

EMC Test Report

Report No.: AGC05443231001ER02

PRODUCT DESIGNATION: Mug warmer wireless charger

BRAND NAME : N/A

MODEL NAME : MO2154

APPLICANT: MID OCEAN BRANDS B.V

DATE OF ISSUE : Oct. 17, 2023

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

ETSI EN 301 489-3 V2.1.1 (2019-03)

REPORT VERSION : V1.0

Attestation of Global Configuration (Shenzhen) Co., Ltd



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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	1	Oct. 17, 2023	Valid	Initial release



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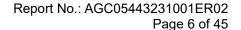
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1. TEST REPORT CERTIFICATION

MID OCEAN BRANDS B.V	
Unit 201 2/F,. Laford Centre,838 Lai Chi Kok Road,Cheung Sha Wan,Kowloon,Hongkong	
MID OCEAN BRANDS B.V	
Unit 201 2/F,. Laford Centre,838 Lai Chi Kok Road,Cheung Sha Wan,Kowloon,Hongkong	
N/A	
N/A	
Mug warmer wireless charger	
N/A	
MO2154	
Oct. 07, 2023	
Oct. 07, 2023~Oct. 17, 2023	
None	
Normal	
Pass	
AGCRT-EC-EMC	

We, Attestation of Global Compliance (Shenzhen) Co., Ltd., hereby certify that the submitted samples of the above item, as detailed in chapter 2.1 of this report, has been tested in our facility. The test record, data evaluation and test configuration represented herein are true and accurate accounts of measurements of the sample's EMC characteristics under the conditions herein specified.

Prepared By	Alan Duan		
•	Alan Duan (Project Engineer)	Oct. 17, 2023	
Reviewed By	Calin Lin		
	Calvin Liu (Reviewer)	Oct. 17, 2023	
Approved By	Max Zhang		
	Max Zhang Authorized Officer	Oct. 17, 2023	



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2. GENERAL INFORMATION

2.1. DESCRIPTION OF EUT

EUT 1-Portable Power Station			
Brand Name	N/A		
Test Model	MO2154		
Hardware Version	V1.0		
Software Version	V1.0		
Input Rating	DC 5V 3A, 9V 3A		
Output Rating	DC 5V 1A, 7.5V 1A, 9V 1.1A, 9V 1.66A		
WPT Technology			
Operating Frequency	110.5KHz-205KHz		
Modulation Type	FSK		
Antenna Type	Coil Antenna		
Antenna Gain	0dBi		



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2.2. OBJECTIVE

Perform Electro Magnetic Interference (EMI) and Electro Magnetic Susceptibility (EMS) tests for CE Marking.

2.3. TEST STANDARDS AND RESULTS

The EUT has been tested according to ETSI EN 301 489-1 V2.2.3 (2019-11), ETSI EN 301 489-3 V2.1.1 (2019-03)

	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services;	
ETSI EN 301 489-1	Part 1: Common technical requirements; Harmonised Standard for	
	ElectroMagnetic Compatibility.	
	Electro Magnetic Compatibility (EMC) standard for radio equipment and services;	
ETSI EN 301 489-3	Part 3: Specific conditions for Short-Range Devices (SRD) operating on	
E131EN 301 409-3	frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the	
	essential requirements of article 3.1(b) of Directive 2014/53/EU	

2.4. TEST ITEMS AND THE RESULTS

2.4.	2.4. TEST HEMS AND THE RESULTS				
No.	Basic Standard Test Type				
EMIS	EMISSION (EN 301 489-1 §7.1)				
1	EN 55032	EN 55032 Radiated emission			
2	EN 55032	Conducted emission, AC ports	PASS		
3	EN 55032	Conducted emission, Telecom ports	N/A		
4	EN 61000-3-2	Harmonic current emissions	PASS		
5	EN 61000-3-3	Voltage fluctuations & flicker PASS			
IMM	IMMUNITY (EN 301 489-1 §7.2)				
6	EN 61000-4-2	Electrostatic discharge immunity	PASS		
7	EN 61000-4-3	Radiated RF electromagnetic field immunity PASS			
8	EN 61000-4-4	Electrical fast transient/burst immunity	PASS		
9	ISO 7637-1, -2	Transients and surges, DC ports N/A			
10	EN 61000-4-5	Surge immunity, AC ports, Telecom ports	PASS		
11	EN 61000-4-6	Immunity to conducted disturbances induced by RF fields	PASS		
12	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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2.5. ENVIRONMENTAL CONDITIONS

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

Temperature: 15-35°CRelative humidity: 30-60 %

- Atmospheric pressure: 86-106 kPa

3. TEST MODE DESCRIPTION

TEST MODE DESCRIPTION			
NO.	EMI TEST MODE DESCRIPTION	WORST	
1	Adapter(5V/3A)+Wireless load (5W))	V	
2	Adapter(9V/3A)+Wireless load (5W))		
3	Adapter(9V/3A)+Wireless load (15W)		
4	Adapter(5V/3A)+Wireless load (15W))		
NO.	EMS TEST MODE DESCRIPTION	WORST	
1	Adapter(5V/3A)+Wireless load (5W))	V	
2	Adapter(9V/3A)+Wireless load (5W))		
3	Adapter(9V/3A)+Wireless load (15W)		
4	Adapter(5V/3A)+Wireless load (15W))		
Note: 1. V means EMI worst mode.			
2. All modes have been tested and only the worst mode test data recorded in the test report.			

I/O Port Information (⊠ Applicable ☐ Not Applicable)

I/O Port of EUT				
I/O Port Type Number Cable Description Tested With				
Type-C Port	1		1.2m,unshielded	

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



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4. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in measurement" (GUM) published by CISPR and ANSI.

- Uncertainty of Radiated Emission, Uc = ±2.9dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.9 dB

5. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Data Cable
wireless charging load	Huawei	-	

Note: 1."-- "means no any support device during testing.

2. All the cables were provided by AGC Lab.



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6. IDENTIFICATION OF THE RESPONSIBLE TESTING LOCATION

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

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer Model		S/N	Cal. Date	Cal. Due	
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024	
Test software	R&S	V1.71	/	N/A	N/A	

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 05, 2023	Jan. 04, 2025
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Mar. 23, 2023	Mar. 22, 2025
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Jun. 01, 2023	May 31, 2024
Test software	FARA	EZ_EMC (Ver.RA-03A)	/	N/A	N/A
Test software	Tnscend	JS32-RE (4.0.0.0)	/	N/A	N/A

TEST EQUIPMENT OF ESD TEST

Equipment Manufacturer		Model	S/N	Cal. Date	Cal. Due	
ESD Simulator	EM Test	NSG 438	782	Dec. 29, 2022	Dec. 28, 2023	

TEST EQUIPMENT OF POWER HARMONICS / VOLTAGE FLUCTUATION / FLICKER TEST

Equipment	Manufacturer	lanufacturer Model S/N		Cal. Date	Cal. Due	
Signal Conditioning Unit	Schaffner	CCN1000-1	72431	Jun. 08, 2023	Jun. 07, 2024	
AC Source	Schaffner	NSG 1007	56825	Jun. 02, 2023	Jun. 01, 2024	
Test software	TC	4.29.0	1	N/A	N/A	



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TEST EQUIPMENT OF SURGE/EFT/DIPSTEST

Equipment	Manufacturer	ırer Model S/N		Cal. Date	Cal. Due	
EFT Surge	Schaffner	Modula 6150	34437	Jun. 03, 2023	Jun. 02, 2024	
Generator	Schainlei				Juli. 02, 2024	
Test software	TC	2.31	1	N/A	N/A	

TEST EQUIPMENT OF RS IMMUNITY TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Generator	R&S	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024
POWER SENSOR	R&S	URV5-Z4	100124	Mar. 23, 2023	Mar. 22, 2024
POWER METER	R&S	NRVD	8323781027	Mar. 24, 2023	Mar. 23, 2024
POWER AMPLIFIER	KALMUS	7100LC	04-02/17-06-	N/A	N/A
POWER AWPLIFIER	KALIVIUS		001	IN/A	IN/A
RF AMPLIFIER	Milmega	AS0104-55_55	1004793	N/A	N/A
Double-Ridged	ETS LINDGREN	3117	00034609	Mar. 00. 0000	M 00 0005
Waveguide Horn	E 13 LINDGREN	3117		Mar. 23, 2023	Mar. 22, 2025
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 05, 2023	Jan. 04, 2025
Test software	Tnscend	JS35-RS	2.0.1.8	N/A	N/A

TEST EQUIPMENT OF CS IMMUNITY TEST

Equipment	Manufacturer	acturer Model		Cal. Date	Cal. Due	
Power Amplifier	AR	75A250	18464	N/A	N/A	
CDN	ZHINAN	ZN3751	15004	Aug. 03, 2022	Aug. 02, 2024	
6dB attenuator	ZHINAN	E-002	N/A	Aug. 04, 2022	Aug. 03, 2024	
Electromagnetic Injection Clamp	Luthi	EM101	35773	Aug. 12, 2022	Aug. 11, 2024	
Power Sensor	R&S	URV5-Z4	100124	Mar. 24, 2023	Mar. 23, 2025	
Power Meter	R&S NRVD		8323781027	Mar. 24, 2023	Mar. 23, 2024	
SIGNAL GENERATOR	R&S	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024	
Test software	Tnscend	JS35-CS	2.0.1.7	N/A	N/A	



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7. RADIATED DISTURBANCE MEASUREMENT

7.1. LIMITS OF RADIATED DISTURBANCES

Limits for radiated disturbance 30M to1 GHz at a measurement distance of 3 m

Frequency range (MHz)	Quasi peak limits(dBuV/m), for Class B ITE, at 3m measurement distance		
30 - 230	40		
230 - 1000	47		

Limits for radiated disturbance above 1 GHz at a measurement distance of 3 m

Eroguanov rango (MUz)	Limits (dBuV/m), Class B ITE				
Frequency range (MHz)	Peak	Average			
1000-3000MHz	70	50			
3000-6000MHz	74	54			

Note: 1. The lower limit shall apply at the transition frequency.

2. Additional provisions may be required for cases where interference occurs.

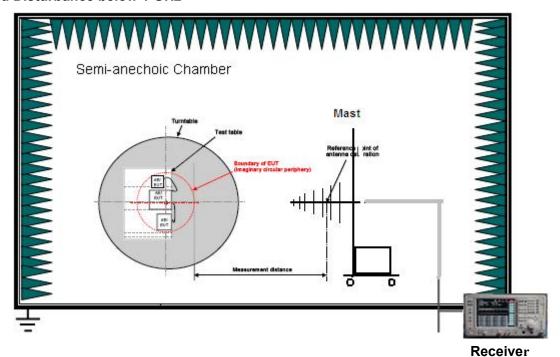
7.2. TEST PROCEDURE

- (1). The EUT was placed on the top of an insulating table 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- (2). The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- (3). The antenna is a broadband antenna, and its height is varied from 1 to 4 meter above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- (4). For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the heights from 1 to 4 meters and the ratable table was turned from 0 degrees to 360 degrees to find the maximum reading.

