FCC TEST REPORT

For

Zigbee SoC

Model Number: JASMG21A

FCC ID: U2ZJASMG21A

Report Number : WT228002022

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection
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Revision History

No	Date	Remark
V1.0	2022.11.02	Initial issue

Test report declaration

Applicant	:	Sheenway Asia Ltd.
Address	:	Room1313, 13/F, Austin Tower, 22-26 Austin Avenue, Tsim Sha Tsui, Kowloon, Hong Kong, China
Manufacturer	:	Sheenway Asia Ltd.
Address	:	Room1313, 13/F, Austin Tower, 22-26 Austin Avenue, Tsim Sha Tsui, Kowloon, Hong Kong, China
EUT Description	:	Zigbee SoC
Model No.	:	JASMG21A
FCC ID	:	U2ZJASMG21A

Test Standards:

FCC Part 15 Subpart C 15.247
ANSI C63.10-2013

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	(Zhou Fangai 周芳媛)	Date:	Nov.02, 2022
Checked by:	(Shi Changda 施昌达)	Date:	Nov.02, 2022
Approved by:	(Lin Yixiang 林奕翔)	Date:	Nov.02, 2022

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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
6dB DTS bandwidth measurement	15.247 (a) (2)	Pass
Maximum Peak Conducted Power	15.247 (b) (3)	Pass
Maximum Power Spectral Density Level	15.247 (e)	Pass
Conducted Bandedge and Spurious	15.247 (d)	Pass
Radiated Bandedge and Spurious	15.247 (d) 15.209 15.205	Pass
Conducted emission test for AC power port	15.207	Pass
Antenna Requirement	15.203 15.247 (b)	Pass

Remark: “N/A” means “Not applicable.”

2. GENERAL INFORMATION

2.1. Report information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

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The lab will not be liable for any loss or damage resulting for false, inaccurate, inappropriate or incomplete product information provided by the applicant/manufacturer.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A.

The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078 and T-20047.

The Laboratory is Accredited Testing Laboratory of American Association for Laboratory Accreditation (A2LA) and certificate number is 3292.01.

2.3. Measurement Uncertainty

Conducted Emission
9 kHz~150 kHz U=3.7dB k=2
150 kHz~30MHz U=3.3dB k=2

Radiated Emission
30MHz~1000MHz U=4.3dB k=2
1GHz~6GHz U=4.6 dB k=2
6GHz~40GHz U=5.1dB k=2

3. PRODUCT DESCRIPTION

NOTE: The extreme test conditions for temperature and antenna gain were declared by the manufacturer.

3.1. EUT Description

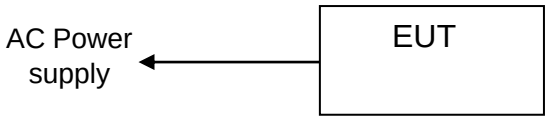
Description	:	Zigbee SoC
Manufacturer	:	Sheenway Asia Ltd.
Model Number	:	JASMG21A
Rated Input	:	1.71V~3.8V DC
Power supply	:	AC 120V/60Hz
Operate Frequency	:	2405MHz-2480MHz
Modulation	:	DSSS (O-QPSK)
Data Rate (Mbps)	:	250kbps
Antenna Designation	:	chip antenna
Antenna Gain	:	2dBi

Remark: --

Table 2 Working Frequency List

Channel	Center Frequency (MHz)	Channel	Center Frequency (MHz)
11	2405	19	2445
12	2410	20	2450
13	2415	21	2455
14	2420	22	2460
15	2425	23	2465
16	2430	24	2470
17	2435	25	2475
18	2440	26	2480

3.2. Block Diagram of EUT Configuration



Test Setup

3.3. Operating Condition of EUT

Worst-case mode and channel used for power line conducted emissions was the mode and channel with the highest output power.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y, Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.
Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Date Rate	Channel
Maximum Peak Conducted Power	TX	250 kbps	11, 18, 26
6dB DTS bandwidth Power Spectral Density	TX	250 kbps	11, 18, 26
Spurious Emission (below 1GHz)	TX	250 kbps	Worst-case
Spurious Emission (above 1GHz)	TX	250 kbps	11, 18, 26
Band Edge	TX	250 kbps	11, 26
Conducted emission test for AC power port	TX	250 kbps	Worst-case

3.4. Special Accessories

Not available for this EUT intended for grant.

3.5. Equipment Modifications

Not available for this EUT intended for grant.

3.6. Support Equipment List

Table 3 Support Equipment List

Name	Model No	S/N	Manufacturer
Notebook	HP ProBook 440 G6	---	HP

3.7. Test Conditions

Date of test：Aug.30, 2022 – Nov.02, 2022
Date of EUT Receive：Aug.15, 2022
Temperature: (20-25) ℃
Relative Humidity: (41-56) %

4. TEST EQUIPMENT USED

Table 4 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB9058/05	Test Receiver	R&S	ESCI 3	Sep.24,2021	1 Year
SB9058/05	Test Receiver	R&S	ESCI 3	Sep.13,2022	1 Year
SB4357	AMN	R&S	ENN216	Aug.23,2022	1 Year
SB9549	Shielded Room	Albatross	SR	Sep.24,2021	1 Year
SB9549	Shielded Room	Albatross	SR	Sep.06,2022	1 Year
SB15044/01	Test Receiver	R&S	ESW8	Sep.14,2021	1 Year
SB15044/01	Test Receiver	R&S	ESW8	Sep.13,2022	1 Year
SB3345	Loop Antenna	Schwarzbeck	FMZB1516-113	Jan.20,2022	1 Year
SB18856	Broadband Antenna	SCHWARZBECK	VULB9163	Sep.26,2021	1 Year
SB18856	Broadband Antenna	SCHWARZBECK	VULB9163	Sep.07,2022	1 Year
SB18844	Semi Anechoic Chamber	Albatross	9×6×6(m)	Mar.22,2022	1 Year
SB8501/09	Test Receiver	R&S	ESU40	Jan.20,2022	1 Year
SB3435	Horn Antenna	R&S	HF906	Dec.03,2021	1 Year
SB9058/03	Pre-Amplifier	R&S	SCU 18	Jan.20,2022	1 Year
SB8501/11	Antenna	R&S	3160-09	Mar.09,2020	3 Years
SB8501/16	Pre-Amplifier	R&S	SCU-26	Jan.20,2022	1 Year
SB9555/02	Fully Anechoic Chamber	Albatross	10.0×5.2×5.4(m)	Aug.16,2022	1 Year
SB20321/01	Spectrum Analyzer	R&S	FSV3044	Dec.24,2021	1 Year

Table 5 Test software

Name	Manufacturer	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscend co.,ltd	2.6.87.0615

5. DUTY CYCLE

5.1. LIMITS OF DUTY CYCLE

None; for reporting purposes only

5.2. TEST PROCEDURE

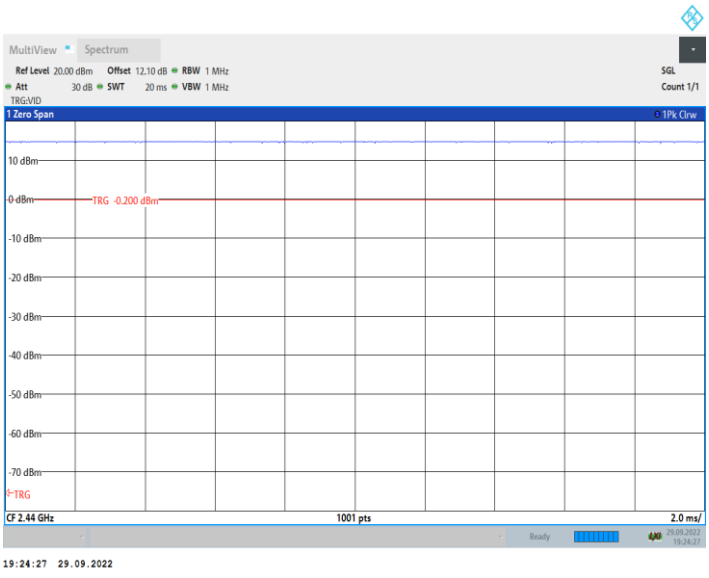
Reference to KDB558074 D01 15.247 Meas Guidance v05r02, Zero-Span Spectrum Analyzer Method.

5.3. TEST SETUP

5.4. TEST DATA

Table 6 Duty Cycle Test Data

Test Mode	On Time (ms)	Duty Cycle (%)	Duty Factor	1/T Minimum VBW (kHz)
Channel 18 (2440 MHz)	--	100	0.0	0.01



6. 6DB BANDWIDTH MEASUREMENT

6.1. LIMITS OF 6dB BANDWIDTH MEASUREMENT

CFR 47 (FCC) part 15.247 (a) (2)

6.2. TEST PROCEDURE

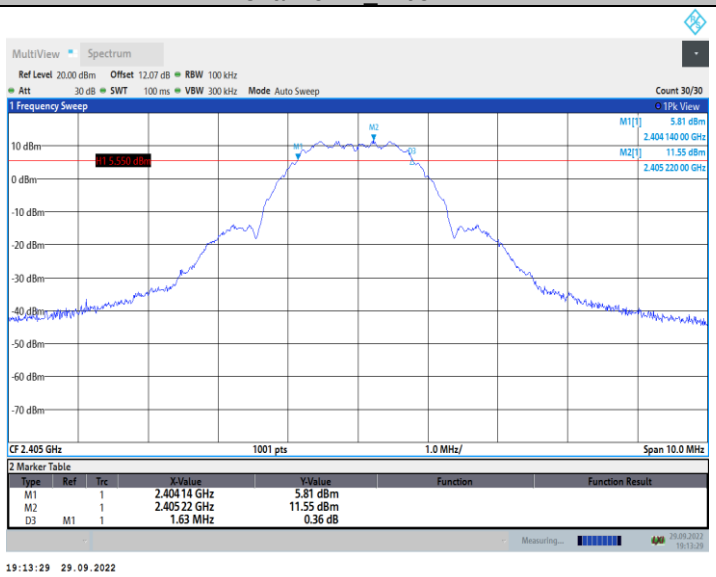
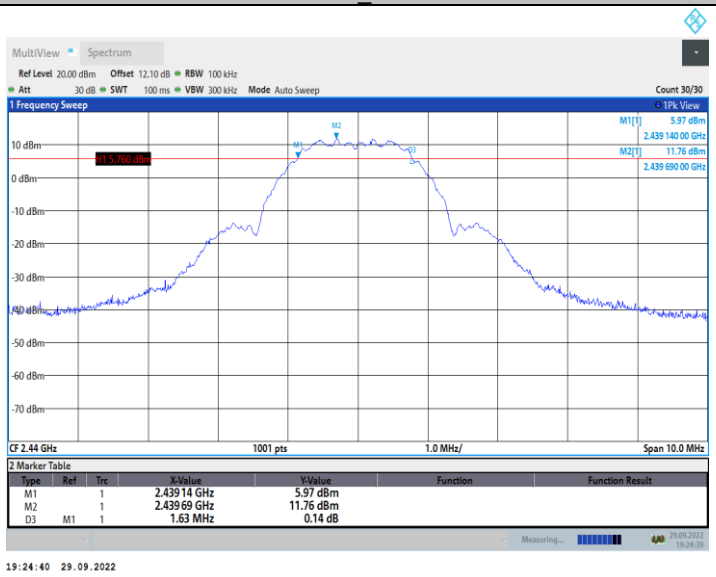
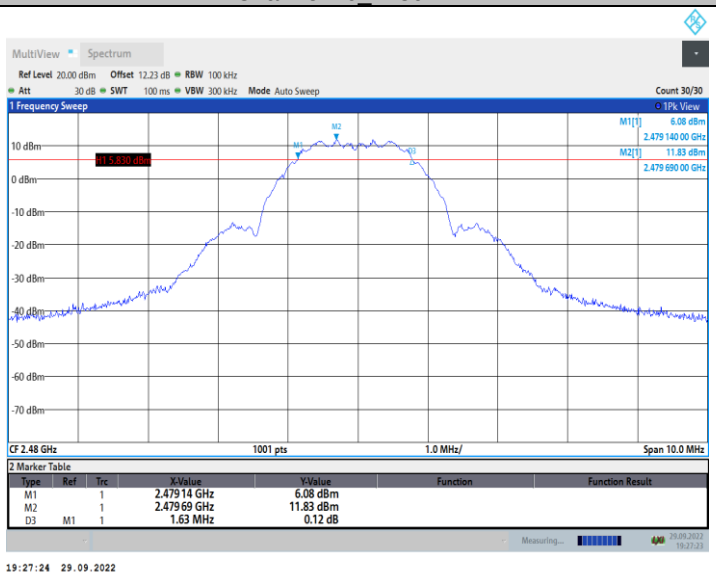
Reference to KDB558074 D01 15.247 Meas Guidance v05r02,
The transmitter output was connected to the spectrum analyzer.
a) Set RBW = 100 kHz.
b) Set the VBW ≥ [3 × RBW].
c) Detector = Peak.
d)Trace mode = max hold.
e)Sweep = auto couple.
f)Allow the trace to stabilize.
g)Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

