



FCC PART 15.247

TEST REPORT

For

Xiamen Ilead Tek Co., Ltd.

Room 01, Unit 2101, No.50 Chengyi North Street, Software Park Phase III, Xiamen, Fujian,
China

FCC ID: 2ASPY-ALD-Y200

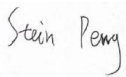
Report Type: Original Report	Product Name: PeriPage Mini Printer
Report Number:	XMTN1240325-15534E-RF-02
Report Date:	2024-04-17
Reviewed By:	Stein Peng 
Approved By:	Miles Chen 
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Name:	PeriPage Mini Printer
Tested Model:	ALD-Y200
Multiple Model(s):	A40, P40, ALD-P900
Power Supply:	DC 5V from USB port or 7.4V from battery
Maximum Conducted Output Peak Power:	BLE: -1.85dBm
Frequency Range:	BLE: 2402~2480MHz
Modulation Technique:	BLE: GFSK
Antenna Type:	PCB on-board
★Maximum Antenna Gain:	-4.73dBi
EUT Received Status:	Good
<i>Note:</i> 1. The Maximum Antenna Gain was declared by manufacturer. 2. The model difference please refer to declaration letter. 2. All measurement and test data in this report was gathered from production sample serial number: XMTN1240325-15534E-RF-2. (Assigned by the BACL(Xiamen). The EUT supplied by the applicant was received on 2024-03-25)	

Objective

This report is prepared on behalf of Xiamen Ilead Tek Co., Ltd. in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2020, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Xiamen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Xiamen) to collect test data is located on the Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone Xiamen.

Bay Area Compliance Laboratories Corp. (Xiamen) Lab is accredited to ISO/IEC 17025 by A2LA (Certificate Number: 7134.01) and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No. : CN1384.

Measurement Uncertainty

Item		U_{lab}
Conducted Emission	150kHz-30MHz	2.33 dB
Radiated Emission	9kHz-30MHz	2.59 dB
	30MHz~1GHz	4.79 dB
	1GHz~6GHz	4.6 dB
	6GHz-18GHz	5.42 dB
	18GHz~26.5GHz	5.47 dB
Occupied Channel Bandwidth		$\pm 0.10\text{MHz}$
Transmitter Conducted Power(Conducted RF power)		$\pm 0.624\text{ dB}$
Conducted Spurious Emission		$\pm 2.52\text{ dB}$
Power Spectral Density		$\pm 0.61\text{dB}$
Duty Cycle		1%
Temperature		$\pm 1^{\circ}\text{C}$
Humidity		$\pm 5\%$
Supply voltages		$\pm 0.4\%$

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

SYSTEM TEST CONFIGURATION

Test Mode and Voltage

The system was configured for testing in a typical mode (as normally used by a typical user).	
Test mode:	Test mode 1: Transmitting
Test voltage:	Test mode 1: DC 7.4V
Remark:	During all emission tests, the EUT was configured to measure its highest possible emission level and the worst case's test data was presented in this test report.

Description of Test Configuration

For BLE mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

EUT was tested with Channel 0, 19 and 39.

Equipment Modifications

No modification was made to the EUT tested.

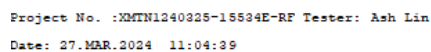
EUT Exercise Software

RF Test Tool: BR BlueletSuite_v5.11

★Power Level: 3

Duty cycle

BLE: Middle Channel

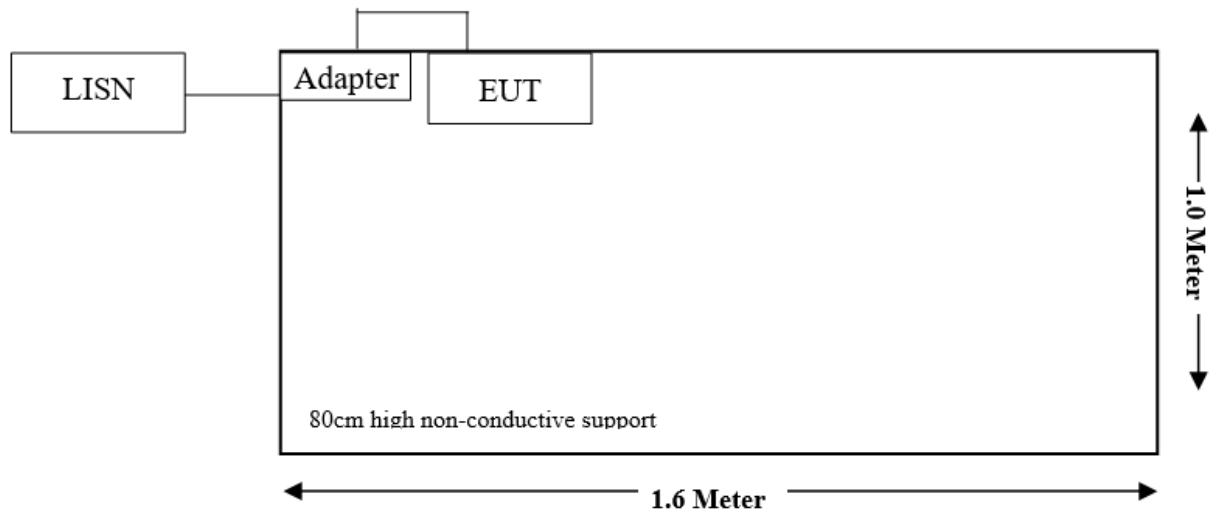


Manufacturer	Description	Model	Serial Number
CARREGADOR PORTATIL	Adapter	S64A38BL	222700047954T4
/	/	/	/

Cable Description	Length (m)	From Port	To
USB cable	0.5	EUT	Adapter

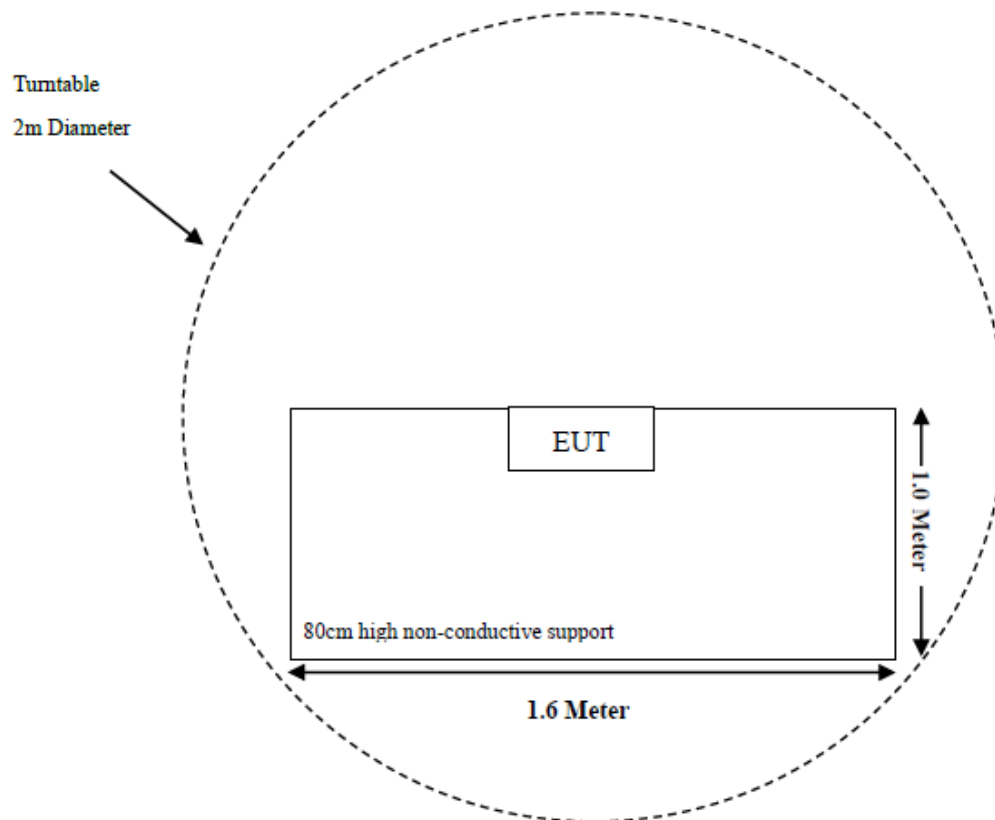
Block Diagram of Test Setup

Conducted Emission:

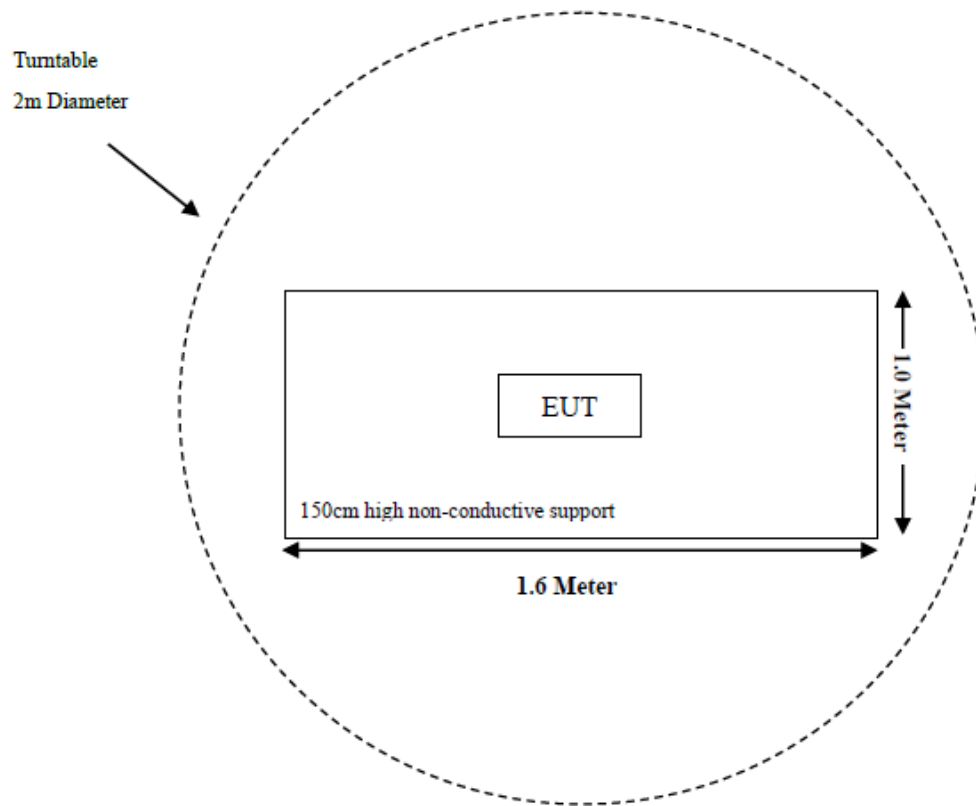


Radiated Emission:

