FCC/ISED - TEST REPORT

Report Number	:	**68.950.24.0328.01**	Date of Issue:	**2024-06-28**
Model/HVIN	:	**CPSS1**		
Product Type	:	Camera		
Applicant	:	GoPro, Inc.		
Address	:	3025 Clearview Way, San Mateo, CA 94402, USA		
Manufacturer	:	GoPro, Inc.		
Address	:	3025 Clearview Way, San Mateo, CA 94402, USA		
Test Result	:	■ **Positive** ☐ **Negative**		
Total pages including Appendices	:	**50**		

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
	Building 12&13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen City, 518052, P. R. China
Telephone:	86 755 8828 6998
Fax:	86 755 828 5299
FCC Registration No.:	514049
FCC Designation No.:	CN5009
IC Registration No.:	10320A
ISED CAB identifier:	CN0077

3 Description of the Equipment Under Test

Product:	Camera
Model no.:	CPSS1
FCC ID:	CNFCPSS1
IC:	10193A-CPSS1
PMN:	CPSS1
HVIN:	CPSS1
Rating:	3.89VDC
RF Transmission Frequency:	2402MHz-2480MHz
No. of Operated Channel:	40
Modulation:	GFSK
Antenna Type:	Internal Integrated Metal Antenna
Antenna Gain:	-1.08dBi max for 2.4GHz
Description of the EUT:	The Equipment Under Test (EUT) is a Camera supports Bluetooth Low Energy / Bluetooth BR+EDR/ Wi-Fi functions

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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2023 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators
RSS-Gen Issue 5 April 2018 Amendment 1 March 2019 + Amendment 2 February 2021	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 3 August 2023	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices

All the test methods were according to KDB 558074 D01 15.247 Meas Guidance v05r02 Measurement Guidance and ANSI C63.10-2020.

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5 Summary of Test Results

Technical Requirements			
FCC Part 15 Subpart C/ RSS-247 Issue 3/RSS-Gen Issue 5			
Test Condition		Test Site	Test Result
§15.207 & RSS-GEN 8.8	Conducted emission AC power port	Site 1	Pass
§15.247 (b) (3) & RSS-247 5.4(d)	Conducted output power	Site 1	Pass
RSS-247 5.4(d)	Equivalent Isotropic Radiated Power	Site 1	Pass
§15.247(a)(2) & RSS-247 5.2(a) & RSS-GEN 6.7	6dB bandwidth and 99% Occupied Bandwidth	Site 1	Pass
§15.247(e) & RSS-247 5.2(b)	Power spectral density	Site 1	Pass
§15.247(d) & RSS-247 5.5	Spurious RF conducted emissions	Site 1	Pass
§15.247(d) & RSS-247 5.5	Band edge	Site 1	Pass
§15.247(d) & §15.209 & §15.205 & RSS-247 5.5 & RSS-Gen 6.13	Spurious radiated emissions for transmitter	Site 1	Pass
§15.203 & RSS-Gen 6.8	Antenna requirement	See note 2	Pass

Note 1: N/A=Not Applicable.
Note 2: The EUT uses an Internal Integrated Metal Antenna, which gain is -1.08dBi. In accordance to §15.203 & RSS-Gen 6.8, it is considered sufficiently to comply with the provisions of this section.

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6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: CNFCPSS1, complies with Section 15.207, 15.209, 15.205, 15.247 of the FCC Part 15, Subpart C.

This submittal(s) (test report) is intended for IC: 10193A-CPSS1, complies with RSS-247, RSS-GEN.

The Model CPSS1 supports Bluetooth Low Energy/Bluetooth BR+EDR/Wi-Fi functions, it is powered by a 3.89VDC, 1900mAh rechargeable Lithium Ion Battery or 5VDC supplies by USB type C port for charging battery.
The TX and RX range is 2402MHz-2480MHz for Bluetooth, 2412MHz – 2462MHz for 2.4GHz Wi-Fi, 5180MHz – 5320MHz, 5500MHz – 5700MHz, 5745MHz – 5825MHz for 5GHz Wi-Fi.
(This device shall not be capable of transmitting in the band 5600-5650MHz for Canada. This restriction is for the protection of Terminal Doppler Weather Radar (TDWR) operating in this band.)

This report is for the Bluetooth Low Energy part.

SUMMARY:

All tests according to the regulations cited on page 6 were

■ - Performed

☐ - **Not** Performed

The Equipment under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

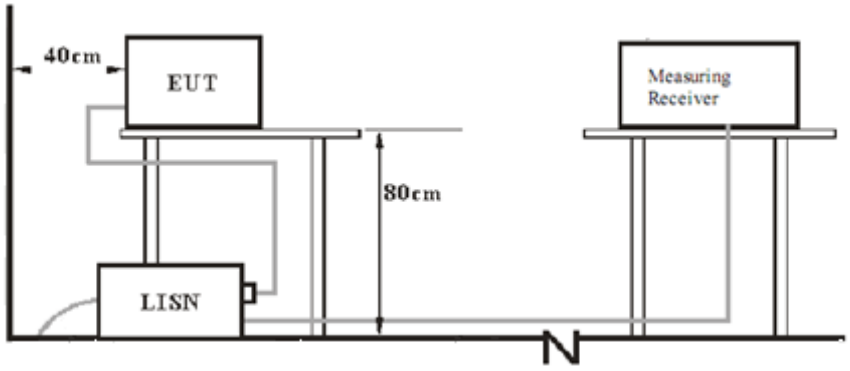
Sample Received Date:	2024-03-29
Testing Start Date:	2024-04-01
Testing End Date:	2024-05-06

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Reviewed by:	Prepared by:	Tested by:
John Zhi	Joe Gu	Carry Cai
Project Manager	Project Engineer	Test Engineer

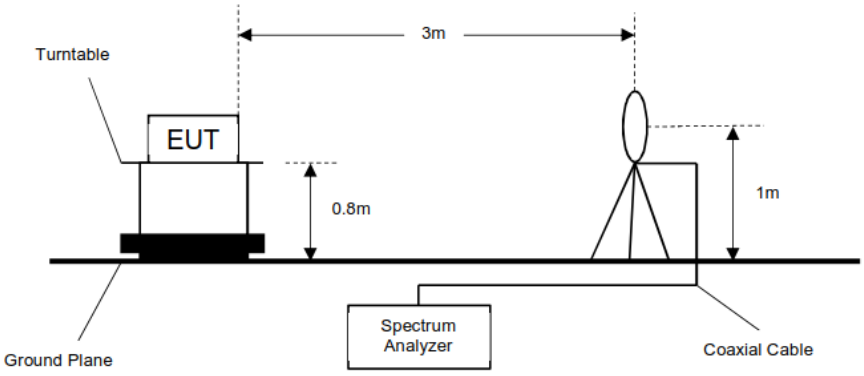
7 Test Setups

7.1 AC Power Line Conducted Emission test setups

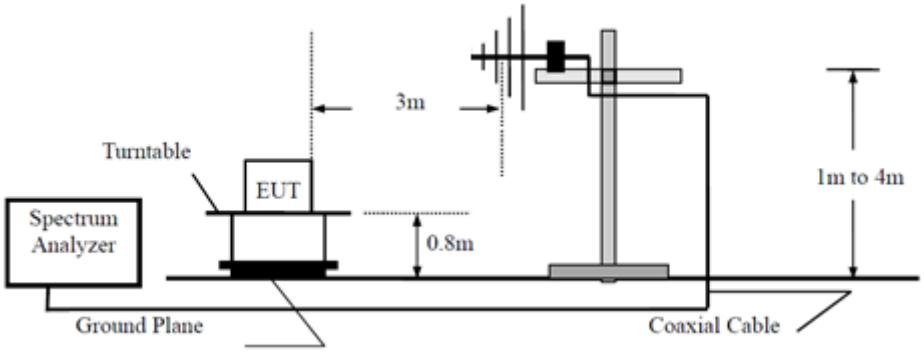


7.2 Radiated test setups

9KHz - 30MHz



30MHz - 1GHz



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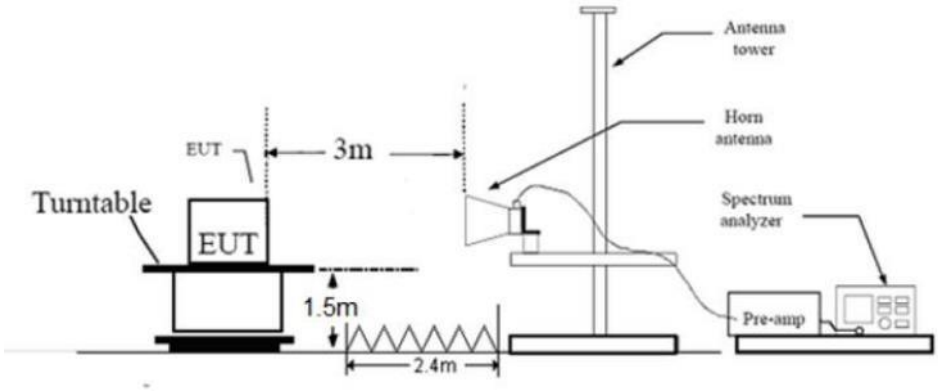
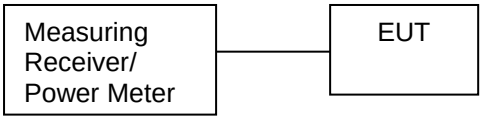
Above 1GHz



7.3 Conducted RF test setups



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8 Systems Test Configuration

Auxiliary Equipment Used during Test:

Description	Manufacturer	Model NO.	S/N
LAPTOP	LENOVO	T460S	---
USB TYPE C CABLE	GOPRO	0.46M (LENGTH)	---
AC ADAPTER	APPLE	A1401	---

Test software information:

Test Software Version	RF TOOL(Ver:0.2.1)	
Modulation	Setting TX Power	Packet Type
GFSK	/	/

The system was configured to non-hopping mode, testing channel 0, 19, 39.

