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# EMC Test Report

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Report No.: AGC03739230301EE01

**PRODUCT DESIGNATION** : Dual Band Digital Two Way Radio

**BRAND NAME** : VITAI, JUENTAI, ZASTONE

**MODEL NAME** : VDG-UV008, JD-UV008, ZT-UV008

**APPLICANT** : VITAI ELECTRONICS CO., LIMITED

**DATE OF ISSUE** : Apr. 13, 2023

**STANDARD(S)** : ETSI EN 301 489-1 V2.2.3: 2019-11  
ETSI EN 301 489-5 V2.2.1: 2019-04

**REPORT VERSION** : V1.0



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**REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 13, 2023	Valid	Initial release

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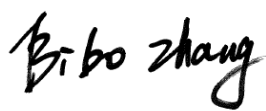


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## 1. GENERAL INFORMATION

<b>Applicant</b>	VITAI ELECTRONICS CO., LIMITED
<b>Address</b>	Room 1901 Buiding 1, Zhongjun Tianfeng,Jiangbinbei Road,Quanzhou,Fujian Province ,China
<b>Manufacturer</b>	VITAI ELECTRONICS CO., LIMITED
<b>Address</b>	Room 1901 Buiding 1, Zhongjun Tianfeng,Jiangbinbei Road,Quanzhou,Fujian Province ,China
<b>Factory</b>	VITAI ELECTRONICS CO., LIMITED
<b>Address</b>	Room 1901 Buiding 1, Zhongjun Tianfeng,Jiangbinbei Road,Quanzhou,Fujian Province ,China
<b>Product Designation</b>	Dual Band Digital Two Way Radio
<b>Brand Name</b>	VITAI, JUENTAI, ZASTONE
<b>Test Model</b>	VDG-UV008
<b>Series Model</b>	JD-UV008, ZT-UV008
<b>Difference Description</b>	Only the model name & brand name are different.
<b>Date of receipt of test it</b>	Mar. 24, 2023
<b>Date of Test</b>	Mar. 24, 2023~Apr. 13, 2023
<b>Test Result</b>	Pass

The above equipment was tested by Attestation Of Global Compliance Science & Technology Co., Ltd for compliance with the requirements set forth in ETSI EN 301 489-1 and ETSI EN 301 489-5. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Prepared By	
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## 2. EUT DESCRIPTION

<b>Product Designation</b>	Dual Band Digital Two Way Radio
<b>Brand Name</b>	VITAI
<b>Model Name</b>	VDG-UV008
<b>Hardware Version</b>	LD8800DF697
<b>Software Version</b>	V1.02.03.1007
<b>Operation Frequency</b>	From 136MHz to 174MHz VHF From 400MHz to 480MHz UHF
<b>Modulation</b>	F3E/4FSK
<b>Operation Mode</b>	Push to talk
<b>Channel Separation</b>	12.5KHz
<b>Rated Output Power</b>	5W (It was fixed by the manufacturer, any individual can't arbitrarily change it.)
<b>Antenna Designation</b>	Detachable
<b>Antenna Gain</b>	1.5dBi
<b>Power Supply</b>	DC 7.4V, 2500mAh by battery, Charger for 8.4V

Note:

1. For more details, refer to the user's manual of the EUT.

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### 3.TEST METHODOLOGY

All tests were performed in accordance with the procedure documented in ETSI EN 301 489-1 V2.2.3:2019-11 as referenced in ETSI EN 301 489-5 V2.2.1: 2019-04.

<b>ETSI EN 301 489-1</b>	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility.
<b>ETSI EN 301 489-5</b>	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 5: Specific conditions for Private land Mobile Radio (PMR) and ancillary equipment (speech and non-speech) and Terrestrial Trunked Radio (TETRA); Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

#### 3.1 UNIT OF MEASUREMENT

Measurements of radiated interference are reported in terms of dB(uV/m) at a specified distance. The indicated readings on the Spectrum analyzers were converted to dB (uV/m) by use of appropriate conversion factors. Measurements of conducted interference are reported in terms of dB(uV).

The field strength is calculated by adding the Antenna Factor and Cable Factors and subtracting the Amplifier Gain from the measured reading. The following is a sample calculation:

$$FS = RA + AF + CF - AG$$

Where FS = Field Strength  
RA = Receiver Amplitude  
AF = Antenna Factor  
CF = Cable Attenuation Factor  
AG = Amplifier Gain

Assume a receiver reading of 52.5 dBuV is obtained. The Antenna Factor of 7.4dB/m and a Cable Factor of 1.1dB are added. The Amplifier Gain of 29 dB is subtracted, giving field strength of 32 dBuV/m. The 32-dBuV/m values was mathematically converted to its corresponding level in uV/m.

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dBuV/m}$$

**Note:** Level in uV/m = Common Antilogarithm  $[(32 \text{ dBuV/m})/20] = 39.8 \text{ uV/m}$

#### 3.2 ANTENNA

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 meters from the leading edge of the turntable.

### 3.3 DECISION OF TEST MODE

MODE NO.	EMI TEST MODE DESCRIPTION	WORST
1	Standby Mode +Charging	V
2	Operate in Transmitting From Charging Mode—VHF Analog	
3	Operate in Receiving From Charging Mode—VHF Analog	
4	Operate in Transmitting From Charging Mode—VHF Digital	
5	Operate in Receiving From Charging Mode—VHF Digital	
6	Operate in Transmitting From Charging Mode—UHF Analog	
7	Operate in Receiving From Charging Mode—UHF Analog	
8	Operate in Transmitting From Charging Mode—UHF Digital	
9	Operate in Receiving From Charging Mode—UHF Digital	
MODE NO.	EMS TEST MODE DESCRIPTION	
1	Standby Mode +Charging	
2	Operate in Transmitting From Charging Mode—VHF Analog	
3	Operate in Receiving From Charging Mode—VHF Analog	
4	Operate in Transmitting From Charging Mode—VHF Digital	
5	Operate in Receiving From Charging Mode—VHF Digital	
6	Operate in Transmitting From Charging Mode—UHF Analog	
7	Operate in Receiving From Charging Mode—UHF Analog	
8	Operate in Transmitting From Charging Mode—UHF Digital	
9	Operate in Receiving From Charging Mode—UHF Digital	
'Note: 1.V means EMI worst mode. 2. All the modes had been test, but only the worst data was recorded in the report		

#### I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Cable Description	Tested With
Antenna Port	1	--	1
Earphone Port	1	--	1

Note: All the above "--" means that EUT has no cable.

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### 3.4 ENVIRONMENTAL CONDITIONS

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

- Temperature: 15-35°C
- Relative humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

### 3.5 MEASUREMENT UNCERTAINTY

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

- Uncertainty of Conducted Emission,  $U_c = \pm 2.9\text{dB}$
- Uncertainty of Radiated Emission below 1GHz,  $U_c = \pm 3.9\text{dB}$
- Uncertainty of Radiated Emission above 1GHz,  $U_c = \pm 4.9\text{dB}$

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#### 4. TEST ITEMS AND THE RESULTS

No.	Basic Standard	Test Type	Result
<b>EMISSION (EN 301 489-1 §7.1)</b>			
1	EN 55032	Radiated emission	PASS
2	EN 55032	Conducted emission, AC ports	PASS
3	EN 55032	Conducted emission, DC ports	N/A
4	EN 55032	Conducted emission, Telecom ports	N/A
5	EN 61000-3-2	Harmonic current emissions	N/A
6	EN 61000-3-3	Voltage fluctuations & flicker	PASS
<b>IMMUNITY (EN 301 489-1 §7.2)</b>			
7	EN 61000-4-2	Electrostatic discharge immunity	PASS
8	EN 61000-4-3	Radiated RF electromagnetic field immunity	PASS
9	EN 61000-4-4	Electrical fast transient/burst immunity	PASS
10	ISO 7637-1, -2	Transients and surges, DC ports	N/A
11	EN 61000-4-5	Surge immunity, AC ports, Telecom ports	PASS
12	EN 61000-4-6	Immunity to conducted disturbances induced by RF fields	PASS
13	EN 61000-4-11	Voltage dips and short interruptions immunity	PASS

Note: 1. N/A- Not Applicable.

2. The latest versions of basic standards are applied.

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## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

<b>Site</b>	Attestation of Global Compliance (Shenzhen) Co., Ltd
<b>Location</b>	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao 'an District, Shenzhen, Guangdong, China

### 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1	Battery	N/A	VTB-UV008	--	--	--
2	Adapter	N/A	NLA050120W1U6	--	--	1.0m Unshielded
3	Charger	N/A	VTC-UV008	--	--	--
4	Lanyard	N/A	--	--	--	--

**Notes:**

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

### 6.3 TEST SETUP

The equipment under test was configured and operated in a manner of normal operation. EUT tended to maximize its emission characteristics in a typical application for conducted and radiated emission measurement. The RF module plus ancillary (stand alone unit) was evaluated as per table 2 of clause 7.1 of ETSI EN 301 489-1.

Software Used During the Test	
Operating System	--
File Name	--
Program Sequence	--
RF Management Software	--

Remark: During the test, no modification is made to the EUT to comply with Class B limit levels.