Below 1GHz



Above 1GHz



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum Conducted Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

TEST EQUIPMENT LIST

Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions					
EMI Test Receiver	Rohde & Schwarz	ESR	103105	2023/09/12	2024/09/11
LISN	Rohde & Schwarz	ENV216	100129	2023/09/12	2024/09/11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	0357.8810.54	2023/09/12	2024/09/11
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC001	2023/08/29	2024/08/28
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESR	103103	2023/09/12	2024/09/11
Loop Antenna	Rohde & Schwarz	HFH2-Z2	830749/001	2023/07/27	2026/07/26
Antenna	Sunol Sciences	JB6	A122022-5	2023/07/27	2026/07/26
Amplifier	Sonoma	310B	120903	2023/09/12	2024/09/11
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC002	2023/08/29	2024/08/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-2M	CC006	2023/08/29	2024/08/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-12M	CC007	2023/08/29	2024/08/28
Coaxial Cable	XINHANGWEIBO	HFH2-CC	335.3609	2023.9.20	2024/09/19
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Above 1 GHz					
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102051	2023/09/12	2024/09/11
Double Ridge Guide Horn Antenna	A.H.Systems	SAS-571	1980	2023/07/28	2026/07/27
Horn Antenna	EMCO	3116	9407-2232	2023/07/31	2026/07/30
Preamplifier	A.H.Systems	PAM-0118P	489	2023/09/12	2024/09/11
Preamplifier	A.H.Systems	PAM-1840	200	2023/09/12	2024/09/11
Coaxial Cable	XINHANGWEIBO	XH800A-N-6M	CC004	2023/08/29	2024/08/28
Coaxial Cable	XINHANGWEIBO	XH800A-N-1M	CC005	2023/08/29	2024/08/28
Test Software	Audix	E3	18621a	N/A	N/A
RF Conducted Test					
Spectrum Analyzer	Rohde & Schwarz	FSU	100405	2023-09-12	2024/09/11
Coaxial Cable	N/A	N/A	N/A	Each time	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Xiamen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.
- c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one PCB antenna arrangement for Bluetooth, which was permanently attached and the antenna gain is -4.73 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

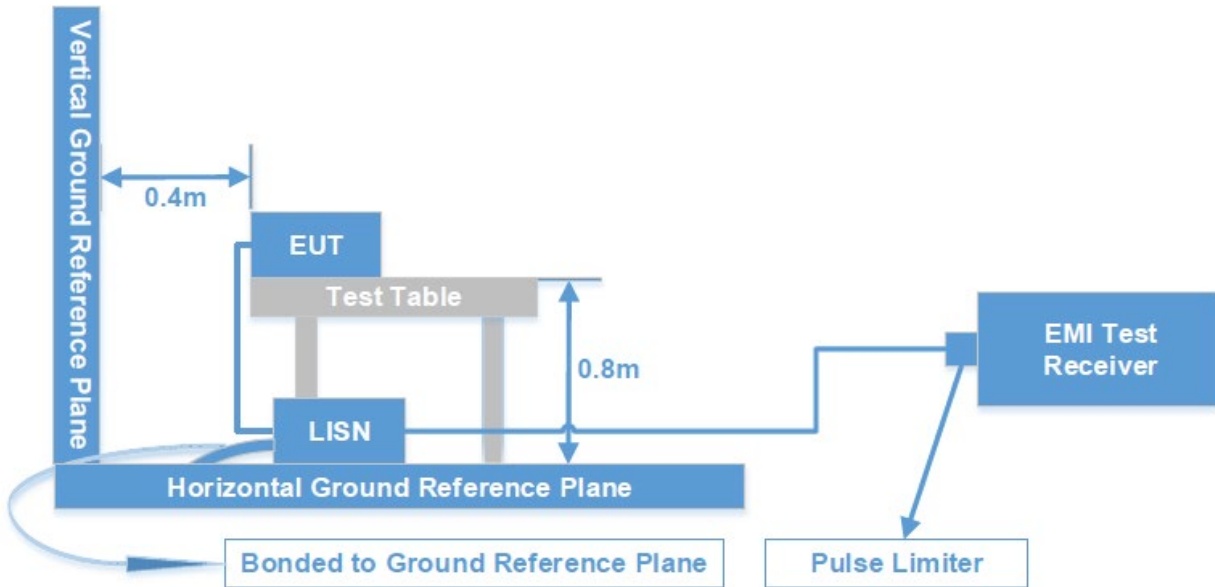
Result: Compliance

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



The setup of EUT is according with per ANSI C63.10-2020 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	VBW	Detector
150 kHz – 30 MHz	9 kHz	30 kHz	QP/AV

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Level & Margin Calculation

The Level is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

$$\begin{aligned}\text{Factor (dB)} &= \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)} \\ \text{Level (dB}\mu\text{V)} &= \text{Reading (dB}\mu\text{V)} + \text{Factor (dB)}\end{aligned}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Level (dB}\mu\text{V)}$$

Test Data

EUT operation mode: Transmitting in high channel (worst case)

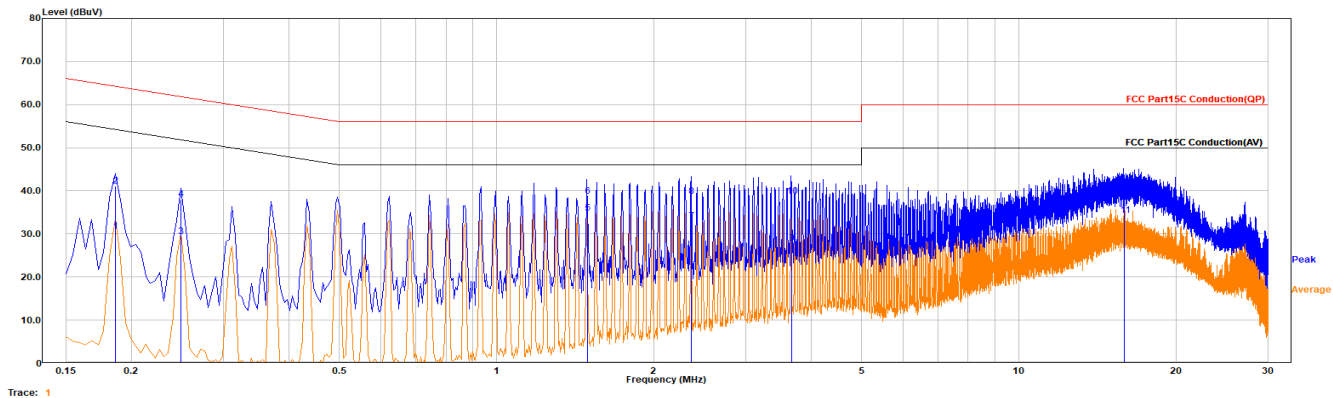
Date: 2024-04-16 time: 16:52:28

Project No.: XMTN1240325-15534E-RF

Temp/Humi: 21.1°C/66%

Test Mode: Transmitting

Tested by : Ash Lin



Freq MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBμV	Margin dB	Phase	Remark
0.186	11.07	19.50	30.57	54.21	23.64	Line	Average
0.186	21.67	19.50	41.17	64.21	23.04	Line	QP
0.248	9.91	19.54	29.45	51.81	22.36	Line	Average
0.248	18.53	19.54	38.07	61.81	23.75	Line	QP
1.492	15.21	19.64	34.85	46.00	11.15	Line	Average
1.492	19.16	19.64	38.80	56.00	17.20	Line	QP
2.364	13.29	19.64	32.93	46.00	13.07	Line	Average
2.364	19.14	19.64	38.78	56.00	17.22	Line	QP
3.671	8.31	19.63	27.93	46.00	18.07	Line	Average
3.671	19.02	19.63	38.64	56.00	17.36	Line	QP
15.959	14.37	19.96	34.33	50.00	15.67	Line	Average
15.959	21.21	19.96	41.17	60.00	18.83	Line	QP

