FCC PART 15.247
TEST REPORT

On Behalf of

Interactive Technologies, Inc
15655 S. Mahaffie Street Olathe, KS 66062 United States

FCC ID: ULP-EFR24CM
Model: EFR24CM

March 28, 2024

This Report Concerns:	**Equipment Type:**
☒ Original Report	EFR32MG21 Compute Module

Test Engineer:	Charlie He / Charlie He
Report Number:	**QCT24BR-1285E-02**
Test Date:	March 1~28, 2024
Reviewed By:	Gordon Tan/ Gordon Tan
Approved By:	Kendy Wang / Kendy Wang
Prepared By:	**Shenzhen QC Testing Laboratory Co., Ltd.** East of 1/F., Building E, Xinghong Science Park, No.111, Shuiku Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China **Tel: 0755-23008269** **Fax: 0755-23726780**

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Revision History of This Test Report

Report Number	Description	Issued Date
QCT24BR-1285E-02	Initial Issue	2024-3-28

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1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Description	EFR32MG21 Compute Module
Model No.	EFR24CM
Tested Model	EFR24CM
Sample(s) Status	Engineer sample
Operation Frequency:	2405MHz~2480MHz
Channel numbers:	16
Channel separation:	5MHz
Modulation type:	OQPSK
Antenna Type:	PCB antenna Wire antenna Dipole Antenna
Antenna gain*1:	PCB antenna: 1.44dBi Wire antenna: 0dBi Dipole Antenna: 8dBi
Power supply:	DC 12V
Trade Mark:	N/A
Applicant	Interactive Technologies, Inc
Address	15655 S. Mahaffie Street Olathe, KS 66062 United States
Manufacturer	Designs Midwest Hong Kong Limited
Address	Room 2705, Block C, Tiley Central Plaza II, No.3 Haide Road, NanShan District, Shenzhen, Guangdong, China
Sample No.	Y24B1285E01YN

Note: *1This information provided by Manufacturer, SZ QC Lab is not responsible for the accuracy of this information.

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1.2 System Test Configuration

1.2.1 Channel List

Operation Frequency each of channel			
Channel	Frequency	Channel	Frequency
1	2405 MHz	9	2445 MHz
2	2410MHz	10	2450 MHz
3	2415 MHz	11	2455 MHz
4	2420 MHz	12	2460 MHz
5	2425 MHz	13	2465 MHz
6	2430 MHz	14	2470 MHz
7	2435 MHz	15	2475 MHz
8	2440 MHz	16	2480 MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2405MHz
The middle channel	2440MHz
The Highest channel	2480MHz

1.2.2 EUT Exercise Software

" sscom5.13.1 " software was used to test, The power level is default. The software and power level was provided by the applicant.

1.2.3 Support Equipment

Manufacturer	Description	Model	Serial Number
JINGE	Battery	12V/24V	/
Dell	Notebook	Inspiron 15 3511	/

1.2.4 Test mode

Transmitting mode: Keep the EUT in continuously transmitting.

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1.3 Test Facility

Test Firm : Shenzhen QC Testing Laboratory Co., Ltd.

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19. The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS – Registration No.: L8464

The EMC Laboratory has been accredited by CNAS, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

A2LA Certificate Number: 6759.01

The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 561109

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission.

IC Registration Number: 29628

CAB identifier: CN0141

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

1.4 Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	±1.42 x10^{-4}%
RF output power, conducted	±1.06dB
Power Spectral Density, conducted	±1.06dB
Unwanted Emissions, conducted	±2.51dB
AC Power Line Conducted Emission	±1.80dB
Radiated Spurious Emission test (9kHz-30MHz)	±2.66dB
Radiated Spurious Emission test (30MHz-1000MHz)	±4.04dB
Radiated Spurious Emission test (1000MHz-18000MHz)	±4.70 dB
Radiated Spurious Emission test (18GHz-40GHz)	±4.80dB
Temperature	±0.8℃
Humidity	±3.2%
DC and low frequency voltages	±0.1%
Time	±5%
Duty cycle	±5%

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

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2. Summary of Test Results

Test Item	Section	Result
Antenna Requirement	FCC part 15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	FCC part 15.207	N/A
Conducted Peak Output Power	FCC part 15.247 (b)(3)	Pass
Channel Bandwidth & 99% Occupied Bandwidth	FCC part 15.247 (a)(2)	Pass
Power Spectral Density	FCC part 15.247 (e)	Pass
Band Edge	FCC part 15.247(d)	Pass
Spurious Emissions	FCC part 15.205/15.209	Pass

Note: 1. Pass: The EUT complies with the essential requirements in the standard.

2.Test according to ANSI C63.10:2013

3.. All indications of Pass/Fail in this report are opinions expressed by Shenzhen QC Testing Laboratory Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

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3. List of Test and Measurement Instruments

3.1 Radiated Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1.	Spectrum Analyzer	ROHDE&SCHWARZ	FSV 40	101458	2024.03.14	2025.03.13
2.	Loop Antenna	EMCO	6502	2133	2022.07.23	2024.07.22
3.	Logarithmic compound broadband Antenna	SCKWARZBECK	VULB9168	VULB9168-1-588	2023.04.01	2025.03.31
4.	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB 7	2277573376	2024.03.14	2025.03.13
5.	EMI Test Receiver	R&S	ESPI	101131	2024.03.14	2025.03.13
6.	Horn Antenna	SCHWARZBECK	BBHA9120D	02069	2023.04.01	2025.03.31
7.	Horn Antenna	COM-MW	ZLB7-18-40G -950	12221225	2023.01.12	2025.01.09
8.	Amplifier	R&S	BBV9721	9721-031	2024.03.14	2025.03.13
9.	Amplifier	HPX	BP-01G-18G	210902	2024.03.14	2025.03.13
10.	Pre-amplifier	COM-MW	DLAN-18000 -40000-02	10229104	2024.03.14	2025.03.13
11.	966 Chamber	ZhongYu Electron	9*6*6	/	2022.07.25	2025.07.24
Radiated Emission Measurement Software: EZ_EMC						

3.2 RF Conducted test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1.	Wideband Radio Communication Tester	Rohde & Schwarz	CW500	151583	2023.03.21	2024.03.20
2.	Wideband Radio Communication Tester	Rohde & Schwarz	CW500	151583	2024.03.14	2025.03.13
3.	Spectrum Analyzer	ROHDE& SCHWARZ	FSV 40	101458	2024.03.14	2025.03.13
4.	Signal Generator	Agilent	N5182A	MY50141563	2023.03.21	2024.03.20
5.	Signal Generator	Agilent	N5182A	MY50141563	2024.03.14	2025.03.13
6.	RF Automatic Test System	MW	MW100-RFCB/ MW100-PSB	MW2007004	2023.03.21	2024.03.20
7.	RF Automatic Test System	MW	MW100-RFCB/ MW100-PSB	MW2007004	2024.03.14	2025.03.13
RF Conducted Measurement Software: MTS 8310						

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4. Antenna requirement

Standard requirement: FCC Part15 C Section 15.203 /247(c)

15.203 requirement:
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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

EUT Antenna: Reference to the Internal photo for details.

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5. Conducted Peak Output Power

5.1 Applicable Standard

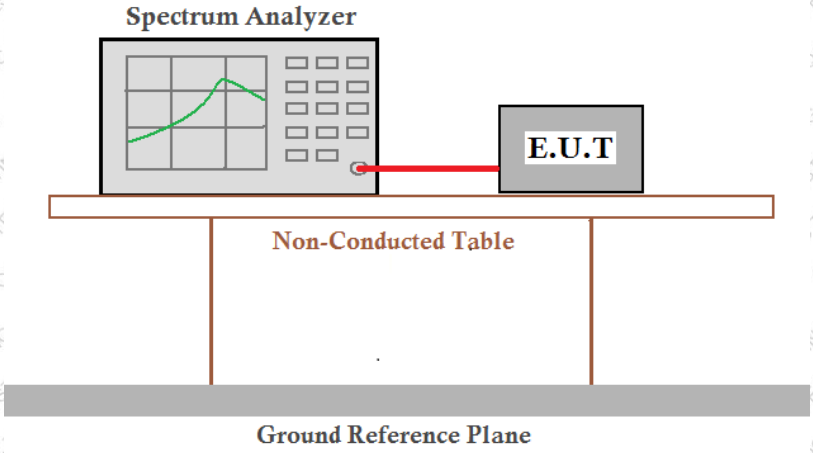
FCC Part15 C Section 15.247 (b)(3)

5.2 Limit

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.

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling 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 transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

5.3 Test setup



5.4 Test Data

Temperature	24.9 ℃	Humidity	53 %
ATM Pressure	101.1kPa	Antenna Gain	See page 4
Test by	Charlie He	Test result	PASS

Please refer to following table and plots.