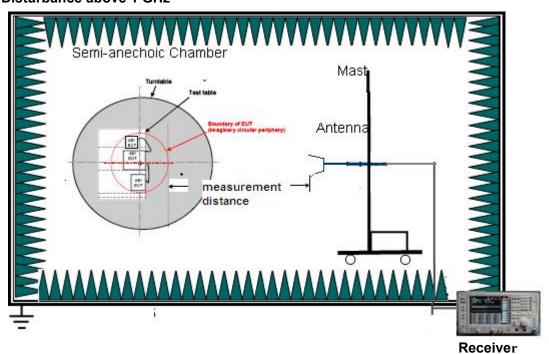


7.3. BLOCK DIAGRAM OF TEST SETUP

Radiated Disturbance below 1 GHz



Radiated Disturbance above 1 GHz



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

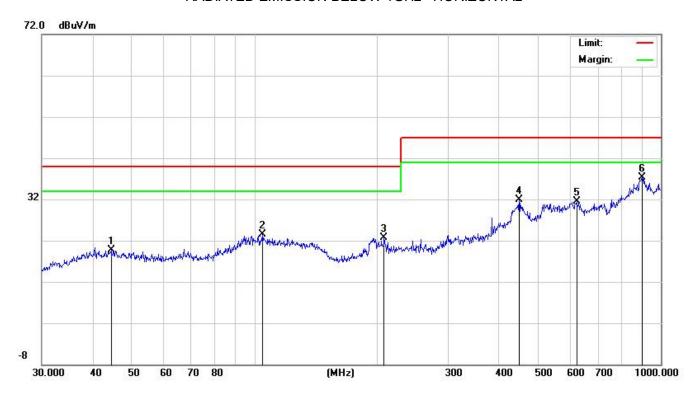


7.4. TEST RESULT

The test modes were carried out for all modes.

The worst test mode of the EUT was Mode 1, and its test data was showed as the follow:

RADIATED EMISSION BELOW 1GHz-HORIZONTAL

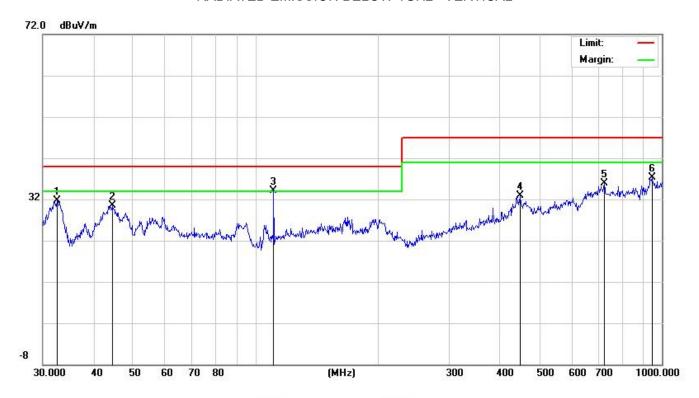


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		44.4307	6.19	13.59	19.78	40.00	-20.22	peak
2		104.9033	7.32	16.25	23.57	40.00	-16.43	peak
3		208.5801	8.15	14.46	22.61	40.00	-17.39	peak
4		447.9821	7.04	24.82	31.86	47.00	-15.14	peak
5		620.7096	6.35	25.13	31.48	47.00	-15.52	peak
6	*	900.1473	5.51	31.78	37.29	47.00	-9.71	peak

RESULT: PASS



RADIATED EMISSION BELOW 1GHz-VERTICAL



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		32.5198	17.25	14.43	31.68	40.00	-8.32	peak
2		44.5868	13.64	16.95	30.59	40.00	-9.41	peak
3	*	110.9571	18.00	16.12	34.12	40.00	-5.88	peak
4		447.9822	7.11	25.74	32.85	47.00	-14.15	peak
5		721.7259	7.19	28.64	35.83	47.00	-11.17	peak
6		945.4399	6.54	30.78	37.32	47.00	-9.68	peak

RESULT: PASS



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8. MAINS TERMINAL DISTURBANCE VOLTAGE MEASUREMENT

8.1. LIMITS OF MAINS TERMINAL DISTURBANCE VOLTAGE

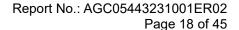
Eroguanov rango (MHz)	Limits (dBu	uV) Class B ITE
Frequency range (MHz)	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

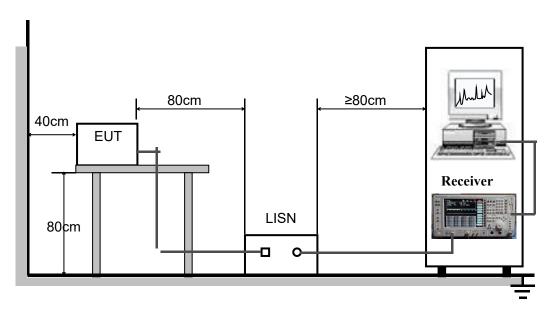
8.2. TEST PROCEDURE

- (1) The EUT was placed 0.4 meters from the conducting wall of shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). The LISN provide $50\Omega/50\mu H$ of coupling impedance for the measuring instrument.
- (2) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- (3)The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 20dB under the prescribed limits are not reported.





8.3. TEST SETUP



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

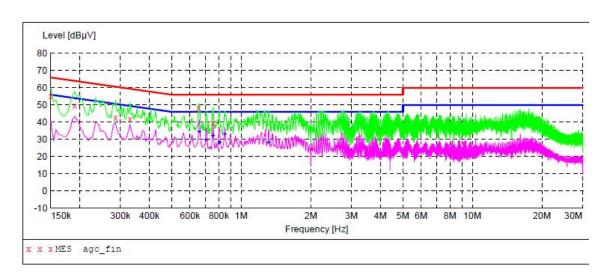
8.4. TEST RESULT

The test modes were carried out for all modes.

The worst test mode of the EUT was Mode 1, and its test data was showed as the follow:



LINE CONCUTED EMISSION TEST-L



MEASUREMENT RESULT: "agc fin"

20	23/	10	/12	9:	E 2
20	1231	T U /	14	2 .	J.

-	020/10/12 3.						
	Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
	0.150000	55.40	6.1	66	10.6	QP	L1
	0.190000	49.80	6.1	64	14.2	QP	L1
	0.286000	42.60	6.1	61	18.0	QP	L1
	0.330000	42.00	6.1	60	17.5	QP	L1
	0.654000	48.10	6.2	56	7.9	QP	L1
	0.754000	39.50	6.2	56	16.5	QP	L1

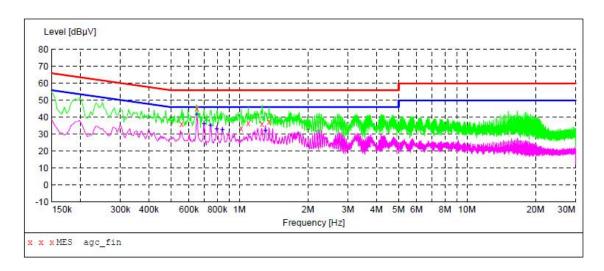
MEASUREMENT RESULT: "agc fin2"

2023/10/12 9:53

- 0.2	3/10/12 3.	-					
	Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
	0.658000	34.50	6.2	46	11.5	AV	L1
	0.706000	29.80	6.2	46	16.2	AV	L1
	0.754000	32.30	6.2	46	13.7	AV	L1
	0.806000	28.30	6.2	46	17.7	AV	L1
	0.850000	33.20	6.2	46	12.8	AV	L1
	1.314000	28.20	6.2	46	17.8	AV	L1



LINE CONCUTED EMISSION TEST-N



MEASUREMENT RESULT: "agc fin"

2023/10/12 9:57

2023/10/12 9:	:5/					
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.558000	36.00	6.2	56	20.0	QP	N
0.650000	45.40	6.2	56	10.6	QP	N
1.018000	33.30	6.2	56	22.7	QP	N
1.094000	36.60	6.2	56	19.4	QP	N
1.258000	36.20	6.2	56	19.8	QP	N
1.350000	37.40	6.2	56	18.6	QP	N

MEASUREMENT RESULT: "agc fin2"

2023/10/12 9:57

2023/10/12	3.31					
Frequenc M	cy Level Hz dBµV		Limit dBµV	Margin dB	Detector	Line
0.65000	00 41.60	6.2	46	4.4	AV	N
0.69800	00 36.20	6.2	46	9.8	AV	N
0.74600	00 35.30	6.2	46	10.7	AV	N
0.79400	00 33.20	6.2	46	12.8	AV	N
0.84200	32.80	6.2	46	13.2	AV	N
1.30200	32.30	6.2	46	13.7	AV	N



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9. HARMONIC CURRENT MEASUREMENT

9.1. LIMITS OF HARMONIC CURRENT

Limits for Class A Equipment				
Harmonics Order n	Max. permissible harmonic current (A)			
Odd	d harmonics			
3	2.30			
5	1.14			
7	0.77			
9	0.40			
11	0.33			
13	0.21			
15≤n≤39	0.15×15/n			
Eve	n harmonics			
2	1.08			
4	0.43			
6	0.30			
8≤n≤40	0.23×8/n			

Note: 1. According to section 5 of EN61000-3-2: 2014, the EUT is Class A equipment.

2. The above limits are for all applications having an active input power>75W. No limits apply for equipment with an active input power up to and including 75W.

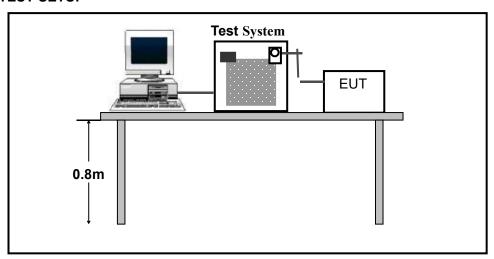


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9.2. TEST PROCEDURE

- 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.
- 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.

9.3. TEST SETUP



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

9.4. TEST RESULT

No applicable for equipment with an active input power up to and including 75W.



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10. VOLTAGE FLUCTUATIONS AND FLICK MEASUREMENT

10.1. LIMITS OF VOLTAGE FLUCTUATIONS AND FLICK

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 3.3%
d _{max} (%)	4%	d _{max} means maximum relative voltage change.
d _c (%)	3.3%	d _c means relative steady-state voltage change.