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9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. Both sides of AC line were checked for maximum conducted interference.
6. The frequency range from 150 kHz to 30 MHz was searched.
7. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

Limit

Frequency MHz	QP Limit dBµV	AV Limit dBµV
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

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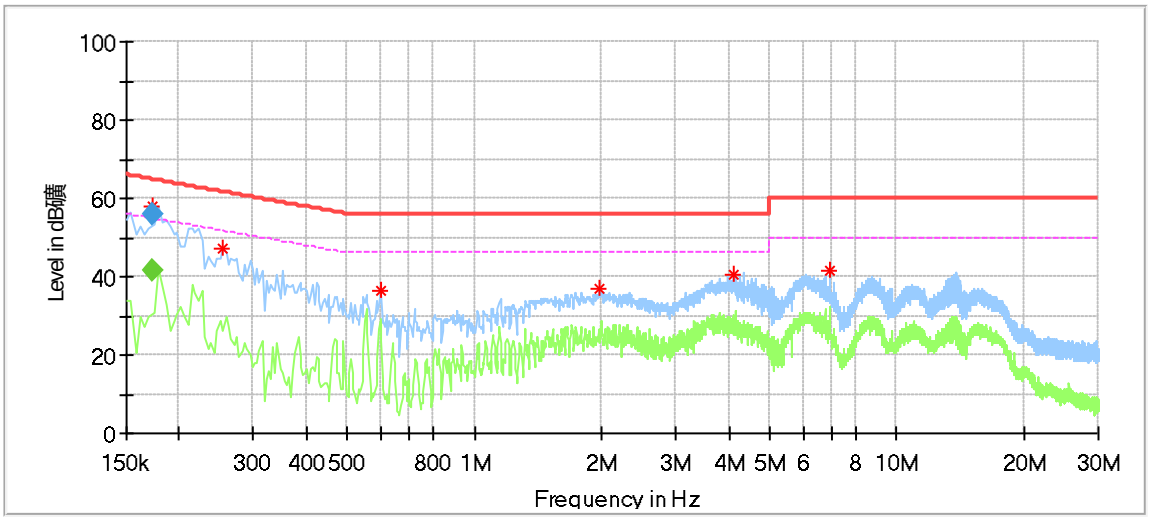
Conducted Emission

Product Type	:	Camera
M/N	:	CPSS1
Operating Condition	:	Charging and transmitting
Test Specification	:	Line
Comment	:	AC 120V/60Hz(External adapter)



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.173500	57.91	---	64.58	6.67	L1	9.54
0.254000	46.99	---	61.63	14.64	L1	9.56
0.598000	36.43	---	56.00	19.57	L1	9.60
1.970000	36.71	---	56.00	19.29	L1	9.62
4.122000	40.28	---	56.00	15.72	L1	9.70
6.918000	41.49	---	60.00	18.51	L1	9.83

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.173500	---	41.79	54.79	13.01	L1	9.54
0.173500	55.83	---	64.79	8.96	L1	9.54

Remark:
Level=Reading Level + Correction Factor
Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)

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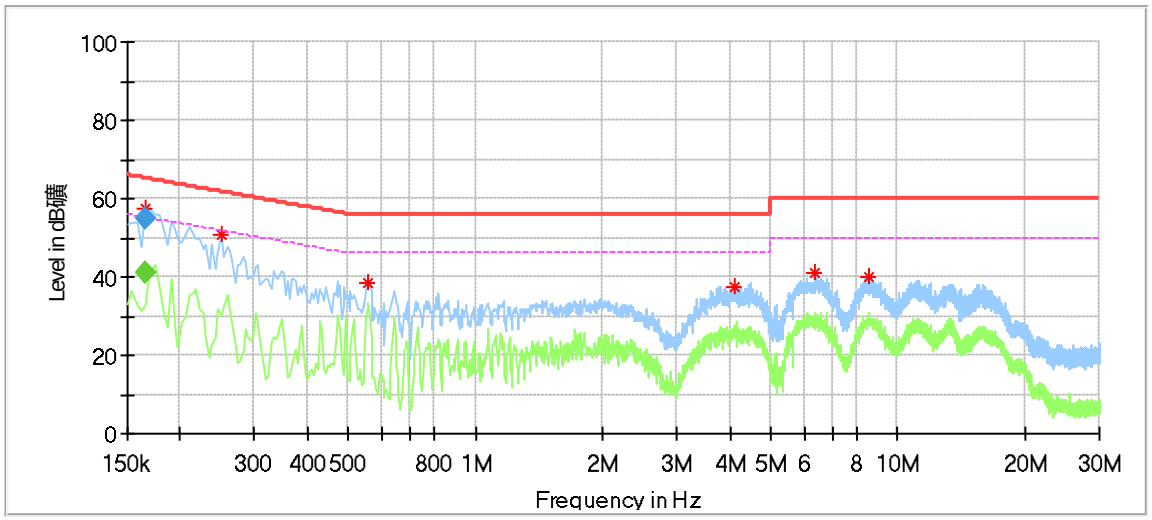
Conducted Emission

Product Type	:	Camera
M/N	:	CPSS1
Operating Condition	:	Charging and transmitting
Test Specification	:	Neutral
Comment	:	AC 120V/60Hz(External adapter)



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.165500	57.60	---	64.96	7.36	N	9.57
0.250000	50.75	---	61.76	11.00	N	9.59
0.554000	38.62	---	56.00	17.38	N	9.63
4.110000	37.31	---	56.00	18.69	N	9.73
6.370000	40.87	---	60.00	19.13	N	9.83
8.538000	39.93	---	60.00	20.07	N	9.92

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.165500	---	41.17	55.18	14.01	N	9.57
0.165500	54.92	---	65.18	10.26	N	9.57

Remark:
Level=Reading Level + Correction Factor
Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)

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9.2 Conducted Output Power & EIRP

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Use the following test receiver settings:
   Span = approximately 5 times the 6dB bandwidth, centered on a channel need to test, RBW > the 6dB bandwidth of the emission being measured, VBW≥3RBW,
   Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power and record the results in the test report.
5. Repeat above procedures until all frequencies measured were complete.

Limits

According to §15.247 (b) (3) & RSS-247 5.4(d), conducted output power limit as below:

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1	≤30

According to & RSS-247 5.4(d), EIRP limit as below:

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤4	≤36

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Conducted Output Power & EIRP

Frequency MHz	Mode	Conducted Output Power dBm	Antenna Gain dBi	EIRP dBm	Result
Bottom channel 2402MHz	LE 1Mbps	6.92	-1.08	5.84	Pass
Middle channel 2440MHz	LE 1Mbps	6.97	-1.08	5.89	Pass
Top channel 2480MHz	LE 1Mbps	5.90	-1.08	4.82	Pass
Bottom channel 2402MHz	LE 2Mbps	7.11	-1.08	6.03	Pass
Middle channel 2440MHz	LE 2Mbps	7.25	-1.08	6.17	Pass
Top channel 2480MHz	LE 2Mbps	6.14	-1.08	5.06	Pass

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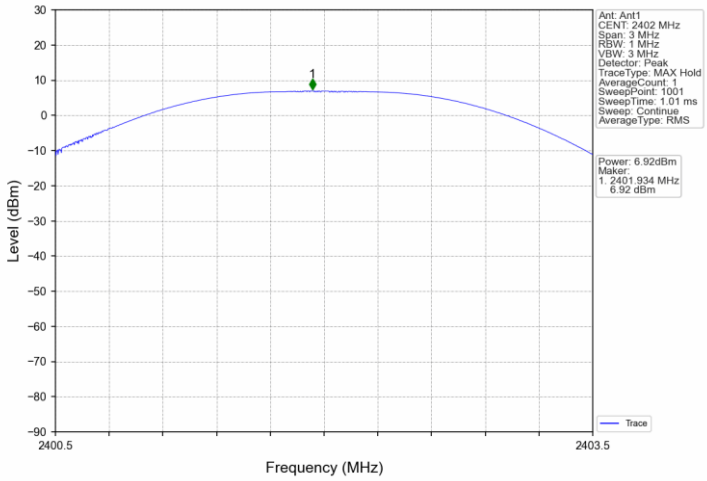
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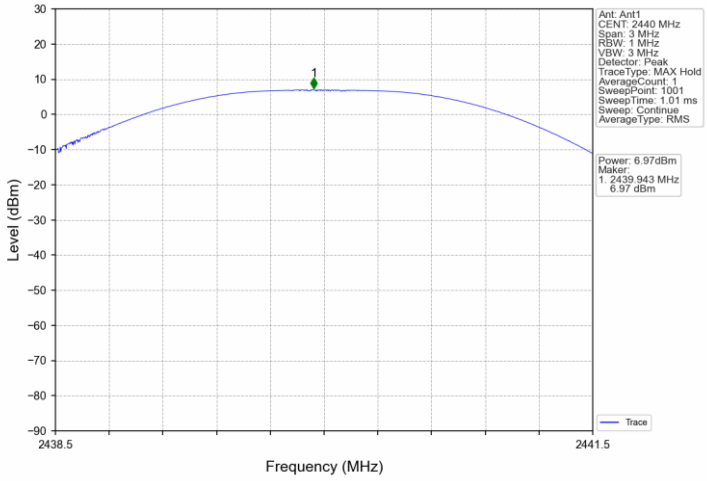
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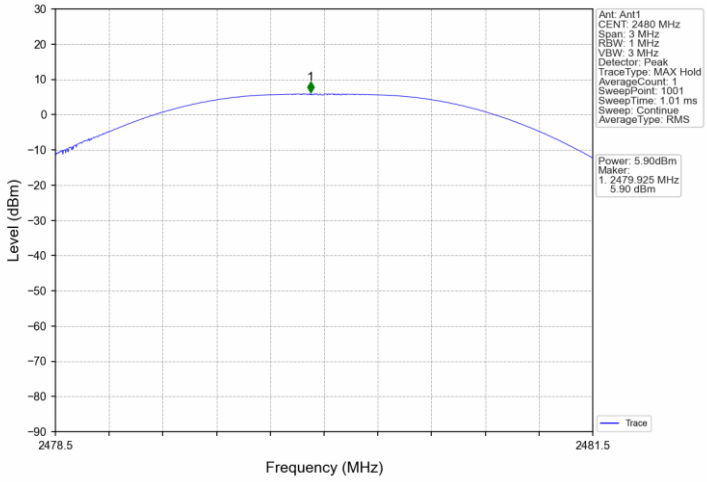

