

Zhongchuang Compliance Service Laboratory

Floor 3, Huilian Industrial Zone, No.18, Xinh Community Industrial South Road, Fuhai Street, Bao 'an District, Shenzhen, Guangdong cunwang163@gmail.com <http://www.zctscine.com>

Certificate of Conformity

Certificate No. : ZCS2023053105
Product : Handheld 3-Axis Gimbal
Brand Name : N/A
Model Name : F10pro
Series Model : F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro,F9plus,F10,F10plus,F11,F11S,F11pro,F11plus,F12,F12S,F12pro,F12plus,S5,S5pro,S5B,S5Bpro,L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro
Holder : SIMJOY INTERNATIONAL CO., LIMITED
Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.
Manufacturer : SIMJOY INTERNATIONAL CO., LIMITED
Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.

The submitted sample of the above equipment has been tested and found to comply with the following European Directive:

Radio Equipment Directive 2014/53/EU

The standard(s) used for showing compliance with the essential requirements in the specified directive(s):

Applicable Standard(s)	Test Report(s) Number
ETSI EN 300 328 V2.2.2 (2019-07)	ZCT20230531R02
EN IEC 62311:2020	ZCT20230531N04
ETSI EN 301 489-1 V2.2.3 (2019-11)	ZCT20230531E05
ETSI EN 301 489-17 V3.2.2 (2019-12)	
EN IEC 61000-3-2:2019	
EN 61000-3-3-2013AMD.1:2019	ZCT20230531L06
IEC 62368-1:2014	
EN 62368-1 +A11:2017	

This certificate is part of the full test report(s) and should be read in conjunction with it. This certificate is based on an evaluation of one sample of above mentioned product. It does not imply assessment of the production of the product. Without the written approval of ZCT Compliance Service Laboratory this certificate is not permitted to be reproduced, except in full. It is not permitted to use the test lab's logo. The CE marking may only be used if all the relevant and effective European Directives are applicable.



Approved by: Harry Wang

MAY 31, 2023

HARRY WANG/Technical Director





TEST REPORT

ETSI EN 301 489

Equipment under Test : Handheld 3-Axis Gimbal Stabilizer

Trade Mark : N/A

Model /Type : F10pro

Listed Models : F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro,F9plus,F10,F10plus,F11, F11S,F11pro,F11plus,F12,F12S,F12pro,F12plus,S5,S5pro,S5B, S5Bpro,L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro

Applicant : SIMJOY INTERNATIONAL CO., LIMITED

Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao' an District, Shenzhen.

Manufacturer : SIMJOY INTERNATIONAL CO., LIMITED

Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao' an District, Shenzhen.

Laboratory : Zhongchuang Compliance Service Laboratory

Address : Floor 3, Huilian Industrial Zone, No.18, Xinhe Community Industrial South Road, Fuhai Street, Bao 'an District, Shenzhen, Guangdong

Email : cunwang163@gmail.com

Website : <http://www.zctscine.com>

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Test Result:	PASS
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TEST REPORT

Applicant's name : SIMJOY INTERNATIONAL CO., LIMITED

Address..... : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao' an District, Shenzhen.

Manufacturer..... : SIMJOY INTERNATIONAL CO., LIMITED

Address..... : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao' an District, Shenzhen.

Test item description : Handheld 3-Axis Gimbal Stabilizer

Model/Type reference..... : F10pro

List Model : F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro,F9plus,F10,F10plus, F11,F11S,F11pro,F11plus,F12,F12S,F12pro,F12plus,S5,S5pro,S5B, S5Bpro,L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro

Standard : **ETSI EN 301 489-1 V2.2.3 (2019-11)**
ETSI EN 301 489-17 V3.2.2 (2019-12)
EN IEC 61000-3-2:2019
EN 61000-3-3-2013AMD.1:2019

Date of receipt of test sample.....: May. 23, 2023

Date of testing..... : May. 23, 2023~ May. 31, 2023

Date of issue..... : Mar. 31, 2023

Result..... : **PASS**

Compiled by
(position+printed name+signature)...: File administrators :Mary Peng *Mary Peng*

Supervised by
(position+printed name+signature)...: Technique principal :Jack Luo *Jack Luo*

Approved by
(position+printed name+signature)...: Manager:Harry Wang *Harry Wang*



Testing Laboratory Name : Zhongchuang Compliance Service Laboratory

Address..... : Floor 3, Huilian Industrial Zone, No.18, Xinhe Community Industrial South Road, Fuhai Street, Bao 'an District, Shenzhen, Guangdong

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1. Test Standards and Test description

1.1. Test Standards

The tests were performed according to following standards:

[ETSI EN 301 489-1 V2.2.3 \(2019-11\)](#)–Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

[ETSI EN 301 489-17 V3.2.2 \(2019-12\)](#)–Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for wideband transmission systems

[EN IEC 61000-3-2:2019](#) Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

[EN 61000-3-3-2013AMD.1:2019](#) Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

1.2. Test Description

Test item	Standards requirement	Result
Radiated Emission	ETSI EN301 489-1 Clause 7.1	Pass
Conducted Emission (AC Mains)	ETSI EN301 489-1 Clause 7.1	Pass
Harmonic Current Emissions	ETSI EN301 489-1 Clause 7.1/ EN IEC 61000-3-2:2019	Pass
Voltage Fluctuations and Flicker	ETSI EN301 489-1 Clause 7.1/ EN 61000-3-3-2013AMD.1:2019	Pass
Electrostatic Discharge	ETSI EN301 489-1 Clause 7.2	Pass
RF Electromagnetic Field	ETSI EN301 489-1 Clause 7.2	Pass
Fast Transients Common Mode	ETSI EN301 489-1 Clause 7.2	Pass
Surges, Line to Line and Line to Ground	ETSI EN301 489-1 Clause 7.2	Pass
RF Common Mode 0,15 MHz to 80 MHz	ETSI EN301 489-1 Clause 7.2	Pass
Voltage Dips and Interruptions	ETSI EN301 489-1 Clause 7.2	Pass

Remark: The measurement uncertainty is not included in the test result.

2. Summary

2.1. Product Description

Product Name:	Handheld 3-Axis Gimbal Stabilizer
Model/Type reference:	F10pro
List Model:	F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro,F9plus,F10,F10plus,F11,F11S,F11pro,F11plus,F12,F12S,F12pro,F12plus,S5,S5pro,S5B,S5Bpro,L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro
Power supply:	DC 24V by Adapter AC 100-240V/50-60Hz
Adapter information:	MODEL:CW2402200US INPUT:100-240V/50-60Hz, 1.2A OUTPUT: DC 24V~, 2A
BT	
Supported type:	BT v5.0
Modulation:	GFSK,8DPSK, π /4DQPSK
Operation frequency:	2402MHz-2480MHz
Channel number:	79
Channel separation:	1MHz

2.2. EUT operation mode

Test mode	BT
1	■

Note:

1. ■ is operation mode.

Pre-scan above all test mode, found below test mode which it was worse case mode.

Test item	Test mode (Worse case mode)
Conducted emission	Mode 1
Radiated emission	Mode 1
EMS	RS,CS: Mode 1 Others: All Modes

2.3. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

<input type="radio"/>	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
<input type="radio"/>	Multimeter	Manufacturer :	/
		Model No. :	/

2.4. Modifications

No modifications were implemented to meet testing criteria.

3. Test Environment

3.1. Address of the test laboratory

Zhongchuang Compliance Service Laboratory

Floor 3, Huilian Industrial Zone, No.18, Xinhe Community Industrial South Road, Fuhai Street, Bao 'an District, Shenzhen, Guangdong

3.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Lative Humidity	55 %
Air Pressure	989 hPa

3.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements and is documented in the Zhongchuang Compliance Service Laboratory. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Zhongchuang Compliance Service Laboratory is reported:

Test Item	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.24 dB	(1)
Radiated Emission	1~18GHz	5.16 dB	(1)
Conducted Disturbance	0.15~30MHz	3.39 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.4. Equipments Used during the Test

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Ultrar-Broadband Antenna	Rohde&Schwarz	HL562	100015	2024/02/14
2	EMI Test Receiver	Rohde&Schwarz	ESI 26	100009	2024/02/14
3	RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	N/A
4	Turetable	ETS	2088	2149	N/A
5	Antenna Mast	ETS	2075	2346	N/A
6	EMI Test Software	Rohde&Schwarz	ESK1	N/A	N/A
7	Horn Antenna	Rohde&Schwarz	HF906	100039	2024/02/14
8	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2024/02/14
9	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	2024/02/14
10	HORN ANTENNA	ShwarzBeck	9120D	1011	2024/02/14
11	TURNTABLE	MATURO	TT2.0	----	N/A
12	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A
13	EMI Test Software	Audix	E3	N/A	N/A

Electrostatic Discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	EM TEST	DITOC0103Z	0301-04	2024/02/14

Conducted Susceptibility Test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal Generator	IFR	2023A	202304/060	2024/02/14
2	Amplifier	AR	75A250	302205	2024/02/14
3	Dual Directional Coupler	AR	DC2600	302389	2024/02/14
4	6db Attenuator	EMTEST	ATT6/75	0010230A	2024/02/14
5	EM Clamp	LÜTHI	EM101	335625	2024/02/14
6	CDN	EMTEST	CDN M3	0802-03	2024/02/14
7	Audio Analyzer	Rohde&Schwarz	UPL	SB3439	2024/02/14
8	Universal Radio Communication Tester	Rohde&Schwarz	CMU200	112012	2024/02/14

RF Electromagnetic Field					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal Generator	IFR	2032	203002/100	2024/02/14
2	AMPLIFIER	AR	150W1000	301584	2024/02/14
3	DUAL DIRECTIONAL COUPLER	AR	DC6080	301508	2024/02/14
4	POWER HEAD	AR	PH2000	301193	2024/02/14
5	POWER METER	AR	PM2002	302799	2024/02/14
6	TRANSMITTING AERIAL	AR	AT1080	28570	2024/02/14
7	POWER AMPLIFIER	AR	25S1G4A	0325511	2024/02/14
8	DUAL DIRECTIONAL COUPLER	AR	DC7144A	0325100	2024/02/14
9	TRANSMITTING AERIAL	AR	AT4002A	0324848	2024/02/14
10	Audio Analyzer	Rohde&Schwarz	UPL	SB3439	2024/02/14
11	Universal Radio Communication Tester	Rohde&Schwarz	CMU200	112012	2024/02/14



Voltage Fluctuation and Flicker & Harmonic Current					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Purified Power Source	CALIFORNIA INSTRUMENTS	HFS500	54513	2024/02/14
2	Harmonic And Flicker Analyzer	EM TEST	DPA503S1	0500-10	2024/02/14

Electrical Fast Transient/Burst Test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Ultra Compact Simulator	EM TEST	UCS500M6	0500-19	2024/02/14
2	Coupling Clamp	EM TEST	HFK	1501-14	2024/02/14

Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	Rohde&Schwarz	ESCI	100106	2024/02/14
2	Artificial Mains	Rohde&Schwarz	ESH2-Z5	100028	2024/02/14
3	Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	2024/02/14
4	EMI Test Software	Rohde&Schwarz	ESK1	N/A	2024/02/14

Voltage Dips and Interruptions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Ultra Compact Simulator	EM TEST	UCS500M6	0500-19	2024/02/14
2	Motor Driven Voltage Transformer	EM TEST	MV2616	0301-11	2024/02/14

The Calibration Interval was one year.

4. Test conditions and Results

4.1. EMISSION

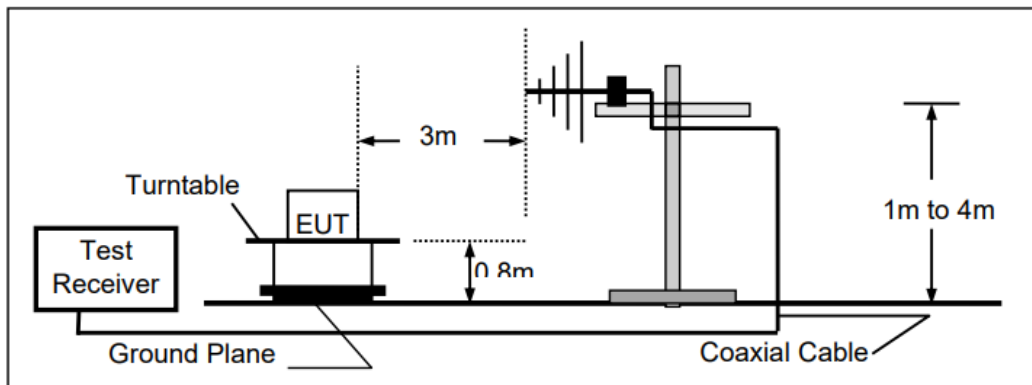
4.1.1. Radiated Emission

LIMIT

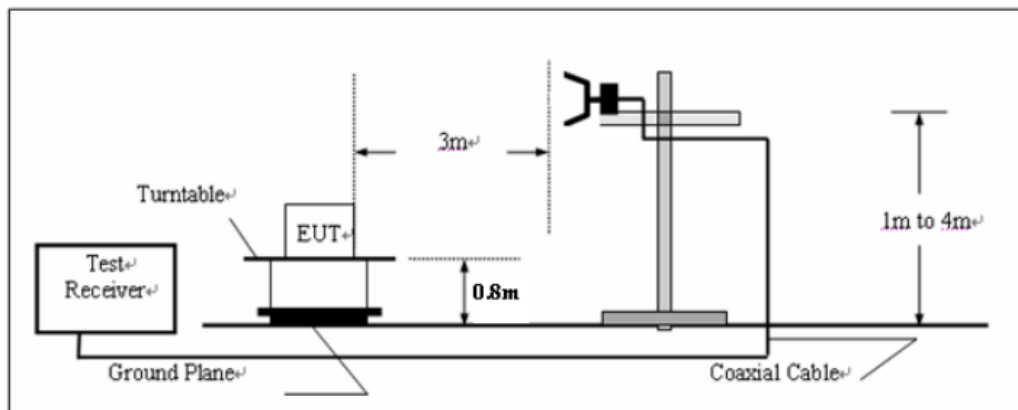
Please refer to ETSI EN301489-1 Clause 8.2.3, Table 4 and EN55032 Clause 6, Table 6, and Class B

TEST CONFIGURATION

- a) Radiated emission test set-up, frequency below 1000MHz:



- b) Radiated emission test set-up, frequency above 1000MHz



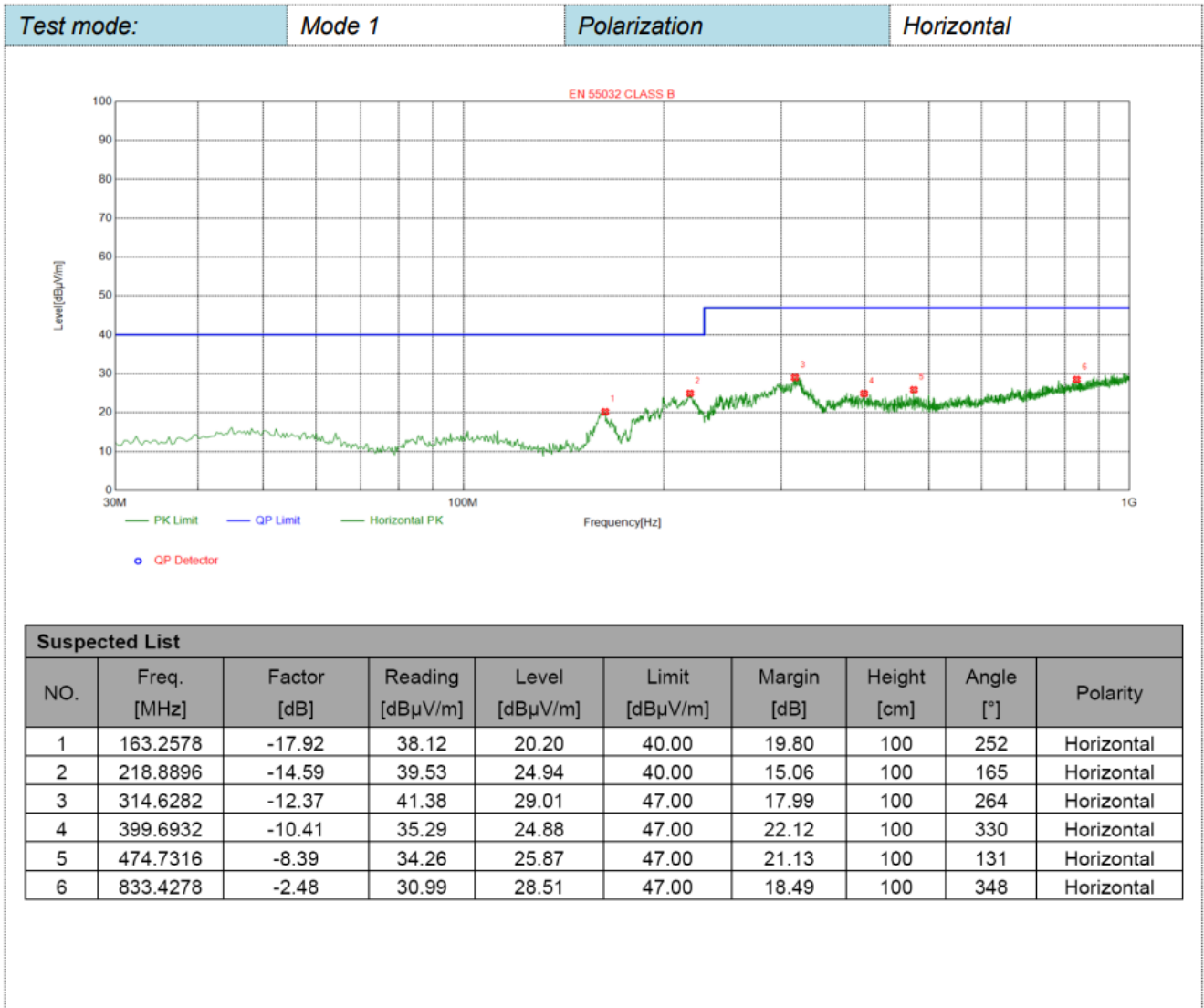
TEST PROCEDURE

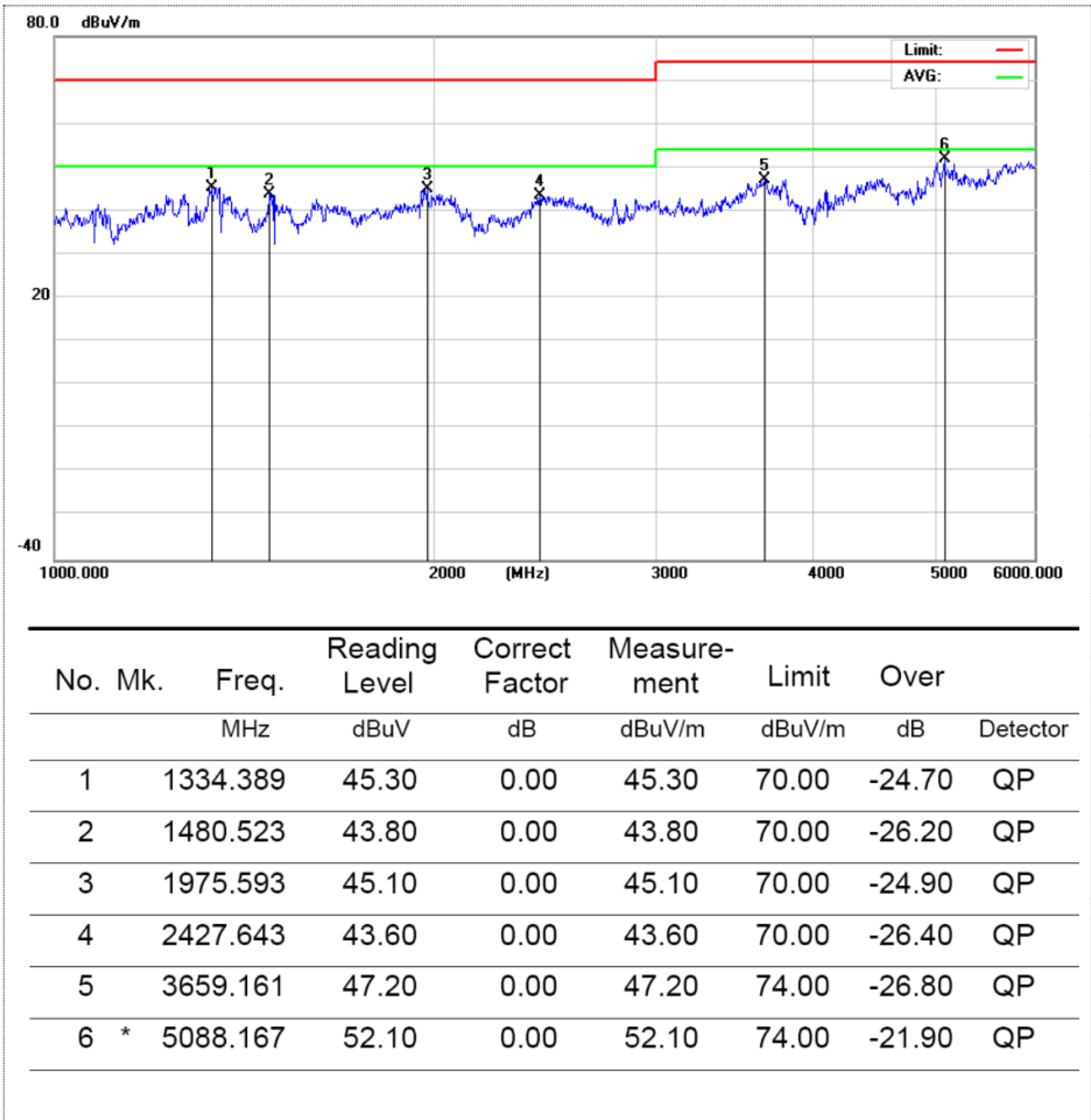
Please refer to ETSI EN 301 489-1 Clause 8.2.3 and EN 55032 Clause 6 for the measurement methods

