

FCC EMC Test Report

Project No. : 2104C082
Equipment : LCD Monitor
Brand Name : N/A
Test Model : **24G2*****(*=0-9,A-Z,a-z,+,-,/, \ or blank)
Series Model : N/A
Applicant : TPV Electronics (Fujian) Co., Ltd.
Address : Rongqiao Economic and Technological Development Zone, Fuqing City,
Fujian Province, P.R. China
Date of Receipt : Apr. 13, 2021
Date of Test : Apr. 13, 2021 ~ May 13, 2021
Issued Date : May 28, 2021
Report Version : R00
Test Sample : Engineering Sample No.: DG202104131
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.

Derek Tong

Prepared by : Derek Tong

Kevin Li

Approved by : Kevin Li



Certificate #5123.02

Add: No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

Tel: +86-769-8318-3000

Web: www.newbtl.com

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** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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

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BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** 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 Version	Description	Issued Date
R00	Original Issue.	May 28, 2021

1. SUMMARY OF TEST RESULTS

Emission		
Ref Standard(s)	Test Item	Result
FCC CFR Title 47,Part 15,Subpart B	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, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's Test Firm Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

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	3.18

B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB08 (10m)	CISPR	30MHz ~ 200MHz	V	4.44
		30MHz ~ 200MHz	H	3.44
		200MHz ~ 1,000MHz	V	4.28
		200MHz ~ 1,000MHz	H	3.52

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB08 (3m)	CISPR	1GHz ~ 6GHz	4.36

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	53%	Jayce Yao
Radiated emissions 30 MHz to 1 GHz	25°C	60%	Kay Zhu
Radiated emissions above 1 GHz	25°C	60%	Kay Zhu

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	LCD Monitor
Brand Name	N/A
Test Model	**24G2*****(*=0-9,A-Z,a-z,+,-,/,\ or blank)
Series Model	N/A
Model Difference(s)	Only differ in model name due to marketing purpose
Power Source	AC Mains.
Power Rating	100-240V~50-60Hz 1.3A
Connecting I/O Port(s)	1* AC port 1* D-SUB port 2* HDMI port 1* DP port 5* USB port 1* Earphone port 1* Audio port
Classification Of EUT	Class B
Highest Internal Frequency(Fx)	571MHz

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	-
D-SUB	Shielded	YES	1.8/1.5/1.2	Bonded two Ferrite Cores
DP	Shielded	NO	1.8/1.5/1.2	-
USB	Shielded	NO	1.8/1.5/1.2	-
Audio	Non-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, 1.2m length, worst case is Power cable 1.8m with HDMI+D-SUB+DP+Audio+USB length testing and recording in test report.

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 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 1920*1080/144Hz 1.8m H
Mode 2	HDMI 2 1920*1080/144Hz 1.8m H
Mode 3	DP 1920*1080/160Hz 1.8m H
Mode 4	D-SUB 1920*1080/60Hz 1.8m H
Mode 5	HDMI1 1080P 1.8m H
Mode 6	HDMI2 1080P 1.8m H
Mode 7	HDMI 1 1280*1024/60Hz 1.8m H
Mode 8	HDMI 1 640*480/60Hz 1.8m H
Mode 9	HDMI 1 1920*1080/144Hz 1.5m H
Mode 10	HDMI 1 1920*1080/144Hz 1.2m H
Mode 11	HDMI 1 1920*1080/144Hz without earphone 1.8m H
Mode 12	HDMI 1 1920*1080/144Hz 1.8m V

AC Power Line Conducted Emissions test	
Final Test Mode	Description
Mode 1	HDMI 1 1920*1080/144Hz 1.8m H
Mode 2	HDMI 2 1920*1080/144Hz 1.8m H
Mode 5	HDMI1 1080P 1.8m H

Radiated emissions 30 MHz to 1 GHz test	
Final Test Mode	Description
Mode 1	HDMI 1 1920*1080/144Hz 1.8m H
Mode 2	HDMI 2 1920*1080/144Hz 1.8m H
Mode 5	HDMI1 1080P 1.8m H
Mode 11	HDMI 1 1920*1080/144Hz without earphone 1.8m H

Radiated emissions Above 1 GHz test	
Final Test Mode	Description
Mode 1	HDMI 1 1920*1080/144Hz 1.8m H
Mode 2	HDMI 2 1920*1080/144Hz 1.8m H
Mode 5	HDMI1 1080P 1.8m H
Mode 11	HDMI 1 1920*1080/144Hz without earphone 1.8m H

Evaluation description:

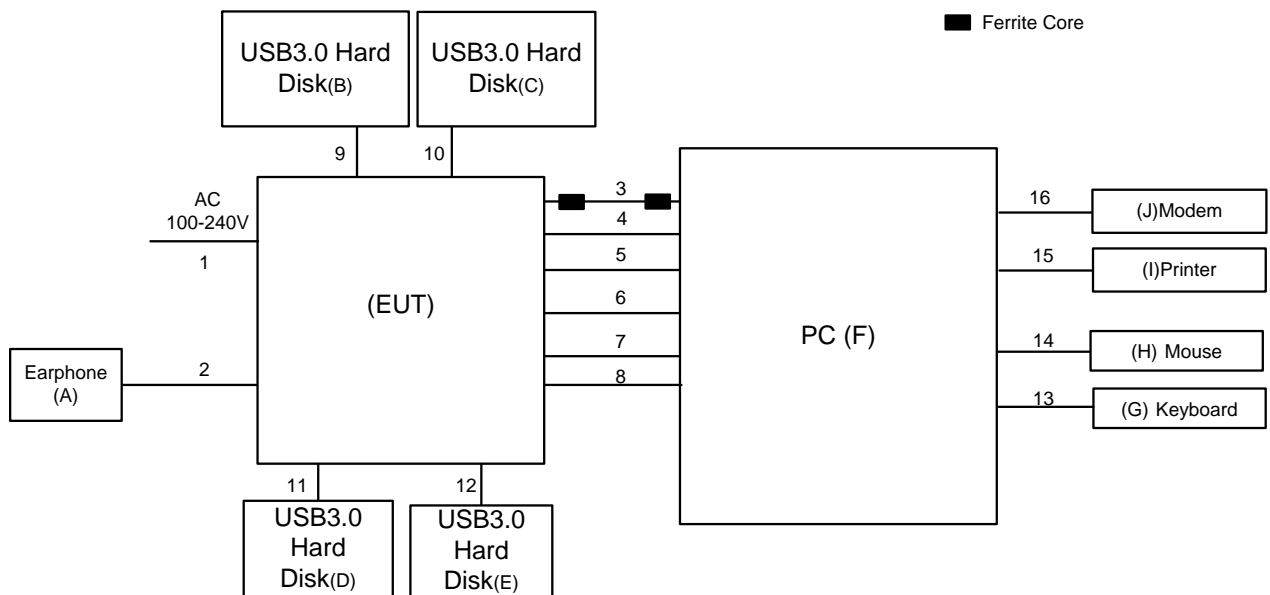
1. The maximum resolution is evaluated Mode 1-6. The worst case is Mode 1 and evaluated the middle and low resolution Mode 7 and Mode 8.
2. According to the client's requirement, choose Mode 1, Mode 2, Mode 5 and recorded in test report.

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&D-SUB&DP&USB&Aduio cable.
2. EUT connected to Earphone via Earphone cable.
3. EUT connected to USB3.0 Hard Disk via USB cable.
4. Mouse and Keyboard connected to PC via USB cable.
5. Modem connected to PC via RS232 cable.
6. Printer connected to PC via Parallel 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	Earphone	APPLE	N/A	N/A
B	USB3.0 Hard Disk	LACIE	Lacie S.A series	NL34BJSM
C	USB3.0 Hard Disk	LACIE	Lacie S.A series	NL33PVLS
D	USB3.0 Hard Disk	LACIE	Lacie S.A series	NL34BJRF
E	USB3.0 Hard Disk	LACIE	Lacie S.A series	NL33PVK4
F	PC	DELL	Vostro 470	24454162837
G	Keyboard	DELL	KB212-B	CN0HTXH97158125004DXA01
H	Mouse	Lenovo	M-SBF96	N/A
I	Printer	SII	DPU-414	3018507 B
J	Modem	ACEEX	DM-1414V	603002131

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	AC Cable	NO	NO	1.8/1.5/1.2m
2	Earphone	NO	NO	1.2m
3	D-SUB Cable	YES	YES	1.8/1.5/1.2m
4	HDMI Cable	YES	NO	1.8/1.5/1.2m
5	HDMI Cable	YES	NO	1.8/1.5/1.2m
6	DP Cable	YES	NO	1.8/1.5/1.2m
7	USB Cable	YES	NO	1.8/1.5/1.2m
8	AUDIO Cable	NO	NO	1.8/1.5/1.2m
9	USB Cable	YES	NO	1m
10	USB Cable	YES	NO	1m
11	USB Cable	YES	NO	1m
12	USB Cable	YES	NO	1m
13	USB Cable	YES	NO	1.8m
14	USB Cable	YES	NO	1.8m
15	Parallel Cable	YES	NO	1.8m
16	RS232 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 (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56 *	56 - 46 *
0.5 - 5.0	56.00	46.00
5.0 - 30.0	60.00	50.00

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	50Ω Terminator	SHX	TF2-3G-A	8122901	Feb. 27, 2022
2	TWO-LINE V-NETWORK	R&S	ENV216	100526	Nov. 04, 2021
3	EMI Test Receiver	R&S	ESR3	101862	Jul. 25, 2021
4	Artificial-Mains Network	SCHWARZBECK	NSLK 8127	8127685	Feb. 28, 2022
5	Cable	N/A	RG400	N/A(12m)	Mar. 09, 2022
6	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.

