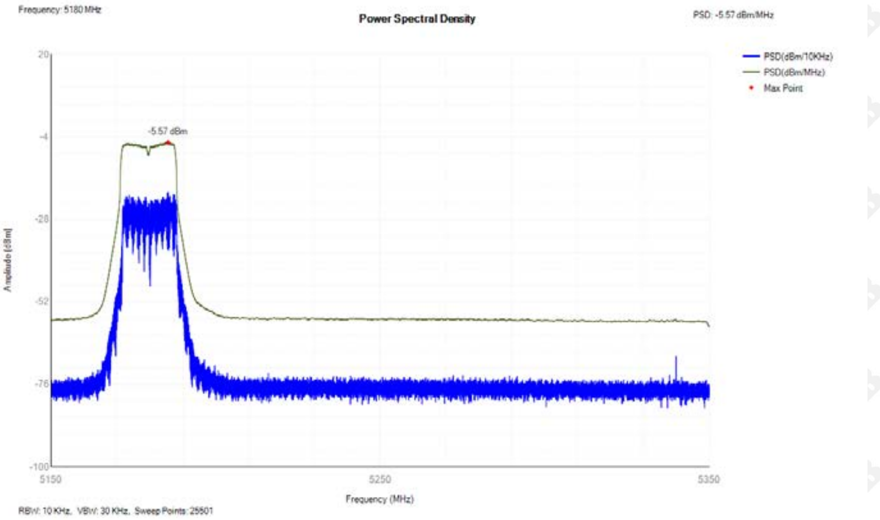
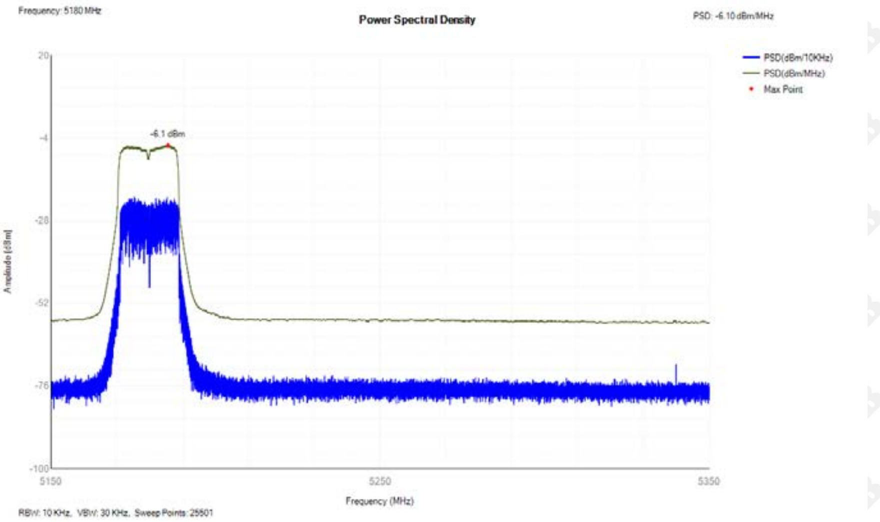
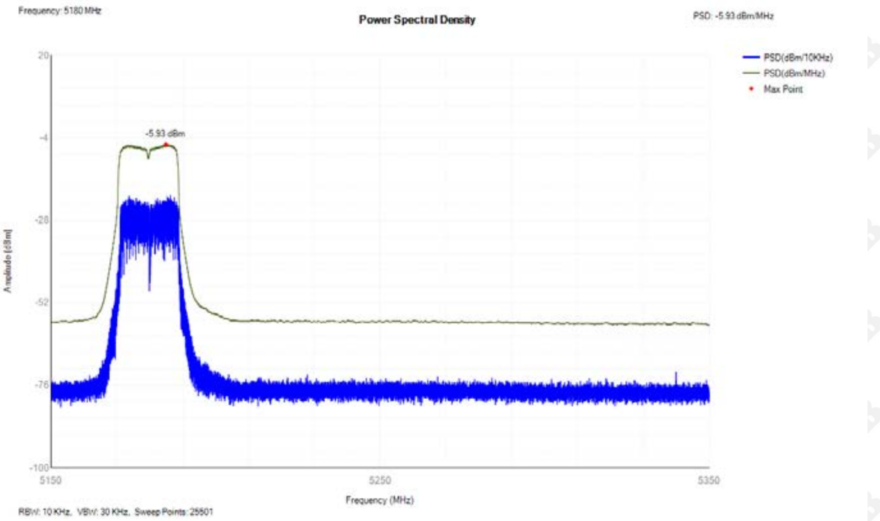
$PD = D + G + Y + 10 \times \log (1 / x)$ (dBm / MHz) (14)

9.4 Test Result

5150-5250MHz

Test conditions	Antenna	Modulation	Test Channel (MHz)	Power Density (dBm/MHz)	Result
NVNT	Ant1	802.11(a20)	5180	-5.57	Pass
	Ant1	802.11(ac20)	5180	-6.1	Pass
	Ant1	802.11(n20)	5180	-5.93	Pass
	Ant1	802.11(n40)	5190	-9.42	Pass
	Ant1	802.11(ac40)	5190	-9.5	Pass
	Ant1	802.11(ac80)	5210	-11.55	Pass

Test graph

Test conditions	Antenna	Test Channel (MHz)	5150-5250MHz
NVNT	Ant1	5180	
		5180	
		5180	

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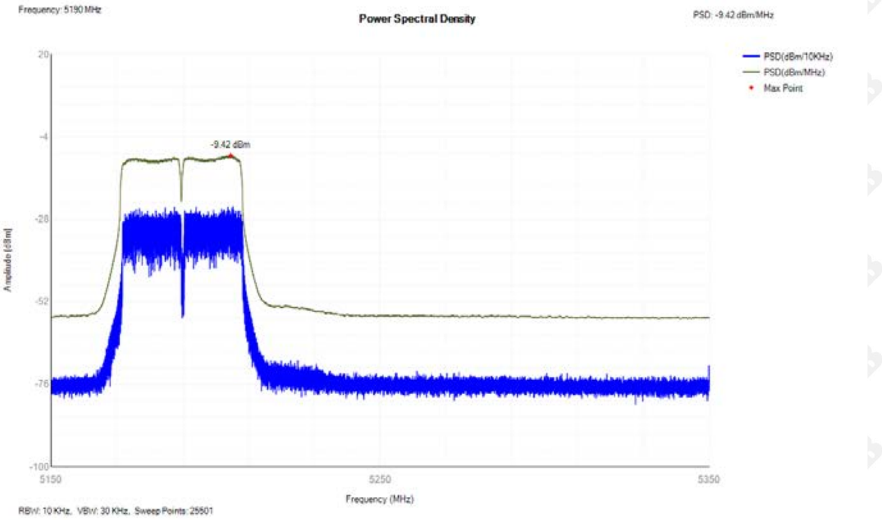
<tr><td></td><td></td><td>5190</td><td>
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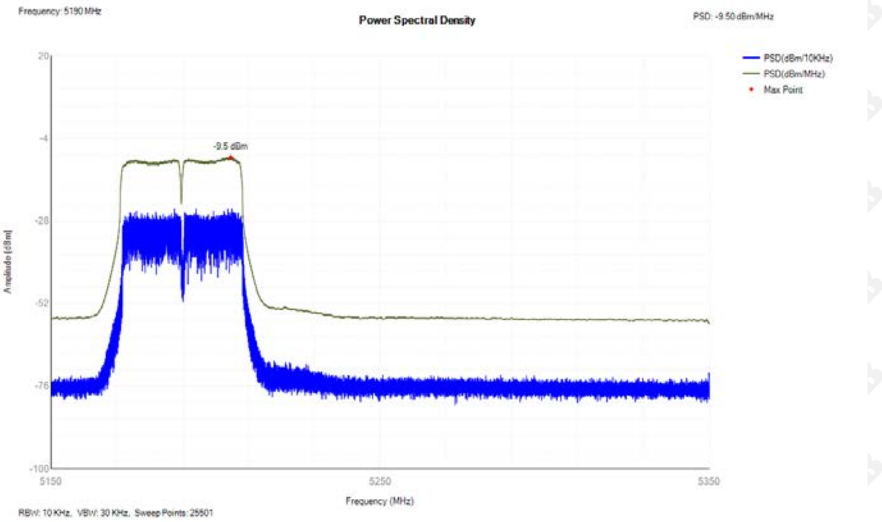
<tr><td></td><td></td><td>5190</td><td>
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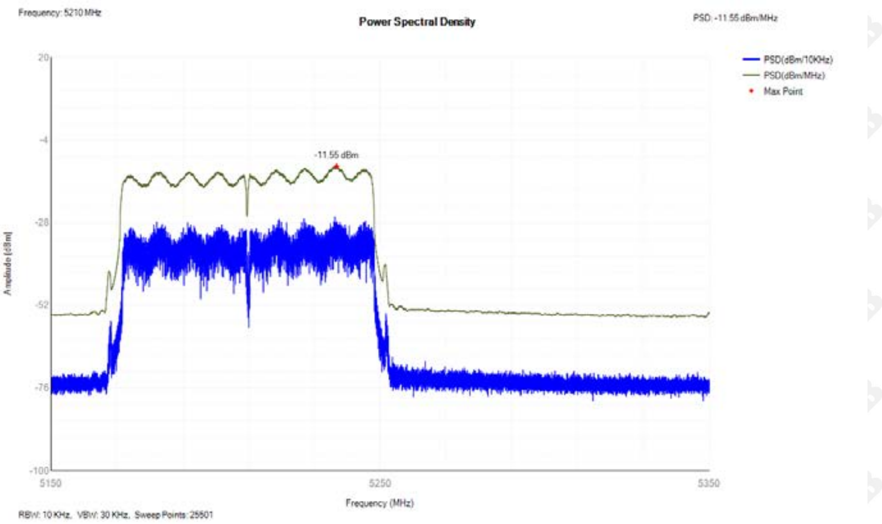
<tr><td></td><td></td><td>5210</td><td>
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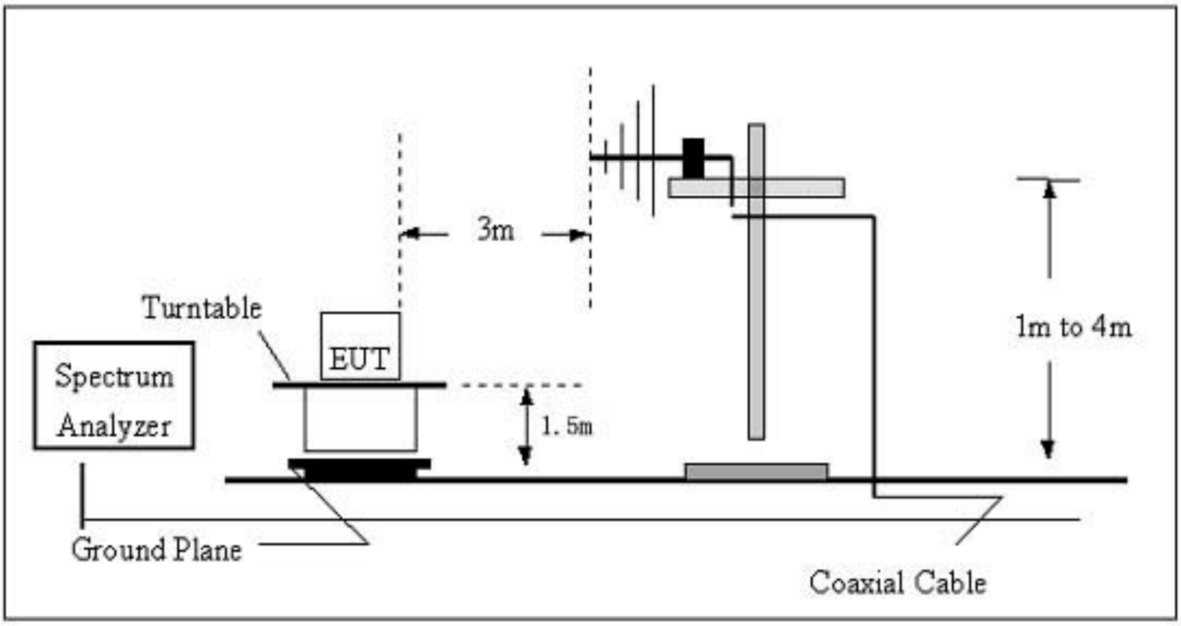
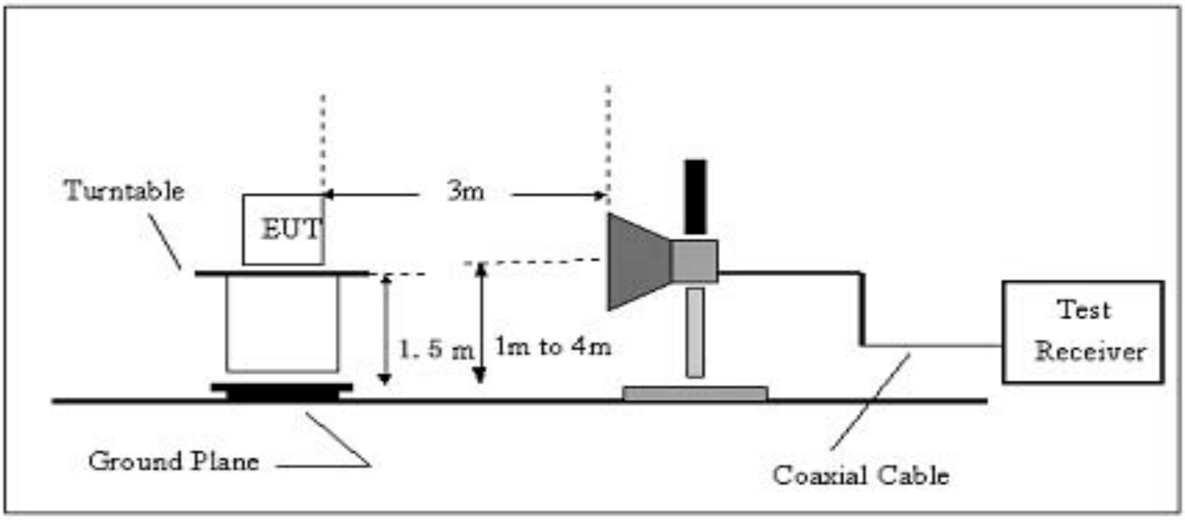
10. TRANSMITTER UNWANTED EMISSIONS OUTSIDE THE 5 GHZ RLAN BANDS

10.1 Block Diagram Of Test Setup

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



10.2 Limits

Frequency range	Maximum power, e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz/300KHz
47 MHz to 74 MHz	-54 dBm	100 kHz/300KHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz/300KHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz/300KHz
118 MHz to 174 MHz	-36 dBm	100 kHz/300KHz
174 MHz to 230 MHz	-54 dBm	100 kHz/300KHz
230 MHz to 470 MHz	-36 dBm	100 kHz/300KHz
470 MHz to 862 MHz	-54 dBm	100 kHz/300KHz
862 MHz to 1 GHz	-36 dBm	100 kHz/300KHz
1 GHz to 5.15 GHz	-30 dBm	1 MHz/3MHz
5.35 GHz to 5.47 GHz	-30 dBm	1 MHz/3MHz
5.725 GHz to 26 GHz	-30 dBm	1 MHz/3MHz

10.3 Test Procedure

1. Scan from 30MHz to 26GHz, find the maximum radiation frequency to measure.
2. The technique used to find the Spurious Emissions of the transmitter was the antenna substitution method. Substitution method was performed to determine the actual ERP/EIRP emission levels of the EUT.
Test procedure as below:
1) The EUT was powered ON and placed on a 1.5m high table at a 3 meter fully Anechoic Chamber. The antenna of the transmitter was extended to its maximum length. modulation mode and the measuring receiver shall be tuned to the frequency of the transmitter under test.
2) The EUT was set 3 meters(above 18GHz the distance is 1 meter) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
4) Steps 1) to 3) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
5) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
6) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 3) is obtained for this set of conditions.
7) The output power into the substitution antenna was then measured.
8) Steps 6) and 7)were repeated with both antennas polarized.
9) Calculate power in dBm by the following formula:

ERP(dBm) = SG(dBm) – cable loss (dB) + antenna gain (dBd)
EIRP(dBm) = SG (dBm) – cable loss (dB) + antenna gain (dBi)
EIRP=ERP+2.15dB

where:

SG is the generator output power into the substitution antenna.

Test the EUT in the lowest channel , the Highest channel
Repeat above procedures until all frequencies measured was complete.

10.4 Test Results

Remark: This Report only show the test plots of the ANT1 worst case.
Modulation : 802.11(a20) (the worst data)
Below 1GHz,

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5180MHz									
46.802	-55.04	-12.61	-67.65	-36.00	-31.65	peak	1.5	244	H
67.471	-54.98	-12.08	-67.06	-54.00	-13.06	peak	1.3	314	H
104.013	-56.30	-11.98	-68.28	-54.00	-14.28	peak	1.4	144	H
217.132	-53.46	-10.59	-64.05	-54.00	-10.05	peak	1.0	319	H
328.276	-53.35	-10.01	-63.36	-36.00	-27.36	peak	1.9	9	H
870.085	-52.32	-0.09	-52.41	-36.00	-16.41	peak	1.5	360	H
48.549	-54.88	-11.97	-66.85	-36.00	-30.85	peak	1.9	155	V
101.071	-54.75	-12.33	-67.08	-54.00	-13.08	peak	1.8	264	V
183.820	-55.50	-12.01	-67.51	-54.00	-13.51	peak	1.7	206	V
217.265	-53.52	-11.00	-64.51	-54.00	-10.51	peak	1.9	178	V
328.536	-53.25	-10.28	-63.53	-36.00	-27.53	peak	1.9	229	V
871.328	-51.83	-0.55	-52.38	-36.00	-16.38	peak	1.1	188	V
Channel:5240MHz									
44.993	-55.46	-11.95	-67.41	-36.00	-31.41	peak	1.1	320	H
67.322	-55.20	-11.81	-67.01	-54.00	-13.01	peak	1.8	350	H
104.189	-55.81	-11.82	-67.63	-54.00	-13.63	peak	1.6	123	H
219.066	-53.36	-11.24	-64.60	-54.00	-10.60	peak	1.1	190	H
325.887	-52.80	-10.14	-62.94	-36.00	-26.94	peak	1.9	201	H
870.810	-51.80	-0.27	-52.07	-36.00	-16.07	peak	1.2	349	H
47.607	-55.31	-12.59	-67.91	-36.00	-31.91	peak	1.4	334	V
102.267	-54.89	-12.33	-67.23	-54.00	-13.23	peak	1.2	267	V
184.028	-56.23	-11.75	-67.99	-54.00	-13.99	peak	1.1	171	V
219.221	-52.82	-11.24	-64.06	-54.00	-10.06	peak	1.8	213	V
327.262	-53.06	-9.65	-62.70	-36.00	-26.70	peak	1.7	269	V
870.875	-52.17	-0.25	-52.42	-36.00	-16.42	peak	1.0	291	V

Above 1GHz,

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5180MHz									
10360	-68.70	16.36	-52.34	-30.00	-22.34	peak	1.2	102	H
15540	-60.37	20.41	-39.96	-30.00	-9.96	peak	1.2	244	H
10360	-65.10	16.36	-48.74	-30.00	-18.74	peak	1.4	298	V
15540	-60.52	20.41	-40.11	-30.00	-10.11	peak	1.6	358	V
Channel:5240MHz									
10480	-67.91	16.37	-51.54	-30.00	-21.54	peak	1.0	218	H
15720	-58.05	20.42	-37.63	-30.00	-7.63	peak	1.2	196	H
10480	-67.40	16.37	-51.03	-30.00	-21.03	peak	1.2	51	V
15720	-60.05	20.42	-39.63	-30.00	-9.63	peak	1.3	130	V

Below 1GHz, 802.11(n40) (the worst data)

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5190MHz									
44.781	-55.26	-12.03	-67.29	-36.00	-31.29	peak	1.7	282	H
66.574	-54.75	-12.37	-67.12	-54.00	-13.12	peak	1.0	302	H
104.734	-55.46	-11.69	-67.16	-54.00	-13.16	peak	1.7	215	H
217.149	-53.22	-10.89	-64.12	-54.00	-10.12	peak	1.5	139	H
327.863	-52.70	-10.29	-62.99	-36.00	-26.99	peak	1.8	312	H
871.201	-52.22	-0.48	-52.70	-36.00	-16.70	peak	1.0	192	H
48.394	-55.37	-12.45	-67.82	-36.00	-31.82	peak	1.8	56	V
101.085	-55.09	-12.06	-67.15	-54.00	-13.15	peak	1.9	319	V
182.831	-56.01	-12.46	-68.47	-54.00	-14.47	peak	1.6	50	V
218.134	-52.73	-10.61	-63.34	-54.00	-9.34	peak	1.9	152	V
328.382	-52.91	-9.52	-62.42	-36.00	-26.42	peak	1.4	56	V
869.827	-51.95	0.13	-51.82	-36.00	-15.82	peak	1.5	38	V
Channel:5230MHz									
46.200	-55.13	-12.06	-67.19	-36.00	-31.19	peak	1.6	107	H
66.334	-54.61	-12.19	-66.79	-54.00	-12.79	peak	1.9	41	H
104.752	-56.17	-12.22	-68.39	-54.00	-14.39	peak	1.3	22	H
218.183	-52.74	-10.93	-63.67	-54.00	-9.67	peak	1.1	301	H
326.639	-52.71	-10.28	-62.99	-36.00	-26.99	peak	1.1	248	H
871.758	-52.46	-0.07	-52.53	-36.00	-16.53	peak	1.1	25	H
46.657	-54.93	-11.97	-66.90	-36.00	-30.90	peak	1.3	20	V
101.839	-55.00	-11.86	-66.86	-54.00	-12.86	peak	1.8	145	V
183.867	-55.75	-11.72	-67.47	-54.00	-13.47	peak	1.2	312	V
217.539	-53.19	-11.06	-64.25	-54.00	-10.25	peak	1.3	350	V
326.356	-53.29	-10.30	-63.59	-36.00	-27.59	peak	1.7	169	V
869.162	-51.99	-0.50	-52.49	-36.00	-16.49	peak	1.4	320	V

Above 1GHz,

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5190MHz									
10360	-68.89	16.37	-52.52	-30.00	-22.52	peak	1.3	175	H
15540	-59.47	20.42	-39.05	-30.00	-9.05	peak	1.3	22	H
10360	-65.46	16.37	-49.09	-30.00	-19.09	peak	1.4	177	V
15540	-58.49	20.42	-38.07	-30.00	-8.07	peak	1.1	137	V
Channel:5230MHz									
10480	-66.56	16.37	-50.19	-30.00	-20.19	peak	1.2	145	H
15720	-58.17	20.42	-37.75	-30.00	-7.75	peak	1.5	99	H
10480	-67.83	16.37	-51.46	-30.00	-21.46	peak	1.2	271	V
15720	-59.79	20.42	-39.37	-30.00	-9.37	peak	1.4	144	V

Below 1GHz, 802.11(ac80) (the worst data)

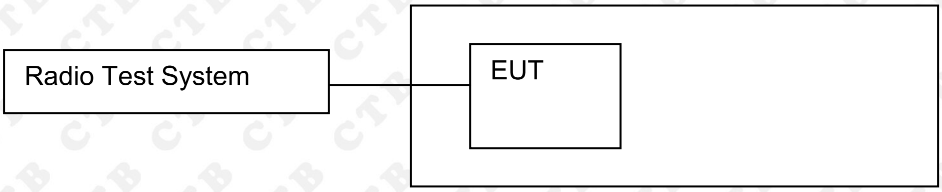
Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5210MHz									
45.895	-55.20	-12.67	-67.87	-36.00	-31.87	peak	1.8	47	H
67.173	-55.15	-12.23	-67.38	-54.00	-13.38	peak	1.6	143	H
103.461	-56.07	-12.54	-68.61	-54.00	-14.61	peak	1.5	144	H
217.196	-53.34	-10.91	-64.25	-54.00	-10.25	peak	1.0	182	H
327.526	-52.92	-9.98	-62.90	-36.00	-26.90	peak	1.1	118	H
870.135	-52.06	-0.03	-52.08	-36.00	-16.08	peak	1.5	47	H
48.432	-55.38	-12.68	-68.06	-36.00	-32.06	peak	1.1	174	V
102.031	-54.69	-12.64	-67.33	-54.00	-13.33	peak	1.6	308	V
183.448	-56.19	-12.20	-68.39	-54.00	-14.39	peak	1.3	231	V
217.102	-52.74	-11.04	-63.78	-54.00	-9.78	peak	1.0	46	V
326.981	-52.77	-9.61	-62.37	-36.00	-26.37	peak	1.8	273	V
870.274	-52.40	-0.37	-52.77	-36.00	-16.77	peak	1.1	329	V

Above 1GHz,

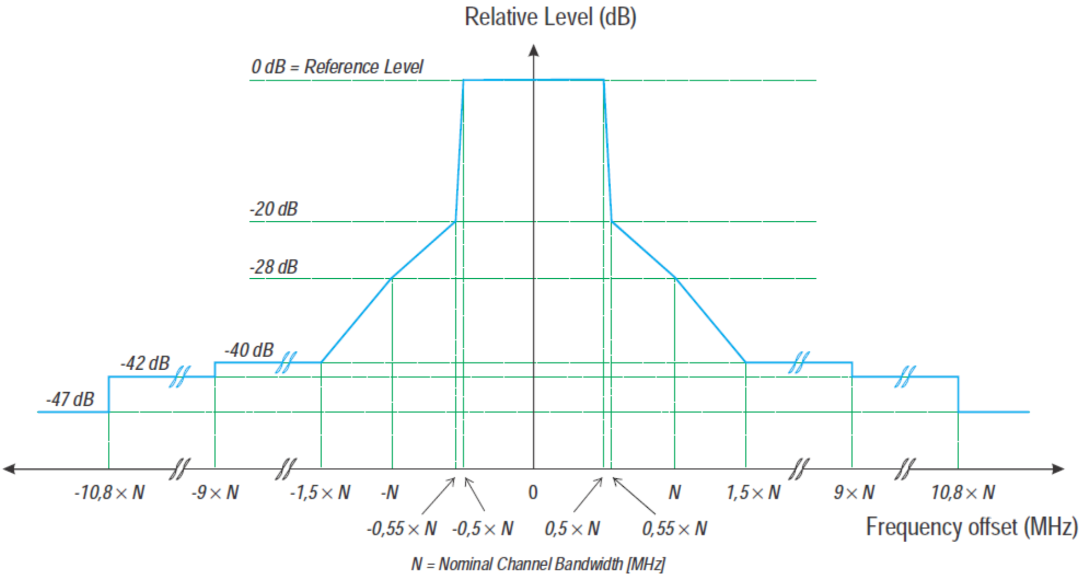
Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5210MHz									
10420	-66.16	16.36	-49.80	-30.00	-19.80	peak	1.4	108	H
15630	-59.71	20.41	-39.30	-30.00	-9.30	peak	1.1	106	H
10420	-67.31	16.36	-50.95	-30.00	-20.95	peak	1.4	157	V
15630	-58.85	20.41	-38.44	-30.00	-8.44	peak	1.3	241	V

11. TRANSMITTER UNWANTED EMISSIONS WITHIN THE 5 GHZ RLAN BANDS

11.1 Block Diagram Of Test Setup



11.2 Limit



11.3 Test procedure

The UUT shall be configured for continuous transmit mode (duty cycle equal to 100 %). If this is not possible, then option 2 shall be used.

Step 1: Determination of the reference average power level.

• Spectrum analyser settings:

- Resolution bandwidth: 1 MHz
- Video bandwidth: 30 kHz
- Detector mode: Peak
- Trace mode: Video Average
- Sweep Time: Coupled
- Centre Frequency: Centre frequency of the channel being tested
- Span: 2 × Nominal Channel Bandwidth

• Use the marker to find the highest average power level of the power envelope of the UUT. This level shall be used as the reference level for the relative measurements.

Step 2: Determination of the relative average power levels.

