

Test Report

Report No. : MTi250107021-0201E5
Date of issue : 2025-05-23
Applicant : Heltec Automation Technology Co., Ltd
Product : MeshPocket
Model(s) : HT-298A, HT-298B, HT-298C, HT-298D, HT-298G,
HT-298P, HT-298S, HT-298T, HT-298Z

Shenzhen Microtest Co., Ltd.

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Test Result Certification		
Applicant	Heltec Automation Technology Co., Ltd	
Applicant Address	1f, No.54,56,58, Zirui North Street,Gaoxin District, Chengdu	
Manufacturer	Heltec Automation Technology Co., Ltd	
Manufacturer Address	1f, No.54, 56, 58, Zirui North Street, Gaoxin District, Chengdu	
Product description		
Product name	MeshPocket	
Trademark		
Model name	HT-298A	
Series Model(s)	HT-298B, HT-298C, HT-298D, HT-298G, HT-298P, HT-298S, HT-298T, HT-298Z	
Standards	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	
Testing Information		
Date of test	2025-04-23 to 2025-05-19	
Test result	Pass	
Prepared by:	James Qin	
Reviewed by:	David Lee	
Approved by:	Lewis Lian	

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1 General Description

1.1 Description of the EUT

Product name:	MeshPocket
Model name:	HT-298A
Series Model:	HT-298B, HT-298C, HT-298D, HT-298G, HT-298P, HT-298S, HT-298T, HT-298Z
Model difference:	All the models are the same circuit and module, except the model name.
Electrical rating:	Type-C Input: DC 5V/3A, 9V/2.22A Type-C Output: DC 5V/3A, 9V/2.22A Battery: DC 3.87V 5000mAh 19.35Wh Wireless Output: 5W/7.5W/10W/15W
Accessories:	Cable: 1. USB-A Magnetic charging cable(60cm)*1 2. Type-C to Type-C cable(25cm) *1
Hardware version:	V1.0.0
Software version:	V1.0.0
Test sample(s) number:	MTi250107021-02-R001

1.2 Description of test modes

For test, the EUT has been pre-tested under the following test modes, Only the worst case data will be shown in the report.

No.	Emission test modes
Mode1	Charging(Type-C)+Wireless output: 5W+BT+LoRa
Mode2	Charging(Type-C)+Wireless output: 7.5W+BT+LoRa
Mode3	Wireless output: 5W
Mode4	Wireless output: 7.5W
Mode5	Wireless output: 10W
Mode6	Wireless output: 15W

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1.3 Environmental Conditions

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

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH (30% RH ~ 60% RH for ESD test)
Atmospheric pressure:	98 kPa ~ 101 kPa

1.4 Description of support units

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

Support equipment list

Description	Model	Serial No.	Manufacturer
wireless charging load	YBZ1.1	/	YBZ
Mobile phone	HUAWEI mate 30	/	HUAWEI
USB-C AC adapter(65W)	EP-TA865	/	SAMSUNG

Support cable list

Description	Length (m)	From	To
/	/	/	/

1.5 Measurement uncertainty

Measurement	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	±3.1dB
Radiated emissions (30MHz~1GHz)	±4.7dB
Radiated emissions (above 1GHz)	±5.1dB
Temperature	±1 °C
Humidity	± 5 %

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

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2 Summary of Test Result

No.	Item	Standard	Requirement	Result
1	Conducted emissions (AC power port)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 8.4 EN 301 489-17, clause 7.1	Pass
2	Radiated emissions (30MHz-1GHz)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 8.2 EN 301 489-17, clause 7.1	Pass
3	Radiated emissions (above 1GHz)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 8.2 EN 301 489-17, clause 7.1	Pass
4	Harmonic current emissions	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	Class A	N/A
5	Voltage fluctuations and flicker	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 8.6 EN 301 489-17, clause 7.1	Pass
6	Electrostatic discharge	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 9.3 EN 301 489-17, clause 7.2	Pass
7	Radio frequency electromagnetic field (80 MHz to 6 000 MHz)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 9.2 EN 301 489-17, clause 7.2	Pass
8	Fast transients, common mode (AC power port)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 9.4 EN 301 489-17, clause 7.2	Pass
9	Surges (AC power port)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 9.8 EN 301 489-17, clause 7.2	Pass
10	Radio frequency, common mode 0,15 MHz to 80 MHz (AC power port)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 9.5 EN 301 489-17, clause 7.2	Pass
11	Voltage dips and interruptions	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 301 489-1, clause 9.7 EN 301 489-17, clause 7.2	Pass

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3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573
IC Registration No.:	21760
CABID:	CN0093

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4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Conducted emissions (AC power port)						
1	EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2025-03-14	2026-03-13
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2025-03-18	2026-03-17
3	Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100263	2025-03-18	2026-03-17
Radiated emissions (30MHz-1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2025-03-14	2026-03-13
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Amplifier	Hewlett-Packard	8447F	3113A06184	2025-03-18	2026-03-17
Radiated emissions (above 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2025-03-14	2026-03-13
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-06-17	2025-06-16
3	Amplifier	Agilent	8449B	3008A01120	2025-03-18	2026-03-17
Voltage fluctuations and flicker						
1	Harmonics & Flicker Analyser	Laplace Instruments LTD	AC 2000A	311216	2025-03-14	2026-03-13
Electrostatic discharge						
1	Electrical Discharge Simulator	3CTEST	EDS 30V	ES031000420021	2024-05-06	2025-05-05
Radio frequency electromagnetic field (80 MHz to 6 000 MHz)						
1	Power Amplifier	micotop	MPA-80-1000-250	MPA1903081	2025-03-18	2026-03-17
2	Matrix Switch	micotop	MSW-80-6000-RS	MPA1903083	2025-03-19	2026-03-18
3	Power Amplifier	micotop	MPA-1000-6000-75	MPA1903082	2025-03-18	2026-03-17
4	Audio Analyzer	Agilent	U8903A	MY52140004	2025-03-18	2026-03-17
5	Stacked Log. Per. Broadband Antenna	Schwarzbeck	STLP 9129	00113	2023-04-26	2026-04-25
6	MXG RF Signal Generator	Agilent	N5181A	MY47420567	2025-03-18	2026-03-17
7	Power Sensor	Agilent	E9304A H18	MY41497225	2025-03-17	2026-03-16
8	Power Sensor	Agilent	E9304A H18	MY41499117	2025-03-17	2026-03-16
9	EPM Series Power Meter	Agilent	E4419B	MY45102877	2025-03-18	2026-03-17
Fast transients, common mode (AC power port)						

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No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
1	Electrical Fast Transient Generator	HTEC Instrument Ltd.	HEFT 51	153701	2025-03-13	2026-03-12
Surges (AC power port)						
1	Surge Generator	HTEC Instrument Ltd.	HCWG 51	153702	2025-03-13	2026-03-12
Radio frequency, common mode 0,15 MHz to 80 MHz (AC power port)						
1	Coupled Decoupling Network	Schloder	M2+M3-16A	A2210332/2015	2025-03-18	2026-03-17
Voltage dips and interruptions						
1	Cycle Sag Simulator	Prima	DRP61011AG	PR15056303	2025-03-13	2026-03-12

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5 Evaluation Results (Evaluation)

5.1 Harmonic current emissions

Test Requirement:	Class A
Test Limit:	Not specified

5.1.1 Conclusion:

Refer to EN IEC 61000-3-2 clause 7.1:

"For the following categories of equipment, limits are not specified in this document:

- lighting equipment with a rated power less than but not equal to 5 W;
- equipment with a rated power of 75 W or less, other than lighting equipment;"

Since the rated power of the EUT is less than above described, it is deemed to comply with the requirement.

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6 Emission Test Results (EMI)

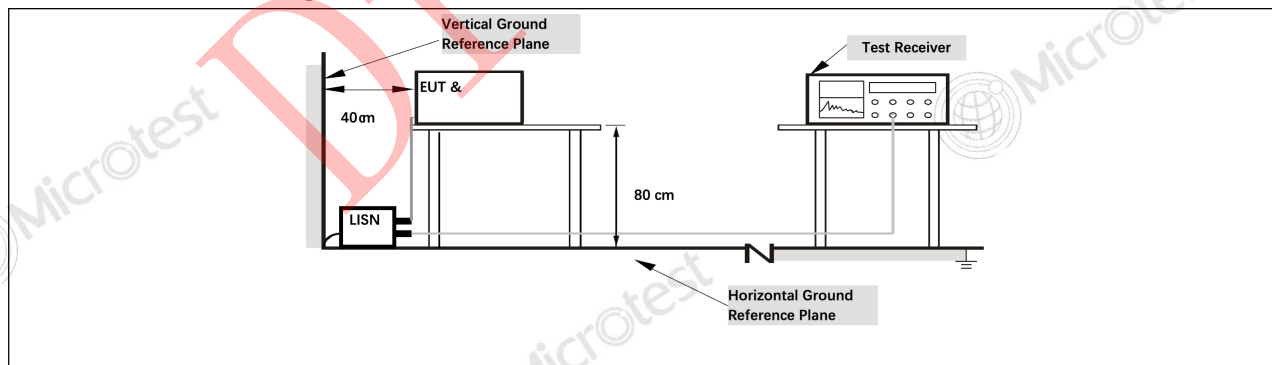
6.1 Conducted emissions (AC power port)

