





TEST REPORT

Test item description: Single-channel LoRaWAN GatewayModule

Trademark(s):  

Model/Type reference: RG-03H

Applicant's name: Shenzhen Ai-Thinker Technology Co., Ltd

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Manufacturer: Shenzhen Ai-Thinker Technology Co., Ltd

Address: 410,Block C, Huafeng Smart Innovation Port.Gushu 2nd Road, Gushu Community, Xixiang Street, Baoan District, Shenzhen, China

Prepared By: Shenzhen CTB Testing Technology Co., Ltd.

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Sample Received Date: Mar. 16, 2026

Sample tested Date: Mar. 16, 2026 to Apr. 27, 2026

Issue Date: Apr. 27, 2026

Report No.: CTB26031613702RE05

Test Standards: ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-17 V3.3.1 (2024-09)
ETSI EN 301 489-3 V2.3.2 (2023-01)
ETSI EN 301 489-52 V1.2.1 (2021-11)

Test Results: PASS

Remark: This is RED EMC test report.

Compiled by: Reviewed by: Approved by:

Kai Chen

Kai Chen

Martin Feng

Martin Feng

Bin Mei

Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

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(NOTE: N/A MEANS NOT APPLICABLE)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB26031613702RE05	Apr. 27, 2026	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

EMISSION		
Standard	Test Item	Test result
EN 55032	Conducted emissions from the AC mains power ports	Pass
EN 55032	Asymmetric mode conducted emissions	N/A ¹
EN 55032	Conducted differential voltage emissions	N/A ²
EN 55032	Radiated emissions	Pass
EN 61000-3-2	Harmonic current emission(H)	N/A ³
EN 61000-3-3	Voltage fluctuations & flicker(F)	Pass

IMMUNITY		
Standard	Test Item	Test result
IEC 61000-4-2	Electrostatic discharge (ESD)	Pass
IEC 61000-4-3	Continuous RF electromagnetic field disturbances(RS)	Pass
IEC 61000-4-4	Electrical fast transients/burst (EFT)	Pass
IEC 61000-4-5	Surges	Pass
IEC 61000-4-6	Radio frequency, common mode	Pass
IEC 61000-4-11	Voltage dips and interruptions (DIPS)	Pass

Remark:

1. Applicable to ports listed above and intended to connect to cables longer than 3 m.
2. The Product has no antenna port.
3. The Product belongs to Class A, and its power is less than 75W, so it deems to fulfil this standard without testing.

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test item	Value (dB)
Conducted Emission (150kHz-30MHz)	3.2
Radiated Emission(30MHz-1000MHz)	4.8
Radiated Emission(1GHz-6GHz)	4.9

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model/Type reference:	RG-03H
Model Difference:	N/A
Bluetooth Version:	Bluetooth 5.0
Wi-Fi Specification:	IEEE 802.11b/g/n
SRD:	868.10MHz
Receiver Category:	2
LTE Band(s):	Band1, 3, 7, 8, 20, 28a
Power class	3
Hardware Version:	V1.0
Software Version:	V1.0
	Bluetooth: 2402-2480MHz
	WiFi (2.4G): IEEE 802.11b/g/n 20: 2412-2472MHz/ 13 channel
	IEEE 802.11n 40: 2422-2462MHz/ 9 channel
	LTE Band1: Tx:1920-1980 MHz, Rx: 2110-2170 MHz
Operation Frequency:	LTE Band3: Tx: 1710-1785MHz, Rx: 1805-1880MHz
	LTE Band7: Tx: 2500-2570MHz, Rx: 2620-2690MHz
	LTE Band8: Tx: 880-915MHz, Rx: 925-960MHz
	LTE Band20: Tx: 832-862MHz, Rx: 791-821MHz
	LTE Band28a: Tx: 703-733MHz, Rx: 758-788MHz
	Bluetooth: 3.94dBm
	WiFi (2.4G): 16.25dBm
	LTE Band1: 23.11dBm
Max. RF output power:	LTE Band3: 23.3dBm
	LTE Band7: 22.92dBm
	LTE Band8: 23.37dBm,
	LTE Band20: 23.7dBm
	LTE Band28a: 23.19dBm
	Bluetooth: GFSK
Type of Modulation:	WiFi (2.4G): DSSS, OFDM
	SRD: FSK
	LTE: QPSK & 16QAM
Antenna installation:	External antenna
	Bluetooth: 1.0dBi
Antenna Gain:	WiFi (2.4G): 1.0dBi
	LTE Band1: 1.0dBi
	LTE Band3: 1.0dBi

LTE Band7: 1.0dBi
 LTE Band8: 1.0dBi
 LTE Band20: 1.0dBi
 LTE Band28a: 1.0dBi
 INPUT: 100-240V 50/60Hz
 OUTPUT: 12V 1.0A

Ratings:

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	Laptop	DELL	Vostro 5490	N/A	AE
2	Router	Huawei	AX2 Pro	/	AE

Notes:

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

4.4 Test Mode

Test Mode	Description	Remark
Mode 1	Bluetooth	TR, CR, TT, CT for EMS testing
Mode 2	2.4G WIFI	TR, CR, TT, CT for EMS testing
Mode 3	SRD	TR, CR, TT, CT for EMS testing
Mode 4	LTE BAND 1	TR, CR, TT, CT for EMS testing
Mode 5	LTE BAND 3	TR, CR, TT, CT for EMS testing
Mode 6	LTE BAND 7	TR, CR, TT, CT for EMS testing
Mode 7	LTE BAND 8	TR, CR, TT, CT for EMS testing
Mode 8	LTE BAND 20	TR, CR, TT, CT for EMS testing
Mode 9	LTE BAND 28a	TR, CR, TT, CT for EMS testing

NOTE: 1 The test modes were carried out for all operation modes. The final test mode of the EUT was the worst test mode for EMI, and its test data was showed.

2 "Link" is the connect horn alarm mode.

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinh Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Continuous disturbance							
No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware version	Calibrated Date	Calibrated until
1	843 Shield Room	C/ R/ T	843	/	/	2024/6/22	2027/6/21
2	LISN	ROHDE&SCHWARZ	ESH3-Z5	831551852	/	2025/5/22	2026/5/21
3	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100428	V4.42.SP3	2025/5/22	2026/5/21
4	Coaxial cable	ZDECL	Z302S	18091904	/	2025/5/22	2026/5/21
5	ISN	Schwarzbeck	NTFM8158	183	/	2025/6/18	2026/6/17
6	Voltage sensor	Schwarzbeck	TK 9420	01189	/	2025/9/19	2026/9/18
7	EZ-EMC	Frad	EMC-con3A1.1	/	/	/	/
8	Current Probe	FCC	F-52B	199453	/	2025/5/24	2026/5/23
9	Communication test set	R&S	CMW500	108058	B.19.07 (E1962B)	2025/5/23	2026/5/22
10	Communication test set	Agilent	E5515C	MY50102567	V3.5.80	2025/5/23	2026/5/22

Radiated emission(No.1 Chamber)							
No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware version	Calibrated until	Calibrated until
1	966 Chamber	C/ R/ T	966	/	/	2024/6/23	2027/6/22
2	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	01911	/	2025/6/1	2026/5/31
3	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	/	2025/6/29	2026/6/28
4	Amplifier	Agilent	8449B	3008A01838	/	2025/6/3	2026/6/2
5	Amplifier	HP	8447E	2945A02747	/	2025/5/23	2026/5/22
6	loop antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2025/6/2	2026/6/1
7	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESPI	100362	RF_ATTEN_7 (104489/003)	2025/5/23	2026/5/22
8	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2025/5/23	2026/5/22

9	Coaxial cable	ETS	RFC-SNS-100-NMS-80	/	/	2025/5/24	2026/5/23
10	Coaxial cable	ETS	RFC-SN-100-NMS-20	/	/	2025/5/24	2026/5/23
11	Coaxial cable	ETS	RFC-SNS-100-SMS-20	/	/	2025/5/24	2026/5/23
12	Coaxial cable	ETS	RFC-NNS-100-NMS-300	/	/	2025/5/24	2026/5/23
13	EMI test software	Frad	EZ-EMC	Ver/FA-03A2 RE	/	/	/
14	Communication test set	R&S	CMW500	108058	B.19.07 (E1962B)	2025/5/23	2026/5/22
15	Communication test set	Agilent	E5515C	MY50102567	V3.5.80	2025/5/23	2026/5/22

Harmonic current emission& Voltage changes, voltage fluctuations and flicker							
No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Calibrated Date	Calibrated until
1	Flicker & Harmonic Tester	Laplace Instruments	AC2000A	311363	Version 2.0	2025/5/30	2026/5/29
2	POWER SOURCE	HTEC Instruments	HPF5010	633088	/	2025/6/18	2026/6/17
3	H&F Test PC	HVAEIPC	S25	/	/	/	/
4	Flicker & Harmonic software	HTEC	Version 2.0	/	V2.0	/	/
5	Three-phase harmonic scintillation	Schloder	LMG 641	07552407	/	2025/6/18	2026/6/17
6	Three-phase harmonic power supply	CI	60kVA	/	/	2025/6/18	2026/6/17
7	Three-phase 75A impedance network	Yian	YIAN-3-75	375025	/	2025/6/18	2026/6/17
8	Harmonic flicker test system software GMC	GMC	LMG600 Control 3.130	/	LMG600 Control 3.130		/
9	Communication test set	R&S	CMW500	108058	Version 2.0	2025/5/23	2026/5/22
10	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2025/5/23	2026/5/22

