FCC EMC Test Report

Project No.	:	2404C224
Equipment	:	LCD Monitor
Brand Name	:	N/A
Test Model	:	CQ27G4
Series Model	:	CQ27G4X, **CQ27G4********(*=0-9, A-Z,a-z, +, -,/,\ or blank)
Applicant	:	TPV Electronics (Fujian) Co., Ltd.
Address	:	Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, P.R. China
Date of Receipt	:	Apr. 25, 2024
Date of Test	:	Apr. 25, 2024 ~ May 08, 2024
Issued Date	:	May 28, 2024
Report Version	:	R01
Test Sample	:	Engineering Sample No.: DG202404252, DG202404254
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).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

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-FCCE-1-2404C224	R00	Original report.	May 17, 2024	Invalid
BTL-FCCE-1-2404C224	R01	Corrected test mode.	May 28, 2024	Valid

1. SUMMARY OF TEST RESULTS

Emission		
Standard(s)	Test Item	Result
FCC CFR Title 47,Part 15,Subpart B ANSI C63.4-2014 ANSI C63.4-2014 amended as per ANSI C63.4a-2017	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 City, Guangdong People's Republic of 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-C02	CISPR	150kHz ~ 30MHz	2.88

B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	*U*,(dB)
DG-CB08 (10m)	CISPR	30MHz ~ 200MHz	V	4.48
		30MHz ~ 200MHz	H	4.50
		200MHz ~ 1,000MHz	V	4.60
		200MHz ~ 1,000MHz	H	4.84

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

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	Test Date
AC Power Line Conducted Emissions	25°C	76%	Parker Mai	Apr. 30, 2024
Radiated emissions 30 MHz to 1 GHz	25°C	56%	Amous Shen	May 08, 2024
Radiated emissions above 1 GHz	25°C	56%	Amous Shen	May 08, 2024

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	LCD Monitor
Brand Name	N/A
Test Model	CQ27G4
Series Model	CQ27G4X,**CQ27G4********(*=0-9,A-Z,a-z,+,-,/,\ or blank)
Model Difference(s)	Only differ in model name due to marketing purpose.
Identification No. of EUT(S/N)	N/A
Dimensions and mass	611.5X(396.4~516.4)X239.4mm
Component unit of EUT	☒Single unit ☐Multiple unit
Sample Status	☒Engineering sample ☐Final shipment prototype
Power Source	AC Mains.
Power Rating	100-240V ~, 50/60Hz, 1.5A
Connecting I/O Port(s)	Config1: 1* AC port 2* HDMI port 1* DP port 1* Earphone port Config2: 1* AC port 1* HDMI port 1* DP port 1* Earphone port
Classification of EUT	Class B
Highest Internal Frequency(Fx)	724.5MHz

Cable Type	Shielded Type	Ferrite Core	Length(m)	Note
AC Power Cord	Non-shielded	NO	1.8/1.5/1.2	1.8m is worst case Detachable
HDMI	Shielded	NO	1.8/1.5/1.2	-
DP	Shielded	NO	1.8/1.5/1.2	-

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. Power cable 1.8m, 1.5m and 1.2m length, worst case is Power cable 1.8m with HDMI+DP length testing and recorded in test report.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible 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	HDMI 1 2560*1440/144Hz 1.8m(config1)
Mode 2	HDMI 2 2560*1440/144Hz 1.8m(config1)
Mode 3	DP 2560*1440/180Hz 1.8m(config1)
Mode 4	HDMI 1 1080P 1.8m(config1)
Mode 5	HDMI 1 1024*768/60Hz 1.8m(config1)
Mode 6	HDMI 1 800*600/60Hz 1.8m(config1)
Mode 7	HDMI 1 2560*1440/144Hz 1.5m(config1)
Mode 8	HDMI 2 2560*1440/144Hz 1.5m(config1)
Mode 9	DP 2560*1440/180Hz 1.5m(config1)
Mode 10	HDMI 1 2560*1440/144Hz 1.2m(config1)
Mode 11	HDMI 2 2560*1440/144Hz 1.2m(config1)
Mode 12	DP 2560*1440/180Hz 1.2m(config1)
Mode 13	HDMI 1 2560*1440/144Hz 1.8m (config2)
Mode 14	HDMI 1 2560*1440/144Hz 1.8m(without earphone) (config1)

AC Power Line Conducted Emissions Test	
Final Test Mode	Description
Mode 1	HDMI 1 2560*1440/144Hz 1.8m(config1)
Mode 2	HDMI 2 2560*1440/144Hz 1.8m(config1)
Mode 4	HDMI 1 1080P 1.8m(config1)

Radiated Emissions 30 MHz to 1 GHz Test	
Final Test Mode	Description
Mode 1	HDMI 1 2560*1440/144Hz 1.8m(config1)
Mode 2	HDMI 2 2560*1440/144Hz 1.8m(config1)
Mode 4	HDMI 1 1080P 1.8m(config1)
Mode 14	HDMI 1 2560*1440/144Hz 1.8m (without earphone) (config1)

Radiated emissions above 1 GHz Test	
Final Test Mode	Description
Mode 1	HDMI 1 2560*1440/144Hz 1.8m(config1)
Mode 2	HDMI 2 2560*1440/144Hz 1.8m(config1)
Mode 4	HDMI 1 1080P 1.8m(config1)
Mode 14	HDMI 1 2560*1440/144Hz 1.8m (without earphone) (config1)

Note:

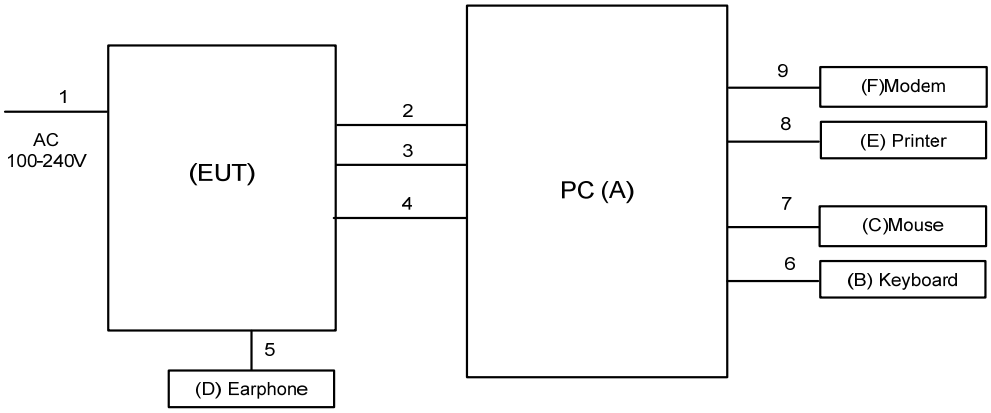
1. For radiated emission: Evaluated the maximum resolution mode 1-4 for the 1.8m cable. The worst case is mode 1 and evaluated the middle and low resolution mode 5-6. At last, evaluated the 1.5m and 1.2m cable mode 7-12, config2 mode 13 and without earphone mode 14. According to the client's requirement, choose mode 1, mode 2, mode 4, mode 14 and recorded in test report.
2. For Conducted emissions: Evaluated the maximum resolution mode 1-4 for the 1.8m cable. The worst case is mode 1 and evaluated the middle and low resolution mode 5-6. At last, evaluated the 1.5m and 1.2m cable mode 7-12, config2 mode 13. According to the client's requirement, choose mode 1, mode 2, mode 4 and recorded in test report.

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 PC via HDMI&DP Cable.
2. EUT connected to Earphone via Earphone Cable.
3. Mouse and Keyboard connected to PC via USB Cable.
4. Printer connected to PC via USB Cable.
5. Modem connected to PC via RS232 Cable.

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



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	PC	DELL	8920-D16N8S	GZS91L2
B	Keyboard	DELL	KB212-B	CN0HTXH97158125004DXA01
C	Mouse	DELL	MS111-P	CN011D3V71581279OLOT
D	Earphone	APPLE	N/A	N/A
E	Printer	Lenovo	M630	SP00335371
F	Modem	Lenovo	LEM56SP	4000137896

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	AC Cable	NO	NO	1.8/1.5/1.2m
2	HDMI Cable	YES	NO	1.8/1.5/1.2m
3	HDMI Cable	YES	NO	1.8/1.5/1.2m
4	DP Cable	YES	NO	1.8/1.5/1.2m
5	Earphone Cable	YES	NO	1.5m
6	USB Cable	YES	NO	1.2m
7	USB Cable	YES	NO	1.2m
8	USB Cable	YES	NO	1.5m
9	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	EMI Test Receiver	R&S	ESR3	103027	Jun. 16, 2024
2	TWO-LINE V-NETWORK	R&S	ENV216	10274	Dec. 22, 2024
3	TWO-LINE V-NETWORK	R&S	ENV216	101447	Dec. 22, 2024
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
5	Cable	N/A	SFT205-NMNM-9M-001	9M	Nov. 27, 2024

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

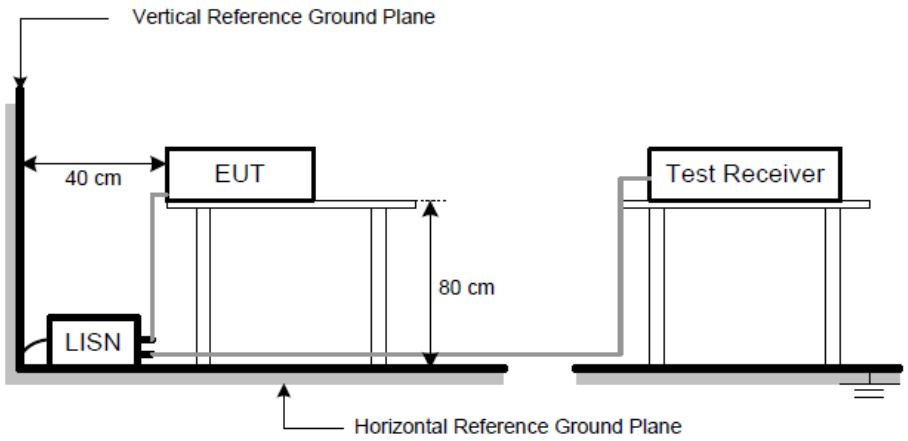
3.1.3 TEST PROCEDURE

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



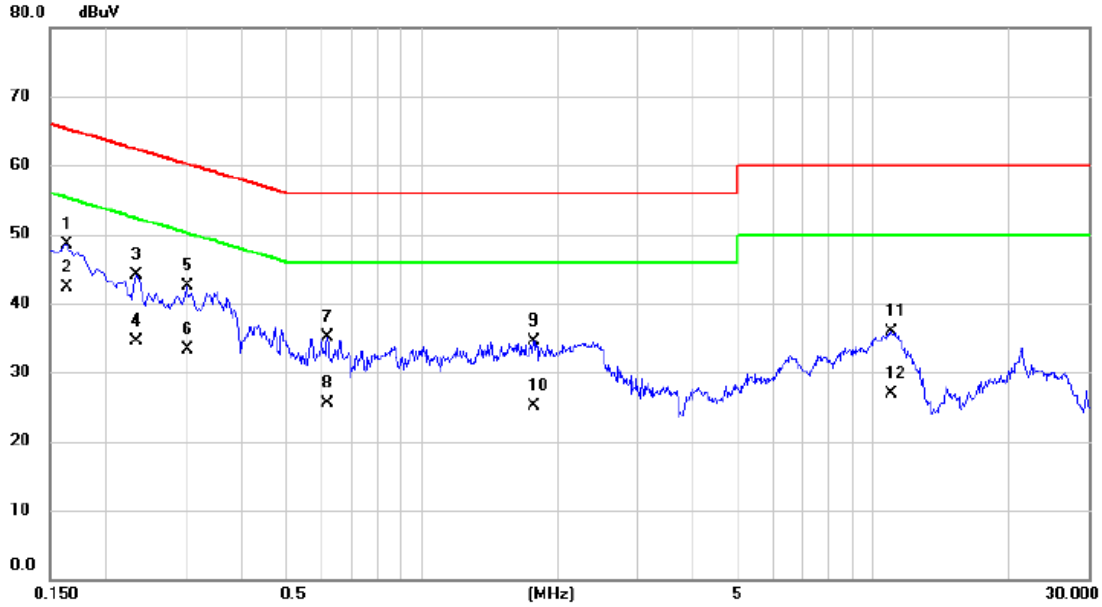
3.1.6 TEST RESULTS

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.