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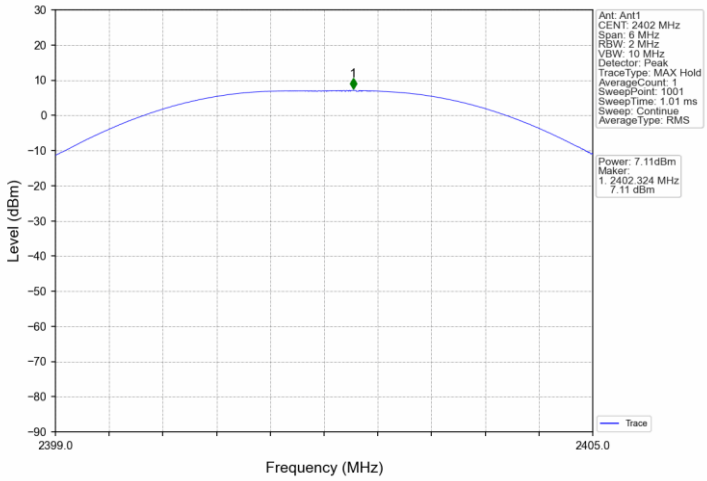
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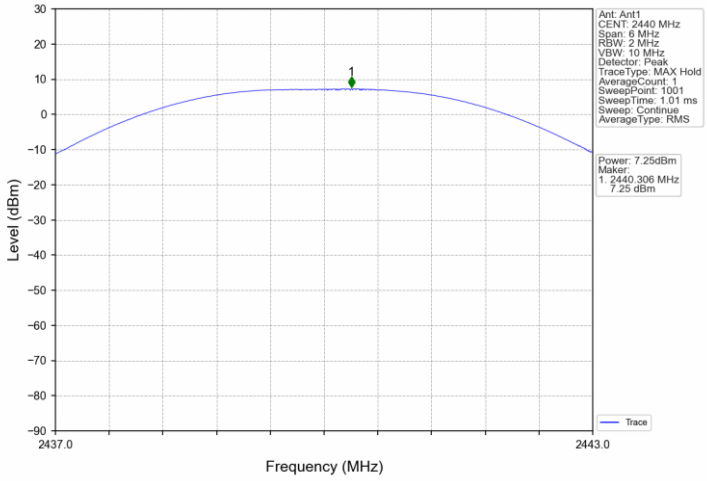
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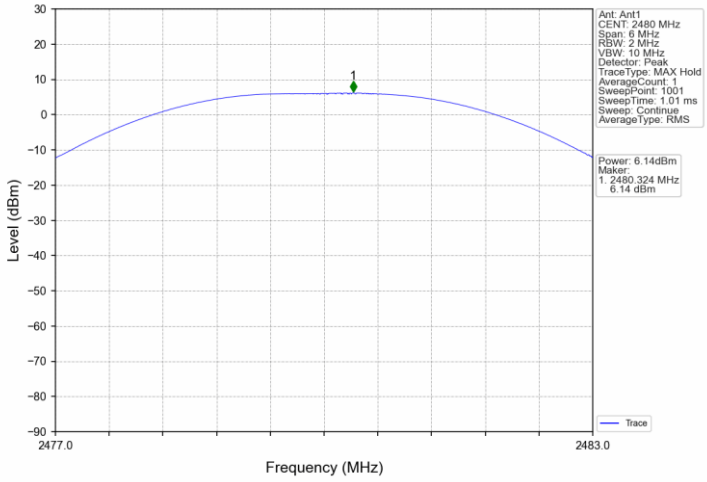

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9.3 Power Spectral Density

Test Method

1. The RF output of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting, the instrument center frequency is set to the nominal EUT channel center frequency enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings:
4. Set analyzer center frequency to DTS channel center frequency. RBW=3kHz, VBW≥3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
5. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
6. Repeat above procedures until other frequencies measured were completed.

Limit

Limit [dBm/3KHz]
≤8

Test result

Frequency MHz	Mode	Power spectral density dBm/3KHz	Result
Bottom channel 2402MHz	LE 1Mbps	-10.16	Pass
Middle channel 2440MHz	LE 1Mbps	-9.89	Pass
Top channel 2480MHz	LE 1Mbps	-10.93	Pass
Bottom channel 2402MHz	LE 2Mbps	-12.49	Pass
Middle channel 2440MHz	LE 2Mbps	-12.50	Pass
Top channel 2480MHz	LE 2Mbps	-13.67	Pass

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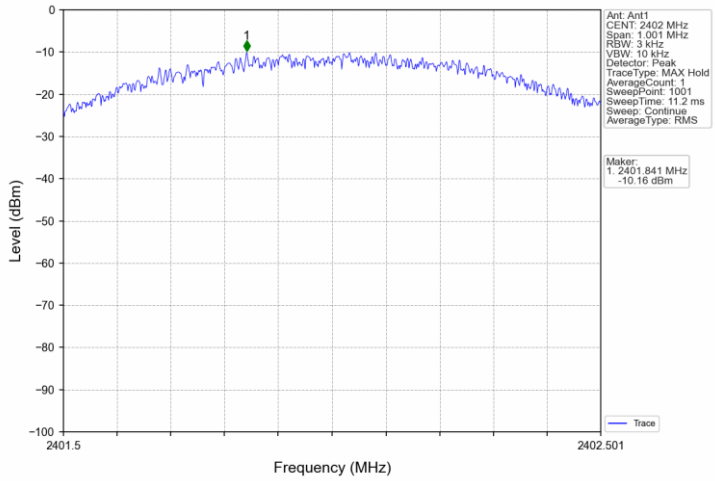
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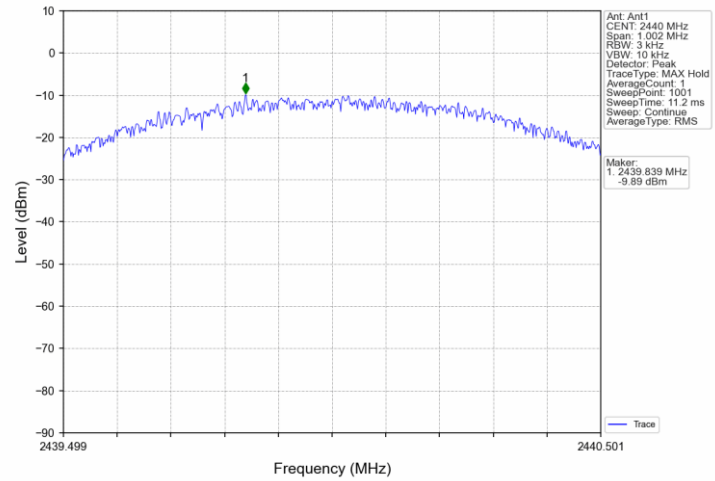
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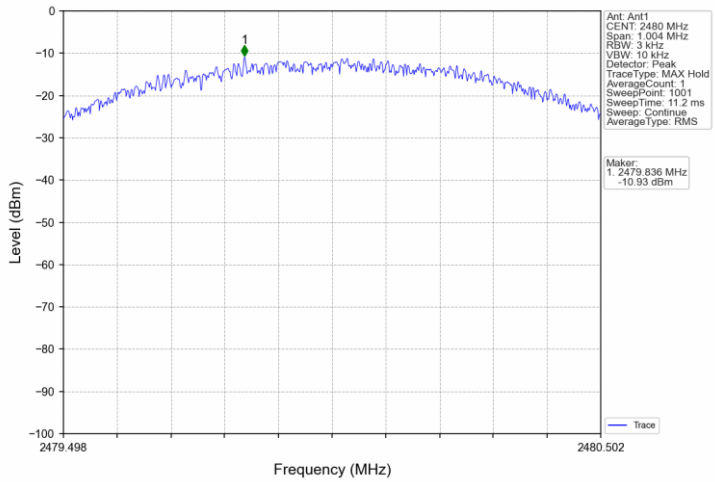