Electrostatic discharges							
No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Calibrated Date	Calibrated until
1	ESD Simulator	TESTQ	NSG437	329	V01.00	2025/6/2	2026/6/1
2	Communication test set	R&S	CMW500	108058	Version 2.0	2025/5/23	2026/5/22
3	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2025/5/23	2026/5/22

Ringing Wave & Surges & Fast transients							
No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Calibrated Date	Calibrated until
1	Surge& Burst Generator	Lioncel	LSE-545CB	0180602	/	2025/5/21	2026/5/20
2	Capacitive coupling clamp	Lioncel	EFTC	018071801	/	2025/5/21	2026/5/20

3	Isolation transformer	Soulemc	HIT 90K	234915	/	/	/
4	Coupled decoupling network	Soulemc	SCDN SR200A	234909	/	2025/2/25	2026/2/24
5	Combinationsurge wave module	Soulemc	SCWG 10KP	234906	/	2025/2/25	2026/2/24
6	Communicationsurge wave module	Soulemc	STSG 10KP	234907	/	2025/2/25	2026/2/24
7	Ring wave module	Soulemc	SRWG 10KP	234908	/	2025/2/25	2026/2/24
8	surge computer	Soulemc	SCWG 10KP	234905	V0.1.0	/	/
9	Unshielded Symmetric Communication Line Coupling Network	Soulemc	SCN 8T	234910	/	2025/2/25	2026/2/24
10	Unshielded symmetrical communication line decoupling network	Soulemc	SDE 8T	234911	/	2025/2/25	2026/2/24
11	Capacitive coupling clamp	Soulemc	SCCC.4	234912	/	2025/2/25	2026/2/24
12	EFT Clamp SHV cable	Soulemc	50 欧 · 1.5M	/	/	/	/
13	Surge LAN cable	Soulemc	(8 线) 1M	/	/	/	/
14	Surge LAN cable	Soulemc	(8 线) 1.2M	/	/	/	/
15	EFT generator	Soulemc	SUCG 5000E	231903	V1.3.4	2025/2/25	2026/2/24
16	EFT Coupled decoupling network	Soulemc	SCDN E200A	234904	/	2025/2/25	2026/2/24
17	Communication test set	R&S	CMW500	108058	Version 2.0	2025/5/23	2026/5/22
18	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2025/5/23	2026/5/22

Voltage dips

No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Calibrated Date	Calibrated until
1	Voltage dip simulator	Lioncel	VDS-1102	180902	V1.04	2025/5/22	2026/5/21
2	DIPS fault simulator	Soulemc	SSAG 3P200T	234913	V1.5.4	2025/5/22	2026/5/21
3	Communication test set	R&S	CMW500	108058	Version 2.0	2025/5/23	2026/5/22
4	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2025/5/23	2026/5/22

Injected currents

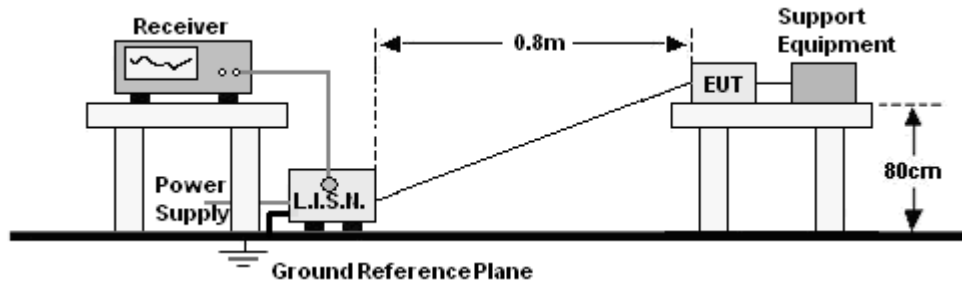
No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware version	Calibrated Date	Calibrated until
1	C/S Test System	SKET	CITS-150K230M-7 5W	SK20210604	20H2	2025/6/18	2026/6/17
2	CDN	SKET	CDN-150K230M-M 2/M3-16A	21302	/	2025/5/22	2026/5/21
3	CDN	Schaffner	CDNT400	/	/	2025/5/22	2026/5/21
4	6dB 100Watt Attenuator	SKET	AP-DC03G-100W-N-6dB	/	/	2025/5/28	2026/5/27
5	Electromagnetic Injection	Prima	PECL-100	/	/	2025/6/18	2026/6/17

	Clamp						
6	50Ω Load	SKET	TL-DC01G-2W-50 BNC	/	/	2025/6/18	2026/6/17
7	CS test software	SKET	EMC-S	V2.0.0.11	/	/	/
8	M5 Coupled decoupling network	HTEC	CDN M5	234902	/	2025/6/3	2026/6/2
9	M2 Coupled decoupling network	HTEC	CDN M2	234901	/	2025/6/3	2026/6/2
10	Communicati on test set	R&S	CMW500	108058	Version 2.0	2025/5/23	2026/5/22
11	Communicati on test set	Agilent	E5515C	MY5010256 7	B.19.07 (E1962B)	2025/5/23	2026/5/22

Radio frequency electromagnetic field							
No.	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Calibrated Date	Calibrated until
1	966 Chamber	C/ R/ T	966	/	/	2024/6/23	2027/6/22
2	Signal Generator	Agilent	N5181A	MY4906092 0	A.01.60	2025/5/22	2026/5/21
3	Stacked Double Log.-Per. Antenna	SKET	STLP 9129 Plus	2106070106	/	/	/
4	Switch Controller	SKET	RFSU-DC18G-4C	2106070105	/	/	/
5	RF Power Meter	Agilent	E9304A	MY4149046 2	/	2025/5/23	2026/5/22
6	RF Power Meter	Agilent	E9301A	MY4149567 5	/	2025/5/23	2026/5/22
7	E-Field Probe	Narda	EP-601	811ZX10305	/	2025/6/3	2026/6/2
8	Power Amplifier	SKET	HAP-80M01G-250 W	2106070103	/	2025/5/30	2026/5/29
9	Power Amplifier	SKET	HAP-01G 06G-75W	2106070104	/	2025/5/30	2026/5/29
10	Audio Analysis	R&S	ATS-1	ATS 1-41152	/	2025/5/23	2026/5/22
11	Audio Output Matching Network	SKET	RCO Network	/	/	2025/5/23	2026/5/22
12	RS test software	SKET	V2.0.0.19	/	/	/	/
13	Communication test set	R&S	CMW500	108058	Version 2.0	2025/5/23	2026/5/22
14	Communication test set	Agilent	E5515C	MY5010256 7	B.19.07 (E1962B)	2025/5/23	2026/5/22

6. CONDUCTED EMISSIONS

6.1 Block Diagram Of Test Setup



6.2 Limit

Limits for Conducted emissions at the mains ports of Class B MME

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56*	56 to 46*
0,50 to 5	56	46
5 to 30	60	50

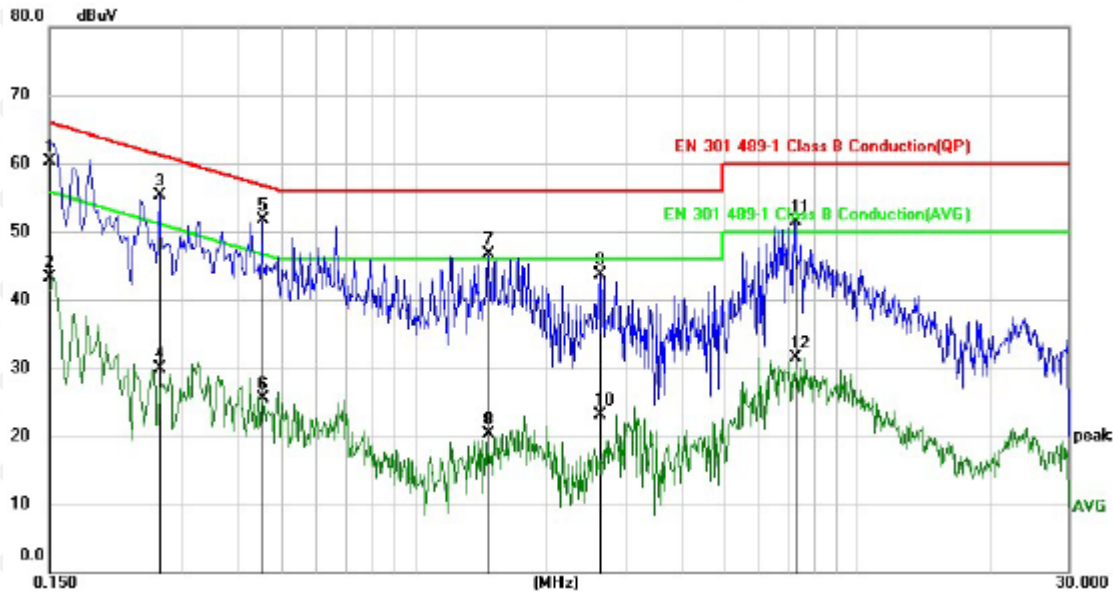
Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

6.3 Test procedure

- The Product was placed on a nonconductive table 0.8m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 Test Result

