



FCC EMC Test Report

FCC ID: BBP-OTE0A91

This report concerns: Original Grant

Project No. : 2307C208
Equipment : Meeting Device
Brand Name : RICOH
Test Model : RICOH Meeting 360 V2
Series Model : N/A
Applicant : Ricoh Company Ltd
Address : 2-7-1 Izumi, Ebina, Kanagawa 243-0460, Japan
Manufacturer : Thundercomm Technology Co., Ltd
Address : No. 107, Middle Datagu Road, Xiantao Street, Yubei District, Chongqing, China, 401122
Factory : Ability Technology (DongGuan) Co.,Ltd
Address : Songbai Road East , Huanan Industrial area, Liao bu Town , Dong guan city, Guang dong, China
Date of Receipt : Sep. 14, 2023
Date of Test : Dec. 11, 2023 ~ Dec. 12, 2023
Issued Date : Dec. 12, 2023
Report Version : R03
Test Sample : Engineering Sample No.: DG2023091485
Standard(s) : FCC CFR Title 47, Part 15, Subpart B

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

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BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FICE-1-2307C208	R00	Original Report.	Nov. 23, 2023	Invalid
BTL-FICE-1-2307C208	R01	Modified the applicant informations.	Nov. 30, 2023	Invalid
BTL-FICE-1-2307C208	R02	The Bluetooth function of the product is deleted, so the relevant information in the report is deleted, which does not affect the test result.	Dec. 08, 2023	Invalid
BTL-FCCE-1-2307C208	R03	Modified the comments of Timco, 1. Added the FCC ID: BBP-OTEOA91. 2. Added the test site registration number. 3. Removed the IC standard. So all test items have retested and recorded.	Dec. 12, 2023	Valid

1. SUMMARY OF TEST RESULTS

Emission		
Standard(s)	Test Item	Result
FCC CFR Title 47,Part 15,Subpart B ANSI C63.4-2014	AC Power Line Conducted Emissions	PASS
	Radiated Emissions 30 MHz to 1 GHz	PASS
	Radiated Emissions Above 1 GHz	PASS

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town, Dongguan City, Guangdong 523792.

BTL's Registration Number for FCC: 162128

BTL's Designation Number for FCC: CN5042

1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$))

The BTL measurement uncertainty as below table:

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U , (dB)
DG-C01	CISPR	150kHz ~ 30MHz	2.98

B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)
DG-CB02 (3m)	CISPR	30MHz ~ 200MHz	V	4.34
		30MHz ~ 200MHz	H	3.38
		200MHz ~ 1,000MHz	V	4.80
		200MHz ~ 1,000MHz	H	4.16

Test Site	Method	Measurement Frequency Range	U , (dB)
DG-CB02 (3m)	CISPR	1GHz ~ 6GHz	4.38
		6GHz ~ 18GHz	5.12

Test Site	Method	Measurement Frequency Range	U , (dB)
DG-CB02 (1m)	CISPR	18 ~ 26.5 GHz	3.36
		26.5 ~ 40 GHz	3.58

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Tested By
AC Power Line Conducted Emissions	25°C	51%	Jack Zhang
Radiated emissions 30 MHz to 1 GHz	24°C	46%	Heming Zhu
Radiated emissions above 1 GHz	23-26°C	42-52%	Heming Zhu

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Meeting Device
Brand Name	RICOH
Test Model	RICOH Meeting 360 V2
Series Model	N/A
Model Difference(s)	N/A
Identification No. of EUT(S/N)	N/A
Dimensions and mass	90mm*110mm*268.3mm
Component unit of EUT	☐ Single unit ☒ Multiple unit
Sample Status	☒ Engineering sample ☐ Final shipment prototype
Power Source	1# DC Voltage supplied from AC adapter. Model: S1C045DC 2# Supplied from PC USB port.
Power Rating	1# I/P: 100-240V~ 50/60Hz 1.5A O/P: 5.0V === 3.0A 15.0W; 9.0V === 3.0A 27.0W; 15.0V === 3.0A 45.0W; 20.0V === 2.25A 45.0W; 2# Input 5V or 9V or 15V === 3A or 20V === 2.25A 45W Max.
Connecting I/O Port(s)	2* UCB Type-C port 1* MGMT port
Classification of EUT	Class B
Highest Internal Frequency(Fx)	5.8GHz

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	FULL SYSTEM(Camera on+2.4G WIFI+USB-C Play)(adapter)
Mode 2	FULL SYSTEM(Camera on+5G WIFI+USB-C Play)(adapter)
Mode 3	FULL SYSTEM(Camera on+5.8G WIFI+USB-C Play)(adapter)
Mode 4	FULL SYSTEM(Camera on+2.4G WIFI+USB-C Play)(PC)

AC Power Line Conducted Emissions Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Camera on+2.4G WIFI+USB-C Play)(adapter)
Mode 4	FULL SYSTEM(Camera on+2.4G WIFI+USB-C Play)(PC)

Radiated Emissions 30 MHz to 1 GHz Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Camera on+2.4G WIFI+USB-C Play)(adapter)
Mode 4	FULL SYSTEM(Camera on+2.4G WIFI+USB-C Play)(PC)

Radiated emissions above 1 GHz Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Camera on+2.4G WIFI+USB-C Play)(adapter)
Mode 4	FULL SYSTEM(Camera on+2.4G WIFI+USB-C Play)(PC)

Note:

- Test mode 1-mode 3, the worst result is mode 1 to evaluated mode 4 PC power supply.
The worst case is recorded in the test report.
- For Radiated emissions above 1 GHz Test: The results from 1GHz ~ 6GHz were the worst for Mode 1, so mode 1 was used to evaluate 6GHz ~ 40GHz and recorded in this report.
- The product supports 2.4G&5G WIFI function.
The frequency exemptions are 2400-2483.5MHz, 5150-5250MHz, 5250-5350MHz, 5470-5725MHz, 5725-5850MHz.
- Radiated emission above 1GHz tested with 2.4G&5G filter.

2.3 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The standard test signals and output signal as following:

For Mode 1 – Mode 3:

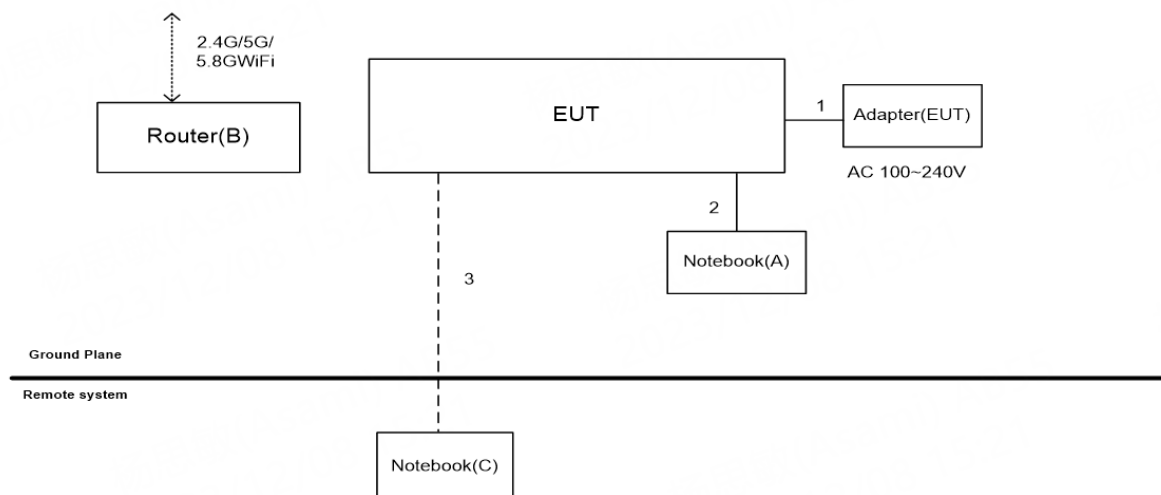
1. EUT connected to Adapter via USB-C cable.
2. EUT connected to Notebook(A) via USB-C cable.
3. EUT connected to Notebook(C) via RJ45 cable.
4. EUT connected to Router(B) via 2.4G / 5G / 5.8G WiFi.

For Mode 4:

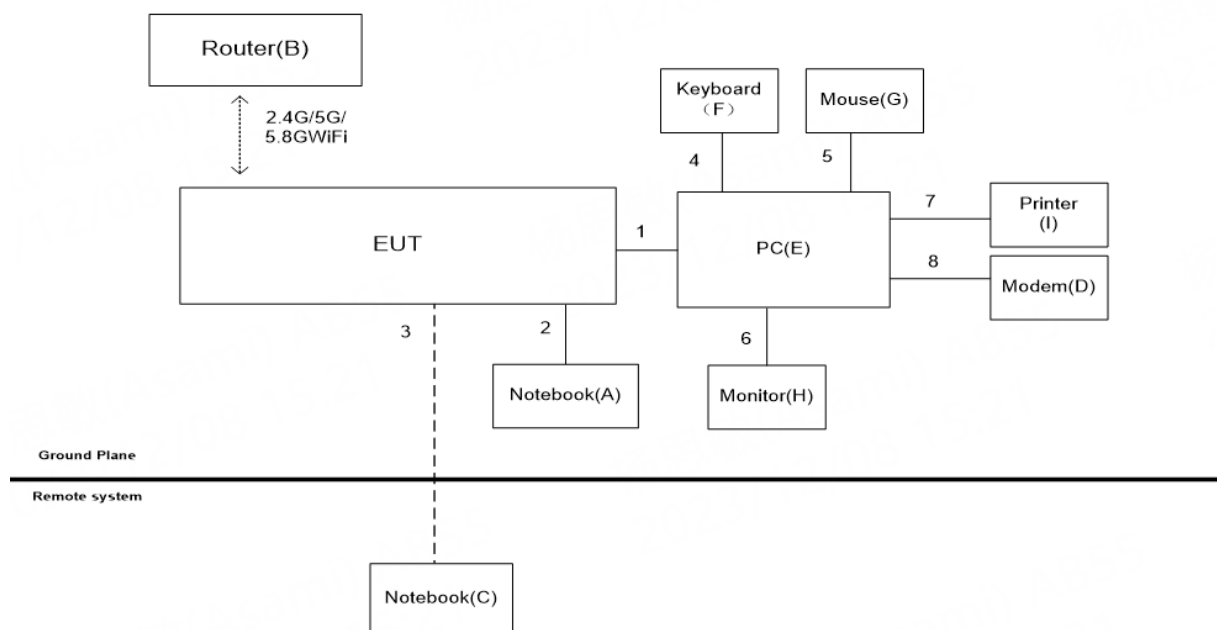
1. EUT connected to PC(E) via USB-C cable.
2. EUT connected to Notebook(A) via USB-C cable.
3. EUT connected to Notebook(C) via RJ45 cable.
4. EUT connected to Router(B) via 2.4G / 5G / 5.8G WiFi.
5. PC(E) connected to Mouse(G) & Keyboard(F) via USB cable.
6. PC(E) connected to Monitor(H) via HDMI cable.
7. PC(E) connected to Printer(I) via USB cable.
8. PC(E) connected to Modem(D) via RS232 cable.

