



Shenzhen Global Test Service Co.,Ltd.

Room No. 101, Building 1, and Room No. 101, Building 3,
No. 88 Jinkang Road, Jinsha Community, Kengzi Sub-district,
Pingshan District, Shenzhen City, Guangdong, China



中国认可
国际互认
检测
TESTING
CNAS L8169

TEST REPORT

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

ETSI EN 301 489-17 V3.3.1 (2024-09)

EN 55032:2015+A11:2020+A1:2020/ EN 55035:2017+A11:2020

Report Reference No. : GTS20260702010-1-01

Compiled by

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Jason Hu



Date of issue : Jul.21, 2026

Representative Laboratory Name : Shenzhen Global Test Service Co.,Ltd.

Address : Room No. 101, Building 1, and Room No. 101, Building 3, No. 88
Jinkang Road, Jinsha Community, Kengzi Sub-district, Pingshan
District, Shenzhen City, Guangdong, China

Applicant's name : Ningbo Vamson Import and Export Trade Co.,Ltd

Address : Rm 1108, Fukang Bldg., No 666 Sangtian Rd., Yinzhou Dist.,
Ningbo, Zhejiang, China

Test specification :

Standard : ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-17 V3.3.1 (2024-09)
EN 55032:2015+A11:2020+A1:2020/EN 55035:2017+A11:2020
TRF Originator : Shenzhen Global Test Service Co.,Ltd.
Master TRF : Dated 2014-12

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Test item description : Recharg. Smart Tag Card Android

Trade Mark : N/A

Manufacturer : morethanmerchandise GmbH

Model/Type reference : 4068134200938 F17

List Model : BR2606023

Ratings : DC 3.7V by battery
Recharged by DC 5.0V

Result : PASS

TEST REPORT

Test Report No. :	GTS20260702010-1-01	Jul.21, 2026
		Date of issue

Equipment under Test : Recharg. Smart Tag Card Android

Model /Type : 4068134200938 F17

Listed model : BR2606023

Applicant : **Ningbo Vamson Import and Export Trade Co.,Ltd**

Address : Rm 1108, Fukang Bldg., No 666 Sangtian Rd.,Yinzhou Dist., Ningbo, Zhejiang, China

Manufacturer : **morethanmerchandise GmbH**

Address : Bollhörnkai 1 • D-24103 Kiel • Germany

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

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1. TEST STANDARDS

The tests were performed according to following standards:

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

[ETSI EN 301 489-17 V3.3.1 \(2024-09\)](#)—ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband and Wideband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility

[EN 55032:2015+A11:2020+A1:2020](#) Electromagnetic compatibility of multimedia equipment - Emission Requirements

[EN 55035:2017+A11:2020](#) Electromagnetic compatibility of multimedia equipment - Immunity requirements

[EN IEC 61000-3-2:2019+A1:2021+A2:2024](#) Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

[EN 61000-3-3:2013+A2:2021](#) Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Jul.06, 2026
Testing commenced on	:	Jul.06, 2026
Testing concluded on	:	Jul.20, 2026

2.2. Product Description

Product Name:	Recharg. Smart Tag Card Android
Trade Mark:	N/A
Model/Type reference:	4068134200938 F17
List Model:	BR2606023
Model Declaration	PCB board, structure and internal of these model(s) are the same, Only the model name different , So no additional models were tested.
Power supply:	DC 3.7V by battery Recharged by DC 5.0V
Hardware Version	N/A
Software Version	N/A
Bluetooth	
Frequency Range	2402MHz ~ 2480MHz
Channel Number	40 channels for Bluetooth (DTS)
Channel Spacing	2MHz for Bluetooth (DTS)
Modulation Type	GFSK for Bluetooth (DTS)
Antenna Description	PCB antenna, 0dBi(Max.) for Bluetooth

2.3. EUT operation mode

Test mode	Bluetooth	DC IN
1	■	■
2		■

Note:

1. ■ is operation mode.

Pre-scan above all test mode, found below test mode which it was worse case mode. Test results reported represents the worst case simultaneous transmission condition.

Pre-test conducted emission and radiated emission at both voltage AC 120V/60Hz and AC 230V/50Hz, recorded worst case.

Test item	Test mode (Worse case mode)
Conducted emission	Mode 1
Radiated emission	Mode 1
EMS	All Mode

2.4. EUT configuration

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

○ - supplied by the manufacturer

● - supplied by the lab

○	Adapter	M/N:	ESM-050200
		Manufacturer:	--

2.5. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.

Room No. 101, Building 1, and Room No. 101, Building 3, No. 88 Jinkang Road, Jinsha Community, Kengzi Sub-district, Pingshan District, Shenzhen City, Guangdong, China

3.2. Test Facility

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

CNAS (No. CNAS L8169)

Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)

Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

Industry Canada Registration Number. is 24189.

FCC Designation Number is CN1401.

FCC Registered Test Site Number is 684561.

3.3. Environmental conditions

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

Normal Temperature:	15-35 ° C
Lative Humidity	30-60 %
Air Pressure	950-1050mbar

3.4. Statement of the measurement uncertainty

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

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)

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

3.5. Test Description

Emission Measurement		
Radiated Emission	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 55032:2015+A11:2020+A1:2020	PASS
Conducted Emission	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 55032:2015+A11:2020+A1:2020	PASS
Harmonic Current Emissions	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN IEC 61000-3-2:2019+A1:2021+A2:2024	N/A
Voltage Fluctuations and Flicker	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 61000-3-3:2013+A2:2021	PASS
Immunity Measurement		
Electrostatic Discharge	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 55035:2017+A11:2020	PASS
RF Electromagnetic Field	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 55035:2017+A11:2020	PASS
Fast Transients Common Mode	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 55035:2017+A11:2020	PASS
RF Common Mode 0,15 MHz to 80 MHz	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 55035:2017+A11:2020	PASS
Voltage Dips and Interruptions	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 55035:2017+A11:2020	PASS
Surges	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 55035:2017+A11:2020	PASS

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

3.6. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Calibration Due Date
1	EMI Test Receiver	R&S	ESPI 3	/	2025/08/09	2026/08/08
2	LISN	R&S	ESH2-Z5	893606/008	2026/06/11	2027/06/10
3	Transient Limiter	CYBERTEK	EM5010A	E1950100106	2026/06/11	2027/06/10
4	Test Receiver	R&S	ESCI 7	101102	2025/08/09	2025/08/08
5	Spectrum Analyzer	Agilent	N9020A	MY48010425	2026/06/12	2027/06/11
6	Spectrum Analyzer	R&S	FSV40-N	101800	2026/06/12	2026/06/11
7	Active Loop Antenna	Beijing Da Ze Technology Co.,Ltd.	ZN30900C	/	2026/06/12	2027/06/11
8	By-log Antenna	SCHWARZBECK	VULB9163	000976	2026/06/12	2027/06/11
9	Double Ridged Horn Antenna (1~18GHz)	SCHWARZBECK	BBHA 9120D	01622	2025/12/01	2026/11/30
10	Horn Antenna (18GHz~40GHz)	Schwarzbeck	BBHA9170	791	2026/06/12	2027/06/11
11	Amplifier (30MHz~1GHz)	SKET	LAPA_30M 01G-32	SK2024010400 1	2025/12/23	2026/12/22
12	Amplifier (1GHz~18GHz)	EMCI	EMC01264 5SE	980340	2025/12/23	2026/12/22
13	Amplifier (26.5GHz~40GHz)	Schwarzbeck	BBV9179	9719-025	2025/12/01	2026/11/30
14	ESD Simulators	EXPERT IN EMC LIONCEL	ESD-203B	/	2026/06/12	2027/06/11
15	RF POWER AMPLIFIER	Mic-Top	MPA-80-1000-250	MPA2210372	2026/06/11	2027/06/10
16	RF POWER AMPLIFIER	Mic-Top	MPA-1000-6000-10	MPA2210371	2026/06/11	2027/06/10
17	RF POWER AMPLIFIER	SKET	HAP_03G0 6G-50W	--	2026/06/12	2027/06/11
18	Stacked Broadband Log Periodic Antenna	Schwarzbeck	VULP 9118 E	01036	2025/12/23	2026/12/22
19	Stacked Mikrowellen Log.-Per Antenna	Schwarzbeck	STLP9149	00814	2025/12/23	2026/12/22
20	Electric field probe	Agilent	E9301A	MY41496608	2026/06/11	2027/06/10
21	ESG Vector Signal Generator	Agilent	N5181A	MY50145351	2026/06/11	2027/06/10
22	Power meter	Agilent	MY4510449 3	E4602B	2026/06/12	2027/06/11
23	Field Probe	Narda	EP601	811ZX10352	2025/12/26	2026/12/25
24	Ultra Compact Simulator	EMC Partner	TRANSIEN T3000	106336	2026/06/11	2027/06/10
25	Coupling Clamp	EMC Partner	CN-EFT1000	1574	2026/06/11	2027/06/10
26	Signal Line Coupling Network	EXPERT IN EMC LIONCEL	CDN-508SUS	0200502	2026/06/11	2027/06/10

