



中国认可  
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检测  
TESTING  
CNAS L3163

# FCC EMC Test Report

**Project No.** : 2309C132  
**Equipment** : Notebook PC  
**Brand Name** : RAZER  
**Test Model** : RZ09-0510  
**Series Model** : N/A  
**Applicant** : Razer Inc.  
**Address** : 9 Pasteur, Suite 100, Irvine, CA92618, USA.  
**Manufacturer** : Razer Inc.  
**Address** : 9 Pasteur, Suite 100, Irvine, CA92618, USA.  
**Date of Receipt** : Sep. 26, 2023  
**Date of Test** : Oct. 07, 2023 ~ Nov. 11, 2023  
**Issued Date** : Nov. 23, 2023  
**Report Version** : R00  
**Test Sample** : Sample No.: DG2023092635, DG2023092636, DG2023100892, DG2023101269  
**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.(Dongguan).

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**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-FCCE-1-2309C132	R00	Original Report.	Nov. 23, 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 at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.

### 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-CB08 (3m)	CISPR	30MHz ~ 200MHz	V	3.64
		30MHz ~ 200MHz	H	4.16
		200MHz ~ 1,000MHz	V	4.44
		200MHz ~ 1,000MHz	H	4.42

Test Site	Method	Measurement Frequency Range	$U$ , (dB)
DG-CB08 (3m)	CISPR	1GHz ~ 6GHz	4.24
		6GHz ~ 18GHz	3.84

Test Site	Method	Measurement Frequency Range	$U$ , (dB)
DG-CB08 (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	24°C	50%	Jeter Wang
Radiated emissions 30 MHz to 1 GHz	25°C	52%	Bernie Wu
Radiated emissions above 1 GHz	25~29°C	44~51%	Bernie Wu Amous Shen

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Notebook PC
Brand Name	RAZER
Test Model	RZ09-0510
Series Model	N/A
Model Difference(s)	N/A
Identification No. of EUT(S/N)	N/A
Dimensions and mass	355mm x 244mm x 21.99mm
Component unit of EUT	<input type="checkbox"/> Single unit <input checked="" type="checkbox"/> Multiple unit
Sample Status	<input checked="" type="checkbox"/> Engineering sample <input type="checkbox"/> Final shipment prototype
Power Source	1# DC voltage supplied from AC adapter. Model 1: RC30-042 Model 2: RC30-0484 2# Supplied from battery. Model: RC30-0483
Power Rating	1# Model 1: I/P: 100-240V~ 4A MAX 50/60Hz O/P: 19.5V===14.36A Model 2: I/P: 100-240V~ 4.5A 50/60Hz O/P: 19.5V===16.92A 2# DC 15.4V 6182mAh 95.2Wh
Connecting I/O Port(s)	1* DC port 1* SD Card port 2* Type-C port 3* USB port 1* HDMI port 1* Earphone port
Classification of EUT	Class B
Highest Internal Frequency(Fx)	5850MHz

Note:

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

## 2. Config:

Device	Manufacturer	Model No.	Key parameter
MB	BYD	APF22002_MB	There are two kinds of structure MB1 or MB2, only differ in GPU size ,GPU related layout and VRAM qty.
CPU	Intel	i9-14900HX	24Cores, 2.2GHz
GPU	NVIDIA	GN21-X6 (NVIDIA GeForce RTX4070)	/
		GN21-X9 (NVIDIA GeForce RTX4080)	/
		GN21-X11 (NVIDIA GeForce RTX4090)	/
WI-FI+BT	Intel	BE200NGW	/
Panel	AUO	B160ZANXXXX(X=0-9 or A-Z or a-z or "-" or "/" or "." or blank just for different region)	Dual UHD+FHD+mini-LED
	BOE	NE160QAMXXXXXX(X=0-9 or A-Z or a-z or "-" or "/" or "." or blank just for different region)	Dual UHD+FHD+mini-LED
	Samsung	ATNA60DL03XXX(X=0-9 or A-Z or a-z or "-" or "/" or "." or blank just for different region)	QHD 240Hz OLED
Battery	BYD	RC30-0483	Li-ion Battery Pack, 15.4V 6182mAh 95.2Wh
Adapter	RAZER	RC30-042(280W)	AC Input:100-240V,4A Max,50/60Hz DC Output:19.5V/14.36A
		RC30-0484(330W)	AC Input:100-240V,4.5A ,50/60Hz DC Output:19.5V/16.92A
M.2 SSD	SSSTC	/	1TB / 1TB x 2 / 2TB / 2TB x 2
	Samsung	/	1TB / 1TB x 2 / 2TB / 2TB x 2
	Neo Forza/ Goldkey	/	4TB x 2
Memory	Samsung	/	8GB x 2 / 16GB x 2 / 32GB x 2
	Hynix	/	8GB x 2 / 16GB x 2 / 32GB x 2
	Neo Forza/ Goldkey	/	48GB x 2



## 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 (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU1
Mode 2	FULL SYSTEM (Charging+Type-C1 OUT 5V3A+Type-C2 OUT 5V3A+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU1
Mode 3	FULL SYSTEM (Charging+Type-C1 Display 3840*2400/120Hz+Type-C2 Display 3840*2400/120Hz+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU1
Mode 4	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Speaker+BT+2.4G WiFi) With 330W Adapter;SKU1
Mode 5	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+5G WiFi) With 330W Adapter;SKU1
Mode 6	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU2
Mode 7	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU3
Mode 8	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU4
Mode 9	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU5
Mode 10	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 280W Adapter;SKU6

### AC Power Line Conducted Emissions Test

Final Test Mode	Description
Mode 1	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU1

### Radiated Emissions 30 MHz to 1 GHz Test

Final Test Mode	Description
Mode 1	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU1

Radiated emissions above 1 GHz Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM (Charging+Type-C1 R/W+Type-C2 R/W+SD R/W+HDMI OUT 3840*2400/120Hz+Earphone+BT+2.4G WiFi) With 330W Adapter;SKU1

Config	Manufacturer	SKU1	SKU2	SKU3
MB	BYD	APF22002_MB (MB1)	APF22002_MB (MB1)	APF22002_MB (MB1)
CPU	Intel	i9-14900HX	i9-14900HX	i9-14900HX
GPU	NVIDIA	GN21-X11 (NVIDIA GeForce RTX4090)	GN21-X11 (NVIDIA GeForce RTX4090)	GN21-X9 (NVIDIA GeForce RTX4080)
Panel	AUO	B160ZAN01.U	/	/
	BOE	/	/	NE160QAM-NM1
	Samsung	/	ATNA60DL03	/
Battery	BYD	RC30-0483	RC30-0483	RC30-0483
Adapter	RAZER	RC30-0484	RC30-0484	RC30-0484
M.2 SSD	Samsung	2TB x 2	2TB	2TB
Memory	Samsung	32GB x 2	16GB x 2	/
	Hynix	/	/	16GB x 2
WIFI+BT	Intel	BE200NGW	BE200NGW	BE200NGW

Config	Manufacturer	SKU4	SKU5	SKU6
MB	BYD	APF22002_MB (MB1)	APF22002_MB (MB1)	APF22002_MB (MB2)
CPU	Intel	i9-14900HX	i9-14900HX	i9-14900HX
GPU	NVIDIA	GN21-X11 (NVIDIA GeForce RTX4090)	GN21-X11 (NVIDIA GeForce RTX4090)	GN21-X6 (NVIDIA GeForce RTX4070)
Panel	AUO	B160ZAN01.U	/	B160ZAN01.U
	BOE	/	NE160QAM-NM1	/
Battery	BYD	RC30-0483	RC30-0483	RC30-0483
Adapter	RAZER	RC30-0484	RC30-0484	RC30-042
M.2 SSD	SSSTC	/	2TB x 2	2TB
	Neo Forza/ Goldkey	4TB x 2	/	/
Memory	Hynix	/	32GB x 2	8GB x 2
	Neo Forza/ Goldkey	48GB x 2	/	/
WIFI+BT	Intel	BE200NGW	BE200NGW	BE200NGW

Note:

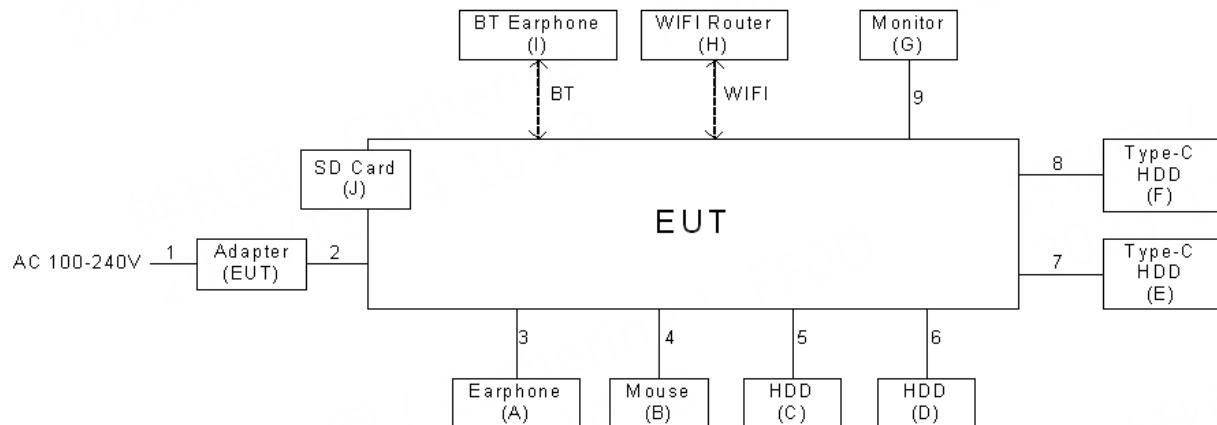
1. Pretested Mode 1-5, the worst case is Mode 1 and evaluated SKU2-SKU6 (Mode 6-10). The worst case is Mode 1 and recorded in this report.
2. The product supports BT&2.4G&5G WIFI function.  
The frequency exemptions are 2400-2483.5MHz, 5150-5250MHz, 5250-5350MHz, 5470-5725MHz, 5725-5850MHz.
3. Radiated 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:

1. EUT connected to Adapter (EUT) via DC Cable.
2. The SD Card is plugged into EUT.
3. EUT connected to Earphone via Earphone Cable.
4. EUT connected to Mouse via USB Cable.
5. EUT connected to HDD via USB Cable.
6. EUT connected to Type-C HDD via Type-C Cable.
7. EUT connected to Monitor via HDMI Cable.
8. EUT connected to BT Earphone via the BT function.
9. EUT connected to Wireless Router via the WIFI function.

### 2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



Ground Plane

Remote system

## 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	Earphone	RAZER	N/A	N/A
B	Mouse	RAZER	RZ03-0252	N/A
C	HDD	LACIE	Lacie S.A	NL33PVP7
D	HDD	LACIE	Lacie S.A	NL33PVK0
E	Type-C HDD	Samsung	MU-PA500R	S50UNV0M704477
F	Type-C HDD	Samsung	MU-PA500R	S50UNV0M705670
G	Monitor	PHILIPS	241P6V	UHBA1633026326
H	WIFI Router	RAZER	RZ37-0251	N/A
I	BT Earphone	MICROKIA	M9	N/A
J	SD Card	Kingston	8GB	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	AC Cable	NO	NO	1m
2	DC Cable	NO	NO	1.8m
3	Earphone Cable	NO	NO	1.2m
4	USB Cable	YES	NO	1.8m
5	USB Cable	YES	NO	1m
6	USB Cable	YES	NO	1m
7	Type-C Cable	YES	NO	1m
8	Type-C Cable	YES	NO	1m
9	HDMI Cable	YES	NO	1.8m

### 3. EMC EMISSION TEST

#### 3.1 AC POWER LINE CONDUCTED EMISSIONS TEST

##### 3.1.1 LIMIT

Frequency of Emission (MHz)	Class B (dB $\mu$ V)	
	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	RG400	N/A(12m)	Sep. 13, 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.

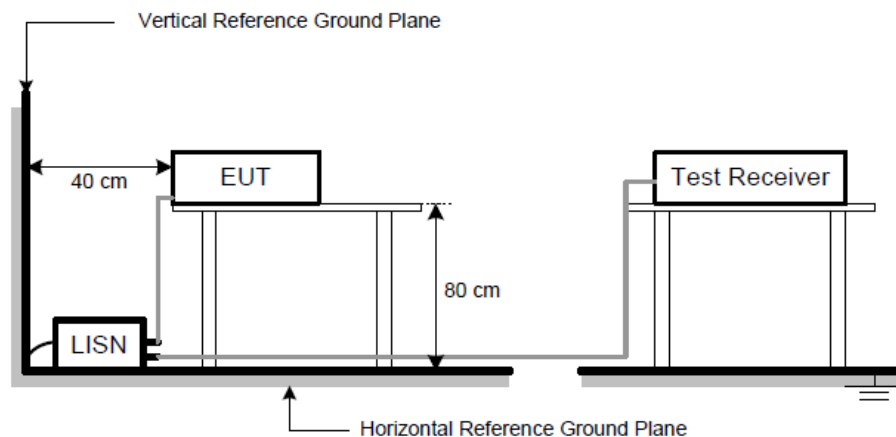
### 3.1.3 TEST PROCEDURE

- 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.
- Measuring frequency range from 150KHz to 30MHz.

### 3.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.5 TEST SETUP

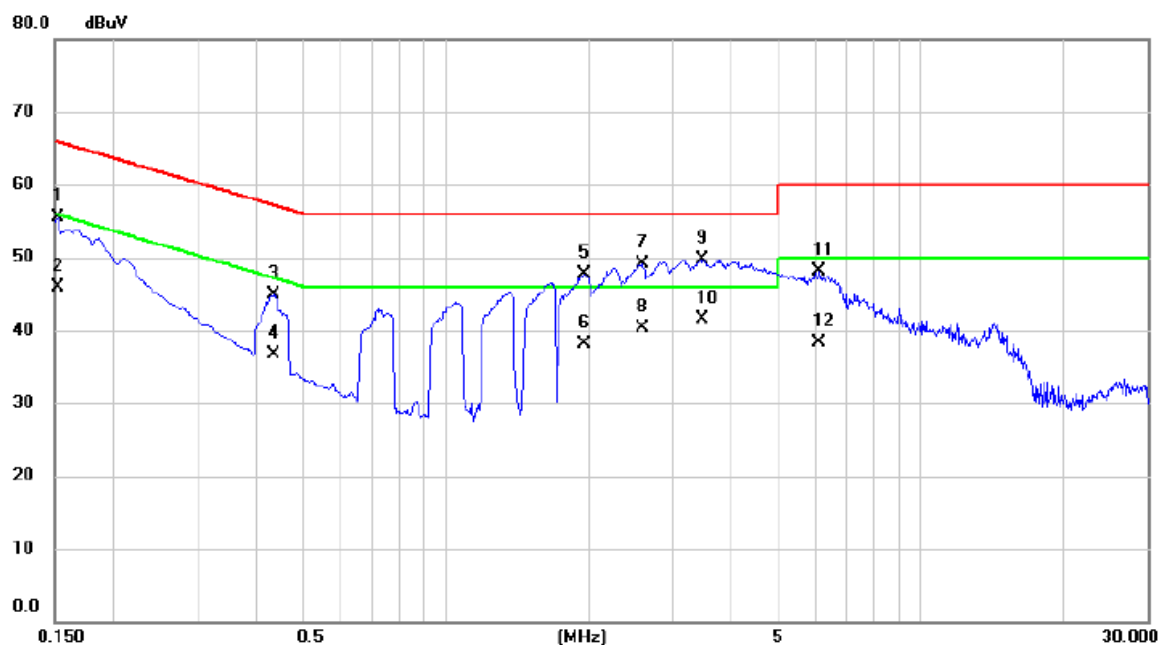


### 3.1.6 TEST RESULTS

Remark:

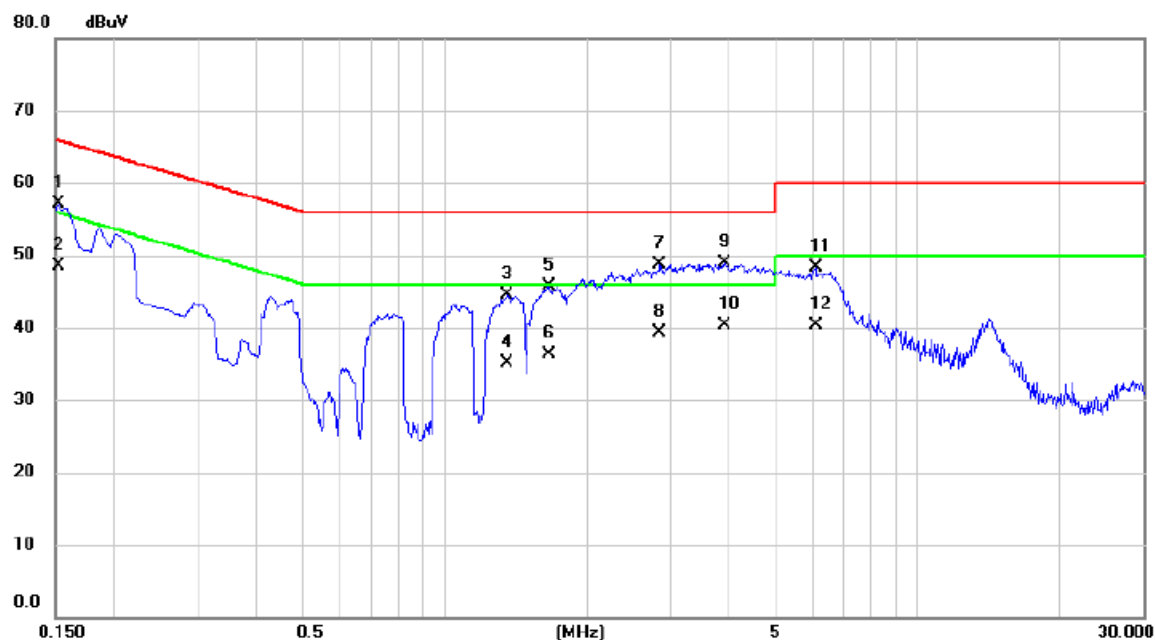
- Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10 kHz, VBW=10 kHz, Swp. Time =0.3 sec./MHz.
- 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	45.73	9.68	55.41	65.88	-10.47	QP	
2		0.1522	36.20	9.68	45.88	55.88	-10.00	AVG	
3		0.4335	35.16	9.75	44.91	57.19	-12.28	QP	
4		0.4335	26.90	9.75	36.65	47.19	-10.54	AVG	
5		1.9613	37.82	9.88	47.70	56.00	-8.30	QP	
6		1.9613	28.30	9.88	38.18	46.00	-7.82	AVG	
7		2.5913	39.11	9.92	49.03	56.00	-6.97	QP	
8		2.5913	30.40	9.92	40.32	46.00	-5.68	AVG	
9		3.4620	39.75	9.97	49.72	56.00	-6.28	QP	
10	*	3.4620	31.60	9.97	41.57	46.00	-4.43	AVG	
11		6.1058	37.89	10.17	48.06	60.00	-11.94	QP	
12		6.1058	28.10	10.17	38.27	50.00	-11.73	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	47.50	9.68	57.18	65.88	-8.70	QP	
2		0.1522	38.90	9.68	48.58	55.88	-7.30	AVG	
3		1.3560	34.68	9.82	44.50	56.00	-11.50	QP	
4		1.3560	25.30	9.82	35.12	46.00	-10.88	AVG	
5		1.6575	35.88	9.84	45.72	56.00	-10.28	QP	
6		1.6575	26.40	9.84	36.24	46.00	-9.76	AVG	
7		2.8523	38.68	9.94	48.62	56.00	-7.38	QP	
8		2.8523	29.30	9.94	39.24	46.00	-6.76	AVG	
9		3.9143	38.94	10.01	48.95	56.00	-7.05	QP	
10	*	3.9143	30.20	10.01	40.21	46.00	-5.79	AVG	
11		6.0878	38.05	10.18	48.23	60.00	-11.77	QP	
12		6.0878	30.20	10.18	40.38	50.00	-9.62	AVG	



## 3.2 RADIATED EMISSIONS 30 MHZ TO 1 GHZ

### 3.2.1 LIMIT

Frequency (MHz)	Class B (at 3m)	
	( $\mu$ V/m) Quasi-peak	(dB $\mu$ 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 $\mu$ V/m) = 20log Emission level ( $\mu$ V/m).  
3m Emission level = 10m Emission level + 20log(10m/3m).
- (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	Receiver	Keysight	N9038A	MY53220133	Oct. 08, 2024
2	Pre-Amplifier	EMC INSTRUMENT	EMC 9135	980283	Jun. 16, 2024
3	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	946	Aug. 10, 2024
4	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A
5	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
6	Controller	MF	MF-7802	MF780208159	N/A
7	Cable	RW	LMR400-NMNM-8M	N/A	Dec. 05, 2023
8	Cable	RW	LMR400-NMNM-3.5M	N/A	Dec. 05, 2023
9	Cable	RW	LMR400-NMNM-14M	N/A	Dec. 05, 2023

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

All calibration period of equipment list is one year.

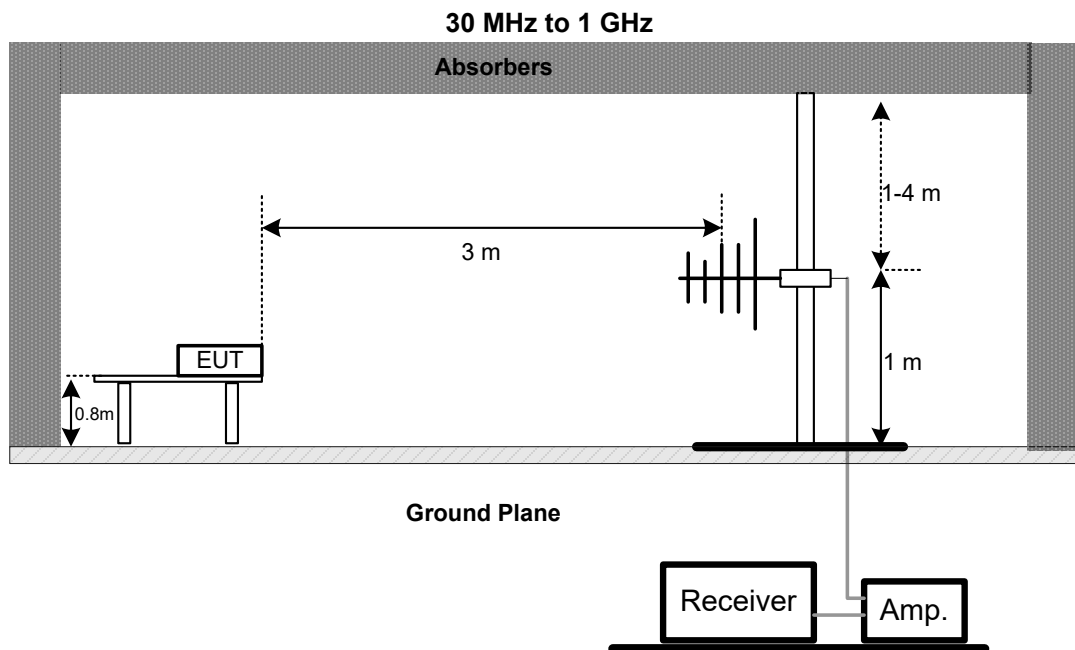
### 3.2.3 TEST PROCEDURE

- 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 10 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