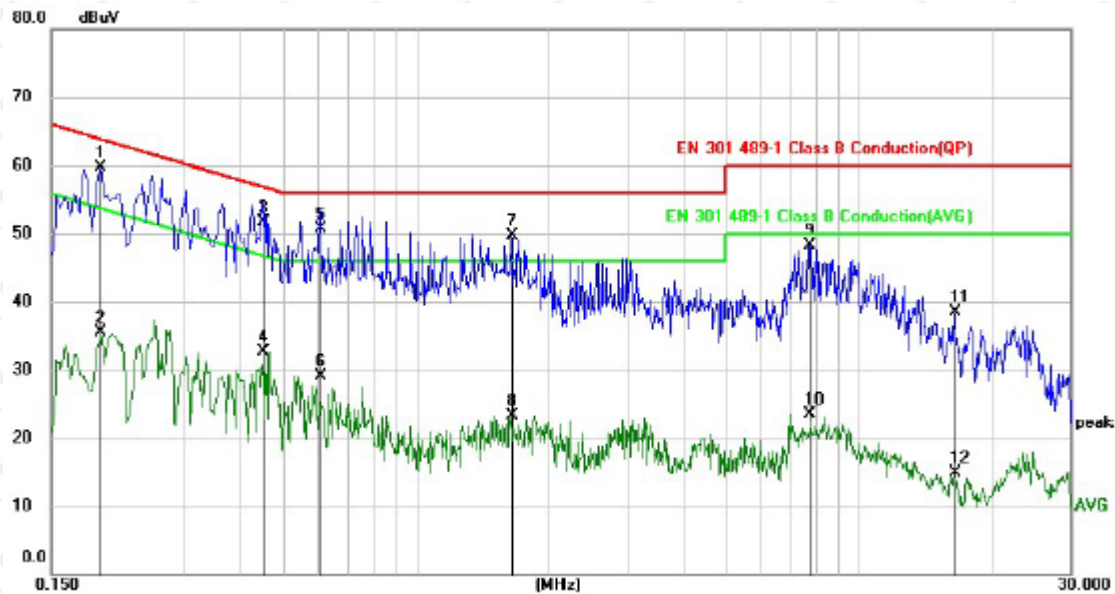
Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1500	50.15	10.07	60.22	66.00	-5.78	QP
2		0.1500	33.25	10.07	43.32	56.00	-12.68	AVG
3		0.2660	45.29	10.08	55.37	61.24	-5.87	QP
4		0.2660	19.77	10.08	29.85	51.24	-21.39	AVG
5	*	0.4540	41.69	10.09	51.78	56.80	-5.02	QP
6		0.4540	15.47	10.09	25.56	46.80	-21.24	AVG
7		1.4700	36.49	10.15	46.64	56.00	-9.36	QP
8		1.4700	10.09	10.15	20.24	46.00	-25.76	AVG
9		2.6339	33.44	10.19	43.63	56.00	-12.37	QP
10		2.6339	12.95	10.19	23.14	46.00	-22.86	AVG
11		7.2138	41.16	10.38	51.54	60.00	-8.46	QP
12		7.2138	21.08	10.38	31.46	50.00	-18.54	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

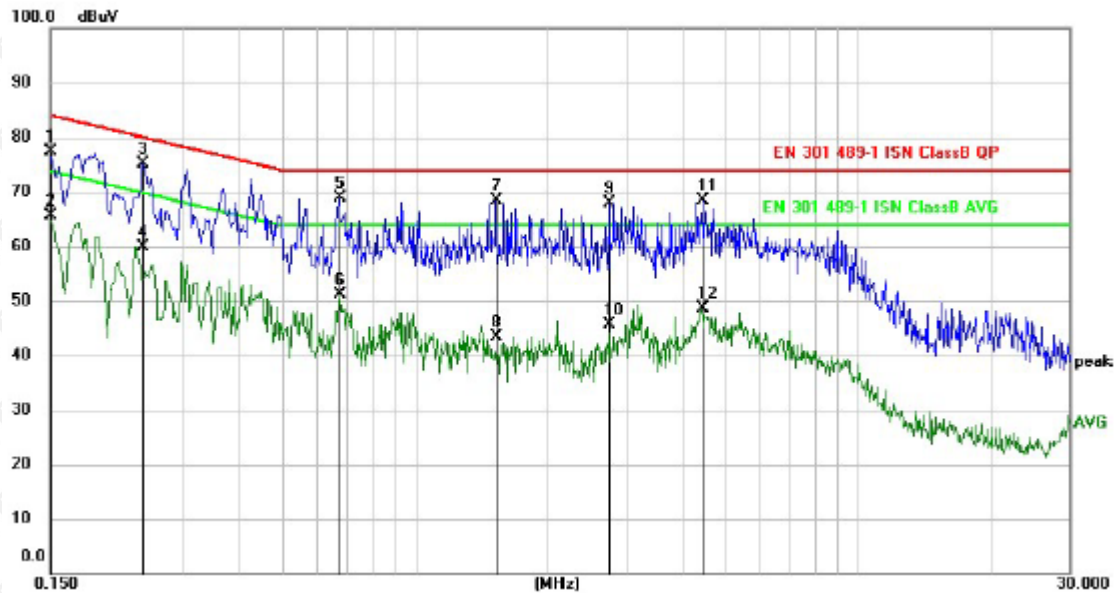
Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.1940	49.67	10.08	59.75	63.86	-4.11	QP
2		0.1940	25.33	10.08	35.41	53.86	-18.45	AVG
3		0.4500	41.56	10.09	51.65	56.88	-5.23	QP
4		0.4500	22.69	10.09	32.78	46.88	-14.10	AVG
5		0.6100	40.62	10.10	50.72	56.00	-5.28	QP
6		0.6100	19.06	10.10	29.16	46.00	-16.84	AVG
7		1.6419	39.46	10.16	49.62	56.00	-6.38	QP
8		1.6419	13.24	10.16	23.40	46.00	-22.60	AVG
9		7.6900	37.91	10.39	48.30	60.00	-11.70	QP
10		7.6900	13.10	10.39	23.49	50.00	-26.51	AVG
11		16.4419	27.79	10.80	38.59	60.00	-21.41	QP
12		16.4419	4.03	10.80	14.83	50.00	-35.17	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

Temperature:	23°C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Network port
Test Mode	1(the worst data)	Remark:	N/A



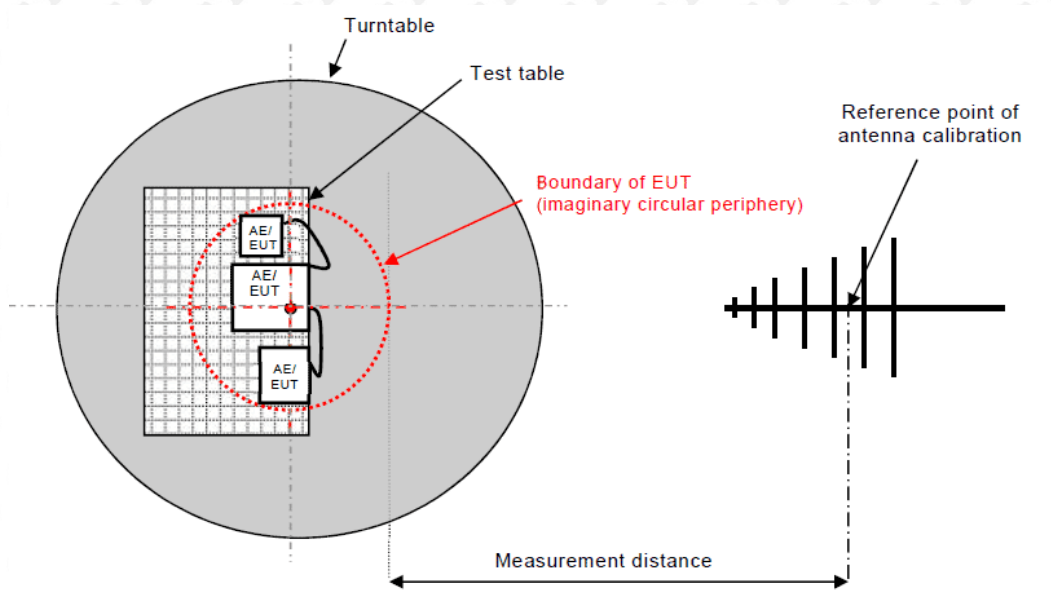
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1500	57.26	20.08	77.34	84.00	-6.66	QP
2		0.1500	45.45	20.08	65.53	74.00	-8.47	AVG
3	*	0.2419	55.07	20.02	75.09	80.03	-4.94	QP
4		0.2419	39.87	20.02	59.89	70.03	-10.14	AVG
5		0.6740	49.01	19.99	69.00	74.00	-5.00	QP
6		0.6740	31.17	19.99	51.16	64.00	-12.84	AVG
7		1.5220	48.53	19.97	68.50	74.00	-5.50	QP
8		1.5220	23.45	19.97	43.42	64.00	-20.58	AVG
9		2.7459	47.99	19.96	67.95	74.00	-6.05	QP
10		2.7459	25.69	19.96	45.65	64.00	-18.35	AVG
11		4.4699	48.35	19.98	68.33	74.00	-5.67	QP
12		4.4699	28.56	19.98	48.54	64.00	-15.46	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