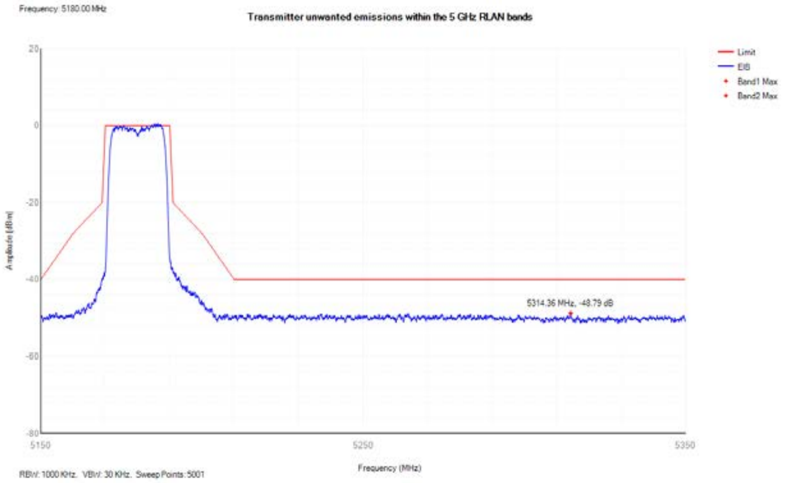
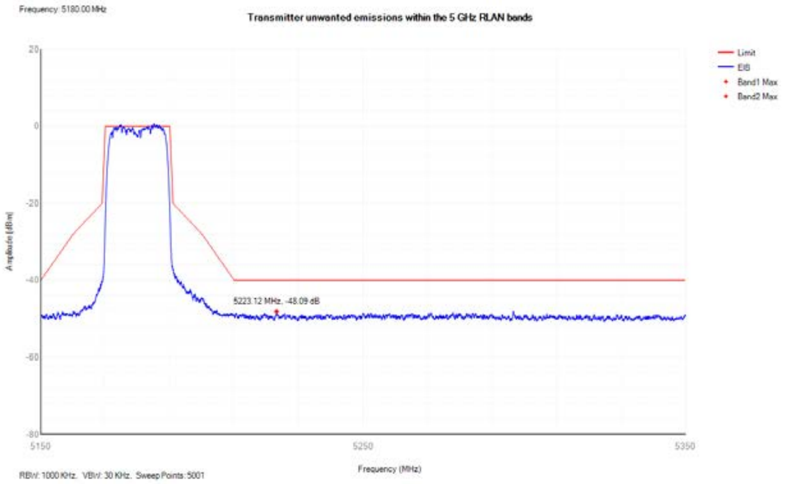
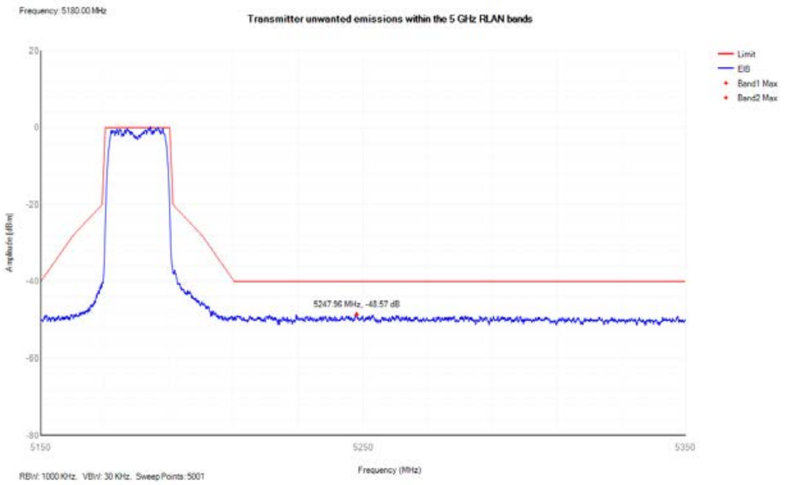
• Adjust the frequency range of the spectrum analyser to allow the measurement to be performed within the sub-bands 5 150 MHz to 5 350 MHz and 5 470 MHz to 5 725 MHz. No other parameter of the spectrum analyser should be changed.

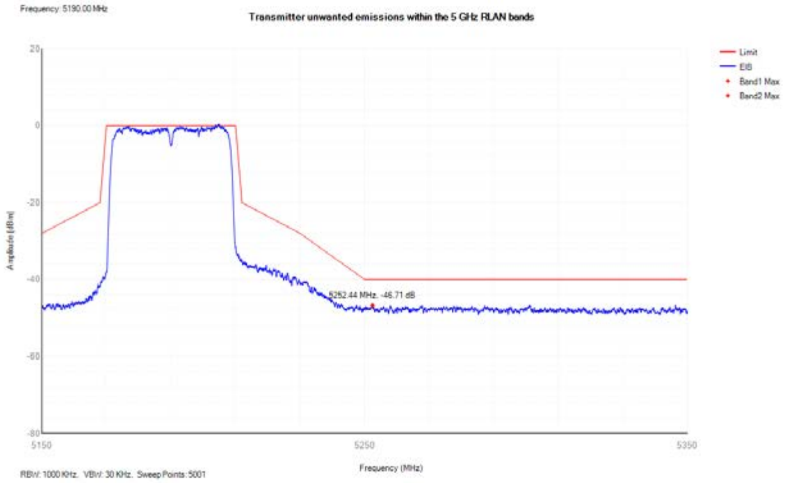
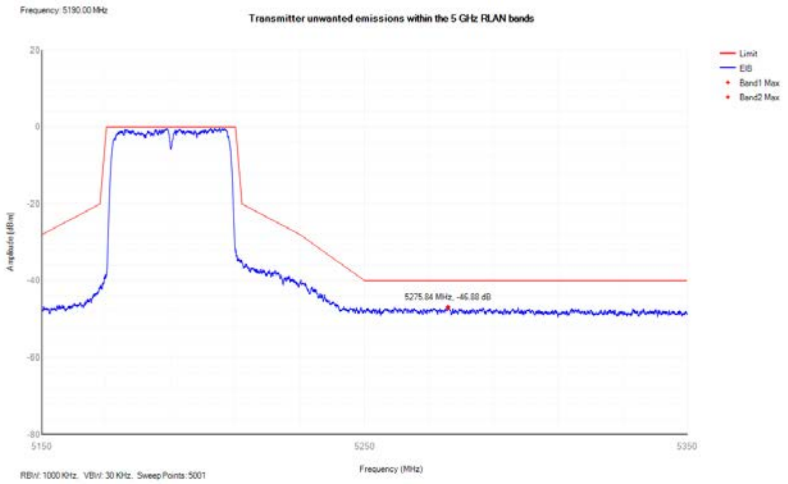
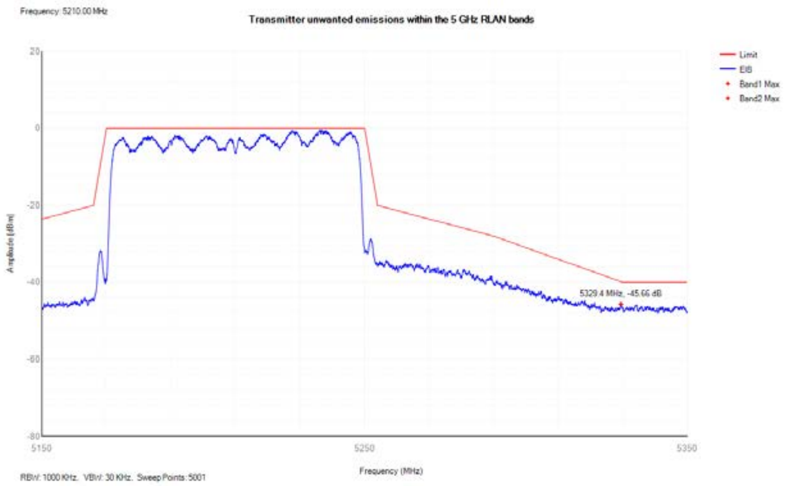
• Compare the relative power envelope of the UUT with the limits defined in clause 4.2.4.2.2.

11.4 Test Result

Remark: This Report only show the test plots of the ANT1 and ANT 2 worst case.

Test graph

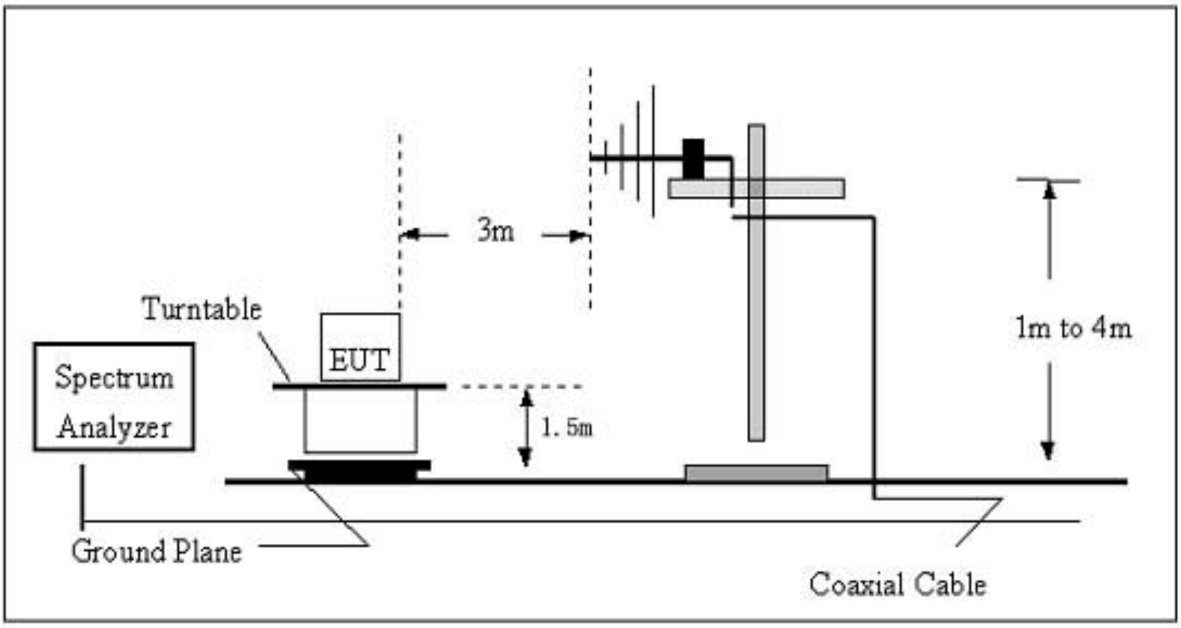
Test conditions	Antenna	Test Channel (MHz)	5150-5250MHz
NVNT	Ant1	5180	
		5180	
		5180	

		5190	
		5190	
		5210	

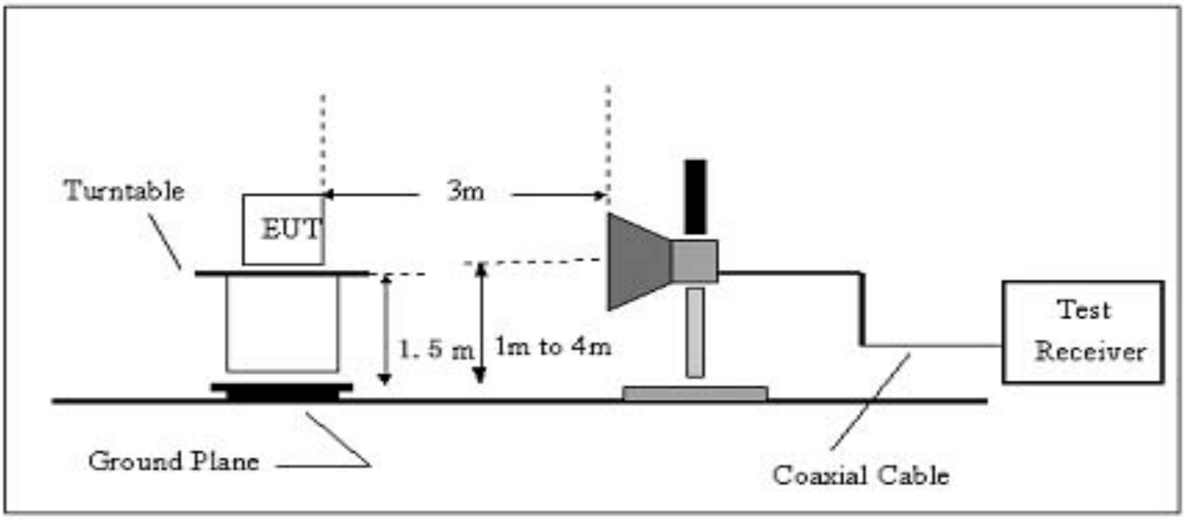
12. RECEIVER SPURIOUS EMISSIONS

12.1 Block Diagram Of Test Setup

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



12.2 Limits

Frequency(MHz)	Limit
30-1000	-57dBm
1000-12750	-47dBm

12.3 Test Procedure

30MHz ~ 1GHz:

1. Scan from 30MHz to 26GHz, find the maximum radiation frequency to measure.
2. The technique used to find the Spurious Emissions of the transmitter was the antenna substitution method. Substitution method was performed to determine the actual ERP/EIRP emission levels of the EUT.

Test procedure as below:

1) The EUT was powered ON and placed on a 1.5m high table at a 3 meter fully Anechoic Chamber. The antenna of the transmitter was extended to its maximum length. modulation mode and the measuring receiver shall be tuned to the frequency of the transmitter under test.
2) The EUT was set 3 meters(above 18GHz the distance is 1 meter) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
4) Steps 1) to 3) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
5) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
6) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 3) is obtained for this set of conditions.
7) The output power into the substitution antenna was then measured.
8) Steps 6) and 7)were repeated with both antennas polarized.
9) Calculate power in dBm by the following formula:

   ERP(dBm) = SG(dBm) – cable loss (dB) + antenna gain (dBd)
   EIRP(dBm) = SG (dBm) – cable loss (dB) + antenna gain (dBi)
   EIRP=ERP+2.15dB

   where:

   SG is the generator output power into the substitution antenna.
10) Test the EUT in the lowest channel , the Highest channel

Repeat above procedures until all frequencies measured was complete.

12.4 Test Results

Modulation : 802.11(a20) (the worst data)
Below 1GHz,

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5180MHz									
45.124	-60.16	-12.63	-72.79	-57.00	-15.79	peak	1.6	203	H
68.478	-60.76	-12.07	-72.83	-57.00	-15.83	peak	1.6	300	H
103.751	-60.27	-12.41	-72.69	-57.00	-15.69	peak	1.3	219	H
217.377	-62.65	-11.07	-73.73	-57.00	-16.73	peak	1.5	168	H
327.784	-61.24	-9.46	-70.70	-57.00	-13.70	peak	1.2	139	H
869.727	-68.69	-0.32	-69.00	-57.00	-12.00	peak	1.6	230	H
48.721	-60.85	-11.93	-72.79	-57.00	-15.79	peak	1.5	98	V
102.269	-61.28	-12.19	-73.48	-57.00	-16.48	peak	1.7	326	V
181.939	-62.52	-11.81	-74.34	-57.00	-17.34	peak	1.3	106	V
218.056	-60.72	-10.57	-71.29	-57.00	-14.29	peak	1.3	227	V
327.394	-59.51	-9.46	-68.97	-57.00	-11.97	peak	1.8	251	V
871.451	-70.27	0.17	-70.10	-57.00	-13.10	peak	1.7	38	V
Channel:5260MHz									
46.861	-60.15	-11.99	-72.14	-57.00	-15.14	peak	1.1	103	H
66.470	-60.77	-12.24	-73.01	-57.00	-16.01	peak	1.7	216	H
104.187	-60.35	-12.34	-72.70	-57.00	-15.70	peak	1.3	67	H
217.580	-62.62	-11.26	-73.88	-57.00	-16.88	peak	1.5	78	H
326.242	-61.34	-9.70	-71.04	-57.00	-14.04	peak	1.8	142	H
869.188	-68.98	0.08	-68.89	-57.00	-11.89	peak	1.8	75	H
46.661	-60.71	-12.41	-73.13	-57.00	-16.13	peak	1.3	144	V
99.883	-61.52	-12.54	-74.07	-57.00	-17.07	peak	1.6	117	V
182.732	-62.17	-11.69	-73.85	-57.00	-16.85	peak	1.8	213	V
219.739	-60.50	-10.67	-71.17	-57.00	-14.17	peak	1.2	233	V
328.404	-59.51	-9.89	-69.40	-57.00	-12.40	peak	1.0	298	V
870.091	-69.89	0.21	-69.68	-57.00	-12.68	peak	1.3	53	V

Above 1GHz,

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
2287.68	-74.67	12.61	-62.06	-47	-15.06	peak	1.7	358	H
2290.93	-78.05	12.69	-65.36	-47	-18.36	peak	1.5	113	V
3705.89	-75.65	14.84	-60.81	-47	-13.81	peak	1.6	68	H
3709.49	-78.27	14.57	-63.70	-47	-16.70	peak	1.8	293	V
4022.10	-75.29	15.85	-59.44	-47	-12.44	peak	1.5	98	H
4025.96	-78.58	15.94	-62.64	-47	-15.64	peak	1.8	289	V
5266.62	-76.83	17.09	-59.74	-47	-12.74	peak	1.0	46	H
5266.68	-79.21	16.94	-62.27	-47	-15.27	peak	1.3	281	V

Below 1GHz, 802.11(n40) (the worst data)

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5190MHz									
44.438	-60.36	-12.51	-72.88	-57.00	-15.88	peak	1.1	36	H
66.696	-60.23	-12.50	-72.73	-57.00	-15.73	peak	1.4	67	H
105.138	-60.32	-12.31	-72.63	-57.00	-15.63	peak	1.3	201	H
217.311	-62.47	-10.67	-73.14	-57.00	-16.14	peak	1.8	340	H
327.858	-61.41	-9.89	-71.30	-57.00	-14.30	peak	1.2	6	H
870.883	-69.05	-0.44	-69.49	-57.00	-12.49	peak	1.0	66	H
46.153	-60.93	-11.82	-72.75	-57.00	-15.75	peak	1.2	183	V
100.711	-61.28	-12.40	-73.68	-57.00	-16.68	peak	1.6	61	V
184.321	-62.06	-11.93	-73.99	-57.00	-16.99	peak	1.3	1	V
217.726	-60.91	-10.52	-71.44	-57.00	-14.44	peak	1.6	281	V
328.416	-59.41	-9.58	-68.99	-57.00	-11.99	peak	1.4	48	V
871.030	-69.78	0.00	-69.78	-57.00	-12.78	peak	1.6	333	V
Channel:5270MHz									
44.138	-60.86	-12.50	-73.35	-57.00	-16.35	peak	1.1	141	H
68.576	-60.60	-12.18	-72.78	-57.00	-15.78	peak	1.4	278	H
104.137	-60.25	-11.88	-72.13	-57.00	-15.13	peak	1.2	101	H
217.053	-62.07	-10.95	-73.02	-57.00	-16.02	peak	1.7	111	H
325.651	-61.64	-9.44	-71.09	-57.00	-14.09	peak	1.4	245	H
869.383	-69.13	0.18	-68.95	-57.00	-11.95	peak	1.6	160	H
46.654	-60.91	-12.25	-73.16	-57.00	-16.16	peak	1.1	135	V
100.817	-61.33	-12.20	-73.53	-57.00	-16.53	peak	1.2	230	V
182.468	-62.10	-11.69	-73.79	-57.00	-16.79	peak	1.5	196	V
217.692	-60.69	-11.01	-71.71	-57.00	-14.71	peak	1.1	26	V
325.940	-59.55	-9.44	-68.99	-57.00	-11.99	peak	1.7	280	V
870.091	-69.64	-0.43	-70.07	-57.00	-13.07	peak	1.2	176	V

Above 1GHz,

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5190MHz									
45.100	-60.03	-12.68	-72.71	-57.00	-15.71	peak	1.2	292	H
68.387	-60.48	-12.42	-72.90	-57.00	-15.90	peak	1.4	232	V
106.440	-60.82	-12.07	-72.90	-57.00	-15.90	peak	1.0	271	H
217.678	-62.74	-10.99	-73.73	-57.00	-16.73	peak	1.3	297	V
328.305	-61.72	-10.02	-71.74	-57.00	-14.74	peak	1.9	49	H
869.618	-68.68	-0.35	-69.03	-57.00	-12.03	peak	1.6	15	V
47.733	-60.36	-12.60	-72.96	-57.00	-15.96	peak	1.0	243	H
102.106	-61.08	-12.01	-73.09	-57.00	-16.09	peak	1.5	212	V

Below 1GHz, 802.11(ac80) (the worst data)

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Channel:5210MHz									
46.109	-60.82	-11.99	-72.81	-57.00	-15.81	peak	1.3	287	H
68.475	-60.82	-12.03	-72.85	-57.00	-15.85	peak	1.7	186	H
105.115	-60.31	-11.79	-72.09	-57.00	-15.09	peak	1.2	5	H
217.382	-62.61	-10.63	-73.25	-57.00	-16.25	peak	1.3	359	H
326.394	-61.63	-10.16	-71.79	-57.00	-14.79	peak	1.4	169	H
871.024	-69.44	-0.37	-69.80	-57.00	-12.80	peak	1.3	107	H
47.512	-60.26	-12.07	-72.33	-57.00	-15.33	peak	1.2	180	V
101.530	-60.98	-12.52	-73.50	-57.00	-16.50	peak	1.0	153	V
182.961	-62.05	-12.46	-74.51	-57.00	-17.51	peak	1.4	9	V
217.169	-60.96	-11.14	-72.10	-57.00	-15.10	peak	1.7	87	V
328.408	-59.25	-10.21	-69.46	-57.00	-12.46	peak	1.6	123	V
869.424	-70.22	0.03	-70.19	-57.00	-13.19	peak	1.5	359	V

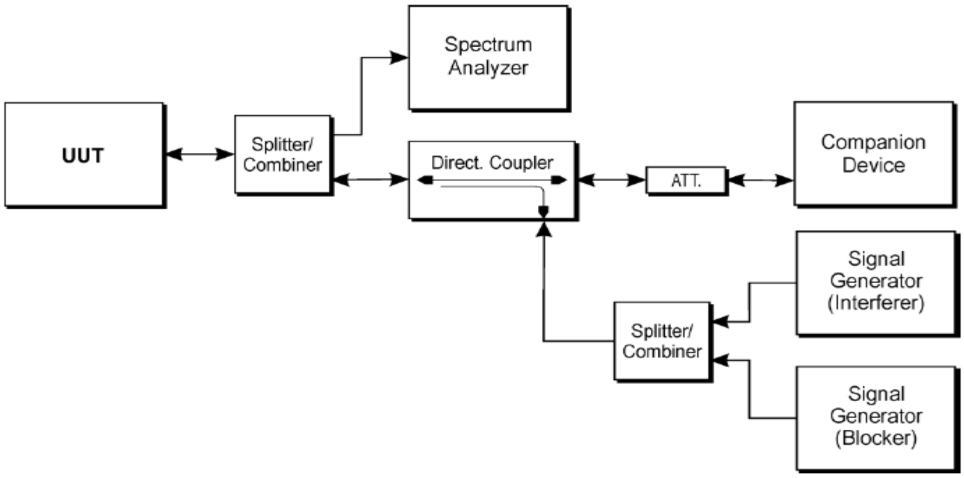
Channel:5290MHz									
45.760	-60.25	-12.01	-72.26	-57.00	-15.26	peak	1.9	100	H
67.097	-60.30	-11.77	-72.07	-57.00	-15.07	peak	1.4	145	H
104.435	-60.66	-12.00	-72.65	-57.00	-15.65	peak	1.1	323	H
217.402	-62.78	-10.51	-73.28	-57.00	-16.28	peak	1.2	282	H
326.901	-61.76	-9.59	-71.36	-57.00	-14.36	peak	1.1	244	H
871.103	-68.65	-0.03	-68.68	-57.00	-11.68	peak	1.1	135	H
48.131	-60.54	-11.94	-72.48	-57.00	-15.48	peak	1.6	174	V
99.633	-60.77	-12.43	-73.21	-57.00	-16.21	peak	1.5	351	V
181.954	-62.29	-12.08	-74.36	-57.00	-17.36	peak	1.7	172	V
216.798	-61.32	-10.91	-72.24	-57.00	-15.24	peak	1.1	248	V
327.668	-59.34	-10.26	-69.61	-57.00	-12.61	peak	1.5	174	V
871.391	-69.85	-0.31	-70.16	-57.00	-13.16	peak	1.2	196	V

Above 1GHz,

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
2295.89	-72.54	12.61	-59.93	-47	-12.93	peak	1.0	29	H
2298.61	-76.44	12.69	-63.75	-47	-16.75	peak	1.1	68	V
3706.97	-74.83	14.84	-59.99	-47	-12.99	peak	1.3	80	H
3709.06	-79.08	14.57	-64.51	-47	-17.51	peak	1.8	219	V
4009.03	-77.63	15.85	-61.78	-47	-14.78	peak	1.9	160	H
4010.36	-78.97	15.94	-63.03	-47	-16.03	peak	1.6	329	V
5253.35	-75.76	17.09	-58.67	-47	-11.67	peak	1.1	260	H
5254.77	-79.48	16.94	-62.54	-47	-15.54	peak	1.7	3	V

13. ADAPTIVITY

13.1 Block Diagram Of Test Setup



13.2 Limit

Requirement	Operational Mode		
	Frame Based Equipment	Load Based Equipment (CCA using 'energy detect')	Load Based Equipment (CCA not using any of the mechanisms referenced)
Minimum Clear Channel Assessment (CCA) Time	20 us (see note 1)	(see note 2)	20 us (see note 1)
Maximum Channel Occupancy (COT) Time	1ms to 10 ms	(see note 2)	(13/32)*q ms (see note 3)
Minimum Idle Period	5% of COT	(see note 2)	NA
Extended CCA check	NA	(see note 2)	N*CCA (see note 4)
Short Control Signalling Transmissions	Maximum duty cycle of 5% within an observation period of 50 ms (see note 5)		

Note 1: The CCA time used by the equipment shall be declared by the manufacturer.
Note 2: LBT based spectrum sharing mechanism based on the Clear Channel Assessment (CCA) mode using 'energy detect', as described in IEEE 802.11TM-2007[9], clauses 15 and 17, in IEEE 802.11n TM -2009[10], clauses 20.
Note 3: q is selected by the manufacturer in the range [4…32]
Note 4: The value of N shall be randomly selected in the range [1…q]
Note 5: Adaptive equipment may or may not have Short Control Signaling Transmissions.

13.3 Test procedure

Step 1:

• The UUT shall connect to a companion device during the test. The signal generator, the spectrum analyser, the UUT, the traffic source and the companion device are connected using a set-up equivalent to the example given by figure 14 although the interference source is switched off at this point in time. The spectrum analyser is

used to monitor the transmissions of the UUT in response to the interference signal. The traffic source might be part of the UUT itself.

• The received signal level (wanted signal from the companion device) at the UUT shall be sufficient to maintain a reliable link for the duration of the test. A typical value for the received signal level which can be used in most cases is -50 dBm/MHz.

• The analyser shall be set as follows:

- RBW: ≥ Occupied Channel Bandwidth (if the analyser does not support this setting, the highest available setting shall be used)
- VBW: ≥ RBW (if the analyser does not support this setting, the highest available setting shall be used)
- Detector Mode: RMS
- Centre Frequency: Equal to the centre frequency of the operating channel
- Span: 0 Hz
- Sweep time: > 2 × Channel Occupancy Time
- Trace Mode: Clear/Write
- Trigger Mode: Video or RF/IF Power

Step 2:

• Configure the traffic source so that it fills the UUT's buffers to a level causing the UUT to always have transmissions queued (buffer-ready-for-transmission condition) towards the companion device. Where this is not possible, the UUT shall be configured to occupy the Channel Occupancy Time of the Fixed Frame Period

to the highest extent possible.

• To avoid adverse effects on the measurement results, a unidirectional traffic source should be used. An example of such a unidirectional traffic source not triggering reverse traffic on higher layer protocols is UDP.