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Mode 1 – Mode 3



Mode 4



2.5 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	Notebook	Lenovo	V310-14IKB	LR07SH32
B	Router	AUSU	RT-AC66U	E8ICGG000138
C	Notebook	Lenovo	V310-14IKB	LR07SH58
D	Modem	Lenovo	LEM56SP	4000137896
E	PC	DELL	OptiPlex 7090 Tower	N/A
F	Keyboard	DELL	KB212-B	CN0HTXH97158125004DXA01
G	Mouse	DELL	MS111-P	CN011D3V71581279OLOT
H	Monitor	PHILIPS	241P6V	UHBA1633026326
I	Printer	Lenovo	M630	SP00335371

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	USB-C Cable	YES	NO	2m
2	USB-C Cable	YES	NO	2m
3	RJ45 Cable	NO	NO	10m
4	USB Cable	YES	NO	1.8m
5	USB Cable	YES	NO	1.8m
6	HDMI Cable	YES	NO	1.8m
7	USB Cable	YES	NO	1.5m
8	RS232 Cable	YES	NO	1.5m

3. EMC EMISSION TEST

3.1 AC POWER LINE CONDUCTED EMISSIONS TEST

3.1.1 LIMIT

Frequency of Emission (MHz)	Class B (dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56 *	56 - 46 *
0.5 - 5	56	46
5 - 30	60	50

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value - Limit Value

3.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	100526	Jun. 16, 2024
2	EMI Test Receiver	R&S	ESR3	101862	Jan. 07, 2024
3	Artificial-Mains Network	SCHWARZBECK	NSLK 8127	8127685	Jan. 07, 2024
4	Cable	N/A	SFT205-NMNM-12M-001	12M	Nov. 27, 2024
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

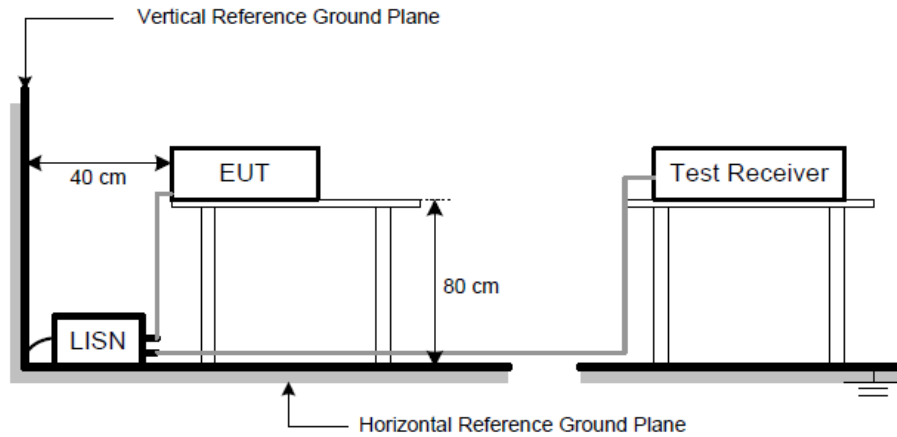
3.1.3 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.
- f. Measuring frequency range from 150KHz to 30MHz.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP

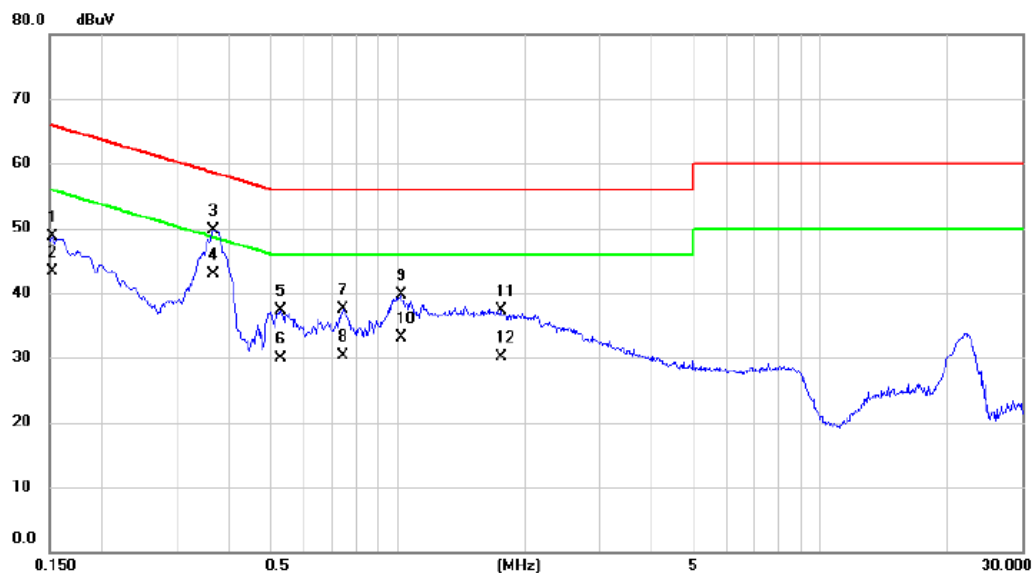


3.1.6 TEST RESULTS

Remark:

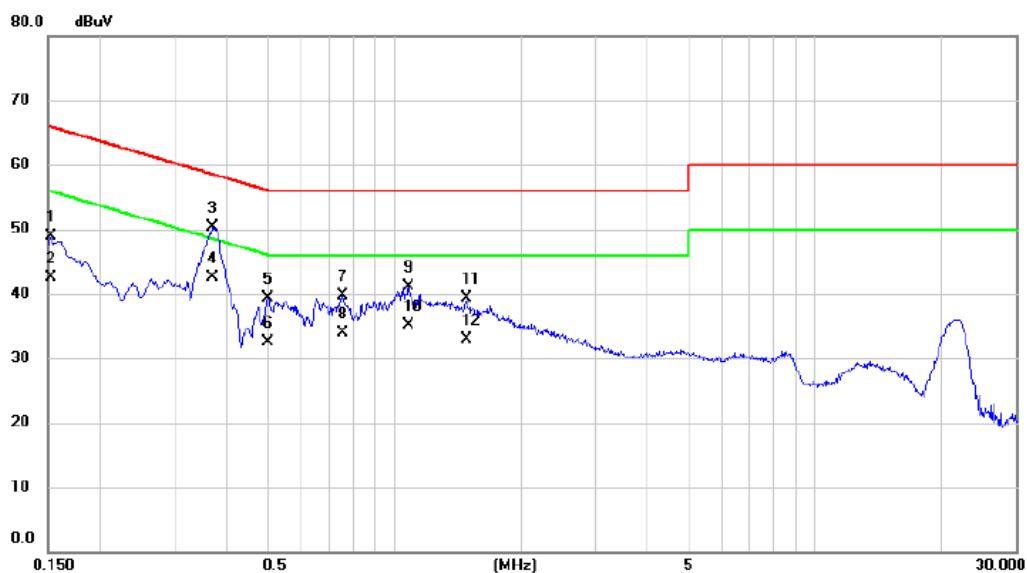
- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10 kHz, VBW=10 kHz, Swp. Time =0.3 sec./MHz.
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a “*” marked in AVG Mode column of Interference Voltage Measured.

Test Voltage	AC 120V/60Hz	Phase	Line
Test Mode	Mode 1		



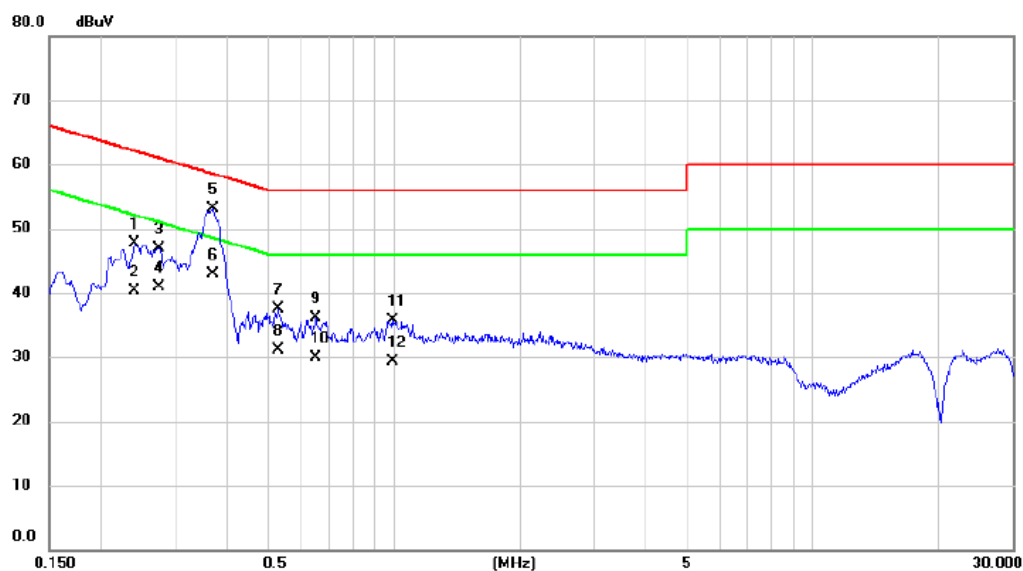
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1522	39.06	9.67	48.73	65.88	-17.15	QP	
2		0.1522	33.70	9.67	43.37	55.88	-12.51	AVG	
3		0.3660	40.01	9.71	49.72	58.59	-8.87	QP	
4	*	0.3660	33.20	9.71	42.91	48.59	-5.68	AVG	
5		0.5280	27.53	9.73	37.26	56.00	-18.74	QP	
6		0.5280	20.10	9.73	29.83	46.00	-16.17	AVG	
7		0.7417	27.68	9.74	37.42	56.00	-18.58	QP	
8		0.7417	20.50	9.74	30.24	46.00	-15.76	AVG	
9		1.0207	29.91	9.76	39.67	56.00	-16.33	QP	
10		1.0207	23.40	9.76	33.16	46.00	-12.84	AVG	
11		1.7565	27.51	9.79	37.30	56.00	-18.70	QP	
12		1.7565	20.30	9.79	30.09	46.00	-15.91	AVG	

Test Voltage	AC 120V/60Hz	Phase	Neutral
Test Mode	Mode 1		



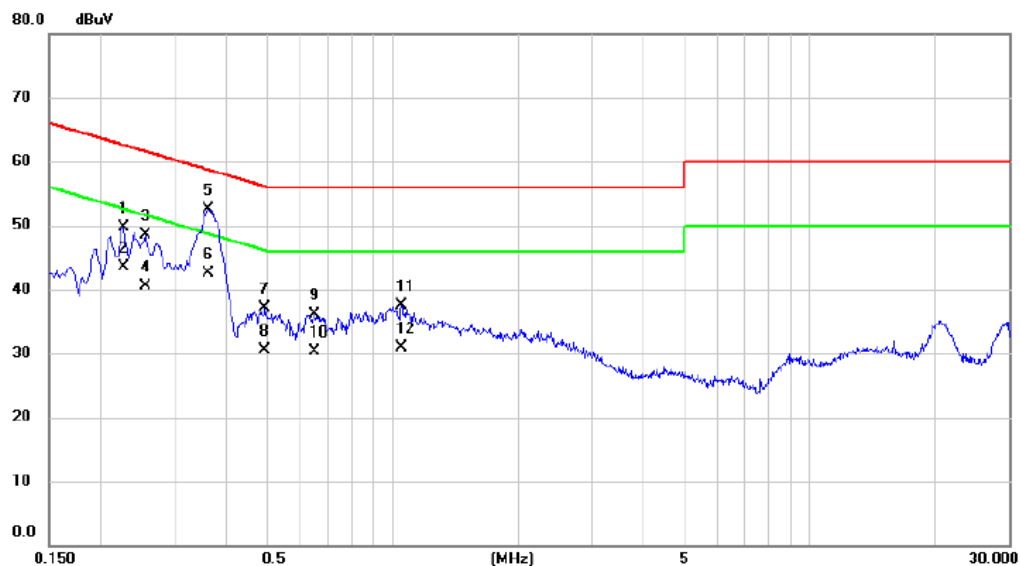
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1522	39.17	9.67	48.84	65.88	-17.04	QP	
2		0.1522	32.90	9.67	42.57	55.88	-13.31	AVG	
3		0.3704	40.53	9.71	50.24	58.49	-8.25	QP	
4	*	0.3704	32.70	9.71	42.41	48.49	-6.08	AVG	
5		0.4987	29.58	9.73	39.31	56.02	-16.71	QP	
6		0.4987	22.80	9.73	32.53	46.02	-13.49	AVG	
7		0.7552	30.02	9.74	39.76	56.00	-16.24	QP	
8		0.7552	24.20	9.74	33.94	46.00	-12.06	AVG	
9		1.0770	31.33	9.76	41.09	56.00	-14.91	QP	
10		1.0770	25.30	9.76	35.06	46.00	-10.94	AVG	
11		1.4798	29.56	9.77	39.33	56.00	-16.67	QP	
12		1.4798	23.10	9.77	32.87	46.00	-13.13	AVG	

