FCC PART 15.247

TEST REPORT

For

AKUVOX (XIAMEN) NETWORKS CO., LTD.

10/F, No.56 Guanri Road, Software Park II, Xiamen 361009, China

FCC ID: 2AHCR-PG71

Report Type:	**Product Name:**
Original Report	HyPanel Pro

Report Number:	XMDN240219-08385E-RF-03
Report Date:	2025-01-06
Reviewed By:	Ash Lin
Approved By:	Miles Chen
Prepared By:	Bay Area Compliance Laboratories Corp. (Xiamen) Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone XiaMen Tel: +86-592-3200111 www.baclcorp.com.cn

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	XMDN240219-08385E-RF-03	R1V1	2025-01-06	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	AKUVOX (XIAMEN) NETWORKS CO., LTD.
Product Name:	HyPanel Pro
Tested Model:	PG71
Series Model(s):	PG71N
Power Supply:	DC 12V from Adapter or DC 48V from PoE
Maximum Conducted Output Peak Power:	7.34dBm
Frequency Range:	Zigbee: 2405~2480MHz
Modulation Technique:	O-QPSK
Antenna Type:	LDS Antenna
★Maximum Antenna Gain:	1.3 dBi
EUT Received Status:	Good
Note: *1. The Maximum Antenna Gain was declared by manufacturer.* *2. The model difference is PG71 is equipped with a camera and an indicator Led, while PG71N does not. Please refer to declaration letter for more detail.* *3. All measurement and test data in this report was gathered from production sample serial number: XMDN240219-08385E-RF-1(model:PG71), XMDN240219-08385E-RF-2(model:PG71N) (Assigned by the BACL (Xiamen). The EUT supplied by the applicant was received on 2024-05-06)*	

Objective

This report is prepared on behalf of AKUVOX (XIAMEN) NETWORKS 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 C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

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~200MHz	4.38 dB
	200MHz~1GHz	4.50 dB
	1GHz~6GHz	4.6 dB
	6GHz-18GHz	5.42 dB
	18GHz~26.5GHz	5.47 dB
Occupied Channel Bandwidth		0.053 kHz
Transmitter Conducted Power(Conducted RF power)		0.624 dB
Conducted Spurious Emission		2.52 dB
Power Spectral Density		0.61 dB
Duty Cycle		1%
Temperature		1℃
Humidity		5%
Supply voltages		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:	DC 12V from Adapter(AC 120V/60Hz) or DC 48V from PoE(AC 120V/60Hz)
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.

Note:
1. Power from adapter and PoE were evaluated in the XMDN240219-08385E-RF-02 report for the AC Line Conducted Emissions Test and Radiation Spurious Emissions Test. The report showed that PoE had worse emissions in AC Line Conducted Emissions Test and Radiation Spurious Emissions Test. Therefore, only the test results with worst case PoE are reflected in this report.

2. For series model PG71N, Radiated Spurious Emissions below 1GHz and AC line conducted emissions was tested since the hardware difference.

Description of Test Configuration

For BLE mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	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**

EUT was tested with Channel 11, 18 and 26.

Equipment Modifications

No modification was made to the EUT tested.

★EUT Exercise Software

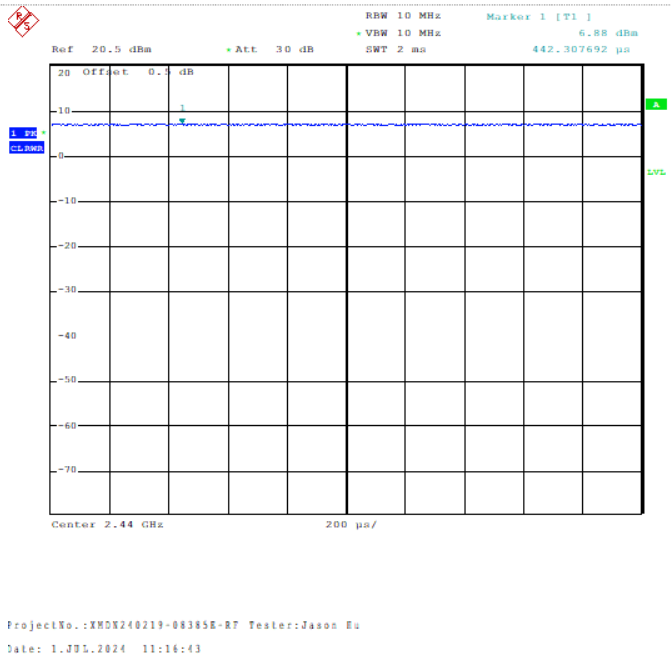
RF Test Tool: sscom5.13.1

Mode	Power level		
	Low channel	Middle channel	High channel
Zigbee	10	10	10

Duty Cycle

Mode	Ton (ms)	Ton+Toff (ms)	Duty Cycle (%)	1/Ton (Hz)	VBW Setting (kHz)
Middle	100	100	100.00	10	0.01

Middle Channel



Support Equipment List and Details

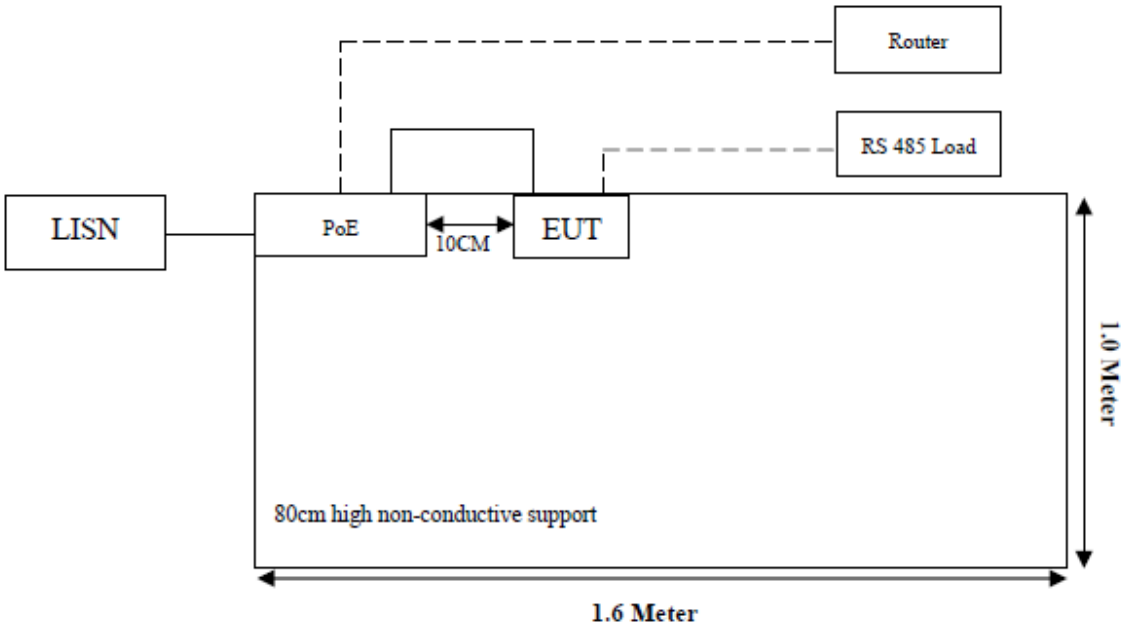
Manufacturer	Description	Model	Serial Number
NETGEAR	POE	MSIP-REN-NGR-GS108Ev3	3UJD1756006EB
SWITCHING ADAPTER	Adapter	FJ-SW126K1201000DU	unknown
BACL	RS 485 Load	unknown	unknown
Honor	Router	WS831	W6E7S15B09001200

External I/O Cable

Cable Description	Length (m)	From Port	To
Network cable	1	EUT	POE
Network cable	10	POE	Router
Load cable	10	EUT	RS 485 Load

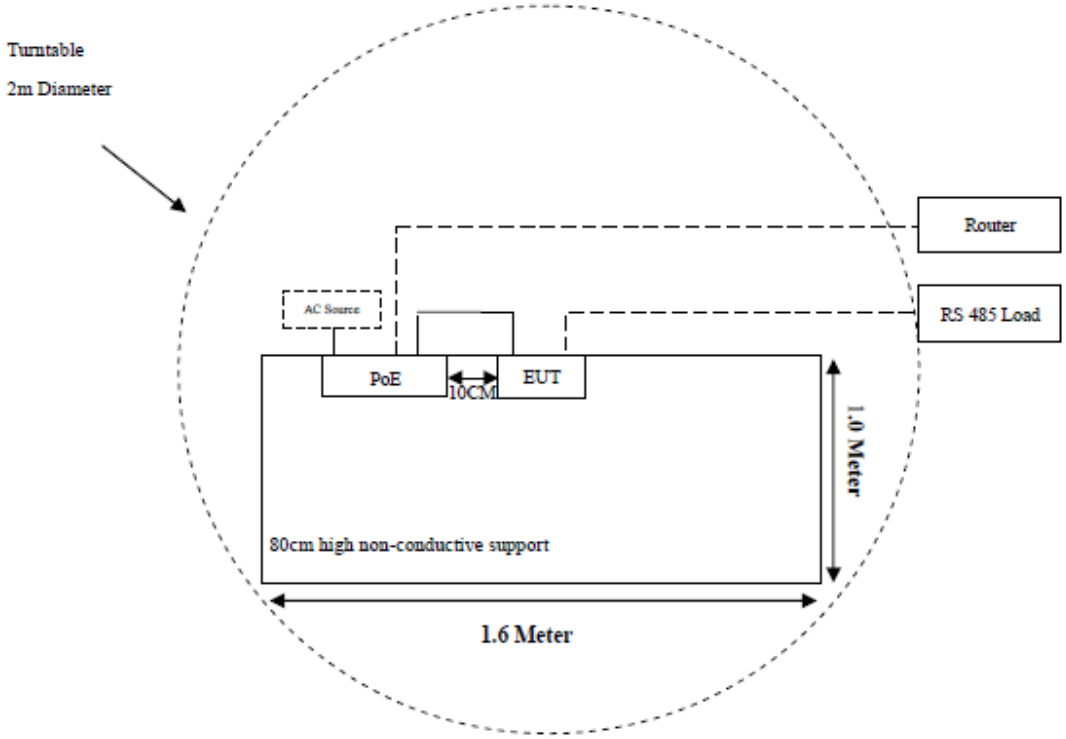
Block Diagram of Test Setup

Conducted Emission:

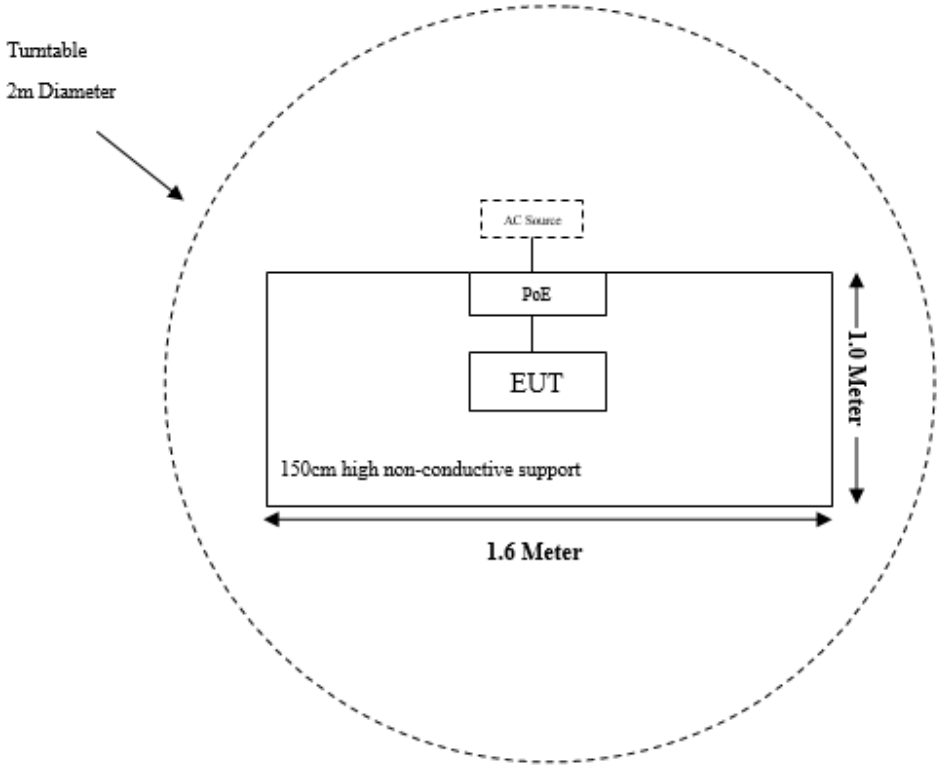


Radiated Emissions:

Below 1GHz



Above 1GHz


Turntable
2m Diameter
AC Source
PoE
EUT
150cm high non-conductive support
1.0 Meter
1.6 Meter