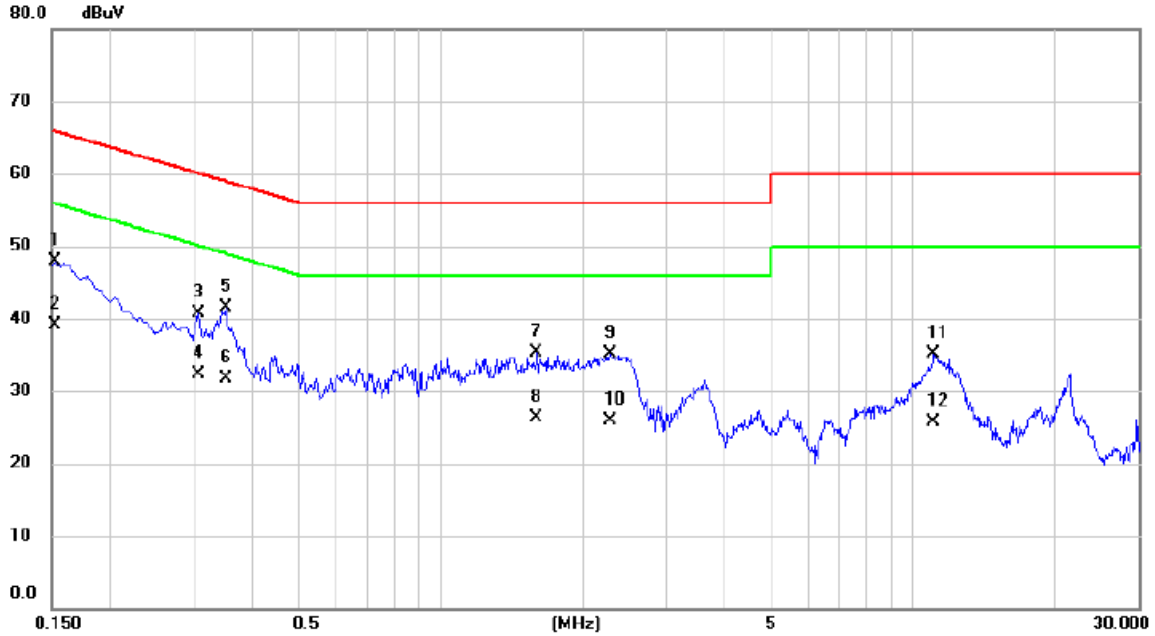
(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.

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



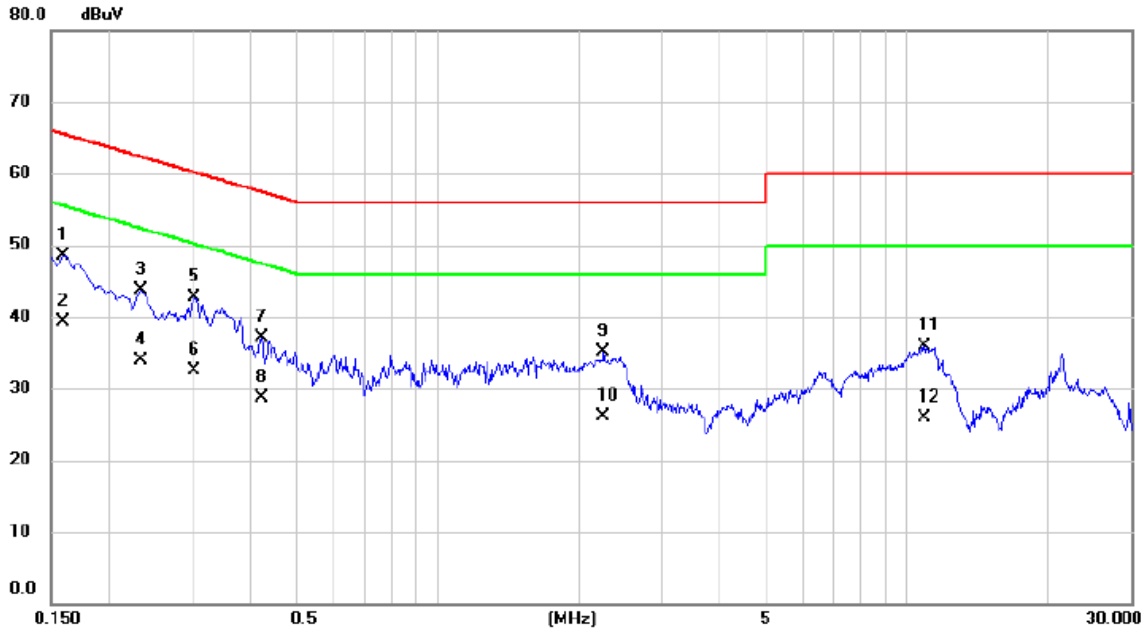
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1635	38.74	9.74	48.48	65.28	-16.80	QP	
2	*	0.1635	32.52	9.74	42.26	55.28	-13.02	AVG	
3		0.2333	34.41	9.75	44.16	62.33	-18.17	QP	
4		0.2333	24.80	9.75	34.55	52.33	-17.78	AVG	
5		0.3030	32.70	9.77	42.47	60.16	-17.69	QP	
6		0.3030	23.60	9.77	33.37	50.16	-16.79	AVG	
7		0.6180	25.26	9.79	35.05	56.00	-20.95	QP	
8		0.6180	15.80	9.79	25.59	46.00	-20.41	AVG	
9		1.7655	24.72	9.85	34.57	56.00	-21.43	QP	
10		1.7655	15.30	9.85	25.15	46.00	-20.85	AVG	
11		10.9253	25.30	10.55	35.85	60.00	-24.15	QP	
12		10.9253	16.40	10.55	26.95	50.00	-23.05	AVG	

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



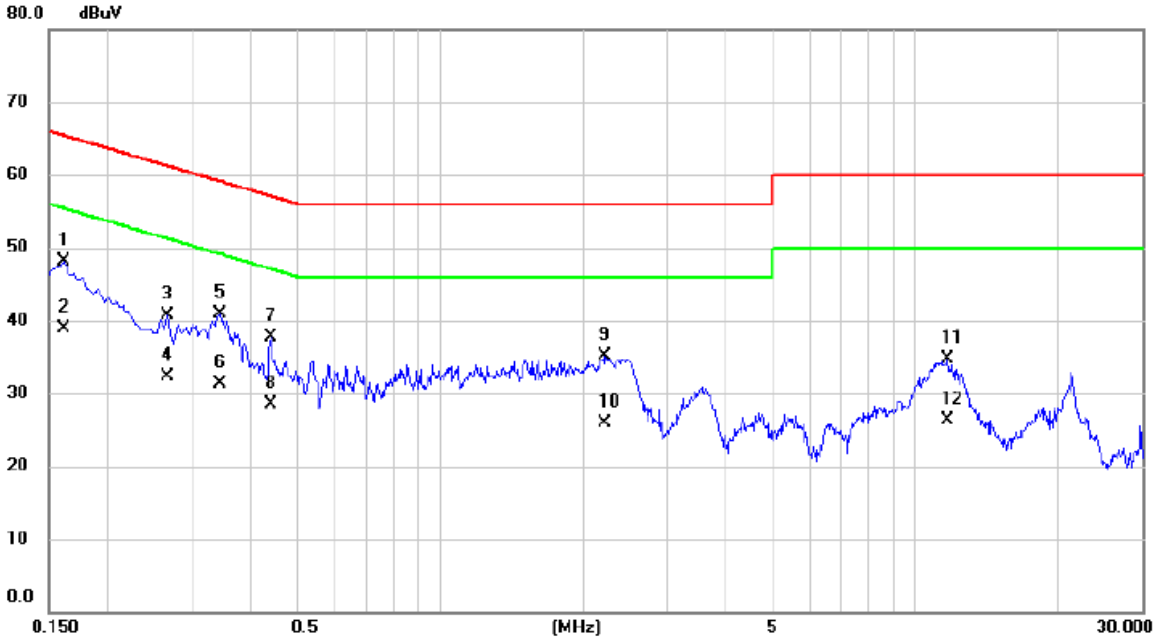
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1522	38.36	9.59	47.95	65.88	-17.93	QP	
2	*	0.1522	29.50	9.59	39.09	55.88	-16.79	AVG	
3		0.3075	31.15	9.63	40.78	60.04	-19.26	QP	
4		0.3075	22.70	9.63	32.33	50.04	-17.71	AVG	
5		0.3502	31.83	9.64	41.47	58.96	-17.49	QP	
6		0.3502	22.10	9.64	31.74	48.96	-17.22	AVG	
7		1.5945	25.66	9.70	35.36	56.00	-20.64	QP	
8		1.5945	16.70	9.70	26.40	46.00	-19.60	AVG	
9		2.2830	25.44	9.73	35.17	56.00	-20.83	QP	
10		2.2830	16.20	9.73	25.93	46.00	-20.07	AVG	
11		11.0265	24.62	10.40	35.02	60.00	-24.98	QP	
12		11.0265	15.30	10.40	25.70	50.00	-24.30	AVG	

Test Voltage	AC 120V/60Hz	Phase	Line
Test Mode	Mode 2		



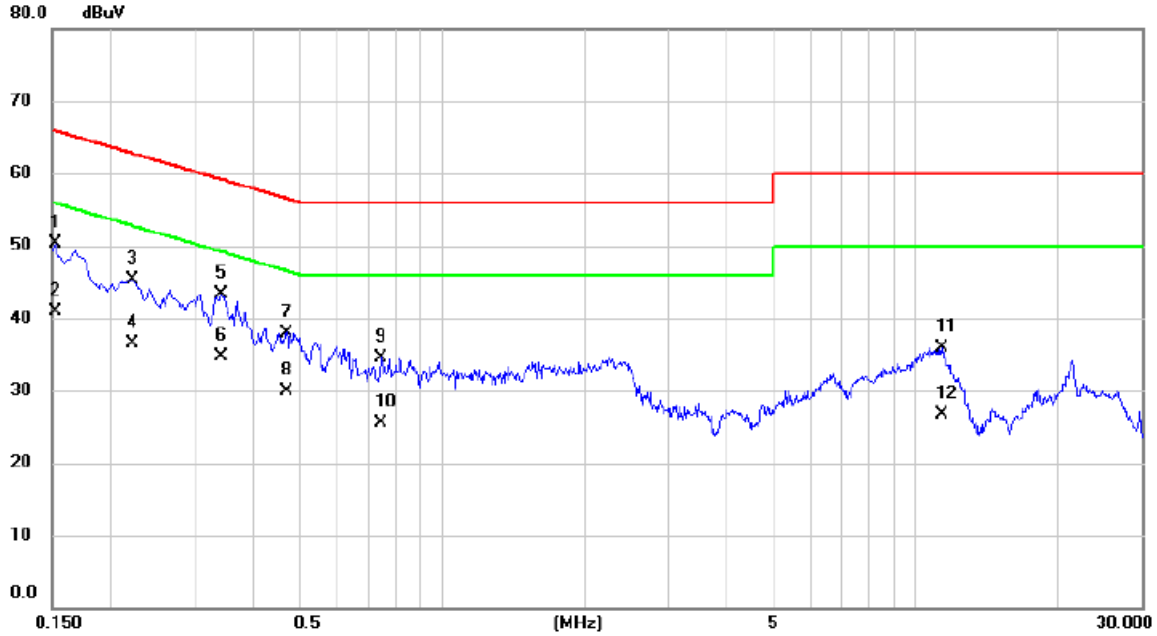
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1590	38.73	9.74	48.47	65.52	-17.05	QP	
2	*	0.1590	29.50	9.74	39.24	55.52	-16.28	AVG	
3		0.2333	33.89	9.75	43.64	62.33	-18.69	QP	
4		0.2333	24.10	9.75	33.85	52.33	-18.48	AVG	
5		0.3030	32.95	9.77	42.72	60.16	-17.44	QP	
6		0.3030	22.80	9.77	32.57	50.16	-17.59	AVG	
7		0.4222	27.25	9.77	37.02	57.40	-20.38	QP	
8		0.4222	18.90	9.77	28.67	47.40	-18.73	AVG	
9		2.2515	25.17	9.88	35.05	56.00	-20.95	QP	
10		2.2515	16.20	9.88	26.08	46.00	-19.92	AVG	
11		10.8893	25.32	10.55	35.87	60.00	-24.13	QP	
12		10.8893	15.30	10.55	25.85	50.00	-24.15	AVG	