TEST RESULTS

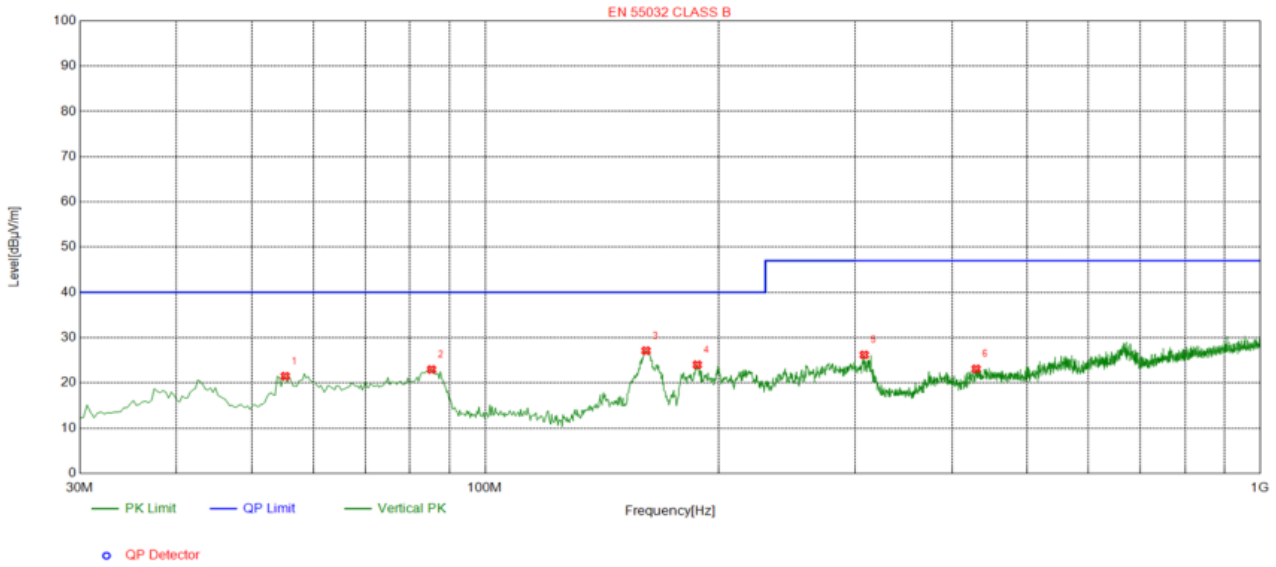
-----Passed-----

Please refer to the below test data:

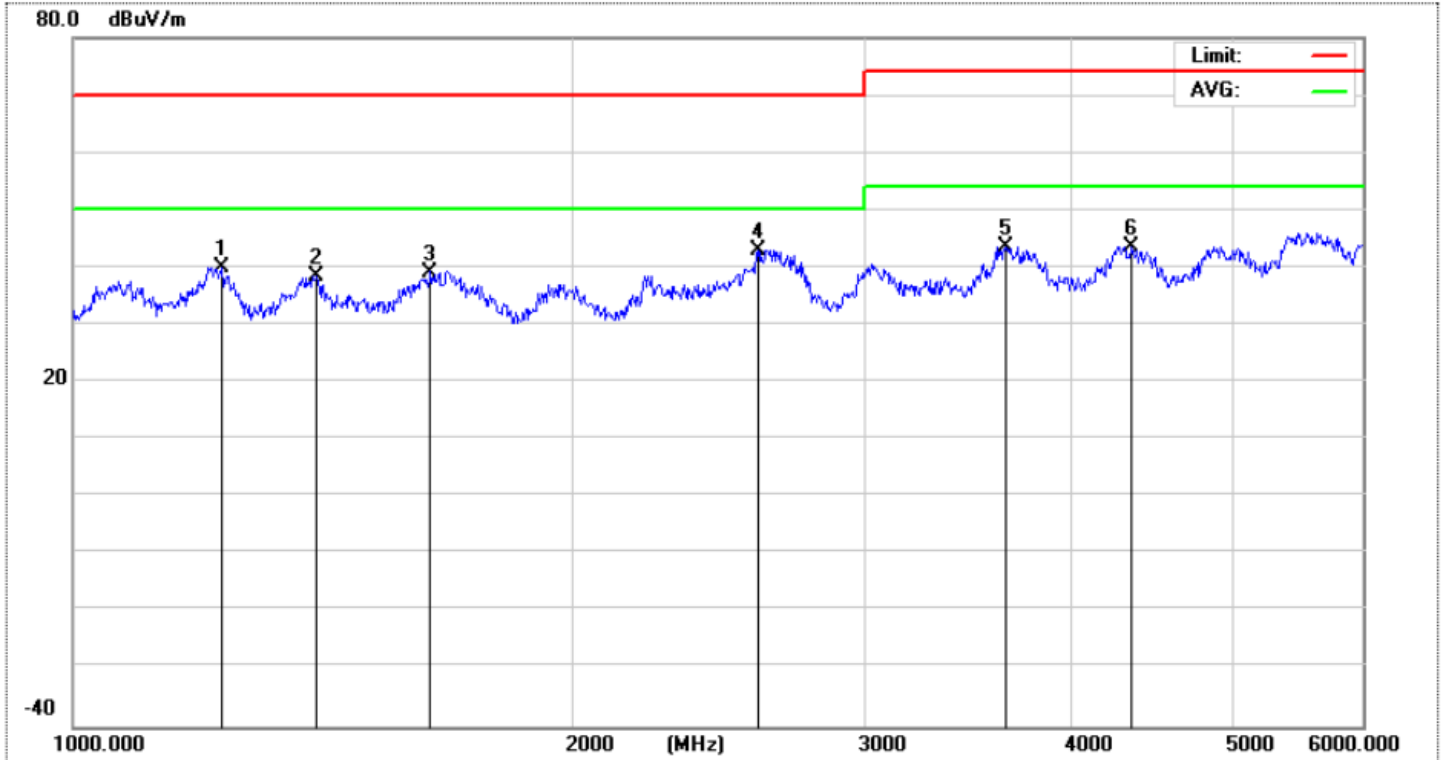




Test mode: Mode 1 Polarization Vertical



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	55.2284	-14.44	35.90	21.46	40.00	18.54	100	12	Vertical
2	85.3084	-18.20	41.15	22.95	40.00	17.05	100	26	Vertical
3	161.3171	-18.10	45.21	27.11	40.00	12.89	100	191	Vertical
4	187.8393	-16.19	40.20	24.01	40.00	15.99	100	331	Vertical
5	308.4828	-12.63	38.81	26.18	47.00	20.82	100	342	Vertical
6	430.0967	-9.85	32.94	23.09	47.00	23.91	100	144	Vertical



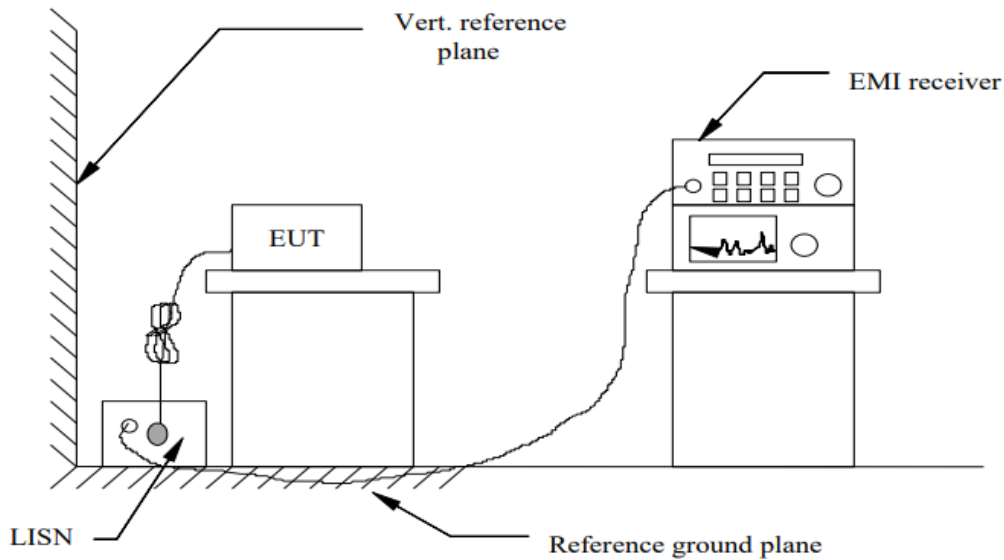
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		1228.818	40.10	0.00	40.10	70.00	-29.90	QP
2		1403.042	38.60	0.00	38.60	70.00	-31.40	QP
3		1642.661	39.20	0.00	39.20	70.00	-30.80	QP
4	*	2589.395	43.10	0.00	43.10	70.00	-26.90	QP
5		3652.610	43.50	0.00	43.50	74.00	-30.50	QP
6		4353.737	43.60	0.00	43.60	74.00	-30.40	QP

4.1.2. Conducted Emission (AC Mains)

LIMIT

Please refer to ETSI EN301489-1 Clause 8.4.3, Table 8 and EN55032 Clause 5, Table 2, and Class B

TEST CONFIGURATION



TEST PROCEDURE

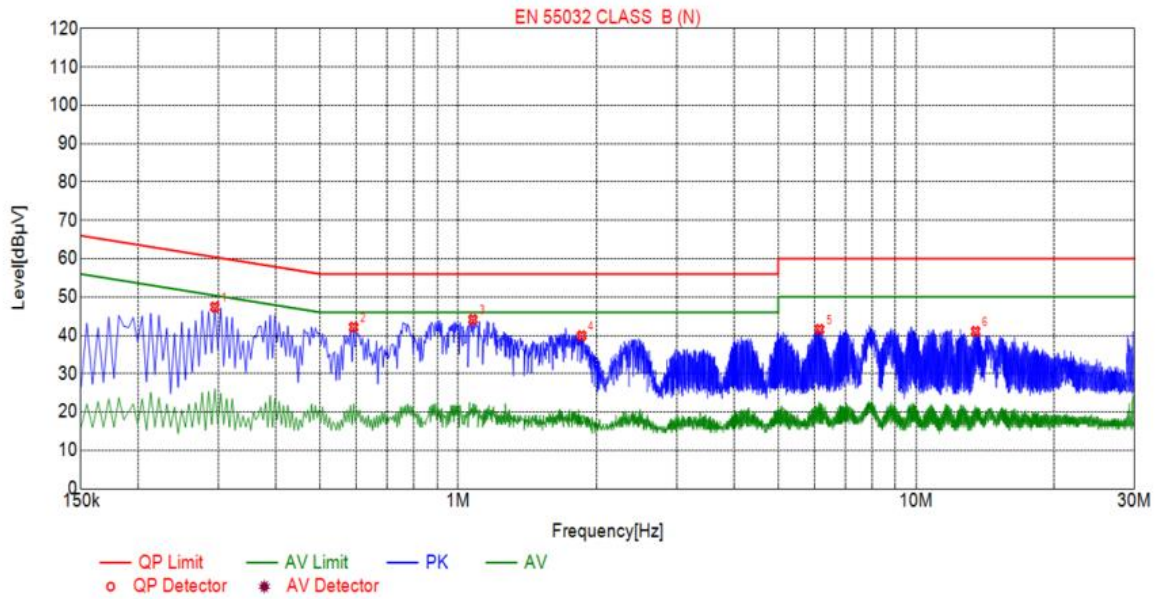
Please refer to ETSI EN 301 489-1 Clause 8.4.3 and EN 55032 Clause 5 for the measurement methods

TEST RESULTS

-----Passed-----

Please refer to the below test data:

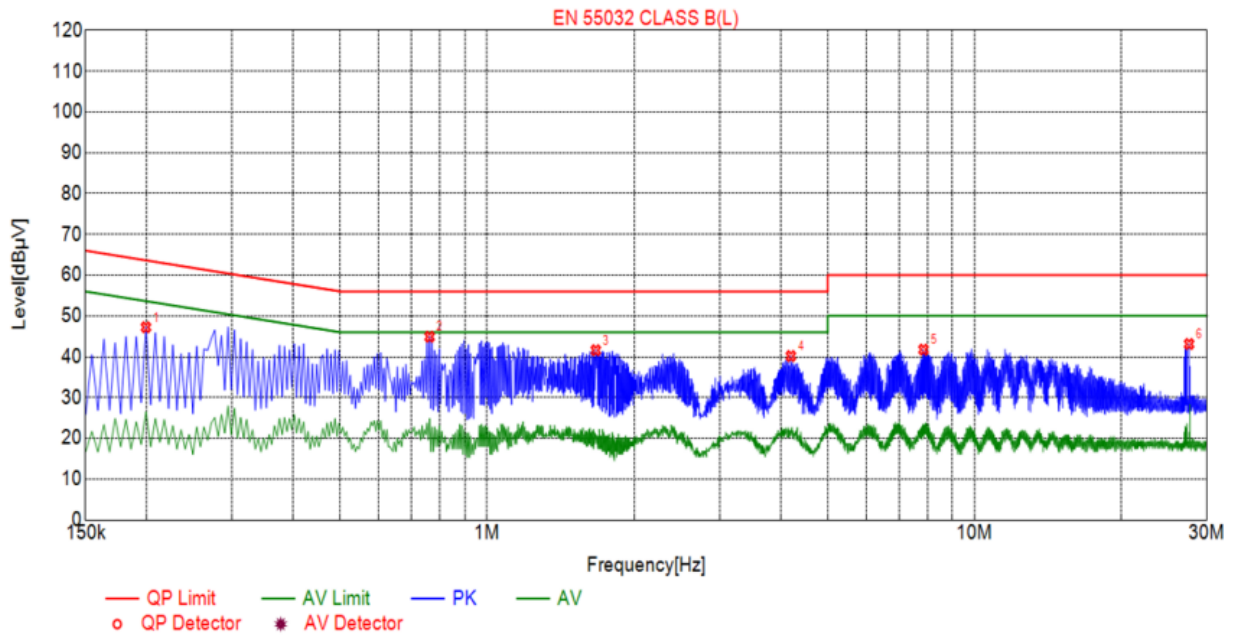
Test mode: Mode 4 Polarization L



Suspected List

NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.2940	47.39	10.03	60.41	13.02	37.36	PK	N
2	0.5910	42.16	10.05	56.00	13.84	32.11	PK	N
3	1.0770	44.13	10.07	56.00	11.87	34.06	PK	N
4	1.8600	39.92	10.14	56.00	16.08	29.78	PK	N
5	6.1530	41.55	10.23	60.00	18.45	31.32	PK	N
6	13.4880	41.04	9.96	60.00	18.96	31.08	PK	N

Test mode:	Mode 4	Polarization	N
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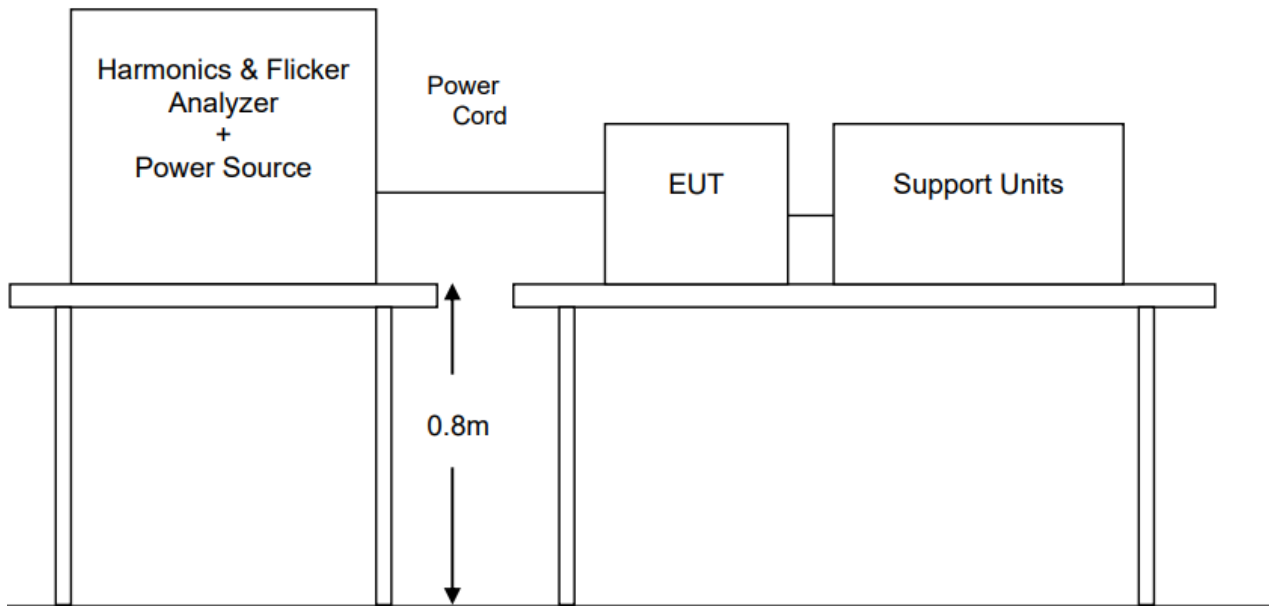
Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1995	47.24	10.03	63.63	16.39	37.21	PK	L
2	0.7620	44.91	10.05	56.00	11.09	34.86	PK	L
3	1.6710	41.60	10.12	56.00	14.40	31.48	PK	L
4	4.2000	40.17	10.25	56.00	15.83	29.92	PK	L
5	7.8585	41.75	10.16	60.00	18.25	31.59	PK	L
6	27.5730	43.13	10.26	60.00	16.87	32.87	PK	L

4.1.3. Harmonic Current Emission

LIMIT

Please refer to EN61000-3-2

TEST CONFIGURATION



TEST PROCEDURE

Please refer to EN61000-3-2 for the measurement methods.