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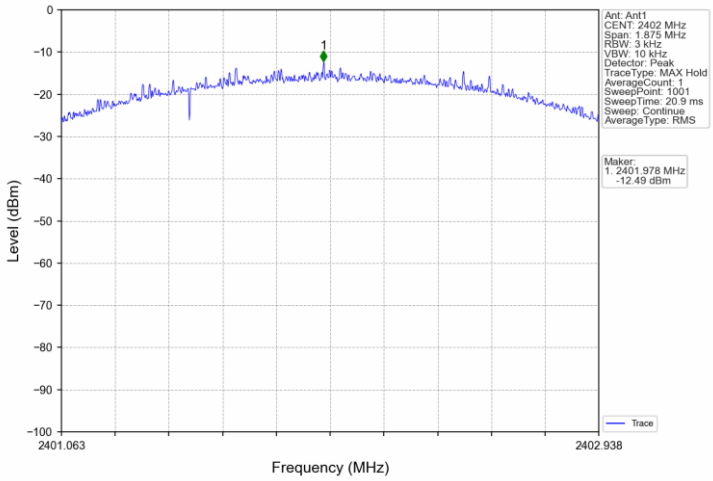
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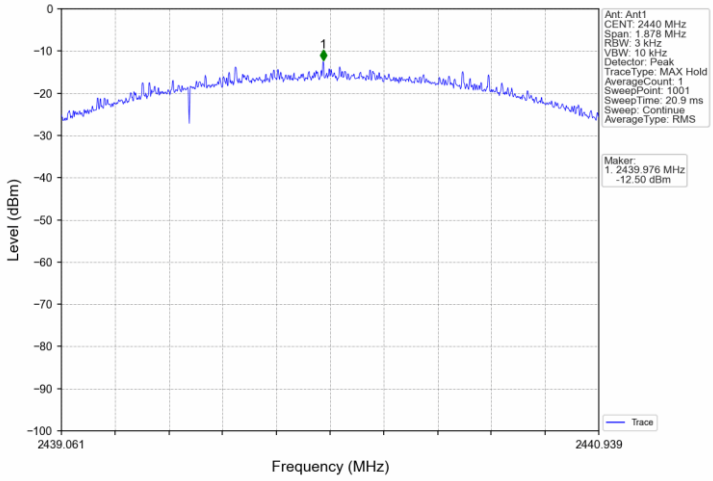
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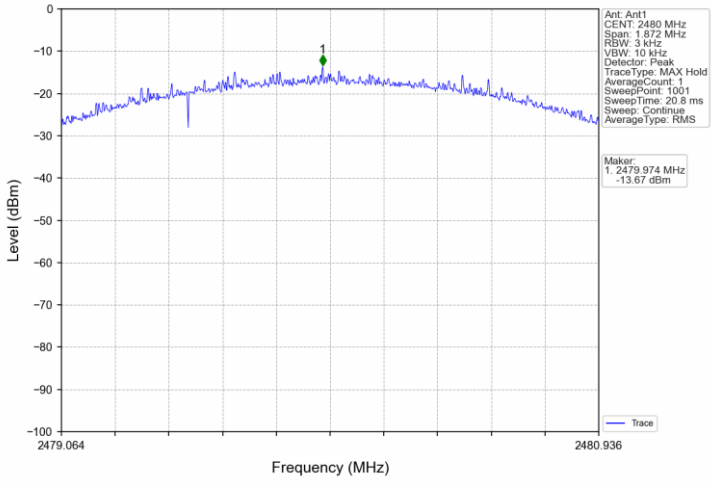

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9.4 6 dB Bandwidth and 99% Occupied Bandwidth

Test Method for 6 dB Bandwidth

1. The RF output of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Set center frequency to the nominal EUT channel center frequency.
3. Set RBW =1% to 5% of the OBW, but not less than 100 kHz, VBW≥ 3 × RBW Detector = Peak. Trace mode = max hold. Sweep = auto Trace = max hold
4. 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.
5. Record the results in the test report.

Limit

Limit [kHz]
≥500

Test Method for 99 % Bandwidth

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW. Set RBW = 1 % to 5 % of the OBW
   Set VBW ≥ 3 RBW Trace mode = max hold. Sweep = auto couple.
   Allow the trace to stabilize.
3. Use the 99 % power bandwidth function of the instrument.
4. Record the results in the test report.

Limit

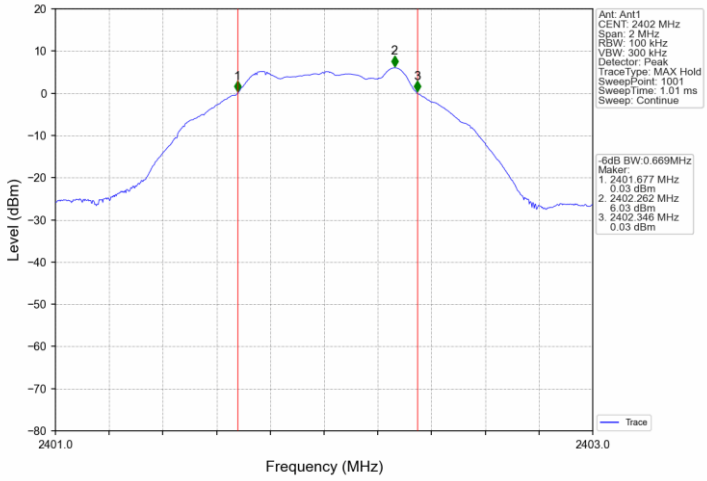
Limit [kHz]
No Limit

Test result

Frequency MHz	Mode	6dB bandwidth MHz	99% bandwidth MHz	Result
Bottom channel 2402MHz	LE 1Mbps	0.669	1.035	Pass
Middle channel 2440MHz	LE 1Mbps	0.669	1.033	Pass
Top channel 2480MHz	LE 1Mbps	0.667	1.034	Pass
Bottom channel 2402MHz	LE 2Mbps	1.250	2.076	Pass
Middle channel 2440MHz	LE 2Mbps	1.247	2.075	Pass
Top channel 2480MHz	LE 2Mbps	1.249	2.073	Pass

6 dB Bandwidth

1M_LCH_2402MHz_Ant1_NTNV



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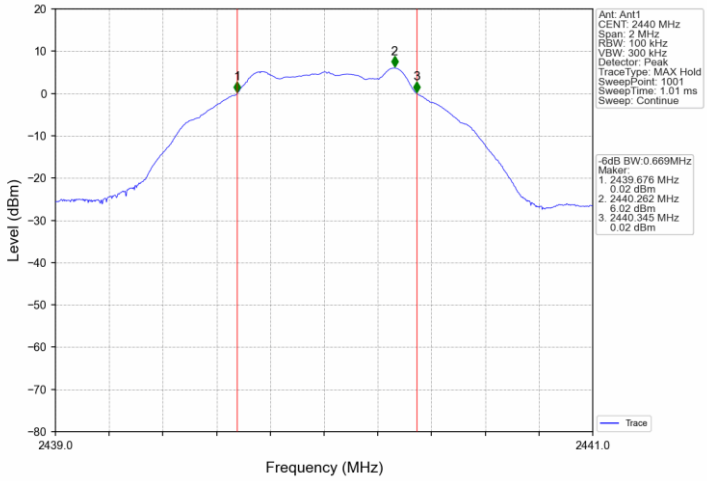

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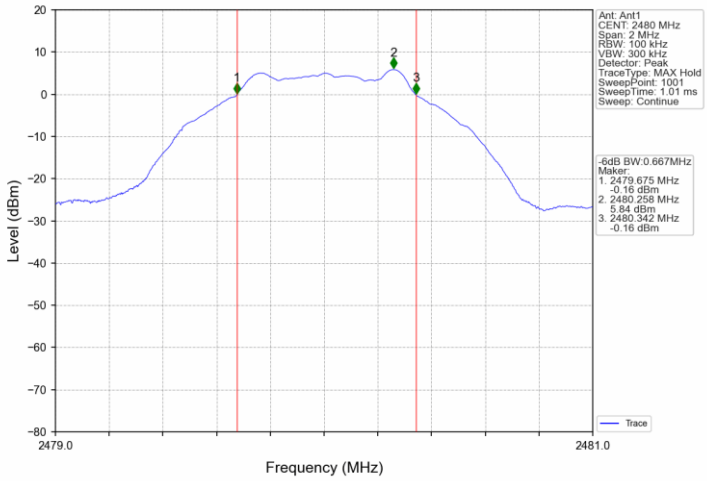

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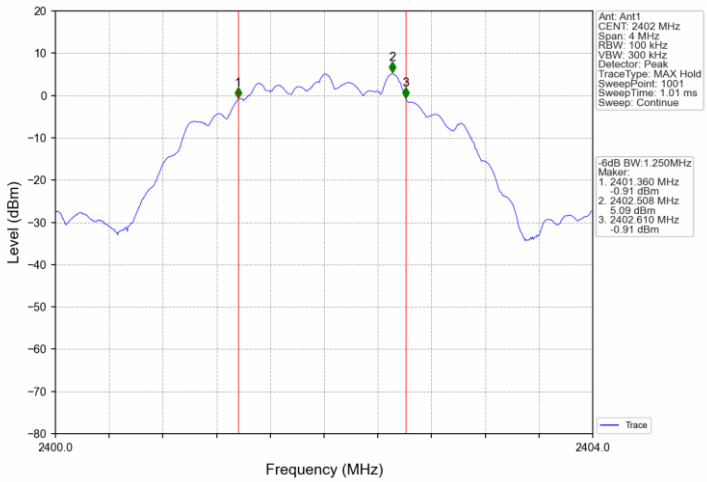
2M_LCH_2402MHz_Ant1_NTNV

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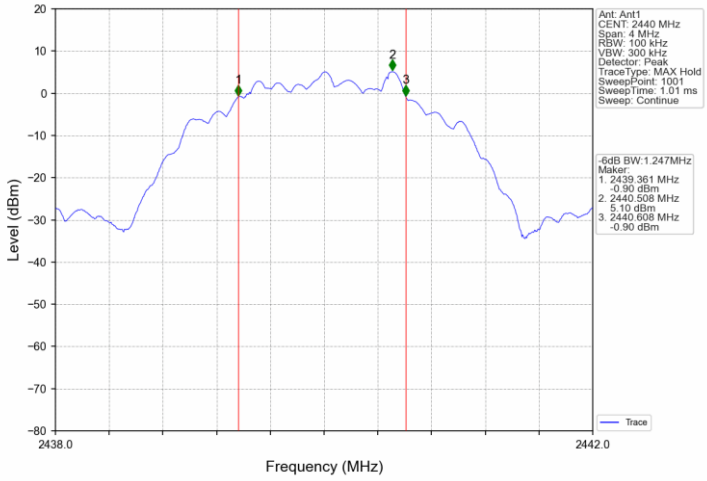
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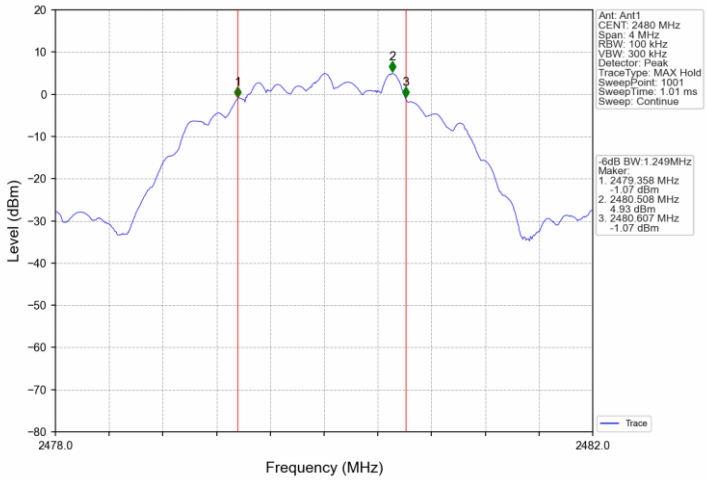