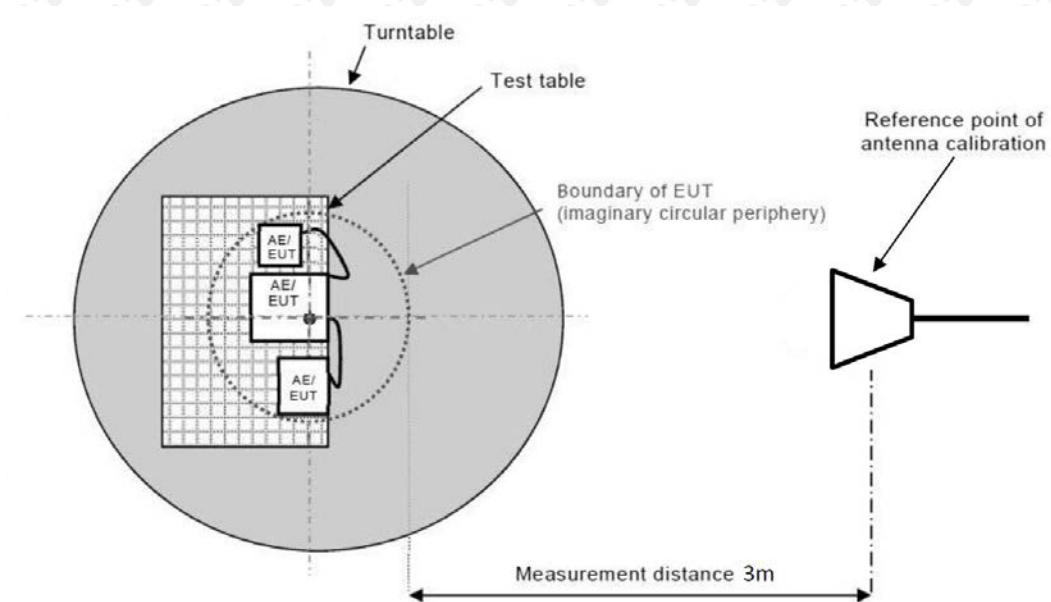
7. RADIATEMISSIONS TEST

7.1 Block Diagram Of Test Setup

30MHz ~ 1GHz:



Above 1GHz:



7.2 Limits

Limits for radiated disturbance of Class B MME

Frequency (MHz)	Quasi-peak limits at 3m dB(μ V/m)
30-230	40
230-1000	47

Frequency (GHz)	limit above 1G at 3m dB(μ V/m)	
	Average	peak
1-3	50	70
3-6	54	74

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

7.3 Test Procedure

30MHz ~ 1GHz:

- The Product was placed on the nonconductive turntable 0.8m above the ground in a semi anechoic chamber.
- Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

- The Product was placed on the non-conductive turntable 0.8m above the ground in a full anechoic chamber..
- Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

7.4 Test Results

Below 1GHz

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Horizontal
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		46.9125	31.80	-6.27	25.53	40.00	-14.47	QP
2		125.2260	37.10	-5.95	31.15	40.00	-8.85	QP
3	!	199.2855	42.23	-6.37	35.86	40.00	-4.14	QP
4	!	250.3012	48.11	-4.74	43.37	47.00	-3.63	QP
5	*	375.0025	48.23	-1.30	46.93	47.00	-0.07	QP
6	!	550.9480	39.51	2.49	42.00	47.00	-5.00	QP

Remark: Result=Reading +Factor
Over Limit=Result -Limit

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Vertical
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	!	38.6838	40.48	-6.03	34.45	40.00	-5.55	QP
2	!	74.5623	44.41	-8.31	36.10	40.00	-3.90	QP
3	*	92.1386	44.74	-7.89	36.85	40.00	-3.15	QP
4	!	189.0743	41.93	-5.14	36.79	40.00	-3.21	QP
5	!	374.6225	43.17	-1.31	41.86	47.00	-5.14	QP
6	!	500.3010	42.59	0.95	43.54	47.00	-3.46	QP

Remark: Result=Reading +Factor
Over Limit=Result -Limit

Above 1GHz

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Horizontal
Test Mode	1(the worst data)	Remark:	N/A

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	1969.89	45.73	1.45	47.17	70.00	-22.83	peak
2	1969.12	27.98	1.45	29.42	50.00	-20.58	AVG
3	3776.06	44.26	5.79	50.05	74.00	-23.95	peak
4	3776.79	25.30	5.79	31.08	54.00	-22.92	AVG
5	4843.80	41.96	9.62	51.59	74.00	-22.41	peak
6	4842.48	23.80	9.62	33.42	54.00	-20.58	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

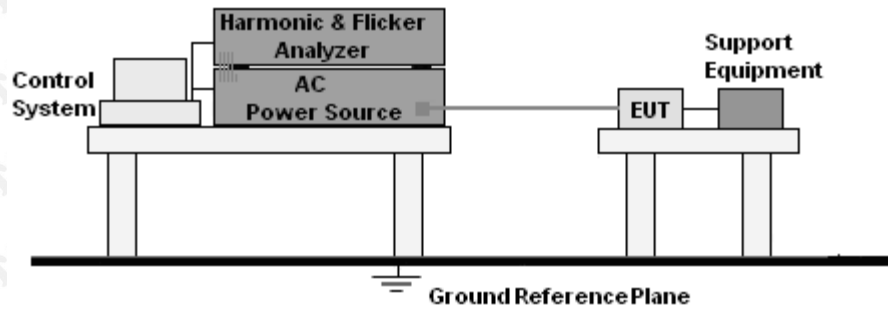
Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Vertical
Test Mode	1(the worst data)	Remark:	N/A

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	1998.24	46.29	1.50	47.79	70.00	-22.21	peak
2	1995.22	28.50	1.50	30.00	50.00	-20.00	AVG
3	3806.98	45.25	5.90	51.16	74.00	-22.84	peak
4	3808.83	28.54	5.90	34.44	54.00	-19.56	AVG
5	4772.60	44.58	9.38	53.95	74.00	-20.05	peak
6	4773.92	26.52	9.38	35.90	54.00	-18.10	AVG

Remark: Result=Reading +Factor
Over Limit=Result -Limit

8. HARMONIC CURRENT EMISSION(H)

8.1 Block Diagram of Test Setup



8.2 Limit

EN IEC 61000-3-2:2019 Clause 7.

8.3 Test Procedure

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

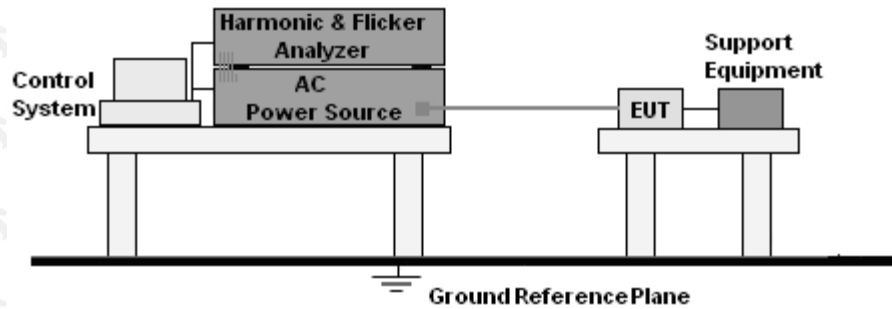
8.4 Test Results

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode	1(the worst data)
Remark:	N/A	Test results	N/A

Remark: No limits apply for equipment with an active input power up to and including 75W.

9. VOLTAGE FLUCTUATIONS & FLICKER(F)

9.1 Block Diagram of Test Setup



9.2 Limit

EN 61000-3-3:2013/A1:2019 Clause 5.

9.3 Test Procedure

- The Product was placed on the top of a non-conductive table above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
- During the flick test, the measure time shall include that part of whole operation cycle in which the Product produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

9.4 Test Results

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode	1(the worst data)
Remark:	N/A	Test results	PASS

Test Name	Test Result	Limit Usage	Info
dc Test [L1]	OK		
dmax Test [L1]	OK	11.1 %	$0.44 \% \leq 4.00 \%$
Pst Test [L1]	OK	5.9 %	$0.059 \leq 1.000$
Plt Test [L1]	OK	8.5 %	$0.055 \leq 0.650$
tmax Test [L1]	OK		

10. IMMUNITY TEST OF GENERAL THE PERFORMANCE CRITERIA

Product Standard	ETSI EN 301 489-1
<p>The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests.</p> <p>For the purpose of the present document two categories of performance criteria apply:</p> <ul style="list-style-type: none"> •Performance criteria for continuous phenomena. •Performance criteria for transient phenomena. <p>NOTE: Normally, the performance criteria depends upon the type of radio equipment and/or its intended application. Thus, the present document only contains general performance criteria commonly used for the assessment of radio equipment.</p>	
Performance criteria for continuous phenomena	<p>During the test, the equipment shall:</p> <ul style="list-style-type: none"> •continue to operate as intended; •not unintentionally transmit; •not unintentionally change its operating state; •not unintentionally change critical stored data.
Performance criteria for transient phenomena	<p>For all ports and transient phenomena with the exception described below, the following applies:</p> <ul style="list-style-type: none"> •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. <p>For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:</p> <ul style="list-style-type: none"> •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.

According To EN 301489 -17standard, The General Performance Criteria As Following:

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 clauses.

Table 1: Performance criteria

Criteria	During the 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 applied to Transmitters (CT)

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

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or NotACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission

resulting from the application of the test is correctly interpreted.

Performance criteria for Transient phenomena applied to Transmitters (TT)

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

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Continuous phenomena applied to Receivers (CR)

The performance criteria A shall apply.

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Transient phenomena applied to Receivers (TR)

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

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

According To EN 301489 -52 standard, The General Performance Criteria As Following:

GSM and DCS Performance Criteria

General

The equipment shall meet the performance criteria specified in this clause and clauses 6.1.1 to 6.1.4, as appropriate.

Portable equipment intended for use whilst powered by the main battery of a vehicle shall additionally fulfil the applicable requirements set out in ETSI EN 301 489-1 [1], clauses 7.1 and 7.2 for mobile equipment.