TEST RESULTS

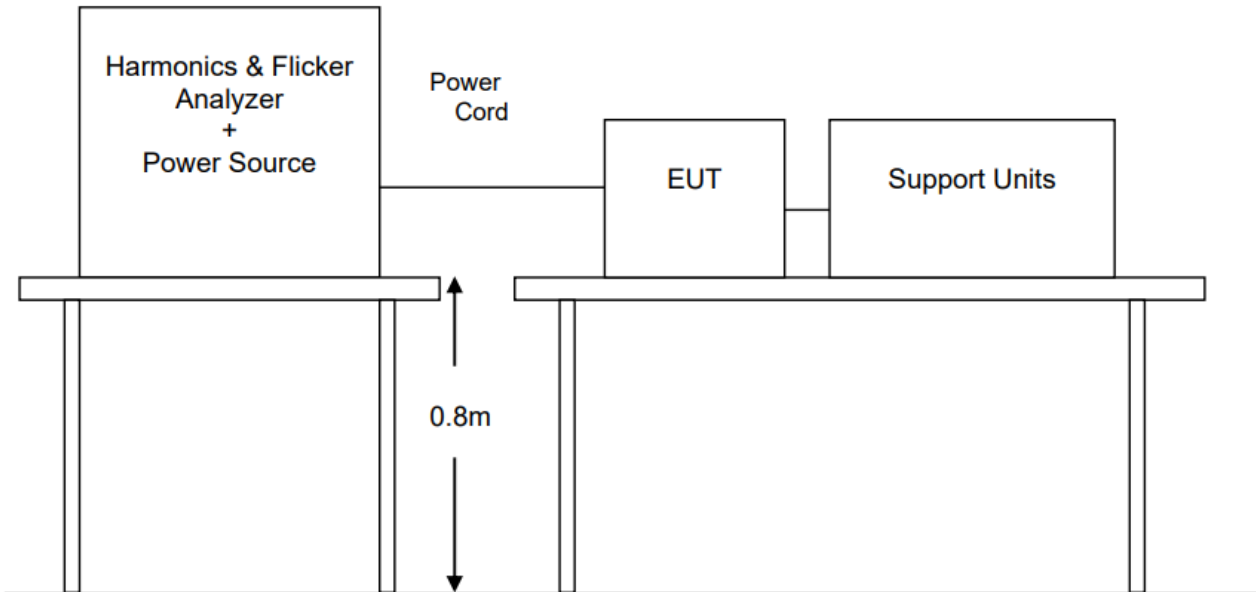
The power of the Adpter is less than 75W, So this test item is not applicable for the EUT.

4.1.4. Voltage Fluctuation and Flicker

LIMIT

Please refer to EN61000-3-3

TEST CONFIGURATION



TEST PROCEDURE

Please refer to EN61000-3-3 for the measurement methods.

TEST RESULTS

*See clause 6.1*** *** EN 61000-3-3:2013, clause 6.1:" ... Tests need not be made on equipment which is unlikely to produce significant voltage fluctuations or flicker. ...".*

4.2. IMMUNITY

4.2.1. Performance criteria

■ EN301489-17

General performance criteria

- 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.

Criteria	During test	After test
A	Shall operate as intended. May show degradation of performance (see note 1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 2). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more). May show degradation of performance (see note 1). No unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2).

NOTE 1:
 Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.

If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2:
 No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed.

If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

Performance criteria for Continuous phenomena applied to Transmitters (CT)

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 duration for which performance criteria C 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 Criterion of EN55024

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

4.2.2. Electrostatic Discharge

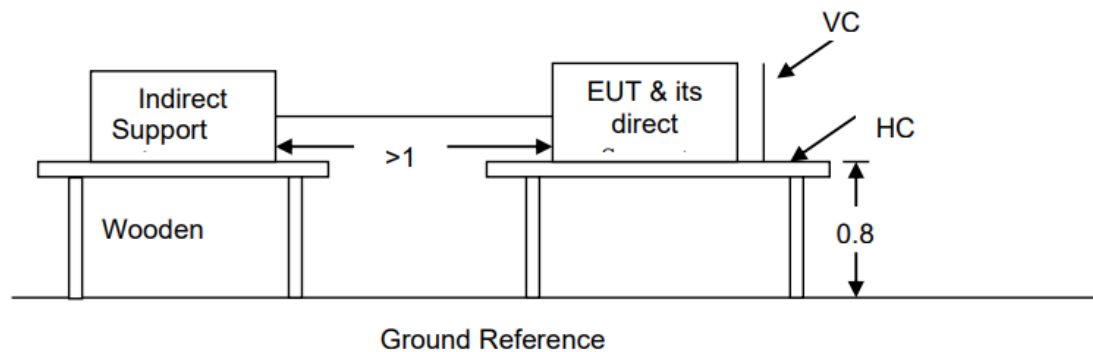
PERFORMANCE CRITERION

Criteria B

TEST LEVEL

Contact Discharge at $\pm 2\text{KV}, \pm 4\text{KV}$; Air Discharge at $\pm 2\text{KV}, \pm 4\text{KV}, \pm 8\text{KV}$

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

Contact Discharge:

The ESD generator is held perpendicular to the surface to which the discharge is applied and the tip of the discharge electrode touch the surface of EUT. Then turn the discharge switch. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Air Discharge:

Air discharge is used where contact discharge can't be applied. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Indirect discharge for horizontal coupling plane:

At least 10 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT.

Indirect discharge for vertical coupling plane:

At least 10 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

-----Passed-----

Please refer to the below test data:

Direct discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
Contact discharge	±2	No degradation in performance of the EUT was observed (A)	B	Pass
	±4		A	
Air discharge	±2	A	B	
	±4	A	B	
	±8	A	B	
Indirect discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
HCP (6 sides)	±2	A	B	Pass
	±4	A	B	
VCP (4 sides)	±2	A	B	
	±4	A	B	

Remark: The ancillary equipment's specification for an acceptable level of performance or degradation of performance during and/or after the ESD tests.

4.2.3. RF Electromagnetic Field

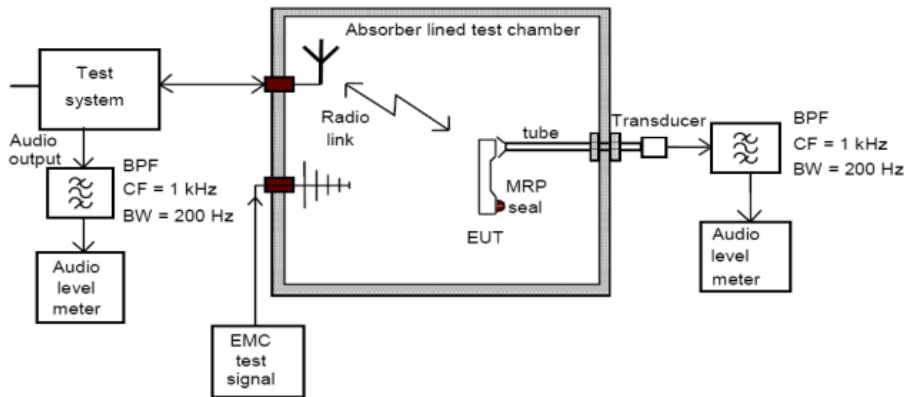
PERFORMANCE CRITERION

Criteria A

TEST LEVEL

3V/m (80%, 1kHz Amplitude Modulation)

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.2.2 and EN 61000-4-3 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

-----Passed-----

Please refer to the below test data:

● Link mode

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)	Result
80 MHz-1 GHz 1 GHz-6 GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A	Pass
			H		A	Pass
			V	Rear	A	Pass
			H		A	Pass
			V	Left	A	Pass
			H		A	Pass
			V	Right	A	Pass
			H		A	Pass
			V	Top	A	Pass
			H		A	Pass
			V	Bottom	A	Pass
			H		A	Pass

Remark: A: No degradation in performance of the EUT was observed.

4.2.4. Fast Transients Common Mode

PERFORMANCE CRITERION

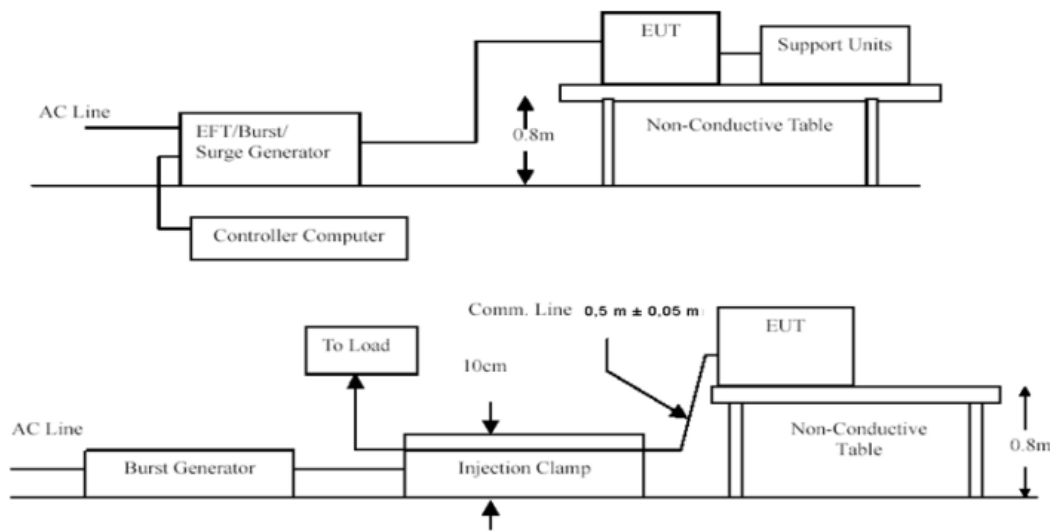
Criteria B

TEST LEVEL

1KV for AC main port

(Impulse Frequency: 5 kHz; Tr/Th: 5/50ns; Burst Duration: 15ms; Burst Period: 3Hz)

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.4.2 and EN 61000-4-4 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

-----Passed-----

Please refer to the below test data:

Lead under Test	Level (\pm kV)	Coupling Direct/Clamp	Observations (Performance Criterion)	Result
L	± 1	Direct	A	Pass
N	± 1	Direct	A	Pass
L-N	± 1	Direct	A	Pass

Remark: A: No degradation in performance of the EUT was observed.

4.2.5. Surge

PERFORMANCE CRITERION

Criteria B

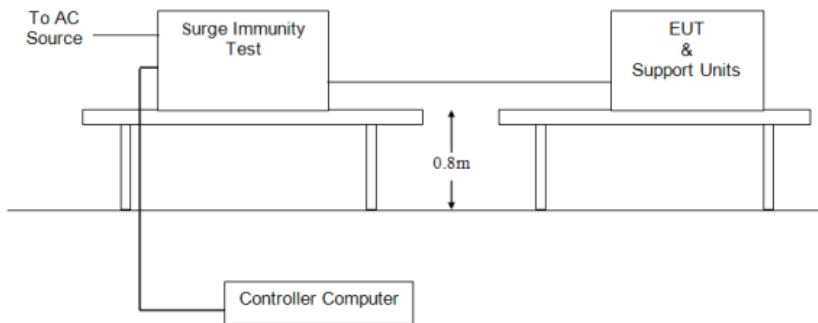
TEST LEVEL

1kV Line to Line: Differential mode

2kV Line to Ground: Common mode

(Voltage Waveform: 1.2/50 us; Current Waveform: 8/20 us)

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

-----Passed-----

Please refer to the below test data:

Location	Level(kV)	Pulse No	Surge Interval	Phase(deg)	Observations (Performance Criterion)	Result
L-N	± 1	5	60s	0°	A	Pass
				90°	A	Pass
				180°	A	Pass
				270°	A	Pass

Remark: A: No degradation in performance of the EUT was observed.

4.2.6. Radio frequency common mode

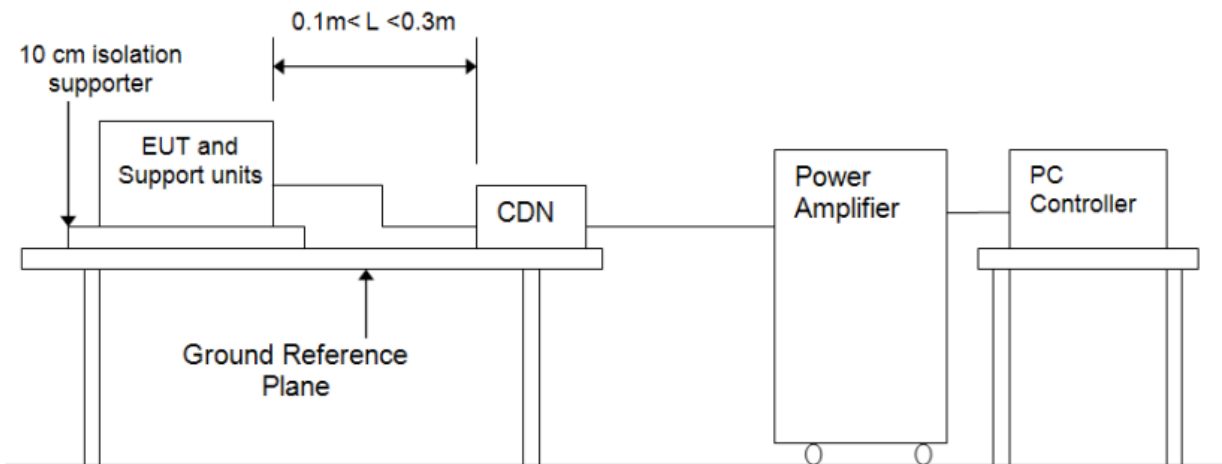
PERFORMANCE CRITERION

Criteria A

TEST LEVEL

3Vrms on AC main port (80%, 1kHz Amplitude Modulation)

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.5.2 and EN 61000-4-6 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

-----Passed-----

Please refer to the below test data:

- **Link mode**

Frequency	Injected Position	Level	Modulation	Observations (Performance Criterion)	Result
150kHz to 80MHz	AC Mains	3Vrms	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	A	Pass

Remark: A: No degradation in performance of the EUT was observed.

4.2.7. Voltage dips and interruptions

PERFORMANCE CRITERION

>95% VD, 0.5 period----Performance criterion: B

>95% VD, 1.0 period----Performance criterion: B

30% VD, 25 period----Performance criterion: C

>95% VI, 250 period----Performance criterion: C

TEST LEVEL

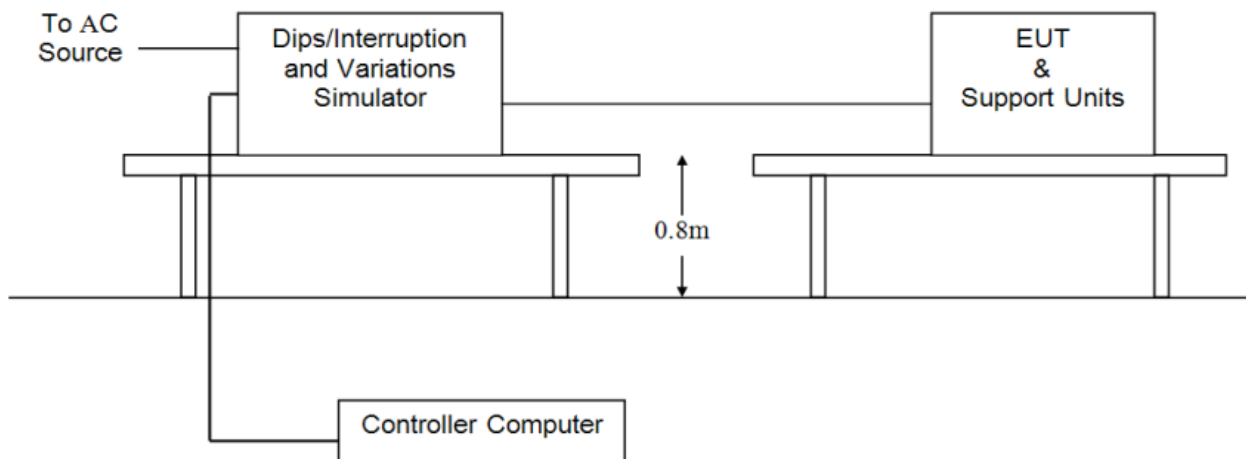
0% of VT(Supply Voltage) for 0.5 period

0% of VT(Supply Voltage) for 1.0 period

70% of VT(Supply Voltage) for 25 period

0% of VT(Supply Voltage) for 250 period

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.7.2 and EN 61000-4-11 for the measurement methods.

TEST MODE

Please reference to the section 2.3

TEST RESULTS

-----Passed-----

Please refer to the below test data:

Test Level % UT	Duration (Periods)	Phase angle	No. of drop out	Time between dropout	Observations (Performance Criterion)	Result
0	0.5	0°, 90°, 180°, 270°	3	10s	A	Pass
0	1.0	0°, 90°, 180°, 270°	3	10s	A	Pass
70	25	0°, 90°, 180°, 270°	3	10s	A	Pass
0	250	0°, 90°, 180°, 270°	3	10s	B	Pass

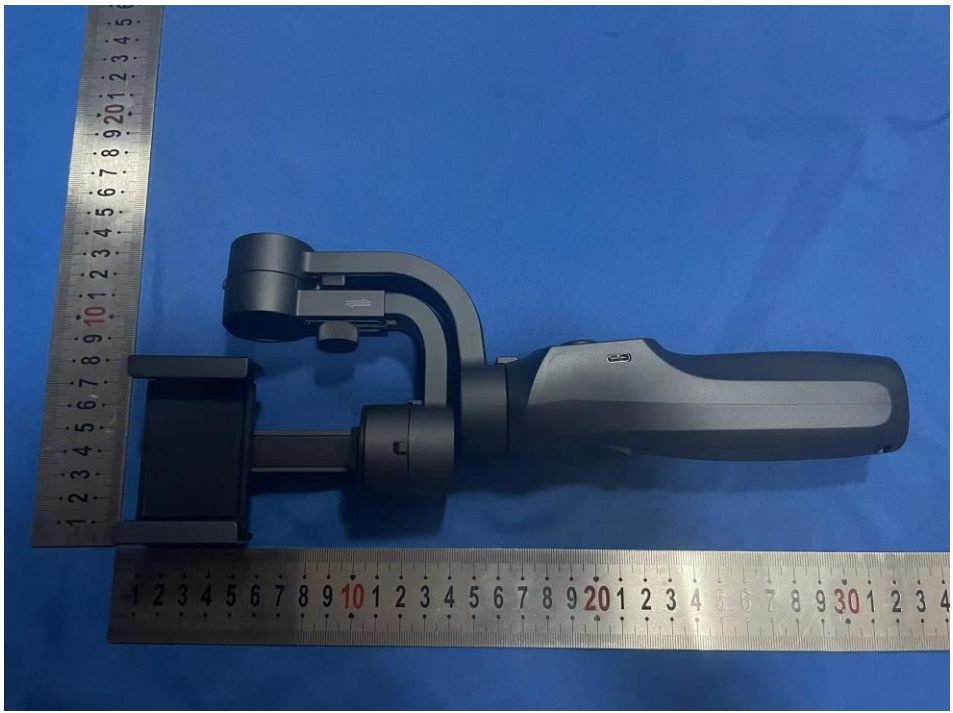
Remark :

A: No degradation in performance of the EUT was observed.