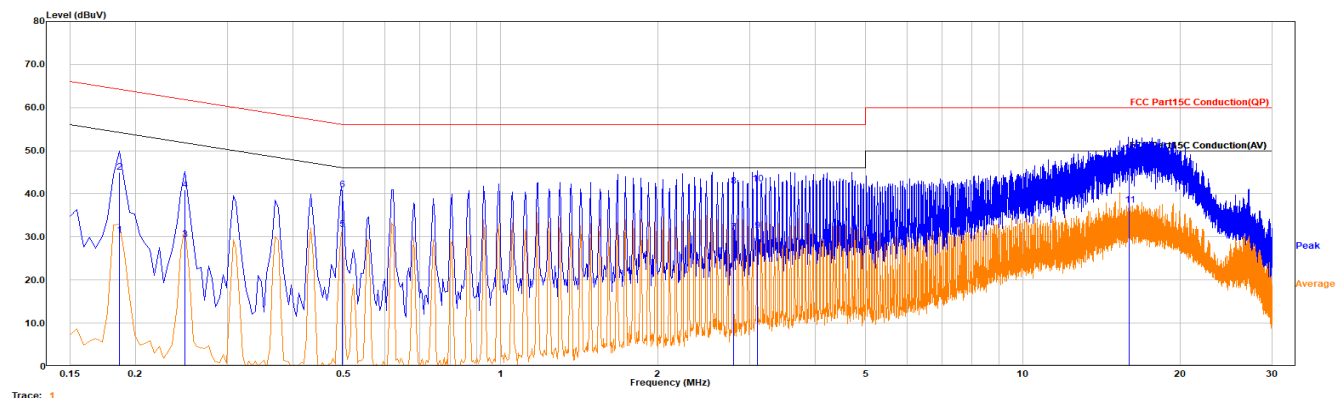
Date: 2024-04-16 time: 16:55:42

Project No.: XMTN1240325-15534E-RF

Temp/Humi : 21.1°C/66%

Test Mode: Transmitting

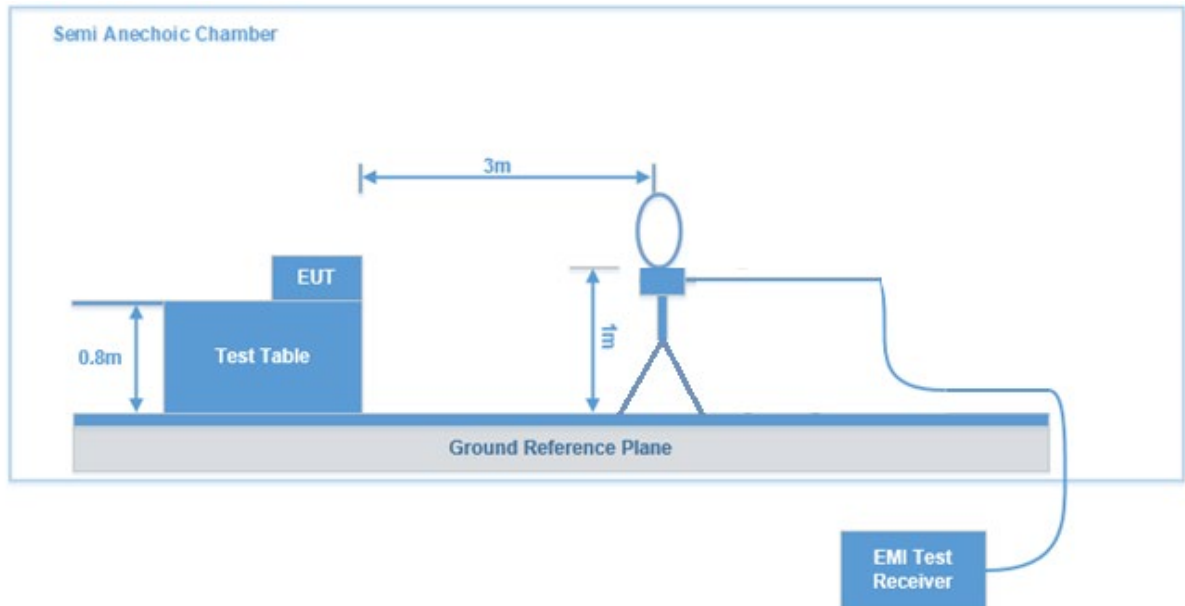
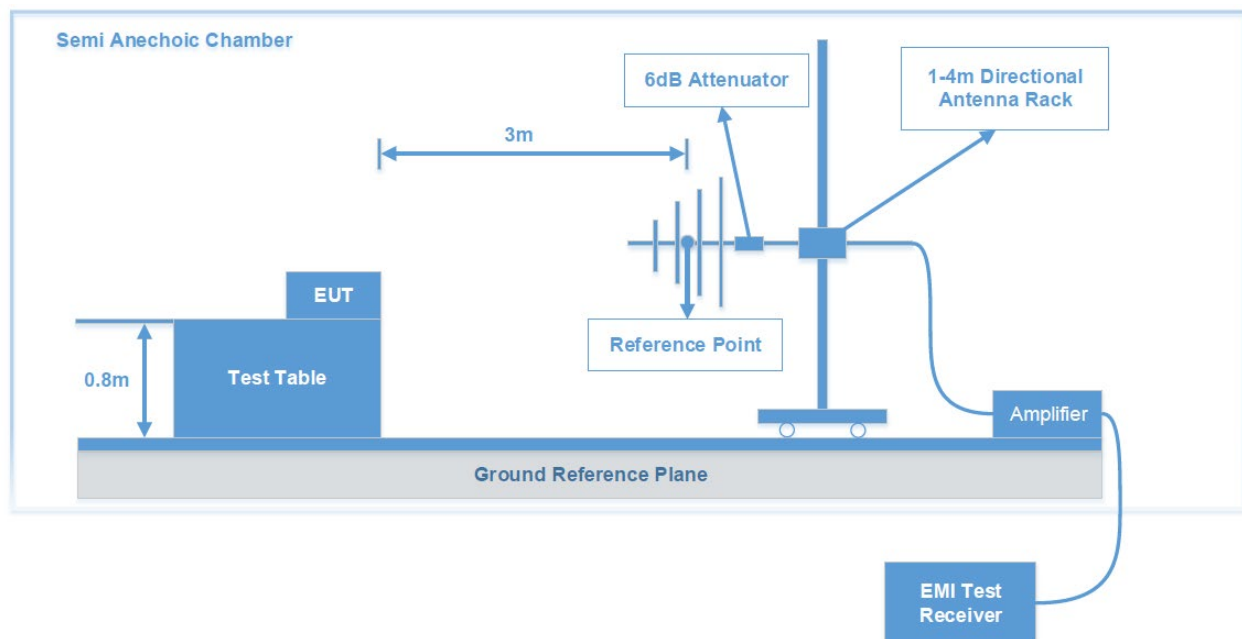
Tested by : Ash Lin

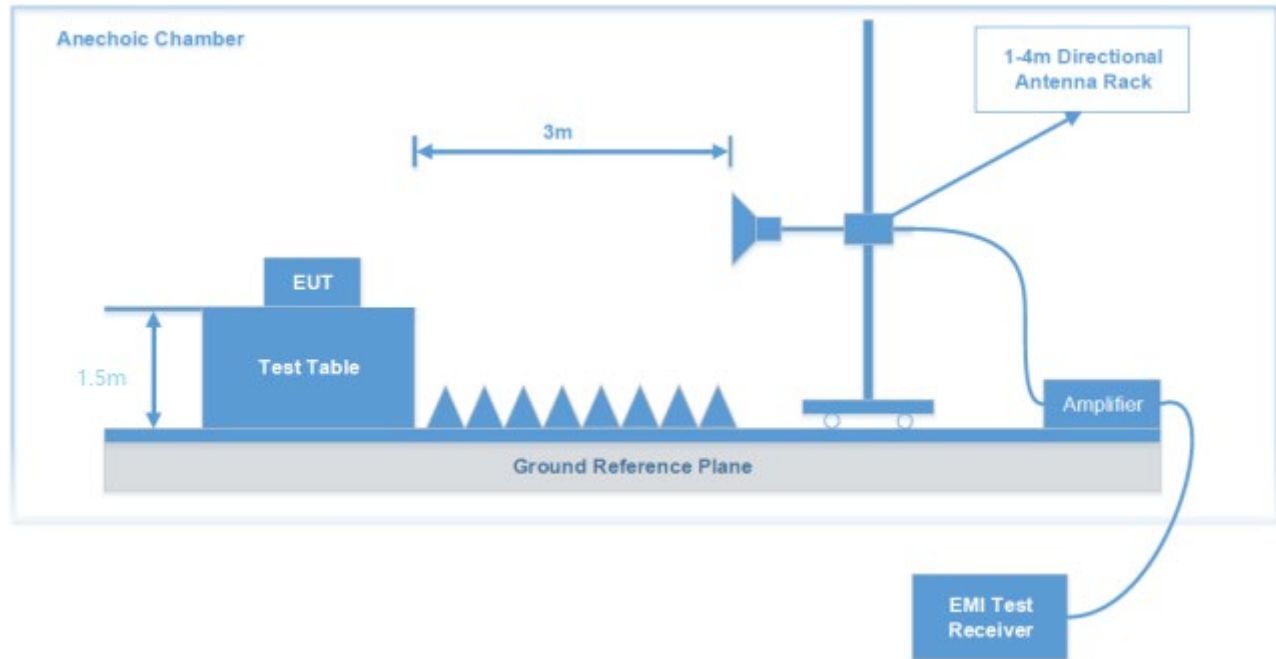


Freq MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Phase	Remark
0.186	10.92	19.47	30.39	54.21	23.81	Neutral	Average
0.186	25.52	19.47	45.00	64.21	19.21	Neutral	QP
0.248	9.78	19.52	29.30	51.81	22.51	Neutral	Average
0.248	21.47	19.52	40.99	61.81	20.82	Neutral	QP
0.497	12.21	19.63	31.84	46.05	14.21	Neutral	Average
0.497	21.37	19.63	41.00	56.05	15.05	Neutral	QP
2.795	11.43	19.65	31.08	46.00	14.92	Neutral	Average
2.795	22.11	19.65	41.76	56.00	14.24	Neutral	QP
3.105	11.83	19.64	31.47	46.00	14.53	Neutral	Average
3.105	22.72	19.64	42.36	56.00	13.64	Neutral	QP
16.000	17.38	19.94	37.32	50.00	12.68	Neutral	Average
16.000	29.53	19.94	49.47	60.00	10.53	Neutral	QP

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS**Applicable Standard**

FCC §15.247 (d); §15.209; §15.205;

EUT Setup**9 kHz-30MHz:****30MHz -1 GHz:**

Above 1GHz:

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2020. The specification used was the FCC 15.209, and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Below 1GHz:

Frequency Range	RBW	VBW	IF B/W	Measurement
9 kHz – 150 kHz	200Hz	1 kHz	/	PK
	/	/	200Hz	QP/AV
150 kHz – 30 MHz	10 kHz	30 kHz	/	PK
	/	/	9kHz	QP/AV
30 MHz – 1000 MHz	100 kHz	300 kHz	/	PK
	/	/	120kHz	QP

Above 1GHz:

Duty Cycle	RBW	VBW	Measurement
Any	1MHz	3MHz	PK
>98%	1MHz	10Hz	AV
<98%	1MHz	≥1/T	AV

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

For each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable. The report shall list the six emissions with the smallest margin relative to the limit, for each of the three antenna orientations (parallel, perpendicular, and ground parallel) unless the margin is greater than 20 dB, then the following statement shall be made: “all emissions were greater than 20 dB below the limit.”