Test Requirement:	EN 301 489-1, clause 8.4 EN 301 489-17, clause 7.1		
Test Limit:	Frequency Range (MHz)	Detector Type / Bandwidth	Limit (dBuV)
	0.15 to 0.5	Quasi Peak / 9 kHz	66 to 56
	0.5 to 5	Quasi Peak / 9 kHz	56
	5 to 30	Quasi Peak / 9 kHz	60
	0.15 to 0.5	Average / 9 kHz	56 to 46
	0.5 to 5	Average / 9 kHz	46
	5 to 30	Average / 9 kHz	50
Test Method:	EN 55032, annex A.3		
Procedure:	An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. Remark: Level= Read Level+ Cable Loss+ LISN Factor		

6.1.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25.9 °C	Humidity:	55 %	Atmospheric Pressure:	100 kPa
Pre test mode:		Mode1, Mode2			
Final test mode:		All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report			

6.1.2 Test Setup Diagram:

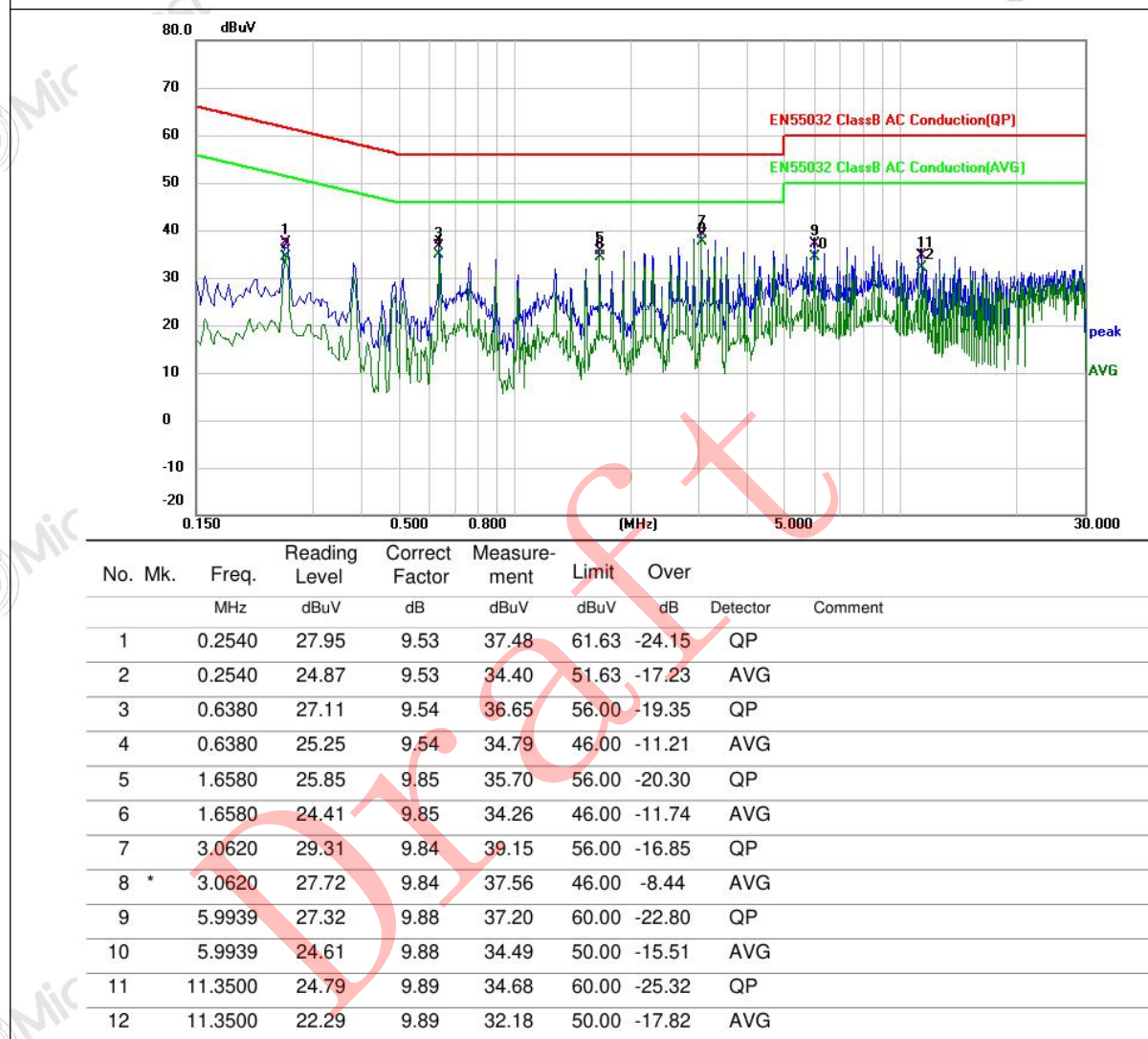


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6.1.3 Test Data:

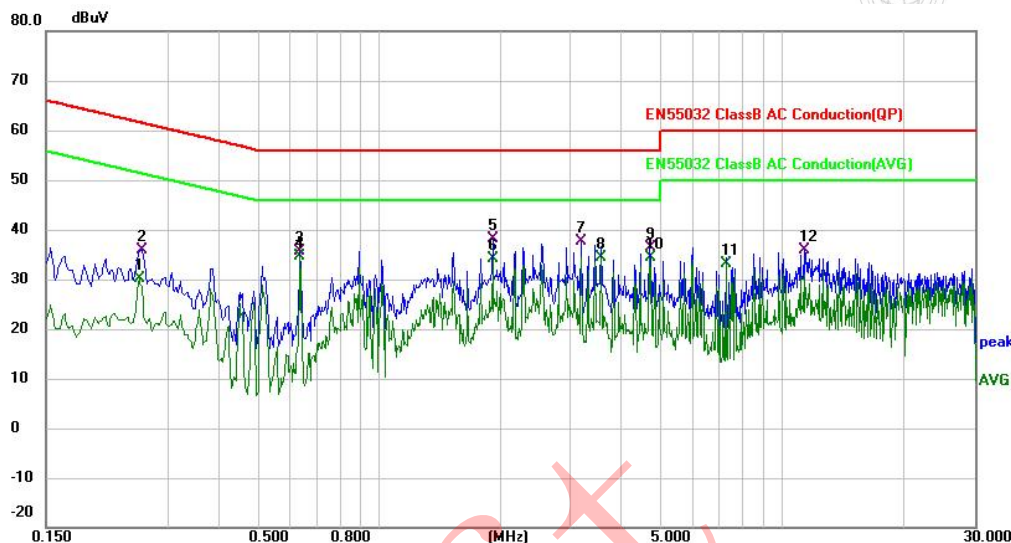
Mode2 / Line: Line



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Mode2 / Line: Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2540	20.36	9.80	30.16	51.63	-21.47	AVG	
2		0.2580	26.16	9.79	35.95	61.50	-25.55	QP	
3		0.6380	25.83	9.81	35.64	56.00	-20.36	QP	
4	*	0.6380	24.75	9.81	34.56	46.00	-11.44	AVG	
5		1.9140	28.42	9.75	38.17	56.00	-17.83	QP	
6		1.9140	24.31	9.75	34.06	46.00	-11.94	AVG	
7		3.1860	27.83	9.85	37.68	56.00	-18.32	QP	
8		3.5700	24.35	9.94	34.29	46.00	-11.71	AVG	
9		4.7180	26.50	9.95	36.45	56.00	-19.55	QP	
10		4.7180	24.32	9.95	34.27	46.00	-11.73	AVG	
11		7.2700	23.09	9.92	33.01	50.00	-16.99	AVG	
12		11.3500	26.11	9.87	35.98	60.00	-24.02	QP	

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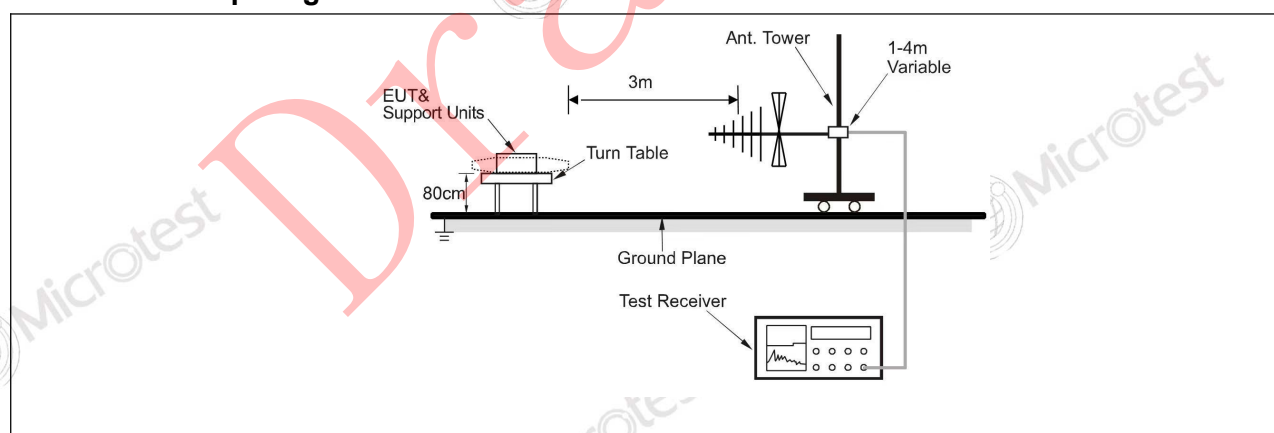
6.2 Radiated emissions (30MHz-1GHz)