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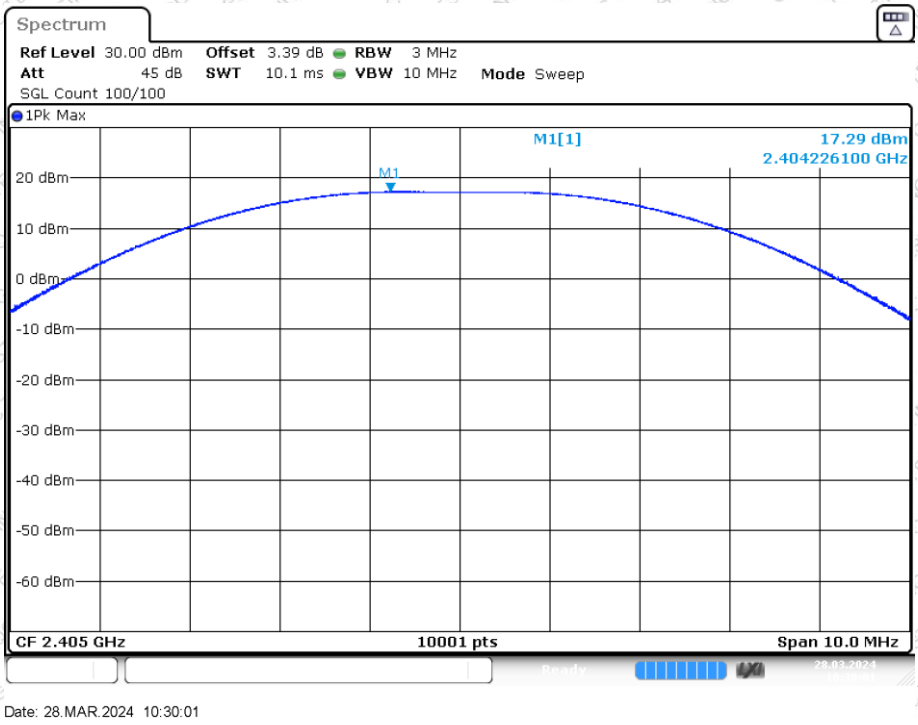
Output Power:

Mode	Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
802.15.4	Lowest	17.29	28	Pass
	Middle	16.18		
	Highest	16.19		

Note: When the antenna gain value is greater than 6dbi,
so the Directional Gain= 8dBi＞6dBi.
So Pout = Plimit-(GTX-6)]=(30-2)dBm =28dBm

Power NVNT 802.15.4 2405MHz Ant1



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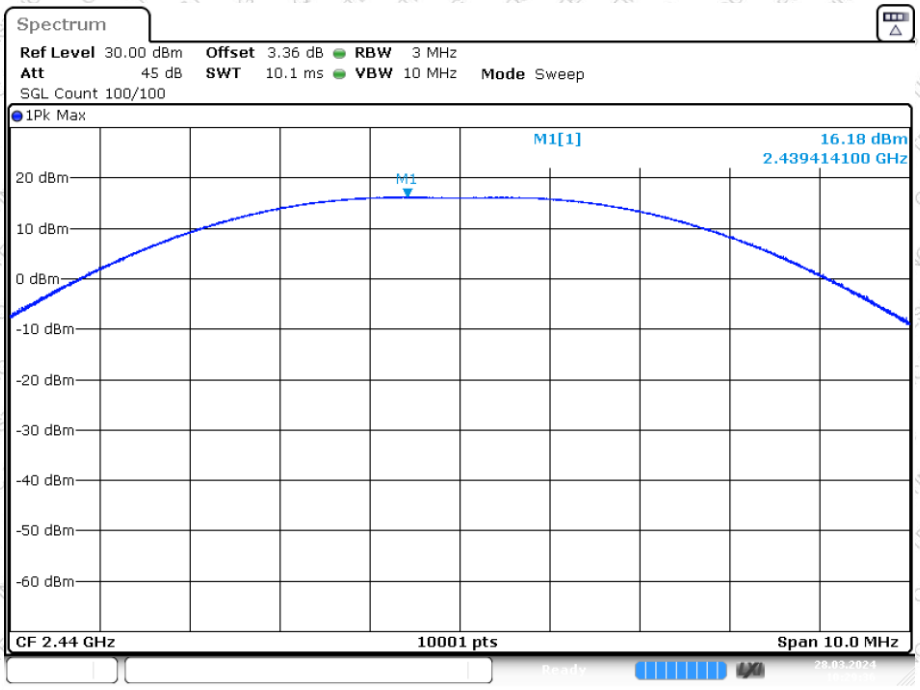
Power NVNT 802.15.4 2440MHz Ant1



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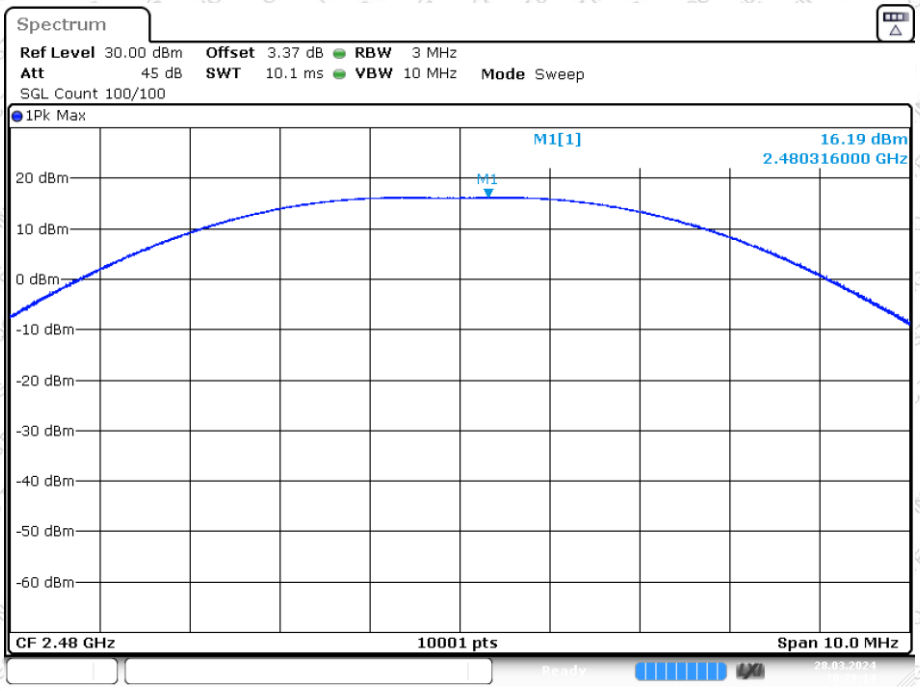
Power NVNT 802.15.4 2480MHz Ant1



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6. Channel Bandwidth & 99% Occupied Bandwidth

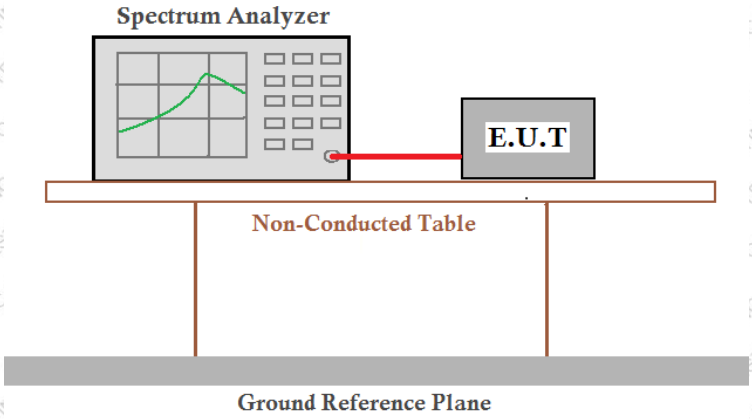
6.1 Applicable Standard

FCC Part15 C Section 15.247 (a)(2)

6.2 Limit

The minimum 6 dB bandwidth shall be 500 kHz.

6.3 Test setup



6.4 Test Procedure

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

6.5 Test Data

Temperature	24.9 ℃	Humidity	53 %
ATM Pressure	101.1kPa	Antenna Gain	See page 4
Test by	Charlie He	Test result	PASS

Please refer to following table and plots.

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DTS Bandwidth:

Mode	Test channel	DTS Bandwidth (MHz)	Limit (MHz)	Verdict
802.15.4	Lowest	1.664	0.5	PASS
	Middle	1.657	0.5	PASS
	Highest	1.624	0.5	PASS

99% Occupied Bandwidth:

Mode	Test channel	99% Occupied Bandwidth (MHz)	Verdict
802.15.4	Lowest	2.235	PASS
	Middle	2.24	PASS
	Highest	2.246	PASS

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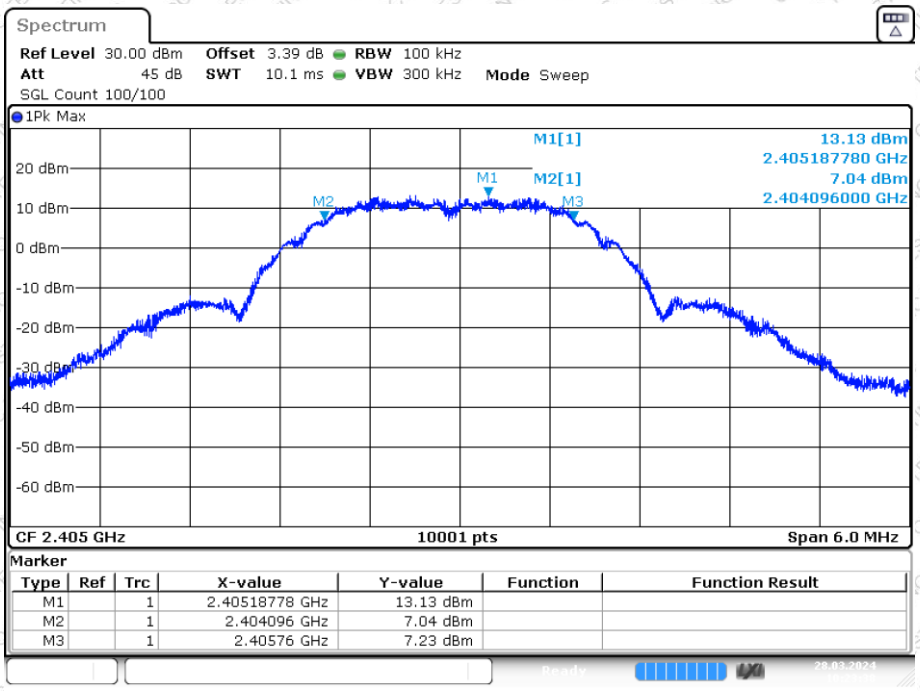
DTS Bandwidth:

-6dB Bandwidth NVNT 802.15.4 2405MHz Ant1



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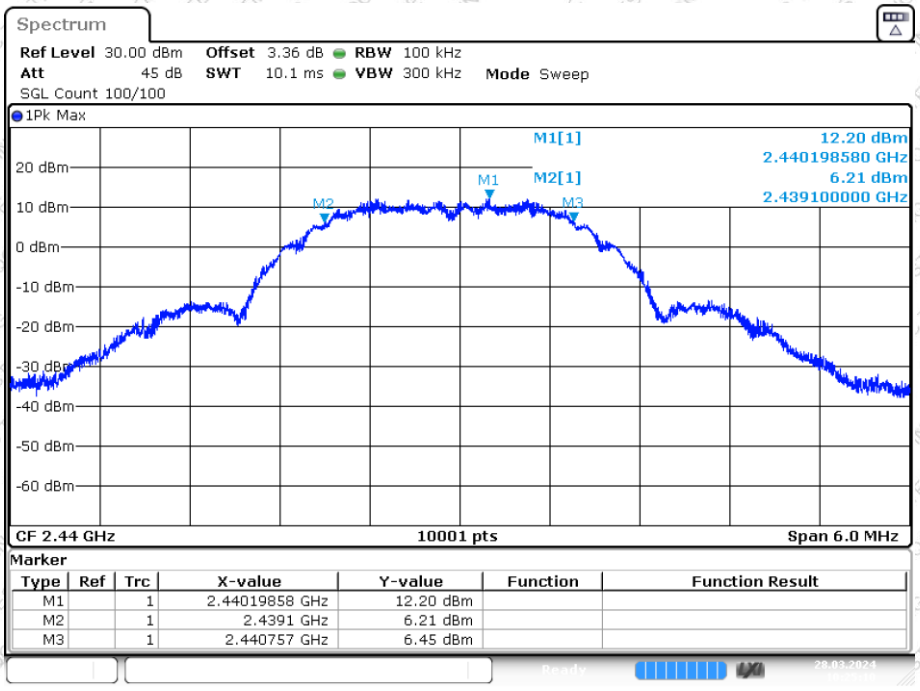
-6dB Bandwidth NVNT 802.15.4 2440MHz Ant1



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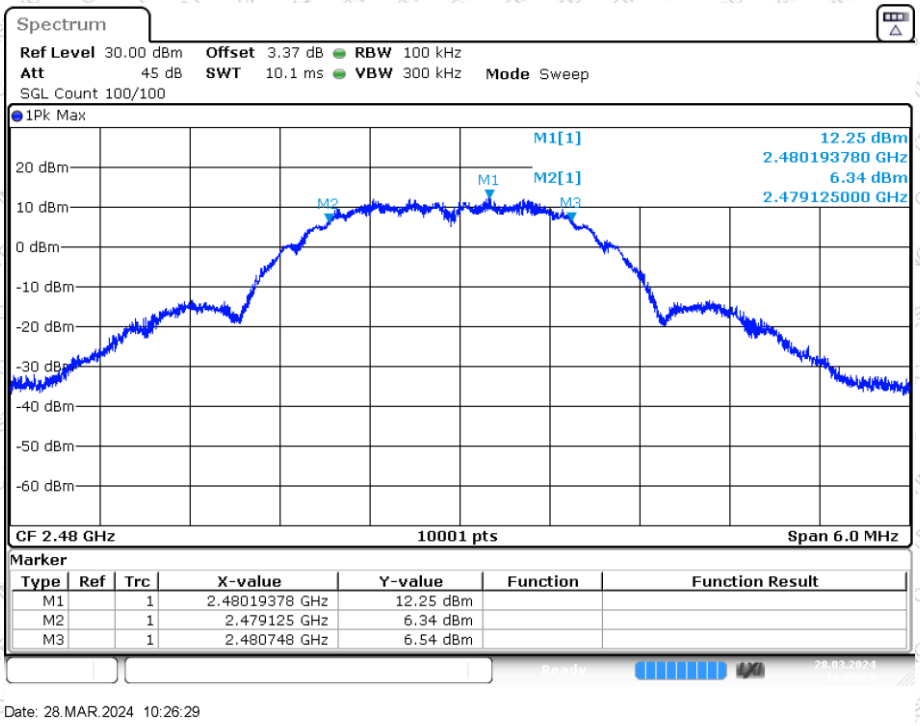
-6dB Bandwidth NVNT 802.15.4 2480MHz Ant1



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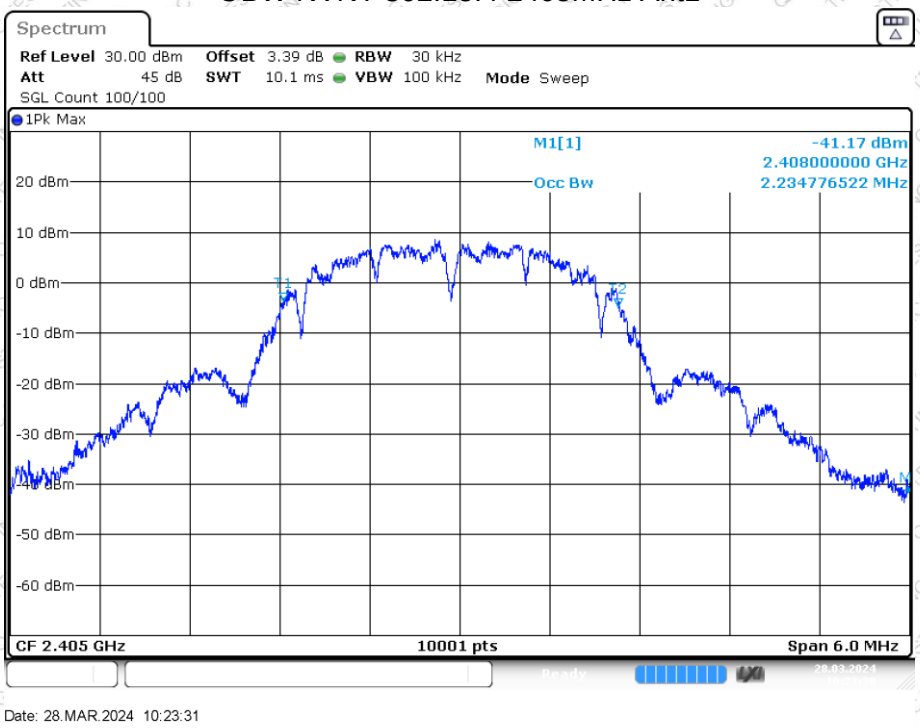
99% Occupied Bandwidth:

OBW NVNT 802.15.4 2405MHz Ant1



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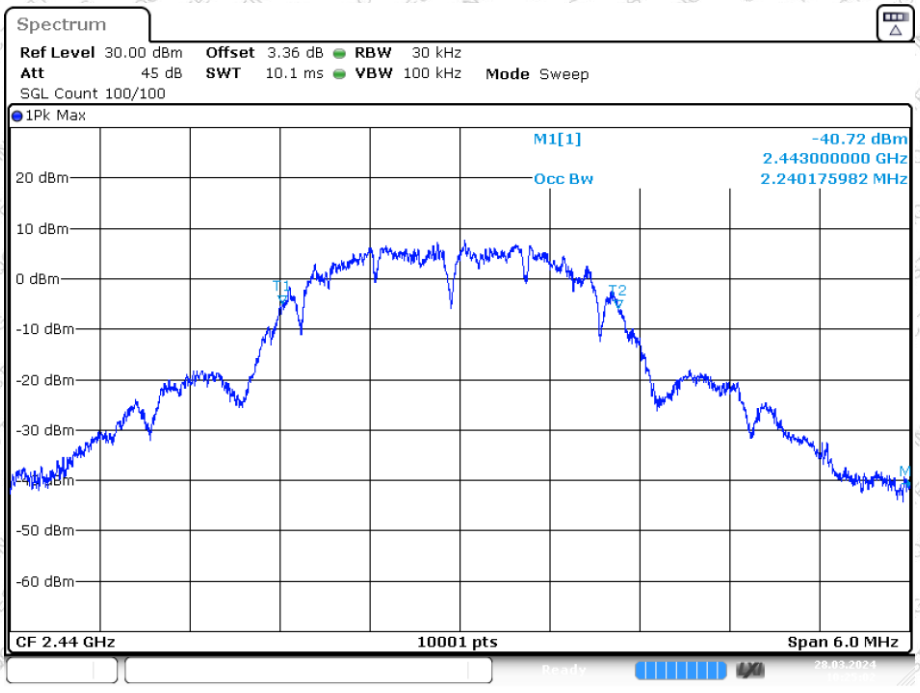
OBW NVNT 802.15.4 2440MHz Ant1



