TEST REPORT

Product Name:	Mini PC
Trademark:	N/A
Model Number:	B4 Turbo, For other models, see section P4.1
Prepared For:	Creature Information(Guangzhou)Technology Co., Limited
Address:	No.123, Baishashui Road, Tianhe District, Guangzhou, China
Manufacturer:	Creature Information(Guangzhou)Technology Co., Limited
Address:	No.123, Baishashui Road, Tianhe District, Guangzhou, China
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	Mar. 17, 2025
Sample tested Date:	Mar. 17, 2025 to Apr. 07, 2025
Issue Date:	Apr. 07, 2025
Report No.:	CTB25031709702RE03
Test Standards	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.4 (2020-09)
Test Results	PASS
Remark:	This is RED EMC test report.

Compiled by:	Reviewed by:	Approved by:
Zhou Kui	Arron Liu	Bin Mei
Zhou Kui	Arron Liu	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.

TABLE OF CONTENT

Test Report Declaration Page

(NOTE: N/A MEANS NOT APPLICABLE)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB25031709702RE03	Apr. 7, 2025	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(s):	B4 Turbo, MP01, MP02, MP03, MP05, B1, B1 A, B1 G, B1 J, B1 S, B1 Plus, B1 Pro, B1 Power, B1 Turbo, B1 Ultra, B1 Mini, B2, B2 A, B2 G, B2 J, B2 S, B2 Plus, B2 Pro, B2 Power, B2 Turbo, B2 Ultra, B2 Mini, B2N, B2N S, B2N Plus, B2N Pro, B2N Power, B2N Ultra, B3, B3 A, B3 G, B3 J, B3 S, B3 Plus, B3 Pro, B3 Power, B3 Turbo, B3 Ultra, B3 Mini, B3N, B3N S, B3N Plus, B3N Pro, B3N Power, B3N Ultra, B4, B4 A, B4 G, B4 J, B4 S, B4 Plus, B4 Pro, B4 Power, B4 Turbo, B4 Ultra, B4 Mini, B4A, B4A Plus, B4A Pro, B4A Power, B4A Turbo, B4A Ultra, B5, B5 A, B5 G, B5 J, B5 S, B5 Plus, B5 Pro, B5 Power, B5 Turbo, B5 Ultra, B5A, B5A Plus, B5A Pro, B5A Power, B5A Turbo, B5A Ultra, B6, B6 A, B6 G, B6 J, B6 S, B6 Plus, B6 Pro, B6 Power, B6 Turbo, B6 Ultra, B6A, B6A Plus, B6A Pro, B6A Power, B6A Turbo, B6A Ultra, B7, B7 A, B7 G, B7 J, B7 S, B7 Plus, B7 Pro, B7 Power, B7 Turbo, B7 Ultra, B7A, B7A Plus, B7A Pro, B7A Power, B7A Turbo, B7A Ultra, B8, B8 A, B8 G, B8 J, B8 S, B8 Plus, B8 Pro, B8 Power, B8 Turbo, B8 Ultra, B8A, B8A Plus, B8A Pro, B8A Power, B8A Turbo, B8A Ultra, B9, B9 A, B9 AI, B9 G, B9 J, B9 S, B9 Plus, B9 Pro, B9 Power, B9 Turbo, B9 Ultra, B9A, B9A AI, B9A Plus, B9A Pro, B9A Power, B9A Turbo, B9A Ultra, B10, B10 A, B10 AI, B10 G, B10 J, B10 S, B10 Plus, B10 Pro, B10 Power, B10 Turbo, B10 Ultra, B10A, B10A AI, B10A Plus, B10A Pro, B10A Power, B10A Turbo, B10A Ultra, B11, B11 A, B11 AI, B11 G, B11 J, B11 S, B11 Plus, B11 Pro, B11 Power, B11 Turbo, B11 Ultra, B11A, B11A AI, B11A Plus, B11A Pro, B11A Power, B11A Turbo, B11A Ultra, B12, B12 A, B12 AI, B12 G, B12 J, B12 S, B12 Plus, B12 Pro, B12 Power, B12 Turbo, B12 Ultra, B12A, B12A AI, B12A Plus, B12A Pro, B12A Power, B12A Turbo, B12A Ultra, B13, B13 A, B13 AI, B13 G, B13 J, B13 S, B13 Plus, B13 Pro, B13 Power, B13 Turbo, B13 Ultra, B13A, B13A AI, B13A Plus, B13A Pro, B13A Power, B13A Turbo, B13A Ultra, B14, B14 A, B14 AI, B14 G, B14 J, B14 S, B14 Plus, B14 Pro, B14 Power, B14 Turbo, B14 Ultra, B14A, B14A AI, B14A Plus, B14A Pro, B14A Power, B14A Turbo, B14A Ultra, B15, B15 A, B15 AI, B15 G, B15 J, B15 S, B15 Plus, B15 Pro, B15 Power, B15 Turbo, B15 Ultra, B15A, B15A AI, B15A Plus, B15A Pro, B15A Power, B15A Turbo, B15A Ultra, M1U, M1U Plus, M1U Pro, M1U Power, M1U Turbo, M1U Ultra, M2U, M2U Plus, M2U Pro, M2U Power, M2U Turbo, M2U Ultra, M3U, M3U Plus, M3U Pro, M3U Power, M3U Turbo, M3U Ultra, M4U, M4U Plus, M4U Pro, M4U Power, M4U Turbo, M4U Ultra, M5U, M5U Plus, M5U Pro, M5U Power, M5U Turbo, M5U Ultra, M6U, M6U Plus, M6U Pro, M6U Power, M6U Turbo, M6U Ultra
Model Description:	All the model are the same circuit and RF module, only the model name and appearance are different. Test sample model: B4 Turbo
Bluetooth Version:	Bluetooth 5.2
WIFI Version:	IEEE 802.11a/b/g/n/ac
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	Bluetooth: 2402-2480MHz IEEE 802.11a/n/ac(20M): 5725MHz ~5850MHz/ 5 channel IEEE 802.11n/ac(40M): 5725MHz ~5850MHz/ 2 channel IEEE 802.11ac(80M): 5725MHz ~5850MHz/ 1 channel
Max. RF output power:	Bluetooth: 8.25dBm WiFi(5G):13.52dBm
Type of Modulation:	Bluetooth: GFSK, π/4 DQPSK, 8DPSK WiFi: DSSS, OFDM

Antenna installation:	Bluetooth: Internal antenna
Antenna Gain:	Bluetooth: 1.0dBi WiFi(5G) ANT1:1.0dBi, ANT2:1.0dBi
Ratings:	For AC/DC ADAPTER: 100-240V~, 50/60Hz, 1.0A Max. For Mini PC: 12V ⎓ 2.0A

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.	Keyboard	DELL	KB216t	N/A	AE
2.	Mouse	DELL	MS116c	N/A	AE
3.	Monitor	DELL	SE2218HV	N/A	AE
4.	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	5.8G WIFI	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, Xinhe 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 until
1	843 Shield Room	C/ R/ T	843	/	/	2027/6/21
2	AMN	ROHDE&SCHWARZ	ESH3-Z5	831551852	/	2025/6/30
3	Pulse limiter	ROHDE&SCHWARZ	ESH3Z2	357881052	/	2025/6/28
4	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100428	V4.42.SP3	2025/6/30
5	Coaxial cable	ZDECL	Z302S	18091904	/	2025/6/30
6	ISN	Schwarzbeck	NTFM8158	183	/	2025/6/30
7	Voltage sensor	Schwarzbeck	TK 9420	01189	/	2025/10/25
8	EZ-EMC	Frad	EMC-con3A1.1	/	/	/
9	Current Probe	FCC	F-52B	199453	/	2025/5/27
10	Communication test set	R&S	CMW500	108058	B.19.07 （E1962B ）	2025/6/28
11	Communication test set	Agilent	E5515C	MY50102567	V3.5.80	2025/6/28

Radiated emission(No.2 Chamber)