Portable or mobile equipment powered by the AC mains shall additionally fulfil the applicable requirements of ETSI EN 301 489-1 [1], clauses 7.1 and 7.2 for radio and ancillary equipment for fixed use.

The establishment and maintenance of a communications link, the assessment of RXQUAL, and the assessment of the audio breakthrough by monitoring the speech output signal level, are used as performance criteria to ensure that all primary functions of the transmitter and receiver are evaluated during the immunity tests. In addition, the test shall also be performed in idle mode to ensure the transmitter does not unintentionally operate.

The maintenance of a communications link shall be assessed using an indicator which may be part of the test system or the EUT.

If an equipment is of a specialized nature, such that the performance criteria described in the following clauses are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in the following clauses.

Performance criteria for Continuous phenomena applied to Transmitters (CT)

A communication link shall be established at the start of the test, and maintained during the test, see clauses 4.2.3 and 4.2.4.

During the test, the uplink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check).

NOTE: When there is a high level background noise present the filter bandwidth can be reduced down to a minimum of 40 Hz.

At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

Performance criteria for Transient phenomena applied to Transmitters (TT)

A communications link shall be established at the start of the test, see appropriate clauses 4.2 to 4.2.4.

At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.

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

In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

Performance criteria for Continuous phenomena applied to Receivers (CR)

A communications link shall be established at the start of the test, see appropriate clauses 4.2 to 4.2.6.

During the test, the RXQUAL of the downlink shall not exceed the value of three, measured during each individual exposure in the test sequence.

During the test, the downlink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check).

NOTE: When there is a high level background noise present the filter bandwidth can be reduced down to a minimum of 40 Hz.

At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained.

Performance criteria for Transient phenomena applied to Receivers (TR)

A communications link shall be established at the start of the test, see appropriate clauses 4.2. to 4.2.6.

At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.

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

Performance criteria for ancillary equipment tested on a stand alone basis

The provision of ETSI EN 301 489-1 [1], clause 6.4 shall apply.

CDMA Direct Spread (UTRA and E-UTRA) Performance Criteria

General

The equipment shall meet the performance criteria specified in this clause and clauses 6.2.2 and 6.2.3 as appropriate.

The maintenance of a communications link shall be assessed by using an indicator, which may be part of the test system or the equipment under test.

If an equipment is of a specialized nature, that the performance criteria described in the following clauses are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after testing, as required by the present document.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in the following clauses.

In addition, the test shall also be performed in idle mode to ensure the transmitter does not unintentionally operate.

The requirements apply to all types of UTRA and E-UTRA (FDD or TDD) for the UE.

Performance criteria for continuous phenomena

General

A communication link shall be established at the start of the test, and maintained during the test, clauses 4.1 and 4.2.

In the speech mode, the performance criteria shall be that the Up Link and Down Link speech output levels shall be at least 35 dB less than the recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (annex B).

NOTE: When there is a high level of background audio noise present, the filter bandwidth can be reduced down to a minimum of 40 Hz.

At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained.

In addition to confirming the above performance in traffic mode, the test shall be performed in idle mode, and the transmitter shall not unintentionally operate.

UTRA

In the data transfer mode, the performance criteria can be one of the following:

- if the BER (as referred in ETSI TS 134 109 [4]) is used, it shall not exceed 0,001 during the test sequence;
- if the BLER (as referred in ETSI TS 134 109 [4]) is used, it shall not exceed 0,01 during the test sequence.

The BLER calculation shall be based on evaluating the CRC on each transport block.

E-UTRA

In the data transfer mode, the performance criteria shall be that the throughput shall be ≥ 95 % of the maximum throughput of the reference measurement channel as specified in annex C in ETSI TS 136 101 [9] with parameters specified in tables 7.3.1-1 and 7.3.1-2 in ETSI TS 136 101 [9] during the test sequence.

Performance criteria for Transient phenomena

A communications link shall be established at the start of the test, clauses 4.1 and 4.2.

At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.

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

In addition to confirming the above performance in traffic mode, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

According To EN 301489 -3 standard, The General Performance Criteria As Following:

Table 1: Performance criteria

Criteria	During the test	After test (i.e. as a result of the application of the test)
A	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
B	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
NOTE: Whether a phenomenon is considered transient, continuous or otherwise is indicated in the test procedures for the phenomenon in ETSI EN 301 489-1 [1], clause 9.		

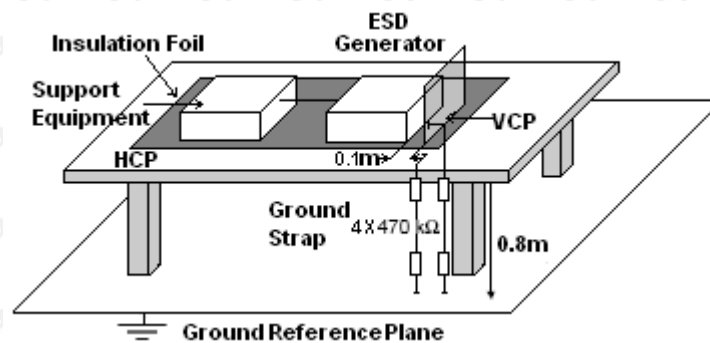
- performance criterion A applies for immunity tests with phenomena of a continuous nature;
- performance criterion B applies for immunity tests with phenomena of a transient nature.

11. ELECTROSTATIC DISCHARGE (ESD)

11.1 Test Specification

Test Port	: Enclosure port
Discharge Impedance	: 330 ohm / 150 pF
Discharge Mode	: Single Discharge
Discharge Period	: one second between each discharge

11.2 Block Diagram of Test Setup



11.3 Test Procedure

- Electrostatic discharges were applied only to those points and surfaces of the Product that are accessible to users during normal operation.
- The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- The time interval between two successive single discharges was at least 1 second.
- 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 Product.
- Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- Air discharges were applied with the round discharge tip of the discharge electrode approaching the Product as fast as possible (without causing mechanical damage) to touch the Product. After each discharge, the ESD generator was removed from the Product and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the Product. The ESD generator was positioned vertically at a distance of 0.1 meters from the Product with the discharge electrode touching the HCP.
- 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 Product were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the Product.

11.4 Test Results

Temperature :	23℃	Relative Humidity :	54%
Pressure :	101kPa	Test Mode :	Mode1- Mode9

Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	Performance Criterion
Contact Discharge	Conductive Surfaces	4	10	A
	Indirect Discharge HCP	4	10	A
	Indirect Discharge VCP	4	10	A
Air Discharge	Slots, Apertures, and Insulating Surfaces	8	10	A
Note: A: No performance degradation during test. B: During the test, the EUT shut down, after the test, it reset by itself. C: During the test, the EUT shut down, after the test, it reset by user.				

Type	Antenna Polar.	Observation item	Test Result	Limit	Result
LTE BAND 1	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 3	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 7	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 8	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 20	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 38	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 40	VERT/HOTRI	Throughput	100	>95	Pass

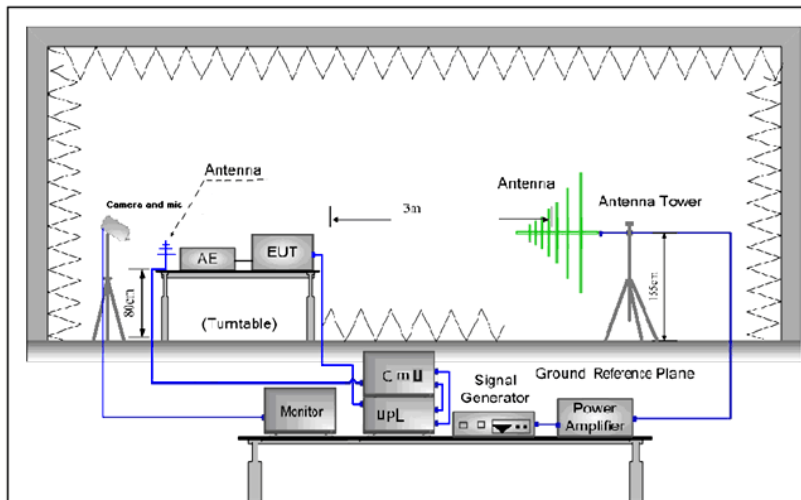
12. CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES(RS)

12.1 Test Specification

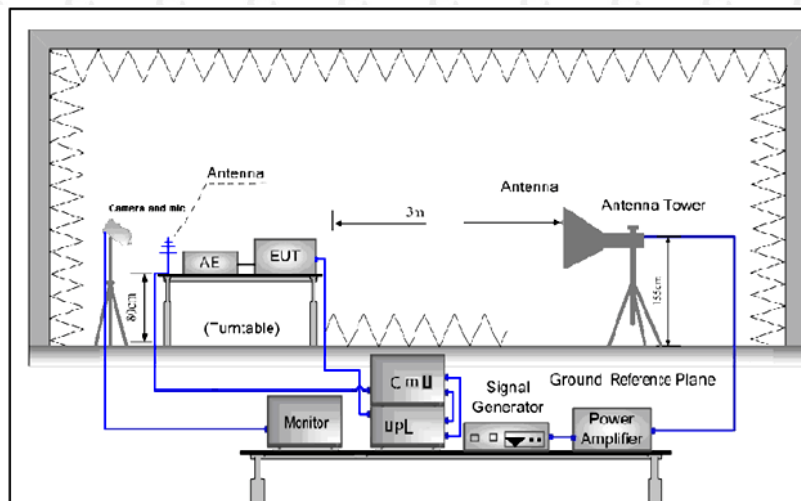
Test Port	: Enclosure port
Step Size	: 1%
Modulation	: 1kHz, 80% AM
Dwell Time	: 1 second
Polarization	: Horizontal & Vertical

12.2 Block Diagram of Test Setup

Below 1GHz:



Above 1GHz:



12.3 Test Procedure

- The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the Product.
- The frequency range is swept from 80MHz to 6000MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave, and the step size was 1%.
- 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, but should not exceed 5 s at each of the frequencies during the scan.
- The test was performed with the Product exposed to both vertically and horizontally polarized fields on each of the four sides.
- For Broadcast reception function: Group 2 not apply in this test.