Level & Margin Calculation

The Level is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\begin{aligned}\text{Factor (dB/m)} &= \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)} \\ \text{Level (dB}\mu\text{V/m)} &= \text{Reading (dB}\mu\text{V)} + \text{Factor (dB/m)}\end{aligned}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Level (dB}\mu\text{V/m)}$$

Test Data

Please refer to the below table and plots.

After pre-scan in the X, Y and Z axes of orientation, the worst case is below:

Frequency Range:	Below 1 GHz	Above 1 GHz
Temperature:	20.0°C	21.1°C
Relative Humidity:	62 %	68 %
ATM Pressure:	101.1kPa	100.8kPa
Test Date:	2024-04-02	2024-04-07
Test Engineer:	Ash Lin	Ash Lin

1) 9 kHz~30MHz

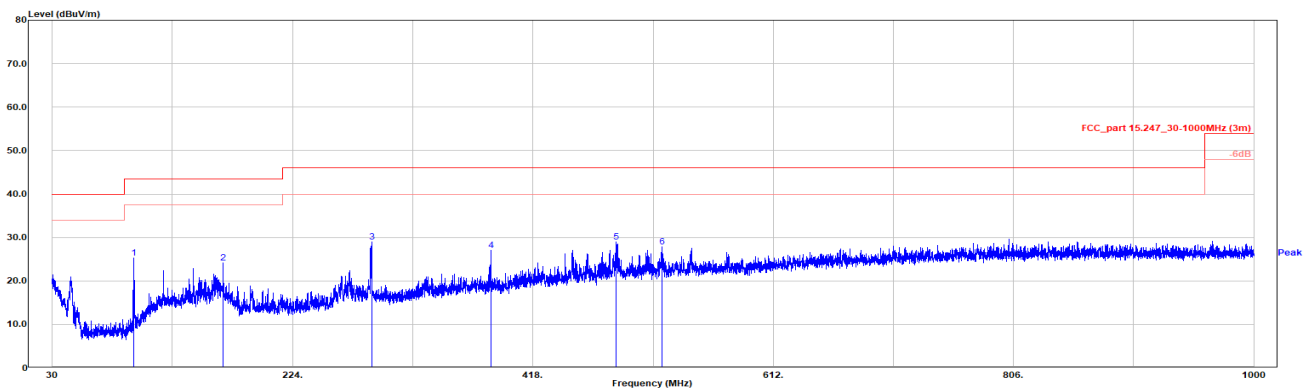
EUT operation mode: Transmitting in High channel (worst case)

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

2) 30MHz-1GHz

Date: 2024-04-02 time: 10:57:20

Project No.: XMTN1240325-15534E-RF Temp/Humi : 20°C/62%
Test Mode : BLE CH39 Transmitting Tested by : Ash Lin



Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
95.960	41.33	-16.13	25.20	43.50	18.30	Horizontal	QP
168.031	35.88	-11.67	24.21	43.50	19.29	Horizontal	QP
288.020	38.21	-9.25	28.96	46.00	17.04	Horizontal	QP
384.050	33.90	-6.93	26.97	46.00	19.03	Horizontal	QP
485.415	32.60	-3.60	28.99	46.00	17.01	Horizontal	QP
522.372	31.17	-3.39	27.79	46.00	18.21	Horizontal	QP

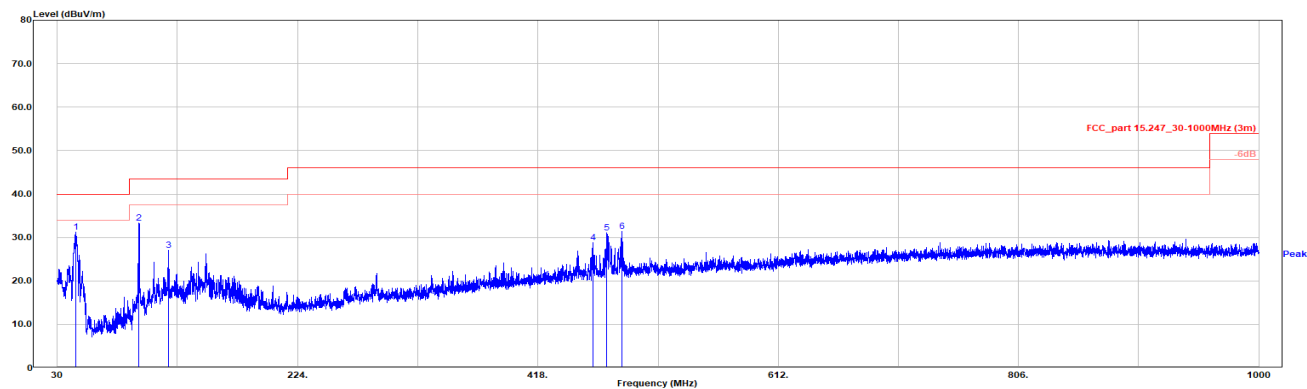
Date: 2024-04-02 time: 11:00:22

Project No.: XMTN1240325-15534E-RF

Temp/Humi: 20°C/62%

Test Mode : BLE CH39 Transmitting

Tested by : Ash Lin



Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
44.938	46.38	-15.15	31.24	40.00	8.76	Vertical	QP
95.960	49.50	-16.13	33.37	43.50	10.13	Vertical	QP
120.016	37.43	-10.38	27.05	43.50	16.45	Vertical	QP
462.426	33.38	-4.50	28.88	46.00	17.12	Vertical	QP
473.678	35.11	-4.10	31.01	46.00	14.99	Vertical	QP
485.609	35.06	-3.61	31.45	46.00	14.55	Vertical	QP

3) 1GHz~18GHz

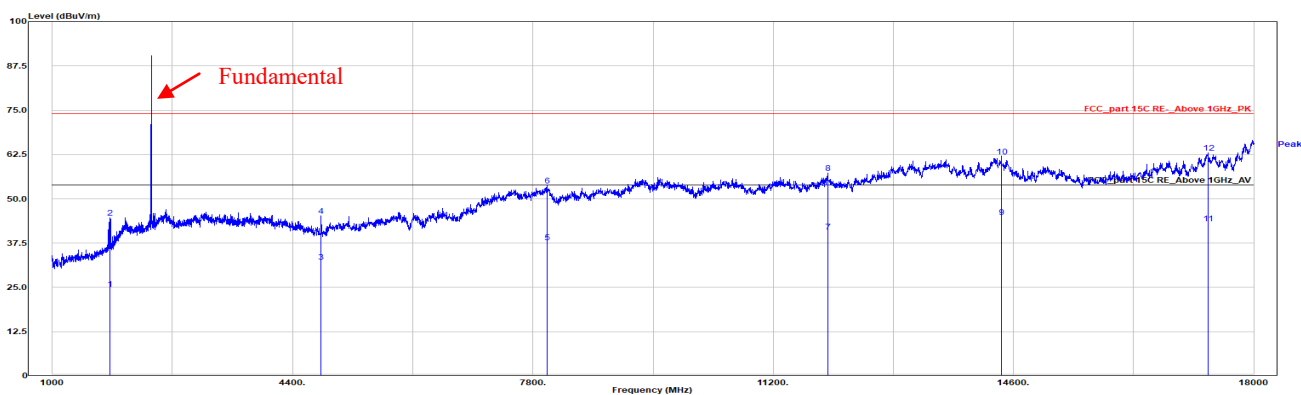
Date: 2024-04-07 time: 16:42:32

Project No.: XMTN1240325-15534E-RF

Temp/Humi: 21.1°C/68%

Test Mode: BLE CH0 Transmitting

Tested by : Ash Lin



Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
1819.400	31.82	-7.18	24.64	54.00	29.36	horizontal	Average
1819.400	51.82	-7.18	44.64	74.00	29.36	horizontal	Peak
4804.600	34.93	-2.72	32.21	54.00	21.79	horizontal	Average
4804.600	47.94	-2.72	45.22	74.00	28.78	horizontal	Peak
7997.200	31.34	6.40	37.74	54.00	16.26	horizontal	Average
7997.200	47.30	6.40	53.70	74.00	20.30	horizontal	Peak
11968.400	30.23	10.55	40.78	54.00	13.22	horizontal	Average
11968.400	46.72	10.55	57.27	74.00	16.73	horizontal	Peak
14430.000	30.56	14.25	44.81	54.00	9.19	horizontal	Average
14430.000	47.76	14.25	62.01	74.00	11.99	horizontal	Peak
17350.600	28.16	14.87	43.03	54.00	10.97	horizontal	Average
17350.600	48.11	14.87	62.98	74.00	11.02	horizontal	Peak

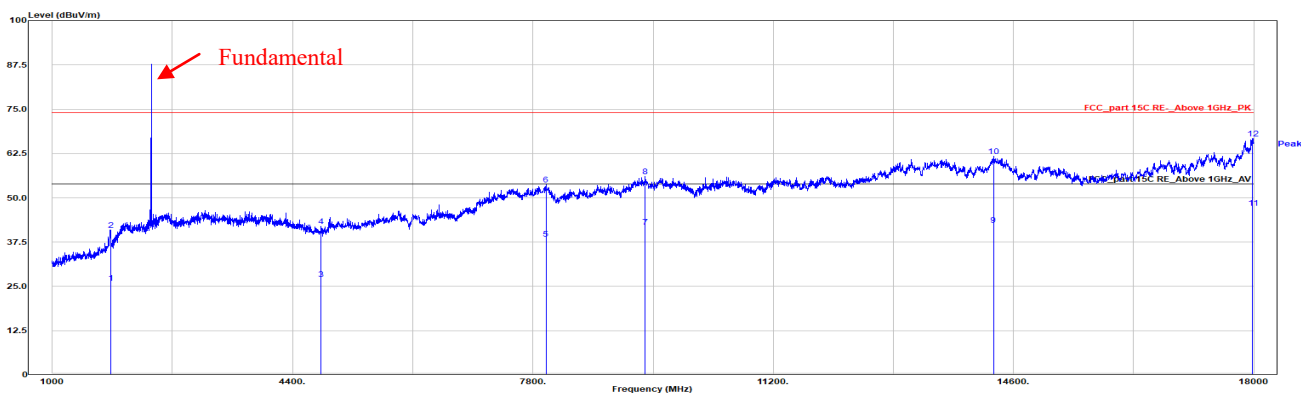
Date: 2024-04-07 time: 16:38:33

Project No.: XMTN1240325-15534E-RF

Temp/Humi: 21.1°C/68%

Test Mode : BLE CH0 Transmitting

Tested by : Ash Lin



Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
1822.800	33.17	-7.17	26.00	54.00	28.00	vertical	Average
1822.800	48.17	-7.17	41.00	74.00	33.00	vertical	Peak
4804.600	29.74	-2.72	27.02	54.00	26.98	vertical	Average
4804.600	44.74	-2.72	42.02	74.00	31.98	vertical	Peak
7983.600	32.03	6.47	38.50	54.00	15.50	vertical	Average
7983.600	47.20	6.47	53.67	74.00	20.33	vertical	Peak
9384.400	32.72	9.01	41.73	54.00	12.27	vertical	Average
9384.400	47.08	9.01	56.09	74.00	17.91	vertical	Peak
14314.400	27.64	14.77	42.41	54.00	11.59	vertical	Average
14314.400	46.96	14.77	61.73	74.00	12.27	vertical	Peak
17983.000	28.40	18.67	47.07	54.00	6.93	vertical	Average
17983.000	48.04	18.67	66.71	74.00	7.29	vertical	Peak