No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware version	Calibrated until
1	966 Chamber	C/ R/ T	966	/	/	2026/11/14
2	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	01911	/	2026/7/07
3	Broadband Antenna	Schwarzbeck	VULB 9168	1471	/	2025/7/06
4	Amplifier	Agilent	8449B	3008A01838	/	2025/6/30
5	Preamplifier	Schwarzbeck	BBV 9743 B	00500	/	2025/5/23
6	EMI TEST RECEIVER	R&S	ESCI7	100861	/	2025/10/25
7	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2025/6/28
8	EMI test software	Farad	EZ-EMC	/	Ver. FARAD-3A1+	/
9	Coaxial cable	Rosenberg	8m	/	/	2025/10/25
10	Coaxial cable	Times	2m	/	/	2025/10/25

11	Coaxial cable	Times	2m	/	/	2025/10/25
12	Coaxial cable	Times	1m	/	/	2025/10/25
13	loop antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2025/6/29
14	Communication test set	R&S	CMW500	108058	B.19.07 (E1962B)	2025/6/28
15	Communication test set	Agilent	E5515C	MY50102567	V3.5.80	2025/6/28

Harmonic current emission& Voltage changes, voltage fluctuations and flicker

No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Calibrated until
1	Power Analyzer	Laplace Instruments	AC2000A	311363	Version 2.0	2025/6/28
2	AC Power source	HTEC Instruments	HPF5010	633088	/	2025/6/28
3	H&F Test PC	HVAEIPC	S25	/	/	2025/6/28
4	Flicker & Harmonic software	HTEC	Version 2.0	/	/	/
5	Three-phase harmonic scintillation	Schloder	LMG 641	/	/	/
6	Three-phase harmonic power supply	Chroma	60kVA	/	/	2025/5/23
7	Communication test set	R&S	CMW500	108058	Version 2.0	2025/6/28
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 （E1962B ）	2025/6/28

Electrostatic discharges

No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Calibrated until
1	ESD Simulator	TESTQ	NSG437	329	V01.00	2025/6/29
2	Communication test set	R&S	CMW500	108058	Version 2.0	2025/6/28
3	Communication test set	Agilent	E5515C	MY50102567	B.19.07 （E1962B ）	2025/6/28

Ringing Wave &Surges & Fast transients

No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Calibrated until
1	Surge& Burst Generator	Lioncel	LSE-545CB	180602	/	2025/6/28
2	Capacitive coupling clamp	Lioncel	EFTC	18071801	/	2025/6/28
3	Isolation transformer	Soulemc	HIT 90K	234915	/	2025/5/23
4	Coupled decoupling network	Soulemc	SCDN SR200A	234909	/	2025/2/19
5	Combinationsurge wave module	Soulemc	SCWG 10KP	234906	/	2025/1/31
6	Communicationsurge wave module	Soulemc	STSG 10KP	234907	/	2025/1/31
7	Ring wave module	Soulemc	SRWG 10KP	234908	/	2025/1/31
8	surge computer	Soulemc	SCWG 10KP	234905	V0.1.0	/

9	Unshielded Symmetric Communication Line Coupling Network	Soulemc	SCN 8T	234910	/	2025/2/19
10	Unshielded symmetrical communication line decoupling network	Soulemc	SDE 8T	234911	/	2025/2/19
11	Capacitive coupling clamp	Soulemc	SCCC.4	234912	/	2025/1/28
12	EFT Clamp SHVcable	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	2025/1/31
16	EFT Coupled decoupling network	Soulemc	SCDN E200A	234904	/	2025/1/31
17	Communication test set	R&S	CMW500	108058	Version 2.0	2025/6/28
18	Communication test set	Agilent	E5515C	MY50102567	B.19.07 （E1962B）	2025/6/28

Voltage dips						
No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Calibrated until
1	Voltage dip simulator	Lioncel	VDS-1102	180902	V1.04	2025/6/28
2	DIPS fault simulator	Soulemc	SSAG 3P200T	234913	V1.5.4	2025/2/19
3	Communication test set	R&S	CMW500	108058	Version 2.0	2025/6/28
4	Communication test set	Agilent	E5515C	MY50102567	B.19.07（E1962B）	2025/6/28

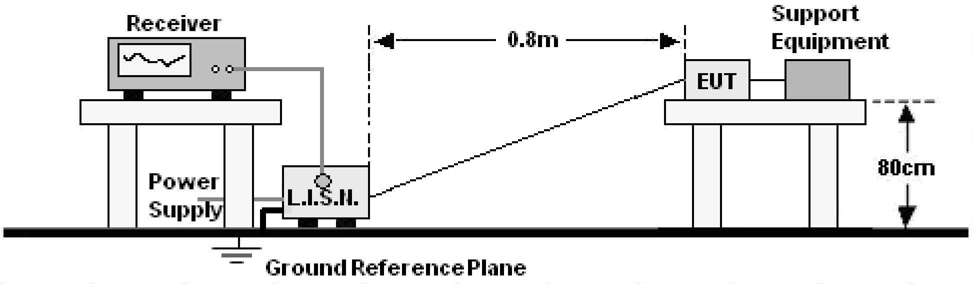
Injected currents						
No.	Equipment	Manufacturer	Model No.	Serial No.	Firmware version	Calibrated until
1	C/S Test System	SKET	CITS-150K230M-75W	SK20210604	20H2	2025/6/30
2	CDN	SKET	CDN-150K230M-M2/M3-16A	21302	/	2025/6/30
3	CDN	SKET	/	CDNT400	/	2025/6/30
4	6dB 100Watt Attenuator	SKET	AP-DC01G-100W-N-6dB	/	/	2025/6/30
5	Electromagnetic Injection Clamp	Prima	PECL-100	/	/	2025/6/30
6	50Ω Load	SKET	TL-DC01G-2W-50BNC	/	/	2025/6/30
7	CS test software	SKET	V2.0.0.11	/	/	/
8	M5 Coupled decoupling network	HTEC	CDN M5	234902	/	2025/5/23
9	M2 Coupled decoupling network	HTEC	CDN M2	234901	/	2025/5/23
10	Communication test set	R&S	CMW500	108058	Version 2.0	2025/6/28
11	Communication test set	Agilent	E5515C	MY50102567	B.19.07（E1962B）	2025/6/28

Radio frequency electromagnetic field						
No.	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Calibrated until
1	966 Chamber	C/ R/ T	966	/	/	2027/6/21
2	Signal Generator	Agilent	N5181A	MY49060920	A.01.60	2025/6/28
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	MY41490462	/	2025/6/28
6	RF Power Meter	Agilent	E9301A	MY41495675	/	2025/6/28
7	E-Field Probe	Narda	EP-601	811ZX10305	/	2025/7/06

8	Power Amplifier	SKET	HAP-80M01G-250W	2106070103	/	2025/6/28
9	Power Amplifier	SKET	HAP-01G 06G-75W	2106070104	/	2025/6/28
10	Audio Analysis	R&S	ATS-1	ATS 1-41152	/	2025/7/01
11	Audio Output Matching Network	SKET	RCO Network	/	/	2025/7/01
12	RS test software	SKET	V2.0.0.19	/	/	/
13	966 Chamber	C/ R/ T	966	/	/	2026/11/14
14	Communication test set	R&S	CMW500	108058	Version 2.0	2025/6/28
15	Communication test set	Agilent	E5515C	MY50102567	B.19.07 （E1962B）	2025/6/28