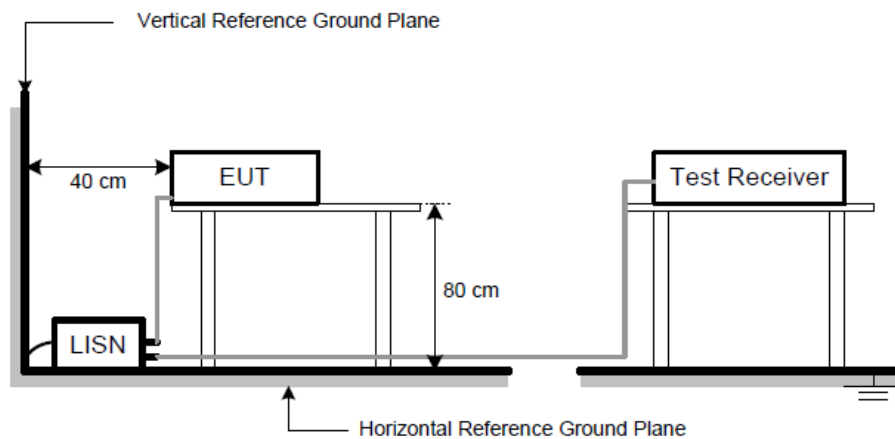
3.1.3 TEST PROCEDURE

- 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

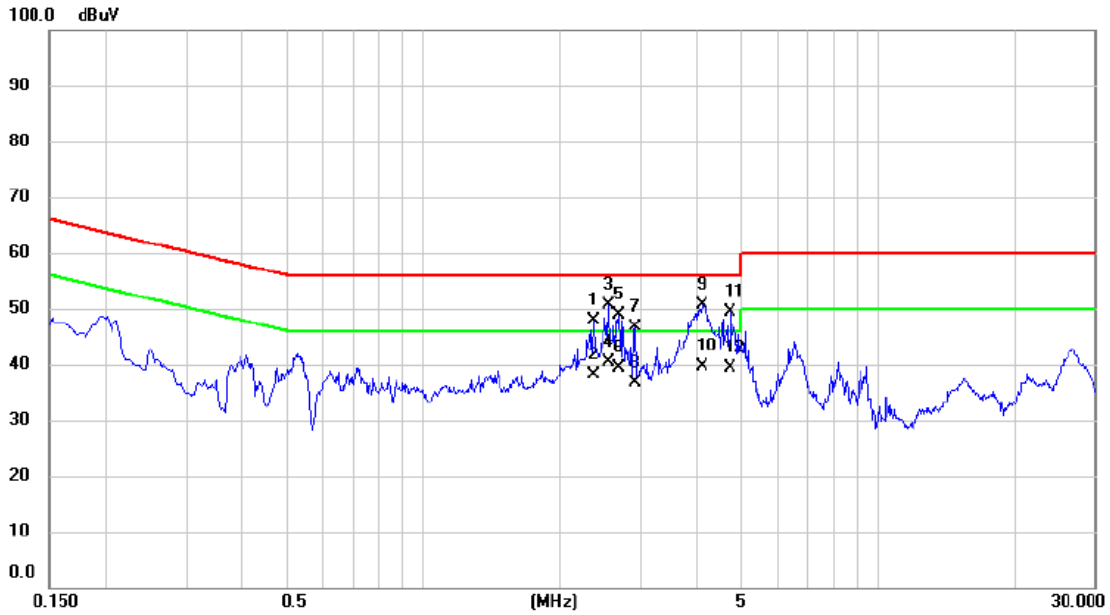


3.1.6 TEST RESULTS

Remark

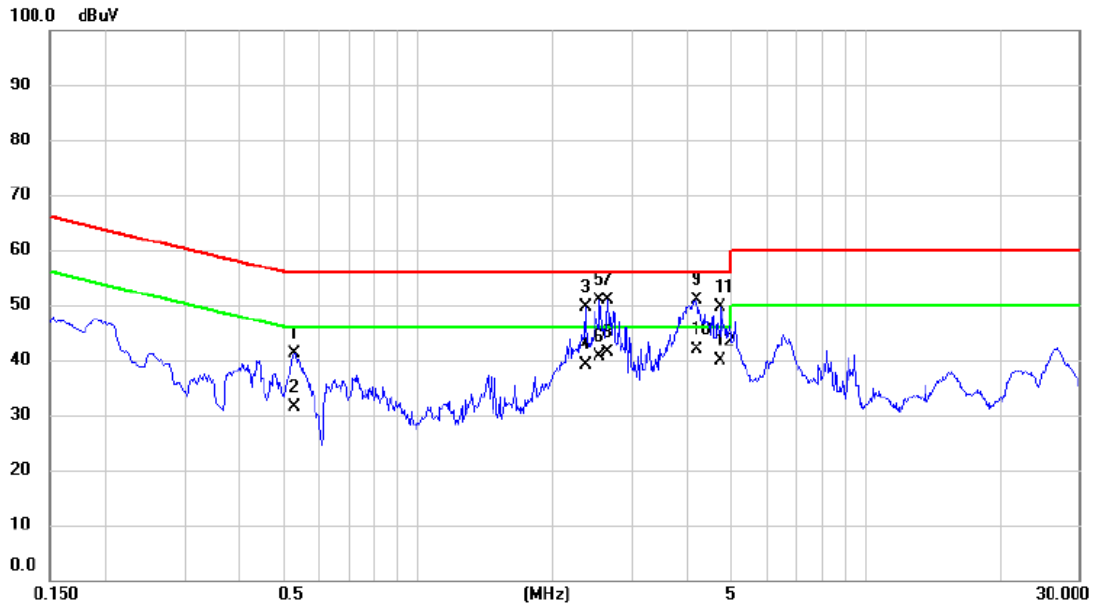
- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10 kHz, VBW=10 kHz, Swp. 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		



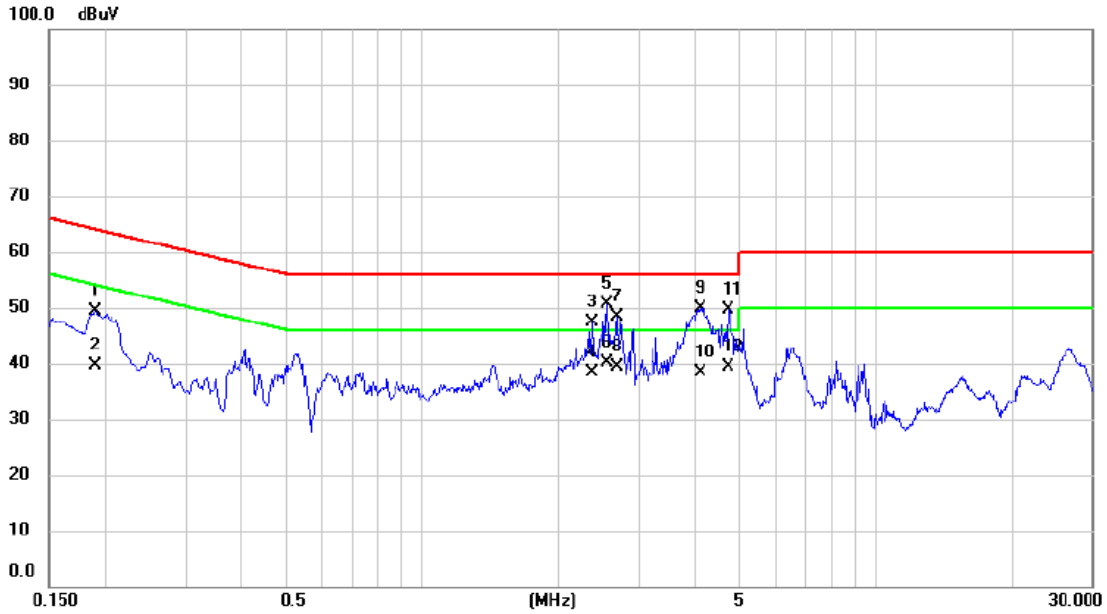
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		2.3640	38.17	9.82	47.99	56.00	-8.01	QP	
2		2.3640	28.40	9.82	38.22	46.00	-7.78	AVG	
3		2.5508	40.80	9.83	50.63	56.00	-5.37	QP	
4		2.5508	30.60	9.83	40.43	46.00	-5.57	AVG	
5		2.6903	39.06	9.84	48.90	56.00	-7.10	QP	
6		2.6903	29.50	9.84	39.34	46.00	-6.66	AVG	
7		2.9153	36.69	9.86	46.55	56.00	-9.45	QP	
8		2.9153	26.70	9.86	36.56	46.00	-9.44	AVG	
9	*	4.1055	40.71	9.93	50.64	56.00	-5.36	QP	
10		4.1055	29.60	9.93	39.53	46.00	-6.47	AVG	
11		4.7355	39.43	9.97	49.40	56.00	-6.60	QP	
12		4.7355	29.40	9.97	39.37	46.00	-6.63	AVG	

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



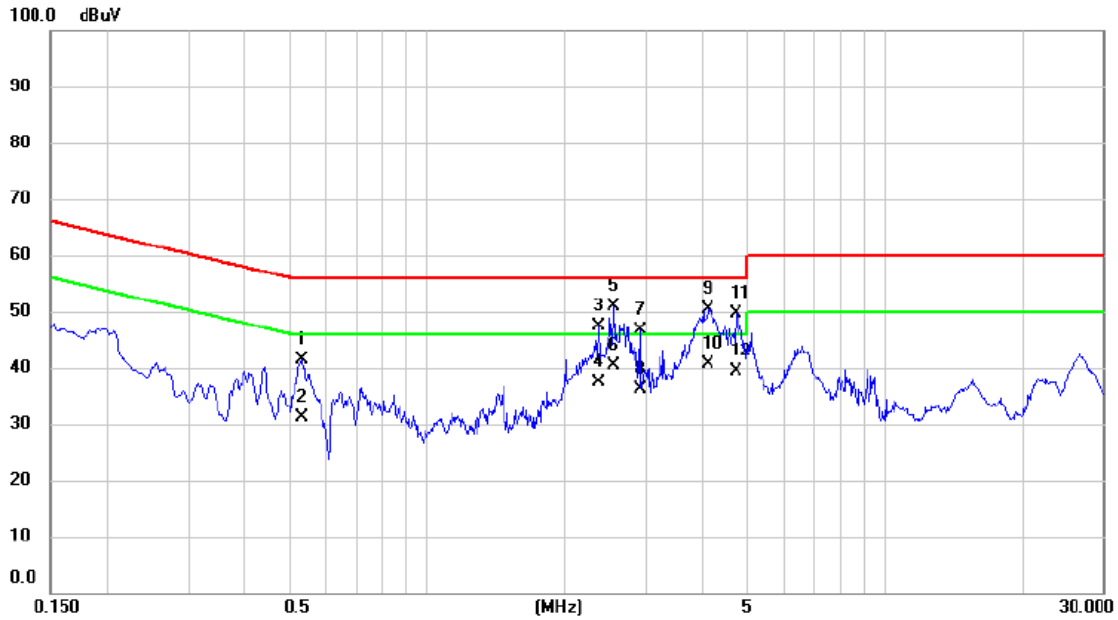
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.5302	31.57	9.68	41.25	56.00	-14.75	QP	
2		0.5302	21.60	9.68	31.28	46.00	-14.72	AVG	
3		2.3663	39.84	9.82	49.66	56.00	-6.34	QP	
4		2.3663	29.40	9.82	39.22	46.00	-6.78	AVG	
5		2.5463	40.98	9.83	50.81	56.00	-5.19	QP	
6		2.5463	30.80	9.83	40.63	46.00	-5.37	AVG	
7		2.6430	41.06	9.84	50.90	56.00	-5.10	QP	
8		2.6430	31.47	9.84	41.31	46.00	-4.69	AVG	
9		4.1843	41.02	9.94	50.96	56.00	-5.04	QP	
10	*	4.1843	32.05	9.94	41.99	46.00	-4.01	AVG	
11		4.7400	39.77	9.97	49.74	56.00	-6.26	QP	
12		4.7400	29.80	9.97	39.77	46.00	-6.23	AVG	

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



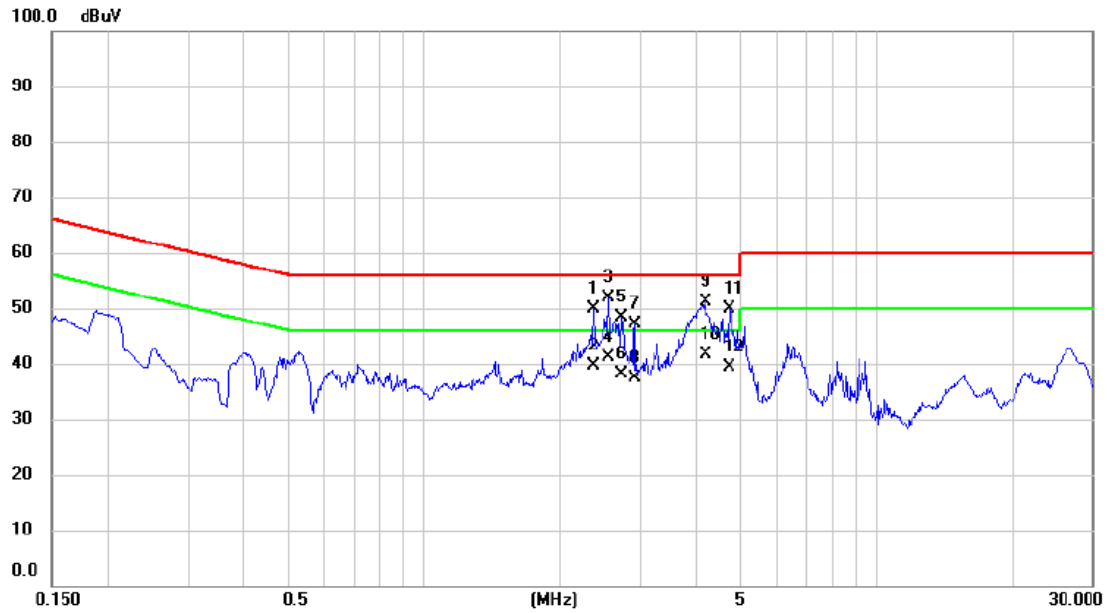
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1905	39.68	9.65	49.33	64.01	-14.68	QP	
2		0.1905	29.97	9.65	39.62	54.01	-14.39	AVG	
3		2.3730	37.51	9.82	47.33	56.00	-8.67	QP	
4		2.3730	28.44	9.82	38.26	46.00	-7.74	AVG	
5	*	2.5530	40.84	9.83	50.67	56.00	-5.33	QP	
6		2.5530	30.32	9.83	40.15	46.00	-5.85	AVG	
7		2.6857	38.43	9.84	48.27	56.00	-7.73	QP	
8		2.6857	29.42	9.84	39.26	46.00	-6.74	AVG	
9		4.1055	40.02	9.93	49.95	56.00	-6.05	QP	
10		4.1055	28.33	9.93	38.26	46.00	-7.74	AVG	
11		4.7377	39.75	9.97	49.72	56.00	-6.28	QP	
12		4.7377	29.29	9.97	39.26	46.00	-6.74	AVG	