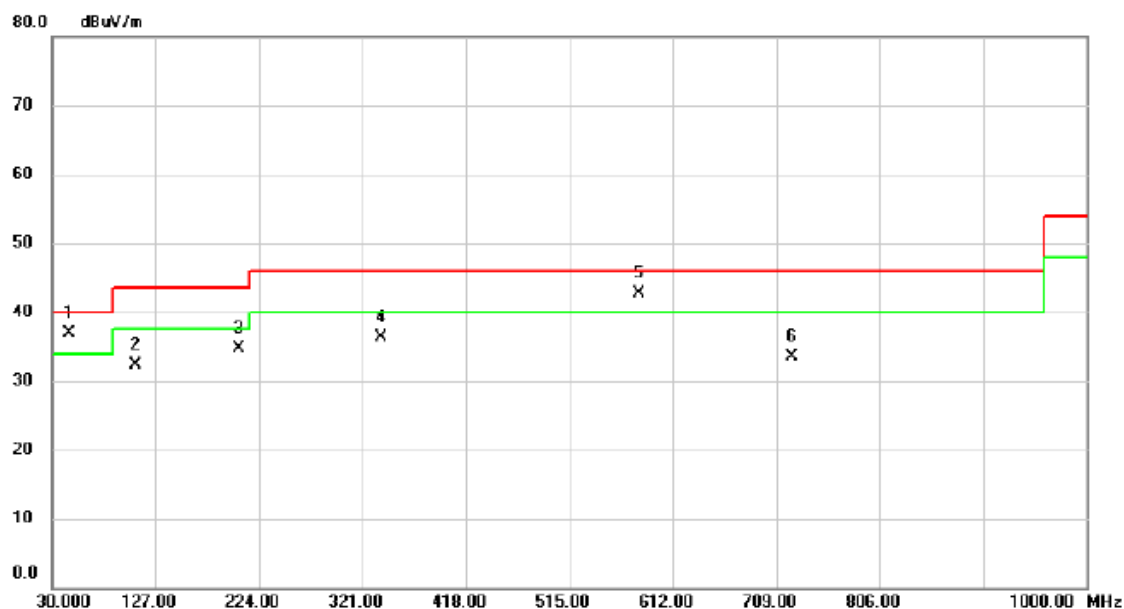


### 3.2.6 TEST RESULTS

Remark:

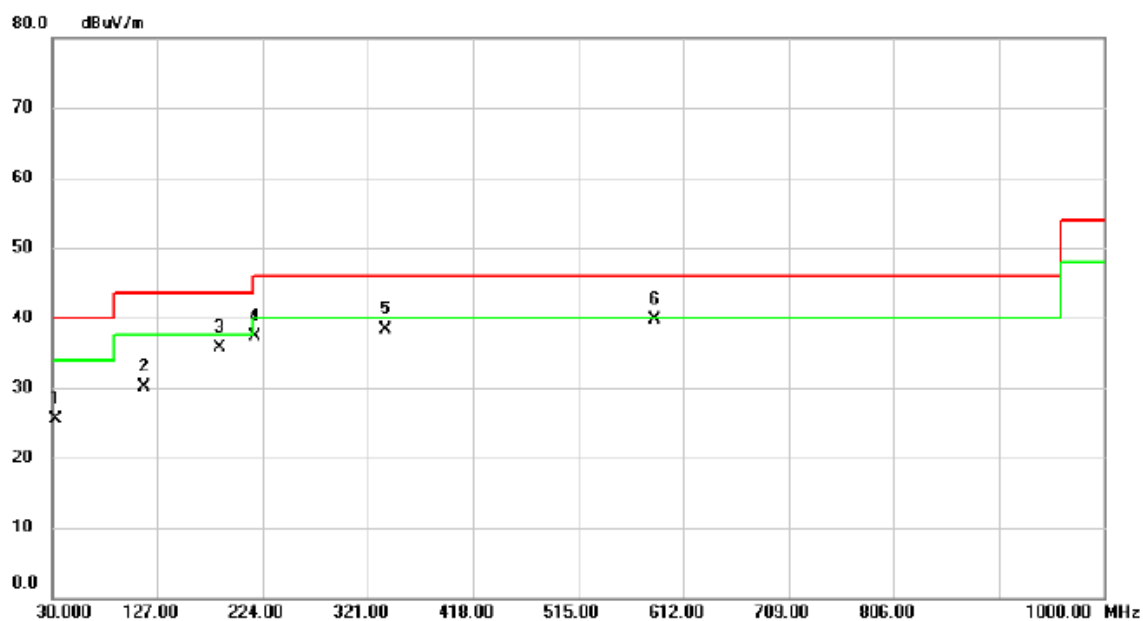
- (1) Measuring frequency range from 30 MHz to 1000 MHz
- (2) If the peak scan value lower limit more than 20 dB, then this signal data does not show in table.

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	54.60	-17.74	36.86	40.00	-3.14	QP	
2		108.5700	51.82	-19.50	32.32	43.50	-11.18	QP	
3		205.5700	53.87	-19.17	34.70	43.50	-8.80	QP	
4		338.4600	50.55	-14.18	36.37	46.00	-9.63	QP	
5	!	579.9900	51.93	-9.18	42.75	46.00	-3.25	QP	
6		723.5500	40.75	-7.23	33.52	46.00	-12.48	QP	

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



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		32.9100	43.22	-17.72	25.50	40.00	-14.50	QP	
2		114.3900	48.85	-18.81	30.04	43.50	-13.46	QP	
3		184.2300	53.64	-17.96	35.68	43.50	-7.82	QP	
4		217.2100	56.70	-19.32	37.38	46.00	-8.62	QP	
5		337.4900	52.54	-14.22	38.32	46.00	-7.68	QP	
6	*	585.8100	48.82	-9.09	39.73	46.00	-6.27	QP	

### 3.3 RADIATED EMISSIONS ABOVE 1 GHZ

#### 3.3.1 LIMIT

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

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

#### FREQUENCY RANGE OF RADIATED MEASUREMENT (FOR UNINTENTIONAL RADIATORS)

Highest internal frequency (F <sub>x</sub> )	Highest measurement frequency (F <sub>M</sub> )
F <sub>x</sub> ≤ 108 MHz	1 GHz
108 MHz < F <sub>x</sub> ≤ 500 MHz	2 GHz
500 MHz < F <sub>x</sub> ≤ 1 GHz	5 GHz
F <sub>x</sub> > 1 GHz	5 x F <sub>x</sub> up to a maximum of 40 GHz
Note: F <sub>x</sub> 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 $\mu$ 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	Horn Antenna	EMCO	3115	9605-4803	Jun. 17, 2024
2	Amplifier	Agilent	8449B	3008A02333	Jan. 07, 2024
3	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A
4	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
5	Controller	MF	MF-7802	MF780208159	N/A
6	Receiver	Keysight	N9038A	MY53220133	Oct. 09, 2024
7	Cable	RW	RWLP50-4.0A-NMRASM-4M	N/A	Jul. 30, 2024
8	Cable	RW	RWLP50-4.0A-NMRASM-12M	N/A	Jul. 30, 2024
9	Cable	RW	RWLP50-4.0A-NMRASM-1M	N/A	Jul. 30, 2024
10	Cable	RegalWay	RWLP50-2.6A-2.92M2.92M-1.1M	N/A	Jul. 26, 2024
11	Cable	Tonscend	HF160-KMKM-3M	N/A	Jul. 26, 2024
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA9170(3m)	9170-319	May 30, 2024
13	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330-K	619413	Jul. 06, 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

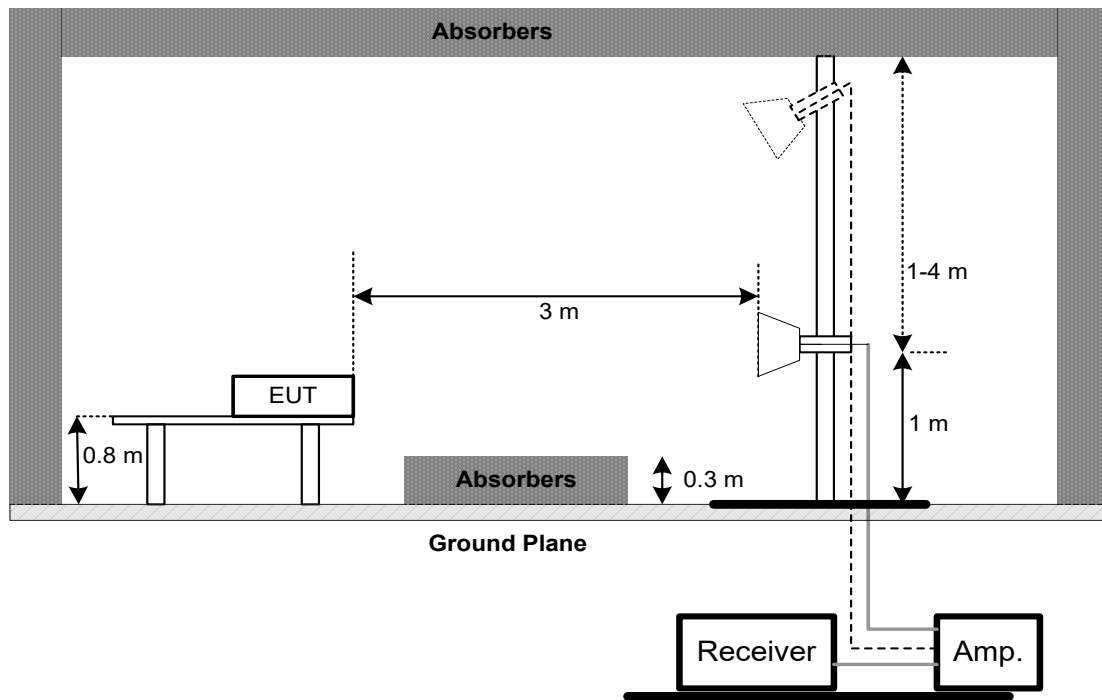
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.  
Note:  
For measurement of frequency 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