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## 7. ETSI EN 301 489-1/-5 REQUIREMENTS

### 7.1 RADIATED EMISSION

#### LIMIT

Please refer to ETSI EN 301 489-1 Clause 8.2.3, Table 3 and EN 55032 Annex A, Table A.4, A.5, Class B

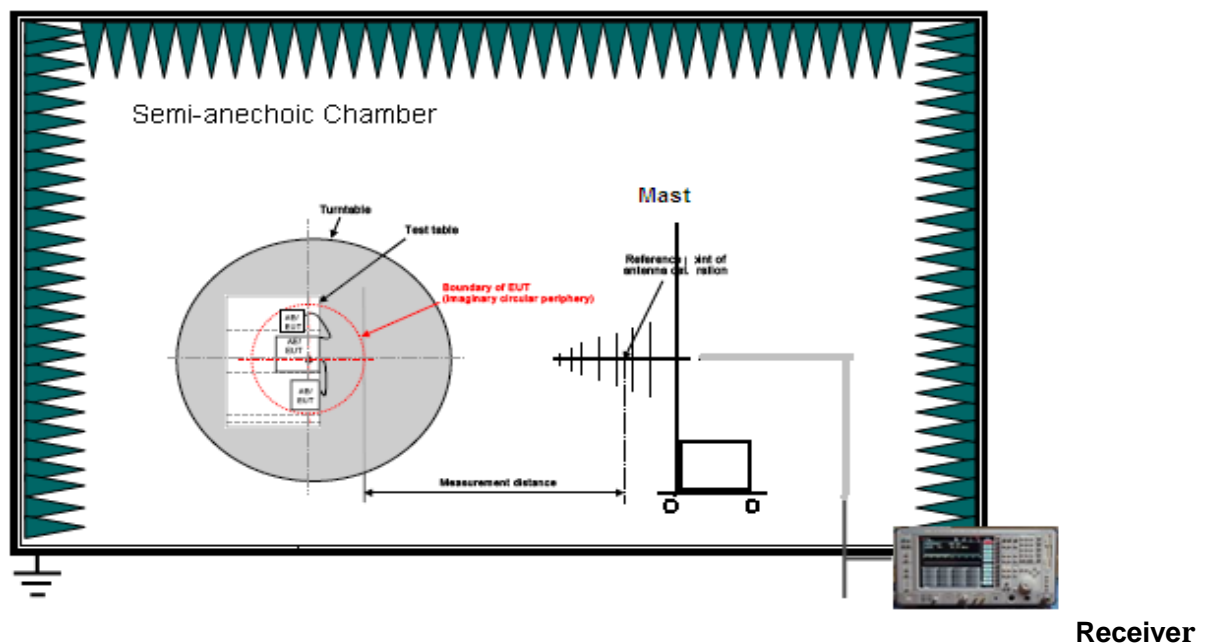
#### MEASUREMENT EQUIPMENT USED

Radiated Emission Test Site # 4					
Name of Equipment	MANUFACTURER	MODEL	SERIAL NUMBER	Cal. Date	Cal. Due
EMI TEST RECEIVER	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
SPECTRUM ANALYZER	AGILENT	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
AMPLIFIER	Schwarzbeck	BBV 9718	9718-162	Jun. 06, 2022	Jun. 05, 2023
ANTENNA	R&S	VULB9168	D69250	Apr. 28, 2021	Apr. 27, 2023
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023

**Remark:** Each piece of equipment is scheduled for calibration once a year. Except for the antenna was once two years.

#### TEST CONFIGURATION

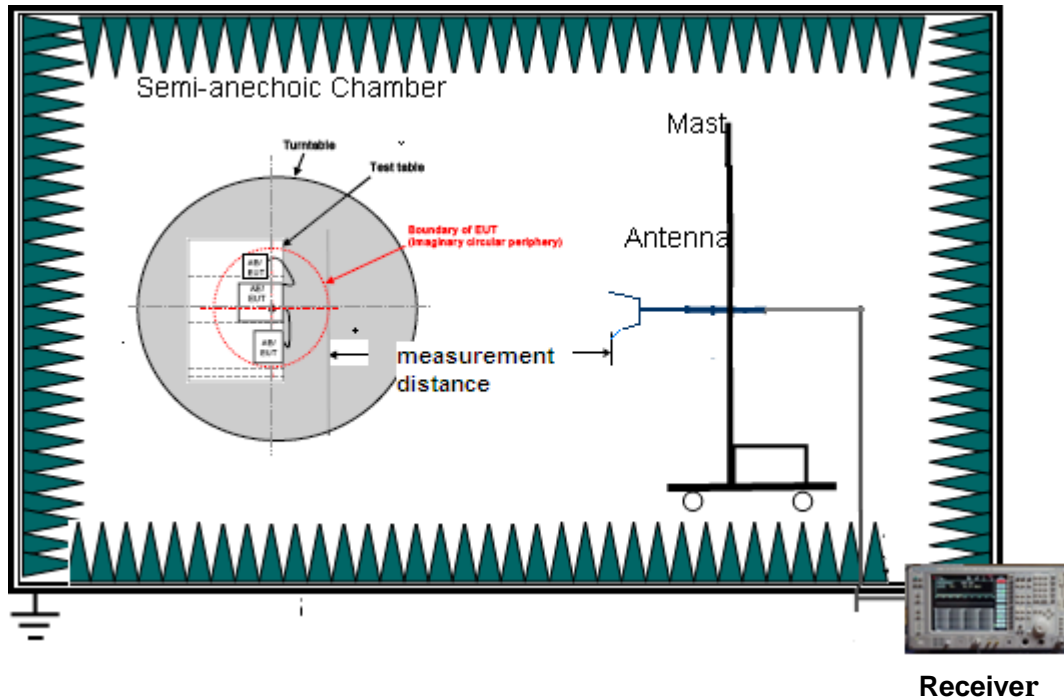
##### Radiated Disturbance 30M to1 GHz



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Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency up to 1GHz.

### Radiated Disturbance above 1 GHz



Note: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection (PK) at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

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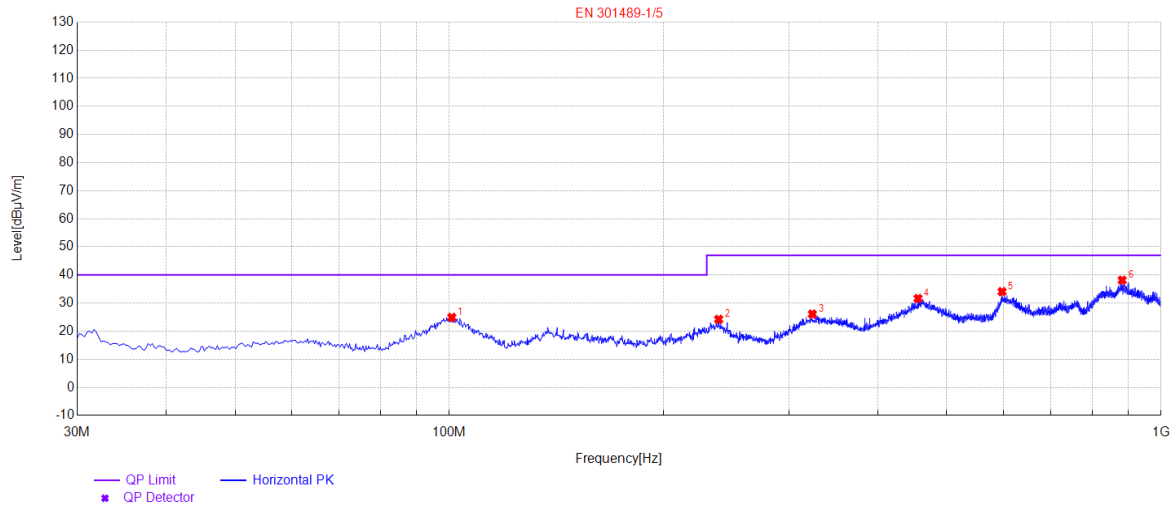
## TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.2.2 and EN 55032 Annex D for the measurement methods.

## TEST RESULTS (OPERATE IN MODE 1)

### 30MHZ-1GHZ

#### TEST RESULT OF RADIATED EMISSION TEST –HORIZONTAL



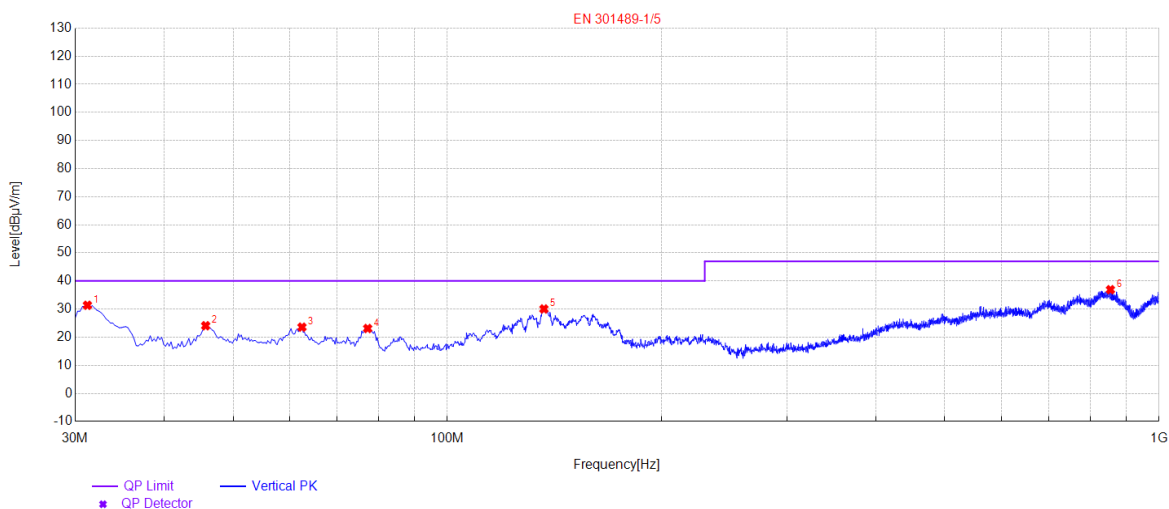
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	100.81	24.91	21.07	40.00	15.09	100	261	Horizontal
2	239.035	24.21	17.38	47.00	22.79	100	108	Horizontal
3	323.6675	26.08	21.24	47.00	20.92	100	360	Horizontal
4	455.5875	31.62	26.96	47.00	15.38	100	65	Horizontal
5	597.935	34.07	28.05	47.00	12.93	100	231	Horizontal
6	881.9025	38.15	33.12	47.00	8.85	100	144	Horizontal

## RESULT: PASS

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## TEST RESULT OF RADIATED EMISSION TEST –VERTICAL



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	31.2125	31.35	10.08	40.00	8.65	100	66	Vertical
2	45.7625	24.06	12.65	40.00	15.94	100	182	Vertical
3	62.495	23.56	14.57	40.00	16.44	100	230	Vertical
4	77.2875	23.09	12.52	40.00	16.91	100	0	Vertical
5	136.7	30.03	19.47	40.00	9.97	100	129	Vertical
6	854.5	36.90	32.14	47.00	10.10	100	168	Vertical

### RESULT: PASS

- Note:** 1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Measurement..  
2. The “Factor” value can be calculated automatically by software of measurement system.  
3. Only the data of the worst case would be record in this test report.