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



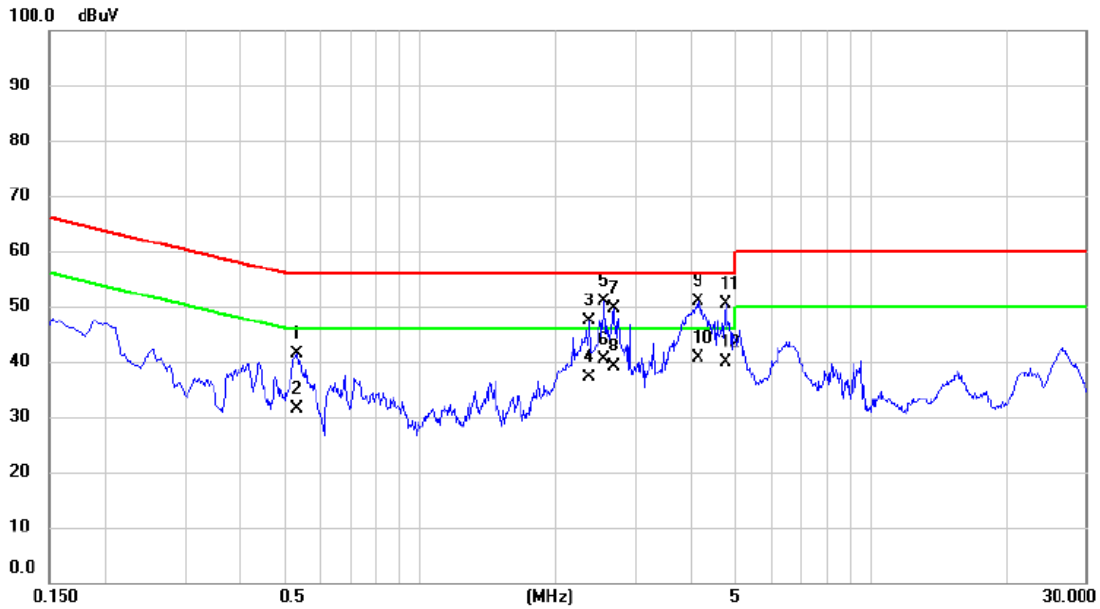
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.5325	31.71	9.68	41.39	56.00	-14.61	QP	
2		0.5325	21.50	9.68	31.18	46.00	-14.82	AVG	
3		2.3730	37.44	9.82	47.26	56.00	-8.74	QP	
4		2.3730	27.60	9.82	37.42	46.00	-8.58	AVG	
5	*	2.5574	40.94	9.83	50.77	56.00	-5.23	QP	
6		2.5574	30.60	9.83	40.43	46.00	-5.57	AVG	
7		2.9220	36.64	9.87	46.51	56.00	-9.49	QP	
8		2.9220	26.38	9.87	36.25	46.00	-9.75	AVG	
9		4.1190	40.51	9.93	50.44	56.00	-5.56	QP	
10		4.1190	30.70	9.93	40.63	46.00	-5.37	AVG	
11		4.7445	39.64	9.97	49.61	56.00	-6.39	QP	
12		4.7445	29.40	9.97	39.37	46.00	-6.63	AVG	

Test Voltage	AC 120V/60Hz	Phase	Line
Test Mode	Mode 5		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		2.3708	39.99	9.82	49.81	56.00	-6.19	QP	
2		2.3708	29.70	9.82	39.52	46.00	-6.48	AVG	
3	*	2.5553	42.13	9.83	51.96	56.00	-4.04	QP	
4		2.5553	31.40	9.83	41.23	46.00	-4.77	AVG	
5		2.7308	38.46	9.84	48.30	56.00	-7.70	QP	
6		2.7308	28.40	9.84	38.24	46.00	-7.76	AVG	
7		2.9153	37.15	9.86	47.01	56.00	-8.99	QP	
8		2.9153	27.40	9.86	37.26	46.00	-8.74	AVG	
9		4.1888	41.10	9.94	51.04	56.00	-4.96	QP	
10		4.1888	31.60	9.94	41.54	46.00	-4.46	AVG	
11		4.7378	39.90	9.97	49.87	56.00	-6.13	QP	
12		4.7378	29.40	9.97	39.37	46.00	-6.63	AVG	

Test Voltage	AC 120V/60Hz	Phase	Neutral
Test Mode	Mode 5		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.5325	31.73	9.68	41.41	56.00	-14.59	QP	
2		0.5325	21.80	9.68	31.48	46.00	-14.52	AVG	
3		2.3730	37.57	9.82	47.39	56.00	-8.61	QP	
4		2.3730	27.40	9.82	37.22	46.00	-8.78	AVG	
5	*	2.5574	41.01	9.83	50.84	56.00	-5.16	QP	
6		2.5574	30.60	9.83	40.43	46.00	-5.57	AVG	
7		2.6835	39.87	9.84	49.71	56.00	-6.29	QP	
8		2.6835	29.40	9.84	39.24	46.00	-6.76	AVG	
9		4.1415	40.83	9.94	50.77	56.00	-5.23	QP	
10		4.1415	30.60	9.94	40.54	46.00	-5.46	AVG	
11		4.7468	40.33	9.97	50.30	56.00	-5.70	QP	
12		4.7468	29.90	9.97	39.87	46.00	-6.13	AVG	

3.2 RADIATED EMISSIONS 30 MHZ TO 1 GHZ

3.2.1 LIMIT

Frequency (MHz)	Class B (at 10m)
	dBuV/m
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	Jul. 25, 2021
2	Pre-Amplifier	EMC INSTRUMENT	EMC 9135	980284	Dec. 13, 2021
3	Pre-Amplifier	EMC INSTRUMENT	EMC 9135	980283	Dec. 13, 2021
4	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	946	Oct. 16, 2021
5	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	947	Nov. 09, 2021
6	Cable	emci	LMR-400 (5m+8m+8m)	N/A	Jan. 06, 2022
7	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A
8	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
9	Attenuator	EMCI	EMCI-N-6-06	N0670	Nov. 09, 2021
10	Attenuator	EMCI	EMCI-N-6-06	N0671	Oct. 16, 2021

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

All calibration period of equipment list is one year.

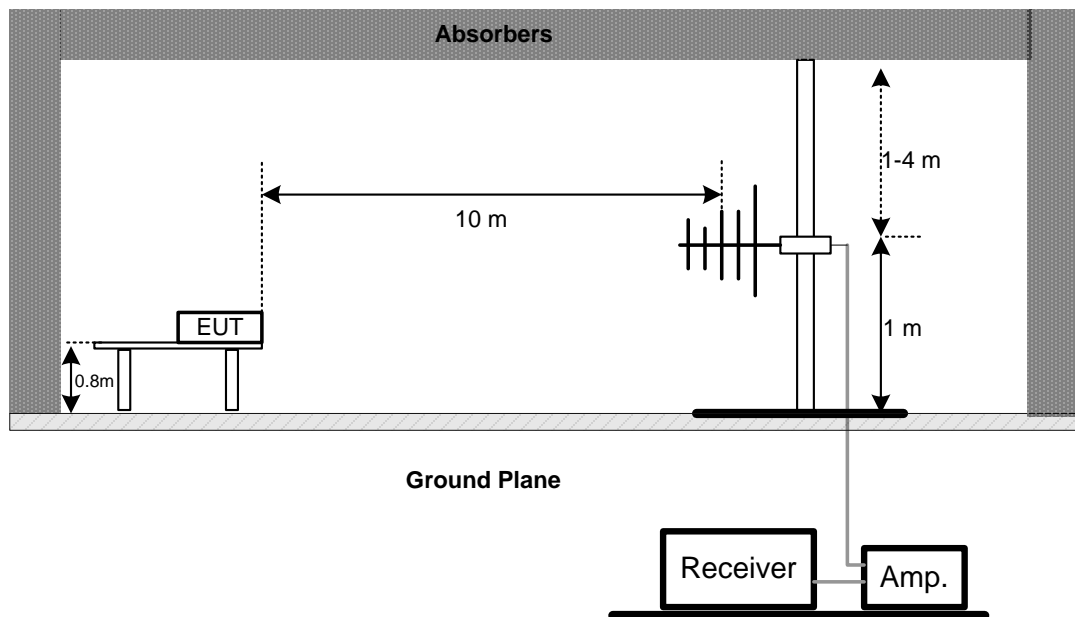
3.2.3 TEST PROCEDURE

- The measuring distance of 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.
- 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 - Block Diagram of system tested.

3.2.4 DEVIATION FROM TEST STANDARD

No deviation

3.2.5 TEST SETUP

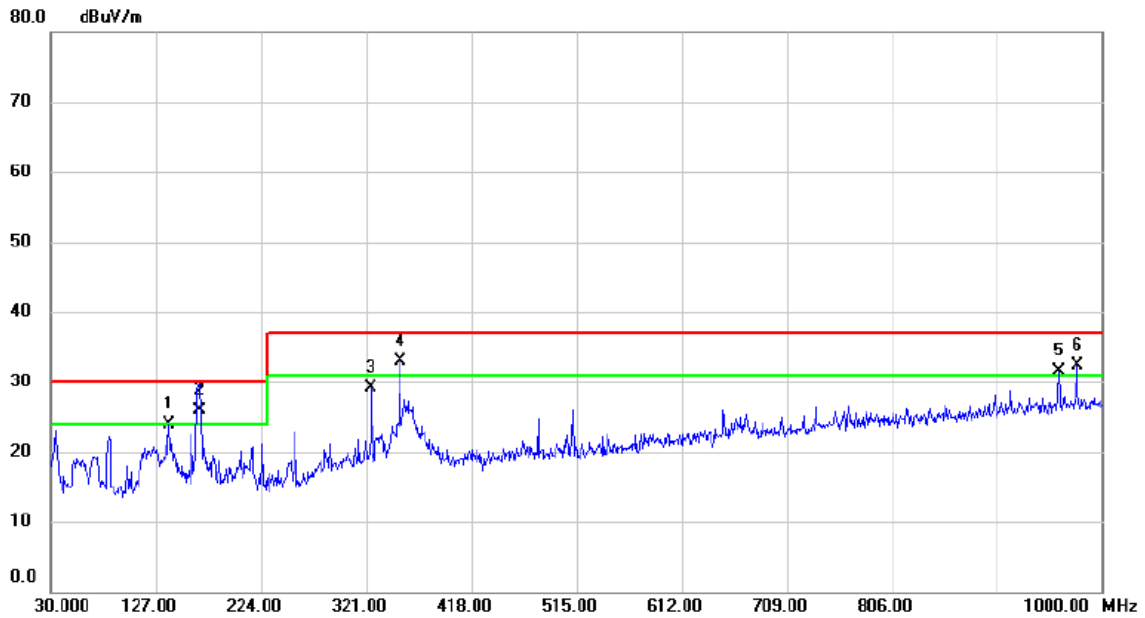


3.2.6 TEST RESULTS-BELOW 1 GHZ

Remark :

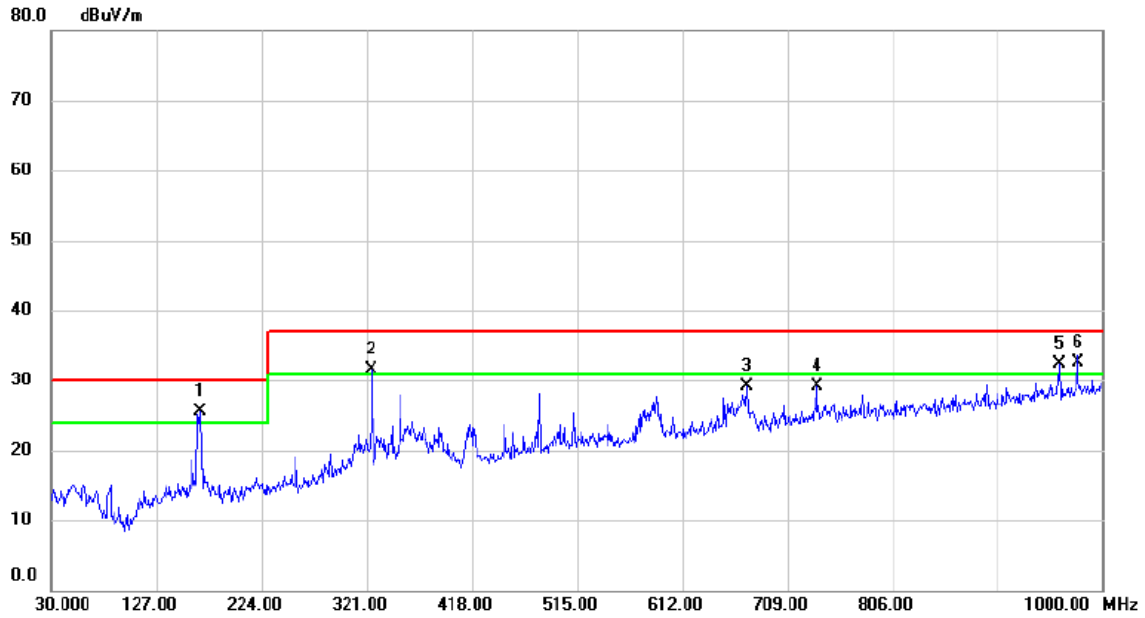
- Measuring frequency range from 30 MHz to 1000 MHz
- If the peak scan value lower limit more than 20 dB, then this signal data does not show in table.

