GRANT OF EQUIPMENT AUTHORIZATION

ТСВ

Certification Issued Under the Authority of the Federal Communications Commission

By:

Eurofins Electrical and Electronic Testing NA, Inc 914 W. Patapsco Avenue Baltimore, MD 21230-3432

Date of Grant: 06/30/2023

Application Dated: 06/30/2023

SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD. 3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China

Attention: Lv weifa

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2BBKW-MICT Name of Grantee: SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD. Equipment Class: Part 15 Spread Spectrum Transmitter Wireless Lavalier Microphone Notes: Frequency Output Frequency Emission Grant Notes FCC Rule Parts Range (MHZ) Watts **Tolerance Designator** 15C 2402.0 - 2480.0 0.00113 Output power listed is conducted.



CERTIFICATE

of Conformity

EC Council Directive 2014/53/EU

Certificate No.: XK2306012120C

Applicant	:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.			
Address		3104, Building 2, Huasheng Longyue Tower, Jinglong Community,			
	•	Longhua Street, Longhua District, Shenzhen, China			
Manufacturer	:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.			
Address		3104, Building 2, Huasheng Longyue Tower, Jinglong Community,			
Address	•	Longhua Street, Longhua District, Shenzhen, China			
Product	:	Wireless Lavalier Microphone			
		M6 Pro, M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro,			
Model No.		M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus,			
		MWX(X: 1~1000), M5 Pro			
Trademark		N/A			

Applied Specifications/ Standards	Documentary Evidence	Result Of Test Report
ETSI EN 301 489-1 V2.2.3 (2019-11)		
ETSI EN 301 489-17 V3.2.4 (2020-09)		
EN 55032:2015+A11:2020	XK2206012120E	Conform
EN 55035:2017+A11:2020	XX2300012120E	Contonn
EN IEC 61000-3-2:2019		
EN 61000-3-3:2013+A1:2019		
ETSI EN 300 328 V2.2.2 (2019-07)	XK2306012120BT	Conform
EN IEC 62368-1:2020+A11:2020	XK2306012120S	Conform
EN 50663:2017, EN 62479:2010	XK2306012120MF	Conform

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 the RED Directive 2014/53/EU. It is only valid in connection with the test report number as listed. The certificate does not imply the assessment of the production and does not permit using the SiCT's logo without permission.



Authorized Signer:

Date:

Shenzhen SiCT Technology Co., Ltd.

202, Building 3, No.111 Huanguan Middle Road, Songyuanxia Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China E-mail: info@sict-lab.com.cn Http:// www.sict-lab.com.cn



CERTIFICATE

of Conformity

EC Council Directive 2011/65/EU and 2015/863/EU

Certificate No.: XK2306012121C

Applicant	:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.
Address	:	3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China
Manufacturer	:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.
Address	:	3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China
Product	:	Wireless Lavalier Microphone
Model No.		M6 Pro, M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro, M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus, MWX(X: 1~1000), M5 Pro
Brand Name	÷	N/A
Test Standard	:	IEC62321-1:2013, IEC62321-3-1:2013, IEC62321-4:2013+A1:2017 IEC62321-5:2013, IEC 62321-6:2015, IEC 62321-7-1:2015 IEC 62321-7-2:2017, IEC 62321-8:2017

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 RoHS 2.0 Directive (EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU. It is only valid in connection with the test report number XK2306012121R

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

RoHS

Authorized Signer: Andy Wang, 66 ger Date: June 21, 2023

Shenzhen SiCT Technology Co., Ltd.

202, Building 3, No.111 Huanguan Middle Road, Songyuanxia Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, P. R. China E-mail: info@sict-lab.com.cn Http:// www.sict-lab.com.cn

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

Test Report

For

SHENZHEN STARMAX AUDIO-VISUAL

TECHNOLOGY CO., LTD.

Product Name:	Wireless Lavalier Microphone
Model/Type No.:	M6 Pro, M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro, M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus, MWX(X: 1~1000), M5 Pro
Prepared By:	Shenzhen SiCT Technology Co., Ltd.
	202, Building 3, No.111 Huanguan Middle Road, Songyuanxia Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, P. R. China
Report Number:	XK2306012120BT
Tested Date:	June 17-21, 2023
Issued Date:	June 21, 2023
Tested By:	Smile Xu/ Smile Xu
	SiCT

Reviewed By:

Ninah

Nina Li

EMC Technical Manager

Approved By:



EMC General Manager



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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information	
Applicant:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO.,
	LTD.
Address of applicant:	3104, Building 2, Huasheng Longyue Tower, Jinglong Community,
	Longhua Street, Longhua District, Shenzhen, China
Manufacturer:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO.,
	LTD.
Address of Manufacturer:	3104, Building 2, Huasheng Longyue Tower, Jinglong Community,
	Longhua Street, Longhua District, Shenzhen, China

General Description of EUT	
Product Name:	Wireless Lavalier Microphone
Brand Name:	N/A
Test Model:	M6 Pro
Adding Model(s):	M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro, M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus, MWX(X: 1~1000), M5 Pro
Rated Voltage:	DC5V 2A
Battery Capacity:	1
Power Adapter:	1
Software Version:	/
Hardware Version:	1
Note: The test date is gethered t	ware a production complete provided by the manufacturer. The

Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model SW/30, DC watch, but the circuit and the electronic construction do not change, declared by the manufacturer.

Technical index for Bluetooth				
Supported Type:	Blueto	ooth 4.2+EDR		
Modulation:	GFSK	, π/4QPSK, 8DPSK		
Operation Frequency:	2402MHz~2480MHz			
Channel Number:	79			
Channel Separation:	1MHz			
Modulation:	\boxtimes	FHSS		Other forms of modulation GFSK
Type of Equipment:	\boxtimes	Stand-alone		Combined Equipment
		Plug-in radio device		Other



Adaptive / Non-adaptive		non-	adaptive Equipment
Equipment:		adap mode	tive Equipment without the possibility to switch to a non-adaptive
		adap	tive Equipment which can also operate in a non-adaptive mode
Receiver Categories:		Adap	otive equipment with a maximum RF output power greater than 10
	non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % (irrespective of the maximum RF output power); or equipment (adaptive or non-adaptive) with a maximum RF output power greater than 0 dBm e.i.r.p. and less than or equal to 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment.		
		non-a of 1 (ada e.i.r.p	adaptive equipment with a maximum Medium Utilization (MU) factor % (irrespective of the maximum RF output power); or equipment ptive or non-adaptive) with a maximum RF output power of 0 dBm o shall be considered as receiver category 3 equipment.
Operating Mode:	\square	Sing	le Antenna Equipment
		\boxtimes	Equipment with only 1 antenna
			Equipment with 2 diversity antennas but only 1 antenna active at any moment in time
			Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1antenna is used.
		Sma	rt Antenna Systems - Multiple Antennas without beam forming
			Single spatial stream / Standard throughput
			High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1
			High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2
		Sma	rt Antenna Systems - Multiple Antennas with beam forming
			Single spatial stream / Standard throughput
			High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1
			High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2

SiCTLab					
	Shenzhen SiCT Technology Co., Ltd. Report No. XK2306012120				
Antenna Type:					
		Imporary RF connector provided			
		No temporary RF connector provided			
		Antenna Gain:2.93 dBi			
		Beamforming gain:dB			
		Dedicated Antennas (equipment with antenna connector)			
		Single power level with corresponding antenna(s)			
		Multiple power settings and corresponding antenna(s)			
		Number of different Power Levels:			
		Power Level 1: dBm			
		Power Level 2: dBm			
		Power Level 3: dBm			
Information is Provided by the Supplier					
⊠In Case of FHSS Modulation:	In case of non-Adaptive Frequency Hopping equipment: The number of Hopping Frequencies:				
		In case of Adaptive Frequency Hopping Equipment: The maximum number of Hopping Frequencies: Refer to section 4.3 The minimum number of Hopping Frequencies: Refer to section 4.3			
	The	Dwell Time: Refer to section 4.3			
	The	Minimum Channel Occupation Time: Refer to section 4.3			
In Case of Adaptive	The	Channel Occupancy Time implemented by the equipment:/ ms			
Equipment:		The equipment has implemented an LBT based DAA mechanism In case of equipment using modulation different from FHSS:			
		The equipment is Frame Based equipment			
		The equipment is Load Based equipment			
		The equipment can switch dynamically between Frame Based and Load Based equipment			
		The CCA time implemented by the equipment:/ μs			
		The equipment has implemented an non-LBT based DAA mechanism			
		The equipment can operate in more than one adaptive mode			
In Case of	The	maximum RF Output Power (e.i.r.p.): dBm			
Non-adaptive Equipment	The	maximum (corresponding) Duty Cycle: %			

The worst case operational mode for each of the following tests:					
utput Power	Refer to section 3.3				
bied Channel Bandwidth	Refer to section 6.3				
mitter Unwanted Emissions in the OOB	Refer to section 7.3				
in					
mitter Unwanted Emissions in the Spurious in	Refer to section 8.3				
ver Spurious Emissions	Refer to section 9.3				
FHSS					
Dwell time:	Refer to section 4.3				
Minimum Frequency Occupation:	Refer to section 4.3				
Hopping Sequence:	Refer to section 4.3				
Hopping Frequency Separation	Refer to section 5.3				
Other					
Power Spectral Density:					
Adaptive Equipment					
Adaptivity:	-				
Receiver Blocking:	Refer to section 10.3				
Non-adaptive Equipment					
Duty cycle:	-				
Tx-Sequence:	-				
Тх-дар:	-				
Medium Utilisation:	-				
	vorst case operational mode for each of the f utput Power bied Channel Bandwidth mitter Unwanted Emissions in the OOB in mitter Unwanted Emissions in the Spurious in ver Spurious Emissions FHSS Dwell time: Minimum Frequency Occupation: Hopping Sequence: Hopping Sequence: Hopping Frequency Separation Other Power Spectral Density: Adaptive Equipment Adaptivity: Receiver Blocking: Non-adaptive Equipment Duty cycle: Tx-Sequence: Tx-gap: Medium Utilisation:				



1.2 Test Standards

The tests were performed according to following standards:

ETSI EN 300 328 V2.2.2 (2019-07) Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonised Standard for access to radio spectrum

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained

1.3 Report Version

Version No.	Date of issue	Description
Rev.00	2023-04-25	Original

1.4 Test Methodology

All measurements contained in this report were conducted with ETSI EN 300328, The equipment under test (EUT) was configured to measure its highest possible emission level. For more detail refer to the Operating Instructions.

1.5 EUT Setup and Test Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, the EUT was operated in the engineering mode to fix the Tx/Rx frequency that was for the purpose of the measurements, more detailed description as follows:



Test Frequency List	
Description	Test Frequency
EDR	2402MHz(CH00), 2441MHz(CH39), 2480MHz(CH78)
Hopping	2402-2480MHz

Modulation Configure						
Modulation	Packet	Packet Type	Packet Size			
	DH1	4	27			
GFSK	DH3	11	183			
	DH5	15	339			
Pi/4 DQPSK	2DH1	20	54			
	2DH3	26	367			
	2DH5	30	379			
	3DH1	24	83			
8DPSK	3DH3	27	552			
	3DH5	31	1021			
Note: The bluetooth has h	peen tested on the modu	lation of GESK (Pi/4) D(DPSK and 8DPSK			

Note: The bluetooth has been tested on the modulation of GFSK, (Pi/4) DQPSK and 8DPSK, compliance test and record the worst case(8DPSK).

Environmental Conditions	NTNV	LTNV	HTNV		
Temperature (°C)	24	-10	40		
Voltage (V)	AC 230				
Relative Humidity: 45 %.					
ATM Pressure	1019	mbar			

Ac	Accessories Devices And Cable List and Details					
0	Laptop	Manufacturer :	LENOVO			
		Model No. :	E43L			
		Manufacturer :	/			
		Model No. :	/			
		Length (m):	/			
		Shielded/Unshielded:	/			
•	- supplied by the manufacturer					
0	- supplied by the lab					

1.6 Measurement Uncertainty

Measurement uncertainty						
Parameter	Uncertainty	Note				
Conducted RF Output Power	±0.42dB	(1)				
Occupied Bandwidth	±1×10-7	(1)				
Conducted Power Spectral Density	±0.70dB	(1)				
	30-200MHz ±4.52dB	(1)				
Dedicted Spurious Emissions	0.2-1GHz ±5.56dB	(1)				
Radiated Spunous Emissions	1-6GHz ±3.84dB	(1)				
	6-18GHz ±3.92dB	(1)				

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal [Date	Due Date
Spectrum Analyzer	Rohde & Schwarz	FSP	100397	2023-	05-30	2024-05-29
Spectrum Analyzer	Agilent	E4407B	MY44210554	2023-	05-30	2024-05-29
EMI Test Receiver	Rohde & Schwarz	ESCI 3	100687	2023-	05-30	2024-05-29
EMI Test Receiver	Rohde & Schwarz	ESPI7	1	2023-	05-30	2024-05-29
Semi Annechoic Chamber	SAEMC	FSAC318	/	2023-	05-30	2024-05-29
Horn Antenna	A.H.	AH-118	1	2023-	2023-05-30 2	
Loop Antenna	1	ZN30900A	/	2023-	05-30	2024-05-29
Broadband Logarithmic	Schwarzbeck	VULB 9162	/	2023-05-30 202		2024-05-29
Period Antenna						
Broadband Preamplifier	Schwarzbeck	BBV9718-182	9718-182	2023-	05-30	2024-05-29
Vector Signal Generator	Agilent	N5182A	MY47071034	2023-	05-30	2024-05-29
SFU Signal Generator	R&S	SFU	/	2023-	05-30	2024-05-29
Software List						
Description	Manufacturer Model Version				Version	
Test Software	Farad		EZ-EMC RA-03A ⁴		RA-03A1	
*Remark: indicates software version used in the compliance certification testing						

2. SUMMARY OF TEST RESULTS

Standards	Reference	Description of Test Item	Result		
	4.3.1.2	RF Output Power	Passed		
	4.3.1.3	Duty Cycle, Tx-sequence, Tx-gap	N/A		
	4.3.1.4	Accumulated Transmit Time, Frequency Occupation and Hopping Sequence	Passed		
	4.3.1.5	Hopping Frequency Separation	Passed		
	4.3.1.6	Medium Utilisation (MU) Factor	N/A		
	4.3.1.7	Adaptivity (Adaptive Frequency Hopping)	N/A		
EN 300 328	4.3.1.8	Occupied Channel Bandwidth	Passed		
	4.3.1.9	Transmitter Unwanted Emissions in the Out-of-band Domain	Passed		
	4.3.1.10	Transmitter Unwanted Emissions in the Spurious Domain	Passed		
	4.3.1.11	Receiver Spurious Emissions	Passed		
	4.3.1.12	Receiver Blocking	Passed		
	4.3.1.13	Geo-location capability	N/A		
Passed: The EUT complies with the essential requirements in the standard					
Failed: The EUT does not comply with the essential requirements in the standard					
N/A: not applicat	ble				

3. RF Output Power

3.1 Limit

According to ETSI EN 300 328 Section 4.3.1.2.3, The RF output power for FHSS equipment shall be equal to or less than 20 dBm.

For non-adaptive FHSS equipment, where the manufacturer has declared an RF output power lower than 20 dBm e.i.r.p., the RF output power shall be equal to or less than that declared value.

3.2 Test Procedure

1. The test conditions.

 \square Normal condition \square Extreme conditions

2. Please refer to ETSI EN 300 328 Sub-clause 5.4.2.2.1 for the measurement method.

3.3 Summary of Test Results

⊠ Passed

Not Applicable

Test conditions	Modulation	EIRP (dBm)	Limit (dBm)	Result
NTNV	GFSK	-2.35	<20	PASS
NTNV	π/4QPSK	0.33	<20	PASS
NTNV	8DPSK	1.26	<20	PASS
LTNV	GFSK	-1.39	<20	PASS
LTNV	π/4QPSK	0.23	<20	PASS
LTNV	8DPSK	1.39	<20	PASS
HTNV	GFSK	-1.17	<20	PASS
HTNV	π/4QPSK	0.52	<20	PASS
HTNV	8DPSK	1.47	<20	PASS
Note: Measured Por	wer(EIRP) include the	e cable loss and ante	nna gain.	



4. Accumulated Transmit Time, Frequency Occupation and Hopping

Sequence

4.1 Limit

According to ETSI EN 300 328 section 4.3.1.4.3,

Adaptive FHSS equipment shall be capable of operating over a minimum of 70 % of the band specified in table 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 FHSS 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.

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.

4.2 Test procedure

1. The test conditions.

Normal condition Extreme conditions

2. Please refer to ETSI EN 300 328 Sub-clause5.4.4.2.1 for the measurement method.

4.3 Summary of Test Results/Plots

Passed

Not Applicable



			Maximum Accumulated Dwell Time		
Modulation	Test Channel	Packet	Acc. Dwell Time	Limit	
			ms	ms	
OFOK	2402MHz	DH5	294.474	<400	
Grok	2480MHz	DH5	332.005	<400	
π /4QPSK	2402MHz	2DH5	297.773	<400	
	2480MHz	2DH5	320.901	<400	
anner	2402MHz	3DH5	329.916	<400	
8DPSK	2480MHz	3DH5	303.765	<400	
Test Period: 400ms X Minimum number of hopping frequencies (N)					
Accumulated Dwell Time = Time slot length (Dwell time) X Number of data points within a test period					
8DPSK Test Period: 40 Accumulated D	2480MHz 0ms X Minimum nu 0well Time = Time sl	3DH5 mber of hoppin ot length (Dwe	303.765 ng frequencies (N) ell time) X Number of data	<400 vithin a test period	

Note: Test data is corrected with the worst case, which the packet length is DH5, 2DH5, 3DH5.

			Frequency Occupation requirement		
Modulation	lest Channel	Packet	Burst Number	Limit(Burst Number)	
CESK	2402MHz	DH5	3	≥1	
Grok	2480MHz	DH5	5	≥1	
π /4QPSK	2402MHz	2DH5	5	≥1	
	2480MHz	2DH5	2	≥1	
8DPSK	2402MHz	3DH5	1	≥1	
	2480MHz	3DH5	4	≥1	
Test Period: 4 X Dwell time X Minimum number of hopping frequencies (N)					
Occupation Time = Time slot length (Dwell time) X Number of data points within a test period					
Note: Test data	is corrected with the	e worst case, v	which the packet len	gth is DH5, 2DH5, 3DH5.	