Test Voltage	AC 120V/60Hz	Phase	Line
Test Mode	Mode 4		



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.2400	37.93	9.71	47.64	62.10	-14.46	QP	
2	0.2400	30.50	9.71	40.21	52.10	-11.89	AVG	
3	0.2737	37.27	9.71	46.98	61.00	-14.02	QP	
4	0.2737	31.10	9.71	40.81	51.00	-10.19	AVG	
5 *	0.3682	43.28	9.73	53.01	58.54	-5.53	QP	
6	0.3682	33.10	9.73	42.83	48.54	-5.71	AVG	
7	0.5280	27.77	9.75	37.52	56.00	-18.48	QP	
8	0.5280	21.40	9.75	31.15	46.00	-14.85	AVG	
9	0.6495	26.31	9.76	36.07	56.00	-19.93	QP	
10	0.6495	20.10	9.76	29.86	46.00	-16.14	AVG	
11	0.9937	25.88	9.79	35.67	56.00	-20.33	QP	
12	0.9937	19.50	9.79	29.29	46.00	-16.71	AVG	

Test Voltage	AC 120V/60Hz	Phase	Neutral
Test Mode	Mode 4		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2265	40.06	9.71	49.77	62.58	-12.81	QP	
2		0.2265	33.70	9.71	43.41	52.58	-9.17	AVG	
3		0.2558	38.71	9.71	48.42	61.57	-13.15	QP	
4		0.2558	30.80	9.71	40.51	51.57	-11.06	AVG	
5		0.3615	42.73	9.73	52.46	58.69	-6.23	QP	
6	*	0.3615	32.80	9.73	42.53	48.69	-6.16	AVG	
7		0.4942	27.38	9.75	37.13	56.10	-18.97	QP	
8		0.4942	20.70	9.75	30.45	46.10	-15.65	AVG	
9		0.6517	26.41	9.76	36.17	56.00	-19.83	QP	
10		0.6517	20.50	9.76	30.26	46.00	-15.74	AVG	
11		1.0522	27.66	9.79	37.45	56.00	-18.55	QP	
12		1.0522	21.20	9.79	30.99	46.00	-15.01	AVG	

3.2 RADIATED EMISSIONS 30 MHZ TO 1 GHZ

3.2.1 LIMIT

Frequency (MHz)	Class B (at 3m)	
	($\mu\text{V/m}$) Quasi-peak	(dB $\mu\text{V/m}$) Quasi-peak
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
960 - 1000	500	54

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dB $\mu\text{V/m}$) = $20\log$ Emission level ($\mu\text{V/m}$).
3m Emission level = 10m Emission level + $20\log(10\text{m}/3\text{m})$.
- (3) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

3.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Amplifier	EMC INSTRUMENT	EMC001330	980989	Nov. 17, 2024
2	Cable	RW	LMR-400(30MHz-1GHz)(10m+2.5m+0.8M)	N/A	Jul. 04, 2024
3	Controller	MF	MF-7802BS	N/A	N/A
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
5	EMI Test Receiver	Keysight	N9038A	MY56400060	Jan. 07, 2024
6	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	9168-806	Jun. 17, 2024
7	Attenuator	EMCI	EMCI-N-6-06	N0657	Jun. 17, 2024

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.

All calibration period of equipment list is one year.

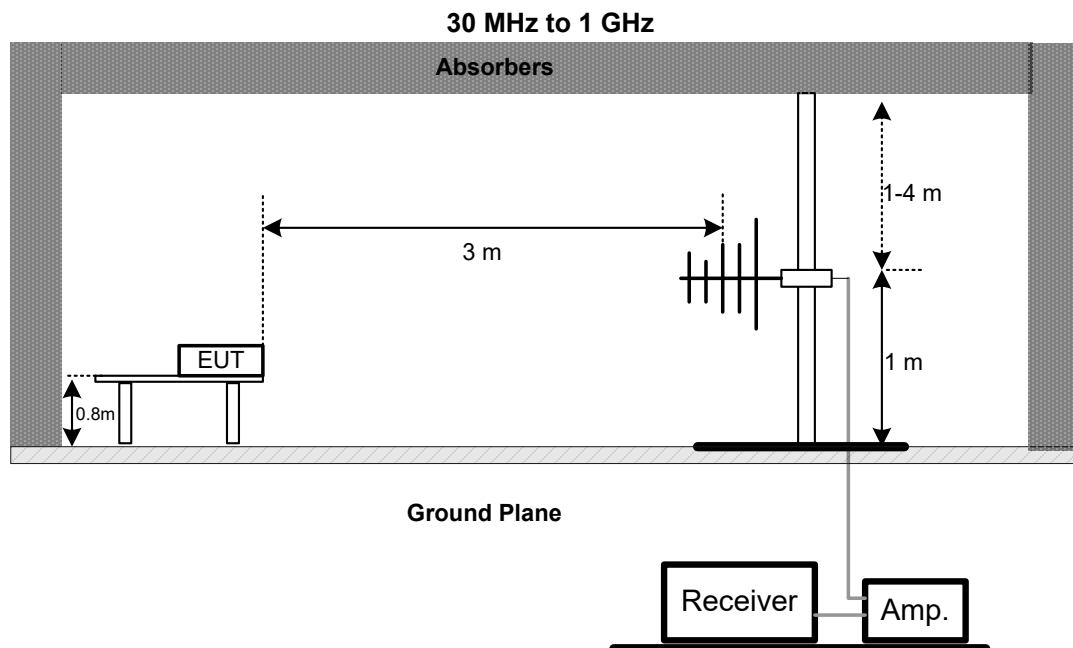
3.2.3 TEST PROCEDURE

- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- For the actual test configuration, please refer to the related Item - EUT Test Photos.

3.2.4 DEVIATION FROM TEST STANDARD

No deviation

3.2.5 TEST SETUP

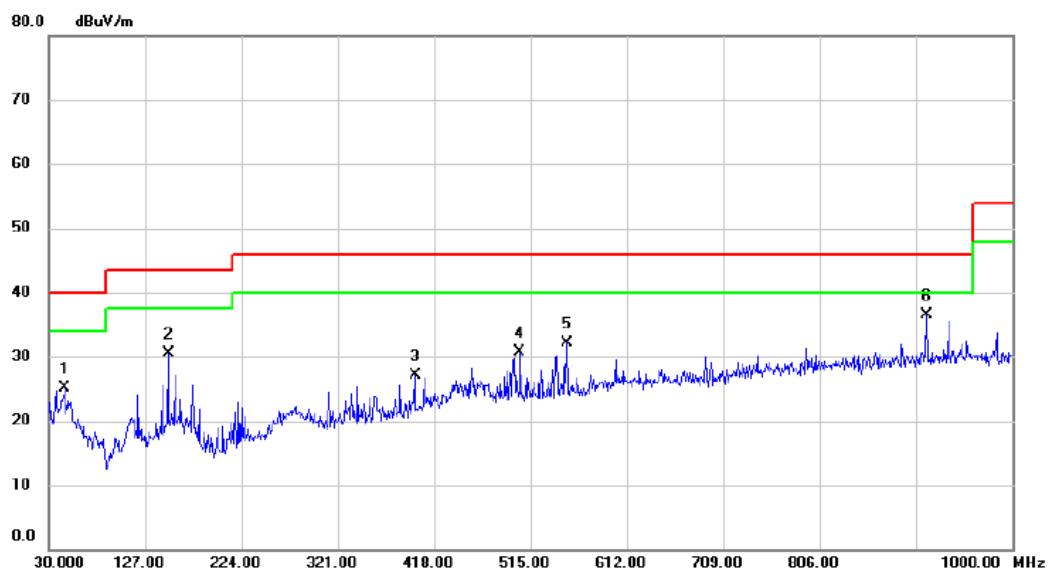


3.2.6 TEST RESULTS

Remark:

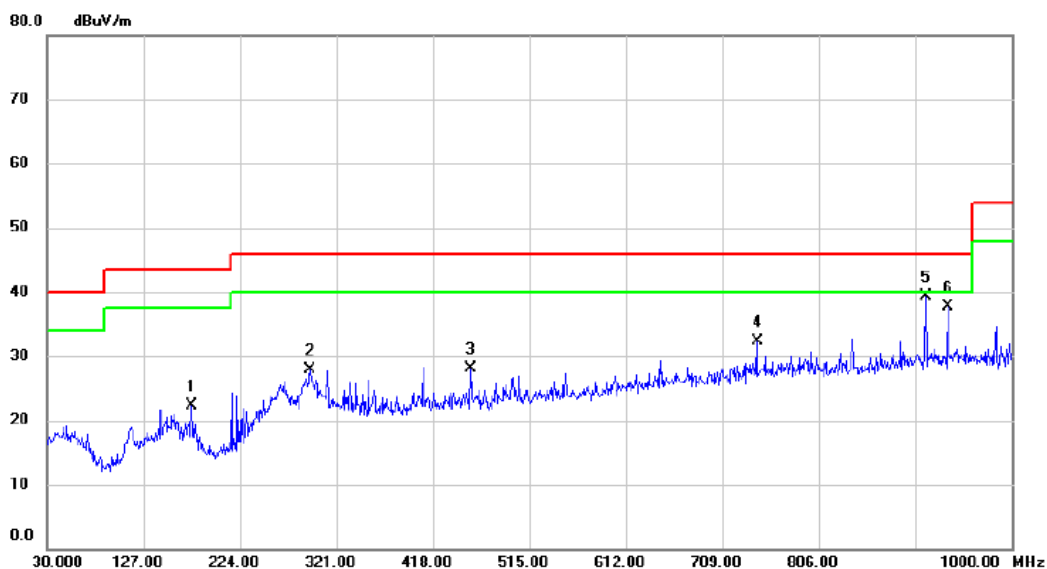
- (1) Measuring frequency range from 30 MHz to 1000 MHz
- (2) If the peak scan value lower limit more than 20 dB, then this signal data does not show in table.

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 1		



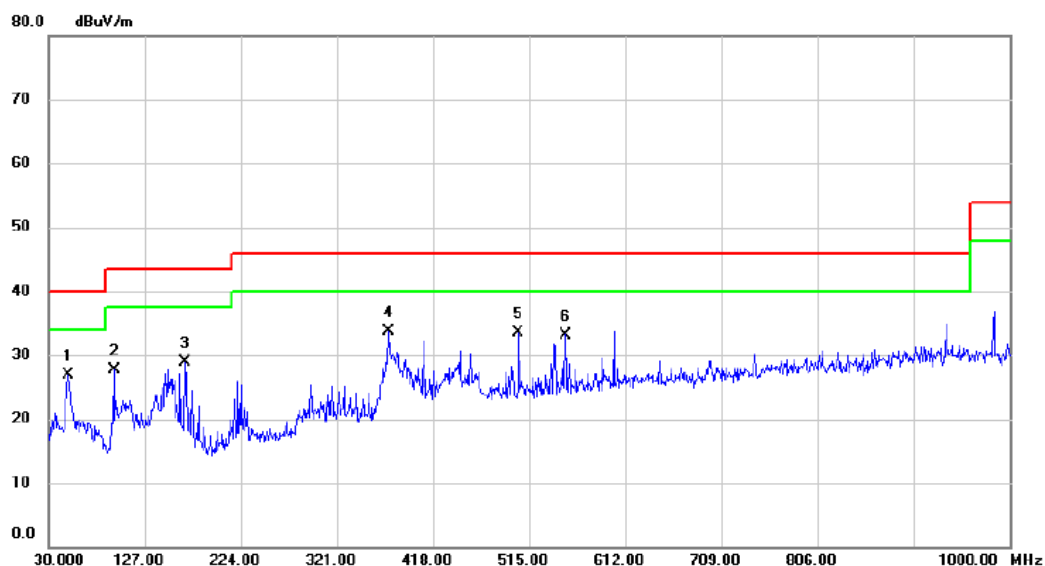
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		46.4900	36.64	-11.46	25.18	40.00	-14.82	QP	
2		150.2800	41.60	-11.06	30.54	43.50	-12.96	QP	
3		398.6000	35.20	-8.19	27.01	46.00	-18.99	QP	
4		504.3300	36.25	-5.58	30.67	46.00	-15.33	QP	
5		551.8600	37.12	-5.03	32.09	46.00	-13.91	QP	
6	*	913.6700	35.72	0.73	36.45	46.00	-9.55	QP	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