B: During the test, the power shut down, after the experiment, the function can automatically return to normal.

5. Test Setup Photos





*****END OF REPORT*****

FCC Test Report

Equipment under Test : Handheld 3-Axis Gimbal Stabilizer

Trade Name : N/A

Model /Type : F10pro

Listed Models : F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro,F9plus,F10,F10plus,F11,F11S,F11pro,F11plus,F12,F12S,F12pro,F12plus,S5,S5pro,S5B,S5Bpro,L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro

Applicant : **SIMJOY INTERNATIONAL CO., LIMITED**

Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.

Manufacturer : **SIMJOY INTERNATIONAL CO., LIMITED**

Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.

Laboratory : **Zhongchuang Compliance Service Laboratory**

Address : Floor 3, Huilian Industrial Zone, No.18, Xinhe Community Industrial South Road, Fuhai Street, Bao 'an District, Shenzhen, Guangdong

Website : <http://www.zctscine.com>

TEST RESULT CERTIFICATION

Applicant's name : **SIMJOY INTERNATIONAL CO., LIMITED**

Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.

Manufacturer's Name : **SIMJOY INTERNATIONAL CO., LIMITED**

Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.

Product description

Product name : Handheld 3-Axis Gimbal Stabilizer

Model No.: : F10pro

Standards : FCC Part 15, Subpart B
ANSI C63.4: 2014

This device described above has been tested by ZCT, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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Date of Test.....

Date (s) of performance of tests May 24 to May 31, 2023

Date of Issue May 31, 2023

Test Result Pass

Compiled by:

Mary Peng

Mary Peng

Reviewed by:

Jack Luo

Jack Luo

Approved by:

Harry Wang

Harry Wang/Manager



This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Zhongchuang Compliance Service Laboratory



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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B: November 12, 2020	Conducted Emission	Class B	N/A	
	Radiated Emission	Class B	PASS	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

Zhongchuang Compliance Service Laboratory

1.2 Floor 3, Huilian Industrial Zone, No.18, Xinhe Community Industrial South Road, Fuhai Street, Bao 'an District, Shenzhen, Guangdong

1.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$ · where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$ · providing a level of confidence of approximately **95** %.

Test Item	Uncertainty
Conducted Emission	2.6dB
Radiated Emission(Below 1G)	4.56dB(distance:3m; Polarize:V)
	4.42dB(distance:3m; Polarize:H)
Radiated Emission(1GHz-18GHz)	3.78dB(distance:3m; Polarize:V)
	3.69dB(distance:3m; Polarize:H)

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Handheld 3-Axis Gimbal Stabilizer				
Brand	N/A				
Model Name	F10pro				
Additional Model Number(s)	F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro,F9plus,F10,F10plus ,F11,F11S,F11pro,F11plus,F12,F12S,F12pro,F12plus,S5,S5pro, S5B,S5Bpro,L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro				
Model Difference	It's just the difference in appearance, the scheme and function are the same				
Product Description	<p>The EUT is a Handheld 3-Axis Gimbal Stabilizer</p> <table border="1" data-bbox="507 878 1297 947"> <tr> <td>oscillator frequency:</td> <td>N/A</td> </tr> <tr> <td>Connecting I/O port:</td> <td>N/A</td> </tr> </table> <p>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</p>	oscillator frequency:	N/A	Connecting I/O port:	N/A
oscillator frequency:	N/A				
Connecting I/O port:	N/A				
Power Rating	DC5V 1A				

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

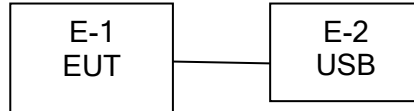
Pretest Mode	Description
Mode 1	USB

For Conducted Test	
Final Test Mode	Description
Mode 1	USB

For Radiated Test	
Final Test Mode	Description
Mode 1	USB

2.3 DESCRIPTION OF TEST SETUP

Mode 1:



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	EUT	N/A	F10PRO	N/A	EUT
E-2	USB	N/A	JU2300-L	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

2.5 MEASUREMENT INSTRUMENTS LIST

2.5.1 CONDUCTED TEST SITE

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	LISN	R&S	ENV216	201334	Apr. 2,2023	Apr. 1,2024	1 year
2	LISN	SCHWARZBECK	NNLK 8129	8129267	Apr. 2,2023	Apr. 1,2024	1 year
3	Pulse Limiter	SCHWARZBECK	VTSD 9561F	9716	Apr. 2,2023	Apr. 1,2024	1 year
4	50Ω Antenna Factor	ANRITSU CORP	MP59B	6200983704	Apr. 2,2023	Apr. 1,2024	1 year
5	Test Cable	N/A	C01	N/A	Apr. 2,2023	Apr. 1,2024	1 year
6	Test Cable	N/A	C02	N/A	Apr. 2,2023	Apr. 1,2024	1 year
7	Test Cable	N/A	C03	N/A	Apr. 2,2023	Apr. 1,2024	1 year
8	EMI Test Receiver	R&S	ESCI	201318	Apr. 2,2023	Apr. 1,2024	1 year
9	Passive Voltage Probe	ES201-Z3	R&S	100173	Apr. 2,2023	Apr. 1,2024	1 year
10	Triple-Loop Antenna	EVERFINE	LIA-2	11020016	Apr. 2,2023	Apr. 1,2024	1 year
11	Absorbing Clamp	R&S	MDS-21	100423	Apr. 2,2023	Apr. 1,2024	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Bilog Antenna	TESEQ	CBL6111D	31437	Apr. 2,2023	Apr. 1,2024	1 year
2	Test Cable	N/A	R-01	N/A	Apr. 2,2023	Apr. 1,2024	1 year
3	Test Cable	N/A	R-02	N/A	Apr. 2,2023	Apr. 1,2024	1 year
4	EMI Test Receiver	Rohde&Schwarz	ESVD	847312/008	Apr. 2,2023	Apr. 1,2024	1 year
5	Antenna Mast	EM	SC100_1	N/A	N/A	N/A	N/A
6	Turn Table	EM	SC100	060533	N/A	N/A	N/A
7	50Ω Antenna Factor	Anritsu Corp	MP59B	6200983705	Apr. 2,2023	Apr. 1,2024	1 year
8	Spectrum Analyzer	Agilent	E4407B	160400005	Apr. 2,2023	Apr. 1,2024	1 year
9	Horn Antenna	EM	EM-AH-20180	2011071402	Apr. 2,2023	Apr. 1,2024	1 year
10	Amplifier	EM	EM-30180	060536	Apr. 2,2023	Apr. 1,2024	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

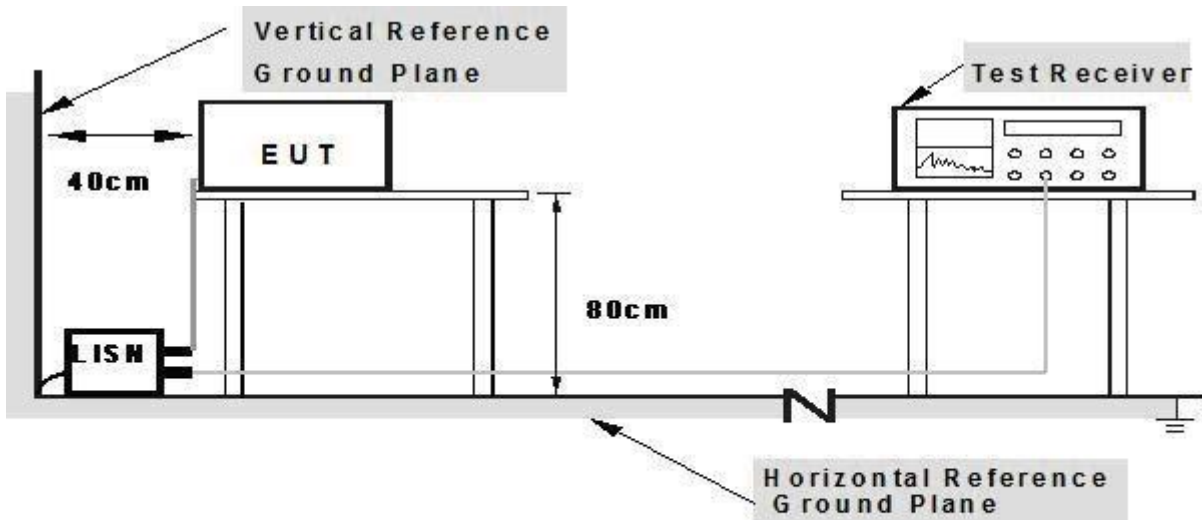
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.1.3 TEST SETUP



- Note: 1. Support units were connected to second LISN.**
2. Both of LISN s (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.5 TEST RESULTS

EUT :	Handheld 3-Axis Gimbal Stabilizer	Model Name. :	F10pro
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	N/A
Test Mode :	N/A	Phase :	N/A
Test Voltage :	N/A		

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

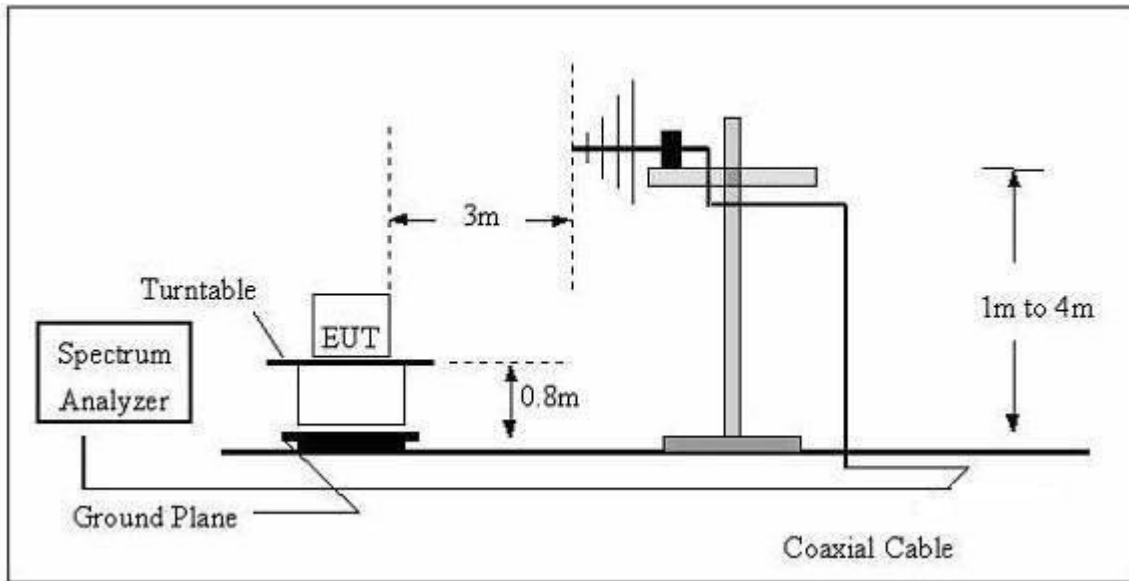
- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

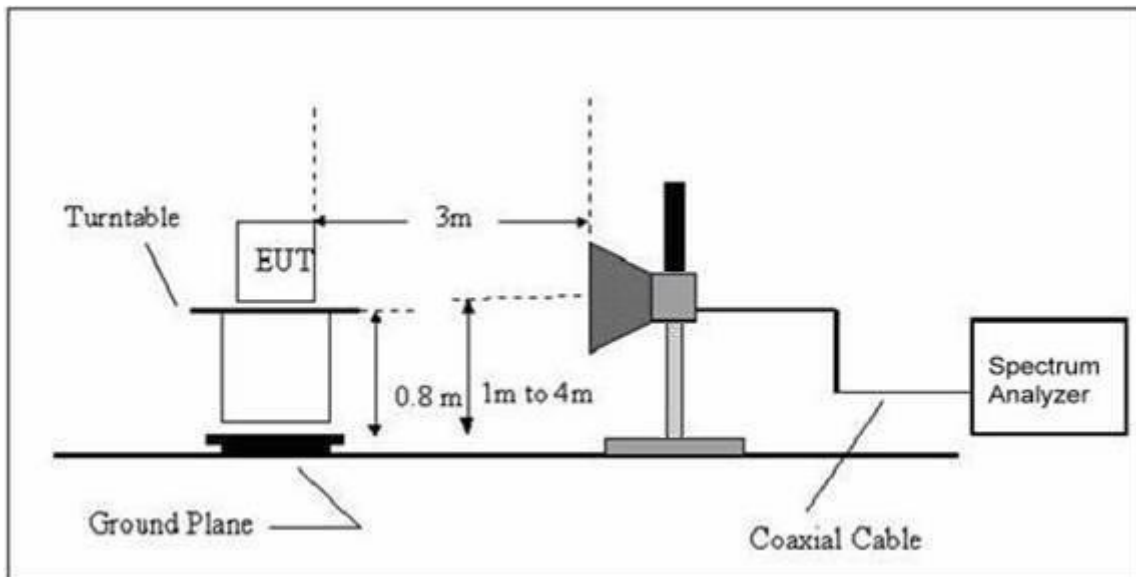
- a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



3.2.4 EUT OPERATING CONDITIONS

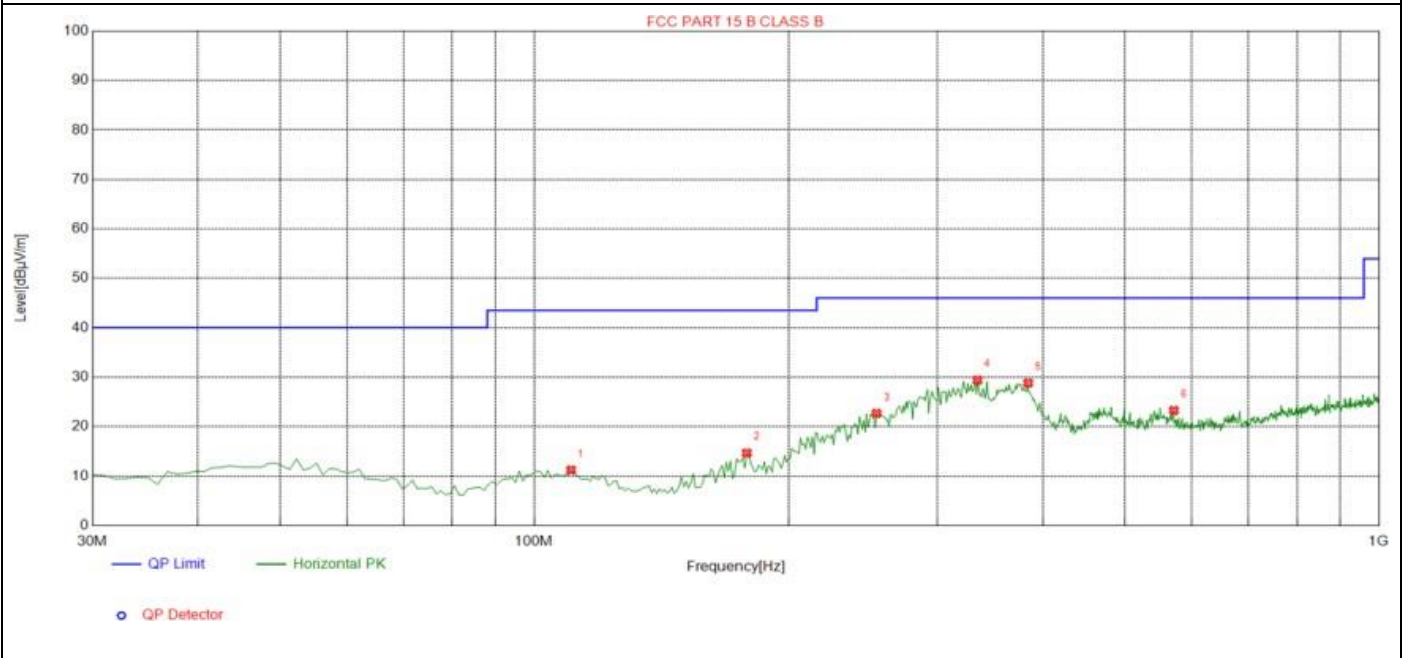
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 TEST RESULTS

EUT :	Handheld 3-Axis Gimbal Stabilizer	Model Name :	F10pro
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2023-05-29
Test Mode :	USB	Polarization :	Horizontal
Test Power :	DC 5V		

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Antenna Factor + Cable Loss.
3. N/A means All Data have pass Limit