Hopping Sequence						
Modulation	Number of Hopping Frequencies	Limit	Band Allocation(%)	Limit Band Allocation(%)	Result	
GFSK	79	≥15.00	95.4			
π/4QPSK	79	≥15.00	95.9	≥70%	Pass	
8DPSK	79	≥15.00	95.8			
Note [.] Test da	ta is corrected with t	he worst case v	which the packet length is I	0H5 2DH5 3DH	15	

Test plot as follows:



5. Hopping Frequency Separation

5.1 Limit

According to ETSI EN 300 328 section 4.3.1.5.3, For adaptive FHSS equipment, the minimum Hopping Frequency Separation shall be 100 kHz.

5.2 Test procedure

1. The test conditions.

Normal condition Extreme conditions

2. Please refer to ETSI EN 300 328 Sub-clause5.4.5.2.1 for the measurement method.

5.3 Summary of Test Results/Plots

Passed Not Applicable

Test	Test Channel Channel Separation		Limit	
lest Mode	MHz	MHz	MHz	
CESK	2402	0.968	>0.1	
Gron	2480	1.029	>0.1	
Pi/4 DQPSK	2402	0.837	>0.1	
	2480	1.048	>0.1	
0DDCK	2402	0.963	>0.1	
OUPSK	2480	0.806	>0.1	
Note: Test data is corrected with the worst case, which the packet length is DH5, 2DH5, 3DH5.				

Test plot as follows:















6. Occupied Channel Bandwidth

6.1 Limit

According to ETSI EN 300 328 section 4.3.1.8.3,

The Occupied Channel Bandwidth for each hopping frequency shall be within the band given in table 1. In addition, for non-adaptive FHSS equipment with e.i.r.p. greater than 10 dBm, the Occupied Channel Bandwidth for every occupied hopping frequency shall be equal to or less than 5 MHz.

6.2 Test procedure

1. The test conditions.

Normal condition Extreme conditions

2. Please refer to ETSI EN 300 328 Sub-clause5.4.7.2.1 for the measurement method.

6.3 Summary of Test Results/Plots

- ⊠ Passed
- Not Applicable

	Channel	Occupied	Measured Frequency (MHz)				
Mode		Channel Bandwidth(MHz)	Low	High	Limit (MHz)	Result	
GFSK	CH00	0.884	2401.541	2402.425	2400 00~2483 50	Pass	
	CH78	0.882	2479.541	2480.423	2400.00~2463.50		
π/4QPSK	CH00	1.184	2401.39	2402.574	2400 00-2482 50	Pass	
	CH78	1.183	2479.389	2480.572	2400.00~2463.30		
8DPSK	CH00	1.222	2401.36	2402.582	2400 00-2482 50	Pass	
	CH78	1.221	2479.36	2480.581	2400.00~2463.50		
Note: Test data is corrected with the worst case, which the packet length is DH5, 2DH5, 3DH5.							



Test plot as follows:











7. Transmitter Unwanted Emissions in the Out-of-band Domain

7.1 Standard Application

According ETSI EN 300 328 to section 4.3.1.9.3, The transmitter unwanted emissions in the out-of-band domain shall not exceed the values provided by the mask in figure 1.



7.2 Test procedure

1. The test conditions.

Normal condition Extreme conditions

2. Please refer to ETSI EN 300 328 Sub-clause5.4.8.2.1 for the measurement method

7.3 Summary of Test Results/Plots

Passed

Not Applicable



Test CH.	Test Segment	Max. Emissions Reading (dBm)	Limit				
	MHz	Normal	dBm				
Test Mode: GFSK DH5							
	2400-BW to 2400	-72.5	-10				
CHUU	2400-2BW to 2400-BW	-72.73	-20				
0179	2483.5 to 2483.5+BW	-73.23	-10				
Сп/о	2483.5+BW to 2483.5+2BW	-69.63	-20				
Test Mode: Pi/4 DQPSK 2DH5							
	2400-BW to 2400	-72.91	-10				
CHUU	2400-2BW to 2400-BW	-62.98	-20				
01170	2483.5 to 2483.5+BW	-66.86	-10				
	2483.5+BW to 2483.5+2BW	-72.45	-20				
Test Mode: 8DPSK 3DH5							
CL 100	2400-BW to 2400	-72.29	-10				
CHUU	2400-2BW to 2400-BW	-70.89	-20				
01170	2483.5 to 2483.5+BW	-71.49	-10				
	2483.5+BW to 2483.5+2BW	-72.1	-20				
Note 1: the data ju	ist list the worst cases						













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8. Transmitter Unwanted Emissions in the Spurious Domain

8.1 Limit

According to ETSI EN 300 328 section 4.3.1.10.3,

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in table 4. In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

Frequency range	Maximum power	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 694 MHz	-54 dBm	100 kHz
694 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

Table 4: Transmitter limits for spurious emissions

8.2 Test Procedure

1. The test conditions.

Normal condition Extreme conditions

2. Please refer to ETSI EN 300 328 Sub-clause 5.4.9.2.2 for the measurement method.

8.3 Summary of Test Results/Plots

☐ Passed ☐ Not Applicable

Note1: According to the data, the EUT complied with the EN 300328 standards, and had the worst cases: GFSK DH5 mode, so only show the test data for worse case.

Note 2: The EUT was tested in 3 orthogonal positions and the worst case position data was reported.



> Radiated Spurious Emission From 30MHz To 1GHz















Spurious Emission Above 1GHz








Shenzhen SiCT Technology Co., Ltd.

Report No. XK2306012120BT







9. Receiver Spurious Emissions

9.1 Limit

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The receiver spurious emissions shall not exceed the values given in table 5.

In case of FHSS equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

Table 5: Spurious emission limits for receivers

Frequency range	Maximum power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12,75 GHz	-47 dBm	1 MHz

9.2 Test Procedure

1. The test conditions.

Normal condition Extreme conditions

2. Please refer to ETSI EN 300 328 Sub-clause 5.4.10.2.2 for the measurement method.

9.3 Summary of Test Results/Plots

Passed Interview Not Applicable

Note: According to the data, the EUT complied with the EN 300328 standards, and had the worst cases: GFSK DH5 mode, so only show the test data for worse case.



Receiver Spurious Emission From 30MHz To 1GHz

















Receiver Spurious Emission Above 1GHz















10. Receiver Blocking

10.1 Limit

According to ETSI EN 300 328 section 4.3.1.11.2,

Performance Criteria

For equipment that supports a PER or FER test to be performed, the minimum performance criterion shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER test to be performed, the minimum performance criterion shall be no loss of the wireless transmission function needed for the intended use of the equipment.

Receiver Category 1: Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p.

Wan	ted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal	
(-133 dBr	n + 10 × log ₁₀ (OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504			
(-139 dBm + 10 × log ₁₀ (OCBW)) or -74 dBm whichever is less (see note 3)		2 300 2 330 2 360 2 524 2 584 2 674	-34	CW	
NOTE 1: NOTE 2:	 NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal 				
NOTE 3:	required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Point + 20 dB where Points is the minimum level of wanted signal				
NOTE 4:	 ability a manual signal up to r min * Load matter min is dre minimum rever or wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. TE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2. 				

Receiver Category 2: non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % (irrespective of the maximum RF output power); or equipment (adaptive or non-adaptive) with a maximum RF output power greater than 0 dBm e.i.r.p. and less than or equal to 10 dBm e.i.r.p.



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Wanted si compa (se	ignal mean power from anion device (dBm) e notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 7 or (-74 dBm	10 × log ₁₀ (OCBW) + 10 dB) + 10 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OC NOTE 2: In o wa min as NOTE 3: Tho ass for this	BW is in Hz. case of radiated measuremented signal from the companity be performed using a want nimum level of wanted signal defined in clause 4.3.1.12.3 is elevel specified is the level a sembly gain. In case of conduting (in-band) antenna assembles level is equivalent to a power stream of the company set of the sembles of the set of the	nts using a co ion device car ed signal up t required to m in the absence to the UUT rec ucted measure nbly gain (G). er flux density	mpanion device a not be determine o P _{min} + 26 dB wi eet the minimum e of any blocking eiver input assum ements, this level In case of radiate (PFD) in front of	and the level of the ed, a relative test here P _{min} is the performance criteria signal. hing a 0 dBi antenna has to be corrected d measurements, the UUT antenna

Receiver category 3: non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % (irrespective of the maximum RF output power); or

equipment (adaptive or non-adaptive) with a maximum RF output power of 0 dBm e.i.r.p.

Wante co	d signal mean power from mpanion device (dBm)	Blocking signal	Blocking signal power	Type of blocking signal	
	(see notes 1 and 3)	frequency	(dBm)		
		(MHz)	(see note 3)		
(-139 dBn	n + 10 × log ₁₀ (OCBW) + 20 dB)	2 380			
or (-74 d	Bm + 20 dB) whichever is less	2 504	24	CW	
	(see note 2)	2 300	-34	CVV	
	(000 11010 2)	2 584			
NOTE 1: NOTE 2:	OCBW is in Hz. In case of radiated measurement	nts using a com	panion device ar	nd the level of the	
	wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P _{min} + 30 dB where P _{min} is the				
	minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.				
NOTE 3:	NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected				
	for the (in-band) antenna assem	bly gain (G). In	case of radiated	measurements,	
	this level is equivalent to a power flux density (PFD) in front of the UUT antenna				
	with the UUT being configured/p	positioned as rec	corded in clause	5.4.3.2.2.	



10.2 Test Procedure

1. The test conditions.

Normal condition Extreme conditions

2. Please refer to ETSI EN 300 328 Sub-clause 5.4.10.2.1 for the measurement method.

10.3 Summary of Test Results/Plots

Passed Interview Not Applicable

Receiver category 2 (Power <10dBm)							
Operating Channel	OCBW (Hz)	Wanted signal power (dBm)	Blocking signal Frequency (MHz)	Blocking signal power (dBm)	PER(%)	Limit(%)	Result
Lowost	884000 00	60.43	2300	-47	0.11	<10	PASS
Lowest	004000.00	-09.43	2380	-57	0.12	<10	PASS
Highest	882000.00	-69.48	2504	-57	0.16	<10	PASS
			2584	-47	0.26	<10	PASS

Note:

- 1. The equipment belong to Receiver Category 2.
- 2. Wanted signal power (dBm) = (-139 dBm + 10 × log10(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less .



EXHIBIT 1 - EUT PHOTOGRAPHS



Photo 1



Photo 2





Photo 3



Photo 4





Photo 5



Photo 6





Photo 7



Photo 8





Photo 9



Photo 10





Photo 11



Photo 12





Photo 13



Photo 14





Photo 15



Photo 16





Photo 17



Photo 18





Photo 19



Photo 20





Photo 20



Photo 22





Photo 23



Photo 24



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Photo 25



Photo 26





Photo 27

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



TEST REPORT EN IEC 62368-1 Audio/video, information and communication technology equipment Part 1: Safety requirements				
Report Number:	XK2306012120S			
Tested by (name + signature) :	Rachel Yang	Rachel Yang SICT To		
Reviewed by (name + signature) :	Jean Shu	Jem Ghr 5 SICTLAN		
Approved by (name + signature) :	Andy Wang	Andy Wang * pi		
Date of issue:	June 21, 2023			
Total number of pages:	81 pages			
Name of Testing Laboratory preparing the Report:	Shenzhen SiCT Technology Co., Ltd. 202, Building 3, No.111 Huanguan Middle Road, Songyuanxia Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China			
Applicant's name:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.			
Address:	3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China			
Test specification:				
Standard:	EN IEC 62368-1:202	0+A11:2020		
Test procedure:	Type test			
Non-standard test method:	N/A			
Tast item description	Wireless Lavalier Mi	ronhone		
Trade Mark(s)	N/A			
Manufacturer	SHENZHEN STARM 3104, Building 2, Hui Longhua Street, Lon	AX AUDIO-VISUAL TECHNOLOGY CO., LTD asheng Longyue Tower, Jinglong Community, ghua District, Shenzhen, China		
Model/Type reference:	M6 Pro, M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro, M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus, MWX(X: 1~1000), M5 Pro			
Ratings:	Input: 5V === 2A,			
	Class III equipment.			



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

- Attachment No.1: European Group Differences and National Differences (23 pages)

- Attachment No.2: Product photos (14 pages)

Summary of testing:	
Tests performed (name of test and test clause): -Refer to appended clause table for details	Testing location: Shenzhen SiCT Technology Co., Ltd. 202, Building 3, No.111 Huanguan Middle Road, Songyuanxia Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China
European Group Differences and National Differences	ences
igtimes The product fulfils the requirements of EN IEC	C 62368-1: 2020+A11: 2020.





The model's name can be replaced by other's model in this report.

Test item particulars:	
Product group	end product Duilt-in component
Classification of use by	☐ Ordinary person ☐ Children likely present ☐ Instructed person
Supply connection:	□ Skilled person □ AC mains □ DC mains ⊠ not mains connected: □ ES1 □ ES2
Supply tolerance:	☐ +10%/-10% ☐ +20%/-15%
Supply connection – type:	 + %/ - % None pluggable equipment type A - non-detachable supply cord appliance coupler
	☐ direct plug-in ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler
	mating connector dother: External power supply
Considered current rating of protective	□ A;
device:	Location: Duilding equipment
Equipment mobility:	 N/A Movable ☐ hand-held ☐ transportable ☐ direct plug-in ☐ stationary ☐ for building-in ☐ wall/ceiling-mounted ☐ SRME/rack-mounted
Overvoltage category (OVC):	□ other: □ OVC I □ OVC II □ OVC IV ⊠ other: not directly connected to the mains
Class of equipment:	□ Class I □ Class II ⊠ Class III □ Not classified □
Special installation location:	N/A ☐ restricted access area ☐ outdoor location ☐
Pollution degree (PD)	□ PD 1
Manufacturer's specified T _{ma} :	25 °C 🗌 Outdoor: minimum °C
IP protection class	⊠ IPX0 □ IP
Power systems:	⊠ TN ⊠ TT □ IT - V ∟-∟ □ not AC mains
Altitude during operation (m)	⊠ 2000 m or less □ m
Altitude of test laboratory (m)	⊠ 2000 m or less □ m
Mass of equipment (kg)	0.09kg

Possible test case verdicts:					
- test case does not apply to the test object:	N/A				
- test object does meet the requirement	P (Pass)				
- test object does not meet the requirement:	F (Fail)				
Testing:					
Date of receipt of test item	June 17, 2023				
Date (s) of performance of tests	June 17, 2023 to June 21, 2023				
General remarks:					
"(See Enclosure #)" refers to additional informatio "(See appended table)" refers to a table appended	n appended to the report. to the report.				
Throughout this report a 🗌 comma / 🔀 point	is used as the decimal separator.				
Manufacturer's Declaration per sub-clause 4.2.8	5 of IECEE 02:				
The application for obtaining a Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	 □ Yes ⊠ Not applicable 				
When differences exist; they shall be identified	in the General product information section.				
Name and address of factory (ies) :	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.				
	3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China				
 General product information and other remarks: Product Description The product covered in this report was Wireless Lavalier Microphone it can be supplied by DC source via Micro USB and internal re-chargeable battery. The product was submitted and evaluated for use at the max ambient temperature (Tma) permitted by the manufacturer's specification of: 25°C. 					
Model Differences					
All models covered in this report are the same with appearance (for color, silk-screen only) and suppl	h each other, except for different model No. and y plug connection for trading purpose.				
Additional application considerations					
N/A					



OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS					
Clause	Possible Hazard				
5	Electrically-caused injury				
Class and Energy Source	Body Part	Safeguards			
(e.g. ES3: Primary circuit)	(e.g. Ordinary)	В	S	R	
ES1: All circuit	Ordinary	N/A	N/A	N/A	
6	Electrically-caused fire				
Class and Energy Source	Material part		Safeguards		
(e.g. PS2: 100 Watt circuit)	(e.g. Printed board)	В	1 st S	2 nd S	
DS2: Dottony coll output	Plastic enclosure and	Sec. 6.2	Enclosure	N/A	
PS2. Ballery cell output	Printed board	366 0.3	V-1		
PS1: 5Vdc input	USB	N/A	N/A	N/A	
7	Injury caused by hazardous	substances			
Class and Energy Source	Body Part		Safeguards		
(e.g. Ozone)	(e.g., Skilled)	В	S	R	
N/A	N/A	N/A	N/A	N/A	
8	Mechanically-caused injury				
Class and Energy Source	Body Part	Safeguards			
(e.g. MS3: Plastic fan blades)	(e.g. Ordinary)	В	S	R	
MS1: Sharp edges and Corners	Ordinary	N/A	N/A	N/A	
MS1: Equipment mass	Ordinary	N/A	N/A	N/A	
9	Thermal burn				
Class and Energy Source	Body Part		Safeguards		
(e.g. TS1: Keyboard caps)	(e.g., Ordinary)	В	S	R	
TS1	Ordinary	N/A	N/A	N/A	
10	Radiation	Γ			
Class and Energy Source	Body Part		Safeguards		
(e.g. RS1: PMP sound output)	(e.g., Ordinary)	В	S	R	
RS1: Indicator light	Ordinary	N/A	N/A	N/A	
Supplementary Information:					
"B" – Basic Safeguard; "S" – Supplementary Safeguard; "R" – Reinforced Safeguard					

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

4	GENERAL REQUIREMENTS		
4.1.1	Acceptance of materials, components and subassemblies		Р
4.1.2	Use of components	(See appended table 4.1.2)	Р
4.1.3	Equipment design and construction		Р
4.1.4	Specified ambient temperature for outdoor use (°C)		N/A
4.1.5	Constructions and components not specifically covered		N/A
4.1.8	Liquids and liquid filled components (LFC)	(See G.15)	Р
4.1.15	Markings and instructions	(See Annex F)	Р
4.4.3	Safeguard robustness		Р
4.4.3.1	General		N/A
4.4.3.2	Steady force tests	(See Clause T.3, T.4, T.5)	Р
4.4.3.3	Drop tests		Р
4.4.3.4	Impact tests		N/A
4.4.3.5	Internal accessible safeguard tests		N/A
4.4.3.6	Glass impact tests	(See Clause T.9, Annex U)	N/A
4.4.3.7	Glass fixation tests		N/A
	Glass impact test (1J)		N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests		Р
4.4.3.9	Air comprising a safeguard		N/A
4.4.3.10	Accessibility, glass, safeguard effectiveness	All safeguards remain effective	N/A
4.4.4	Displacement of a safeguard by an insulating liquid		N/A
4.4.5	Safety interlocks	(See Annex K)	N/A
4.5	Explosion		Р
4.5.1	General	(See Annex M for batteries)	Р
4.5.2	No explosion during normal/abnormal operating condition	(See Clause B.2, B.3)	Р
	No harm by explosion during single fault conditions	(See Clause B.4)	Р
4.6	Fixing of conductors		N/A
	Fix conductors not to defeat a safeguard		N/A
	Compliance is checked by test	(See Clause T.2)	N/A
4.7	Equipment for direct insertion into mains socket	-outlets	N/A
4.7.2	Mains plug part complies with relevant standard:		N/A