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	2024/03/29	2025/03/28
LISN	Rohde & Schwarz	ENV216	100129	2024/03/29	2025/03/28
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	0357.8810.54	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC001	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESR	103103	2024/03/29	2025/03/28
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	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC002	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-2M	CC006	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-12M	CC007	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	HFH2-CC	335.3609	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Above 1 GHz					
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102051	2024/03/29	2025/03/28
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
Horn Antenna	EMCO	3115	9002-3355	2024/11/19	2027/11/18
Preamplifier	A.H.Systems	PAM-0118P	489	2024/03/29	2025/03/28
Preamplifier	A.H.Systems	PAM-1840	200	2024/03/29	2025/03/28
Filter Switch Unit	Decentest	DT7220FSU	DS79904	2024/02/23	2025/02/22
Multiplex Switch Test Control Set	Decentest	DT7220SCU	DS79901	2024/02/23	2025/02/22
Coaxial Cable	XINHANGWEIBO	XH800A-N-6M	CC003	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH800A-N-1M	CC005	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH360A-2.92-3M	CC008	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH360A-2.92-1M	CC009	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
RF Conducted Test					
Spectrum Analyzer	Rohde & Schwarz	FSU	100405	2024/03/29	2025/03/28
Coaxial Cable	N/A	N/A	N/A	2024/03/29	2025/03/28

*** 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 LDS antenna for Zigbee, which was permanently attached and the antenna gain is 1.3 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

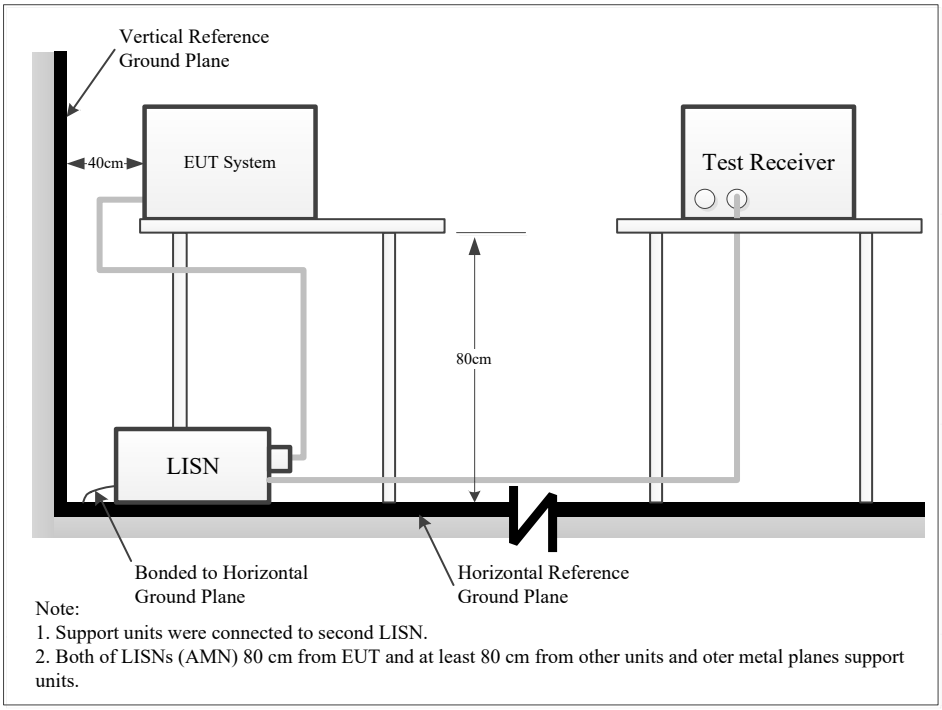
Result: Compliance

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



Note:
1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at least 80 cm from other units and oter metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 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.

Result & Margin Calculation

The Result 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:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
Result (dBμV) = Reading (dBμV) + Factor (dB)

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:

Margin (dB) = Limit (dBμV) –Result (dBμV)

Test Data

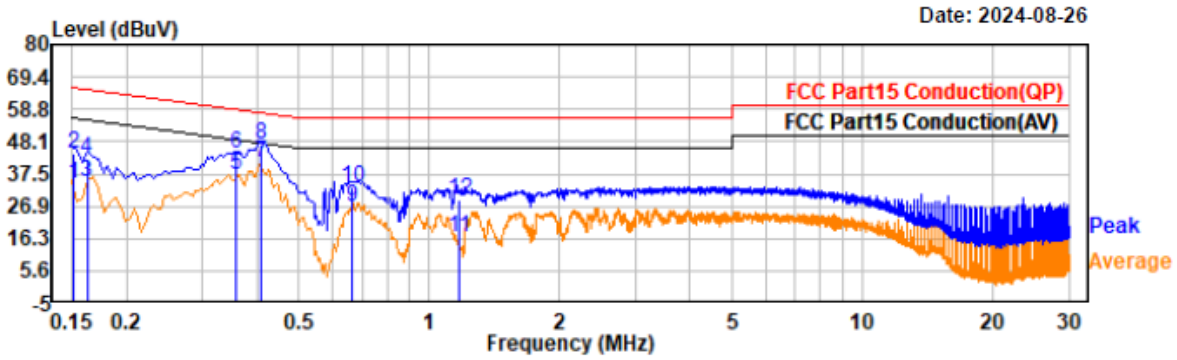
Temperature:	19.8℃~22.4℃
Relative Humidity:	41%~56%
ATM Pressure:	100.1kPa
Test Date:	2024-08-26~2025-01-02
Test Engineer:	Spike Gao

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

EUT Model: PG71

Project No.: XMDN240219-08385E
Test Mode: Zigbee 2480
EUT Model: PG71

Temp/Humi/ATM: 22.4℃/56%/100.1kPa
Tested by: Spike Gao
Power Source: DC 48V from PoE

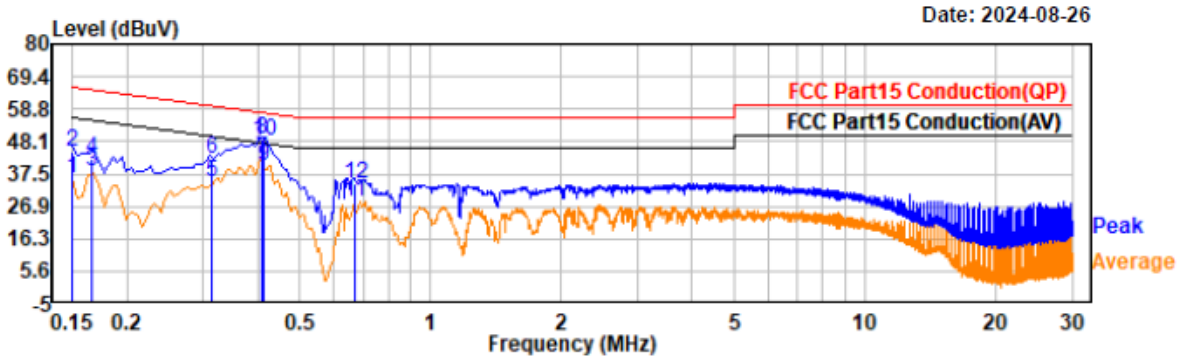


Trace: 1

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.15	13.15	21.03	34.18	55.95	21.77	Line	Average
0.15	22.99	21.03	44.02	65.95	21.93	Line	QP
0.16	13.54	21.10	34.64	55.34	20.70	Line	Average
0.16	21.32	21.10	42.42	65.34	22.92	Line	QP
0.36	16.63	20.64	37.27	48.75	11.48	Line	Average
0.36	23.48	20.64	44.12	58.75	14.63	Line	QP
0.41	20.99	20.50	41.49	47.69	6.20	Line	Average
0.41	26.78	20.50	47.28	57.69	10.41	Line	QP
0.66	6.21	20.55	26.76	46.00	19.24	Line	Average
0.66	12.51	20.55	33.06	56.00	22.94	Line	QP
1.17	-4.00	20.71	16.71	46.00	29.29	Line	Average
1.17	8.46	20.71	29.17	56.00	26.83	Line	QP

Project No.: XMDN240219-08385E
Test Mode: Zigbee 2480
EUT Model: PG71

Temp/Humi/ATM: 22.4℃/56%/100.1kPa
Tested by: Spike Gao
Power Source: DC 48V from PoE



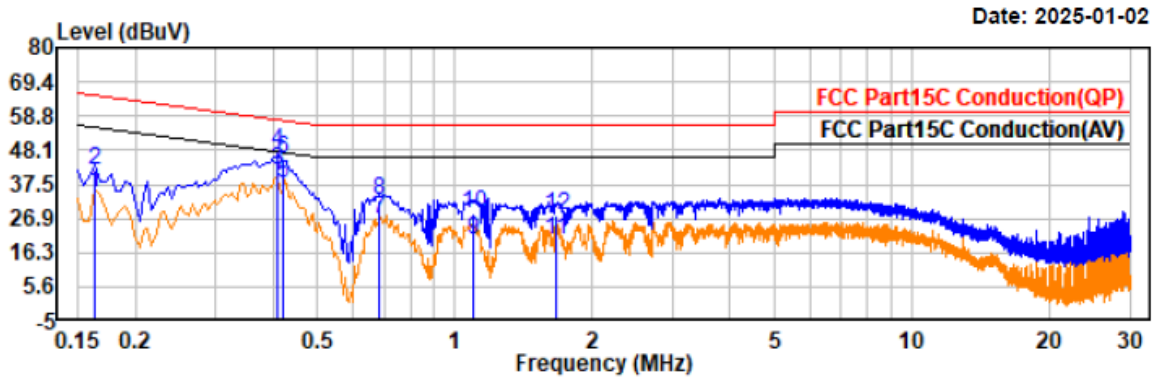
Trace: 1

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.15	15.30	20.83	36.13	55.98	19.85	Neutral	Average
0.15	24.04	20.83	44.87	65.98	21.11	Neutral	QP
0.17	17.26	20.91	38.17	55.12	16.95	Neutral	Average
0.17	21.45	20.91	42.36	65.12	22.76	Neutral	QP
0.31	14.11	20.69	34.80	49.87	15.07	Neutral	Average
0.31	21.63	20.69	42.32	59.87	17.55	Neutral	QP
0.41	22.26	20.46	42.72	47.68	4.96	Neutral	Average
0.41	28.21	20.46	48.67	57.68	9.01	Neutral	QP
0.41	19.63	20.45	40.08	47.57	7.49	Neutral	Average
0.41	27.68	20.45	48.13	57.57	9.44	Neutral	QP
0.67	8.25	20.39	28.64	46.00	17.36	Neutral	Average
0.67	14.03	20.39	34.42	56.00	21.58	Neutral	QP

EUT Model: PG71N

Project No.: XMDN240219-08385E
Test Mode: Zigbee 2480
EUT Model: PG71N

Temp/Humi/ATM: 19.8℃/41%/100.1kPa
Tested by: Spike Gao
Power Source: DC 48V From POE

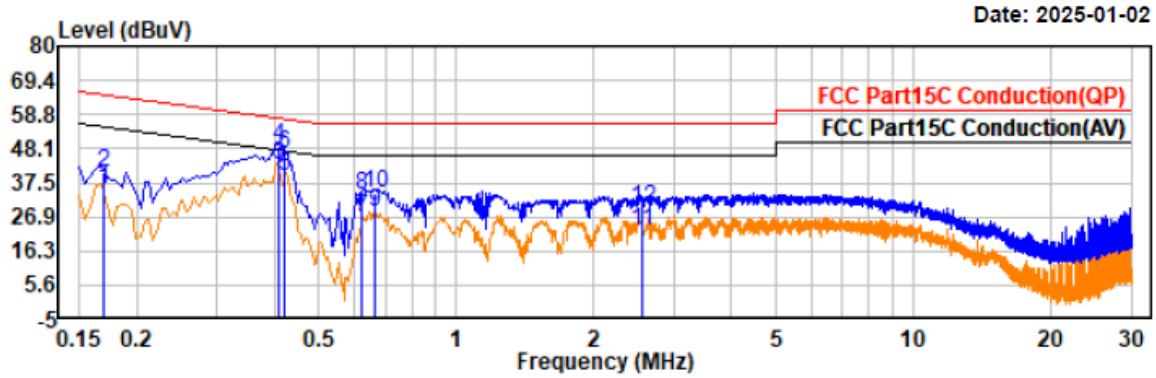


Trace: 1
Condition: QP/AV RBW:9kHz VBW:30kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.16	14.05	20.82	34.87	55.30	20.43	Line	Average
0.16	21.25	20.82	42.07	65.30	23.23	Line	QP
0.41	21.40	20.35	41.75	47.69	5.94	Line	Average
0.41	27.26	20.35	47.61	57.69	10.08	Line	QP
0.42	17.71	20.34	38.05	47.44	9.39	Line	Average
0.42	25.17	20.34	45.51	57.44	11.93	Line	QP
0.69	6.42	20.49	26.91	46.00	19.09	Line	Average
0.69	12.16	20.49	32.65	56.00	23.35	Line	QP
1.10	-0.79	20.95	20.16	46.00	25.84	Line	Average
1.10	7.25	20.95	28.20	56.00	27.80	Line	QP
1.66	-0.86	21.08	20.22	46.00	25.78	Line	Average
1.66	6.99	21.08	28.07	56.00	27.93	Line	QP