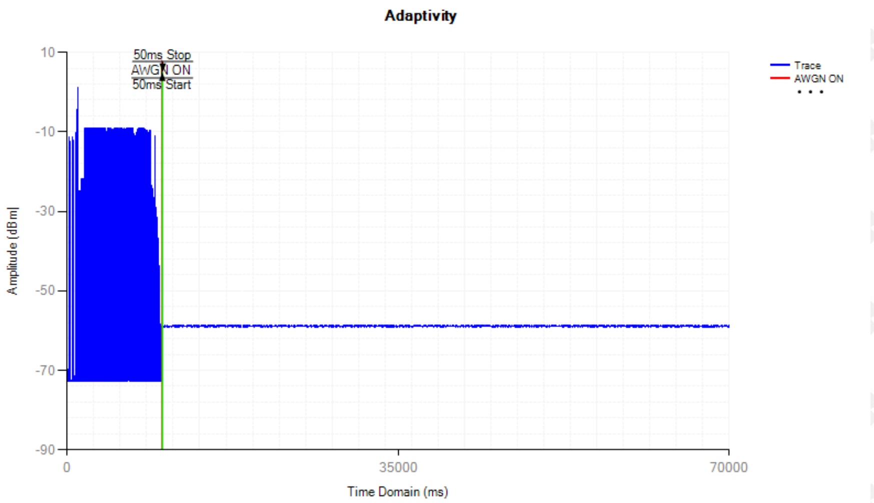
13.4 Test Result

WORST CASE

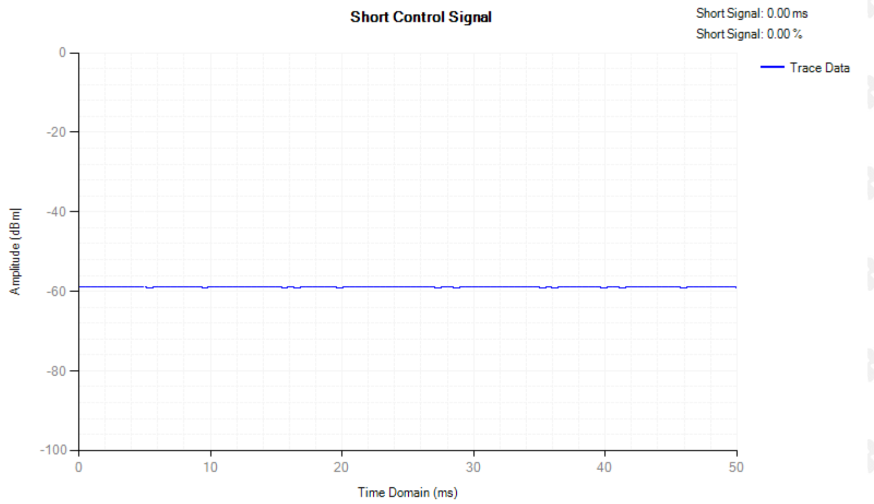
Adaptivity

Condition	Mode	Frequency (MHz)	Interfer Type	Interfer Level (dBm)	Short Control (ms)	Limit (ms)	Short Control (n)	Limit (n)	Verdict
NVNT	802.11a	5180	AWGN	-63	0	<=2.5	0	<=50	Pass
NVNT	802.11a	5180	LTE	-63	0	<=2.5	0	<=50	Pass
NVNT	802.11a	5180	OFDM	-63	0	<=2.5	0	<=50	Pass

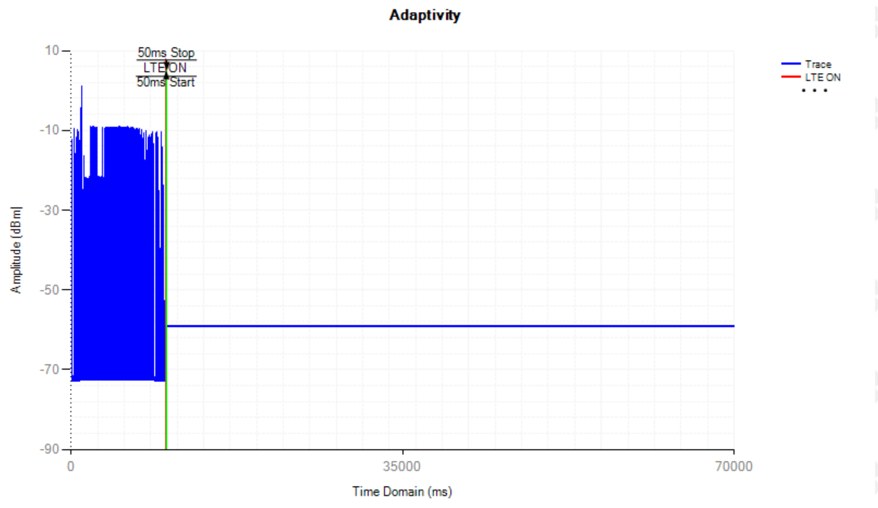
Adaptivity NVNT 802.11a 5180MHz AWGN



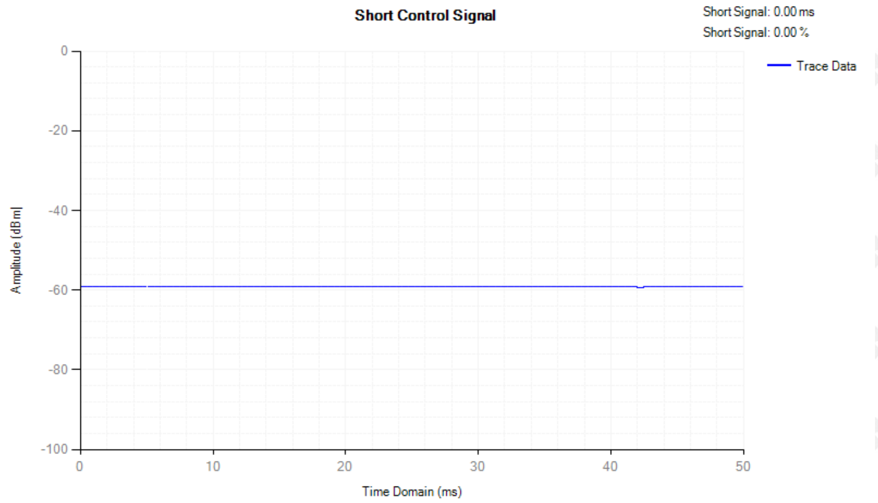
Control Signal NVNT 802.11a 5180MHz AWGN



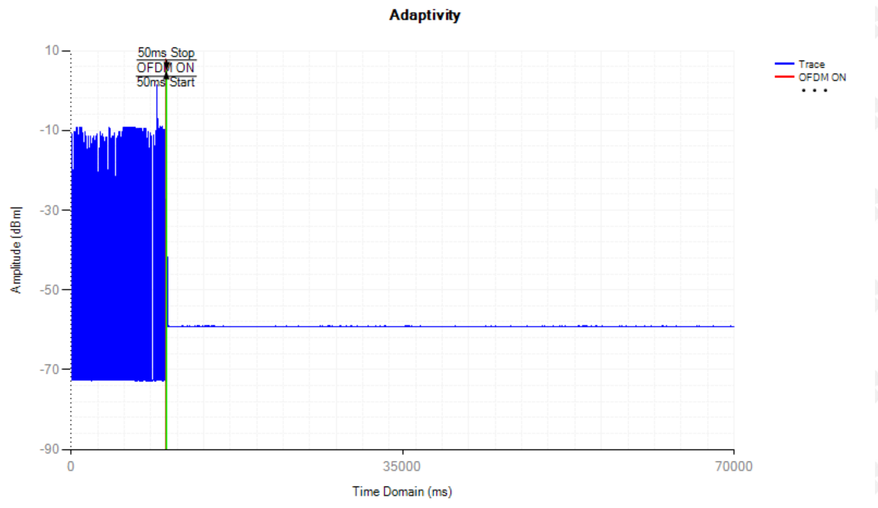
Adaptivity NVNT 802.11a 5180MHz LTE



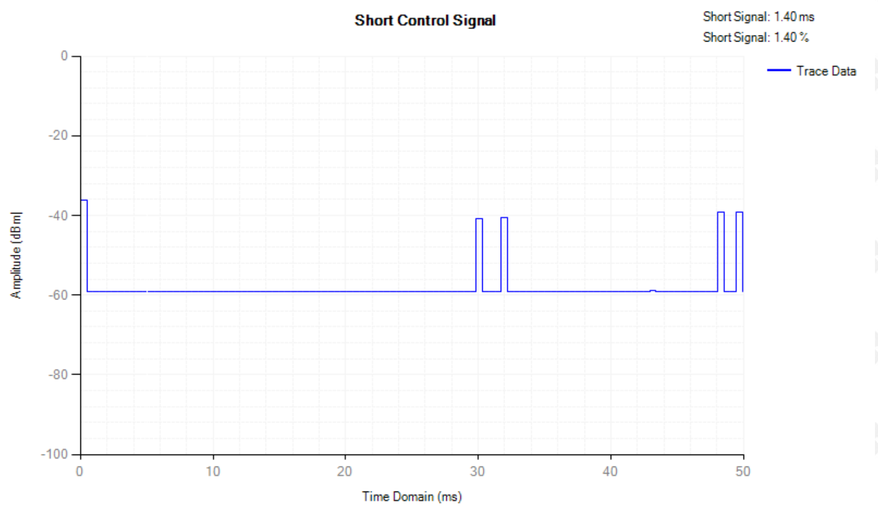
Control Signal NVNT802.11a 5180MHz LTE



Adaptivity NVNT 802.11a 5180MHz OFDM



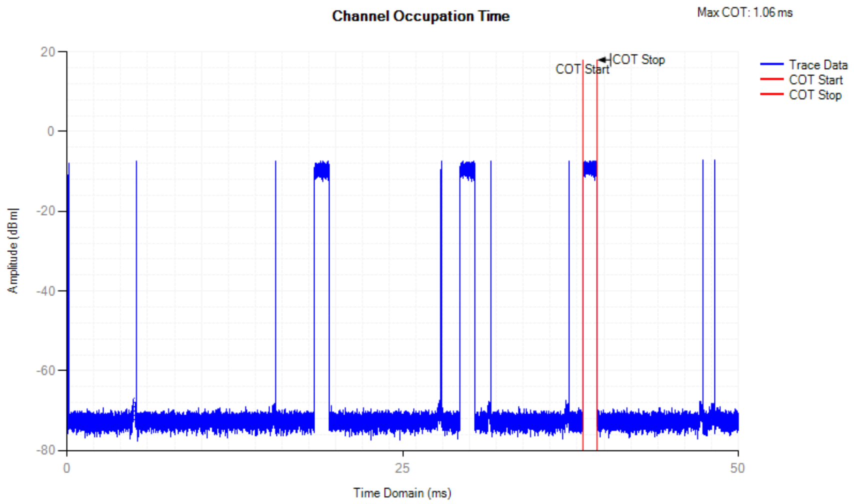
Control Signal NVNT 802.11a 5180MHz OFDM



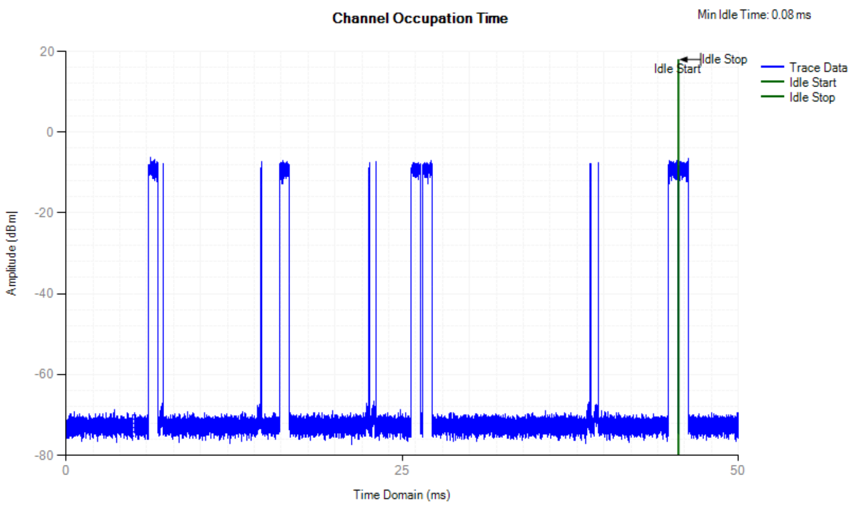
Adaptivity COT Channel Occupancy Time

Condition	Mode	Frequency (MHz)	Priority Class	Max COT (ms)	Limit COT (ms)	Min Idle Time (ms)	Limit Idle Time (ms)	Verdict
NVNT	802.11a	5180	1	1.06	<=6	0.08	>0.027	Pass

COT NVNT 802.11a 5180MHz



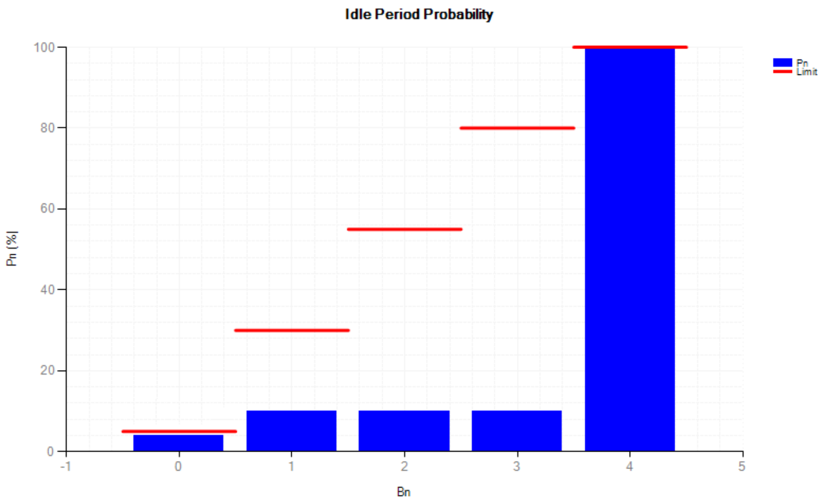
Idle NVNT 802.11a 5180MHz



Adaptivity COT Idle Period Probability

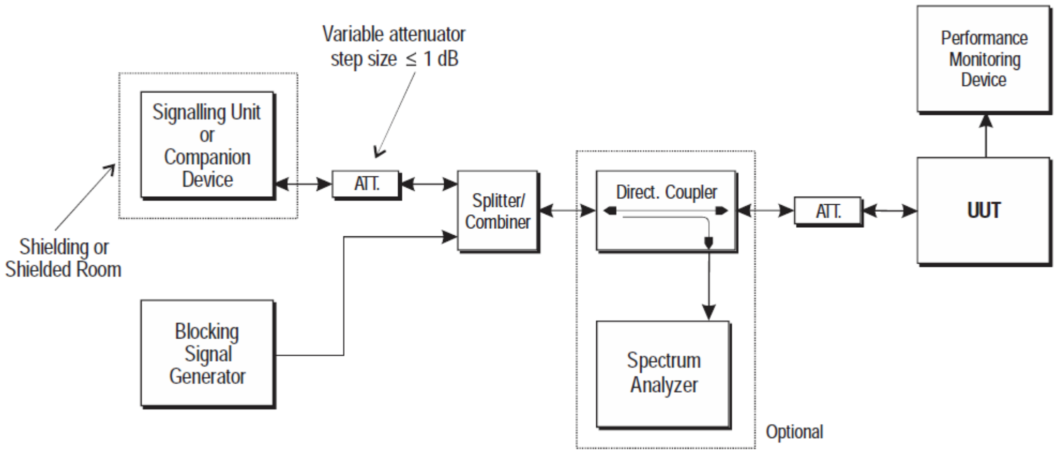
Condition	Mode	Frequency (MHz)	Priority Class	Bn	H(Bn)	Pn (%)	Limit (%)	Verdict
NVNT	802.11a	5180	1	0	264	2.61	5	Pass
NVNT	802.11a	5180	1	1	41	3.00	12	Pass
NVNT	802.11a	5180	1	2	13	3.12	18.25	Pass
NVNT	802.11a	5180	1	3	24	3.31	24.5	Pass
NVNT	802.11a	5180	1	4	18	3.55	30.75	Pass
NVNT	802.11a	5180	1	5	5	3.63	37	Pass
NVNT	802.11a	5180	1	6	1	3.61	43.25	Pass
NVNT	802.11a	5180	1	7	1	3.62	49.5	Pass
NVNT	802.11a	5180	1	8	4	3.61	55.75	Pass
NVNT	802.11a	5180	1	9	1	3.60	62	Pass
NVNT	802.11a	5180	1	10	1	3.71	68.25	Pass
NVNT	802.11a	5180	1	11	9	3.72	74.5	Pass
NVNT	802.11a	5180	1	12	4	3.80	80.75	Pass
NVNT	802.11a	5180	1	13	5	3.84	87	Pass
NVNT	802.11a	5180	1	14	18	4.02	93.25	Pass
NVNT	802.11a	5180	1	15	102	5.01	99.5	Pass
NVNT	802.11a	5180	1	16	9568	100	100	Pass

Idle Period Probability NVNT 802.11a 5180MHz



14. RECEIVER BLOCKING

14.1 Block Diagram Of Test Setup



14.2 Limit

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)		Type of blocking signal
		Master or Slave with radar detection (see table D.2, note 2)	Slave without radar detection (see table D.2, note 2)	
Pmin + 6 dB	5 100	-53	-59	Continuous Wave
Pmin + 6 dB	4 900 5 000 5 975	-47	-53	Continuous Wave

NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined clause 4.2.8.3 in the absence of any blocking signal.
NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.

14.3 Test procedure

Step 1:

• The UUT shall be set to the first operating frequency to be tested (see clause 5.3.2).

Step 2:

• The blocking signal generator is set to the first frequency as defined in table 9.

Step 3:

• With the blocking signal generator switched off a communication link is set up between the UUT and the associated companion device using the test setup shown in figure 18. The attenuation of the variable attenuator shall be increased in 1 dB steps to a value at which the minimum performance criteria as specified in clause 4.2.8.3 is still met. The resulting level for the wanted signal at the input of the UUT is Pmin.

- This signal level (Pmin) is increased by 6 dB resulting in a new level (Pmin + 6 dB) of the wanted signal at the UUT receiver input.

Step 4:

- The level of the blocking signal at the UUT input is set to the level provided in table 9. It shall be verified and recorded in the test report that the performance criteria as specified in clause 4.2.8.3 are met.
- If the performance criteria as specified in clause 4.2.8.3 are met, the level of the blocking signal at the UUT may be further increased (e.g. in steps of 1 dB) until the level whereby the performance criteria as specified in clause 4.2.8.3 are no longer met. The highest level at which the performance criteria are met is recorded in the

test report.

Step 5:

- Repeat step 4 for each remaining combination of frequency and level as specified in table 9.

Step 6:

- Repeat step 2 to step 5 with the UUT operating at the other operating frequencies at which the blocking test has to be performed. See clause 5.3.2.

14.4 Test Result

Slave without radar detection:

5150-5250MHz

Test conditions	Modulation	Channel (MHz)	P_{min}(dBm)	Blocking Frequency(MHz)	Blocking Power(dB)	Measured PER(%)	Limit (%)
NVNT	802.11(n20)	5180	-74	5100	-59	0.65	10
	802.11(n20)	5180	-74	4900	-53	0.35	10
	802.11(n20)	5180	-74	5000	-53	0.39	10
	802.11(n20)	5180	-74	5975	-53	0.41	10
	802.11(n40)	5190	-74	5100	-59	0.26	10
	802.11(n40)	5190	-74	4900	-53	0.63	10
	802.11(n40)	5190	-74	5000	-53	0.58	10
	802.11(n40)	5190	-74	5975	-53	0.55	10
	802.11(n80)	5210	-74	5100	-59	0.61	10
	802.11(n80)	5210	-74	4900	-53	0.49	10
	802.11(n80)	5210	-74	5000	-53	0.72	10
	802.11(n80)	5210	-74	5975	-53	0.34	10
Note:This report only shows the worst case test data.							

15. EUT PHOTOGRAPHS

Refer to Report No. CTB230216021REX for EUT external and internal photos.

16. EUT TEST SETUP PHOTOGRAPHS

Spurious emissions

※※※※※ **END OF REPORT** ※※※※※

TEST REPORT

Product Name:	Projector
Trademark:	GJTOS, xintepric, clokowe, ELEPHAS, GOODEE, Cibest, ARTSEA, YABER, WIMIUS, Uyole, Bacar, Lifegoods, BLAUPUNKT, EKO, VOLLPS, Auking, AngBeam, Thundeal
Model Number:	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Prepared For:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Manufacturer:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	Jan. 29, 2023
Sample tested Date:	Jan. 29, 2023 to Feb. 16, 2023
Issue Date:	Feb. 16, 2023
Report No.:	CTB230216025RFX
Test Standards	ETSI EN 300 440 V2.2.1 (2018-07)
Test Results	PASS
Remark:	This is 5.8G radio test report.

Compiled by:	Reviewed by:	Approved by:
ChenZheng	Arron Liu	Bin Mei
Chen Zheng	Arron Liu	Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

TABLE OF CONTENT

(Note: N/A means not applicable)

1. SVERSION

Report No.	Issue Date	Description	Approved
CTB230216025RFX	Feb. 16, 2023	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	EN 300 440 V2.2.0		
Test Item	**Test Requirement**	**Test Method**	**Results**
Transmitter Parameters			
Transmitter measurement requirements	Clause 4.2.1		
Equivalent isotropically radiated power (e.i.r.p.)	Clause 4.2.2	Clauses 4.2.2.3.1 and 4.2.2.3.2.	PASS
Permitted range of operating frequencies	Clause 4.2.3	Clauses 4.2.3.4.	PASS
Unwanted emissions in the Spurious domain	Clause 4.2.4	Clauses 4.2.4.3	PASS
Duty Cycle	Clause 4.2.5	Clauses 4.2.5.3	PASS
Additional requirements for FHSS equipment	Clause 4.2.6	Clauses 4.2.6.3	N/A
Receiver Parameters			
Receiver category	Clause 4.3.1		
Adjacent channel selectivity	Clause 4.3.3	Clause 4.3.3.3	N/A
Blocking or desensitization	Clause 4.3.4	Clause 4.3.4.3	N/A
Spurious radiations	Clause 4.3.5	Clause 4.3.5.3	PASS

Remark:
Note: N/A is an abbreviation for Not Applicable and means this test intem is not applicable for this device according to the technology characteristic of device.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radiated Frequency.
CH: In this whole report CH means channel.

3. MEASUREMENT UNCERTAINTY

Where relevant, the measurement uncertainty figures shall be calculated and shall correspond to an expansion factor (coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). Principles for the calculation of measurement uncertainty are contained in ETSI TR 100 028 [i.4], in particular in annex D of the ETSI TR 100 028-2 [i.4].

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Receiver Reference Sensitivity level	1.9dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63℃
frequency	1×10^{-7}

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: A6
Hardware Version:	PJ67V810
Software Version:	YKV01.20221123
Operation Frequency:	IEEE 802.11a/n (20M): 5725MHz ~5850MHz/ 5 channel IEEE 802.11n (40M): 5725MHz ~5850MHz/ 2 channel
Max. RF output power:	6.99dBm
Type of Modulation:	WiFi: DSSS, CCK and OFDM
Antenna installation:	FPC antenna
Antenna Gain:	1.0dBi
Ratings:	AC 100-240V~50/60Hz

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
/	/	/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
149	5745	151	5755	153	5765
159	5795	161	5805	165	5825

4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Low channel	Middle channel	High channel
Transmitting	5745 MHz	5785 MHz	5825 MHz
Receiving	5745 MHz	5785 MHz	5825 MHz

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(AC(V):	230V
Low Voltage(AC)(V):	207V
High Voltage(AC)(V):	253V
Normal Temperature(℃) :	23
Low Temperature(℃) :	-20
High Temperature(℃) :	55

Note:

(1) The temperature range as declared by the manufacturer; or one of the following specified temperature ranges:
- Temperature category I (General): -20 °C to +55 °C;
- Temperature category II (Portable): -10 °C to +55 °C;
- Temperature category III (Equipment for normal indoor use): 5 °C to +35 °C.

(2) When the radio equipment is intended for operation with the usual types of battery power source, the normal test voltage shall be 1,1 multiplied by the nominal voltage of the battery

(3) When the radio equipment is intended for operation from the usual type of battery power sources the extreme test voltages shall be 1,3 and 0,9 multiplied by the nominal voltage of the battery

Table 5: Receiver categories

Receiver category	Relevant receiver clauses	Risk assessment of receiver performance
1	4.3.3, 4.3.4 and 4.3.5	Highly reliable SRD communication media; e.g. serving human life inherent systems (may result in a physical risk to a person).
2	4.3.4 and 4.3.5	Medium reliable SRD communication media e.g. causing inconvenience to persons, which cannot simply be overcome by other means.
3	4.3.5	Standard reliable SRD communication media e.g. Inconvenience to persons, which can simply be overcome by other means (e.g. manual).

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

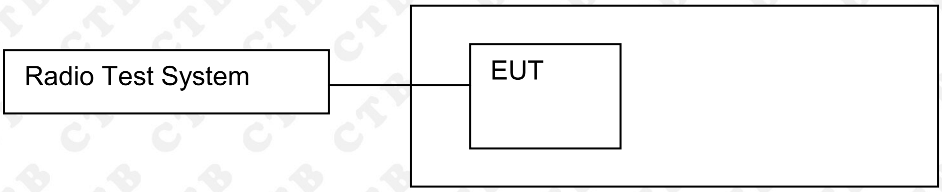
RF conduction and RadiationTest equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2023.07.19
2	Power Sensor	Agilent	U2021XA	MY56120032	2023.07.19
3	Power Sensor	Agilent	U2021XA	MY56120034	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2023.07.19
6	Signal Generator	Agilent	N5181A	MY50140365	2023.07.19
7	Vector signal generator	Agilent	N5182A	MY47420195	2023.07.19
8	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2023.07.19
10	5 GHz Filter	Shenxiang	MSF5150-5850MS-1155	20181015001	2023.07.19
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2023.07.19
12	BT&WI-FI Automatic test software	Micowave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2023.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2023.07.19
15	234G Automatic test software	Micowave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	2023.07.19
18	Amplifier	HP	8447E	2945A02747	2023.07.19
19	Amplifier	Agilent	8449B	3008A01838	2023.07.19
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2023.07.22

21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	2023.07.22
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	2023.07.23
24	loop antenna	ZHINAN	ZN30900A	GTS534	/
25	40G Horn antenna	A/H/System	SAS-574	588	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2024.10.30

6. EQUIVALENT ISOTROPICALLY RADIATED POWER (E.I.R.P.)

6.1 Block Diagram Of Test Setup



6.2 Limit

Table 2: Maximum radiated peak power (e.i.r.p.)

Frequency Bands	Power	Application	Notes
2 400 MHz to 2 483,5 MHz	10 mW e.i.r.p.	Non-specific short range devices	
2 400 MHz to 2 483,5 MHz	25 mW e.i.r.p.	Radio determination devices	
(a) 2 446 MHz to 2 454 MHz	500 mW e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and annex D
(b) 2 446 MHz to 2 454 MHz	4 W e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and annex D
5 725 MHz to 5 875 MHz	25 mW e.i.r.p.	Non-specific short range devices	
9 200 MHz to 9 500 MHz	25 mW e.i.r.p.	Radio determination devices	
9 500 MHz to 9 975 MHz	25 mW e.i.r.p.	Radio determination devices	
10,5 GHz to 10,6 GHz	500 mW e.i.r.p.	Radio determination devices	
13,4 GHz to 14,0 GHz	25 mW e.i.r.p.	Radio determination devices	
17,1 GHz to 17,3 GHz	400 mW e.i.r.p.	Radio determination devices	See annex F
24,00 GHz to 24,25 GHz	100 mW e.i.r.p.	Non-specific short range devices and Radio determination devices	

6.3

Step 1:

• using a suitable means, the output of the transmitter shall be coupled to a matched diode detector;

• the output of the diode detector shall be connected to the vertical channel of an oscilloscope;

• the combination of the diode detector and the oscilloscope shall be capable of faithfully reproducing the envelope peaks and the duty cycle of the transmitter output signal;

• the observed duty cycle of the transmitter (Tx on/(Tx on + Tx off)) shall be noted as x, $(0 < x < 1)$ and recorded.

Step 2:

• the average output power of the transmitter shall be determined using a wideband, calibrated RF power meter with a matched thermocouple detector or an equivalent thereof and, where applicable, with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be recorded as "A" (in dBm);

• the e.i.r.p. shall be calculated from the above measured power output A, the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:

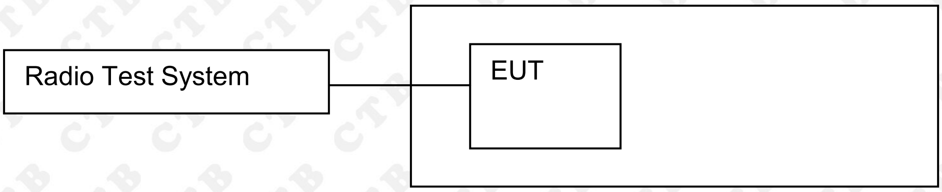
- $P = A + G + 10 \log (1/x)$;

6.4 Test Result

Condition	Mode	Frequency (MHz)	Max EIRP (dBm)	Limit (dBm)	Verdict
NVNT	802.11a	5745	6.32	14	Pass
NVNT	802.11a	5785	6.54	14	Pass
NVNT	802.11a	5825	6.59	14	Pass
NVNT	802.11ac20	5745	6.35	14	Pass
NVNT	802.11ac20	5785	6.44	14	Pass
NVNT	802.11ac20	5825	6.99	14	Pass
NVNT	802.11ac40	5755	5.8	14	Pass
NVNT	802.11ac40	5795	5.56	14	Pass
NVNT	802.11ac80	5775	4.81	14	Pass
NVNT	802.11n(HT20)	5745	6.53	14	Pass
NVNT	802.11n(HT20)	5785	6.45	14	Pass
NVNT	802.11n(HT20)	5825	6.96	14	Pass
NVNT	802.11n(HT40)	5755	6.3	14	Pass
NVNT	802.11n(HT40)	5795	5.8	14	Pass

7. PERMITTED RANGE OF OPERATING FREQUENCIES

7.1 Block Diagram Of Test Setup



7.2 Limit

5725MHz to 5825MHz

7.3 Test procedure

a) put the spectrum analyser in video averaging mode with a minimum of 50 sweeps selected;

b) select the lowest operating frequency of the equipment under test and activate the transmitter with modulation applied. The RF emission of the equipment shall be displayed on the spectrum analyser;

c) using the marker of the spectrum analyser, find the lowest frequency below the operating frequency at which the spectral power density drops below the level given in clause 4.2.3. This frequency shall be recorded in the test report;

d) select the highest operating frequency of the equipment under test and find the highest frequency at which the spectral power density drops below the value given in clause 4.2.3. This frequency shall be recorded in the test report;

e) the difference between the frequencies measured in steps c) and d) is the operating frequency range. It shall be recorded in the test report.

This measurement shall be repeated for each frequency range declared by the manufacturer.