6.3. TEST SETUP

6.4. Test Data

Table 7 6dB Bandwidth Test Data

Channel	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11	2405	1.63	0.5	PASS
18	2440	1.63	0.5	PASS
26	2480	1.63	0.5	PASS

Channel 11_2405 MHz

Channel 18_2440 MHz

Channel 26_2480 MHz


7. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

7.1. LIMITS OF Maximum Conducted Output Power Measurement

CFR 47 (FCC) part 15.247 (b) (3)

7.2. TEST PROCEDURE

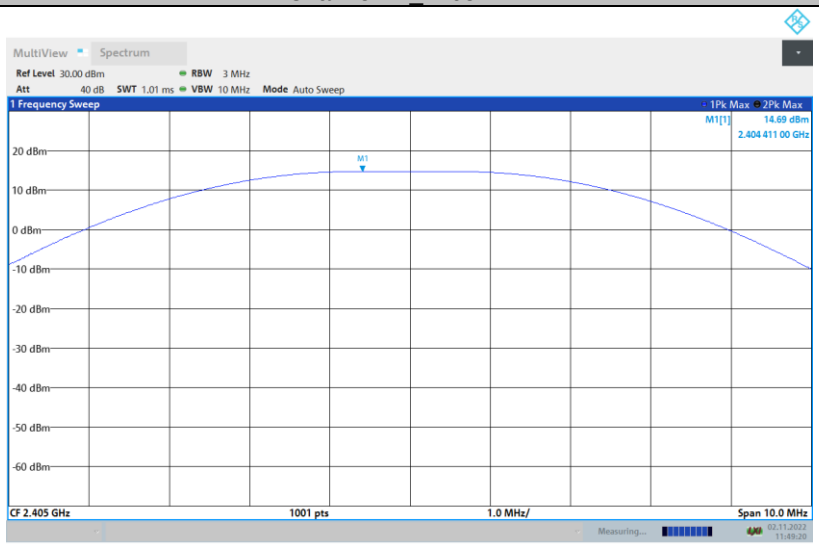
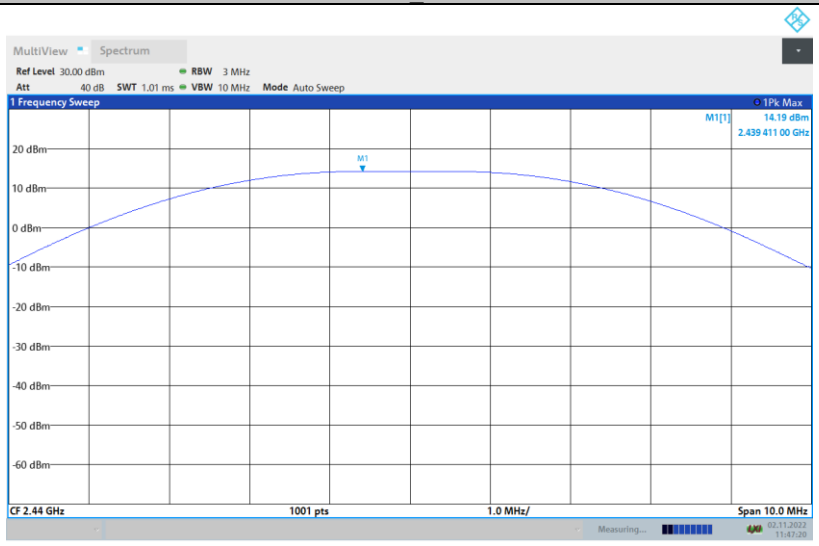
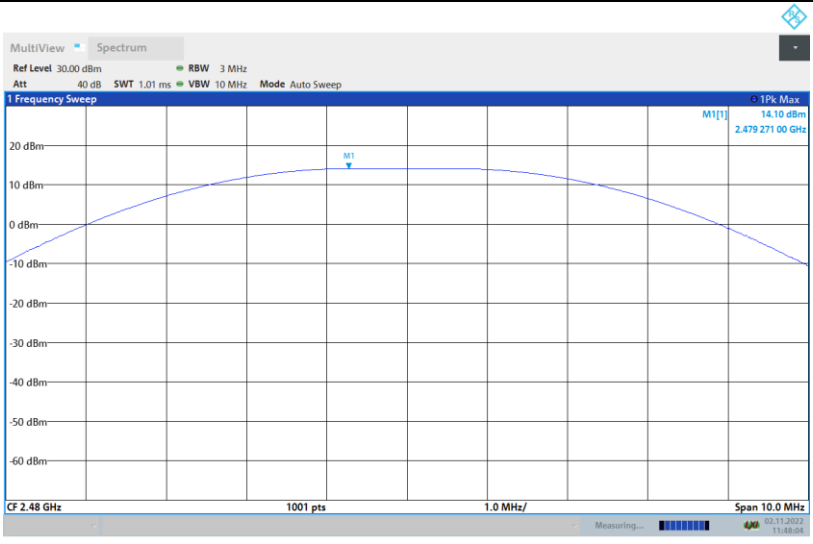
Reference to KDB558074 D01 15.247 Meas Guidance v05r02,
The transmitter output was connected to the spectrum analyzer.
a) Set the RBW ≥ DTS bandwidth.
b) Set the VBW ≥ [3 × RBW].
c) Set the span ≥ [3 × RBW].
d) Detector = Peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

7.3. TEST SETUP

7.4. TEST DATA

Table 8 Maximum Conducted Output Power

Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Verdict
11	2405	14.69	<=30	PASS
18	2440	14.19	<=30	PASS
26	2480	14.10	<=30	PASS

Channel 11_2405 MHz
 11:49:21 02.11.2022
Channel 18_2440 MHz
 11:47:20 02.11.2022
Channel 26_2480 MHz
 11:48:05 02.11.2022

8. MAXIMUM POWER SPECTRAL DENSITY LEVEL MEASUREMENT

8.1. LIMITS OF Maximum Power Spectral Density Level Measurement

CFR 47 (FCC) part 15.247 (e)

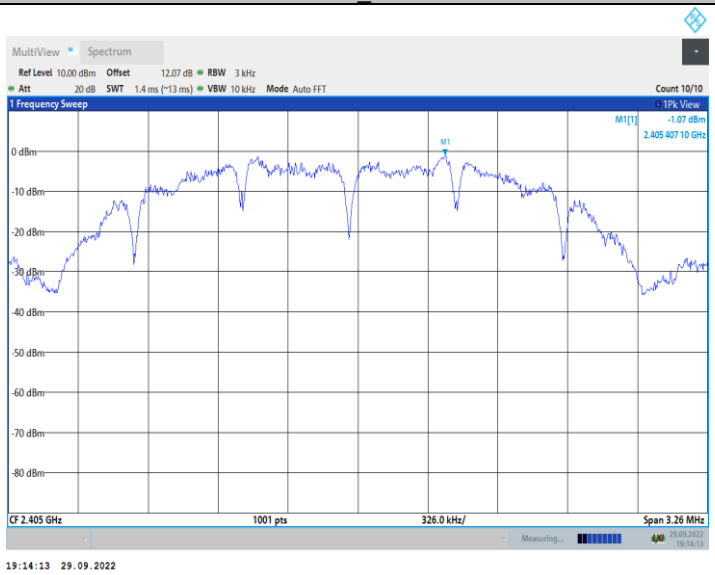
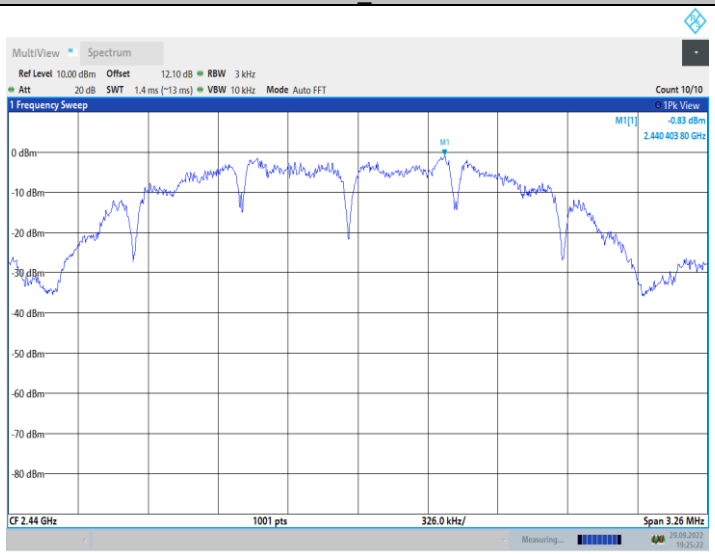
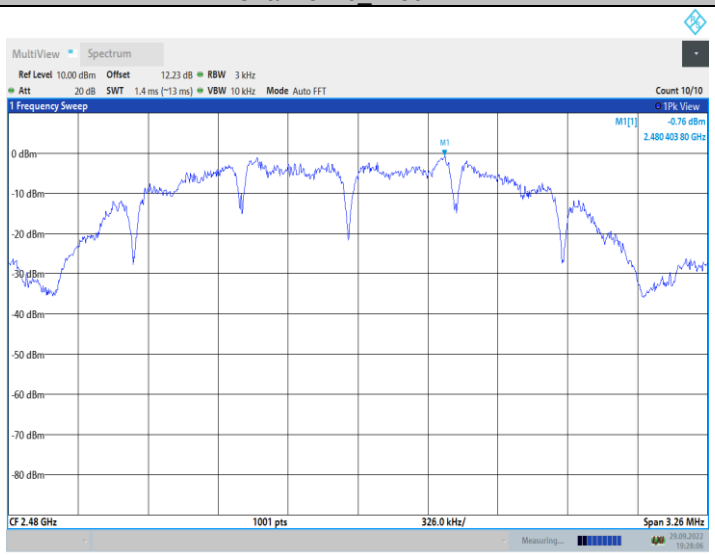
8.2. TEST PROCEDURE