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



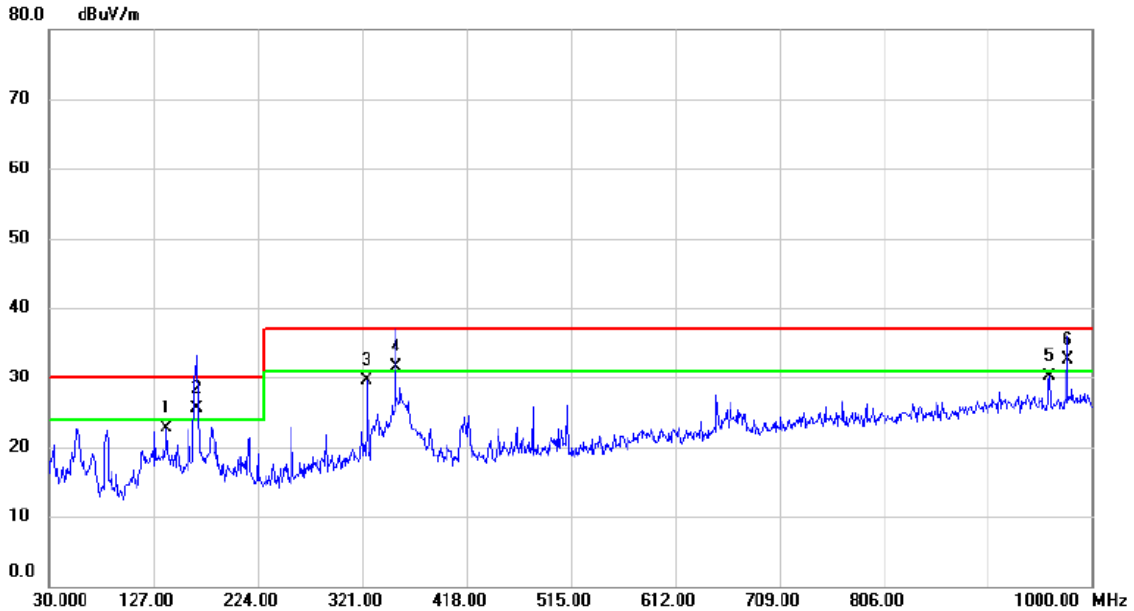
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		139.6100	41.42	-17.57	23.85	30.00	-6.15	QP	
2	*	167.7400	43.17	-17.18	25.99	30.00	-4.01	QP	
3		325.8500	43.90	-14.73	29.17	37.00	-7.83	QP	
4	!	352.0400	47.20	-14.23	32.97	37.00	-4.03	QP	
5	!	960.2300	37.03	-5.45	31.58	37.00	-5.42	QP	
6	!	976.7200	37.65	-5.33	32.32	37.00	-4.68	QP	

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



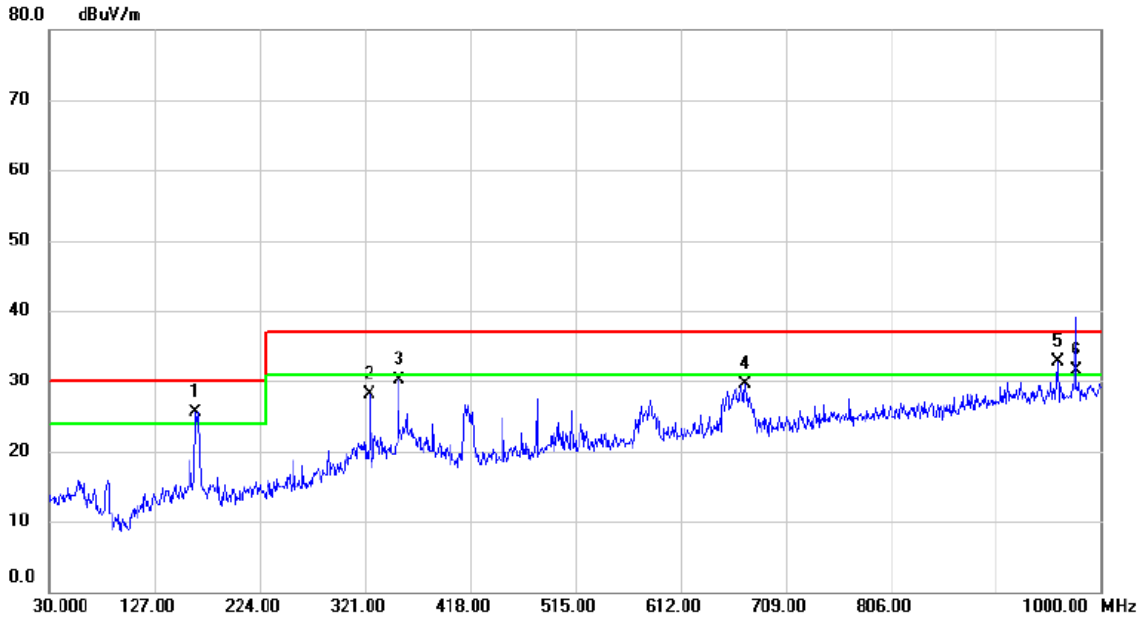
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	!	168.2250	41.86	-16.45	25.41	30.00	-4.59	QP	
2	!	325.8500	45.96	-14.46	31.50	37.00	-5.50	QP	
3		672.1400	37.10	-8.01	29.09	37.00	-7.91	QP	
4		736.1600	36.33	-7.20	29.13	37.00	-7.87	QP	
5	!	960.2300	36.94	-4.69	32.25	37.00	-4.75	QP	
6	*	977.2050	37.04	-4.62	32.42	37.00	-4.58	QP	

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



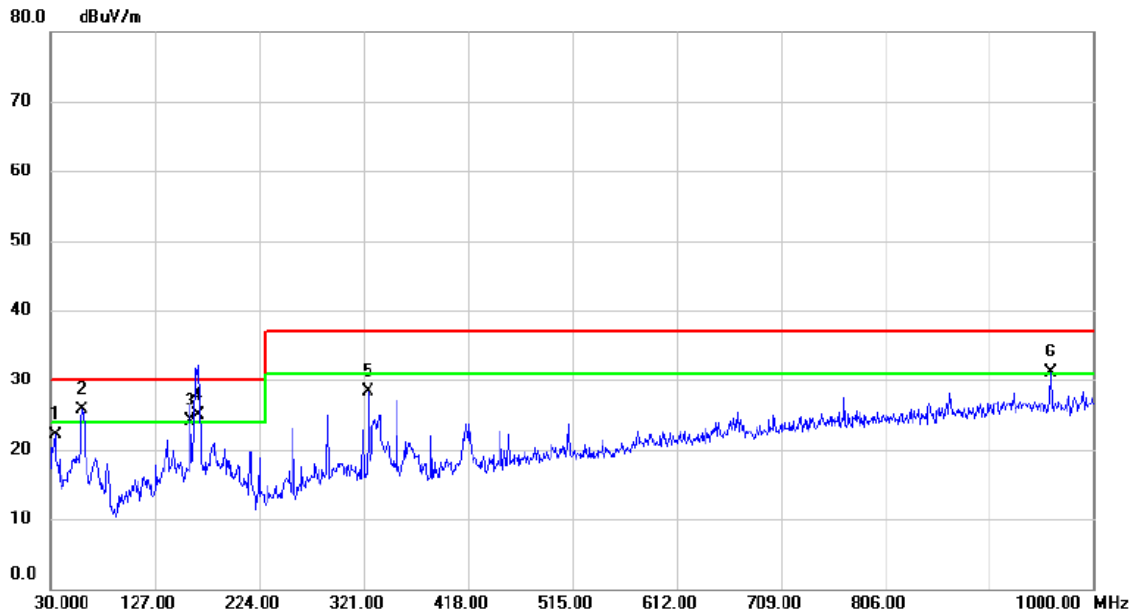
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		139.6100	40.28	-17.57	22.71	30.00	-7.29	QP	
2	*	167.7400	42.73	-17.18	25.55	30.00	-4.45	QP	
3		325.8500	44.24	-14.73	29.51	37.00	-7.49	QP	
4	!	352.0400	45.76	-14.23	31.53	37.00	-5.47	QP	
5		960.2300	35.53	-5.45	30.08	37.00	-6.92	QP	
6	!	976.7200	37.77	-5.33	32.44	37.00	-4.56	QP	

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



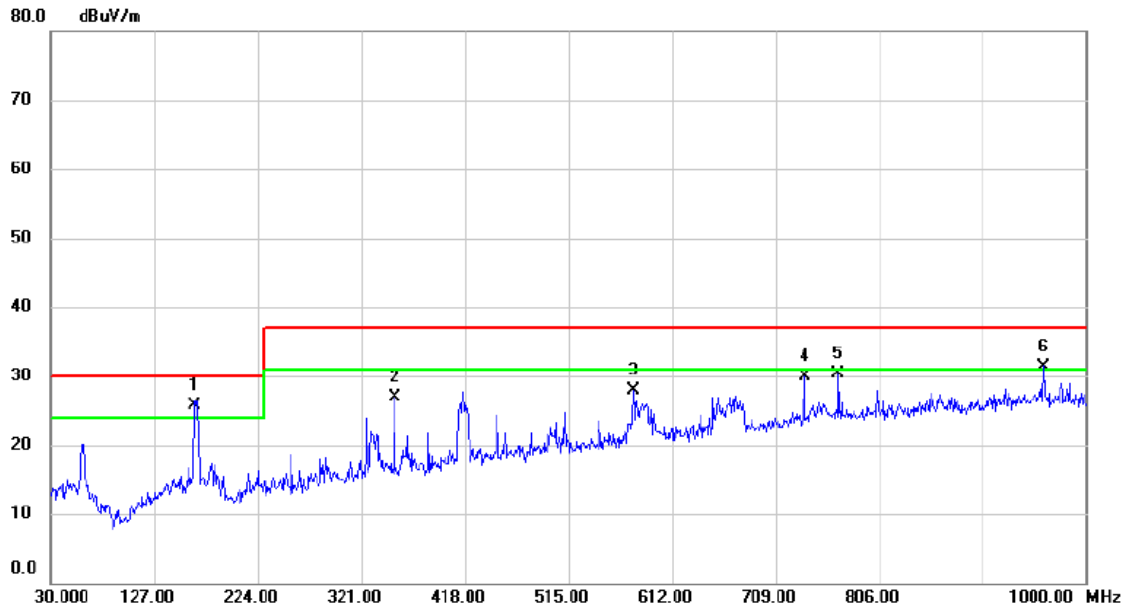
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	!	164.8300	41.84	-16.37	25.47	30.00	-4.53	QP	
2		325.8500	42.56	-14.46	28.10	37.00	-8.90	QP	
3		352.0400	43.92	-13.84	30.08	37.00	-6.92	QP	
4		672.1400	37.55	-8.01	29.54	37.00	-7.46	QP	
5	*	960.2300	37.37	-4.69	32.68	37.00	-4.32	QP	
6	!	976.7200	36.07	-4.62	31.45	37.00	-5.55	QP	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 5		