IEC 62368-1				
Clause	Requirement + Test	Result - Remark	Verdict	
4.7.3	Torque (Nm):		N/A	
4.8	Equipment containing coin/button cell batteries		N/A	
4.8.1	General		N/A	
4.8.2	Instructional safeguard:		N/A	
4.8.3	Battery compartment door/cover construction		N/A	
	Open torque test		N/A	
4.8.4.2	Stress relief test		N/A	
4.8.4.3	Battery replacement test		N/A	
4.8.4.4	Drop test		N/A	
4.8.4.5	Impact test		N/A	
4.8.4.6	Crush test		N/A	
4.8.5	Compliance		N/A	
	30N force test with test probe		N/A	
	20N force test with test hook		N/A	
4.9	Likelihood of fire or shock due to entry of conductive object		Р	
4.10	Component requirements		N/A	
4.10.1	Disconnect Device	(See Annex L)	N/A	
4.10.2	Switches and relays	(See Annex G)	N/A	

5	ELECTRICALLY-CAUSED INJURY		Р
5.2	Classification and limits of electrical energy sources		Р
5.2.2	ES1, ES2 and ES3 limits	(See appended table 5.2)	Р
5.2.2.2	Steady-state voltage and current limits	(See appended table 5.2)	Р
5.2.2.3	Capacitance limits	(See appended table 5.2)	N/A
5.2.2.4	Single pulse limits	(See appended table 5.2)	N/A
5.2.2.5	Limits for repetitive pulses:	(See appended table 5.2)	N/A
5.2.2.6	Ringing signals	(See Annex H)	N/A
5.2.2.7	Audio signals	(See Clause E.1)	N/A
5.3	Protection against electrical energy sources		N/A
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons		N/A
5.3.1 a)	Accessible ES1/ES2 derived from ES2/ES3 circuits		N/A
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		N/A
5.3.2.1	Accessibility to electrical energy sources and safeguards		N/A
	Accessibility to outdoor equipment bare parts		N/A


IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.3.2.2	Contact requirements		N/A
	Test with test probe from Annex V		
5.3.2.2 a)	Air gap – electric strength test potential (V)	(See appended table 5.4.9)	N/A
5.3.2.2 b)	Air gap – distance (mm):		N/A
5.3.2.3	Compliance		N/A
5.3.2.4	Terminals for connecting stripped wire		N/A
5.4	Insulation materials and requirements		N/A
5.4.1.2	Properties of insulating material		N/A
5.4.1.3	Material is non-hygroscopic		N/A
5.4.1.4	Maximum operating temperature for insulating materials	(See appended table)	N/A
5.4.1.5	Pollution degrees		N/A
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N/A
5.4.1.5.3	Thermal cycling test		N/A
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		N/A
5.4.1.8	Determination of working voltage	(See appended table 5.4.1.8)	N/A
5.4.1.9	Insulating surfaces		N/A
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		N/A
5.4.1.10.2	Vicat test:	(See appended table 5.4.1.10.2)	N/A
5.4.1.10.3	Ball pressure test:	(See appended table 5.4.1.10.3)	N/A
5.4.2	Clearances		N/A
5.4.2.1	General requirements		N/A
	Clearances in circuits connected to AC Mains, Alternative method	(See Annex X)	N/A
5.4.2.2	Procedure 1 for determining clearance		N/A
	Temporary overvoltage		
5.4.2.3	Procedure 2 for determining clearance		N/A
5.4.2.3.2.2	a.c. mains transient voltage		
5.4.2.3.2.3	d.c. mains transient voltage		
5.4.2.3.2.4	External circuit transient voltage		
5.4.2.3.2.5	Transient voltage determined by measurement:		
5.4.2.4	Determining the adequacy of a clearance using an electric strength test	(See appended table 5.4.2)	N/A

	IEC 62368-1		
Clause	Requirement + Test	Result - Remark	Verdict
5.4.2.5	Multiplication factors for clearances and test voltages		N/A
5.4.2.6	Clearance measurement:	(See appended table 5.4.2)	N/A
5.4.3	Creepage distances		N/A
5.4.3.1	General		N/A
5.4.3.3	Material group		
5.4.3.4	Creepage distances measurement	(See appended table 5.4.3)	N/A
5.4.4	Solid insulation		N/A
5.4.4.1	General requirements		N/A
5.4.4.2	Minimum distance through insulation	(See appended table 5.4.4.2)	N/A
5.4.4.3	Insulating compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Insulating compound forming cemented joints		N/A
5.4.4.6	Thin sheet material		N/A
5.4.4.6.1	General requirements		N/A
5.4.4.6.2	Separable thin sheet material		N/A
	Number of layers (pcs):		N/A
5.4.4.6.3	Non-separable thin sheet material		N/A
	Number of layers (pcs):		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material:	(See appended table 5.4.9)	N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components		N/A
5.4.4.9	Solid insulation at frequencies >30 kHz, <i>E</i> _P , <i>K</i> _R , <i>d</i> , <i>V</i> _{PW} (V):	(See appended Table 5.4.4.9)	N/A
	Alternative by electric strength test, tested voltage (V), <i>K</i> _R :	(See appended Tables 5.4.4.9 and 5.4.9)	N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
5.4.5.3	Insulation resistance (MΩ)		N/A
	Electric strength test	(See appended table 5.4.9)	N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard		N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		N/A
	Relative humidity (%), temperature (°C), duration (h):		—

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.9	Electric strength test		N/A
5.4.9.1	Test procedure for type test of solid insulation:	(See appended table 5.4.9)	N/A
5.4.9.2	Test procedure for routine test		N/A
5.4.10	Safeguards against transient voltages from external circuits		N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test	(See appended table 5.4.9)	N/A
5.4.10.2.3	Steady-state test:	(See appended table 5.4.9)	N/A
5.4.10.3	Verification for insulation breakdown for impulse test		N/A
5.4.11	Separation between external circuits and earth		N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	SPDs bridge separation between external circuit and earth		N/A
	Rated operating voltage U _{op} (V):		
	Nominal voltage U _{peak} (V):		
	Max increase due to variation ΔU_{sp} :		
	Max increase due to ageing ΔU_{sa} :		
5.4.11.3	Test method and compliance:	(See appended table 5.4.9)	N/A
5.4.12	Insulating liquid		N/A
5.4.12.1	General requirements		N/A
5.4.12.2	Electric strength of an insulating liquid	(See appended table 5.4.9)	N/A
5.4.12.3	Compatibility of an insulating liquid	(See appended table 5.4.9)	N/A
5.4.12.4	Container for insulating liquid		N/A
5.5	Components as safeguards		N/A
5.5.1	General		N/A
5.5.2	Capacitors and RC units		N/A
5.5.2.1	General requirement		N/A
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector	(See appended table 5.5.2.2)	N/A
5.5.3	Transformers		N/A
5.5.4	Optocouplers	(See sub-clause 5.4 or Clause G.12)	N/A
5.5.5	Relays	(See sub-clause 5.4)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.5.6	Resistors	(See Clause G.10)	N/A
5.5.7	SPDs	(See Clause G.8)	N/A
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable		N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment		N/A
	RCD rated residual operating current (mA):		
5.6	Protective conductor	1	N/A
5.6.2	Requirement for protective conductors		N/A
5.6	Protective conductor		N/A
5.6.2	Requirement for protective conductors		N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation		N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm ²):		
	Protective earthing conductor serving as a reinforced safeguard		N/A
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm ²):		
5.6.4.2	Protective current rating (A):		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Terminal size for connecting protective earthing conductors (mm)		N/A
	Terminal size for connecting protective bonding conductors (mm):		N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective bonding system		N/A
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method:	(See appended table 5.6.6)	N/A
5.6.6.3	Resistance (Ω) or voltage drop:	(See appended table 5.6.6)	N/A
5.6.7	Reliable connection of a protective earthing conductor		N/A
5.6.8	Functional earthing		N/A
	Conductor size (mm ²):		N/A
	Class II with functional earthing marking:		N/A
	Appliance inlet cl & cr (mm):		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
5.7	Prospective touch voltage, touch current and pro	otective conductor current	N/A
5.7.2	Measuring devices and networks		N/A
5.7.2.1	Measurement of touch current		N/A
5.7.2.2	Measurement of voltage		N/A
5.7.3	Equipment set-up, supply connections and earth connections		N/A
5.7.4	Unearthed accessible parts:	(See appended table 5.7.4)	N/A
5.7.5	Earthed accessible conductive parts	(See appended table 5.7.5)	N/A
5.7.6	Requirements when touch current exceeds ES2 limits		N/A
	Protective conductor current (mA):		N/A
	Instructional Safeguard:		N/A
5.7.7	Prospective touch voltage and touch current associated with external circuits		N/A
5.7.7.1	Touch current from coaxial cables		N/A
5.7.7.2	Prospective touch voltage and touch current associated with paired conductor cables		N/A
5.7.8	Summation of touch currents from external circuits		N/A
	a) Equipment connected to earthed external circuits, current (mA)		N/A
	b) Equipment connected to unearthed external circuits, current (mA):		N/A
5.8	Backfeed safeguard in battery backed up supplie	es estatution esta estatution estatution est	N/A
	Mains terminal ES	(See appended table 5.8)	N/A
	Air gap (mm):		N/A

6	ELECTRICALLY- CAUSED FIRE		Р
6.2	Classification of PS and PIS		Р
6.2.2	Power source circuit classifications:	(See appended table 6.2.2)	Р
6.2.3	Classification of potential ignition sources		Р
6.2.3.1	Arcing PIS	(See appended table 6.2.3.1)	N/A
6.2.3.2	Resistive PIS	(See appended table 6.2.3.2)	N/A
6.3	Safeguards against fire under normal operating and abnormal operating conditions		Р
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials	(See appended table B.1.5 and B.3)	N/A
	Combustible materials outside fire enclosure:		Р
6.4	Safeguards against fire under single fault conditions		Р
6.4.1	Safeguard method		Р



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Clause	Requirement + Test	Result - Remark	Verdict
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		Р
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	Fire enclosure	Р
6.4.3.1	Supplementary safeguards		N/A
6.4.3.2	Single Fault Conditions	(See appended table B.4)	N/A
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		Р
6.4.5	Control of fire spread in PS2 circuits		Р
6.4.5.2	Supplementary safeguards		N/A
6.4.6	Control of fire spread in PS3 circuits		N/A
6.4.7	Separation of combustible materials from a PIS		N/A
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers	Fire enclosure used	Р
6.4.8.2	Fire enclosure and fire barrier material properties		Р
6.4.8.2.1	Requirements for a fire barrier		N/A
6.4.8.2.2	Requirements for a fire enclosure	Enclosure material: V-1	Р
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		Р
6.4.8.3.1	Fire enclosure and fire barrier openings		Р
6.4.8.3.2	Fire barrier dimensions		Р
6.4.8.3.3	Top openings and properties		N/A
	Openings dimensions (mm):		N/A
6.4.8.3.4	Bottom openings and properties		Р
	Openings dimensions (mm):		Р
	Flammability tests for the bottom of a fire enclosure	(See Clause S.3)	N/A
	Instructional Safeguard:		N/A
6.4.8.3.5	Side openings and properties		Р
	Openings dimensions (mm):		Р
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c):		N/A
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating		N/A
6.4.9	Flammability of insulating liquid		N/A
6.5	Internal and external wiring		N/A
6.5.1	General requirements		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
6.5.2	Requirements for interconnection to building wiring		N/A
6.5.3	Internal wiring size (mm ²) for socket-outlets:		N/A
6.6	Safeguards against fire due to the connection to	additional equipment	N/A

7	INJURY CAUSED BY HAZARDOUS SUBSTANCES	N/A
7.2	Reduction of exposure to hazardous substances	
7.3	Ozone exposure	N/A
7.4	Use of personal safeguards or personal protective equipment (PPE)	N/A
	Personal safeguards and instructions:	—
7.5	Use of instructional safeguards and instructions	N/A
	Instructional safeguard (ISO 7010):	—
7.6	Batteries and their protection circuits	N/A

8	MECHANICALLY-CAUSED INJURY		Р
8.2	Mechanical energy source classifications		Р
8.3	Safeguards against mechanical energy sources		N/A
8.4	Safeguards against parts with sharp edges and co	orners	Р
8.4.1	Safeguards	Edges and corners are rounded, MS1	Р
	Instructional Safeguard		N/A
8.4.2	Sharp edges or corners		N/A
8.5	Safeguards against moving parts		N/A
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts		N/A
	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
	Moving MS3 parts only accessible to skilled person		N/A
8.5.2	Instructional safeguard:		N/A
8.5.4	Special categories of equipment containing moving parts		N/A
8.5.4.1	General		N/A
8.5.4.2	Equipment containing work cells with MS3 parts		N/A
8.5.4.2.1	Protection of persons in the work cell		N/A
8.5.4.2.2	Access protection override		N/A
8.5.4.2.2.1	Override system		N/A
8.5.4.2.2.2	Visual indicator		N/A
8.5.4.2.3	Emergency stop system		N/A



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

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Clause	Requirement + Test	Result - Remark	Verdict
8.8	Handles strength		N/A
8.8.1	General		N/A
8.8.2	Handle strength test		N/A
	Number of handles		
	Force applied (N)		
8.9	Wheels or casters attachment requirements		N/A
8.9.2	Pull test		N/A
8.10	Carts, stands and similar carriers		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions:		N/A
8.10.3	Cart, stand or carrier loading test		N/A
	Loading force applied (N)		N/A
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Force applied (N)		
8.10.6	Thermoplastic temperature stability		N/A
8.11	Mounting means for slide-rail mounted equipmen	t (SRME)	N/A
8.11.1	General		N/A
8.11.2	Requirements for slide rails		N/A
	Instructional Safeguard		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force (N) applied:		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance		N/A
8.12	Telescoping or rod antennas		N/A
	Button/ball diameter (mm):		

9	THERMAL BURN INJURY		Р
9.2	Thermal energy source classifications		Р
9.3	Touch temperature limits		Р
9.3.1	Touch temperatures of accessible parts	(See appended table)	Р
9.3.2	Test method and compliance		Р
9.4	Safeguards against thermal energy sources		Р
9.5	Requirements for safeguards		Р
9.5.1	Equipment safeguard		Р

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Clause	Requirement + Test	Result - Remark	Verdict
9.5.2	Instructional safeguard		N/A
9.6	9.6 Requirements for wireless power transmitters		N/A
9.6.1	General		N/A
9.6.2	Specification of the foreign objects		N/A
9.6.3	Test method and compliance:	(See appended table 9.6)	N/A

10	RADIATION		Р
10.2	Radiation energy source classification	Radiation energy source classification	
10.2.1	General classification	Indicator light as RS1	Р
	Lasers		
	Lamps and lamp systems		
	Image projectors		
	X-Ray		
	Personal music player		
10.3	Safeguards against laser radiation		N/A
	The standard(s) equipment containing laser(s) comply		N/A
10.4	Safeguards against optical radiation from lamps and lamp systems (including LED types)		N/A
10.4.1	General requirements		N/A
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A
	Risk group marking and location		N/A
	Information for safe operation and installation		N/A
10.4.2	Requirements for enclosures		N/A
	UV radiation exposure	(See Annex C)	N/A
10.4.3	Instructional safeguard		N/A
10.5	Safeguards against X-radiation		N/A
10.5.1	Requirements		N/A
	Instructional safeguard for skilled persons:		
10.5.3	Maximum radiation (pA/kg)	(See appended tables B.3 & B.4)	—
10.6	Safeguards against acoustic energy sources		Р
10.6.1	General		Р
10.6.2	Classification		Р
	Acoustic output <i>L</i> _{Aeq,T} , dB(A):		Р
	Unweighted RMS output voltage (mV)		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Digital output signal (dBFS):		N/A
10.6.3	Requirements for dose-based systems		N/A
10.6.3.1	General requirements		N/A
10.6.3.2	Dose-based warning and automatic decrease		N/A
10.6.3.3	Exposure-based warning and requirements		N/A
	30 s integrated exposure level (MEL30)		N/A
	Warning for MEL \geq 100 dB(A)		N/A
10.6.4	Measurement methods		N/A
10.6.5	Protection of persons		N/A
	Instructional safeguards		N/A
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		Р
10.6.6.1	Corded listening devices with analogue input		N/A
	Listening device input voltage (mV):		N/A
10.6.6.2	Corded listening devices with digital input		N/A
	Max. acoustic output <i>L</i> _{Aeq,T} , dB(A):		N/A
10.6.6.3	Cordless listening devices		Р
	Max. acoustic output <i>L</i> _{Aeq,T} , dB(A):	68.5dB	Р

в	NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS		Р
B.1	General		Р
B.1.5	Temperature measurement conditions	(See appended table B.1.5)	Р
B.2	Normal operating conditions		Р
B.2.1	General requirements:	(See Test Item Particulars and appended test tables)	Р
	Audio Amplifiers and equipment with audio amplifiers:	No audio amplifier circuits	N/A
B.2.3	Supply voltage and tolerances		Р
B.2.5	Input test:	(See appended table B.2.5)	Р
B.3	Simulated abnormal operating conditions		Р
B.3.1	General		Р
B.3.2	Covering of ventilation openings		Р
	Instructional safeguard		N/A
B.3.3	DC mains polarity test		Р
B.3.4	Setting of voltage selector		N/A
B.3.5	Maximum load at output terminals	(See appended table B.3)	Р
B.3.6	Reverse battery polarity	No battery used	N/A



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Clause	Requirement + Test	Result - Remark	Verdict
B.3.7	Audio amplifier abnormal operating conditions	No audio amplifiers	N/A
B.3.8	Safeguards functional during and after abnormal operating conditions	(See appended table B.3)	Р
B.4	Simulated single fault conditions		Р
B.4.1	General		Р
B.4.2	Temperature controlling device	No such controlling device	N/A
B.4.3	Blocked motor test	No motor used	N/A
B.4.4	Functional insulation		N/A
B.4.4.1	Short circuit of clearances for functional insulation		N/A
B.4.4.2	Short circuit of creepage distances for functional insulation		N/A
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors		N/A
B.4.6	Short circuit or disconnection of passive components	(See appended table B.4)	Р
B.4.7	Continuous operation of components	Not intermittent or short-time operation equipment	N/A
B.4.8	Compliance during and after single fault conditions	(See appended table B.4)	Р
B.4.9	Battery charging and discharging under single fault conditions	(See Annex M)	Р
С	UV RADIATION		N/A
C.1	Protection of materials in equipment from UV rate	diation	N/A
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus:		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure test		N/A
C.2.4	Xenon-arc light-exposure test		N/A
D	TEST GENERATORS		N/A
D.1	Impulse test generators		N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
E	TEST CONDITIONS FOR EQUIPMENT CONTAINI	NG AUDIO AMPLIFIERS	Р
E.1	Electrical energy source classification for audio	signals	Р
	Maximum non-clipped output power (W):		—