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

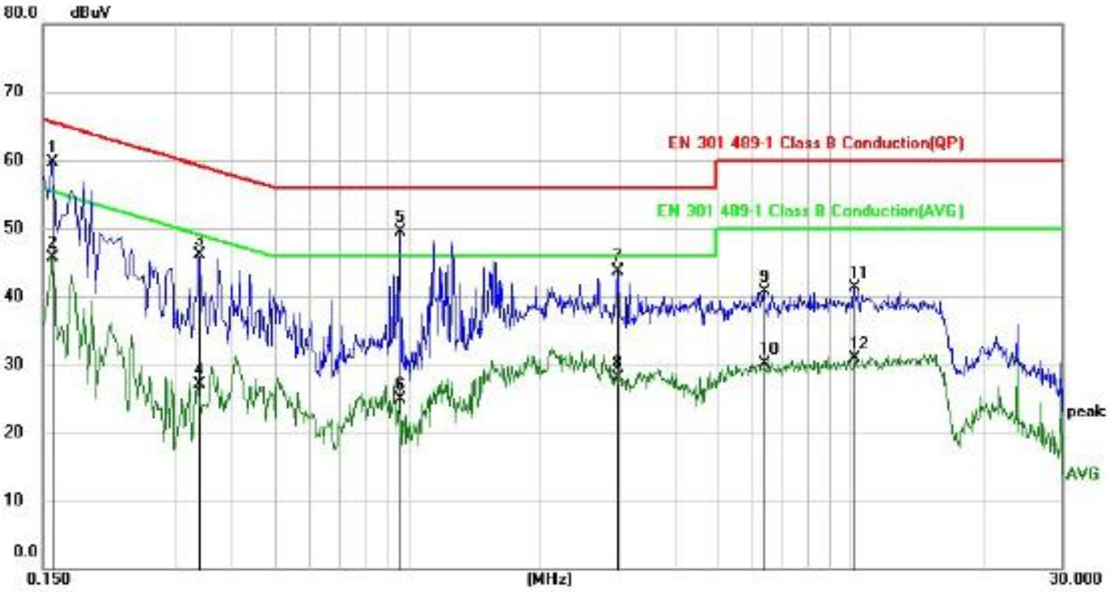
a. The Product was placed on a nonconductive table 0.8m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connectedto the main through Line Impedance Stability Network (L.I.S.N).

b. The RBW of the receiver was set at 9 kHz in150 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.

c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 Test Result

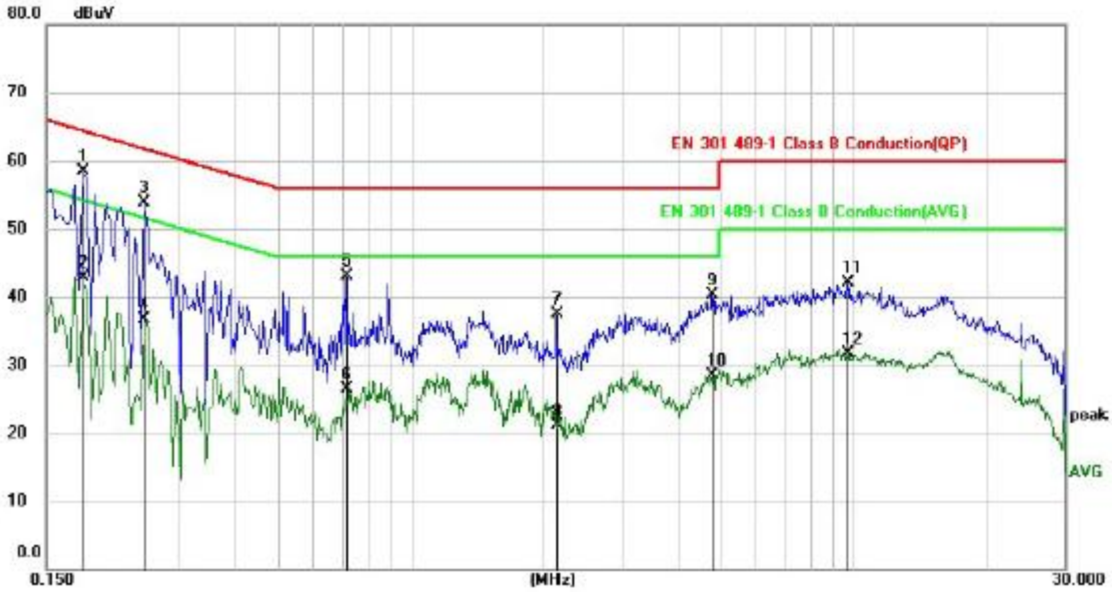
Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1580	48.79	10.86	59.65	65.57	-5.92	QP
2		0.1580	34.83	10.86	45.69	55.57	-9.88	AVG
3		0.3379	35.56	10.61	46.17	59.25	-13.08	QP
4		0.3379	16.47	10.61	27.08	49.25	-22.17	AVG
5		0.9620	38.67	10.92	49.59	56.00	-6.41	QP
6		0.9620	14.00	10.92	24.92	46.00	-21.08	AVG
7		2.9780	31.99	11.80	43.79	56.00	-12.21	QP
8		2.9780	16.33	11.80	28.13	46.00	-17.87	AVG
9		6.3700	28.06	12.72	40.78	60.00	-19.22	QP
10		6.3700	17.40	12.72	30.12	50.00	-19.88	AVG
11		10.1500	28.06	13.24	41.30	60.00	-18.70	QP
12		10.1500	17.58	13.24	30.82	50.00	-19.18	AVG

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

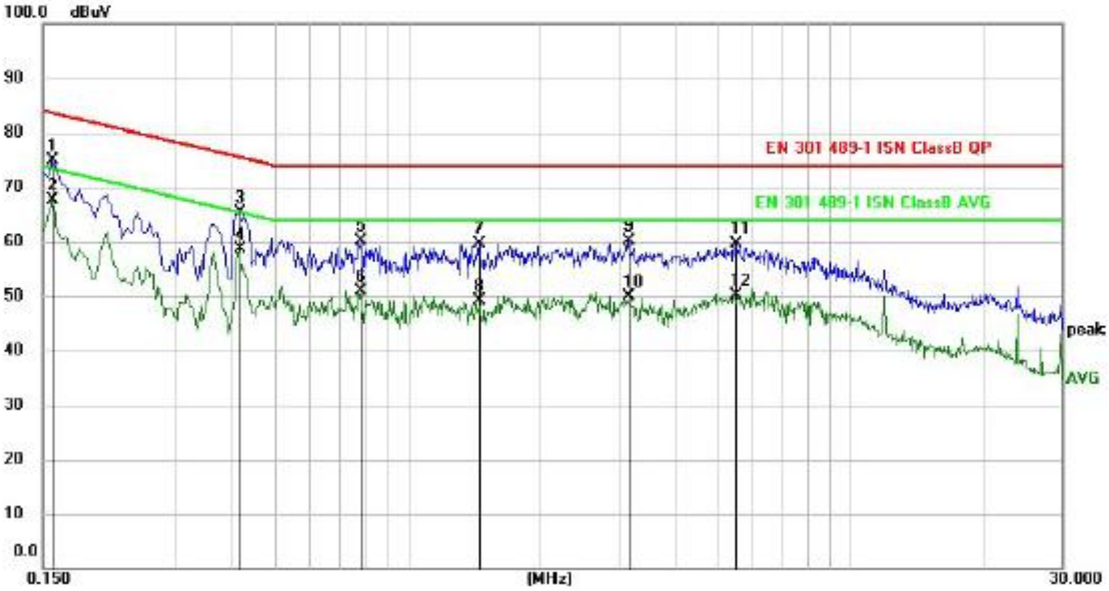
Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Mode	1(the worst data)	Remark:	N/A



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1819	47.68	10.78	58.46	64.40	-5.94	QP
2		0.1819	32.15	10.78	42.93	54.40	-11.47	AVG
3		0.2500	43.17	10.68	53.85	61.76	-7.91	QP
4		0.2500	26.05	10.68	36.73	51.76	-15.03	AVG
5		0.7140	32.46	10.73	43.19	56.00	-12.81	QP
6		0.7140	15.72	10.73	26.45	46.00	-19.55	AVG
7		2.1340	25.92	11.61	37.53	56.00	-18.47	QP
8		2.1340	9.40	11.61	21.01	46.00	-24.99	AVG
9		4.7900	28.12	12.19	40.31	56.00	-15.69	QP
10		4.7900	16.28	12.19	28.47	46.00	-17.53	AVG
11		9.6660	28.97	13.21	42.18	60.00	-17.82	QP
12		9.6660	18.43	13.21	31.64	50.00	-18.36	AVG