Test Requirement:	EN 301 489-1, clause 8.2 EN 301 489-17, clause 7.1		
Test Limit:	FREQUENCY (MHz)	dB(μ V/m) At 10m	dB(μ V/m) At 3m
	30MHz-230MHz	30	40
	230MHz-1GHz	37	47
	Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz		
Test Method:	EN 55032, annex A.2		
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor		

6.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.8 °C	Humidity:	54 %	Atmospheric Pressure:	99.8 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report				

6.2.2 Test Setup Diagram:

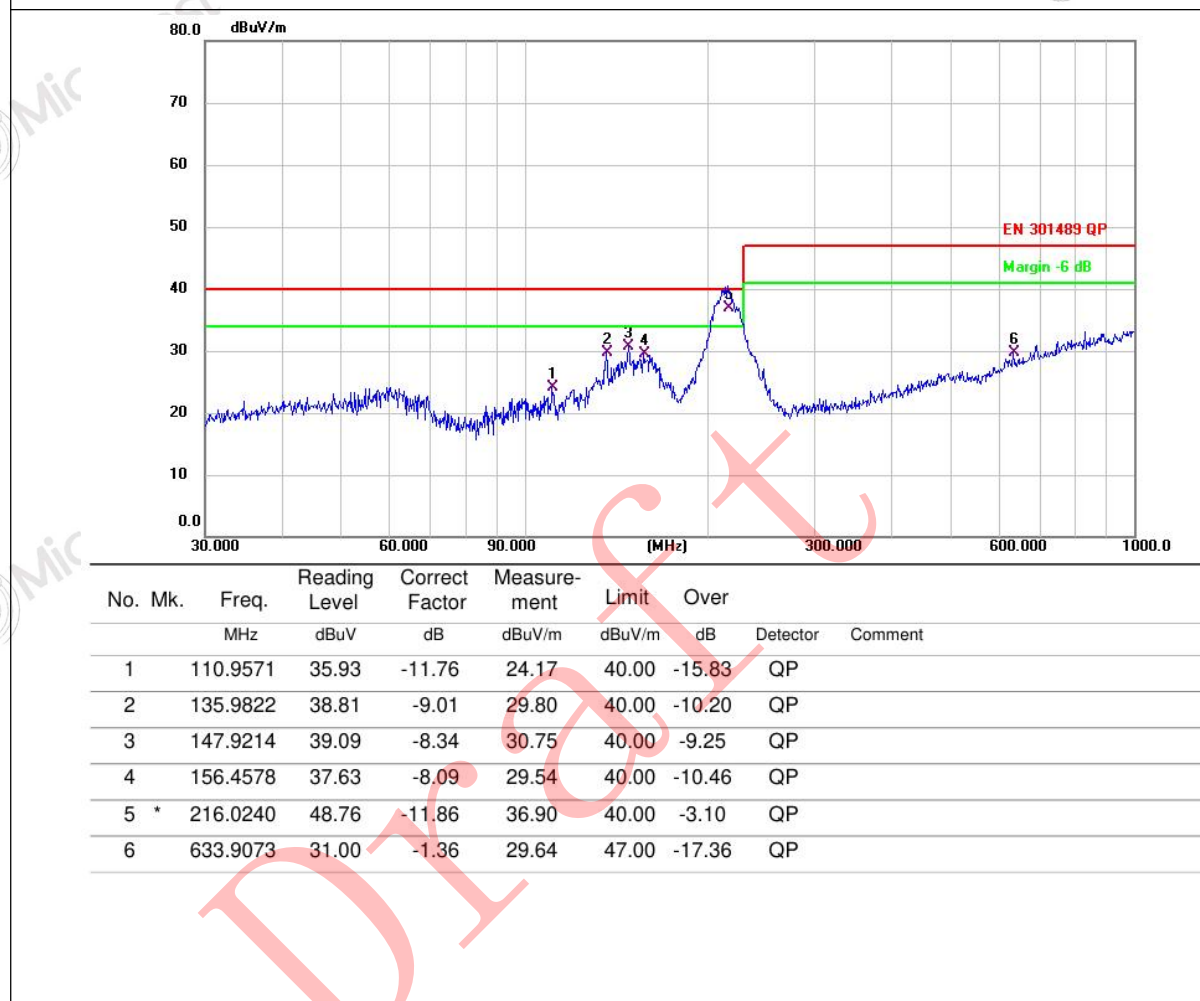


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6.2.3 Test Data:

Mode1 / Polarization: Horizontal



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Mode1 / Polarization: Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		44.1202	40.07	-8.74	31.33	40.00	-8.67	QP	
2	!	57.5939	44.93	-9.63	35.30	40.00	-4.70	QP	
3	!	61.3463	45.95	-9.96	35.99	40.00	-4.01	QP	
4		110.9571	41.95	-11.76	30.19	40.00	-9.81	QP	
5		135.5062	39.57	-9.06	30.51	40.00	-9.49	QP	
6	*	213.7634	48.67	-11.94	36.73	40.00	-3.27	QP	

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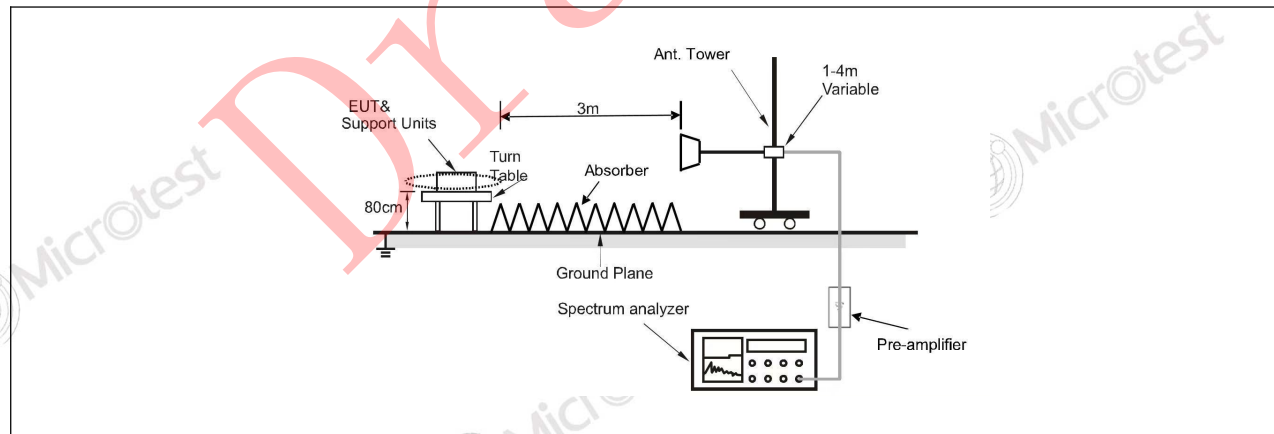
6.3 Radiated emissions (above 1GHz)

Test Requirement:	EN 301 489-1, clause 8.2 EN 301 489-17, clause 7.1		
Test Limit:	Frequency range (MHz)		Radiated emissions limit (dBuV/m)
			Peak Average
	1000 to 3000		70 50
	3000 to 6000		74 54
	Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000MHz to 6000MHz		
Test Method:	EN 55032, annex A.2		
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor		

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25.9 °C	Humidity:	54 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report				