Test Voltage	AC 120V/60Hz	Phase	Neutral
Test Mode	Mode 2		



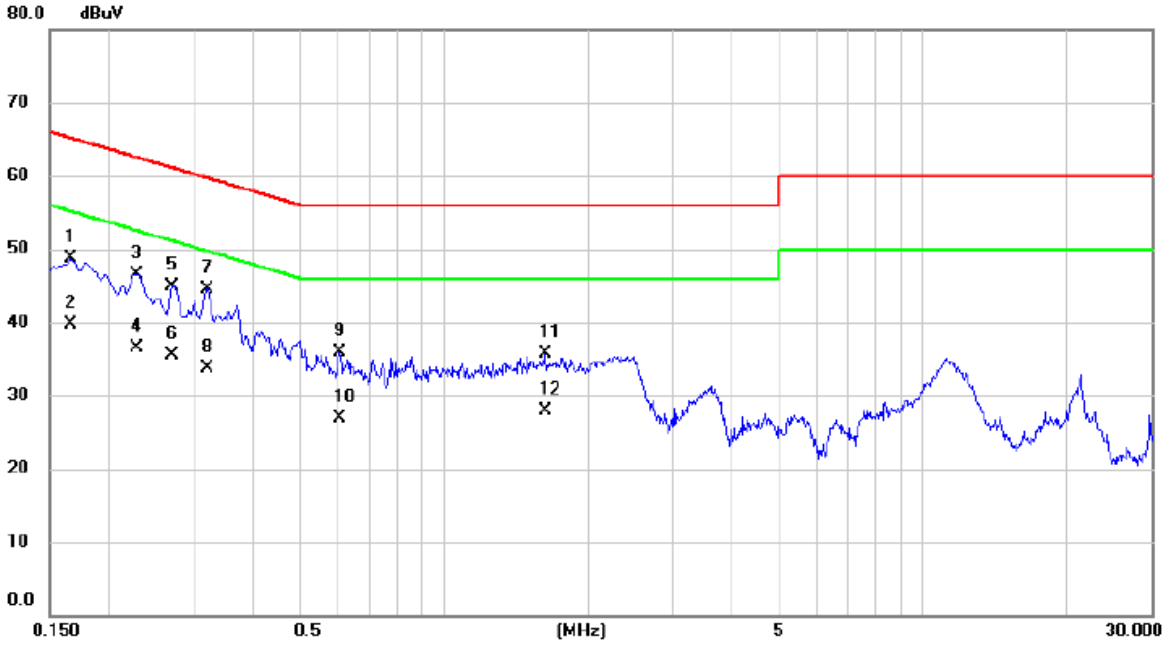
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1613	38.52	9.59	48.11	65.40	-17.29	QP	
2	*	0.1613	29.30	9.59	38.89	55.40	-16.51	AVG	
3		0.2670	31.00	9.62	40.62	61.21	-20.59	QP	
4		0.2670	22.70	9.62	32.32	51.21	-18.89	AVG	
5		0.3435	31.33	9.64	40.97	59.12	-18.15	QP	
6		0.3435	21.60	9.64	31.24	49.12	-17.88	AVG	
7		0.4402	27.99	9.64	37.63	57.06	-19.43	QP	
8		0.4402	18.90	9.64	28.54	47.06	-18.52	AVG	
9		2.2268	25.41	9.71	35.12	56.00	-20.88	QP	
10		2.2268	16.20	9.71	25.91	46.00	-20.09	AVG	
11		11.7104	24.32	10.37	34.69	60.00	-25.31	QP	
12		11.7104	15.90	10.37	26.27	50.00	-23.73	AVG	

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



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1522	40.58	9.74	50.32	65.88	-15.56	QP	
2		0.1522	31.20	9.74	40.94	55.88	-14.94	AVG	
3		0.2220	35.59	9.74	45.33	62.74	-17.41	QP	
4		0.2220	26.80	9.74	36.54	52.74	-16.20	AVG	
5		0.3412	33.50	9.77	43.27	59.17	-15.90	QP	
6	*	0.3412	24.90	9.77	34.67	49.17	-14.50	AVG	
7		0.4695	28.21	9.79	38.00	56.52	-18.52	QP	
8		0.4695	20.10	9.79	29.89	46.52	-16.63	AVG	
9		0.7440	24.80	9.80	34.60	56.00	-21.40	QP	
10		0.7440	15.70	9.80	25.50	46.00	-20.50	AVG	
11		11.3460	25.38	10.52	35.90	60.00	-24.10	QP	
12		11.3460	16.20	10.52	26.72	50.00	-23.28	AVG	

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



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1658	39.13	9.59	48.72	65.17	-16.45	QP	
2		0.1658	30.20	9.59	39.79	55.17	-15.38	AVG	
3		0.2288	36.99	9.61	46.60	62.49	-15.89	QP	
4		0.2288	26.90	9.61	36.51	52.49	-15.98	AVG	
5		0.2714	35.31	9.62	44.93	61.07	-16.14	QP	
6		0.2714	25.80	9.62	35.42	51.07	-15.65	AVG	
7	*	0.3210	34.97	9.63	44.60	59.68	-15.08	QP	
8		0.3210	24.10	9.63	33.73	49.68	-15.95	AVG	
9		0.6066	26.25	9.65	35.90	56.00	-20.10	QP	
10		0.6066	17.30	9.65	26.95	46.00	-19.05	AVG	
11		1.6260	26.04	9.70	35.74	56.00	-20.26	QP	
12		1.6260	18.20	9.70	27.90	46.00	-18.10	AVG	

3.2 RADIATED EMISSIONS 30 MHZ TO 1 GHZ

3.2.1 LIMIT

Limits For FCC CFR Title 47, Part 15, Subpart B (use alternative limits: CISPR 22 third edition)

Frequency (MHz)	Class B (at 10m)
	dBμV/m Quasi-peak
30 - 230	30
230 - 1000	37

NOTE:
(1) The tighter limit applies at the band edges.
(2) Emission level (dBuV/m) = 20log Emission level (uV/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	MY54450004	Jun. 16, 2024
2	Receiver	Keysight	N9038A	MY53220133	Oct. 08, 2024
3	Pre-Amplifier	EMC INSTRUMENT	EMC 9135	980284	Jun. 16, 2024
4	Pre-Amplifier	EMC INSTRUMENT	EMC 9135	980283	Jun. 16, 2024
5	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	947	Nov. 10, 2024
6	Attenuator	EMCI	EMCI-N-6-06	AT-N0670	Nov. 10, 2024
7	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	1461	Nov. 28, 2024
8	Attenuator	EMCI	EMCI-N-6-06	AT-06010	Nov. 28, 2024
9	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A
10	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
11	Controller	MF	MF-7802	MF780208159	N/A
12	Cable	RW	LMR400-NMNM-10M	N/A	Dec. 03, 2024
13	Cable	RW	LMR400-NMNM-7M	N/A	Dec. 03, 2024
14	Cable	RW	LMR400-NMNM-3.5M	N/A	Dec. 03, 2024
15	Cable	RW	LMR400-NMNM-7M	N/A	Dec. 03, 2024
16	Cable	RW	LMR400-NMNM-8M	N/A	Dec. 03, 2024
17	Cable	RW	LMR400-NMNM-3.5M	N/A	Dec. 03, 2024

Remark: “N/A” denotes no model name, no serial no. or no calibration specified.
All calibration period of equipment list is one year.

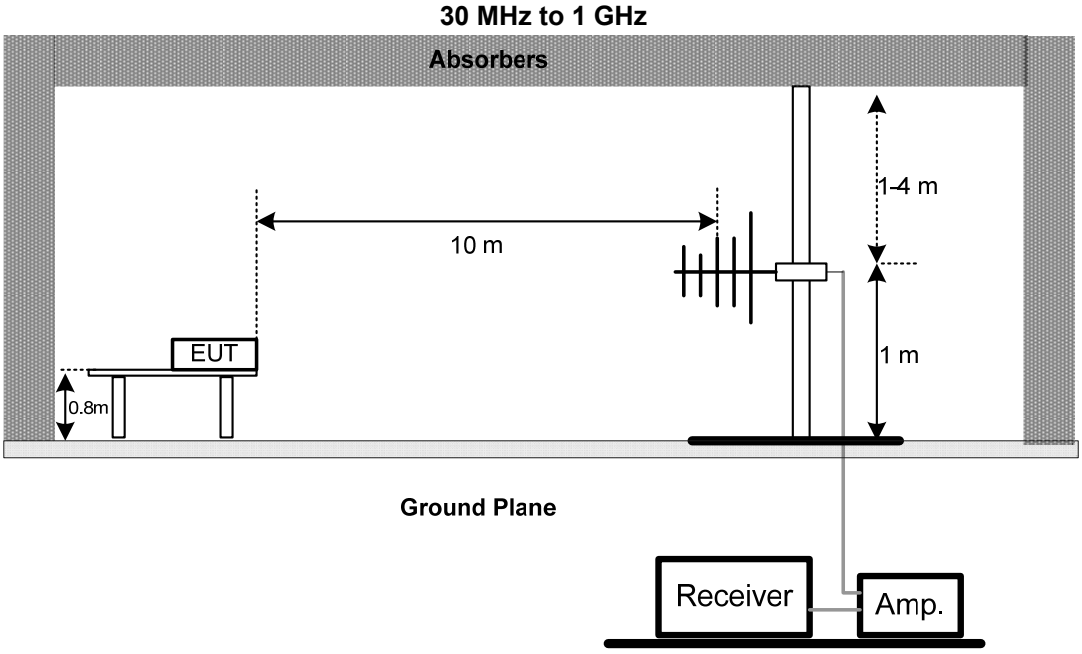
3.2.3 TEST PROCEDURE

a. The measuring distance of 10 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.
b. 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.
c. 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).
d. 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.
e. 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.
f. 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

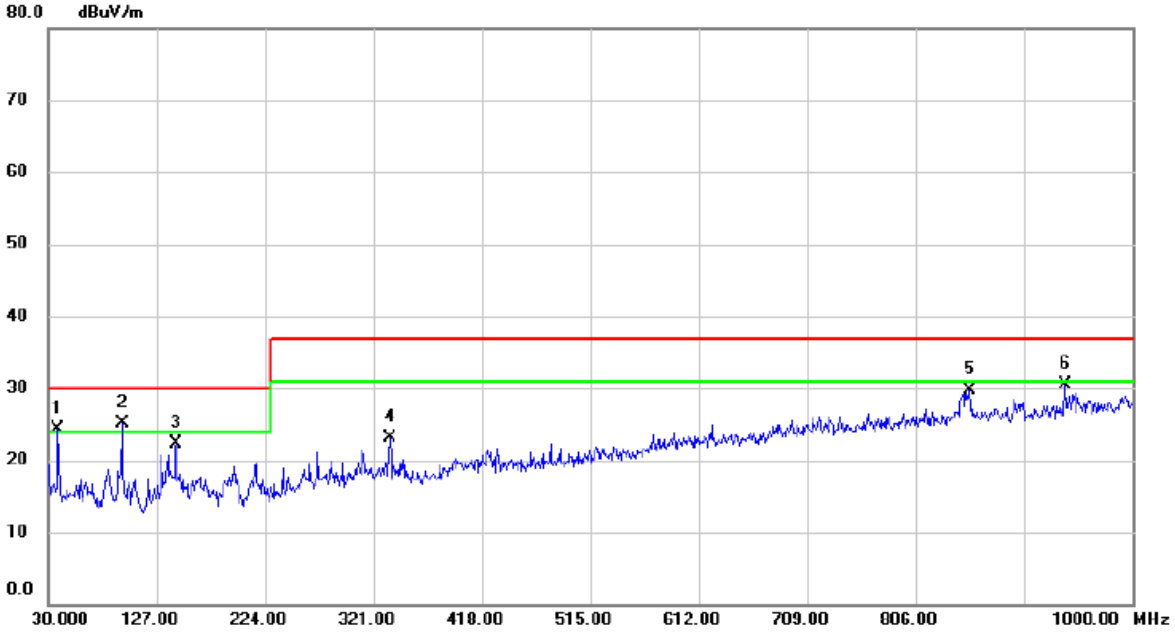


3.2.6 TEST RESULTS

Remark:

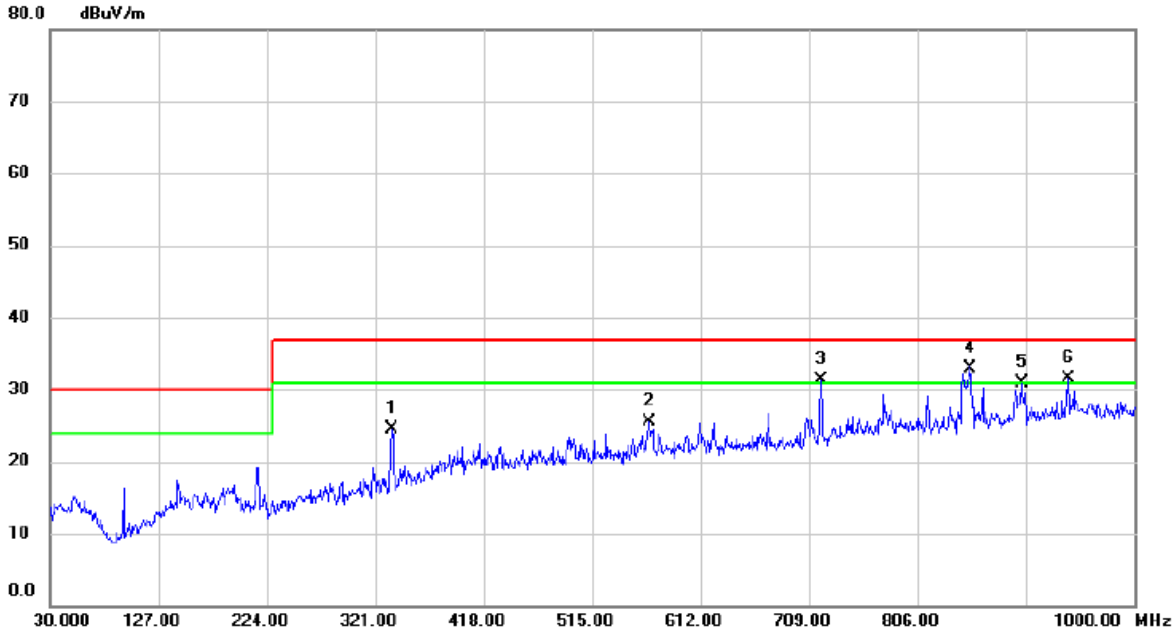
(1) Measuring frequency range from 30 MHz to 1000 MHz
(2) If the peak scan value lower limit more than 20 dB, then this signal data does not show in table.