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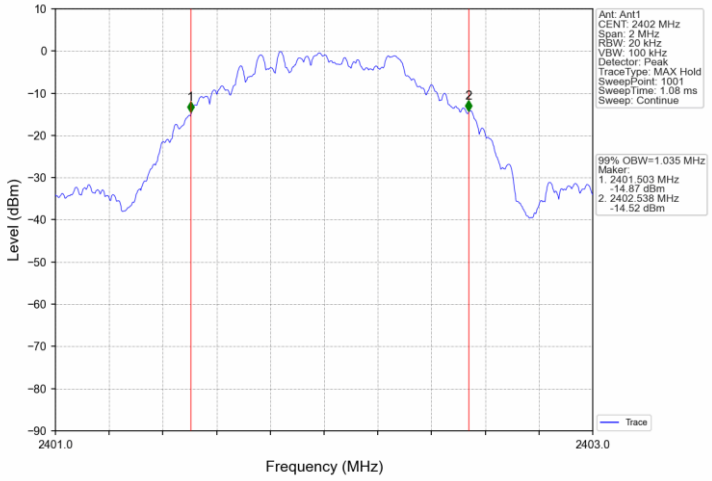
99% Bandwidth

1M_LCH_2402MHz_Ant1_NTNV



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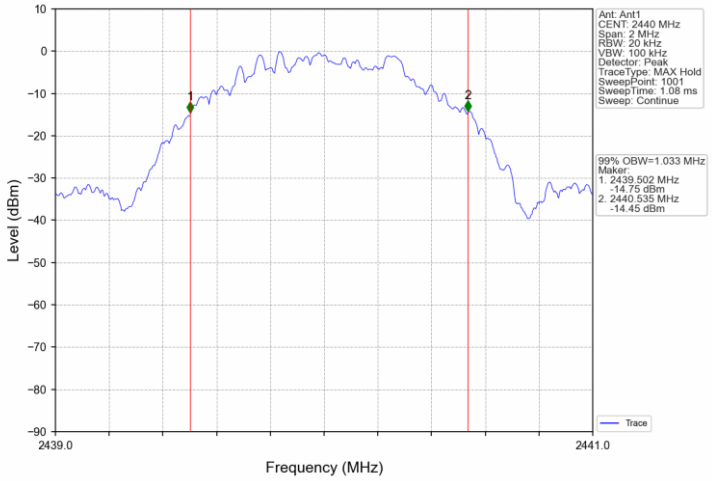
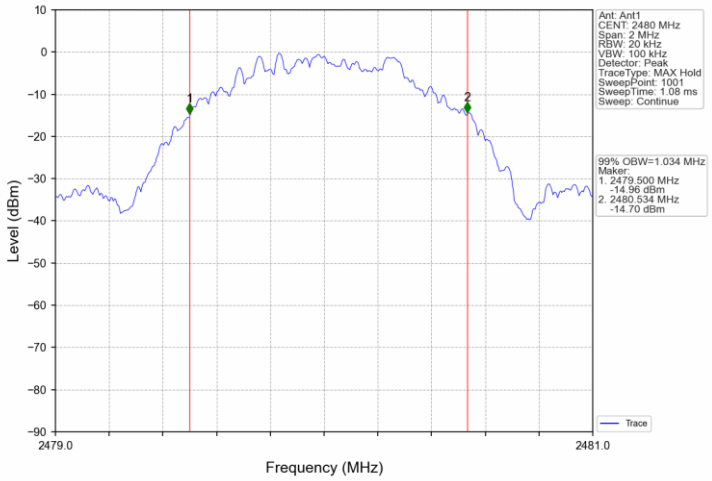


1M_HCH_2480MHz_Ant1_NTNV



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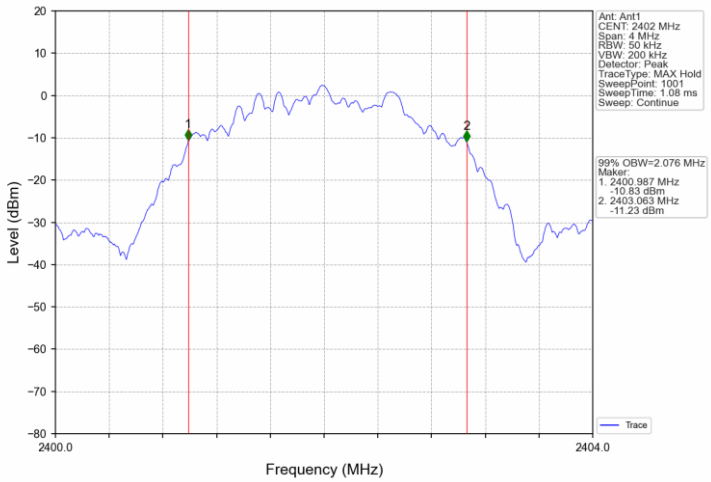
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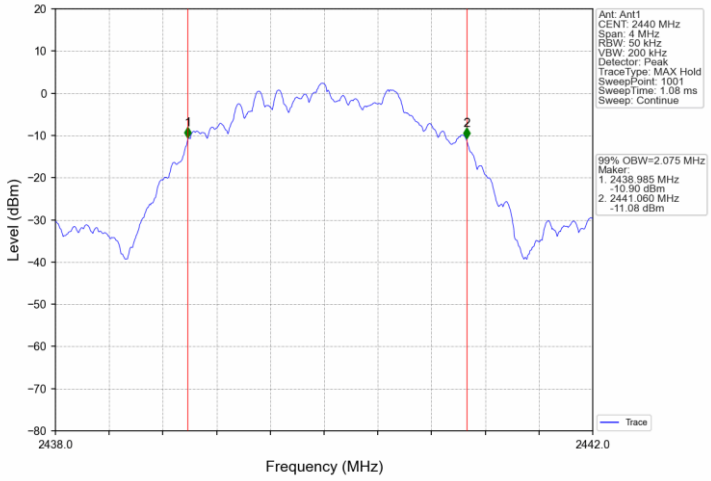
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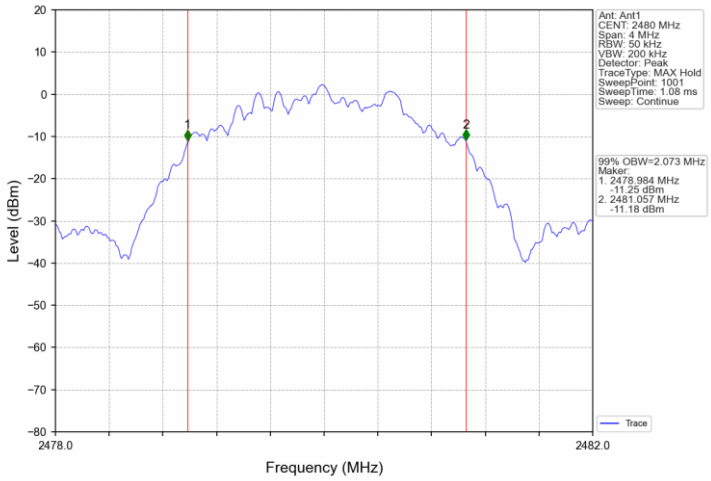

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9.5 Spurious RF Conducted Emissions

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting, the instrument center frequency is set to the nominal EUT channel center frequency enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
5. The level displayed must comply with the limit specified in this Section. Submit these plots.
6. Repeat above procedures until all frequencies measured were complete.

Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

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Spurious RF conducted emissions

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
LE 1Mbps	SISO	2402	1	6.61	-13.39	Pass
		2440	1	6.63	-13.37	Pass
		2480	1	5.57	-14.43	Pass
LE 2Mbps	SISO	2402	1	5.72	-14.28	Pass
		2440	1	5.79	-14.21	Pass
		2480	1	4.73	-15.27	Pass