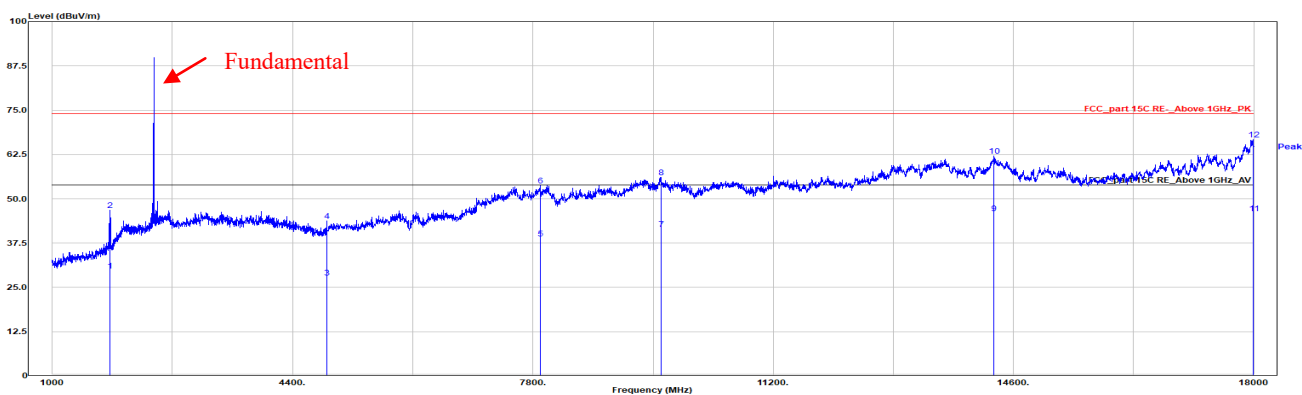
Date: 2024-04-07 time: 16:45:52

Project No.: XMTN1240325-15534E-RF

Temp/Humi: 21.1°C/68%

Test Mode: BLE CH19 Transmitting

Tested by : Ash Lin



Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
1816.000	36.94	-7.20	29.74	54.00	24.26	horizontal	Average
1816.000	53.94	-7.20	46.74	74.00	27.26	horizontal	Peak
4879.400	29.62	-1.81	27.81	54.00	26.19	horizontal	Average
4879.400	45.62	-1.81	43.81	74.00	30.19	horizontal	Peak
7902.000	32.22	6.55	38.77	54.00	15.23	horizontal	Average
7902.000	47.22	6.55	53.77	74.00	20.23	horizontal	Peak
9612.200	32.09	9.32	41.41	54.00	12.59	horizontal	Average
9612.200	46.81	9.32	56.13	74.00	17.87	horizontal	Peak
14317.800	31.07	14.75	45.82	54.00	8.18	horizontal	Average
14317.800	47.40	14.75	62.15	74.00	11.85	horizontal	Peak
17993.200	27.21	18.73	45.94	54.00	8.06	horizontal	Average
17993.200	47.92	18.73	66.65	74.00	7.35	horizontal	Peak

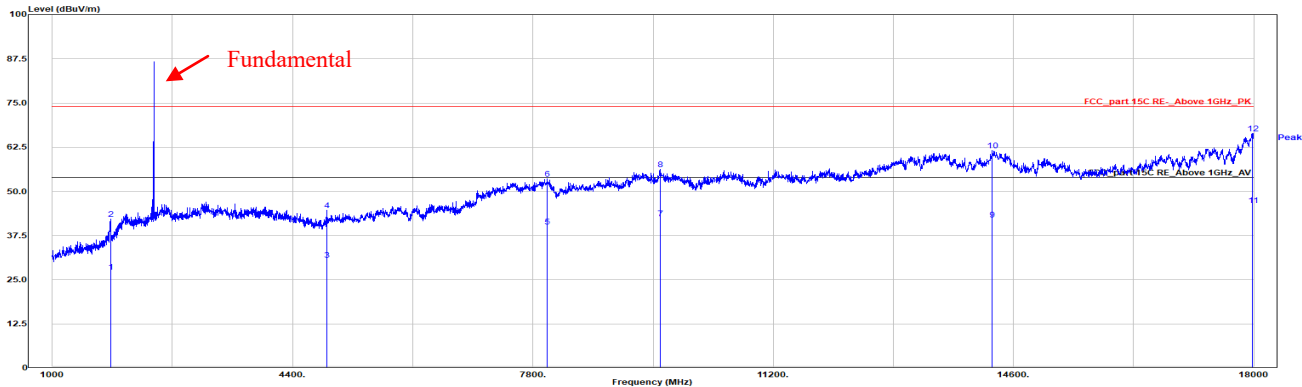
Date: 2024-04-07 time: 16:48:10

Project No. : XMTN1240325-15534E-RF

Temp/Humi: 21.1°C/68%

Test Mode : BLE CH19 Transmitting

Tested by : Ash Lin



Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
1822.800	34.32	-7.17	27.15	54.00	26.85	vertical	Average
1822.800	49.32	-7.17	42.15	74.00	31.85	vertical	Peak
4879.400	32.50	-1.81	30.69	54.00	23.31	vertical	Average
4879.400	46.50	-1.81	44.69	74.00	29.31	vertical	Peak
8007.400	33.67	6.31	39.98	54.00	14.02	vertical	Average
8007.400	47.26	6.31	53.57	74.00	20.43	vertical	Peak
9602.000	32.96	9.46	42.42	54.00	11.58	vertical	Average
9602.000	46.70	9.46	56.16	74.00	17.84	vertical	Peak
14294.000	27.23	14.78	42.01	54.00	11.99	vertical	Average
14294.000	46.83	14.78	61.61	74.00	12.39	vertical	Peak
17983.000	27.35	18.67	46.02	54.00	7.98	vertical	Average
17983.000	47.64	18.67	66.31	74.00	7.69	vertical	Peak

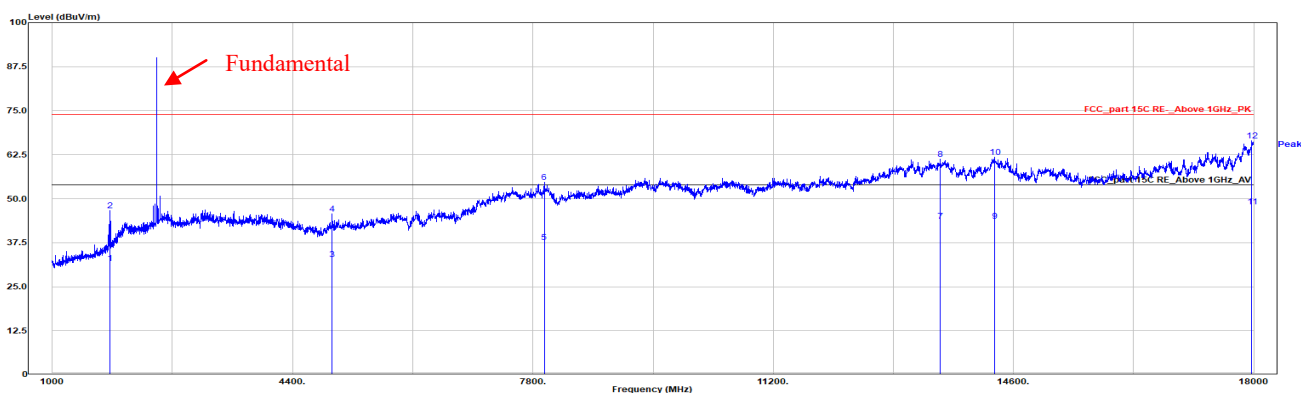
Date: 2024-04-07 time: 16:55:16

Project No. : XMTN1240325-15534E-RF

Temp/Humi: 21.1°C/68%

Test Mode : BLE CH39 Transmitting

Tested by : Ash Lin



Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
1816.000	38.81	-7.20	31.61	54.00	22.39	horizontal	Average
1816.000	53.81	-7.20	46.61	74.00	27.39	horizontal	Peak
4961.000	33.75	-0.98	32.77	54.00	21.23	horizontal	Average
4961.000	46.75	-0.98	45.77	74.00	28.23	horizontal	Peak
7959.800	31.11	6.60	37.71	54.00	16.29	horizontal	Average
7959.800	48.11	6.60	54.71	74.00	19.29	horizontal	Peak
13559.600	28.80	14.83	43.63	54.00	10.37	horizontal	Average
13559.600	46.38	14.83	61.21	74.00	12.79	horizontal	Peak
14328.000	29.00	14.69	43.69	54.00	10.31	horizontal	Average
14328.000	47.10	14.69	61.79	74.00	12.21	horizontal	Peak
17969.400	29.18	18.60	47.78	54.00	6.22	horizontal	Average
17969.400	47.91	18.60	66.51	74.00	7.49	horizontal	Peak