27	CS Test system	Frankonia	CIT-10-75	126B1333/2015	2026/06/11	2027/06/10
28	6dB Attenuator	Frankonia	75-A-FFN-06	/	2026/06/11	2027/06/10
29	CDN	Frankonia	CDN M2/M3	/	2026/06/11	2027/06/10
30	Coupling Decoupling Network	LuTHi	CDN801-M4	/	2026/06/11	2027/06/10
31	Harmonic and Flicker Analyzer	EMC PARTNER	HAR1000-1P	0221	2025/12/23	2026/12/22
32	RF Cable	HUBER+SUHNER	RG214	N/A	2026/06/12	2027/06/11
33	ISN CAT5	SCHWARZBECK	CAT5 8158	121	2025/12/23	2026/12/22
34	integrated measuring instrument	R&S	CMW500	107519	2026/06/12	2027/06/11
35	Sound Level meter	BK Precision	735	7350087310010020	2026/06/12	2027/06/11
36	Audio Analyzer	R&S	UPV	1146.2003K02-101721-UW	2026/06/12	2027/06/11
37	Mouse Simulation	Bruel & Kjaer	4227	A0304216	2026/06/12	2027/06/11
38	Ear Simulation and supply	Bruel & Kjaer	2669.4182.5935	A0305284	2026/06/12	2027/06/11
39	Acoustical Calibrators	Bruel & Kjaer	4231	A0304215	2026/06/12	2027/06/11
40	Conducted Emission	Tonscend	JS32-CE	Ver 2.5	/	/
41	Radiated Emission	Tonscend	JS32-RE	Ver 2.5.1.8	/	/

The calibration interval is 1 year.

4. TEST CONDITIONS AND RESULTS

4.1. EMISSION

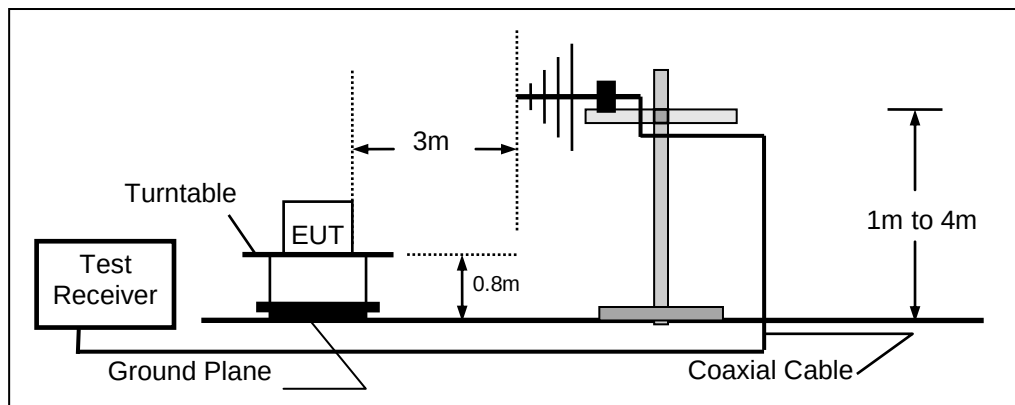
4.1.1. Radiated Emission

LIMIT

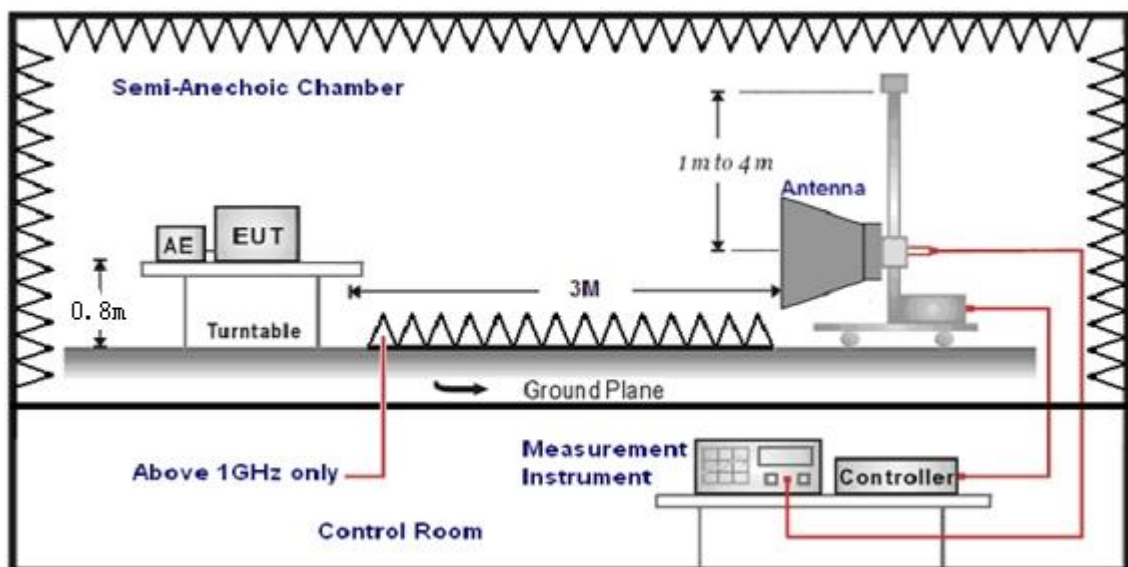
Please refer to ETSI EN301489-1 Clause 8.2.3, Table 4 and EN55032 Annex A, Table A.4,A.5, and Class B

TEST CONFIGURATION

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



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



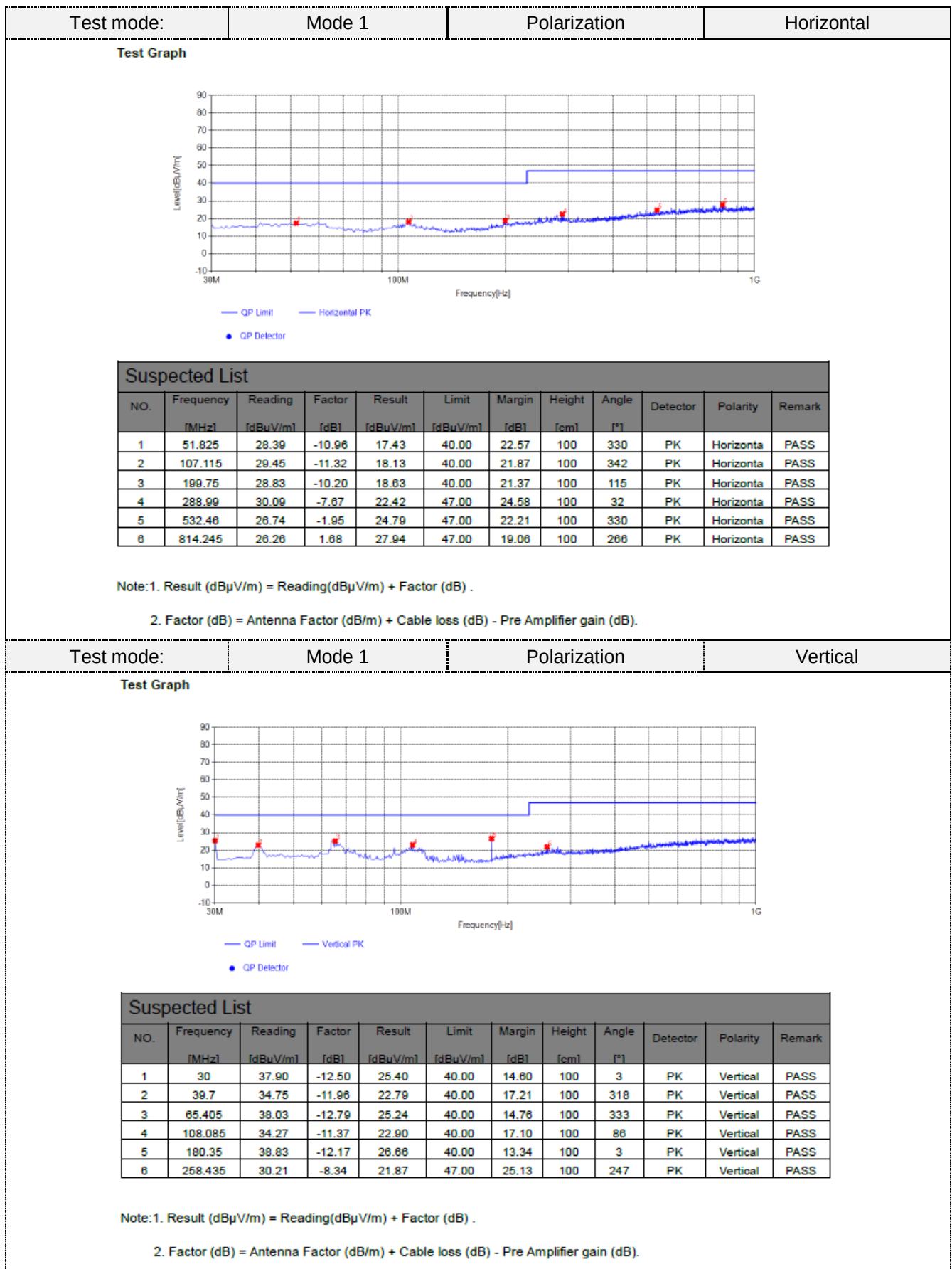
TEST PROCEDURE

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

TEST RESULTS

Passed

Please refer to the below test data:



Note: All the modes have been tested and recorded worst mode in the report.