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Clause	Requirement + Test	Result - Remark	Verdict
	Rated load impedance (Ω):		
_	Open-circuit output voltage (V):		
	Instructional safeguard:	See Clause F.5	
E.2	Audio amplifier normal operating conditions		Р
_	Audio signal source type:		
	Audio output power (W):		
	Audio output voltage (V):		
	Rated load impedance (Ω):		
	Requirements for temperature measurement	(See Table B.1.5)	Р
E.3	Audio amplifier abnormal operating conditions	(See Table B.3, B.4)	Р
F	EQUIPMENT MARKINGS, INSTRUCTIONS, AND SAFEGUARDS	INSTRUCTIONAL	Р
F.1	General		Р
	Language:	English	
F.2	Letter symbols and graphical symbols		Р
F.2.1	Letter symbols according to IEC60027-1		Р
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific		Р
F.3	Equipment markings		Р
F.3.1	Equipment marking locations	Located on the external enclosure surface	Р
F.3.2	Equipment identification markings		Р
F.3.2.1	Manufacturer identification		Р
F.3.2.2	Model identification	See copy of marking plate	Р
F.3.3	Equipment rating markings	See copy of marking plate	Р
F.3.3.1	Equipment with direct connection to mains		N/A
F.3.3.2	Equipment without direct connection to mains		Р
F.3.3.3	Nature of the supply voltage	See copy of marking plate	Р
F.3.3.4	Rated voltage	See copy of marking plate	Р
F.3.3.5	Rated frequency	See copy of marking plate	Р
F.3.3.6	Rated current or rated power:	See copy of marking plate	Р
F.3.3.7	Equipment with multiple supply connections		N/A
F.3.4	Voltage setting device		N/A
F.3.5	Terminals and operating devices		P
F.3.5.1	Mains appliance outlet and socket-outlet markings		N/A
F.3.5.2	Switch position identification marking		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.5.3	Replacement fuse identification and rating markings		N/A
	Instructional safeguards for neutral fuse		N/A
F.3.5.4	Replacement battery identification marking:		N/A
F.3.5.5	Neutral conductor terminal		N/A
F.3.5.6	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification		Р
F.3.6.1	Class I equipment	Class III Equipment	N/A
F.3.6.1.1	Protective earthing conductor terminal:		N/A
F.3.6.1.2	Protective bonding conductor terminals:		N/A
F.3.6.2	Equipment class marking:		N/A
F.3.6.3	Functional earthing terminal marking		N/A
F.3.7	Equipment IP rating marking:	IPX0	Р
F.3.8	External power supply output marking		N/A
F.3.9	Durability, legibility and permanence of marking		Р
F.3.10	Test for permanence of markings		Р
F.4	Instructions		Р
	a) Information prior to installation and initial use		Р
	 Equipment for use in locations where children not likely to be present 		Р
	c) Instructions for installation and interconnection		N/A
	d) Equipment intended for use only in restricted access area		N/A
	e) Equipment intended to be fastened in place		N/A
	f) Instructions for audio equipment terminals		Р
	g) Protective earthing used as a safeguard		N/A
	h) Protective conductor current exceeding ES2 limits		N/A
	i) Graphic symbols used on equipment		Р
	j) Permanently connected equipment not provided with all-pole mains switch		N/A
	k) Replaceable components or modules providing safeguard function		N/A
	I) Equipment containing insulating liquid		N/A
	m) Installation instructions for outdoor equipment		N/A
F.5	Instructional safeguards		N/A
G	COMPONENTS		Р
G.1	Switches		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
G.1.1	General		N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.1.3	Test method and compliance		N/A
G.2	Relays		N/A
G.2.1	Requirements		N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supplying power to other equipment		N/A
G.2.4	Test method and compliance		N/A
G.3	Protective devices		N/A
G.3.1	Thermal cut-offs		N/A
	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N/A
	b) Thermal links tested as part of the equipment		N/A
G.3.2.2	Test method and compliance		N/A
G.3.3	PTC thermistors		N/A
G.3.4	Overcurrent protection devices		N/A
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions	(See appended table B.4)	N/A
G.4	Connectors		N/A
G.4.1	Spacings		N/A
G.4.2	Mains connector configuration:		N/A
G.4.3	Plug is shaped that insertion into mains socket- outlets or appliance coupler is unlikely		N/A
G.5	Wound components		N/A
G.5.1	Wire insulation in wound components		N/A
G.5.1.2	Protection against mechanical stress		N/A
G.5.2	Endurance test		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Test time (days per cycle):		
	Test temperature (°C):		
G.5.2.3	Wound components supplied from the mains		N/A
G.5.2.4	No insulation breakdown		N/A
G.5.3	Transformers		N/A
G.5.3.1	Compliance method:		N/A
	Position:		N/A
	Method of protection:		N/A
G.5.3.2	Insulation		N/A
	Protection from displacement of windings		
G.5.3.3	Transformer overload tests		N/A
G.5.3.3.1	Test conditions		N/A
G.5.3.3.2	Winding temperatures		N/A
G.5.3.3.3	Winding temperatures - alternative test method		N/A
G.5.3.4	Transformers using FIW		N/A
G.5.3.4.1	General		N/A
	FIW wire nominal diameter:		
G.5.3.4.2	Transformers with basic insulation only		N/A
G.5.3.4.3	Transformers with double insulation or reinforced insulation		N/A
G.5.3.4.4	Transformers with FIW wound on metal or ferrite core		N/A
G.5.3.4.5	Thermal cycling test and compliance		N/A
G.5.3.4.6	Partial discharge test		N/A
G.5.3.4.7	Routine test		N/A
G.5.4	Motors		N/A
G.5.4.1	General requirements		N/A
G.5.4.2	Motor overload test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4.2	Locked-rotor overload test		N/A
	Test duration (days)		
G.5.4.5	Running overload test for DC motors		N/A
G.5.4.5.2	Tested in the unit		N/A
G.5.4.5.3	Alternative method		N/A
G.5.4.6	Locked-rotor overload test for DC motors		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.4.6.3	Alternative method		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage:		
G.6	Wire Insulation		N/A
G.6.1	General		N/A
G.6.2	Enamelled winding wire insulation		N/A
G.7	Mains supply cords		N/A
G.7.1	General requirements		N/A
	Туре:		
G.7.2	Cross sectional area (mm ² or AWG)		N/A
G.7.3	Cord anchorages and strain relief for non- detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N):		N/A
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm):		N/A
G.7.3.2.4	Strain relief and cord anchorage material		N/A
G.7.4	Cord Entry		N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Test method and compliance		N/A
	Overall diameter or minor overall dimension, <i>D</i> (mm)		
	Radius of curvature after test (mm)		
G.7.6	Supply wiring space		N/A
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	Varistors		N/A
G.8.1	General requirements		N/A
G.8.2	Safeguards against fire		N/A
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
G.8.2.3	Temporary overvoltage test		N/A
G.9	Integrated circuit (IC) current limiters		N/A
G.9.1	Requirements		N/A
	IC limiter output current (max. 5A)		
	Manufacturers' defined drift		
G.9.2	Test Program		N/A
G.9.3	Compliance		N/A
G.10	Resistors		N/A
G.10.1	General		N/A
G.10.2	Conditioning		N/A
G.10.3	Resistor test		N/A
G.10.4	Voltage surge test		N/A
G.10.5	Impulse test		N/A
G.10.6	Overload test		N/A
G.11	Capacitors and RC units		N/A
G.11.1	General requirements		N/A
G.11.2	Conditioning of capacitors and RC units		N/A
G.11.3	Rules for selecting capacitors		N/A
G.12	Optocouplers		N/A
	Optocouplers comply with IEC 60747-5-5 with specifics		N/A
	Type test voltage V _{ini,a} :		
	Routine test voltage, V _{ini, b} :		
G.13	Printed boards		Р
G.13.1	General requirements	(See appended table 4.1.2)	Р
G.13.2	Uncoated printed boards		Р
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs)		
G.13.6	Tests on coated printed boards		
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2	Test method and compliance		N/A
G.14	Coating on components terminals		N/A
G.14.1	Requirements	(See Clause G.13)	N/A



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Clause	Requirement + Test	Result - Remark	Verdict
G.15	Pressurized liquid filled components		N/A
G.15.1	Requirements		N/A
G.15.2	Test methods and compliance		N/A
G.15.2.1	Hydrostatic pressure test		N/A
G.15.2.2	Creep resistance test		N/A
G.15.2.3	Tubing and fittings compatibility test		N/A
G.15.2.4	Vibration test		N/A
G.15.2.5	Thermal cycling test		N/A
G.15.2.6	Force test		N/A
G.15.3	Compliance		N/A
G.16	IC including capacitor discharge function (ICX)		N/A
G.16.1	Condition for fault tested is not required		N/A
	ICX with associated circuitry tested in equipment		N/A
	ICX tested separately		N/A
G.16.2	Tests		N/A
	Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test:		—
	Mains voltage that impulses to be superimposed on		
			-
	ICX tested by itself for 10000 cycles test		—
G.16.3	Capacitor discharge test:		N/A
н	CRITERIA FOR TELEPHONE RINGING SIGNALS		N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B	1	N/A
H.3.1	Ringing signal		N/A
H.3.1.1	Frequency (Hz):		
H.3.1.2	Voltage (V)		
H.3.1.3	Cadence; time (s) and voltage (V):		
H.3.1.4	Single fault current (mA):		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V)		N/A



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Clause	Requirement + Test	Result - Remark	Verdict	
J	INSULATED WINDING WIRES FOR USE WITHOU	IT INTERLEAVED INSULATION	N/A	
J.1	General		N/A	
	Winding wire insulation:			
	Solid round winding wire, diameter (mm):		N/A	
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm ²)		N/A	
J.2/J.3	Tests and Manufacturing	(See separate test report)		
к	SAFETY INTERLOCKS		N/A	
K.1	General requirements			
	Instructional safeguard		N/A	
K.2	Components of safety interlock safeguard mech	anism	N/A	
K.3	Inadvertent change of operating mode			
K.4	Interlock safeguard override		N/A	
K.5	Fail-safe		N/A	
K.5.1	Under single fault condition		N/A	
K.6	Mechanically operated safety interlocks		N/A	
K.6.1	Endurance requirement		N/A	
K.6.2	Test method and compliance:		N/A	
K.7	Interlock circuit isolation		N/A	
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A	
	In circuit connected to mains, separation distance for contact gaps (mm)		N/A	
	In circuit isolated from mains, separation distance for contact gaps (mm)		N/A	
	Electric strength test before and after the test of K.7.2	(See appended table 5.4.9)	N/A	
K.7.2	Overload test, Current (A)		N/A	
K.7.3	Endurance test		N/A	
K.7.4	Electric strength test		N/A	
L	DISCONNECT DEVICES		N/A	
L.1	General requirements		N/A	
L.2	Permanently connected equipment		N/A	
L.3	Parts that remain energized		N/A	
L.4	Single-phase equipment		N/A	
L.5	Three-phase equipment		N/A	
L.6	Switches as disconnect devices		N/A	
L.7	Plugs as disconnect devices		N/A	



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Clause	Requirement + Test	Result - Remark	Verdict		
L.8	Multiple power sources		N/A		
	Instructional safeguard		N/A		
М	EQUIPMENT CONTAINING BATTERIES AND THE	IR PROTECTION CIRCUITS	Р		
M.1	General requirements		Р		
M.2	Safety of batteries and their cells		Р		
M.2.1	Batteries and their cells comply with relevant IEC standards		Р		
М.3	Protection circuits for batteries provided within the equipment		Р		
M.3.1	Requirements		Р		
M.3.2	Test method		Р		
	Overcharging of a rechargeable battery		Р		
	Excessive discharging		Р		
	Unintentional charging of a non-rechargeable battery		N/A		
	Reverse charging of a rechargeable battery		N/A		
M.3.3	Compliance	(See appended table M.3)	Р		
М.4	Additional safeguards for equipment containing a portable secondary lithium battery				
M.4.1	General		Р		
M.4.2	Charging safeguards		Р		
M.4.2.1	Requirements		Р		
M.4.2.2	Compliance:	(See appended table M.4.2)	Р		
M.4.3	Fire enclosure		Р		
M.4.4	Drop test of equipment containing a secondary lithium battery		Р		
M.4.4.2	Preparation and procedure for the drop test		N/A		
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%)::		N/A		
M.4.4.4	Check of the charge/discharge function		N/A		
M.4.4.5	Charge / discharge cycle test		N/A		
M.4.4.6	Compliance		N/A		
M.5	Risk of burn due to short-circuit during carrying		N/A		
M.5.1	Requirement		N/A		
M.5.2	Test method and compliance		N/A		
M.6	Safeguards against short-circuits		N/A		
M.6.1	External and internal faults		N/A		
M.6.2	Compliance		N/A		



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Clause	Requirement + Test Result - Remark	Verdict
M.7	Risk of explosion from lead acid and NiCd batteries	N/A
M.7.1	Ventilation preventing explosive gas concentration	N/A
	Calculated hydrogen generation rate:	N/A
M.7.2	Test method and compliance	N/A
	Minimum air flow rate, Q (m ³ /h)	N/A
M.7.3	Ventilation tests	N/A
M.7.3.1	General	N/A
M.7.3.2	Ventilation test – alternative 1	N/A
	Hydrogen gas concentration (%):	N/A
M.7.3.3	Ventilation test – alternative 2	N/A
	Obtained hydrogen generation rate:	N/A
M.7.3.4	Ventilation test – alternative 3	N/A
	Hydrogen gas concentration (%):	N/A
M.7.4	Marking	N/A
M.8	Protection against internal ignition from external spark sources of batteries with aqueous electrolyte	N/A
M.8.1	General	N/A
M.8.2	Test method	N/A
M.8.2.1	General	N/A
M.8.2.2	Estimation of hypothetical volume V _Z (m ³ /s):	
M.8.2.3	Correction factors	
M.8.2.4	Calculation of distance <i>d</i> (mm):	
M.9	Preventing electrolyte spillage	N/A
M.9.1	Protection from electrolyte spillage	N/A
M.9.2	Tray for preventing electrolyte spillage	N/A
M.10	Instructions to prevent reasonably foreseeable misuse	N/A
	Instructional safeguard	N/A
N	ELECTROCHEMICAL POTENTIALS	N/A
	Material(s) used	
0	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES	N/A
	Value of X (mm): Considered	
Р	SAFEGUARDS AGAINST CONDUCTIVE OBJECTS	Р
P.1	General	Р
P.2	Safeguards against entry or consequences of entry of a foreign object	Р
P.2.1	General	Р
P.2.2	Safeguards against entry of a foreign object	N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Location and Dimensions (mm):		
P.2.3	Safeguards against the consequences of entry of a foreign object		N/A
P.2.3.1	Safeguard requirements		N/A
	The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment		N/A
	Transportable equipment with metalized plastic parts:		N/A
P.2.3.2	Consequence of entry test		N/A
P.3	Safeguards against spillage of internal liquids		N/A
P.3.1	General		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Compliance		N/A
P.4	Metallized coatings and adhesives securing parts	S	N/A
P.4.1	General		N/A
P.4.2	Tests		N/A
	Conditioning, T _C (°C)		—
	Duration (weeks)		
Q	CIRCUITS INTENDED FOR INTERCONNECTION	WITH BUILDING WIRING	N/A
Q.1	Limited power sources		N/A
Q.1.1	Requirements		N/A
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output		N/A
	d) Overcurrent protective device limited output		N/A
	e) IC current limiter complying with G.9		N/A
Q.1.2	Test method and compliance:	(See appended table Q.1)	N/A
	Current rating of overcurrent protective device (A)		N/A
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A)		N/A
	Current limiting method		
R	LIMITED SHORT CIRCUIT TEST		N/A
R.1	General		N/A
R.2	Test setup		N/A



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



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Clause	Requirement + Test	Result - Remark	Verdict	
Т.6	Enclosure impact test	(See appended table T.6)	N/A	
	Fall test		N/A	
	Swing test		N/A	
T.7	Drop test:	(See appended table T.7)	Р	
Т.8	Stress relief test:	(See appended table T.8)	Р	
Т.9	Glass Impact Test:	(See appended table T.9)	N/A	
T.10	Glass fragmentation test		N/A	
	Number of particles counted:		N/A	
T.11	Test for telescoping or rod antennas		N/A	
	Torque value (Nm):		N/A	
U	MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION			
U.1	General		N/A	
	Instructional safeguard :		N/A	
U.2	Test method and compliance for non-intrinsically p	protected CRTs	N/A	
U.3	Protective screen			
V	DETERMINATION OF ACCESSIBLE PARTS			
V.1	Accessible parts of equipment		Р	
V.1.1	General		Р	
V.1.2	Surfaces and openings tested with jointed test probes		Р	
V.1.3	Openings tested with straight unjointed test probes		Р	
V.1.4	Plugs, jacks, connectors tested with blunt probe		Р	
V.1.5	Slot openings tested with wedge probe		Р	
V.1.6	Terminals tested with rigid test wire		Р	
V.2	Accessible part criterion		Р	
X	ALTERNATIVE METHOD FOR DETERMINING CLEA CIRCUITS CONNECTED TO AN AC MAINS NOT EX RMS)	ARANCES FOR INSULATION IN CEEDING 420 V PEAK (300 V	N/A	
	Clearance	(See appended table X)	N/A	
Υ	CONSTRUCTION REQUIREMENTS FOR OUTDOOR	RENCLOSURES	N/A	
Y.1	General		N/A	
Y.2	Resistance to UV radiation		N/A	
Y.3	Resistance to corrosion		N/A	
Y.3	Resistance to corrosion		N/A	
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by		N/A	

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Clause	Requirement + Test	Result - Remark	Verdict		
Y.3.2	Test apparatus		N/A		
Y.3.3	Water – saturated sulphur dioxide atmosphere		N/A		
Y.3.4	Test procedure:		N/A		
Y.3.5	3.5 Compliance				
Y.4	Gaskets		N/A		
Y.4.1	General		N/A		
Y.4.2	Gasket tests		N/A		
Y.4.3	Tensile strength and elongation tests		N/A		
	Alternative test methods		N/A		
Y.4.4	Compression test		N/A		
Y.4.5	Oil resistance		N/A		
Y.4.6	Securing means	(See Annex P.4)	N/A		
Y.5	7.5 Protection of equipment within an outdoor enclosure				
Y.5.1	General		N/A		
Y.5.2	Protection from moisture		N/A		
	Relevant tests of IEC 60529 or Y.5.3		N/A		
Y.5.3	Water spray test		N/A		
Y.5.4	Protection from plants and vermin		N/A		
Y.5.5	Protection from excessive dust		N/A		
Y.5.5.1	General		N/A		
Y.5.5.2	IP5X equipment		N/A		
Y.5.5.3	IP6X equipment		N/A		
Y.6	Mechanical strength of enclosures		N/A		
Y.6.1	General		N/A		
Y.6.2	Impact test	(See Table T.6)	N/A		



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Clause	Requirement + Test		Result - Remark	Verdict	

5.2	TABLE: Classificati	on of electrical e	nergy sources					Р
Supply	Location (e.g.	Test conditions	Test conditions Parameters				E	S Class
vollage	designation)		U (V)	I (mA)	Type ¹⁾	Additional Info ²⁾		
5Vdc	All circuits	Normal			SS			
		Abnormal			SS		ES1 (declared)	
		Single fault – SC/OC			SS			eclared)
Supplementary information:								
1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc.								
2) Additional	Info: Frequency, Puls	se duration, Pulse	off time, C	apacitanc	e value, et	С.		