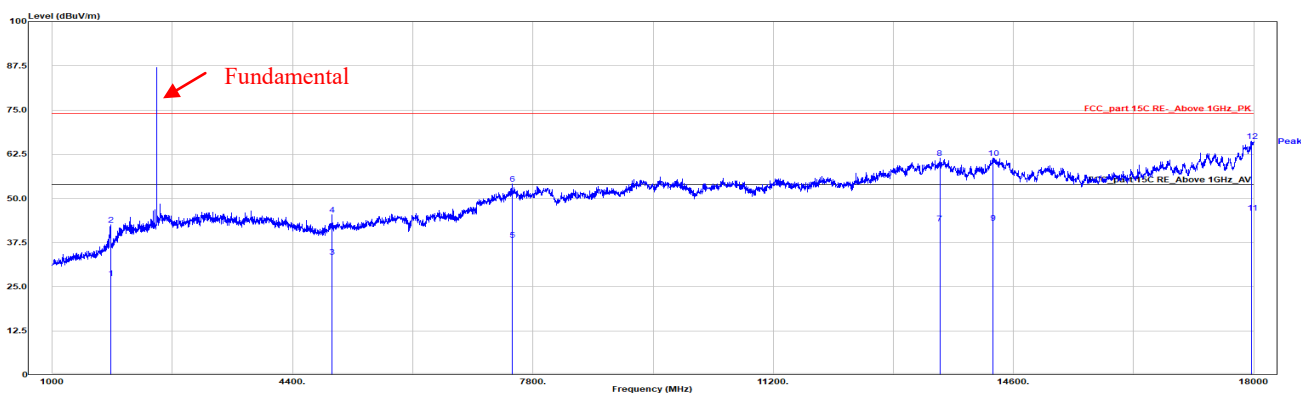
Date: 2024-04-07 time: 16:51:29

Project No.: XMTN1240325-15534E-RF

Temp/Humi: 21.1°C/68%

Test Mode : BLE CH39 Transmitting

Tested by : Ash Lin



Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
1822.800	34.65	-7.17	27.48	54.00	26.52	vertical	Average
1822.800	49.65	-7.17	42.48	74.00	31.52	vertical	Peak
4957.600	34.37	-0.98	33.39	54.00	20.61	vertical	Average
4957.600	46.37	-0.98	45.39	74.00	28.61	vertical	Peak
7504.200	31.26	6.99	38.25	54.00	15.75	vertical	Average
7504.200	47.03	6.99	54.02	74.00	19.98	vertical	Peak
13556.200	28.04	14.85	42.89	54.00	11.11	vertical	Average
13556.200	46.50	14.85	61.35	74.00	12.65	vertical	Peak
14304.200	28.24	14.83	43.07	54.00	10.93	vertical	Average
14304.200	46.62	14.83	61.45	74.00	12.55	vertical	Peak
17972.800	27.33	18.62	45.95	54.00	8.05	vertical	Average
17972.800	47.52	18.62	66.14	74.00	7.86	vertical	Peak

4) 18GHz~25GHz

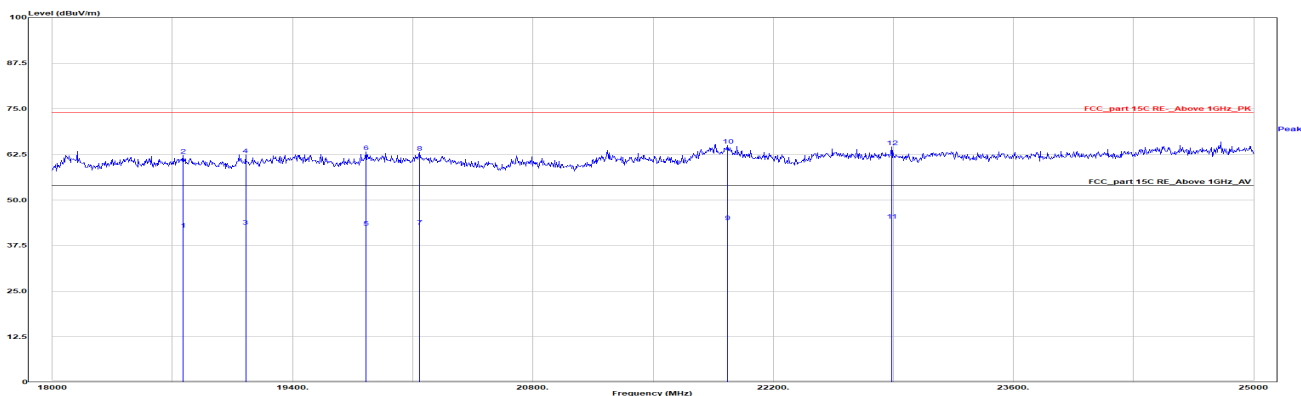
Date: 2024-04-07 time: 18:47:03

Project No.: XMTN1240325-15534E-RF

Temp/Humi: 21.1°C/68%

Test Mode: BLE CH39 Transmitting

Tested by : Ash Lin



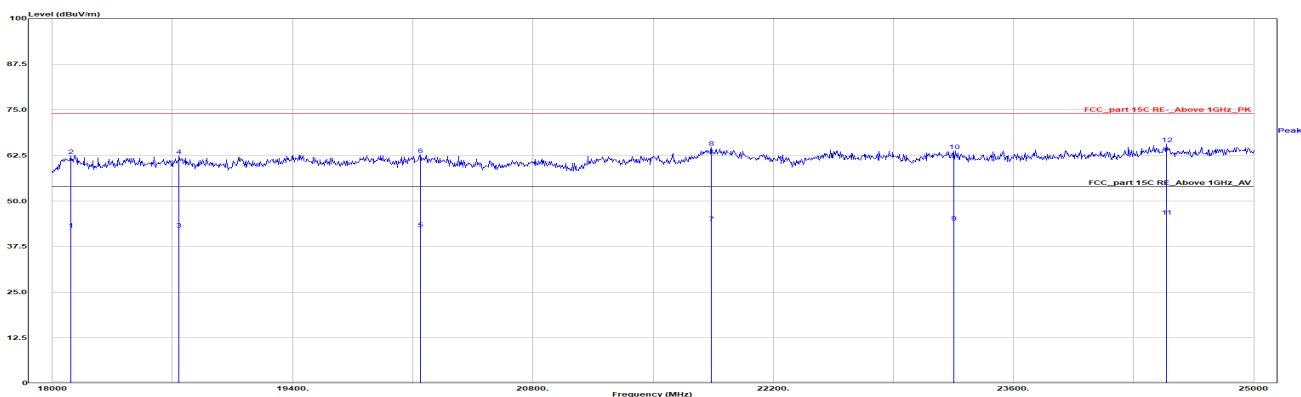
Date: 2024-04-07 time: 18:41:03

Project No.: XMTN1240325-15534E-RF

Temp/Humi: 21.1°C/68%

Test Mode : BLE CH39 Transmitting

Tested by : Ash Lin



Restricted Bands Emissions:

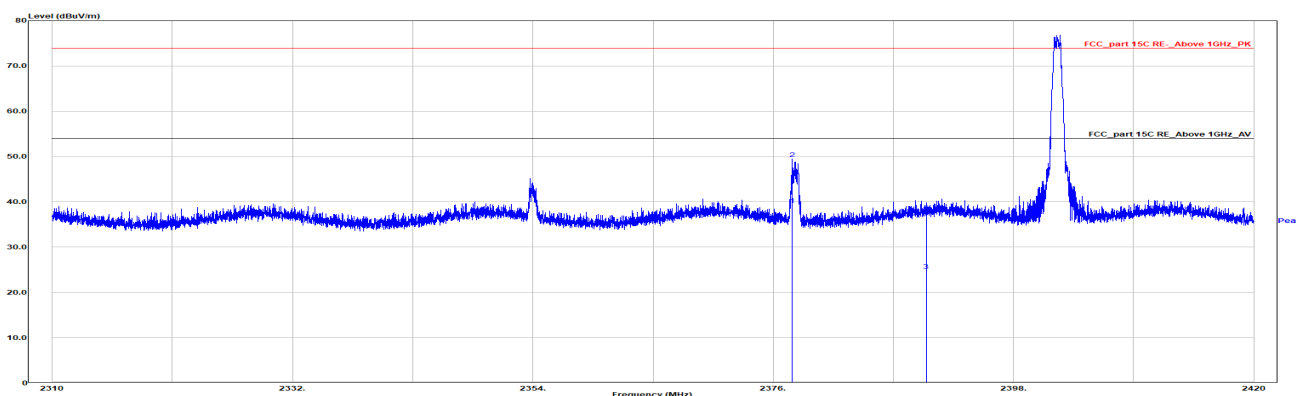
Pre-Scan with in the X,Y and Z axes of orientation, the worst case in Z-axis of orientation in horizontal polarization was recorded

Note:

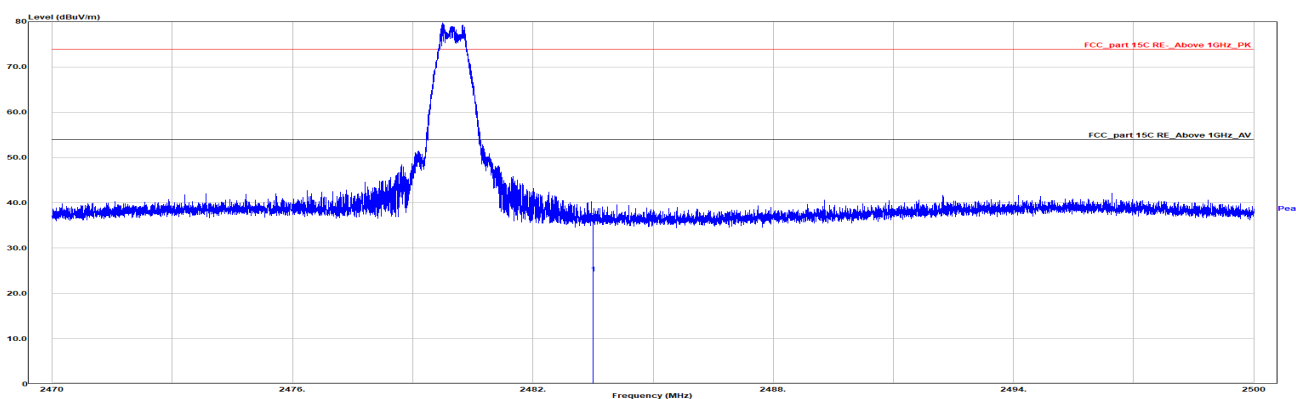
1. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB/m)