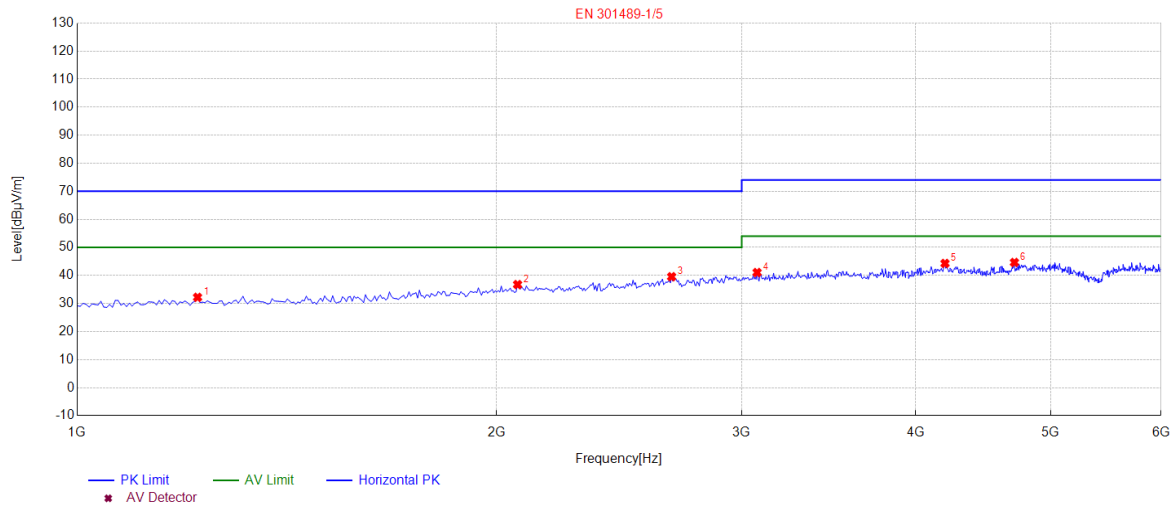
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the “Dedicated Testing/Inspection Stamp” is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

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## ABOVE 1GHZ

### TEST RESULT OF RADIATED EMISSION TEST –HORIZONTAL



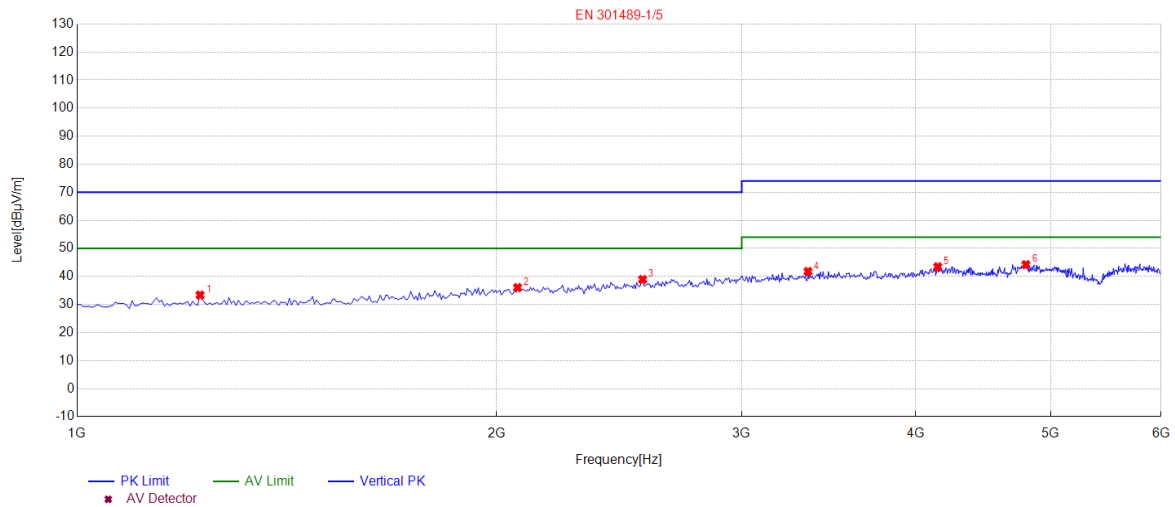
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1220.2202	32.19	-19.88	70.00	37.81	100	140	Horizontal
2	2071.0711	36.75	-15.61	70.00	33.25	100	150	Horizontal
3	2671.6717	39.54	-12.47	70.00	30.46	100	10	Horizontal
4	3077.0771	41.04	-10.99	74.00	32.96	100	310	Horizontal
5	4198.1982	44.28	-7.86	74.00	29.72	100	120	Horizontal
6	4708.7087	44.63	-7.01	74.00	29.37	100	10	Horizontal

### RESULT: PASS

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## TEST RESULT OF RADIATED EMISSION TEST –VERTICAL



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1225.2252	33.36	-19.88	70.00	36.64	100	210	Vertical
2	2071.0711	36.03	-15.61	70.00	33.97	100	340	Vertical
3	2546.5465	38.91	-12.94	70.00	31.09	100	320	Vertical
4	3347.3473	41.76	-10.17	74.00	32.24	100	290	Vertical
5	4148.1481	43.43	-7.92	74.00	30.57	100	180	Vertical
6	4798.7988	44.19	-6.79	74.00	29.81	100	240	Vertical

### RESULT: PASS

- Note:** 1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Measurement.  
2. The “Factor” value can be calculated automatically by software of measurement system.  
3. Only the data of the worst case would be record in this test report.

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the “Dedicated Testing/Inspection Stamp” is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

## 7.2 AC MAINS LINE CONDUCTED EMISSION

### LIMIT

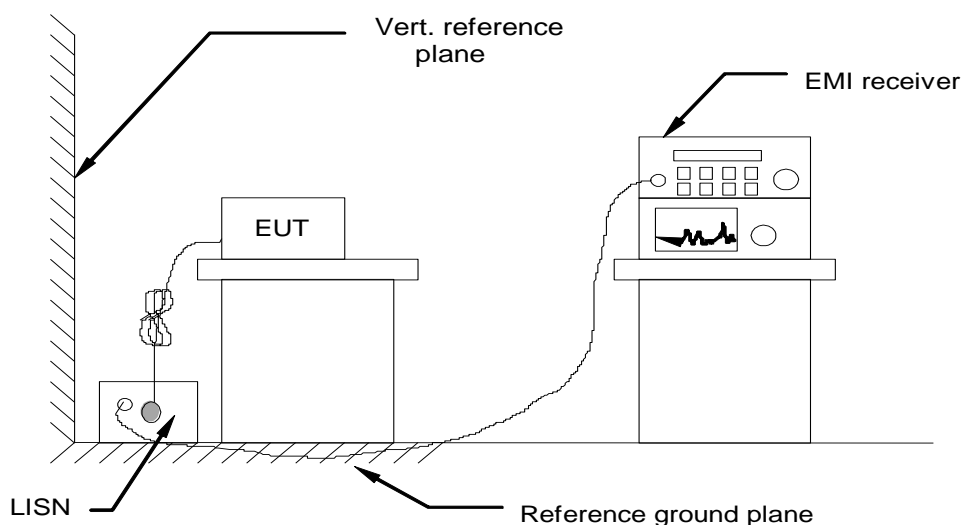
Please refer to ETSI EN 301 489-1 Clause 8.4.3, Table 8 and EN 55032 Annex A, Table A.9, Class B

### MEASUREMENT EQUIPMENT USED

Conducted Emission Test Site # 3					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI	1166.5950.03	Jun. 06, 2022	Jun. 05, 2023
LISN	R&S	ESH2-Z5	100086	Jun. 08, 2022	Jun. 07, 2023

Remark: Each piece of equipment is scheduled for calibration once a year.

### TEST CONFIGURATION



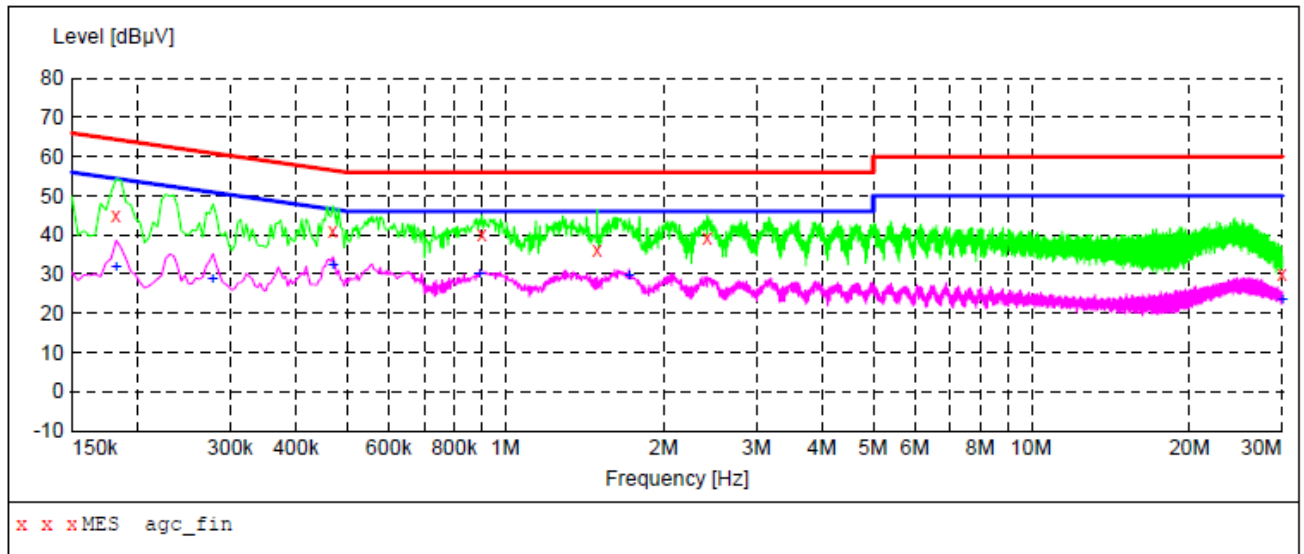
### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.4.2 and EN 55032 Annex D for the measurement methods.