5.4.1.8	TABLE: Working voltage measurement					
Location		RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments	
Supplementary information:						

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

5.4.1.10.3	TABLE: Ball pre	essure test of thermopla	stics				N/A	
Allowed imp	Allowed impression diameter (mm)				≤ 2 mm			
Object/Part No./Material Manufacturer/trademark Thicknes		Thickness	(mm)	Test temperature (°C)	Impi diame	ression eter (mm)		
Supplementary information:								



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Clause	Requirement + Test	Result - Remark	Verdict					

5.4.2, 5.4.3 TABLE: Minimum Clearances/Creepage distance							N/A		
Clearance (cl creepage dis (cr) at/of/betv	l) and tance ween:	Up (V)	U _{rms} (V)	Freq ¹⁾ (Hz)	Required cl (mm)	cl (mm)	E.S. ²⁾ (V)	Required cr (mm)	cr (mm)
Supplementa	iry informa	ation:							
1) Only for frequency above 30 kHz									
2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)									

5.4.4.2	TABLE: Minimun	TABLE: Minimum distance through insulation							
Distance through insulation (DTI) at/of		Peak voltage (V)	Insulation	Required DTI (mm)	Mea	asured DTI (mm)			
Supplement	ary information:								

5.4.4.9	TABLE: Solid insulation at frequencies >30 kHz						N/A		
Insulation material		Ep	Frequency (kHz)	K _R	Thickness d (mm)	Insulation	V _{PW} (Vpk)		
Supplement	Supplementary information:								

5.4.9	TABLE: Electric strength tests				N/A			
Test voltage applied between:		Voltage shape (Surge, Impulse, AC, DC, etc.)	Test voltage (V)	Bre Y	eakdown ´es / No			
Supplementary information:								



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Clause	Requirement + Test		Result - Remark	Verdict			

5.5.2.2	TABLE	Stored discharge c	on capacitors				N/A
Location		Supply voltage (V)	Operating and fault condition ¹⁾	Switch position	Measured voltage (Vpk)	E	S Class
Supplemen	ntary inform	mation:			·		
X-capacito	rs installed	d for testing:					
[] bleedir	ng resistor	rating:					
[] ICX:							

1) Normal operating condition (e.g., normal operation, or open fuse), SC= short circuit, OC= open circuit

5.6.6	TABLE: Resistance of	TABLE: Resistance of protective conductors and terminations						
Location		Test current (A)	Duration (min)	Voltage drop (V)	Re	sistance (Ω)		
Supplementary information:								

5.7.4	TABLE	E: Unearthed acces	ssible parts				N/A
Location		Operating and	Supply Voltage (V)	F	ES		
		fault conditions		Voltage (V _{rms} or V _{pk})	Current (A _{rms} or A _{pk})	Freq. (Hz)	class
Supplementary information:							
Abbreviatio	n: SC= s	short circuit; OC= o	pen circuit				

5.7.5	TABLE: Earthed access	ible conductive part			N/A	
Supply voltage (V):						
Phase(s)		[] Single Phase; [] Three	[] Wye			
Power Distr	ibution System:	[]TN []TT []IT				
Location		Fault Condition No in IECTouch current60990 clause 6.2.2(mA)		Comm	Comment	
Supplementary Information:						

5.8	TABLE: Backfeed safeguard in battery backed up supplies						N/A
Location		Supply	Operating and fault	Time (s)	Open-circuit	Touch	ES Class



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Clause	Requirement + Test		Result - Remark	Verdict

	voltage (V)	condition	voltage (V)		current (A)			
Supplementary information:								
Abbreviation: SC= short circuit, OC= open circuit								

6.2.2	TABLE: Power source	circuit classificat	tions			Р		
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power ¹⁾ (W)	Time (S)	PS class		
All circuits	Normal					PS1 (declared)		
Supplement	tary information:				· · · · · · · · · · · · · · · · · · ·			
Abbreviation: SC= short circuit; OC= open circuit								
1) Measure	d after 3 s for PS1 and m	easured after 5 s f	or PS2 and P	S3.				

6.2.3.1	TABLE: Determi	TABLE: Determination of Arcing PIS								
Location		Open circuit voltage after 3 s (Vpk)	Measured r.m.s current (A)	Calculated value	Ar ۲	cing PIS? ⁄es / No				
Supplement	Supplementary information:									

6.2.3.2	TABLE: Determin	nation of resistive PIS			N/A			
Location		Operating and fault condition	Dissipate power (W)	Ar `	cing PIS? Yes / No			
Supplementary information:								
Abbreviatio	n: SC= short circuit	; OC= open circuit						

8.5.5	TABLE: High pre	TABLE: High pressure lamp							
Lamp manu	facturer	Lamp type	Explosion method	Longest axis of glass particle (mm)	Parl bey Y	icle found yond 1 m ′es / No			
Supplement	Supplementary information:								



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Clause	Requirement + Test		Result - Remark	Verdict

9.6	TABLE	: Tempera	ture meas	urements	for wireles	s power t	ransmitter	S	N/A
Supply volta	Supply voltage (V)								—
Max. transm	Max. transmit power of transmitter (W):								
		w/o rece direct o	eiver and contact	with rece direct	with receiver and direct contact		with receiver and at distance of 2 mm		iver and at e of 5 mm
Foreign o	bjects	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)
Supplement	Supplementary information:								

5.4.1.4,	TABLE: Tem	perature r	neasurem	ents				Р
9.3, B.1.5, B.2.6								
Supply volta	Supply voltage (V):				Battery discharge			
Ambient temperature during test T_{amb} (°C) :								—
Maximum measured temperature T of part/at:					Τ (°C)		Allowed T _{max} (°C)
PCB near R1				33.2	35.6			130
PCB near C5				31.9	36.3			130
Battery surf	ace			47.7	45.5			Ref.
Internal wire	9			36.4	35.2			80
Plastic encl	osure (inside)			38.1	39.6			Ref.
Plastic encl	osure (outside))		32.8	33.4			48
Temperatur winding:	e T of	t₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
Supplementary information:								

B.2.5	TABL	TABLE: Input test								
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condit	ion/status	
5.0	DC	1.90	2.0	9.5				Norma	l work	
Supplementary information: Equipment may be have rated current or rated power or both. Both should be measured										



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Clause	Requirement + Test	Result	- Remark	Verdict

B.3, B.4	TABLE: Abnorn	nal operating	and fault	condition f	ests		Р	
Ambient tem	perature T _{amb} (°C	C)		:	25.0°C			
Power source	e for EUT: Manu	facturer, model	l/type, out	putrating:				
Component N	No. Condition	N Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observatio	n	
Q1	S-C	5VDC	10 mins			Unit shutdown immediately recoverable when the fault removed, no damage, no hazard		
С3	S-C	5VDC	10 mins			Unit shutdown immediately recoverable when the fault removed, no damage, no hazard		
U1(1-4)	S-C	5VDC	10 mins			Unit shutdown immerecoverable when the removed, no damag hazard	ediately, he fault e, no	
Battery	S-C	5VDC	10 mins			Unit shutdown immediately recoverable when the fault removed,no damage, no hazard		
Supplementary information:								

M.3	TABLE: Pr	otection circu	its f	or batteri	es provid	ed v	vithin	the eq	uipment		Р
Is it possible t	to install the	battery in a rev	verse	e polarity p	oosition?.	:			No		_
			Charging								
Equipment S	pecification	Voltage (V)						Current (A)			
		5.0V						2.0			
			Battery specification								
		Non-rechargeable batteries Rechargeable batteries									
		Discharging	ging Unintentional		Charging			Discharging	F	Reverse	
Manufactu	urer/type	current (A)	c cu	harging irrent (A)	Voltage	(V)	Curr	ent (A)	current (A)	C CU	harging irrent (A)
LC/402126					Max. 4	.2	0.	230	0.230		
Note: The tes	ts of M.3.2 a	re applicable o	nly v	when above	e appropri	ate c	data is	not ava	ailable.		
Specified bat	tery tempera	ture (°C)				:					
Component No.	Fault condition	Charge/ discharge mo	ode	Test time	Temp. (°C)	Cu (rrent (A)	Voltag (V)	e Observation		ition
Battery	Normal	Charge mod	de			N 0.	lax. 102	Max. 4.20	No damag hazards	e, I	No



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Clause	Requirement + Test	Result - Remark	Verdict

Battery	B- to P- SC	Charge mode			Max. 0.113	Max. 4.20	No damage, No hazards	
Battery	Normal	Discharge mode			Max. 0.021	Max. 4.20	No damage, No hazards	
Battery	B- to P- SC	Discharge mode			Max. 0.022	Max. 4.20	No damage, No hazards	
Supplementary information:								

Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal.

M.4.2	TABLE: battery	ABLE: Charging safeguards for equipment containing a secondary lithiur attery							
Maximum s	pecified o	charging voltag	e (V)		.∶ Max. 4.2V	,			
Maximum s	pecified o	charging currer	nt (A)		.: Max. 0.23	0A			
Highest spe	cified cha	arging tempera	ture (°C)		.: 45				
Lowest spec	cified cha	irging temperat	ture (°C)		.: 0	-			
Battery Operating				Measurement		Observatio	on		
manufacture	er/type	condition	Charging voltage (V)	Charging current (A)	Temp. (°C)				
LC/402126		Normal operation	4.175	0.102	Charging case battery body:38.5°C (under 25.0°C ambient)	The charging voltages exceed 4.20V and charging current no 230mA	ge not the ot exceed		
LC/402126		Abnormal operation	4.176	0.113	Charging case battery body:37.4°C (under 25.0°C ambient)	The charging voltage exceed 4.20V and charging current no 230mA	ge not the ot exceed		
LC/402126		Single fault (U1 pin 1-8 SC)	4.177	0	Charging case battery body:28.0°C (under 25°C ambient)	Unit shut down imr no damage, no haz	nediately, zards.		
Supplement	ary inform	nation:							
Abbreviation	n: SC= sh pecified c	nort circuit; OC	= open circuit; nt; HSCT= high	MSCV= maxi nest specified	mum specifie charging tem	d charging voltage; perature; LSCT= lov	MSCC= /est		

specified charging temperature



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Clause	Requirement + Test		Result - Remark	Verdict				

Q.1	TABLE: Circuits inter	nded for inte	rconnectior	n with build	ling wiring	(LPS)	N/A		
Output Circuit	Condition		Time (s)	I _{sc}	(A)	S (\	/A)		
	Condition	$O_{oc}(V)$		Meas.	Limit	Meas.	Limit		
Supplementary Information:									

T.2, T.3, T.4, T.5	TABL	ABLE: Steady force test							
Location/Part		Material	Thickness (mm)	Probe	Force (N)	Test Duration (s)	Obse	rvation	
Enclosure to side, bottom	р, I (Т.4)	Plastic	1.8mm		100	5	No dan haz	nage, No ards	
Supplementary information:									

T.6, T.9	TABLE: Imp	act test				N/A		
Location/Part		Material	Thickness (mm)	Height (mm)	Observatio	n		
Supplement	Supplementary information:							

T.7	TABLE: Dro	p test				Р			
Location/Part		Material	Thickness (mm)	Height (mm)	Observation				
Enclosure top, side, bottom		Plastic	1.8mm	1000	No damage, No hazards				
Supplement	Supplementary information:								

T.8	TABLE	TABLE: Stress relief test							
Location/Part		Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observ	vation		
Enclosure top, side, P bottom		Plastic	1.8mm	74	7	No dama haza	age, No ards		
Supplement	Supplementary information:								



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

X	TABLE: Alternat	ive method for determin	ing minimum clearance	s distances	N/A
Clearance distanced between:		Peak of working voltage (V)	Required cl (mm)	Measured cl (mm)	
Supplement	ary information:				
[



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

4.1.2	TAE	FABLE: Critical components information					Р			
Object / part No.		Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾				
Plastic enclosure		Lenovo co., Ltd	C2950	V-0, 75°C	UL 94	UL				
PCB		Interchangeable	Interchangeab le	V-0,130°C	UL 796	UL				
Internal wires		Sumitomo Electric Industries Ltd	3302	Min. 30V, min. 80°C, Min. 40AWG, VW-1	UL758	UL E41105				
(Alternative)		Interchangeable	Interchangeabl e	Min. 30V, min. 80°C, Min. 40AWG, VW-1	UL758	UL				
Battery pack		LC	402126	DC3.7V 230mAh, 0.851Wh	IEC/EN 62133	CE				
Supplementary information:										
1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.										


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Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT			
IEC 62368-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES (Audio/video, information and communication technology equipment - Part 1: Safety requirements)			
ifferences according to EN IEC 62368-1:2020+A11:2020			
ttachment Form No EU_GD_IEC62368_1E			
ttachment Originator: UL(Demko)			
aster Attachment 2021-02-04			
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CENELEC COMMON MODIFICATIONS (EN)	Р		
Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018.			
Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed "Z".			
Add the following annexes:	Р		
Annex ZA (normative) Normative references to international publications with their corresponding European publications			
Annex ZB (normative) Special national conditions			
Annex ZC (informative) A-deviations			
Annex ZD (informative) IEC and CENELEC code designations for flexible cords			
Modification to Clause 3 .	N/A		
3.19 Sound exposure	N/A		
Replace 3.3.19 of IEC 62368-1 with the following definitions:			



E	uropean group differences and national differences of I	EN IEC 62368-1:2020+A11:20	20
Clause	Requirement + Test	Result - Remark	Verdict
3.3.19.1	momentary exposure level, MEL metric for estimating 1 s sound exposure level from		N/A
	the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2.		
	Note 1 to entry: MEL is measured as A-weighted levels in dB.		
	Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information.		
3.3.19.3	sound exposure, <i>E</i>		N/A
	A-weighted sound pressure (p) squared and integrated over a stated period of time, T		
	Note 1 to entry: The SI unit is $Pa^2 s$.		
	$E = \int_{\Omega} p(t)^2 \mathrm{d}t$		
3.3.19.4	sound exposure level, SEL		Ν/Δ
	legerithmic measure of sound expensive relative to		19/23
	a reference value, <i>E0</i> , typically the 1 kHz threshold of hearing in humans.		
	Note 1 to entry: <i>SEL</i> is measured as A-weighted levels in dB.		
	$SEL = 10 \lg \left(\frac{E}{E_0}\right)_{dB}$		
	Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.		
3.3.19.5	digital signal level relative to full scale, dBFS		N/A
	levels reported in dBFS are always r.m.s. Full scale		
	Hz sine wave whose undithered positive peak		
	value is positive digital full scale, leaving the code corresponding to negative digital full scale unused		
	Note 1 to entry: It is invalid to use dBFS for non-		
	based on a sine wave, the level of signals with a		
	crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS.		
2	Modification to Clause 10		Р
10.6	Safeguards against acoustic energy sources		Р
	Replace 10.6 of IEC 62368-1 with the following:		



E	uropean group differences and national differences of E	EN IEC 62368-1:2020+A11:2	2020
Clause	Requirement + Test	Result - Remark	Verdict
10.6.1.1	Introduction Safeguard requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment intended for use by an ordinary person , that: – is designed to allow the user to listen to audio or audiovisual content / material; and		P
	 uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). EXAMPLES Portable CD players, MP3 audio 		
	 PDAs or similar equipment. Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3. NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360. 		
	NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible.		
	Listening devices sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to: – professional equipment;		
	NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.		
	 hearing aid equipment and other devices for assistive listening; the following type of analogue personal music 		



ttachment No.1				
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Clause	Requirement + Test	Result - Remark	Verdict	
		1		
	players: • long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and • cassette player/recorder;			
	NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.			
	 a player while connected to an external amplifier that does not allow the user to walk around while in use. 			
	For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply.			
	The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.			
10.6.1.2	Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz		N/A	
	The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand- held and body mounted devices, attention is drawn to EN 50360 and EN 50566.			
10.6.2	Classification of devices without the capacity to	estimate sound dose	Р	
10.6.2.1	 General This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3. For classifying the acoustic output <i>L</i>Aeq, <i>T</i>, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period. For music where the average sound pressure (long term <i>L</i>Aeq, <i>T</i>) measured over the duration of the period built is a supervised built over the duration of the period. 		P	
	song is lower than the average produced by the programme simulation noise, measurements may			



-			
Clause	Requirement + Test	Result - Remark	Verdict
	be done over the duration of the complete cong. In	1	
	this case. The comes the duration of the song.		
	this case, T becomes the duration of the song.		
	NOTE Classical music, acoustic music and		
	broadcast typically has an average sound pressure		
	(long term $LAeg, T$) which is much lower than the		
	average programme simulation noise. Therefore, if		
	the player is capable to analyse the content and		
	compare it with the programme simulation noise,		
	the warning does not need to be given as long as		
	the average sound pressure of the song does not		
	exceed the required limit.		
	For example, if the player is set with the		
	programme simulation noise to 85 dB, but the		
	average music level of the song is only 65 dB,		
	there is no need to give a warning or ask an		
	acknowledgement as long as the average sound		
	dB		
10.6.2.2	RS1 limits (to be superseded, see 10.6.3.2)		P
	RS1 is a class 1 acoustic energy source that does		
	not exceed the following:		
	- for equipment provided as a package (player with		
	connector between the player and its listening		
	device, or where the combination of player and		
	listening device is known by other means such as		
	setting or automatic detection, the LAeg T acoustic		
	output shall be ≤ 85 dB when playing the fixed		
	"programme simulation noise" described in EN		
	50332-1.		
	 – for equipment provided with a standardized 		
	connector (for example, a 3,5 phone jack) that		
	allows connection to a listening device for general		
	use, the unweighted r.m.s. output voltage shall be		
	≤ 27 mV (analogue interface) or -25 dBFS (digital		
	interface) when playing the fixed "programme		
	simulation noise" described in EN 50332-1.		
	- The RS1 limits will be updated for all devices as		
10622	RS2 limits (to be superseded, see 10.6.3.3)		NI/A
10.0.2.3			IN/A
	RS2 is a class 2 acoustic energy source that does		
	not exceed the following:		
	- for equipment provided as a package (player with		
	its listening device), and with a proprietary		
	connector between the player and its listening		
	lietoping device is known by other means such as		
	softing or automatic 130 detection the LAce T		
	setting or automatic 150 detection, the LAeq, I		
	the fixed "programme simulation poise" as		
	described in FN 50332-1		
	- for equipment provided with a standardized		
	connector (for example, a 3.5 phone jack) that		