10.2. TEST PROCEDURE

- 1. 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
- 2. 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.

10.3. TEST SETUP

Same as 9.3

10.4. TEST RESULT

Test Specification

Test Frequency	50Hz	Test Voltage	230V AC
Waveform	Sine	Test Time	10 minutes(P _{st}); 2 hours (P _{lt})

Test Result

Test Parameter	Measurement Value	Limit	Remarks
P _{st}	0.248	1.0	Pass
P _{lt}	0.108	0.65	Pass
T _{dt(s)}	0.0	0.5	Pass
d _{max} (%)	0.00%	4%	Pass
d _c (%)	0.00%	3.3%	Pass



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11. IMMUNITY TEST

11.1. DESCRIPTION OF PERFORMANCE CRITERIA

The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests.

For the purpose of the present document two categories of performance criteria apply:

- Performance criteria for continuous phenomena.
- Performance criteria for transient phenomena.

11.2. GENERAL PERFORMANCE CRITERIA

1. Performance criteria for continuous phenomena

During the test, the equipment shall:

- continue to operate as intended;
- not unintentionally transmit;
- not unintentionally change its operating state;
- · not unintentionally change critical stored data.

2. Performance criteria for transient phenomena

For all ports and transient phenomena with the exception described below, the following applies:

- The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data.
- After application of the transient phenomena, the equipment shall operate as intended.

For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:

- For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.
- For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

For a 0 % residual voltage dip tests the following performance criteria apply:

• The performance criteria for transient phenomena shall apply.

For a 70 % residual voltage dip and voltage interruption tests, the following performance criteria apply:

- in the case where the equipment is fitted with or connected to a battery back-up, the performance criteria for transient phenomena shall apply;
- in the case where the equipment is powered solely from the AC mains supply (without the use of a parallel battery back-up) volatile user data may have been lost and if applicable the communication link need not to be maintained and lost functions should be recoverable by user or operator;
- no unintentional responses shall occur at the end of the test, when the voltage is restored to nominal;
- in the event of loss of function(s) or in the event of loss of user stored data, this fact shall be recorded.



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5. Performance Table

	EN 301 489-3 Performance criteria				
Criteria	During Test	After Test			
А	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions			
В	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions			

- 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.

Where "operate as intended" or "no loss of function" is specified, the EUT shall demonstrate correct functioning as described in EN 301 489-3 clause 5.

Where the EUT has more than one mode of operation, an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in sufficient modes to confirm there are no such unintentional responses.



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12. ELECTROSTATIC DISCHARGE IMMUNITY TEST

12.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-2
Discharge Impedance	330Ω / 150 pF
Discharge Voltage	Air Discharge ±8 kV, Contact Discharge ± 4 kV
Polarity	Positive / Negative
Number of Discharge	Minimum 20 times at each test point
Discharge Mode	Single discharge
Discharge Period	1-second minimum

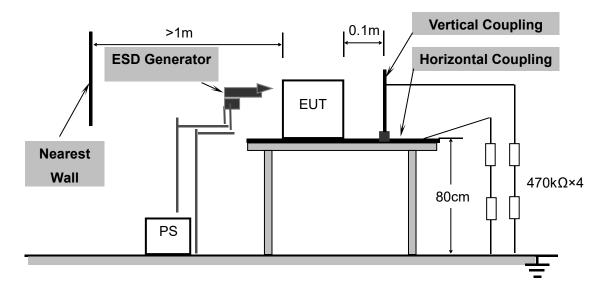
12.2 TEST PROCEDURE

The test procedure was in accordance with EN 61000-4-2:

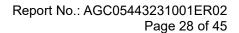
- a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- c. The time interval between two successive single discharges was at least 1 second.
- d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
- e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were completed.
- g. At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator was positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
- h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m×0.5m) was placed vertically to and 0.1 meters from the EUT.



12.3 TEST SETUP



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





12.4 TEST RESULT

DESCRIPTION OF THE ELECTROSTATIC DISCHARGES (ESD)

Times of Discharge	Voltage	Coupling	Test Mode	Performance criteria
Mini 25 / Point	±4kV	Contact discharge	Mode 1/2/3/4	А
Mini 25 / Point	±4kV; ±8kV	Air Discharge	Mode 1/2/3/4	А
Mini 25 / Point	±4kV	Indirect Discharge HCP	Mode 1/2/3/4	Α
Mini 25 / Point	±4kV	Indirect Discharge VCP	Mode 1/2/3/4	А

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

ESD location:

Yellow line: Air discharge Red line: Contact discharge







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12.5 PERFORMANCE

⊠ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

⋈ PASS	☐ FAIL



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13. RADIATED, RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY TEST

13.1. TEST SPECIFICATION

Basic Standard	EN 61000-4-3	
Frequency Range	80 MHz – 6000MHz	
Field Strength	3V/m	
Modulation	1 kHz sine wave, 80%, AM modulation	
Frequency Step	1% of fundamental	
Polarity of Antenna	Horizontal and Vertical	
Test Distance	3m	
Antenna Height	1.55m	
Dwell Time	3 seconds	

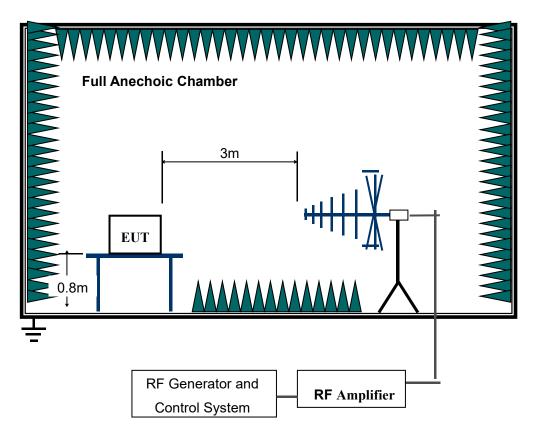
13.2. TEST PROCEDURE

The test procedure was in accordance with EN 61000-4-3.

- a. The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- b. The test signal was 80% amplitude modulated with a 1 kHz sine wave.
- c. The frequency range was swept from 80 MHz to 6000MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers. The rate of sweep did not exceed 1.5×10⁻³ decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- d. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- e. The field strength level was 3V/m.
- f. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.



13.3. TEST SETUP



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



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13.4. TEST RESULT

Freq. Range (MHz)	Field	Modulation	Polarity	Position	Test Mode	Performance criteria
80-6000	3V/m	Yes	Н	Front	Mode 1/2/3/4	Α
80-6000	3V/m	Yes	Н	Back	Mode 1/2/3/4	Α
80-6000	3V/m	Yes	Н	Left	Mode 1/2/3/4	А
80-6000	3V/m	Yes	Н	Right	Mode 1/2/3/4	А
80-6000	3V/m	Yes	V	Front	Mode 1/2/3/4	А
80-6000	3V/m	Yes	V	Back	Mode 1/2/3/4	А
80-6000	3V/m	Yes	V	Left	Mode 1/2/3/4	А
80-6000	3V/m	Yes	V	Right	Mode 1/2/3/4	А

A: No degradation or PER < 10% in the performance of the EUT was observed.

13.5. PERFORMANCE

⊠ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.



14. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

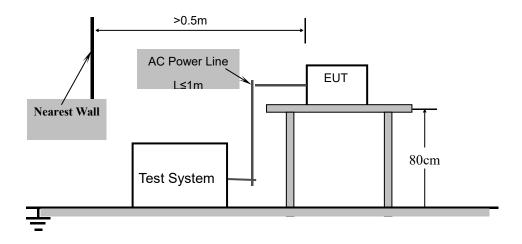
14.1. TEST SPECIFICATION

Basic Standard	EN 61000-4-4
Test Voltage	a.c. power port ±1 kV
Polarity	Positive/Negative
Impulse Frequency	5kHz
Impulse wave shape	5/50ns
Burst Duration	15ms
Burst Period	300ms
Test Duration	Not less than 1 min.

14.2. TEST PROCEDURE

- 1. The EUT was tested with 1000 volt discharges to the AC power input leads.
- 2. Both positive and negative polarity discharges were applied.
- 3. The length of the "hot wire" from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1 meter.
- 4. The duration time of each test sequential was 1 minute.
- 5. The transient/burst waveform was in accordance with IEC 61000-4-4, 5/50ns.

14.3. TEST SETUP



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



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14.4. TEST RESULT

Test Point	Polarity	Test Level (kV)	Test Mode	Performance criteria
a.c. port, L	+/-	1	Mode 1/2/3/4	Α
a.c. port, N	+/-	1	Mode 1/2/3/4	А
a.c. port, L-N	+/-	1	Mode 1/2/3/4	А
A. No de que detien in the mentanese of the CUT was absenced				

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

14.5. PERFORMANCE

⊠ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

	☐ FAIL	⊠ PASS
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15. SURGE IMMUNITY TEST

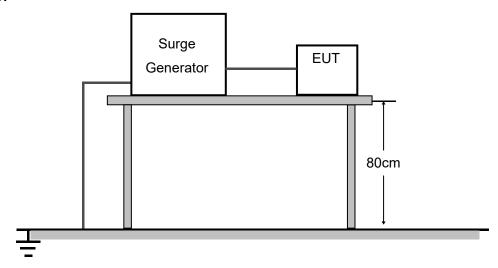
15.1. TEST SPECIFICATION

Basic Standard	EN 61000-4-5	
Waveform	Voltage 1.2/50 μs; Current 8/20 μs	
Test Voltage	a.c. power port, line to line +/-1.0 kV	
Polarity	Positive/Negative	
Phase Angle	0°, 90°, 180°, 270°	
Repetition Rate	60sec	
Times	5 time/each condition.	

15.2. TEST PROCEDURE

- a. The EUT and the auxiliary equipment were placed on a table of 0.8m heights above a metal ground reference plane. The size of ground plane is greater than 1m×1m and project beyond the EUT by at least 0.1m on all sides. The ground plane is connected to the protective earth. The length of power cord between the coupling device and the EUT was less than 2 meters (provided by the manufacturer).
- b. The EUT was connected to the power mains through a coupling device that directly couples the surge interference signal. The surge noise was applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave (positive and negative).
- c. The surges were applied line to line and line(s) to earth. All lower levels including the selected test level were tested. The polarity of each surge level included positive and negative test pulses.

15.3. TEST SETUP



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



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15.4. TEST RESULT

Coupling Line	Polarity	Voltage (kV)	Test Mode	Performance criteria
a.c. power, L-N	+/-	1.0	Mode 1/2/3/4	А
A: No degradation in the p	erformance of th	e EUT was observed.		