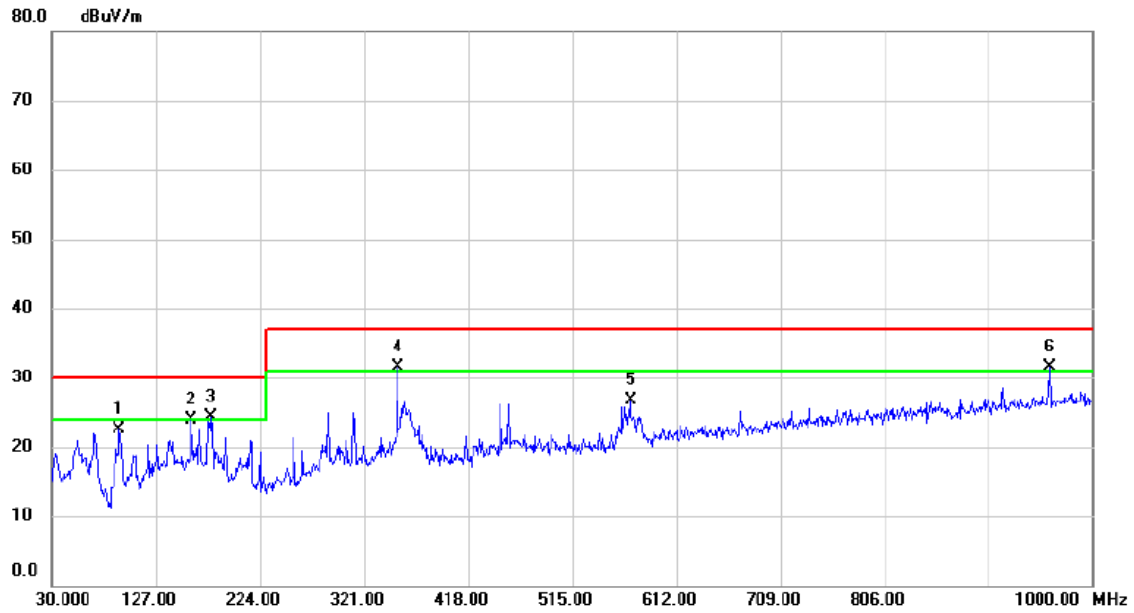
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		33.8800	41.07	-18.93	22.14	30.00	-7.86	QP	
2	*	59.1000	43.65	-17.86	25.79	30.00	-4.21	QP	
3	!	159.9800	41.15	-16.96	24.19	30.00	-5.81	QP	
4	!	167.7400	42.18	-17.18	25.00	30.00	-5.00	QP	
5		325.8500	43.06	-14.73	28.33	37.00	-8.67	QP	
6	!	960.2300	36.59	-5.45	31.14	37.00	-5.86	QP	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 5		



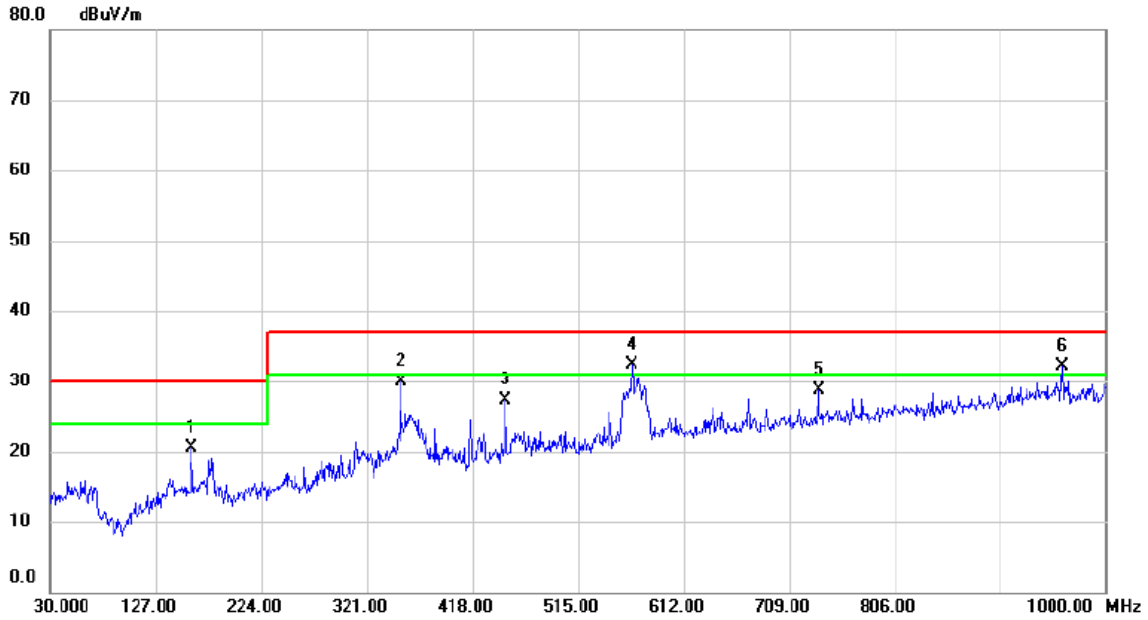
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	164.8300	42.10	-16.37	25.73	30.00	-4.27	QP	
2		352.0400	40.75	-13.84	26.91	37.00	-10.09	QP	
3		576.1100	37.18	-9.29	27.89	37.00	-9.11	QP	
4		736.1600	37.03	-7.20	29.83	37.00	-7.17	QP	
5		768.1700	37.09	-6.80	30.29	37.00	-6.71	QP	
6	!	960.2300	36.09	-4.69	31.40	37.00	-5.60	QP	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 11		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		93.0500	45.26	-22.69	22.57	30.00	-7.43	QP	
2		159.9800	40.79	-16.96	23.83	30.00	-6.17	QP	
3	!	178.4100	42.40	-18.02	24.38	30.00	-5.62	QP	
4	*	352.0400	45.69	-14.23	31.46	37.00	-5.54	QP	
5		569.3200	36.37	-9.66	26.71	37.00	-10.29	QP	
6	!	960.2300	36.86	-5.45	31.41	37.00	-5.59	QP	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 11		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		159.9800	36.77	-16.24	20.53	30.00	-9.47	QP	
2		352.0400	43.70	-13.84	29.86	37.00	-7.14	QP	
3		448.0700	38.66	-11.34	27.32	37.00	-9.68	QP	
4	*	564.4700	41.85	-9.60	32.25	37.00	-4.75	QP	
5		736.1600	35.93	-7.20	28.73	37.00	-8.27	QP	
6	!	960.2300	36.83	-4.69	32.14	37.00	-4.86	QP	

3.3 RADIATED EMISSIONS ABOVE 1 GHZ

3.3.1 LIMIT

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

FREQUENCY RANGE OF RADIATED MEASUREMENT (FOR UNINTENTIONAL RADIATORS)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

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

3.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Horn Antenna	EMCO	3115	9605-4803	May 10, 2022
2	Amplifier	Agilent	8449B	3008A02333	Feb. 28, 2022
3	MXE EMI Receiver	Agilent	N9038A	MY53220133	Feb. 28, 2022
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	Mlcable Inc.	B10-01-01-5M	18047123	Jan. 06, 2022
8	Cable	Mlcable Inc.	B10-01-01-12M	18072743	Jan. 06, 2022
9	Cable	RegalWay	RWLPS50-7.9A -SMSM-1M	20200102 001	Jan. 06, 2022

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

All calibration period of equipment list is one year.

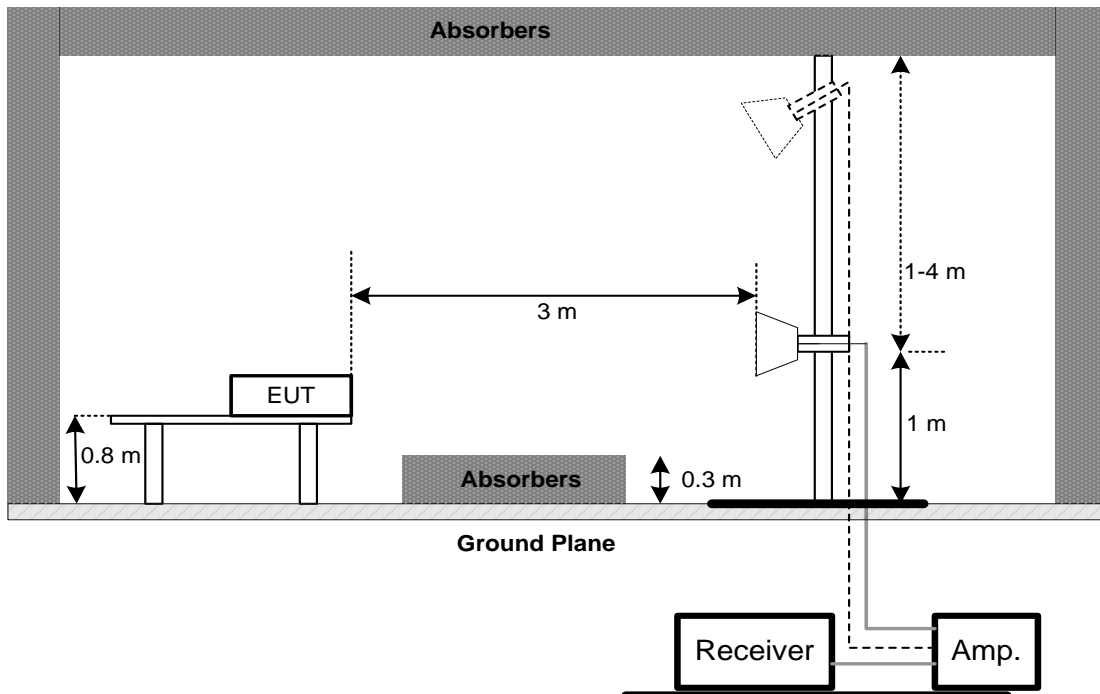
3.3.3 TEST PROCEDURE

- 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 Quasi Peak 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 - Block Diagram of system tested.

3.3.4 DEVIATION FROM TEST STANDARD

No deviation

3.3.5 TEST SETUP

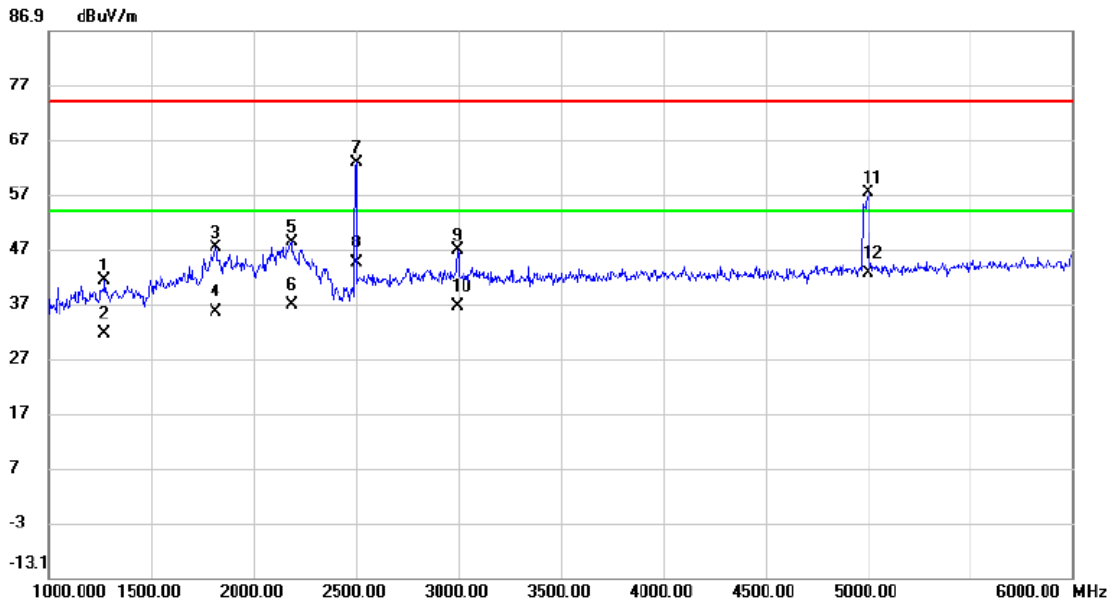


3.3.6 TEST RESULTS-ABOVE 1 GHZ

Remark :