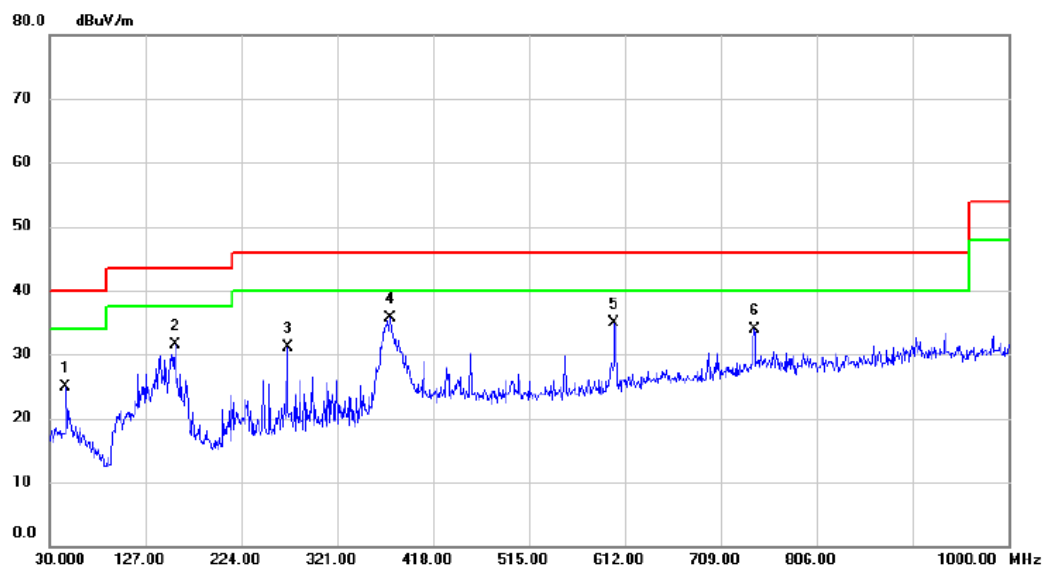
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		175.5000	34.51	-12.14	22.37	43.50	-21.13	QP	
2		294.8100	38.69	-10.73	27.96	46.00	-18.04	QP	
3		455.8300	34.57	-6.46	28.11	46.00	-17.89	QP	
4		743.9200	33.49	-1.12	32.37	46.00	-13.63	QP	
5	*	913.6700	38.62	0.73	39.35	46.00	-6.65	QP	
6		935.9800	36.72	0.89	37.61	46.00	-8.39	QP	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 4		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		50.3700	38.32	-11.36	26.96	40.00	-13.04	QP	
2		95.9600	43.72	-15.92	27.80	43.50	-15.70	QP	
3		167.7400	40.27	-11.33	28.94	43.50	-14.56	QP	
4	*	373.3800	42.57	-8.90	33.67	46.00	-12.33	QP	
5		504.3300	39.06	-5.58	33.48	46.00	-12.52	QP	
6		551.8600	38.23	-5.03	33.20	46.00	-12.80	QP	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 4		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		46.4900	36.31	-11.46	24.85	40.00	-15.15	QP	
2		157.0700	42.48	-10.96	31.52	43.50	-11.98	QP	
3		270.5600	42.75	-11.64	31.11	46.00	-14.89	QP	
4	*	374.3500	44.60	-8.87	35.73	46.00	-10.27	QP	
5		601.3300	38.77	-3.79	34.98	46.00	-11.02	QP	
6		742.9500	35.00	-1.15	33.85	46.00	-12.15	QP	

3.3 RADIATED EMISSIONS ABOVE 1 GHZ

3.3.1 LIMIT

Frequency (MHz)	Class B	
	(dB μ V/m) (at 3m)	
	Peak	Average
Above 1000	74	54

Frequency (MHz)	Class B	
	(dB μ V/m) (at 1m)	
	Peak	Average
Above 18000	83.5	63.5

FREQUENCY RANGE OF RADIATED MEASUREMENT (FOR UNINTENTIONAL RADIATORS)

Highest internal frequency (F _x)	Highest measurement frequency (F _M)
F _x ≤ 108 MHz	1 GHz
108 MHz < F _x ≤ 500 MHz	2 GHz
500 MHz < F _x ≤ 1 GHz	5 GHz
F _x > 1 GHz	5 x F _x up to a maximum of 40 GHz
Note: F _x is the highest fundamental frequency generated and/or used in the ITE or digital apparatus under test.	

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dB μ V/m) = 20log Emission level (uV/m).
1m Emission level = 3m Emission level + 20log(3m/1m).
- (3) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

3.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Horn Antenna	ARA	DRG-118A	16554	Apr. 14, 2024
2	Amplifier	Agilent	8449B	3008A02334	Jan. 07, 2024
3	Cable	mitron	RWLP50-4.0A-KJ-SMSM-12M	N/A	May 05, 2024
4	Cable	RW	RWP50-402-SMSM-1M	20210802	Aug. 07, 2024
5	Controller	MF	MF-7802BS	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	EMI Test Receiver	Keysight	N9038A	MY56400060	Jan. 07, 2024
8	Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	1227	Dec. 10, 2023
9	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330-K	619413	Jul. 07, 2024
10	EXA Signal Analyzer	Keysight	N9010A	MY56480488	Jan. 16, 2024
11	Cable	RegalWay	RWLP50-2.6A-2.92M2.92M-1.1M	N/A	Jul. 26, 2024
12	Cable	Tonscend	HF160-KMKM-3M	N/A	Jul. 26, 2024

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.

All calibration period of equipment list is one year.

3.3.3 TEST PROCEDURE

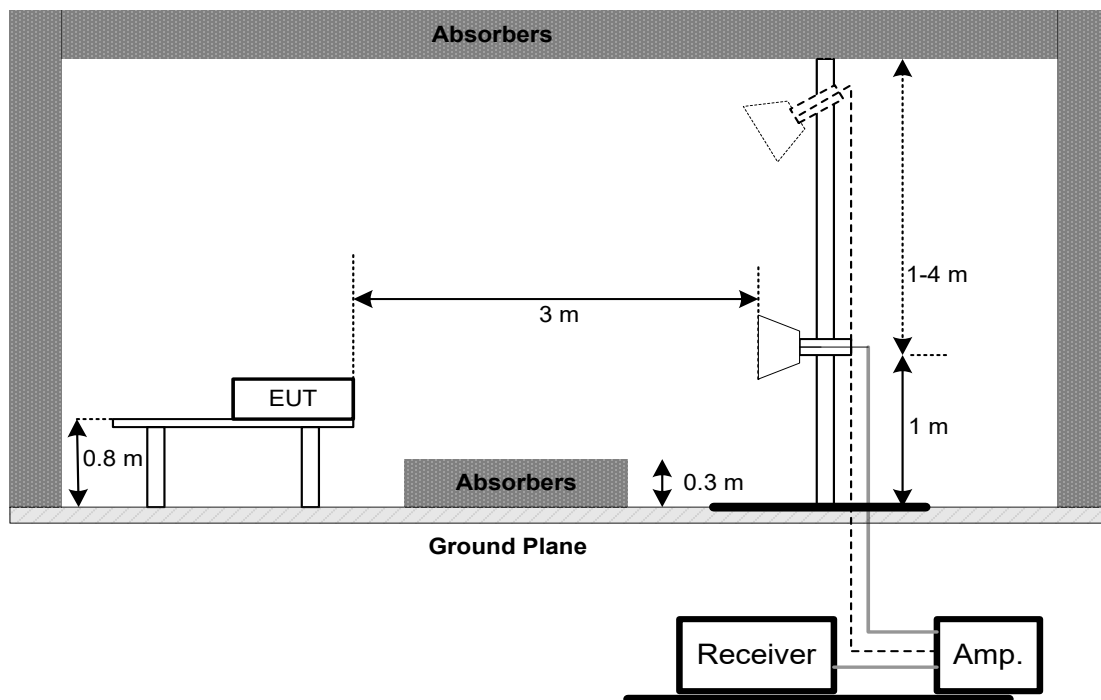
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
Note:
For measurement of frequency 1GHz -18GHz, the EUT was set 3 meters away from the receiver antenna. For 18G - 40GHz, the EUT was set 1 meter.
Emission level (dBuV/m)=20log Emission level (uV/m).
The limits above 18GHz shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1m
Distance extrapolation factor = 20 log (3m/1m) dB ;
Limit line = specific limits (dBuV) + 9.5 dB.
- The height of the equipment or of the substitution antenna shall be 0.8 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then AVG detector mode re-measured.
- The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.
- For the actual test configuration, please refer to the related Item - EUT Test Photos.

3.3.4 DEVIATION FROM TEST STANDARD

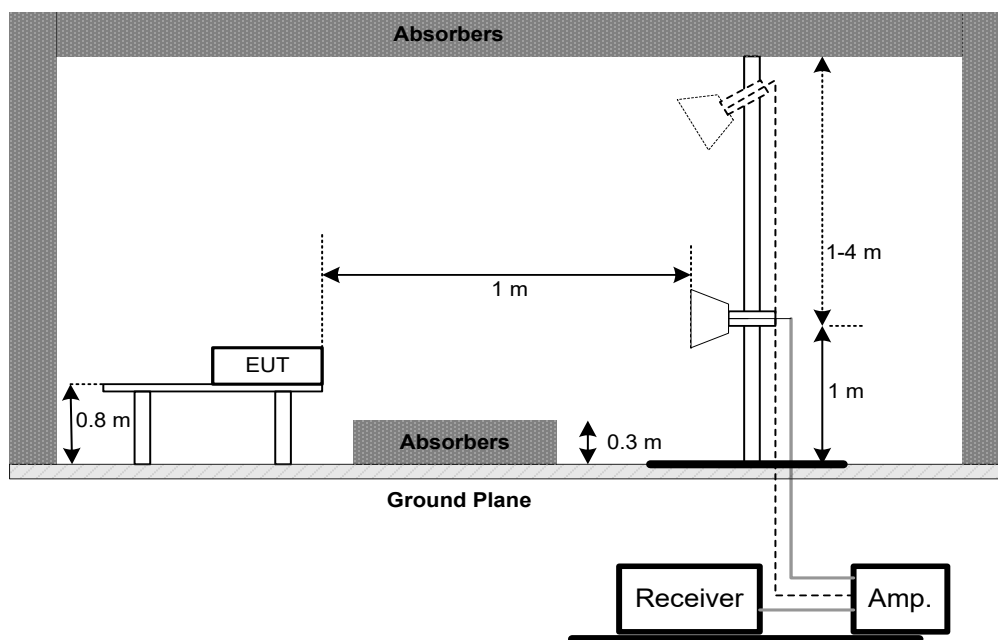
No deviation

3.3.5 TEST SETUP

1 GHz-18 GHz



18 GHz-40 GHz

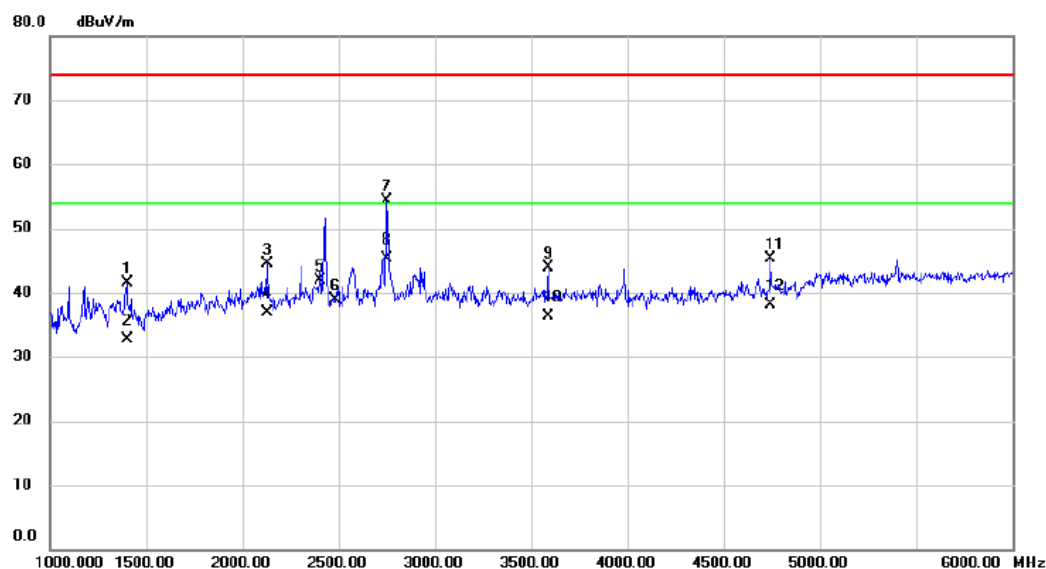


3.3.6 TEST RESULTS

Remark:

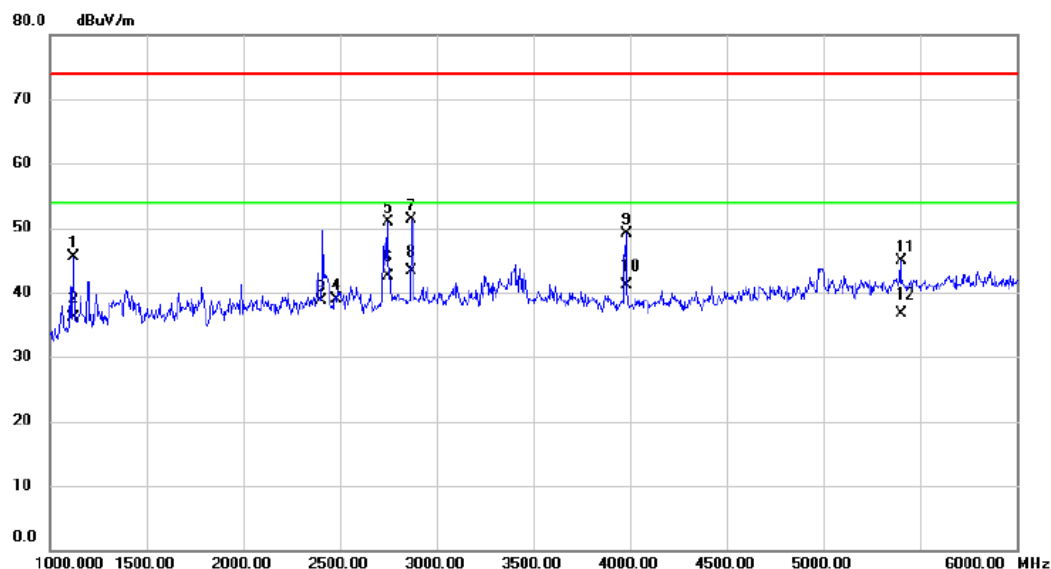
- (1) Radiated emissions measured in frequency range above 1000 MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.
- (2) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
- (3) A preamp was used for this test in order to provide sufficient measurement sensitivity.

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 1		
Note	2.4G WIFI(2400-2483.5MHz) is intentional transmissions, which is not applicable to the radiation emission requirements in this standard.		



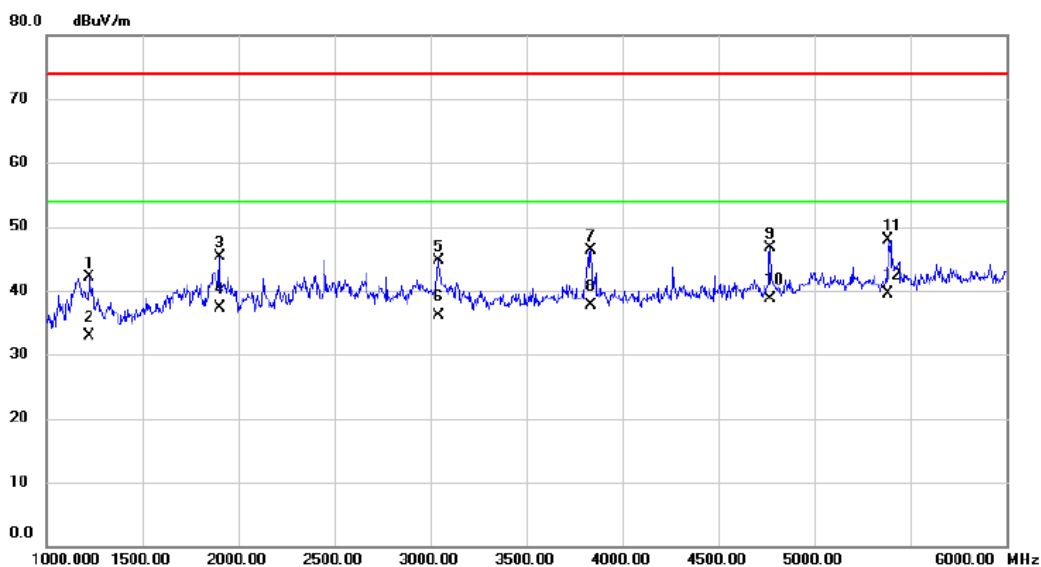
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1400.000	45.33	-3.91	41.42	74.00	-32.58	peak	
2		1400.000	36.52	-3.91	32.61	54.00	-21.39	AVG	
3		2127.500	43.49	0.93	44.42	74.00	-29.58	peak	
4		2127.500	35.98	0.93	36.91	54.00	-17.09	AVG	
5		2400.000	40.14	1.74	41.88	74.00	-32.12	peak	
6		2483.500	36.85	1.99	38.84	74.00	-35.16	peak	
7		2750.000	51.51	2.79	54.30	74.00	-19.70	peak	
8	*	2750.000	42.51	2.79	45.30	54.00	-8.70	AVG	
9		3590.000	39.29	4.61	43.90	74.00	-30.10	peak	
10		3590.000	31.74	4.61	36.35	54.00	-17.65	AVG	
11		4740.000	37.39	7.93	45.32	74.00	-28.68	peak	
12		4740.000	30.22	7.93	38.15	54.00	-15.85	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		
Note	2.4G WIFI(2400-2483.5MHz) is intentional transmissions, which is not applicable to the radiation emission requirements in this standard.		



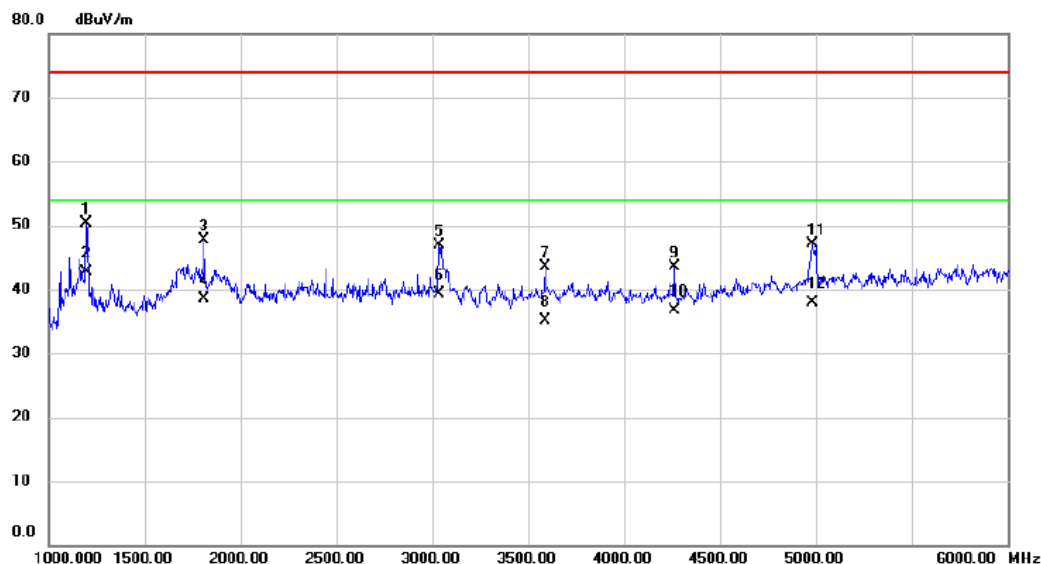
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1122.500	50.71	-5.13	45.58	74.00	-28.42	peak	
2		1122.500	41.22	-5.13	36.09	54.00	-17.91	AVG	
3		2400.000	36.96	1.74	38.70	74.00	-35.30	peak	
4		2483.500	36.93	1.99	38.92	74.00	-35.08	peak	
5		2747.500	48.04	2.78	50.82	74.00	-23.18	peak	
6		2747.500	39.74	2.78	42.52	54.00	-11.48	AVG	
7		2872.500	48.10	3.15	51.25	74.00	-22.75	peak	
8	*	2872.500	40.15	3.15	43.30	54.00	-10.70	AVG	
9		3982.500	43.68	5.42	49.10	74.00	-24.90	peak	
10		3982.500	35.66	5.42	41.08	54.00	-12.92	AVG	
11		5400.000	35.14	9.80	44.94	74.00	-29.06	peak	
12		5400.000	26.85	9.80	36.65	54.00	-17.35	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 4		



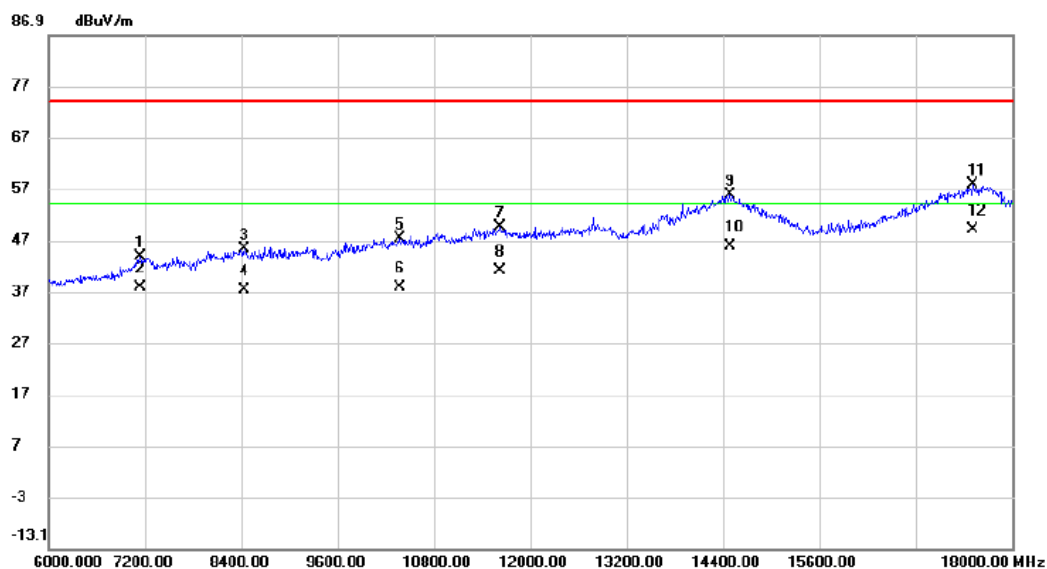
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1225.000	46.75	-4.68	42.07	74.00	-31.93	peak	
2		1225.000	37.52	-4.68	32.84	54.00	-21.16	AVG	
3		1900.000	45.61	-0.25	45.36	74.00	-28.64	peak	
4		1900.000	37.52	-0.25	37.27	54.00	-16.73	AVG	
5		3040.000	41.16	3.61	44.77	74.00	-29.23	peak	
6		3040.000	32.41	3.61	36.02	54.00	-17.98	AVG	
7		3835.000	41.11	5.12	46.23	74.00	-27.77	peak	
8		3835.000	32.65	5.12	37.77	54.00	-16.23	AVG	
9		4772.500	38.53	8.10	46.63	74.00	-27.37	peak	
10		4772.500	30.52	8.10	38.62	54.00	-15.38	AVG	
11		5385.000	38.12	9.78	47.90	74.00	-26.10	peak	
12	*	5385.000	29.63	9.78	39.41	54.00	-14.59	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 4		