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



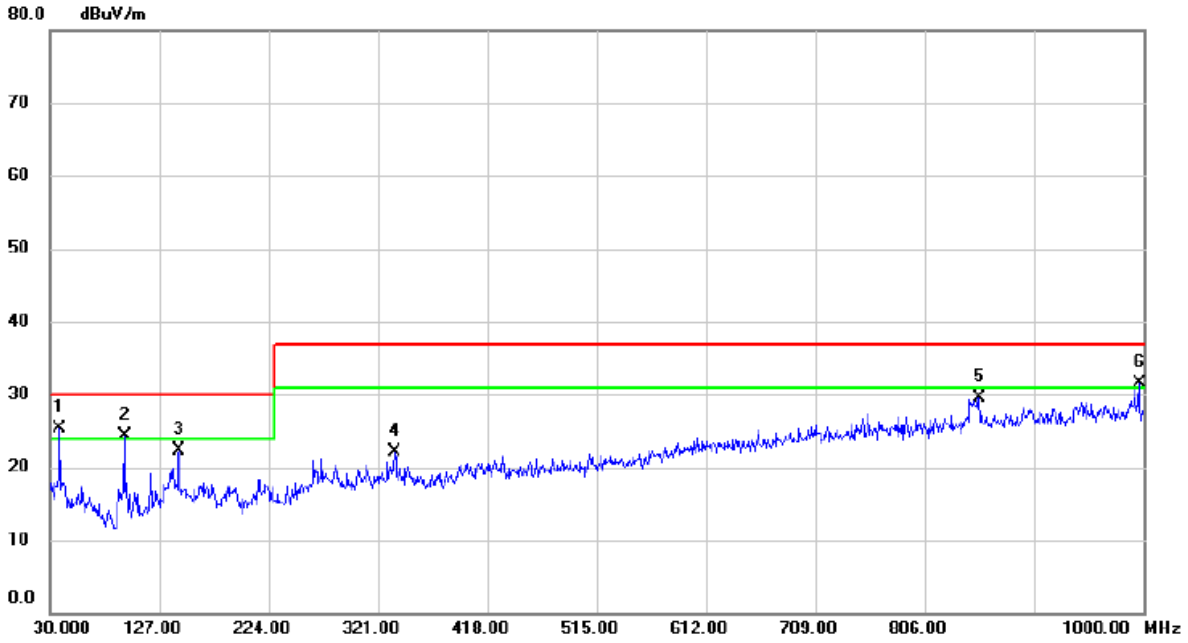
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	!	38.7300	42.61	-18.34	24.27	30.00	-5.73	QP	
2	*	95.9600	48.03	-22.86	25.17	30.00	-4.83	QP	
3		144.4600	39.73	-17.34	22.39	30.00	-7.61	QP	
4		335.5500	37.78	-14.72	23.06	37.00	-13.94	QP	
5		854.5000	36.31	-6.52	29.79	37.00	-7.21	QP	
6		939.8600	36.57	-6.06	30.51	37.00	-6.49	QP	

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



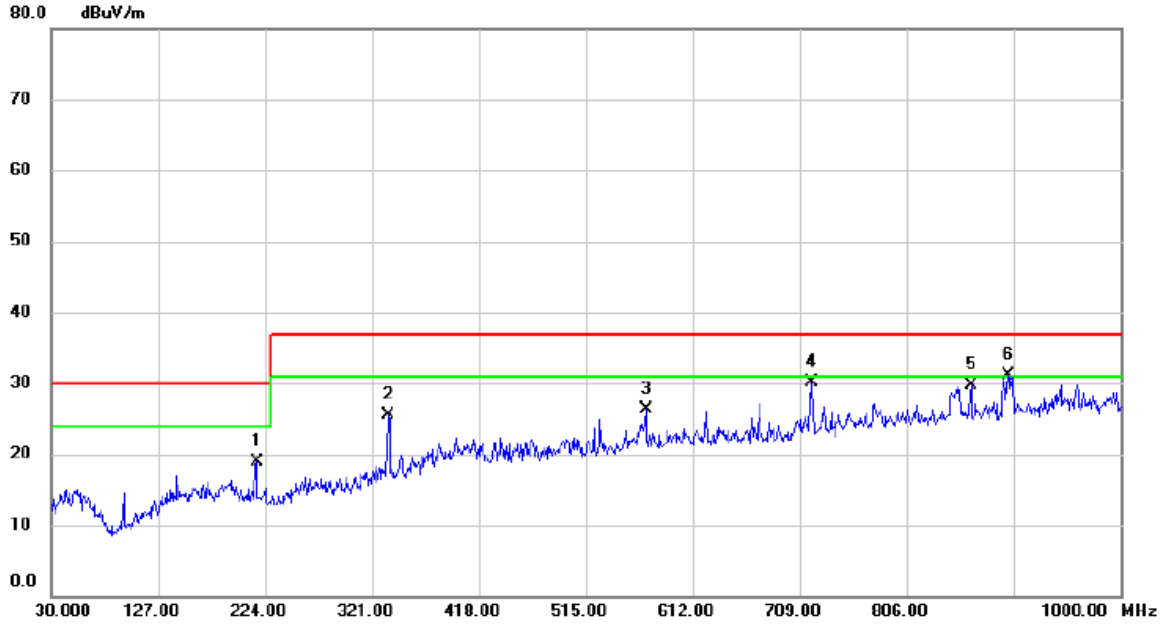
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		336.0350	39.13	-14.58	24.55	37.00	-12.45	QP	
2		565.4400	35.50	-10.01	25.49	37.00	-11.51	QP	
3	!	720.1550	39.25	-8.01	31.24	37.00	-5.76	QP	
4	*	853.5300	40.27	-7.29	32.98	37.00	-4.02	QP	
5		899.1200	37.32	-6.44	30.88	37.00	-6.12	QP	
6	!	940.8300	37.15	-5.62	31.53	37.00	-5.47	QP	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 2		



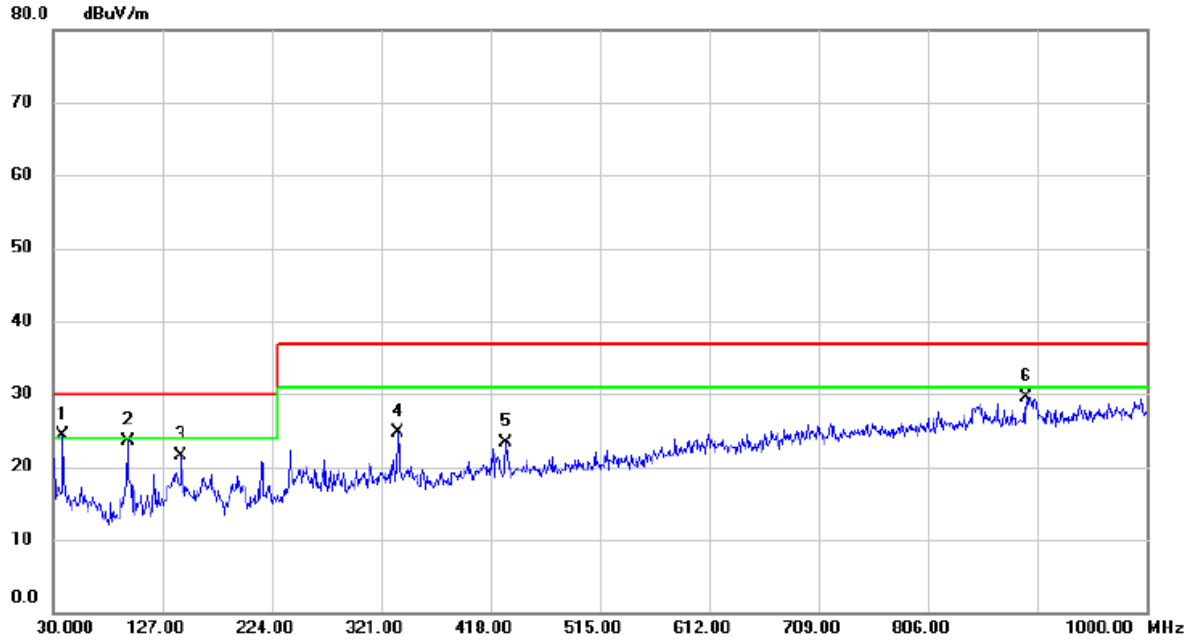
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	38.7300	43.55	-18.34	25.21	30.00	-4.79	QP	
2	!	95.9600	47.18	-22.86	24.32	30.00	-5.68	QP	
3		144.4600	39.55	-17.34	22.21	30.00	-7.79	QP	
4		335.5500	36.84	-14.72	22.12	37.00	-14.88	QP	
5		854.5000	35.94	-6.52	29.42	37.00	-7.58	QP	
6	!	996.1200	36.47	-5.03	31.44	37.00	-5.56	QP	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 2		



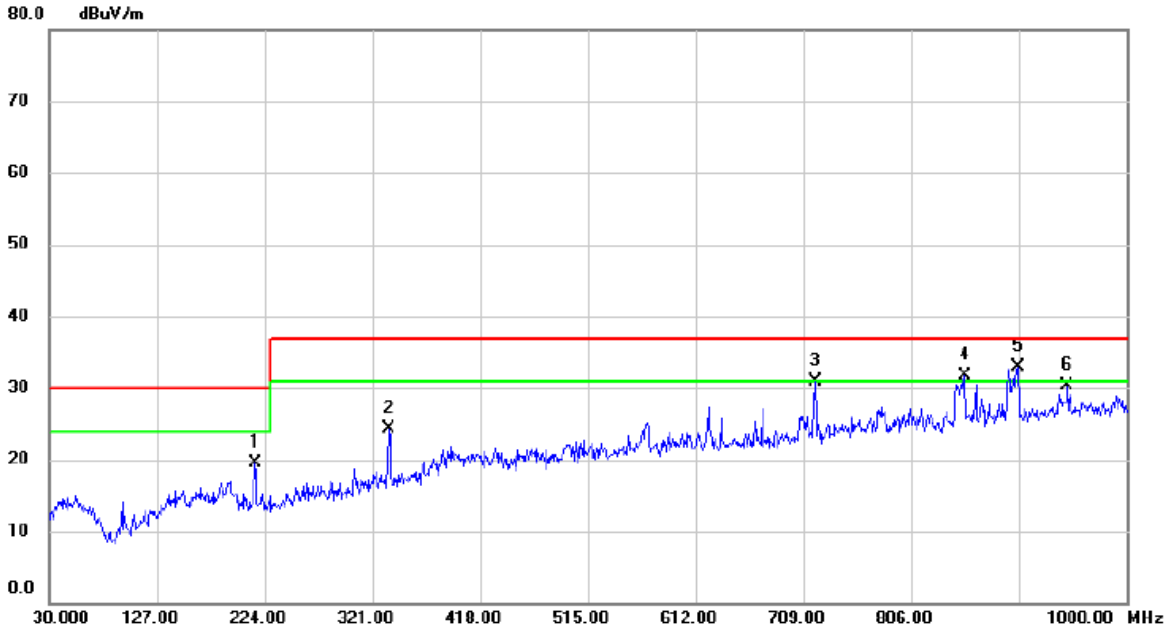
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		216.2400	38.37	-19.42	18.95	30.00	-11.05	QP	
2		336.0350	40.05	-14.58	25.47	37.00	-11.53	QP	
3		569.8050	36.28	-9.93	26.35	37.00	-10.65	QP	
4		719.6700	38.16	-8.03	30.13	37.00	-6.87	QP	
5		864.2000	36.82	-7.09	29.73	37.00	-7.27	QP	
6	*	898.1500	37.60	-6.46	31.14	37.00	-5.86	QP	