6.3.2 Test Setup Diagram:

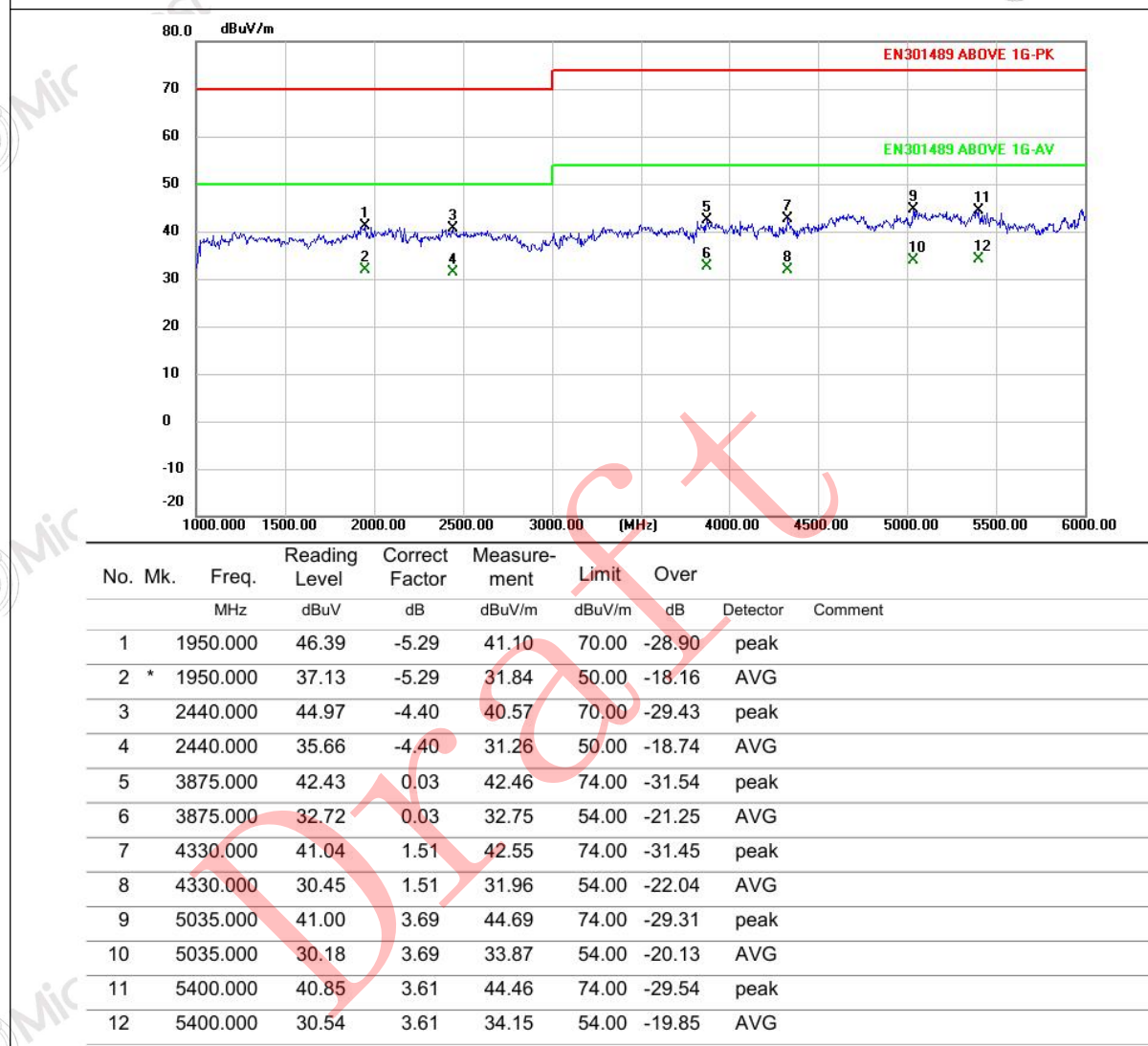


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6.3.3 Test Data:

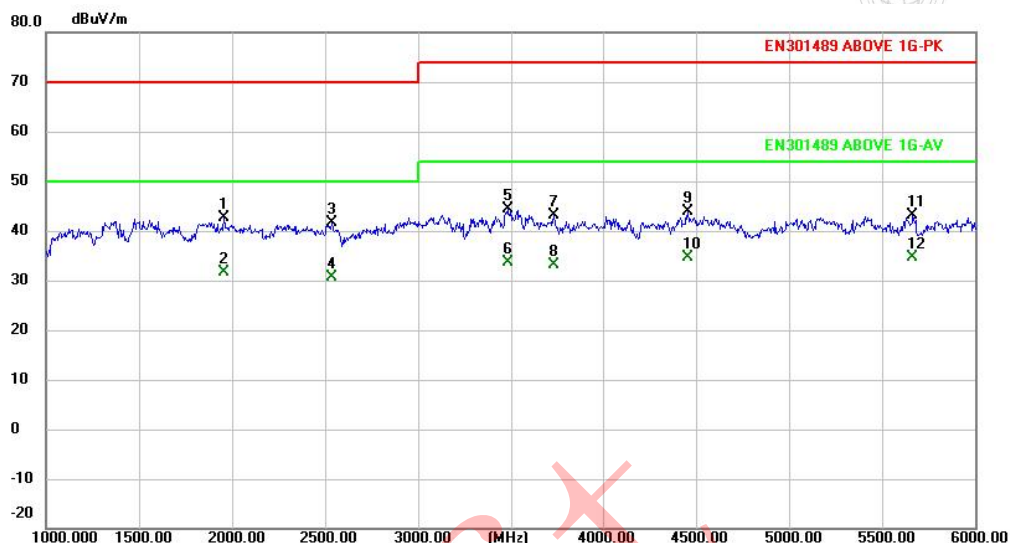
Mode1 / Polarization: Horizontal



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Mode1 / Polarization: Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1955.000	47.83	-5.27	42.56	70.00	-27.44	peak	
2	*	1955.000	36.79	-5.27	31.52	50.00	-18.48	AVG	
3		2535.000	45.80	-4.22	41.58	70.00	-28.42	peak	
4		2535.000	34.96	-4.22	30.74	50.00	-19.26	AVG	
5		3480.000	45.82	-1.32	44.50	74.00	-29.50	peak	
6		3480.000	35.00	-1.32	33.68	54.00	-20.32	AVG	
7		3735.000	43.56	-0.55	43.01	74.00	-30.99	peak	
8		3735.000	33.80	-0.55	33.25	54.00	-20.75	AVG	
9		4455.000	42.10	1.89	43.99	74.00	-30.01	peak	
10		4455.000	32.72	1.89	34.61	54.00	-19.39	AVG	
11		5665.000	39.30	3.90	43.20	74.00	-30.80	peak	
12		5665.000	30.67	3.90	34.57	54.00	-19.43	AVG	

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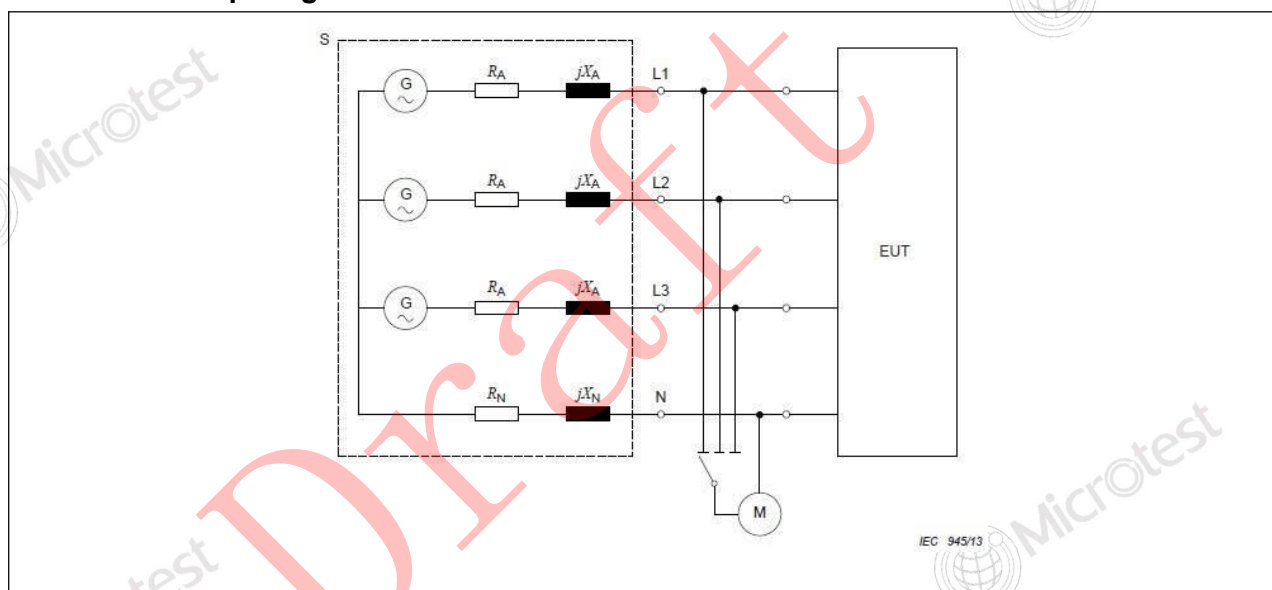
6.4 Voltage fluctuations and flicker

Test Requirement:	EN 301 489-1, clause 8.6 EN 301 489-17, clause 7.1
Test Limit:	EN 61000-3-3, clause 5
Test Method:	EN 61000-3-3, clause 6

6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25.3 °C	Humidity:	53 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report				

6.4.2 Test Setup Diagram:



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6.4.3 Test Data:

HA-PC Link Plus. Software v4.00. Firmware v4.02
Report Number :282
Tested On : 25 April 2025 10:49 for 600 Seconds.
Serial Number : MTi250107021-0202
Tested by : Ryan

Load Power : 12.6 W 31.8 VA Power Factor 0.396
Load Current : 0.1 Arms 0.7 Apk Crest Factor 4.741

EN 61000-3-3:2013 - Voltage reduction is positive

Voltage Variations

Nominal Voltage: 230 Vrms
Highest Half-cycle level: -0.11%
Lowest Half-cycle level: +0.77%

d(max): -0.21% Limit: 4% PASS
t(max): 0.00seconds Limit: 500ms PASS

Steady State definition: >1000ms within +/- 0.2%
Largest d(c) change down: +0.02%
Largest d(c) change up: -0.00%
Largest d(c) change: +0.02% Limit: 3.3% PASS

Flicker

Short Term Flicker Pst: 0.00 Limit: 1.00 PASS

Pst Classifier Plt Calculation

Duration Flicker Interval Pst

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

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7 Immunity Test Results (EMS)

Performance Criteria for ETSI EN 301 489-1 V2.2.3 (2019-11)

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.

Continuous and non-continuous operation

Latency is the time delay between the initiation and the completion of operation of the EUT.

Correct functioning requires completing the relevant operation within the maximum latency time.

Where the maximum latency is specified in the applicable harmonised radio standard (in the wanted performance criterion, or an acknowledge requirement), that value shall be used.

Where this is not the case, then the maximum latency is that required by the intended use of the EUT.

Operating modes

Where the EUT has more than one mode of operation (see clause 4.4.1), an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in all modes to confirm there are no such unintentional responses.