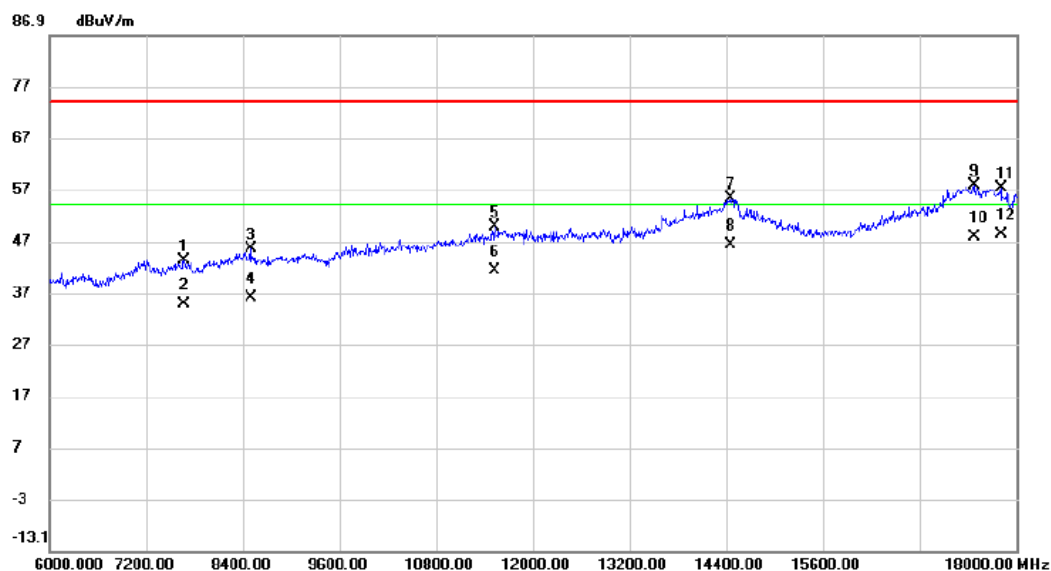
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1197.500	55.10	-4.81	50.29	74.00	-23.71	peak	
2	*	1197.500	47.51	-4.81	42.70	54.00	-11.30	AVG	
3		1812.500	48.63	-0.95	47.68	74.00	-26.32	peak	
4		1812.500	39.52	-0.95	38.57	54.00	-15.43	AVG	
5		3037.500	43.25	3.60	46.85	74.00	-27.15	peak	
6		3037.500	35.66	3.60	39.26	54.00	-14.74	AVG	
7		3590.000	38.80	4.61	43.41	74.00	-30.59	peak	
8		3590.000	30.41	4.61	35.02	54.00	-18.98	AVG	
9		4265.000	37.37	6.13	43.50	74.00	-30.50	peak	
10		4265.000	30.52	6.13	36.65	54.00	-17.35	AVG	
11		4980.000	37.92	9.15	47.07	74.00	-26.93	peak	
12		4980.000	28.72	9.15	37.87	54.00	-16.13	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 1		



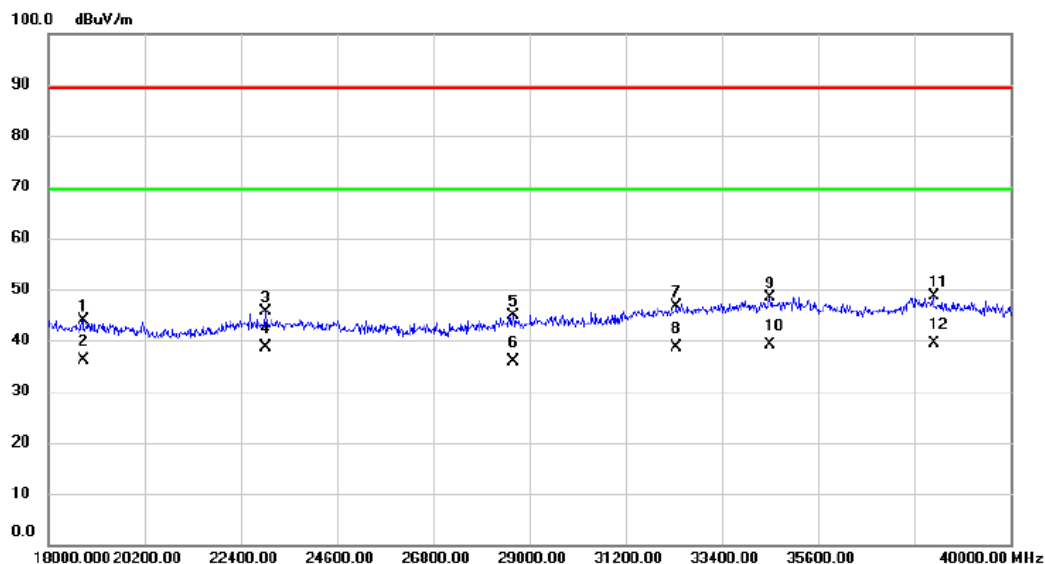
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		7140.000	29.39	14.32	43.71	74.00	-30.29	peak	
2		7140.000	23.52	14.32	37.84	54.00	-16.16	AVG	
3		8436.000	29.55	15.79	45.34	74.00	-28.66	peak	
4		8436.000	21.41	15.79	37.20	54.00	-16.80	AVG	
5		10380.00	29.08	18.19	47.27	74.00	-26.73	peak	
6		10380.00	19.54	18.19	37.73	54.00	-16.27	AVG	
7		11628.00	28.57	20.96	49.53	74.00	-24.47	peak	
8		11628.00	20.13	20.96	41.09	54.00	-12.91	AVG	
9		14484.00	29.99	25.78	55.77	74.00	-18.23	peak	
10		14484.00	20.12	25.78	45.90	54.00	-8.10	AVG	
11		17508.00	28.33	29.52	57.85	74.00	-16.15	peak	
12	*	17508.00	19.54	29.52	49.06	54.00	-4.94	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



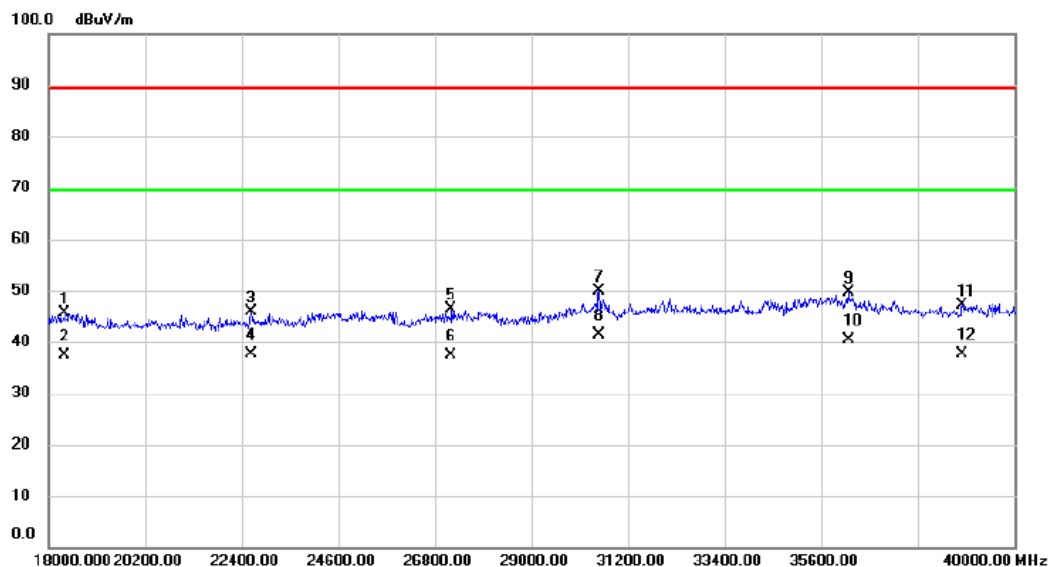
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		7668.00	28.35	15.02	43.37	74.00	-30.63	peak	
2		7668.00	19.87	15.02	34.89	54.00	-19.11	AVG	
3		8502.00	29.61	15.92	45.53	74.00	-28.47	peak	
4		8502.00	20.14	15.92	36.06	54.00	-17.94	AVG	
5		11520.00	28.68	21.00	49.68	74.00	-24.32	peak	
6		11520.00	20.34	21.00	41.34	54.00	-12.66	AVG	
7		14460.00	29.48	25.72	55.20	74.00	-18.80	peak	
8		14460.00	20.52	25.72	46.24	54.00	-7.76	AVG	
9		17478.00	28.46	29.39	57.85	74.00	-16.15	peak	
10		17478.00	18.44	29.39	47.83	54.00	-6.17	AVG	
11		17814.00	27.66	29.56	57.22	74.00	-16.78	peak	
12	*	17814.00	18.74	29.56	48.30	54.00	-5.70	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		18792.00	36.86	7.14	44.00	89.50	-45.50	peak	
2		18792.00	28.99	7.14	36.13	69.50	-33.37	AVG	
3		22972.00	37.25	8.42	45.67	89.50	-43.83	peak	
4		22972.00	30.11	8.42	38.53	69.50	-30.97	AVG	
5		28626.00	35.63	9.29	44.92	89.50	-44.58	peak	
6		28626.00	26.54	9.29	35.83	69.50	-33.67	AVG	
7		32366.00	38.05	8.53	46.58	89.50	-42.92	peak	
8		32366.00	30.12	8.53	38.65	69.50	-30.85	AVG	
9		34500.00	40.79	7.71	48.50	89.50	-41.00	peak	
10		34500.00	31.52	7.71	39.23	69.50	-30.27	AVG	
11		38240.00	37.78	10.93	48.71	89.50	-40.79	peak	
12	*	38240.00	28.41	10.93	39.34	69.50	-30.16	AVG	

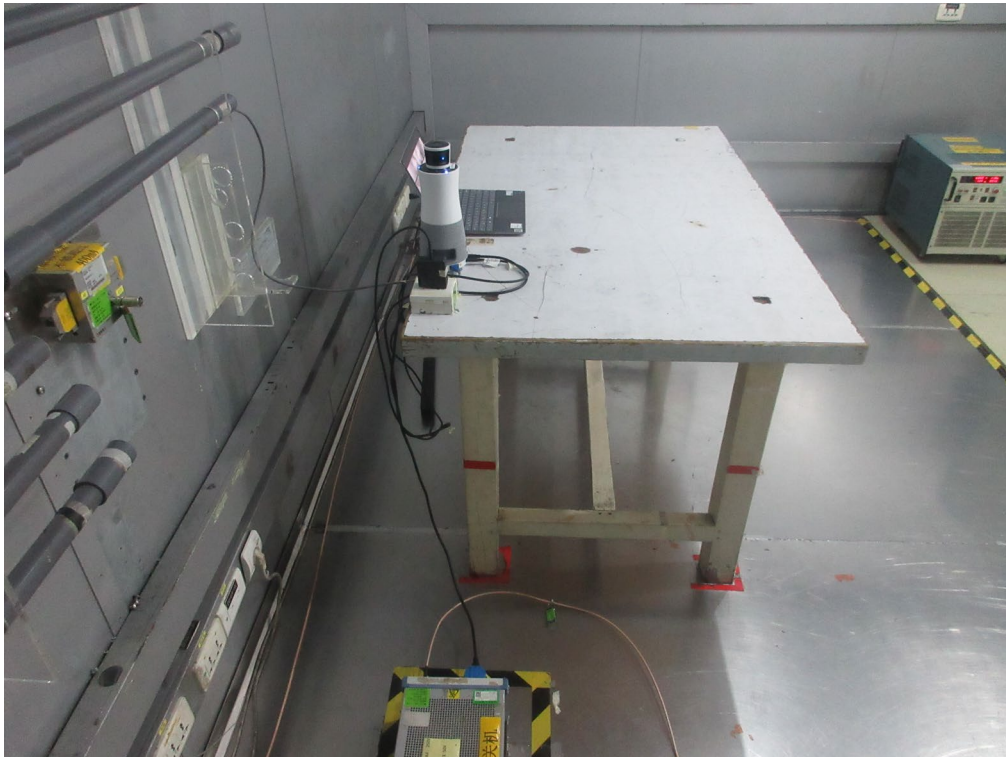
Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