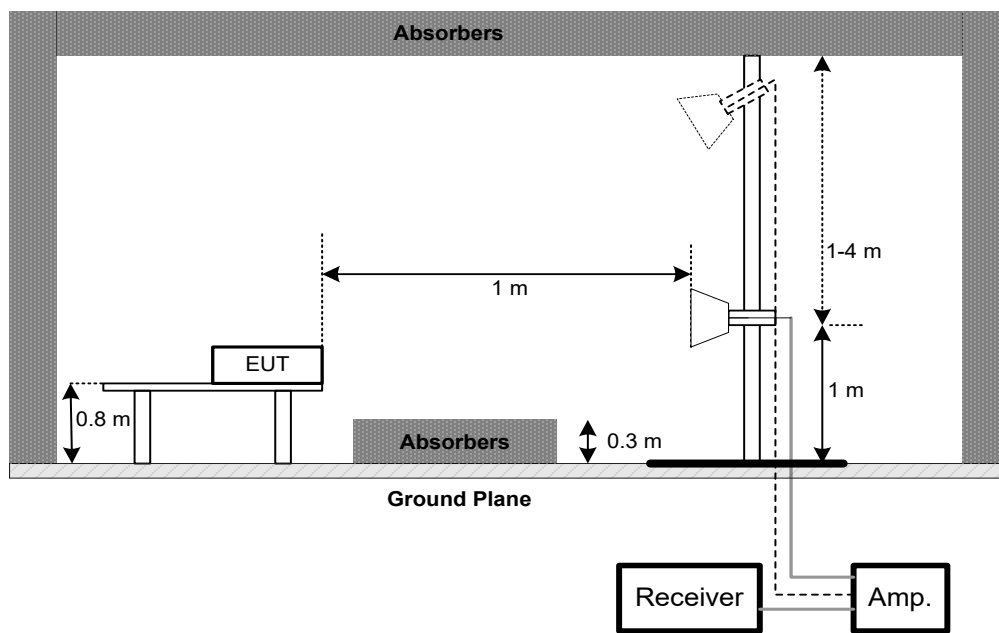
No deviation

### 3.3.5 TEST SETUP

1 GHz-18 GHz



18 GHz-40 GHz



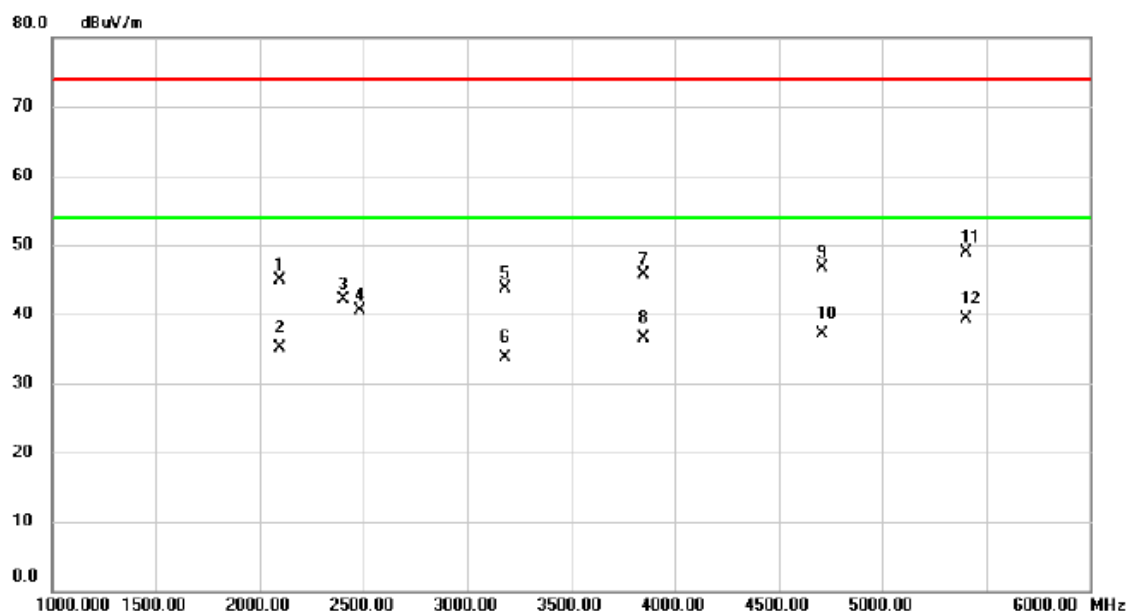
### 3.3.6 TEST RESULTS

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.

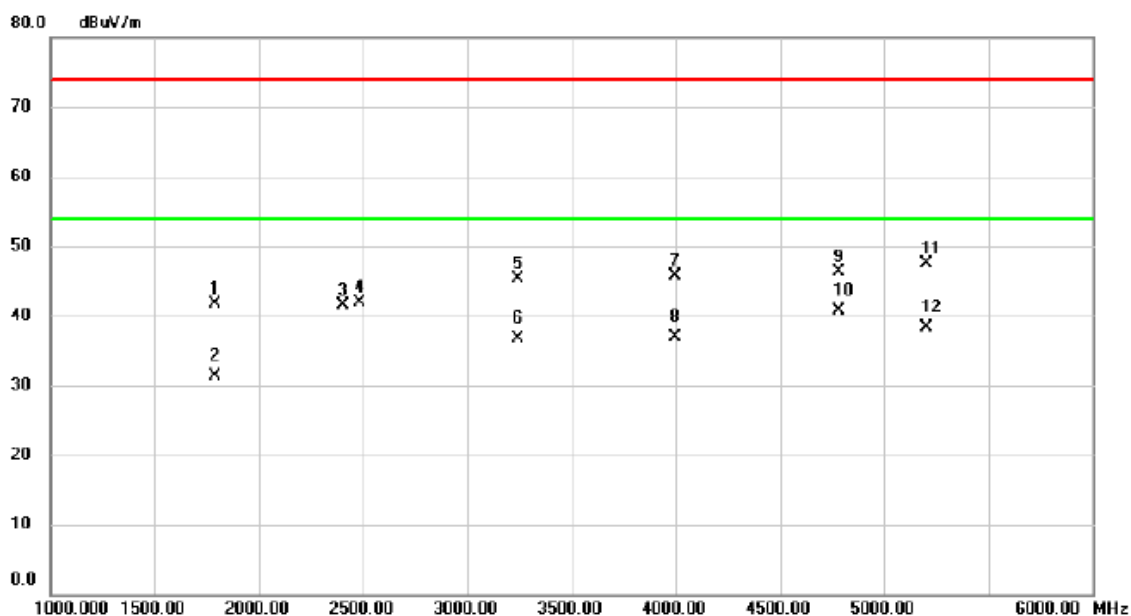


Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 1		
Note	BT & 2.4G WIFI (2400-2483.5MHz) is intentional transmissions, which is not applicable to the radiation emission requirements in this standard.		