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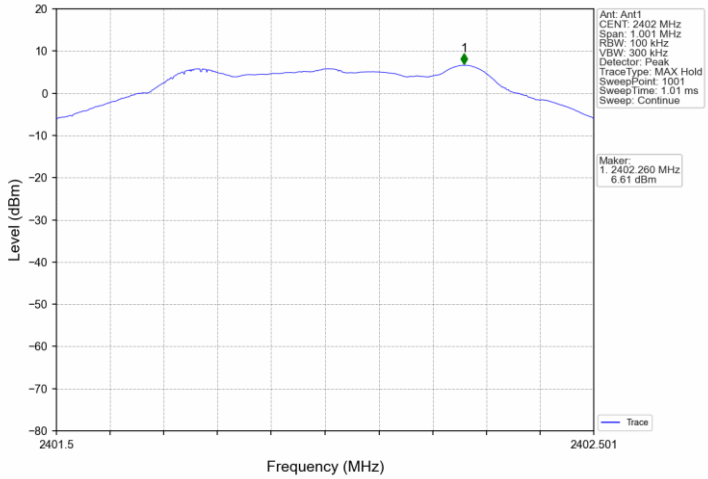
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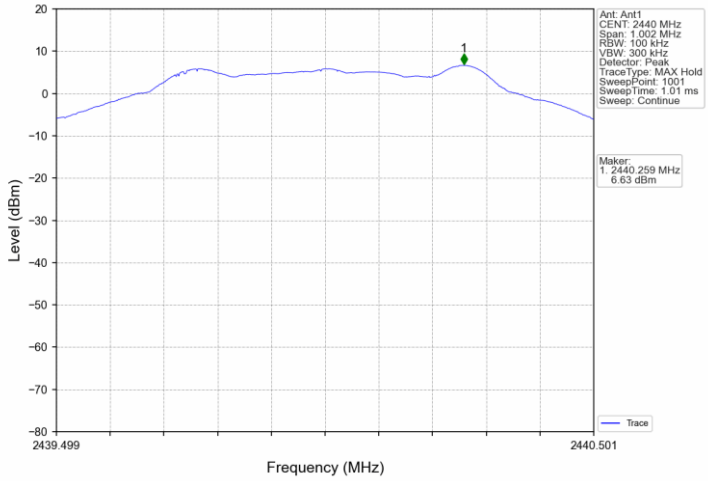
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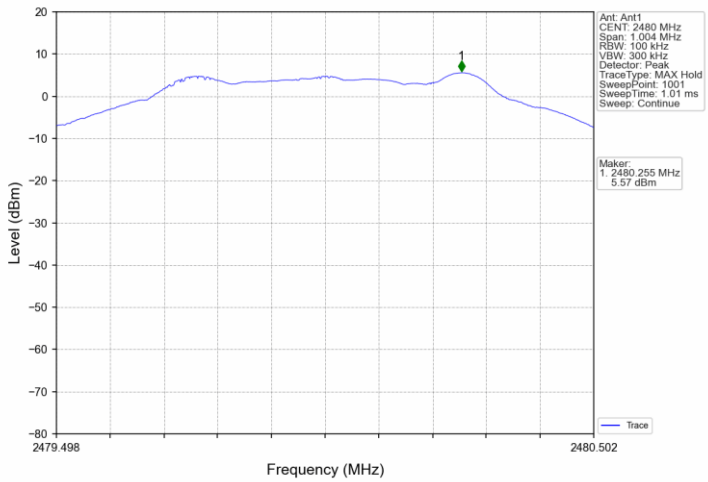

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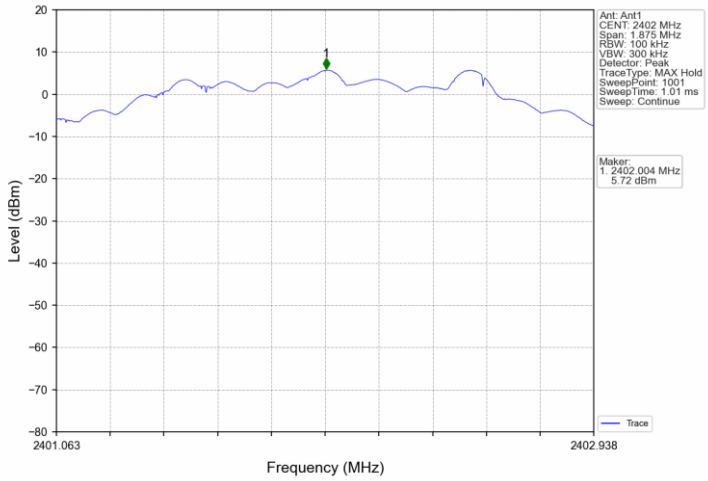
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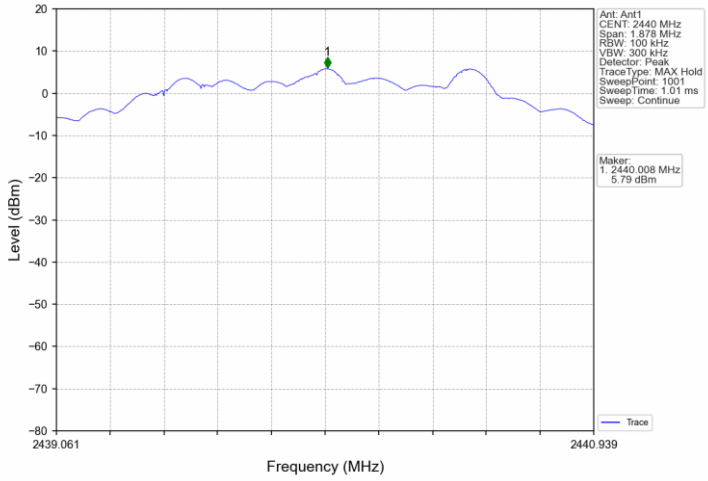
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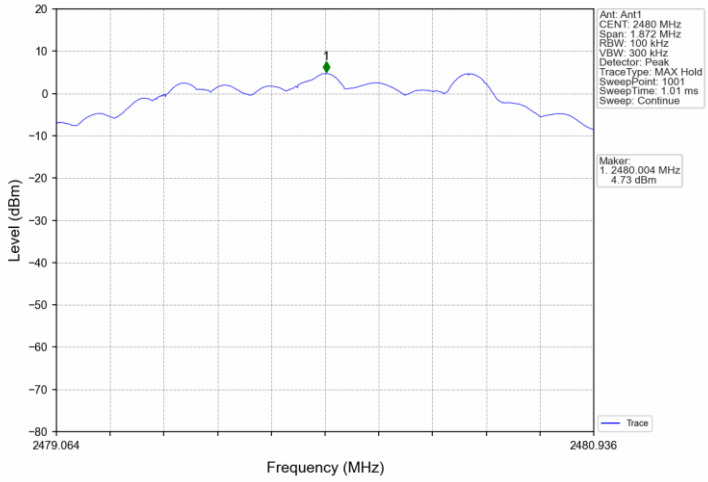

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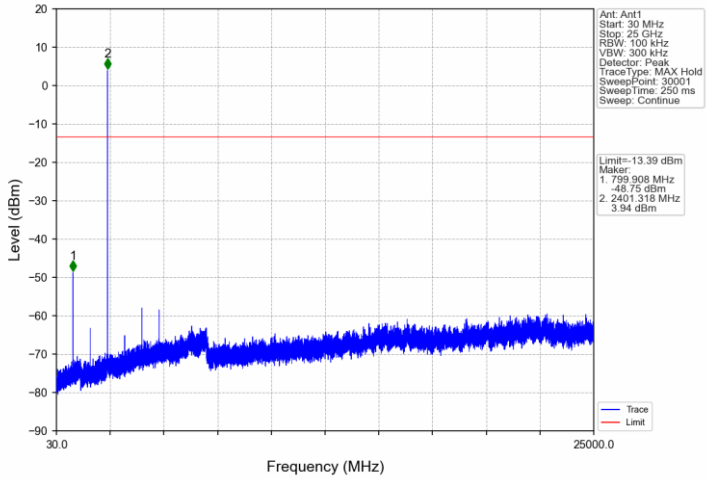
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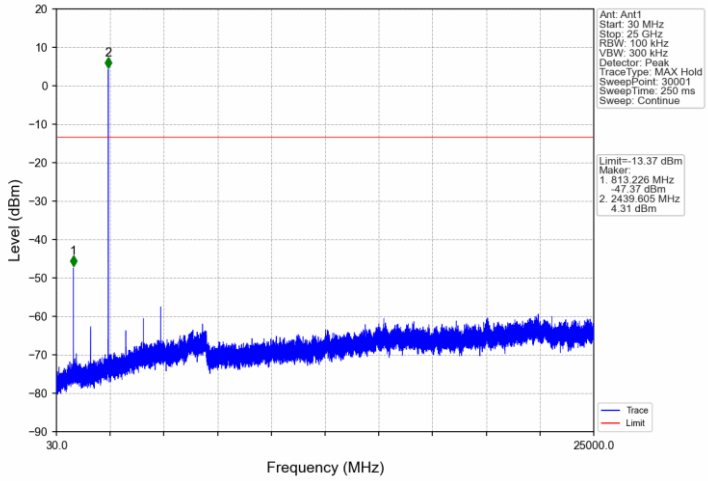
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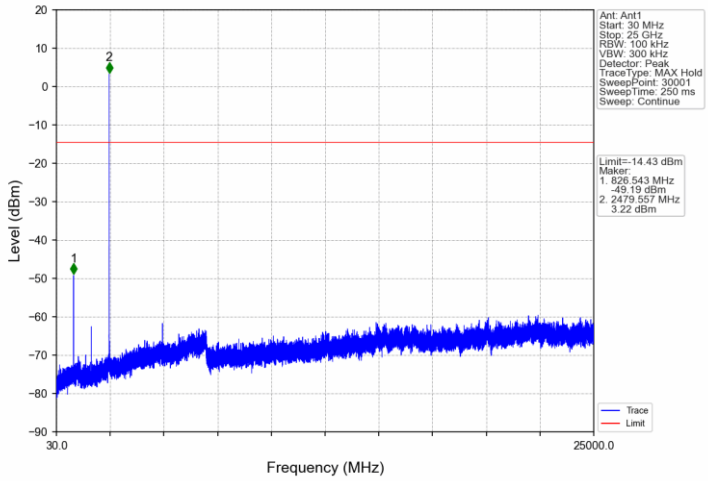