15.5. PERFORMANCE

⊠ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

	⊠ PASS	
--	--------	--



16. IMMUNITY TO CONDUCTED DISTURBANCES INDUCED BY RF FIELDS

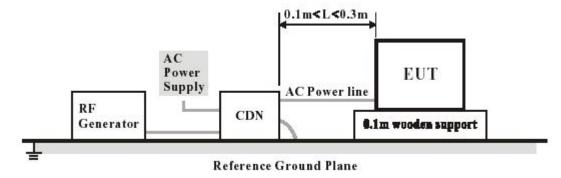
16.1. TEST SPECIFICATION

Basic Standard	EN 61000-4-6
Frequency Range	0.15 MHz – 80 MHz
Field Strength	3Vrms
Modulation	1 kHz Sine Wave, 80% AM
Frequency Step	1% of fundamental
Coupled Cable	a.c. power line
Coupling Device	CDN

16.2. TEST PROCEDURE

- 1. The EUT shall be tested within its intended operating and climatic conditions.
- 2. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.
- 3. The test signal was 80% amplitude modulated with a 1 kHz sine wave
- 4. The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80% amplitude. The sweep rate shall not exceed 1.5×10-3 decades/s. The step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value where the frequency is swept incrementally.
- 5. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequencies and harmonics or frequencies of dominant interest, shall be analyzed separately.
- 6. Attempts should be made to fully exercise the EUT during test, and to fully interrogate all exercise modes selected for susceptibility.

16.3. TEST SETUP



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



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16.4. TEST RESULT

Test Point	Frequency (MHz)	Level (V rms)	Test Mode	Performance criteria	
a.c. port	0.15 – 80	3	Mode 1/2/3/4	A	
A: No degradation in the performance of the EUT was observed.					

16.5. PERFORMANCE

⊠ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.				
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.				
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.				

	PASS	
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17. VOLTAGE DIPS AND SHORT INTERRUPTIONS IMMUNITY TEST

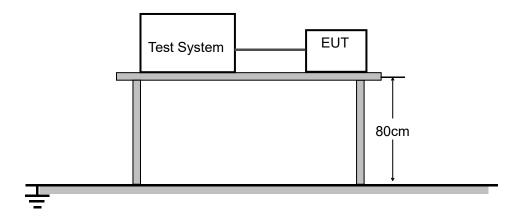
17.1. TEST SPECIFICATION

Basic Standard	EN 61000-4-11
	100% reduction, 0.5 Cycle
Voltage Dips	100% reduction, 1.0 Cycle
	30% reduction, 25 Cycles
Voltage Interruptions	100% reduction, 250 Cycles
Voltage Phase Angle	0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°

17.2. TEST PROCEDURE

- a). The power cord was used as supplied by the manufacturer. The EUT was connected to the line output of the Voltage Dips and Interruption Generator.
- b). The EUT was tested for (1) 100% voltage dip of supplied voltage with duration of 0.5 cycles, (2)100% voltage dip of supplied voltage and duration 1.0 cycle. (3) 30% voltage dip of supplied voltage and duration 25 cycles. (4) 100% voltage interruption of supplied voltage with duration of 250 Cycles was followed.
- c). Voltage reductions occur at 0 degree crossover point of the voltage waveform. The performance of the EUT was checked after the voltage dip or interruption.

17.3. TEST SETUP



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



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17.4. TEST RESULT

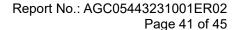
Test Mode	Voltage Reduction	Duration (cycle)	Times	Interval (Sec)	Test Mode	Performance criteria
	100%	0.5	3	10	Mode 1/2/3/4	В
Voltage dips	100%	1	3	10	Mode 1/2/3/4	В
	30%	25	3	10	Mode 1/2/3/4	В
Voltage interruptions	100%	250	3	10	Mode 1/2/3/4	С

- A: No degradation in the performance of the EUT was observed.
- B: Stop charging during the test and self-recoverable after test.
- C: Lost functions can be recoverable by user or operator.

17.5. PERFORMANCE

☐ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
⊠ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
⊠ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

⊠ PASS



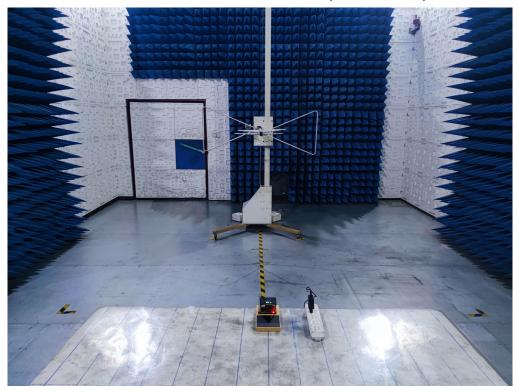


APPENDIX I: PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST SETUP

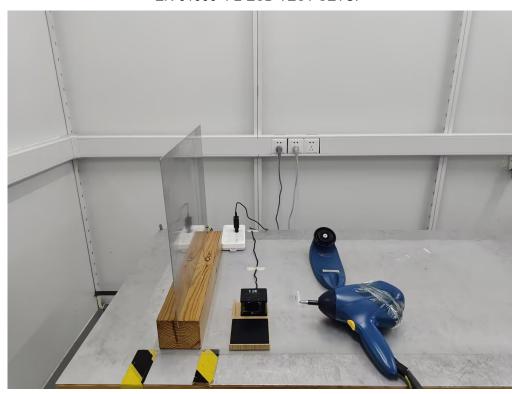


RADIATED EMISSION TEST SETUP (BELOW 1GHz)

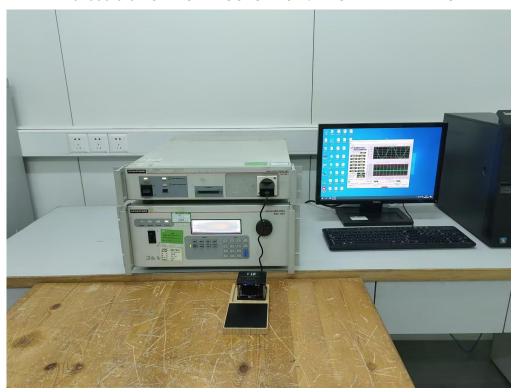




EN 61000-4-2 ESD TEST SETUP



EN61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST SETUP

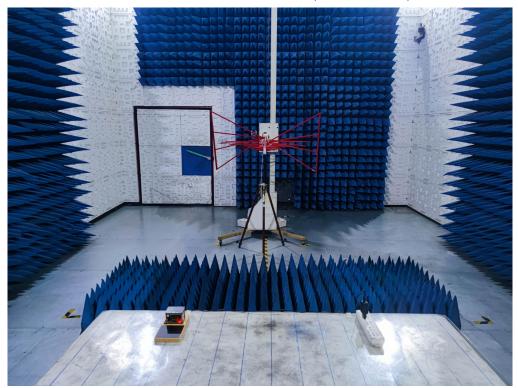


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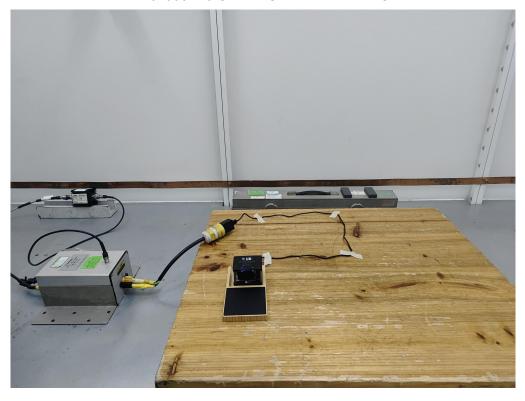
Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/

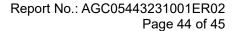






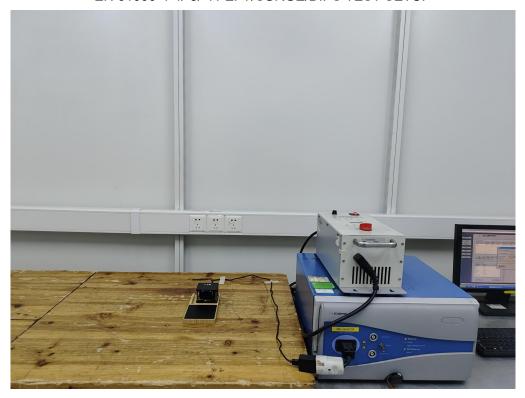
EN 61000-4-6 CS IMMUNITY TEST SETUP







EN 61000-4-4/-5/-11 EFT/SURGE/DIPS TEST SETUP





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APPENDIX II: PHOTOGRAPHS OF EUT

Refer to the Report No.: AGC05443231001AP01

----END OF REPORT----



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.



EMC Test Report

Report No.: AGC05443231001EE01

PRODUCT DESIGNATION: Mug warmer wireless charger

BRAND NAME : N/A

MODEL NAME : MO2154

APPLICANT: MID OCEAN BRANDS B.V

DATE OF ISSUE : Oct. 17, 2023

STANDARD(S) : EN IEC 55014-1:2021 EN IEC 55014-2:2021

REPORT VERSION: V1.0

Attestation of Global Configuration (Shenzhen) Co., Ltd



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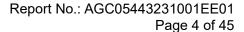
REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	1	Oct. 17, 2023	Valid	Initial release



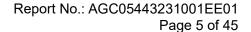
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1. General information

Applicant	MID OCEAN BRANDS B.V				
Address	Unit 201 2/F,. Laford Centre,838 Lai Chi Kok Road,Cheung Sha Wan,Kowloon,Hongkong				
Manufacturer	MID OCEAN BRANDS B.V				
Address	Unit 201 2/F,. Laford Centre,838 Lai Chi Kok Road,Cheung Sha Wan,Kowloon,Hongkong				
Factory	N/A				
Address	N/A				
Product Designation	Mug warmer wireless charger				
Brand Name	N/A				
Test Model	MO2154				
Deviation from Standard	No any deviation from the test method				
Date of receipt of test item	Oct. 07, 2023				
Date of Test	Oct. 07, 2023~Oct. 17, 2023				
Test Result	Pass				
Test Report Form No	AGCER-EMC-GEN-V1				
Note: The test results of this report relate only to the tested sample identified in this report.					