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.

Continuous and non-continuous operation

Latency is the time delay between the initiation and the completion of operation of the EUT.

Correct functioning requires completing the relevant operation within the maximum latency time.

Where the maximum latency is specified in the applicable harmonised radio standard (in the wanted performance criterion, or an acknowledge requirement), that value shall be used.

Where this is not the case, then the maximum latency is that required by the intended use of the EUT.

Operating modes

Where the EUT has more than one mode of operation (see clause 4.4.1), an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in all modes to confirm there are no such unintentional responses.

Performance Criteria for ETSI EN 301 489-17 V3.2.4 (2020-09)

Performance criteria

General performance criteria

The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following

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clauses.

Performance table

Performance criteria overview

Table 2: Performance criteria

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

Minimum performance level

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

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

Performance criteria for Continuous phenomena

The performance criteria A shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.

Performance criteria for Transient phenomena

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

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur as a result of the application of the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur as a result of the application of the test.

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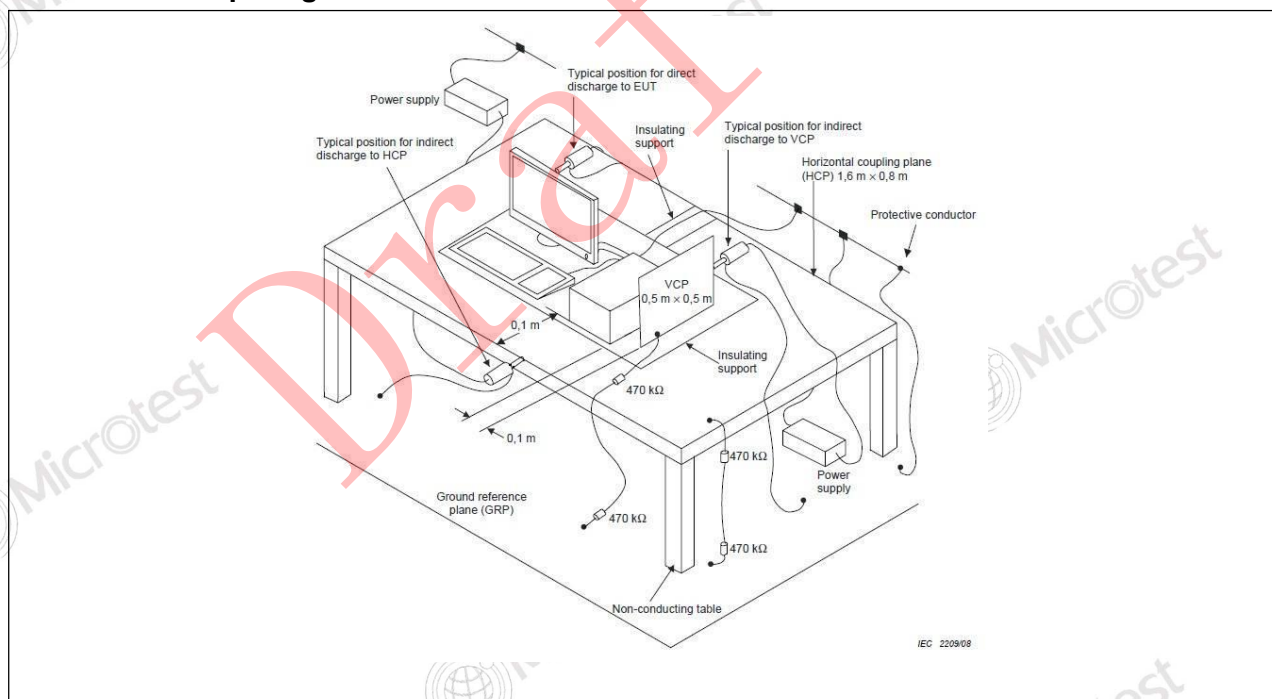
7.1 Electrostatic discharge

Test Requirement:	EN 301 489-1, clause 9.3 EN 301 489-17, clause 7.2
Test Method:	EN 61000-4-2, clauses 6, 7 and 8
Procedure:	Discharge Impedance: 330Ω/150pF Number of Discharge: Minimum 10 times at each test point Discharge Mode: Single Discharge Discharge Period: 1 second minimum
Performance Criteria:	TT(B), TR(B)

7.1.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.2 °C	Humidity:	43 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report				

7.1.2 Test Setup Diagram:



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7.1.3 Test Data:

Discharge type	Volt (kV)	Polarity	Test Point	Result/ Observations
Air discharge	2,4,8	+	1	A
Air discharge	2,4,8	-	1	A
Contact discharge	4	+	2	A
Contact discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

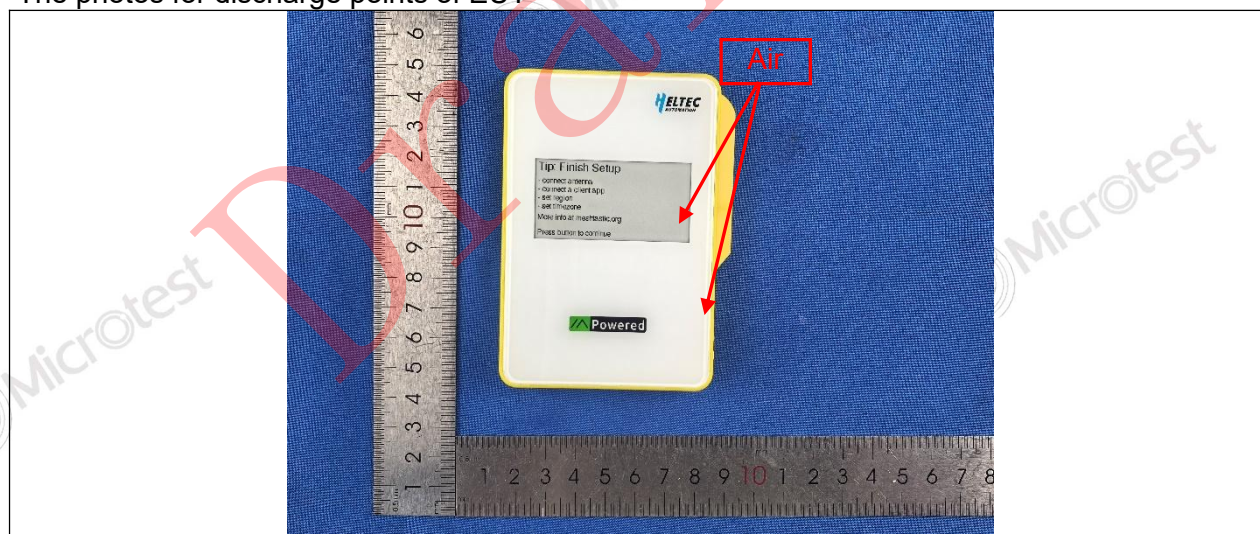
Test Point: 1. All insulated enclosure and seams.

2. All accessible metal parts of the enclosure.

3. All side.

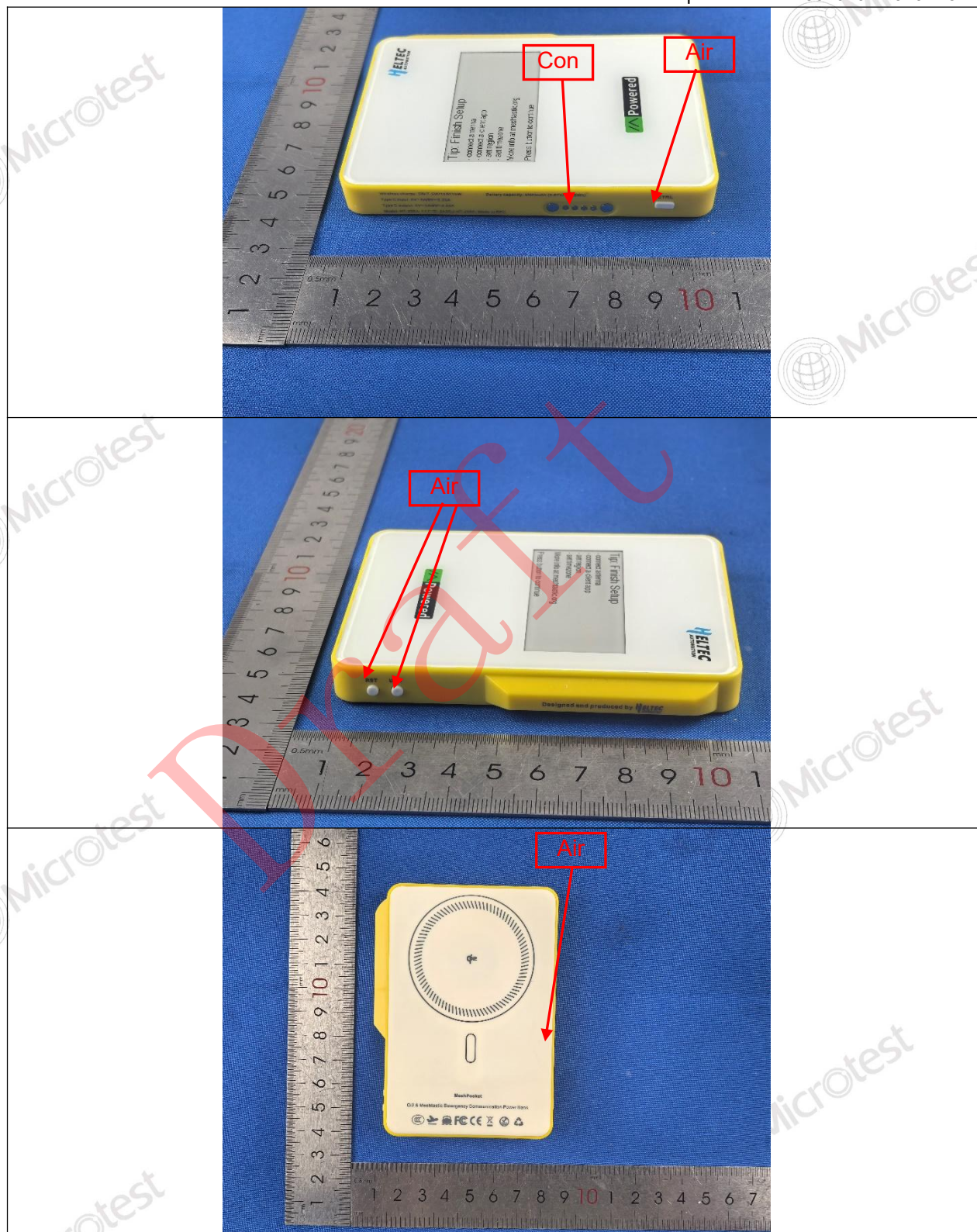
A: No degradation in the performance of the EUT was observed.