12.4 Test Results

Temperature :	23 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Mode :	Mode1- Mode3

Frequency	Position	Field Strength	Performance Criterion
80 - 6000MHz	Front, Right, Back, Left, Up, Down	3V/m	A
Note: A: No performance degradation during test.			

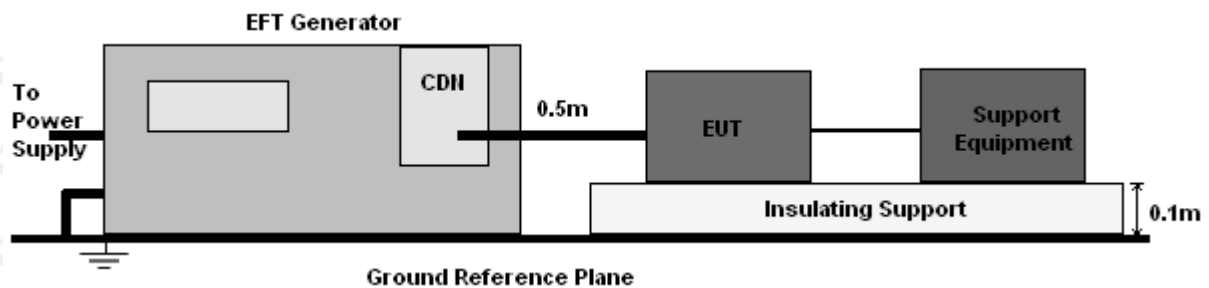
13. ELECTRICAL FAST TRANSIENTS/BURST (EFT)

13.1 Test Specification

Test Port	: input a.c. power port
Impulse Frequency	: 5 kHz
Impulse Wave-shape	: 5/50 ns
Burst Duration	: 15 ms
Burst Period	: 300 ms
Test Duration	: 2 minutes per polarity

13.2 Block Diagram of EUT Test Setup

For input a.c. power port:



13.3 Test Procedure

- The Product and support units were located on a non-conductive table above ground reference plane.
- A 0.5m-long power cord was attached to Product during the test.

13.4 Test Results

Temperature :	23 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Mode :	Mode1- Mode9

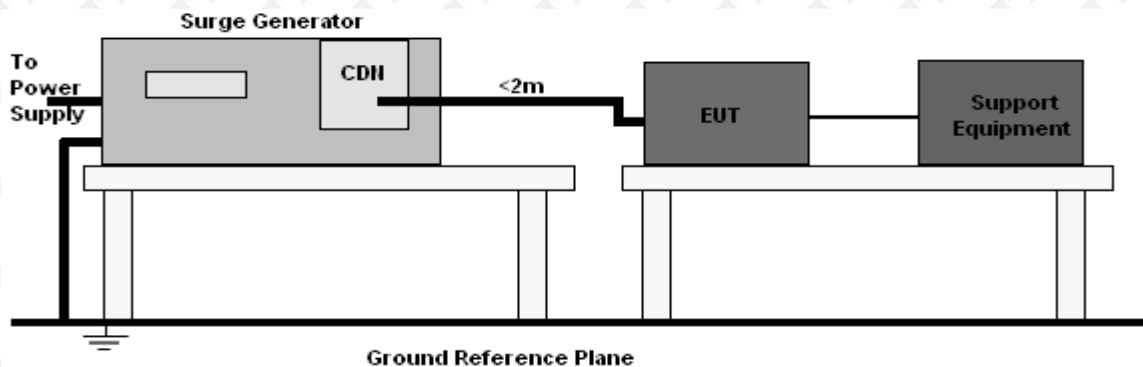
Coupling	Voltage (kV)	Polarity	Performance Criterion
AC Mains L-N	1.0	±	A
Signal Line	0.5	±	N/A
LAN Ports	0.5	±	A
DC Ports	0.5	±	N/A
Note: A: No performance degradation during test. B: During the test, the EUT shut down, after the test, it reset by itself. C: During the test, the EUT shut down, after the test, it reset by user.			

14. SURGES IMMUNITY TEST

14.1 Test Specification

Test Port	: input a.c. power port
Wave-Shape	: Open Circuit Voltage - 1.2 / 50 us Short Circuit Current - 8 / 20 us
Pulse Repetition Rate	: 1 pulse / min.
Phase Angle	: 0° / 90° / 180° / 270°
Test Events	: 5 pulses (positive & negative) for each polarity

14.2 Block Diagram of EUT Test Setup



14.3 Test Procedure

- The surge is to be applied to the Product power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave.
- The power cord between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter). Interconnection line between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter).

14.4 Test Result

Temperature :	23 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Mode :	Mode1- Mode9

Coupling Line	Voltage (kV)	Polarity	Performance Criterion
L - N	1	±	A
L - PE	2	±	N/A
N - PE	2	±	N/A
LAN Ports	±1	/	A
Note: A: No performance degradation during test. B: During the test, the EUT shut down, after the test, it reset by itself. C: During the test, the EUT shut down, after the test, it reset by user.			

Remark: No test shall be required where normal functioning cannot be achieved because of the impact of the CDN on the Product.

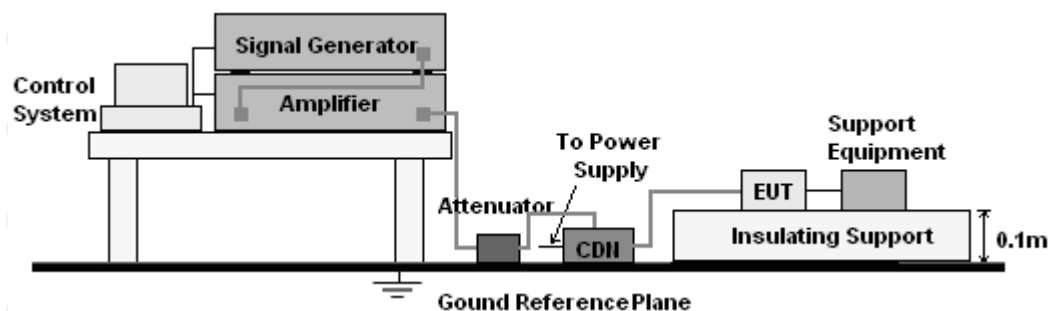
15. CONTINUOUS INDUCED RF DISTURBANCES (CS)

15.1 Test Specification

Test Port	: input a.c.power port
Step Size	: 1%
Modulation	: 1kHz, 80% AM
Dwell Time	: 1 second

15.2 Block Diagram of EUT Test Setup

For input a.c. power port:



15.3 Test Procedure

For input a.c.power port:

- The Product and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.
- The frequency range is swept from 150 kHz to 10MHz, 10MHz to 30MHz, 30MHz to 80MHz with the signal 80% amplitude modulated with a 1 kHz sine wave, and the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the Product to be able to respond.

15.4 Test Result

Temperature :	23 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Mode :	Mode1- Mode9

Inject Line	Frequency (MHz)	Voltage Level (V r.m.s.)	Performance Criterion
ac. port	0.15 - 80	3	A
LAN Ports	0.15 - 80	3	A
Note: A: No performance degradation during test.			

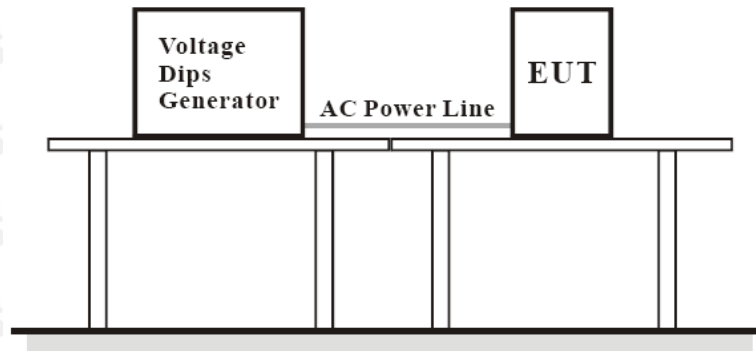
Type	Antenna Polar.	Observation item	Test Result	Limit	Result
LTE BAND 1	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 3	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 7	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 8	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 20	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 38	VERT/HOTRI	Throughput	100	>95	Pass
LTE BAND 40	VERT/HOTRI	Throughput	100	>95	Pass

16. VOLTAGE DIPS AND INTERRUPTIONS (DIPS)

16.1 Test Specification

Test Port	: input a.c. power port
Phase Angle	: 0°, 180°
Test cycle	: 3 times

16.2 Block Diagram of EUT Test Setup



16.3 Test Procedure

- The Product and support units were located on a non-conductive table above ground floor.
- Set the parameter of tests and then perform the test software of test simulator.
- Conditions changes to occur at 0 degree crossover point of the voltage waveform.