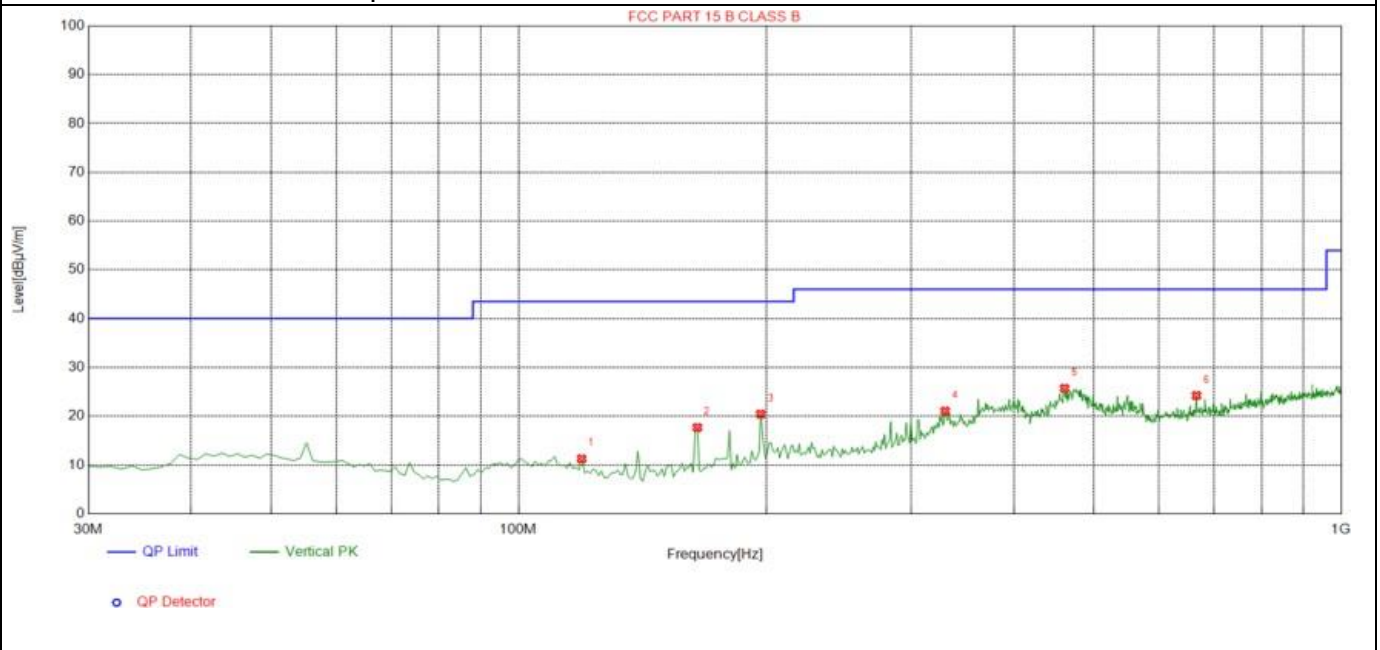


Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	110.5906	-15.53	26.73	11.20	43.50	32.30	100	12	Horizontal
2	178.5586	-16.92	31.57	14.65	43.50	28.85	100	317	Horizontal
3	254.2943	-13.45	36.14	22.69	46.00	23.31	100	317	Horizontal
4	334.8849	-11.61	41.02	29.41	46.00	16.59	100	317	Horizontal
5	384.4044	-10.75	39.57	28.82	46.00	17.18	100	333	Horizontal
6	571.8018	-6.43	29.70	23.27	46.00	22.73	100	305	Horizontal

EUT :	Handheld 3-Axis Gimbal Stabilizer	Model Name :	F10pro
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2023-05-29
Test Mode :	USB	Polarization :	Vertical
Test Power :	DC 5V		

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Antenna Factor + Cable Loss.
3. N/A means All Data have pass Limit



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	119.3293	-16.99	28.24	11.25	43.50	32.25	100	157	Vertical
2	164.9650	-17.76	35.43	17.67	43.50	25.83	100	243	Vertical
3	197.0070	-15.34	35.77	20.43	43.50	23.07	100	282	Vertical
4	330.0300	-11.59	32.63	21.04	46.00	24.96	100	246	Vertical
5	461.1111	-8.63	34.35	25.72	46.00	20.28	100	10	Vertical
6	666.9570	-4.75	29.00	24.25	46.00	21.75	100	1	Vertical



3.2.6 TEST RESULTS(Above 1GHz)

EUT :	Handheld 3-Axis Gimbal Stabilizer	Model Name :	F10pro
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2023-05-29
Test Mode :	N/A	Polarization :	N/A
Test Power :	N/A		

4. LABELING REQUIREMENTS

(a) In addition to the requirements in part 2 of this chapter, a device subject to certification, or Supplier's Declaration of Conformity shall be labeled as follows:

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under part 73 of this chapter, land mobile operation under part 90 of this chapter, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector Antenna Factor shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

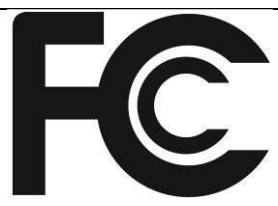
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When the device is so small or for such use that it is impracticable to label it with the statement specified under paragraph (a) of this section in a font that is four-point or larger, and the device does not have a display that can show electronic labeling, then the information required by this paragraph shall be placed in the user manual and must also either be placed on the device packaging or on a removable label attached to the device.

(b)-(c) [Reserved]

(d) Consumer electronics TV receiving devices, including TV receivers, videocassette recorders, and similar devices, that incorporate features intended to be used with cable television service, but do not fully comply with the technical standards for cable ready equipment set forth in §15.118, shall not be marketed with terminology that describes the device as "cable ready" or "cable compatible," or that otherwise conveys the impression that the device is fully compatible with cable service. Factual statements about the various features of a device that are intended for use with cable service or the quality of such features are acceptable so long as such statements do not imply that the device is fully compatible with cable service. Statements relating to product features are generally acceptable where they are limited to one or more specific features of a device, rather than the device as a whole. This requirement applies to consumer TV receivers, videocassette recorders and similar devices manufactured or imported for sale in this country on or after October 31, 1994.

	<p>This device complies with part 15 of the FCC Rules for use with cable television service.</p> <p>This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.</p>
--	---

5. ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1



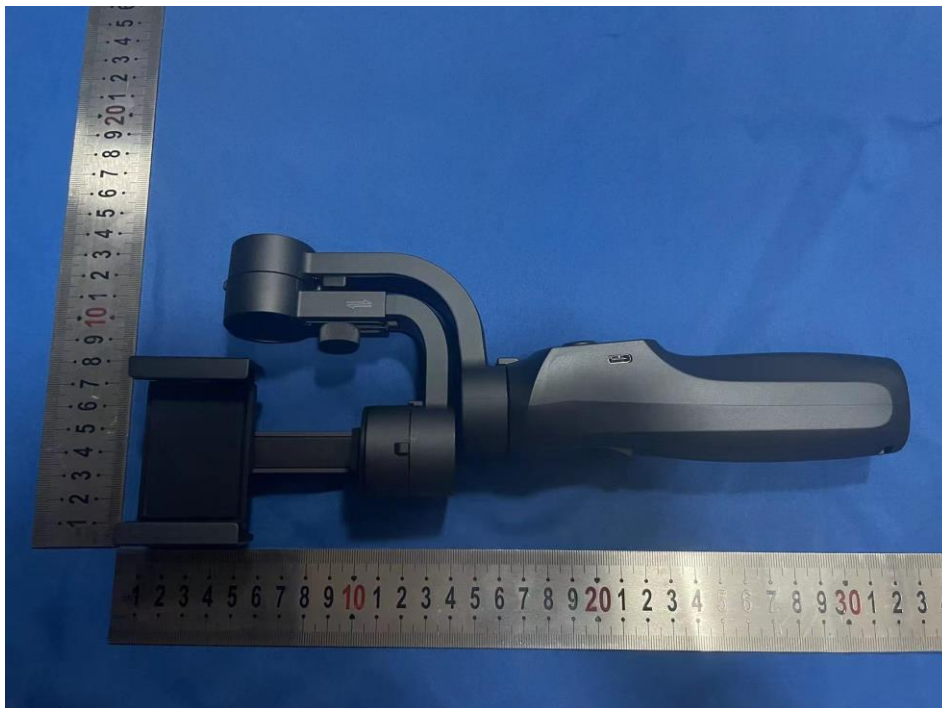
Photo 2



Photo 3



Photo 4



*****END OF REPORT*****

Zhongchuang Compliance Service Laboratory

Floor 3, Huilian Industrial Zone, No.18, Xinhe Community Industrial South Road, Fuhai Street, Bao'an District, Shenzhen, Guangdong

cunwang163@gmail.com

<http://www.zctscine.com>

Certificate of Conformity

Certificate No. : ZCS2023053101
Product : Handheld 3-Axis Gimbal
Brand Name : N/A
Model Name : F10pro
Series Model : F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro,F9plus,F10,F10plus,F11,F11S,F11pro,F11plus,F12,F12S,F12pro,F12plus,S5,S5pro,S5B,S5Bpro,L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro
Holder : SIMJOY INTERNATIONAL CO., LIMITED
Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.
Manufacturer : SIMJOY INTERNATIONAL CO., LIMITED
Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.
Report No. : ZCT20230531F01
Applied Standards : FCC Part 15 SUBPART B
ANSI C63.4: 2014

The certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical report is at the applicant disposal. This is to certify the tested sample that is in conformity with all provisions of above FCC standard. It is only valid in connection with the test report number ZCT20230531F01

The certificate does not imply the assessment of the production and does not permit using the ZCT's logo without permission



Approved by: Harry Wang

MAY 31, 2023

HARRY WANG/Technical Director





TEST REPORT

ETSI EN 300 328 V2.2.2 (2019-07)

Product : Handheld 3-Axis Gimbal Stabilizer
Model Name : F10pro(Additional models are as follows)
Brand : N/A
Report No. : ZCT20230531R02

Prepared for

SIMJOY INTERNATIONAL CO., LIMITED

A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.

Prepared by

Zhongchuang Compliance Service Laboratory

Floor 3, Huilian Industrial Zone, No.18, Xinhe Community Industrial South Road, Fuhai Street, Bao 'an District, Shenzhen, Guangdong, China



Additional models are as follows:

F3

F5,F5S,F5pro,F5plus,

F6,

F8,

F9,F9S,F9pro,F9plus

F10,F10plus

F11,F11S,F11pro,F11plus

F12,F12S,F12pro,F12plus

S5,S5pro,S5B,S5Bpro

L7Bpro,L7Bplus,L7Cpro,L7Cplus

L9,L9pro

1 TEST RESULT CERTIFICATION

Applicant's name : SIMJOY INTERNATIONAL CO., LIMITED

Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.Guangdong, China

Manufacture's name : SIMJOY INTERNATIONAL CO., LIMITED

Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen,Guangdong, China

Product name : Handheld 3-Axis Gimbal Stabilizer

Model name : F10pro(Additional models are as follows)

This device described above has been tested by ZCT, and the test results show that the equipment under test (EUT) is in compliance with the 2014/53/EU RED Directive Art.3.2 requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of ZCT, this document may be altered or revised by ZCT, personal only, and shall be noted in the revision of the document.

Date of Test

Date (s) of performance of tests: May 23, 2023 to May 31, 2023

Date of Issue: May 31, 2023

Test Result: **Pass**

Test Engineer:

Jack Luo/ Engineer

Jack Luo

Technical Manager:

Mary Peng / Manager

Mary Peng





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2 Test Summary

For Bluetooth BR/EDR

Clause (EN 300 328)	Test Parameter	Verdict	Remark
4.3.1.2	RF Output Power	PASS	
4.3.1.3	Duty Cycle and Tx-Sequence and Tx-Gap	N/A (See Note1)	Only applicable for non-adaptive equipment Output Power >10dBm
4.3.1.4	Accumulated Transmit Time, Frequency Occupation	PASS	
4.3.1.4	Hopping Frequency Sequence	PASS	
4.3.1.5	Hopping Frequency Separation	PASS	
4.3.1.6	Medium Utilisation Factor	N/A (See Note1)	Only applicable for non-adaptive equipment Output Power >10dBm
4.3.1.7	Adaptivity (Adaptive Frequency Hopping)	N/A (See Note1)	Only applicable for adaptive equipment Output Power >10dBm
4.3.1.8	Occupied Channel Bandwidth	PASS	
4.3.1.9	Transmitter Unwanted Emission in the out-of Band	PASS	
4.3.1.10	Transmitter Unwanted Emissions in the Spurious Domain	PASS	
4.3.1.11	Receiver Spurious Emissions	PASS	
4.3.1.12	Receiver Blocking	PASS	
4.3.1.13	Geo-location capability	N/A (See Note1)	Only applicable for have Geo-location function equipment
<p>NOTE1: N/A means not applicable</p> <p>NOTE2: Receiver category 1(Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p. shall be considered as receiver category 1 equipment.) Receiver category 2(Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment with a maximum RF output power of 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment.) Receiver category 3(Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment with a maximum RF output power of 0 dBm e.i.r.p. shall be considered as receiver category 3 equipment.)</p>			

For BLE

Clause (EN 300 328)	Test Parameter	Verdict	Remark
4.3.2.2	RF Output Power	PASS	
4.3.2.3	Power Spectral Density	PASS	
4.3.2.4	Duty Cycle and Tx-Sequence and Tx-Gap	N/A (See Note1)	Only applicable for non-adaptive equipment Output Power >10dBm
4.3.2.5	Medium Utilisation Factor	N/A (See Note1)	Only applicable for non-adaptive equipment Output Power >10dBm
4.3.2.6	Adaptivity (adaptive equipment using modulations other than FHSS)	N/A (See Note1)	Only applicable for non-adaptive equipment Output Power >10dBm
4.3.2.7	Occupied Channel Bandwidth	PASS	
4.3.2.8	Transmitter Unwanted Emission in the Out-of Band	PASS	
4.3.2.9	Transmitter Unwanted Emissions in the Spurious Domain	PASS	
4.3.2.10	Receiver Spurious Emissions	PASS	
4.3.2.11	Receiver Blocking	PASS	
4.3.2.12	Geo-location capability	N/A (See Note1)	Only applicable for have Geo-location function equipment
<p>NOTE1: N/A means not applicable</p> <p>NOTE2: Receiver category 1(Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p. shall be considered as receiver category 1 equipment.)</p> <p>Receiver category 2(Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment with a maximum RF output power of 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment.)</p> <p>Receiver category 3(Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment with a maximum RF output power of 0 dBm e.i.r.p. shall be considered as receiver category 3 equipment.)</p>			

3 General Information

3.1 GeneralDescription of E.U.T.

Product Name	:	Handheld 3-Axis Gimbal Stabilizer
Model Name	:	F10pro,F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro, F9plus F10,F10plus,F11,F11S,F11pro,F11plus,F12,F12S, F12pro,F12plus,S5,S5pro,S5B,S5Bpro,L7Bpro,L7Bplus L7Cpro,L7Cplus,L9,L9pro
Bluetooth Version	:	BT 4.2 Dual Mode
Operating frequency	:	2402-2480MHz
Numbers of Channel	:	79 channels For BT 40 Channels For BLE
Antenna Type	:	Internal PCB Antenna
Antenna Gain	:	-0.68 dBi
Type of Modulation	:	GFSK, $\pi/4$ -DQPSK, 8DPSK For BT GFSK For BLE
Power supply	:	220-240Vac,50/60Hz
Hardware Version	:	/
Software Version	:	/

Note:

For more details, please refer to the User's manual of the EUT.

BT-CM means Bluetooth BR/EDR

BT-LE means Bluetooth Low Energy

3.2 Channel List

For Bluetooth BR/EDR:

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	-	-

Bluetooth BR/EDR Test Frequency and channel:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	39	2441	78	2480



For BLE

Frequency Band	Channel Number	Frequency
2400~2483.5MHz	0	2402MHz
	1	2404MHz
	:	:
	38	2478 MHz
	39	2480 MHz

BLE Test Frequency and channel:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	19	2440	39	2480

4 Equipment During Test

4.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	MY56070279	Apr. 01, 2024
MIMO4TX-1	/	MIMO4TX	TW5451101	Apr. 01, 2024
MXG Vector Signal Generator	Agilent	N5182A	MY50143410	Apr. 01, 2024
MXG Analog Signal Generator	ZCTIGHT	N5181B	MY53050432	Apr. 01, 2024
Power Meter	R&S	OSP 120	26591986	Apr. 01, 2024

Radiated Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	Apr. 01, 2024
Bilog Antenna	SCHWARZBECK	VULB9168	9168-572	Apr. 01, 2024
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	Apr. 01, 2024
Spectrum Analyzer	Agilent	E4407B	MY45109572	Apr. 01, 2024
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	Apr. 01, 2024
LOW NOISE AMPLIFIER	ZHINAN	ZN3380C	15002	Apr. 01, 2024

4.2 Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5dB
Power Spectral Density, conducted	±3dB
Unwanted Emissions, conducted	±3dB
All emissions, radiated	±6dB
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conduction disturbance(150kHz~30MHz)	±3.26dB
Radiated Emission(30MHz~1GHz)	±4.76dB
Radiated Emission(1GHz~25GHz)	±5.39dB

5 RF Requirements

1. Normal Test Conditions:

Ambient Condition: 230V, 25°C

2. Extreme Test Conditions:

Extreme Temperature: -20°C to +50°C;

For tests at extreme temperatures, measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer.

Test Conditions	Normal	LTLV	HTHV
Temperature (°C)	25	-20	50
Voltage (V)	230V	230V	230V

3. 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.

Modulation	Test mode	Low channel	Middle channel	High channel
GFSK	Transmitting	2402MHz	2441MHz	2480MHz
GFSK	Receiving	2402MHz	2441MHz	2480MHz
$\pi/4$ DQPSK	Transmitting	2402MHz	2441MHz	2480MHz
$\pi/4$ DQPSK	Receiving	2402MHz	2441MHz	2480MHz
8DPSK	Transmitting	2402MHz	2441MHz	2480MHz
8DPSK	Receiving	2402MHz	2441MHz	2480MHz
GFSK(BLE)	Transmitting	2402MHz	2440MHz	2480MHz
GFSK(BLE)	Receiving	2402MHz	2440MHz	2480MHz

4. Additional Information

EN 300 328	Information Is Provided By The Manufacturer			
The Type Of Modulation Used By The Equipment	<input checked="" type="checkbox"/> FHSS <input type="checkbox"/> other forms of modulation			
In Case Of FHSS Modulation:	<input checked="" type="checkbox"/> In case of non-Adaptive Frequency Hopping equipment The number of Hopping Frequencies:79 <input type="checkbox"/> In case of Adaptive Frequency Hopping Equipment The maximum number of Hopping Frequencies: The minimum number of HoppingFrequencies:			
Adaptive/non-adaptive equipment:	<input checked="" type="checkbox"/> non-adaptive Equipment			
	<input type="checkbox"/> adaptive Equipment without the possibility to switch to a non-adaptive mode			
	<input type="checkbox"/> adaptive Equipment which can also operate in a non-adaptive mode			
In case of adaptive equipment:	The maximum Channel Occupancy Time implemented by the equipment: 58ms			
	<input type="checkbox"/> The equipment has implemented an LBT based DAA mechanism case of equipment using modulation different from FHSS: <input type="checkbox"/> The equipment is Frame Based equipment <input type="checkbox"/> The equipment is Load Based equipment <input type="checkbox"/> The equipment can switch dynamically between Frame Based and Load Based equipment The CCA time implemented by the equipment:			
	<input type="checkbox"/> The equipment has implemented an non-LBT based DAA mechanism <input type="checkbox"/> The equipment can operate in more than one adaptive mode			
The Worst Case Operational Mode For Each Of The Following Tests:		BLE	BT	Unit
	RF Output Power	1.36	0.48	dBm
	Power Spectral Density	-4.11	N/A	dBm/MHz
	Duty Cycle, Tx-Sequence, Tx-gap.	N/A	N/A	
	Accumulated Transmit time, Frequency Occupation & Hopping Sequence (only for FHSS equipment)	N/A	PASS	
	Hopping Frequency Separation (only for FHSS equipment)	N/A	1000	KHz
	Medium Utilisation.	N/A	N/A	
	Adaptivity	N/A	N/A	
	Receiver Blocking.	PASS	PASS	
Nominal Channel Bandwidth	1.136	1.103	MHz	

	<p>Transmitter Unwanted Emissions in the OOB domain. PASS PASS</p> <p>Transmitter Unwanted Emissions in the spurious domain PASS PASS</p> <p>Receiver spurious emissions PASS PASS</p>
The Different Transmit Operating Modes (Tick All That Apply):	<p><input checked="" type="checkbox"/> Operating mode 1: Single Antenna Equipment</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Equipment with only 1 antenna <input type="checkbox"/> Equipment with 2 diversity antennas but only 1 antenna active at any moment in time <input type="checkbox"/> Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1 antenna is used. (e.g. IEEE 802.11™ [i.3] legacy mode in smart antenna systems)
	<p><input type="checkbox"/> Operating mode 2: Smart Antenna Systems - Multiple Antennas without beam forming</p> <ul style="list-style-type: none"> <input type="checkbox"/> Single spatial stream / Standard throughput / (e.g. IEEE 802.11™ [i.3] legacy mode) <input type="checkbox"/> High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1 <input type="checkbox"/> High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2
	<p><input type="checkbox"/> Operating mode 3: Smart Antenna Systems - Multiple Antennas with beam forming</p> <ul style="list-style-type: none"> <input type="checkbox"/> Single spatial stream / Standard throughput (e.g. IEEE 802.11™ [i.3] legacy mode) <input type="checkbox"/> High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1 <input type="checkbox"/> High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2
Operating Frequency Range(S) Of The Equipment:	2402 MHz to 2480 MHz
Nominal Channel Bandwidth(s):	Occupied Channel Bandwidth: 1.136MHz
Type of Equipment (stand-alone, combined, plug-in radio device, etc.):	<p><input checked="" type="checkbox"/> Stand-alone</p> <p><input type="checkbox"/> Combined Equipment (Equipment where the radio part is fully integrated within another type of equipment)</p> <p><input type="checkbox"/> Plug-in radio device (Equipment intended for a variety of host systems)</p> <p><input type="checkbox"/> Other</p>
Describe the test modes available which can facilitate testing:	For Bluetooth BR/EDR: Modulation Mode: GFSK, $\pi/4$ -DQPSK, 8DPSK



	For BLE: Modulation Mode: GFSK Test Frequency: Low Frequency, Middle Frequency, High Frequency
The equipment type (e.g. Bluetooth®, IEEE 802.11™ [i.3], proprietary, etc.):	Bluetooth Classical, BLE
NOTE:N/A means not applicable	

5.1 RF Output power

5.1.1 Definition

The RF output power is defined as the mean equivalent isotropically radiated power (e.i.r.p.) of the equipment during a transmission burst.