### TEST RESULTS (OPERATE IN MODE 1)

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

### CONDUCTED EMISSION TEST -L1



#### MEASUREMENT RESULT: "agc\_fin"

2023/3/29 20:38

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.182000	45.20	6.2	64	19.2	QP	L1
0.470000	41.20	6.2	57	15.3	QP	L1
0.902000	40.10	6.3	56	15.9	QP	L1
1.494000	36.00	6.3	56	20.0	QP	L1
2.422000	39.40	6.4	56	16.6	QP	L1
30.000000	30.10	9.2	60	29.9	QP	L1

#### MEASUREMENT RESULT: "agc\_fin2"

2023/3/29 20:38

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.182000	32.00	6.2	54	22.4	AV	L1
0.278000	28.80	6.2	51	22.1	AV	L1
0.470000	32.40	6.2	47	14.1	AV	L1
0.894000	30.00	6.3	46	16.0	AV	L1
1.718000	29.80	6.3	46	16.2	AV	L1
30.000000	23.60	9.2	50	26.4	AV	L1

### RESULT: PASS

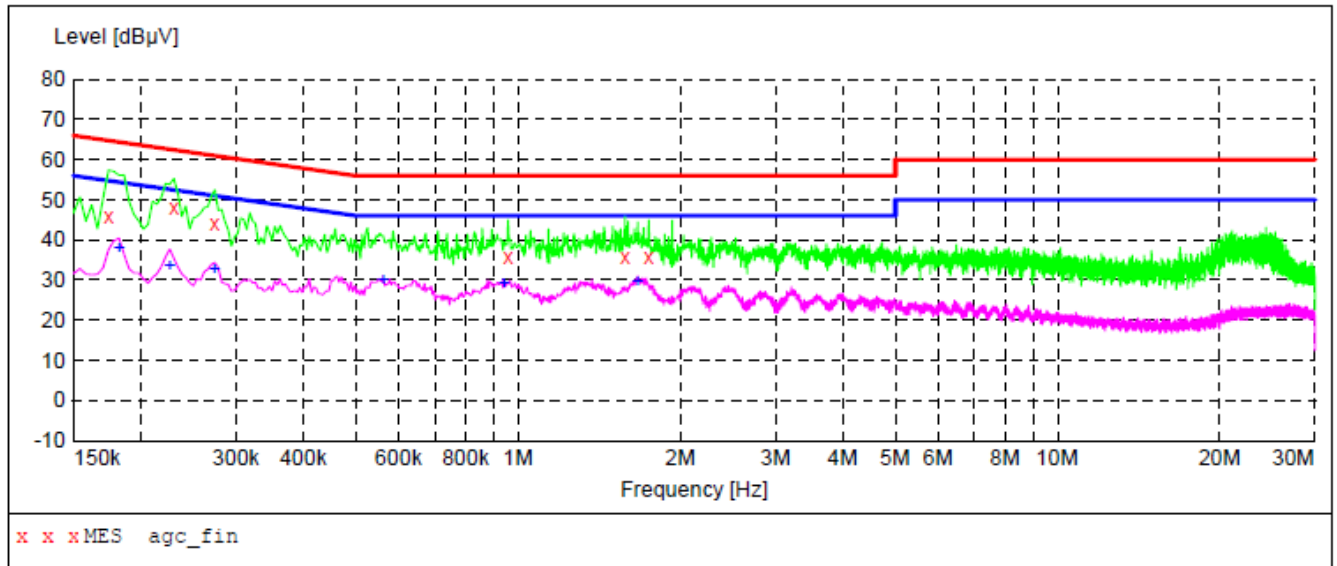
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

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### CONDUCTED EMISSION TEST – N



#### MEASUREMENT RESULT: "agc\_fin"

2023/3/29 20:34

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.174000	45.80	6.2	65	19.0	QP	N
0.230000	48.20	6.2	62	14.2	QP	N
0.274000	44.10	6.2	61	16.9	QP	N
0.958000	35.90	6.3	56	20.1	QP	N
1.578000	35.90	6.3	56	20.1	QP	N
1.746000	35.80	6.3	56	20.2	QP	N

#### MEASUREMENT RESULT: "agc\_fin2"

2023/3/29 20:34

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.182000	37.90	6.2	54	16.5	AV	N
0.226000	33.50	6.2	53	19.1	AV	N
0.274000	32.70	6.2	51	18.3	AV	N
0.562000	30.20	6.2	46	15.8	AV	N
0.942000	29.00	6.3	46	17.0	AV	N
1.666000	29.70	6.3	46	16.3	AV	N

### RESULT: PASS

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### 7.3 AC MAINS HARMONIC CURRENT EMISSION

#### LIMITS OF HARMONIC CURRENT

Limits for Class A Equipment	
Harmonics Order n	Max. permissible harmonic current (A)
<b>Odd harmonics</b>	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 \times 15/n$
<b>Even harmonics</b>	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 \times 8/n$

**NOTE:**

1. According to section 5 of EN61000-3-2: 2000, the EUT is Class A equipment.
2. The above limits are for all applications having an active input power > 50W. No limits apply for equipment with an active input power up to and including 50W.

#### TEST PROCEDURE

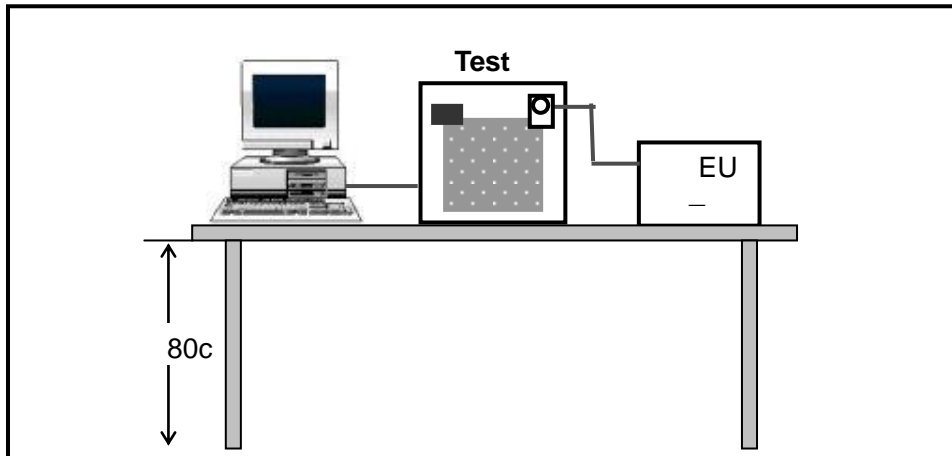
- 1.1 The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
- 1.2 The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.

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### MEASUREMENT EQUIPMENT USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Conditioning Unit	Schaffner	CCN1000-1	72431	Jul. 06, 2022	Jul. 05, 2023
AC Source	Schaffner	NSG 1007	58825	Jul. 11, 2022	Jul. 10, 2023

### TEST SETUP



For the actual test configuration, please refer to Appendix II: Photographs of the Test Configuration.

### TEST RESULT

#### Test Specification

Test Frequency:	50Hz	Test Voltage:	AC 230V/50Hz
Waveform:	Sine	Test Time:	2.5min
Classification:	Class A		

#### NOTE:

1. The active input power of the EUT is **less than 50W**.
2. No limits apply for equipment with an active input power up to and including 50W.

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## 7.4 AC MAINS VOLTAGE FLUCTUATION AND FLICKER

### LIMITS OF VOLTAGE FLUCTUATIONS AND FLICKER

Test Item	Limit	Note
$P_{st}$	1.0	$P_{st}$ means Short-term flicker indicator
$P_{lt}$	0.65	$P_{lt}$ means long-term flicker indicator
$T_{dt}$	0.5	$T_{dt}$ means maximum time that $d_t$ exceeds 3%
$d_{max}(\%)$	4%	$d_{max}$ means maximum relative voltage change.
$d_c(\%)$	3.3%	$d_c$ means relative steady-state voltage change.