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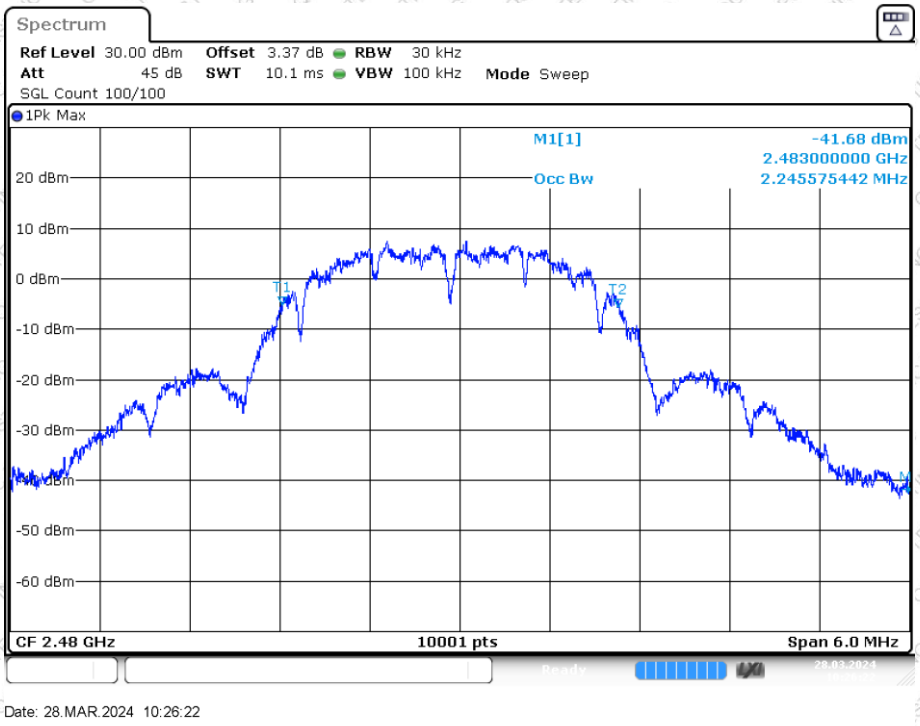
OBW NVNT 802.15.4 2480MHz Ant1



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7. Power Spectral Density

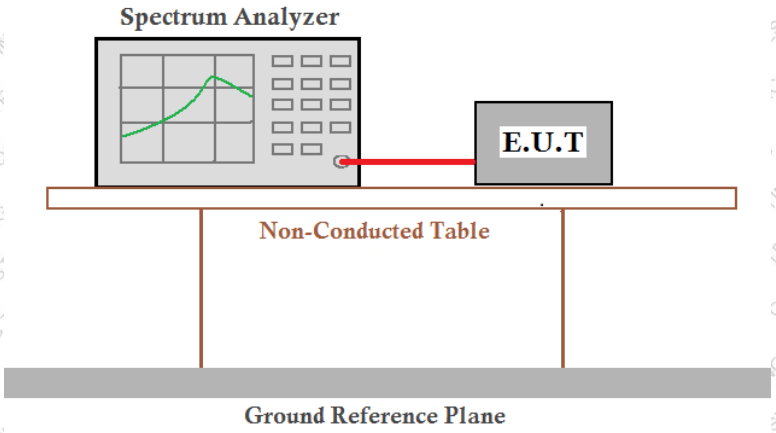
7.1 Applicable Standard

FCC Part15 C Section 15.247 (e)

7.2 Limit

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.

7.3 Test setup



7.4 Test Procedure

Refer to KDB558074 D01 15.247 Meas Guidance v05r02

7.5 Test Data

Temperature	24.9 ℃	Humidity	53 %
ATM Pressure	101.1kPa	Antenna Gain	See page 4
Test by	Charlie He	Test result	PASS

Please refer to following table and plots.

Mode	Test channel	Power Spectral Density (dBm/3kHz)	Limit(dBm/3kHz)	Result
802.15.4	Lowest	1.39	6.00	Pass
	Middle	0.7		
	Highest	0.66		

Note: When the antenna gain value is greater than 6dbi,
So the Directional Gain= 8dBi > 6dBi.
So PSDout = PSDlimit-(GTX-6)=(8-2)dBm =6dBm

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PSD NVNT 802.15.4 2405MHz Ant1

Date: 28.MAR.2024 10:23:52

PSD NVNT 802.15.4 2440MHz Ant1

Date: 28.MAR.2024 10:25:23

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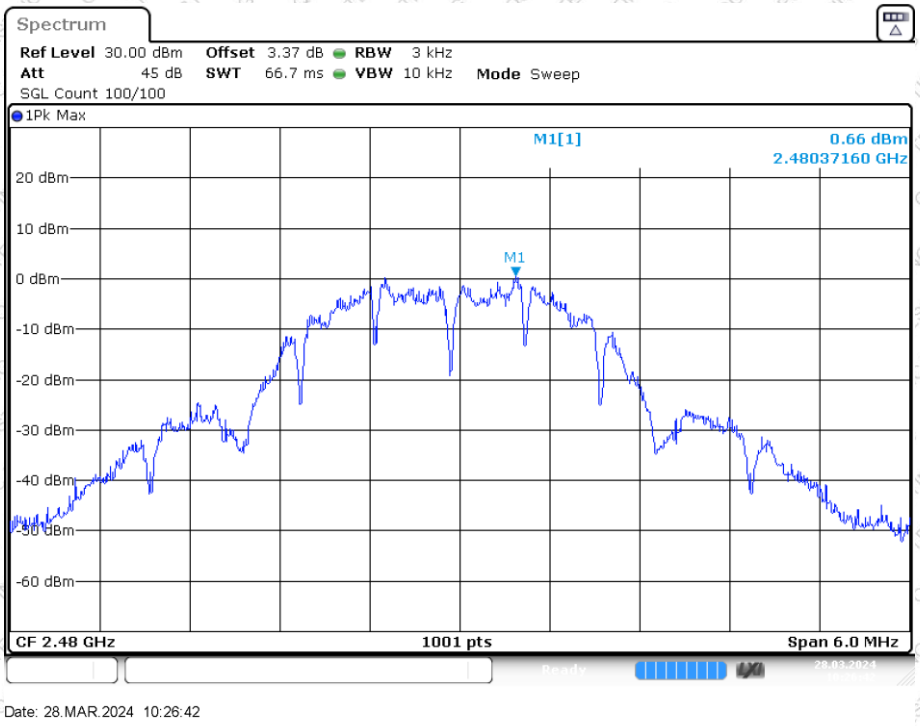
PSD NVNT 802.15.4 2480MHz Ant1



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8. Spurious Emission in Non-restricted & restricted Bands

8.1 Conducted Emission Method

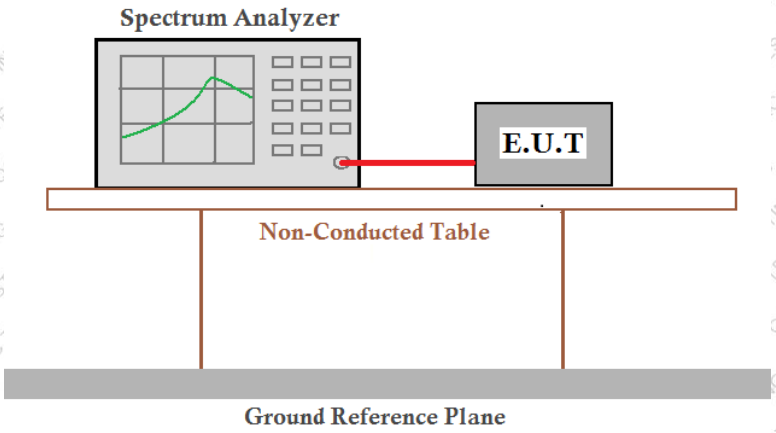
8.1.1 Applicable Standard

FCC Part15 C Section 15.247 (d)

8.1.2 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

8.1.3 Test setup



8.1.4 Test Procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 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.
- 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.
- 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.
- Repeat above procedures until all measured frequencies were complete.

8.1.5 Test Data

Temperature	24.9 ℃	Humidity	53 %
ATM Pressure	101.1kPa	Antenna Gain	See page 4
Test by	Charlie He	Test result	PASS

Please refer to following plots.