7.4 Test Result

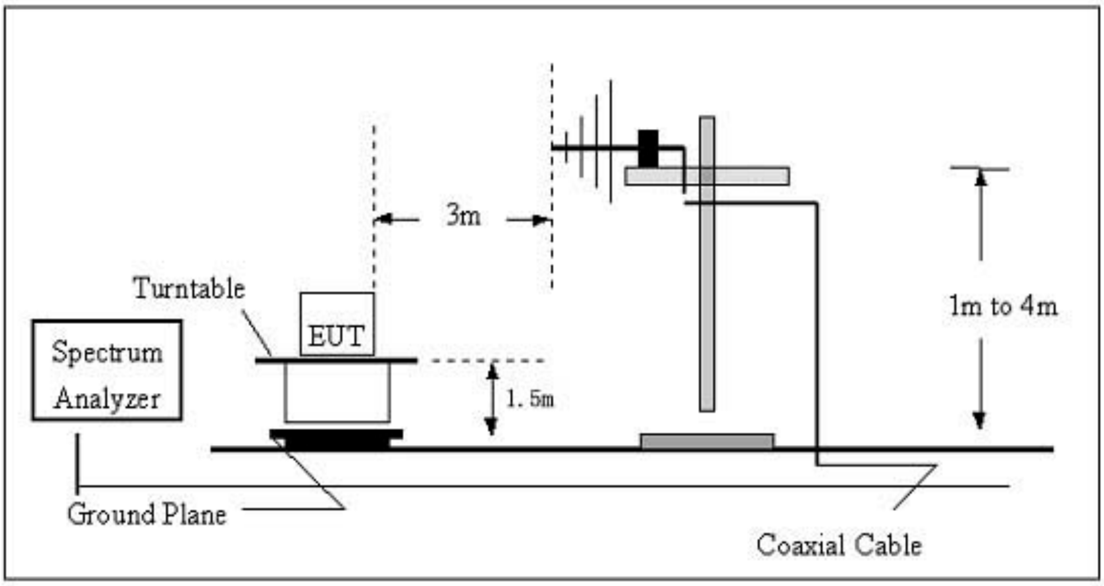
5.8G_5725MHz-5825MHz

Test Conditions	Frequencies (MHz) at -30dBm/30kHz (EIRP)	
	Lowest Frequency (fL)	Highest Frequency (fH)
Normal	5744.985	5774.983
LTLV	5744.980	5774.982
LTHV	5744.974	5774.980
HTHV	5744.992	5774.985
HTLV	5744.981	5774.983

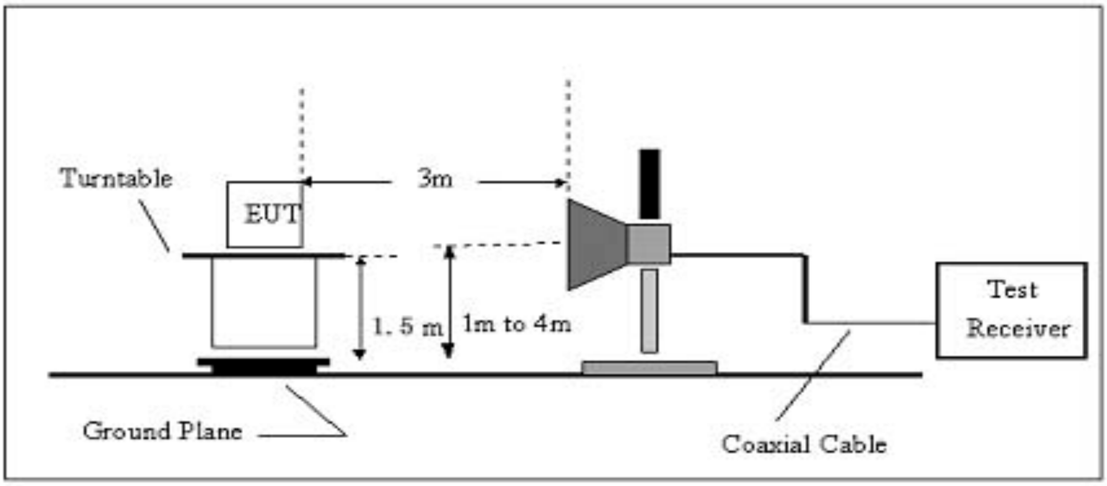
8. UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

8.1 Block Diagram Of Test Setup

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



8.2 Limits

Table 3: Spurious emissions

Frequency ranges / State	47 MHz to 74 MHz 87,5 MHz to 108 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤ 1 000 MHz	Frequencies > 1 000 MHz
Operating	4 nW	250 nW	1 μW
Standby	2 nW	2 nW	20 nW

8.3 Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the nonconductive turntable 1.5m above the ground in a full anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable 1.5 m above the ground in a full anechoic chamber..

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

8.4 Test Results

The worse test 802.11n(HT20) Low channel

Tx in operation mode				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
48.80	Vertical	-69.99	-54.00	Pass
130.10	V	-72.25	-36.00	
188.80	V	-75.24	-54.00	
389.56	V	-76.17	-36.00	
510.45	V	-74.21	-54.00	
678.72	V	-56.68	-54.00	
956.45	V	-52.75	-36.00	
1740.04	V	-41.11	-30.00	
2425.02	V	-43.59	-30.00	
3294.58	V	-42.75	-30.00	
134.43	Horizontal	-70.22	-36.00	
217.67	H	-70.95	-54.00	
359.40	H	-72.45	-36.00	
485.82	H	-73.30	-54.00	
694.21	H	-71.97	-54.00	
870.21	H	-47.70	-36.00	
1738.78	H	-43.39	-30.00	
2426.11	H	-42.83	-30.00	
3294.10	H	-46.24	-30.00	
Tx in standby Mode				
N/A: Not applicable, since the spurious emission of the EUT is too weak to be detected.(≤-80dBm)				

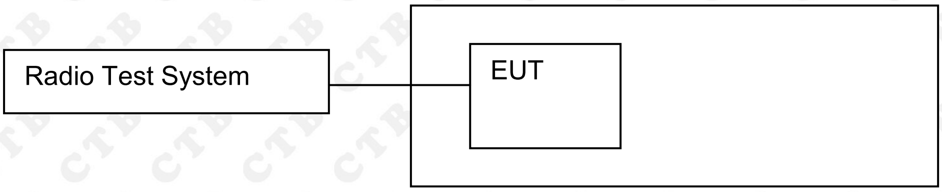
802.11n(HT20) High channel

Tx in operation mode				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
50.43	Vertical	-70.36	-54.00	Pass
127.91	V	-72.75	-36.00	
189.45	V	-75.34	-54.00	
388.83	V	-76.44	-36.00	
509.58	V	-74.10	-54.00	
676.89	V	-56.67	-54.00	
955.88	V	-52.38	-36.00	
1737.93	V	-40.65	-30.00	
2423.25	V	-43.82	-30.00	
3294.71	V	-42.72	-30.00	
133.20	Horizontal	-70.33	-36.00	
216.76	H	-71.47	-54.00	
359.50	H	-72.51	-36.00	
487.07	H	-73.23	-54.00	
694.15	H	-72.72	-54.00	
870.29	H	-48.05	-36.00	
1739.09	H	-43.61	-30.00	
2424.26	H	-42.81	-30.00	
3292.82	H	-46.23	-30.00	
Tx in standby Mode				
N/A: Not applicable, since the spurious emission of the EUT is too weak to be detected.(≤-80dBm)				

Remark: This Report only show the test plots of the ANT0 worst case.

9. DUTY CYCLE

9.1 Block Diagram Of Test Setup



9.2 Limit

Table 4: Duty cycle limits

Frequency Band	Duty cycle	Application	Notes
2 400 MHz to 2 483,5 MHz	No Restriction	Generic use	
2 400 MHz to 2 483,5 MHz	No Restriction	Detection, movement and alert applications	
(a) 2 446 MHz to 2 454 MHz	No Restriction	RFID	Limits shown in annex D shall apply
(b) 2 446 MHz to 2 454 MHz	≤ 15 %	RFID	Limits shown in annex D shall apply
5 725 MHz to 5 875 MHz	No Restriction	Generic use	
9 200 MHz to 9 500 MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
9 500 MHz to 9 975 MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
10,5 GHz to 10,6 GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
13,4 GHz to 14,0 GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
17,1 GHz to 17,3 GHz	DAA or equivalent techniques	Radiodetermination: GBSAR detecting and movement and alert applications	Limits shown in annex F shall apply
24,00 GHz to 24,25 GHz	No Restriction	Generic use and for Radiodetermination: radar, detection, movement and alert applications	

9.3 T

An assessment of the overall Duty Cycle shall be made for a representative period of Tobs over the observation bandwidth Fobs. Unless otherwise specified, Tobs is 1 hour and the observation bandwidth Fobs is the operational frequency band.

The representative period shall be the most active one in normal use of the device. As a guide "Normal use" is considered as representing the behaviour of the device during transmission of 99 % of the [emissions] generated during its operational lifetime.

Procedures such setup, commissioning, and maintenance are not considered part of normal operation.

For manual operated or event dependant devices, with or without software controlled functions, the manufacturer shall declare whether the device once triggered, follows a pre-programmed cycle, or whether the transmitter remains on until the trigger is released or the device is manually reset. The manufacturer shall also give a description of the application

for the device and include a typical usage pattern. The typical usage pattern as declared by the manufacturer shall be used to determine the duty cycle and compare to the limit in table 4.

Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.

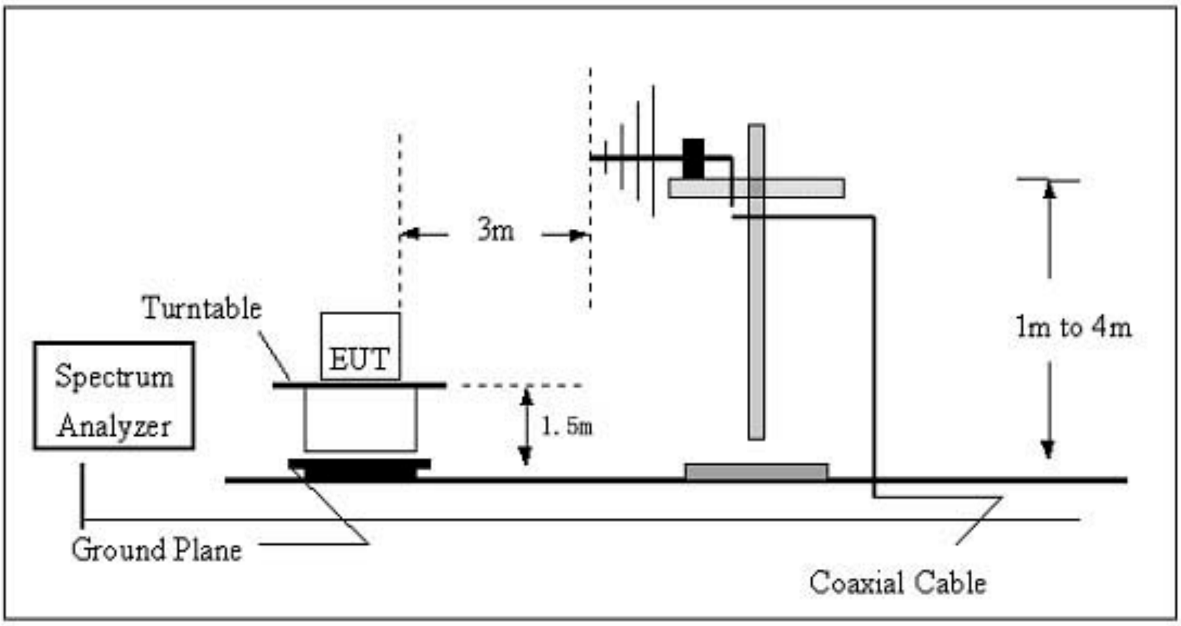
9.4 Test Result

For generic use devices operating at frequency range 5725-5825MHz, according to Final draft ETSI EN 300 440 V2.2.1 (2018-05), the duty cycle is no restriction.

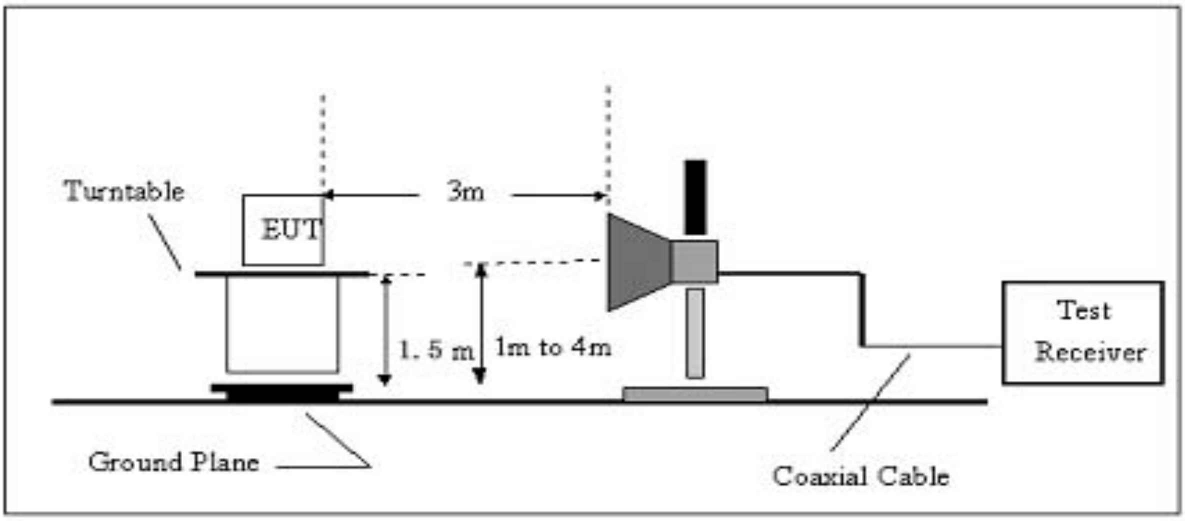
10. SPURIOUS EMISSIONS

10.1 Block Diagram Of Test Setup

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



10.2 Limits

According to the Final draft ETSI EN 300 440 V2.2.1 (2018-05) Section 4.3.5.4, the power of any spurious emission shall not exceed 2 nW in the range 25 MHz to 1 GHz and shall not exceed 20 nW on frequencies above 1 GHz.

10.3 Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the nonconductive turntable 1.5m above the ground in a full anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna’s height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable 1.5 m above the ground in a full anechoic chamber..

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

10.4 Test Results

The worse test 802.11n(HT20) Low channel

Rx in operation mode				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
51.02	Vertical	-69.57	-57.00	Pass
128.13	V	-69.87	-57.00	
190.55	V	-70.63	-57.00	
389.93	V	-68.41	-57.00	
508.45	V	-69.47	-57.00	
679.06	V	-69.12	-57.00	
956.13	V	-68.05	-57.00	
1739.47	V	-66.69	-47.00	
2423.97	V	-67.30	-47.00	
3293.20	V	-67.56	-47.00	
133.81	Horizontal	-69.90	-57.00	
217.95	H	-69.31	-57.00	
360.95	H	-69.42	-57.00	
485.83	H	-69.07	-57.00	
692.25	H	-67.78	-57.00	
870.67	H	-68.08	-57.00	
1738.78	H	-67.10	-47.00	
2423.98	H	-68.52	-47.00	
3292.68	H	-67.96	-47.00	
Rx in standby Mode				
N/A: Not applicable, since the spurious emission of the EUT is too weak to be detected.(≤-80dBm)				

802.11n(HT20) High channel

Rx in operation mode				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
50.80	Vertical	-69.59	-57.00	Pass
130.84	V	-69.85	-57.00	
190.70	V	-70.41	-57.00	
388.63	V	-68.45	-57.00	
509.89	V	-69.44	-57.00	
677.08	V	-68.97	-57.00	
956.92	V	-67.76	-57.00	
1738.70	V	-66.96	-47.00	
2423.38	V	-67.76	-47.00	
3293.21	V	-67.11	-47.00	
132.80	Horizontal	-70.10	-57.00	
215.46	H	-68.65	-57.00	
358.47	H	-69.58	-57.00	
485.53	H	-68.74	-57.00	
693.17	H	-68.02	-57.00	
869.63	H	-68.19	-57.00	
1739.01	H	-67.49	-47.00	
2426.86	H	-68.52	-47.00	
3292.04	H	-68.28	-47.00	
Rx in standby Mode				
N/A: Not applicable, since the spurious emission of the EUT is too weak to be detected.(≤-80dBm)				

Remark: This Report only show the test plots of the ANT0 worst case.

11. ADJACENT CHANNEL SELECTIVITY

11.1 Applicability

This requirement applies to Equipment Category 1 receivers, when invoked, as defined in EN 300440 V2.2.0 clause 4.3.1.

11.2 LIMITS

The adjacent channel selectivity of the equipment under specified conditions shall not be less than -30 dBm + k.

The correction factor, *k*, is as follows:

$$k = -20\log f - 10\log BW$$

Where:

- f is the frequency in GHz;
- BW is the channel bandwidth in MHz.

The factor k is limited within the following:

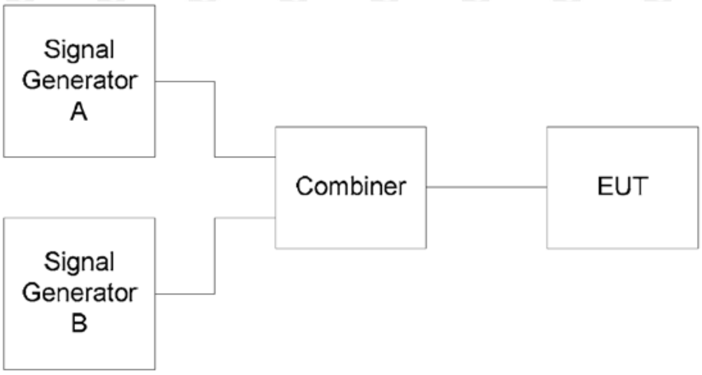
- -40 dB < k < 0 dB.

The measured adjacent channel selectivity shall be stated in the test report.

11.3 Methods of measurement

This measurement shall be conducted under normal conditions.
Two signal generators A and B shall be connected to the receiver via a combining network to the receiver, either:
a) via a test fixture or a test antenna to the receiver integrated, dedicated or test antenna; or
b) directly to the receiver permanent or temporary antenna connector.
The method of coupling to the receiver shall be stated in the test report.
Signal generator A shall be at the nominal frequency of the receiver, with normal modulation of the wanted signal.
Signal generator B shall be unmodulated and shall be adjusted to the adjacent channel centre frequency immediately above that of the wanted signal.
Initially signal generator B shall be switched off and using signal generator A the level that still gives sufficient response shall be established. The output level of generator A shall then be increased by 3 dB.
Signal generator B is then switched on and adjusted until the wanted criteria are met. This level shall be recorded.
The measurements shall be repeated with signal generator B unmodulated and adjusted to the adjacent channel centre immediately below the wanted signal.
The adjacent channel selectivity shall be recorded for the upper and lower adjacent channels as the level in dBm of the unwanted signal.
For tagging systems (e.g. RF identification, anti-theft, access control, location and similar systems) signal generator A may be replaced by a physical tag positioned at 70 % of the measured system range in metres. In this case, the blocking or desensitization shall be recorded as the ratio in dB of lowest level of the unwanted signal (generator B) resulting in a non-read of the tag. to the declared sensitivity of the receiver +3 dB.

11.4 Test Setup Layout



11.5 TEST RESULTS

N/A

12. BLOCKING OR DESENSITIZATION

12.1 Applicability

This requirement applies to Equipment Category 1 and Category 2 receivers, when invoked, as defined in EN 300440 V2.2.0 clause 4.3.1.

12.2 LIMITS

The blocking level, for any frequency within the specified ranges, shall not be less than the values given in table 6, except at frequencies on which spurious responses are found.

Table 6: Limits for blocking or desensitization

Receiver category	Limit
1	-30 dBm + k
2	-45 dBm + k
3	-60 dBm + k

The correction factor, k, is as follows:

$$k = -20\log f - 10\log BW$$

Where:

- f is the frequency in GHz;
- BW is the occupied bandwidth in MHz.

The factor k is limited within the following:

- -40 dB < k < 0 dB.

The measured blocking level shall be stated in the test report.

12.3 Test Procedures

This measurement shall be conducted under normal conditions.

Two signal generators A and B shall be connected to the receiver via a combining network to the receiver, either:

a) via a test fixture or a test antenna to the receiver integrated, dedicated or test antenna; or

b) directly to the receiver permanent or temporary antenna connector.

The method of coupling to the receiver shall be stated in the test report.

Signal generator A shall be at the nominal frequency of the receiver, with normal modulation of the wanted signal.

Signal generator B shall be unmodulated and shall be adjusted to a test frequency at approximately 10 times, 20 times and 50 times of the receive channel bandwidth above upper band edge of the receive channel.

Initially signal generator B shall be switched off and using signal generator A the level which still gives sufficient response shall be established. The output level of generator A shall then be increased by 3 dB.

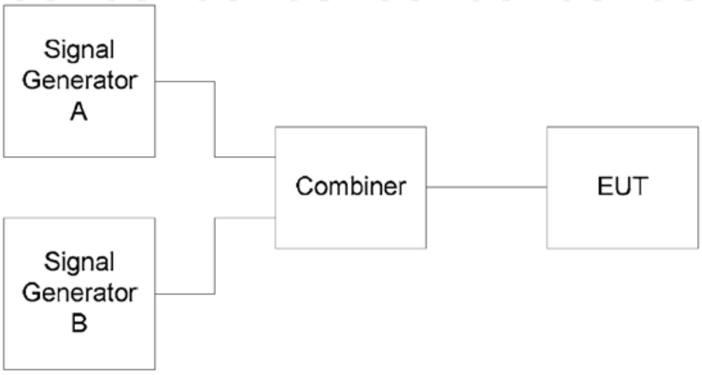
Signal generator B is then switched on and adjusted until the wanted criteria are met. This level shall be recorded.

The measurement shall be repeated with the test frequency for signal generator B at approximately 10 times, 20 times and 50 times of the receive channel bandwidth below the lower band edge of the receive channel.

The blocking or desensitization shall be recorded as the level in dBm of lowest level of the unwanted signal (generator B).

For tagging systems (e.g. RF identification, anti-theft, access control, location and similar systems) signal generator A may be replaced by a physical tag positioned at 70 % of the measured system range in metres. In this case, the blocking or desensitization shall be recorded as the ratio in dB of lowest level of the unwanted signal (generator B) resulting in a non-read of the tag. to the declared sensitivity of the receiver +3 dB.

12.4 Test Setup Layout



12.5 TEST RESULTS

N/A

13. EUT PHOTOGRAPHS

Refer to Report No.: CTB230216021REX for EUT external and internal photos.

14. EUT TEST SETUP PHOTOGRAPHS

Spurious emissions

※※※※※ END OF REPORT ※※※※※

TEST REPORT

Product Name:	Projector
Trademark:	GJTOS, xinteprid, clokowe, ELEPHAS, GOODEE, Cibest, ARTSEA, YABER, WIMIUS, Uyole, Bacar, Lifegoods, BLAUPUNKT, EKO, VOLLPS, Auking, AngBeam, Thundeal
Model Number:	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Prepared For:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Manufacturer:	Dongguan Yingke Technology Co.,Ltd.
Address:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District,Shenzhen, Guangdong, China
Sample Received Date:	Jan. 29, 2023
Sample tested Date:	Jan. 29, 2023 to Feb. 16, 2023
Issue Date:	Feb. 16, 2023
Report No.:	CTB230216026RHX
Test Standards	EN 62479:2010 EN 50663:2017
Test Results	PASS
Remark:	This is RED health test report.

Compiled by:	Reviewed by:	Approved by:
ChenZheng	Arron Liu	Bin Mei
Chen Zheng	Arron Liu	Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

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TABLE OF CONTENTS

1. VERSION

ReportNo.	Issue Date	Description	Approved
CTB230216026RHX	Feb. 16, 2023	Original	Valid

2. GENERAL INFORMATION

2.1 Product Information

Model(s):	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: A6
WIFI Version:	IEEE 802.11a/b/g/n/ac
Bluetooth Version:	Bluetooth V5.1
Hardware Version:	PJ67V810
Software Version:	YKV01.20221123
Operation Frequency:	Bluetooth: 2402-2480MHz WiFi: IEEE 802.11b/g/n 20: 2412-2472MHz/ 13 channel IEEE 802.11n 40: 2422-2462MHz/ 9 channel IEEE 802.11a/n/ac(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11n/ac(40M): 5150MHz ~5250MHz/ 2 channel IEEE 802.11ac(80M): 5150MHz ~5250MHz/ 1 channel IEEE 802.11a/n (20M): 5725MHz ~5850MHz/ 5 channel IEEE 802.11n (40M): 5725MHz ~5850MHz/ 2 channel
Max. RF output power:	Bluetooth: 1.77dBm WiFi (2.4G) : 7.54dBm WiFi(5G): 6.72dBm WiFi(5.8G):6.99dBm
Type of Modulation:	Bluetooth: GFSK, π/4 DQPSK, 8DPSK WiFi: DSSS, OFDM, CCK
Antenna installation:	FPC antenna
Antenna Gain:	1.0dBi
Ratings:	AC 100-240V~50/60Hz

3. Health Requirements

3.1 Limits

According to Council Recommendation: the criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation.

Reference levels for electric, magnetic and electromagnetic fields (10MHz to 300GHz)
Low-power electronic and electrical equipment is deemed to comply with the provisions of this standard if it can be demonstrated using routes B, C or D that the available antenna power and/or the average total radiated power is less than or equal to the applicable low-power exclusion level Pmax.
Annex A contains example values for Pmax derived from existing exposure limits listed in the bibliography, such as the ICNIRP guidelines [1], IEEE Std C95.1-1999 [2], and IEEE Std C95.1-2005 [3].
For wireless devices operated close to a person's body with available antenna powers and/or average total radiated powers higher than the Pmax values given in Annex A, the alternative Pmax values (called Pmax′), described in Annex B can also be used.

For low power equipment using pulsed signals, other limits may apply in addition to those considered in Annex A and Annex B. Both ICNIRP guidelines [1] and IEEE standards [2], [3] have specific restrictions on exposures to pulsed fields, and the requirements of those standards with respect to exposure to pulses shall be met. Annex C discusses this topic further.

Exposure tier	Region of body	Exclusion levelPmax
General public	Head and trunk	20mW(13dBm)
General public	Limbs	40mW(16dBm)

3.2 Exposure Evaluation

Mode	The worst e.i.r.p. (dBm)	Pmax(dBm)	Result
Bluetooth	1.77	13	PASS
WiFi (2.4G)	7.54	13	PASS
WiFi(5G)	6.72	13	PASS
WiFi(5.8G)	6.99	13	PASS

Remark:

1,refer to RF test report for e.i.r.p.

2, After performed the test at low/middle/high channel, the record is the worst.

※※※※※ END OF REPORT ※※※※※

TEST REPORT

EN IEC 62368-1

Audio/video, information and communication technology equipment

Part 1: Safety requirements

Report Number....................................:	CTB230224008RSX
Date of issue...:	February 25, 2023
Total number of pages......................:	89
Name of Testing Laboratory...........:	Shenzhen CTB Testing Technology Co., Ltd.
Address...:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Applicant's name................................:	Dongguan Yingke Technology Co.,Ltd.
Address...:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province, China
Test specification:	
Standard.. :	EN IEC 62368-1:2020+A11:2020
Test procedure...................................:	Safety Report
Non-standard test method..............:	N/A
TRF template used.............................:	IECEE OD-2020-F1:2021, Ed.1.4
Test Report Form No.........................:	IEC62368_1E
Test Report Form(s) Originator.....:	UL(US)
Master TRF..:	Dated 2022-04-14

Note:

If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

Test item description.........................:	Projector
Trade Mark(s)..:	GJTOS
Model/Type reference........................:	A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8
Manufacturer..:	Dongguan Yingke Technology Co.,Ltd.
Address..:	5A, Building 1, 8 Shahu Second Road, Tangxia Town, Dongguan City, Guangdong Province, China
Ratings..:	Input: AC100-240V, 50/60Hz, 1.5A, 150W

Test item particulars:	
Product group .... :	☒ end product ☐ built-in component
Classification of use by..:	☒ Ordinary person ☒ Children likely present ☒ Instructed person ☒ Skilled person
Supply connection... :	☒ AC mains ☐ DC mains ☐ not mains connected ☐ ES1 ☐ ES2 ☐ ES3
Supply tolerance ....:	☒ +10%/-10% ☐ +20%/-15% ☐ + %/ - % ☐ None
Supply connection – type ....:	☒ pluggable equipment type A - ☐ non-detachable supply cord ☒ appliance coupler ☐ direct plug-in ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☐ mating connector ☐ other:
Considered current rating of protective device..:	☒ 16A or 20A for building; 3.15A for equipment. Location: ☒ building ☒ equipment ☐ N/A
Equipment mobility... :	☒ movable ☐ hand-held ☐ transportable ☐ direct plug-in ☐ stationary ☐ for building-in ☐ wall/ceiling-mounted ☐ SRME/rack-mounted ☐ other:
Overvoltage category (OVC) ....:	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV ☐ other:
Class of equipment ....:	☐ Class I ☒ Class II ☐ Class III ☐ Not classified ☐
Special installation location ....:	☒ N/A ☐ restricted access area ☐ outdoor location ☐
Pollution degree (PD) ....:	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified T_{ma}.................................:	35 °C ☐ Outdoor: minimum °C
IP protection class ....:	☒ IPX0 ☐ IP___
Power systems .... :	☒ TN ☐ TT ☐ IT - V $_{L-L}$ ☐ not AC mains
Altitude during operation (m) .... :	☒ 2000 m or less ☐ m
Altitude of test laboratory (m) .... :	☒ 2000 m or less ☐ m
Mass of equipment (kg) ....:	Approx. 0.971kg

Possible test case verdicts:	
- test case does not apply to the test object.... :	N/A(Not applicable)
- test object does meet the requirement........... :	P (Pass)
- test object does not meet the requirement.... :	F (Fail)
Testing:	
Date of receipt of test item.................................. :	2023-02-08
Date (s) of performance of tests.........................:	2023-02-08 to 2023-02-21
Laboratory sample number.................................. :	230130001-1X

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

General product information and other remarks:

- The appliance is “Projector” and intended for indoor or similar condition used only.
- Max. operated temperature is considered as 35 °C for declared from manufacture.
- Instructions and equipment marking related to safety is applied in the language that is acceptable in the country in which the equipment is to be sold.