Project No.: XMDN240219-08385E
Test Mode: Zigbee 2480
EUT Model: PG71N

Temp/Humi/ATM: 19.8℃/41%/100.1kPa
Tested by: Spike Gao
Power Source: DC 48V From POE



Trace: 1
Condition: QP/AV RBW:9kHz VBW:30kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.17	14.90	20.71	35.61	54.99	19.38	Neutral	Average
0.17	20.24	20.71	40.95	64.99	24.04	Neutral	QP
0.41	22.85	20.45	43.30	47.69	4.39	Neutral	Average
0.41	28.67	20.45	49.12	57.69	8.57	Neutral	QP
0.42	19.09	20.44	39.53	47.43	7.90	Neutral	Average
0.42	26.43	20.44	46.87	57.43	10.56	Neutral	QP
0.62	6.43	20.33	26.76	46.00	19.24	Neutral	Average
0.62	13.48	20.33	33.81	56.00	22.19	Neutral	QP
0.66	8.02	20.32	28.34	46.00	17.66	Neutral	Average
0.66	13.76	20.32	34.08	56.00	21.92	Neutral	QP
2.55	1.81	20.93	22.74	46.00	23.26	Neutral	Average
2.55	8.56	20.93	29.49	56.00	26.51	Neutral	QP

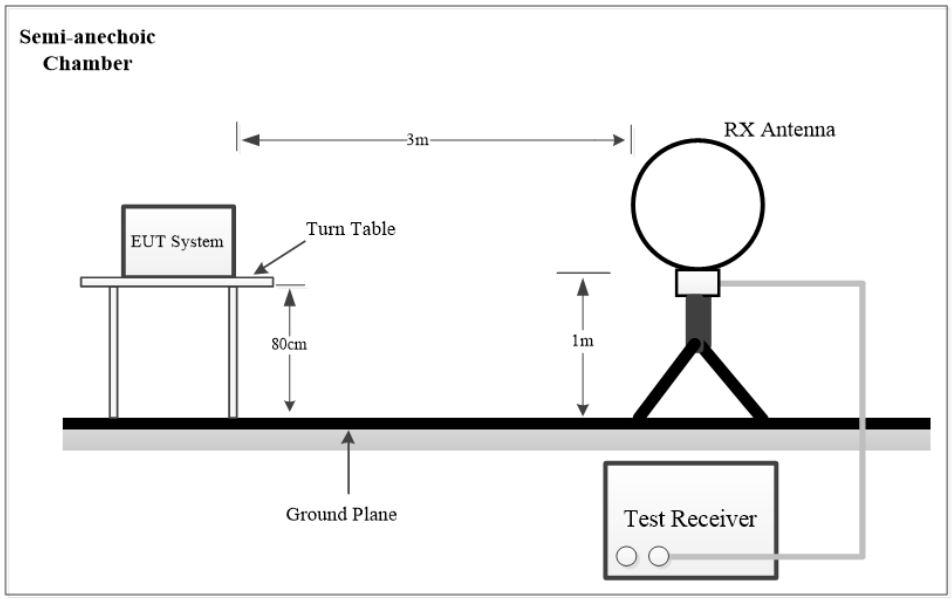
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

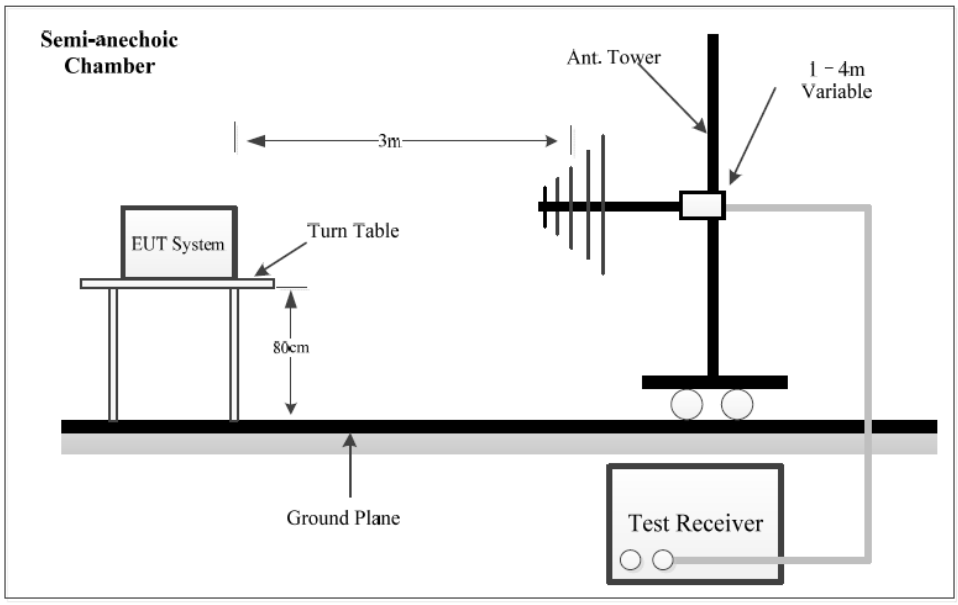
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

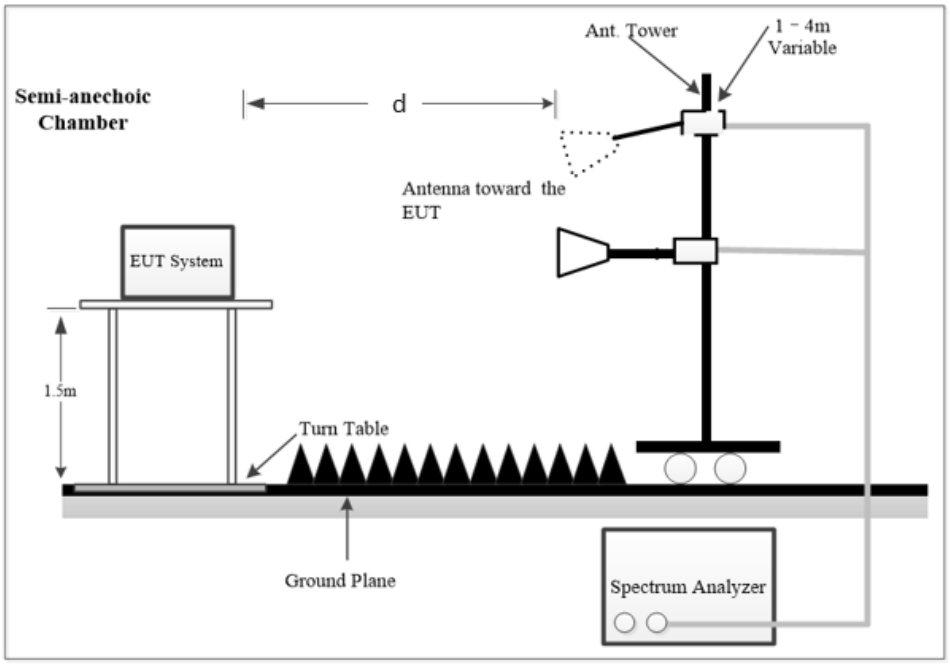
9 kHz-30MHz:



30MHz -1 GHz:



Above 1GHz:



The radiated emission tests using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

NOTE:
d is testing distance;

For Radiated Emission test (1GHz-18GHz) and Bandedge Emission test, which was performed at 3 m distance.

For Radiated Emission test (18GHz-25GHz), which was performed at 1.0 m distance, according to ANSI C63.10-2013, the test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.0m.

Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.0m]) dB= 9.54 dB

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 25GHz.

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

Below 1GHz:

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

Above 1GHz:
Pre-scan:

Duty Cycle	RBW	VBW	Measurement
Any	1MHz	3MHz	PK
＞98%	1MHz	5kHz	AV
＜98%	1MHz	≥1/T, not less than 5kHz	AV

Final measurement for emission identified during the pre-scan:

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

Note: T is minimum transmission duration

Test Procedure

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

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.”

Below 1GHz, if the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 10 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

Above 1GHz, if the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 6 dB below the AV emission limit, there's no need to record the measured AV level of the emissions in the report.

Result & Margin Calculation

The Result 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:

For 9 kHz to 18GHz Radiated emission test
Factor (dB/m) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

For 18GHz to 25GHz Radiated emission test and Bandedge emissions test
Factor (dB/m) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB) - Extrapolation factor (dB)

Extrapolation factor=9.54dB (distance=1m)

Result (dBμV/m) = Reading (dBμV) + Factor (dB/m)

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:

Margin (dB) = Limit (dBμV/m) –Result (dBμV/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:	20.5℃~23.5℃	21.7℃~23.5℃
Relative Humidity:	44%~53%	49%~53%
ATM Pressure:	100.1kPa~101kPa	100.1kPa
Test Date:	2024-07-26~2024-12-27	2024-08-26~2024-12-04
Test Engineer:	Wlif Wu	Wlif Wu

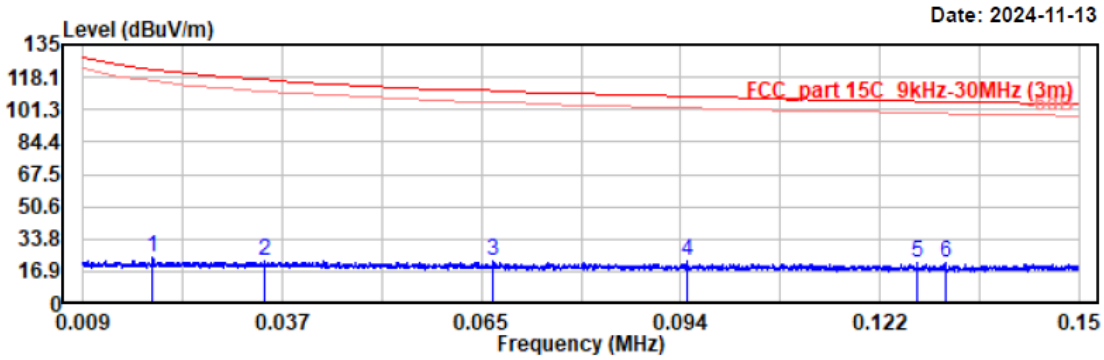
1) 9 kHz~30MHz

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

EUT Model: PG71

Project No.: XMDN240219-08385E-RF
Test Mode: Ziggee 2480
EUT Model: PG71
Test distance: 3m

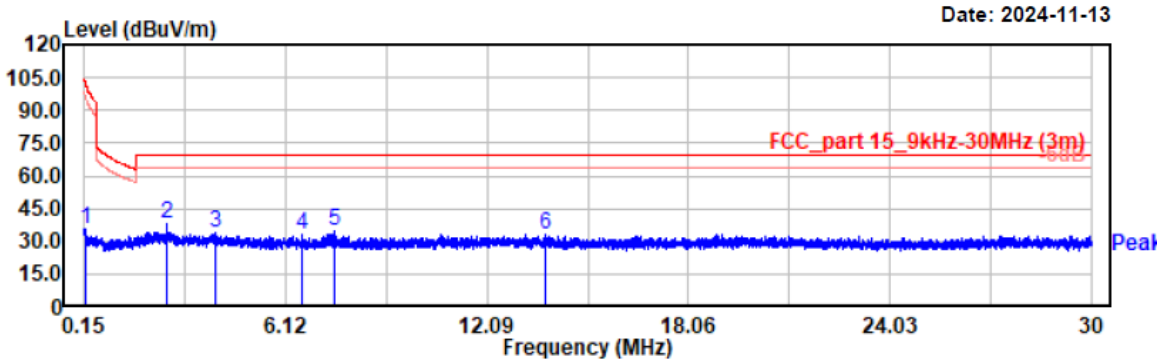
Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.019	4.07	19.78	23.85	122.08	98.23	Peak
0.035	2.67	19.91	22.58	116.81	94.23	Peak
0.067	2.50	19.84	22.34	111.08	88.74	Peak
0.095	2.51	19.77	22.28	108.09	85.81	Peak
0.127	1.28	19.73	21.01	105.53	84.52	Peak
0.131	1.27	19.73	21.00	105.26	84.26	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: Zigbee 2480
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