The photos for discharge points of EUT



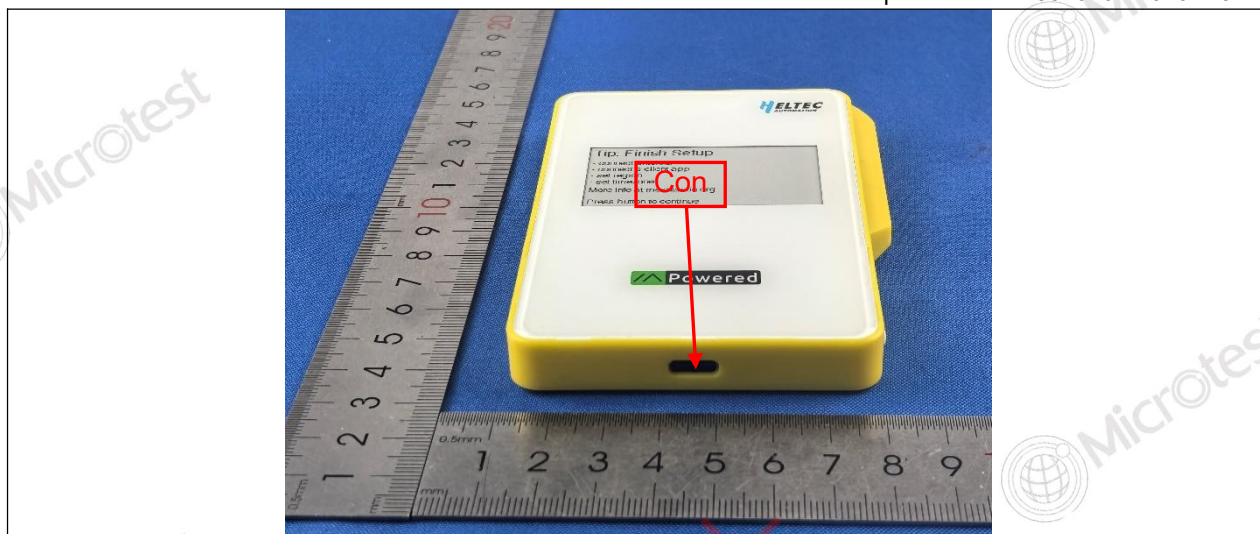
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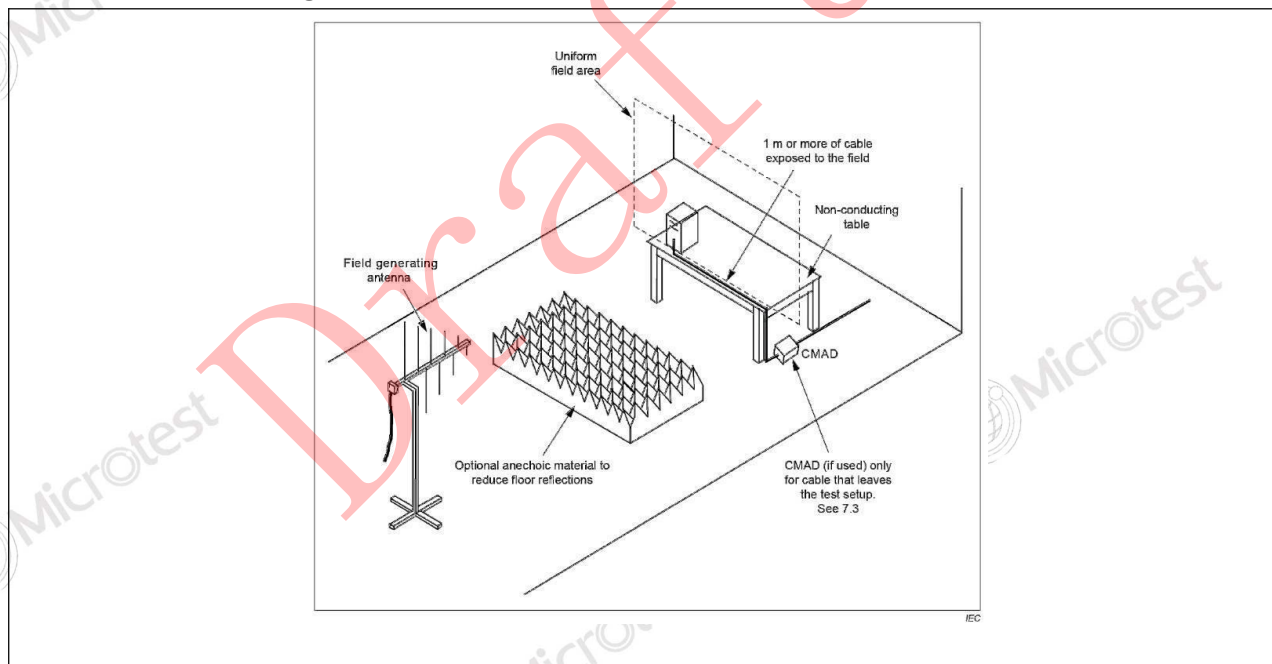
7.2 Radio frequency electromagnetic field (80 MHz to 6 000 MHz)

Test Requirement:	EN 301 489-1, clause 9.2 EN 301 489-17, clause 7.2
Test Method:	EN 61000-4-3, clauses 6, 7 and 8
Procedure:	Frequency Range: 80MHz to 6GHz Antenna Polarisation: Vertical and Horizontal Modulation: 1kHz,80% Amp. Mod,1% increment
Performance Criteria:	CT(A), CR(A)

7.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	26.4 °C	Humidity:	55 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report				

7.2.2 Test Setup Diagram:



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7.2.3 Test Data:

Frequency	Field Strength (V/m)	EUT face	Dwell time	Result/ Observations
80MHz-6GHz	3	Front	3s	A
80MHz-6GHz	3	Back	3s	A
80MHz-6GHz	3	Left	3s	A
80MHz-6GHz	3	Right	3s	A
80MHz-6GHz	3	Top	3s	A
80MHz-6GHz	3	Bottom	3s	A

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

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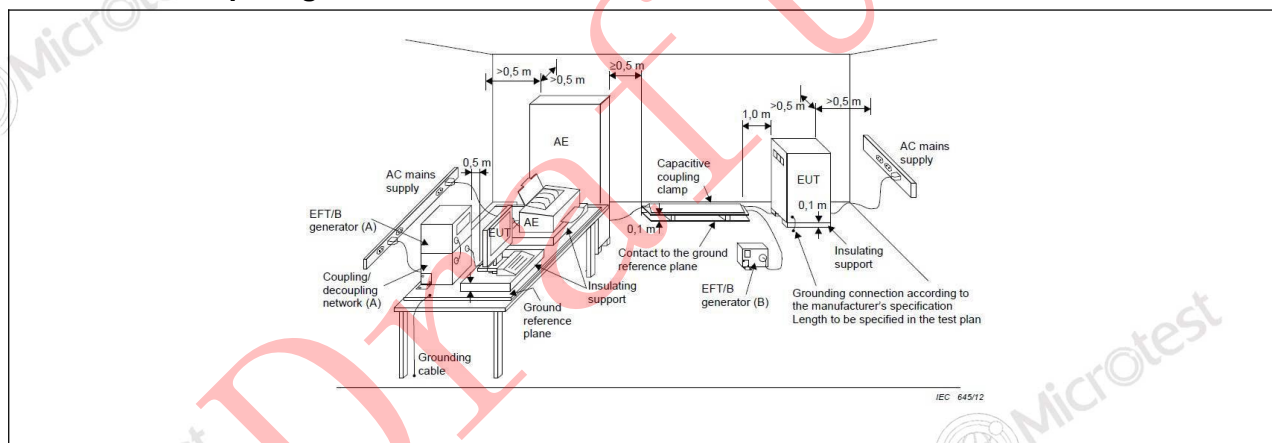
7.3 Fast transients, common mode (AC power port)