16.4 Test Result

Temperature :	23 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Mode :	Mode1- Mode9

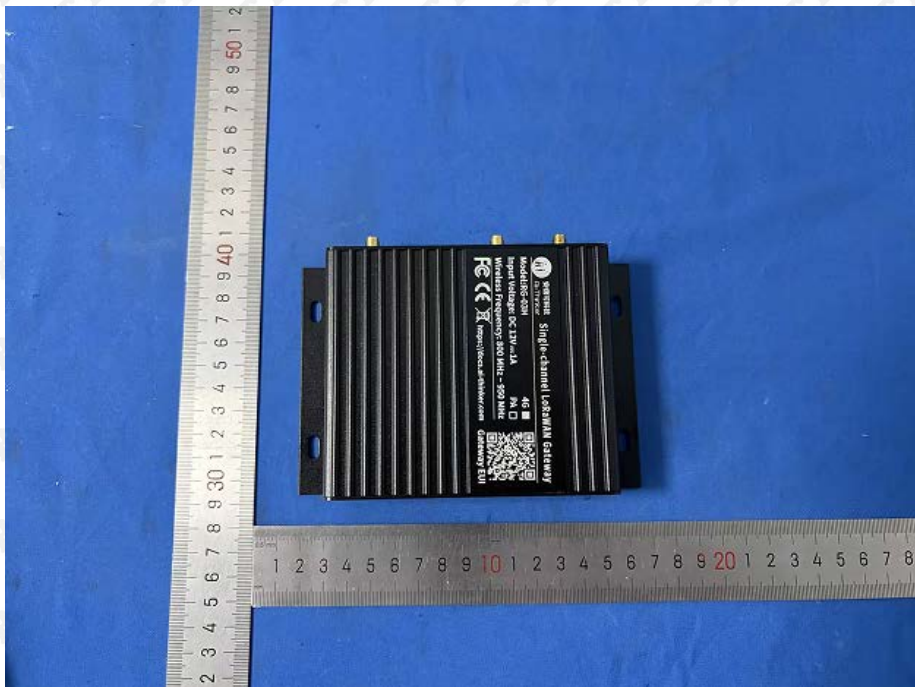
Voltage Dips:			
Test Level % U_T	Voltage dips in % U_T	Duration (ms)	Performance Criterion
0	100	10	A
0	100	20	A
70	30	500	A
Voltage Interruptions:			
0	100	5000	C
Note: A: No performance degradation during test. B: During the test, the EUT shut down, after the test, it reset by itself. C: During the test, the EUT shut down, after the test, it reset by user.			