Test Mode: Mode 1 (above 1GHz)	Test Distance: 3m
Test voltage: AC 230V	Test Results: Passed
Detector Function: Peak+AV	/

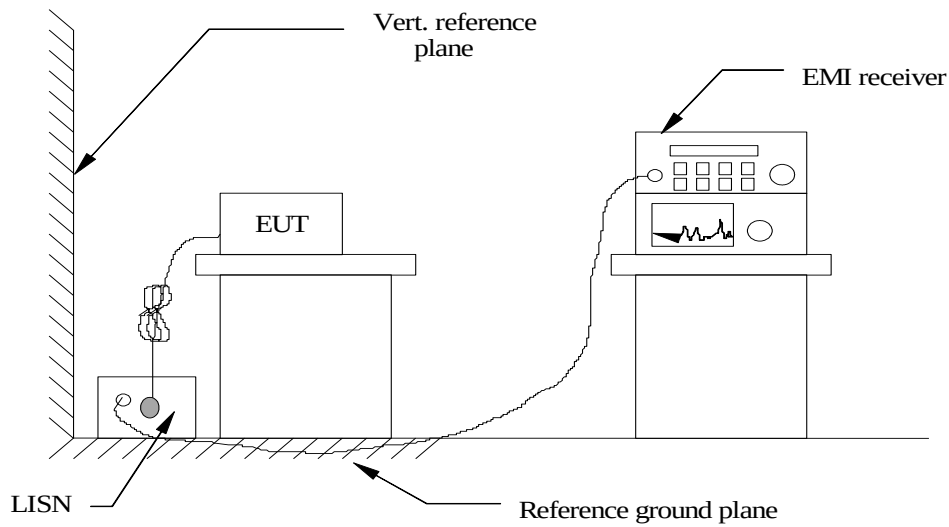
Frequency MHz	Emission Level dB μ V/m		Limits dB μ V/m		Margin dB μ V/m		Polarization
	Peak	AV	Peak	AV	Peak	AV	
1288.56	54.97	38.25	74.00	54.00	-19.03	-15.75	H
1831.03	57.14	32.35	74.00	54.00	-16.86	-21.65	H
2159.52	53.75	36.73	74.00	54.00	-20.25	-17.27	H
3250.78	54.30	39.65	74.00	54.00	-19.70	-14.35	H
4479.29	52.35	34.62	74.00	54.00	-21.65	-19.38	H
5703.66	52.66	33.72	74.00	54.00	-21.34	-20.28	H
1285.67	54.71	38.00	74.00	54.00	-19.29	-16.00	V
1831.45	57.58	32.24	74.00	54.00	-16.42	-21.76	V
2160.68	53.27	36.81	74.00	54.00	-20.73	-17.19	V
3250.52	53.25	40.12	74.00	54.00	-20.75	-13.88	V
4478.89	53.45	35.05	74.00	54.00	-20.55	-18.95	V
5703.62	52.95	33.54	74.00	54.00	-21.05	-20.46	V

4.1.2. Conducted Emission (AC Mains)

LIMIT

Please refer to ETSI EN301489-1 Clause 8.4.3, Table 8 and EN55032 Annex A, Table A.9, A.11

TEST CONFIGURATION



TEST PROCEDURE

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

TEST RESULTS

Passed

Please refer to the below test data:

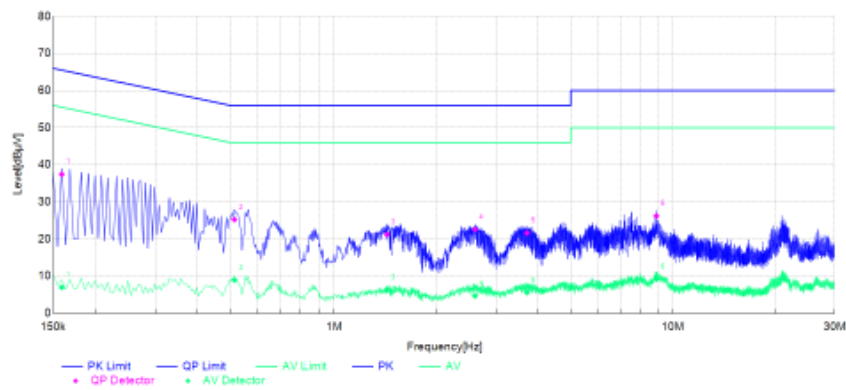
Test mode:

Mode 1

Polarization

L

Test Graph



Final Data List

NO.	Frequency [MHz]	QP Reading [dBμV]	AVG. Reading [dBμV]	Factor [dB]	QP Result [dBμV]	AVG. Result [dBμV]	QP Limit [dBμV]	AVG. Limit [dBμV]	QP Margin [dB]	AVG. Margin [dB]	Line	Remark
1	0.159	27.14	-3.33	10.31	37.45	6.98	65.52	55.52	28.07	48.54	L1	PASS
2	0.5145	14.99	-1.29	10.24	25.23	8.95	56.00	46.00	30.77	37.05	L1	PASS
3	1.4325	11.00	-3.97	10.23	21.23	6.26	56.00	46.00	34.77	39.74	L1	PASS
4	2.6025	12.27	-5.65	10.31	22.58	4.66	56.00	46.00	33.42	41.34	L1	PASS
5	3.7095	11.26	-4.79	10.36	21.62	5.57	56.00	46.00	34.38	40.43	L1	PASS
6	8.9295	15.64	-1.37	10.55	26.19	9.18	60.00	50.00	33.81	40.82	L1	PASS

Note:1. Result (dBμV) = Reading (dBμV) + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

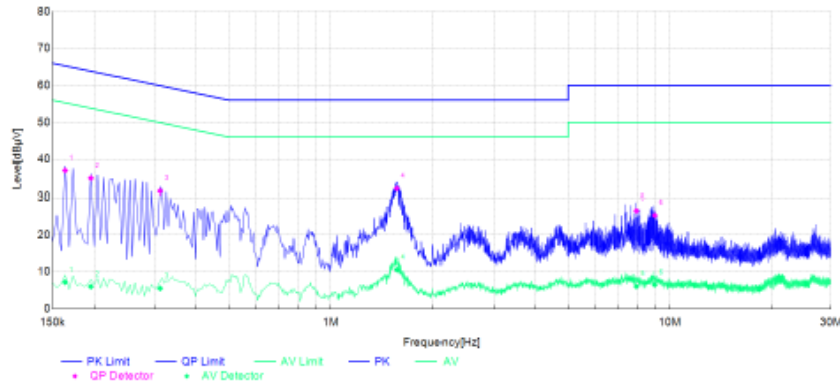
Test mode:

Mode1

Polarization

N

Test Graph



Final Data List

NO.	Frequency [MHz]	QP Reading [dBμV]	AVG. Reading [dBμV]	Factor [dB]	QP Result [dBμV]	AVG. Result [dBμV]	QP Limit [dBμV]	AVG. Limit [dBμV]	QP Margin [dB]	AVG. Margin [dB]	Line	Remark
1	0.1635	26.68	-3.09	10.29	36.97	7.20	65.28	55.28	28.31	48.08	N	PASS
2	0.195	24.74	-4.13	10.16	34.90	6.03	63.82	53.82	28.92	47.79	N	PASS
3	0.312	21.35	-4.56	10.11	31.46	5.55	59.92	49.92	28.46	44.37	N	PASS
4	1.572	21.89	0.35	10.24	32.13	10.59	56.00	46.00	23.87	35.41	N	PASS
5	7.9485	15.94	-4.48	10.57	26.51	6.09	60.00	50.00	33.49	43.91	N	PASS
6	9.0105	14.73	-4.03	10.55	25.28	6.52	60.00	50.00	34.72	43.48	N	PASS

Note:1. Result (dBμV) = Reading (dBμV) + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

4.1.3. CONDUCTED EMISSION (WIRED NETWORK PORT)

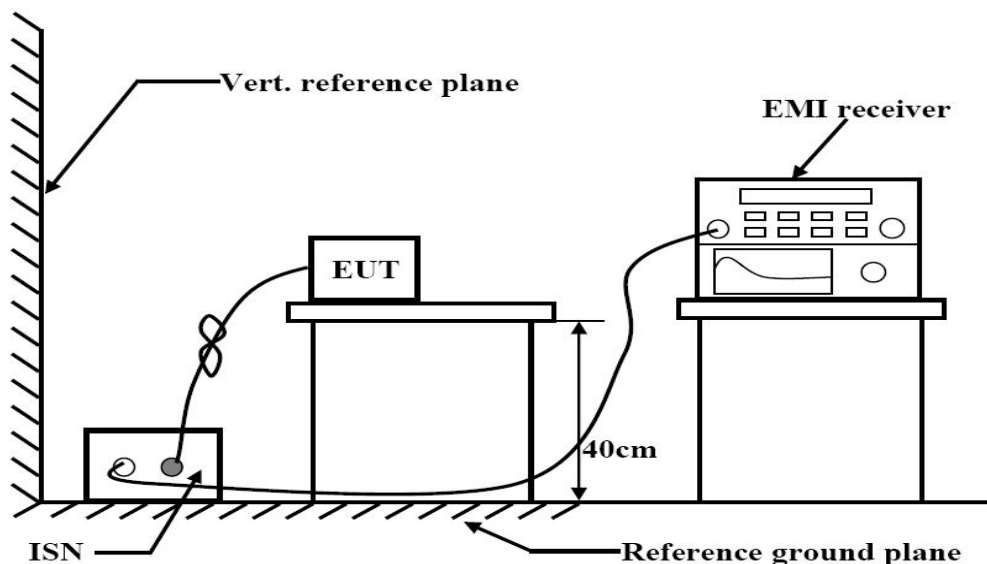
Conducted Emission Limit(Wired Network Port)

Limits for asymmetric mode conducted emissions				
Frequency (MHz)	Class B voltage limits (dB μ V)		Class B current limits (dB μ A)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	84.0~74.0	74.0~64.0	40.0~30.0	30.0~20.0
0.50 ~ 30.00	74.0	64.0	30.0	20.0

NOTE 1-The limits decrease linearly with the logarithm of the frequency in the range 0,15 MHz to 0,5 MHz.