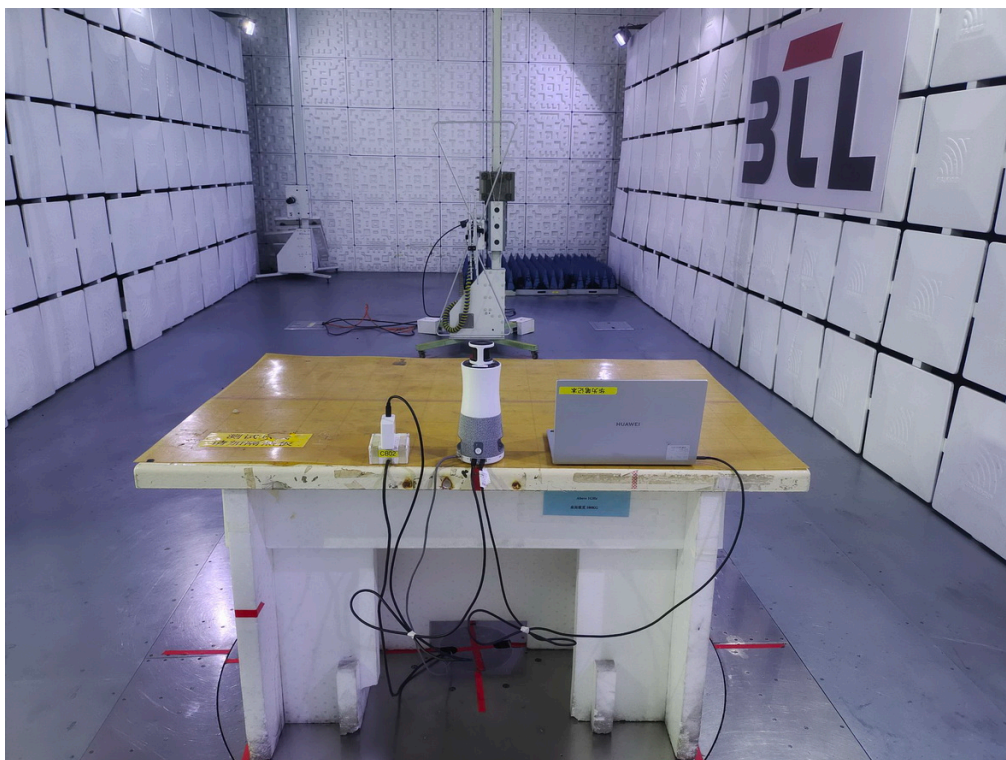
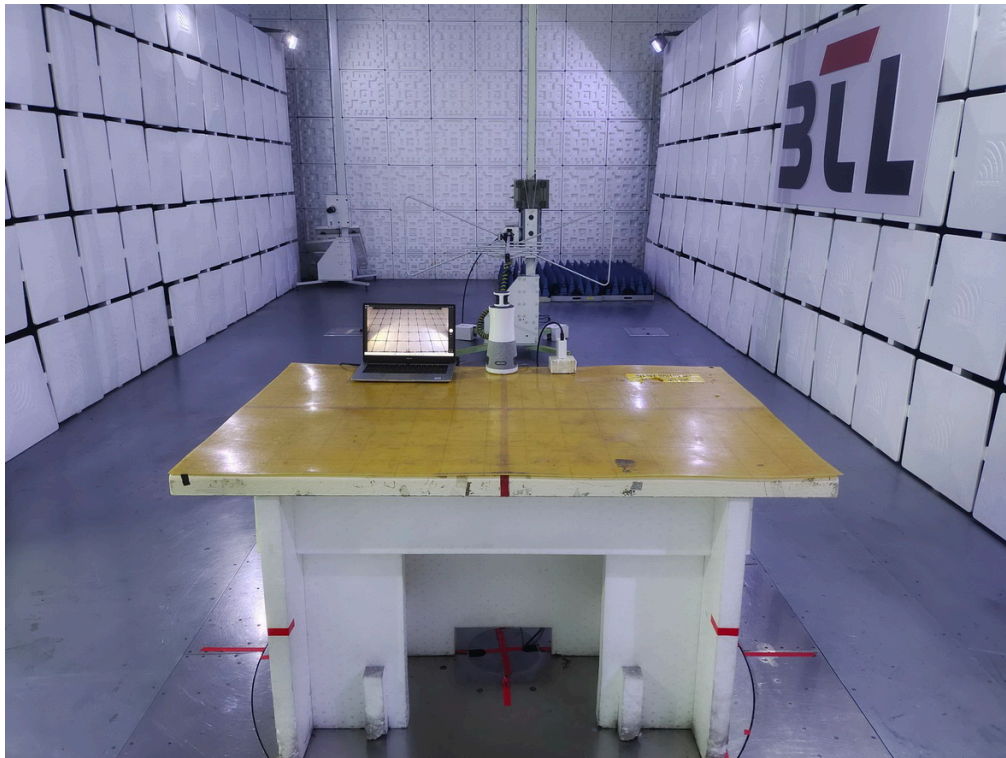
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		18374.00	38.53	6.98	45.51	89.50	-43.99	peak	
2		18374.00	30.41	6.98	37.39	69.50	-32.11	AVG	
3		22620.00	37.14	8.67	45.81	89.50	-43.69	peak	
4		22620.00	28.99	8.67	37.66	69.50	-31.84	AVG	
5		27174.00	36.50	9.82	46.32	89.50	-43.18	peak	
6		27174.00	27.66	9.82	37.48	69.50	-32.02	AVG	
7		30540.00	41.13	8.80	49.93	89.50	-39.57	peak	
8	*	30540.00	32.65	8.80	41.45	69.50	-28.05	AVG	
9		36216.00	39.64	9.88	49.52	89.50	-39.98	peak	
10		36216.00	30.42	9.88	40.30	69.50	-29.20	AVG	
11		38812.00	35.88	11.37	47.25	89.50	-42.25	peak	
12		38812.00	26.33	11.37	37.70	69.50	-31.80	AVG	

4. EUT TEST PHOTO

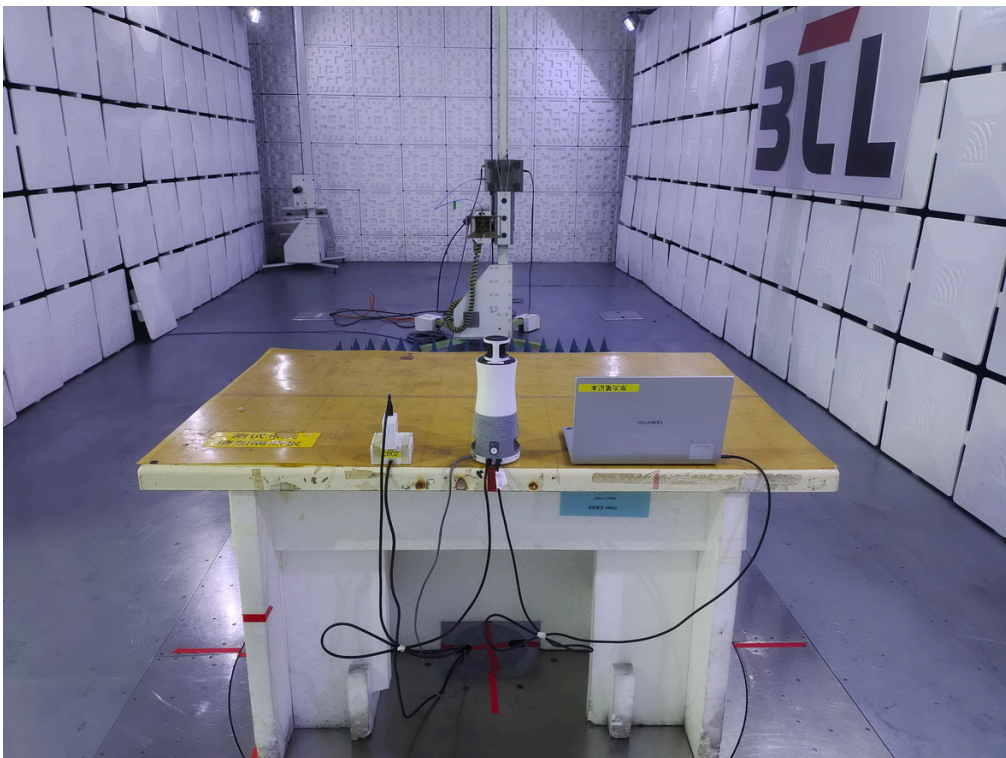
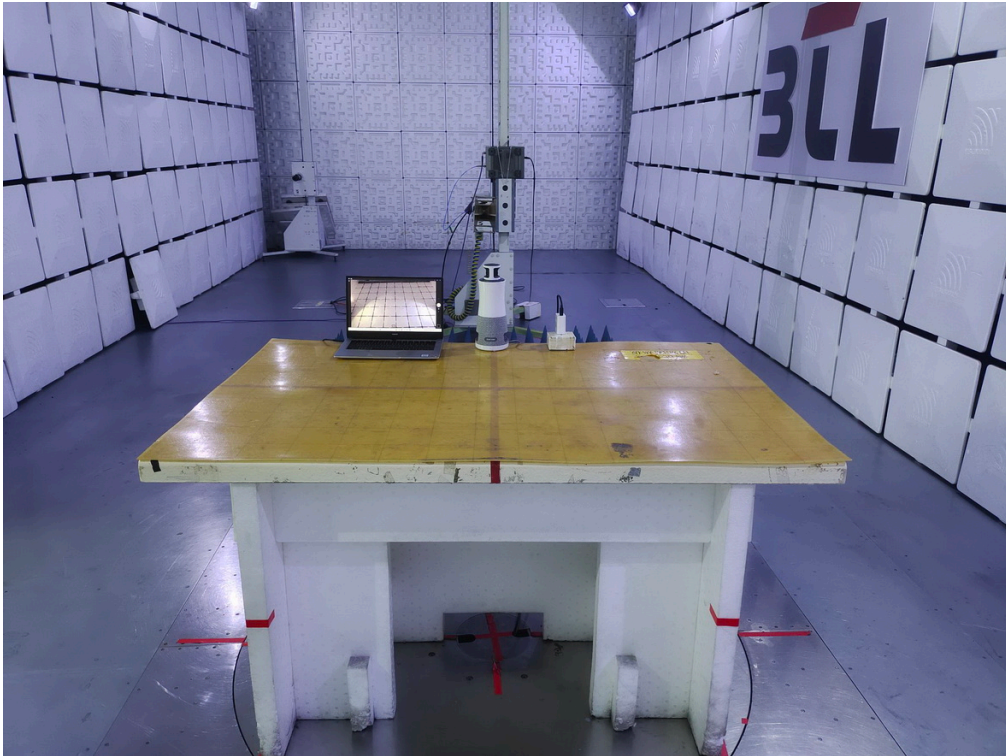
Mode 1-Mode 3
AC Power Line Conducted Emissions



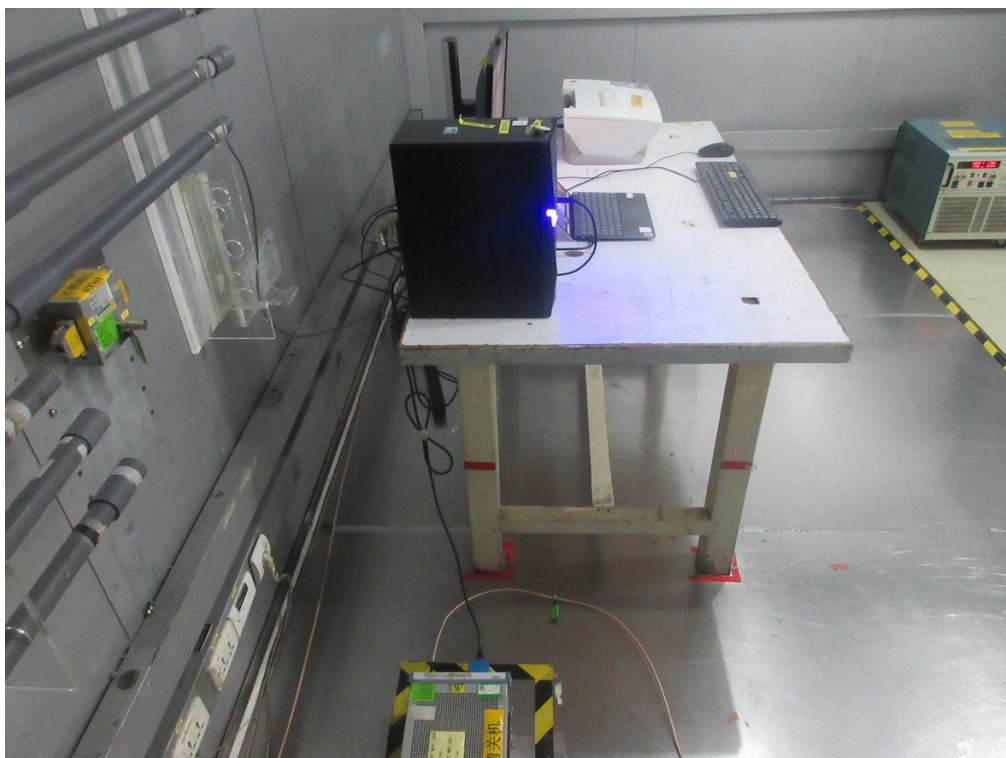
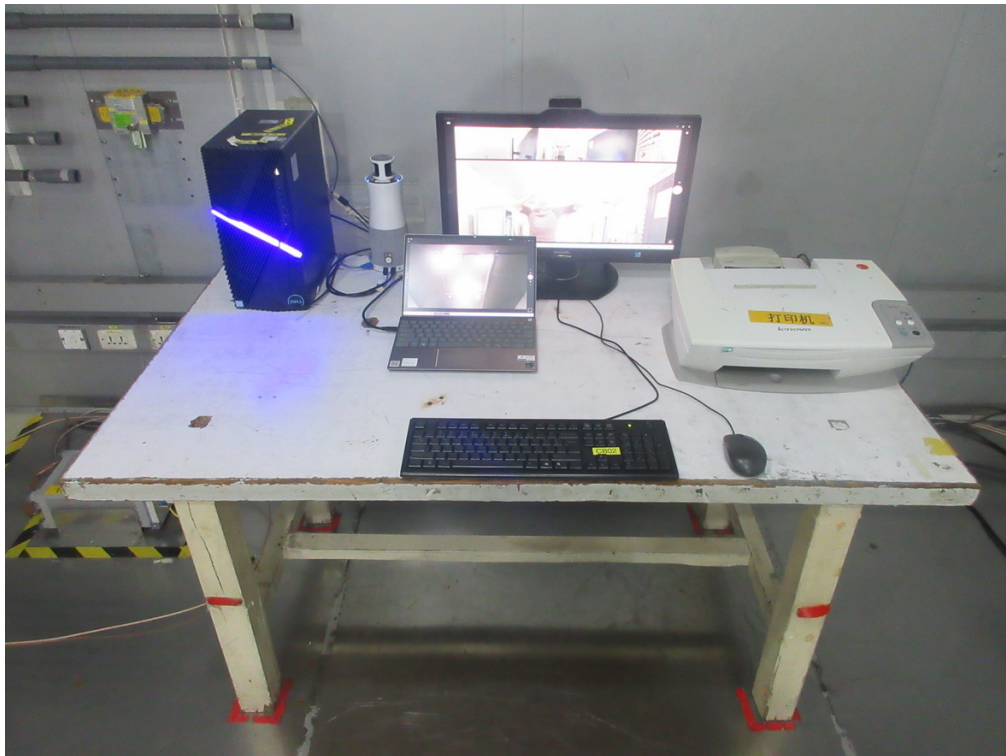
Radiated Emissions 30 MHz to 1 GHz