Prepared By	Alan Duan	Alan Duan				
	Alan Duan (Project Engineer)	Oct. 17, 2023				
Reviewed By	Calin Lin					
	Calvin Liu (Reviewer)	Oct. 17, 2023				
Approved By	Max Zhang					
	Max Zhang Authorized Officer	Oct. 17, 2023				



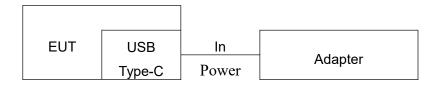
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2. Description of Test Configuration

2.1. Technical Description of Product

Categorization of Equipment	Class B equipment
Test arrangements of EUT	Table-top
Hardware Version	V1.0
Software Version	V1.0
EUT Input Rating	DC 5V 3A, 9V 3A
EUT Output Rating	DC 5V 1A, 7.5V 1A, 9V 1.1A, 9V 1.66A

Connection Diagram of Host System



I/O Port Information (⊠ Applicable ☐ Not Applicable)

Port Type	Input/Output	Number	Cable Description
USB Type-C	ln	1	1.2m,unshielded

2.2. Description of Support Equipment

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
		-	-		-

2.3. Description of Test Modes

No.	Test Mode Description
1	Work mode



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3. Summary of Measurement Results and Uncertainty

3.1. Test Specifications

EN IEC 55014-1:2021	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
EN IEC 55014-2:2021	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard

3.2. Description of Measurement Results

Test items	Test Standard(s)	Verdict
Conducted emissions from the AC mains power ports	EN IEC 55014-1	Pass
Radiated emissions at frequencies up to 1 GHz	EN IEC 55014-1	Pass
Voltage fluctuations and flicker	EN 61000-3-3	Pass
Electrostatic discharge	IEC 61000-4-2 a	Pass
Radio-frequency electromagnetic field	IEC 61000-4-3 a	Pass
Fast transients	IEC 61000-4-4 a	Pass
Surges	IEC 61000-4-5 a	Pass
Radio-frequency common mode (Injected currents)	IEC 61000-4-6 a	Pass
Notes	·	1

Note:

The applicable versions of the basic standards are defined in the standard which listed in the test specification.



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Performance table

	Performance Criteria for Immunity
Performance criterion A	The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
Performance criterion B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after the test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
Performance criterion C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.



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3.3. Description of Measurement Uncertainty

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Conducted emissions from the AC mains power ports	Uc = ±2.9 dB
Radiated emissions at frequencies up to 1 GHz	Uc = ±3.9 dB
Radiated emissions at frequencies above 1 GHz	Uc = ±4.9 dB



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4. Test Facility

Laboratory name: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Laboratory Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai

Street, Bao'an District, Shenzhen, Guangdong, China

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. is accredited in accordance with the recognized International Standard ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laborat ories (CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories).

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This laboratory also meets the requirements of any additional program requirements in the Electrical field.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842

CAB identifier: CN0063

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

VCCI Membership No.: 4112

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered in accordance with VCCI Council Rules.

VCCI Registration No. C-20098 for conducted emissions at AC main power ports

VCCI Registration No. T-20102 for conducted emissions at telecommunication ports

VCCI Registration No. R-20136 for radiated emissions below 1GHz

VCCI Registration No. G-20132 for radiated emissions above 1GHz



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5. Measurement of Conducted Emissions from the AC Mains Power Ports

5.1. Requirements

General limits for conducted emissions, low voltage AC mains port

Network device	Detector type/ bandwidth	Frequency Range (MHz)	Limits dB(µV)	Measurement specifications
		0.15 to 0.5	66 to 56	
	Quasi-peak/ 9kHz	0.5 to 5	56	Instrumentation: CISPR 16-1-1, Clauses 4, 5
A B 4 B I	OKI 12	5 to 30	60	and 7
AMN Average/ 9kHz		0.15 to 0.5	59 to 46	Networks: CISPR 16-1-2, Clause 4
	1 0	0.5 to 5	46	Method: CISPR 16-2-1, Clause 7
		5 to 30	50	Set-up: CISPR 16-2-1, Clause 7

Note:

1. The lower limit shall apply at the transition frequency.

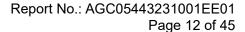
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.5MHz.

Limits for the mains port of motor operated tools

Frequency		Tools (P = rated power of the motor only.)					
range			700 W < P ≤ 1 000 W		P > 1 000 W		
1	2 3		4	5	6	7	
MHz	Quasi-peak dB(µV)	Average dB(µV)	Quasi-peak dB(µV)	Average dB(µV)	Quasi-peak dB(µV)	Average dB(µV)	
0.15 to 0.35	66 to 59	59 to 49	70 to 63	63 to 53	76 to 69	69 to 59	
0.35 to 5	59	49	63	53	69	59	
5 to 30	64	54	68	58	74	64	

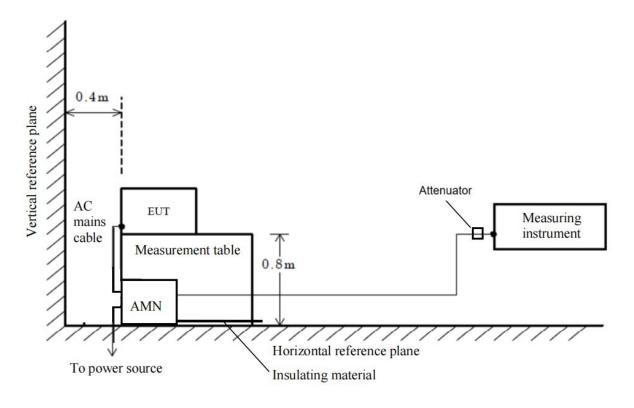
Note:

- 1. The lower limit shall apply at the transition frequency.
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.35MHz.





5.2. Block Diagram of Test Setup





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5.3. Equipment Details

Measuring Instruments

Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESPI	101206	Jun. 03, 2023	Jun. 02, 2024
Artificial Mains Network	R&S	ESH2-Z5	100086	Jun. 03, 2023	Jun. 02, 2024
Attenuator	East sheep	LM-XX-6-5W	N/A	Jun. 09, 2023	Jun. 08, 2024

Measuring Software

Software Name	Manufacturer	Details
ES-K1	R&S	For EMC Measurement, Version 1.71

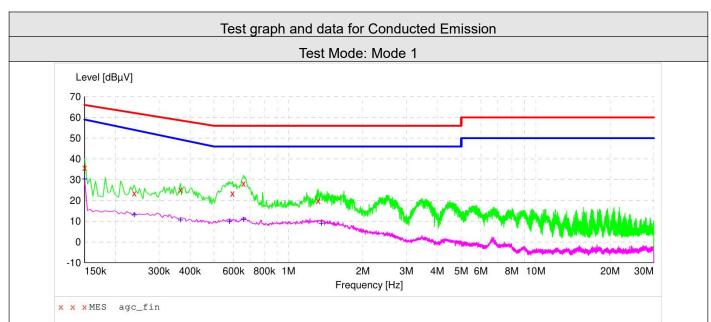
5.4. Configuration of the EUT and method of measurement

- a. The EUT was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, the EUT was placed on the top surface of a measurement table, 0.8 m high from the horizontal reference plane, and was positioned at a distance of 0.4 m away from the vertical reference plane. When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 10 cm non-conductive covering to insulate the EUT from the ground plane.
- b. Support equipment, if needed, was placed as per CISPR 16-2-1.
- c. All I/O cables were positioned to simulate typical actual usage as per CISPR 16-2-1.
- d. The EMI receiver measured the emission levels emanating from the EUT into the AC Mains through an Artificial Mains Network (AMN) and an attenuator used on the front end of the EMI receiver. Testing included measurements on all live and neutral lines.
- e. The more description of the tests, the test methods, and the test set-ups are given in the applicable test standard.
- f. Record at least six highest emissions relative to the limits at each frequency of interest unless the emission is 10 dB or greater below the limit.
- g. A conducted emission is calculated by the following equation:
 - Measurement Level (dBµV) = Receiver reading (dBµV) + Tansd (dB)
 - Transd(dB)= AMN Factor(dB)+Cable Loss(dB)+Attenuation(dB)
 - Margin= Limit-Level



5.5. Test Summary

Test Engineer	Jimu	Temperature	23.1℃
Test Date	2023-10-12	Air Pressure	985 Mbar
Worst Mode	Mode 1	Relative Humidity	58.8 %
Verdict	Pass		



Frequency [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector	Line
0.150000	35.8	9.3	66.0	30.2	QP	L1
0.238000	23.5	9.3	62.2	38.7	QP	L1
0.366000	25.2	9.3	58.6	33.4	QP	L1
0.594000	23.4	9.3	56.0	32.6	QP	L1
0.658000	28.2	9.3	57.0	28.8	QP	L1
1.318000	20.0	9.3	56.0	36.0	QP	L1
0.150000	30.9	9.3	59.0	28.1	AV	L1
0.238000	13.6	9.3	54.0	40.4	AV	L1
0.366000	11.1	9.3	49.4	38.3	AV	L1
0.578000	10.3	9.3	46.0	35.7	AV	L1
0.658000	11.2	9.3	46.0	34.8	AV	L1
1.358000	9.5	9.3	46.0	36.5	AV	L1



Test graph and data for Conducted Emission Test Mode: Mode 1 Level [dBµV] 70 60 50 40 30 20 10 150k 2M 300k 400k 600k 800k 1M ЗМ 4M 5M 6M 8M 10M 20M 30M Frequency [Hz] x x x MES agc_fin

Frequency [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector	Line
0.150000	36.0	9.3	66.0	30.0	QP	N
0.442000	24.1	9.3	57.0	32.9	QP	N
0.630000	23.5	9.3	56.0	32.5	QP	N
0.746000	24.2	9.3	56.0	31.8	QP	N
1.382000	24.2	9.3	56.0	31.8	QP	N
2.342000	18.8	9.4	66.0	47.2	QP	N
0.150000	30.9	9.3	59.0	28.1	AV	N
0.346000	11.0	9.3	50.0	39.0	AV	N
0.642000	18.8	9.3	46.0	27.2	AV	N
0.746000	8.4	9.3	46.0	37.6	AV	N
1.322000	9.7	9.3	46.0	36.3	AV	N
2.466000	10.4	9.4	46.0	35.6	AV	N



6. Measurement of Radiated Emissions at Frequencies up to 1 GHz

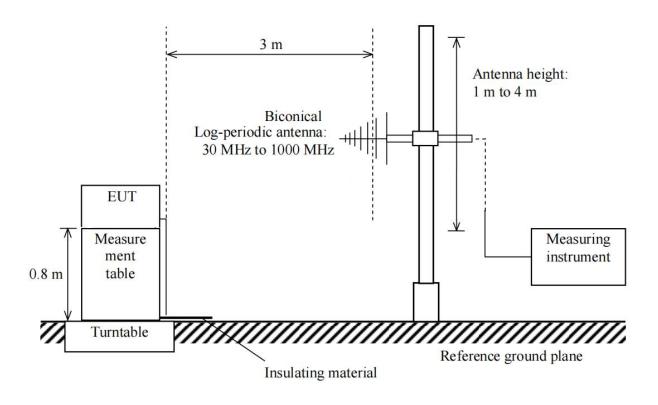
6.1. Requirements

Requirements for radiated emissions at frequencies up to 1 GHz at 3m distance

Test facility	Detector type/ bandwidth	Frequency Range (MHz)	Limits dB(µV/m)	Measurement specifications
Ouasi-neak/		30 to 230	40	Instrumentation: CISPR 16-1-1, Clauses 4, 5 Antennas: CISPR 16-1-4, Clause 4.5
SAC	120kHz	230 to 1000	47	Test Site: CISPR 16-1-4, Clause 6 Method: CISPR 16-2-3, Clause 7.6

Note:

6.2. Block Diagram of Test Setup



^{1.} The lower limit shall apply at the transition frequency.