NOTE 2-The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is $20 \log_{10} 150 / I = 44$ dB).

Test Configuration



EMI Test Receiver Setup

During the conducted emission test, the EMI test receiver was set with the following configurations:

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	150KHz ~ 30MHz
(IF)RBW	9kHz

All data was recorded in the Quasi-peak and average detection mode.

Test Procedure

Please refer to ETSI EN 301 489-1 Clause 8.7.2 and EN 55032 Clause 6 for the measurement methods.

Test Data

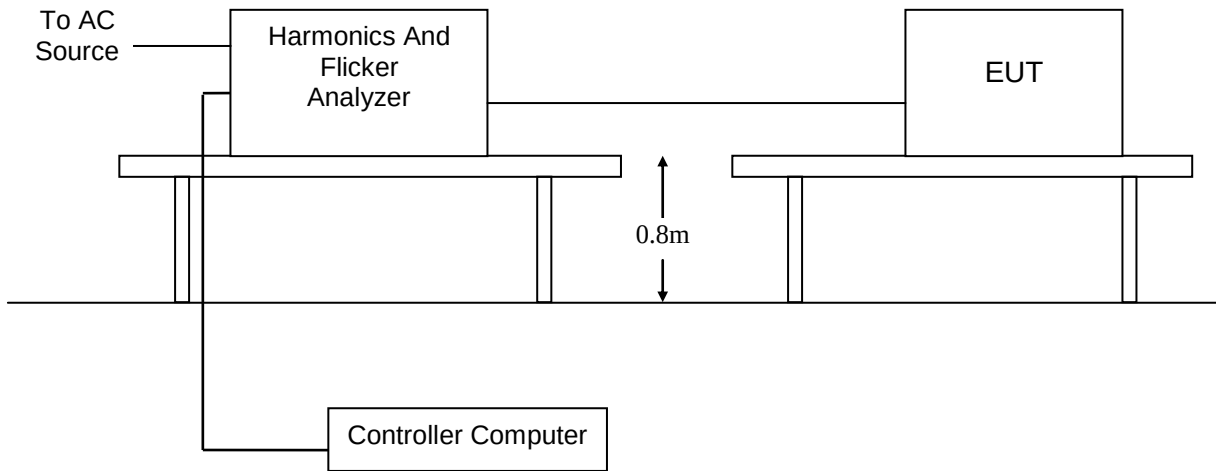
Not applicable.

4.1.4. Harmonic Current Emission

LIMIT

Please refer to EN 61000-3-2

TEST CONFIGURATION



TEST PROCEDURE

Please refer to EN 61000-3-2 for the measurement methods.

TEST RESULTS

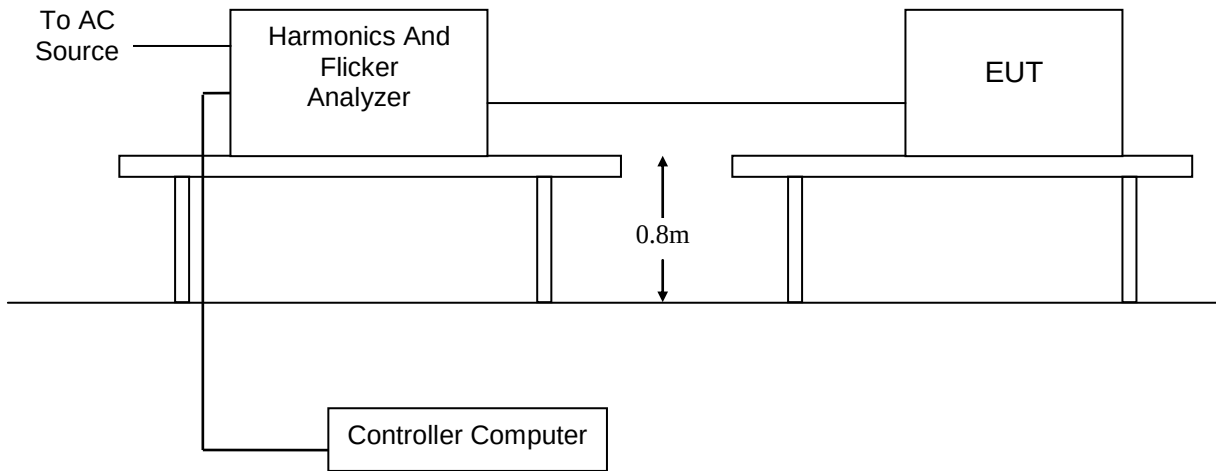
Not applicable.

4.1.5. Voltage Fluctuation and Flicker

LIMIT

Please refer to EN 61000-3-3

TEST CONFIGURATION



TEST PROCEDURE

Please refer to EN 61000-3-3 for the measurement methods.

TEST RESULTS

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.153	1.00	PASS
Plt	0.087	0.65	PASS
dc [%]	0.242	3.30	PASS
dmax [%]	0.561	4.00	PASS
dt [s]	0.072	0.50	PASS

4.2. IMMUNITY

4.2.1. Performance criteria

■ ETSI EN301489-17

General performance criteria

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

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

Criteria	During test	After test
A	Shall operate as intended. (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.		

Performance criteria for Continuous phenomena

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.

4.2.2. Monitoring EUT in Immunity Test

4.2.2.1 Monitoring for Continuous Phenomena Applied to the EUT

■ BT Mode

At the start of the test, establish a wireless link between the EUT and CMW500(integrate BT protocol Analyzer);

During the test, observe whether the EUT operate as intended, no loss of function and no unintentional transmissions. Monitoring PER and shall exceed 10%

After the test, Check the function and critical stored data of the EUT with no degradation.

In addition, when EUT working in Idle /Receiver mode, monitor whether the transmitter unintentionally operates.

■ other Mode

During and after the test, observe the Screen status by eyes or monitor to see whether there is degradation of performance

4.2.2.2 Monitoring for Transient Phenomena Applied to the EUT

■ BT Mode

At the start of the test, establish a wireless link between the EUT and CMW500(integrate BT protocol Analyzer);

After the test, Check the function and critical stored data of the EUT with no degradation.

In addition, when EUT working in Idle /Receiver mode, monitor whether the transmitter unintentionally operates.

■ other Mode

After the test, observe the Screen status by eyes or monitor to see whether there is degradation of performance

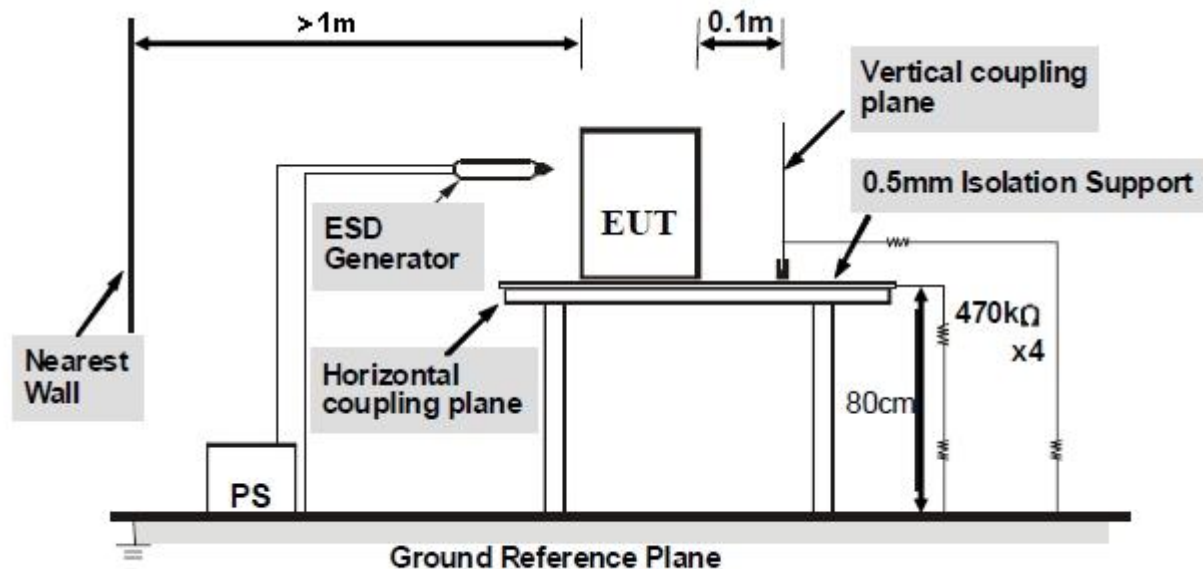
4.2.3. Electrostatic Discharge

LIMIT

SEVERITY LEVELS OF ELECTROSTATIC DISCHARGE

Test level: Contact Discharge at $\pm 2\text{KV}$, $\pm 4\text{KV}$ Air Discharge at $\pm 2\text{KV}$, $\pm 4\text{KV}$, $\pm 8\text{KV}$