-Series model see below:

A6, A2, A8, B2, B6, B8, C2, C6, C8, K2, K6, K8, M2, M6, M8, N2, N6, N8, P2, P6, P8, Q2, Q6, Q8, R2, R6, R8, S2, S6, S8, T2, T6, T8

-All the model are only the names different, other circuit and outlok are the same.

-All test(s) were performed on product model no.: “A6” to represent other models also.

- Projector COB Integrated Light Source Has been certified, please refer to the test report: EDG2302030087L00101R.

Copy of marking plate:

The artwork below may be only a draft.

projector GJTOS

Model: A6

Input: AC100-240V, 50/60Hz, 1.5A, 150W

Importer: xxx Address: yyy

Dongguan Yingke Technology Co.,Ltd.

MADE IN CHINA

Remark for above marking:

1. The height of graphical symbols shall not be less than 5 mm;
2. The height of letters and numerals shall not be less than 2 mm;
3. The height dimension of CE mark should not less than 5mm, the height dimension of WEEE symbol should not less than 7mm.
4. The main rating label was attached in enclosure.

List of Attachments (including a total number of pages in each attachment):

ATTACHMENT NO.1: EN IEC 62368-1:2020+A11:2020. (NATIONAL DEVIATION). (21 pages)

ATTACHMENT NO.2: PHOTO DOCUMENTATION. (10 pages)

Summary of testing:

The submitted sample were tested and found to compliance with requirements of the standards EN IEC 62368-1:2020+A11:2020

Testing location		
Laboratory name……………	:	Shenzhen CTB Testing Technology Co., Ltd.
Testing location/address:	:	1&2/F, Building A, No. 26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Tested By (Test Engineer)	:	Kor Fan Kor Fan
Reviewed By (Supervisor)	:	Finerb Bai Finerb Bai
Approved By (Chief Engineer)	:	Kubo Lee Kubo Lee

OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	**Possible Hazard**			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
ES3: Primary circuits supplied by a.c. mains supply	Ordinary person	N/A	N/A	Enclosure, see 5.3.2, 5.4.2, 5.4.3, 5.5.3, 5.5.4.
ES3: X capacitor between L and N	Ordinary person	N/A	N/A	See 5.5.2.2
ES2: Secondary circuits (after T1 secondary)	Ordinary person	Enclosure, see 5.3.2	N/A	N/A
ES1: All data ports	Ordinary person	N/A	N/A	N/A
6	Electrically-caused fire			
Class and Energy Source (e.g. PS2: 100 Watt circuit)	Material part (e.g. Printed board)	Safeguards		
		B	1st S	2nd S
PS3	Enclosure	See 6.3.1	See 6.4.3, 6.4.7	N/A
PS3	Printed board	See 6.3.1	V-0	N/A
PS3	Internal / external wiring	See 6.3.1	See 6.5 (Equipment safeguards, rated VW-1)	N/A
PS1	Output terminals	N/A	N/A	N/A
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
N/A	N/A	N/A	N/A	N/A
8	Mechanically-caused injury			
Class and Energy Source (e.g. MS3: Plastic fan blades)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
MS1: Equipment Mass (<7kg)	Ordinary	N/A	N/A	N/A
MS1: Sharp edges and corner of product	Ordinary	N/A	N/A	N/A
MS1: Fan blades	Ordinary	N/A	N/A	N/A
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
TS1: External accessible parts	Ordinary person	N/A	N/A	N/A

10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
RS1: LED indicator light	Ordinary	N/A	N/A	N/A
RS1: Light source	Ordinary	N/A	N/A	N/A
Supplementary Information: “B” – Basic Safeguard; “S” – Supplementary Safeguard; “R” – Reinforced Safeguard				

ENERGY SOURCE DIAGRAM
Optional. Manufacturers are to provide the energy sources diagram identify declared energy sources and identifying the demarcations are between power sources. Recommend diagram be provided included in power supply and multipart systems. Insert diagram below. Example diagram designs are; Block diagrams; image(s) with layered data; mechanical drawings
See “OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS” ☒ **ES** ☒ **PS** ☒ **MS** ☒ **TS** ☒ **RS**

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

4	**GENERAL REQUIREMENTS**		P
4.1.1	Acceptance of materials, components and subassemblies	(See appended Table 4.1.2.)	P
4.1.2	Use of components	Safeguard components are certified to IEC and/or national standards and are used correctly within their ratings.	P
4.1.3	Equipment design and construction		P
4.1.4	Specified ambient temperature for outdoor use (ºC) .... :		N/A
4.1.5	Constructions and components not specifically covered		P
4.1.8	Liquids and liquid filled components (LFC)	(See G.15)	N/A
4.1.15	Markings and instructions	(See Annex F)	P
4.4.3	Safeguard robustness	See below	P
4.4.3.1	General		P
4.4.3.2	Steady force tests	(See Annex T.4)	P
4.4.3.3	Drop tests	(See Annex T.7)	P
4.4.3.4	Impact tests	(See Annex T.6)	N/A
4.4.3.5	Internal accessible safeguard tests		N/A
4.4.3.6	Glass impact tests		N/A
4.4.3.7	Glass fixation tests		N/A
	Glass impact test (1J)		N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests	(See Annex T.8)	P
4.4.3.9	Air comprising a safeguard		P
4.4.3.10	Accessibility, glass, safeguard effectiveness	No damaged. The class 3/2 energy sources could not become accessible to an ordinary person, and all other safeguards remain effective during and after above tests.	P
4.4.4	Displacement of a safeguard by an insulating liquid		N/A
4.4.5	Safety interlocks	(See Annex K)	N/A
4.5	**Explosion**		P
4.5.1	General	No explosion observed during normal / abnormal / single fault conditions.	P
4.5.2	No explosion during normal/abnormal operating condition	(See Clause B.2, B.3)	P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	No harm by explosion during single fault conditions	(See Clause B.4)	P
4.6	**Fixing of conductors**		P
	Fix conductors not to defeat a safeguard		P
	Compliance is checked by test...................................:	(See Clause T.2)	P
4.7	**Equipment for direct insertion into mains socket–outlets**		N/A
4.7.2	Mains plug part complies with relevant standard... :		N/A
4.7.3	Torque (Nm).. :		N/A
4.8	**Equipment containing coin/button cell batteries**		N/A
4.8.1	General		N/A
4.8.2	Instructional safeguard... :		N/A
4.8.3	Battery compartment door/cover construction		N/A
	Open torque test		N/A
4.8.4.2	Stress relief test		N/A
4.8.4.3	Battery replacement test		N/A
4.8.4.4	Drop test		N/A
4.8.4.5	Impact test		N/A
4.8.4.6	Crush test		N/A
4.8.5	Compliance		N/A
	30N force test with test probe		N/A
	20N force test with test hook		N/A
4.9	**Likelihood of fire or shock due to entry of conductive object**		N/A
4.10	**Component requirements**		P
4.10.1	Disconnect Device	(See Annex L)	P
4.10.2	Switches and relays	(See Annex G)	N/A

5	**ELECTRICALLY-CAUSED INJURY**		P
5.2	**Classification and limits of electrical energy sources**		P
5.2.2	ES1, ES2 and ES3 limits		P
5.2.2.2	Steady-state voltage and current limits..................... :	(See appended table 5.2)	P
5.2.2.3	Capacitance limits... :		P
5.2.2.4	Single pulse limits...:		N/A
5.2.2.5	Limits for repetitive pulses...:		N/A
5.2.2.6	Ringing signals		N/A
5.2.2.7	Audio signals	(See Clause E.1)	P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.3	**Protection against electrical energy sources**		P
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	See below.	P
5.3.1 a)	Accessible ES1/ES2 derived from ES2/ES3 circuits		P
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		N/A
5.3.2.1	Accessibility to electrical energy sources and safeguards		P
	Accessibility to outdoor equipment bare parts		N/A
5.3.2.2	Contact requirements		P
	Test with test probe from Annex V	No bare parts at ES2 or ES3 basic safeguard could be accessed by operator.	—
5.3.2.2 a)	Air gap – electric strength test potential (V)............. :	(See appended table 5.4.9)	N/A
5.3.2.2 b)	Air gap – distance (mm) .... :	Complied with the minimum distance requirement. (See appended table 5.4.2.2, 5.4.2.4 and 5.4.3.)	P
5.3.2.3	Compliance		P
5.3.2.4	Terminals for connecting stripped wire	No such terminals	N/A
5.4	**Insulation materials and requirements**		P
5.4.1.2	Properties of insulating material		P
5.4.1.3	Material is non-hygroscopic		P
5.4.1.4	Maximum operating temperature for insulating materials... :	(See appended table 5.4.1.4, 9.3, B.1.5, B.2.6)	P
5.4.1.5	Pollution degrees..:	PD2.	P
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound	Pollution degree 2 is applied. No insulating compound applied (however see 5.5.4)	N/A
5.4.1.5.3	Thermal cycling test	Certified sources of optical isolators used.	P
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		N/A
5.4.1.8	Determination of working voltage............................:	(See appended table 5.4.1.8)	P
5.4.1.9	Insulating surfaces		P
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		P
5.4.1.10.2	Vicat test...:		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.10.3	Ball pressure test..:	(See appended table 5.4.1.10.3)	P
5.4.2	Clearances	Procedure 2 is higher. Hence the determination of clearance is by procedure 2. (See appended table 5.4.2.2, 5.4.2.4 and 5.4.3)	P
5.4.2.1	General requirements		P
	Clearances in circuits connected to AC Mains, Alternative method	(See Annex X)	N/A
5.4.2.2	Procedure 1 for determining clearance	Procedure 1: Up to 30kHz: a) Steady state voltage: 492Vp b) 1.1 times mains voltage: 264Vp c) Temporary overvoltage: 2000V Clearance: 2.54mm for Reinforced	P
	Temporary overvoltage ....:	2000V	—
5.4.2.3	Procedure 2 for determining clearance	Procedure 2: - Required withstand voltage: 2500V, Clearance: 3.0mm for Reinforced	P
5.4.2.3.2.2	a.c. mains transient voltage.......................................:	2500Vpeak.	—
5.4.2.3.2.3	d.c. mains transient voltage ....:	--	—
5.4.2.3.2.4	External circuit transient voltage................................:	--	—
5.4.2.3.2.5	Transient voltage determined by measurement.......:	--	—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test ....:	(See appended table 5.4.2)	P
5.4.2.5	Multiplication factors for clearances and test voltages ....:		N/A
5.4.2.6	Clearance measurement..:	(See appended table 5.4.2)	P
5.4.3	Creepage distances	See appended table 5.4.2.2, 5.4.2.4 and 5.4.3	P
5.4.3.1	General		P
5.4.3.3	Material group...:	IIIb	—
5.4.3.4	Creepage distances measurement...........................:	(See appended table 5.4.3)	P
5.4.4	Solid insulation		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.1	General requirements		P
5.4.4.2	Minimum distance through insulation .... :	(See appended table 5.4.4.2)	P
5.4.4.3	Insulating compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Insulating compound forming cemented joints		N/A
5.4.4.6	Thin sheet material		P
5.4.4.6.1	General requirements	Two layers of thin sheet materials are used in T1 and are located within the equipment enclosure	P
5.4.4.6.2	Separable thin sheet material	Two layers of insulating tape provided as double/reinforced insulation and each layer passed the electric strength test for reinforced insulation. See appended Table 5.4.9.	P
	Number of layers (pcs) .... :	2-layer min.	P
5.4.4.6.3	Non-separable thin sheet material		N/A
	Number of layers (pcs) .... :		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material..:	(See appended table 5.4.9)	N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components	(See Annex G5 and G6)	P
5.4.4.9	Solid insulation at frequencies >30 kHz, E_P, K_R, d, V_{PW} (V)...:	(See appended Table 5.4.4.9)	N/A
	Alternative by electric strength test, tested voltage (V), K_R...:	(See appended Tables 5.4.4.9 and 5.4.9)	N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
5.4.5.3	Insulation resistance (MΩ)....................................... :		N/A
	Electric strength test...:	(See appended table 5.4.9)	N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard		N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning	Electric strength test conducted after humidity treatment.	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Relative humidity (%), temperature (°C), duration (h)...:	93%, 30°C, 48h	—
5.4.9	Electric strength test	(See appended table 5.4.9)	P
5.4.9.1	Test procedure for type test of solid insulation.......:	Method 1 used.	P
5.4.9.2	Test procedure for routine test		N/A
5.4.10	Safeguards against transient voltages from external circuits		N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test...:	(See appended table 5.4.9)	N/A
5.4.10.2.3	Steady-state test...:	(See appended table 5.4.9)	N/A
5.4.10.3	Verification for insulation breakdown for impulse test...:		N/A
5.4.11	Separation between external circuits and earth		N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	SPDs bridge separation between external circuit and earth		N/A
	Rated operating voltage U_{op} (V)................................:		—
	Nominal voltage U_{peak} (V)..:		—
	Max increase due to variation ΔU_{sp} ....:		—
	Max increase due to ageing ΔU_{sa} ....:		—
5.4.11.3	Test method and compliance....................................:	(See appended table 5.4.9)	N/A
5.4.12	Insulating liquid		N/A
5.4.12.1	General requirements		N/A
5.4.12.2	Electric strength of an insulating liquid....................:	(See appended table 5.4.9)	N/A
5.4.12.3	Compatibility of an insulating liquid..........................:	(See appended table 5.4.9)	N/A
5.4.12.4	Container for insulating liquid..................................:		N/A
5.5	**Components as safeguards**		P
5.5.1	General		P
5.5.2	Capacitors and RC units	X/Y Capacitors comply with IEC 60384-14. (See appended table 4.1.2)	P
5.5.2.1	General requirement		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector.................................... :	(See appended table 5.5.2.2)	P
5.5.3	Transformers	(See Annex G.5.3)	P
5.5.4	Optocouplers	(See appended table 4.1.2)	P
5.5.5	Relays	(See sub-clause 5.4)	N/A
5.5.6	Resistors	(See Clause G.10)	P
5.5.7	SPDs	(See Clause G.8)	N/A
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable..........................:		N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment		N/A
	RCD rated residual operating current (mA).............:		—
5.6	**Protective conductor**		N/A
5.6.2	Requirement for protective conductors		N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation		N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm^2) .... :		—
	Protective earthing conductor serving as a reinforced safeguard		N/A
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm^2)................. :	(see table 4.1.2)	—
5.6.4.2	Protective current rating (A)....................................... :		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Terminal size for connecting protective earthing conductors (mm)...:		N/A
	Terminal size for connecting protective bonding conductors (mm)..:		N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective bonding system		N/A
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method...:	(See appended table 5.6.6)	N/A
5.6.6.3	Resistance (Ω) or voltage drop.................................:	(See appended table 5.6.6)	N/A
5.6.7	Reliable connection of a protective earthing conductor		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

5.6.8	Functional earthing		N/A
	Conductor size (mm^2)...:		N/A
	Class II with functional earthing marking ....:		N/A
	Appliance inlet cl & cr (mm).......................................:		N/A
5.7	**Prospective touch voltage, touch current and protective conductor current**		P
5.7.2	Measuring devices and networks		P
5.7.2.1	Measurement of touch current	(See appended table 5.7.4)	P
5.7.2.2	Measurement of voltage	(See appended table 5.7.4)	P
5.7.3	Equipment set-up, supply connections and earth connections		P
5.7.4	Unearthed accessible parts.......................................:	(See appended table 5.7.4)	P
5.7.5	Earthed accessible conductive parts........................:	(See appended table 5.7.5)	N/A
5.7.6	Requirements when touch current exceeds ES2 limits		N/A
	Protective conductor current (mA)...........................:		N/A
	Instructional Safeguard..:		N/A
5.7.7	Prospective touch voltage and touch current associated with external circuits		N/A
5.7.7.1	Touch current from coaxial cables		N/A
5.7.7.2	Prospective touch voltage and touch current associated with paired conductor cables		N/A
5.7.8	Summation of touch currents from external circuits		N/A
	a) Equipment connected to earthed external circuits, current (mA)...:		N/A
	b) Equipment connected to unearthed external circuits, current (mA)...:		N/A
5.8	**Backfeed safeguard in battery backed up supplies**		N/A
	Mains terminal ES...:	(See appended table 5.8)	N/A
	Air gap (mm)...:		N/A

6	**ELECTRICALLY- CAUSED FIRE**		P
6.2	**Classification of PS and PIS**		P
6.2.2	Power source circuit classifications............................:	(See appended table 6.2.2)	P
6.2.3	Classification of potential ignition sources	See below.	P
6.2.3.1	Arcing PIS ....:	Primary circuits are considered as arcing PIS.	P

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Clause	Requirement + Test	Result - Remark	Verdict
6.2.3.2	Resistive PIS ....:	All components located within the EUT are considered as resistive PIS.	P
6.3	**Safeguards against fire under normal operating and abnormal operating conditions**		P
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials...:	(See appended table 5.4.1.4, 9.3, B.1.5, B.2.6)	P
	Combustible materials outside fire enclosure..........:		N/A
6.4	**Safeguards against fire under single fault conditions**		P
6.4.1	Safeguard method	Method of Control fire spread used.	P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		N/A
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		P
6.4.3.1	Supplementary safeguards		P
6.4.3.2	Single Fault Conditions...:	(See appended table B.4)	P
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		N/A
6.4.5	Control of fire spread in PS2 circuits	See below.	P
6.4.5.2	Supplementary safeguards	Compliance detailed as follows: - Printed board: rated V-1 or VTM-1 min. class material; Other components other than PCB and wires are: - mounted on PCB rated V-1 or VTM-1 min., or - made of V-2, VTM-2 or HF2 min. Detail see table 4.1.2	P
6.4.6	Control of fire spread in PS3 circuits		N/A
6.4.7	Separation of combustible materials from a PIS		P
6.4.7.2	Separation by distance		P
6.4.7.3	Separation by a fire barrier		P
6.4.8	Fire enclosures and fire barriers	Equipment enclosure was evaluated as a fire enclosure and as enclosure.	P
6.4.8.2	Fire enclosure and fire barrier material properties	V-0 rated fire enclosure.	P
6.4.8.2.1	Requirements for a fire barrier		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.8.2.2	Requirements for a fire enclosure	V-0 rated fire enclosure.	P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier	See below	P
6.4.8.3.1	Fire enclosure and fire barrier openings		P
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top openings and properties		N/A
	Openings dimensions (mm)......................................:		N/A
6.4.8.3.4	Bottom openings and properties		N/A
	Openings dimensions (mm)......................................:		N/A
	Flammability tests for the bottom of a fire enclosure	(See Clause S.3)	N/A
	Instructional Safeguard..:		N/A
6.4.8.3.5	Side openings and properties	Objects can not fall within the area indicated by the 15mm in Figure 44	P
	Openings dimensions (mm)......................................:	Circular hole with dimension 1.80mm max.(Internal baffle)	P
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c)..:		N/A
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating............:	Fire enclosure is made of V-0 material.	P
6.4.9	Flammability of insulating liquid................................:		N/A
6.5	**Internal and external wiring**		P
6.5.1	General requirements	The material of VW-1 on internal wiring were considered compliance equal to equivalent to IEC/TS 60695-11-21 relevant standards	P
6.5.2	Requirements for interconnection to building wiring ....:	No such interconnection to building wiring.	N/A
6.5.3	Internal wiring size (mm^2) for socket-outlets........... :	See appended table 4.1.2	N/A
6.6	**Safeguards against fire due to the connection to additional equipment**		P

7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		N/A
7.2	**Reduction of exposure to hazardous substances**		N/A
7.3	**Ozone exposure**		N/A
7.4	**Use of personal safeguards or personal protective equipment (PPE)**		N/A
	Personal safeguards and instructions......................:		—
7.5	**Use of instructional safeguards and instructions**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Instructional safeguard (ISO 7010)...........................:		—
7.6	**Batteries and their protection circuits**		N/A

8	**MECHANICALLY-CAUSED INJURY**		P
8.2	**Mechanical energy source classifications**		P
8.3	**Safeguards against mechanical energy sources**		P
8.4	**Safeguards against parts with sharp edges and corners**		P
8.4.1	Safeguards	Accessible edges and corners of the equipment are rounded and are classified as MS1.	P
	Instructional Safeguard..:		N/A
8.4.2	Sharp edges or corners	MS1	P
8.5	**Safeguards against moving parts**		P
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts	Plastic fan blades: MS1 DC fan m=0.07kg, r=30.0mm. N=5500 r/min max. $K = 6 \times 10^{-7} (m r^2 N^2)$ ≈ 1143.45 $\frac{r/\text{min}}{15000} + \frac{K \text{ factor}}{2400}$ ≈ 0.843 <1	P
	MS2 or MS3 part required to be accessible for the function of the equipment	MS1	P
	Moving MS3 parts only accessible to skilled person		N/A
8.5.2	Instructional safeguard.. :		N/A
8.5.4	Special categories of equipment containing moving parts		N/A
8.5.4.1	General		N/A
8.5.4.2	Equipment containing work cells with MS3 parts		N/A
8.5.4.2.1	Protection of persons in the work cell		N/A
8.5.4.2.2	Access protection override		N/A
8.5.4.2.2.1	Override system		N/A
8.5.4.2.2.2	Visual indicator		N/A
8.5.4.2.3	Emergency stop system		N/A
	Maximum stopping distance from the point of activation (m)... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Space between end point and nearest fixed mechanical part (mm)... :		N/A
8.5.4.2.4	Endurance requirements		N/A
	Mechanical system subjected to 100 000 cycles of operation		N/A
	- Mechanical function check and visual inspection		N/A
	- Cable assembly..:		N/A
8.5.4.3	Equipment having electromechanical device for destruction of media		N/A
8.5.4.3.1	Equipment safeguards		N/A
8.5.4.3.2	Instructional safeguards against moving parts......... :		N/A
8.5.4.3.3	Disconnection from the supply		N/A
8.5.4.3.4	Cut type and test force (N).. :		N/A
8.5.4.3.5	Compliance		N/A
8.5.5	High pressure lamps		N/A
	Explosion test...:		N/A
8.5.5.3	Glass particles dimensions (mm)............................. :		N/A
8.6	**Stability of equipment**		N/A
8.6.1	General	MS1	N/A
	Instructional safeguard... :		N/A
8.6.2	Static stability		N/A
8.6.2.2	Static stability test...:		N/A
8.6.2.3	Downward force test		N/A
8.6.3	Relocation stability		N/A
	Wheels diameter (mm)... :		—
	Tilt test		N/A
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test.. :		N/A
8.7	**Equipment mounted to wall, ceiling or other structure**		N/A
8.7.1	Mount means type...:		N/A
8.7.2	Test methods		N/A
	Test 1, additional downwards force (N)..................... :		N/A
	Test 2, number of attachment points and test force (N)..:		N/A
	Test 3 Nominal diameter (mm) and applied torque (Nm)... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8.8	**Handles strength**		N/A
8.8.1	General	No handle	N/A
8.8.2	Handle strength test		N/A
	Number of handles...:		—
	Force applied (N)...:		N/A
8.9	**Wheels or casters attachment requirements**		N/A
8.9.2	Pull test		N/A
8.10	**Carts, stands and similar carriers**		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions...:		N/A
8.10.3	Cart, stand or carrier loading test		N/A
	Loading force applied (N)..:		N/A
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Force applied (N)...:		N/A
8.10.6	Thermoplastic temperature stability		N/A
8.11	**Mounting means for slide-rail mounted equipment (SRME)**		N/A
8.11.1	General		N/A
8.11.2	Requirements for slide rails		N/A
	Instructional Safeguard...:		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force (N) applied.....................:		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance		N/A
8.12	**Telescoping or rod antennas**		N/A
	Button/ball diameter (mm)..:		—

9	**THERMAL BURN INJURY**		P
9.2	**Thermal energy source classifications**		P
9.3	**Touch temperature limits**		P
9.3.1	Touch temperatures of accessible parts...................:	(See appended table 9.3)	P
9.3.2	Test method and compliance		P
9.4	**Safeguards against thermal energy sources**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.5	**Requirements for safeguards**		N/A
9.5.1	Equipment safeguard		N/A
9.5.2	Instructional safeguard.. :		N/A
9.6	**Requirements for wireless power transmitters**		N/A
9.6.1	General		N/A
9.6.2	Specification of the foreign objects		N/A
9.6.3	Test method and compliance.....................................:	(See appended table 9.6)	N/A
10	**RADIATION**		P
10.2	**Radiation energy source classification**		P
10.2.1	General classification	See Energy source identification and classification table.	P
	Lasers...:		—
	Lamps and lamp systems..:	RS1	—
	Image projectors..:		—
	X-Ray...:		—
	Personal music player..:		—
10.3	**Safeguards against laser radiation**		N/A
	The standard(s) equipment containing laser(s) comply...:	No laser radiation	N/A
10.4	**Safeguards against optical radiation from lamps and lamp systems (including LED types)**		P
10.4.1	General requirements	LED backlight and LED indicator are considered as RS1. Light source:RS1	P
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A
	Risk group marking and location...............................:		N/A
	Information for safe operation and installation		N/A
10.4.2	Requirements for enclosures		N/A
	UV radiation exposure..:	(See Annex C)	N/A
10.4.3	Instructional safeguard.. :		N/A
10.5	**Safeguards against X-radiation**		N/A
10.5.1	Requirements	No X-radiation	N/A
	Instructional safeguard for skilled persons.............:		—

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Clause	Requirement + Test	Result - Remark	Verdict
10.5.3	Maximum radiation (pA/kg)....................................... :	(See appended tables B.3 & B.4)	—
10.6	**Safeguards against acoustic energy sources**		N/A
10.6.1	General	No acoustic energy source	N/A
10.6.2	Classification		N/A
	Acoustic output $L_{Aeq,T}$, dB(A)....................................... :		N/A
	Unweighted RMS output voltage (mV)..................... :		N/A
	Digital output signal (dBFS)....................................... :		N/A
10.6.3	Requirements for dose-based systems		N/A
10.6.3.1	General requirements		N/A
10.6.3.2	Dose-based warning and automatic decrease		N/A
10.6.3.3	Exposure-based warning and requirements		N/A
	30 s integrated exposure level (MEL30)....................:		N/A
	Warning for MEL ≥ 100 dB(A)...................................:		N/A
10.6.4	Measurement methods		N/A
10.6.5	Protection of persons		N/A
	Instructional safeguards.. :		N/A
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.6.1	Corded listening devices with analogue input		N/A
	Listening device input voltage (mV).........................:		N/A
10.6.6.2	Corded listening devices with digital input		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A).............................:		N/A
10.6.6.3	Cordless listening devices		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A).............................:		N/A
			N/A

B	**NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS**		P
B.1	**General**		P
B.1.5	Temperature measurement conditions	(See appended table B.1.5)	P
B.2	**Normal operating conditions**		P
B.2.1	General requirements...	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers..	(See Annex E)	P

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Clause	Requirement + Test	Result - Remark	Verdict
B.2.3	Supply voltage and tolerances	+10% and -10% for a.c. mains.	P
B.2.5	Input test	(See appended table B.2.5)	P
B.3	**Simulated abnormal operating conditions**		P
B.3.1	General	(See appended table B.3, B.4)	P
B.3.2	Covering of ventilation openings		N/A
	Instructional safeguard		P
B.3.3	DC mains polarity test		N/A
B.3.4	Setting of voltage selector	No voltage selector	N/A
B.3.5	Maximum load at output terminals	(See appended table B.3, B.4)	P
B.3.6	Reverse battery polarity		N/A
B.3.7	Audio amplifier abnormal operating conditions	(See Annex E)	P
B.3.8	Safeguards functional during and after abnormal operating conditions	(See appended table B.3, B.4)	P
B.4	**Simulated single fault conditions**		P
B.4.1	General		P
B.4.2	Temperature controlling device		N/A
B.4.3	Blocked motor test		P
B.4.4	Functional insulation	(See appended table B.3, B.4)	P
B.4.4.1	Short circuit of clearances for functional insulation		P
B.4.4.2	Short circuit of creepage distances for functional insulation		P
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors	(See appended table B.3, B.4)	P
B.4.6	Short circuit or disconnection of passive components	(See appended table B.3, B.4)	P
B.4.7	Continuous operation of components		N/A
B.4.8	Compliance during and after single fault conditions	(See appended table B.3, B.4)	P
B.4.9	Battery charging and discharging under single fault conditions	(See Annex M)	N/A
C	**UV RADIATION**		N/A
C.1	**Protection of materials in equipment from UV radiation**		N/A
C.1.2	Requirements		N/A
C.1.3	Test method		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
C.2	**UV light conditioning test**		N/A
C.2.1	Test apparatus..		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure test		N/A
C.2.4	Xenon-arc light-exposure test		N/A
D	**TEST GENERATORS**		N/A
D.1	**Impulse test generators**		N/A
D.2	**Antenna interface test generator**		N/A
D.3	**Electronic pulse generator**		N/A
E	**TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS**		P
E.1	**Electrical energy source classification for audio signals**		P
	Maximum non-clipped output power (W)..............	3	—
	Rated load impedance (Ω)	4	—
	Open-circuit output voltage (V)..............................	3.47	—
	Instructional safeguard..	No safeguard necessary	—
E.2	**Audio amplifier normal operating conditions**		P
	Audio signal source type..	1KHz	—
	Audio output power (W)...	2.53	—
	Audio output voltage (V)..	3.18	—
	Rated load impedance (Ω)	4	—
	Requirements for temperature measurement	(See appended table B.1.5)	P
E.3	Audio amplifier abnormal operating conditions	(See appended table B.3, B.4)	P
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P
F.1	**General**		P
	Language	English. Versions in other languages will be provided when national certificate approval.	—
F.2	**Letter symbols and graphical symbols**		P
F.2.1	Letter symbols according to IEC60027-1		N/A
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific		P
F.3	**Equipment markings**		P
F.3.1	Equipment marking locations	The equipment marking is located on the surface and is easily visible.	P