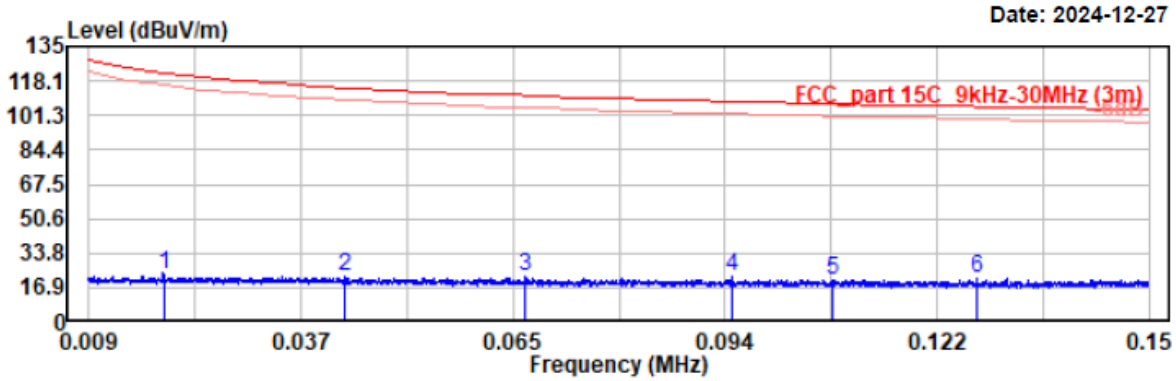


Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.189	16.06	19.72	35.78	102.08	66.30	Peak
2.592	18.49	19.74	38.23	69.54	31.31	Peak
4.054	13.96	19.75	33.71	69.54	35.83	Peak
6.624	13.64	19.73	33.37	69.54	36.17	Peak
7.547	15.00	19.68	34.68	69.54	34.86	Peak
13.803	13.54	19.75	33.29	69.54	36.25	Peak

EUT Model: PG71N

Project No.: XMDN240219-08385E-RF
Test Mode: Zigbee 2480
EUT Model: PG71N
Test distance: 3m

Temp/Humi/ATM: 22.5℃/44%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

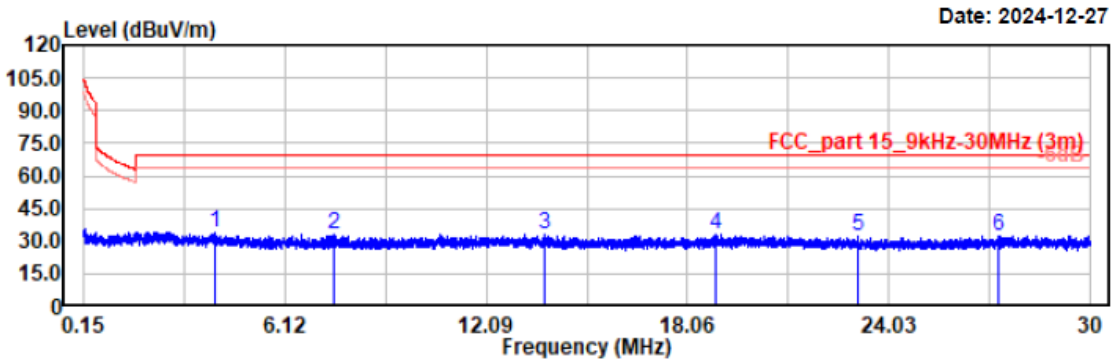


Condition: PK RBW:200Hz VBW:1kHz SWT:auto
QP RBW:200Hz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.019	3.41	19.78	23.19	122.05	98.86	Peak
0.043	2.41	19.91	22.32	114.92	92.60	Peak
0.067	2.50	19.84	22.34	111.08	88.74	Peak
0.095	2.51	19.77	22.28	108.09	85.81	Peak
0.108	1.19	19.73	20.92	106.94	86.02	Peak
0.127	1.28	19.73	21.01	105.53	84.52	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: Zigbee 2480
EUT Model: PG71N
Test distance: 3m

Temp/Humi/ATM: 22.5℃/44%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Condition: PK RBW:10kHz VBW:30kHz SWT:auto
QP RBW:9kHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
4.054	13.96	19.75	33.71	69.54	35.83	Peak
7.559	13.40	19.68	33.08	69.54	36.46	Peak
13.803	13.54	19.75	33.29	69.54	36.25	Peak
18.875	12.90	20.01	32.91	69.54	36.63	Peak
23.135	11.87	20.17	32.04	69.54	37.50	Peak
27.263	12.23	20.10	32.33	69.54	37.21	Peak

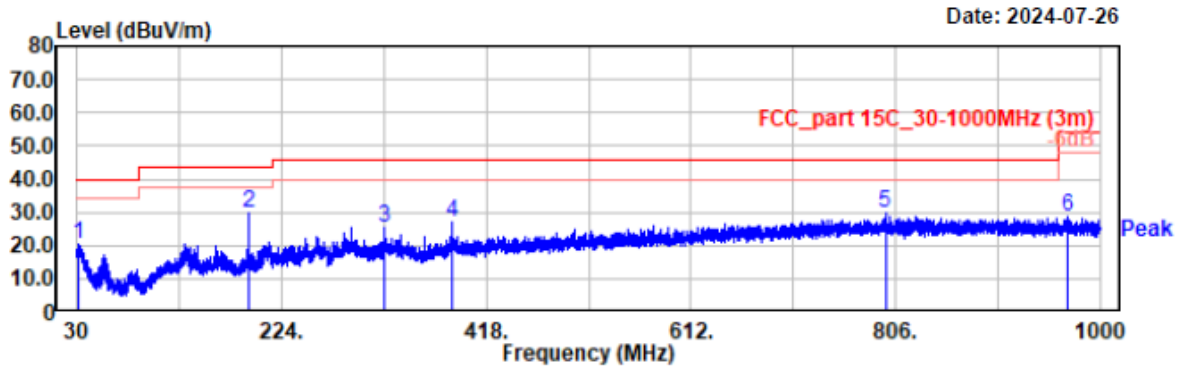
2) 30MHz -1GHz

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

EUT Model: PG71

Project No.: XMDN240219-08385E-RF
Test Mode: Zigbee 2480
EUT Model: PG71
Test distance: 3m

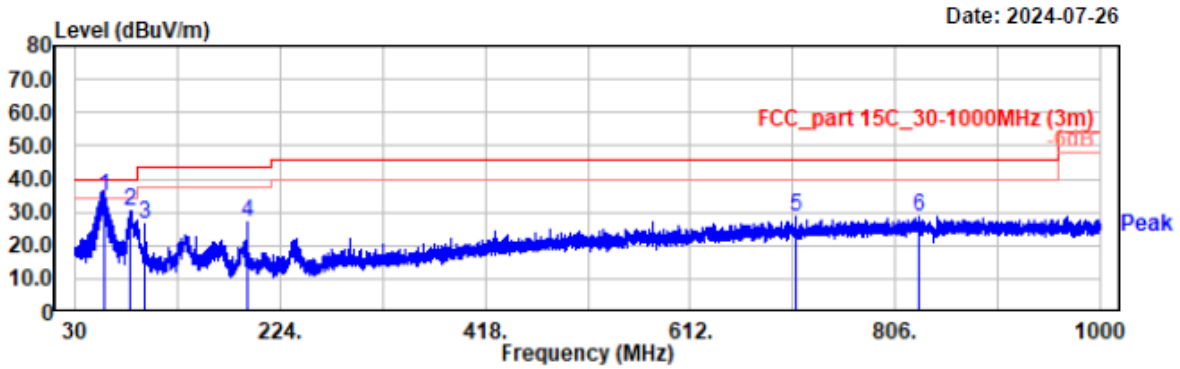
Temp/Humi/ATM: 20.5℃/51%/101kPA
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
31.84	26.84	-6.32	20.52	40.00	19.48	Horizontal	Peak
192.96	41.78	-12.17	29.61	43.50	13.89	Horizontal	Peak
321.78	34.33	-8.72	25.61	46.00	20.39	Horizontal	Peak
386.18	33.88	-6.83	27.05	46.00	18.95	Horizontal	Peak
796.30	28.32	1.24	29.56	46.00	16.44	Horizontal	Peak
969.54	25.00	3.42	28.42	54.00	25.58	Horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: Zigbee 2480
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 20.5℃/51%/101kPA
Tested by: Wlif Wu
Power Source: DC 48V from PoE

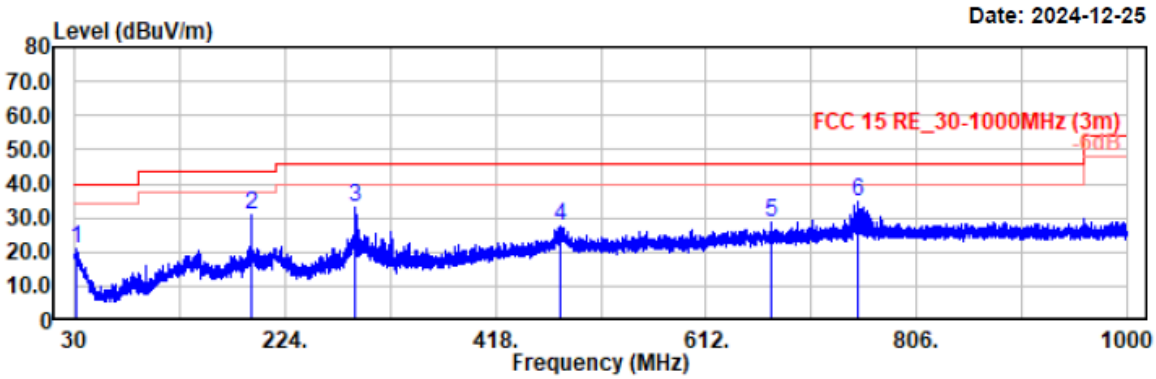


Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
56.87	52.24	-17.67	34.57	40.00	5.43	Vertical	QP
82.57	47.37	-17.20	30.17	40.00	9.83	Vertical	Peak
96.45	42.51	-15.94	26.57	43.50	16.93	Vertical	Peak
193.06	39.13	-12.16	26.97	43.50	16.53	Vertical	Peak
712.30	28.56	-0.08	28.48	46.00	17.52	Vertical	Peak
828.41	26.93	1.73	28.66	46.00	17.34	Vertical	Peak

EUT Model: PG71N

Project No.: XMDN240219-08385E-RF
Test Mode: Zigbee 2480
EUT Model: PG71N
Test distance: 3m

Temp/Humi/ATM: 23.2℃/46%/100.2kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

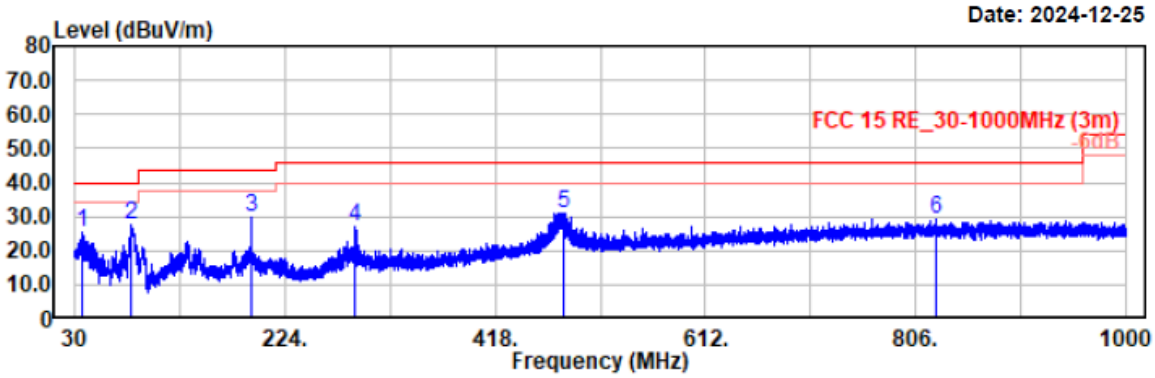


Condition: PK RBW:100kHz VBW:300kHz SWT:auto
QP RBW:120kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
30.97	26.70	-5.84	20.86	40.00	19.14	Horizontal	Peak
192.77	43.22	-12.17	31.05	43.50	12.45	Horizontal	Peak
289.09	42.14	-9.24	32.90	46.00	13.10	Horizontal	Peak
478.33	31.53	-3.91	27.62	46.00	18.38	Horizontal	Peak
672.04	29.05	-0.62	28.43	46.00	17.57	Horizontal	Peak
751.87	34.25	0.52	34.77	46.00	11.23	Horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: Zigbee 2480
EUT Model: PG71N
Test distance: 3m

Temp/Humi/ATM: 23.2℃/46%/100.2kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Condition: PK RBW:100kHz VBW:300kHz SWT:auto
QP RBW:120kHz SWT:auto