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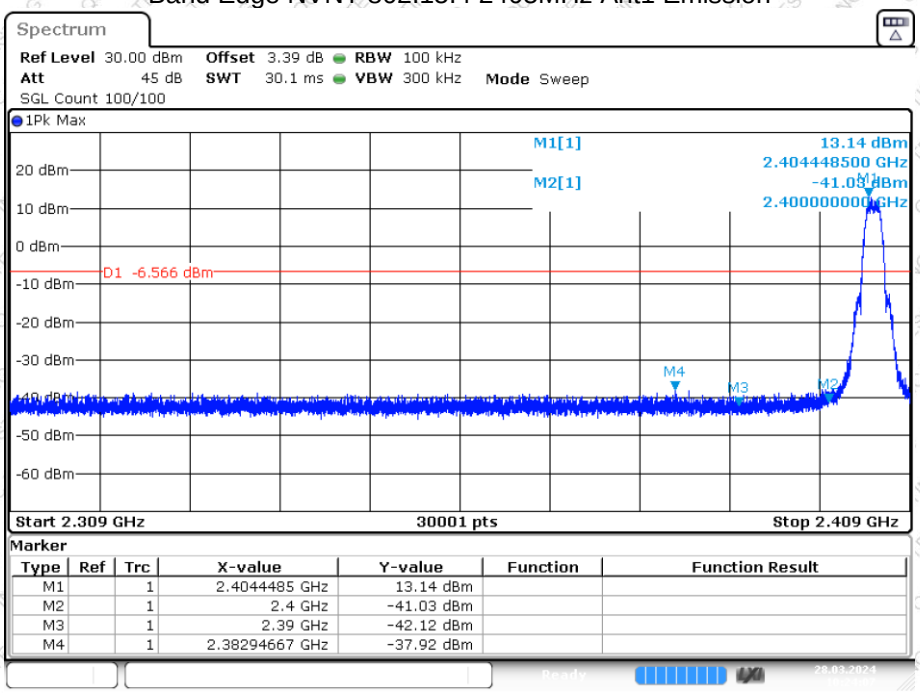
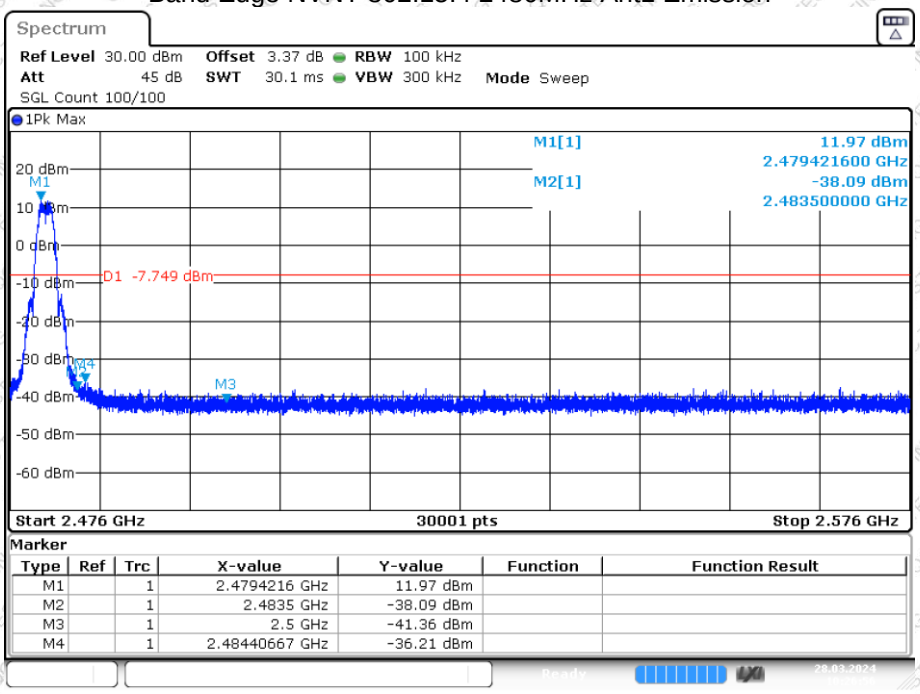
Band Edge NVNT 802.15.4 2405MHz Ant1 Emission



Date: 28.MAR.2024 10:24:07

Band Edge NVNT 802.15.4 2480MHz Ant1 Emission



Date: 28.MAR.2024 10:26:56

Address: East of 1/F., Building E, Xinghong Science Park, No.111, Shuiku Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
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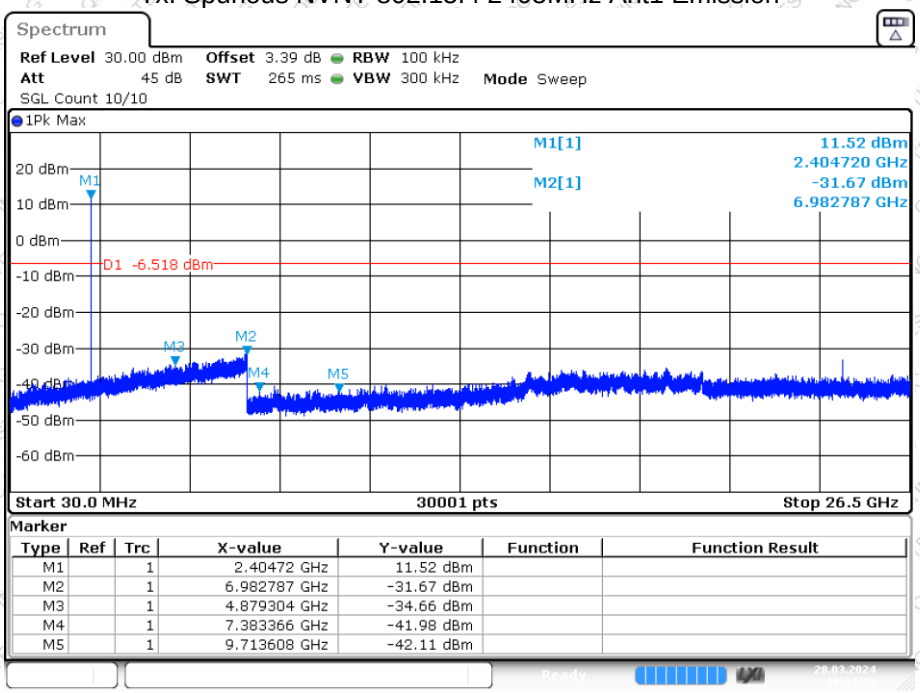
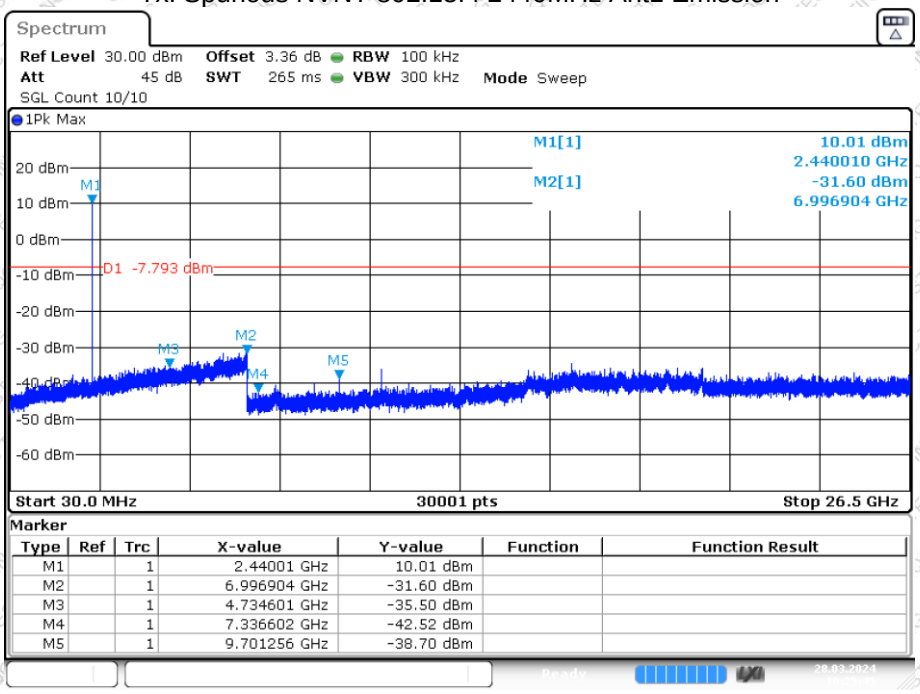
Tx. Spurious NVNT 802.15.4 2405MHz Ant1 Emission



Date: 28.MAR.2024 10:24:29

Tx. Spurious NVNT 802.15.4 2440MHz Ant1 Emission



Date: 28.MAR.2024 10:25:45

Address: East of 1/F., Building E, Xinghong Science Park, No.111, Shuiku Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
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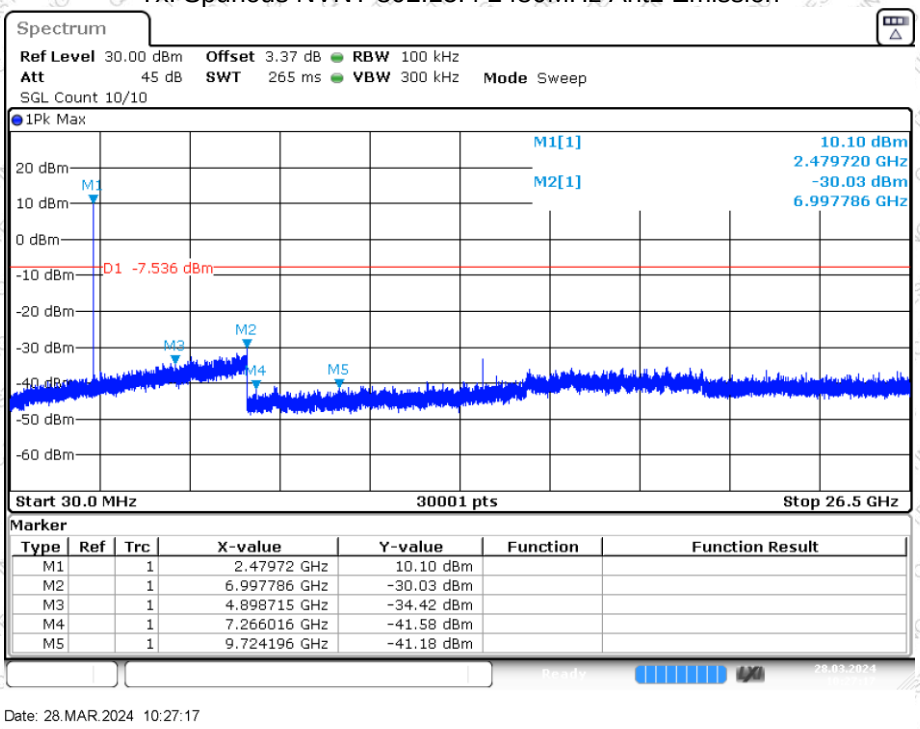
Tx. Spurious NVNT 802.15.4 2480MHz Ant1 Emission