Reference to KDB558074 D01 15.247 Meas Guidance v05r02,
The transmitter output was connected to the spectrum analyzer.
a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: RBW = 3 kHz.
d) Set the VBW = 10 kHz.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

8.3. TEST DATA

Table 9 Maximum Power Spectral Density Level

Channel	Frequency [MHz]	Maximum Power Spectral Density Level [dBm]	Limit [dBm]	Verdict
11	2405	-1.07	<=8	PASS
18	2440	-0.83	<=8	PASS
26	2480	-0.76	<=8	PASS

Channel 11_2405 MHz
 19:14:13 29.09.2022
Channel 18_2440 MHz
 19:25:23 29.09.2022
Channel 26_2480 MHz
 19:28:08 29.09.2022

9. CONDUCTED BANDEDGE AND SPURIOUS MEASURMENT

9.1. LIMITS OF Conducted Bandedge and Spurious Measurement

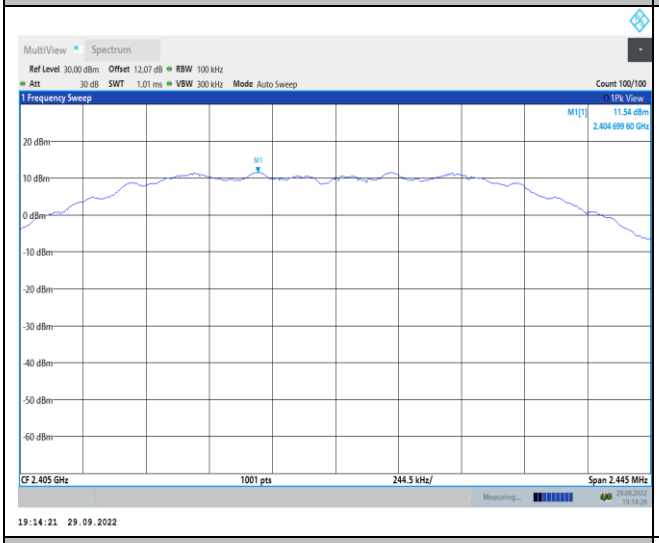
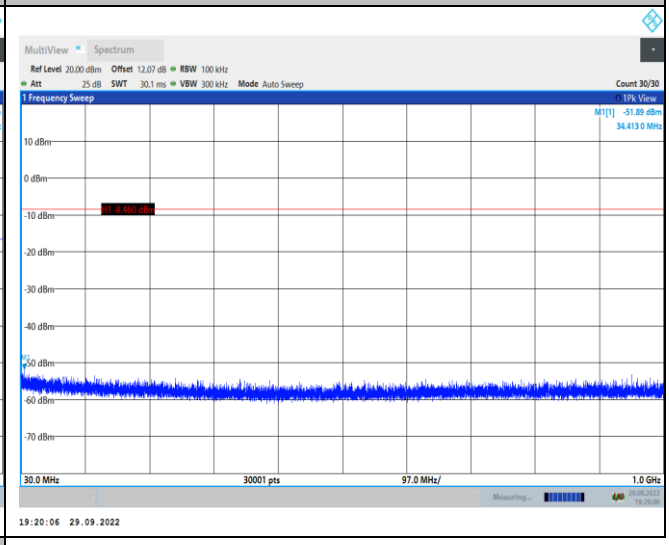
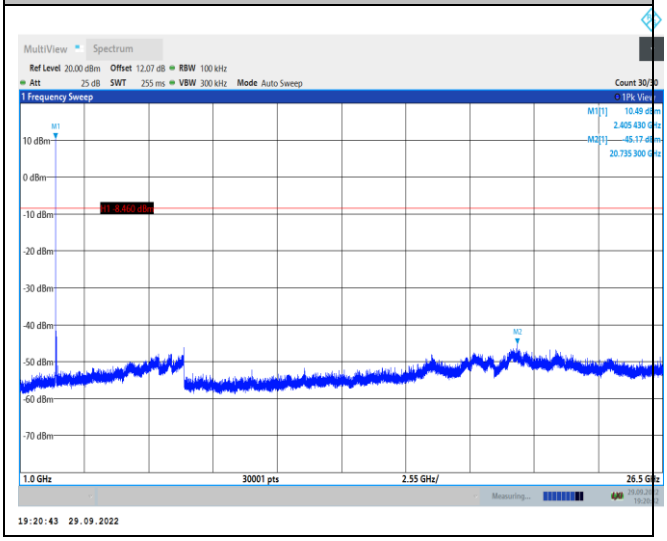
CFR 47 (FCC) part 15.247 (d)

9.2. TEST PROCEDURE

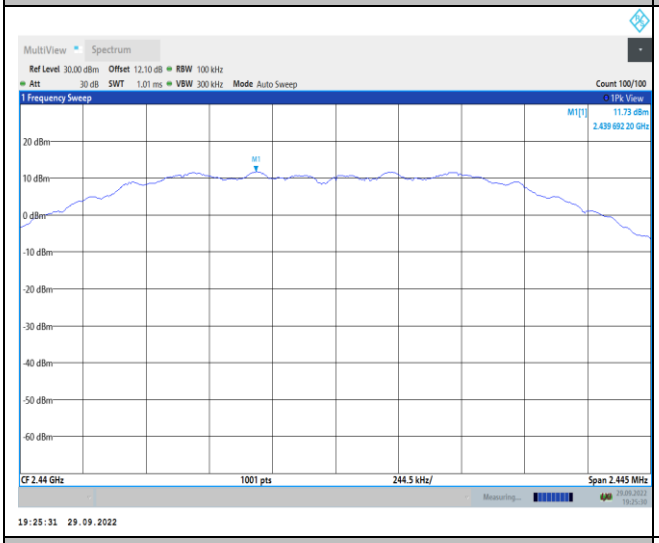
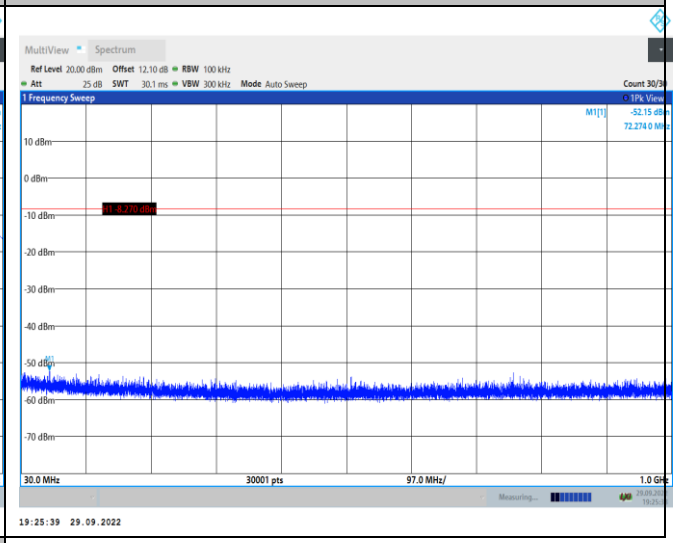
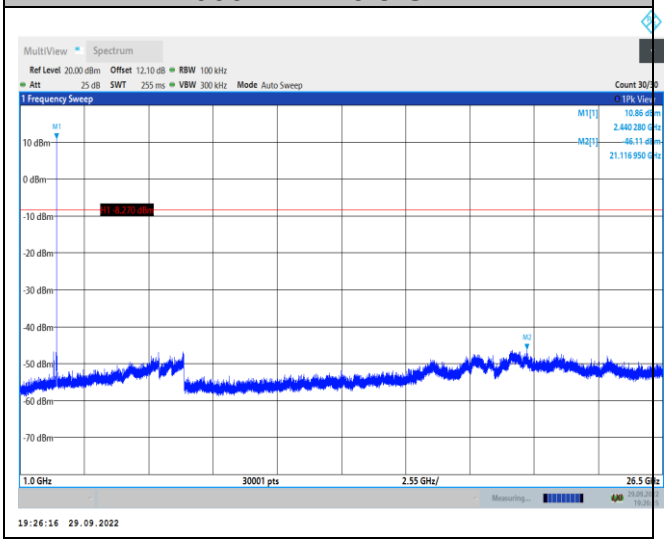
Reference to KDB558074 D01 15.247 Meas Guidance v05r02,
The transmitter output was connected to the spectrum analyzer.
Establish a reference level by using the following procedure:
a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to $\geqslant$ 1.5 times the DTS bandwidth.
c) Set the RBW = 100 kHz.
d) Set the VBW $\geqslant$ 3 x RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.
Emission level measurement
a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW $\geqslant$ 3 x RBW.
d) Detector = peak.
e) Ensure that the number of measurement points $\geqslant$ span/RBW
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level.

9.3. TEST DATA

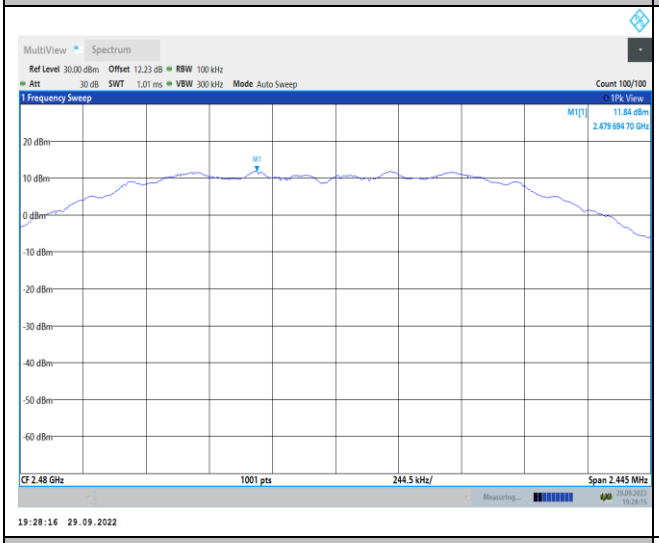
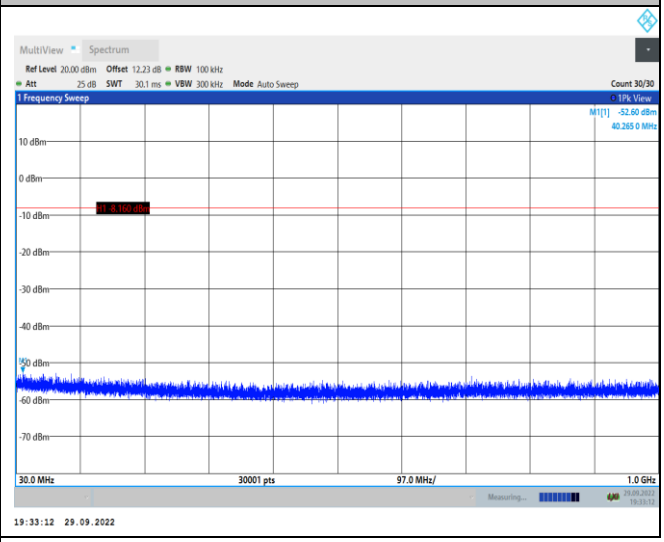
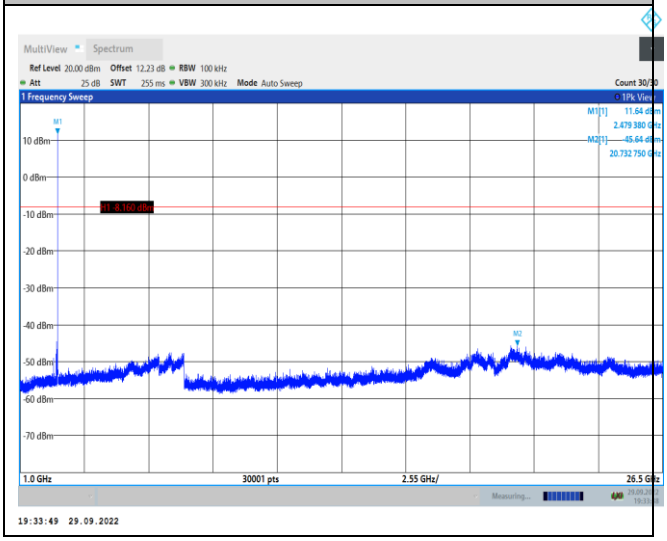
Channel 11