Test Requirement:	EN 301 489-1, clause 9.4 EN 301 489-17, clause 7.2
Test Method:	EN 61000-4-4, clauses 5
Procedure:	Repetition Frequency: 5kHz Burst Period: 300ms
Performance Criteria:	TT(B), TR(B)

7.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	24.3 °C	Humidity:	63 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report				

7.3.2 Test Setup Diagram:



7.3.3 Test Data:

Port	Volt (kV)	Polarity	CDN/ Clamp	Result/ Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A

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

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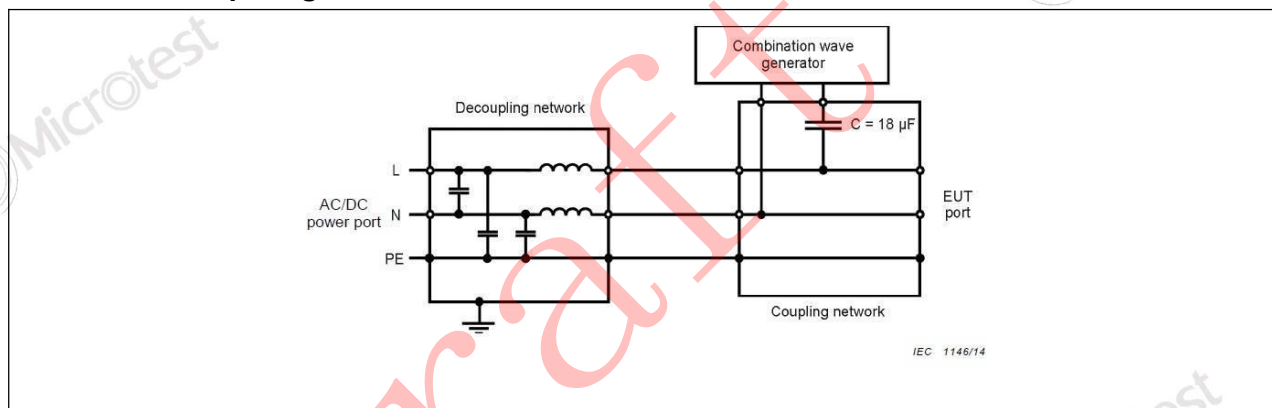
7.4 Surges (AC power port)

Test Requirement:	EN 301 489-1, clause 9.8 EN 301 489-17, clause 7.2
Test Method:	EN 61000-4-5, clauses 7 and 8
Performance Criteria:	TT(B), TR(B)

7.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	24.3 °C	Humidity:	63 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report				

7.4.2 Test Setup Diagram:



7.4.3 Test Data:

Port	Volt (kV)	Polarity	Phase(degree)	Result/ Observations
L-N	1	+	0°	A
L-N	1	-	0°	A
L-N	1	-	90°	A
L-N	1	+	90°	A
L-N	1	-	180°	A
L-N	1	+	180°	A
L-N	1	+	270°	A
L-N	1	-	270°	A

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

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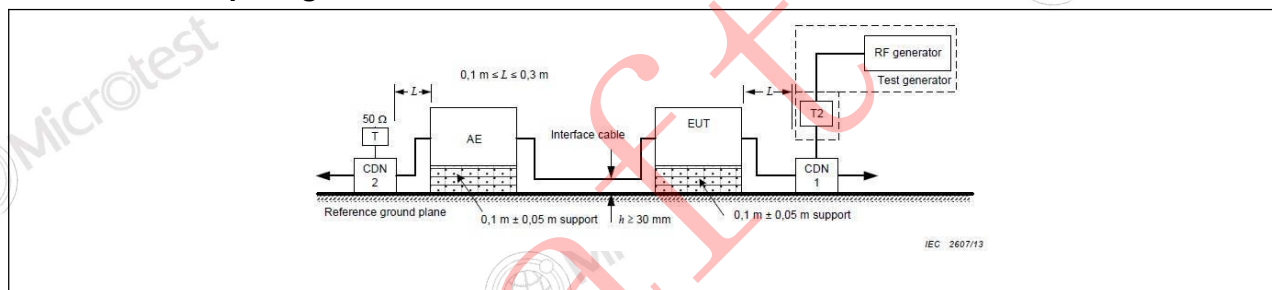
7.5 Radio frequency, common mode 0,15 MHz to 80 MHz (AC power port)

Test Requirement:	EN 301 489-1, clause 9.5 EN 301 489-17, clause 7.2
Test Method:	EN 61000-4-6, clauses 6 and 8
Performance Criteria:	CT(A), CR(A)

7.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	64 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report				

7.5.2 Test Setup Diagram:



7.5.3 Test Data:

Port	Strength (Vrms)	CDN/Clamp	Dwell time	Result/ Observations
AC power port	3	CDN	3s	A

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

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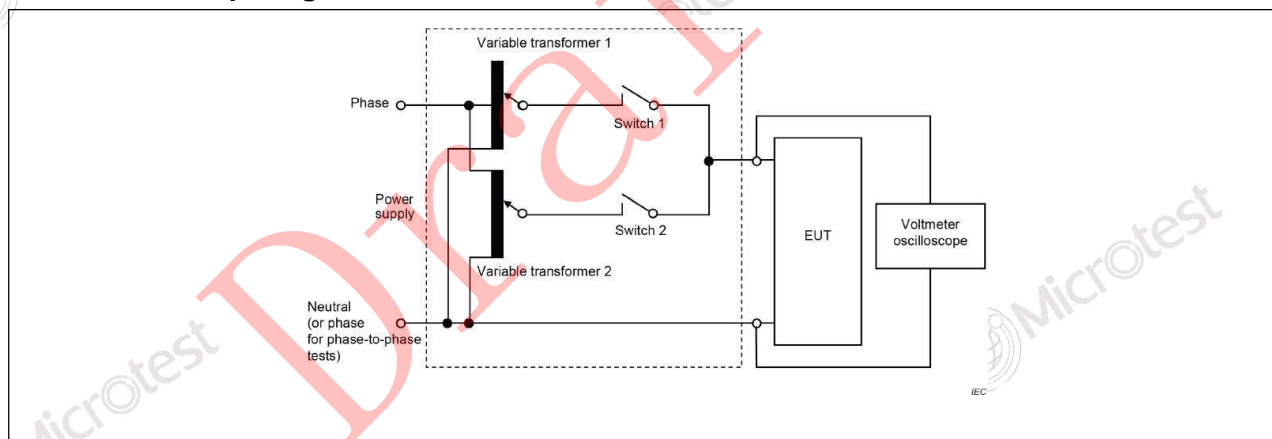
7.6 Voltage dips and interruptions

Test Requirement:	EN 301 489-1, clause 9.7 EN 301 489-17, clause 7.2
Test Method:	EN 61000-4-11, clause 8 The test levels shall be: - voltage dip: 0 % residual voltage for 0,5 cycle; - voltage dip: 0 % residual voltage for 1 cycle; - voltage dip: 70 % residual voltage for 25 cycles (at 50 Hz); - voltage interruption: 0 % residual voltage for 250 cycles (at 50 Hz).
Performance Criteria:	Voltage dips: TT(B), TR(B) Voltage interruptions: TT(C), TR(C)

7.6.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	64 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report				

7.6.2 Test Setup Diagram:



7.6.3 Test Data:

Level %UT	Phase (degree)	Duration	No. of Dips/ Interruptions	Result/ Observations
0	0°	0.5 Cycles	3	A
0	180°	0.5 Cycles	3	A
0	0°	1 Cycles	3	A
0	180°	1 Cycles	3	A
0	0°	250 Cycles	3	B
0	180°	250 Cycles	3	B
70	0°	25 Cycles	3	A
70	180°	25 Cycles	3	A

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

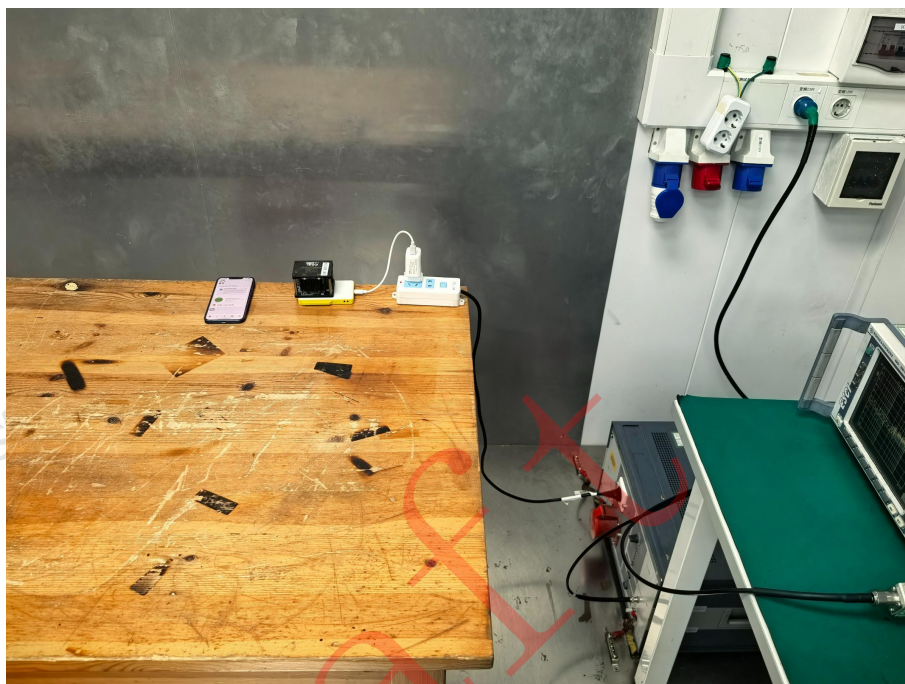
B: The EUT stopped operation during the test, but it can be recovered automatically after test.