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.2	Equipment identification markings	See below.	P
F.3.2.1	Manufacturer identification	See copy of marking plate	P
F.3.2.2	Model identification	See copy of marking plate	P
F.3.3	Equipment rating markings	See below.	P
F.3.3.1	Equipment with direct connection to mains	See copy of marking plate	P
F.3.3.2	Equipment without direct connection to mains		N/A
F.3.3.3	Nature of the supply voltage..................................	See copy of marking plate	P
F.3.3.4	Rated voltage...	See copy of marking plate	P
F.3.3.5	Rated frequency..	See copy of marking plate	P
F.3.3.6	Rated current or rated power.................................	See copy of marking plate	P
F.3.3.7	Equipment with multiple supply connections	Only one connection.	N/A
F.3.4	Voltage setting device	No voltage setting device.	N/A
F.3.5	Terminals and operating devices	No terminals and operating devices	N/A
F.3.5.1	Mains appliance outlet and socket-outlet markings..		N/A
F.3.5.2	Switch position identification marking....................		N/A
F.3.5.3	Replacement fuse identification and rating markings..		N/A
	Instructional safeguards for neutral fuse..............		N/A
F.3.5.4	Replacement battery identification marking..........		N/A
F.3.5.5	Neutral conductor terminal		N/A
F.3.5.6	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification		P
F.3.6.1	Class I equipment		N/A
F.3.6.1.1	Protective earthing conductor terminal.................		N/A
F.3.6.1.2	Protective bonding conductor terminals		N/A
F.3.6.2	Equipment class marking.......................................	See copy of marking plate.	P
F.3.6.3	Functional earthing terminal marking.....................		N/A
F.3.7	Equipment IP rating marking.................................	IPX0	N/A
F.3.8	External power supply output marking.................		P
F.3.9	Durability, legibility and permanence of marking	All markings required are easily discernible under normal lighting conditions.	P

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.10	Test for permanence of markings	After rubbing test by water and petroleum spirit, the marking still legible; it is not easily possible to remove the marking plate and show no curling.	P
F.4	**Instructions**		P
	a)........ Information prior to installation and initial use		P
	b)........ Equipment for use in locations where children not likely to be present		P
	c)........ Instructions for installation and interconnection		P
	d)........ Equipment intended for use only in restricted access area		N/A
	e)........ Equipment intended to be fastened in place		P
	f)........ Instructions for audio equipment terminals		N/A
	g)........ Protective earthing used as a safeguard		N/A
	h)........ Protective conductor current exceeding ES2 limits		N/A
	i)........ Graphic symbols used on equipment		P
	j)........ Permanently connected equipment not provided with all-pole mains switch		N/A
	k)........ Replaceable components or modules providing safeguard function		N/A
	l)........ Equipment containing insulating liquid		N/A
	m)........ Installation instructions for outdoor equipment		N/A
F.5	Instructional safeguards		P
G	**COMPONENTS**		P
G.1	**Switches**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.1.1	General		N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.1.3	Test method and compliance		N/A
G.2	**Relays**		N/A
G.2.1	Requirements		N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supplying power to other equipment		N/A
G.2.4	Test method and compliance		N/A
G.3	**Protective devices**		P
G.3.1	Thermal cut-offs		N/A
	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N/A
	b) Thermal links tested as part of the equipment		N/A
G.3.2.2	Test method and compliance		N/A
G.3.3	PTC thermistors		N/A
G.3.4	Overcurrent protection devices		P
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		P
G.3.5.2	Single faults conditions...	(See appended table B.3, B.4)	P
G.4	**Connectors**		N/A
G.4.1	Spacings		N/A
G.4.2	Mains connector configuration..............................		N/A
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A
G.5	**Wound components**		P
G.5.1	Wire insulation in wound components	(See Annex J)	P

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.1.2	Protection against mechanical stress	Mechanical stress relief achieved by insulation tape and tube.	P
G.5.2	Endurance test		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Test time (days per cycle)..		—
	Test temperature (°C)..		—
G.5.2.3	Wound components supplied from the mains		N/A
G.5.2.4	No insulation breakdown		N/A
G.5.3	Transformers		P
G.5.3.1	Compliance method...	(See Annex G.5.3.2 and G.5.3.3.)	P
	Position..	T1	P
	Method of protection...	Over current protection by circuit design.	P
G.5.3.2	Insulation		P
	Protection from displacement of windings............	Bobbin and insulation tape	—
G.5.3.3	Transformer overload tests	(See appended table B.3, B.4)	P
G.5.3.3.1	Test conditions		P
G.5.3.3.2	Winding temperatures		P
G.5.3.3.3	Winding temperatures - alternative test method		N/A
G.5.3.4	Transformers using FIW		N/A
G.5.3.4.1	General		N/A
	FIW wire nominal diameter....................................		—
G.5.3.4.2	Transformers with basic insulation only		N/A
G.5.3.4.3	Transformers with double insulation or reinforced insulation..		N/A
G.5.3.4.4	Transformers with FIW wound on metal or ferrite core		N/A
G.5.3.4.5	Thermal cycling test and compliance		N/A
G.5.3.4.6	Partial discharge test		N/A
G.5.3.4.7	Routine test		N/A
G.5.4	Motors		P
G.5.4.1	General requirements	DC FAN	P
G.5.4.2	Motor overload test conditions		P
G.5.4.3	Running overload test		N/A
G.5.4.4.2	Locked-rotor overload test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test duration (days)		—
G.5.4.5	Running overload test for DC motors		N/A
G.5.4.5.2	Tested in the unit		N/A
G.5.4.5.3	Alternative method		N/A
G.5.4.6	Locked-rotor overload test for DC motors		P
G.5.4.6.2	Tested in the unit		P
	Maximum Temperature	(See appended table B.3, B.4)	P
G.5.4.6.3	Alternative method		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage		—
G.6	**Wire Insulation**		P
G.6.1	General	Approved triple insulated wires comply with Annex J.	P
G.6.2	Enamelled winding wire insulation		P
G.7	**Mains supply cords**		P
G.7.1	General requirements		P
	Type	(See appended table 4.1.2)	—
G.7.2	Cross sectional area (mm^2 or AWG)	(See appended table 4.1.2)	P
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N)		N/A
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm)..:		N/A
G.7.3.2.4	Strain relief and cord anchorage material		N/A
G.7.4	Cord Entry		N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Test method and compliance		N/A
	Overall diameter or minor overall dimension, *D* (mm)		—
	Radius of curvature after test (mm)		—

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Clause	Requirement + Test	Result - Remark	Verdict
G.7.6	Supply wiring space		N/A
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	**Varistors**		N/A
G.8.1	General requirements		N/A
G.8.2	Safeguards against fire		N/A
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test		N/A
G.8.2.3	Temporary overvoltage test		N/A
G.9	**Integrated circuit (IC) current limiters**		N/A
G.9.1	Requirements	No IC current limiters	N/A
	IC limiter output current (max. 5A)........................		—
	Manufacturers' defined drift		—
G.9.2	Test Program		N/A
G.9.3	Compliance		N/A
G.10	**Resistors**		P
G.10.1	General	Considered	P
G.10.2	Conditioning		N/A
G.10.3	Resistor test		N/A
G.10.4	Voltage surge test		N/A
G.10.5	Impulse test		N/A
G.10.6	Overload test		N/A
G.11	**Capacitors and RC units**		P
G.11.1	General requirements	X/Y-Capacitor used as safeguard and complied with IEC/EN 60384-14 (See appended table 4.1.2)	P
G.11.2	Conditioning of capacitors and RC units		P
G.11.3	Rules for selecting capacitors		P
G.12	**Optocouplers**		P
	Optocouplers comply with IEC 60747-5-5 with specifics	Approved Optocoupler was used	P
	Type test voltage $V_{ini, a}$..		—
	Routine test voltage, $V_{ini, b}$..		—

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Clause	Requirement + Test	Result - Remark	Verdict

G.13	**Printed boards**		P
G.13.1	General requirements		P
G.13.2	Uncoated printed boards		P
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation......................................		N/A
	Number of insulation layers (pcs)		—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2	Test method and compliance		N/A
G.14	**Coating on components terminals**		N/A
G.14.1	Requirements	(See Clause G.13)	N/A
G.15	**Pressurized liquid filled components**		N/A
G.15.1	Requirements		N/A
G.15.2	Test methods and compliance		N/A
G.15.2.1	Hydrostatic pressure test		N/A
G.15.2.2	Creep resistance test		N/A
G.15.2.3	Tubing and fittings compatibility test		N/A
G.15.2.4	Vibration test		N/A
G.15.2.5	Thermal cycling test		N/A
G.15.2.6	Force test		N/A
G.15.3	Compliance		N/A
G.16	**IC including capacitor discharge function (ICX)**		N/A
G.16.1	Condition for fault tested is not required	No ICX	N/A
	ICX with associated circuitry tested in equipment		N/A
	ICX tested separately		N/A
G.16.2	Tests		N/A
	Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test....		—
	Mains voltage that impulses to be superimposed on..		—
	Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test........		—

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Clause	Requirement + Test	Result - Remark	Verdict
G.16.3	Capacitor discharge test...		N/A
H	**CRITERIA FOR TELEPHONE RINGING SIGNALS**		N/A
H.1	**General**		N/A
H.2	**Method A**		N/A
H.3	**Method B**		N/A
H.3.1	Ringing signal		N/A
H.3.1.1	Frequency (Hz)		—
H.3.1.2	Voltage (V)		—
H.3.1.3	Cadence; time (s) and voltage (V)		—
H.3.1.4	Single fault current (mA):...		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V)...		N/A
J	**INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION**		P
J.1	**General**		P
	Winding wire insulation..	(See appended table 4.1.2.)	—
	Solid round winding wire, diameter (mm).............		N/A
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm^2).............		N/A
J.2/J.3	Tests and Manufacturing	(See separate test report)	N/A
K	**SAFETY INTERLOCKS**		N/A
K.1	**General requirements**		N/A
	Instructional safeguard...		N/A
K.2	**Components of safety interlock safeguard mechanism**		N/A
K.3	**Inadvertent change of operating mode**		N/A
K.4	**Interlock safeguard override**		N/A
K.5	**Fail-safe**		N/A
K.5.1	Under single fault condition		N/A
K.6	**Mechanically operated safety interlocks**		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Test method and compliance.................................		N/A
K.7	**Interlock circuit isolation**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A
	In circuit connected to mains, separation distance for contact gaps (mm)...............................		N/A
	In circuit isolated from mains, separation distance for contact gaps (mm)...............................		N/A
	Electric strength test before and after the test of K.7.2...	(See appended table 5.4.9)	N/A
K.7.2	Overload test, Current (A)...		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test		N/A
L	**DISCONNECT DEVICES**		P
L.1	**General requirements**		P
L.2	**Permanently connected equipment**		N/A
L.3	**Parts that remain energized**		N/A
L.4	**Single-phase equipment**	The disconnect device disconnect both poles simultaneously.	P
L.5	**Three-phase equipment**		N/A
L.6	**Switches as disconnect devices**		N/A
L.7	**Plugs as disconnect devices**		N/A
L.8	**Multiple power sources**		N/A
	Instructional safeguard..		N/A
M	**EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS**		N/A
M.1	**General requirements**		N/A
M.2	**Safety of batteries and their cells**		N/A
M.2.1	Batteries and their cells comply with relevant IEC standards..		N/A
M.3	**Protection circuits for batteries provided within the equipment**		N/A
M.3.1	Requirements		N/A
M.3.2	Test method		N/A
	Overcharging of a rechargeable battery		N/A
	Excessive discharging		N/A
	Unintentional charging of a non-rechargeable battery		N/A
	Reverse charging of a rechargeable battery		N/A
M.3.3	Compliance	(See appended table M.3)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
M.4	**Additional safeguards for equipment containing a portable secondary lithium battery**		N/A
M.4.1	General		N/A
M.4.2	Charging safeguards		N/A
M.4.2.1	Requirements		N/A
M.4.2.2	Compliance...	(See appended table M.4.2)	N/A
M.4.3	Fire enclosure..		N/A
M.4.4	Drop test of equipment containing a secondary lithium battery		N/A
M.4.4.2	Preparation and procedure for the drop test		N/A
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%):		N/A
M.4.4.4	Check of the charge/discharge function		N/A
M.4.4.5	Charge / discharge cycle test		N/A
M.4.4.6	Compliance		N/A
M.5	**Risk of burn due to short-circuit during carrying**		N/A
M.5.1	Requirement		N/A
M.5.2	Test method and compliance		N/A
M.6	**Safeguards against short-circuits**		N/A
M.6.1	External and internal faults		N/A
M.6.2	Compliance		N/A
M.7	**Risk of explosion from lead acid and NiCd batteries**		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
	Calculated hydrogen generation rate.....................		N/A
M.7.2	Test method and compliance		N/A
	Minimum air flow rate, Q (m^3/h).............................		N/A
M.7.3	Ventilation tests		N/A
M.7.3.1	General		N/A
M.7.3.2	Ventilation test – alternative 1		N/A
	Hydrogen gas concentration (%)...........................		N/A
M.7.3.3	Ventilation test – alternative 2		N/A
	Obtained hydrogen generation rate......................		N/A
M.7.3.4	Ventilation test – alternative 3		N/A
	Hydrogen gas concentration (%)...........................		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
M.7.4	Marking		N/A
M.8	**Protection against internal ignition from external spark sources of batteries with aqueous electrolyte**		N/A
M.8.1	General		N/A
M.8.2	Test method		N/A
M.8.2.1	General		N/A
M.8.2.2	Estimation of hypothetical volume V_Z (m^3/s)		—
M.8.2.3	Correction factors		—
M.8.2.4	Calculation of distance *d* (mm)		—
M.9	**Preventing electrolyte spillage**		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse		N/A
	Instructional safeguard		N/A
N	**ELECTROCHEMICAL POTENTIALS**		N/A
	Material(s) used		—
O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**		P
	Value of *X* (mm)	Considered	—
P	**SAFEGUARDS AGAINST CONDUCTIVE OBJECTS**		P
P.1	**General**		P
P.2	**Safeguards against entry or consequences of entry of a foreign object**		P
P.2.1	General		P
P.2.2	Safeguards against entry of a foreign object		P
	Location and Dimensions (mm)	Side openings:Circular hole with dimension 1.80mm max.(With internal baffle) Side openings: Rectangle openings with dimension 3.0mm x24.3mm max.(Heat dissipation hole of the fan) Within the projected volume as depicted in Figure P.3 there are no bare conductive parts of ES3 or PS3 circuits.	—
P.2.3	Safeguards against the consequences of entry of a foreign object		N/A
P.2.3.1	Safeguard requirements		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment		N/A
	Transportable equipment with metalized plastic parts........		N/A
P.2.3.2	Consequence of entry test........		N/A
P.3	**Safeguards against spillage of internal liquids**		N/A
P.3.1	General		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Compliance		N/A
P.4	**Metallized coatings and adhesives securing parts**		N/A
P.4.1	General		N/A
P.4.2	Tests		N/A
	Conditioning, T_C (°C)........		—
	Duration (weeks)........		—
Q	**CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING**		P
Q.1	**Limited power sources**		P
Q.1.1	Requirements		P
	a) Inherently limited output	(See appended table Q.1)	N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output	(See appended table Q.1)	P
	d) Overcurrent protective device limited output	(See appended table Q.1)	N/A
	e) IC current limiter complying with G.9		N/A
Q.1.2	Test method and compliance........	(See appended table Q.1)	P
	Current rating of overcurrent protective device (A)		N/A
Q.2	**Test for external circuits – paired conductor cable**		N/A
	Maximum output current (A)		N/A
	Current limiting method........		—
R	**LIMITED SHORT CIRCUIT TEST**		N/A
R.1	**General**		N/A
R.2	**Test setup**		N/A
	Overcurrent protective device for test........		—
R.3	**Test method**		N/A
	Cord/cable used for test........		—

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Clause	Requirement + Test	Result - Remark	Verdict
R.4	**Compliance**		N/A
S	**TESTS FOR RESISTANCE TO HEAT AND FIRE**		N/A
S.1	**Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W**		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	**Flammability test for fire enclosure and fire barrier integrity**		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
S.3	**Flammability test for the bottom of a fire enclosure**		N/A
S.3.1	Mounting of samples		N/A
S.3.2	Test method and compliance		N/A
	Mounting of samples		—
	Wall thickness (mm)		—
S.4	**Flammability classification of materials**		N/A
S.5	**Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power exceeding 4 000 W**		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
T	**MECHANICAL STRENGTH TESTS**		P
T.1	**General**		P
T.2	**Steady force test, 10 N**	(See appended table T.2)	P
T.3	**Steady force test, 30 N**		N/A
T.4	**Steady force test, 100 N**	(See appended table T.4)	N/A
T.5	**Steady force test, 250 N**	(See appended table T.5)	P
T.6	**Enclosure impact test**		N/A
	Fall test	(See appended table T.6)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Swing test		N/A
T.7	**Drop test**	(See appended table T.7)	P
T.8	**Stress relief test**...	(See appended table T.8)	P
T.9	**Glass Impact Test**...		N/A
T.10	**Glass fragmentation test**		N/A
	Number of particles counted..................................	No such glass provided.	N/A
T.11	**Test for telescoping or rod antennas**		N/A
	Torque value (Nm)	No such antennas provided.	N/A
U	**MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION**		N/A
U.1	**General**		N/A
	Instructional safeguard :		N/A
U.2	**Test method and compliance for non-intrinsically protected CRTs**		N/A
U.3	**Protective screen**		N/A
V	**DETERMINATION OF ACCESSIBLE PARTS**		P
V.1	**Accessible parts of equipment**		P
V.1.1	General	Following the probes test specified in this annex Figure V.1, V.2, V.5 are suitable.	P
V.1.2	Surfaces and openings tested with jointed test probes		P
V.1.3	Openings tested with straight unjointed test probes		N/A
V.1.4	Plugs, jacks, connectors tested with blunt probe		P
V.1.5	Slot openings tested with wedge probe		N/A
V.1.6	Terminals tested with rigid test wire		P
V.2	**Accessible part criterion**		P
X	**ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)**		N/A
	Clearance..	(See appended table X)	N/A
Y	**CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES**		N/A
Y.1	**General**		N/A
Y.2	**Resistance to UV radiation**		N/A
Y.3	**Resistance to corrosion**		N/A
7Y.3	**Resistance to corrosion**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by..		N/A
Y.3.2	Test apparatus		N/A
Y.3.3	Water – saturated sulphur dioxide atmosphere		N/A
Y.3.4	Test procedure..		N/A
Y.3.5	Compliance		N/A
Y.4	**Gaskets**		N/A
Y.4.1	General		N/A
Y.4.2	Gasket tests		N/A
Y.4.3	Tensile strength and elongation tests		N/A
	Alternative test methods..		N/A
Y.4.4	Compression test		N/A
Y.4.5	Oil resistance		N/A
Y.4.6	Securing means	(See Annex P.4)	N/A
Y.5	**Protection of equipment within an outdoor enclosure**		N/A
Y.5.1	General		N/A
Y.5.2	Protection from moisture		N/A
	Relevant tests of IEC 60529 or Y.5.3....................		N/A
Y.5.3	Water spray test		N/A
Y.5.4	Protection from plants and vermin		N/A
Y.5.5	Protection from excessive dust		N/A
Y.5.5.1	General		N/A
Y.5.5.2	IP5X equipment		N/A
Y.5.5.3	IP6X equipment		N/A
Y.6	**Mechanical strength of enclosures**		N/A
Y.6.1	General		N/A
Y.6.2	Impact test..	(See Table T.6)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

5.2	TABLE: Classification of electrical energy sources						P
Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters				ES Class
			U (V)	I (mA)	Type[1)]	Additional Info [2)]	
264Vac	Primary circuits supplied by a.c. mains supply	Normal	264V ac	--	SS	60Hz	ES3
		Abnormal – See appended table B.3	--	--	--	--	
		Single fault – See appended table B.4	--	--	--	--	
264Vac	USB1 output	Normal	5.17Vdc	--	SS	--	ES1
		Abnormal – see table B.3, B.4 for detail	5.17Vdc	--	SS	--	
		Single fault – see table B.3, B.4 for detail	--	--	--	--	
264Vac	USB2 output	Normal	5.18Vdc	--	SS	--	ES1
		Abnormal – see table B.3, B.4 for detail	5.18Vdc	--	SS	--	
		Single fault – see table B.3, B.4 for detail	--	--	--	--	
264Vac	Transformer T1 secondary pin 5 - 6	Normal	44.7Vpeak	--	SS	60Hz	ES2
		Abnormal – see table B.3, B.4 for detail	0	--	--	--	
		Single fault – see table B.3, B.4 for detail	0	--	--	--	
264Vac	After D6	Normal	12.24Vpeak	--	SS	60Hz	ES1
		Abnormal – see table B.3, B.4 for detail	0	--	--	--	
		Single fault – see table B.3, B.4 for detail	0	--	--	--	
264Vac	Plastic enclosure	Normal	--	0.06mA rms	SS	--	ES1

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Clause	Requirement + Test	Result - Remark	Verdict

		Abnormal – see table B.3, B.4 for detail	--	0.06mA rms	SS	--
		Single fault – see table B.3, B.4 for detail	--	0.06mA rms		--
Supplementary information:						
1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc. 2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.						

5.4.1.8	**TABLE: Working voltage measurement**				P
Location		RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments
Transformer T1 pin 1-7		222	365	<30KHz	--
Transformer T1 pin 2-7		221	378		--
Transformer T1 pin 3-7		**256**	**492**		Max. Vpeak and Vrms
Transformer T1 pin 4-7		222	380		--
Transformer T1 pin 1-6		248	475		--
Transformer T1 pin 2-6		221	387		--
Transformer T1 pin 3-6		220	384		--
Transformer T1 pin 4-6		221	382		--
Transformer T1 pin 1-5		251	487		--
Transformer T1 pin 2-5		249	477		--
Transformer T1 pin 3-5		249	477		--
Transformer T1 pin 4-5		248	473		--
CY1 primary to secondary		220	356		--
U3 pin 1-3		221	355		--
U3 pin 1-4		220	365		--
U3 pin 2-3		221	354		--
U3 pin 2-4		220	358		--
Supplementary information:					
--					

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Clause	Requirement + Test	Result - Remark	Verdict

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics		N/A
Method.. :		ISO 306 / B50	—
Object/ Part No./Material	Manufacturer/trademark	Thickness (mm)	T softening (°C)
--	--	--	--
Supplementary information:			
--			

5.4.1.10.3	TABLE: Ball pressure test of thermoplastics			P
Allowed impression diameter (mm).. :		$\leq$ 2 mm		—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)
AC connector	See 4.1.2	1.0	125	1.15
Plastic enclosure	See 4.1.2	1.5	125	1.02
Supplementary information:				
--				

5.4.2, 5.4.3	TABLE: Minimum Clearances/Creepage distance							P
Clearance (cl) and creepage distance (cr) at/of/between:	U_p (V)	U_{rms} (V)	Freq [1] (Hz)	Required cl (mm)	cl (mm)	E.S. [2] (V)	Required cr (mm)	cr (mm)
Basic / supplementary:								
L to N before Fuse F1	<420	<250	60	1.5	4.5	--	2.5	4.5
Different polarity of fuse F1 on PCB trace	<420	<250	60	1.5	2.7	--	2.5	2.7
Reinforced:								
Between CY1	<420	<250	60	3.0	7.0	--	5.0	7.0
Between U3	<420	<250	60	3.0	5.8	--	5.0	5.8
T1 primary winding to secondary winding on PCB	256	492	<30K	3.0	7.0	--	5.2	7.0
T1 primary winding to secondary winding	256	492	<30K	3.0	6.0	--	5.2	6.0
T1 primary core to secondary winding	256	492	<30K	3.0	6.0	--	5.2	6.0
Supplementary information:								

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Clause	Requirement + Test	Result - Remark	Verdict

1) Only for frequency above 30 kHz
2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)
3) For clearance and creepage did not describe above are far larger than limit above.
4) The secondary of T1 used triple insulated wire, core as primary of T1

5.4.4.2	**TABLE: Minimum distance through insulation**			P
Distance through insulation (DTI) at/of	Peak voltage (V)	Insulation	Required DTI (mm)	Measured DTI (mm)
Plastic Enclosure	492	Reinforced	0.4	Min. 1.0
Bobbin of T1	492	Reinforced	0.4	Min. 0.45
Insulation tape	420	Reinforced	2 layers	3 layers
Supplementary information:				
1) See appended table 4.1.2 for details.				

5.4.4.9	**TABLE: Solid insulation at frequencies >30 kHz**					N/A
Insulation material	E_P	Frequency (kHz)	K_R	Thickness *d* (mm)	Insulation	V_{PW} (Vpk)
--	--	--	--	--	--	--
Supplementary information:						
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5.4.9	**TABLE: Electric strength tests**		P
Test voltage applied between:	Voltage shape (Surge, Impulse, AC, DC, etc.)	Test voltage (V)	Breakdown Yes / No
Basic / supplementary:			
L to N (Fuse disconnected)	DC	2500V	No
Reinforced:			
L/N to plastic enclosure (with metal foil)	DC	4000V	No
L/N to accessible terminal	DC	4000V	No
Between primary winding and secondary winding of transformer T1	DC	4000V	No
Between secondary winding and core of transformer T1	DC	4000V	No
1-layer insulation tape of transformer T1	DC	4000V	No
Supplementary information:			
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Clause	Requirement + Test	Result - Remark	Verdict

5.5.2.2	TABLE: Stored discharge on capacitors				P
Location	Supply voltage (V)	Operating and fault condition 1)	Switch position	Measured voltage (Vpk)	ES Class
L-N	264V	Normal condition	--	0V	ES1
Supplementary information:					
X-capacitors installed for testing: CX1=0.1uF ☒ bleeding resistor rating: RX1= RX2=1MΩ Normal operating condition (e.g., normal operation, or open fuse), SC= short circuit, OC= open circuit.					

5.6.6	TABLE: Resistance of protective conductors and terminations			N/A
Location	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)
--	--	--	--	--
Supplementary information:				
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5.7.4	TABLE: Unearthed accessible parts					P
Location	Operating and fault conditions	Supply Voltage (V)	Parameters			ES class
			Voltage (V_{rms} or V_{pk})	Current (A_{rms} or A_{pk})	Freq. (Hz)	
L/N to Plastic enclosure (with metal foil)	Normal	264Vac	--	0.06mArms	60	ES1
	Abnormal – see table B.3, B.4 for detail	264Vac	--	0.06mArms	60	
	Single fault – see table B.3, B.4 for detail	264Vac	--	0.06mArms	60	
L/N to output terminal	Normal	264Vac	--	0.13mArms	60	ES1
	Abnormal – see table B.3, B.4 for detail	264Vac	--	0.13mArms	60	
	Single fault – see table B.3, B.4 for detail	264Vac	--	0.13mArms	60	
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit						

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Clause	Requirement + Test	Result - Remark	Verdict

5.7.5	TABLE: Earthed accessible conductive part			N/A
Supply voltage (V)..............................:	--			—
Phase (s) .... :	[X] Single Phase; [ ] Three Phase: [ ] Delta [ ] Wye			—
Power Distribution System .... :	☒ TN ☐ TT ☐ IT			—
Location	Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment	
--	--	--	--	
Supplementary Information:				
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5.8	TABLE: Backfeed safeguard in battery backed up supplies					N/A
Location	Supply voltage (V)	Operating and fault condition	Time (s)	Open-circuit voltage (V)	Touch current (A)	ES Class
--	--	--	--	--	--	--
Supplementary information:						
Abbreviation: SC= short circuit, OC= open circuit						

6.2.2	TABLE: Power source circuit classifications					P
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power1) (W)	Time (S)	PS class
Input circuit	Normal condition	264Vac	--	--	5	PS3 (Declared)
	Abnormal – see table B.3, B.4 for detail	264Vac	--	--	5	
	Single fault – see table B.3, B.4 for detail	--	--	--	--	
USB1 output	Normal	5.0V dc	1.0	5.0	3	PS1
	Abnormal – see table B.3, B.4 for detail	4.35V dc	2.2	9.56	3	
	Single fault – see table B.3, B.4 for detail	0	0	0	3	
USB2 output	Normal	5V dc	1.0	5.0	3	PS1
	Abnormal – see table B.3, B.4 for detail	4.58V dc	2.1	9.60	3	
	Single fault – see table B.3, B.4 for	0	0	0	3	

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Clause	Requirement + Test	Result - Remark	Verdict

	detail					
HDMI	Normal	5.02	0	0	3	PS1
Earphone	Normal	0.06	0	0	3	PS1
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit 1) Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.						