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6.3. Equipment Details

Measuring Instruments

Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
Antenna	SCHWARZBECK	VULB9168	D69250	May 11, 2023	May 10, 2025

Measuring Software

Software Name	Manufacturer	Details	
EZ-EMC	FARA	For EMC Measurement, Version RA-03A	
TS+[JS32-RE]	Tonscend	For EMC measurement, version 4.0.0.0	

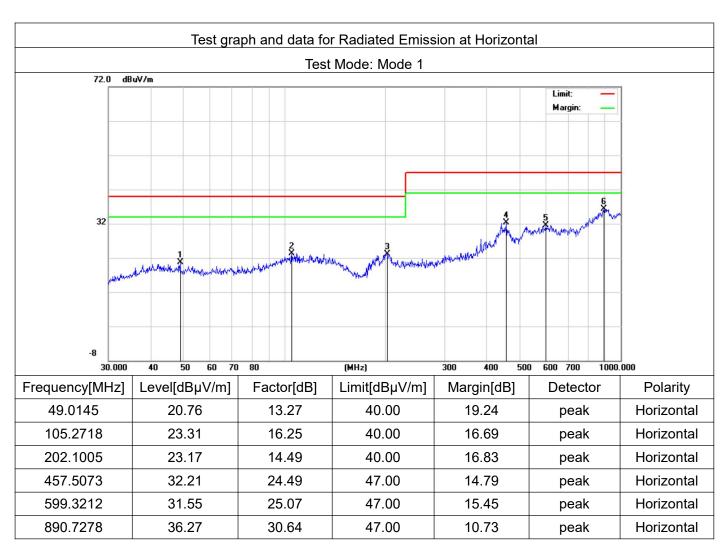
6.4. Configuration of the EUT and method of measurement

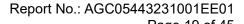
- a. The EUT was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, the EUT was placed on the top surface of a measurement table, 0.8 m high from the horizontal reference plane. When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 10 cm non-conductive covering to insulate the EUT from the ground plane.
- b. Support equipment, if needed, was placed as per CISPR 16-2-3.
- c. All I/O cables were positioned to simulate typical actual usage as per CISPR 16-2-3.
- d. The maximum receiving level of radiated emissions from the EUT was measured while the turntable was rotated from 0° to 360° and the antenna height was scanned between 1 m and 4 m. The cables were laid out to attain the maximum level of radiated emissions.
- e. The more description of the tests, the test methods, and the test set-ups are given in the applicable test standard.
- f. Record at least six highest emissions relative to the limits at each frequency of interest unless the emission is 10 dB or greater below the limit.
- g. A radiated emission is calculated by the following equation:
 - Measurement Level dB(μV/m) = Receiver reading dB(μV) + Factor(dB/m)
 - Factor(dB/m) = Antenna Factor(dB/m) + Cable Loss(dB)
 - Margin= Limit-Level



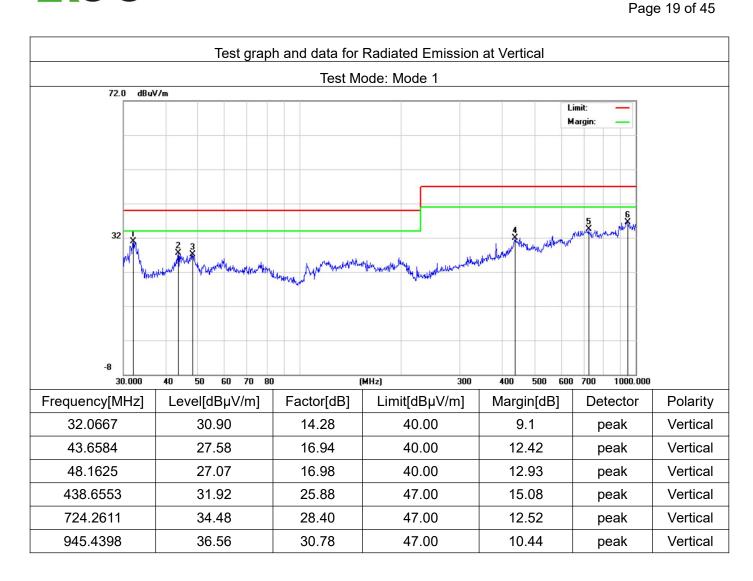
6.5. Test Summary

Test Engineer	Alex	Temperature	23.4℃
Test Date	2023-10-12	Air Pressure	985 Mbar
Worst Mode	Mode 1	Relative Humidity	62.5 %
Verdict	Pass		











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7. Measurement of Voltage Fluctuations and Flicker

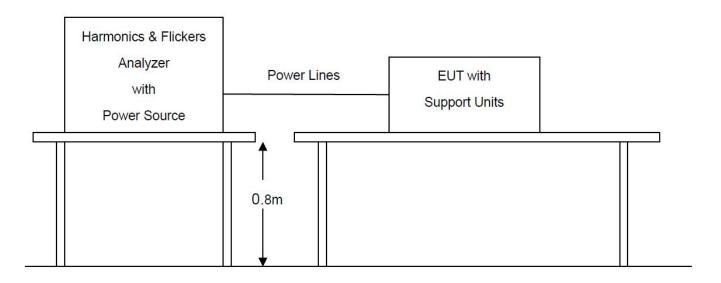
7.1. Requirements

Applicable test standard(s): EN 61000-3-3:2013+A2:2021

Limits of Voltage Fluctuations and Flicker

Parameters	Definitions	Limits
T _{max}	the accumulated time value of $d(t)$ with a deviation exceeding 3.3 % during a single voltage change at the EUT terminals	≤500 ms
d _c	the maximum relative steady-state voltage change	≤3.3%
d _{max}	the maximum relative voltage change	⊠ ≤4% □ ≤6% □ ≤7%
$\boxtimes P_{st}$	short-term flicker severity	≤0.65
$\square P_{lt}$	long-term flicker severity	≤1.0

7.2. Block Diagram of Test Setup



7.3. Equipment Details

Measuring Instruments

Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Conditioning Unit	Schaffner	CCN1000-1	72431	Jun. 02, 2023	Jun. 01, 2024
AC Source	Schaffner	NSG 1007	56825	Jun. 02, 2023	Jun. 01, 2024

Measuring Software

Software Name	Manufacturer	Details
CTS 4	AMETEK	For harmonics and flickers measurement, version 4.29.0

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.

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/



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7.4. Configuration of the EUT and method of measurement

- a. The test shall be conducted according to the general requirements given in the applicable test standard.

 The test duration and test condition had been as defined in the applicable test standard.
- b. All types of voltage fluctuations would been assessed by direct measurement using a flicker meter which complies with the specification given in IEC 61000-4-15:2010.

7.5. Test Summary

Test Engineer	Jimu	Temperature	23.4℃
Test Date	2023-10-12	Air Pressure	985 Mbar
Worst Mode	Mode 1	Relative Humidity	59.6 %
Verdict	Pass		

Parameters	Measurement Value	Limits
T _{max}	0	≤500 ms
d _c	0.00	≤3.3%
d _{max}	0.00	≤4%
P _{st}	0.119	≤0.65

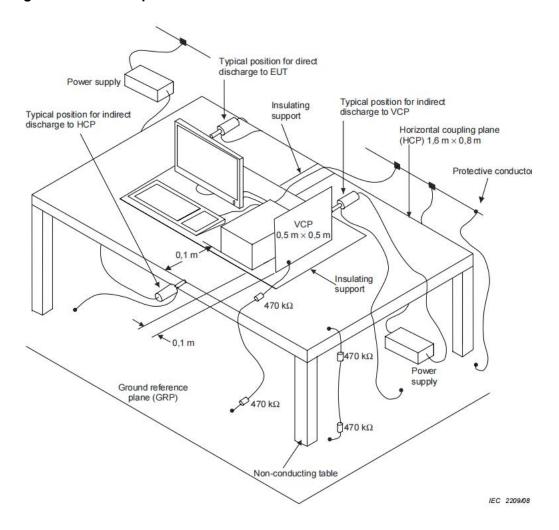


8. Measurement of Electrostatic discharge

8.1. Requirements

Port	Enclosure
Basic Standard	IEC 61000-4-2
Test Level	±8.0 kV (Air Discharge) ±4.0 kV (Contact Discharge) ±4.0 kV (Indirect Discharge)
Required Performance Criterion	В
Time Between Each Discharge:	1 second
Number of Discharge for Each Applied Voltage	10

8.2. Block Diagram of Test Setup





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8.3. Equipment Details

Measuring Instruments

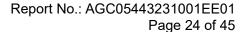
Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	Schaffner	NSG 438	782	Dec. 30, 2022	Dec. 29, 2023

Measuring Software

Software Name	Manufacturer	Details

8.4. Configuration of the EUT and method of measurement

- a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- c. The time interval between two successive single discharges was at least 1 second.
- d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
- e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were completed.
- g. At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator was positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
- h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m×0.5m) was placed vertically to and 0.1 meters from the EUT.
- i. The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance criterion defined in the report.