Corrected Amplitude (dBμV/m) = Corrected Factor (dB/m) + Reading (dBμV)

Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV/m)



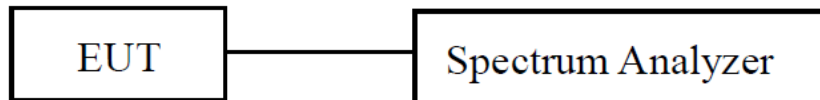
Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
2377.771	35.21	4.14	39.35	54.00	14.65	horizontal	Average
2377.771	45.30	4.14	49.44	74.00	24.56	horizontal	Peak
2390.000	20.53	4.28	24.81	54.00	29.19	horizontal	Average
2390.000	33.56	4.28	37.84	74.00	36.16	horizontal	Peak



Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Pol	Remark
2483.500	19.39	5.03	24.42	54.00	29.58	horizontal	Average
2483.500	31.14	5.03	36.17	74.00	37.83	horizontal	Peak

FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH**Applicable Standard**

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

EUT Setup**Test Procedure**

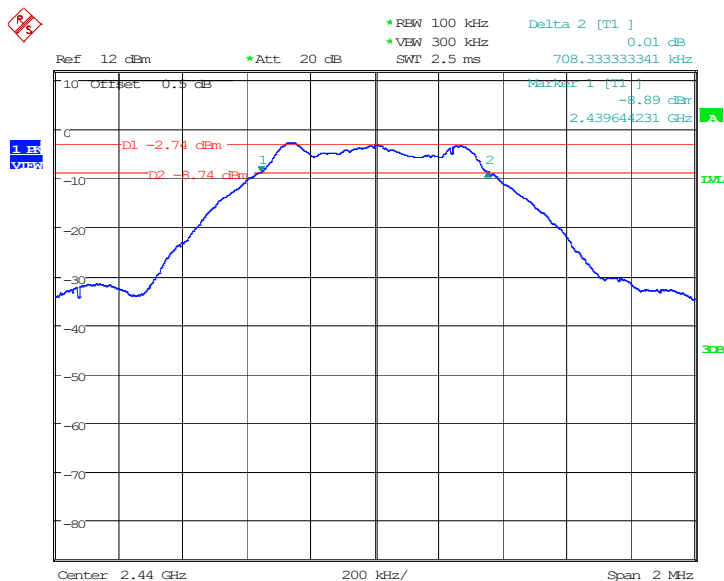
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data

Test Mode:	Transmitting	Test Engineer:	Ash Lin
Test Date:	2024-03-26~2024-03-27	Test Voltage:	DC 7.4V
Test Result:	Compliance	Environment:	Temp.: 23.9°C~24.1°C Humi.: 60%~62% Atm :100.8kPa~101.0kPa
Test Channel	Test Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
Lowest	2402	0.712	≥0.5
Middle	2440	0.708	≥0.5
Highest	2480	0.718	≥0.5

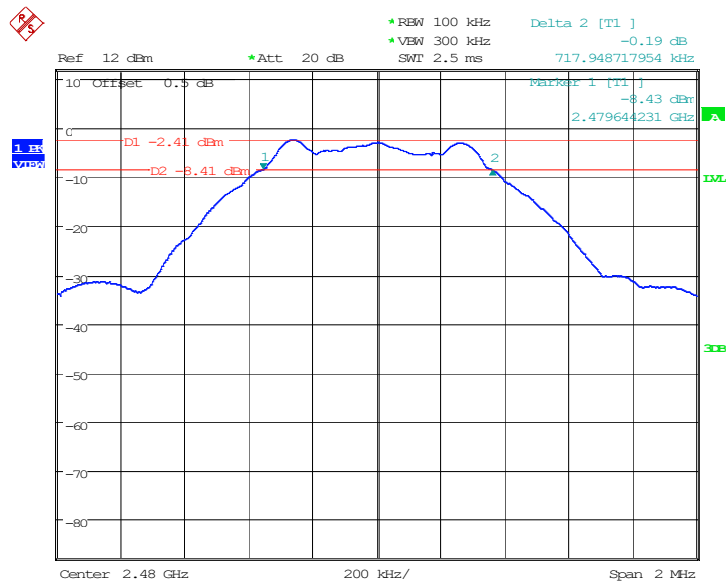
[illegible]

Middle



Page 32 of 44

Highest



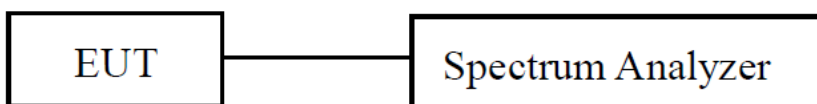
Project No. :XMTN1240325-15534E-RF Tester: Ash Lin
Date: 26.MAR.2024 16:34:48

FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

EUT Setup



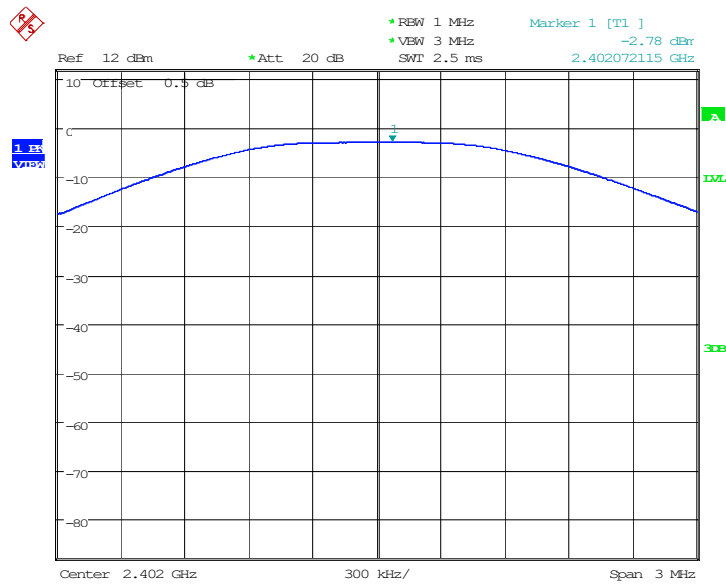
Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.

Test Data

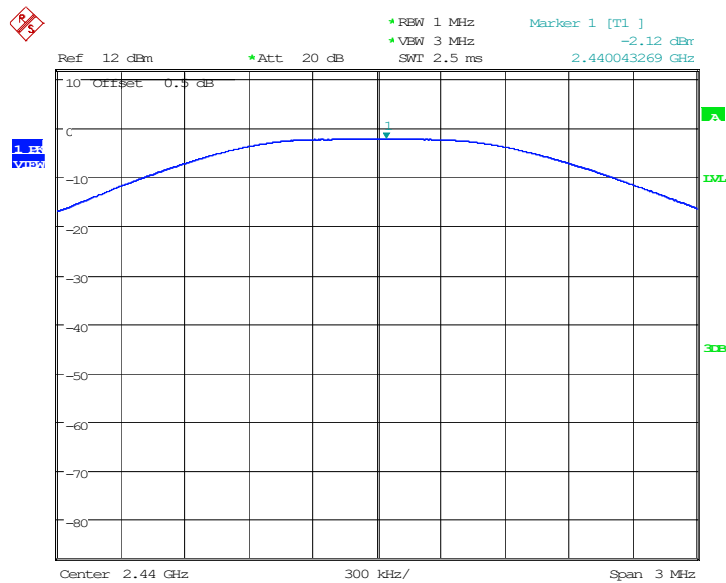
Test Mode:	Transmitting	Test Engineer:	Ash Lin
Test Date:	2024-03-26	Test Voltage:	DC 7.4V
Test Result:	Compliance	Environment:	Temp.: 23.9°C Humi.: 60% Atm.: 100.8kPa
Test Channel	Test Frequency (MHz)	Maximum Conducted Peak Output Power(dBm)	Limit (dBm)
Lowest	2402	-2.78	≤30
Middle	2440	-2.12	≤30
Highest	2480	-1.85	≤30

Lowest



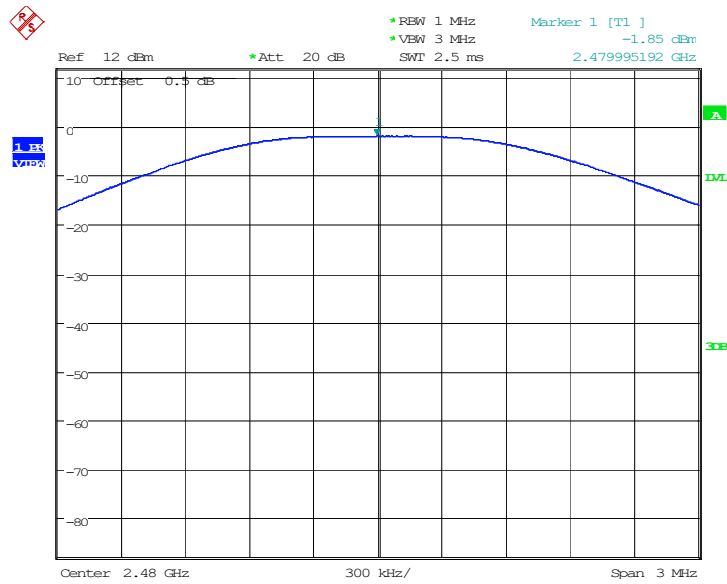
Project No. :XMTN1240325-15534E-RF Tester: Ash Lin
Date: 26.MAR.2024 16:29:05