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8.2 Radiated Emission Method

8.2.1 Applicable Standard

FCC Part15 C Section 15.209 and 15.205

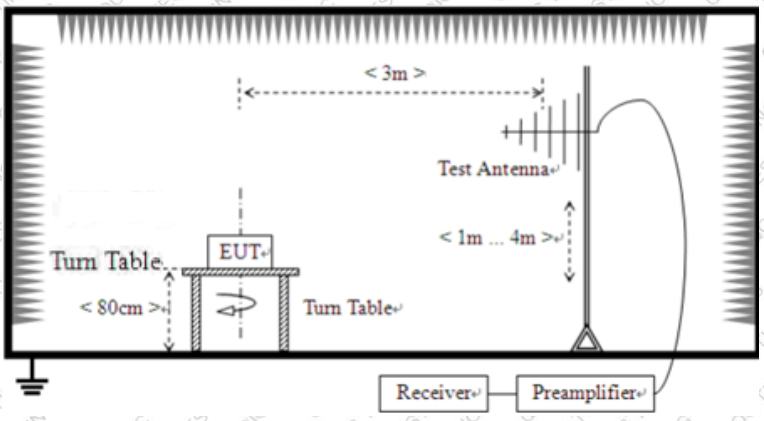
8.2.2 Limit

Frequency	Field Strengths Limits (μV/m at 3 m)	Field Strengths Limits (dBμV/m at 3 m)	Remark
30 – 88	100	40.0	Quasi-peak
88 – 216	150	43.5	Quasi-peak
216 – 960	200	46.0	Quasi-peak
Above 960	500	54.0	Quasi-peak
Above 1GHz	/	54.0	Peak
		74.0	Average

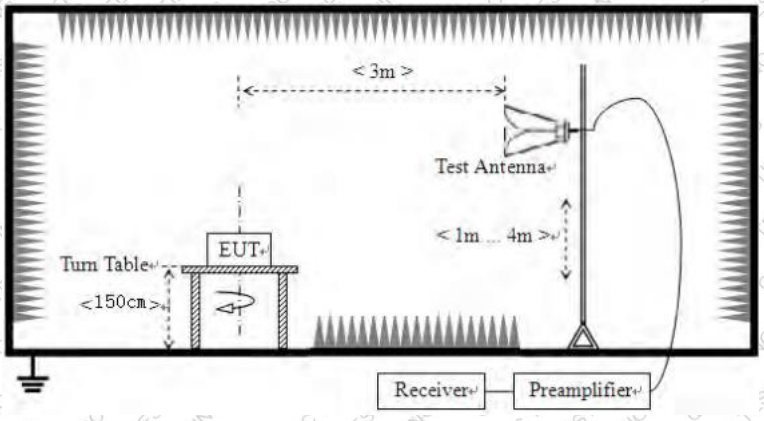
Note: dBμV/m =20log(μV/m)

8.2.3 Test setup

For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



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8.2.4 EMI Test Receiver Setup

Frequency	RBW	VBW	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10 Hz	/	Average

8.2.5 Test procedure

- The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

8.2.6 Test Data

Temperature	24.9 ℃	Humidity	53 %
ATM Pressure	101.1kPa	Antenna Gain	See page 4
Test by	Charlie He	Test result	PASS

Test voltage: DC 12V

Remarks:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.
2. The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

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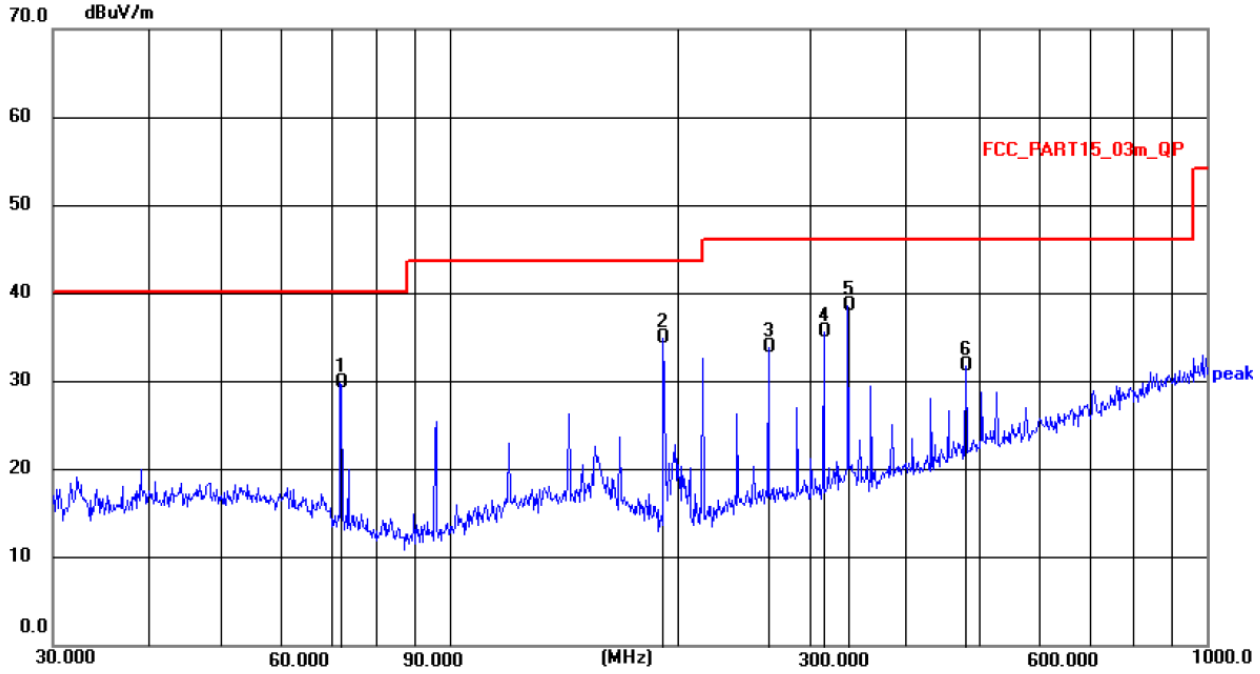
PCB antenna

Below 1GHz

Pre-scan all test modes, found worst case at 802.15.4 2405MHz, and so only show the test result of 802.15.4 2405MHz.

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	71.8320	17.91	11.99	29.90	40.00	10.10	QP
2	191.7450	23.06	11.78	34.84	43.50	8.66	QP
3	263.8190	20.17	13.72	33.89	46.00	12.11	QP
4	312.1794	20.64	14.96	35.60	46.00	10.40	QP
5 *	336.0351	22.80	15.73	38.53	46.00	7.47	QP
6	480.5276	12.11	19.61	31.72	46.00	14.28	QP