5.1.2 Limit

The maximum RF output power for adaptive Frequency Hopping equipment shall be equal to or less than 20dBm. The maximum RF output power for non-adaptive Frequency Hopping equipment, shall be declared by the supplier. See clause 5.3.1 m). The maximum RF output power for this equipment shall be equal to or less than the value declared by the supplier. This declared value shall be equal to or less than 20dBm. This limit shall apply for any combination of power level and intended antenna assembly.

5.1.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

5.1.4 Test Procedure

1. Use a fast power sensor suitable for 2,4 GHz and capable of 1 MS/s.
2. Use the following settings:
 - Sample speed 1 MS/s.
 - The samples represent the RMS power of the signal.
 - Measurement duration: For non-adaptive equipment: equal to the observation period defined in clauses 4.3.1.2.1 or 4.3.2.3.1. 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.
3. 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.
4. 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 half the time between two samples.
 - For each instant in time, sum the power of the individual samples of all ports and store them. Use these stored samples in all following steps.
5. Find the start and stop times of each burst in the stored measurement samples.

NOTE 2: The start and stop times are defined as the points where the power is at least 20 dB below the RMS burst power calculated in step 5.
6. Between the start and stop times of each individual burst calculate the RMS power over the burst. Save these burst values, as well as the start and stop times for each burst.
7. The highest of all Pburst values (value "A" in dBm) will be used for maximum e.i.r.p. calculations.
8. Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.
9. If applicable, add the additional beamforming gain "Y" in dB.
10. If more than one antenna assembly is intended for this power setting, the maximum overall antenna gain (G or G + Y) shall be used.

11. The RF Output Power (P) shall be calculated using the formula below: $P = A + G + Y$
12. This value, which shall comply with the limit given in clauses 4.3.1.1.2 or 4.3.2.1.2, shall be recorded in the test report.

5.1.5 Measurement Record

For Bluetooth BR/EDR:

Test Condition		Transmitter Power(dBm)		
		Temp (25°C)	Temp (-20°C)	Temp (50°C)
Modulation	VOLT	230V	230V	230V
	Power			
GFSK	RMS	0.48	0.44	0.42
$\pi/4$ -DQPSK	RMS	0.33	0.39	0.38
8DPSK	RMS	0.38	0.32	0.31
Limit		<= 20dBm		
Verdict		PASS	PASS	PASS

For BLE:

Test Conditions			Transmitter Power (dBm)		
			Temp (25°C)	Temp (-20°C)	Temp (50°C)
MODES	CHANNEL	VOLT POWER	230V	230V	230V
GFSK	2402 MHz	RMS	1.36	1.31	1.28
	2440 MHz	RMS	1.22	1.20	1.18
	2480 MHz	RMS	1.18	1.14	1.04
Limit			<= 20dBm		
Verdict			PASS	PASS	PASS

5.2 POWER SPECTRAL DENSITY

5.2.1 Applicable standard

According to ETSI EN 300 328 clause 4.3.2.3.2, this requirement applies to all types of equipment using wide band modulations other than FHSS.

5.2.2 Conformance Limit

The Power Spectral Density is the mean equivalent isotropically radiated power(e.i.r.p) spectral density in a 1MHz bandwidth during a transmission burst.

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

5.2.3 Test Procedure

The transmitter shall be connected to a spectrum analyser and the Power Spectral Density as defined in clause 4.3.2.3 shall be measured and recorded.

The test procedure shall be as follows:

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; for spectrum analysers not supporting this number of sweep points, the frequency band may be segmented
- Detector: RMS
- Trace Mode: Max Hold
- Sweep time: For non-continuous transmissions: $2 \times \text{Channel Occupancy Time} \times \text{number of sweep points}$
For continuous transmissions: 10 s; the sweep time may be increased further until a value where the sweep time has no further impact anymore 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 5.3.2.2), 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 $P_{Samplecorr}(n)$ (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 (PSD) 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.

5.2.4 Test Results

For BLE

Test Condition		Measured Data (dBm/MHz)	Limit (dBm/MHz)	Verdict
<input checked="" type="checkbox"/> GFSK	2402MHz	-4.11	≤ 10	PASS
	2440 MHz	-5.32	≤ 10	PASS
	2480 MHz	-6.08	≤ 10	PASS

5.3 ACCUMULATED TRANSMIT TIME, FREQUENCY OCCUPATION

5.3.1 Applicable standard

ETSI EN 300 328 clause 4.3.1.4

5.3.2 Conformance Limit

The requirement applies to all types of frequency hopping equipment.

- For non-adaptive frequency hopping system

The Accumulated Transmit Time on any hopping frequency shall not be greater than 15 ms within any observation period of 15 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 $((1 / U) \times 25 \%)$ and 77 % where U is the number of hopping frequencies in use.

- For adaptive frequency hopping system

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 $((1 / U) \times 25 \%)$ and 77 % where U is the number of hopping frequencies in use.

5.3.3 Test Configuration

The measurements for dwell time shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

5.3.4 Test Procedure

1. Please refer to ETSI EN 300 328 (V2.1.1) clause 5.4.4.1 for the test conditions.
2. Please refer to ETSI EN 300 328 (V2.1.1) clause 5.4.4.2 for the measurement method.

The test procedure shall be as follows:

■ Conducted measurements

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: \geq 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:

This step is only applicable for equipment implementing Option 1 in clause 4.3.1.4.3.1 or Option 1 in 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: $4 \times \text{Dwell Time} \times \text{Actual number of hopping frequencies in use}$.

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, Option 1 or clause 4.3.1.4.3.2, Option 1. 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: \geq RBW
 - Detector Mode: RMS
 - Sweep time: 1 s; this setting may result in long measuring times. To avoid such long measuring times, an FFT analyser may be used
 - Trace Mode: Max Hold
 - Trigger: Free Run
- 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 frequency hopping equipment, it shall be verified whether the equipment uses 70 % of the band specified in table 1. This verification can be done using the lowest and highest -20 dB points from the total spectrum envelope obtained in step 6. The result shall be recorded in the test report.

■ Radiated measurements

A test site as described in annex B and applicable measurement procedures as described in annex C may be used. Alternatively, a test fixture may be used.

The test procedure is further as described under clause 5.4.4.2.1.

5.3.5 Test Results

For Bluetooth BR/EDR

TEST CONDITION (Hopping Mode)			Accumulated Transmit Time (ms)	Limited (ms)	Verdict
GFSK	2402MHz	DH1	131.23	<=400	PASS
	2480MHz		131.21		
	2402MHz	DH3	265.17	<=400	PASS
	2480MHz		265.24		
	2402MHz	DH5	310.23	<=400	PASS
	2480MHz		310.18		
π/4-DQPSK	2402MHz	2DH1	131.04	<=400	PASS
	2480MHz		131.28		
	2402MHz	2DH3	265.34	<=400	PASS
	2480MHz		265.62		
	2402MHz	2DH5	310.23	<=400	PASS
	2480MHz		310.58		
8DPSK	2402MHz	3DH1	131.31	<=400	PASS
	2480MHz		131.24		
	2402MHz	3DH3	265.53	<=400	PASS
	2480MHz		265.12		
	2402MHz	3DH5	310.44	<=400	PASS
	2480MHz		310.45		
NOTE: N/A means not applicable					

TEST CONDITION (Hopping Mode)			Minimum Accumulated Transmit Time		Limit (pcs)	Verdict
			(ms)	(pcs)		
GFSK	2402MHz	DH1	0.39	1	1 ~ 4	PASS
	2480MHz		0.38	1		
	2402MHz	DH3	4.92	3	1 ~ 4	PASS
	2480MHz		3.3	2		
	2402MHz	DH5	8.7	3	1 ~ 4	PASS
	2480MHz		8.7	3		
$\pi/4$ -DQPSK	2402MHz	2DH1	0.37	1	1 ~ 4	PASS
	2480MHz		0.39	1		
	2402MHz	2DH3	4.14	3	1 ~ 4	PASS
	2480MHz		3.3	2		
	2402MHz	2DH5	8.73	3	1 ~ 4	PASS
	2480MHz		8.74	3		
8DPSK	2402MHz	3DH1	0.38	1	1 ~ 4	PASS
	2480MHz		0.14	1		
	2402MHz	3DH3	4.94	3	1 ~ 4	PASS
	2480MHz		3.32	2		
	2402MHz	3DH5	8.75	3	1 ~ 4	PASS
	2480MHz		8.78	3		
NOTE: N/A means not applicable						

5.4 HOPPING FREQUENCY SEQUENCE

5.4.1 Applicable standard

ETSI EN 300 328 clause 4.3.1.4

5.4.2 Conformance Limit

The requirement applies to all types of frequency hopping equipment.

- For non-adaptive frequency hopping system
The hopping sequence(s) shall contain at least N hopping frequencies where N is either 5 or the result of 15 MHz divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.
According to clause 4.3.1.5.3.1 the minimum Hopping Frequency Separation for non-adaptive equipment is equal to the Occupied Channel Bandwidth with a minimum of 100 kHz.
- For adaptive frequency hopping system
The hopping sequence(s) shall contain at least N hopping frequencies at all times, where N is either 15 or the result of 15 MHz divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

5.4.3 Test Configuration

The measurements for hopping sequences shall be performed at normal environmental conditions of the operating temperature range.

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

5.4.4 Test Procedure

1. Please refer to ETSI EN 300 328 (V2.1.1) clause 5.4.4.1 for the test conditions.
2. Please refer to ETSI EN 300 328 (V2.1.1) clause 5.4.4.2 for the measurement method.

The test procedure shall be as follows:

■ Conducted measurements

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: \geq 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:

This step is only applicable for equipment implementing Option 1 in clause 4.3.1.4.3.1 or Option 1 in 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: $4 \times \text{Dwell Time} \times \text{Actual number of hopping frequencies in use}$.

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, Option 1 or clause 4.3.1.4.3.2, Option 1. 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: \geq RBW

- Detector Mode: RMS

- Sweep time: 1 s; this setting may result in long measuring times. To avoid such long measuring times, an FFT analyser may be used

- Trace Mode: Max Hold

- Trigger: Free Run

- 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 frequency hopping equipment, it shall be verified whether the equipment uses 70 % of the bands specified in table 1. This verification can be done using the lowest and highest -20 dB points from the total spectrum envelope obtained in step 6. The result shall be recorded in the test report.

■ Radiated measurements

A test site as described in annex B and applicable measurement procedures as described in annex C may be used. Alternatively, a test fixture may be used.

The test procedure is further as described under clause 5.4.4.2.1.

5.4.5 Test Results

For Bluetooth BR/EDR

Test Condition			Measured Data	Limited	Verdict
GFSK	1Mbps	Hopping Frequency Sequence	79	15-79	PASS
$\pi/4$ -DQPSK	2Mbps		79	15-79	PASS
8DPSK	3Mbps		79	15-79	PASS
NOTE: N/A means not applicable					

5.5 Hopping Frequency Separation

5.5.1 Definition:

The Hopping Frequency Separation is the frequency separation between 2 adjacent hopping frequencies.

5.5.2 Limit

Non-adaptive frequency hopping systems:

The minimum Hopping Frequency Separation shall be equal to Occupied Channel Bandwidth (see clause 4.3.1.7) of a single hop, with a minimum separation of 100kHz.

Adaptive frequency hopping systems:

The minimum Hopping Frequency Separation shall be 100kHz.

5.5.3 EUT Operation Condition

The EUT was programmed to be in hopping on mode.

5.5.4 Test Procedure

1. The output of the transmitter shall be connected to a spectrum analyzer or equivalent.
2. The analyzer 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 (30kHz)
 - VBW: 3 × RBW (100kHz)
 - Detector Mode: RMS
 - Trace Mode: Max Hold
 - Sweep Time: Auto
3. Allow the trace to stabilize.
4. Use the marker-delta function to determine the Hopping Frequency Separation between the peaks of the two adjacent hopping frequencies. This value shall be compared with the limits defined in clause 4.3.1.4.2 and shall be recorded in the test report.

5.5.5 Measurement Record

Please refer to the below photos for more details

Test Condition: Normal				
Modulation	Mode	Separation (KHz)	Limit(kHz)	Result
GFSK	Frequencies Hopping	1000	≥ 100	PASS
π/4-DQPSK	Frequencies Hopping	1000	≥ 100	PASS
8DPSK	Frequencies Hopping	1000	≥ 100	PASS

5.6 Adaptivity (Adaptive Frequency Hopping)

5.6.1 Definition

Adaptive Frequency Hopping using LBT based DAA is a mechanism by which a given hopping frequency is made 'unavailable' because signal was detected before any transmission on that frequency.

In addition, this requirement does not apply for equipment with a maximum declared RF Output power level of less than 10 dBm e.i.r.p. or for equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p.

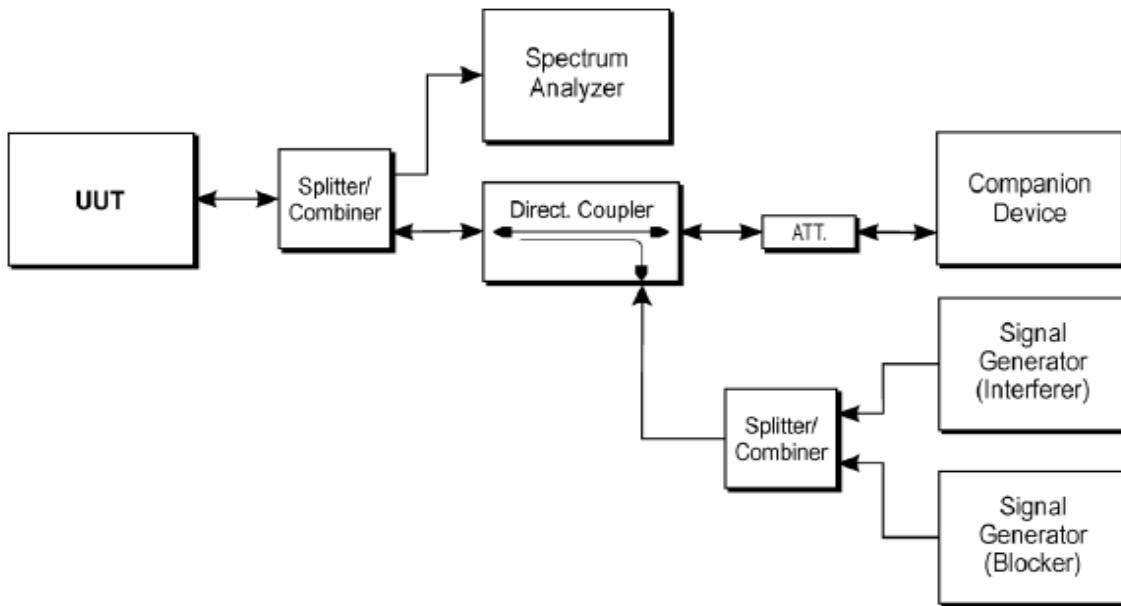
5.6.2 Limit

Refer to section 4.3.7.1 of EN 300 328 V2.1.1

5.6.3 EUT Operation Condition

The EUT was programmed to be in hopping on mode.

5.6.4 Test Procedure



5.6.5 Measurement Record

N/A.

Maximum RF Output Power less than 10 dBm e.i.r.p. No need to test.

5.7 Occupied Channel Bandwidth

5.7.1 Definition

The Occupied Channel Bandwidth is the bandwidth that contains 99 % of the power of the signal.

5.7.2 Limit

The Occupied Channel Bandwidth for each hopping frequency shall fall completely within the band given in clause 1.

For non-adaptive Frequency Hopping equipment with e.i.r.p greater than 10 dBm, the Occupied Channel Bandwidth forevery occupied hopping frequency shall be equal to or less than the value declared by the supplier. This declared valueshall not be greater than 5 MHz.

5.7.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

5.7.4 Test Procedure

1. Connect the UUT to the spectrum analyzer 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 % (20kHz)
- Video BW: 3 × RBW (62kHz)
- Frequency Span: 2 × Occupied Channel Bandwidth (2 MHz)
- Detector Mode: RMS
- Trace Mode: Max Hold

2. Wait until the trace is completed.Find the peak value of the trace and place the analyzer marker on this peak.

3. Use the 99 % bandwidth function of the spectrum analyzer 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 analyzer to avoid the noisesignals left and right from the power envelope being taken into account by this measurement.

5.7.5 Measurement Record

For Bluetooth BR/EDR

Operation Mode	Frequency(MHz)	99%OBW(MHz)	Verdict
GFSK	2402 MHz	0.739	PASS
	2480 MHz	0.678	PASS
π/4-DQPSK	2402 MHz	1.005	PASS
	2480 MHz	1.016	PASS
8DPSK	2402 MHz	1.012	PASS
	2480 MHz	1.103	PASS

For BLE

Operation Mode	Frequency (MHz)	OBW (MHz)	Verdict
GFSK	2402 MHz	1.136	PASS
	2480 MHz	1.019	PASS

5.8 Transmitter unwanted emissions in the out-of-band domain

5.8.1 Definition

Transmitter unwanted emissions in the out-of-band domain are emissions when the equipment is in Transmit mode, on frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious.

5.8.2 Limit

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in figure 1.

NOTE: Within the 2 400 MHz to 2 483,5 MHz band, the Out-of-band emissions are fulfilled by compliance with the Occupied Channel Bandwidth requirement in clause 4.3.1.7.