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Clause	Requirement + Test	Result - Remark	Verdict
	allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1.		
10.6.2.4	RS3 limits		N/A
	RS3 is a class 3 acoustic energy source that exceeds RS2 limits.		
10.6.3	Classification of devices (new)		N/A
10.6.3.1	General Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given below		N/A
10.6.3.2	RS1 limits (new)		N/A
10 6 3 3	 RS1 is a class 1 acoustic energy source that does not exceed the following: for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the <i>L</i>Aeq, <i>T</i> acoustic output shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1. for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. 		
10.6.3.3	 RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week as described in EN 50222 2, abcl. 		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.		
10.6.4	Requirements for maximum sound exposure		N/A
10.6.4.1	Measurement methods		N/A
	All volume controls shall be turned to maximum during tests.		
	Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.		
10.6.4.2	Protection of persons		N/A
	Except as given below, protection requirements for parts accessible to ordinary persons , instructed persons and skilled persons are given in 4.3.		
	safeguard.		
	Between RS2 and an ordinary person , the basic safeguard may be replaced by an instructional safeguard in accordance with Clause F.5, except that the instructional safeguard shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the instructional safeguard may be given through the equipment display during use.		
	The elements of the instructional safeguard shall be as follows:		
	 – element 1a: the symbol , IEC 60417-6044 (2011-01) – element 2: "High sound pressure" or equivalent wording – element 3: "Hearing damage risk" or equivalent wording – element 4: "Do not listen at high volume levels for long periods." or equivalent wording 		
	An equipment safeguard shall prevent exposure of an ordinary person to an RS2 source without intentional physical action from the ordinary person and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off.		
	The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output		



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Clause	Requirement + Test	Result - Remark	Verdict
	exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.		
	NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed.		
	NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off.		
	A skilled person shall not be unintentionally exposed to RS3.		
10.6.5	Requirements for dose-based systems		N/A
10.6.5.1	General requirements		N/A
	Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause.		
	The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration.		
	The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.		
10.6.5.2	Dose-based warning and requirements		N/A
	When a dose of 100 % <i>CSD</i> is reached, and at least at every 100 % further increase of <i>CSD</i> , the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1.		
	The warning shall at least clearly indicate that listening above 100 % <i>CSD</i> leads to the risk of hearing damage or loss.		



E	European group differences and national differences of EN IEC 62368-1:2020+A11:2020		
Clause	Requirement + Test	Result - Remark	Verdict
10.6.5.3	Exposure-based requirements With only dose-based requirements, cause and effect could be far separated in time, defying the		N/A
	practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short- term sound level a user can listen at.		
	The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3. The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster.		
	Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the unweighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than -10 dBFS for a digital interface.		
	NOTE In case the source is known not to be music (or test signal), the EL may be disabled.		



European group differences and national differences of EN IEC 62368-1:2020+A11:2020			
Clause	Requirement + Test	Result - Remark	Verdict

10.6.6	Requirements for listening devices (headphones	, earphones, etc.)	Р
10.6.6.1	Corded listening devices with analogue input		N/A
	With 94 dB <i>L</i> Aeq acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed "programme simulation noise" as described in EN 50332-1 shall be \geq 75 mV.		
	NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV.		
10.6.6.2	Corded listening devices with digital input		N/A
	With any playing device playing the fixed "programme simulation noise" described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the <i>L</i> Aeq, <i>T</i> acoustic output of the listening device shall be \leq 100 dB with an input signal of -10 dBFS.		
10.6.6.3	Cordless listening devices		Р
	In cordless mode, – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the <i>L</i> Aeq, <i>T</i> acoustic output of the listening device shall be \leq 100 dB with an input signal of -10 dBFS.		
10.6.6.4	Measurement method		Р
	Measurements shall be made in accordance with EN 50332-2 as applicable.		
3	Modification to the whole document		Р

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Clause	Requirement	+ Test			Result - Rem	ark	Verdic
	Delete all the	"country" note	es in the refe	erence docum	nent according	g to the following	P
	0.2.1 3.3.8.3 5.2.2.2	Note 1 and 2 Note 1 Note	1 4.1.15 5.4.2.3.2.2 Table 12	Note 4 and 5 Note Note c	3.3.8.1 4.7.3 5.4.2.3.2.4	Note 2 Note 1 and 2 Note 1 and 3	
	5.4.2.3.2.4 Table 13	Note 2	5.4.2.5	Note 2	5.4.5.1	Note	
	5.4.10.2.1 5.5.2.1	Note Note	5.4.10.2.2 5.5.6	Note Note	5.4.10.2.3 5.6.4.2.1	Note Note 2 and 3 and 4	
	5.6.8	Note 2	5.7.6	Note	5.7.7.1	Note 1 and Note 2	
	8.5.4.2.3	Note	10.2.1 Table 39	Note 3 and 4 and 5	10.5.3	Note 2	
	10.6.1 Y.4.5	Note 3 Note	F.3.3.6	Note 3	Y.4.1	Note	
4	Modification	to Clause 1					P
1	Add the follow NOTE Z1 The electrical and within the EU	wing note: e use of certain electronic equ : see Directive	n substance iipment is re 2011/65/El	s in estricted J.			P



European group differences and national differences of EN IEC 62368-1:2020+A11:2020				
	Clause	Requirement + Test	Result - Remark	Verdict

5	Modification to 4.Z1	
4.Z1	Add the following new subclause after 4.9:	Р
	To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. mains, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for pluggable equipment type B or permanently connected equipment, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.	
6	Modification to 5.4.2.3.2.4	Р
5.4.2.3.2.4	Add the following to the end of this subclause:	Р
	The requirement for interconnection with external circuit is in addition given in EN 50491-3:2009.	
7	Modification to 10.2.1	N/A
10.2.1	Add the following to ^{c)} and ^{d)} in table 39:	N/A
	For additional requirements, see 10.5.1.	



European group differences and national differences of EN IEC 62368-1:2020+A11:2020			
Clause	Requirement + Test	Result - Remark	Verdict

8	Modification to 10.5.1		
10.5.1	Add the following after the first paragraph:	N/A	
	For RS 1 compliance is checked by measurement under the following conditions:		
	In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.		
	NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.		
	The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm ² , at any point 10 cm from the outer surface of the apparatus.		
	Moreover, the measurement shall be made under fault conditions causing an increase of the high voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.		
	For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.		
	NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.		
9	Modification to G.7.1	N/A	
G.7.1	Add the following note:	N/A	
	NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.		



European group differences and national differences of EN IEC 62368-1:2020+A11:2020				
Clause	Requirement + Test	Result - Remark	Verdict	

10	Modification to Bibliography		
	Add the following notes for the standards indicated:		
	IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61658-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-11 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-1. IEC 61643-311 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-311. IEC 61643-331		
11	ADDITION OF ANNEXES	N/A	
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		
4.1.15	Denmark, Finland, Norway and Sweden To the end of the subclause the following is added: Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Denmark: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord." In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag"	N/A	



European group differences and national differences of EN IEC 62368-1:2020+A11:2020			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.3	United Kingdom To the end of the subclause the following is added: The torque test is performed using a socket-outlet		N/A
	assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex		
5.2.2.2	Denmark After the 2nd paragraph add the following: A warning (marking safeguard) for high touch current is required if the touch current exceeds the		N/A
5.4.11.1 and	limits of 3,5 mA a.c. or 10 mA d.c. Finland and Sweden		N/A
Annex G	To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable:		
	 If this insulation is solid, including insulation forming part of a component, it shall at least consist of either two layers of thin sheet material, each of which shall pass the electric strength test below, or 		
	 one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. 		
	If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition		
	• passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV),		
	and		
	 is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. 		
	It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.		



E	N IEC 62368-1:2020+A11:2020		
Clause	Requirement + Test	Result - Remark	Verdict
	A capacitor classified Y3 according to EN 60384- 14:2005, may bridge this insulation under the following conditions:		
	 the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; 		
	 the additional testing shall be performed on all the test specimens as described in EN 60384- 14; 		
	the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		
5.5.2.1	Norway		N/A
	After the 3rd paragraph the following is added:		
	Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).		
5.5.6	Finland, Norway and Sweden		N/A
	To the end of the subclause the following is added:		
	Resistors used as basic safeguard or bridging basic insulation in class I pluggable equipment type A shall comply with G.10.1 and the test of G.10.2.		
5.6.1	Denmark		N/A
	 Add to the end of the subclause Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment. Justification: In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse. 		
5.6.4.2.1	Ireland and United Kingdom		N/A
	After the indent for pluggable equipment type A , the following is added: – the protective current rating is taken to be 13 A, this being the largest rating of fuse used in the mains plug.		



European group differences and national differences of EN IEC 62368-1:2020+A11:2020				
Clause	Requirement + Test	Result - Remark	Verdict	
5.6.4.2.1	France		N/A	
	After the indent for pluggable equipment type A , the following is added: – in certain cases, the protective current rating of the circuit supplied from the mains is taken as 20 A instead of 16 A.			
5.6.5.1	To the second paragraph the following is added:		N/A	
	The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm ² to 1,5 mm ² in cross-sectional area.			
5.6.8	Norway		N/A	
	To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as class I equipment . See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.	\$		
5.7.6	Denmark		N/A	
	To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3.5 mA a.c. or 10 mA d.c.			



European group differences and national differences of EN IEC 62368-1:2020+A11:2020				
Clause	Requirement + Test	Result - Remark	Verdict	

5.7.6.2	Denmark	N/A
	To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA.	
5.7.7.1	Norway and Sweden	N/A
	To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.	
	It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example.	
	The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:	
	"Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728- 11)"	
	NOTE In Norway, due to regulation for CATV- installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.	
	Translation to Norwegian (the Swedish text will also be accepted in Norway):	
	"Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV	



European group differences and national differences of EN IEC 62368-1:2020+A11:2020					
Clause Requirement + Test Result - Remark \					
	nettet."				
	Translation to Swedish:				

	"Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medfőra risk főr brand. Főr att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet.".	
8.5.4.2.3	United Kingdom	N/A
	Add the following after the 2 nd dash bullet in 3 rd paragraph:	
	An emergency stop system complying with the	
	requirements of IEC 60204-1 and ISO 13850 is	
R 2 1 and	required where there is a risk of personal injury.	
D.J. I allu		N/A
Б.4	The following is applicable:	
	To protect against excessive currents and short- circuits in the primary circuit of direct plug-in equipment , tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment , until the requirements of Annexes B.3.1 and B.4 are met	



European group differences and national differences of EN IEC 62368-1:2020+A11:2020				
Clause Requirement + Test Result - Remark				

0.40	Denmark	
G.4.2	Definitark	N/A
	To the end of the subclause the following is added:	
	Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.	
	CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.	
	If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.	
	Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a.	
	Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.	
	Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1- 5a or DK 1-7a	
	Justification:	
	Heavy Current Regulations. Section 6c	
G 4 2	United Kingdom	NI/A
0.4.2		IN/A
	To the end of the subclause the following is added:	
	The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the	
	requirements of clauses 22.2 and 23 also apply.	



E	European group differences and national differences of E	EN IEC 62368-1:2020+A11:2	020
Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	United Kingdom		N/A
	To the first paragraph the following is added:		
	Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations.		
	NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		
G.7.1	Ireland		N/A
	To the first paragraph the following is added:		
	Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard		
G.7.2	Ireland and United Kingdom		N/A
	To the first paragraph the following is added:		
	A power supply cord with a conductor of 1,25 mm ² is allowed for equipment which is rated over 10 A and up to and including 13 A.		



European group differences and national differences of EN IEC 62368-1:2020+A11:2020			
Clause	Requirement + Test	Result - Remark	Verdict

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)	N/A
40 5 0	Germany	N1/A
10.5.2	 The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. <i>Justification</i>: German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de 	N/A



European group differences and national differences of EN IEC 62368-1:2020+A11:2020				
Clause	Requirement + Test	Result - Remark	Verdict	

ZD	IEC and CENELEC CODE DESIGNATIONS F	OR FLEXIBLE C	CORDS (EN)	N/A
	Type of flexible cord	Code de	esignations	N/A
		IEC	CENELEC	
	PVC insulated cords			
	Flat twin tinsel cord	60227 IEC 41	НОЗVН-Ү	
	Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F	
	Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F	
	Rubber insulated cords			
	Braided cord	60245 IEC 51	H03RT-F	
	Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F	
	Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F	
	Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F	
	Cords having high flexibility			
	Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H	
	Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	нозрv4-н	
	Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H	
	Cords insulated and sheathed with halogen- free thermoplastic compounds			
	Light halogen-free thermoplastic insulated and sheathed flexible cords		H03Z1Z1-F H03Z1Z1H2-F	
	Ordinary halogen-free thermoplastic insulated and sheathed flexible cords		H05Z1Z1-F H05Z1Z1H2-F	
		÷		





Photo 1_Overall view_1 of appliance



Photo 2_Overall view_2 of appliance





Photo 3_Overall view_3 of appliance



Photo 4_Overall view_4 of appliance





Photo 5_Overall view_5 of appliance



Photo 6_Overall view_6 of appliance





Photo 7_Overall view_7 of appliance



Photo 8_Overall view_8 of appliance





Photo 9_Overall view_9 of appliance



Photo 10_Overall view_10 of appliance





Photo 11_Overall view_11 of appliance



Photo 12_Overall view_12 of appliance





Photo 13_Overall view_13 of appliance



Photo 14_Overall view_14 of appliance





Photo 15_Overall view_15 of appliance



Photo 16_Overall view_16 of appliance





Photo 17_Overall view_17 of appliance



Photo 18_Overall view_18 of appliance





Photo 19_Overall view_19 of appliance



Photo 20_Overall view_20 of appliance





Photo 21_Overall view_21 of appliance



Photo 22_Overall view_22 of appliance





Photo 23_Overall view_23 of appliance



Photo 24_Overall view_24 of appliance





Photo 25_Overall view_25 of appliance



Photo 26_Overall view_26 of appliance


Attachment No.2 Product photos



Photo 27_Overall view_27 of appliance

---The End of Report---



TEST REPORT

Applicant:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.			
Address:	3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China			
Manufacturer:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.			
Address:	3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China			
The following samp	le(s) was /were submitted and identified on behalf of the clients as :			
Sample Name:	Wireless Lavalier Microphone			
Model Number:	M6 Pro, M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro, M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus, MWX(X: 1~1000), M5 Pro			
Sample Received Date:	June 17 to June 21, 2023			
Testing Period:	June 21, 2023			
Report No.:	XK2306012121R			
Test Requested:	 As specified by client, to screen Lead(Pb), Cadmium(Cd), Mercury(Hg), Chromium(Cr)and Bromine(Br)in the submitted sample(s)by XRF. 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 tes Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent 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 the following page(s).			
Test Result(s):	Please refer to the following page(s).			
Test 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.			

Compiled by:

Reviewed by:

mile xu

naly

Smile Xu

Nina Li



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 Shenzhen SiCT Technology Co., Ltd.

Test Method:

when screening results exceed the XRF screening limit in IEC 62321-3-1:2013, further use of chemical methods are required to test the Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs) and Polybrominated Diphenyl Ethers(PBDEs)

1. XRF screening limits in mg/kg for regulated elements according to IEC 62321-3-1:2013

Element	Limit of IEC 62321-3-1:2013 (mg/kg)				
Element	Polymers	Metals	Composite material		
Dh	BL≤(700-3σ) <Χ	BL≤(700-3σ) <Χ	BL≤(500-3σ)<Χ		
T D	<(1300+3σ)≤OL	<(1300+3σ)≤OL	<(1500+3σ)≤OL		
Cd	BL≤(70-3σ) <x <<="" td=""><td>BL≤(70-3σ)<x <<="" td=""><td>LOD <x<(150+3σ)< td=""></x<(150+3σ)<></td></x></td></x>	BL≤(70-3σ) <x <<="" td=""><td>LOD <x<(150+3σ)< td=""></x<(150+3σ)<></td></x>	LOD <x<(150+3σ)< td=""></x<(150+3σ)<>		
ou	(130+3σ) ≤OL	(130+3σ) ≤OL	≤OL		
Цa	BL≤(700-3σ)<Χ	BL≤(700-3σ)<Χ	BL≤(500-3σ)<Χ		
пу	<(1300+3σ)≤OL	<(1300+3σ)≤OL	<(1500+3σ)≤OL		
Cr	BL≤(700-3σ)< X	BL≤(700-3σ)< X	BL≤(500-3σ)< X		
Br	BL≤(300-3σ)< X	1	BL≤(250-3σ)< X		
Note: BL=Under the XRF screening limit OL=Over the XRF screening limit					

X=The symbol"X"marks the region where further investigation is necessary.