Pref.	30 MHz-1000 MHz
	
1000 MHz-26.5 GHz	
	

Channel 18

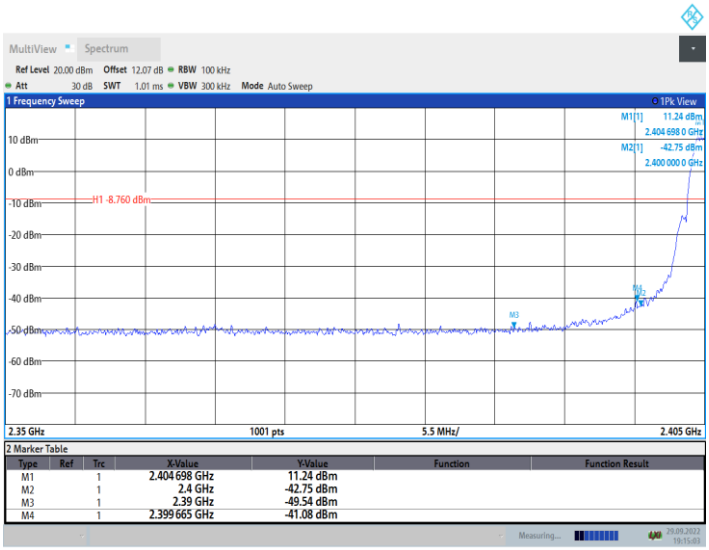
Pref.	30 MHz-1000 MHz
	
1000 MHz-26.5 GHz	
	

Channel 26

Pref.	30 MHz-1000 MHz
	
1000 MHz-26.5 GHz	
	

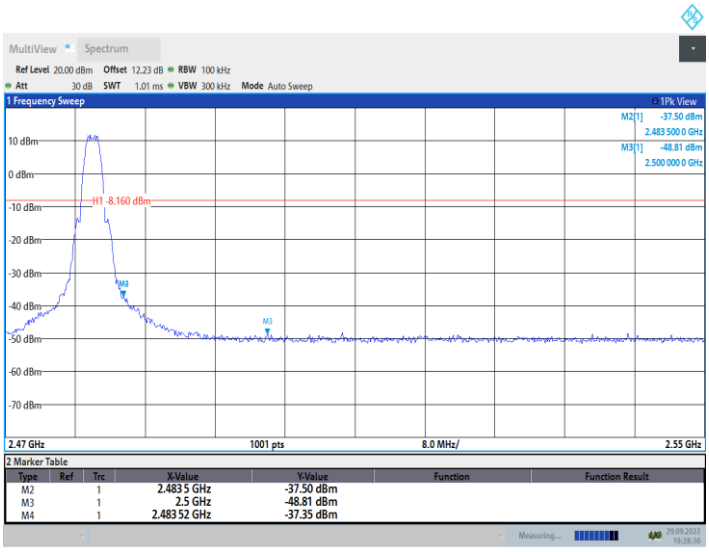
Band Edge

Channel 11



19:15:04 29.09.2022

Channel 26



19:28:31 29.09.2022

10. RADIATED BANDEDGE AND SPURIOUS MEASUREMENT

10.1. LIMITS OF Radiated Bandedge and Spurious Measurement

CFR 47 (FCC) part 15.247 (d) and KDB558074 D01 15.247 Meas Guidance v05r02

10.2. TEST PROCEDURE

1. The testing follows the guidelines in ANSI C63.10:2013 and Reference to KDB558074 D01 15.247 Meas Guidance v05r02.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. For measurement below 1GHz, the EUT was placed on a turntable with 0.8 meter above ground. For measurement above 1 GHz, test at FAR, the EUT is placed on a non-conductive table, which is 1.5 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
6. Use the following spectrum analyzer settings:
(1) Span shall wide enough to fully capture the emission being measured;
(2) Set RBW=100 kHz for f < 1 GHz; VBW >= RBW; Sweep = auto; Detector function = peak; Trace = max hold;
(3) Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement.
Set RBW = 1 MHz, and 1/T (on time) for average measurement.

10.3. TEST DATA

9 kHz-30MHz
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Table 10 Radiated Emission Test Data 9kHz-30MHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (H/V)	Limit (dBμV/m)	Margin (dB)	Note
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Remark:1. Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)
2. All 3 polarizations of the loop antenna had been tested, but only the worst data recorded in the report.
3. OFS and chamber correlation testing had been performed and chamber measured test result is the worst-case test result.

30MHz-1GHz

Worst case is shown below for 30MHz-1GHz only.

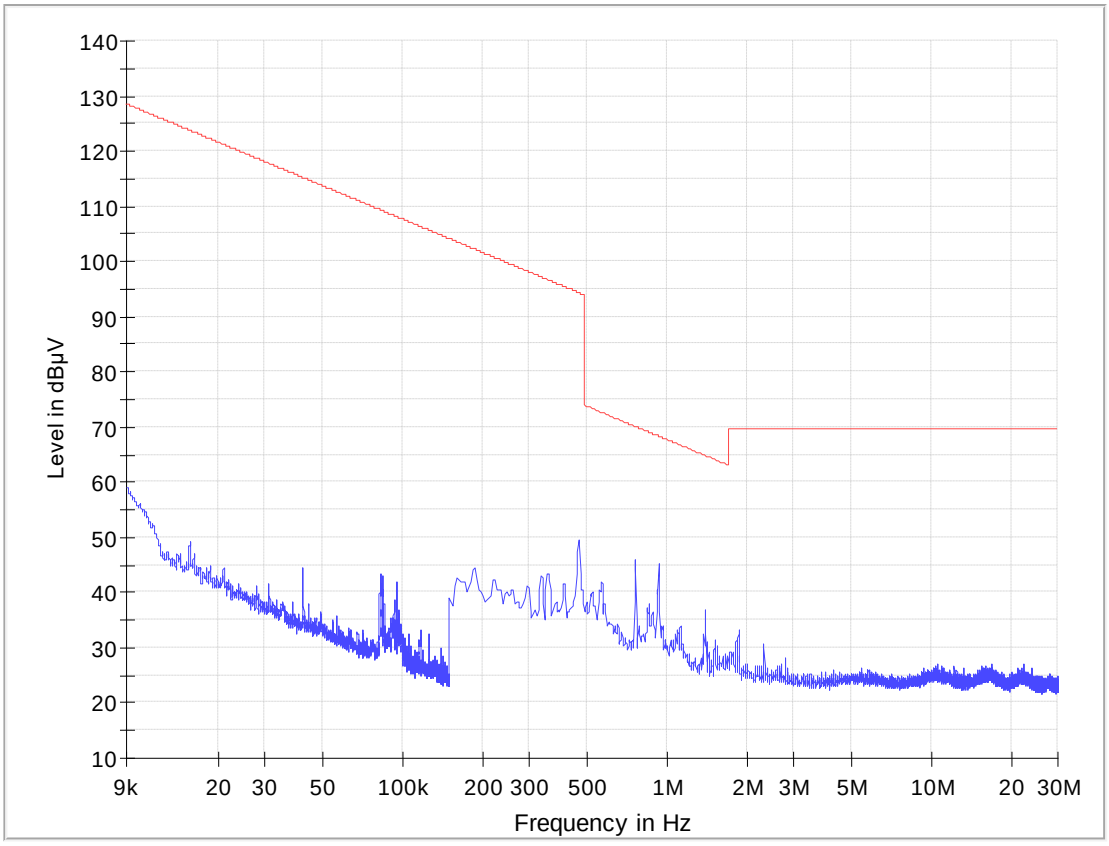
The emissions don't show in following result tables are more than 20dB below the limits.

Table 11 Radiated Emission Test Data 30MHz-1GHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
123.241	1.2	10.5	13.9	25.6	Vertical	43.5	17.9	QP
134.639	1.4	10.5	18.5	30.4	Vertical	43.5	13.1	QP
188.838	1.6	9.7	13.9	25.2	Vertical	43.5	18.3	QP
498.510	2.7	16.1	10.3	29.1	Vertical	46	16.9	QP
831.705	3.7	20.1	8.0	31.8	Vertical	46	14.2	QP
941.436	4.0	21.1	10.5	35.6	Vertical	46	10.4	QP
119.968	1.3	12.3	6.1	19.7	Horizontal	43.5	23.8	QP
230.305	1.7	11.2	11.7	24.6	Horizontal	46	21.4	QP
250.433	1.9	12.1	9.7	23.7	Horizontal	46	22.3	QP
333.246	2.1	13.3	10.7	26.1	Horizontal	46	19.9	QP
499.601	2.7	16.1	10.8	29.6	Horizontal	46	16.4	QP
124.817	1.2	10.5	10.0	21.7	Horizontal	43.5	21.8	QP