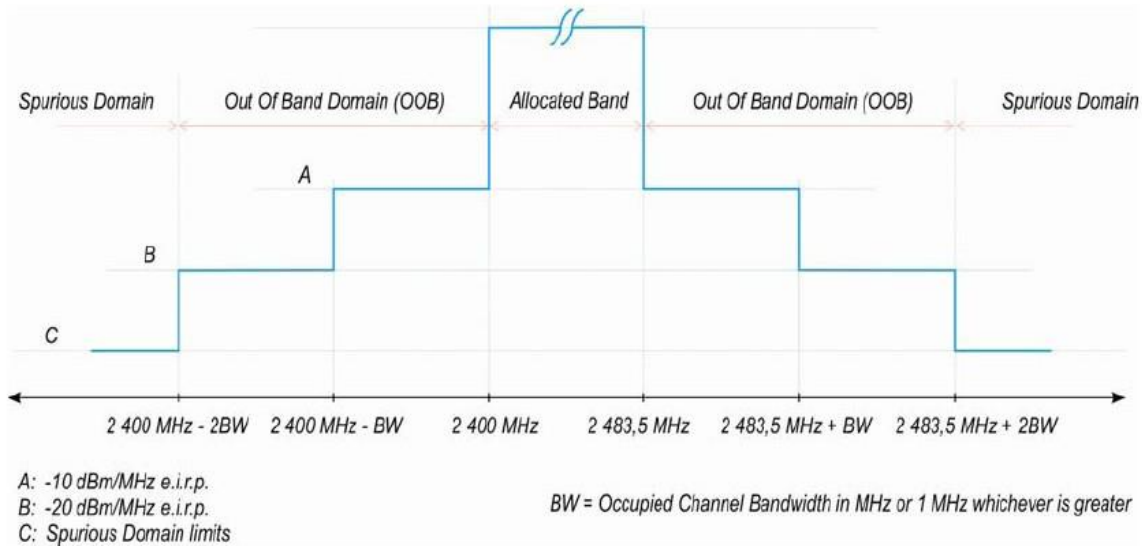


Figure 1: Transmit mask

5.8.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

5.8.4 Test Procedure

1. Connect the UUT to the spectrum analyzer 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: Clear / Write
 - Sweep Mode: Continuous
 - Sweep Points: 5 000
 - Trigger Mode: Video trigger
2. (segment 2 483,5 MHz to 2 483,5 MHz + BW)
 - 1) Adjust the trigger level to select the transmissions with the highest power level.
 - 2) For frequency hopping equipment operating in a normal hopping mode, the different hops will result in signalbursts with different power levels. In this case the burst with the highest power level shall be selected.
 - 3) Set a window (start and stop lines) to match with the start and end of the burst and in which the RMS powershall be measured using the Time Domain Power function.
 - 4) Select RMS power to be measured within the selected window and note the result which is the RMS powerwithin this 1 MHz segment (2 483,5 MHz to 2 484,5 MHz). Compare this value with the applicable limitprovided by the mask.
 - 5) Increase the centre frequency in steps of 1 MHz and repeat this measurement for every 1 MHz segment withinthe range 2 483,5 MHz to 2 483,5 MHz + BW. The centre frequency of the last 1 MHz segment shall be set to2 483,5 MHz + BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).
3. (segment 2 483,5 MHz + BW to 2 483,5 MHz + 2BW):

Change the centre frequency of the analyzer to 2 484 MHz + BW and perform the measurement for the first1MHz segment within range 2 483,5MHz + BW to 2 483,5MHz + 2BW. Increase the centre frequency in1MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1MHzsegment shall be set to 2 483,5MHz + 2 BW - 0,5MHz.
4. (segment 2 400 MHz - BW to 2 400 MHz):

Change the centre frequency of the analyzer to 2 399,5MHz and perform the measurement for the first 1MHzsegment within range 2 400MHz - BW to 2 400MHz Reduce the centre frequency in 1MHz steps and repeatthe measurements to cover this whole range. The centre frequency of the last 1MHz segment shall be set to2400MHz - 2BW + 0,5MHz.
5. (segment 2 400 MHz - 2BW to 2 400 MHz - BW):
 - 1) Change the centre frequency of the analyzer to 2 399,5MHz - BW and perform the measurement for the first1MHz segment within range 2 400MHz - 2BW to 2 400MHz - BW. Reduce the centre frequency in 1MHzsteps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segmentshall be set to 2400MHz - 2BW + 0,5MHz.
 - 2) In case of conducted measurements on equipment with a single transmit chain, the declared antenna assemblygain "G" in dBi shall be added to the results for each of the 1 MHz segments and compared with the limitsprovided by the mask given in figures 1 or 3. If more than one antenna assembly is intended for this powersetting, the antenna with the highest gain shall be

considered.

- 3) 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 beaded. 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 figures 1 or 3.
 - Option 2: the limits provided by the mask given in figures 1 or 3 shall be reduced by $10 \times \log_{10}(A_{ch})$ and the additional beamforming gain "Y" in dB. The results for each of the transmit chains shall be individually compared with these reduced limits.

5.8.5 Measurement Record

PASS.

All the modulation modes were tested, the data of the worst mode are described in the following table

For Bluetooth BR/EDR

Mode	GFSK Low channel		Mode	GFSK High channel	
	Frequency	Level		Limit	Frequency
(MHz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)
2399.545	-46.31	-10	2483.953	-56.16	-10
2398.554	-53.74	-20	2484.051	-62.23	-20

For BLE:

Mode	GFSK Low channel		Mode	GFSK High channel	
	Frequency	Level		Limit	Frequency
(MHz)	(dBm)	(dBm)	(MHz)	(dBm)	(dBm)
2399.506	-58.52	-10	2484.044	-61.16	-10
2398.483	-61.25	-20	2485.012	-61.21	-20

5.9 Transmitter unwanted emissions in the spurious domain

5.9.1 Definition

Transmitter unwanted emissions in the spurious domain are emissions outside the allocated band and outside the out-of-band domain as indicated in figure 1 when the equipment is in Transmit mode.

5.9.2 Limit

Table 1: Transmitter limits for spurious emissions

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
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87.5 MHz	-36 dBm	100 kHz
87.5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12.75 GHz	-30 dBm	1 MHz

5.9.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

5.9.4 Test Procedure

The test site as described in annex B and applicable measurement procedures as described in annex C shall be used.

The test procedure is further as described under clause 5.3.10.2.1.

5.9.5 Measurement Record

Pass,

All the modulation modes were tested, the data of the worst mode are described

For Bluetooth BR/EDR

Frequency (MHz)	Antenna Polarization	Emission level (dBm)	Limit (dBm)	Over (dB)	Verdict
86.35	V	-66.26	-54	-12.26	Pass
114.05	V	-65.18	-54	-11.18	Pass
336.28	V	-50.32	-36	-14.32	Pass
419.38	V	-49.82	-36	-13.82	Pass
569.87	V	-64.23	-54	-10.23	Pass
725.18	V	-68.15	-54	-14.15	Pass
1483.09	V	-49.32	-30	-19.32	Pass
95.26	H	-65.29	-54	-11.29	Pass
147.28	H	-48.11	-36	-12.11	Pass
395.06	H	-47.05	-36	-11.05	Pass
547.12	H	-66.33	-54	-12.33	Pass
715.06	H	-67.58	-54	-13.58	Pass
849.36	H	-66.35	-54	-12.35	Pass
1486.92	H	-51.48	-30	-21.48	Pass

For BLE

Frequency (MHz)	Antenna polarization	Emission level (dBm)	Limit (dBm)	Over (dB)	Verdict
79.35	V	-67.58	-36	-31.58	Pass
114.26	V	-69.13	-54	-15.13	Pass
268.49	V	-51.4	-36	-15.4	Pass
415.29	V	-48.36	-36	-12.36	Pass
526.39	V	-68.72	-54	-14.72	Pass
687.42	V	-67.15	-54	-13.15	Pass
1048.29	V	-50.22	-30	-20.22	Pass
92.35	H	-68.49	-54	-14.49	Pass
139.54	H	-50.29	-36	-14.29	Pass
315.29	H	-49.87	-36	-13.87	Pass
485.19	H	-67.25	-54	-13.25	Pass
682.49	H	-70.12	-54	-16.12	Pass
809.23	H	-71.48	-54	-17.48	Pass
1485.02	H	-50.33	-30	-20.33	Pass

5.10 Receiver spurious emissions

5.10.1 Definition

Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

5.10.2 Limit

Table 2: Spurious emission limits for receivers

Frequency range	Maximum power e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12.75 GHz	-47 dBm	1 MHz

5.10.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

5.10.4 Test Procedure

The test site as described in annex B and applicable measurement procedures as described in annex C shall be used.

The test procedure is further as described under clause 5.3.11.2.1.

5.10.5 Test Result

For Bluetooth BR/EDR

Freq (MHz)	Antenna polarization	Result (dBm)	Limit (dBm)	Margin (dB)	Verdict
145.56	H	-67.33	-57	-10.33	Pass
257.39	H	-68.25	-57	-11.25	Pass
485.22	H	-70.42	-57	-13.42	Pass
1048.57	H	-52.12	-47	-5.12	Pass
2042.68	H	-54.29	-47	-7.29	Pass
3565.95	H	-56.98	-47	-9.98	Pass
247.58	V	-66.87	-57	-9.87	Pass
487.13	V	-68.23	-57	-11.23	Pass
685.01	V	-69.15	-57	-12.15	Pass
1452.07	V	-53.42	-47	-6.42	Pass
2243.68	V	-54.14	-47	-7.14	Pass
3548.12	V	-55.29	-47	-8.29	Pass

For BLE

Frequency (MHz)	Antenna polarization	Result (dBm)	Limit (dBm)	Margin (dB)	Verdict
315.04	H	-70.12	-57	-13.12	Pass
549.12	H	-69.32	-57	-12.32	Pass
784.26	H	-71.46	-57	-14.46	Pass
1025.69	H	-62.15	-47	-15.15	Pass
2413.26	H	-63.25	-47	-16.25	Pass
3259.13	H	-64.13	-47	-17.13	Pass
336.26	V	-71.22	-57	-14.22	Pass
547.15	V	-69.24	-57	-12.24	Pass
895.21	V	-70.48	-57	-13.48	Pass
1124.03	V	-61.26	-47	-14.26	Pass
2546.13	V	-63.24	-47	-16.24	Pass
3258.43	V	-61.49	-47	-14.49	Pass

5.11 Receiver Blocking

5.11.1 Applicable standard

ETSI EN 300 328 clause 4.3.2.11

5.11.2 Conformance Limit

The minimum performance criterion shall be a PER less than or equal to 10 %. The manufacturer may declare alternative performance criteria as long as that is appropriate for the intended use of the equipment (see clause 5.4.1.).

■ General

While maintaining the minimum performance criteria as defined in clause 4.3.1.12.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined for the applicable receiver category provided in below.

● Receiver Category 1

Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
P _{min} + 6 dB	2 380 2 503,5	-53	CW
P _{min} + 6 dB	2 300 2 330 2 360	-47	CW
P _{min} + 6 dB	2 523,5 2 553,5 2 583,5 2 613,5 2 643,5 2 673,5	-47	CW

NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 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 levels have to be corrected by the actual antenna assembly gain.

●Receiver Category 2

Receiver Blocking parameters receiver category 2 equipment

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
Pmin + 6 dB	2 380 2 503,5	-57	CW
Pmin + 6 dB	2 300 2 583,5	-47	CW

NOTE 1: Pmin is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 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 levels have to be corrected by the actual antenna assembly gain.

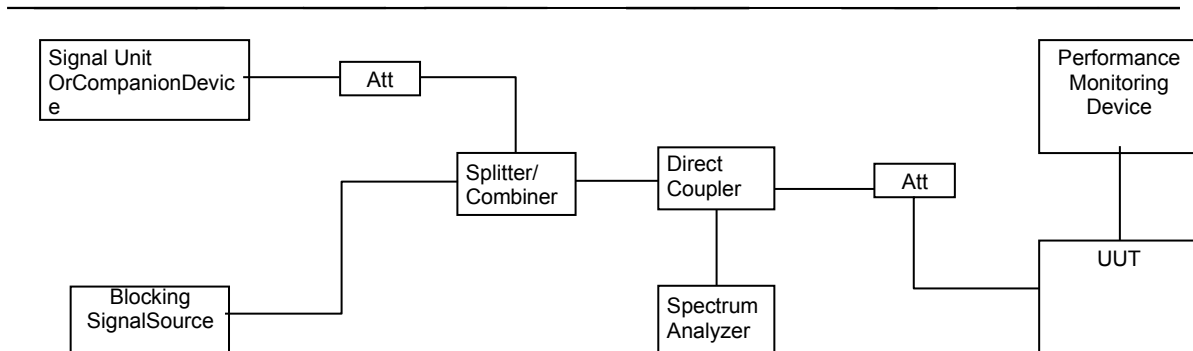
●Receiver Category 3

Receiver Blocking parameters receiver category 3 equipment

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
Pmin + 12 dB	2 380 2 503,5	-57	CW
Pmin + 12 dB	2 300 2 583,5	-47	CW

NOTE 1: Pmin is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 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 levels have to be corrected by the actual antenna assembly gain.

5.11.3 Test Configuration



5.11.4 Test Procedure

1. Please refer to ETSI EN 300328 (V2.1.1) clause 5.4.11.1 for the test conditions.
2. Please refer to ETSI EN 300328 (V2.1.1) clause 5.4.11.2 for the measurement method.

■ Conducted measurement

Adaptive Frequency Hopping equipment using DAA

Step 1:

- For non-frequency hopping equipment, the UUT shall be set to the lowest operating channel.

Step 2:

- The blocking signal generator is set to the first frequency as defined in the appropriate table corresponding to the receiver category and type of equipment.

Step 3:

- With the blocking signal generator switched off, a communication link is established between the UUT and the associated companion device using the test setup shown in figure 6. 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 4.3.1.12.3 or clause 4.3.2.11.3 is still met. The resulting level for the wanted signal at the input of the UUT is P_{min} .
- This signal level (P_{min}) is increased by the value provided in the table corresponding to the receiver category and type of equipment.

Step 4:

- The blocking signal at the UUT is set to the level provided in the table corresponding to the receiver category and type of equipment. It shall be verified and recorded in the test report that the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is met.

Step 5:

- Repeat step 4 for each remaining combination of frequency and level for the blocking signal as provided in the table corresponding to the receiver category and type of equipment.

Step 6:

- For non-frequency hopping equipment, repeat step 2 to step 5 with the UUT operating at the highest operating channel.

- Radiated measurements

When performing radiated measurements on equipment with dedicated antennas, measurements shall be repeated for each alternative dedicated antenna.

A test site as described in annex B and applicable measurement procedures as described in annex C shall be used.

The test procedure is further as described under clause 5.4.11.2.1.

The level of the blocking signal at the UUT referred to in step 4 is assumed to be the level in front of the UUT antenna(s). The UUT shall be positioned with its main beam pointing towards the antenna radiating the blocking signal. The position recorded in clause 5.4.2.2.2 can be used.

5.11.5 Test Results

- Receiver category

For Bluetooth BR/EDR

<input type="checkbox"/>	Receiver category 1	Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p. shall be considered as receiver category 1 equipment.
<input checked="" type="checkbox"/>	Receiver category 2	Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment with a maximum RF output power of 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment.
<input type="checkbox"/>	Receiver category 3	Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment with a maximum RF output power of 0 dBm e.i.r.p. shall be considered as receiver category 3 equipment.
<input type="checkbox"/>	Other Receiver category	Maximum RF Output Power less than 10 dBm e.i.r.p. No need to test Receiver Blocking

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm)	Type of blocking signal	PER(%)	Result
Pmin+6dB	2 380	-53	CW	0.28	PASS
	2 503,5		CW	0.59	
Pmin+6dB	2300.0	-47	CW	0	
	2583.5		CW	0.14	



For BLE

<input type="checkbox"/>	Receiver category 1	Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p. shall be considered as receiver category 1 equipment.
<input checked="" type="checkbox"/>	Receiver category 2	Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment with a maximum RF output power of 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment.
<input type="checkbox"/>	Receiver category 3	Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment with a maximum RF output power of 0 dBm e.i.r.p. shall be considered as receiver category 3 equipment.
<input type="checkbox"/>	Other Receiver category	Maximum RF Output Power less than 10 dBm e.i.r.p. No need to test Receiver Blocking

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm)	Type of blocking signal	PER(%)	Result
Pmin+6dB	2 380	-53	CW	0.33	PASS
	2 503,5		CW	0.08	
Pmin+6dB	2300.0	-47	CW	0.14	
	2583.5		CW	0.42	

*******THE END REPORT*******



TEST REPORT

Report No: ZCT20230531R03

Issued for

Applicant:	SIMJOY INTERNATIONAL CO., LIMITED
Address:	A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.
Product Name:	Handheld 3-Axis Gimbal Stabilizer
Brand Name:	N/A
Model Name:	F10pro
Series Model:	F3,F5,F5S,F5pro,F5plus,F6,F8, F9,F9S,F9pro,F9plus,F10,F10plus F11,F11S,F11pro,F11plus F12,F12S,F12pro,F12plus S5,S5pro,S5B,S5Bpro L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro

TEST RESULT CERTIFICATION

Applicant's Name : SIMJOY INTERNATIONAL CO., LIMITED
Address: A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.

Manufacture's Name : SIMJOY INTERNATIONAL CO., LIMITED

Product Description

Product Name : Handheld 3-Axis Gimbal Stabilizer

Model Name: F10pro

Series Model: F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro,F9plus,F10,F10plus,F11,F11S,F11pro,F11plus,F12,F12S,F12pro,F12plus,S5,S5pro,S5B,S5Bpro,L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro

Test Method: : Please refer to the table below

Test Result: : Please refer to the table below

1. As specified by client ,to screen Lead(Pb),Cadmium(Cd),Mercury(Hg), Chromium(Cr)and Bromine(Br)in the submitted sample(s)by XRF.
2. As specified by client ,when screening results exceed the XRF screening limit in IEC62321:2013 Edition 1.0,further use of wet chemical methods are required to test Lead(Pb),Cadmium(Cd),Mercury(Hg),Hexavalent

Test Requested

Chromium(Cr(VI)),Polybrominated Biphenyls(PBBs),Polybrominated Diphenyl Ethers(PBDEs),Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutylphthalate (DBP) , and Diisobutyl phthalate (DIBP) in the submitted sample(s).

Test Method : Please refer to next page(s).

Test Result : Please refer to next page(s).

Conclusion : The test results comply with the limits of RoHS 2.0 Directive (EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU.

Date of Test :

Date (s) of performance of tests: May 23, 2023 ~ May 31, 2023

Date of Issue : May 31, 2023

Test Result : Pass

Signed for and on behalf of Zhongchuang Compliance Service Laboratory

Approved by: *Jack Luo*
MAY 31, 2023
Jack Luo/ Manager



Test Result:

RoHS 2.0 Directive (EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU

No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
1	black plastic	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
2	Black metal	Pb	BL	--	N.D
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
3	Black plastics	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
4	Black foam cotton	Pb	BL	--	N.D
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
5	Label	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
6	Transparency film	Pb	BL	--	Pass
		Cd	BL	--	

		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
7	Silver metal sheet	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
8	White plastic	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
9	Black plastic	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
10	Silver metal shell	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
11	Screw	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	X	N.D.	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
12	Taping	Pb	BL	--	Pass
		Cd	BL	--	

		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
13	Wire	Pb	BL	--	N.D
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
14	Plastic	Pb	BL	--	N.D
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
15	Screw	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	X	N.D.	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
16	PCB	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	

1. It is the result on total Br while test item on restricted substances in PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).