6.2.3.1	**TABLE: Determination of Arcing PIS**				P
Location		Open circuit voltage after 3 s (Vpk)	Measured r.m.s current (A)	Calculated value	Arcing PIS? Yes / No
Primary circuits		--	--	--	Yes (declaration)
Supplementary information:					
--					

6.2.3.2	**TABLE: Determination of resistive PIS**			P
Location		Operating and fault condition	Dissipate power (W)	Arcing PIS? Yes / No
All internal circuits / components except for output terminals		--	--	Yes (declaration)
Supplementary information:				
Abbreviation: SC= short circuit; OC= open circuit				

8.5.5	**TABLE: High pressure lamp**				N/A
Lamp manufacturer		Lamp type	Explosion method	Longest axis of glass particle (mm)	Particle found beyond 1 m Yes / No
--		--	--	--	--
Supplementary information:					
--					

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Clause	Requirement + Test	Result - Remark	Verdict

9.6	TABLE: Temperature measurements for wireless power transmitters								N/A
Supply voltage (V)...:	--								—
Max. transmit power of transmitter (W)........... :	--								—
Foreign objects	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm		
	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	
--	--	--	--	--	--	--	--	--	
Supplementary information:									
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5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements				P
Supply voltage (V)...:	90V/60Hz		264V/50Hz		—
Ambient temperature during test T_{amb} (°C)......:	25.5	Shift to 35.0	25.6	Shift to 35.0	—
Maximum measured temperature T of part/at:	T (°C)				Allowed T_{max} (°C)
AC inlet	45.3	54.8	44.2	53.6	65
Input wire	60.5	70.0	52.9	62.3	105
LF1 winding	87.1	96.6	61.1	70.5	110
CX1 body	69.5	79.0	58.4	67.8	100
PCB near DB1	98.7	108.2	66.7	76.1	130
C1 body	88.2	97.7	67.0	76.4	105
C11 body	88.4	97.9	80.9	90.3	105
T1 winding	93.7	103.2	87.5	96.9	110
T1 bobbin	86.2	95.7	79.7	89.1	150
PCB near T1	86.6	96.1	73.6	83.0	130
CY1 body	81.4	90.9	72.3	81.7	125
U3 body	81.2	90.7	71.6	81.0	100
PCB near U4	70.0	79.5	67.2	76.6	130
C7 body	70.4	79.9	66.3	75.7	105
Internal wire	69.5	79.0	59.4	68.8	80
L7 winding(mainboard)	56.5	66.0	56.4	65.8	110
C34 board(mainboard)	46.6	56.1	46.6	56.0	105
PCB near U2(mainboard)	49.0	58.5	48.7	58.1	130

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PCB near U3(mainboard)	47.1	56.6	46.8	56.2	130
DC Fan body	56.1	65.6	51.2	60.6	94
Plastic enclosure inside	50.5	60	48.9	58.3	--
Plastic enclosure outside	42.8	--	41.9	--	77
Button	30.6	--	30.2	--	77
Ambient	25.5	35	25.6	35	--

Temperature T of winding:	T_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
--	--	--	--	--	--	--	--
Supplementary information:							
Tested with HDMI mode.							

B.2.5	**TABLE: Input test**							P
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
90	50	1.471	--	76.03	--	F1	1.471	1/8 Max. Non-clipped output power with 1KHz sine wave signal input, display adjusted to maximum power consumption. USB port load: 5VDC, 1.0A each port.
90	60	1.453	--	75.43	--	F1	1.453	
100	50	1.308	1.5	74.48	150	F1	1.308	
100	60	1.284		73.80		F1	1.284	
240	50	0.601		70.95		F1	0.601	
240	60	0.578		70.72		F1	0.578	
264	50	0.562	--	70.97	--	F1	0.562	
264	60	0.541	--	70.73	--	F1	0.541	
Supplementary information:								
--								

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Clause	Requirement + Test	Result - Remark	Verdict

B.3, B.4	**TABLE: Abnormal operating and fault condition tests**					P
Ambient temperature T_{amb} (°C)... :			25°C if not specified			—
Power source for EUT: Manufacturer, model/type, outputrating... :			--			—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation
Ventilation Openings	Blocked	264	2hrs 49mins	F1	0.56	EUT normal working. After testing, no damaged, no hazards. Measured maximum temperature: T1 winding: 65.8°C; T1 Bobbin:61.8°C; PCB near T1: 60.7°C; Plastic enclosure outside: 42.1°C Ambient: 25.0°C
USB1	Overload	264	4hrs	F1	0.56→ 0.59→ 0.61→ 0.01	EUT normal working. when loading was increased to 2.2A, the USB output shutdown. After testing, no damaged, no hazards. Measured maximum temperature: T1 winding: 66.1°C; T1 Bobbin:62.3°C; PCB near T1: 61.1°C; Plastic enclosure outside: 36.2°C Ambient: 25.0°C
USB2	Overload	264	4hrs	F1	0.56→ 0.58→ 0.61→ 0.01	EUT normal working. when loading was increased to 2.1A, the USB output shutdown. After testing, no damaged, no hazards. Measured maximum temperature: T1 winding: 65.8°C; T1 Bobbin:61.9°C; PCB near T1: 60.5°C; Plastic enclosure outside: 35.8°C Ambient: 25.0°C

Speaker	Maximum attainable output power	264	2hrs 40mins	F1	0.58	EUT normal working. After testing, no damaged, no hazards. Measured maximum temperature: T1 winding: 101.2°C; T1 Bobbin: 99.5°C; PCB near T1: 94.6°C; Plastic enclosure outside: 39.6°C Ambient: 25.0°C
Speaker	SC	264	2hrs 30mins	F1	0.561	EUT normal working. After testing, no damaged, no hazards. Measured maximum temperature: T1 winding: 98.9°C; T1 Bobbin: 96.4°C; PCB near T1: 82.2°C; Plastic enclosure outside: 32.3°C Ambient: 25.0°C
DC Fan	locked-rotor	264	7hrs	F1	0.578	EUT normal working. After testing, no damaged, no hazards. Measured maximum temperature: T1 winding: 99.9°C; T1 Bobbin: 91.2°C; PCB near T1: 100.5°C; DC Fan body: 86.2°C; Plastic enclosure outside: 40.6°C Ambient: 25.0°C

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T1 output	Overload	264	5hrs 40mins	F1	0.56→ 0.59→ 0.63→ 0.01	EUT normal working. when loading was increased to 2.21A, the T1 output shutdown. After testing, no damaged, no hazards. Measured maximum temperature: T1 winding: 85.8°C; T1 Bobbin: 82.6°C; Plastic enclosure outside: 41.8°C Ambient: 25.0°C
C1	SC	264	1s	F1	0	Fuse F1 opened immediately, no hazards.
DB1	SC	264	1s	F1	0	Fuse F1 opened immediately, no hazards.
T1 Pin 1-3	SC	264	10mins	F1	0.01	Unit shut down immediately, No damage. No hazards.
T1 Pin 7-6	SC	264	10mins	F1	0.01	Unit shut down immediately, No damage. No hazards.
U3 Pin 1-2	SC	264	10mins	F1	0.01	Unit shut down immediately, recoverable, no damage, no hazard.
U3 Pin 3-4	SC	264	10mins	F1	0.01	Unit shut down immediately, recoverable, no damage, no hazard.
U3 Pin 1	OC	264	10mins	F1	0.01	Unit shut down immediately, recoverable, no damage, no hazard.
U3 Pin 3	OC	264	10mins	F1	0.01	Unit shut down immediately, recoverable, no damage, no hazard.
Q1 Pin G-S	SC	264	10mins	F1	0.01	Unit shut down immediately, recoverable, no damage, no hazard.
Q1 pin D-S	SC	264	1s	F1	0	Unit shut down immediately, F1 open, no hazard.
Q1 pin D-G	SC	264	1s	F1	0	Unit shut down immediately, F1 open, no hazard.
USB1	SC	264	10mins	F1	0.01	Unit shut down immediately, recoverable, no damage, no hazard.

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USB2	SC	264	10mins	F1	0.01	Unit shut down immediately, recoverable, no damage, no hazard.
Supplementary information:						
--						

M.3	TABLE: Protection circuits for batteries provided within the equipment							N/A
Is it possible to install the battery in a reverse polarity position?.......:				--				—
Equipment Specification	Charging							
	Voltage (V)			Current (A)				
	--			--				
Manufacturer/type	Battery specification							
	Non-rechargeable batteries		Rechargeable batteries					
	Discharging current (A)	Unintentional charging current (A)	Charging		Discharging current (A)	Reverse charging current (A)		
			Voltage (V)	Current (A)				
--	--	--	--	--	--	--		
Note: The tests of M.3.2 are applicable only when above appropriate data is not available.								
Specified battery temperature (ºC)..:				--				—
Component No.	Fault condition	Charge/ discharge mode	Test time	Temp. (ºC)	Current (A)	Voltage (V)	Observation	
--	--	--	--	--	--	--	--	
Supplementary information:								
Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal.								

M.4.2	TABLE: Charging safeguards for equipment containing a secondary lithium battery					N/A
Maximum specified charging voltage (V).. :			--			—
Maximum specified charging current (A) ....:			--			—
Highest specified charging temperature (ºC) ....:			--			—
Lowest specified charging temperature (ºC) ....:			--			—
Battery manufacturer / type	Operating and fault condition	Measurement			Observation	
		Charging voltage (V)	Charging current (A)	Temp. (ºC)		
--	--	--	--	--	--	
Supplementary information:						

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Clause	Requirement + Test	Result - Remark	Verdict

Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature

Q.1	**TABLE: Circuits intended for interconnection with building wiring (LPS)**						P
Output Circuit	Condition	U_{oc} (V)	Time (s)	I_{sc} (A)		S (VA)	
				Meas.	Limit	Meas.	Limit
USB1	Normal	5.17	5	2.2	<8	9.56	<100
	Abnormal – see table B.3, B.4 for detail	5.17	5	0*	<8	0*	<100
	Single fault – see table B.3, B.4 for detail	0	5	0*	<8	0*	<100
USB2	Normal	5.18	5	2.1	<8	9.60	<100
	Abnormal – see table B.3, B.4 for detail	5.18	5	0*	<8	0*	<100
	Single fault – see table B.3, B.4 for detail	0*	5	0*	<8	0*	<100
HDMI	Normal	5.02	5	0**	<8	0**	<100
Earphone	Normal	0.06	5	0**	<8	0**	<100
Supplementary Information:							
* Stand for USB port shutdown; **stand for port has no corresponding output value.							

T.2, T.3, T.4, T.5	**TABLE: Steady force test**					P
Part/Location	Material	Thickness (mm)	Probe	Force (N)	Test Duration (s)	Observation
Internal component	--	--	V.2	10	5	No damage, No hazard
Top enclosure	Plastic	1.5	--	250	5	No damage, No hazard
Side enclosure	Plastic	1.5	--	250	5	No damage, No hazard
Bottom enclosure	Plastic	1.5	--	250	5	No damage, No hazard
Supplementary information:						
--						

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Clause	Requirement + Test	Result - Remark	Verdict

T.6, T.9	TABLE: Impact test			N/A
Location/part	Material	Thickness (mm)	Height (mm)	Observation
--	--	--	--	--
--	--	--	--	--
Supplementary information:				
--				

T.7	TABLE: Drop test			P
Location/Part	Material	Thickness (mm)	Height (mm)	Observation
Top enclosure	Plastic	1.5	750	No damage, no hazards
Side enclosure	Plastic	1.5	750	No damage, no hazards
Bottom enclosure	Plastic	1.5	750	No damage, no hazards
Supplementary information:				
--				

T.8	TABLE: Stress relief test				P
Location/Part	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation
Enclosure	Plastic	Min. 1.5	70	7	No risk of shrinkage or distortion
Supplementary information:					
--					

X	TABLE: Alternative method for determining minimum clearances distances		N/A
Clearance distanced between:	Peak of working voltage (V)	Required cl (mm)	Measured cl (mm)
--	--	--	--
Supplementary information:			
--			

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Clause	Requirement + Test	Result - Remark	Verdict

4.1.2	TABLE: List of critical components				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity[1]
Power plug(EU)	Guangdong Hongshanchuan Electronic Technology Co., Ltd.	HSC-401	2.5A 250V~	EN 50075	VDE 40020005
Power cord	Guangdong Hongshanchuan Electronic Technology Co., Ltd.	H03VVH2-F	2X 0.5 mm²	EN 50525-2-11	VDE 40037206
Power connector	Guangdong Hongshanchuan Electronic Technology Co., Ltd.	HSC-405	2.5A 250V~	IEC/EN 60320-1	VDE 40040195
AC inlet	LECI Electronics Co., Ltd	DB-8	2.5A 250V~	IEC/EN 60320-1	VDE 40032028
AC connector (CON1)	Zhejiang Kuaili Electronics Co., Ltd.	VH39600	10A 250V~ 105 °C	UL 1977	UL E307817
PCB	Shenzhen Qili Electron Co., Ltd.	QL-M	V-0, 130 °C	UL 796	UL E328832
(Alternative)	Interchangeable	Interchangeable	V-0, 130 °C	UL 796	UL
Line filter LF1	Shenzhen Hualiangkechuang Electronics Co., Ltd.	SQ1212	Class B	IEC/EN 62368-1	Tested with appliance
-bobbin	Chang Chun Plastics Co., Ltd.	T200HF	Phenolic, 150 °C, V-0	UL 94	UL E59481
-Wire	Dong Guan Yida Industrial Co., Ltd.	xUEW(AL)/130	130°C	UL 1446	UL E344055
Fuse (F1)	Shenzhen Lanson Electronics Co., Ltd.	SMT	T 3.15 A, 250 V	IEC/EN 60127-1 IEC/EN 60127-3	VDE 40012592
(Altermative)	Dongguan Luoyi Electronics Technology Co.,	SNT	T3.15A 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE

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Clause	Requirement + Test	Result - Remark	Verdict

	Ltd.				
Optocoupler (U3)	Everlight Electronics Co., Ltd.	EL817	Cr≥7.6 mm, Cl≥7.6 mm, Di≥0.4 mm. 110 °C	IEC/EN 60747-5-5	VDE 132249
(Altermative)	Shenzhen Orient Components Co., Ltd.	ORPC817X	Cr≥7.6 mm, Cl≥7.6 mm, Di≥0.4 mm. 110 °C	UL 1577	UL E323844
X Capacitor (CX1)	Carli Electronics Co., Ltd.	MPX	0.1 uF, 275 Vac, 100 °C	IEC/EN 60384-14	VDE 40008520
(Altermative)	Shenzhen Ruidiwei Technology Co., Ltd.	TENTA	0.1 uF, 250 Vac, 100 °C	IEC/EN 60384-14	VDE
(Altermative)	Dongguan Champion Electronic Technology Co., Ltd	TENTA	0.1 uF, 250 Vac, 110 °C	IEC/EN 60384-14	VDE
Y-Capacitor (CY1)	Shantou Heye Electronics Co., Ltd.	CD	2200pF, 400/250 VAC 125 °C	IEC/EN 60384-14	VDE 40041506
(Altermative)	Jyh Chung Electronic Co., Ltd.	JD	2200pF, 400 VAC 125 °C	IEC/EN 60384-14	VDE 137027
Transformer (T1)	Shenzhen Guangdeli Electronics Co., Ltd.	PQ2620	Class B	IEC/EN 62368-1	Test with appliance
-Bobbin	Chang Chun Plastics Co., Ltd.	T200HF	Phenolic, 150 °C, V-0	UL 94	UL E59481
-Magnet wire	Dong Guan Yida Industrial Co., Ltd.	xUEW(AL)/130	130°C	UL 1446	UL E344055
-Triple insulated wire	Furukawa Electric Co., Ltd.	TEX-ELZ	130°C	UL 2353	UL E206440

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Clause	Requirement + Test	Result - Remark	Verdict

-Insulation tape	Jingjiang Yahua Pressure Sensitive Glue Co., Ltd.	CT* (c)(g)	130°C	UL 510A	UL E165111
-Tube	Changyuan Electronics Group Co., Ltd.	CB-TT-T	200 °C	UL 224	UL E180908
-Varnish	Zhuhai Changxian New Materials Technology Co., Ltd.	E962	130 °C	UL 1446	UL E335405
Discharged resistance (RX1, RX2)	Guangdong Fenghua Advanced Technology(Holding) Co.,Ltd	1206	1Mohm, 1/4W	IEC/EN 62368-1	Test with appliance
Electrolytic Capacitor C1	Interchangeable	Interchangeable	120uF/400V, 105 ºC	IEC/EN 62368-1	Test with appliance
Bridge Diode (DB1)	Interchangeable	Interchangeable	Min 6A, Min 1000V	IEC/EN 62368-1	Tested with appliance
Triode(Q1)	Interchangeable	Interchangeable	Min 15A, Min 650V	IEC/EN 62368-1	Tested with appliance
Fan	Shenzhen Jinxiang Electronics Co., Ltd.	JXD9330P12	DC12V,0.3A	IEC/EN 62368-1	Tested with appliance
Speaker	Shenzhen Shengkaiyue Electronics Co., LTD	SKY28BN04-22H18-001	4Ω, 3W	IEC/EN 62368-1	Tested with appliance
Plastic enclosure	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AC3800	Min. 1.5 mm, V-0, 80 °C	UL 94	UL E162823

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict

TO TEST REPORT
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
(AUDIO/VIDEO, INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT - PART 1: SAFETY REQUIREMENTS)

Differences according to..................: EN IEC 62368-1:2020+A11:2020

Attachment Form No........................: EU_GD_IEC62368_1E

Attachment Originator......................: UL(Demko)

Master Attachment............................: 2021-02-04

Clause	Requirement + Test	Result - Remark	Verdict
	CENELEC COMMON MODIFICATIONS (EN)		—
	Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed "Z".		—
	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords		—
1	**Modification to Clause 3 .**		—
3.3.19	**Sound exposure** *Replace 3.3.19 of IEC 62368-1 with the following definitions:*		N/A
3.3.19.1	**momentary exposure level, MEL** metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2. Note 1 to entry: MEL is measured as A-weighted levels in dB. Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.3.19.3	**sound exposure, *E*** A-weighted sound pressure (*p*) squared and integrated over a stated period of time, *T* Note 1 to entry: The SI unit is Pa² s. $E = \int_0^T p(t)^2 \, \mathrm{d}t$		N/A
3.3.19.4	**sound exposure level, *SEL*** logarithmic measure of sound exposure relative to a reference value, E_0, typically the 1 kHz threshold of hearing in humans. Note 1 to entry: *SEL* is measured as A-weighted levels in dB. $SEL = 10 \lg \left(\frac{E}{E_0}\right)$ dB Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.		N/A
3.3.19.5	**digital signal level relative to full scale, dBFS** levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS.		N/A
2	**Modification to Clause 10**		—
10.6	**Safeguards against acoustic energy sources** Replace 10.6 of IEC 62368-1 with the following:		N/A
10.6.1.1	**Introduction** **Safeguard** requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment intended for use by an **ordinary person**, that: – is designed to allow the user to listen to audio or audiovisual content / material; and		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and – has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment. Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3. NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360. NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible. Listening devices sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to: – professional equipment; NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment. – hearing aid equipment and other devices for assistive listening; – the following type of analogue personal music players: • long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and • cassette player/recorder; NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies. – a player while connected to an external amplifier that does not allow the user to walk around while in use. For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply. The relevant requirements are given in		

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Clause	Requirement + Test	Result - Remark	Verdict
	EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.		
10.6.1.2	**Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz** The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body mounted devices, attention is drawn to EN 50360 and EN 50566.		N/A
10.6.2	**Classification of devices without the capacity to estimate sound dose**		N/A
10.6.2.1	**General** This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3. For classifying the acoustic output $L_{Aeq,T}$, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period. For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, *T* becomes the duration of the song. NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term $L_{Aeq,T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit. For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dB.		N/A
10.6.2.2	**RS1 limits (to be superseded, see 10.6.3.2)** RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 85 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. – The RS1 limits will be updated for all devices as per 10.6.3.2.		
10.6.2.3	**RS2 limits (to be superseded, see 10.6.3.3)** RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 130 detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 100 dB(A) when playing the fixed "programme simulation noise" as described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1.		N/A
10.6.2.4	**RS3 limits** RS3 is a class 3 acoustic energy source that exceeds RS2 limits.		N/A
10.6.3	**Classification of devices (new)**		N/A
10.6.3.1	**General** Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given below.		N/A
10.6.3.2	**RS1 limits (new)** RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1.		
10.6.3.3	**RS2 limits (new)** RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1.		N/A
10.6.4	**Requirements for maximum sound exposure**		N/A
10.6.4.1	**Measurement methods** All volume controls shall be turned to maximum during tests. Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.		N/A
10.6.4.2	**Protection of persons** Except as given below, protection requirements for parts **accessible** to **ordinary persons**, **instructed persons** and **skilled persons** are given in 4.3. NOTE 1 Volume control is not considered a **safeguard.** Between RS2 and an **ordinary person**, the **basic safeguard** may be replaced by an **instructional**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	safeguard in accordance with Clause F.5, except that the **instructional safeguard** shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the **instructional safeguard** may be given through the equipment display during use. The elements of the **instructional safeguard** shall be as follows: – element 1a: the symbol , IEC 60417-6044 (2011-01) – element 2: “High sound pressure” or equivalent wording – element 3: “Hearing damage risk” or equivalent wording – element 4: “Do not listen at high volume levels for long periods.” or equivalent wording An **equipment safeguard** shall prevent exposure of an **ordinary person** to an RS2 source without intentional physical action from the **ordinary person** and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off. The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time. NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed. NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off. A **skilled person** shall not be unintentionally exposed to RS3.		
10.6.5	**Requirements for dose-based systems**		N/A
10.6.5.1	**General requirements** Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause. The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration. The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.		
10.6.5.2	**Dose-based warning and requirements** When a dose of 100 % *CSD* is reached, and at least at every 100 % further increase of *CSD*, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1. The warning shall at least clearly indicate that listening above 100 % *CSD* leads to the risk of hearing damage or loss.		N/A
10.6.5.3	**Exposure-based requirements** With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at. The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3. The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster. Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the unweighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	-10 dBFS for a digital interface. NOTE In case the source is known not to be music (or test signal), the EL may be disabled.		
10.6.6	**Requirements for listening devices (headphones, earphones, etc.)**		N/A
10.6.6.1	**Corded listening devices with analogue input** With 94 dB L_{Aeq} acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1 shall be ≥ 75 mV. NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV.		N/A
10.6.6.2	**Corded listening devices with digital input** With any playing device playing the fixed “programme simulation noise” described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.		N/A
10.6.6.3	**Cordless listening devices** In cordless mode, – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.		N/A
10.6.6.4	**Measurement method** *Measurements shall be made in accordance with EN 50332-2 as applicable.*		N/A

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict
3	**Modification to the whole document**		—
	Delete all the “country” notes in the reference document according to the following list:		—
4	**Modification to Clause 1**		—
1	***Add*** *the following note:* *NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.*		—

0.2.1	Note 1 and 2	1	Note 4 and 5	3.3.8.1	Note 2
3.3.8.3	Note 1	4.1.15	Note	4.7.3	Note 1 and 2
5.2.2.2	Note	5.4.2.3.2.2 Table 12	Note c	5.4.2.3.2.4	Note 1 and 3
5.4.2.3.2.4 Table 13	Note 2	5.4.2.5	Note 2	5.4.5.1	Note
5.4.10.2.1	Note	5.4.10.2.2	Note	5.4.10.2.3	Note
5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3 and 4
5.6.8	Note 2	5.7.6	Note	5.7.7.1	Note 1 and Note 2
8.5.4.2.3	Note	10.2.1 Table 39	Note 3 and 4 and 5	10.5.3	Note 2
~~10.6.1~~	Note 3	F.3.3.6	Note 3	Y.4.1	Note
Y.4.5	Note				

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Clause	Requirement + Test	Result - Remark	Verdict
5	**Modification to 4.Z1**		—
4.Z1	***Add** the following new subclause after 4.9:* To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. **mains**, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for **pluggable equipment type B** or **permanently connected equipment**, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for **pluggable equipment type A** the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.		P
6	**Modification to 5.4.2.3.2.4**		—
5.4.2.3.2.4	***Add** the following to the end of this subclause:* The requirement for interconnection with **external circuit** is in addition given in EN 50491-3:2009.		N/A
7	**Modification to 10.2.1**		—
10.2.1	Add the following to c) and d) in table 39: For additional requirements, see 10.5.1.		N/A
8	**Modification to 10.5.1**		—

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict
10.5.1	***Add** the following after the first paragraph:* For RS 1 compliance is checked by measurement under the following conditions: In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made. NOTE Z1 Soldered joints and paint lockings are examples of adequate locking. The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus. Moreover, the measurement shall be made under fault conditions causing an increase of the high voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made. For RS1, the dose-rate shall not exceed 1 μSv/h taking account of the background level. NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.		N/A
9	**Modification to G.7.1**		—
G.7.1	***Add** the following note:* NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.		P

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict

10	**Modification to Bibliography**		—
	Add the following notes for the standards indicated: IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN 61643-331.		P
11	**ADDITION OF ANNEXES**		—
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		—
4.1.15	**Denmark, Finland, Norway** and **Sweden** To the end of the subclause the following is added: **Class I pluggable equipment type A** intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and **accessible** parts, have a marking stating that the equipment shall be connected to an earthed **mains** socket-outlet. The marking text in the applicable countries shall be as follows: In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.” In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In **Norway**: “Apparatet må tilkoples jordet stikkontakt” In **Sweden**: “Apparaten skall anslutas till jordat uttag”		N/A

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION

Clause	Requirement + Test	Result - Remark	Verdict
4.7.3	**United Kingdom** To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex		N/A
5.2.2.2	**Denmark** After the 2nd paragraph add the following: A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		N/A
5.4.11.1 and Annex G	**Finland and Sweden** To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either • two layers of thin sheet material, each of which shall pass the electric strength test below, or • one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition • passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.		N/A

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict
	A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions: • the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; • the additional testing shall be performed on all the test specimens as described in EN 60384-14; the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		
5.5.2.1	**Norway** After the 3rd paragraph the following is added: Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N/A
5.5.6	**Finland, Norway** and **Sweden** To the end of the subclause the following is added: Resistors used as **basic safeguard** or bridging **basic insulation** in **class I pluggable equipment type A** shall comply with G.10.1 and the test of G.10.2.		N/A
5.6.1	**Denmark** **Add** to the end of the subclause Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment. *Justification:* In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.		N/A
5.6.4.2.1	**Ireland and United Kingdom** After the indent for **pluggable equipment type A**, the following is added: – the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug.		N/A

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict
5.6.4.2.1	**France** After the indent for **pluggable equipment type A**, the following is added: – in certain cases, the **protective current rating** of the circuit supplied from the mains is taken as 20 A instead of 16 A.		N/A
5.6.5.1	To the second paragraph the following is added: The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm^2 to 1,5 mm^2 in cross-sectional area.		N/A
5.6.8	**Norway** To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as **class I equipment**. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.		N/A
5.7.6	**Denmark** To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the **protective conductor current** exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		N/A
5.7.6.2	**Denmark** To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA .		N/A
5.7.7.1	**Norway and Sweden** To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:		N/A

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict
	"Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)" NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): "Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet." Translation to Swedish: "Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medfőra risk főr brand. Főr att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet.".		
8.5.4.2.3	**United Kingdom** Add the following after the 2nd dash bullet in 3rd paragraph: An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury.		N/A

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict
B.3.1 and B.4	**Ireland and United Kingdom** The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of **direct plug-in equipment**, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the **direct plug-in equipment**, until the requirements of Annexes B.3.1 and B.4 are met		N/A
G.4.2	**Denmark** To the end of the subclause the following is added: Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2. Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a. Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c. Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a *Justification:* Heavy Current Regulations, Section 6c		N/A

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict
G.4.2	**United Kingdom** To the end of the subclause the following is added: The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N/A
G.7.1	**United Kingdom** To the first paragraph the following is added: Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a ‘standard plug’ in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations. NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		**N/A**
G.7.1	**Ireland** To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, “13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard		N/A
G.7.2	**Ireland and United Kingdom** To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm^2 is allowed for equipment which is rated over 10 A and up to and including 13 A.		N/A
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		—

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict
10.5.2	**Germany** The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. *Justification*: German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. **NOTE** Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de		N/A

IEC 62368-1_ATTACHMENT NO.1: NATIONAL DEVIATION			
Clause	Requirement + Test	Result - Remark	Verdict

ZD	**IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)**	—
		P

Type of flexible cord	Code designations	
	IEC	CENELEC
PVC insulated cords		
Flat twin tinsel cord	60227 IEC 41	H03VH-Y
Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F
Rubber insulated cords		
Braided cord	60245 IEC 51	H03RT-F
Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F
Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F
Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F
Cords having high flexibility		
Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H
Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H
Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H
Cords insulated and sheathed with halogen-free thermoplastic compounds		
Light halogen-free thermoplastic insulated and sheathed flexible cords		H03Z1Z1-F H03Z1Z1H2-F
Ordinary halogen-free thermoplastic insulated and sheathed flexible cords		H05Z1Z1-F H05Z1Z1H2-F