17. EUT PHOTOGRAPHS

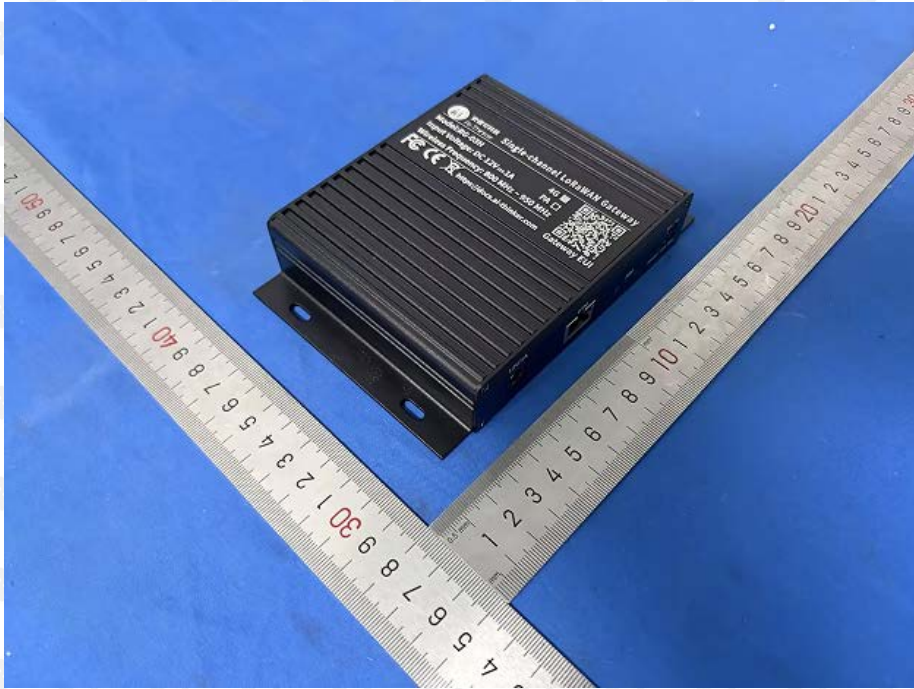
External Photos EUT Photo 1



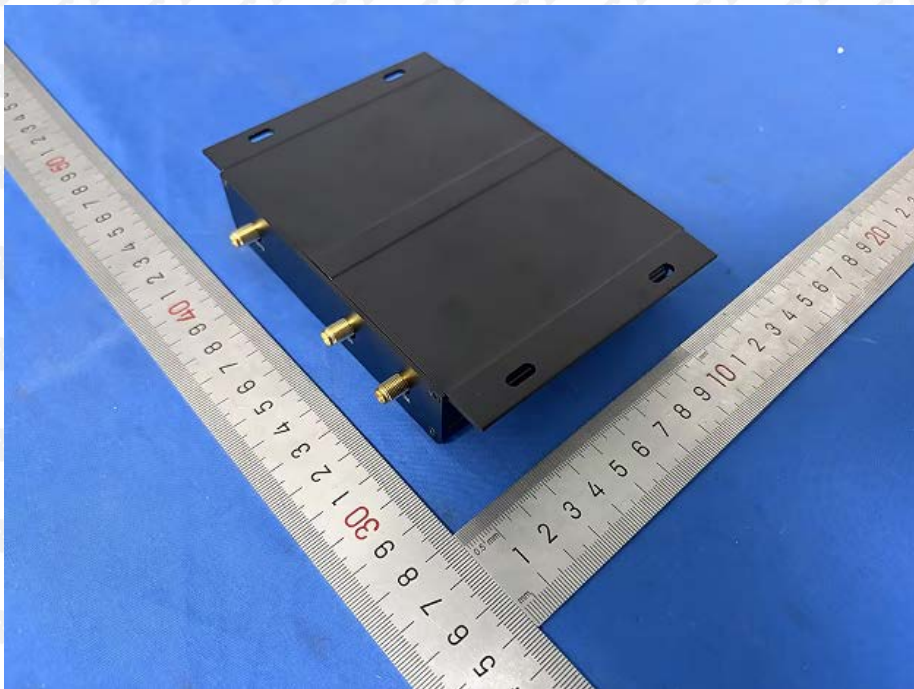
EUT Photo 2



EUT Photo 3



EUT Photo 4



EUT Photo 5



EUT Photo 6



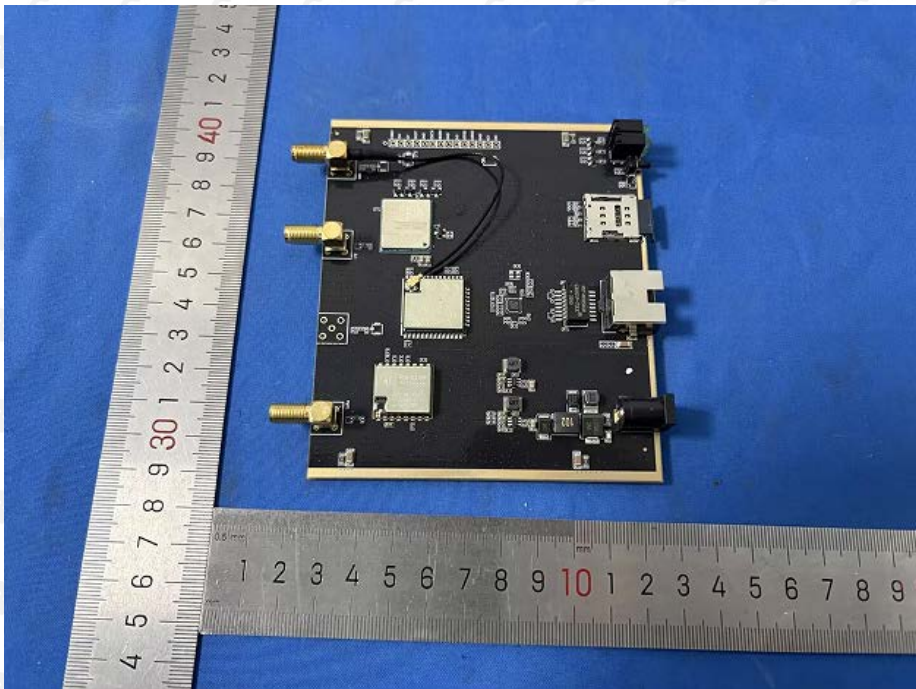
EUT Photo 7



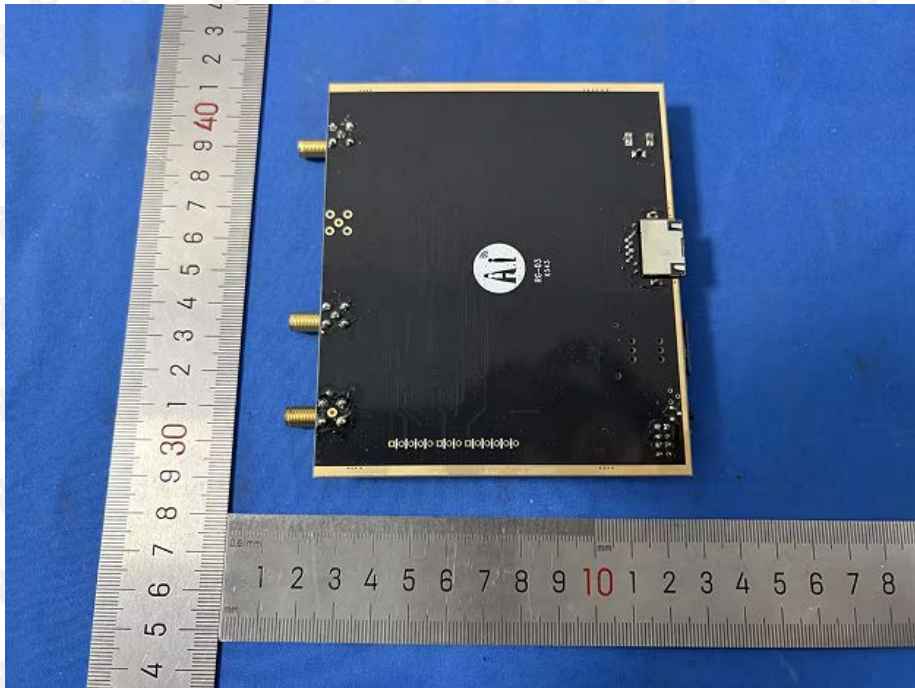
Internal Photos
EUT Photo 1



EUT Photo 2



EUT Photo 3



18. EUT TEST SETUP PHOTOGRAPHS

Conducted emissions



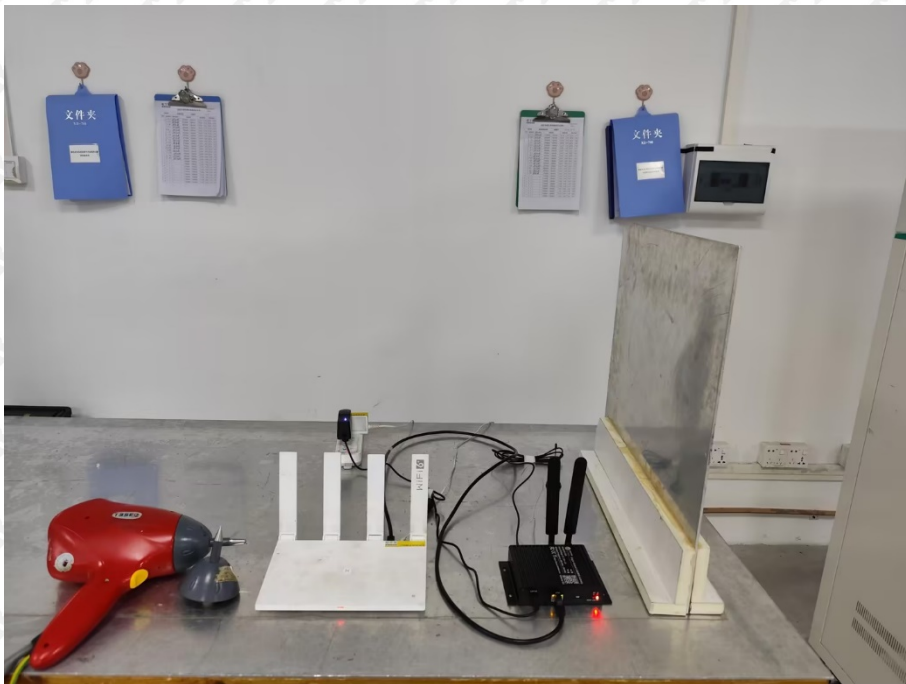
Radiated emissions below 1G



H/F



ESD



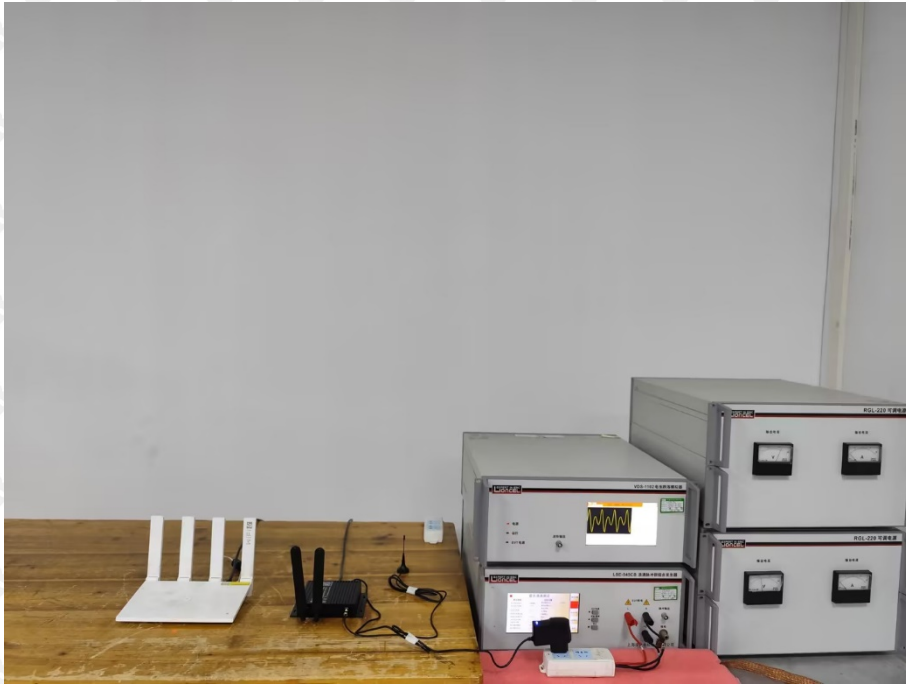
RS



CS



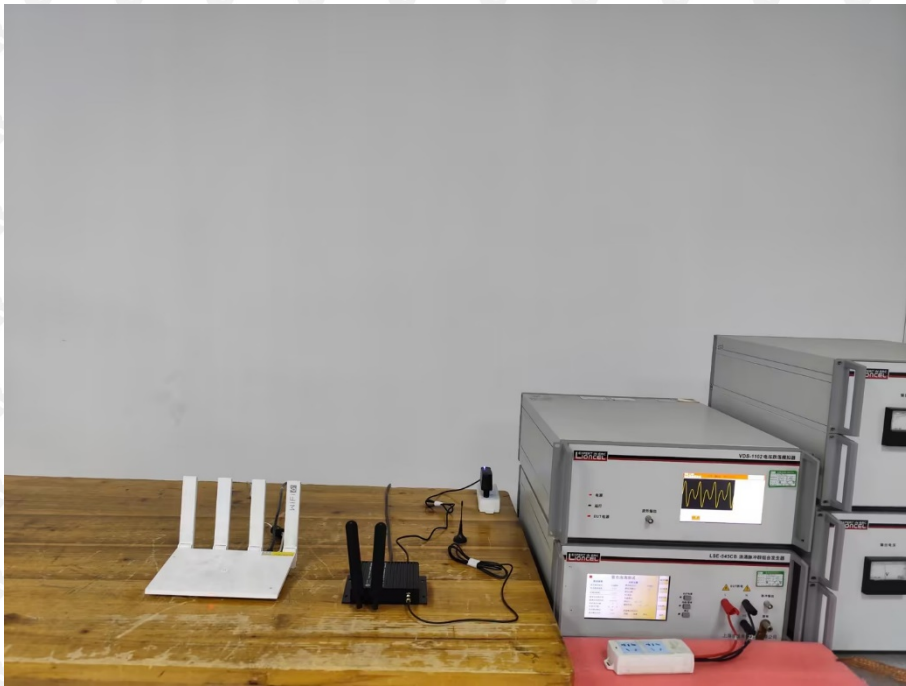
EFT



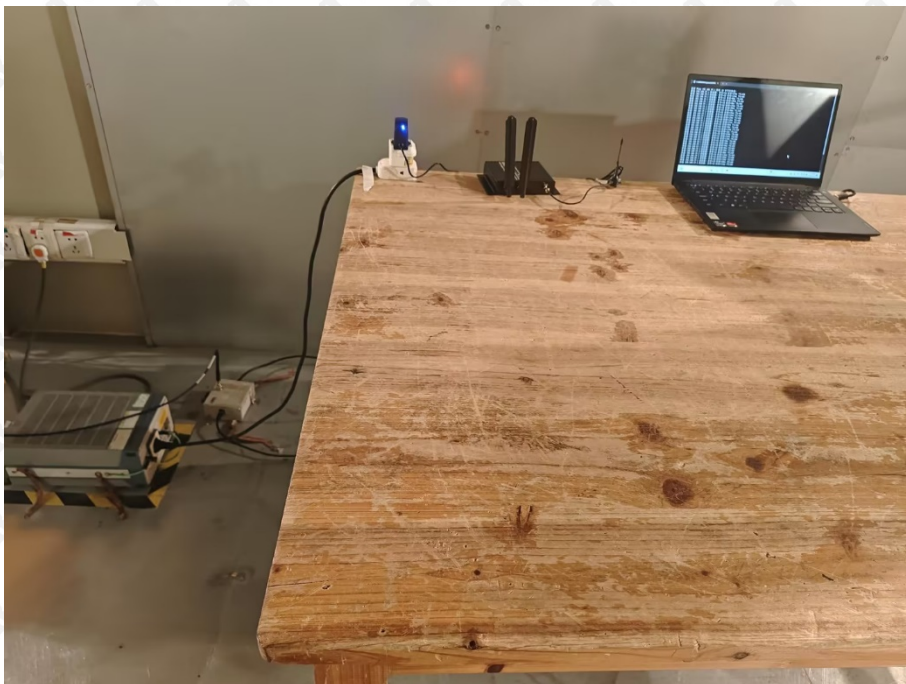
Surges



DIPS



TELE



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