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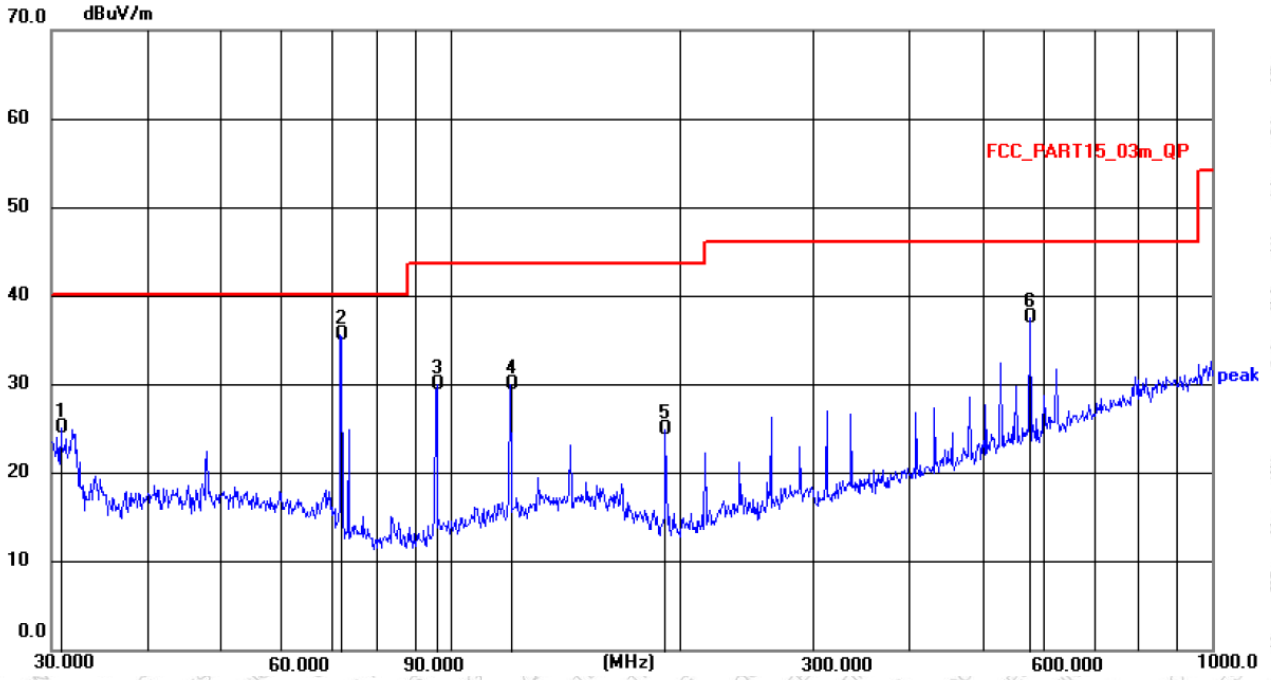
Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.8534	12.46	12.60	25.06	40.00	14.94	QP
2 *	71.8320	24.17	11.49	35.66	40.00	4.34	QP
3	96.0985	19.14	10.81	29.95	43.50	13.55	QP
4	119.8556	16.97	13.10	30.07	43.50	13.43	QP
5	191.7450	13.46	11.48	24.94	43.50	18.56	QP
6	576.6443	16.63	20.90	37.53	46.00	8.47	QP

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Above 1GHz

Test channel: Lowest channel

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
2310	46.81	H	-11.14	35.67	74	38.33	peak
2310	47.29	V	-11.16	36.13	74	37.87	peak
2390	46.7	H	-10.9	35.8	74	38.2	peak
2390	47.34	V	-10.96	36.38	74	37.62	peak
4810	45.86	H	-4.35	41.51	74	32.49	peak
4810	45.54	V	-4.49	41.05	74	32.95	peak

Test channel: Middle channel

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
4880	46.07	H	-4.1	41.97	74	32.03	peak
4880	46.22	V	-4.23	41.99	74	32.01	peak

Test channel: Highest channel

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
2483.5	55.78	H	-10.61	45.17	74	28.83	peak
2483.5	54.1	V	-10.71	43.39	74	30.61	peak
2500	46.58	H	-10.57	36.01	74	37.99	peak
2500	47.23	V	-10.67	36.56	74	37.44	peak
4960	45.78	H	-3.82	41.96	74	32.04	peak
4960	45.76	V	-3.93	41.83	74	32.17	peak

Remarks:

1. Level =Receiver Read level + Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

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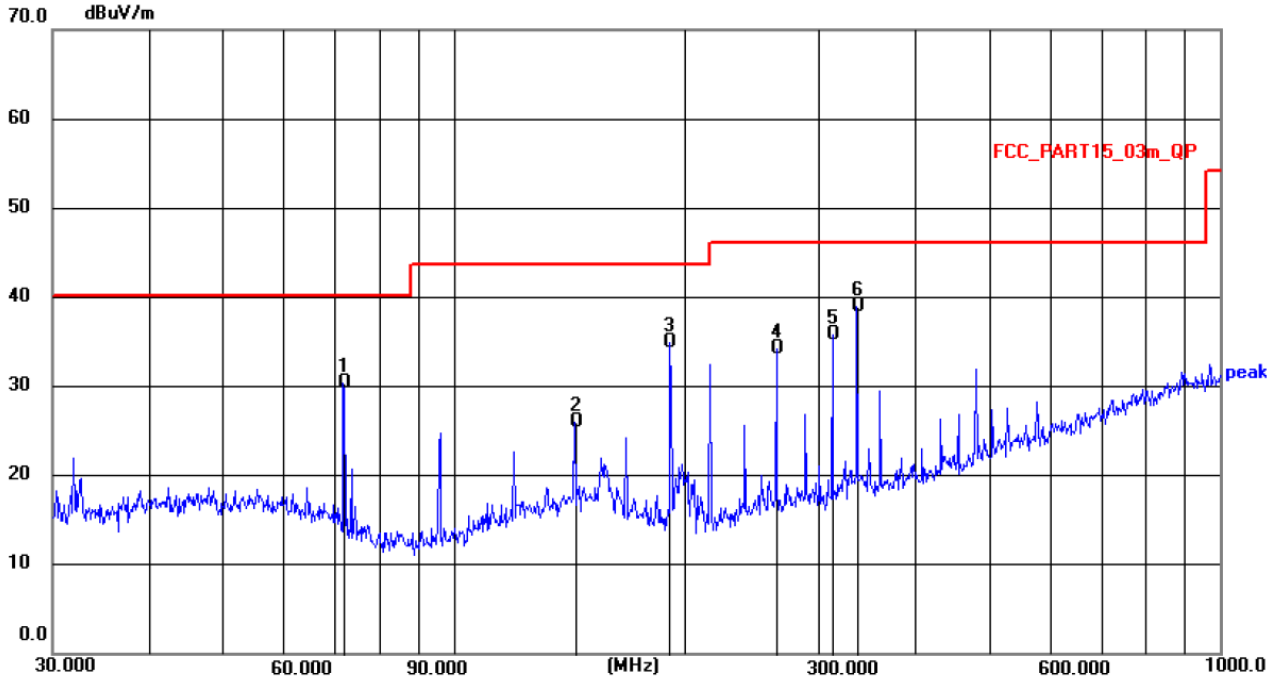
Wire antenna

Below 1GHz

Pre-scan all test modes, found worst case at 802.15.4 2405MHz, and so only show the test result of 802.15.4 2405MHz.

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	71.8320	18.36	11.99	30.35	40.00	9.65	QP
2	143.8295	11.59	14.47	26.06	43.50	17.44	QP
3	191.7450	23.19	11.78	34.97	43.50	8.53	QP
4	263.8190	20.53	13.72	34.25	46.00	11.75	QP
5	312.1794	20.89	14.96	35.85	46.00	10.15	QP
6 *	336.0351	23.19	15.73	38.92	46.00	7.08	QP

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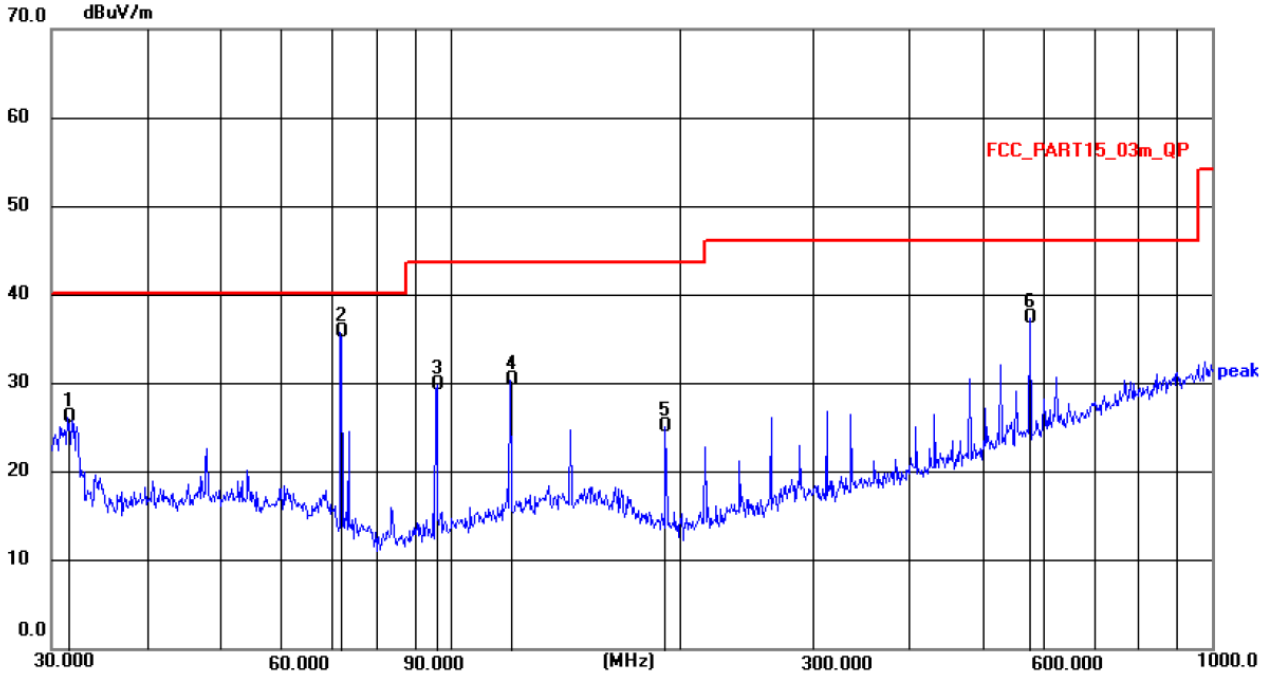
Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.5095	13.44	12.73	26.17	40.00	13.83	QP
2 *	71.8320	24.29	11.49	35.78	40.00	4.22	QP
3	96.0985	19.05	10.81	29.86	43.50	13.64	QP
4	119.8556	17.19	13.10	30.29	43.50	13.21	QP
5	191.7450	13.57	11.48	25.05	43.50	18.45	QP
6	576.6443	16.54	20.90	37.44	46.00	8.56	QP