### MEASUREMENT EQUIPMENT USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Conditioning Unit	Schaffner	CCN1000-1	72431	Jul. 06, 2022	Jul. 05, 2023
AC Source	Schaffner	NSG 1007	58825	Jul. 11, 2022	Jul. 10, 2023

### TEST PROCEDURE

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal conditions
- During the flick measurement, the measure time shall include that part of whole operation changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

### TEST SETUP

Same as 7.3.3

### TEST RESULT

Flicker Measurement	EUT values	Limit	Result
$P_{lt}$	0.248	0.65	Pass
$P_{st}$	0.108	1.00	Pass
$D_c(\%)$	0.00	3.30	Pass
$D_{max}(\%)$	0.0	4.00	Pass
$D_t$ (s)	0.00	0.50	Pass

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## 7.5 ELECTROSTATIC DISCHARGE

### LIMIT

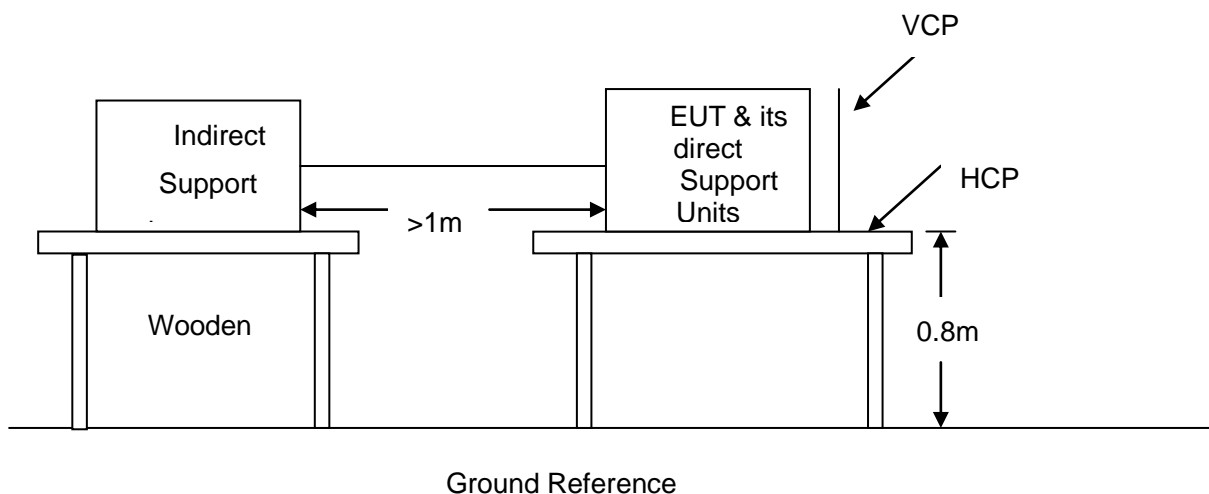
Please refer to EN 61000-4-2

### MEASUREMENT EQUIPMENT USED

ESD test (61000-4-2)					
Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	Schaffner	NSG 438	782	Dec. 30, 2022	Dec. 29, 2023

**Remark:** Each piece of equipment is scheduled for calibration once a year.

### TEST CONFIGURATION



Ambient Condition of the Test Site			
Temperature	21°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	52%RH	EUT DC Voltage Rating	DC 7.4V
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Bibo		

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## **TEST PROCEDURE**

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

## **TEST RESULTS**

The EUT( Handheld Hunter E-Light 140/155Mhz) can function as both transmitter and receiver, so the evaluation of the TT and TR to ESD has undergone by the following means: Two Pieces of EUT are used, one for suffering from ESD and the other one for supporting communication and providing judgments for assessor. Both Operating and Standby mode (Receiving Mode) have been tested

Passed and Judged by performance of both TT and TR

TT:

At the conclusion of each exposure the EUT operates with no user noticeable loss of the communication link and at the conclusion of the total test comprising the series of individual exposures the EUT operates as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link has been maintained during the test. The standby mode is the receiving mode.

TR:

At the conclusion of each exposure the EUT operates with no user noticeable loss of the communication link. At the conclusion of the total test comprising the series of individual exposures the EUT shall operates as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link has been maintained during the test.

## **Description of the Electrostatic Discharges (ESD)**

### **THE RESULT THE RESULT Mode 1/Mode 2/Mode 3/Mode 4/Mode 5/Mode 6/Mode 7/Mode 8/Mode 9**

Amount of Discharges	Voltage	Coupling	Observation	Result (Pass/Fail)
Mini 20 / Point	±2KV, ±4kV	Contact Discharge	TR, TT	Pass
Mini 20 / Point	±2KV, ±4kV, ±8kV	Air Discharge	TR, TT	Pass
Mini 20 / Point	±2KV, ±4kV	Indirect Discharge HCP	TR, TT	Pass
Mini 20 / Point	±2KV, ±4kV	Indirect Discharge VCP	TR, TT	Pass

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# **TEST PLOTS:**

**Note:** Blue is air discharging.

Red is contact discharging.



**Phenomenon:** no function loss during the test.

PERFORMANCE CRITERIA	
Criteria requested	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C

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## 7.6 RF ELECTROMAGNETIC FIELD

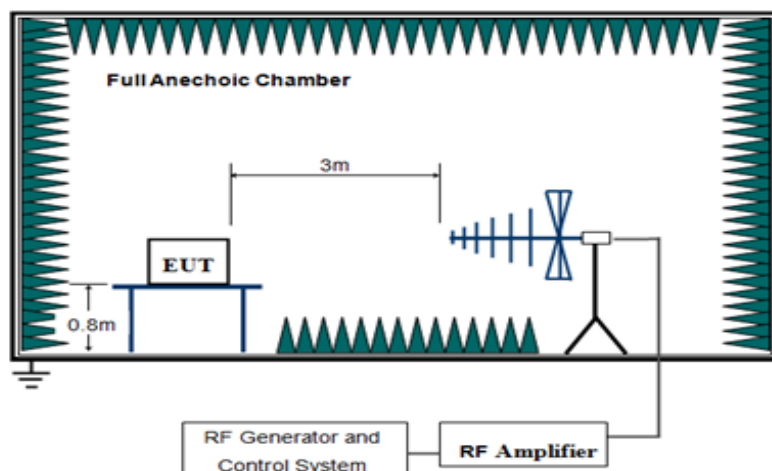
### LIMIT

Please refer to EN 61000-4-3

### MEASUREMENT EQUIPMENT USED

Radiated Electromagnetic Field immunity Measurement (61000-4-3)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	R&S	SML03	102525	Jun. 06, 2022	Jun. 05, 2023
Antenna	R&S	VULB9168	D69250	Apr. 28, 2021	Apr. 27, 2023
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Oct. 31, 2021	Oct. 30, 2023
Power Sensor	R&S	URV5-Z4	100124	Apr. 26, 2021	Apr. 25, 2023
Power Meter	R&S	NRVD	8323781027	Apr. 26, 2021	Apr. 25, 2023
Power Amplifier	KALMUS	7100LC	04-02/17-06-00 1	May 20, 2022	May 19, 2023
RF Amplifier	Milmega	AS0104-55_55	1004793	--	--
Power Amplifier	rflight	NTWPA-2560100	17063183	--	--
Directional Couple	Werlatone	C5571-10	99463	Mar. 10, 2022	Mar. 09, 2024
Directional Couple	Werlatone	C6026-10	99482	Mar. 10, 2022	Mar. 09, 2024
Artificial mouth	B&K	4227	N/A	Mar. 10, 2022	Mar. 09, 2024
Artificial ear	B&K	4153	N/A	Mar. 10, 2022	Mar. 09, 2024

**Remark:** Each piece of equipment is scheduled for calibration once a year. Except for the antenna was once two years.



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## **TEST CONFIGURATION**

Ambient Condition of the Test Site			
Temperature	22.5°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	50%RH	EUT DC Voltage Rating	DC 7.4V
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Bibo		

## **TEST PROCEDURE**

Please refer to ETSI EN 301 489-1 Clause 9.2.2, ETSI EN 301 489-5 Clause 7.2.2 and EN 61000-4-3 for the measurement methods.

**Test Condition : Sweep Step:** 1% **Dwell Times:** 3 Seconds **Modulation:** 400 Hz/80% AM

**Audio Frequency:** 1 KHz/60%

## **TEST RESULTS**

During the assessment of CT and CR, the audio quality was monitored by a distortion analyzer located outside the test environment. An audio generator has been used to provide necessary modulation for CT test and for CR evaluation, an RF Generator has been used to provide source.

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**THE RESULT Mode 1/Mode 2/Mode 3/Mode 4/Mode 5/Mode 6/Mode 7/Mode 8/Mode 9**

EUT Working Mode	Antenna Polarity	Frequency (MHz)	Field Strength (V/m)	Audio Distortion	Observation	Limit	Conclusion
Mode1	H	80-6000	3	N/A	CT/CR	<25%	Pass
	V	80-6000	3	N/A	CT/CR	<25%	Pass
Mode2	H	80-6000	3	7.9%	CT	<25%	Pass
	V	80-6000	3	8.0%	CT	<25%	Pass
Mode3	H	80-6000	3	8.1%	CR	<25%	Pass
	V	80-6000	3	8.5%	CR	<25%	Pass
Mode4	H	80-6000	3	7.6%	CT	<25%	Pass
	V	80-6000	3	8.4%	CT	<25%	Pass
Mode5	H	80-6000	3	8.2%	CR	<25%	Pass
	V	80-6000	3	8.4%	CR	<25%	Pass
Mode6	H	80-6000	3	8.0%	CT	<25%	Pass
	V	80-6000	3	8.5%	CT	<25%	Pass
Mode7	H	80-6000	3	8.1%	CR	<25%	Pass
	V	80-6000	3	8.5%	CR	<25%	Pass
Mode8	H	80-6000	3	7.6%	CT	<25%	Pass
	V	80-6000	3	8.1%	CT	<25%	Pass
Mode9	H	80-6000	3	7.9%	CR	<25%	Pass
	V	80-6000	3	8.4%	CR	<25%	Pass

Note: There was not any unintentional transmission discovered in standby mode

**Phenomenon:** no function loss during the test.

PERFORMANCE CRITERIA	
Criteria requested	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C

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## 7.7 AC MAINS FAST TRANSIENTS – COMMON MODE