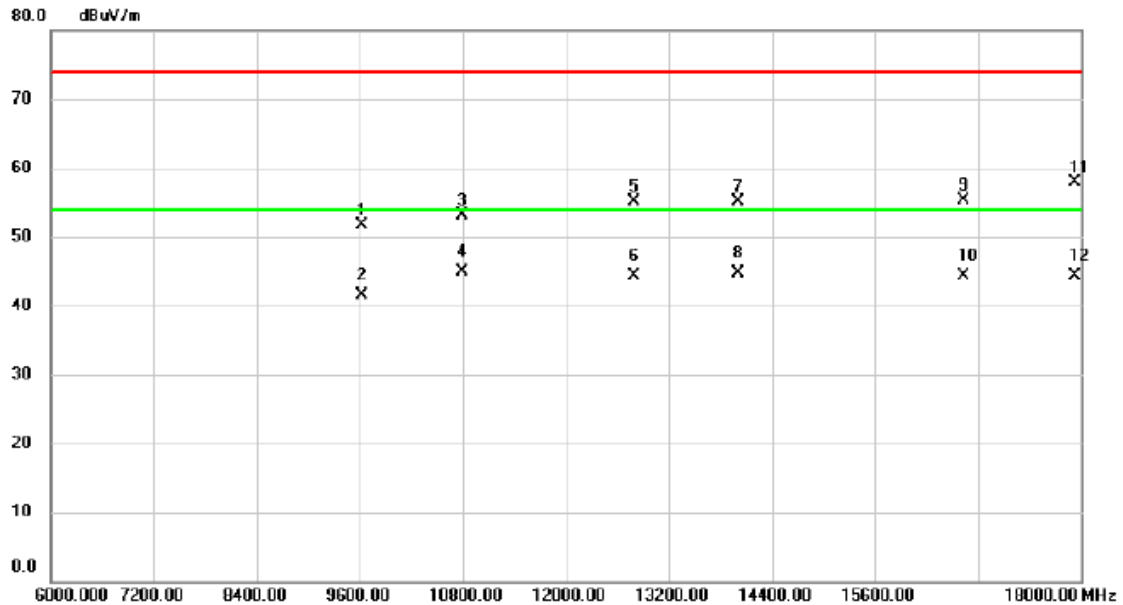
No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2095.000	43.59	1.24	44.83	74.00	-29.17	peak	
2	2095.000	33.95	1.24	35.19	54.00	-18.81	AVG	
3	2400.000	40.03	2.05	42.08	74.00	-31.92	peak	
4	2483.500	38.31	2.27	40.58	74.00	-33.42	peak	
5	3185.000	38.64	5.02	43.66	74.00	-30.34	peak	
6	3185.000	28.74	5.02	33.76	54.00	-20.24	AVG	
7	3852.500	38.38	7.24	45.62	74.00	-28.38	peak	
8	3852.500	29.28	7.24	36.52	54.00	-17.48	AVG	
9	4707.500	37.77	8.94	46.71	74.00	-27.29	peak	
10	4707.500	28.25	8.94	37.19	54.00	-16.81	AVG	
11	5400.000	37.89	11.03	48.92	74.00	-25.08	peak	
12 *	5400.000	28.25	11.03	39.28	54.00	-14.72	AVG	

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



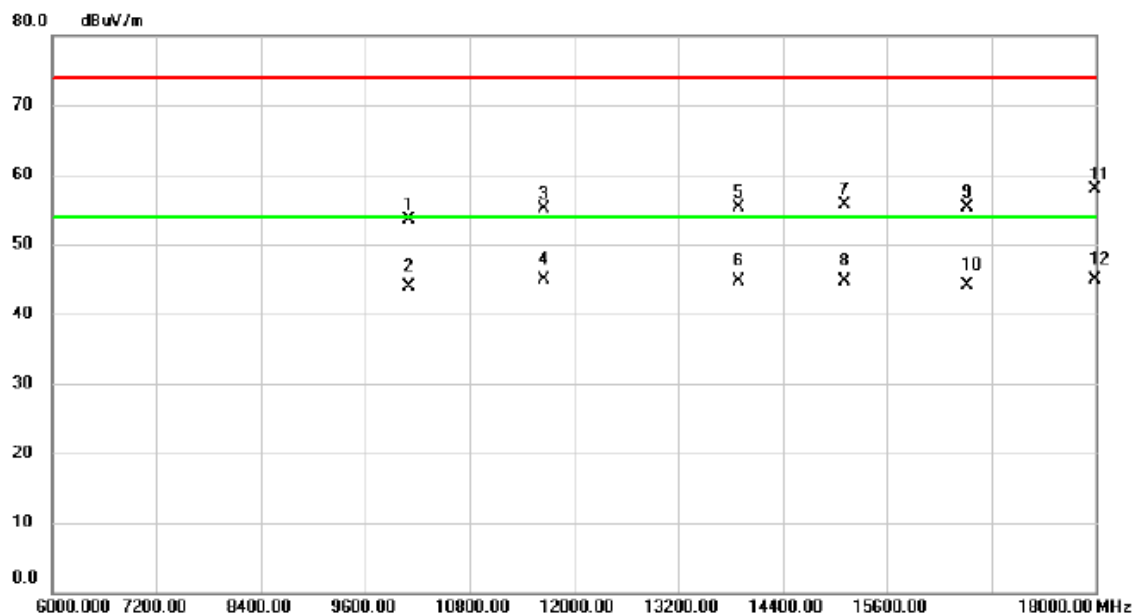
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1787.500	42.16	-0.44	41.72	74.00	-32.28	peak	
2		1787.500	31.69	-0.44	31.25	54.00	-22.75	AVG	
3		2400.000	39.38	2.05	41.43	74.00	-32.57	peak	
4		2483.500	39.60	2.27	41.87	74.00	-32.13	peak	
5		3240.000	40.09	5.23	45.32	74.00	-28.68	peak	
6		3240.000	31.49	5.23	36.72	54.00	-17.28	AVG	
7		3997.500	38.00	7.67	45.67	74.00	-28.33	peak	
8		3997.500	29.14	7.67	36.81	54.00	-17.19	AVG	
9		4782.500	37.22	9.17	46.39	74.00	-27.61	peak	
10	*	4782.500	31.59	9.17	40.76	54.00	-13.24	AVG	
11		5205.000	37.03	10.44	47.47	74.00	-26.53	peak	
12		5205.000	27.81	10.44	38.25	54.00	-15.75	AVG	

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



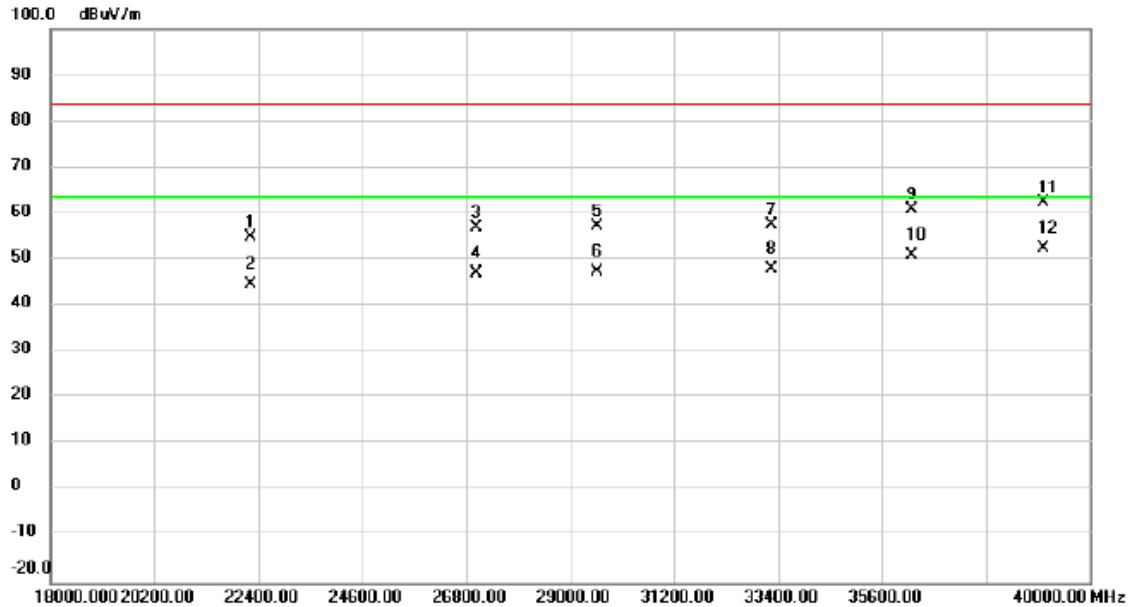
No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9618.000	33.55	18.18	51.73	74.00	-22.27	peak	
2	9618.000	23.30	18.18	41.48	54.00	-12.52	AVG	
3	10788.00	33.53	19.55	53.08	74.00	-20.92	peak	
4 *	10788.00	25.38	19.55	44.93	54.00	-9.07	AVG	
5	12786.00	31.27	23.93	55.20	74.00	-18.80	peak	
6	12786.00	20.33	23.93	44.26	54.00	-9.74	AVG	
7	14004.00	27.40	27.78	55.18	74.00	-18.82	peak	
8	14004.00	17.00	27.78	44.78	54.00	-9.22	AVG	
9	16632.00	29.58	25.76	55.34	74.00	-18.66	peak	
10	16632.00	18.55	25.76	44.31	54.00	-9.69	AVG	
11	17934.00	24.30	33.60	57.90	74.00	-16.10	peak	
12	17934.00	10.61	33.60	44.21	54.00	-9.79	AVG	