8.5. Test Summary

Test Engineer	Sam	Temperature	23℃
Test Date	2023-10-12	Air Pressure	985 Mbar
Test Mode(s)	Mode 1	Relative Humidity	45 %
Verdict	Pass		

Voltage	Coupling	Observation	Performance
±4kV	Contact Discharge	No degradation of performance	Α
±2KV, ±4kV, ±8kV	Air Discharge	No degradation of performance	А
±4kV	Indirect Discharge HCP	No degradation of performance	А
±4kV	Indirect Discharge VCP	No degradation of performance	А

Discharge Point:







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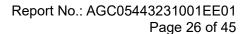
9. Measurement of Radio-Frequency Electromagnetic Field

9.1. Requirements

Port	Enclosure
Basic Standard	IEC 61000-4-3
Required Performance Criterion	A
Test Level	3V/m with 80% AM. 1kHz Modulation at 80 to 1000MHz
Antenna polarization	Vertical and Horizontal
Step size increment ^a	1%
Dwell time b	≤5 seconds
Test Distance	3m
EUT position facing antenna	Front side, back side, left side and right side

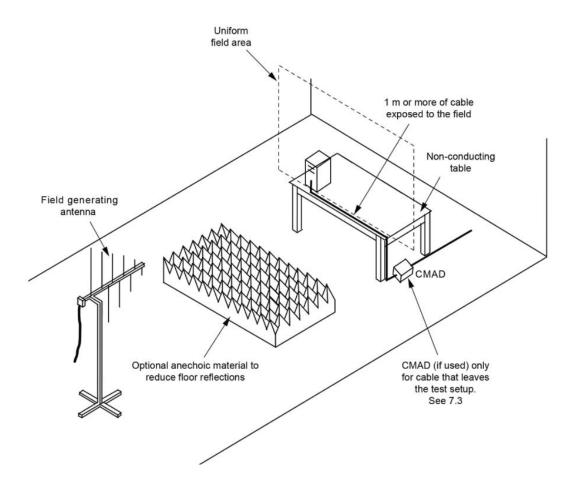
Notes:

- a. Recognizing that a 1% step size is preferred, the frequency range can be swept incrementally with a step size not exceeding 4% of the previous frequency with a test level of twice the value of the specified test level in order to reduce the testing time for equipment requiring testing in multiple configurations and/or long cycle times.
- b. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond. However, the dwell time shall not exceed 5 seconds at each of the frequencies during the scan. The time to exercise the EUT is not interpreted as a total time of a program or a cycle but related to the reaction time in case of failure of the EUT.





9.2. Block Diagram of Test Setup





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9.3. Equipment Details

Measuring Instruments

Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Generator	Aglient	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024
Power Probe	R&S	URV5-Z4	100124	Mar. 24, 2023	Mar. 23, 2025
Power Meter	R&S	NRVD	8323781027	Mar. 24, 2023	Mar. 23, 2025
Power Amplifier	KALMUS	7100LC	04-02/17-06-001	Apr. 25, 2023	Apr. 24, 2024
Wideband Antenna	SCHWARZBECK	VULB9168	D69250	May. 10, 2023	May. 09, 2025

Measuring Software

Software Name	Manufacturer	Details
TS+[JS35-RS]	Tonscend	For EMC measurement, version 2.0.1.8

9.4. Configuration of the EUT and method of measurement

- a. The Equipment Under Test (EUT) was positioned within the Uniform Field Area (UFA) on a supporting table, ensuring a 3-meter separation from the transmitting antenna. This setup aligns with the calibrated square area, guaranteeing field uniformity during testing. The supporting units were strategically located outside the UFA to avoid any potential interference. Nonetheless, the cables connected to the EUT were intentionally exposed to the precisely calibrated field within the UFA.
- b. Before testing, it will verify the proper operation of the test equipment/system. This verification will involve measuring the field strength at one point within the Uniform Field Area (UFA) at various frequencies.
- The test shall be performed according to the above requirements and block diagram which shall specify the test setup.
- d. The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance criterion defined in the report.



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9.5. Test Summary

Test Engineer	Alex	Temperature	22.8℃
Test Date	2023-10-11	Air Pressure	985 Mbar
Test Mode(s)	Mode 1	Relative Humidity	56.5 %
Verdict	Pass		

Frequency	Exposed Side	Field Strength (V/m)	Observation	Performance
	Front		No degradation of performance	А
80MHz to 1GHz	Left	3V/m (rms)	No degradation of performance	А
OUNITZ to TGHZ	Rear		No degradation of performance	А
	Right		No degradation of performance	А



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10. Measurement of Radio-frequency common mode

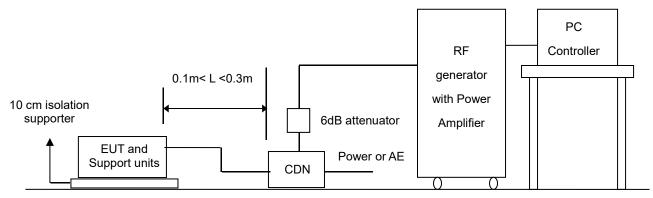
10.1. Requirements

Port	⊠AC mains power ports	signal, wired network and control ports ^a	☐ DC power ports ^a		
Basic Standard	IEC 61000-4-6				
Required Performance Criterion	А				
Test Level	3 V RMS (unmodulated), 80 % AM (1 kHz)	1 V RMS (unmodulated), 80 % AM (1 kHz)	1 V RMS (unmodulated), 80 % AM (1 kHz)		
Test Frequency	⊠ 0.15 to 80 MHz □ 0.15 to 230 MHz				
Step size increment b	1%				
Dwell time °	≤5 seconds				

Notes:

- a. Applicable only to ports which, according to the manufacturer's specification, supports cable lengths greater than 3 m.
- b. Recognizing that a 1% step size is preferred, the frequency range can be swept incrementally with a step size not exceeding 4% of the previous frequency with a test level of twice the value of the specified test level in order to reduce the testing time for equipment requiring testing in multiple configurations and/or long cycle times.
- c. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond. However, the dwell time shall not exceed 5 seconds at each of the frequencies during the scan. The time to exercise the EUT is not interpreted as a total time of a program or a cycle but related to the reaction time in case of failure of the EUT.

10.2. Block Diagram of Test Setup



Ground Reference Plane

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10.3. Equipment Details

Measuring Instruments

Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Power Amplifier	AR	75A250	18464	N/A	N/A
CDN	ZHINAN	ZN3751	15004	Aug. 03, 2022	Sep. 02, 2024
6dB attenuator	ZHINAN	E-002	N/A	Aug. 04, 2022	Aug. 03, 2024
Power Probe	R&S	URV5-Z4	100124	Mar. 24, 2023	Mar. 23, 2025
Electromagnetic Injection Clamp	Luthi	EM101	35773	Aug. 12, 2022	Aug. 11, 2024
Power Meter	R&S	NRVD	8323781027	Mar. 24, 2023	Mar. 23, 2025
Signal Generator	Keysight	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024

Measuring Software

Software Name	Manufacturer	Details
TS+[JS35-CS]	Tonscend	For EMC measurement, version 2.0.1.7

10.4. Configuration of the EUT and method of measurement

- a. The Equipment Under Test (EUT) shall be tested within its intended operating and climatic conditions.
- b. The test generator and the coupling/decoupling network shall be placed directly on, and bonded to, the ground reference plane. The test shall be performed with the test generator connected to each of the coupling devices (CDN, EM clamp, current clamp) in turn. All other cables not under test shall either be disconnected (when functionally allowed) or provided with decoupling networks or unterminated CDNs only.
- c. The test shall be performed according to the above requirements and block diagram which shall specify the test setup.
- d. The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance criterion defined in the report.



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10.5. Test Summary

Test Engineer	Sam	Temperature	23℃
Test Date	2023-10-12	Air Pressure	985 Mbar
Test Mode(s)	Mode 1	Relative Humidity	45 %
Verdict	Pass		

Test port	Test Level	Coupling method	Observation	Performance
A O M = i = =	0.15 to 10 MHz: 3 V			
AC Mains Input	10 to 30 MHz: 3 to 1 V	CDN	No degradation of performance	Α
Прис	30 to 80 MHz, 1 V			



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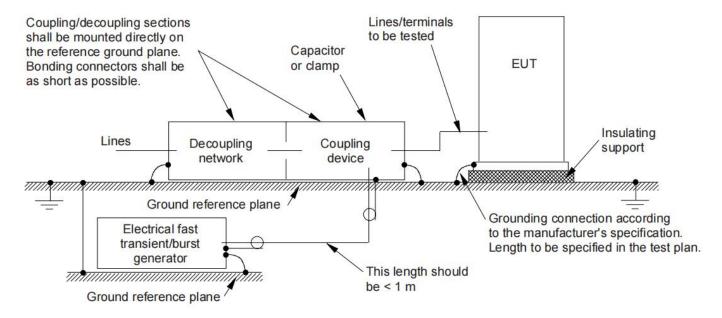
11. Measurement of Fast Transients

11.1. Requirements

Port	⊠ AC mains power ports	signal, wired network and control ports ^a	☐ DC power ports ^a		
Basic Standard	IEC 61000-4-4				
Required Performance Criterion	В				
Test Level	1 kV (peak)	0.5 kV (peak)	0.5 kV (peak)		
Polarity	Positive/Negative				
Impulse Frequency	5kHz				
Impulse wave shape	5/50ns				
Burst Duration	15ms				
Burst Period	300ms				
Notes:					

 Applicable only to ports which, according to the manufacturer's specification, supports cable lengths greater than 3 m.

11.2. Block Diagram of Test Setup





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11.3. Equipment Details

Measuring Instruments

Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
EFT/Surge/DIPS	Schaffner	Modula 6150	34437	Jun. 08, 2023	Jun. 07, 2024
Generator	Ochanno	Wodula 0130	34437	Juli. 00, 2025	Juli. 07 , 2024

Measuring Software

Software Name	Manufacturer	Details
WinModula	Schaffner	For EFT/Surge/Dips measurement, version 2.31 c

11.4. Configuration of the EUT and method of measurement

- a. The Equipment Under Test (EUT), whether stationary floor-mounted or table top, and equipment designed to be mounted in other configurations, shall be placed on a ground reference plane and shall be insulated from it by an insulating support 0,1 m ± 0,01 m thick.
- b. The test generator and the coupling/decoupling network shall be placed directly on, and bonded to, the ground reference plane.
- c. The EUT shall be arranged and connected to satisfy its functional requirements, according to the equipment installation specifications. The minimum distance between the EUT and all other conductive structures (e.g. the walls of a shielded room), except the ground reference plane shall be more than 0,5 m. All cables to the EUT shall be placed on the insulation support 0,1 m above the ground reference plane. Cables not subject to electrical fast transients shall be routed as far as possible from the cable under test to minimize the coupling between the cables.
- d. The test voltages shall be coupled to all of the EUT ports including those between two units of equipment involved in the test, unless the length of the interconnecting cable makes it impossible to test.
- e. Either a direct coupling network or a capacitive clamp shall be used for the application of the test voltages.
- f. The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance criterion defined in the report.