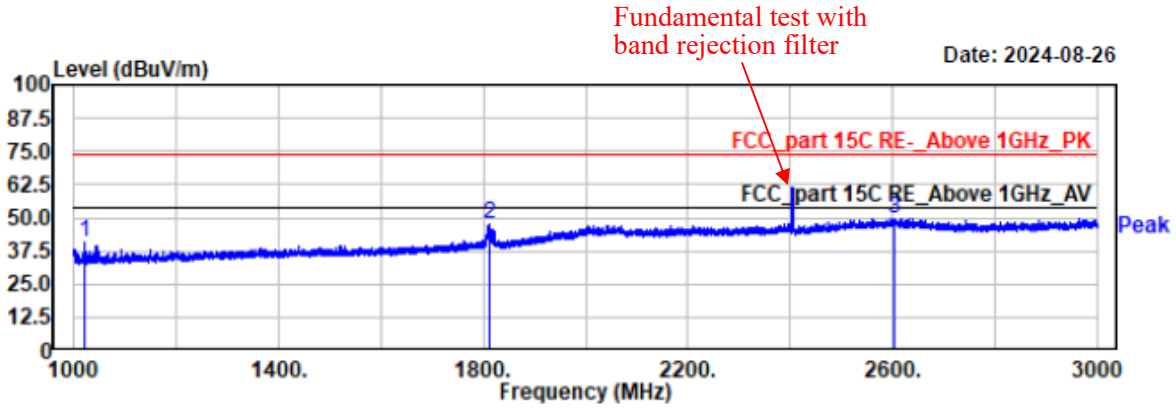
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
35.92	33.86	-8.67	25.19	40.00	14.81	Vertical	Peak
82.48	44.70	-17.20	27.50	40.00	12.50	Vertical	Peak
192.86	41.74	-12.17	29.57	43.50	13.93	Vertical	Peak
289.18	36.40	-9.24	27.16	46.00	18.84	Vertical	Peak
480.47	34.79	-3.81	30.98	46.00	15.02	Vertical	Peak
825.30	27.67	1.66	29.33	46.00	16.67	Vertical	Peak

3) 1GHz~18GHz

EUT Model: PG71

Project No.: XMDN240219-08385E-RF
Test Mode: 2405
EUT Model: PG71
Test distance: 3m

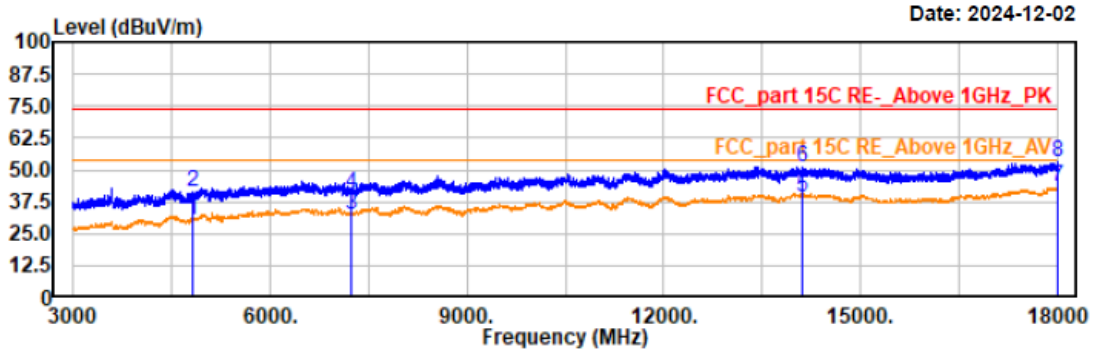
Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1020.00	54.31	-13.73	40.58	74.00	33.42	horizontal	Peak
1811.60	54.82	-7.21	47.61	74.00	26.39	horizontal	Peak
2604.00	49.23	0.49	49.72	74.00	24.28	horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: ZIGBEE 2405
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 23.1℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

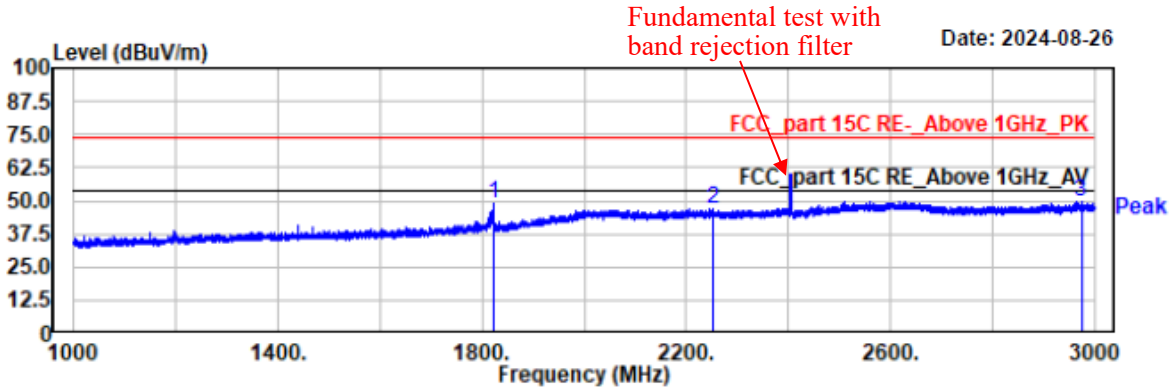


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
4810.00	34.95	-4.44	30.51	54.00	23.49	horizontal	Average
4810.50	45.56	-4.44	41.12	74.00	32.88	horizontal	Peak
7215.00	34.30	-1.71	32.63	54.00	21.37	horizontal	Average
7215.00	42.68	-1.71	41.01	74.00	32.99	horizontal	Peak
14121.00	34.37	5.24	39.61	54.00	14.39	horizontal	Average
14121.00	46.09	5.24	51.33	74.00	22.67	horizontal	Peak
17998.50	35.45	7.74	43.19	54.00	10.81	horizontal	Average
17998.50	45.41	7.74	53.15	74.00	20.85	horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: 2405
EUT Model: PG71
Test distance: 3m

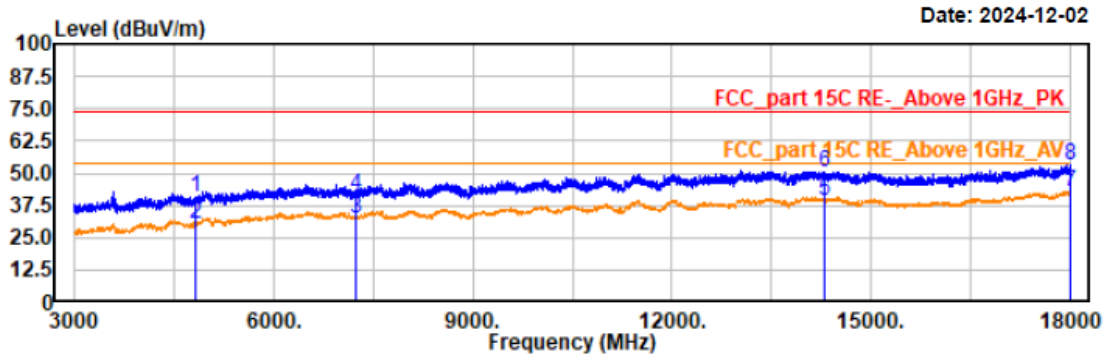
Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1822.60	56.30	-7.17	49.13	74.00	24.87	vertical	Peak
2254.00	49.68	-2.56	47.12	74.00	26.88	vertical	Peak
2973.80	49.81	-0.24	49.57	74.00	24.43	vertical	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: ZIGBEE 2405
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 23.1℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

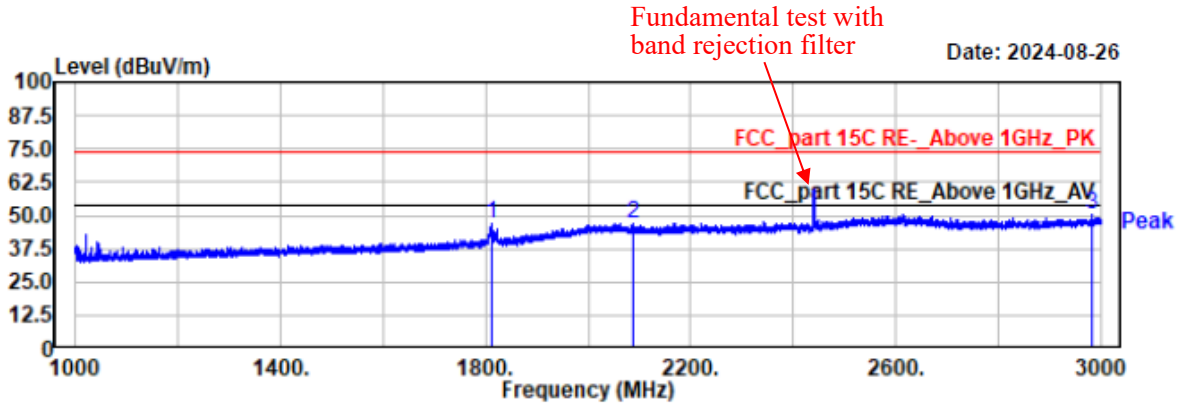


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4810.00	44.96	-4.44	40.52	74.00	33.48	vertical	Peak
4810.50	34.84	-4.44	30.40	54.00	23.60	vertical	Average
7215.00	34.27	-1.71	32.60	54.00	21.40	vertical	Average
7215.00	42.95	-1.71	41.28	74.00	32.72	vertical	Peak
14296.50	34.31	5.20	39.51	54.00	14.49	vertical	Average
14296.50	45.00	5.20	50.20	74.00	23.80	vertical	Peak
17997.00	34.95	7.74	42.69	54.00	11.31	vertical	Average
17997.00	45.04	7.74	52.78	74.00	21.22	vertical	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: 2440
EUT Model: PG71
Test distance: 3m

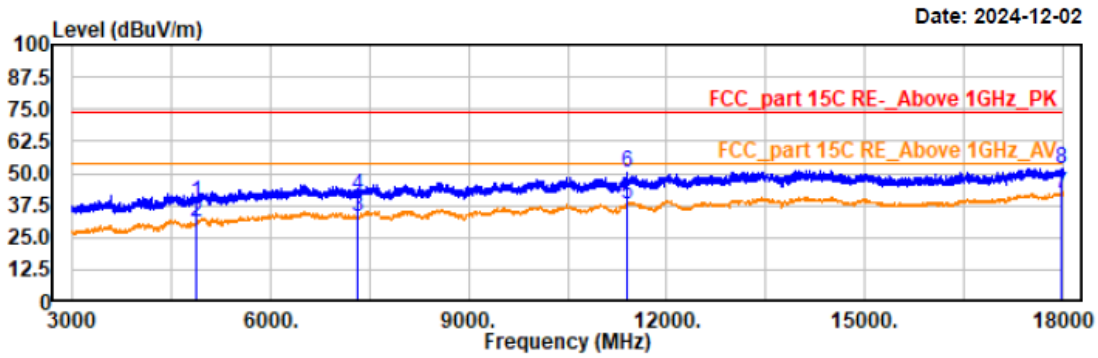
Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1811.00	53.85	-7.22	46.63	74.00	27.37	horizontal	Peak
2086.60	50.01	-2.80	47.21	74.00	26.79	horizontal	Peak
2981.60	50.36	-0.21	50.15	74.00	23.85	horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: ZIGBEE 2440
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 23.1℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

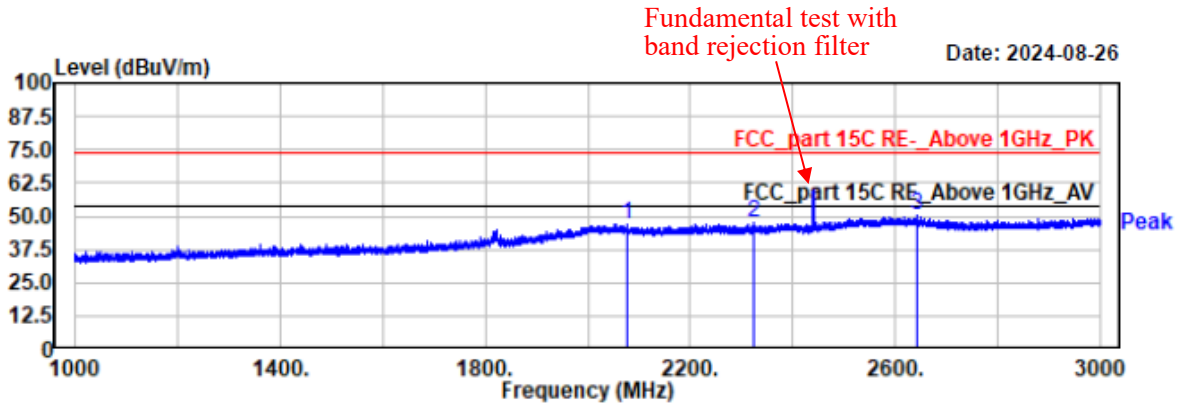


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4879.50	43.12	-4.25	38.87	74.00	35.13	horizontal	Peak
4880.00	35.02	-4.25	30.77	54.00	23.23	horizontal	Average
7320.00	34.92	-1.61	33.31	54.00	20.69	horizontal	Average
7320.00	43.20	-1.61	41.59	74.00	32.41	horizontal	Peak
11398.50	34.66	3.01	37.67	54.00	16.33	horizontal	Average
11398.50	47.38	3.01	50.39	74.00	23.61	horizontal	Peak
17968.50	34.41	7.69	42.10	54.00	11.90	horizontal	Average
17968.50	44.29	7.69	51.98	74.00	22.02	horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: 2440
EUT Model: PG71
Test distance: 3m