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



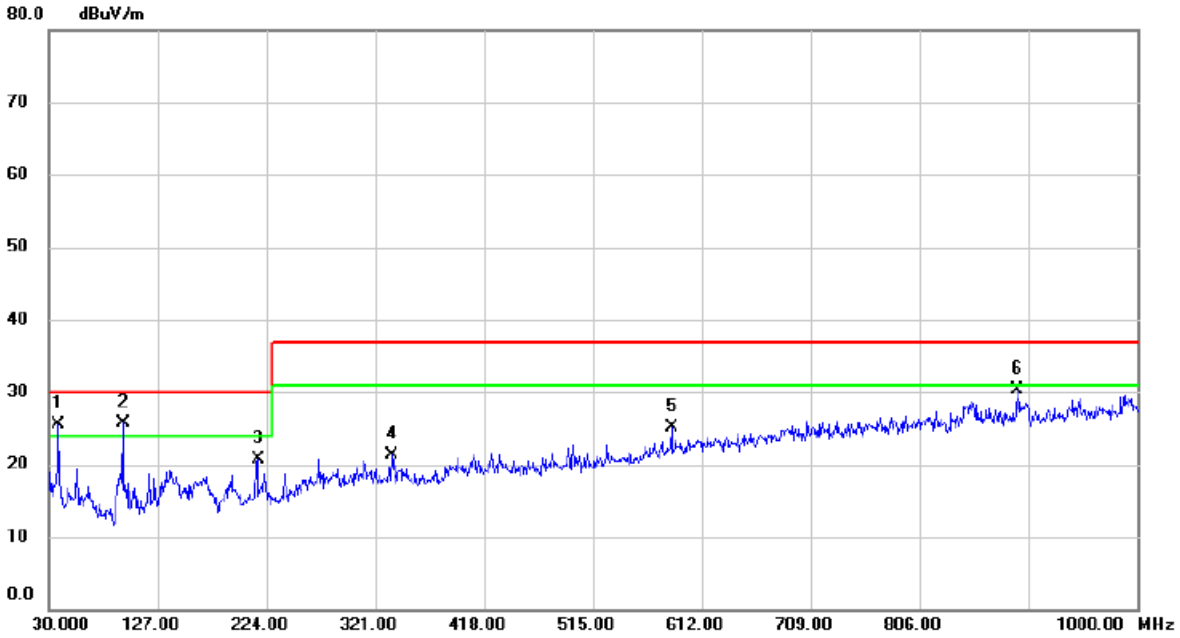
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	38.7300	42.69	-18.34	24.35	30.00	-5.65	QP	
2		95.9600	46.46	-22.86	23.60	30.00	-6.40	QP	
3		143.4900	38.81	-17.39	21.42	30.00	-8.58	QP	
4		335.5500	39.48	-14.72	24.76	37.00	-12.24	QP	
5		431.5800	35.32	-12.05	23.27	37.00	-13.73	QP	
6		893.3000	36.17	-6.61	29.56	37.00	-7.44	QP	

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



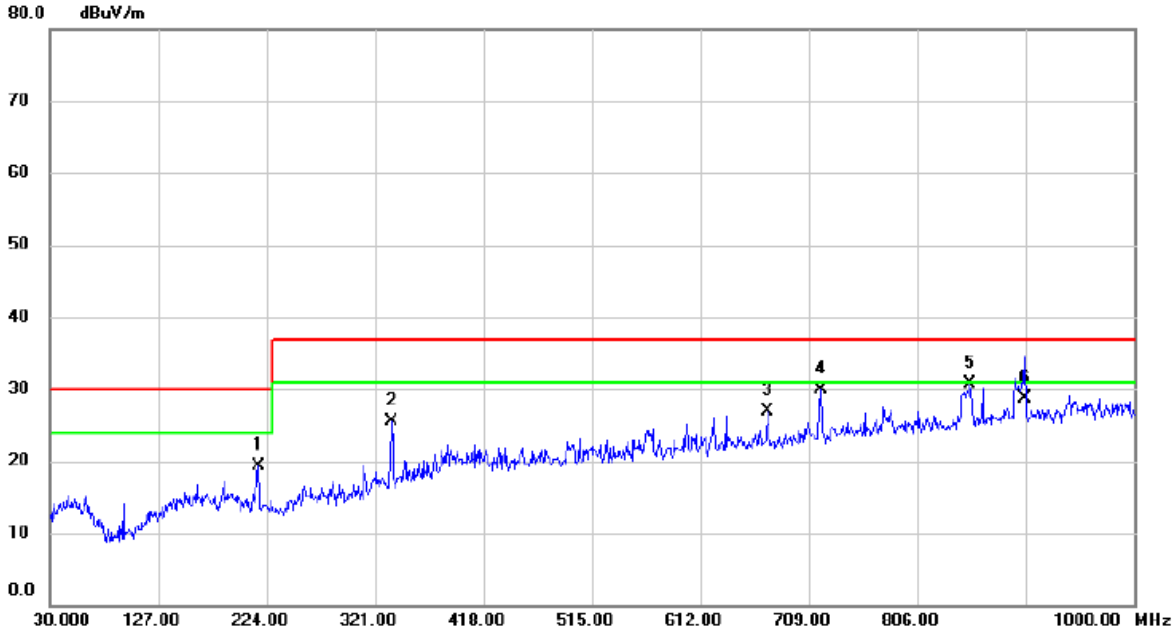
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		215.2700	38.92	-19.42	19.50	30.00	-10.50	QP	
2		335.5500	38.88	-14.58	24.30	37.00	-12.70	QP	
3		719.6700	39.02	-8.03	30.99	37.00	-6.01	QP	
4	!	854.5000	38.95	-7.27	31.68	37.00	-5.32	QP	
5	*	902.0300	39.21	-6.38	32.83	37.00	-4.17	QP	
6		946.6500	35.84	-5.50	30.34	37.00	-6.66	QP	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 14		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	!	38.7300	43.79	-18.34	25.45	30.00	-4.55	QP	
2	*	95.9600	48.47	-22.86	25.61	30.00	-4.39	QP	
3		216.2400	40.50	-19.84	20.66	30.00	-9.34	QP	
4		335.5500	35.99	-14.72	21.27	37.00	-15.73	QP	
5		584.8400	34.30	-9.16	25.14	37.00	-11.86	QP	
6		893.3000	36.94	-6.61	30.33	37.00	-6.67	QP	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 14		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		216.2400	38.71	-19.42	19.29	30.00	-10.71	QP	
2		335.5500	40.16	-14.58	25.58	37.00	-11.42	QP	
3		672.1400	35.56	-8.57	26.99	37.00	-10.01	QP	
4		719.6700	37.91	-8.03	29.88	37.00	-7.12	QP	
5	*	853.5300	37.97	-7.29	30.68	37.00	-6.32	QP	
6		902.0300	35.02	-6.38	28.64	37.00	-8.36	QP	

3.3 RADIATED EMISSIONS ABOVE 1 GHZ

3.3.1 LIMIT

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

FREQUENCY RANGE OF RADIATED MEASUREMENT (FOR UNINTENTIONAL RADIATORS)

Highest internal frequency (Fx)	Highest measurement frequency (F_M)
Fx ≤ 108 MHz	1 GHz
108 MHz < Fx ≤ 500 MHz	2 GHz
500 MHz < Fx ≤1 GHz	5 GHz
Fx > 1 GHz	5 x Fx up to a maximum of 40 GHz
Note: Fx 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 (dBuV/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	Receiver	Keysight	N9038A	MY53220133	Oct. 08, 2024
3	Preamplifier	EMC INSTRUMENT	EMC118A45SE	981003	Nov. 17, 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	RWLP50-4.0A-NMRASM-12M	N/A	Jul. 30, 2024
8	Cable	RW	RWLP50-4.0A-NMRASM-1M	N/A	Jul. 30, 2024
9	Cable	RW	RWLP50-4.0A-NMRASM-4M	N/A	Jul. 30, 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

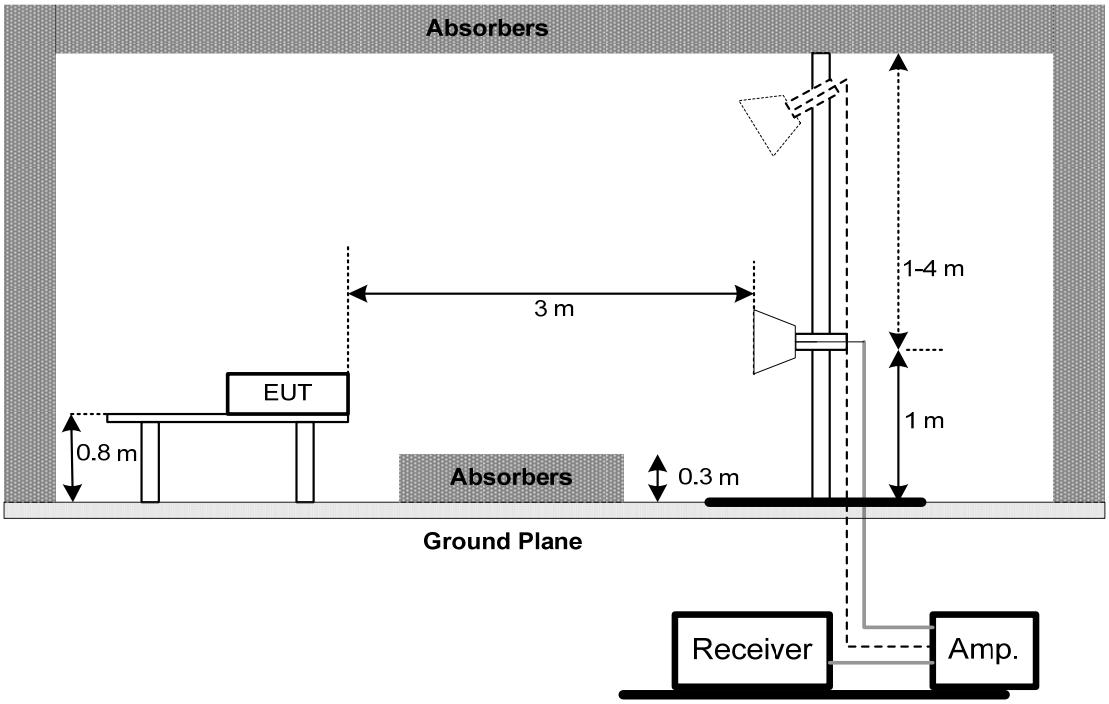
a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The height of the equipment or of 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.
c. 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).
d. 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.
e. 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.
f. 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.
g. 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

Above 1 GHz

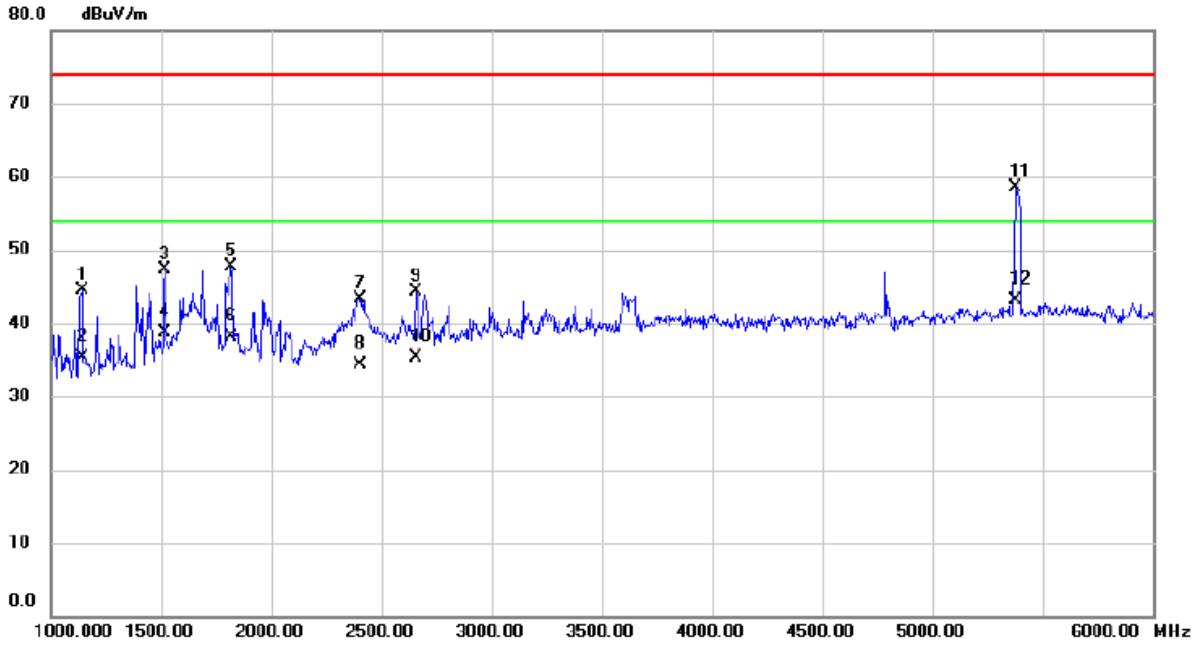


3.3.6 TEST RESULTS

Remark:

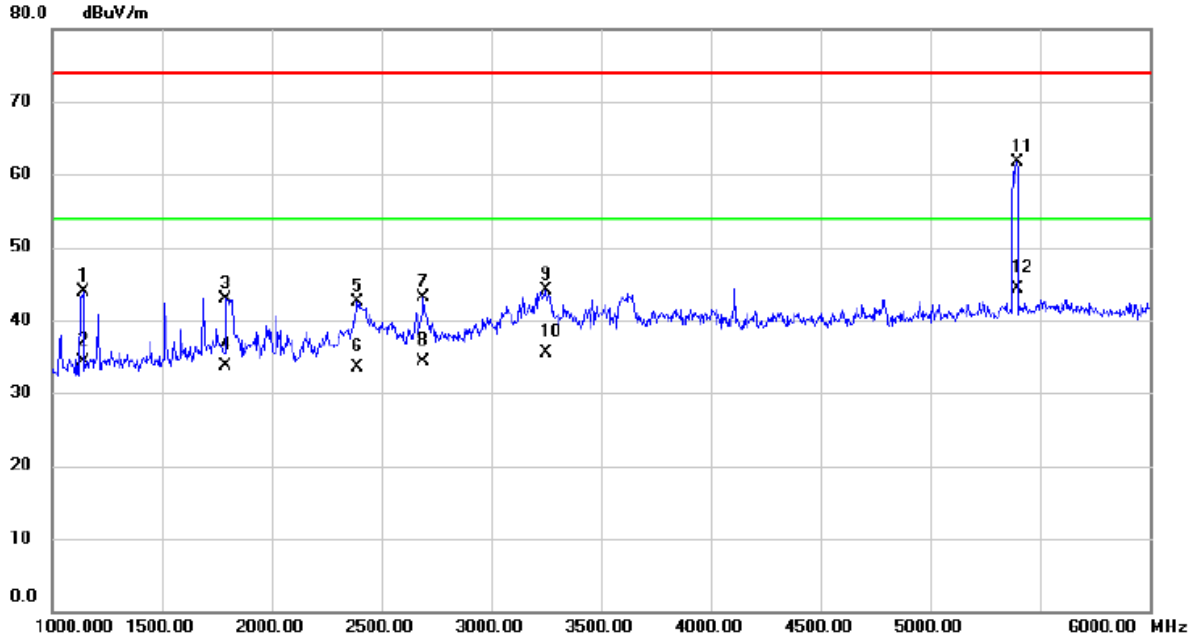
(1) Radiated emissions measured in frequency range above 1000 MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.
(2) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20 dB 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		



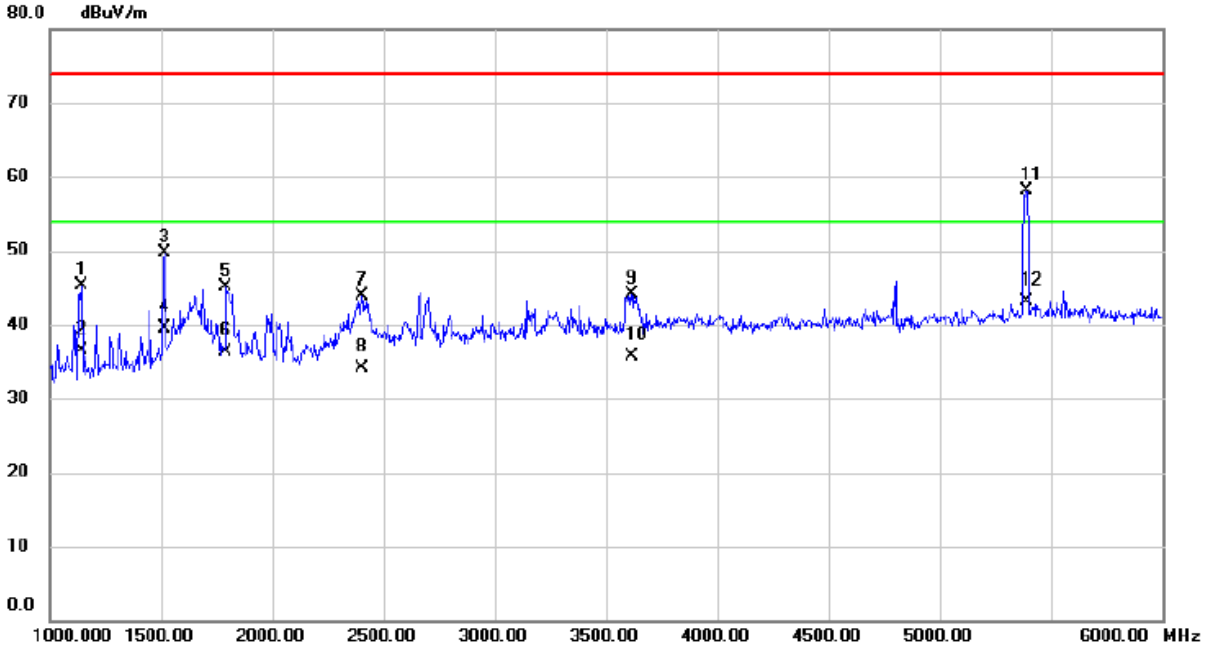
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1140.000	49.16	-4.68	44.48	74.00	-29.52	peak	
2		1140.000	39.90	-4.68	35.22	54.00	-18.78	AVG	
3		1517.500	50.59	-3.35	47.24	74.00	-26.76	peak	
4		1517.500	41.99	-3.35	38.64	54.00	-15.36	AVG	
5		1817.500	49.70	-2.05	47.65	74.00	-26.35	peak	
6		1817.500	40.20	-2.05	38.15	54.00	-15.85	AVG	
7		2402.500	43.80	-0.45	43.35	74.00	-30.65	peak	
8		2402.500	34.74	-0.45	34.29	54.00	-19.71	AVG	
9		2657.500	44.12	0.26	44.38	74.00	-29.62	peak	
10		2657.500	34.97	0.26	35.23	54.00	-18.77	AVG	
11		5377.500	52.60	5.90	58.50	74.00	-15.50	peak	
12	*	5377.500	37.26	5.90	43.16	54.00	-10.84	AVG	

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



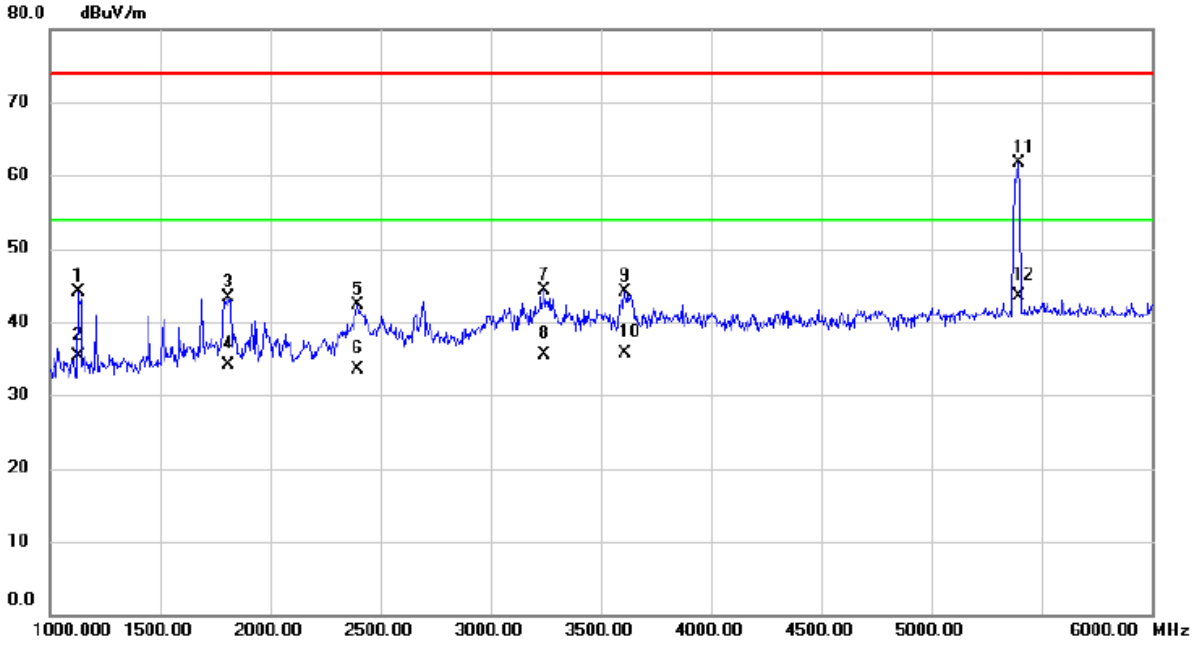
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1140.000	48.49	-4.68	43.81	74.00	-30.19	peak	
2		1140.000	38.93	-4.68	34.25	54.00	-19.75	AVG	
3		1792.500	45.08	-2.16	42.92	74.00	-31.08	peak	
4		1792.500	35.77	-2.16	33.61	54.00	-20.39	AVG	
5		2387.500	43.07	-0.49	42.58	74.00	-31.42	peak	
6		2387.500	34.08	-0.49	33.59	54.00	-20.41	AVG	
7		2690.000	42.63	0.38	43.01	74.00	-30.99	peak	
8		2690.000	33.83	0.38	34.21	54.00	-19.79	AVG	
9		3252.500	41.84	2.17	44.01	74.00	-29.99	peak	
10		3252.500	33.41	2.17	35.58	54.00	-18.42	AVG	
11		5397.500	55.70	5.94	61.64	74.00	-12.36	peak	
12	*	5397.500	38.32	5.94	44.26	54.00	-9.74	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 2		



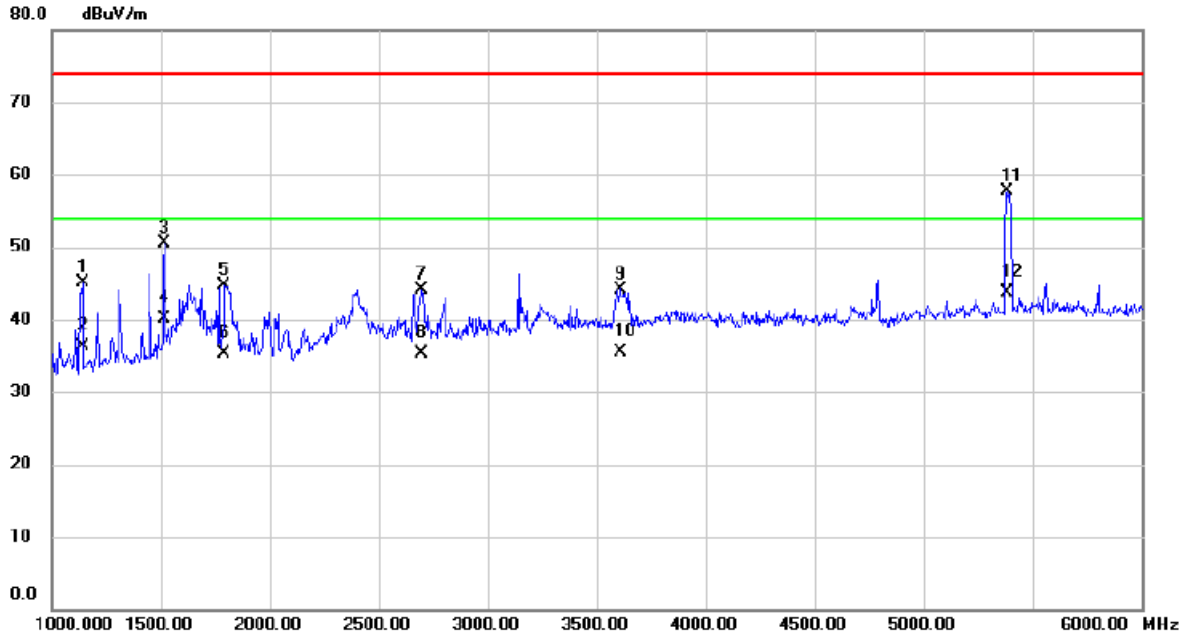
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1140.000	49.92	-4.68	45.24	74.00	-28.76	peak	
2		1140.000	41.19	-4.68	36.51	54.00	-17.49	AVG	
3		1517.500	53.13	-3.35	49.78	74.00	-24.22	peak	
4		1517.500	42.79	-3.35	39.44	54.00	-14.56	AVG	
5		1792.500	47.19	-2.16	45.03	74.00	-28.97	peak	
6		1792.500	38.41	-2.16	36.25	54.00	-17.75	AVG	
7		2400.000	44.32	-0.47	43.85	74.00	-30.15	peak	
8		2400.000	34.65	-0.47	34.18	54.00	-19.82	AVG	
9		3615.000	41.03	3.15	44.18	74.00	-29.82	peak	
10		3615.000	32.61	3.15	35.76	54.00	-18.24	AVG	
11		5392.500	52.21	5.94	58.15	74.00	-15.85	peak	
12	*	5392.500	37.17	5.94	43.11	54.00	-10.89	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 2		