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



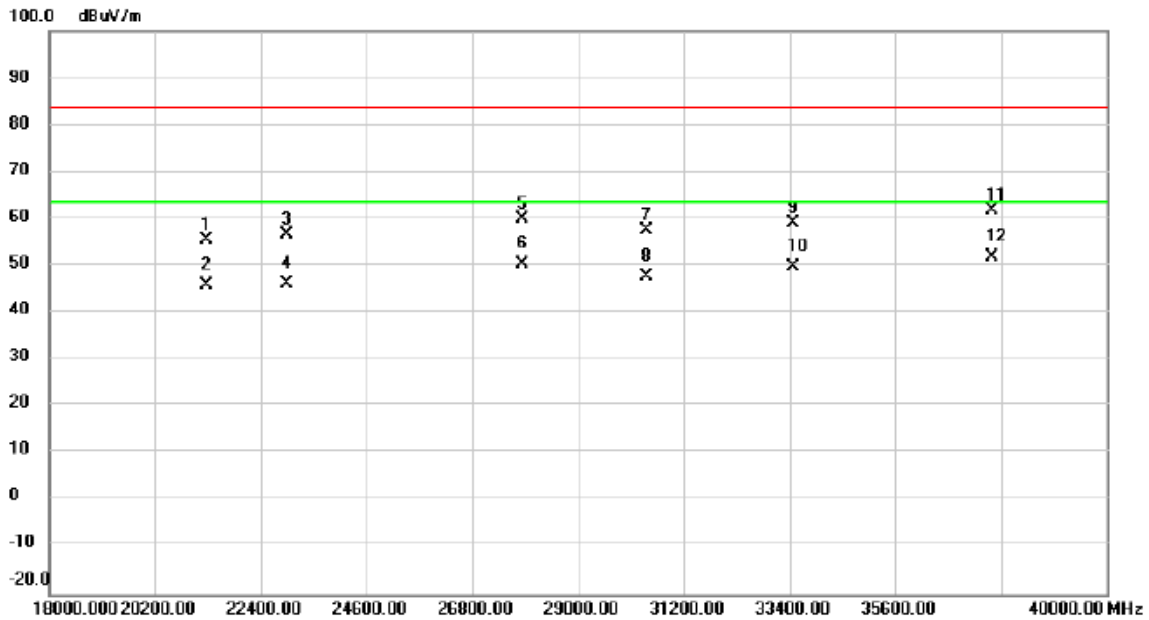
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		10110.00	35.09	18.50	53.59	74.00	-20.41	peak	
2		10110.00	25.32	18.50	43.82	54.00	-10.18	AVG	
3		11658.00	33.58	21.56	55.14	74.00	-18.86	peak	
4	*	11658.00	23.37	21.56	44.93	54.00	-9.07	AVG	
5		13902.00	27.56	27.80	55.36	74.00	-18.64	peak	
6		13902.00	16.97	27.80	44.77	54.00	-9.23	AVG	
7		15108.00	30.79	24.94	55.73	74.00	-18.27	peak	
8		15108.00	19.71	24.94	44.65	54.00	-9.35	AVG	
9		16512.00	30.27	25.04	55.31	74.00	-18.69	peak	
10		16512.00	18.98	25.04	44.02	54.00	-9.98	AVG	
11		17988.00	23.97	33.93	57.90	74.00	-16.10	peak	
12		17988.00	11.00	33.93	44.93	54.00	-9.07	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		22250.25	46.00	8.80	54.80	83.50	-28.70	peak	
2		22250.25	35.93	8.80	44.73	63.50	-18.77	AVG	
3		27007.00	47.00	9.83	56.83	83.50	-26.67	peak	
4		27007.00	37.10	9.83	46.93	63.50	-16.57	AVG	
5		29583.58	48.39	8.96	57.35	83.50	-26.15	peak	
6		29583.58	38.32	8.96	47.28	63.50	-16.22	AVG	
7		33261.26	49.67	7.77	57.44	83.50	-26.06	peak	
8		33261.26	40.05	7.77	47.82	63.50	-15.68	AVG	
9		36234.23	50.89	9.90	60.79	83.50	-22.71	peak	
10		36234.23	40.92	9.90	50.82	63.50	-12.68	AVG	
11		39009.00	50.69	11.59	62.28	83.50	-21.22	peak	
12	*	39009.00	40.80	11.59	52.39	63.50	-11.11	AVG	

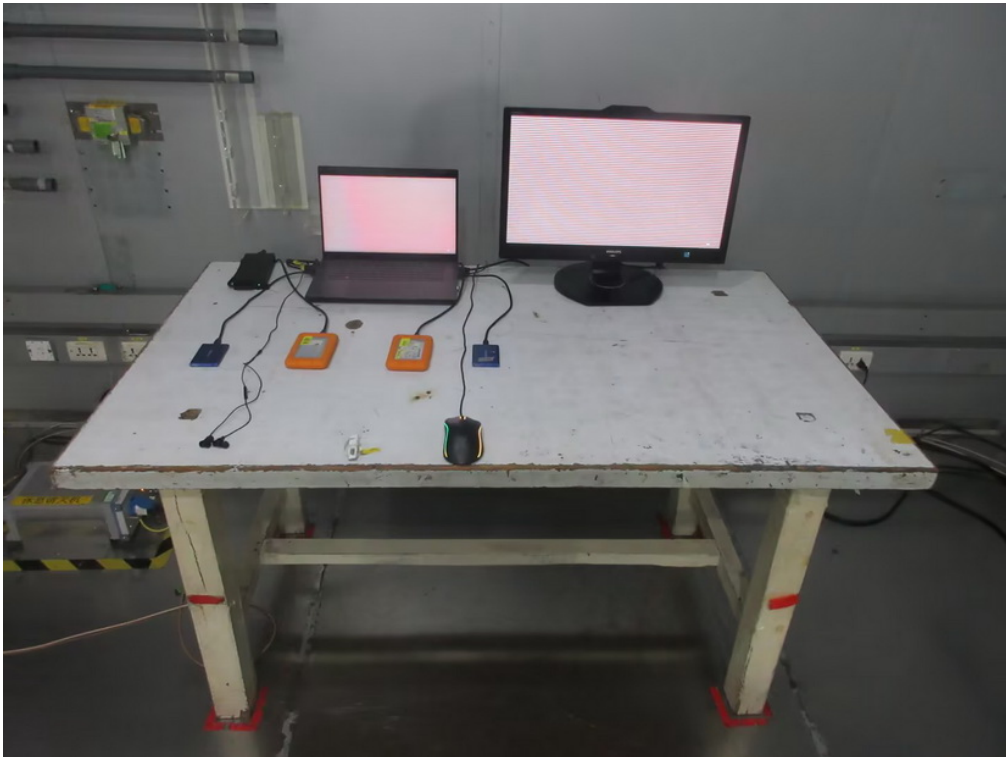
Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		21281.28	46.84	8.60	55.44	83.50	-28.06	peak	
2		21281.28	37.27	8.60	45.87	63.50	-17.63	AVG	
3		22932.93	48.09	8.45	56.54	83.50	-26.96	peak	
4		22932.93	37.57	8.45	46.02	63.50	-17.48	AVG	
5		27843.84	50.39	9.64	60.03	83.50	-23.47	peak	
6		27843.84	40.70	9.64	50.34	63.50	-13.16	AVG	
7		30420.42	48.84	8.80	57.64	83.50	-25.86	peak	
8		30420.42	38.91	8.80	47.71	63.50	-15.79	AVG	
9		33459.45	51.39	7.62	59.01	83.50	-24.49	peak	
10		33459.45	42.00	7.62	49.62	63.50	-13.88	AVG	
11		37621.62	51.08	10.65	61.73	83.50	-21.77	peak	
12	*	37621.62	41.28	10.65	51.93	63.50	-11.57	AVG	