TEST CONFIGURATION



TEST PROCEDURE

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

Contact Discharge:

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

Air Discharge:

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

Indirect discharge for horizontal coupling plane:

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

Indirect discharge for vertical coupling plane:

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

TEST MODE

Please reference to the section 2.3

TEST RESULTS

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

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

4.2.4. RF Electromagnetic Field

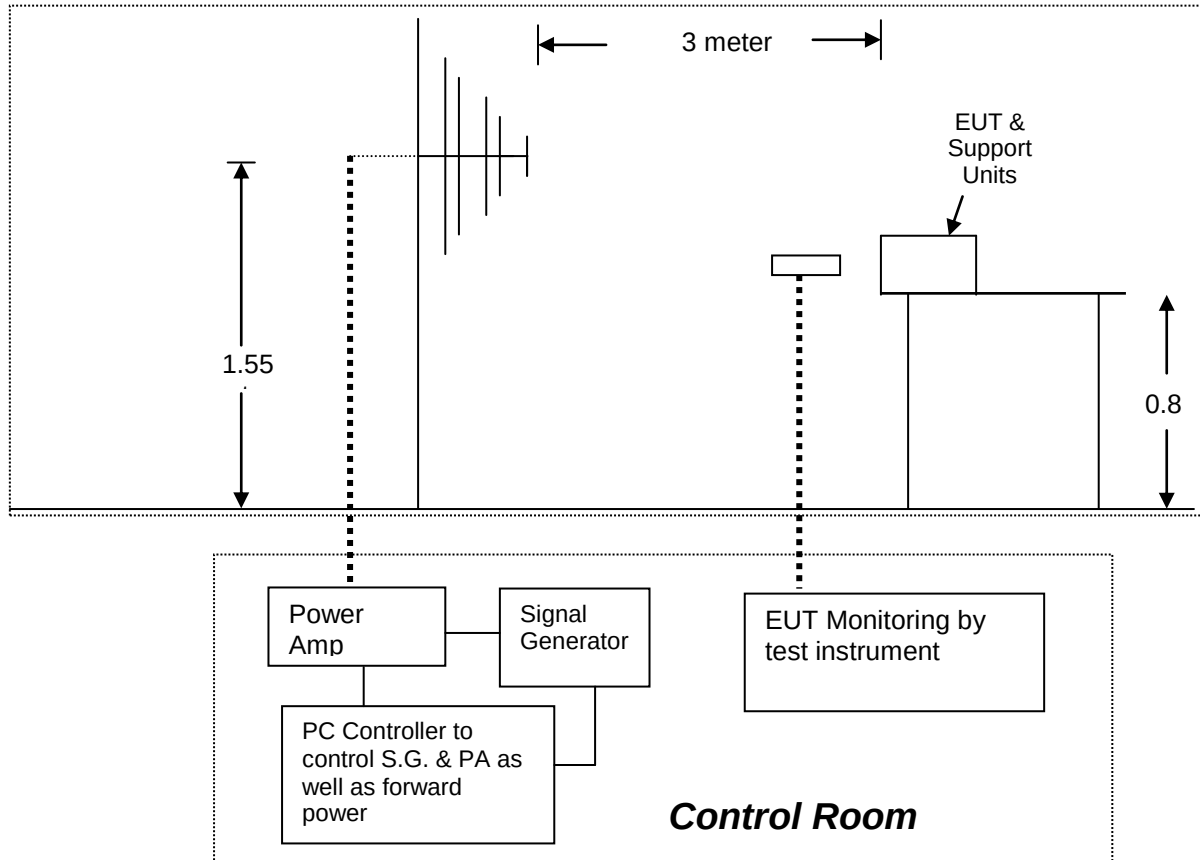
PERFORMANCE CRITERION

Criteria A

TEST LEVEL

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

TEST CONFIGURATION



TEST PROCEDURE

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

TEST MODE

Please reference to the section 2.3

TEST RESULTS

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

Bluetooth Test Result:

EUT Working Mode	Antenna Polarity	Frequency (MHz)	Fielded Strength (V/m)	Observation	Position	Conclusion
Operating Mode	Vertical	80-6000	3	CT, CR	Front, Right, Left, Back	Pass
	Horizontal	80-6000	3	CT, CR	Front, Right, Left, Back	Pass

Special conditions for EMC immunity tests

EUT operating Mode	PER during test(Worst)	PER Limit	Conclusion
Bluetooth	3.2%	10%	Pass

4.2.5. Surges

PERFORMANCE CRITERION

Criteria B

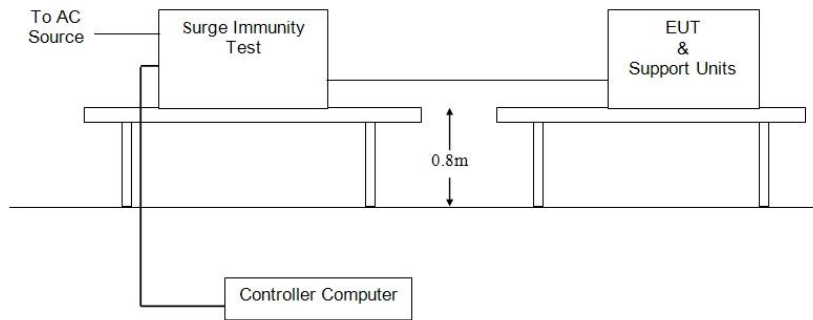
TEST LEVEL

1kV Line to Line: Differential mode

2kV Line to Ground: Common mode

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

TEST CONFIGURATION



TEST PROCEDURE

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

TEST MODE

Please reference to the section 2.3

TEST RESULTS

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

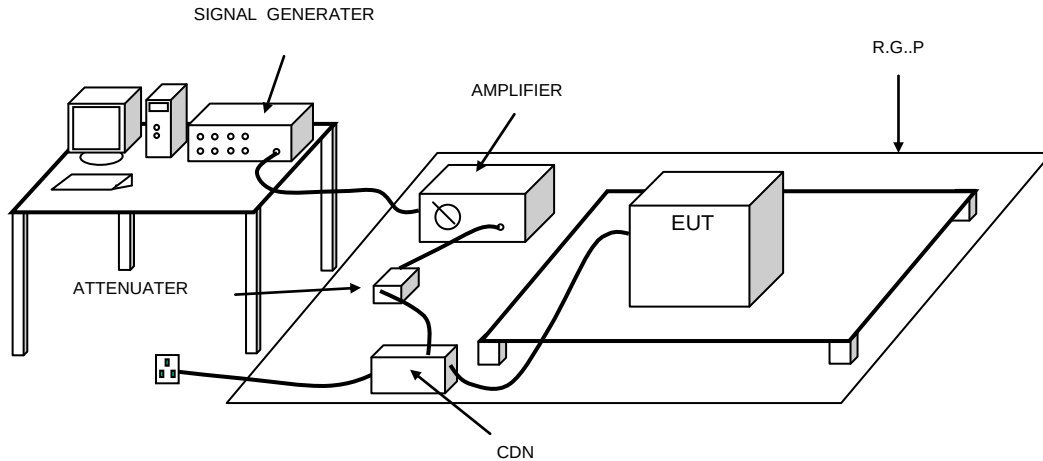
Remark: A: No degradation in performance of the EUT was observed.