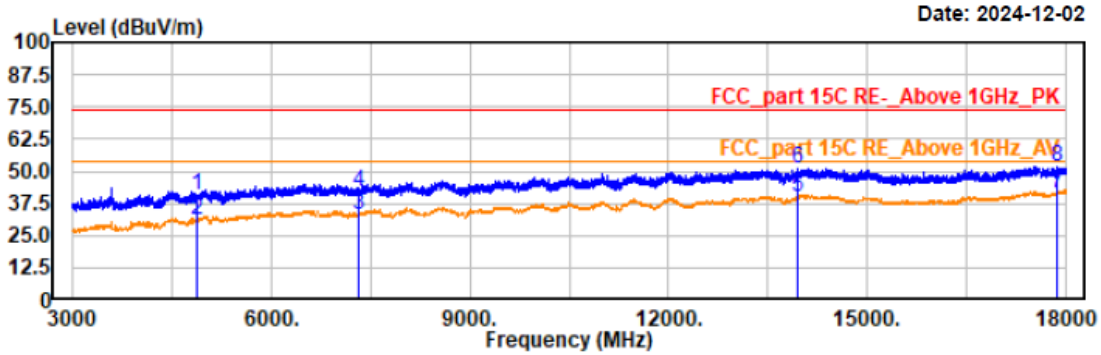
Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2076.40	49.64	-2.63	47.01	74.00	26.99	vertical	Peak
2322.60	49.63	-2.39	47.24	74.00	26.76	vertical	Peak
2641.00	49.87	0.45	50.32	74.00	23.68	vertical	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: ZIGBEE 2440
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 23.1℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

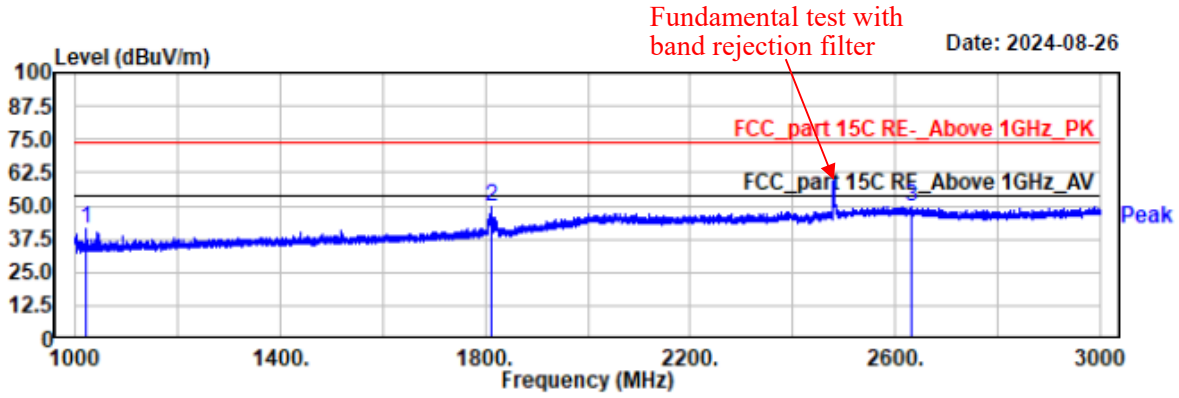


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4879.50	44.71	-4.25	40.46	74.00	33.54	vertical	Peak
4880.00	35.26	-4.25	31.01	54.00	22.99	vertical	Average
7320.00	35.03	-1.61	33.42	54.00	20.58	vertical	Average
7320.00	43.85	-1.61	42.24	74.00	31.76	vertical	Peak
13963.50	35.02	5.10	40.12	54.00	13.88	vertical	Average
13963.50	46.06	5.10	51.16	74.00	22.84	vertical	Peak
17865.00	34.21	7.47	41.68	54.00	12.32	vertical	Average
17865.00	44.25	7.47	51.72	74.00	22.28	vertical	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: 2480
EUT Model: PG71
Test distance: 3m

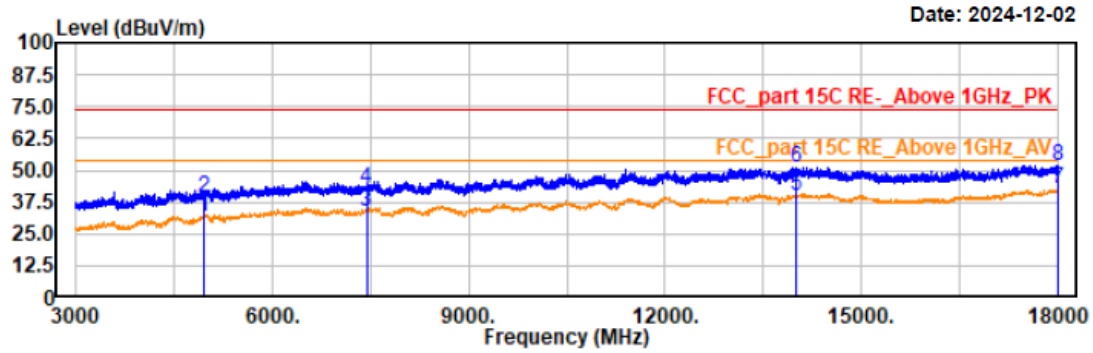
Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1020.20	54.84	-13.73	41.11	74.00	32.89	horizontal	Peak
1811.60	56.60	-7.21	49.39	74.00	24.61	horizontal	Peak
2631.60	49.15	0.47	49.62	74.00	24.38	horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: ZIGBEE 2480
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 23.1℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

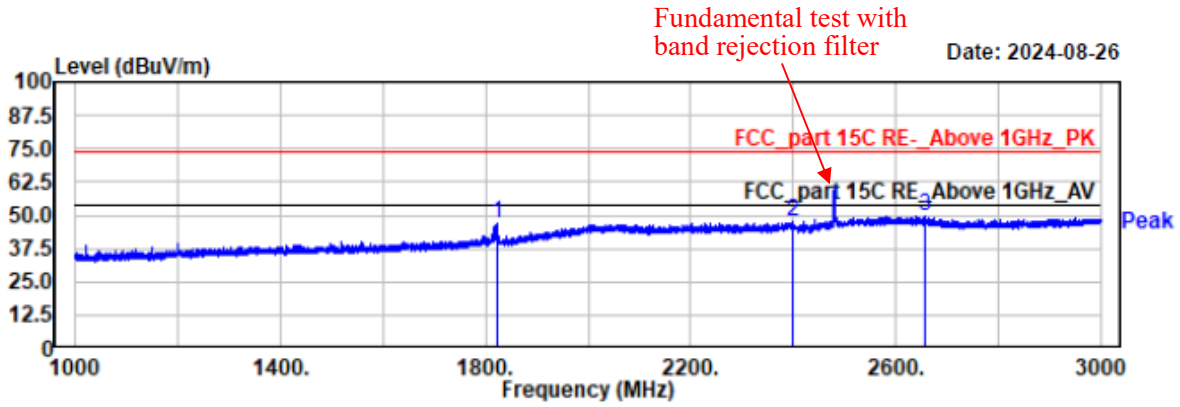


Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4960.00	35.53	-4.01	31.52	54.00	22.48	horizontal	Average
4960.00	43.56	-4.01	39.55	74.00	34.45	horizontal	Peak
7440.00	35.67	-1.59	34.08	54.00	19.92	horizontal	Average
7440.00	44.67	-1.59	43.08	74.00	30.92	horizontal	Peak
14014.50	34.99	5.11	40.10	54.00	13.90	horizontal	Average
14014.50	46.11	5.11	51.22	74.00	22.78	horizontal	Peak
17997.00	35.04	7.74	42.78	54.00	11.22	horizontal	Average
17997.00	44.25	7.74	51.99	74.00	22.01	horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: 2480
EUT Model: PG71
Test distance: 3m

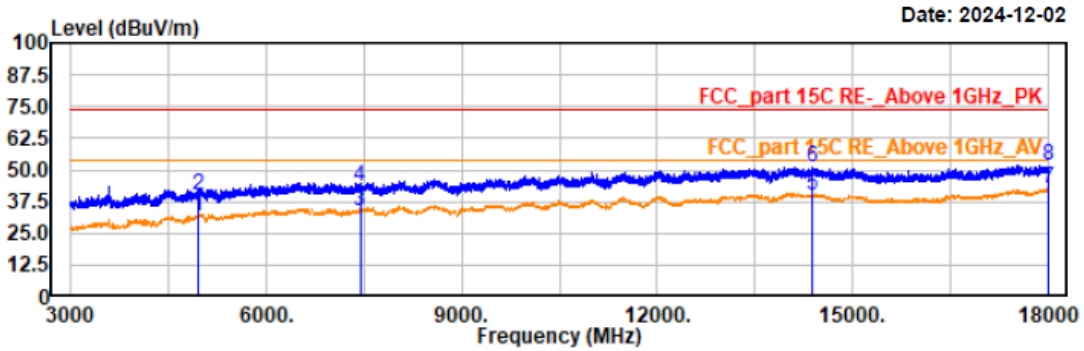
Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1823.20	54.08	-7.17	46.91	74.00	27.09	vertical	Peak
2397.60	49.37	-1.52	47.85	74.00	26.15	vertical	Peak
2656.60	49.49	0.27	49.76	74.00	24.24	vertical	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: ZIGBEE 2480
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 23.1℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4960.50	35.73	-4.01	31.72	54.00	22.28	vertical	Average
4960.50	43.97	-4.01	39.96	74.00	34.04	vertical	Peak
7440.00	35.64	-1.59	34.05	54.00	19.95	vertical	Average
7440.00	44.82	-1.59	43.23	74.00	30.77	vertical	Peak
14385.00	34.66	5.15	39.81	54.00	14.19	vertical	Average
14385.00	45.88	5.15	51.03	74.00	22.97	vertical	Peak
17999.00	34.98	7.74	42.72	54.00	11.28	vertical	Average
17999.00	43.85	7.74	51.59	74.00	22.41	vertical	Peak

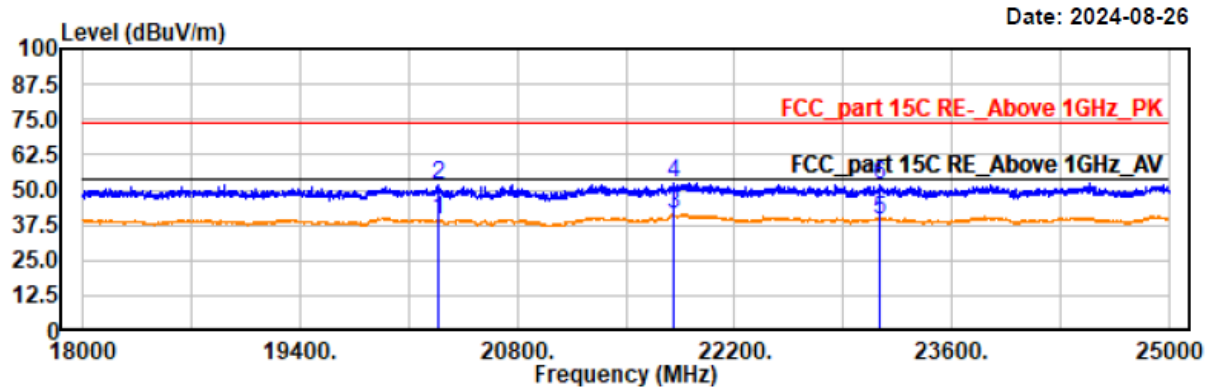
4) 18GHz~25GHz

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

EUT Model: PG71

Project No.: XMDN240219-08385E-RF
Test Mode: Zigbee 2480
EUT Model: PG71
Test distance: 1m

Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

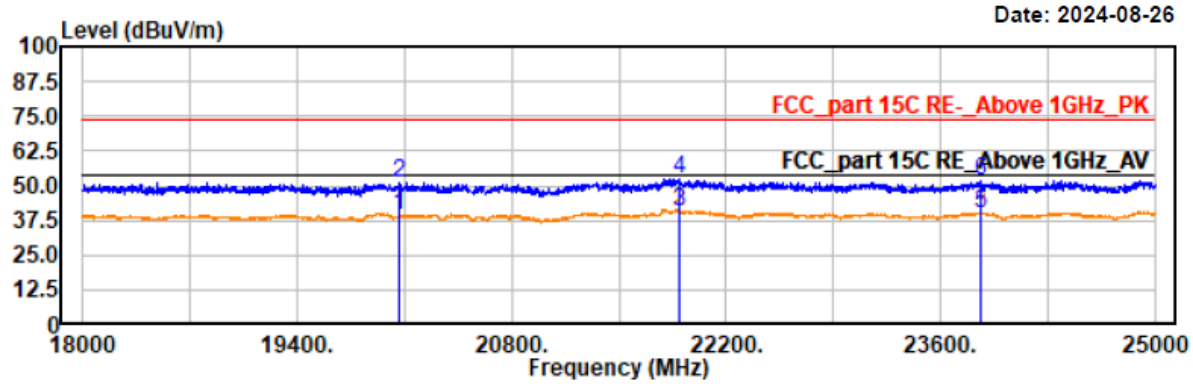


Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
20296.80	38.72	0.46	39.18	54.00	14.82	horizontal	Average
20296.80	51.39	0.46	51.85	74.00	22.15	horizontal	Peak
21803.80	39.65	1.48	41.13	54.00	12.87	horizontal	Average
21803.80	51.26	1.48	52.74	74.00	21.26	horizontal	Peak
23132.60	38.27	1.38	39.65	54.00	14.35	horizontal	Average
23132.60	50.55	1.38	51.93	74.00	22.07	horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: Zigbee 2480
EUT Model: PG71
Test distance: 1m