### LIMIT

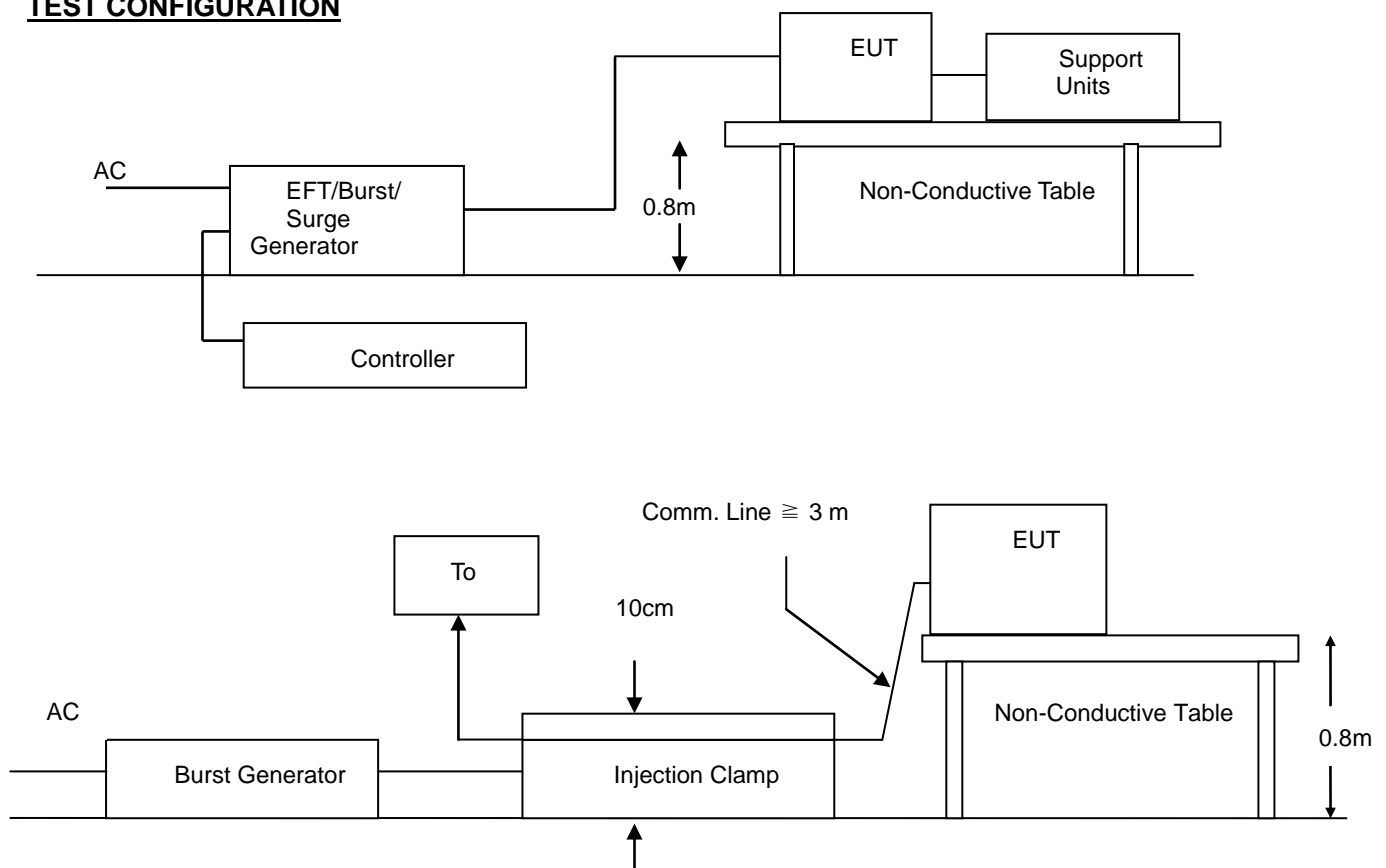
Please refer to EN 61000-4-4

### MEASUREMENT EQUIPMENT USED

AC MAINS FAST TRANSIENTS - COMMON MODE (EN 61000-4-4)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EFT, Surge Generator	Schaffner	Modula 6150	34437	Jun. 23, 2022	Jun. 22, 2023
INA 6501 STEPTTRANSFORMER	Schaffner	INA 6501	126	Aug. 13, 2022	Aug. 12, 2023

**Remark:** Each piece of equipment is scheduled for calibration once a year.

### TEST CONFIGURATION



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Ambient Condition of the Test Site			
Temperature	23.7°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	51%RH	EUT DC Voltage Rating	DC 7.4V
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Bibo		

## TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.4.3 and EN 61000-4-4 for the measurement methods.

## TEST RESULTS

### ☒ Results of Final Tests THE RESULT Mode 1/Mode 2/Mode 3/Mode 4/Mode 5/Mode 6/Mode 7/Mode 8/Mode 9

Impulse Frequency: 5 kHz

Tr/Th: 5/50ns

Burst Duration: 15mCs

Burst Period: 3Hz

Test Point	Polarity	Test Level (kV)	Observation	Conclusion
a.c. port, L	+/-	1	TT,TR	Pass
a.c. port, N	+/-	1	TT,TR	Pass
a.c. port, L-N	+/-	1	TT,TR	Pass

Note: There was not any unintentional transmission discovered in idle mode

**Phenomenon:** no function loss during the test.

PERFORMANCE CRITERIA	
Criteria requested	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C

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## 7.8 AC MAINS SURGE

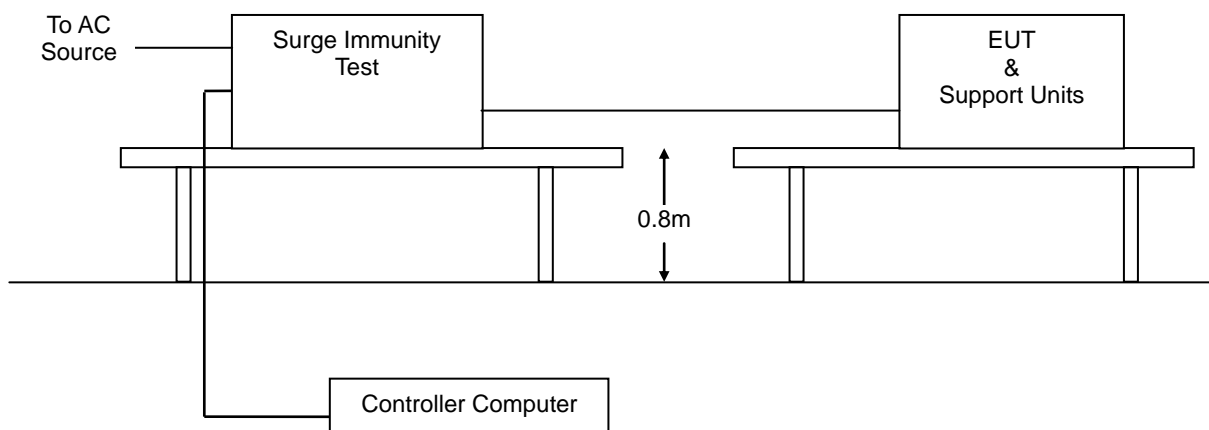
### LIMIT

Please refer to EN 61000-4-5

### MEASUREMENT EQUIPMENT USED

AC MAINS SURGES (EN 61000-4-5)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EFT、Surge Generator	Schaffner	Modula 6150	34437	Jun. 23, 2022	Jun. 22, 2023
INA 6501 STEPTTRANSFORMER	Schaffner	INA 6501	126	Aug. 13, 2022	Aug. 12, 2023

Remark: Each piece of equipment is scheduled for calibration once a year.



### TEST CONFIGURATION

Ambient Condition of the Test Site			
Temperature	24.9°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	51%RH	EUT DC Voltage Rating	DC 7.4V
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Bibo		

### TEST PROCEDURE

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

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## TEST RESULTS

### ☒ Results of Final Tests THE RESULT Mode 1/Mode 2/Mode 3/Mode 4/Mode 5/Mode 6/Mode 7/Mode 8/Mode 9

Voltage Waveform: 1.2/50 us

Current Waveform: 8/20 us

Polarity: Positive/Negative

Phase angle: 0°, 90°, 180°, 270°

Coupling Line	Polarity	Voltage (kV)	Observation	Conclusion
a.c. power, L-N	+/-	1.0	TT,TR	Pass
Note: There was not any unintentional transmission discovered in idle mode				

**Phenomenon:** no function loss during the test.

PERFORMANCE CRITERIA	
Criteria requested	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C

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## 7.9 AC MAINS RF – COMMON MODE

### LIMIT

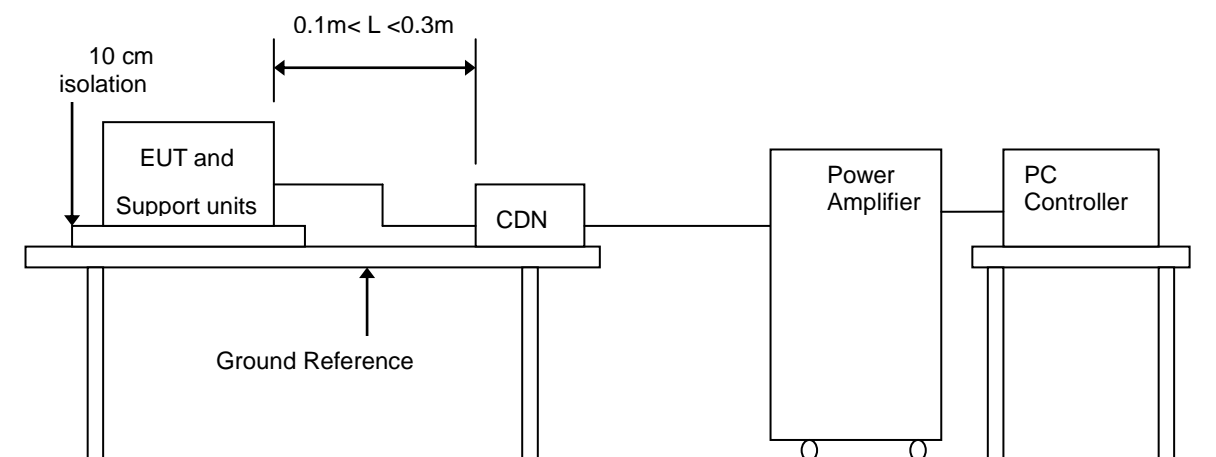
Please refer to EN 61000-4-6

### MEASUREMENT EQUIPMENT USED

AC MAINS RF COMMON MODE (EN 61000-4-6)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	R&S	SML03	102525	Jun. 06, 2022	Jun. 05, 2023
Amplifier	AR	75S780PMR 50A	302276	Jun. 06, 2022	Jun. 05, 2023
Dual Directional Coupler	AR	DC2600A	302389	Jun. 06, 2022	Jun. 05, 2023
CDN	EM TEST	CDN M1/32A	0201-01	Jun. 06, 2022	Jun. 05, 2023
Audio Analyzer	HP	8920B	3104A03367	Jun. 06, 2022	Jun. 05, 2023
Artificial mouth	B&K	4227	N/A	Mar. 10, 2022	Mar. 09, 2024
Artificial ear	B&K	4153	N/A	Mar. 10, 2022	Mar. 09, 2024

Remark: Each piece of equipment is scheduled for calibration once a year.