 3σ =The reproducibility of analytical instruments LOD= Detection limit

2. Chemical Test

Test item	Test method	Test instrument	MDL	Limit
Lead (Pb)	IEC 62321-5:2013 Ed.1.0	ICP-OES	10 mg/kg	1000 mg/kg
Cadmium (Cd)	IEC 62321-5:2013 Ed.1.0	ICP-OES	10 mg/kg	100 mg/kg
Mercury (Hg)	IEC 62321-4:2013+AMD1:2017	ICP-OES	10 mg/kg	1000 mg/kg
Hexavalent	IEC 62321-7-1:2015 Ed.1.0		0.10 µg/cm ²	1000 mg/kg
Chromium(Cr(VI))	IEC 62321-7-2:2017 Ed.1.0	00-015	10 mg/kg	1000 mg/kg
Polybrominated Biphenyls(PBBs)	IEC 62321-6:2015 Ed.1.0	GC-MS	100 mg/kg	1000 mg/kg
Polybrominated, Diphenyl Ethers(PBDEs)	IEC 62321-6:2015 Ed.1.0	GC-MS	100 mg/kg	1000 mg/kg
Bis-(2-ethylhexyl) Phthalate (DEHP)	IEC 62321-8:2017 Ed.1.0	GC-MS	50 mg/kg	1000 mg/kg
Benzyl butyl Phthalate (BBP)	IEC 62321-8:2017 Ed.1.0	GC-MS	50 mg/kg	1000 mg/kg
Dibutyl Phthalate (DBP)	IEC 62321-8:2017 Ed.1.0	GC-MS	50 mg/kg	1000 mg/kg
Diisobutyl Phthalate(DIBP)	IEC 62321-8:2017 Ed.1.0	GC-MS	50 mg/kg	1000 mg/kg



Test Results:

Sample No.	Sample Description	Tested Items	XRF Screening Test	Chemical Test Unit (mg/kg)	Conclusion
		Pb	BL	/	
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
1.	Black plastic case	Br(PBBs&PBDEs)	BL	/	Pass
		DBP	/	N.D.	
		DEHP	/	N.D.	
		BBP	/	N.D.	
		DIBP	/	N.D.	
		Pb	BL	/	
		Cd	BL	1	
		Hg	BL	1	
		Cr(Cr(VI))	BL	1	
2.	Metal spring	Br(PBBs&PBDEs)	1	1	Pass
		DBP	1	1	
		DEHP	1	1	
		BBP	1	1	
		DIBP	1	1	
		Pb	BL	/	
		Cd	BL	1	Pass
		Hg	BL	/	
	Yellow plastic	Cr(Cr(VI))	BL	/	
3.		Br(PBBs&PBDEs)	BL	/	
		DBP	1	N.D.	
		DEHP	1	N.D.	
		BBP	1	N.D.	
		DIBP	1	N.D.	
		Pb	BL	/	
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
4.	Silver metal	Br(PBBs&PBDEs)	1	/	Pass
		DBP	1	/	
		DEHP	/	/	
		BBP	/	/	
		DIBP	1	1	



Note: 1.N.D. = Not Detected (<MDL) MDL = Method Detection Limit

mg/kg = ppm =0.0001% /=Not Regulated or Not Applicable

2. BL = Under the XRF screening limit

IN = Further chemical test will be conducted when the screening result inconclusive

OL = Further chemical test will be conducted while the result is above the screening limit.

3. For metal samples, the sample is negative for Cr(VI), if the Cr(VI) concentration is less than

0.10 μ g/cm², the coating is considered a non- Cr(VI) based coating;

The sample is positive for Cr(VI), if the Cr(VI) concentration is greater than 0.13 μ g/cm², The sample coating is considered to contain Cr(VI);

The result is considered to be inconclusive, the Cr(VI) concentration is between the $0.10 \ \mu g/cm^2$ and $0.13 \ \mu g/cm^2$, Unavoidable coating variations may influence the determination. Because the storage condition and production date of the sample are not known, the test results of the sample of hexavalent chromium can only represent the state of hexavalent chromium in the samples tested.

Remark: 1. The screening results are only used for reference.

2. When conducting the test for PBBs&PBDEs, XRF was introduced to screen Br Exclusively; When conducting the test for Hexavalent Chromium, XRF was introduced to screen Chromium exclusively.

3. According to the client's statement , the material of the sample(s) comply with RoHS directive 2011/65/EU Annex III Exemption, Corresponding exemption clause:

#1 6(c) Lead is exempted as copper alloy containing up to 4% lead by weight.

#2 7(a) Lead is exempted as Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead).



Test Flow:

1. Lead(Pb), Cadmium(Cd) , Mercury (Hg)







3. PBBs/ PBDEs



SAMPLE PHOTO(S):



Photo 1



Photo 2



Photo 3



Photo 4





Photo 5



Photo 6





Photo 7



Photo 8





Photo 9



Photo 10





Photo 11



Photo 12





Photo 13



Photo 14





Photo 15



Photo 16





Photo 17



Photo 18





Photo 19



Photo 20



Photo 21



Photo 22





Photo 23



Photo 24





Photo 25



Photo 26





Photo 27

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



CE/HEALTH TEST REPORT

- Applicant: SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.
- Address: 3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China

Manufacturer: SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.

- Address: 3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China
- EUT: Wireless Lavalier Microphone

Model Number: M6 Pro, M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro, M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus, MWX(X: 1~1000), M5 Pro

- Test Date: June 17-21, 2023
- Date of Report: June 21, 2023
- Report No.: XK2306012120MF

Test Result: The equipment under test was found to be compliance with the requirements of the standards applied.

Test Procedure	Used	d:
Standard	:	EN 50663:2017
		EN 62479:2010

Compiled by:

Reviewed by:

Sky. Wong



Daisy Wei

Sky Wang

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 Shenzhen SiCT Technology Co., Ltd.



	Contents	Page
<u>1.</u>	GENGENERAL INFORMATION	<u></u>
1.1. 1.2.	Environmental conditions Product Description	3 3
<u>2.</u>	METHOD OF MEASUREMENT	

1. GENGENERAL INFORMATION

1.1. Environmental conditions

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

Normal Temperature:	25°C -35°C
Relative Humidity:	35%-55 %
Air Pressure:	101 KPa

1.2. Product Description

Product Name:	Wireless Lavalier Microphone
Trade Mark:	N/A
Model/Type reference:	M6 Pro
List Model:	M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro, M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus, MWX(X: 1~1000), M5 Pro
Power supply:	DC 5V, 2A
Operation frequency	2402MHz-2480MHz
BT Modulation Type	GFSK, π/4DQPSK,8DPSK
Bluetooth	Supported BR+EDR
Channel number:	79
Antenna Type	PCB Antenna
ANT Gain	0.00 dBi

2. METHOD OF MEASUREMENT

Applicable Standard

EN50663: Generic standard for assessment of low power electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (10MHz-300GHz)

EN 62479:2010, Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

<u>Limit</u>

20mW (According to the table A.1)

Table A.1 – Example values of SAR-based P_{max} for some cases described by ICNIRP, IEEE Std C95.1-1999 and IEEE Std C95.1-2005

Guideline / Standard	SAR limit, <i>SAR</i> _{max}	Averaging mass, <i>m</i>	P _{max}	Exposure tier ^a	Region of body ^a
	W/kg	g	mW		
	2	10	20	General public	Head and trunk
	4	10	40	General public	Limbs
	10	10	100	Occupational	Head and trunk
	20	10	200	Occupational	Limbs
	1,6	1	1,6	Uncontrolled environment	Head, trunk, arms, legs
IEEE Std C95 1-1999 [2]	4	10	40	Uncontrolled environment	Hands, wrists, feet and ankles
000.1 1000 [2]	8	1	8	Controlled environment	Head, trunk, arms, legs
	20	10	200	Controlled environment	Hands, wrists, feet and ankles
	2	10	20	Action level	Body except extremities and pinnae
IEEE Std C95.1-2005 [3]	4	10	40	Action level	Extremities and pinnae
	10	10	100	Controlled environment	Body except extremities and pinnae
	20	10	200	Controlled environment	Extremities and pinnae
^a Consult the appropriate standard for more information and definitions of terms.					

Manufacturing tolerance

GFSK(EIRP)					
Channel	Channel 00	Channel 39	Channel 78		
Target (dBm)	2.0	2.0	2.0		
Tolerance ±(dB)	1.0	1.0	1.0		
	π/4DQPSK (EIRP)				
Channel	Channel 00	Channel 39	Channel 78		
Target (dBm)	2.0	2.0	2.0		
Tolerance ±(dB)	1.0	1.0	1.0		
8DPSK(EIRP)					



Shenzhen SiCT Technology Co., Ltd.

Report No.: XK2306012120MF

Channel	Channel 00	Channel 39	Channel 78
Target (dBm)	2.0	2.0	2.0
Tolerance ±(dB)	1.0	1.0	1.0

<u>Test result</u>

Modulation Type	Maximum EIRP including tune up (dBm)	Output power (mW)	Limit (mW)	Results
BT	3.00	1.99	20	Pass

.....End of Report.....

⁻ 州海关技术中心

GUANGZHOU CUSTOMS DISTRICT TECHNOLOGY CENTER

地址:中国广州市天河区珠江新城花城大道66号B座 网址:www.iqtenet.cn 邮编: 510623 Add.: Tower B, No.66 Huacheng Avenue, Zhujiang Xincheng, Tianhe District, Guangzhou, China Website:www.iqtenet.cn Postcode: 510623

编号: 01082300006487 日期: 2023年07月05日 共8页,第1页

M/

检测报告

申请	人	:	深圳市星迈视听技术有限公司
也	址	SANGT	深圳市龙华区龙华街道景龙社区华盛珑悦写字楼 2 栋 3104
检测标	:准	:	GB 4943.1-2022 《音频、视频、信息和通信技术设备 第 1 部分:安全要求》
样品名	称	NOTO.	领夹式无线麦克风
送样数	量	:	1. AST CUSTON SCHOOL CURNES
型	号	- CUST	M6 Pro(其他型号详见本报告第2页"报告备注")
额 定	值	:	5V== 2A
接样日	期	18	2023年06月30日
检测 日	期。	Nº N	2023年07月03日至2023年07月04日
检测结	论	:	根据申请人要求对送检样品仅进行第4.1.15条、第4.4.3条、 第56条 附录 F 附录 T 项目的试验 所检项目检测结果
	申也佥 佯送型额妾佥佥 请 濒 品样 定样测测	申也佥 佯送型额安佥佥令 崔送型额安佥佥领 品样 定样测测品 人址准 称量号值期期论	申请人:: · · · · · · · · · · · · · · · · · · ·





1. 本报告结果仅对测试样品负责。The results in this report are relevant only to the sample(s) tested. 2. 未经鉴发机构书面同意,不得部分引送或复制本报告。Without written permission of IQTC, this report shall not be quoted or reproduced except in full.

制造商	:	深圳市星迈视听技术有限公司			
地址	:	深圳市龙华区龙华街道景龙社区华盛	龙悦ミ	写字楼	2栋3104
生产厂	:	深圳市星迈视听技术有限公司			
地 址	:	深圳市龙华区龙华街道景龙社区华盛	龙悦写	写字楼	2栋3104
施检单位	:	广州海关技术中心电器安全检测研究)	䜣		
施检地点	:	广东省广州市珠江新城花城大道 66 号	B 座		
电 话	:	+86-20-38290492, 38290483	Ema	ail :	esl@iqtcnet.cn
检测负责。	ላ:	李 敏	签	名:	2 in
审核	:	王英程	签	名:	之草乾
声 明	:	本报告中申请人对样品和相关资料的; 准确性负责。	真实恼	生负责	, 检测机构仅对检测数据的
判定用语	:	P:测试样品符合标准要求。			
		N:该试验项目不适用于样品。			
		F:测试样品不符合标准要求。			
		—:未进行该项目试验。			
报告备注:		 本次申请的主检型号 M6 Pro 与覆盖的电气原理、结构和所使用的关键元器同。 本次申请仅对主检型号 M6 Pro 进行 	盖型号 器件埃 亍试验	- M5 P 刃相同,	ro、M7 Pro、M8 Pro、M9 Pro 主要差异在于颜色和外观不
样品铭牌:					
		型号: M6 Pro 额定值: 5V === 2A 深圳市星迈视听技术有限公司	松松	关技	水田で育

1060736



样品描述:				
产品分组:	⊠最终产品 □内装部件			
使用人员分类:	⊠普通人员 □经过指导的人员 □熟练人员 □儿童可能触及			
电源连接:	□交流电网电源 □直流电网电源			
	☑外部电路: ☑ ES1 □ ES2 □ ES3			
额定电压容差:	□ +10%/-10%			
	□ +20%/-15%			
	□ + <u>25%/-10</u> %			
	⊠ 无			
电源连接类型:	□A型可插式设备:□不可拆卸电源软线 □器具耦合器 □直插式 □连接器			
	□B型可插式设备:□不可拆卸电源软线 □器具耦合器			
	□永久性连接			
	□廷按益 □其他・			
在建筑物设施中或在设备中				
用来保护电路的过流保护装 置的电流额定值:	安装位置:□建筑物 □设备			
设备移动性:	□可移式 □手持式 ⊠可携带式			
	□驻立式 □建筑物中 □直插式			
	□机架安装 □墙壁安装			
过压类别:				
	□ OVC IV ⊠ 其他			
电击防护:				
特殊安装位置:	図无 □限制触及区域。(21)。1			
污染等级 (PD):	$\square PD 1 \boxtimes PD 2 \square PD 3$			
最高环境温度:	<u>40</u> °C			
IP 等级:	$\boxtimes IPX0 \Box IP__$			
使用海拔高度:	□2000m或以下 ⊠ <u>5000m</u>			

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GB 4943.1-2022				
条款	试验项目及试验要求	试验结果 - 说明	判定	
4.1.15	标记和说明	(见附录 F)	Р	
4.4.3	安全防护		Р	
4.4.3.2	恒定力试验	(见附录 T)	Р	
4.4.3.3	跌落试验	(见附录 T)	Р	
4.4.3.4	冲击试验	(见附录 T)	Ν	
4.4.3.5	内部可触及的安全防护的试验	(见附录 T)	Ν	
4.4.3.6	玻璃冲击试验	(见附录 T)	Ν	
4.4.3.7	玻璃固定试验	(见附录 T)	Ν	
4.4.3.8	热塑性材料试验	(见附录 T)	Р	
4.4.3.9	构成安全防护的空气		Ν	
4.4.3.10	试验结束后,所有其他安全防护应仍然有效		Р	
	除PS3外,3级能量源不得被一般人员或受过培训人员触及;玻璃未破碎或破裂、或未抛射出质量超过30g或尺 寸超过50mm的碎片、单独样品通过T.10的破碎试验;其 他安全防护仍然有效		Р	
5.6	保护导体		Ν	
5.6.2	保护导体的要求		Ν	
5.6.2.2	保护接地导体的绝缘应是绿黄双色的		Ν	
5.6.3	保护接地导体的要求		Ν	
5.6.4	保护连接导体的要求		Ν	
5.6.4.1	保护连接导体的尺寸(mm ²):		Ν	
	保护电流额定值(A)			
5.6.4.3	限流装置(PTC元件)或过流保护装置(熔断器或断路器)不应与任何可能不满足低电阻状态的其他元器供并 联连接。		Ν	
5.6.5	保护导体的端子		Ν	
	导体的尺寸(mm ²)和最小螺纹直径(mm ² 检验检测专	lê lê	Ν	
5.6.5.2	在主保护接地端子、保护连接端子和连接快上接触的导 电零部件应当使任何两种不同的金属之间不会炎生好 ³⁶ 蚀	1	Ν	
5.6.6	保护连接系统的电阻		Ν	
5.6.6.2	试验电阻 (Ω)		N	
5.6.7	接地的可靠性		N	
5.6.8	功能接地		Ν	

GB 4943.1-2022					
条款	试验项目及试验要求	试验结果 - 说明	判定		
F	设备标志、说明和指示性安全防护		Р		
	说明语言	中文			
F.2	字母符号和图形符号		Р		
F.2.1	量值和单位的字母符号应符合IEC 60027-1		Р		
F.2.2	图形符号		Ν		
F.3	设备标志		Р		
F.3.1	设备标志的位置		Р		
F.3.2	设备的识别标志		Р		
F.3.2.1	制造商标识	深圳市星迈视听 技术有限公司			
F.3.2.2	型号	M6 Pro			
F.3.3	设备额定值标识		Р		
F.3.3.1	直接和电网电源连接的设备		Ν		
F.3.3.2	不直接和电网电源连接的设备		Р		
F.3.3.3	供电电压的性质				
F.3.3.4	额定电压	5V			
F.3.3.5	额定频率				
F.3.3.6	额定电流或额定功率	2A			
F.3.3.7	具有多个电源连接端的设备		Ν		
F.3.4	电压设定装置		Ν		
F.3.5	端子和要操作的装置上的标志		Ν		
F.3.5.1	电网电源器具输出插座和输出插座的标志		Ν		
F.3.5.2	开关位置的识别标志		Ν		
F.3.5.3	更换熔断器的标识和额定值标志		Ν		
F.3.5.4	更换电池的识别标志 旅关校		Ν		
F.3.5.5	中性导体端子	Ŧ	Ν		
F.3.5.6	端子标志位置 1	C-	Ν		
F.3.6	与设备类别有关的设备标志 检验检测专	用章	Ν		
F.3.6.1	I 类设备 7.0 0 0 7.3	<u>1</u>	Ν		
F.3.6.1.1	保护接地导体端子		Ν		
F.3.6.1.2	保护连接导体端子	1	N		
F.3.6.2	设备类别标志		N		
F.3.6.3	功能接地端子标志		Ν		
F.3.7	设备的 IP 额定值标志:				
F.3.8	外部电源输出标志		N		

GB 4943.1-2022				
条款	试验项目及试验要求	试验结果 - 说明	判定	
F.3.9	标志的耐久性、清晰性和持久性		Р	
F.3.10	标志持久性试验		Р	
F.3.10.1	基本要求		Р	
F.3.10.2	试验程序		Р	
F.3.10.3	溶剂油		Р	
F.4	说明书		N	
	a) 本设备不适合在儿童可能会出现的场所使用说明确保		Ν	
	b) 如果设备预定是要固定在位的,则说明书中应解释如 何牢固地固定设备。		Ν	
	c) 如果采用保护接地作为安全防护,则说明书应要求, 设备的保护接地导体要连接到设施的保护接地导体		Ν	
	d)对具有保护接地导体,且其保护导体电流超过5.2.2.2 的ES2 限值的设备,设备应标有符合5.7.5 规定的指示性安全防护。		Ν	
	e) 如果图形符号标志在设备上并用作指示性安全防护, 则说明书应解释该符号的意义。		Ν	
	f)如果永久连接式设备没有安装全极电网电源开关,则 安装说明书应说明,在建筑物电气设施中应安装符合附 录L的全极电源开关。		N	
	g)如果可更换的元器件或模块是提供安全防护功能的,则应按适用的情况,在普通人员说明书、经过指导的人员说明书,或熟练人员说明书中,提供可相应更换的元器件或模块的标识。		N	
F.5	指示性安全防护		N	
	完整的指示性安全防护应标在设备上		N	

Т	机械强度试验		Р
T.2	恒定力试验,10N	¢.	Ν
Т.3	恒定力试验,30N	Ŧ	Ν
T.4	恒定力试验,100 N 检验检测去	いて	Р
T.5	恒定力试验, 250 N	10	Ν
Т.6	外壳冲击试验		Ν
	钢球试验		Ν
	钟摆试验		Ν
T.7	跌落试验:	1000mm	Р
T.8	应力消除试验	70°C	Р
Т.9	玻璃冲击试验		Ν

共8页,第8页

GB 4943.1-2022				
条款	试验项目及试验要求	试验结果 - 说明	判定	
T 10	玻璃破磁试验 磁片数.		N	
	· 狄内极可以拉, 可开处.		14	
T.11	伸缩或拉杆天线试验		Ν	
	力矩 (Nm):			

本报告结尾*******



信息说明 Information Description

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ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4(2020-09) Test Report

For

SHENZHEN STARMAX AUDIO-VISUAL

TECHNOLOGY CO., LTD.