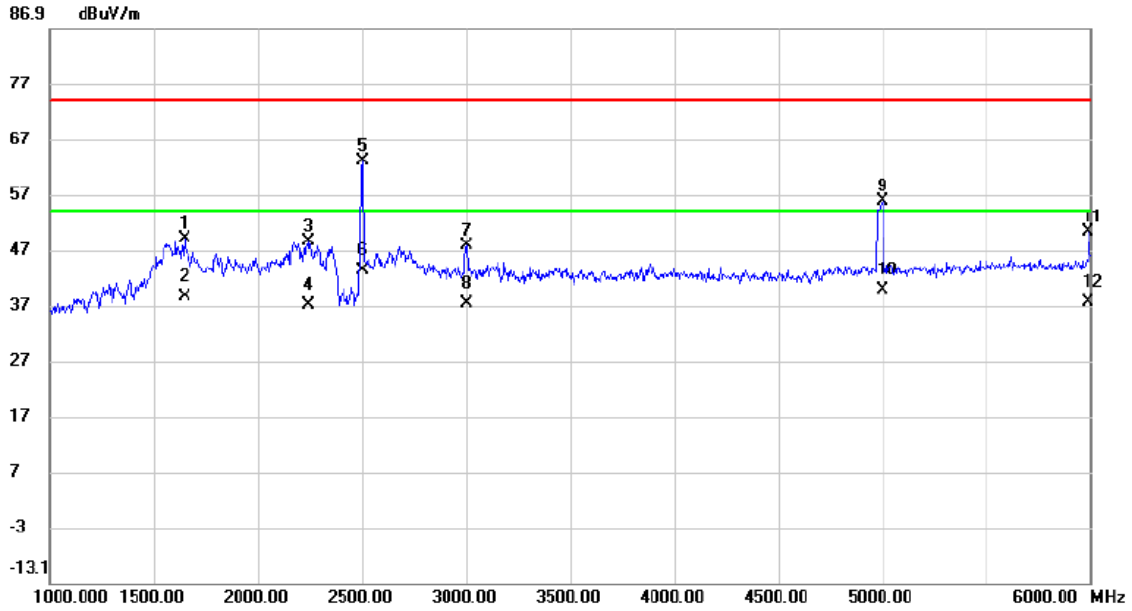
- (1) Radiated emissions measured in frequency range above 1000 MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.
- (2) Data of measurement within this frequency range shown “*” in the table above means the reading of emissions are attenuated more than 20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

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



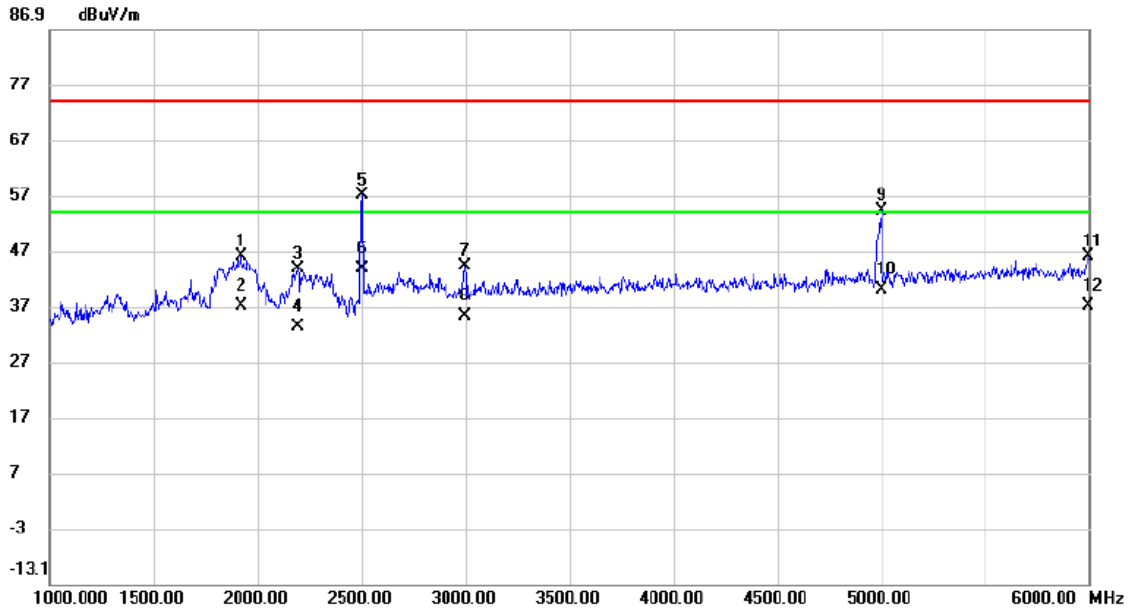
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1270.000	45.14	-3.87	41.27	74.00	-32.73	peak	
2		1270.000	35.46	-3.87	31.59	54.00	-22.41	AVG	
3		1817.500	48.26	-0.99	47.27	74.00	-26.73	peak	
4		1817.500	36.62	-0.99	35.63	54.00	-18.37	AVG	
5		2187.500	47.48	0.86	48.34	74.00	-25.66	peak	
6		2187.500	36.01	0.86	36.87	54.00	-17.13	AVG	
7		2500.000	60.87	2.02	62.89	74.00	-11.11	peak	
8	*	2500.000	42.51	2.02	44.53	54.00	-9.47	AVG	
9		2995.000	42.64	4.23	46.87	74.00	-27.13	peak	
10		2995.000	32.41	4.23	36.64	54.00	-17.36	AVG	
11		5000.000	47.07	10.09	57.16	74.00	-16.84	peak	
12		5000.000	32.32	10.09	42.41	54.00	-11.59	AVG	

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



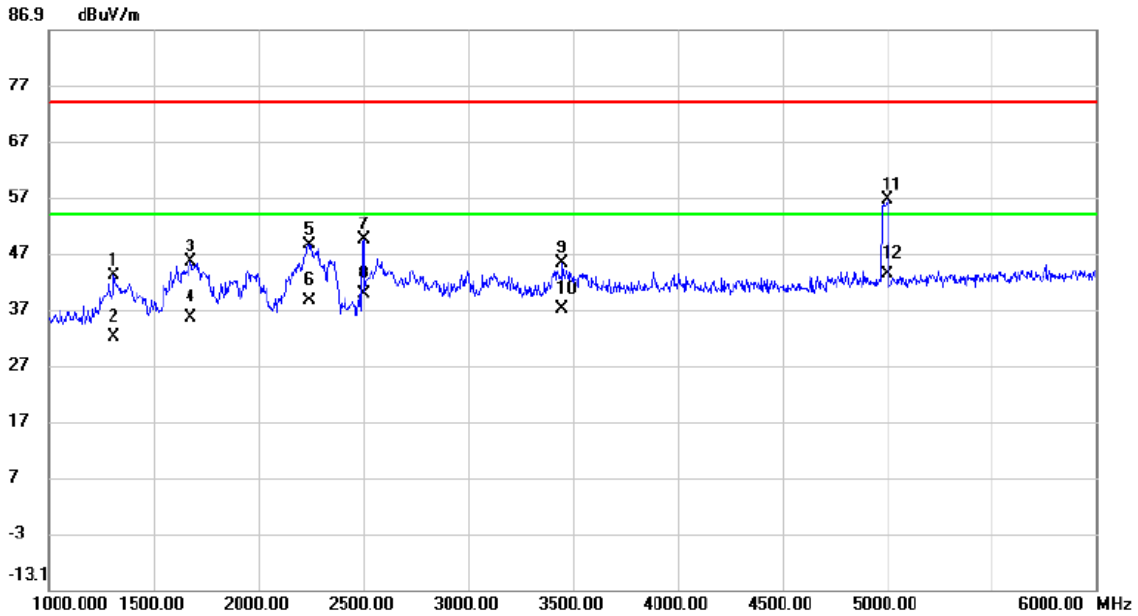
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1647.500	51.06	-2.08	48.98	74.00	-25.02	peak	
2		1647.500	40.58	-2.08	38.50	54.00	-15.50	AVG	
3		2242.500	47.37	1.06	48.43	74.00	-25.57	peak	
4		2242.500	35.91	1.06	36.97	54.00	-17.03	AVG	
5		2500.000	60.95	2.02	62.97	74.00	-11.03	peak	
6	*	2500.000	41.31	2.02	43.33	54.00	-10.67	AVG	
7		3000.000	43.46	4.25	47.71	74.00	-26.29	peak	
8		3000.000	33.12	4.25	37.37	54.00	-16.63	AVG	
9		5000.000	45.68	10.09	55.77	74.00	-18.23	peak	
10		5000.000	29.69	10.09	39.78	54.00	-14.22	AVG	
11		5992.500	38.16	12.18	50.34	74.00	-23.66	peak	
12		5992.500	25.37	12.18	37.55	54.00	-16.45	AVG	

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



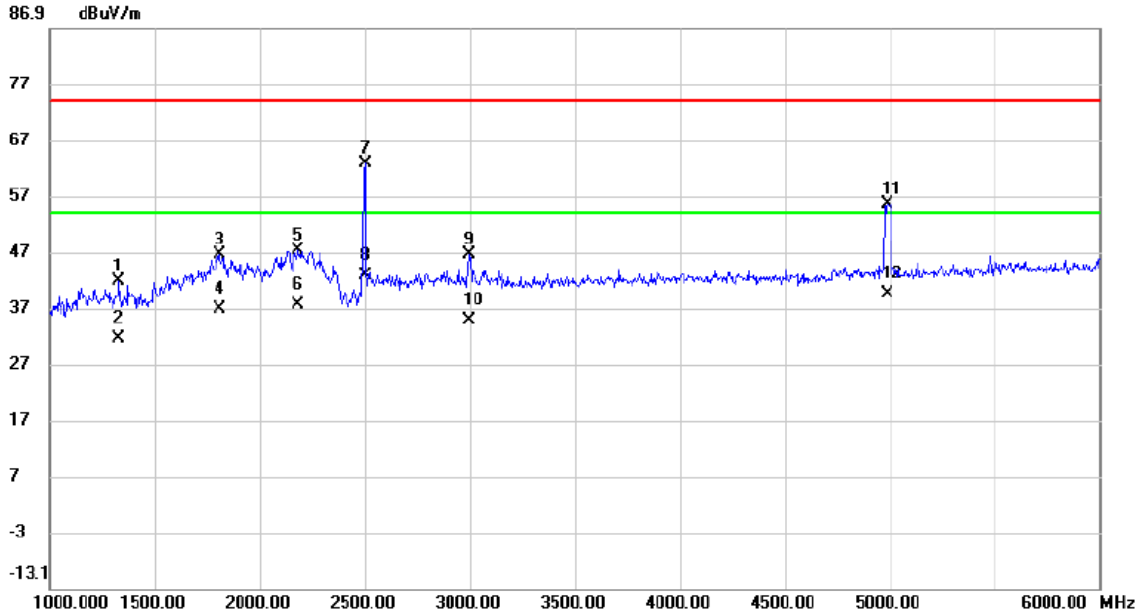
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1922.500	46.35	-0.33	46.02	74.00	-27.98	peak	
2		1922.500	37.30	-0.33	36.97	54.00	-17.03	AVG	
3		2195.000	42.77	0.89	43.66	74.00	-30.34	peak	
4		2195.000	32.31	0.89	33.20	54.00	-20.80	AVG	
5		2500.000	55.09	2.02	57.11	74.00	-16.89	peak	
6	*	2500.000	41.65	2.02	43.67	54.00	-10.33	AVG	
7		2997.500	40.02	4.24	44.26	74.00	-29.74	peak	
8		2997.500	31.00	4.24	35.24	54.00	-18.76	AVG	
9		5000.000	44.14	10.09	54.23	74.00	-19.77	peak	
10		5000.000	30.04	10.09	40.13	54.00	-13.87	AVG	
11		5995.000	33.77	12.18	45.95	74.00	-28.05	peak	
12		5995.000	24.79	12.18	36.97	54.00	-17.03	AVG	