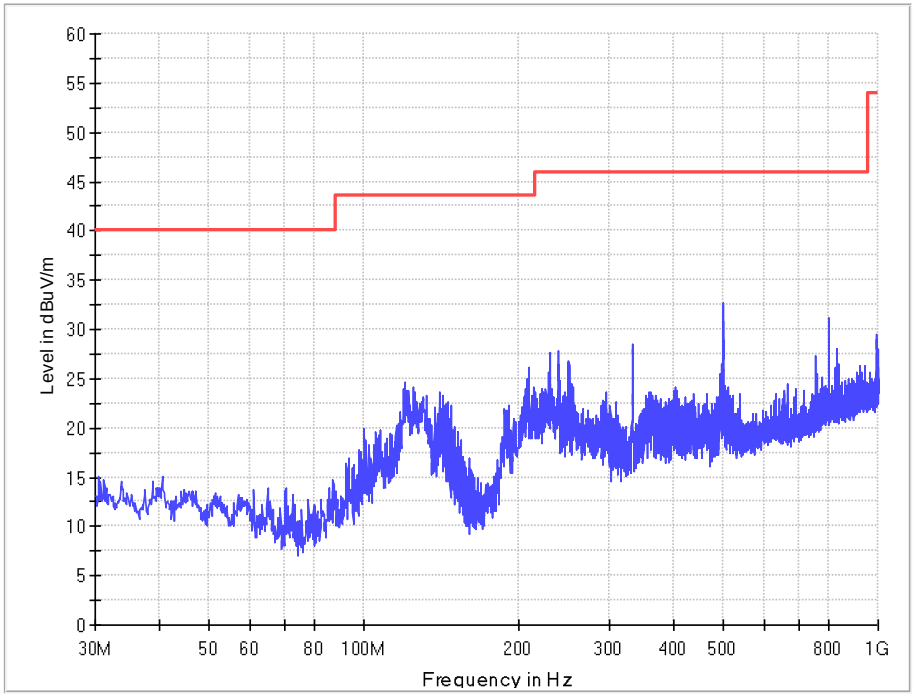
Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

9kHz-30MHz

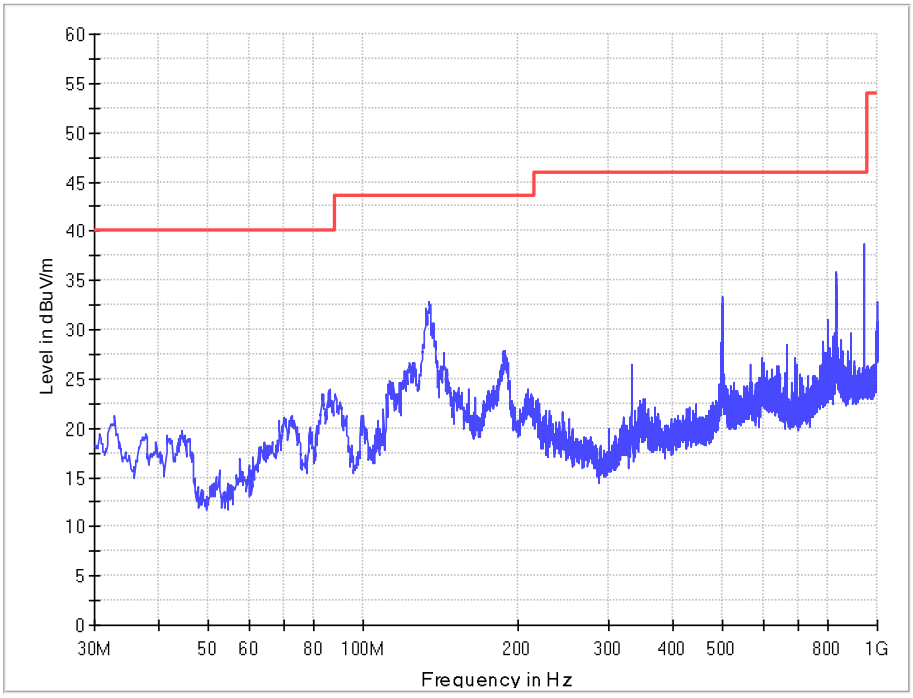

140
130
120
110
100
90
80
70
60
50
40
30
20
10
Level in dBµV
9k
20
30
50
100k
200
300
500
1M
2M
3M
5M
10M
20
30M
Frequency in Hz

30MHz-1GHz

Horizontal



Vertical



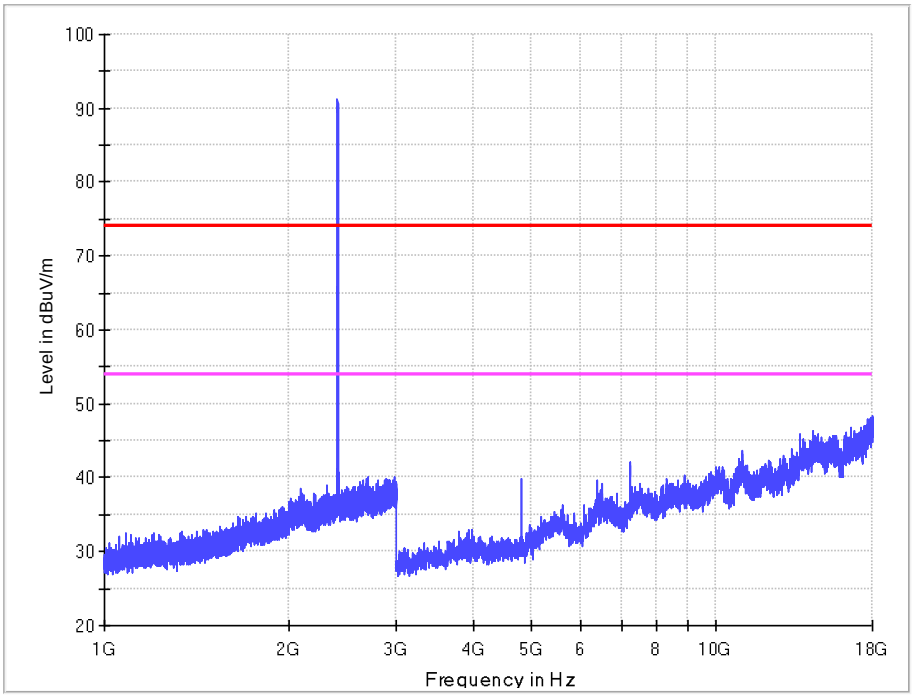
1-18G

CH11

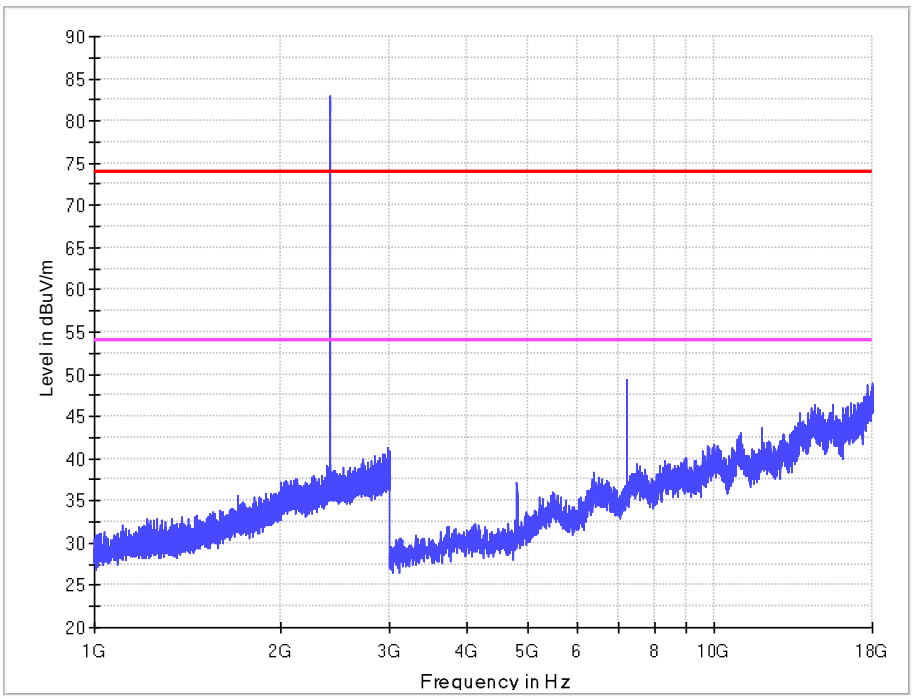
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
7216.698	-38.3	35.6	62.3	59.6	Vertical	74	14.4	PK
7216.698	-38.3	35.6	53.3	50.6	Vertical	54	3.4	AV
---	---	---	---	---	Horizontal	---	---	PK
---	---	---	---	---	Horizontal	---	---	AV

Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

Horizontal



Vertical



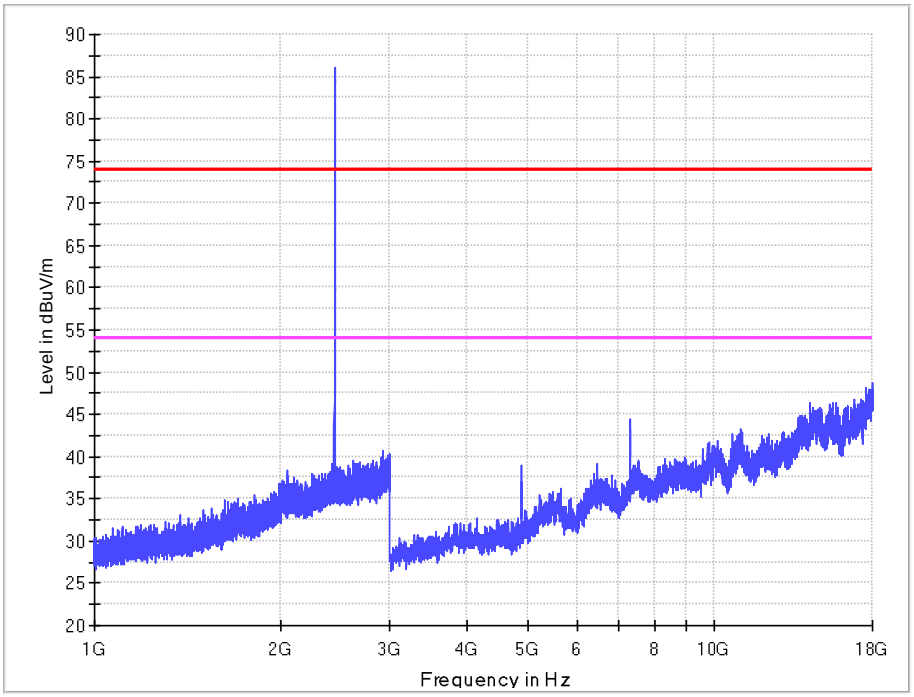
1-18G

CH18

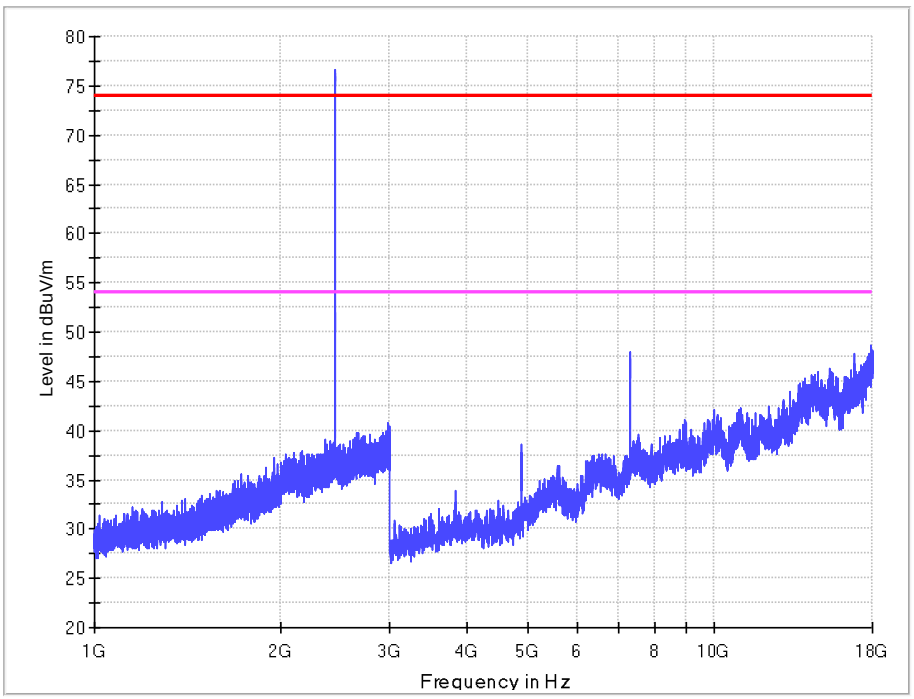
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
7318.261	-38.1	35.6	63.7	61.2	Vertical	74	12.8	PK
7318.261	-38.1	35.6	55.1	52.6	Vertical	54	1.4	AV
---	---	---	---	---	Horizontal	---	---	PK
---	---	---	---	---	Horizontal	---	---	AV

Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

Horizontal



Vertical



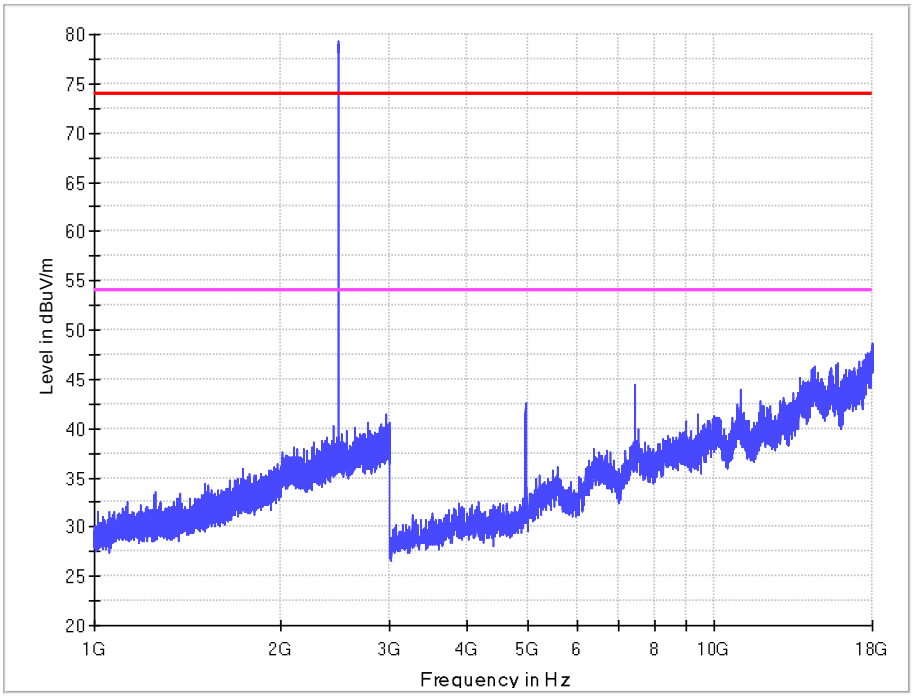
1-18G

CH26

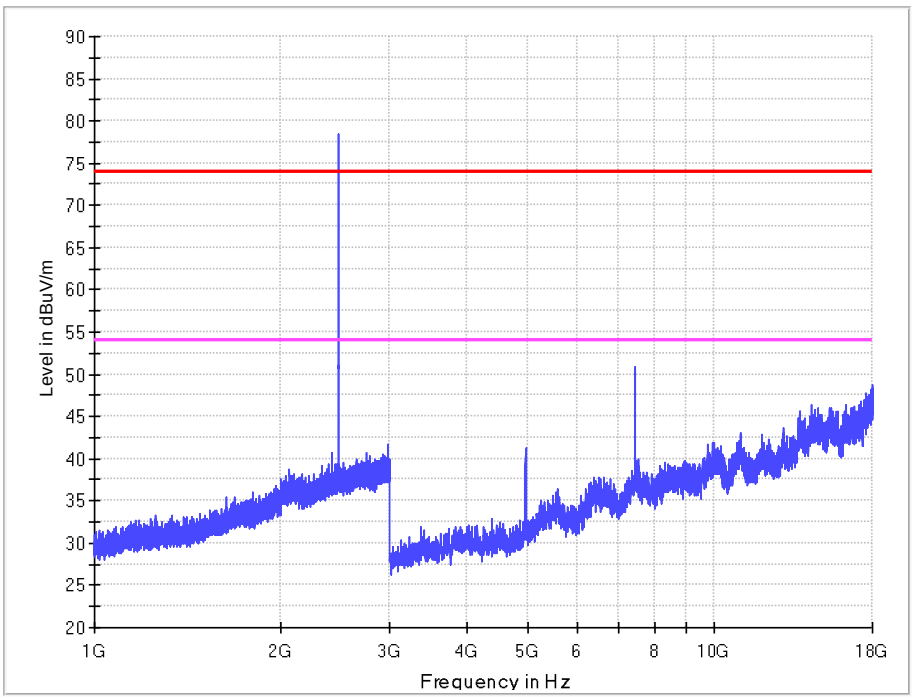
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
7438.300	-37.7	35.6	64.3	62.2	Vertical	74	11.8	PK
7438.300	-37.7	35.6	55.9	53.8	Vertical	54	0.2	AV
---	---	---	---	---	Horizontal	---	---	PK
---	---	---	---	---	Horizontal	---	---	AV

Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

Horizontal



Vertical



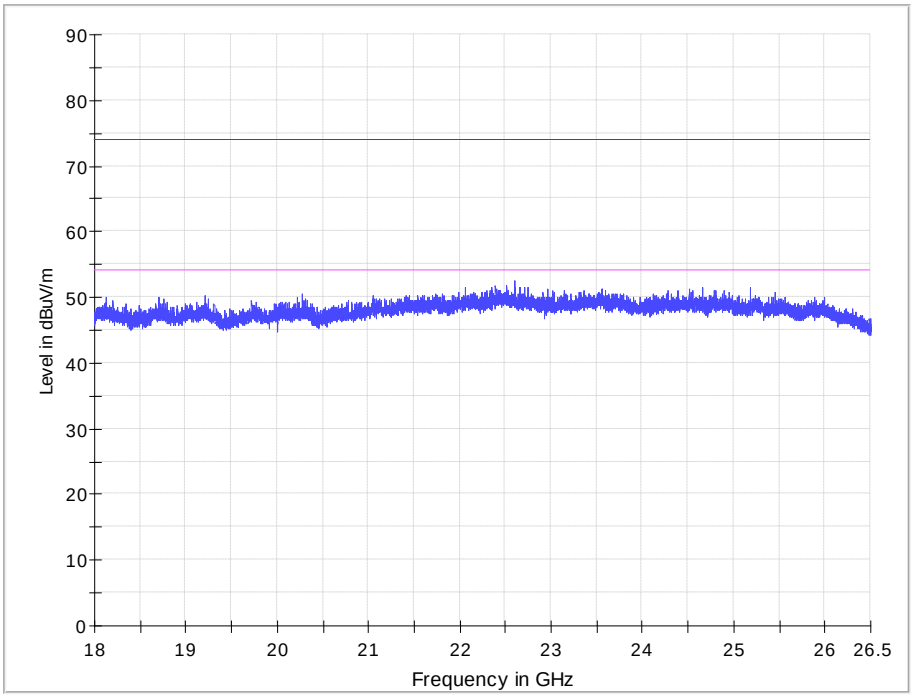
18-26.5G
(Worst Case)

CH26

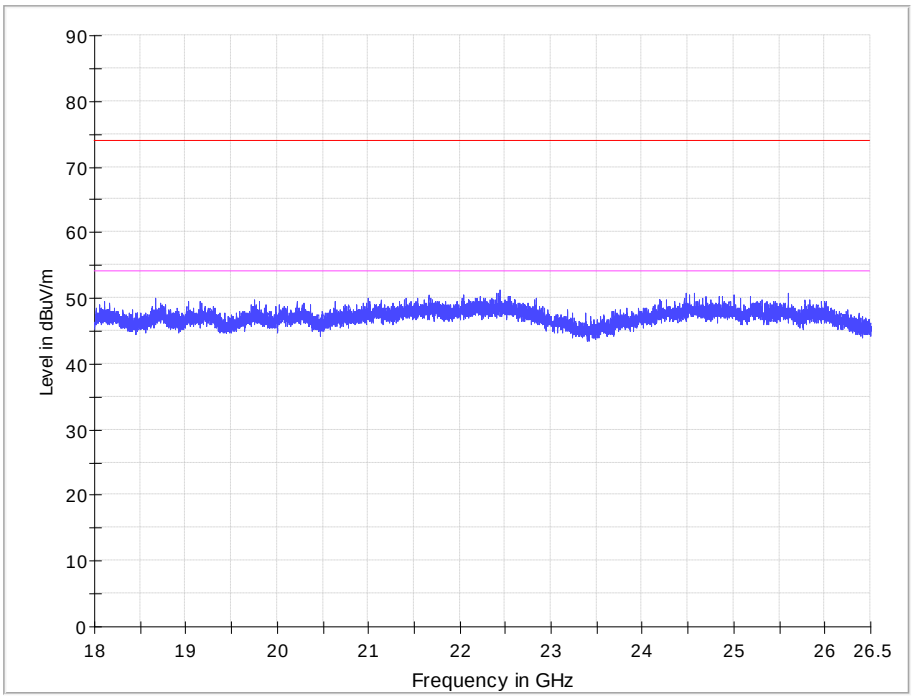
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
22596.800	-32.7	43.7	42.1	53.1	Horizontal	74	20.9	PK
22596.800	-32.7	43.7	33.3	44.3	Horizontal	54	9.7	AV
22445.500	-32.7	43.7	40.9	51.9	Vertical	74	22.1	PK
22445.500	-32.7	43.7	31.4	42.4	Vertical	54	11.6	AV

Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

Horizontal



Vertical



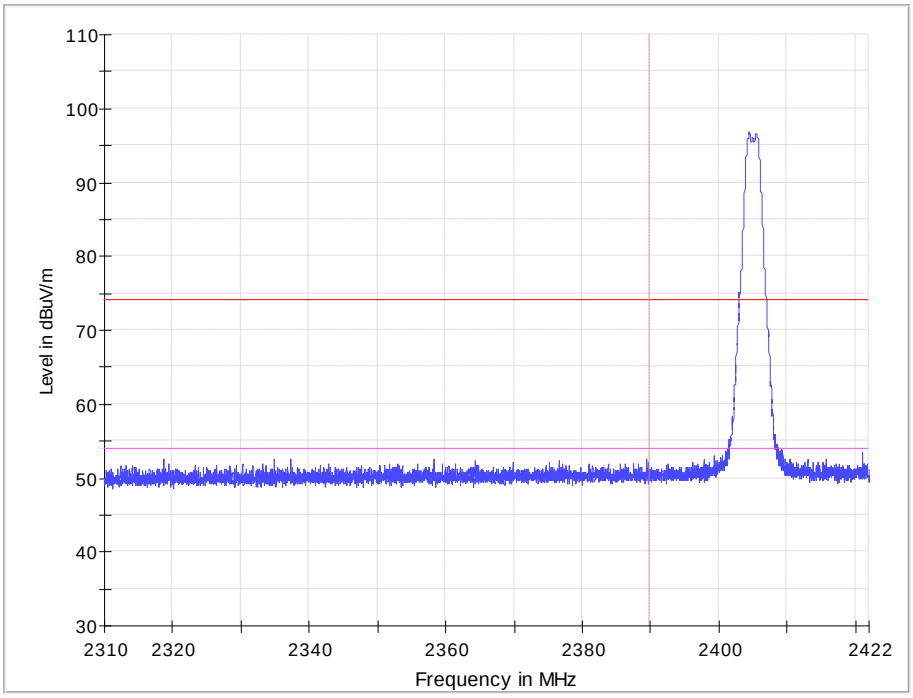
Band edge

CH11
PK

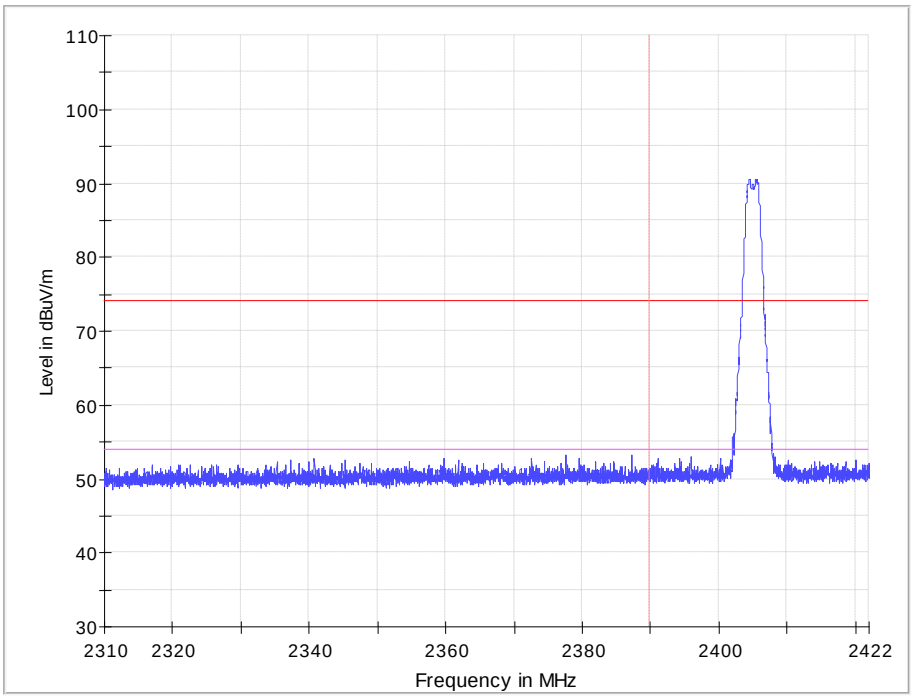
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
2389.408	-40.2	28.3	64.6	52.7	Horizontal	74	21.3	PK
2387.280	-40.2	28.3	65.2	53.3	Vertical	74	20.7	PK

Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

Horizontal



Vertical

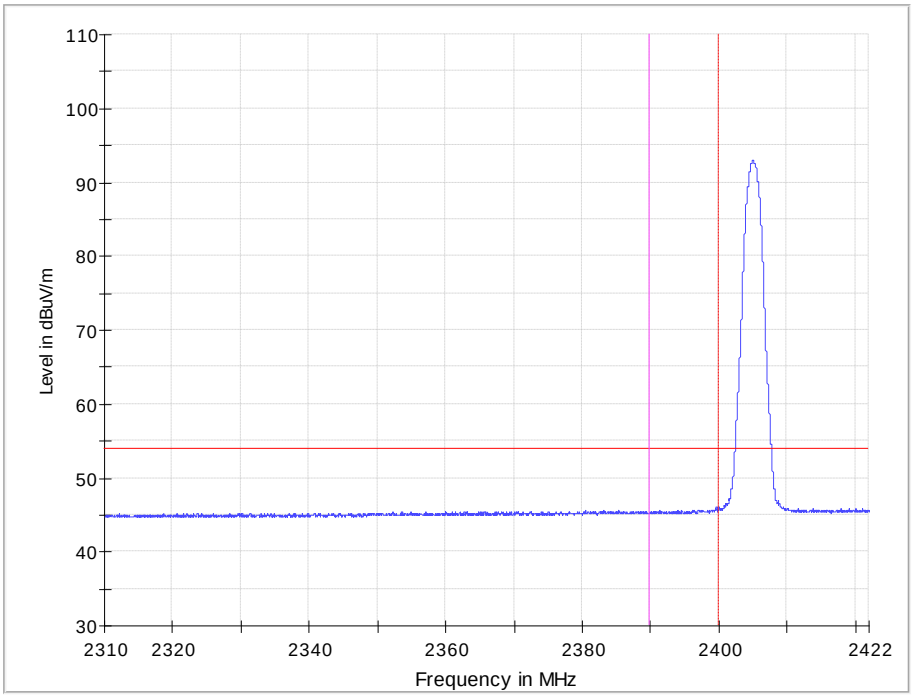


AV

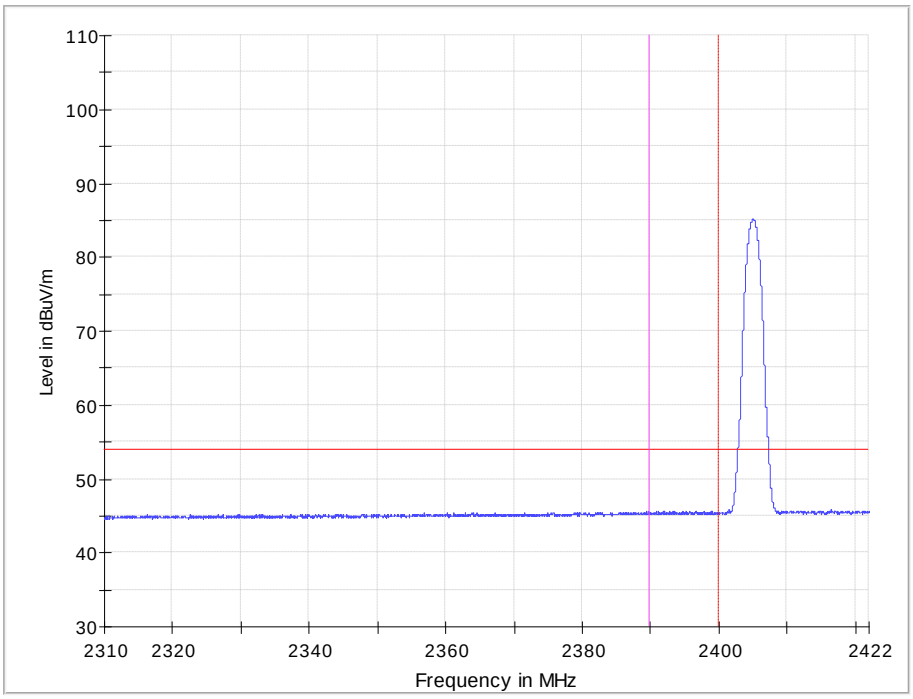
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
2380.414	-40.2	28.3	57.5	45.6	Horizontal	54	8.4	AV
2389.419	-40.2	28.3	57.6	45.7	Vertical	54	8.3	AV

Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

Horizontal



Vertical



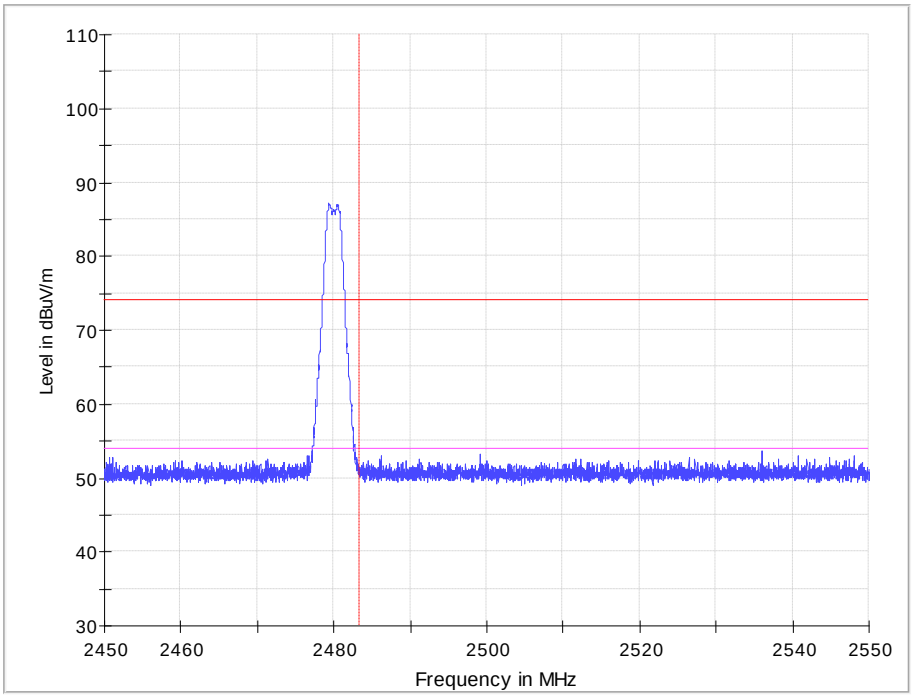
Band edge

CH26
PK

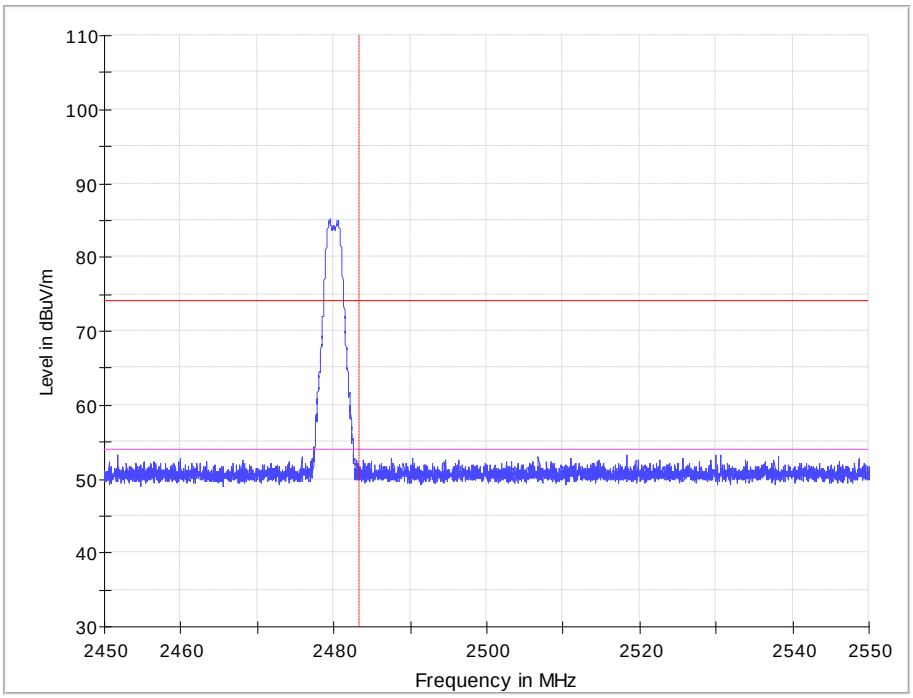
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
2535.980	-40.0	28.6	65.1	53.7	Horizontal	74	20.3	PK
2518.280	-40.0	28.6	64.7	53.3	Vertical	74	20.7	PK

Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

Horizontal



Vertical

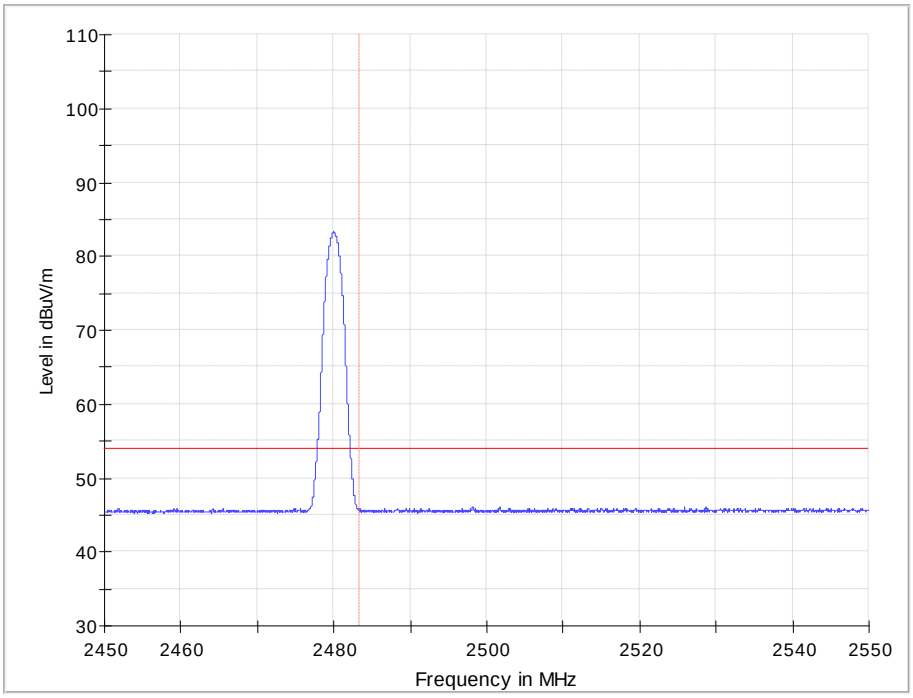


AV

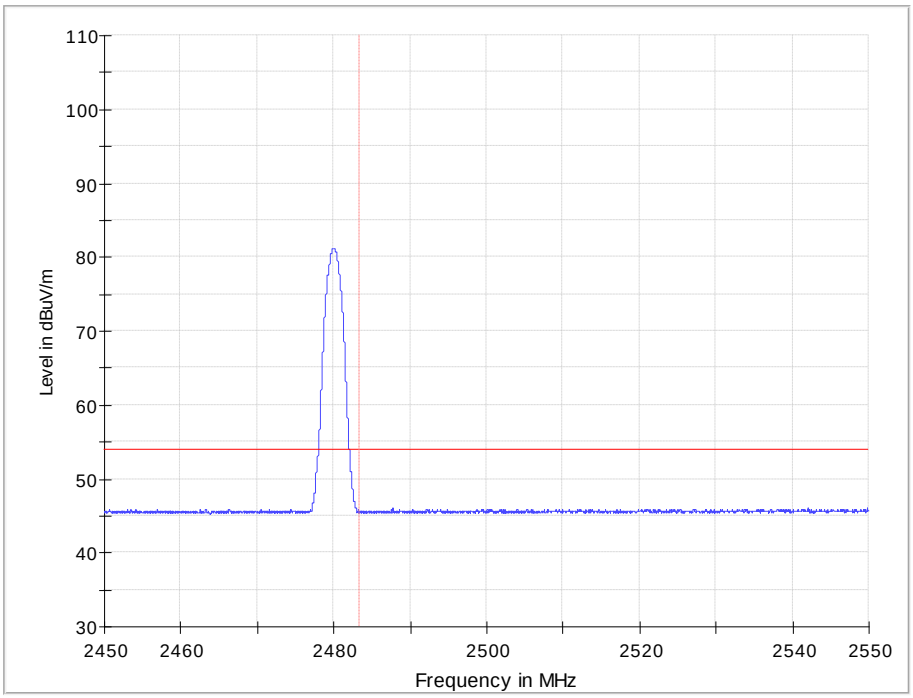
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
2498.150	-40.0	28.6	57.5	46.1	Horizontal	54	7.9	AV
2487.710	-40.0	28.6	57.5	46.1	Vertical	54	7.9	AV

Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

Horizontal



Vertical



11. CONDUCTED EMISSION TEST FOR AC POWER PORT MEASUREMENT

11.1.Test Standard and Limit

11.1.1.Test Standard

FCC Part 15 15.207

11.1.2.Test Limit

Table 12 Conducted Disturbance Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

* Decreasing linearly with logarithm of the frequency
* The lower limit shall apply at the transition frequency.

11.2.Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver is used to test the emissions from both sides of AC line. According to the requirements of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.
The bandwidth of EMI test receiver is set at 9 kHz.

11.3.Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

11.4.Test Data

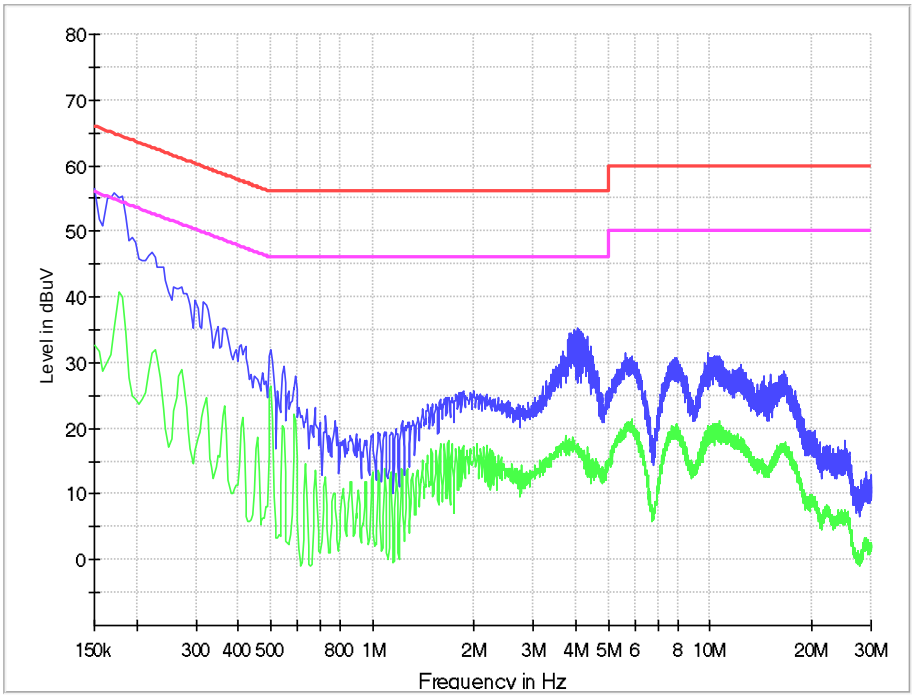
The emissions don’t show in below are too low against the limits. Refer to the test curves.

Table 13 Conducted Emission Test Data

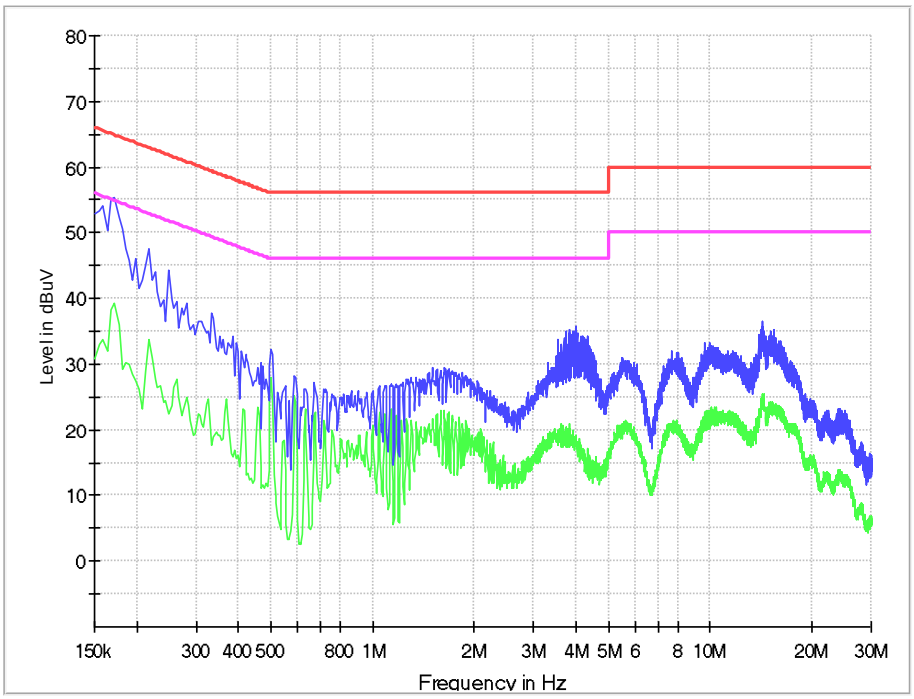
Test mode: Charging and Transmitting(Worst-case)								
	Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
			Reading (dBμV)	Emission Level (dBμV)	Limit (dBμV)	Reading (dBμV)	Emission Level (dBμV)	Limit (dBμV)
Line	0.150	9.7	39.8	49.5	66	21.2	30.9	56
	0.172	9.7	42.3	52.0	64.9	29.1	38.8	54.9
	0.501	9.8	18.6	28.4	56	16.0	25.8	46
	0.546	9.8	15.8	25.6	56	8.1	17.9	46
	0.591	9.8	14.0	23.8	56	10.3	20.1	46
	4.083	9.9	16.3	26.2	56	6.2	16.1	46
Neutral	0.159	9.7	37.0	46.7	65.5	22.4	32.1	55.5
	0.172	9.7	42.7	52.4	64.9	30.5	40.2	54.9
	0.217	9.7	32.3	42.0	62.9	20.9	30.6	52.9
	0.249	9.7	26.8	36.5	61.8	18.2	27.9	51.8
	0.501	9.8	18.9	28.7	56	16.8	26.6	46
	4.006	9.9	18.2	28.1	56	6.8	16.7	46

REMARKS: 1. Emission level (dBuV) =Read Value (dBuV) + Correction Factor (dB)
2. Correction Factor (dB) =LISN Factor (dB) + Cable Factor (dB) +Limiter Factor (dB)
3. The other emission levels were very low against the limit.

Line



Neutral



12. ANTENNA REQUIREMENTS

15.203 requirements:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(b) (4) requirements:
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

12.1. Antenna Connector

Antenna Connector is on the PCB within enclosure and not accessible to user.

12.2. Antenna Gain

The antenna gain of EUT is less than 6 dBi.

----------End of Report----------