Product Name:	Wireless Lavalier Micro	Wireless Lavalier Microphone					
Model/Type No	.: M6 Pro, M5, M6, M7, M M10Pro, M20 Pro, MX, Plus, MWX(X: 1~1000),	M6 Pro, M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro, M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus, MWX(X: 1~1000), M5 Pro					
Prepared By:	Shenzhen SiCT Techno	Shenzhen SiCT Technology Co., Ltd.					
	202, Building 3, No.111 Community, Guanhu St P. R. China	202, Building 3, No.111 Huanguan Middle Road, Songyuanxia Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, P. R. China					
Report Number	: XK2306012120E	XK2306012120E					
Tested Date:	June 17-21, 2023	June 17-21, 2023					
Issued Date:	June 21, 2023	June 21, 2023					
Tested By:	Smile Xu / Gmile	, XU					
Reviewed By:	Ninah	Approved By:	Andy Wang 2015				
	Nina Li FMC Technical Manager		Andy Wang EMC General Manager				


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4.2.5 TEST RESULTS	
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information			
Applicant:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.		
Address of applicant:	3104, Building 2, Huasheng Longyue Tower, Jinglong Community,		
Address of applicant.	Longhua Street, Longhua District, Shenzhen, China		
Manufacturer:	SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD.		
Address of Manufasturar:	3104, Building 2, Huasheng Longyue Tower, Jinglong Community,		
Address of Manufacturer.	Longhua Street, Longhua District, Shenzhen, China		

General Description of EUT	
Product Name:	Wireless Lavalier Microphone
Brand Name:	N/A
Test Model:	M6 Pro
Adding Model(s):	M5, M6, M7, M8, M9,M10, M20, M7 Pro, M8 Pro, M9 Pro, M10Pro, M20 Pro, MX, MX Pro, MXs, MXS, MX Ultra, MX Max, MX Plus, MWX(X: 1~1000), M5 Pro
Rated Voltage:	DC 5V, 2A
Battery Capacity:	1
Power Adapter:	1
Software Version:	1
Hardware Version:	1

Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model SW/30, but the circuit and the electronic construction do not change, declared by the manufacturer.

Receiver RF Specification

Receiver Ri Opecification	
Frequency Range:	2402-2480MHz
Type of Modulation:	FSK
Type of Antenna:	Single Antenna
Antenna Gain:	0dBi
Receiver Categories:	2



1.2 Test Standards

The tests were performed according to following standards:

ETSI EN 301 489-1 V2.2.3 (2019-11) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility.

<u>ETSI EN 301 489-17 V3.2.4(2020-09)</u> ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

1.3 Report version

Version No.	Date of issue	Description			
Rev.00	2023.04.24	Original			
/	/	1			

1.4 Test Methodology

All measurements contained in this report were conducted with the standard ETSI EN 301489-1, ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility.



1.5 EUT Setup and Operation Mode

Test Mode	Normal Operation
S1	

Note:

(1) For immunity tests part: Monitoring indicate light of EUT and sound status.

Ac	Accessories Devices And Cable List and Details				
	/	Manufacturer :	1		
	/	Model No. :	1		
	/	Manufacturer :	1		
	/	Model No. :	1		
	/	Length (m):	1		
	/	Shielded/Unshielded:	1		
•	 supplied by the manufacturer supplied by the lab 				

1.6 Environmental conditions

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

Temperature:	24 ° C
Relative Humidity:	45 %
ATM Pressure:	1019 mbar

1.7 Measurement Uncertainty

Measurement uncertainty				
Parameter	Uncertainty			
Uncertainty for Radiated Emission in 3m chamber	30-200MHz(HP): 3.6 dB , 30-200MHz(VP): 4.5 dB 200-1000MHz(HP): 3.7 dB, 200-1000MHz(VP): 3.7 dB 1-26 GHz: 5.4 dB			
Uncertainty for Conducted Emission	3.3 dB			
Uncertainty for Harmonic test	3.26%			
Uncertainty for Flicker test	4.76%			
Uncertainty for RS test	21%, k=2			
Uncertainty for CS test	29%, k=2			
Uncertainty for ESD test	The immunity measurement system uncertainty is			
Uncertainty for EFT test	within standard requirement and is based on a			
Uncertainty for Surges test	standard uncertainty multiplied by a coverage factor			
Uncertainty for Voltage Dips, Voltage Variations and Short Interruptions Test	k=2, providing a level of confidence of approximately 95%.			



1.8 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Conducted Emissions					
EMI Test Receiver	PIS	ESCI	100687	2023 05 30	2024 05 20

	1100	2001	100007	2023-03-30	2024.00.23
Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	8128247	2023-05-30	2024.05.29
10dB attenuator	SCHWARZBECK	9510-F061	N/A	2023-05-30	2024.05.29
ISN	TESEQ	ISN-T800	30301	2023-05-30	2024.05.29

Radiated Emissions

EMI Test Receiver	R&S	ESCI	100687	2023-05-30	2024.05.29
TRILOG					
Broadband	SCHWARZBECK	VULB9162	1	2023-05-30	2024.05.29
Test-Antenna					
Horn Antenna	A.H.	AH-118	1	2023-05-30	2024.05.29
Broadband preamplifier	SCH WARZBECK	BBV9718	9718-182	2023-05-30	2024.05.29

Harmonic Current Emissions/ Voltage Fluctuations and Flicker

HRMONICS& FLICKRE ANALYSER	VOLTECH	PM6000	2000067 00433	2023-05-30	2024.05.29
Linear power supply	VOLTECH	AFC-150	/	2023-05-30	2024.05.29

Radio Frequency Electromagnetic Field

Signal Generater	R&S	SMB100A	105942	2023-05-30	2024.05.29
RF Power Amplifier	BONN Elektronik	BLWA0830- 160/100/40D	128740	2023-05-30	2024.05.29
Gestockte Breitband (S tacked) Logper.Antenna	SCHWARZBECK	STLP9128D	043	2023-05-30	2024.05.29
Power Meter	R&S	NRP2	102031	2023-05-30	2024.05.29
Amplifier	NJNT	NTWPAS-256 0025	2560025	2023-05-30	2024.05.29
Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2023-05-30	2024.05.29

Electrostatic Discharge

Electrostatic Discharge Simulator	NoiseKen	ESS-B3011	125	2023-05-30	2024.05.29
Fast Transients					

Fast Transient BurstSCHAFFNERMODULA615345722023-05-302024.05.29



Shenzhen SiCT Technology Co., Ltd.

Report No.XK2306012120E

Generator		0			
Capacitive Coupling Clamp	/	CDN8014	1	2023-05-30	2024.05.29

Surge

ourge					
10KV/Telecom Surge Generator	Lioncel	LSG-510CB	1	2023-05-30	2024.05.29
10KV/Telecom Surge Generator	Lioncel	LSG-506CT	1	2023-05-30	2024.05.29
Surge	Lioncel	FHR-T82	1	2023-05-30	2024.05.29
Surge	Lioncel	CN533P	/	2023-05-30	2024.05.29

Radio frequency common mode

RF POWER AMPLIFIER	FRANKONIA	FLL-75	1020A11 09	2023-05-30	2024.05.29
CDN	FRANKONIA	CDN M2+M3	A302701 9	2023-05-30	2024.05.29
6DB Attenuator	FRANKONIA	N/A	1001698	2023-05-30	2024.05.29
EM Injection clamp	FCC	F-203I-23mm	091536	2023-05-30	2024.05.29

Voltage dips and interruptions

Surge/Dip	s Generator	1	TRA2000	/	2023-05-30	2024.05.29

Software List

Description	Manufacturer	Model	Version	
EMI Test Software	Farad	EZ EMC		
(Radiated Emission)*			114-0341	
EMI Test Software	Farad	EZ EMC		
(Conducted Emission)*	Falau		RA-03AT	
*Remark: indicates software version used in the compliance certification testing.				

2. SUMMARY OF TEST RESULTS

			T	
Standards	Reference	Description of Test Item	Result	
	8.2	Radiated Emissions	Pass	
	8.4	Conducted Emissions for AC Power Port	N/A	
	8.5	Harmonic Current Emissions	N/A	
	8.6	Voltage Fluctuations and Flicker	N/A	
ETSI EN	9.2	Radio Frequency Electromagnetic Field*	Pass	
301489-1	9.3	Electrostatic Discharge	Pass	
	9.4	Fast Transients, Common Mode	N/A	
	9.5	Radio Frequency, Common Mode	N/A	
	9.7	Voltage Dips and Interruptions	N/A	
	9.8	Surges	N/A	
Pass: The EUT complies with the essential requirements in the standard				
Fail: The EUT doe	es not comply v	with the essential requirements in the standard		
N/A: not applicabl	le			

*: means test items is not in accredited testing scope of CNAS.



3. EMISSION

3.1 Conducted Emissions

3.1.1 Limit

Please refer to ETSI EN301489-1 Clause 8.4.3.2 and CENELEC EN 55032 Annex A, Table A.10.

Frequency range	Limits dB(μV)			
IVITIZ	Quasi-peak	Average		
0,15 to 0,50	66 to 56	56 to 46		
0,50 to 5	56	46		
5 to 30	60	50		
NOTE 1 The lower limit shall apply at the transition frequencies. NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.				

3.1.2 Test Procedure

Please refer to ETSI EN 301 489-1 Clause 8.4.2 and CENELEC EN 55032 [1], Annex A.3.

3.1.3 Basic Test Setup Block Diagram





3.1.4 Conducted Emissions Test Data

Passed
 Not Applicable

Note: The EUT is DC supply, so this test item is not applicable.



3.2. Radiated Emissions

3.2.1 Limit

Please refer to ETSI EN301489-1 Clause 8.2.3 and CENELEC EN 55014 [1], annex A, tables A.4 and A.5.

Frequency range (MHz)	Quasi-peak limits (dBµV/m@3m)
30~230	40
230~1000	47

Frequency range (GHz)	Average limits (dBµV/m@3m)	Peak limits (dBµV/m@3m)
1 ~ 3	50	70
3~6	54	74

3.2.2 Test Procedure

Please refer to ETSI EN 301 489-1 Clause 8.2.2 and CENELEC EN 55014 [1], annex A.2. for the measurement Methods.

3.2.3 Basic Test Setup Block Diagram





3.2.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of $-6dB_{\mu}V$ means the emission is $6dB_{\mu}V$ below the maximum limit for Class B device. The equation for margin calculation is as follows:

Margin = Corr. Ampl. - EN 301489 Class B Limit

3.2.5 Summary of Test Results/Plots

Passed

Not Applicable



➢ 30MHz to 1GHz









> 1000MHz to 6GHz







3.3. Harmonic Current Emissions

3.3.1 Limit

Please refer to ETSI EN301489-1 Clause 8.5 and CENELEC EN 61000-3-2 [15], clause 7

Class A equipment

Harmonic order	Maximum permissible harmonic current A	
Odd har	monics	
3	2,30	
5	1,14	
7	0,77	
9	0,40	
11	0,33	
13	0,21	
$15 \le n \le 39$	0,15	
Even har	monics	
2	1,08	
4	0,43	
6	0,30	
$8 \le n \le 40$	0,23 <u>8</u>	

Class B equipment

not exceed the values given in Class A limit multiplied by a factor of 1,5

> Class C equipment

Active input power >25 W

Harmonic order n	Maximum permissible harmonic currrent expressed as a percentage of the input current at the fundamental frequency %
2	2
3	30 · <i>λ</i> *
5	10
7	7
9	5
11 ≤ n ≤ 39	3
(odd harmonics only)	
* λ is the circuit power factor	

Active input power ≤25 W



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Harmonic order	Maximum permissible harmonic current	Maximum permissible harmonic current	
n	mA/W	А	
3	3,4	2,30	
5	1,9	1,14	
7	1,0	0,77	
9	0,5	0,40	
11	0,35	0,33	
$13 \le n \le 39$ (odd harmonics only)	<u>3,85</u> n	See Table 1	

the third harmonic current, expressed as a percentage of the fundamental current, shall not exceed 86 % and the fifth harmonic current shall not exceed 61 %. Also, the waveform of the input current shall be such that it reaches the 5 % current threshold before or at 60°, has its peak value before or at 65° and does not fall below the 5 % current threshold before 90°, referenced to any zero crossing of the fundamental supply voltage. The current threshold is 5 % of the highest absolute peak value that occurs in the measurement window, and the phase angle measurements are made on the cycle that includes this absolute peak value

Class D equipment

Harmonic order	Maximum permissible harmonic current per watt	Maximum permissible harmonic current
n	mA/W	А
3	3,4	2,30
5	1,9	1,14
7	1,0	0,77
9	0,5	0,40
11	0,35	0,33
$13 \le n \le 39$ (odd harmonics only)	<u>3,85</u> n	See Table 1



3.3.2 Test Procedure

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

3.3.3 Basic Test Setup Block Diagram



3.3.4 Summary of Test Results/Plots

Passed Not Applicable

Note: The EUT is DC supply, so this test item is not applicable.

3.4. Voltage Fluctuation and Flicker

3.4.1 Limit

SiCTLab

Please refer to EN61000-3-3

- the value of P_{st} shall not be greater than 1,0;
- the value of P_{lt} shall not be greater than 0,65;
- the value of d(t) during a voltage change shall not exceed 3,3 % for more than 500 ms;
- the relative steady-state voltage change, dc, shall not exceed 3,3 %;
- the maximum relative voltage change d_{max}, shall not exceed
- a) 4 % without additional conditions;
- b) 6 % for equipment which is:
- switched manually, or
- switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.
- c) 7 % for equipment which is
- attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
- switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6,limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energised immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching.

Pst and Plt requirements shall not be applied to voltage changes caused by manual switching

3.4.2 Test Procedure

Test is conducting under the description of EN61000-3-3.



3.4.3 Basic Test Setup Block Diagram



3.4.4 Summary of Test Results/Plots

Passed
Not Applicable

Note: The EUT is DC supply, so this test item is not applicable.



4. IMMUNITY

Performance criteria

- EN301489-17:

General performance criteria

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

NOTE: Whether a phenomenon is considered transient, continuous or otherwise is indicated in the test procedures for the phenomenon in ETSI EN 301 489-1 [1], clause 9.

Criterion	During test	After test	
	Operate as intended	Operate as intended	
	No loss of function	No loss of function	
A	No unintentional responses	No degradation of performance	
		No loss of stored data or user programmable functions	
	May show loss of function	Operate as intended	
р	No unintentional responses	Lost function(s) shall be self-recoverable	
D		No degradation of performance	
		No loss of stored data or user programmable functions	

Table 2: Performance Requirements



4.1. Electrostatic Discharge (ESD)

4.1.1 TEST LEVEL

Contact Discharge at ±2kV, ±4kV; Air Discharge at ±2kV, ±4kV, ±8kV

4.1.2 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.



4.1.3 Basic Test Setup Block Diagram



4.1.4 Test Performance

Performance Criterion:	Mode	Verdict
	S1	В
Note: S1 for TT/TR		

4.1.5 TEST RESULTS

⊠ Passed

Not Applicable



Test mode	e	S1			
Туре	Type of discharge	Discharge voltage (kV)	Criteria Level	Result	
	Contact	±2	1	/	
diso Direct Air di	discharge	±4	1	/	
	Air discharge	±2	В	В	Pass
		±4	В	В	
		±8	В	В	
Indirect VC		±2	В	В	
		±4	В	В	Pass
	VCP (4 sides)	±2	В	В	
		±4	В	В	

Note:

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

4.2. Radio Frequency Electromagnetic Field (R/S)

4.2.1 Test Level

Test frequency range: 80MHz~6000MHz Level: 3V/m (80%, 1kHz Amplitude Modulation)

4.2.2 Test Procedure

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

4.2.3 Basic Test Setup Block Diagram



4.2.4 Test Performance

Performance Criterion:	Mode	Verdict
	S1	Α
Note: S1 for CT,CR		

4.2.5 TEST RESULTS

⊠ Passed

Not Applicable



Shenzhen SiCT Technology Co., Ltd.

Report No.XK2306012120E

Test mode:	S1					
Antenna Polarity	Frequency Band (MHz)	Field (V/m)	Test Points	Observations (Performance Criterion)	Criteria Level	Result
		3	Front Side	А	А	Pass
			Rear Side	А	А	Pass
			Left Side	А	А	Pass
Н	80-6000		Right Side	А	А	Pass
			Top Side	А	А	Pass
			Bottom Side	А	A	Pass
V	80-6000	3	Front Side	А	А	Pass
			Rear Side	А	А	Pass
			Left Side	А	А	Pass
			Right Side	А	А	Pass
			Top Side	А	А	Pass
			Bottom Side	А	A	Pass



EXHIBIT 1 – EUT PHOTOGRAPHS



Photo 1



Photo 2





Photo 3



Photo 4





Photo 5



Photo 6





Photo 7



Photo 8





Photo 9



Photo 10





Photo 11



Photo 12





Photo 13



Photo 14





Photo 15



Photo 16





Photo 17



Photo 18





Photo 19



Photo 20




Photo 21



Photo 22





Photo 23



Photo 24





Photo 25



Photo 26





Photo 27

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

GRANT OF EQUIPMENT AUTHORIZATION

ТСВ

Certification Issued Under the Authority of the Federal Communications Commission

By:

Eurofins Electrical and Electronic Testing NA, Inc 914 W. Patapsco Avenue Baltimore, MD 21230-3432

Date of Grant: 06/30/2023

Application Dated: 06/30/2023

SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD. 3104, Building 2, Huasheng Longyue Tower, Jinglong Community, Longhua Street, Longhua District, Shenzhen, China

Attention: Lv weifa

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2BBKW-MICR Name of Grantee: SHENZHEN STARMAX AUDIO-VISUAL TECHNOLOGY CO., LTD. Equipment Class: Part 15 Spread Spectrum Transmitter Wireless Lavalier Microphone Notes: Frequency Output Frequency Emission Grant Notes FCC Rule Parts Range (MHZ) Watts **Tolerance Designator** 15C 2402.0 - 2480.0 0.00291 Output power listed is conducted.