Middle



Project No. :XMTN1240325-15534E-RF Tester: Ash Lin
Date: 26.MAR.2024 16:31:34

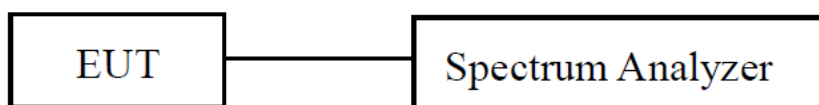
Highest



Project No. :XMTN1240325-15534E-RF Tester: Ash Lin
 Date: 26.MAR.2024 16:32:03

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE**Applicable Standard**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

EUT Setup**Test Procedure**

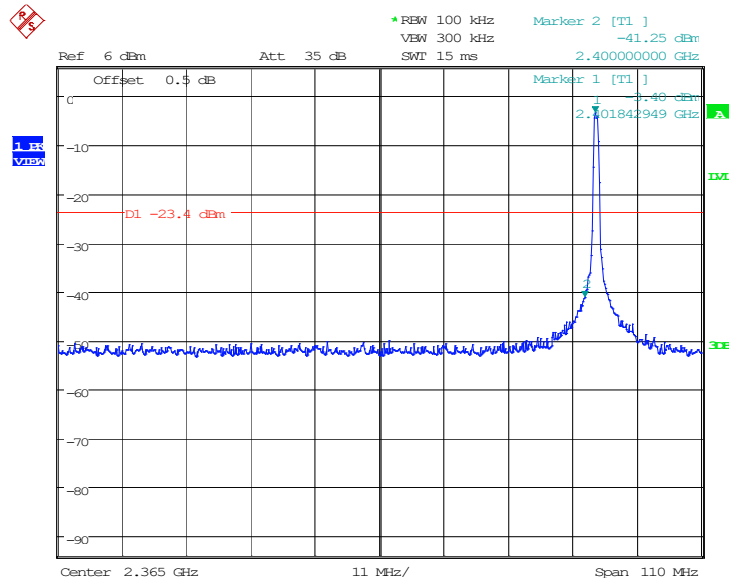
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Test Mode:	Transmitting	Test Engineer:	Ash Lin
Test Date:	2024-03-27	Test Voltage:	DC 7.4V
Test Result:	Compliance	Environment:	Temp.: 24.1°C Humi.: 62% Atm:101.1kPa

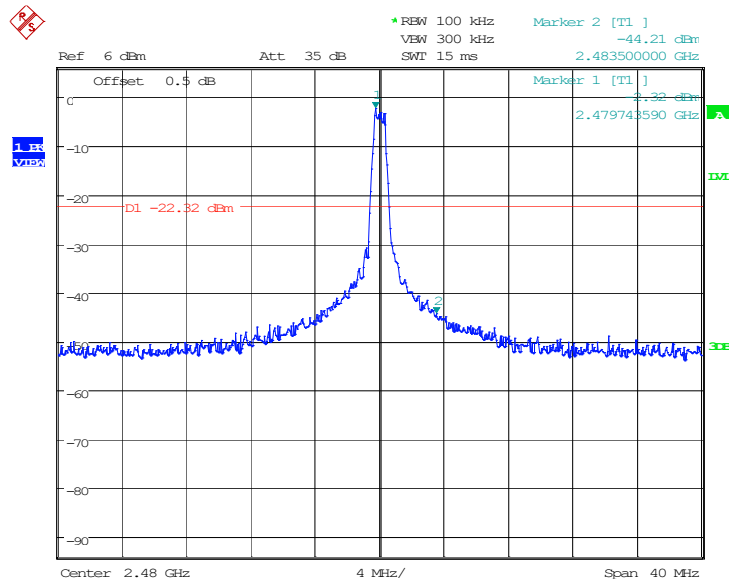
Please refer to the below plots:

Lowest



Project No. :XMTN1240325-15534E-RF Tester: Ash Lin
Date: 27.MAR.2024 10:25:34

Highest



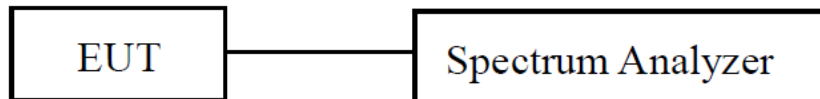
Project No. :XMTN1240325-15534E-RF Tester: Ash Lin
Date: 27.MAR.2024 10:29:02

FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

EUT Setup



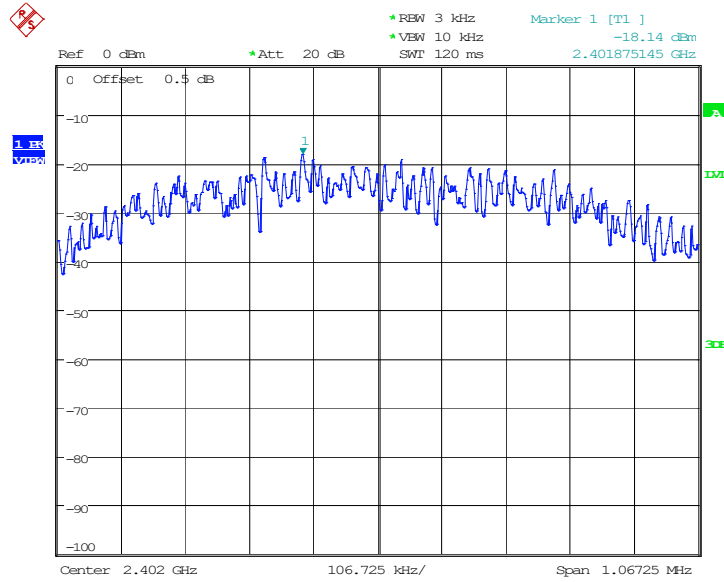
Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW to: $3\text{kHz} \leq \text{RBW} \leq 100\text{ kHz}$.
3. Set the VBW $\geq 3 \times \text{RBW}$.
4. Set the span to 1.5 times the DTS bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Data

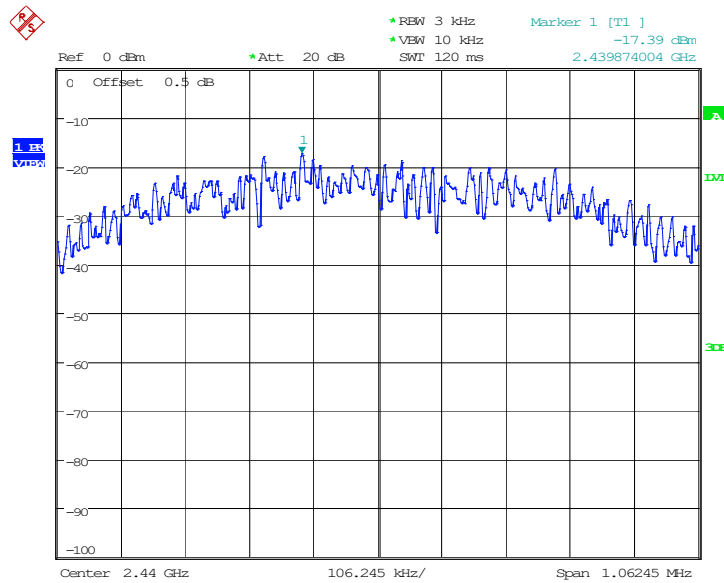
Test Mode:	Transmitting	Test Engineer:	Ash Lin
Test Date:	2024-03-27	Test Voltage:	DC 7.4V
Test Result:	Compliance	Environment:	Temp.: 24.1°C Humi.: 62% Atm: 101.1kPa
Test Channel	Test Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Lowest	2402	-18.14	≤ 8.00
Middle	2440	-17.39	≤ 8.00
Highest	2480	-17.06	≤ 8.00

Lowest



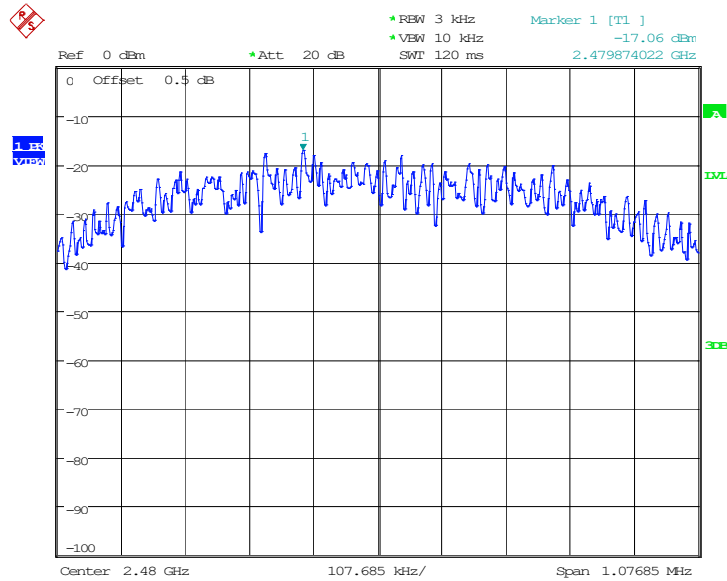
Project No. :XMTN1240325-15534E-RF Tester: Ash Lin
Date: 27.MAR.2024 10:37:55

Middle



Project No. :XMTN1240325-15534E-RF Tester: Ash Lin
Date: 27.MAR.2024 10:39:29

Highest



Project No. :XMTN1240325-15534E-RF Tester: Ash Lin
Date: 27.MAR.2024 10:41:07

EUT PHOTOGRAPHS

Please refer to the attachment XMTN1240325-15534E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and XMTN1240325-15534E-RF-INP EUT INTERNAL PHOTOGRAPHS.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment XMTN1240325-15534E-RF-TSP SETUP PHOTOGRAPHS.

Declarations

1. Bay Area Compliance Laboratories Corp. (Xiamen) is not responsible for authenticity of any information provided by the applicant. Information from the applicant that may affect test results are marked with an asterisk “★”.
2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.
3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor $k=2$ with the 95.45% confidence interval.
5. This report cannot be reproduced except in full, without prior written approval of Bay Area Compliance Laboratories Corp. (Xiamen).
6. This report is valid only with a valid digital signature. The digital signature may be available only under the adobe software above version 7.0.
7. This report may contain standards and test items that are not covered by the accreditation scope and shall be marked with an asterisk “▲”.

******* END OF REPORT *******