PHOTO DOCUMENTATION_ATTACHMENT No. 2

Photo 1: Description top view

Photo 2: Description front, left and top view

Photo 3: Description rear, right and bottom view

Photo 4: Ports view

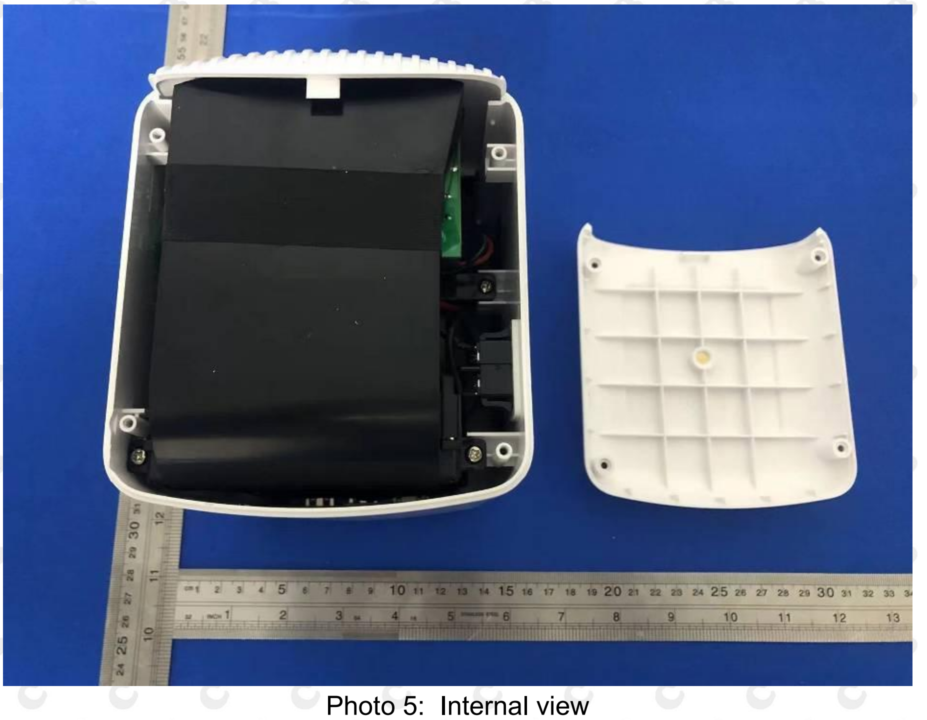

Photo 5: Internal view

Photo 6: Internal view

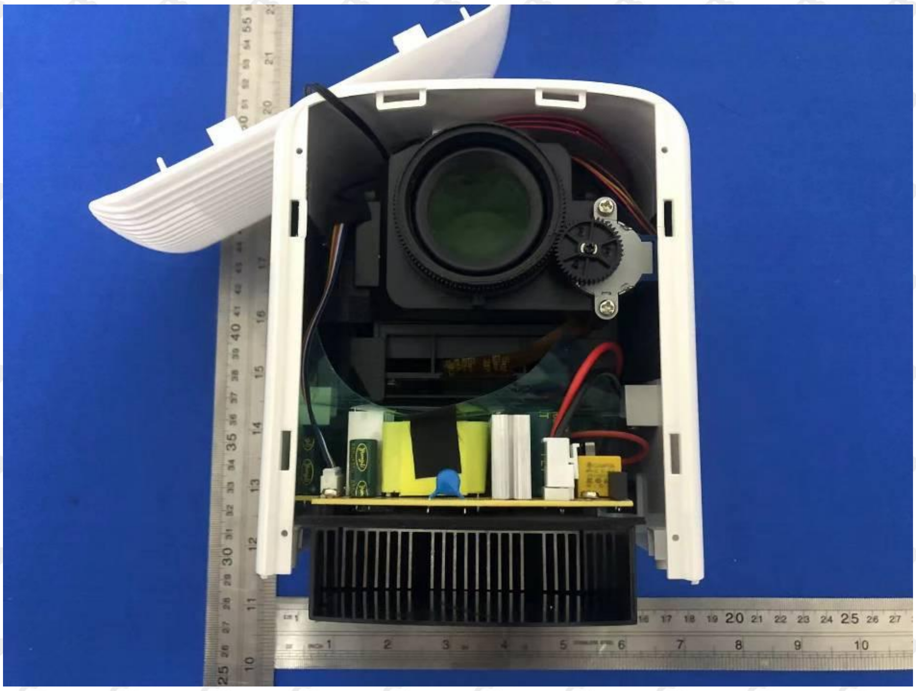

Photo 7: Internal view

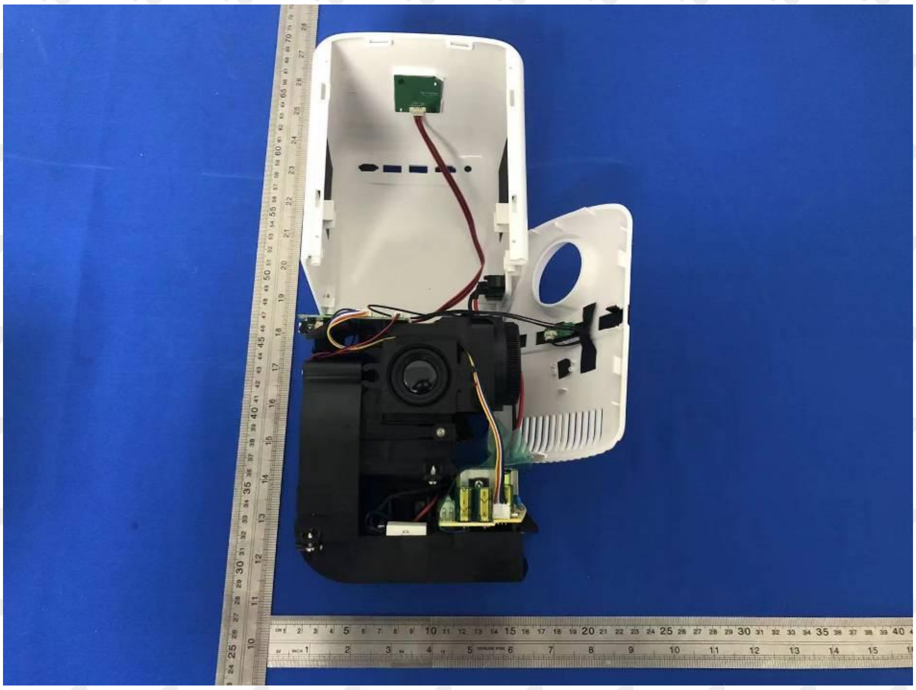

Photo 8: Internal view

Shenzhen CTB Testing Technology Co., Ltd.
Add: 1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao’an District, Shenzhen, Guangdong, China
Tel: 4008-707-283 Web: http://www.ctb-lab.net Email: ctb@ctb-lab.net

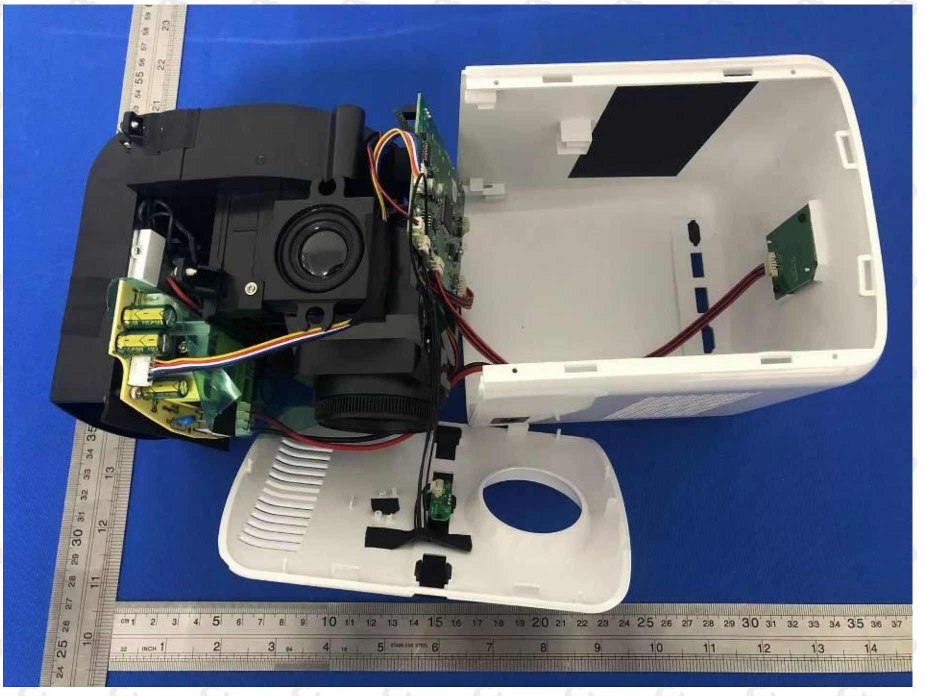

Photo 9: Internal view

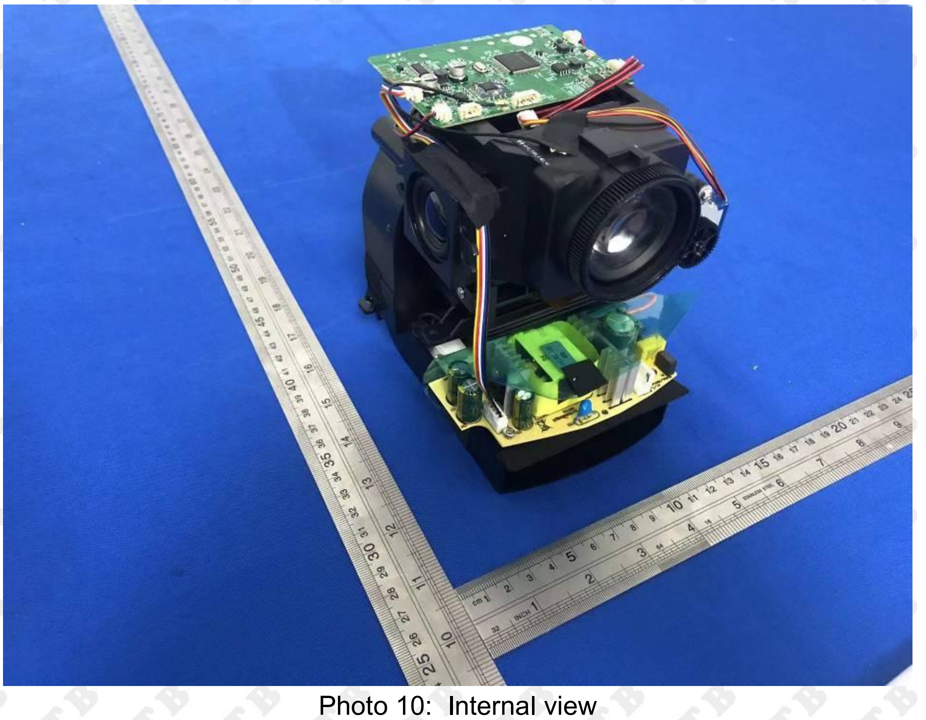

Photo 10: Internal view

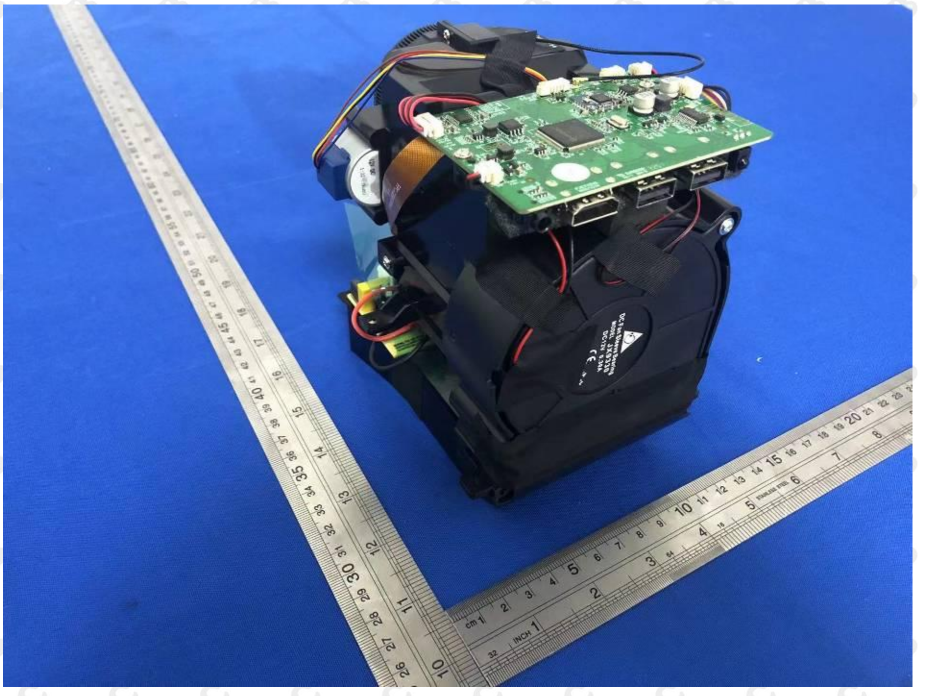

Photo 11: Internal view

Photo 12: DC fan view

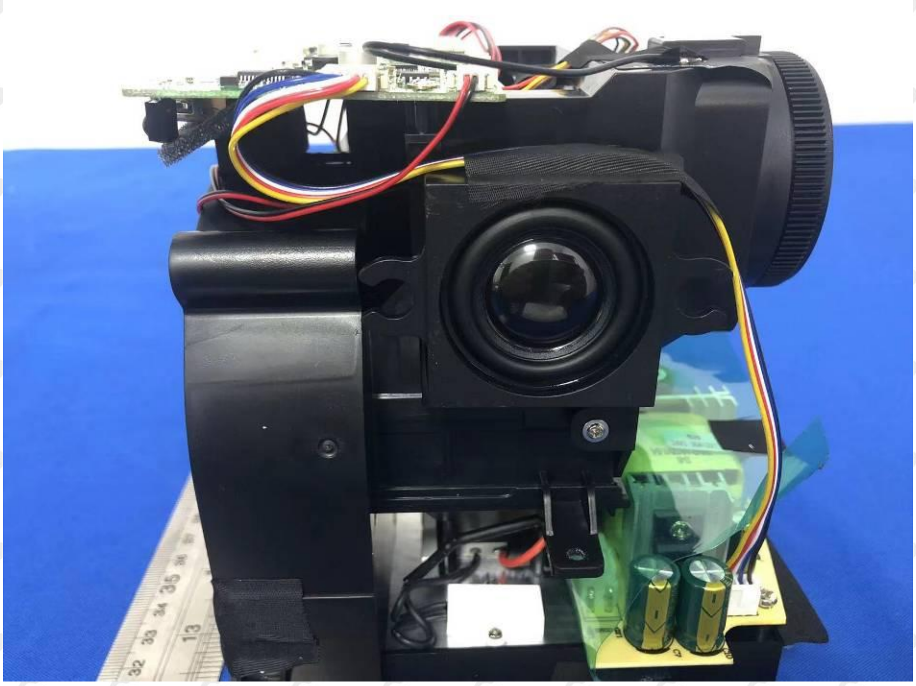

Photo 13: Speaker view

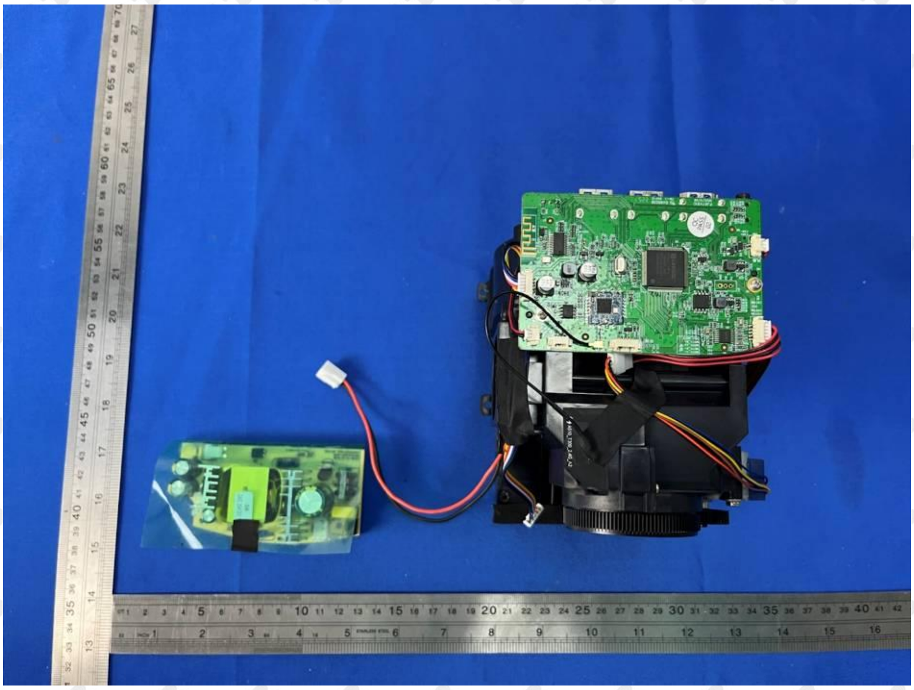

Photo 14: Internal view

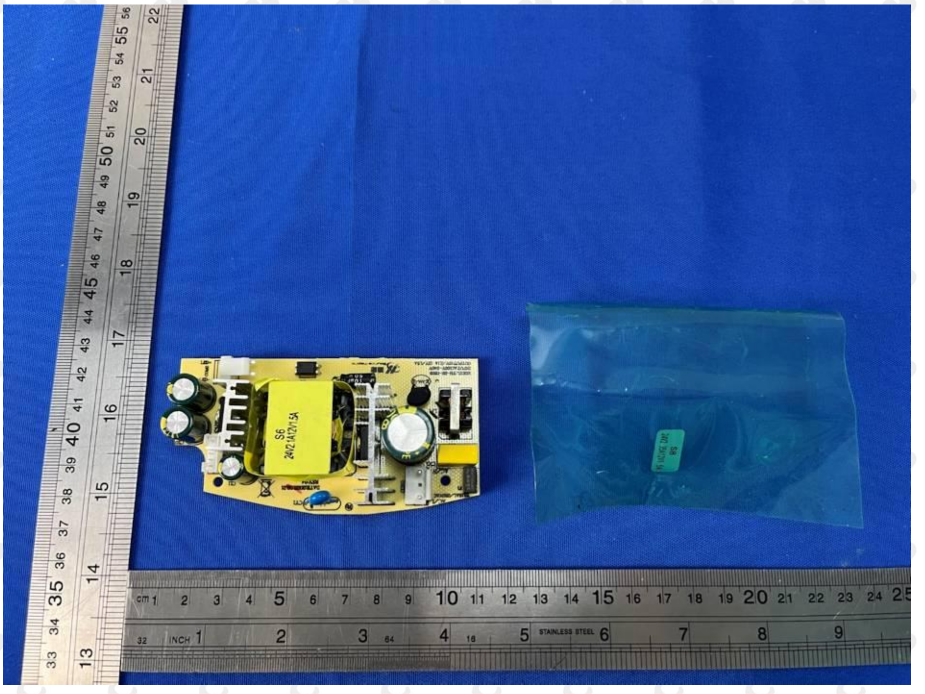

Photo 15: Power board view

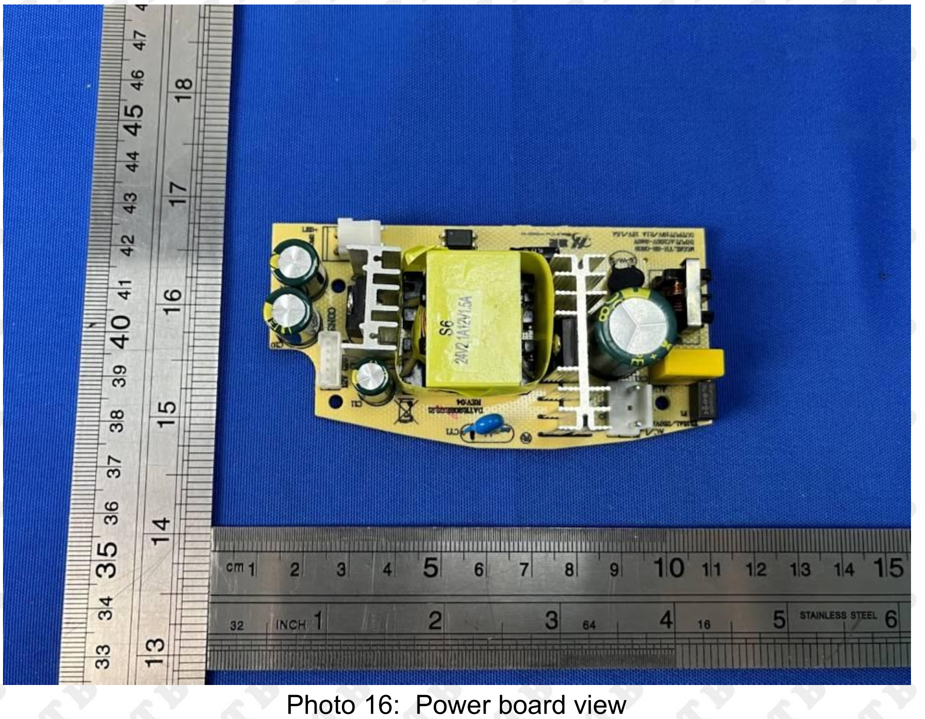

Photo 16: Power board view

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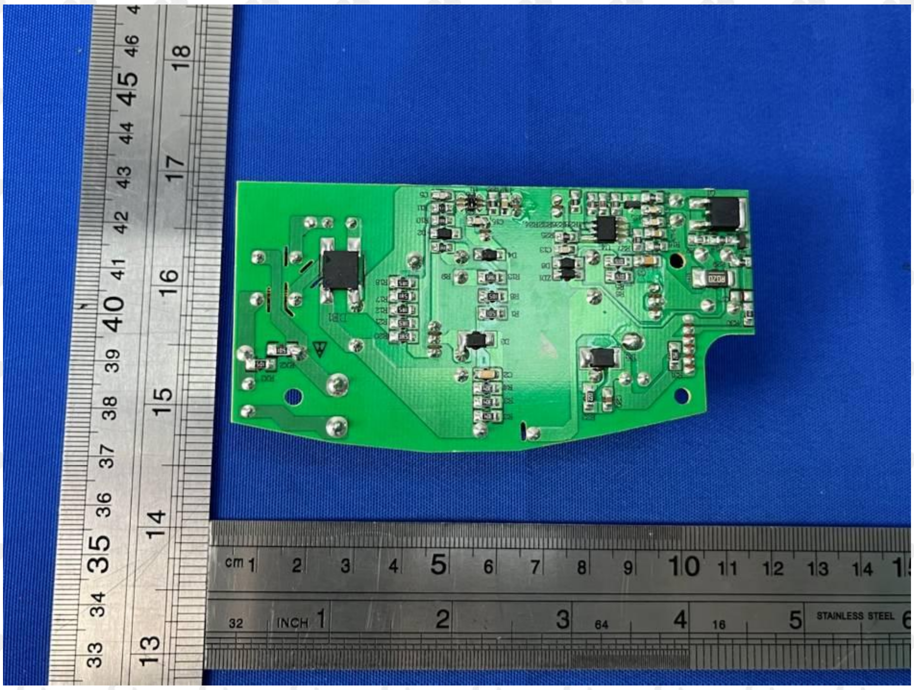

Photo 17: Power board view

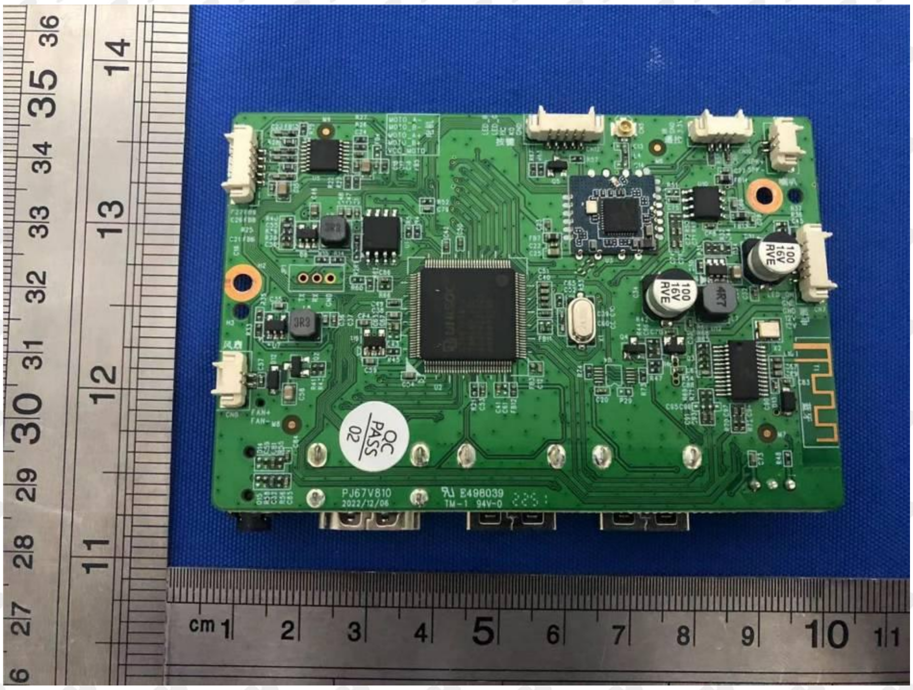

Photo 18: PCB view

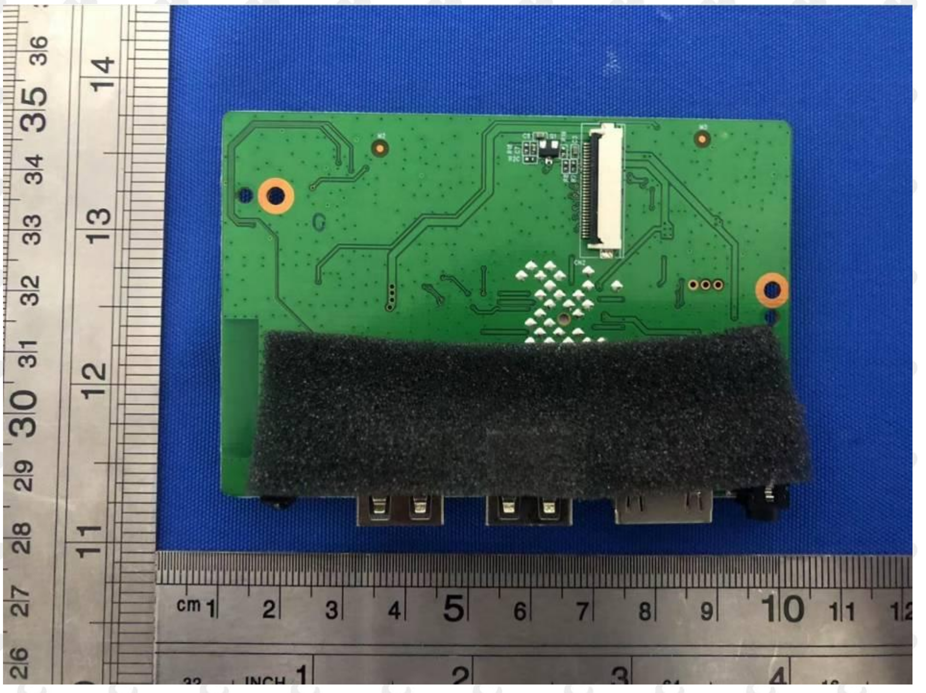

Photo 19: PCB view

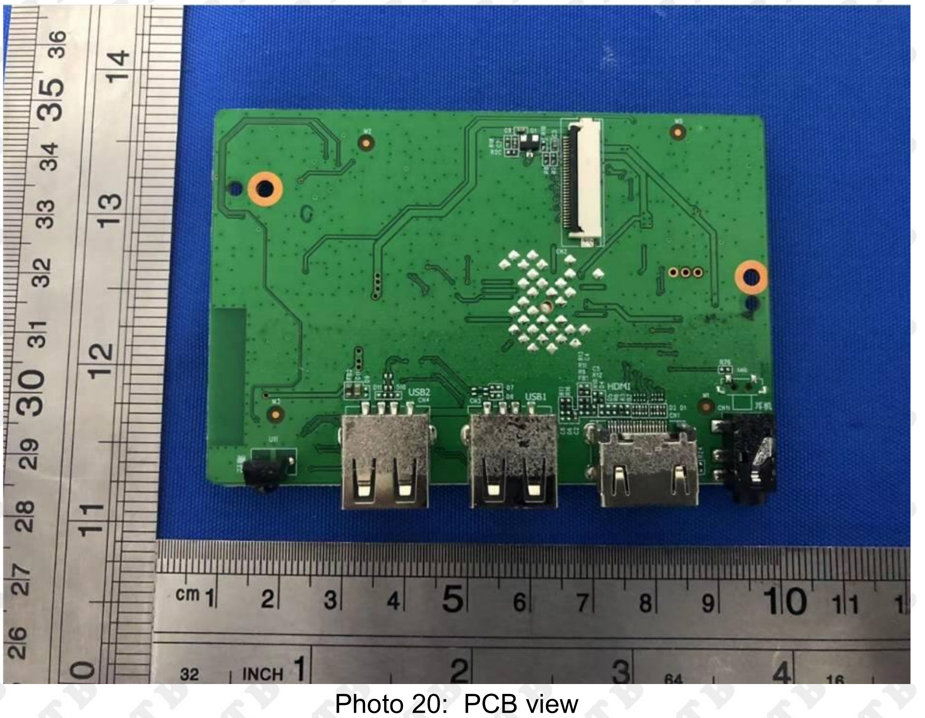

Photo 20: PCB view

******End of this report******

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