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



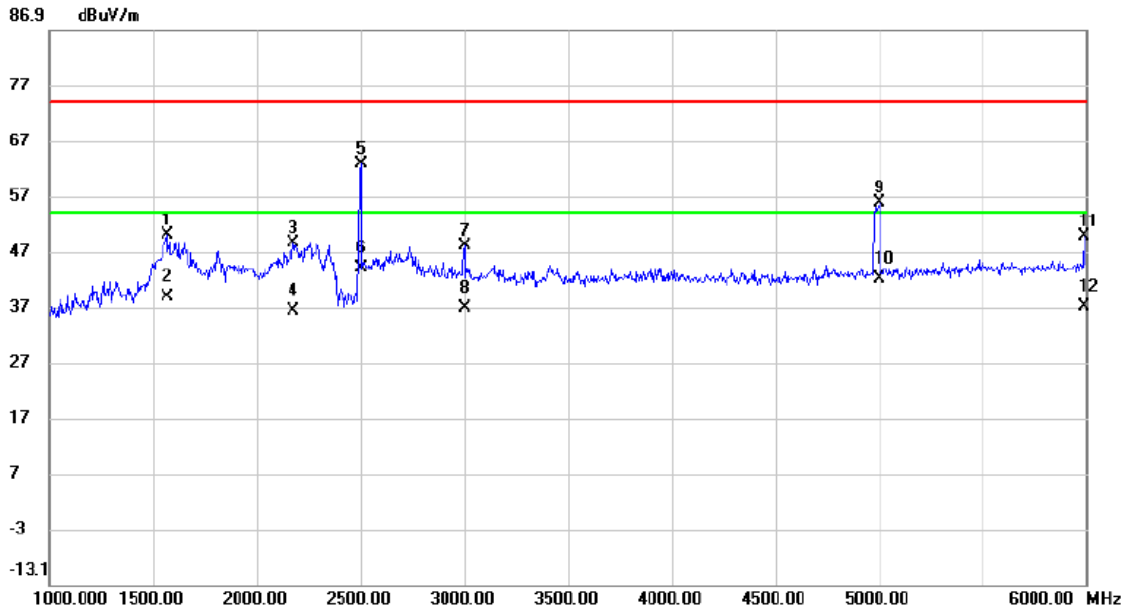
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1312.500	46.70	-3.71	42.99	74.00	-31.01	peak	
2		1312.500	35.74	-3.71	32.03	54.00	-21.97	AVG	
3		1675.000	47.39	-1.91	45.48	74.00	-28.52	peak	
4		1675.000	37.41	-1.91	35.50	54.00	-18.50	AVG	
5		2242.500	47.48	1.06	48.54	74.00	-25.46	peak	
6		2242.500	37.35	1.06	38.41	54.00	-15.59	AVG	
7		2500.000	47.44	2.02	49.46	74.00	-24.54	peak	
8		2500.000	37.85	2.02	39.87	54.00	-14.13	AVG	
9		3452.500	39.51	5.72	45.23	74.00	-28.77	peak	
10		3452.500	31.25	5.72	36.97	54.00	-17.03	AVG	
11		5000.000	46.39	10.09	56.48	74.00	-17.52	peak	
12	*	5000.000	33.14	10.09	43.23	54.00	-10.77	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 5		



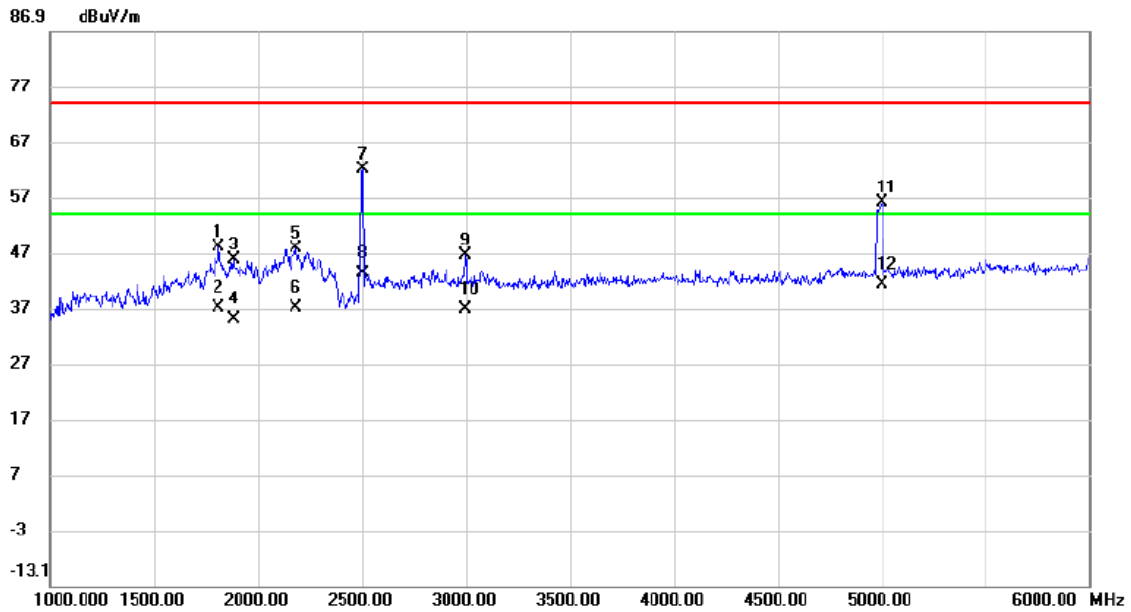
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1332.500	45.51	-3.64	41.87	74.00	-32.13	peak	
2		1332.500	35.23	-3.64	31.59	54.00	-22.41	AVG	
3		1807.500	47.71	-1.06	46.65	74.00	-27.35	peak	
4		1807.500	37.90	-1.06	36.84	54.00	-17.16	AVG	
5		2185.000	46.39	0.86	47.25	74.00	-26.75	peak	
6		2185.000	36.64	0.86	37.50	54.00	-16.50	AVG	
7	*	2500.000	60.73	2.02	62.75	74.00	-11.25	peak	
8		2500.000	40.67	2.02	42.69	54.00	-11.31	AVG	
9		2995.000	42.38	4.23	46.61	74.00	-27.39	peak	
10		2995.000	30.64	4.23	34.87	54.00	-19.13	AVG	
11		4992.500	45.56	10.07	55.63	74.00	-18.37	peak	
12		4992.500	29.57	10.07	39.64	54.00	-14.36	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 5		



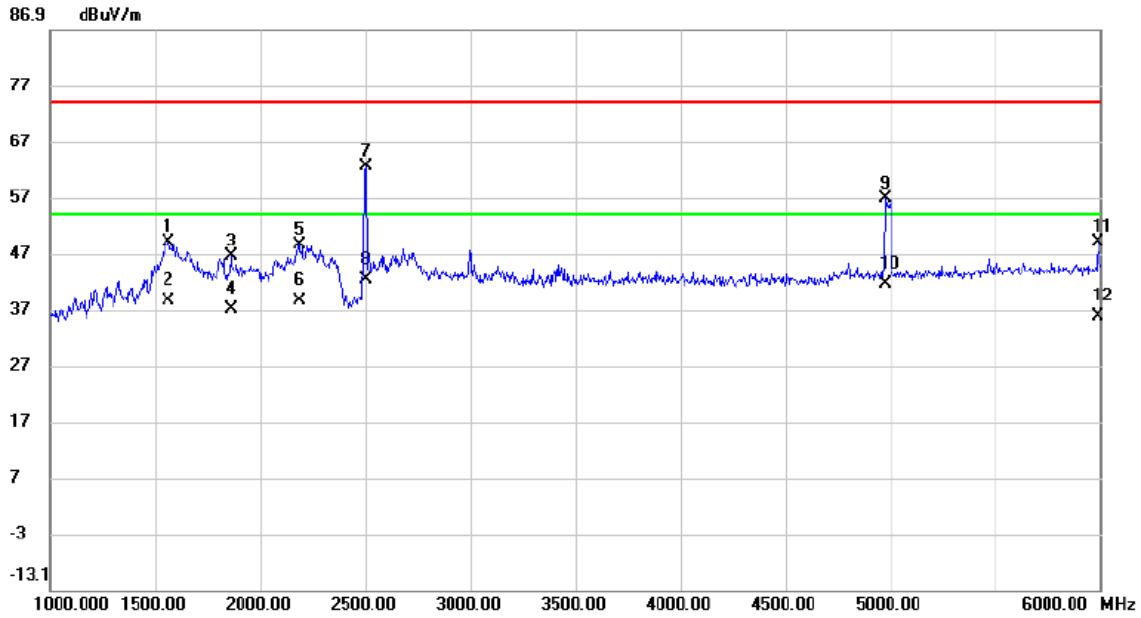
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1567.500	52.53	-2.59	49.94	74.00	-24.06	peak	
2		1567.500	41.36	-2.59	38.77	54.00	-15.23	AVG	
3		2175.000	47.83	0.82	48.65	74.00	-25.35	peak	
4		2175.000	35.38	0.82	36.20	54.00	-17.80	AVG	
5		2500.000	60.75	2.02	62.77	74.00	-11.23	peak	
6	*	2500.000	41.95	2.02	43.97	54.00	-10.03	AVG	
7		3000.000	43.77	4.25	48.02	74.00	-25.98	peak	
8		3000.000	32.62	4.25	36.87	54.00	-17.13	AVG	
9		5000.000	45.80	10.09	55.89	74.00	-18.11	peak	
10		5000.000	31.94	10.09	42.03	54.00	-11.97	AVG	
11		5992.500	37.63	12.18	49.81	74.00	-24.19	peak	
12		5992.500	24.79	12.18	36.97	54.00	-17.03	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 11		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1810.000	49.20	-1.05	48.15	74.00	-25.85	peak	
2		1810.000	38.02	-1.05	36.97	54.00	-17.03	AVG	
3		1882.500	46.43	-0.58	45.85	74.00	-28.15	peak	
4		1882.500	35.71	-0.58	35.13	54.00	-18.87	AVG	
5		2180.000	46.85	0.84	47.69	74.00	-26.31	peak	
6		2180.000	36.09	0.84	36.93	54.00	-17.07	AVG	
7		2500.000	60.11	2.02	62.13	74.00	-11.87	peak	
8	*	2500.000	41.27	2.02	43.29	54.00	-10.71	AVG	
9		2997.500	42.31	4.24	46.55	74.00	-27.45	peak	
10		2997.500	32.63	4.24	36.87	54.00	-17.13	AVG	
11		5000.000	45.90	10.09	55.99	74.00	-18.01	peak	
12		5000.000	31.13	10.09	41.22	54.00	-12.78	AVG	

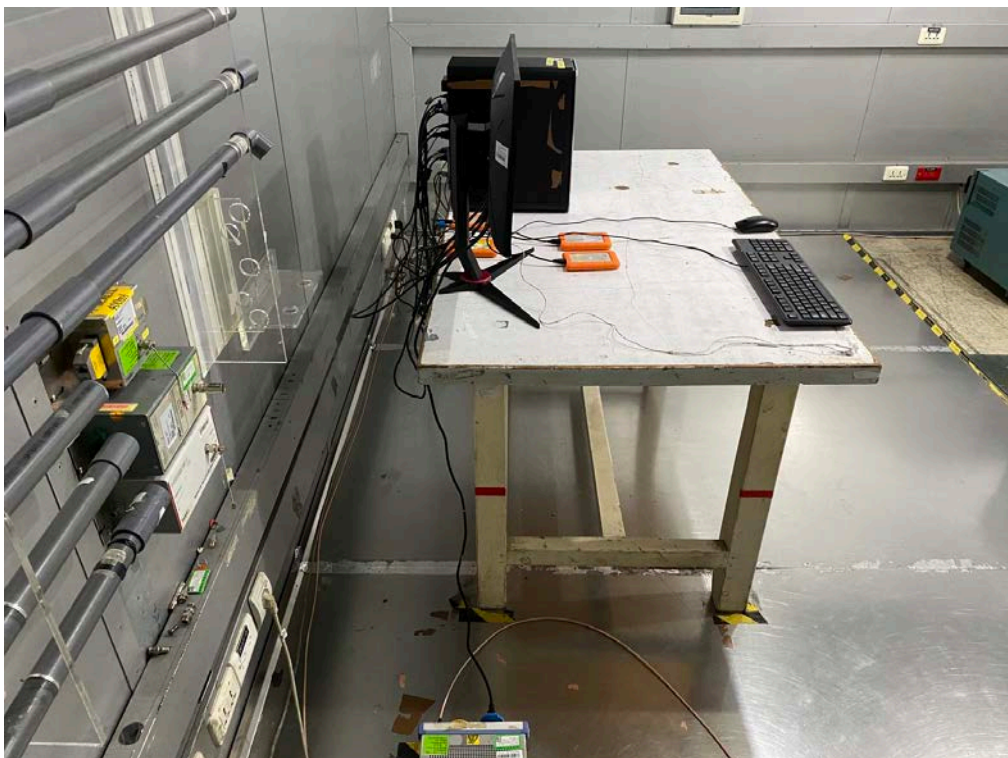
Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 11		