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

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



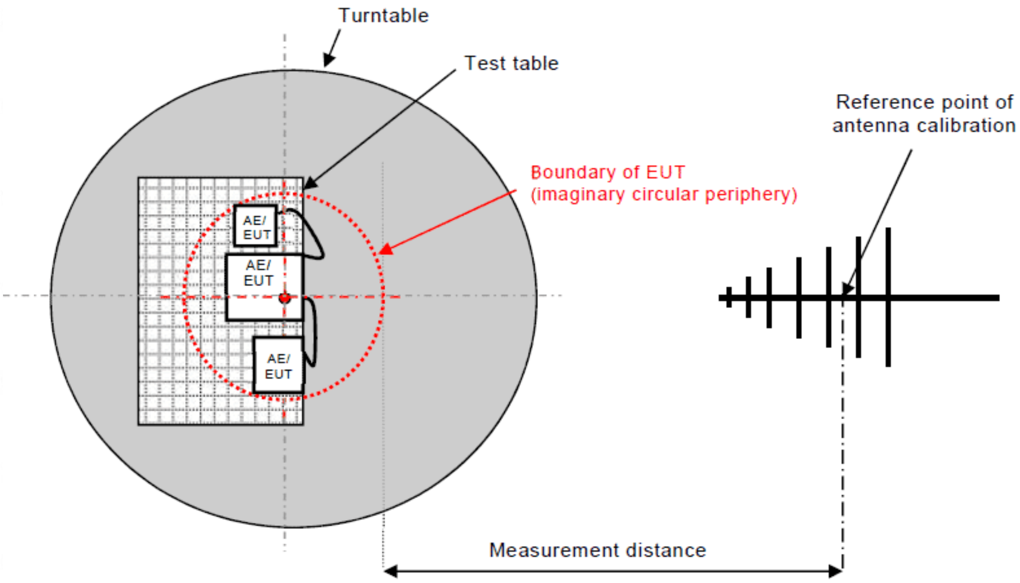
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1580	55.11	19.78	74.89	83.57	-8.68	QP
2	*	0.1580	47.91	19.78	67.69	73.57	-5.88	AVG
3		0.4180	45.71	19.62	65.33	75.49	-10.16	QP
4		0.4180	39.00	19.62	58.62	65.49	-6.87	AVG
5		0.7860	40.34	19.81	60.15	74.00	-13.85	QP
6		0.7860	31.02	19.81	50.83	64.00	-13.17	AVG
7		1.4540	39.32	20.32	59.64	74.00	-14.36	QP
8		1.4540	28.86	20.32	49.18	64.00	-14.82	AVG
9		3.1420	39.26	20.87	60.13	74.00	-13.87	QP
10		3.1420	29.00	20.87	49.87	64.00	-14.13	AVG
11		5.5100	38.50	21.11	59.61	74.00	-14.39	QP
12		5.5100	28.90	21.11	50.01	64.00	-13.99	AVG

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

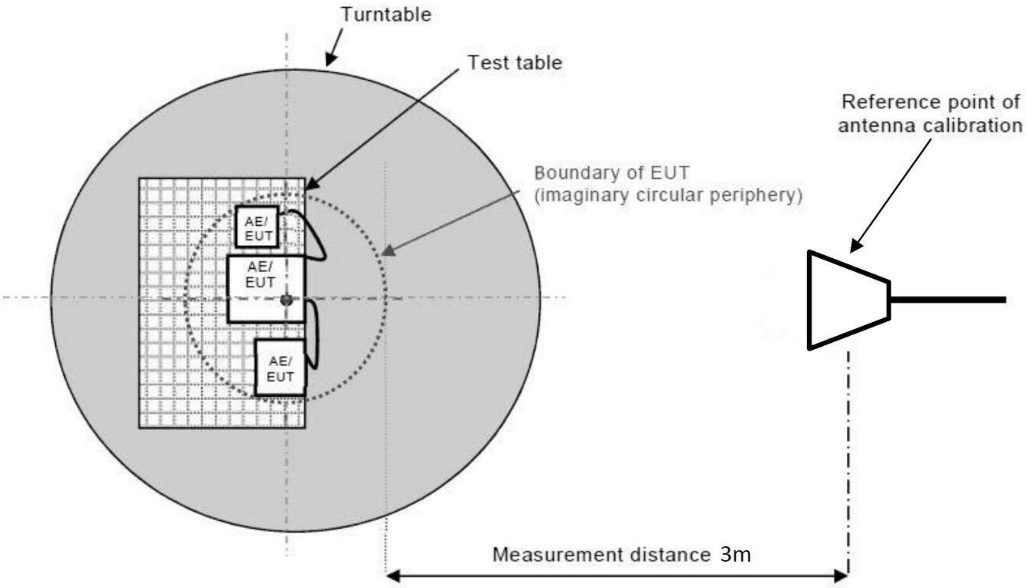
7. RADIATEDEMISSIONS TEST

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(μV/m)
30-230	40
230-1000	47

Frequency (GHz)	limit above 1G at 3m dB(μV/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:

a. The Product was placed on the nonconductive turntable 0.8mabove the ground in a semi anechoic chamber.

b. 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.

c. 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:

a. The Product was placed on the non-conductive turntable0.8m above the ground in a full anechoic chamber..

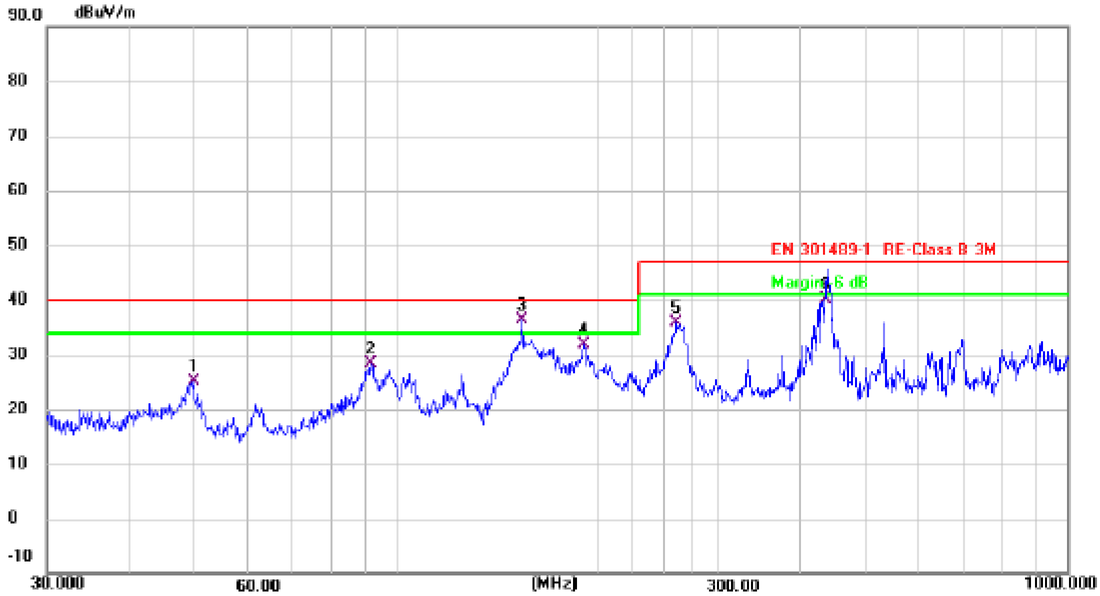
b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is variedin both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. 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