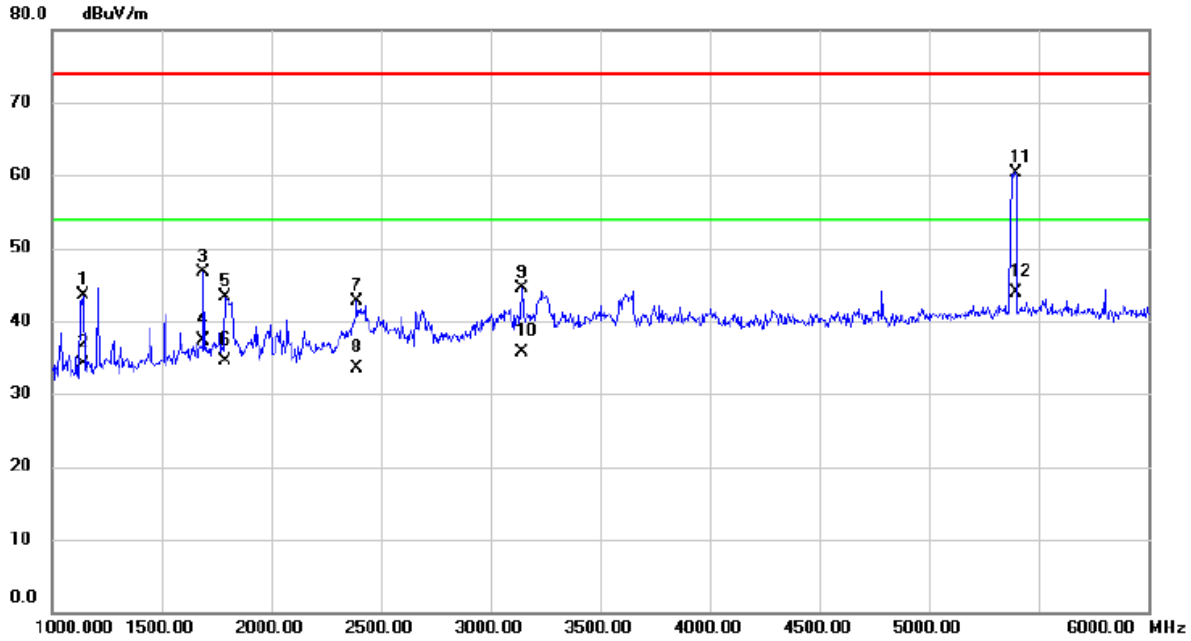
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1127.500	48.80	-4.72	44.08	74.00	-29.92	peak	
2		1127.500	39.95	-4.72	35.23	54.00	-18.77	AVG	
3		1810.000	45.45	-2.08	43.37	74.00	-30.63	peak	
4		1810.000	36.24	-2.08	34.16	54.00	-19.84	AVG	
5		2397.500	42.81	-0.46	42.35	74.00	-31.65	peak	
6		2397.500	33.98	-0.46	33.52	54.00	-20.48	AVG	
7		3245.000	42.06	2.15	44.21	74.00	-29.79	peak	
8		3245.000	33.27	2.15	35.42	54.00	-18.58	AVG	
9		3612.500	40.91	3.15	44.06	74.00	-29.94	peak	
10		3612.500	32.49	3.15	35.64	54.00	-18.36	AVG	
11		5395.000	55.75	5.94	61.69	74.00	-12.31	peak	
12	*	5395.000	37.63	5.94	43.57	54.00	-10.43	AVG	

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



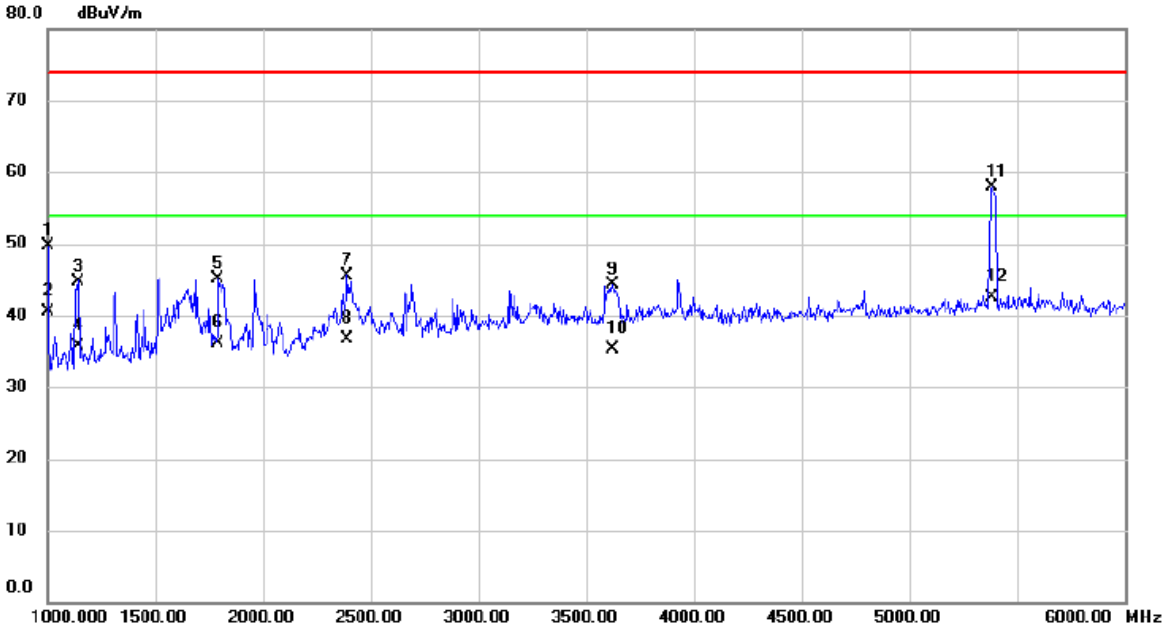
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1140.000	49.71	-4.68	45.03	74.00	-28.97	peak	
2		1140.000	40.93	-4.68	36.25	54.00	-17.75	AVG	
3		1515.000	53.80	-3.36	50.44	74.00	-23.56	peak	
4		1515.000	43.47	-3.36	40.11	54.00	-13.89	AVG	
5		1792.500	46.93	-2.16	44.77	74.00	-29.23	peak	
6		1792.500	37.55	-2.16	35.39	54.00	-18.61	AVG	
7		2697.500	43.73	0.40	44.13	74.00	-29.87	peak	
8		2697.500	34.88	0.40	35.28	54.00	-18.72	AVG	
9		3607.500	41.06	3.14	44.20	74.00	-29.80	peak	
10		3607.500	32.30	3.14	35.44	54.00	-18.56	AVG	
11		5382.500	51.83	5.91	57.74	74.00	-16.26	peak	
12	*	5382.500	37.70	5.91	43.61	54.00	-10.39	AVG	

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



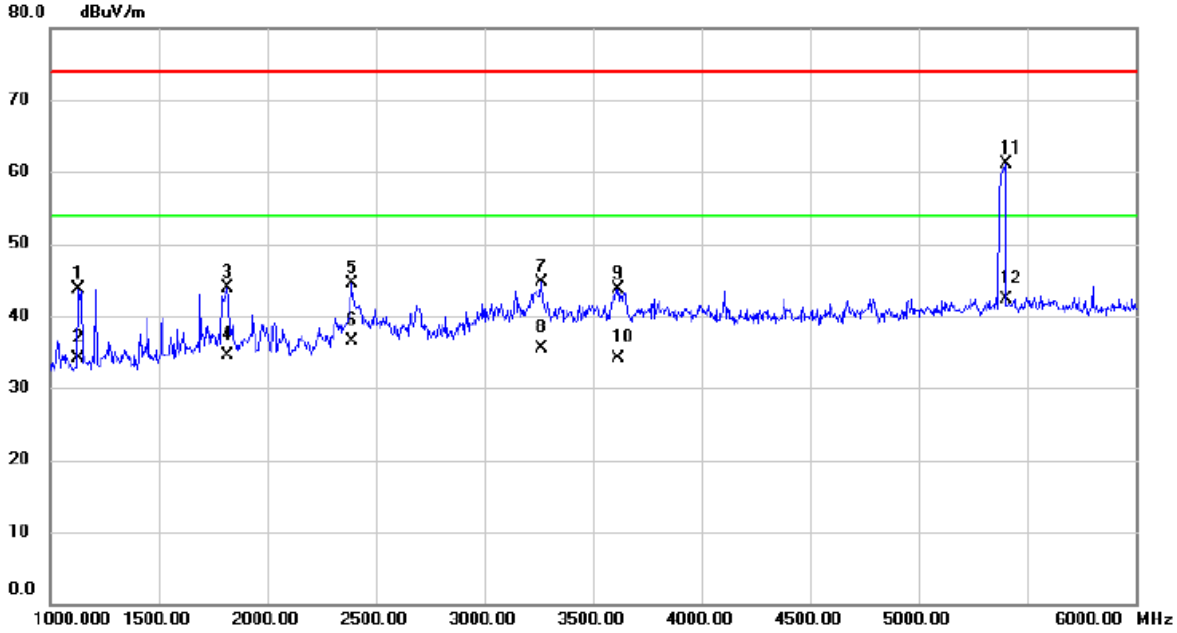
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1140.000	48.20	-4.68	43.52	74.00	-30.48	peak	
2		1140.000	38.79	-4.68	34.11	54.00	-19.89	AVG	
3		1692.500	49.24	-2.59	46.65	74.00	-27.35	peak	
4		1692.500	39.85	-2.59	37.26	54.00	-16.74	AVG	
5		1792.500	45.50	-2.16	43.34	74.00	-30.66	peak	
6		1792.500	36.75	-2.16	34.59	54.00	-19.41	AVG	
7		2392.500	43.22	-0.47	42.75	74.00	-31.25	peak	
8		2392.500	33.99	-0.47	33.52	54.00	-20.48	AVG	
9		3142.500	42.71	1.84	44.55	74.00	-29.45	peak	
10		3142.500	33.80	1.84	35.64	54.00	-18.36	AVG	
11		5397.500	54.46	5.94	60.40	74.00	-13.60	peak	
12	*	5397.500	37.87	5.94	43.81	54.00	-10.19	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 14		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1000.000	54.91	-5.16	49.75	74.00	-24.25	peak	
2		1000.000	45.74	-5.16	40.58	54.00	-13.42	AVG	
3		1140.000	49.48	-4.68	44.80	74.00	-29.20	peak	
4		1140.000	40.43	-4.68	35.75	54.00	-18.25	AVG	
5		1792.500	47.36	-2.16	45.20	74.00	-28.80	peak	
6		1792.500	38.35	-2.16	36.19	54.00	-17.81	AVG	
7		2392.500	46.07	-0.47	45.60	74.00	-28.40	peak	
8		2392.500	37.11	-0.47	36.64	54.00	-17.36	AVG	
9		3620.000	41.23	3.16	44.39	74.00	-29.61	peak	
10		3620.000	32.17	3.16	35.33	54.00	-18.67	AVG	
11		5380.000	51.93	5.90	57.83	74.00	-16.17	peak	
12	*	5380.000	36.61	5.90	42.51	54.00	-11.49	AVG	