2. Screening test by XRF spectroscopy

XRF screening limits in mg/kg for regulated elements according to IEC62321:2013 Ed.1

Sec.6

& Annex D.

Element	Polymer Material	Metallic Material	Composite Material
Pb	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma \leq X < 1500 + 3\sigma \leq OL$
Cd	$BL \leq 70 - 3\sigma \leq X < 130 + 3\sigma \leq OL$	$BL \leq 70 - 3\sigma \leq X < 130 + 3\sigma \leq OL$	$LOD < X < 150 + 3\sigma \leq OL$
Hg	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma \leq X < 1500 + 3\sigma \leq OL$
Cr	$BL \leq 700 - 3\sigma < X$	$BL \leq 700 - 3\sigma < X$	$BL \leq 500 - 3\sigma < X$
Br	$BL \leq 300 - 3\sigma < X$	--	$BL \leq 250 - 3\sigma < X$

XRF detection limits in mg/kg for regulated elements in various material

Element	Polymer Material	Metallic Material	Composite Material
Pb	10	50	50
Cd	10	50	50
Hg	10	50	50
Cr	10	50	50
Br	10	50	50

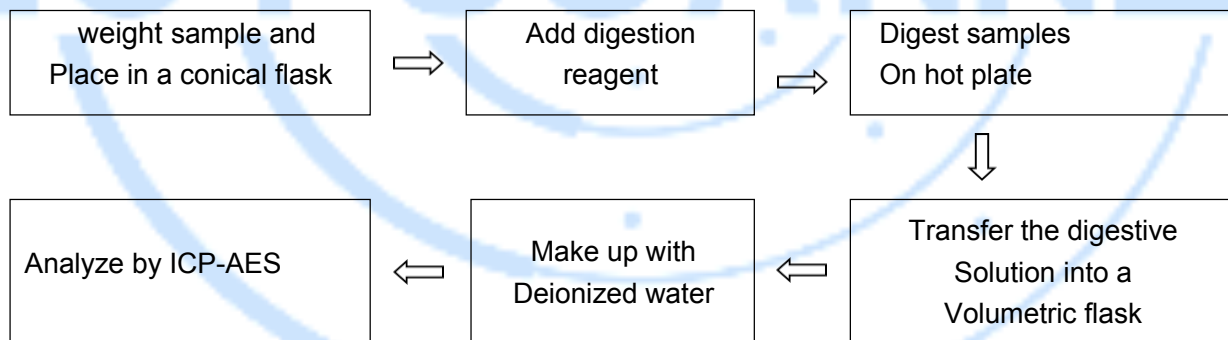
- Note:**
- BL = Under the XRF screening limit
 - OL = Future chemical test will be conducted while result is above the screening
 - X = The symbol "X" marks the region where further investigation is necessary
 - 3σ = The reproducibility of analytical instruments
 - LOD = Detection limit

3. Wet chemical test

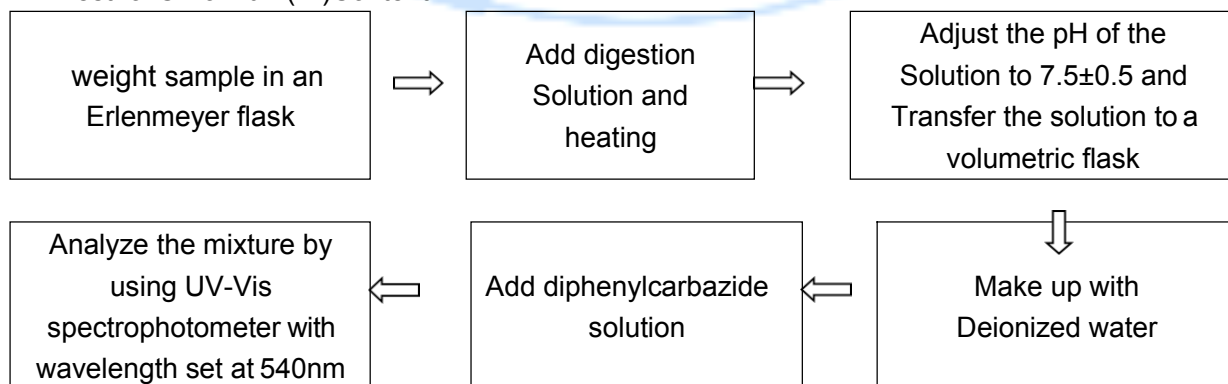
Test Item(s)	Test Method	Test Equipment	MDL
Pb	IEC62321-5:2013	ICP-AES	2
Cd	IEC62321-5:2013	ICP-AES	2
Hg	IEC62321-4:2013	ICP-AES	2
Cr(VI)	IEC62321-7-1:2015 IEC62321-7-2:2017	UV-Vis	2
PBB	IEC62321-6:2015	GC-MS	5
PBDE	IEC62321-6:2015	GC-MS	5
Dibutyl Phthalate(DBP)	IEC62321-8:2017	GC-MS	30
Benzylbutyl Phthalate (BBP)	IEC62321-8:2017	GC-MS	30
Di-(2-ethylhexyl) Phthalate(DEHP)	IEC62321-8:2017	GC-MS	30
Diisobutyl phthalate (DIBP)	IEC62321-8:2017	GC-MS	30

Test Process:

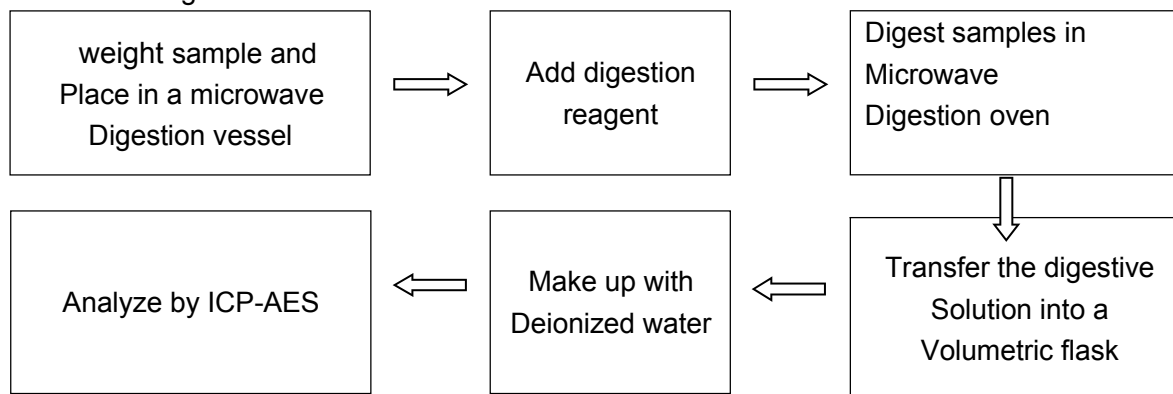
1. Test for Cd/Pb Content



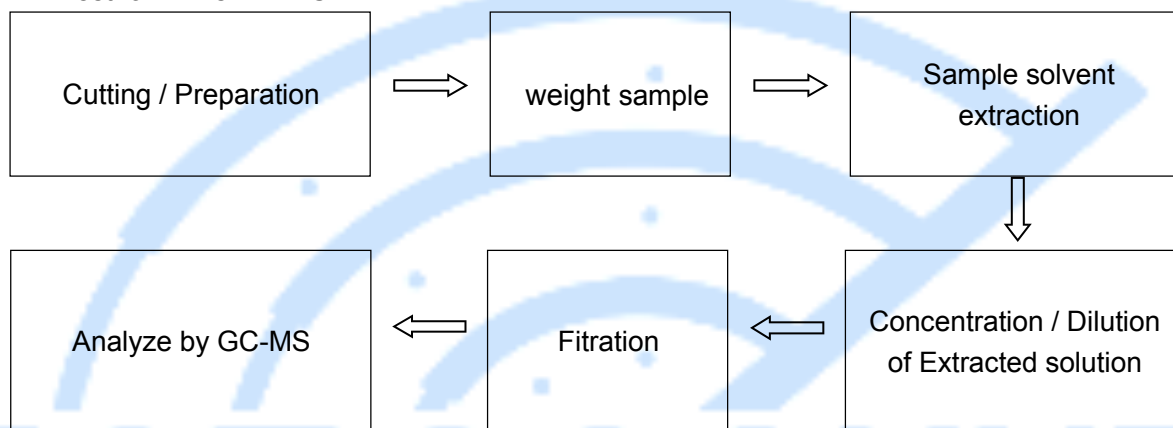
2. Test for Chromium(VI) Content



3. Test for Hg Contents



4. Test for PBBs/PBDES/DBP/BBP/DEHP/DIBP



Note:

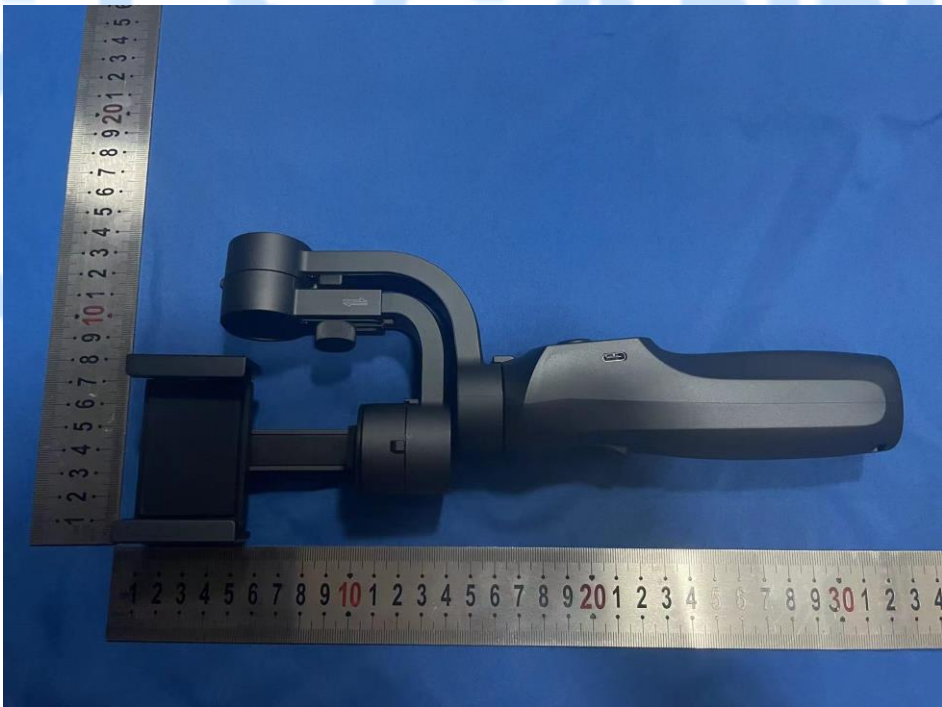
- mg/kg= ppm=0.0001%
- ND=Not Detected(<MDL)
- MDL = Method Detection Limit
- = No Testing
- Negative = Absence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm² sample
- *=According to 2011/65/EU Annex,point 6-Lead as an alloying element is steel containing up to 0.35% lead by weight, aluminum containing up to 0.4% lead by weight and as a copper alloy, containing up to 4% lead by weight can be exempted.

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Accessories equipment

Item	Equipment	Mfr/Brand	Model/Type No.	parameter	Remark
1	Plastic hard shell	Shenzhen Rizhibang Electronics Co., Ltd	940(f1)	PC;V-0;Min. thickness: 1.5, mm	Tested with the appliance
2	Plastic silica gel	Dongguan Zhenneng Electronics Co., Ltd			Tested with the appliance
3	Circuit board	Shenzhen Jialichuang Technology Co., Ltd	4-layer printed circuit board		Tested with the appliance
4	Display	Shenzhen Shengteng Technology Co., Ltd	854*480	-10—45	Tested with the appliance
5	Glass	Jiangxi Tianyi Photoelectric Technology Co., Ltd	K9 high density glass		Tested with the appliance
6	Resistance capacitance	Shenzhen Meilong Technology Co., Ltd			Tested with the appliance
7	Diode triode	Jiangsu Changdian Technology Co., Ltd	SS8050 SS8550	1.5a 40v	Tested with the appliance
8	Integrated circuit	Taiwan Liandian Technology Co., Ltd	FM658AMG	-20-40	Tested with the appliance
9	Hardware	Guangdong Keyou Precision Machinery Manufacturing Co., Ltd			Tested with the appliance
10	Wire rod	Shenzhen Lianjixiang Technology Co., Ltd			Tested with the appliance
11	LED	Shenzhen Shibo Optoelectronics Co., Ltd			Tested with the appliance





※※※※END OF THE REPORT※※※※

Zhongchuang Compliance Service Laboratory

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Certificate of Conformity

Certificate No. : ZCS2023053102
Product : Handheld 3-Axis Gimbal
Brand Name : N/A
Model Name : F10pro
Series Model : F3,F5,F5S,F5pro,F5plus,F6,F8,F9,F9S,F9pro,F9plus,F10,F10plus,F11,F11S,F11pro,F11plus,F12,F12S,F12pro,F12plus,S5,S5pro,S5B,S5Bpro,L7Bpro,L7Bplus,L7Cpro,L7Cplus,L9,L9pro
Holder : SIMJOY INTERNATIONAL CO., LIMITED
Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.
Manufacturer : SIMJOY INTERNATIONAL CO., LIMITED
Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.
Report No. : ZCT20230531R03
Applied Standards : The test results comply with the limits of RoHS 2.0 Directive (EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU.

The applicant of the certificate is authorized to use this certificate in connection with EC declaration of conformity to the Directive. The certificate is only applicable to the equipment's described above. The submitted sample of the above product has been tested according with Standard(s) used for showing compliance with the essential requirements in the specified directive(s):(EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU

RoHS

Approved by: Harry Wang

MAY 31, 2023

HARRY WANG/Technical Director





TEST REPORT

EN IEC 62311:2020

Product : Handheld 3-Axis Gimbal Stabilizer
Model Name : F10pro(Additional models are as follows)
Brand : N/A
Report No. : ZCT20230531N04

Prepared for

SIMJOY INTERNATIONAL CO., LIMITED

A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street,
Bao'an District, Shenzhen.

Prepared by

Zhongchuang Compliance Service Laboratory
Floor 3, Huilian Industrial Zone, No.18, Xinhe Community Industrial South Road,
Fuhai Street, Bao 'an District, Shenzhen, Guangdong



Report No.: ZCT20230531N04

Additional models are as follows

F3

F5,F5S,F5pro,F5plus,

F6,

F8,

F9,F9S,F9pro,F9plus

F10,F10plus

F11,F11S,F11pro,F11plus

F12,F12S,F12pro,F12plus

S5,S5pro,S5B,S5Bpro

L7Bpro,L7Bplus,L7Cpro,L7Cplus

L9,L9pro



Report No.: ZCT20230531N04

1 TEST RESULT CERTIFICATION

Applicant's name : SIMJOY INTERNATIONAL CO., LIMITED
Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.
Manufacture's name : SIMJOY INTERNATIONAL CO., LIMITED
Address : A503, creator center, No. 148, Lingxia Road, Fenghuang community, Fuyong street, Bao'an District, Shenzhen.
Product name : Handheld 3-Axis Gimbal Stabilizer
Model name :
Seral Model : F10pro(Additional models are see page 2)

This device described above has been tested by ZCT, and the test results show that the equipment under test (EUT) is in compliance with the 2014/53/EU Directive Art.3.2 requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests: May 23, 2023 to May 31, 2023

Date of Issue: May 31, 2023

Test Result: **Pass**

Test Engineer:

Mary Peng / Engineer

Mary Peng

Technical Manager:

Jack Luo / Manager

Jack Luo





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Report No.: ZCT20230531N04

2 Test Summary

Test	Test Requirement	Test Method	Limit / Severity	Result
RF Exposure	EN IEC 62311	EN IEC 62311	-	PASS

Remark:

N/A: Not Applicable

RF: In this whole report RF means Radio Frequency.

A.M. Amplitude Modulation.

P.M. Pulse Modulation.



3 General Information

3.1 General Description of E.U.T.

Product Name	:	Handheld 3-Axis Gimbal Stabilizer
Model Name	:	F10pro(Additional models are see page 2)
Specification	:	802.11b/g/n HT20
Operation Frequency	:	2412-2472MHz
Number of Channel	:	13
Type of Modulation	:	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n;
Antenna installation	:	PCB Antenna
Antenna Gain	:	2.5 dBi
Power supply	:	220-240V 50Hz
Hardware Version	:	N/A
Software Version	:	N/A
<p>Note: Serial Model appearance is different from the main test model, but the circuit and electronic structure are the same.</p>		



4 RF Exposure Evaluation

4.1 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 (0Hz to 300GHz, unperturbed RMS values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μ T)	Equivalent plane wave power density Seq (W/m ²)
0-1 Hz	-	3.2×10^4	4×10^4	-
1-8 Hz	10000	$3.2 \times 10^4 / f^2$	$4 \times 10^4 / f^2$	-
8-25 Hz	10000	4000/f	5000/f	-
0.025-0.8 kHz	250/f	4/f	5/f	-
0.8-3 kHz	250/f	5	6.25	-
3-150 kHz	87	5	6.25	-
0.15-1 MHz	87	0.73/f	0.92/f	-
1-10 MHz	$87 / f^{1/2}$	0.73/f	0.92/f	-
10-400 MHz	28	0.073	0.095	2
400-2000 MHz	$1.375 f^{1/2}$	$0.0037 f^{1/2}$	$0.0046 f^{1/2}$	f/200
2-300 GHz	61	0.16	0.2	10

Note:

1. f as indicated in the frequency range column.
2. For frequencies between 100 kHz and 10 GHz, Seq, E2, H2 and B2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10 GHz, Seq, E2, H2 and B2 are to be averaged over any 68 / f.05 minute period (f in GHz).
4. No E-field value is provided for frequencies < 1 Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.



4.2 RF Exposure Evaluations

$$S = PG * \text{Duty factor} / 4\pi R^2$$

P = Peak Power Input to antenna (Watts)

G = Antenna Gain (numeric)

R = distance to the center of radiation of antenna (in meter) = 0.20 m

Note:

1) $P \text{ (Watts)} = (10^{(\text{dBm} / 10)}) / 1000$

2) $G \text{ (Antenna gain in numeric)} = 10^{(\text{Antenna gain in dBi} / 10)}$

3) Duty factor

4) $\pi = 3.142$

4.3 RF Exposure test procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

4.4 Test Result of RF Exposure Evaluation

The maximum power density at a distance of 0.2 m is shown as below:

Frequency (MHz)	Antenna Gain (numeric)	Duty Factor	Peak Output Power (dBm)	Peak Output Power (W)	Calculated RF Exposure (W/ m ²)	Limit (W/ m ²)
2472	2	1.57	14.69	0.02907	1.3917	10

*****THE END REPORT*****