### TEST CONFIGURATION



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Ambient Condition of the Test Site			
Temperature	23.9°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	52%RH	EUT DC Voltage Rating	DC 7.4V
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Bibo		

## TEST PROCEDURE

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

## TEST RESULTS

### ☒ Results of Final Tests THE RESULT Mode 1/Mode 2/Mode 3/Mode 4/Mode 5/Mode 6/Mode 7/Mode 8/Mode 9

Frequency Range: 0.15MHz~80MHz

Frequency Step: 1% of fundamental

Dwell time: 3 Sec. Audio Frequency: 1 KHz /60%

☒ 80% A.M, 400 Hz Sine wave (Voltage: 3 V)

☒ Coupling type: ☒ CDN / ☐ RF Current Probe

EUT Working Mode	Test Point	Frequency (MHz)	Field Strength (Vrms)	Audio Distortion	Observation	Limit	Conclusion
MODE 1	a.c. port	0.15 – 80	3	N/A	CR/CT	<25%	Pass
MODE 2	a.c. port	0.15 – 80	3	8.5%	CT	<25%	Pass
MODE 3	a.c. port	0.15 – 80	3	8.0%	CR	<25%	Pass
MODE 4	a.c. port	0.15 – 80	3	8.4%	CT	<25%	Pass
MODE 5	a.c. port	0.15 – 80	3	8.6%	CR	<25%	Pass
MODE 6	a.c. port	0.15 – 80	3	8.3%	CT	<25%	Pass
MODE 7	a.c. port	0.15 – 80	3	8.5%	CR	<25%	Pass
MODE 8	a.c. port	0.15 – 80	3	8.1%	CT	<25%	Pass
MODE 9	a.c. port	0.15 – 80	3	8.2%	CR	<25%	Pass

Note: There was not any unintentional transmission in Standby mode

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PERFORMANCE CRITERIA	
Criteria requested	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C

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## 7.10 VOLTAGE DIPS AND INTERRUPTION

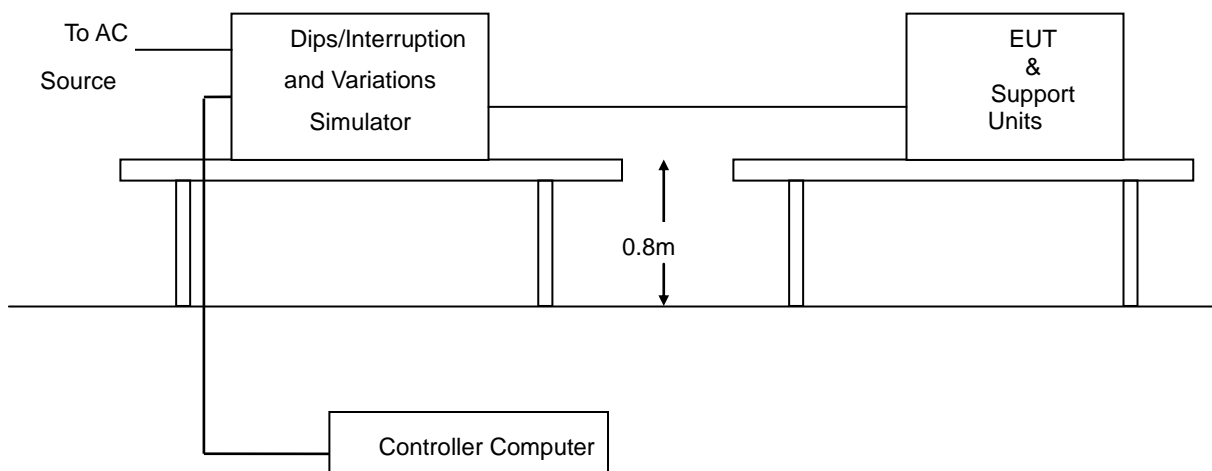
### LIMIT

Please refer to EN 61000-4-11

### MEASUREMENT EQUIPMENT USED

VOLTAGE DIPS AND INTERRUPTIONS (EN 61000-4-11)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EFT, Surge Generator	Schaffner	Modula 6150	34437	Jun. 23, 2022	Jun. 22, 2023
INA 6501 STEPTTRANSFORMER	Schaffner	INA 6501	126	Aug. 13, 2022	Aug. 12, 2023

**Remark:** Each piece of equipment is scheduled for calibration once a year.



### TEST CONFIGURATION

Ambient Condition of the Test Site			
Temperature	24°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	51%RH	EUT DC Voltage Rating	DC 7.4V
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Bibo		

### TEST PROCEDURE

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

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## TEST RESULTS

### Test conditions

Interruption at phase angles of 0, 45, 90, 135, 180, 225, 270 and 315 degree in a 10 sec-interval.

Dips / Interruption	Reduction (%)	Duration (Cycle)
Voltage Dips	100	0.5
Voltage Dips	100	1
Voltage Dips	100	250
Voltage Interruption	30	25

**Note:** The duration with a sequence of three dips/interruptions with a minimum interval of 10 s between each test event.

### ☒ Results of Final Tests THE RESULT Mode 1/Mode 2/Mode 3/Mode 4/Mode 5/Mode 6/Mode 7/Mode 8/Mode 9

Test Mode	Voltage Reduction	Duration (cycle)	Times	Interval (Sec)	Observation	Conclusion
Voltage dips	100%	0.5	3	10	TT,TR	Pass
	100%	1	3	10	TT,TR	Pass
	30%	25	3	10	TT,TR	Pass
Voltage interruptions	100%	250	3	10	TT,TR	Pass

Note: There was not any unintentional transmission in standby mode

**Phenomenon:** no function loss during the test.

PERFORMANCE CRITERIA	
Criteria requested	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C

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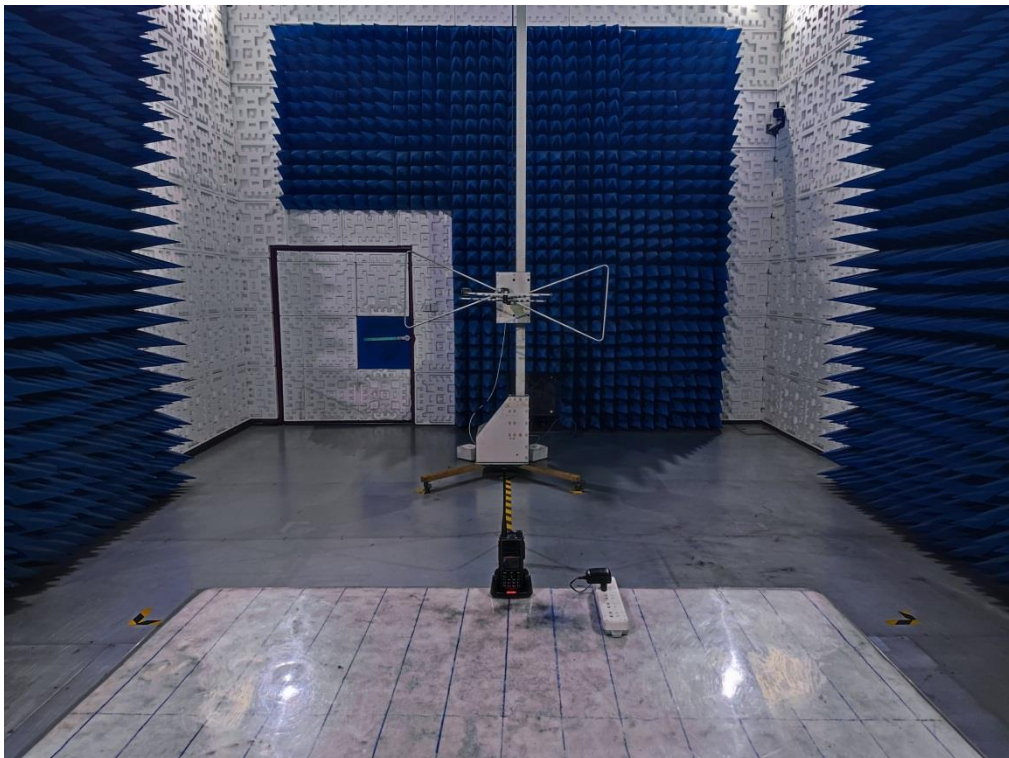