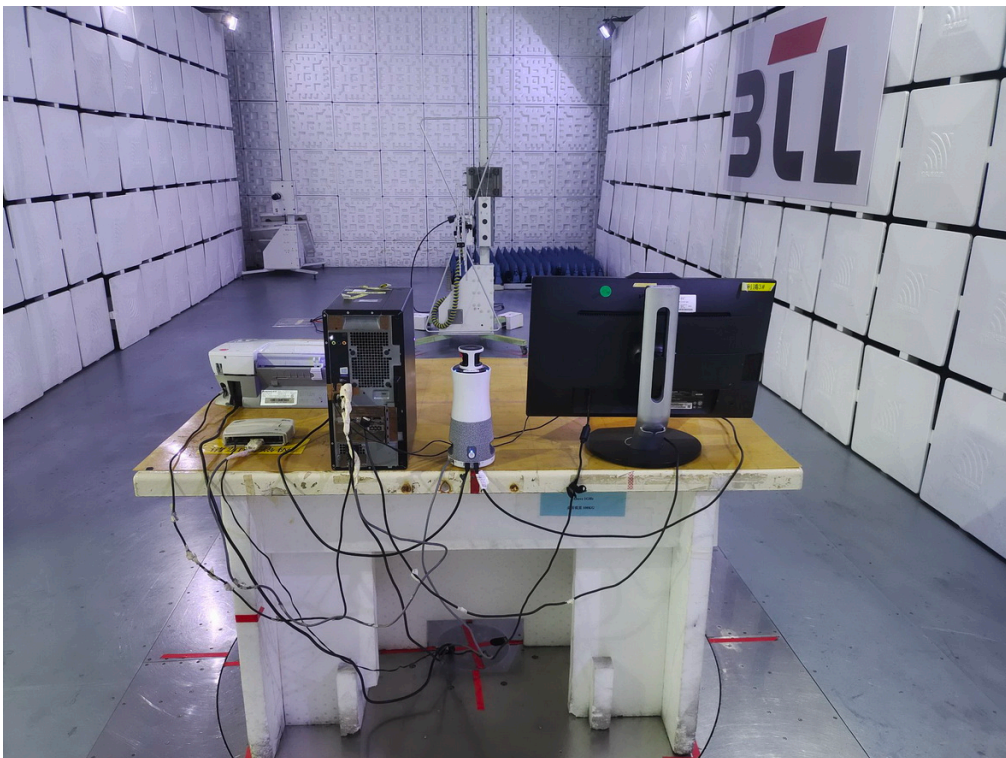
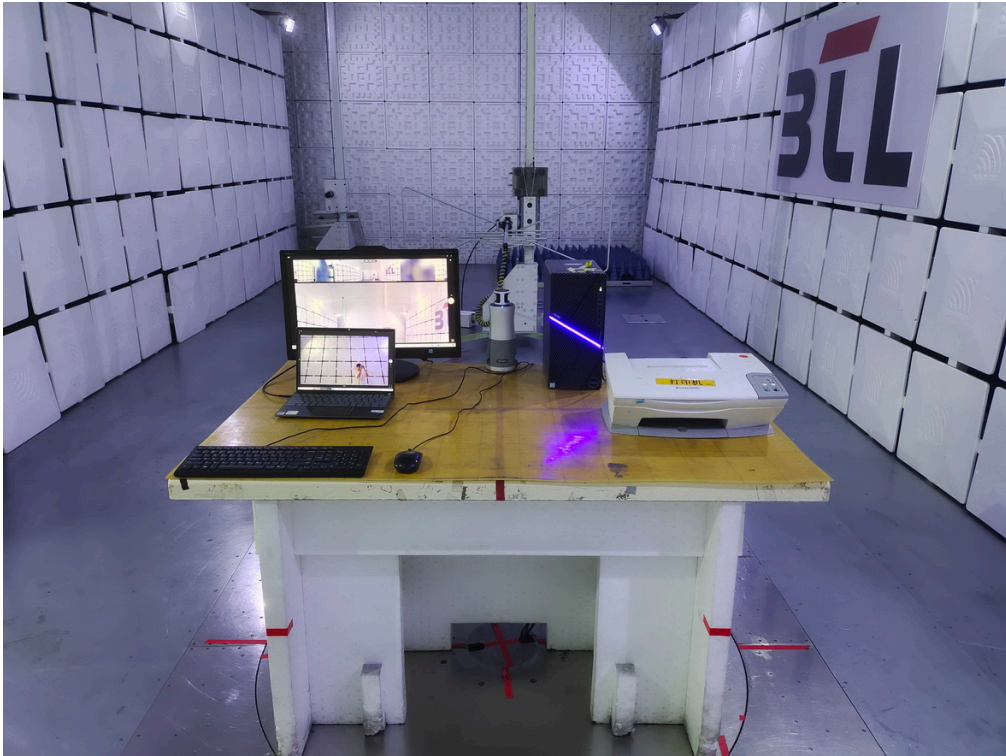
Radiated Emissions Above 1 GHz



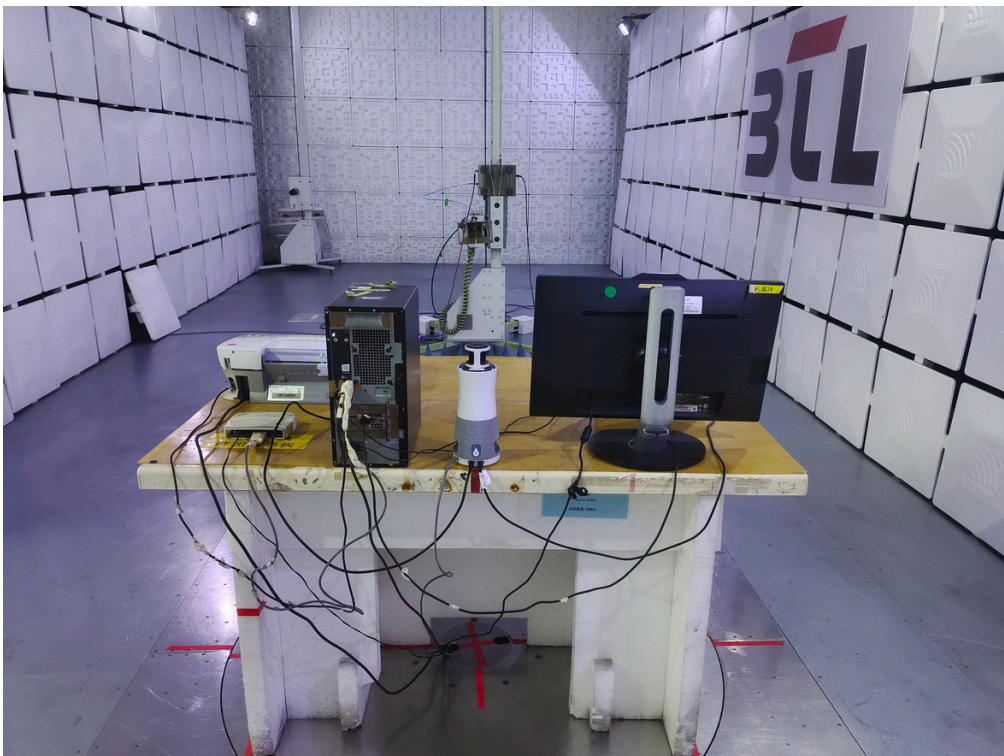
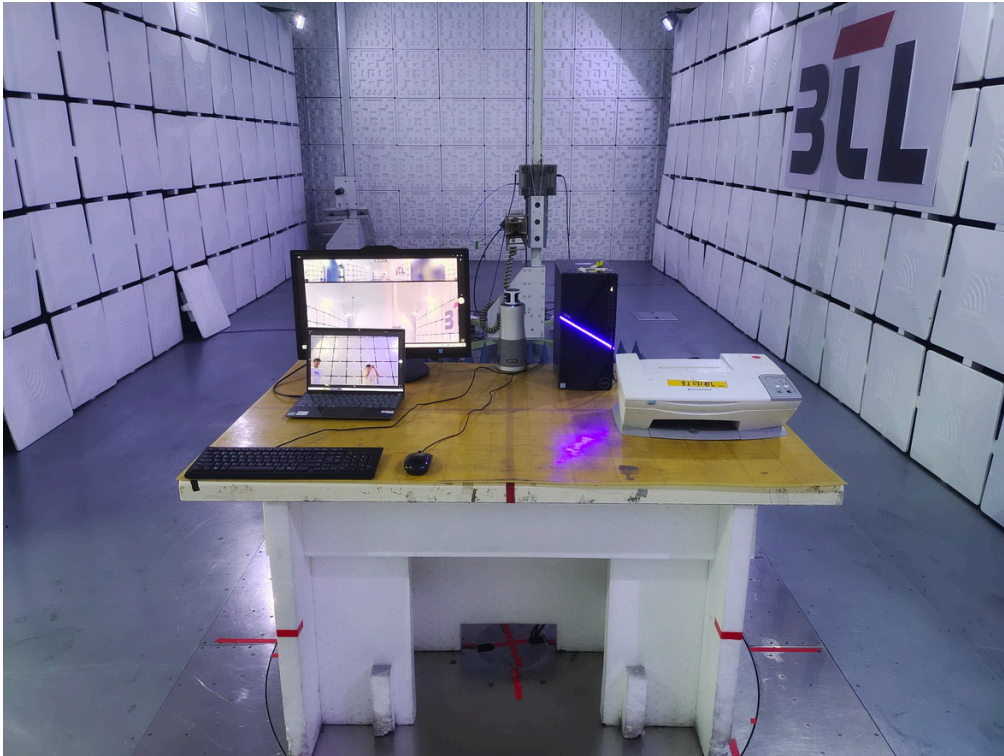
Mode 4
AC Power Line Conducted Emissions



Radiated Emissions 30 MHz to 1 GHz



Radiated Emissions Above 1 GHz



End of Test Report