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11.5. Test Summary

Test Engineer	Sam	Temperature	23℃
Test Date	2023-10-12	Air Pressure	985 Mbar
Test Mode(s)	Mode 1	Relative Humidity	54 %
Verdict	Pass		

Inject Line	Voltage(kV)	Inject Method	Observation	Performance
AC Lines	0.5, 1	Direct	No degradation of performance	Α



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12. Measurement of Surges

12.1. Requirements

Port	⊠ AC mains power ports ^a	☐ signal, wired network and control ports ^b	☐ DC network power ports ^b
		Tana common porto	P
Basic Standard	IEC 61000-4-5		
Required Performance Criterion	В	В	В
Test Level	Line to line: 1 kV; Line to ground: 2 kV	shield to ground: 0.5 kV	Line to ground: 0.5 kV
Tr/Th	1.2/50 (8/20) µs		
Number of impulses	Five positive and five negative impulses		
Time between successive impulses	1 min		
N 1 4			

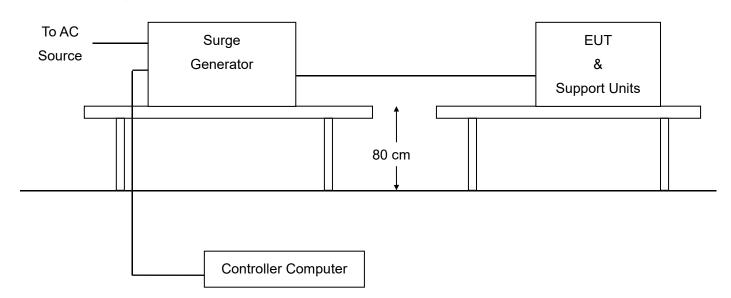
Notes:

- a. The number of pulses applied shall be as follows:
 - Five positive pulses line-to-neutral at 90° phase.
 - Five negative pulses line-to-neutral at 270° phase.

The following additional pulses are required only if the EUT has an earth connection or if the EUT is earthed via any AE:

- Five positive pulses line-to-earth at 90° phase.
- Five negative pulses line-to-earth at 270° phase.
- Five negative pulses neutral-to-earth at 90° phase.
- Five positive pulses neutral-to-earth at 270° phase.
- b. Applicable only to ports which, according to the manufacturer's specification, supports cable lengths greater than 3 m.

12.2. Block Diagram of Test Setup



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12.3. Equipment Details

Measuring Instruments

Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
EFT/Surge/DIPS Generator	Schaffner	Modula 6150	34437	Jun. 08, 2023	Jun. 07, 2024

Measuring Software

Software Name	Manufacturer	Details	
WinModula	Schaffner	For EFT/Surge/Dips measurement, version 2.31 c	

12.4. Configuration of the EUT and method of measurement

- a. Verification shall be performed. It is preferable to perform the verification prior to the test.
- b. The test shall be performed according to the above requirements and block diagram which shall specify the test setup.
- c. When testing line-to-ground, the lines are tested individually in sequence, if there is no other specification.
- d. The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore, all lower test levels including the selected test level shall be tested.
- e. The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance criterion defined in the report.

12.5. Test Summary

Test Engineer	Sam	Temperature	23℃
Test Date	2023-10-12	Air Pressure	985 Mbar
Test Mode(s)	Mode 1	Relative Humidity	54 %
Verdict	Pass		

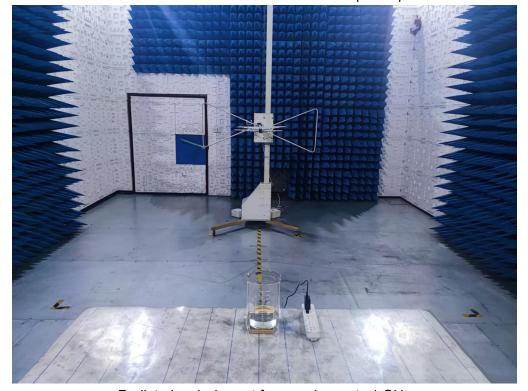
Test port	Coupling	Voltage(kV)	Observation	Performance
	line-to-neutral	0.5, 1	No degradation of performance	Α
AC Mains Input	line-to-earth	0.5, 1, 2	No degradation of performance	А
	neutral-to-earth	0.5, 1, 2	No degradation of performance	А



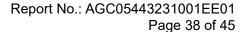
13. Photographs of Test Setup



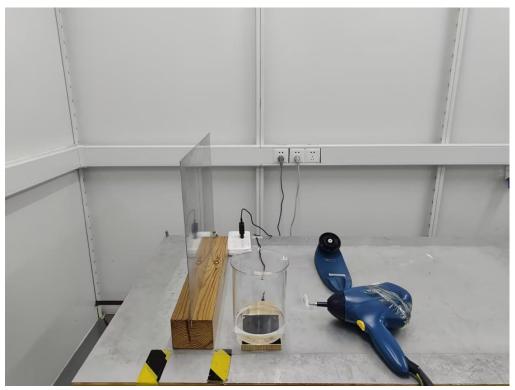
Conducted emissions from the AC mains power ports



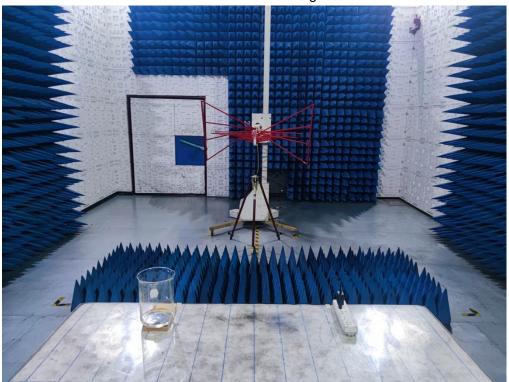
Radiated emissions at frequencies up to 1 GHz



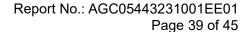




Electrostatic discharge



Radio-frequency electromagnetic field up to 1 GHz



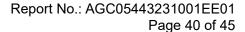




Radio-frequency common mode at the AC mains power ports



Fast transients/Surges/ Voltage dips at the AC mains power ports



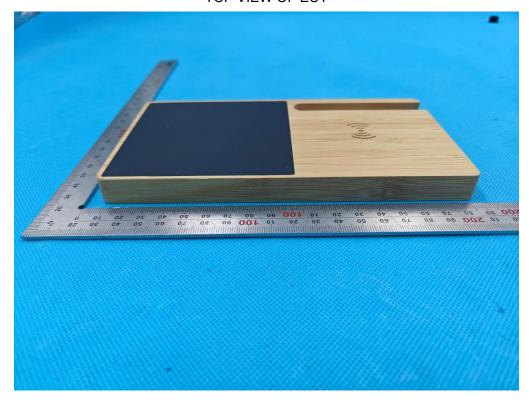


14. Photographs of EUT

All VIEW OF EUT

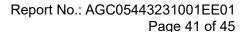


TOP VIEW OF EUT



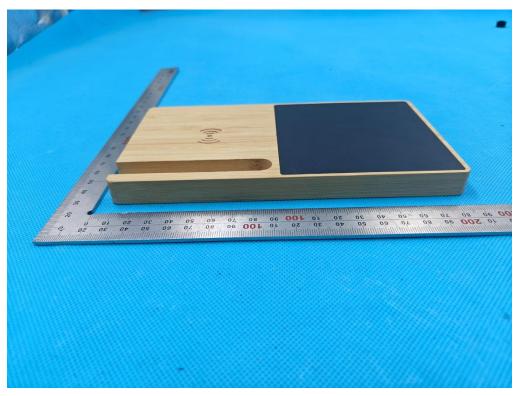
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BOTTOM VIEW OF EUT

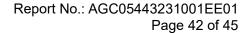


FRONT VIEW OF EUT



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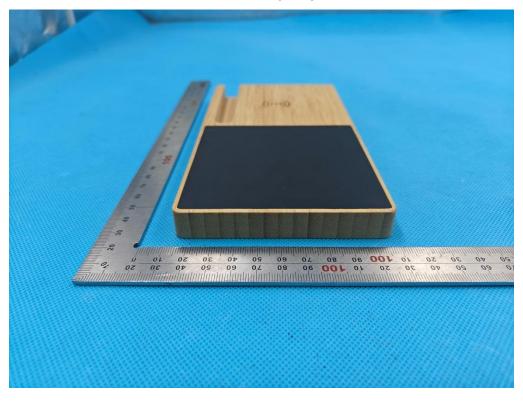


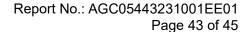


BACK VIEW OF EUT



LEFT VIEW OF EUT



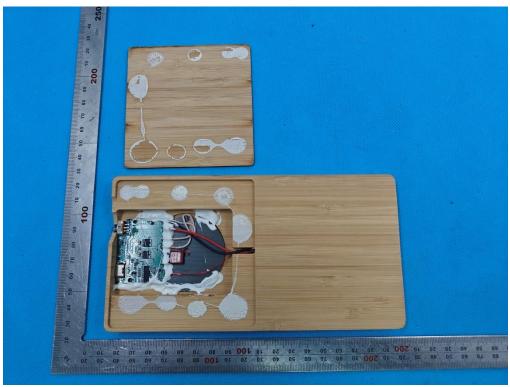




RIGHT VIEW OF EUT

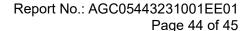


OPEN VIEW OF EUT(FIGURE 1)



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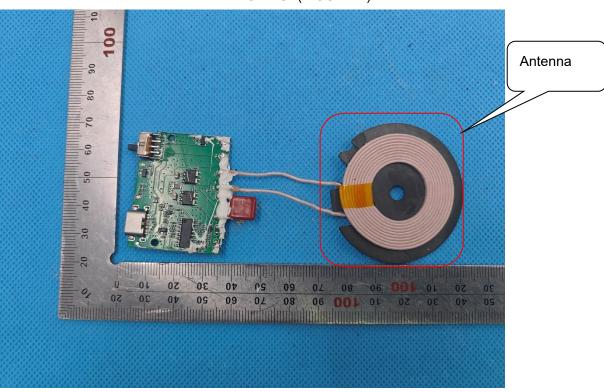


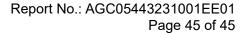


OPEN VIEW OF EUT(FIGURE 2)



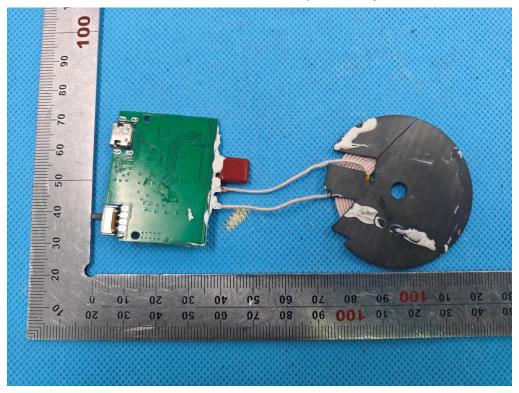
INTERNAL VIEW OF EUT(FIGURE 1)







INTERNAL VIEW OF EUT(FIGURE 2)



----End of Report----



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