4.2.6. RF- Common Mode 0.15MHz to 80MHz**PERFORMANCE CRITERION**

Criteria A

TEST LEVEL

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

TEST CONFIGURATION**TEST PROCEDURE**

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

TEST MODE

Please reference to the section 2.3

TEST RESULTS

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

Special conditions for EMC immunity tests

EUT operating Mode	PER during test(Worst)	PER Limit	Conclusion
Bluetooth	3.7%	10%	Pass

4.2.7. Fast Transients Common Mode

PERFORMANCE CRITERION

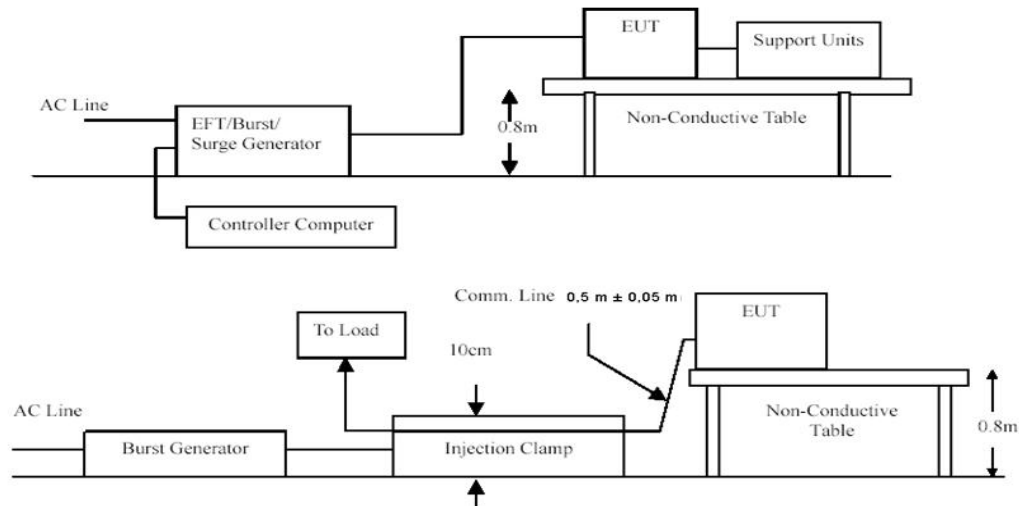
Criteria B

TEST LEVEL

1KV for AC main port

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

TEST CONFIGURATION



TEST PROCEDURE

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

TEST MODE

Please reference to the section 2.3

TEST RESULTS

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

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

4.2.8. Voltage Dips and Interruptions

PERFORMANCE CRITERION

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

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

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

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

TEST LEVEL

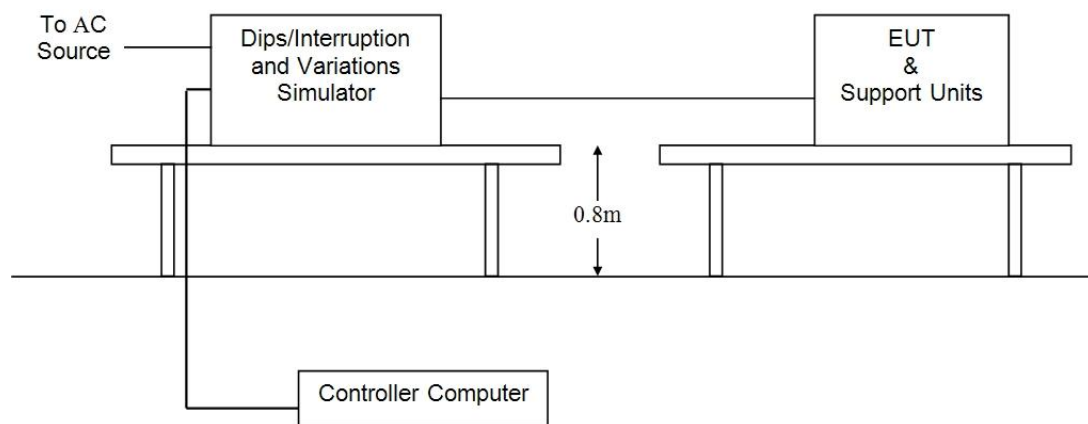
0% of VT(Supply Voltage) for 0.5 period

0% of VT(Supply Voltage) for 1.0 period

70% of VT(Supply Voltage) for 25 period

0% of VT(Supply Voltage) for 250 period

TEST CONFIGURATION



TEST PROCEDURE

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

TEST MODE

Please reference to the section 2.3

TEST RESULTS

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

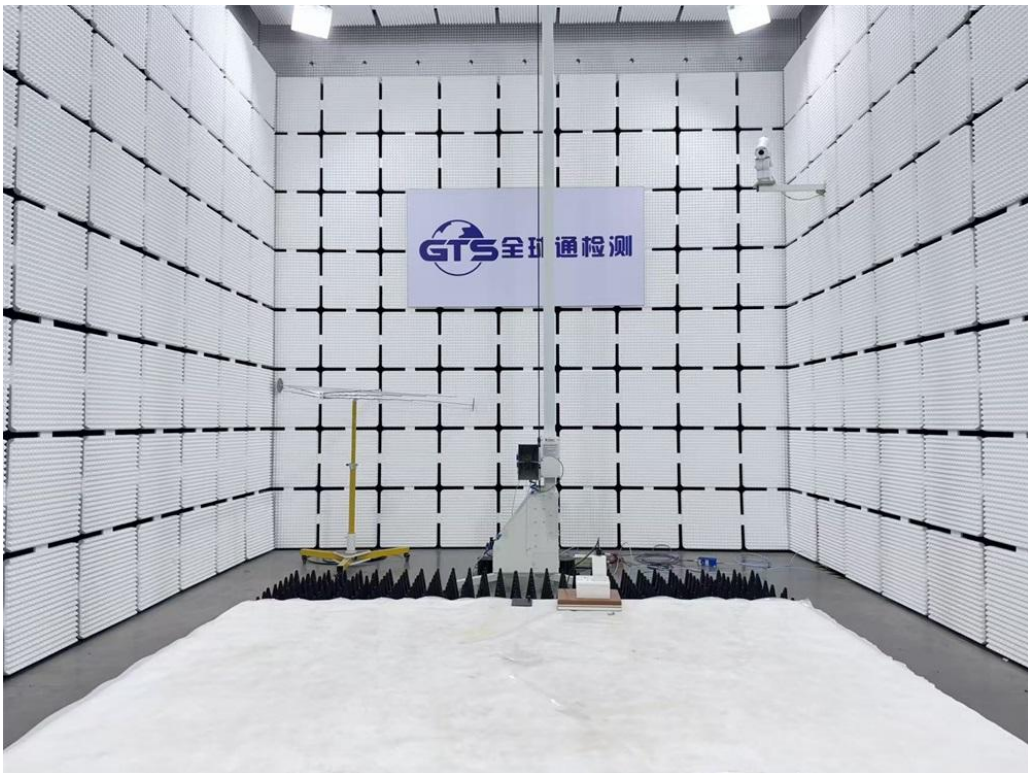
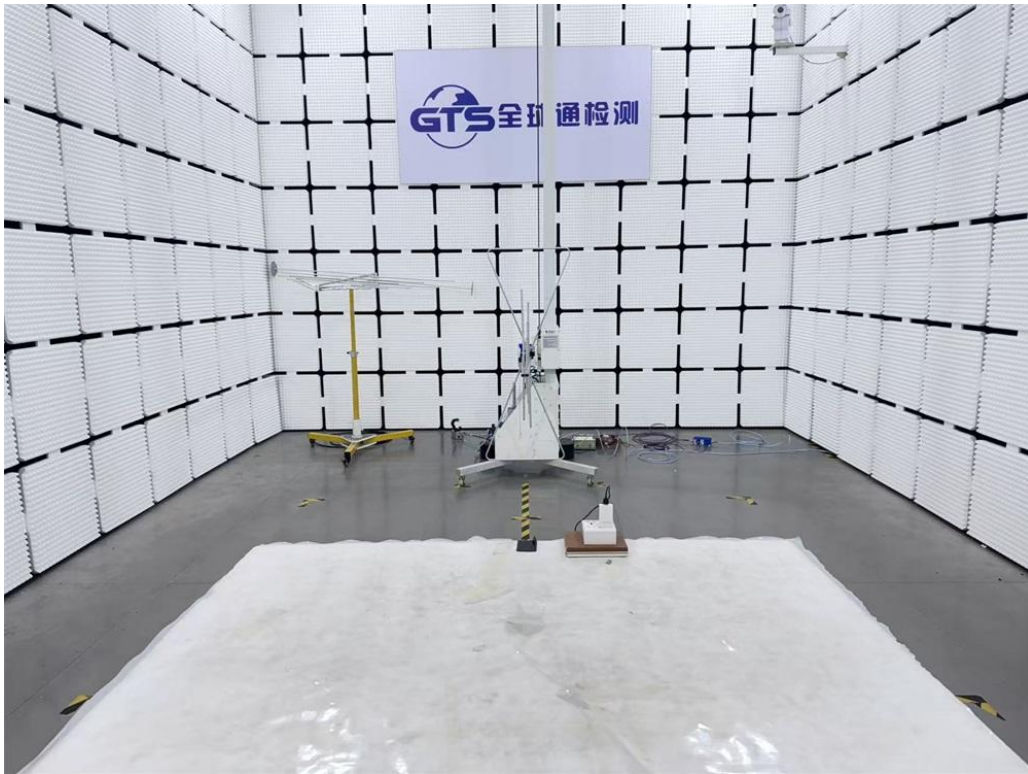
A: No degradation in performance of the EUT was observed.

B: Power temporarily off, can be automatically reset.