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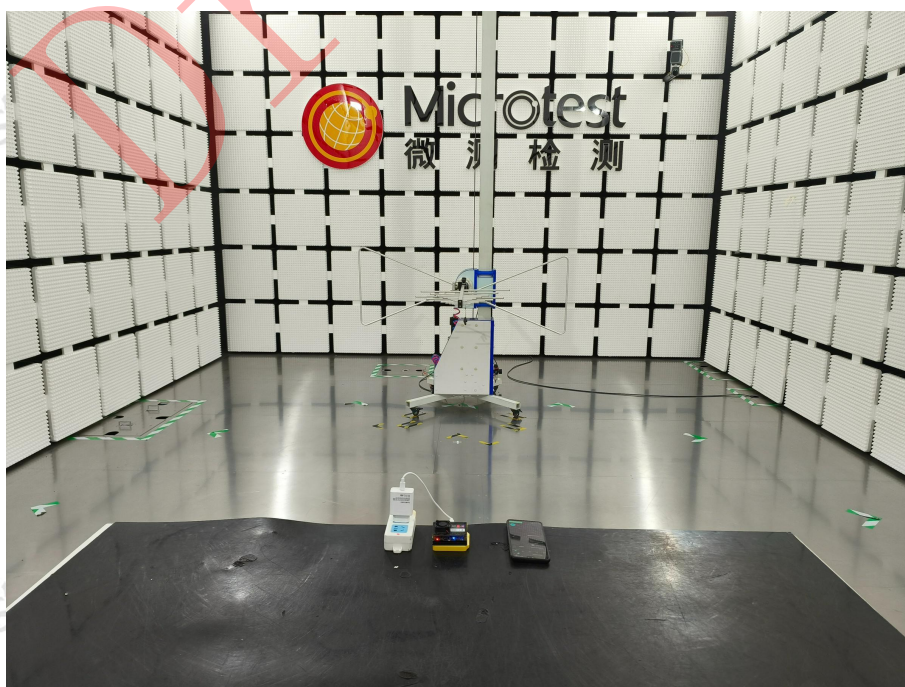
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Photographs of the test setup

Conducted emissions (AC power port)



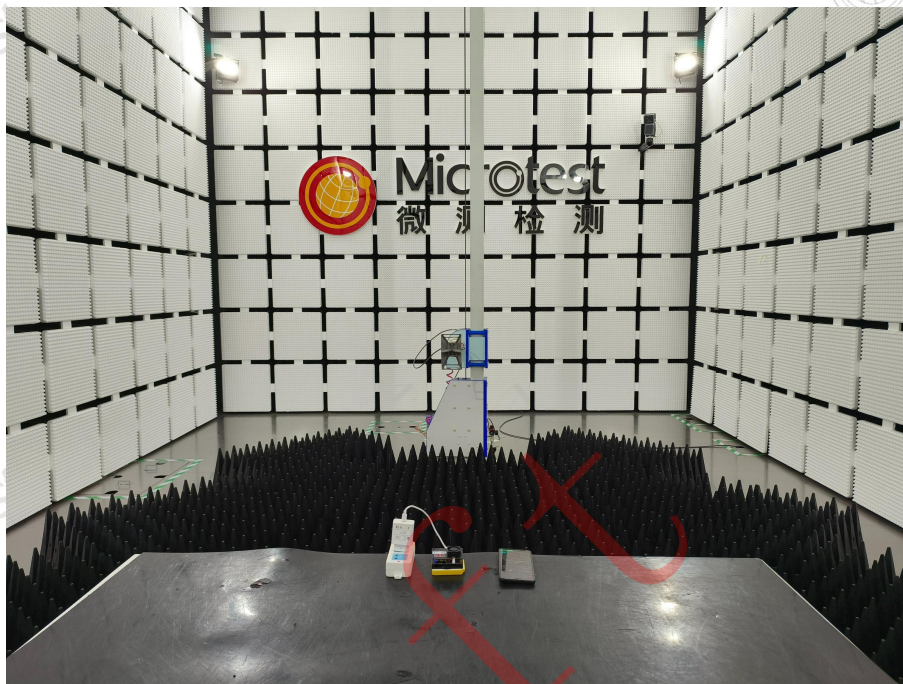
Radiated emissions (30MHz-1GHz)



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Radiated emissions (above 1GHz)



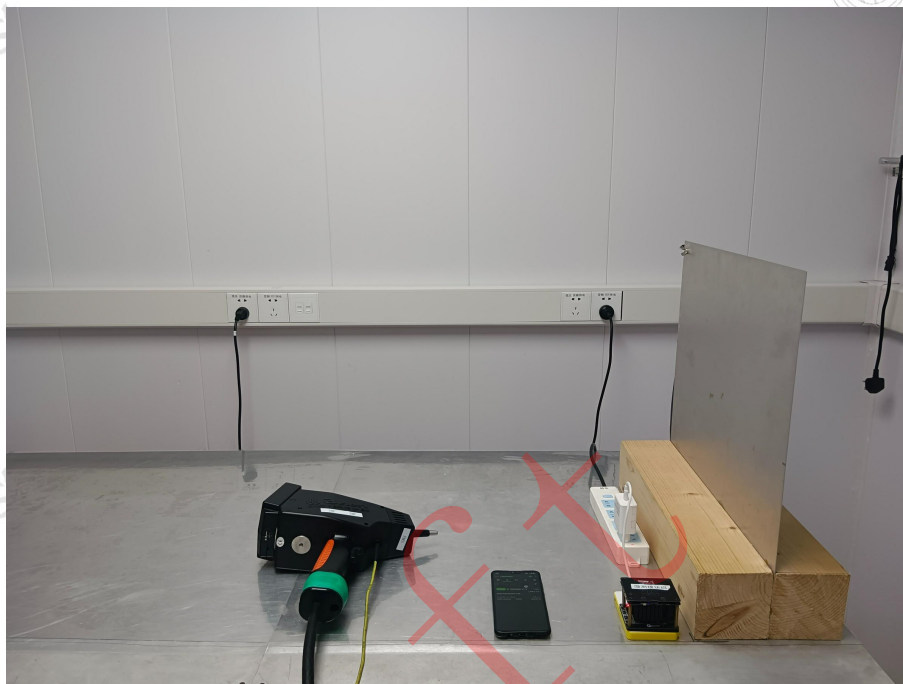
Voltage fluctuations and flicker



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Electrostatic discharge



Radio frequency electromagnetic field (80 MHz to 6 000 MHz)



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Fast transients, common mode (AC power port)



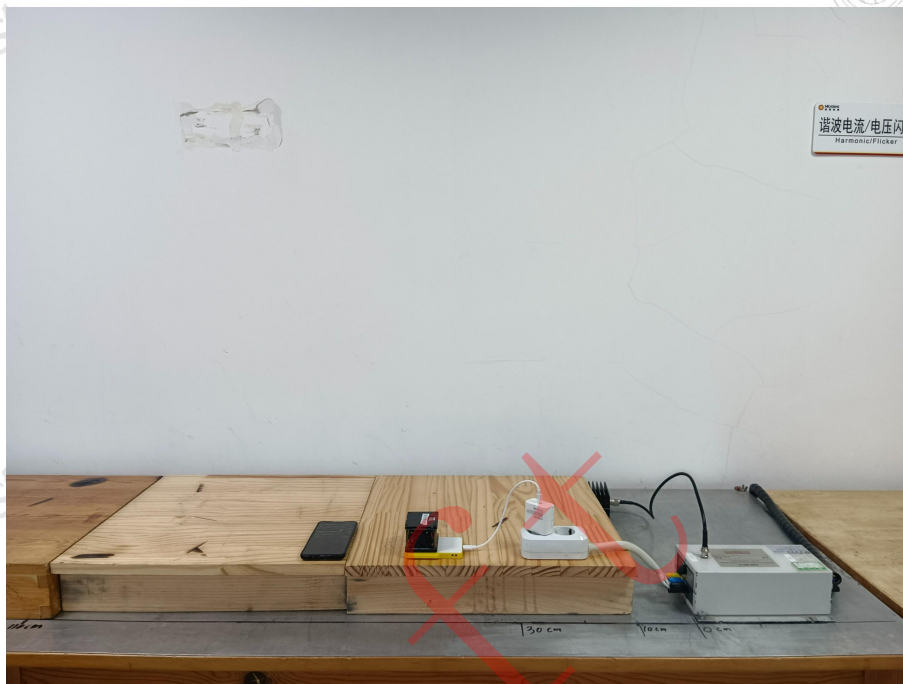
Surges (AC power port)



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Radio frequency, common mode 0,15 MHz to 80 MHz (AC power port)



Voltage dips and interruptions



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Photographs of the EUT

Refer to Appendix - EUT Photos

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Statement

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2. The test results of this report are only responsible for the samples submitted. Client shall be responsible for representativeness of the sample and authenticity of the material.
3. The report shall not be partially reproduced without the written consent of the Laboratory.
4. This report is invalid if transferred, altered or tampered with in any form without authorization.
5. The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.
6. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

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