## APPENDIX I: PHOTOGRPHS OF TEST SETUP

### CONDUCTED EMISSION TEST SETUP



### RADIATED EMISSION TEST SETUP



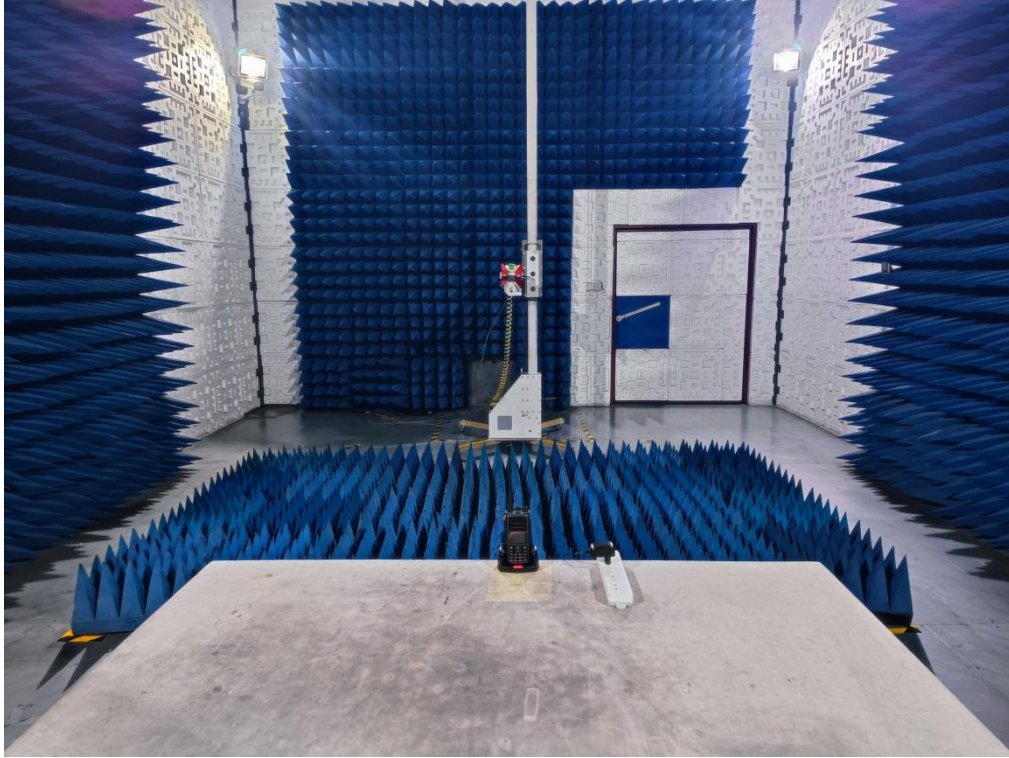
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### RADIATED EMISSION ABOVE 1G TEST SETUP



### EN 61000-3-3 VOLTAGE FLUCTUATION/FLICKER TEST SETUP



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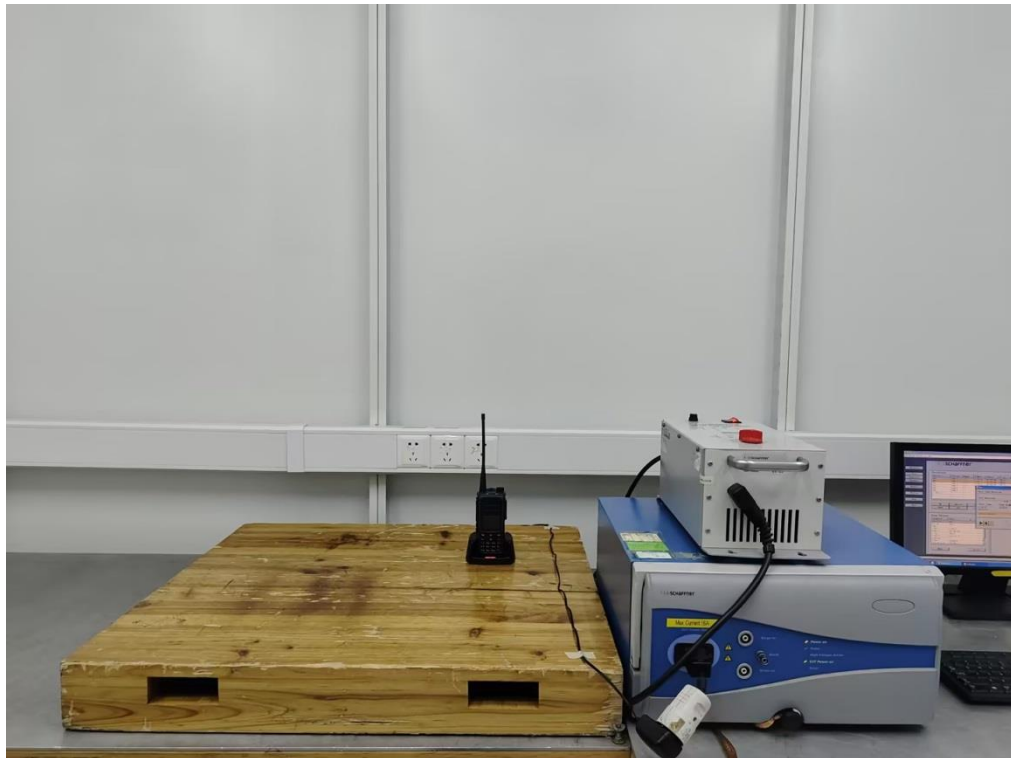
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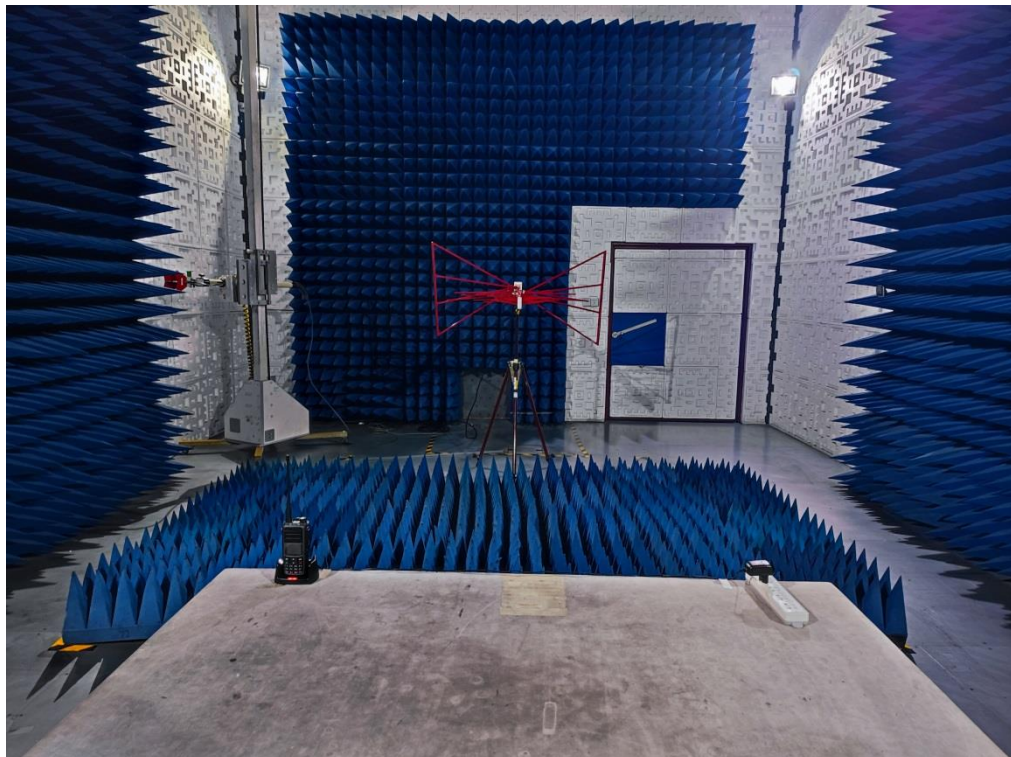
**ESD IMMUNITY TEST SETUP****CS IMMUNITY TEST SETUP**

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### SRUGE/DIPS/EFT IMMUNITY TEST SETUP

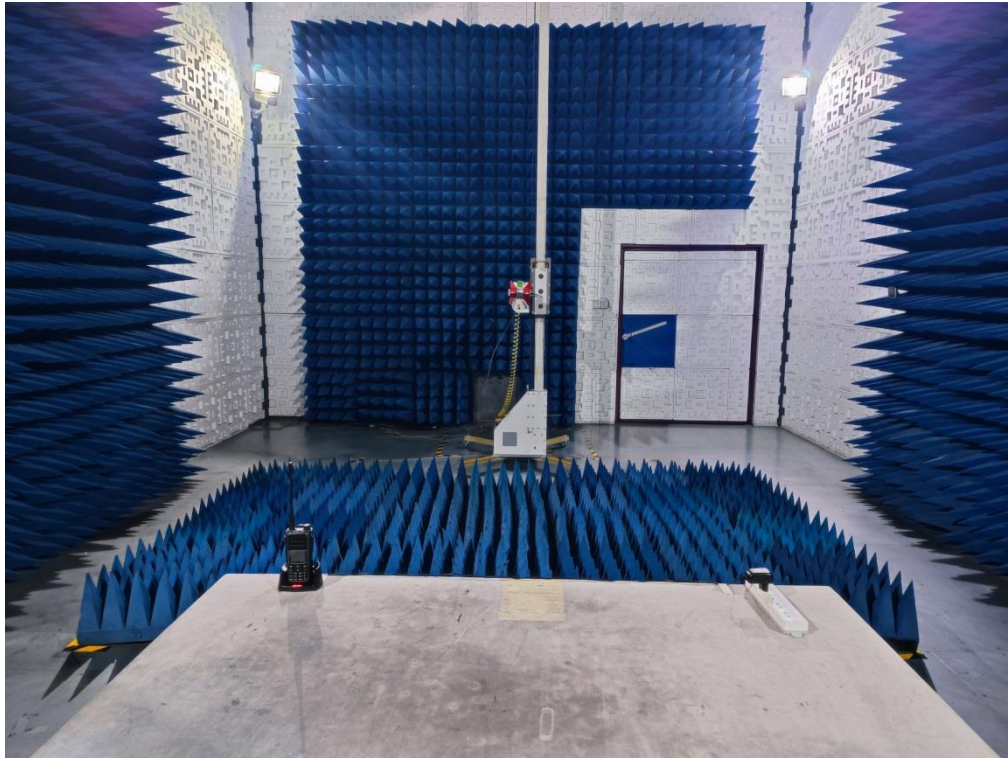


### RS IMMUNITY TEST SETUP



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## EN 61000-4-3 RS ABOVE 1G TEST SETUP

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

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## Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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