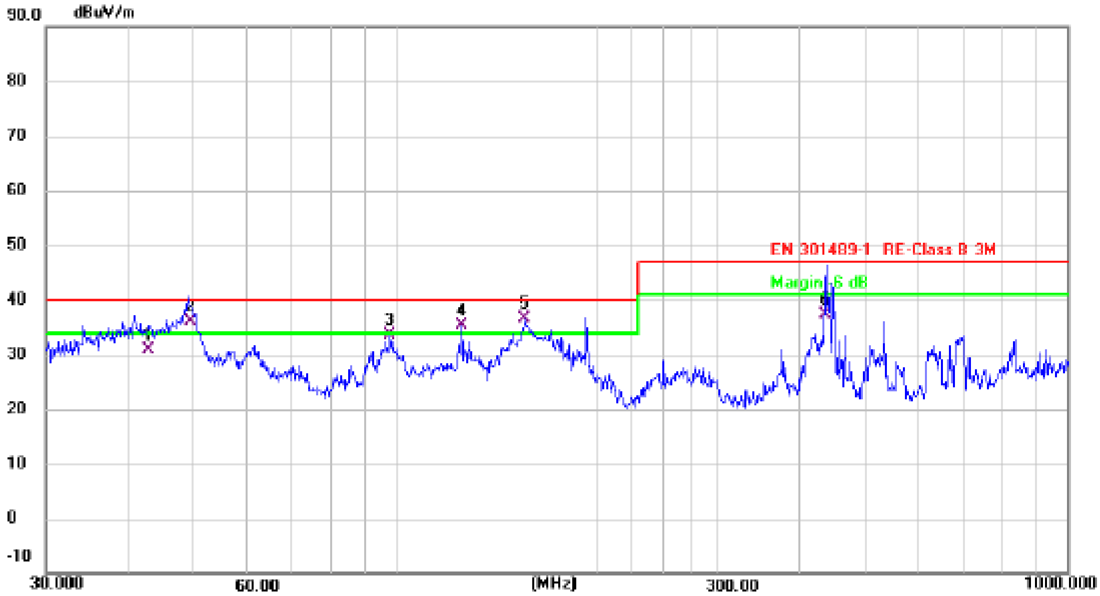
Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Horizontal
Test Mode	1(the worst data)	Remark:	N/A

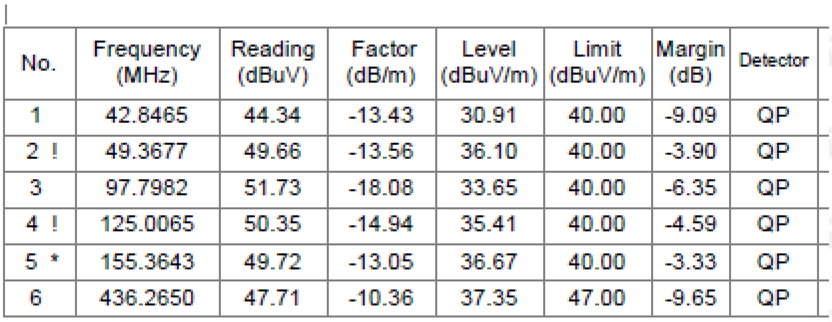


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	49.7066	38.67	-13.56	25.11	40.00	-14.89	QP
2	91.4947	46.65	-18.20	28.45	40.00	-11.55	QP
3 *	153.7385	49.26	-12.95	36.31	40.00	-3.69	QP
4	189.7384	47.47	-15.68	31.79	40.00	-8.21	QP
5	261.0581	50.27	-14.41	35.86	47.00	-11.14	QP
6	437.0800	50.44	-10.35	40.09	47.00	-6.91	QP

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

Temperature:	23 ℃	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)	Detector
1	42.8465	44.34	-13.43	30.91	40.00	-9.09	QP
2 !	49.3677	49.66	-13.56	36.10	40.00	-3.90	QP
3	97.7982	51.73	-18.08	33.65	40.00	-6.35	QP
4 !	125.0065	50.35	-14.94	35.41	40.00	-4.59	QP
5 *	155.3643	49.72	-13.05	36.67	40.00	-3.33	QP
6	436.2650	47.71	-10.36	37.35	47.00	-9.65	QP

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

Above 1GHz

Temperature:	23 ℃	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	1966.07	46.39	1.44	47.82	70.00	-22.18	peak
2	1965.07	27.45	1.44	28.89	50.00	-21.11	AVG
3	3772.45	43.89	5.80	49.69	74.00	-24.31	peak
4	3774.07	26.61	5.80	32.42	54.00	-21.58	AVG
5	4841.83	42.56	9.54	52.10	74.00	-21.90	peak
6	4841.17	24.79	9.54	34.33	54.00	-19.67	AVG

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

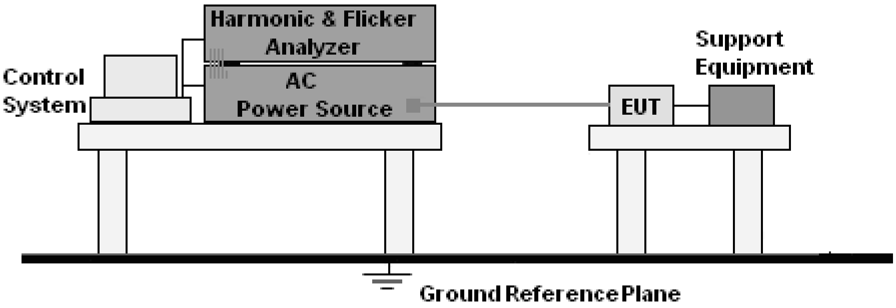
Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Vertical
Test Mode	1(the worst data)	Remark:	N/A

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	1996.41	46.94	1.51	48.45	70.00	-21.55	peak
2	1996.92	28.73	1.51	30.23	50.00	-19.77	AVG
3	3809.89	46.06	5.87	51.92	74.00	-22.08	peak
4	3806.48	27.96	5.87	33.83	54.00	-20.17	AVG
5	4773.66	44.79	9.39	54.18	74.00	-19.82	peak
6	4774.42	27.85	9.39	37.24	54.00	-16.76	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

a. 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.

b. 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.

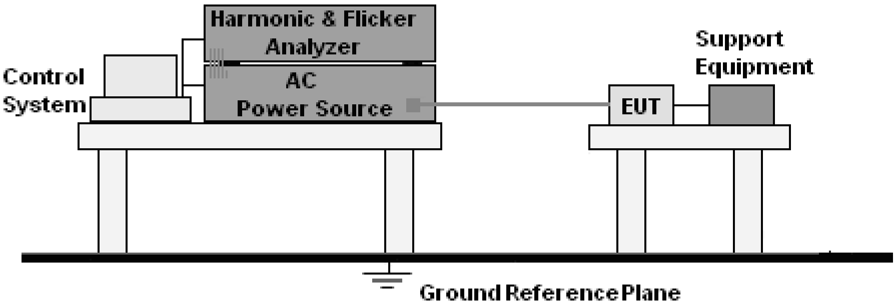
8.4 Test Results

Temperature:	23 ℃	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

a. 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.

b. 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

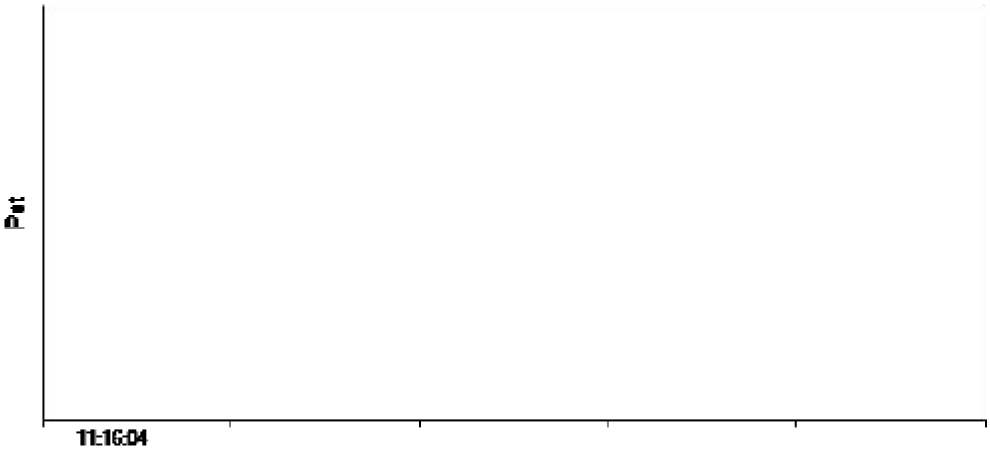
Temperature:	23 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Mode	1(the worst data)
Remark:	N/A	Test results	PASS