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

5. TEST SETUP PHOTOS OF THE EUT

Photo of Radiated Emissions Measurement



Conducted Emission(AC Mains)



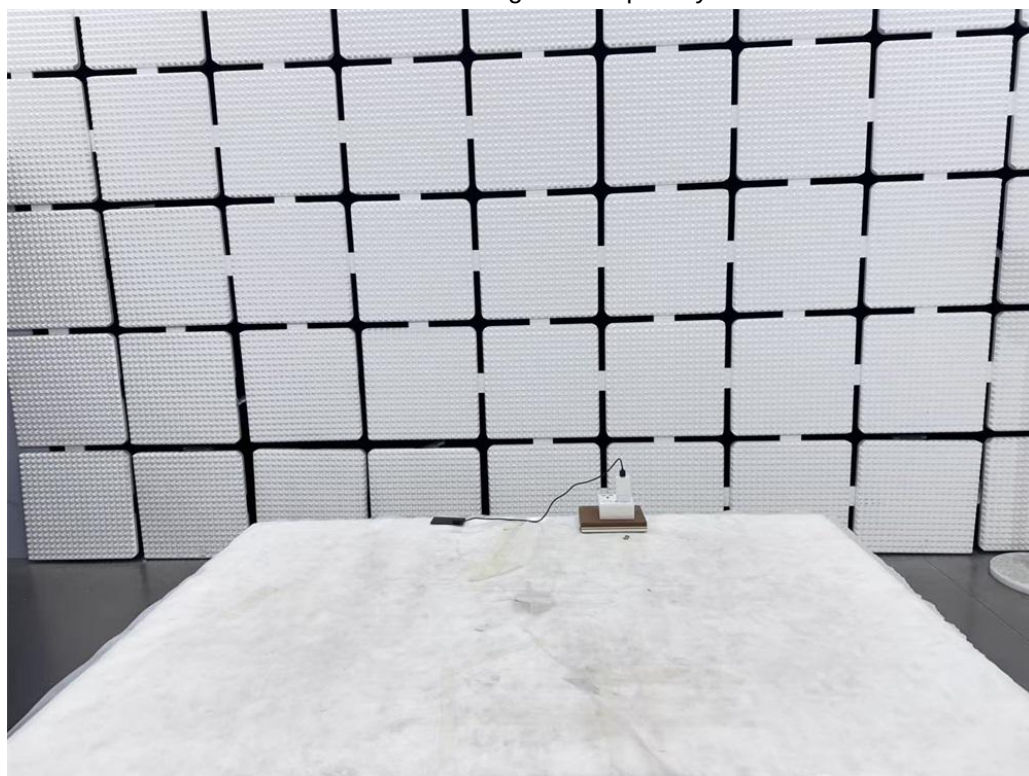
Harmonic Current/ Voltage Fluctuation and Flicker



Electrostatic Discharge



RF Field Strength Susceptibility



RF Common Mode 0,15 MHz to 80 MHz(AC Main)