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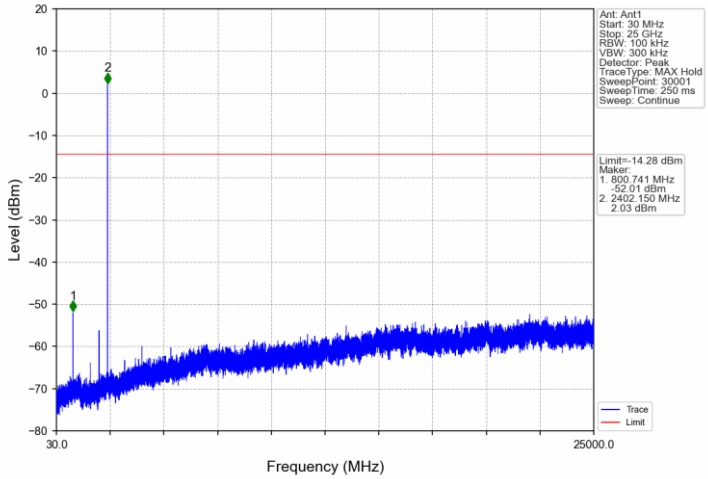
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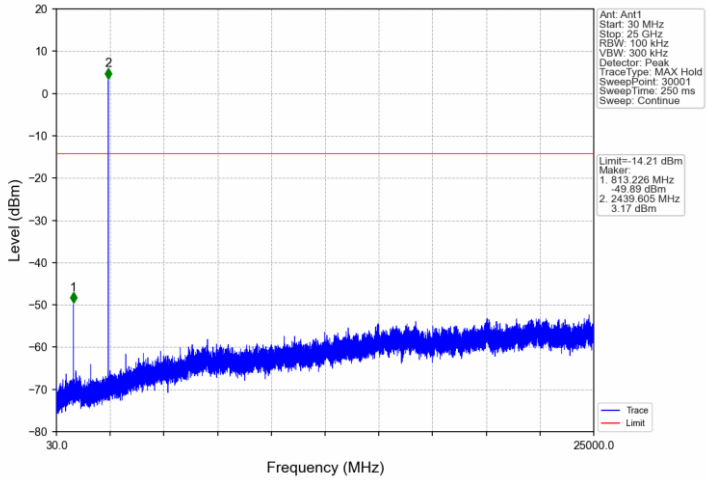
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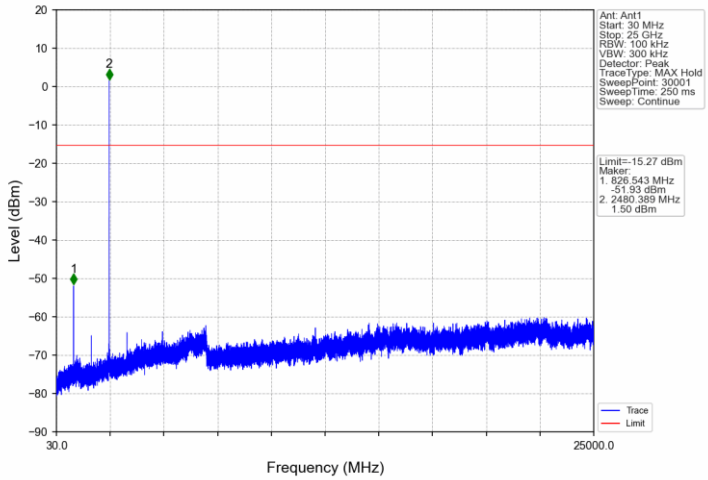

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9.6 Band Edge

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting, the instrument center frequency is set to the nominal EUT channel center frequency enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
5. The level displayed must comply with the limit specified in this Section. Submit these plots.
6. Repeat above procedures until all frequencies measured were complete.

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that 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 § 15.247(b)(3) and RSS-247 section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB.

Frequency Range MHz	Limit (dBc)
30-25000	-20

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Band edge testing

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
LE 1Mbps	SISO	2402	1	6.61	-13.39	Pass
		2440	1	6.63	-13.37	Pass
		2480	1	5.57	-14.43	Pass
LE 2Mbps	SISO	2402	1	5.72	-14.28	Pass
		2440	1	5.79	-14.21	Pass
		2480	1	4.73	-15.27	Pass

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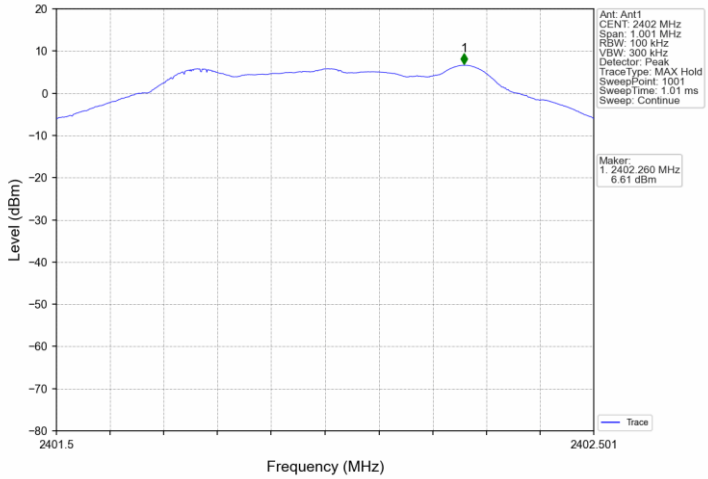
1M_LCH_2402MHz_Ant1_NTNV

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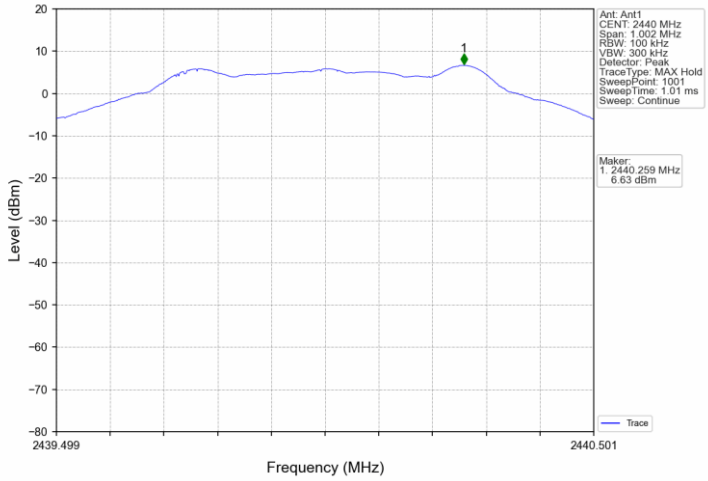
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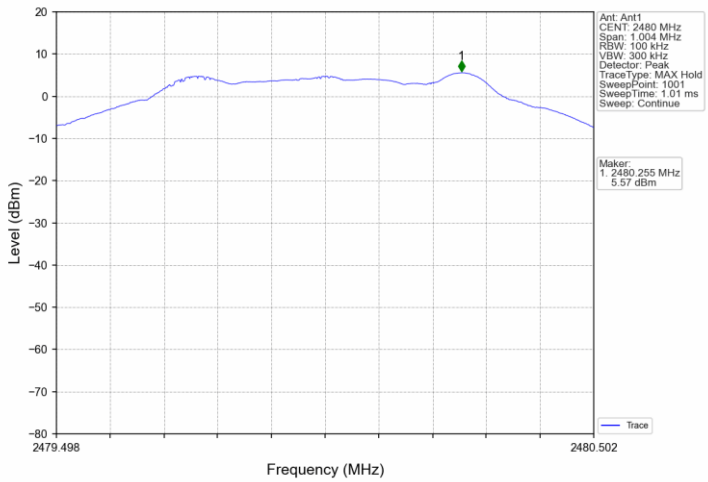

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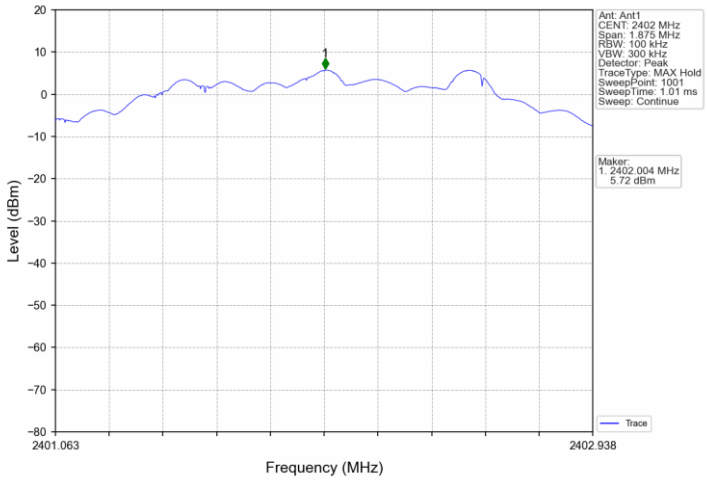
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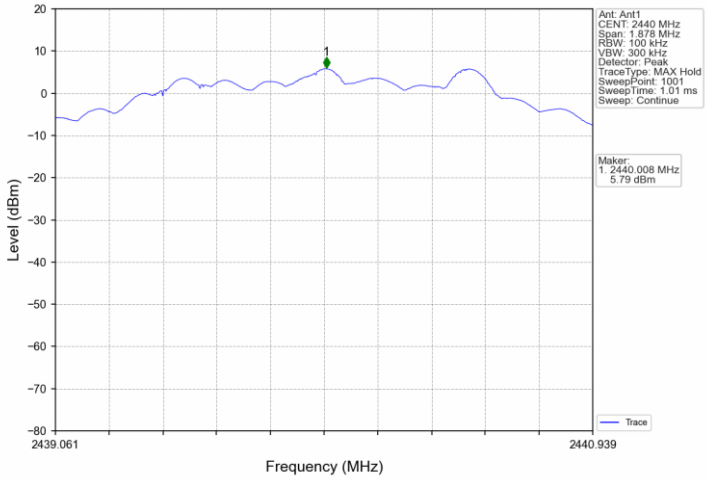
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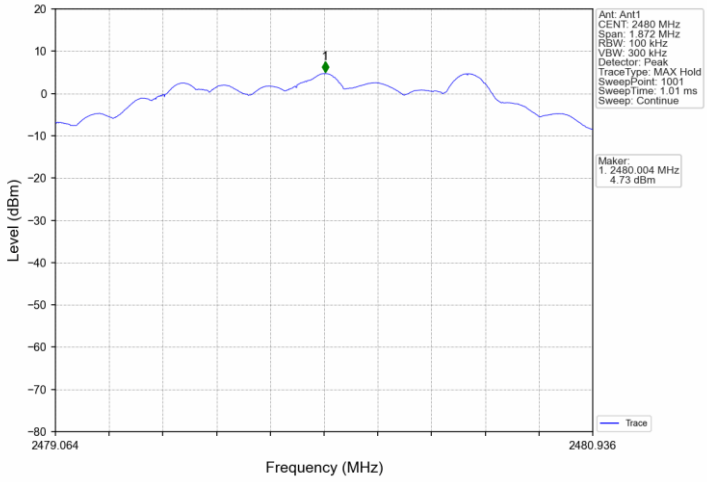