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Above 1GHz

Test channel: Lowest channel

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
2310	49.2	H	-11.14	38.06	74	35.94	peak
2310	48	V	-11.16	36.84	74	37.16	peak
2390	48.59	H	-10.9	37.69	74	36.31	peak
2390	49.66	V	-10.96	38.7	74	35.3	peak
4810	46.75	H	-4.35	42.4	74	31.6	peak
4810	46.41	V	-4.49	41.92	74	32.08	peak

Test channel: Middle channel

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
4880	44.88	H	-4.1	40.78	74	33.22	peak
4880	47.13	V	-4.23	42.9	74	31.1	peak

Test channel: Highest channel

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
2483.5	60.34	H	-10.61	49.73	74	24.27	peak
2483.5	51.01	V	-10.71	40.3	74	33.7	peak
2500	48.3	H	-10.57	37.73	74	36.27	peak
2500	48.06	V	-10.67	37.39	74	36.61	peak
4960	46.59	H	-3.82	42.77	74	31.23	peak
4960	47.27	V	-3.93	43.34	74	30.66	peak

Remarks:

1. Level =Receiver Read level + Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

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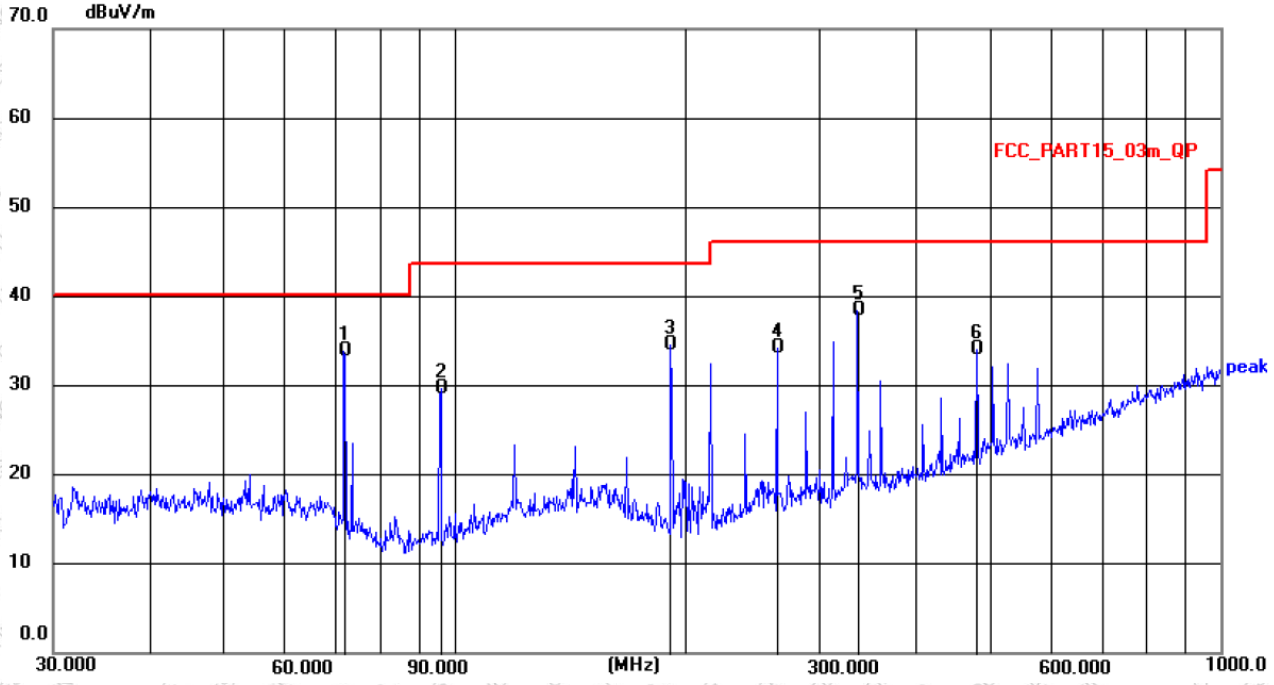
Dipole Antenna

Below 1GHz

Pre-scan all test modes, found worst case at 802.15.4 2405MHz, and so only show the test result of 802.15.4 2405MHz.

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	71.8320	21.82	11.99	33.81	40.00	6.19	QP
2	96.0985	18.95	10.67	29.62	43.50	13.88	QP
3	191.7450	22.77	11.78	34.55	43.50	8.95	QP
4	263.8190	20.49	13.72	34.21	46.00	11.79	QP
5	336.0351	22.62	15.73	38.35	46.00	7.65	QP
6	480.5276	14.43	19.61	34.04	46.00	11.96	QP

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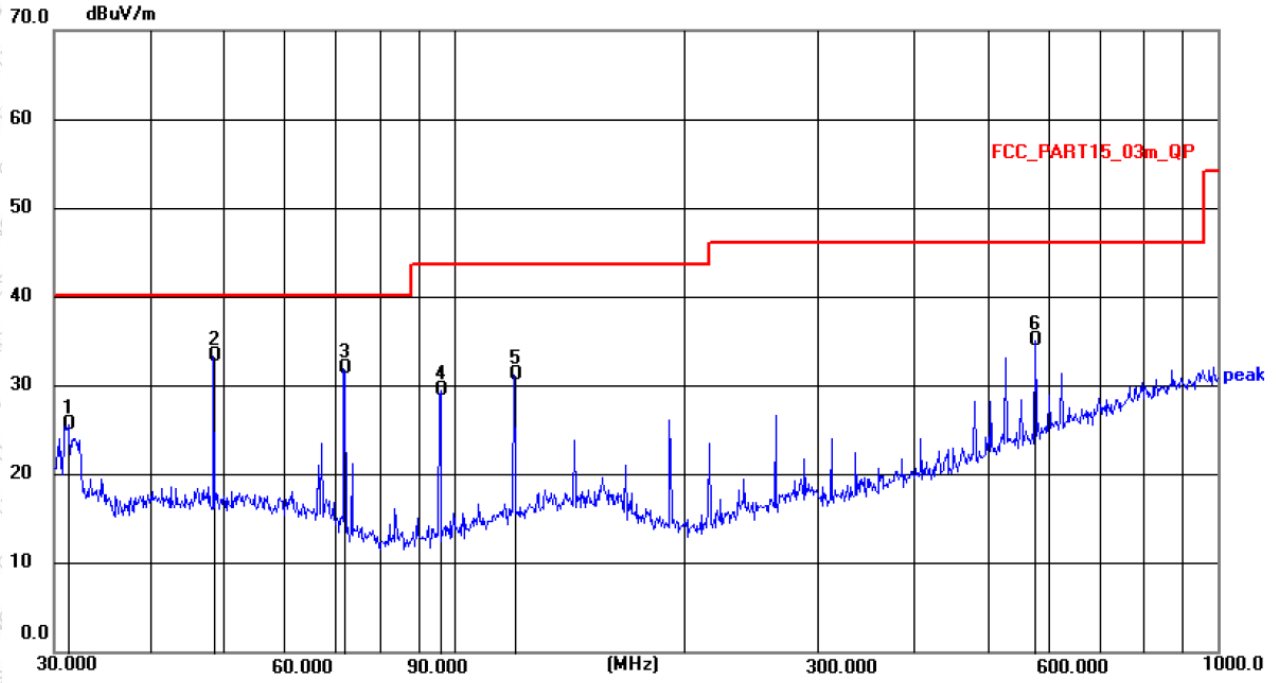
Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.2893	13.01	12.69	25.70	40.00	14.30	QP
2 *	48.5016	18.92	14.46	33.38	40.00	6.62	QP
3	71.8320	20.52	11.49	32.01	40.00	7.99	QP
4	96.0986	18.62	10.81	29.43	43.50	14.07	QP
5	119.8556	18.15	13.10	31.25	43.50	12.25	QP
6	576.6443	14.23	20.90	35.13	46.00	10.87	QP

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Above 1GHz

Test channel: Lowest channel

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
2310	48.09	H	-11.14	36.95	74	37.05	peak
2310	48.09	V	-11.16	36.93	74	37.07	peak
2390	48.22	H	-10.9	37.32	74	36.68	peak
2390	48.84	V	-10.96	37.88	74	36.12	peak
4810	47.2	H	-4.35	42.85	74	31.15	peak
4810	45.89	V	-4.49	41.4	74	32.6	peak

Test channel: Middle channel

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
4880	46.88	H	-4.1	42.78	74	31.22	peak
4880	47.11	V	-4.23	42.88	74	31.12	peak

Test channel: Highest channel

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
2483.5	57.31	H	-10.61	46.7	74	27.3	peak
2483.5	48.3	V	-10.71	37.59	74	36.41	peak
2500	48.16	H	-10.57	37.59	74	36.41	peak
2500	47.53	V	-10.67	36.86	74	37.14	peak
4960	47.55	H	-3.82	43.73	74	30.27	peak
4960	49.52	V	-3.93	45.59	74	28.41	peak
2483.5	57.31	H	-10.61	46.7	74	27.3	peak

Remarks:

1. Level =Receiver Read level + Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

---------- THE END OF TEST REPORT ----------

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