6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7

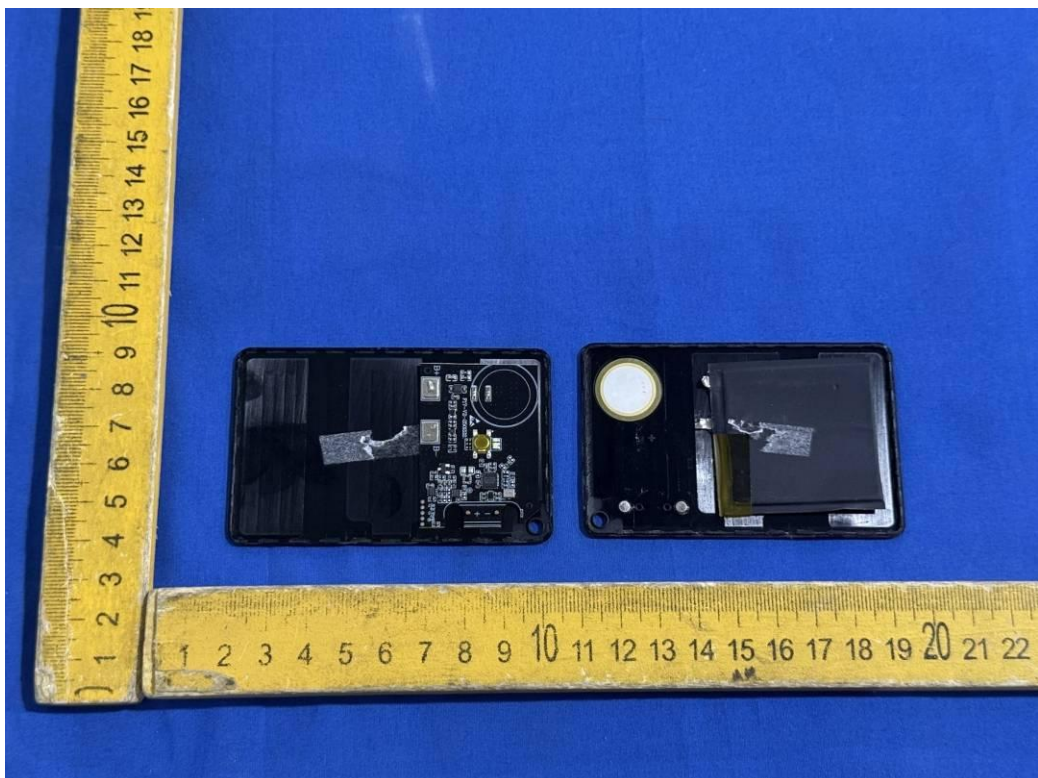


Fig. 8

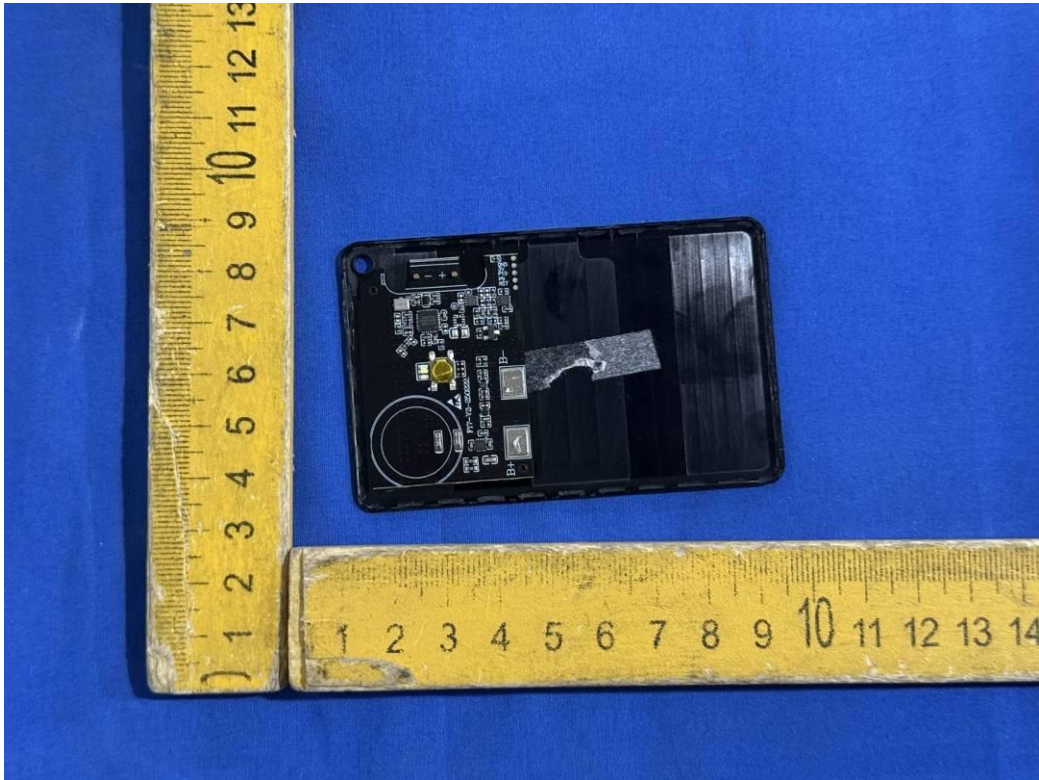


Fig. 9

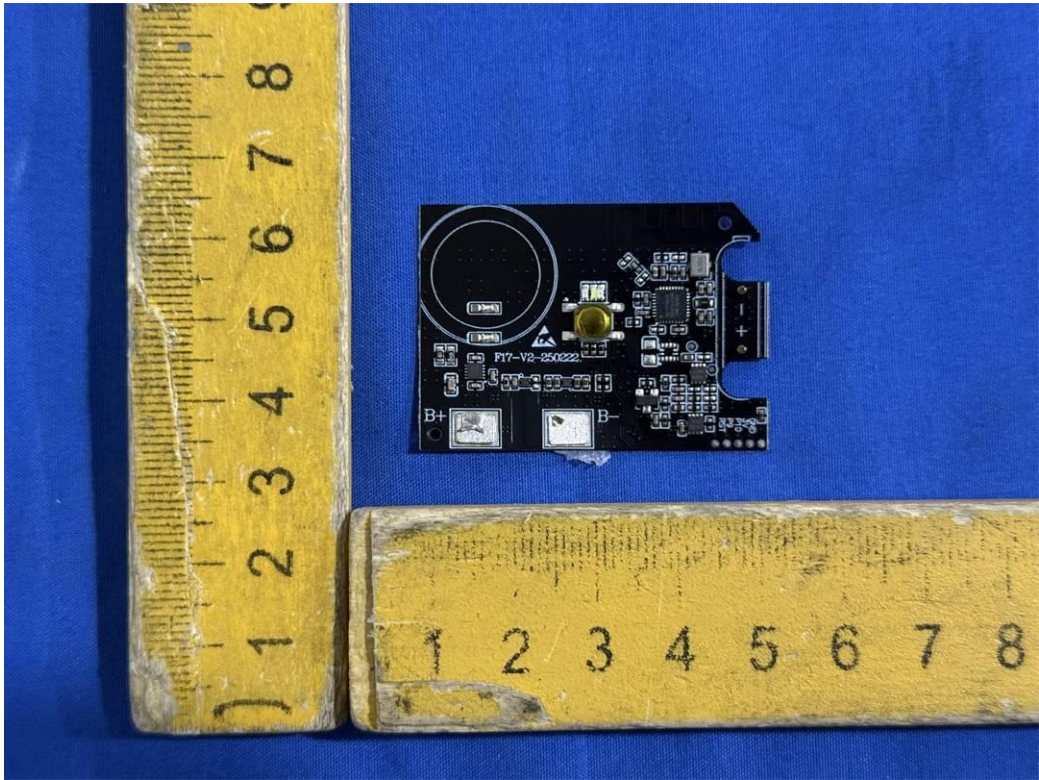


Fig. 10

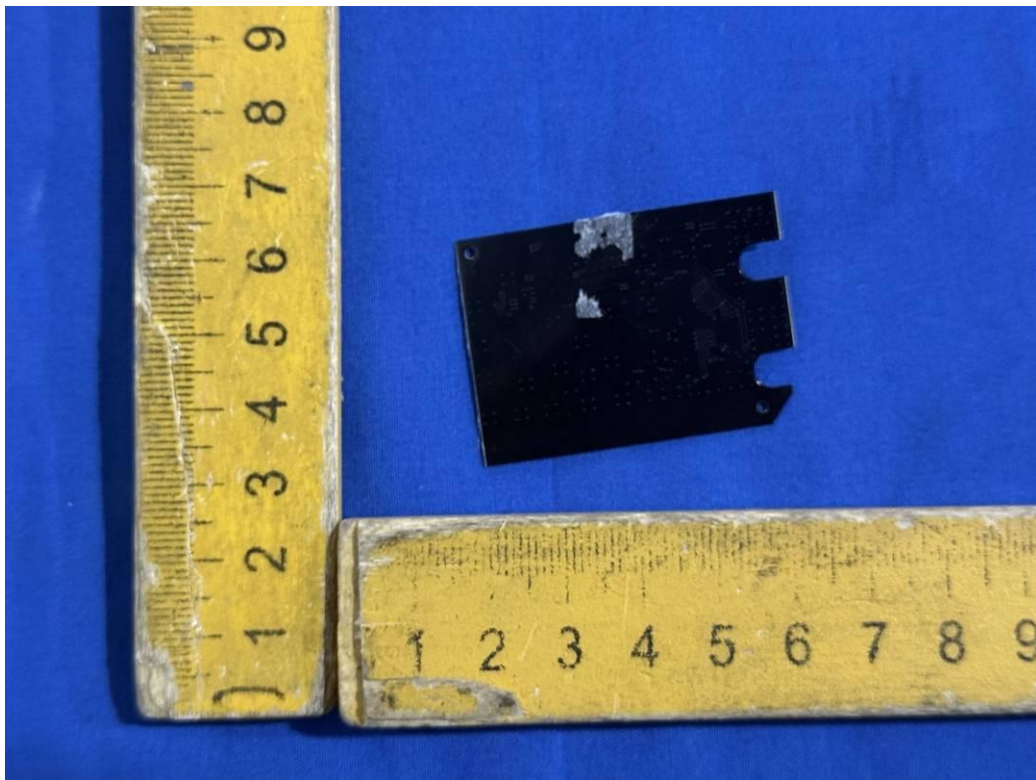


Fig. 11

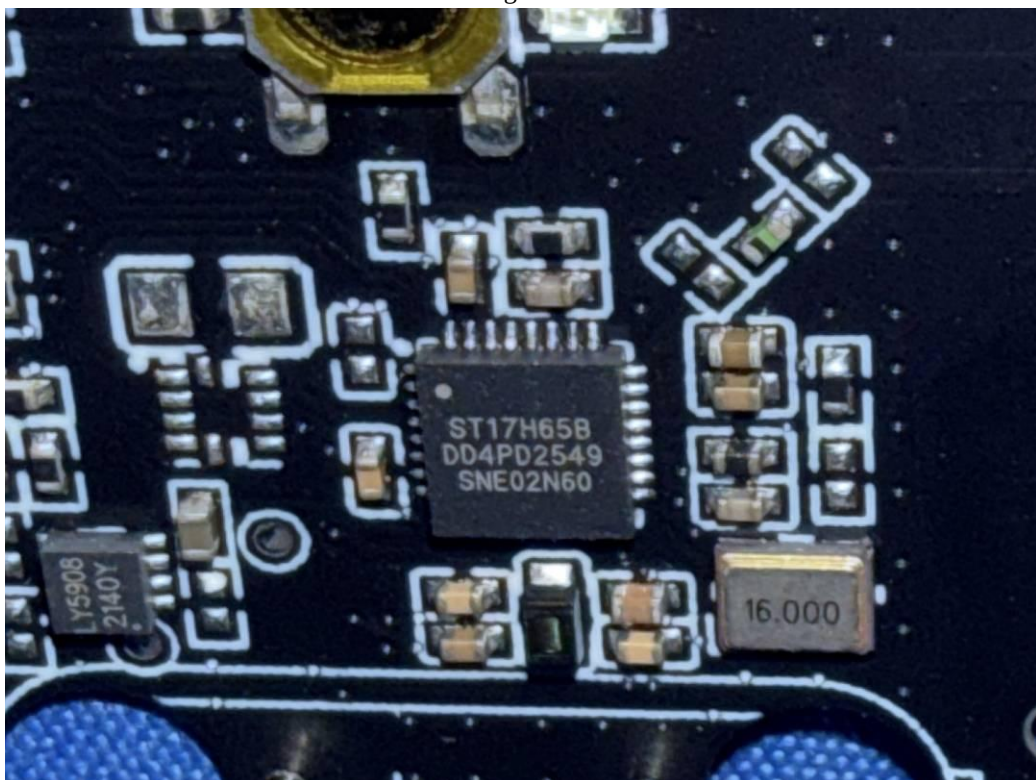


Fig. 12

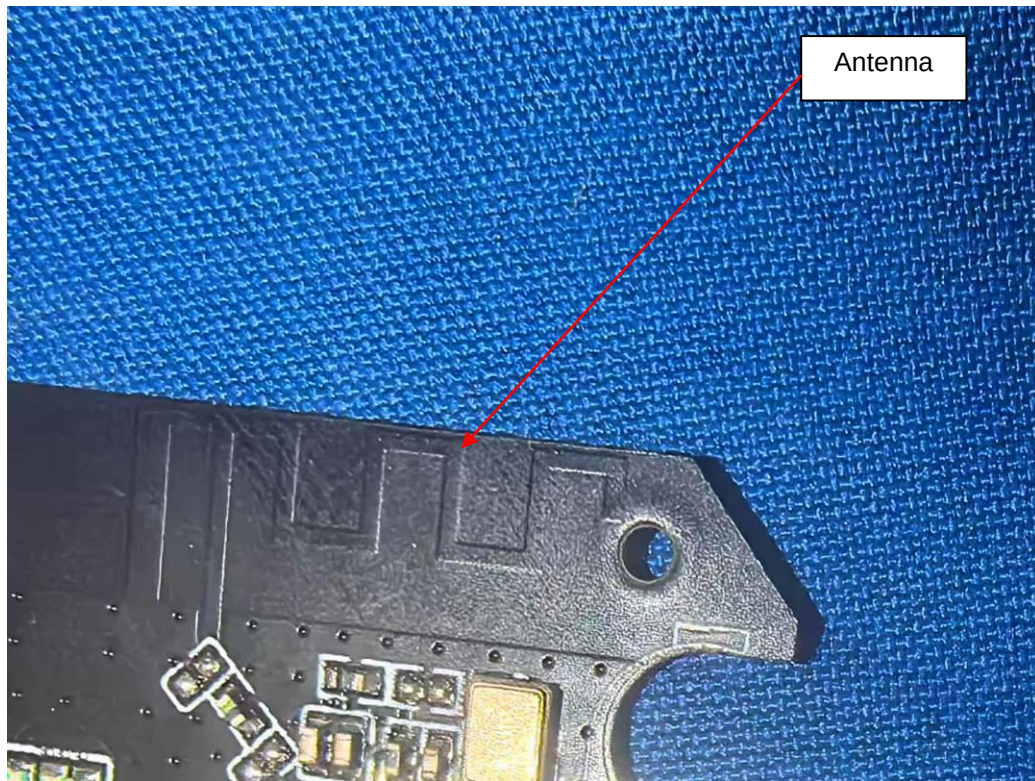


Fig. 13



Fig. 14

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