Temp/Humi/ATM: 23.5℃/53%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
20068.00	39.03	0.10	39.13	54.00	14.87	vertical	Average
20068.00	50.83	0.10	50.93	74.00	23.07	vertical	Peak
21898.40	39.22	1.65	40.87	54.00	13.13	vertical	Average
21898.40	50.87	1.65	52.52	74.00	21.48	vertical	Peak
23856.40	38.17	1.77	39.94	54.00	14.06	vertical	Average
23856.40	49.75	1.77	51.52	74.00	22.48	vertical	Peak

Restricted Bands Emissions:

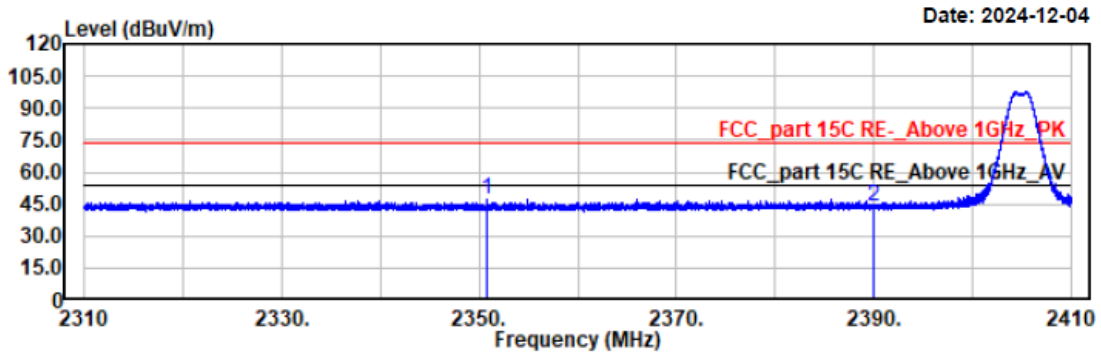
Pre-Scan with Zigbee in the X, Y and Z axes of orientation, and the worst case Z-axis of orientation is recorded

Note:
Factor (dB/m) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)
Result (dBμV/m) = Reading (dBμV) + Factor (dB/m)
Margin (dB) = Limit (dBμV/m) –Result (dBμV/m)

EUT Model: PG71

Project No.: XMDN240219-08385E-RF
Test Mode: zigbee 2405
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 21.7℃/49%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

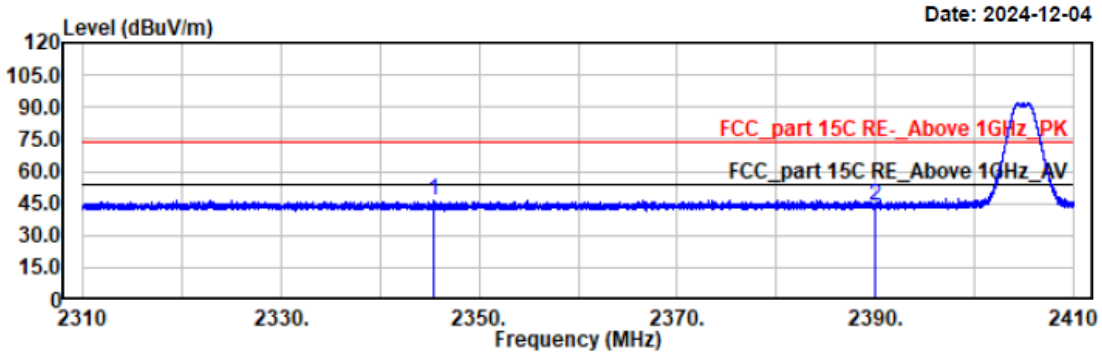


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2350.77	48.09	-0.83	47.26	74.00	26.74	horizontal	Peak
2390.00	44.26	-0.63	43.63	74.00	30.37	horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: zigbee 2405
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 21.7℃/49%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

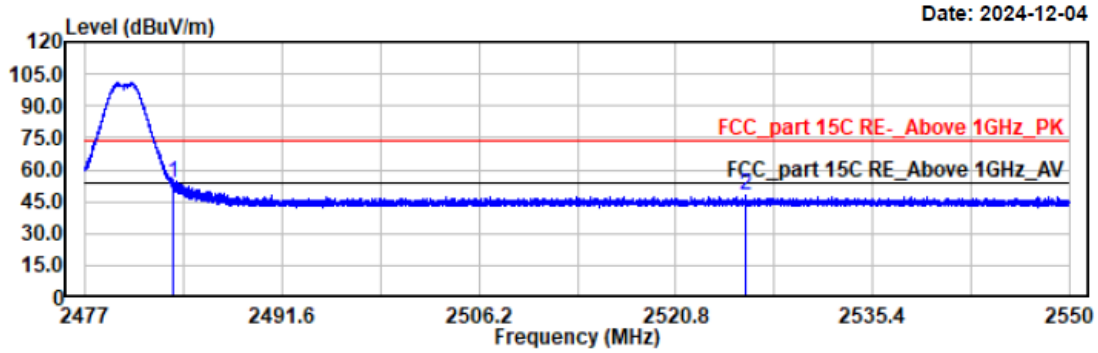


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2345.45	47.01	-0.85	46.16	74.00	27.84	vertical	Peak
2390.00	44.53	-0.63	43.90	74.00	30.10	vertical	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: zigbee 2480
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 21.7℃/49%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE

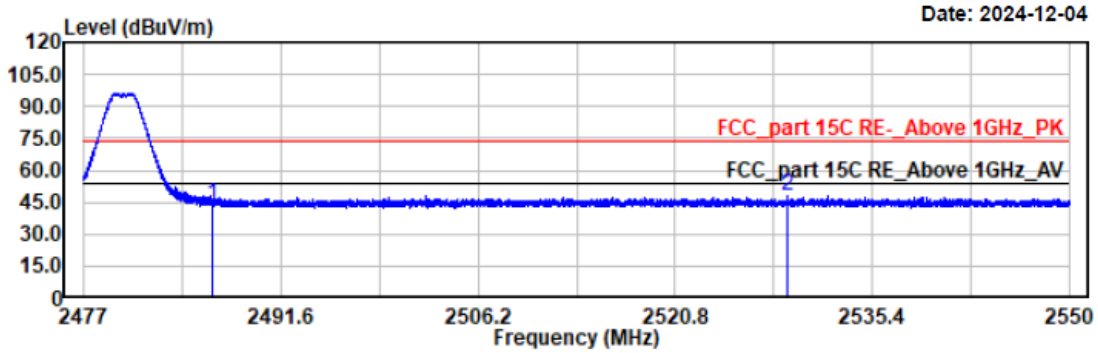


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2483.50	54.27	-0.17	54.10	74.00	19.90	horizontal	Peak
2525.93	47.86	-0.06	47.80	74.00	26.20	horizontal	Peak

Project No.: XMDN240219-08385E-RF
Test Mode: zigbee 2480
EUT Model: PG71
Test distance: 3m

Temp/Humi/ATM: 21.7℃/49%/100.1kPa
Tested by: Wlif Wu
Power Source: DC 48V from PoE



Condition: PK RBW:1MHz VBW:3MHz SWT:auto

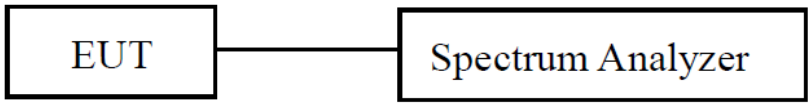
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2486.50	44.04	-0.15	43.89	74.00	30.11	vertical	Peak
2529.09	47.65	-0.05	47.60	74.00	26.40	vertical	Peak

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

According to ANSI C63.10-2013 Section 11.8

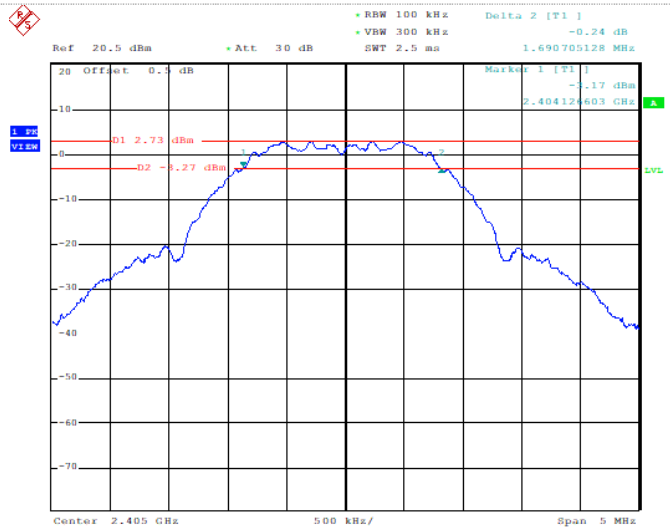
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3×RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Data

Test Mode:	Transmitting	**Test Engineer:**	Jason Hu
Test Date:	2024-07-01	**Test Voltage:**	DC 12V from Adapter (AC 120V/60Hz)
Test Result:	Compliance	**Environment:**	Temp.: 24.1℃ Humi.: 59% Atm :100.2kPa

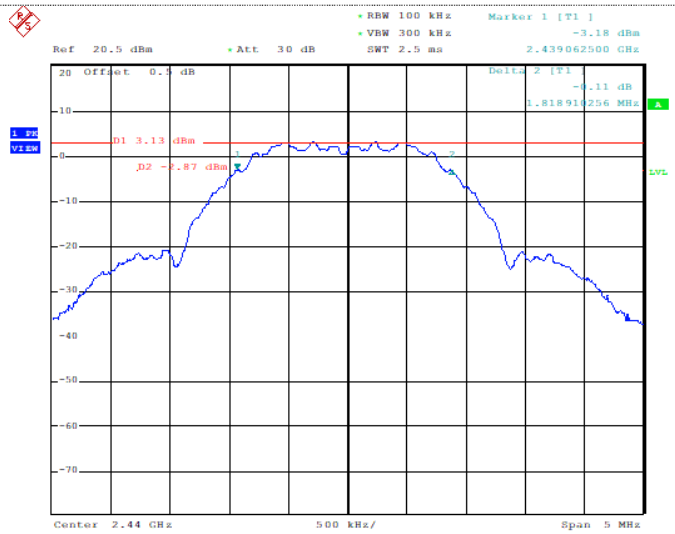
Test Channel	**Test Frequency (MHz)**	**6 dB Bandwidth (MHz)**	**Limit (MHz)**
Lowest	2405	1.691	≥0.5
Middle	2440	1.819	≥0.5
Highest	2480	1.803	≥0.5

Low



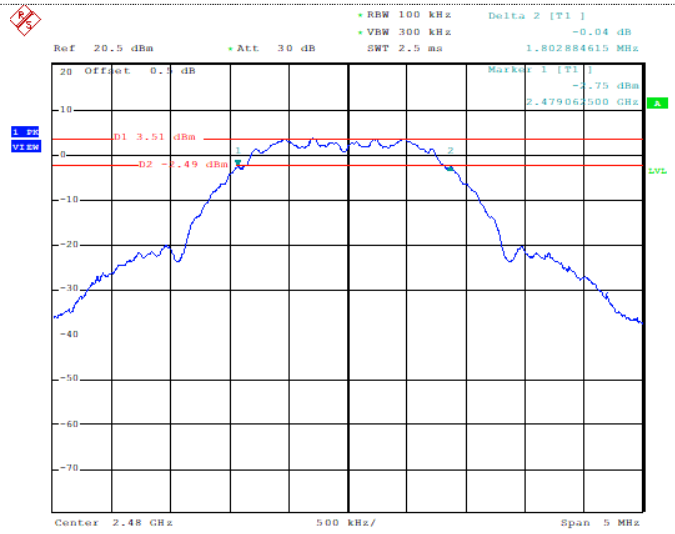
ProjectNo.:XMDN240219-08385E-RF Tester:Jason Hu
Date: 1.JUL.2024 11:34:03

Middle



ProjectNo.:XMDN240219-08385E-RF Tester:Jason Hu
Date: 1.JUL.2024 11:37:53

High

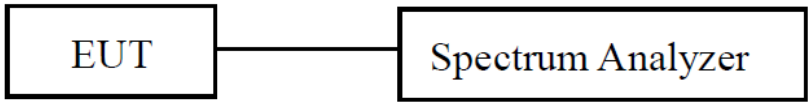

RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
Delta 2 [T1]
-0.04 dB
1.802884615 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
Marker 1 [T1]
-2.75 dBm
2.479062500 GHz
D1 3.51 dBm
D2 -7.49 dBm
Center 2.48 GHz
500 kHz/
Span 5 MHz
ProjectNo.:XMDN240219-08385E-RF Tester:Jason Hu
Date: 1.JUL.2024 11:55:51