Describe:

Load Power	**: 0.066 kW**	**Power Factor:0.702**
Load Current	**: 0.396 Arms**	**Crest Factor:3.538**
Nominal Voltage	**: 231.19 Vrms**	

Test Result: Pass **Status: Test Completed**

Psti and limit line **European Limits**



Result:

T-max (ms):	**0.00**	**Test limit (ms):**	**500.00**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.00**	**Test limit:**	**1.00**	**Pass**

10. IMMUNITY TEST OF GENERAL THE PERFORMANCE CRITERIA

Product Standard	ETSI EN 301 489-1
The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests. For the purpose of the present document two categories of performance criteria apply: •Performance criteria for continuous phenomena. •Performance criteria for transient phenomena. 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.	
Performance criteria for continuous phenomena	During the test, the equipment shall: •continue to operate as intended; •not unintentionally transmit; •not unintentionally change its operating state; •not unintentionally change critical stored data.
Performance criteria for transient phenomena	For all ports and transient phenomena with the exception described below, the following applies: •The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data. •After application of the transient phenomena, the equipment shall operate as intended. For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies: •For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. •For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

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 to10 %.
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 The performance criteria A shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does notoccur. In systems using acknowledgement signals, it is recognized that an ACK nowledgement (ACK) or NotACK nowledgement (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 notoccur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) ornot-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmissionresulting 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. Insystems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and stepsshould 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 durationfor which performance criteria C shall apply.
Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test.Insystems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and stepsshould be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

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 proceduresfor the phenomenon in ETSI EN 301 489-1 [1], clause 9.		

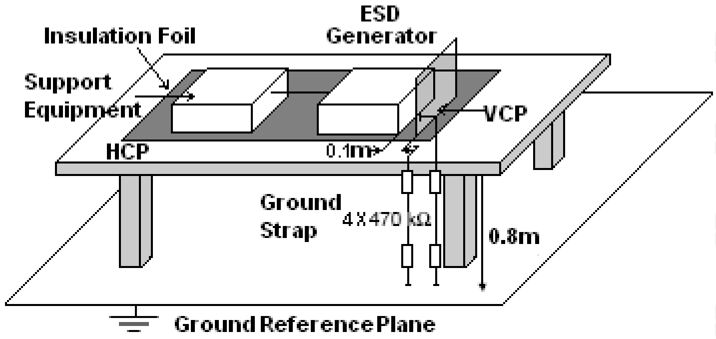
- performance criterion A applies for immunity tests with phenomena of a continuous nature;
- performance criterion B applies for immunity tests with phenomena of a transient nature.

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

a. Electrostatic discharges were applied only to those points and surfaces of the Product that are accessible to users during normal operation.

b. The test was performed with at least ten single discharges on the pre-selectedpoints in the most sensitive polarity.

c. The time interval between two successive single discharges was at least 1second.

d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the Product.

e. Contact discharges were applied to the non-insulating coating, with the pointedtip of the generator penetrating the coating and contacting the conducting substrate.

f. Air discharges were applied with the round discharge tip of the dischargeelectrode approaching the Product as fast as possible (without causing mechanicaldamage) to touch the Product. After each discharge, the ESD generator wasremoved from the Product and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

g. At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the Product. The ESD generator was positioned vertically at a distance of 0.1 meters from the Product with the discharge electrode touching the HCP.

h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently differentpositions 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- Mode2

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.				

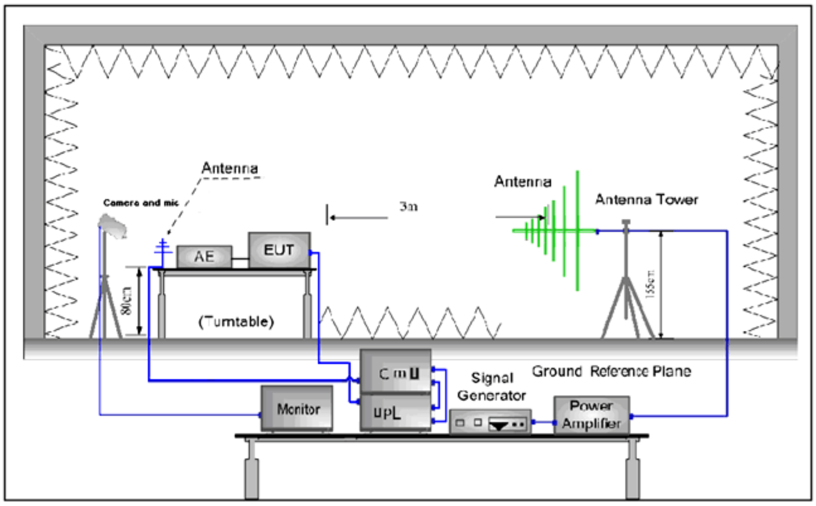
12. CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES(RS)

12.1 Test Specification

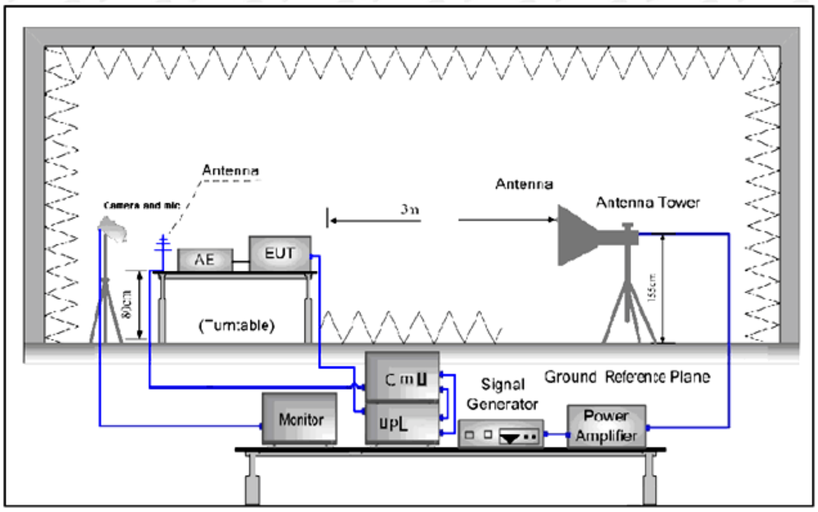
Test Port : Enclosure port
Step Size : 1%
Modulation : 1kHz, 80% AM
Dwell Time : 1 second
Polarization : Horizontal & Vertical

12.2 Block Diagram of Test Setup

Below 1GHz:



Above 1GHz:



12.3 Test Procedure

a. The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the Product.

b. 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%.

c. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond, but should not exceed 5 s at each of the frequencies during the scan.

d. The test was performed with the Product exposed to both vertically and horizontally polarized fields on each of the four sides.

e. For Broadcast reception function: Group 2 not apply in this test.

12.4 Test Results

Temperature：	23 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1- Mode2

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

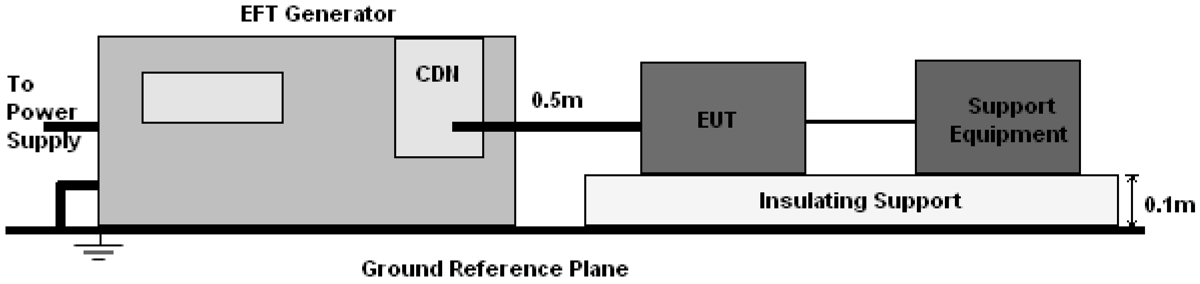
13. ELECTRICAL FAST TRANSIENTS/BURST (EFT)

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

a. The Product and support units were located on a non-conductive table above ground reference plane.

b. A 0.5m-long power cord was attached to Product during the test.