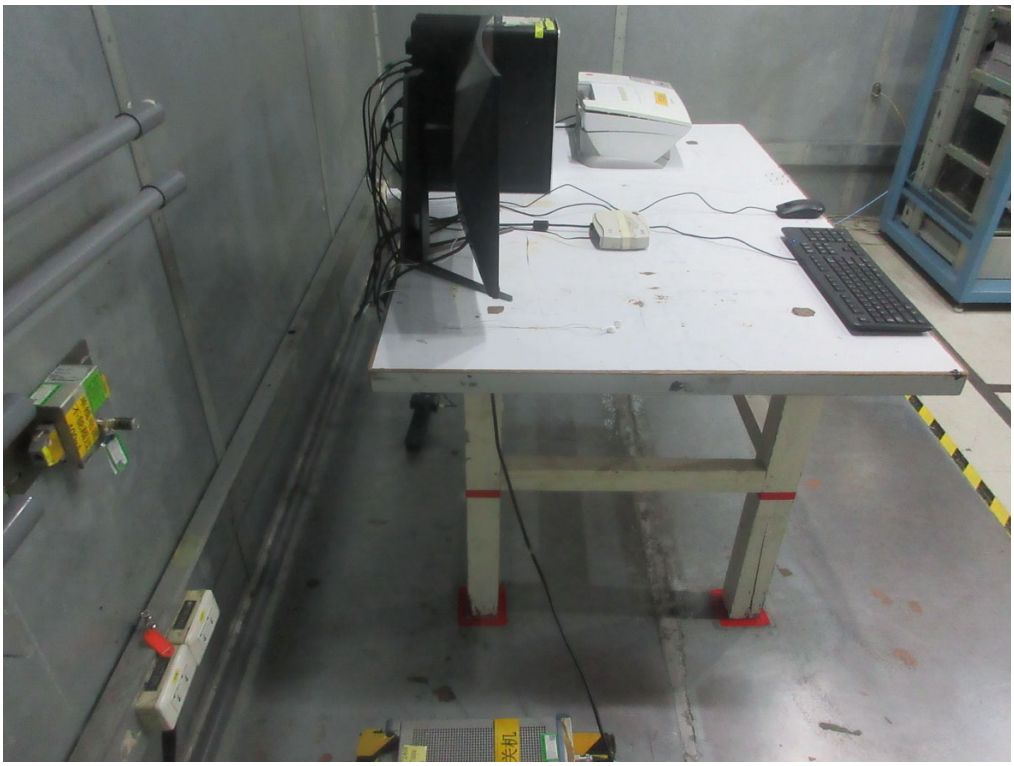
Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 14		



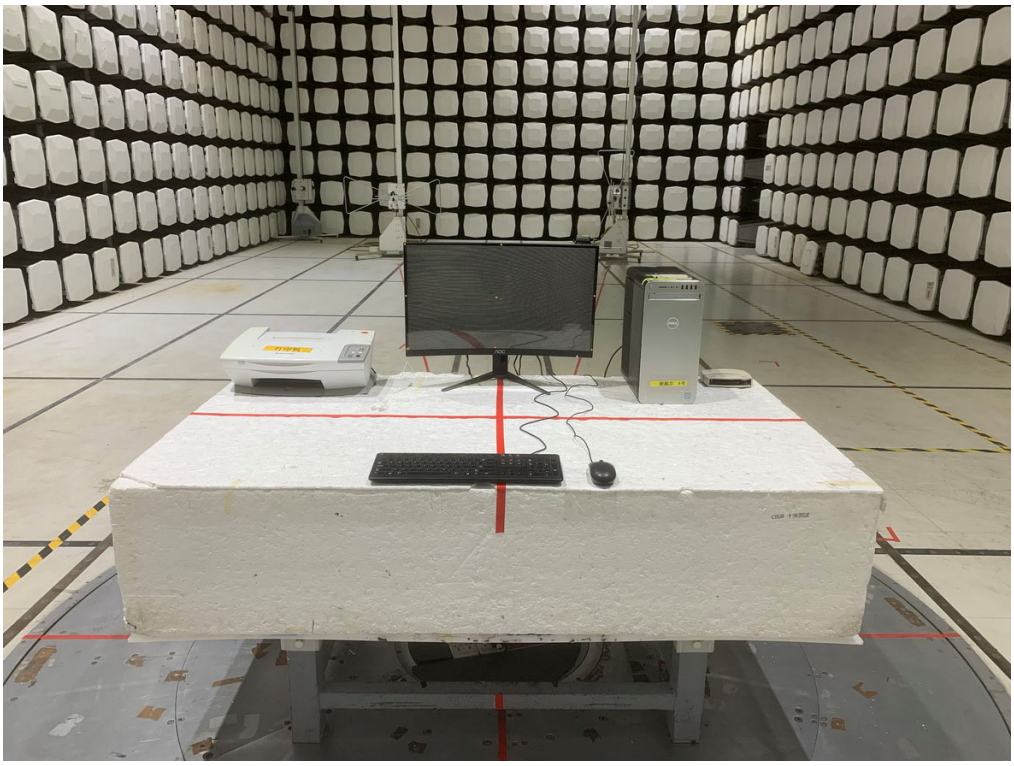
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1127.500	48.50	-4.72	43.78	74.00	-30.22	peak	
2		1127.500	38.84	-4.72	34.12	54.00	-19.88	AVG	
3		1817.500	45.87	-2.05	43.82	74.00	-30.18	peak	
4		1817.500	36.60	-2.05	34.55	54.00	-19.45	AVG	
5		2387.500	44.95	-0.49	44.46	74.00	-29.54	peak	
6		2387.500	37.01	-0.49	36.52	54.00	-17.48	AVG	
7		3260.000	42.47	2.18	44.65	74.00	-29.35	peak	
8		3260.000	33.31	2.18	35.49	54.00	-18.51	AVG	
9		3615.000	40.53	3.15	43.68	74.00	-30.32	peak	
10		3615.000	30.96	3.15	34.11	54.00	-19.89	AVG	
11		5400.000	55.21	5.95	61.16	74.00	-12.84	peak	
12	*	5400.000	36.44	5.95	42.39	54.00	-11.61	AVG	

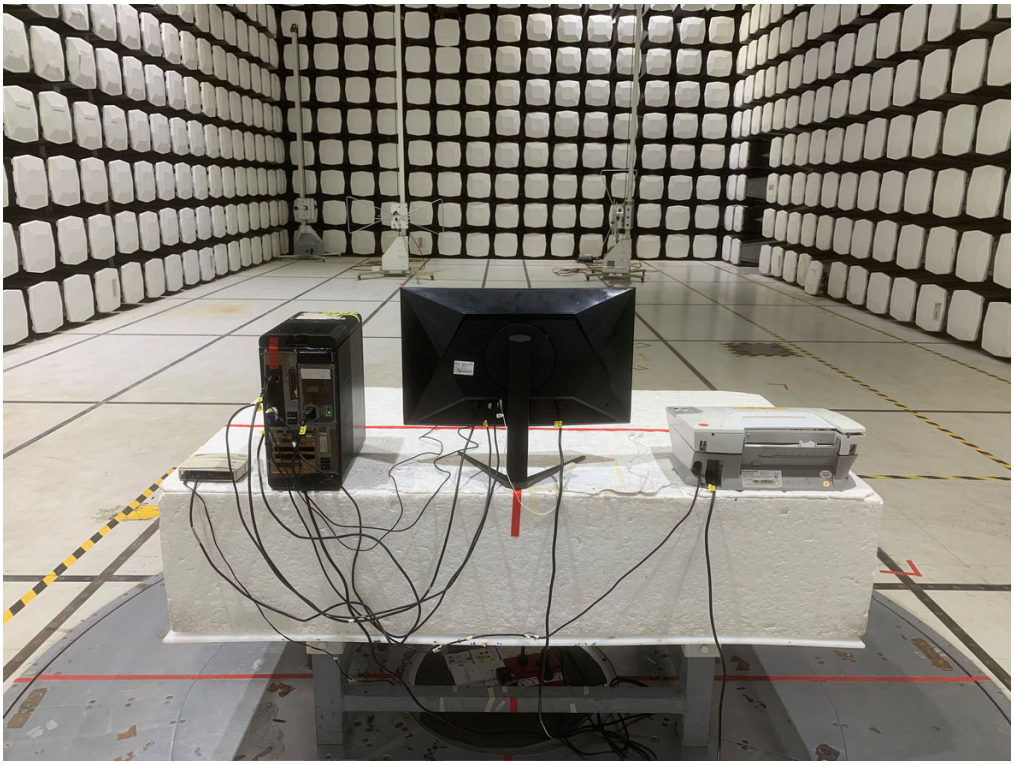
4. EUT TEST PHOTO

AC Power Line Conducted Emissions

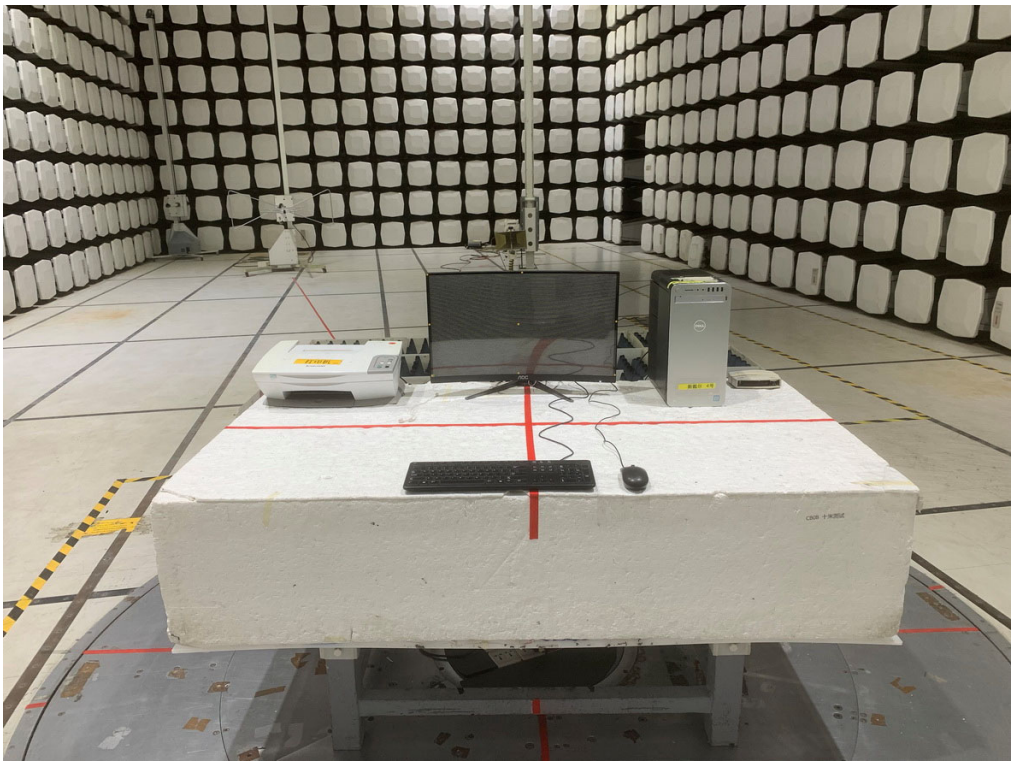


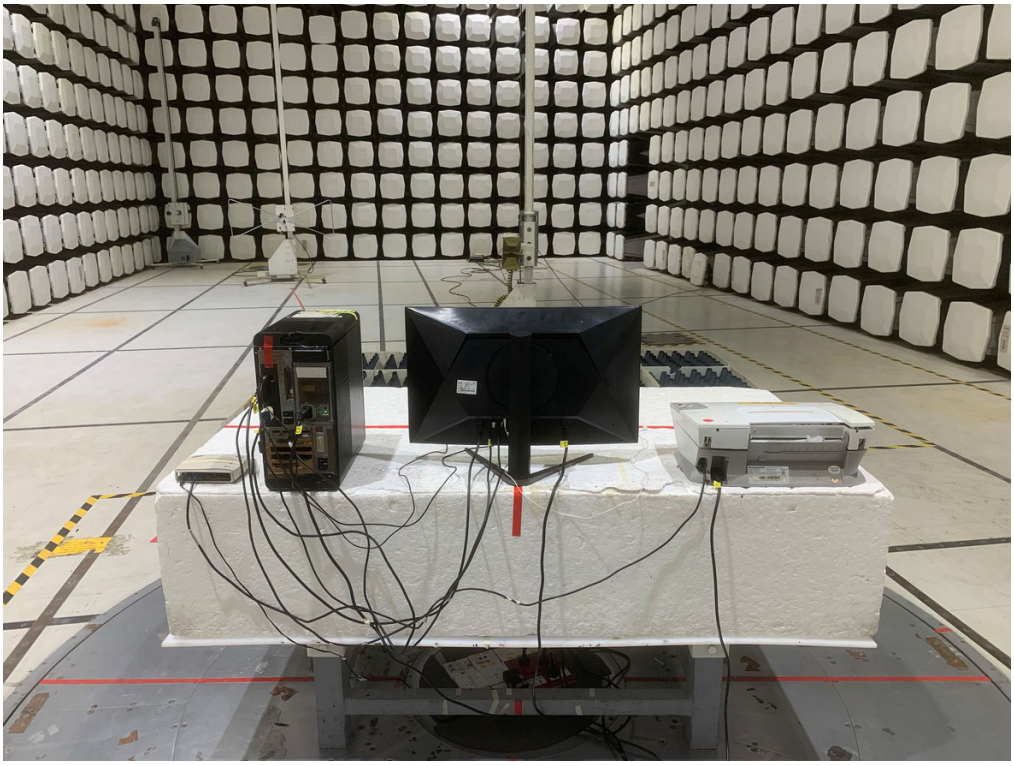
Radiated Emissions 30 MHz to 1 GHz





Radiated Emissions Above 1 GHz





End of Test Report