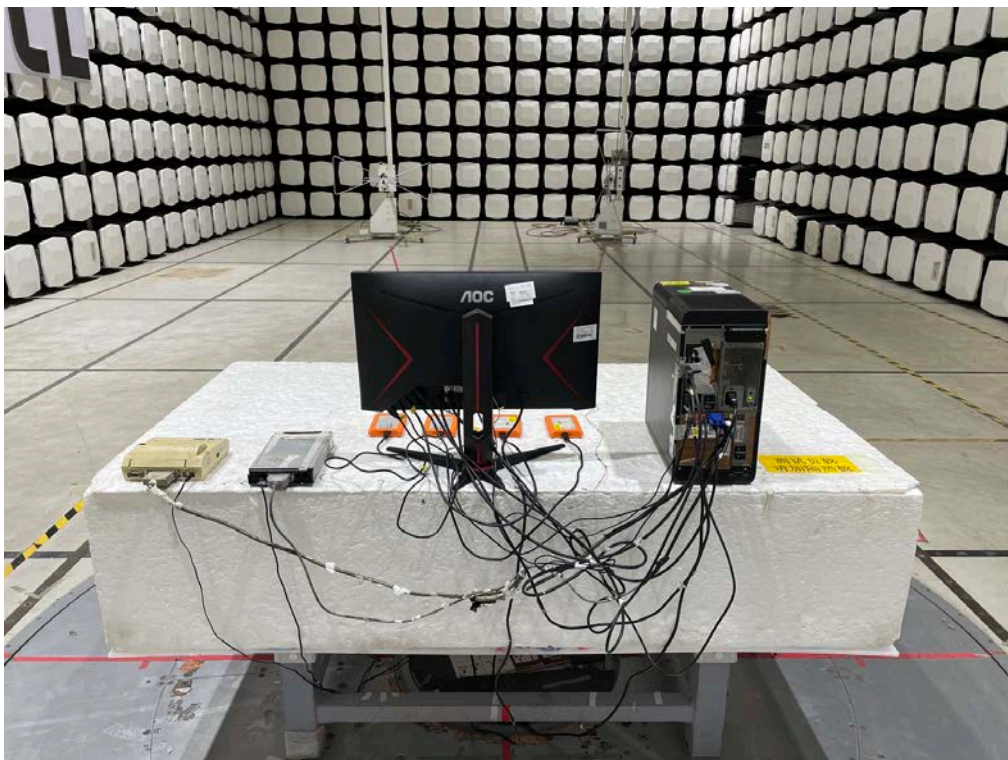
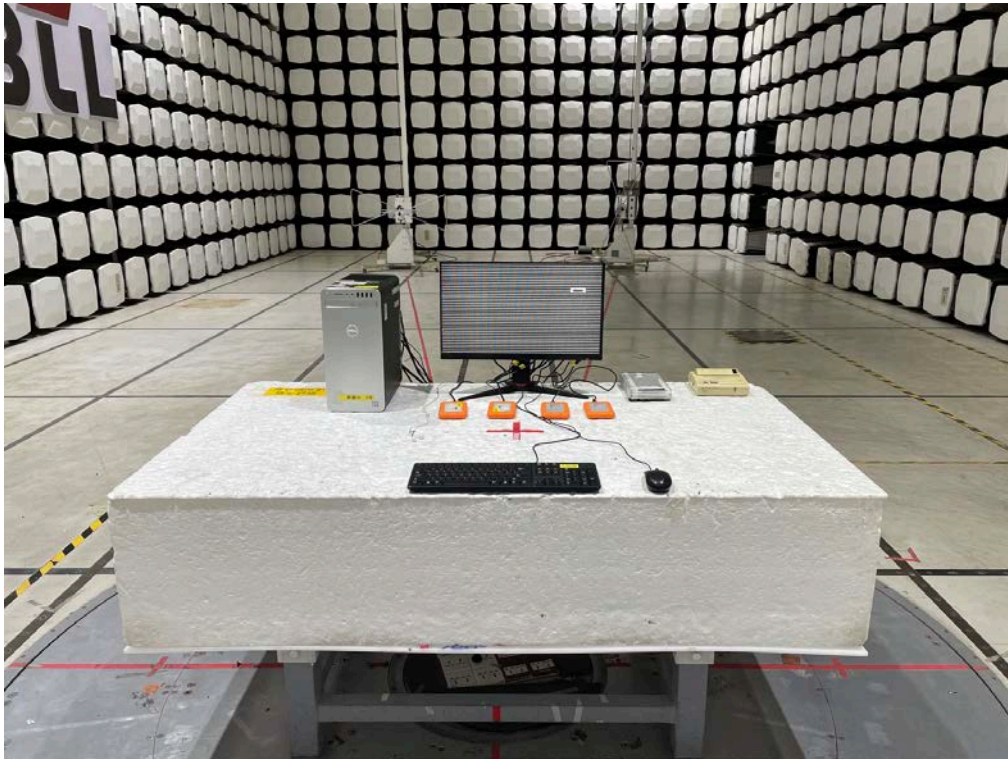
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1565.000	51.55	-2.60	48.95	74.00	-25.05	peak	
2		1565.000	41.23	-2.60	38.63	54.00	-15.37	AVG	
3		1862.500	47.19	-0.70	46.49	74.00	-27.51	peak	
4		1862.500	37.67	-0.70	36.97	54.00	-17.03	AVG	
5		2187.500	47.79	0.86	48.65	74.00	-25.35	peak	
6		2187.500	37.64	0.86	38.50	54.00	-15.50	AVG	
7	*	2500.000	60.56	2.02	62.58	74.00	-11.42	peak	
8		2500.000	40.18	2.02	42.20	54.00	-11.80	AVG	
9		4977.500	46.64	10.03	56.67	74.00	-17.33	peak	
10		4977.500	31.48	10.03	41.51	54.00	-12.49	AVG	
11		5992.500	36.81	12.18	48.99	74.00	-25.01	peak	
12		5992.500	23.60	12.18	35.78	54.00	-18.22	AVG	

4. EUT TEST PHOTO

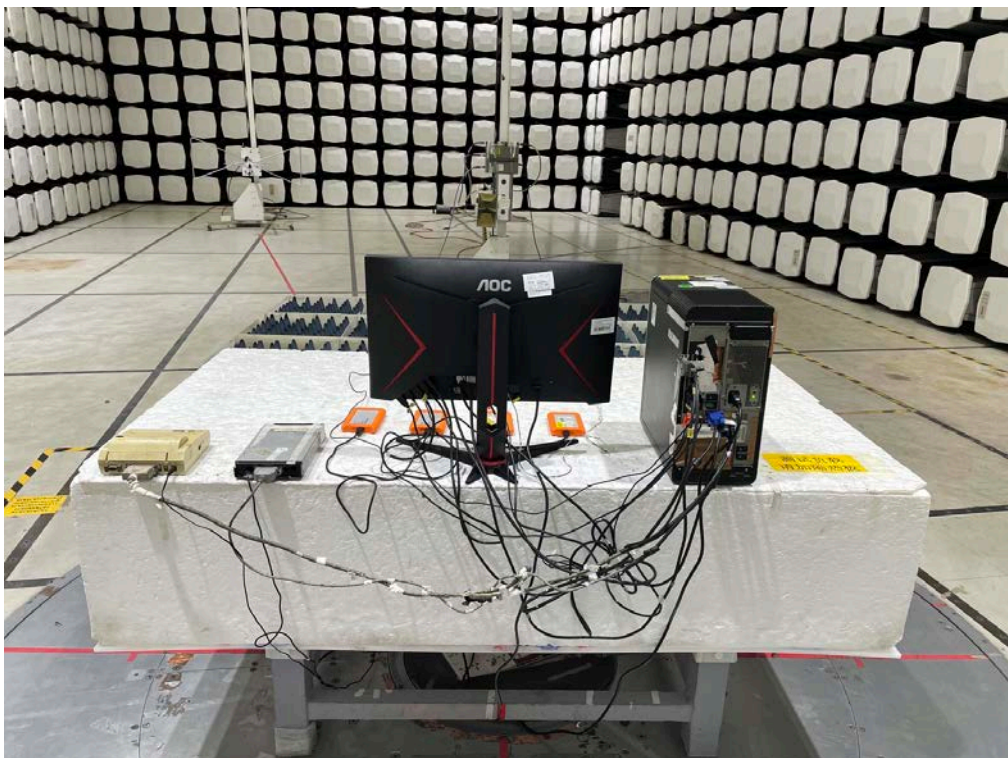
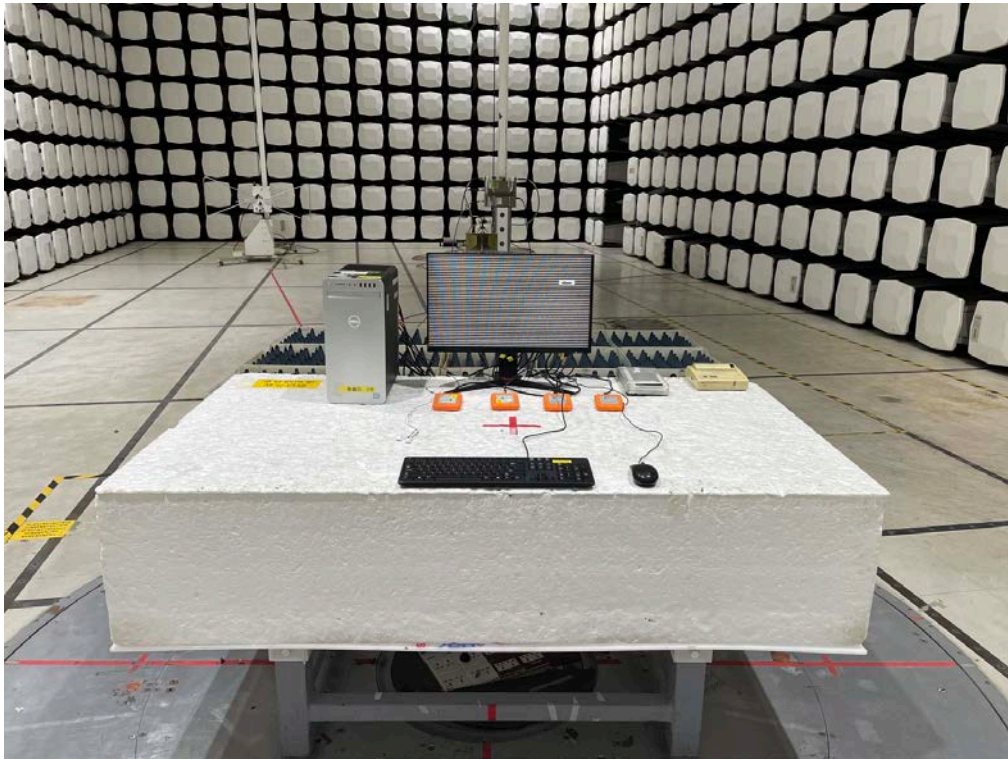
AC Power Line Conducted Emissions



Radiated Emissions 30 MHz to 1 GHz



Radiated Emissions Above 1 GHz

**End of Test Report**