13.4 Test Results

Temperature：	23 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1- Mode2

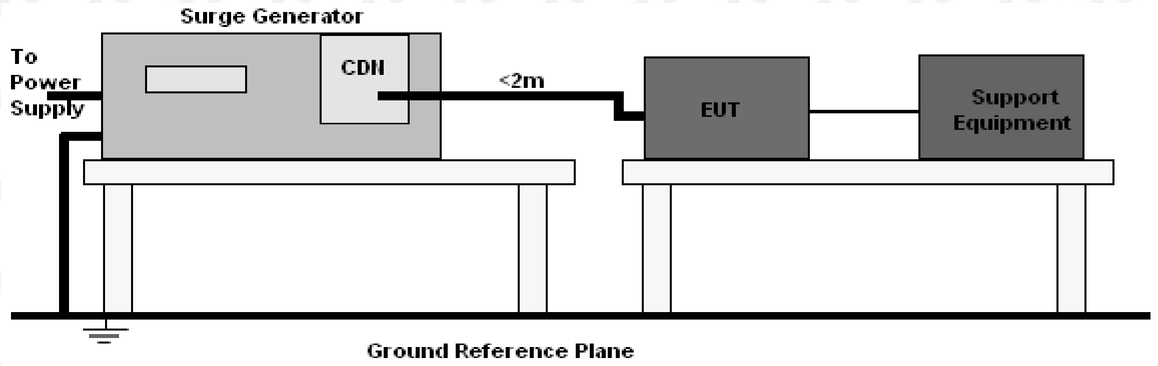
Coupling	**Voltage (kV)**	**Polarity**	**Performance Criterion**
AC Mains L-N	1.0	±	A
Signal Line	0.5	±	N/A
LAN Ports	0.5	±	A
DC Ports	0.5	±	N/A
Note: A: No performance degradation during test. B: During the test, the EUT shut down, after the test, it reset by itself. C: During the test, the EUT shut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

a. 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.

b. 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 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1- Mode2

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.

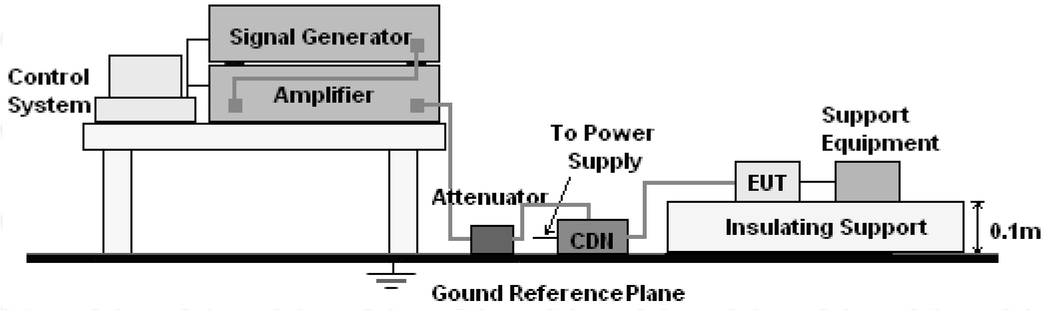
15. CONTINUOUS INDUCED RF DISTURBANCES (CS)

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:

a. 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.

b. 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.

c. 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 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1- Mode2

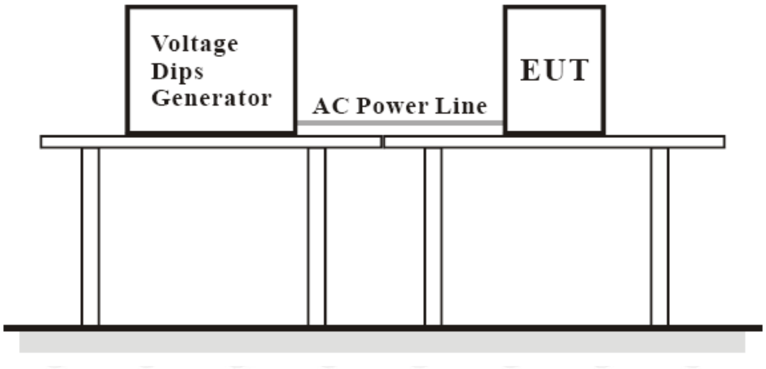
Inject Line	Frequency (MHz)	Voltage Level (V r.m.s.)	Performance Criterion
ac. port	0.15 - 80	3	A
LAN Ports	0.15 - 80	3	A
Note: A: No performance degradation during test.			

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

a. The Product and support units were located on a non-conductive table above ground floor.

b. Set the parameter of tests and then perform the test software of test simulator.

c. Conditions changes to occur at 0 degree crossover point of the voltage waveform.

16.4 Test Result

Temperature：	23 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Mode：	Mode1-Mode2

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

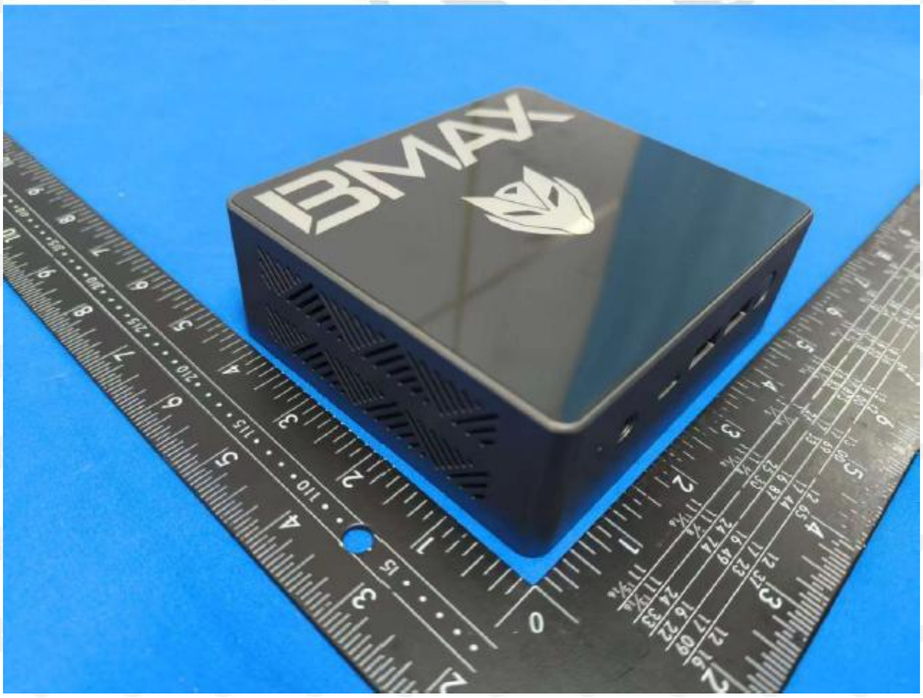
Note: A: No performance degradation during test.
B: During the test, the EUT shut down, after the test, it reset by itself.
C: During the test, the EUT shut down, after the test, it reset by user.