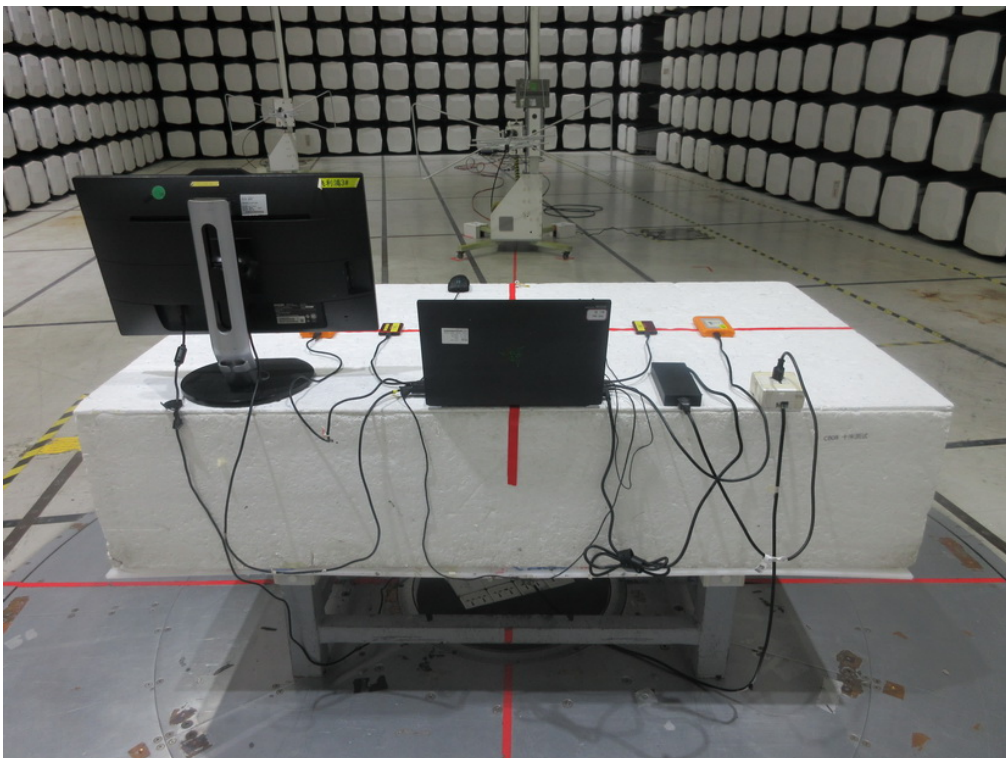
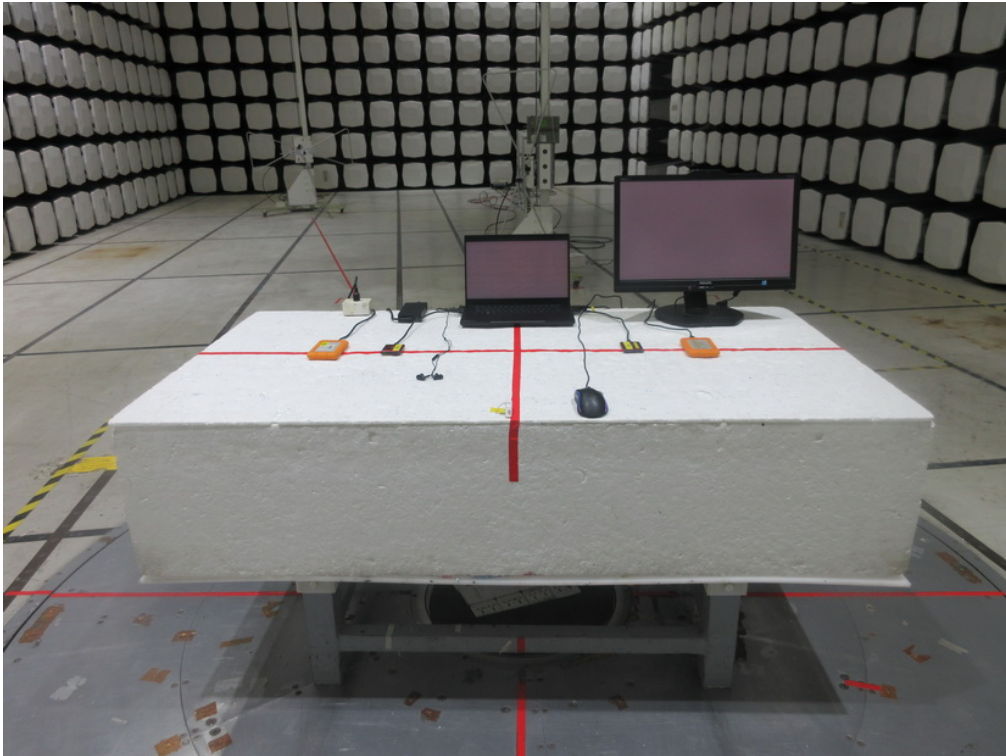
#### 4. EUT TEST PHOTO

##### AC Power Line Conducted Emissions



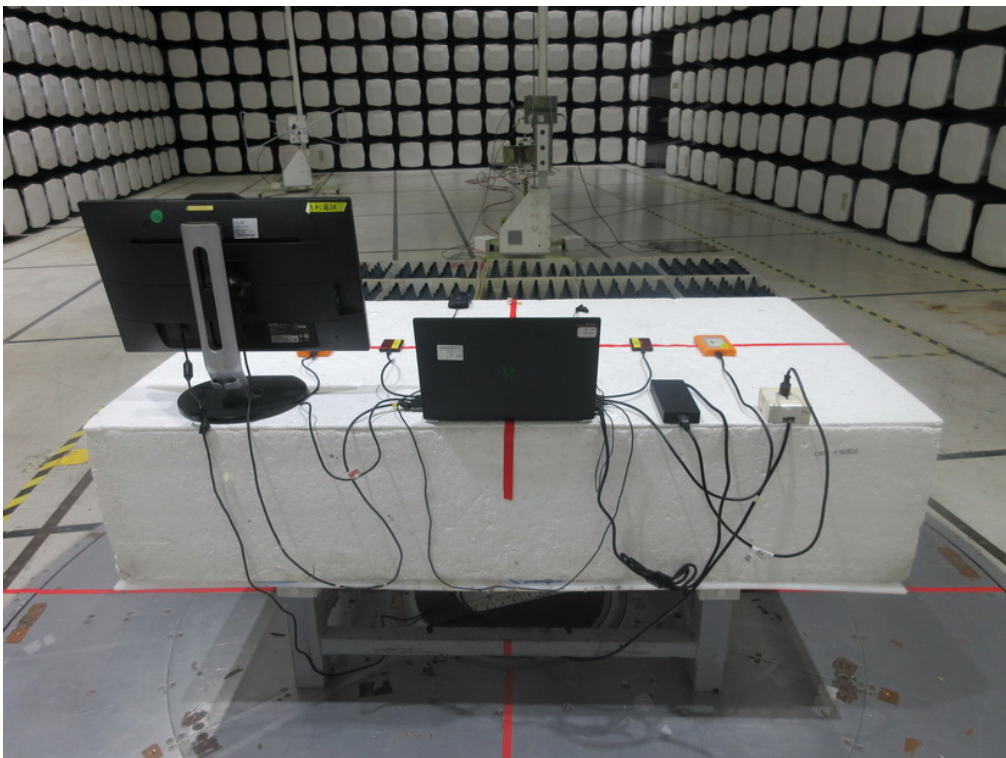


## Radiated Emissions 30 MHz to 1 GHz





## Radiated Emissions Above 1 GHz

**End of Test Report**