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

According to ANSI C63.10-2013 Section 11.9.1.1

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:
a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ [3 × RBW].
c) Set span ≥ [3 × RBW].
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

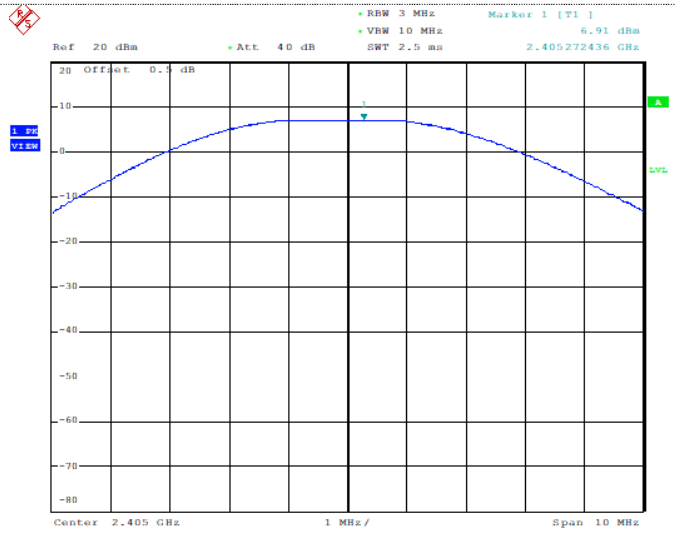
Test Data

Test Mode:	Transmitting	**Test Engineer:**	Jason Hu
Test Date:	2024-07-01	**Test Voltage:**	DC 12V from Adapter (AC 120V/60Hz)
Test Result:	Compliance	**Environment:**	Temp.: 24.1°C Humi.: 59% Atm.:100.2kPa

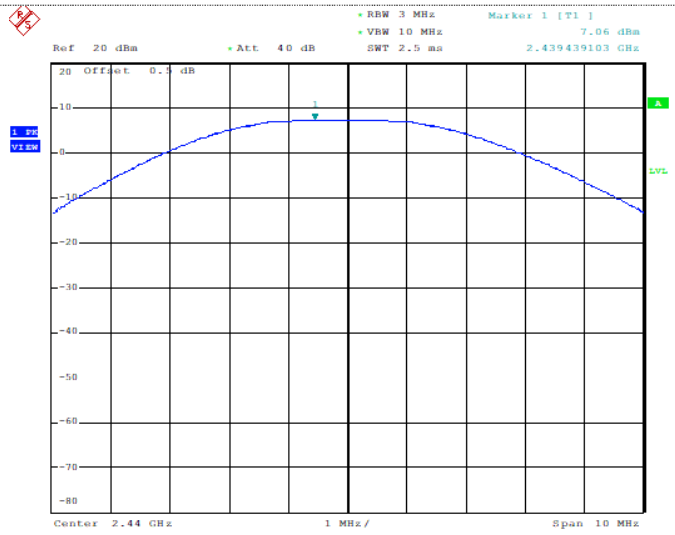
Test Channel	**Test Frequency (MHz)**	**Maximum Conducted Peak Output Power(dBm)**	**Limit (dBm)**
Lowest	2405	6.91	≤30
Middle	2440	7.06	≤30
Highest	2480	7.34	≤30

Please refer to the below plots:

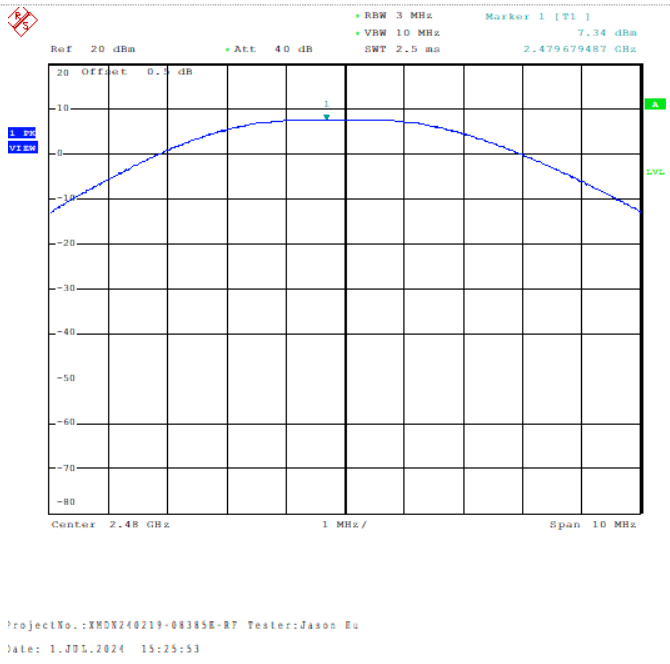
Lowest Channel



Middle Channel



Highest Channel

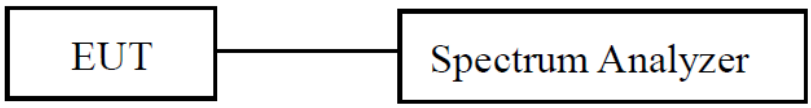


FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

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

According to ANSI C63.10-2013 Section 11.11

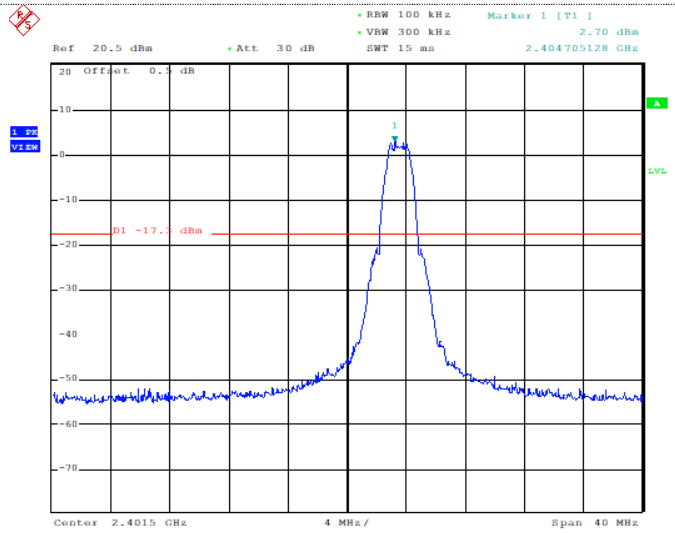
a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Test Data

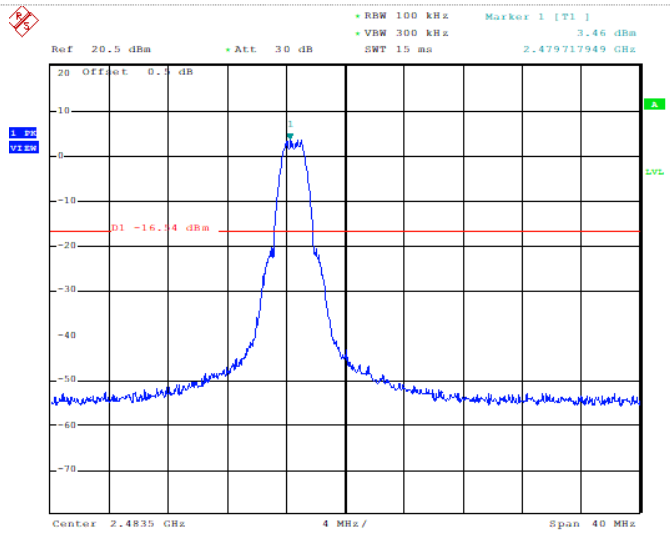
Test Mode:	Transmitting	**Test Engineer:**	Jason Hu
Test Date:	2024-07-01	**Test Voltage:**	DC 12V from Adapter (AC 120V/60Hz)
Test Result:	Compliance	**Environment:**	Temp.: 24.1°C Humi.: 59% Atm.:100.2kPa

Please refer to the below plots:

Lowest Channel



Highest Channel

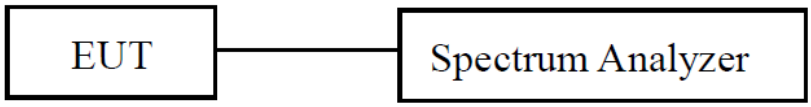


FCC §15.247(e) - POWER SPECTRAL DENSITY

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

According to ANSI C63.10-2013 Section 11.10.2

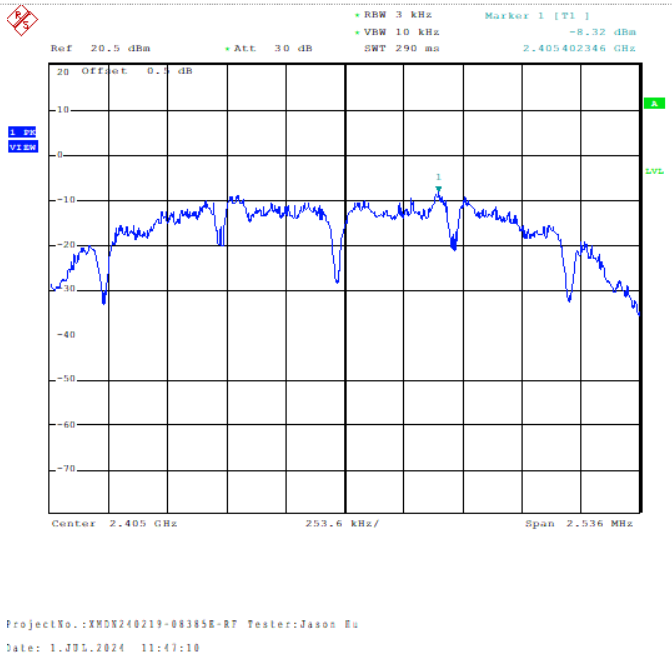
a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ [3 ×RBW].
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

Test Data

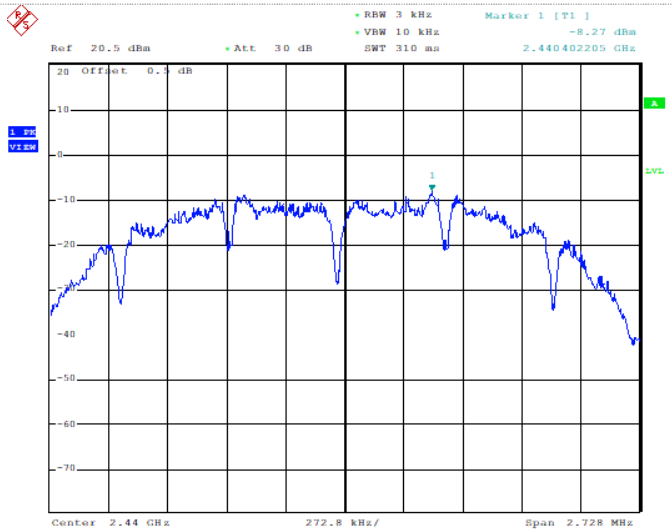
Test Mode:	Transmitting	Test Engineer:	Jason Hu
Test Date:	2024-07-01	Test Voltage:	DC 12V from Adapter (AC 120V/60Hz)
Test Result:	Compliance	Environment:	Temp.: 24.1℃ Humi.: 59% Atm.:100.2kPa

Test Channel	Test Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Lowest	2405	-8.32	≤8.00
Middle	2440	-8.27	≤8.00
Highest	2480	-7.63	≤8.00

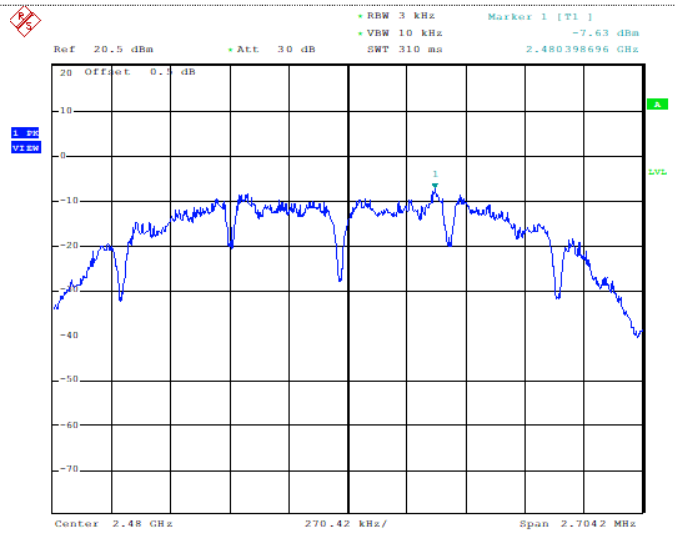
Lowest Channel



Middle Channel



Highest Channel



EUT PHOTOGRAPHS

Please refer to the attachment XMDN240219-08385E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and XMDN240219-08385E-RF-INP EUT INTERNAL PHOTOGRAPHS.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment XMDN240219-08385E-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.

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