17. EUT PHOTOGRAPHS

External Photos

EUT Photo 1

EUT Photo 2



EUT Photo 3

EUT Photo 4

EUT Photo 5

EUT Photo 6

Internal Photos

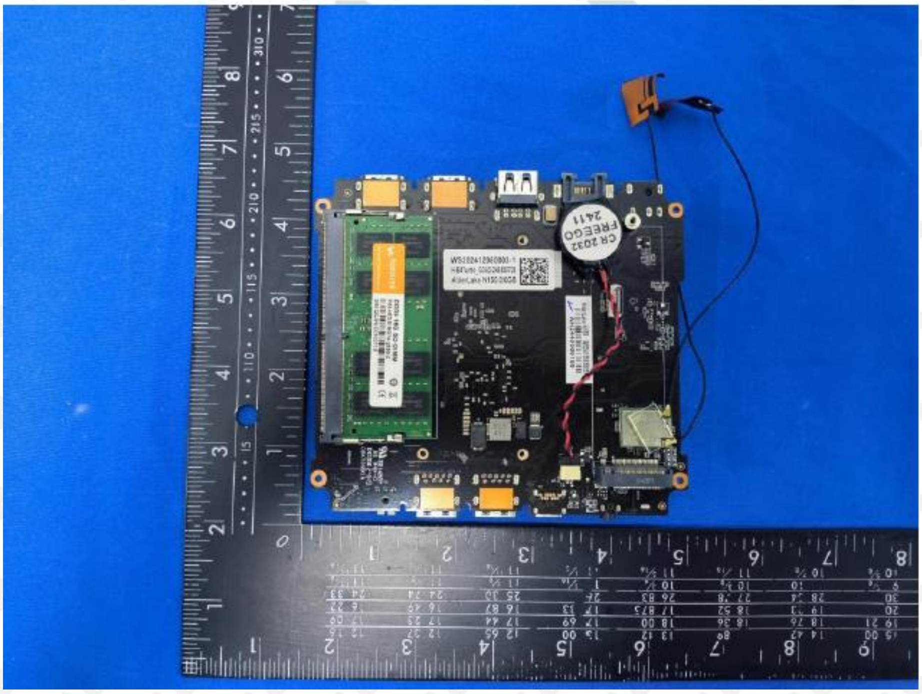
EUT Photo 1

EUT Photo 2

EUT Photo 3

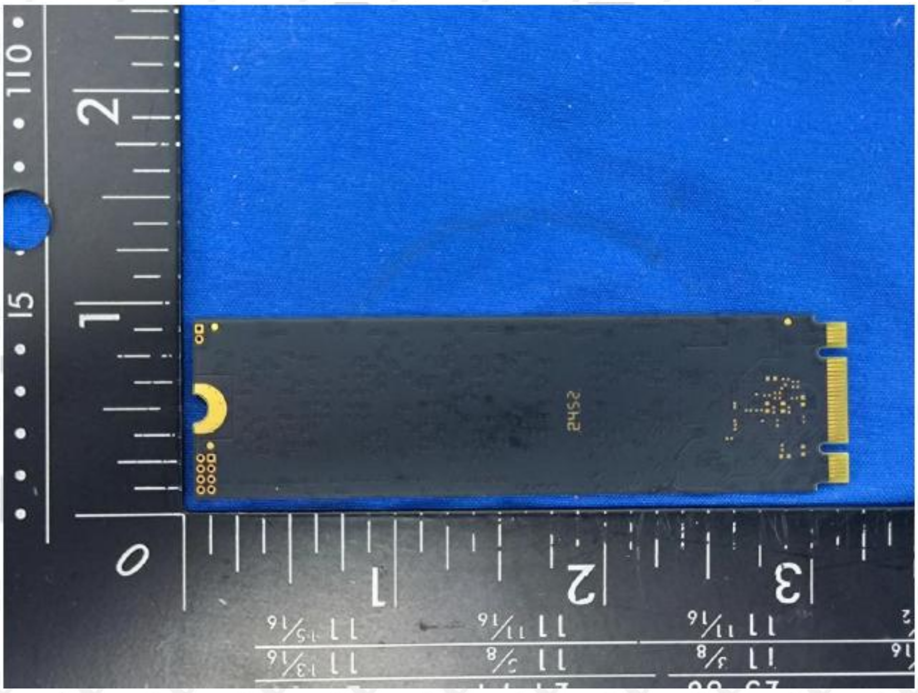
EUT Photo 4

EUT Photo 5

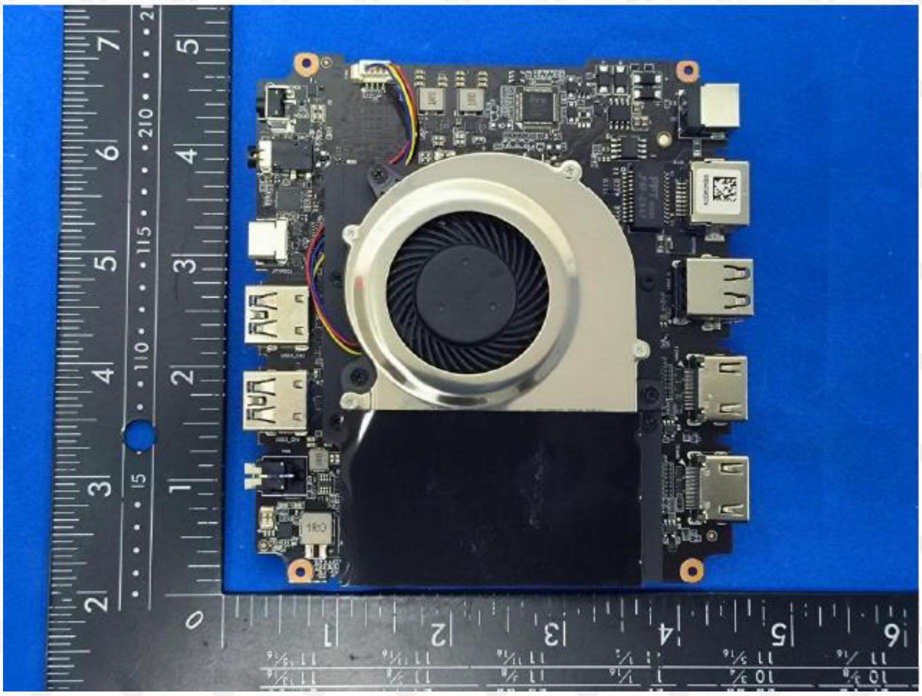


EUT Photo 6

EUT Photo 7



EUT Photo 8



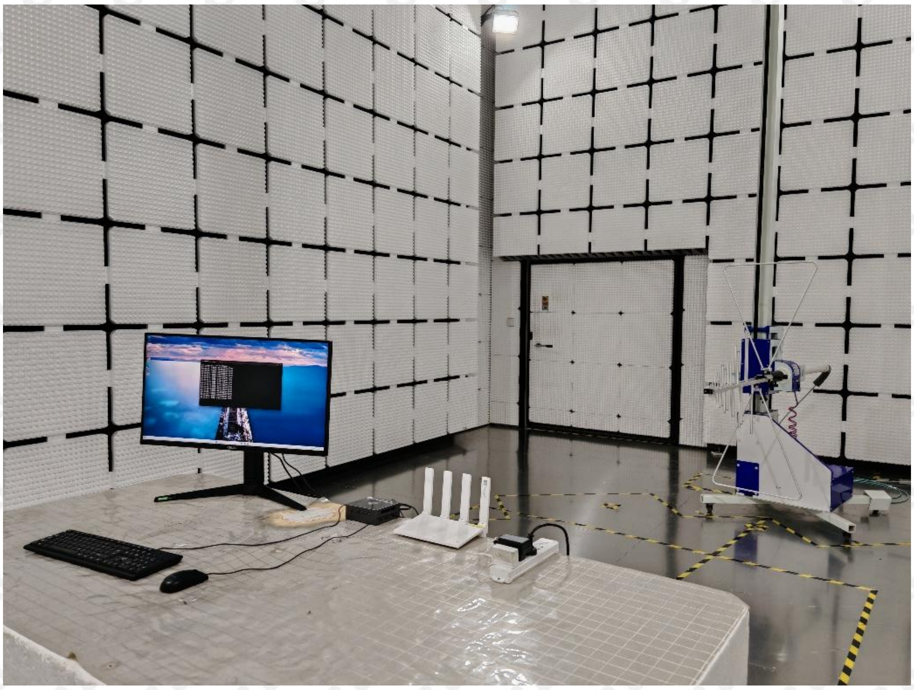
EUT Photo 9

EUT Photo 10

18. EUT TEST SETUP PHOTOGRAPHS

Conducted emissions

Radiated emissions below 1G



H/F

ESD

RS

CS

EFT

Surges

DIPS

TELE

※※※※※ END OF REPORT ※※※※※