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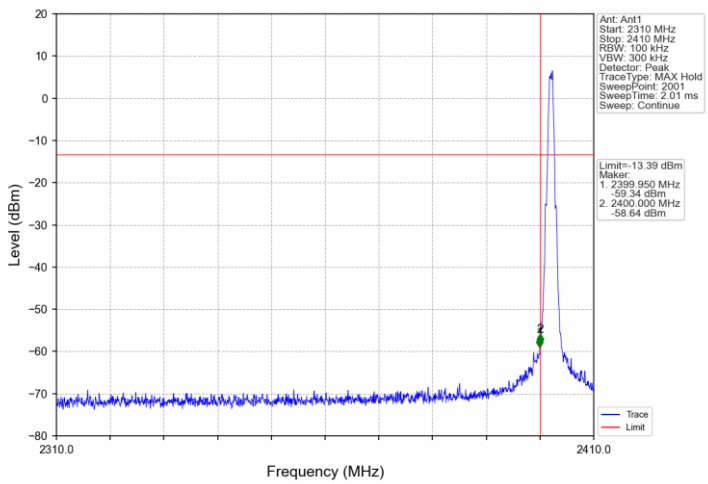
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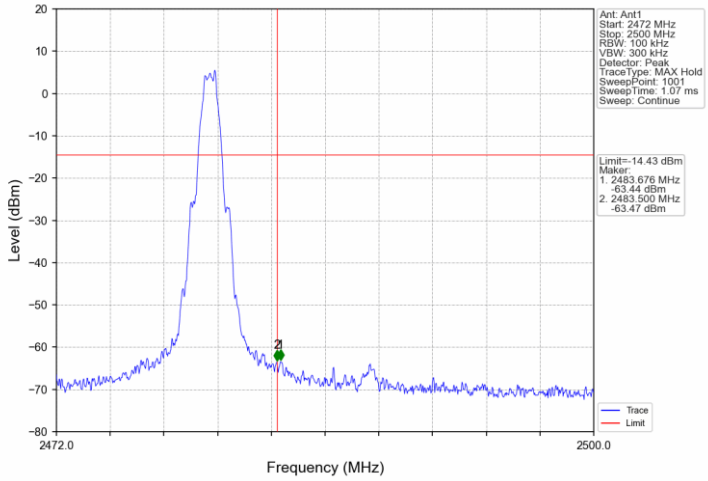

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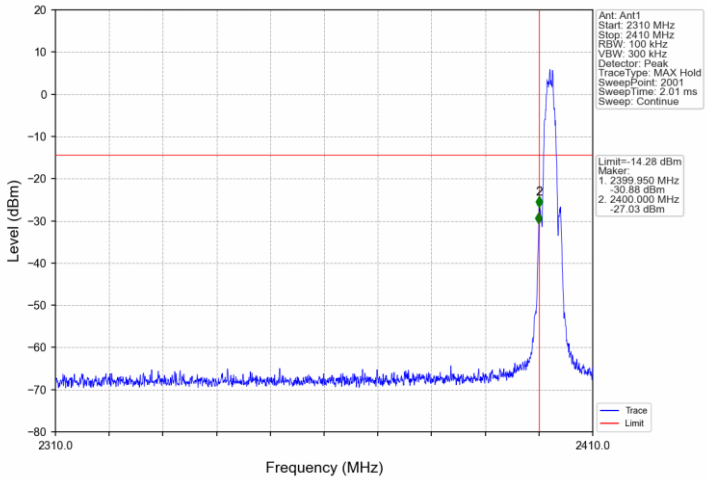
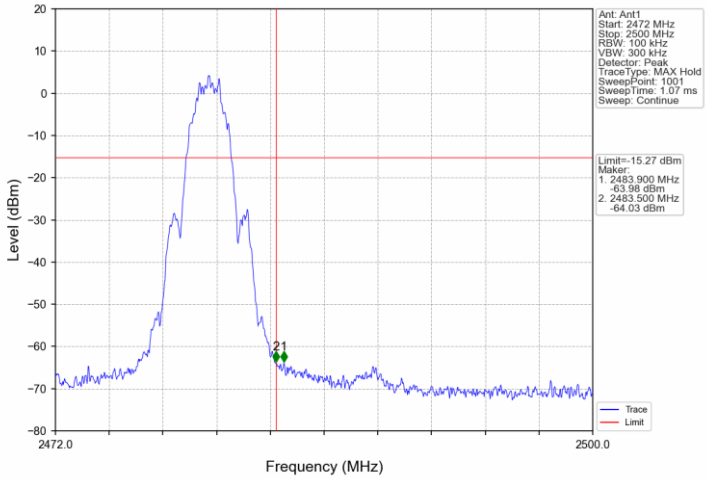
2M_LCH_2402MHz_Ant1_NTNV

2M_HCH_2480MHz_Ant1_NTNV


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9.7 Spurious Radiated Emissions for Transmitter

Test Method

1. The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
3. The height of antenna 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.
4. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. Use the following spectrum analyzer settings According to C63.10:

For Below 1GHz

Use the following test receiver settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious RBW = 100 KHz to 120KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

For Peak unwanted emissions Above 1GHz:

Span = wide enough to capture the peak level of the in-band emission and all spurious RBW = 1MHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Procedures for average unwanted emissions measurements above 1000 MHz

a) RBW = 1MHz.

b) VBW \ [3 × RBW].

c) Detector = RMS (power averaging), if [span / (# of points in sweep)] \ RBW / 2. Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.

d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)

e) Sweep time = auto.

f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)

g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is [10 log (1 / D)], where D is the duty cycle. For example, if the transmit duty

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cycle was 50%, then 3 dB shall be added to the measured emission levels.
2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is [20 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission (AV) at frequency above 1GHz.

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that 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 § 15.247(b)(3) and RSS 247 section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in § 15.209(a) and RSS-Gen is not required. In addition, radiated emissions which fall in the restricted bands, as defined in§ 15.205(a) and RSS-Gen scetion8.9, must also comply with the radiated emission limits specified in § 15.209(a) and RSS-Gen section 8.10.

Frequency MHz	Field Strength μV/m	Field Strength dBμV/m	Detector	Measurement distance meters
0.009-0.490	2400/F(kHz)	48.5-13.8	AV	300
0.490-1.705	24000/F(kHz)	33.8-23.0	QP	30
1.705-30	30	29.5	QP	30
30-88	100	40	QP	3
88-216	150	43.5	QP	3
216-960	200	46	QP	3
960-1000	500	54	QP	3
Above 1000	500	54	AV	3
Above 1000	5000	74	PK	3

Note 1: Limit 3m(dBμV/m)=Limit 300m(dBμV/m)+40Log(300m/3m) (Below 30MHz)
Note 2: Limit 3m(dBμV/m)=Limit 30m(dBμV/m)+40Log(30m/3m) (Below 30MHz)

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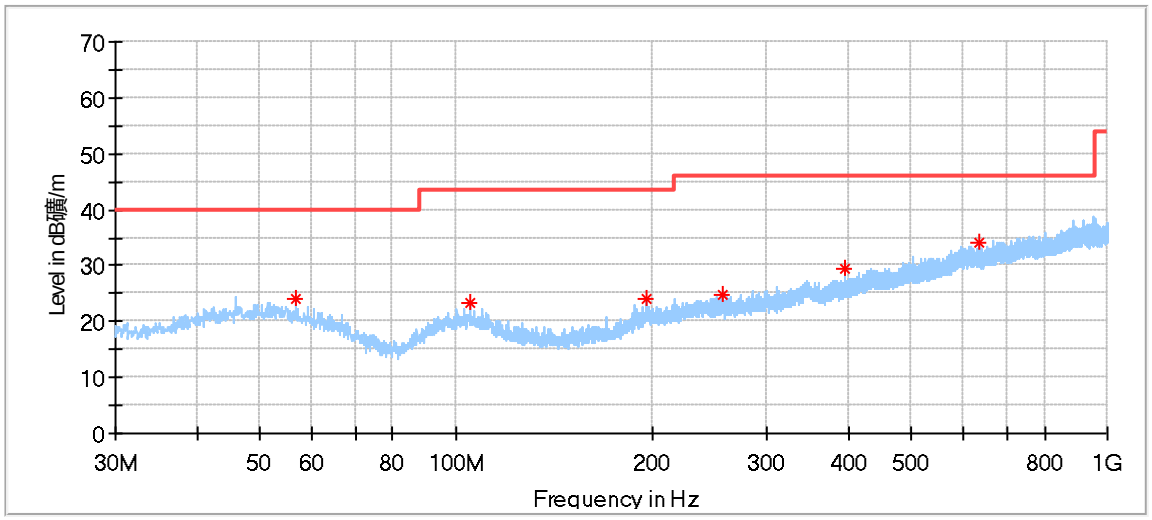
Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Transmitting spurious emission test result as below:

Test data_30MHz to 1000MHz



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
56.836667	24.15	40.00	15.85	200.0	H	228.0	17.44
105.067222	23.21	43.50	20.29	200.0	H	202.0	16.23
196.139444	23.93	43.50	19.57	100.0	H	321.0	16.54
256.117778	24.80	46.00	21.20	200.0	H	0.0	17.68
394.504444	29.48	46.00	16.52	100.0	H	212.0	20.97
636.411667	33.98	46.00	12.02	200.0	H	80.0	25.38

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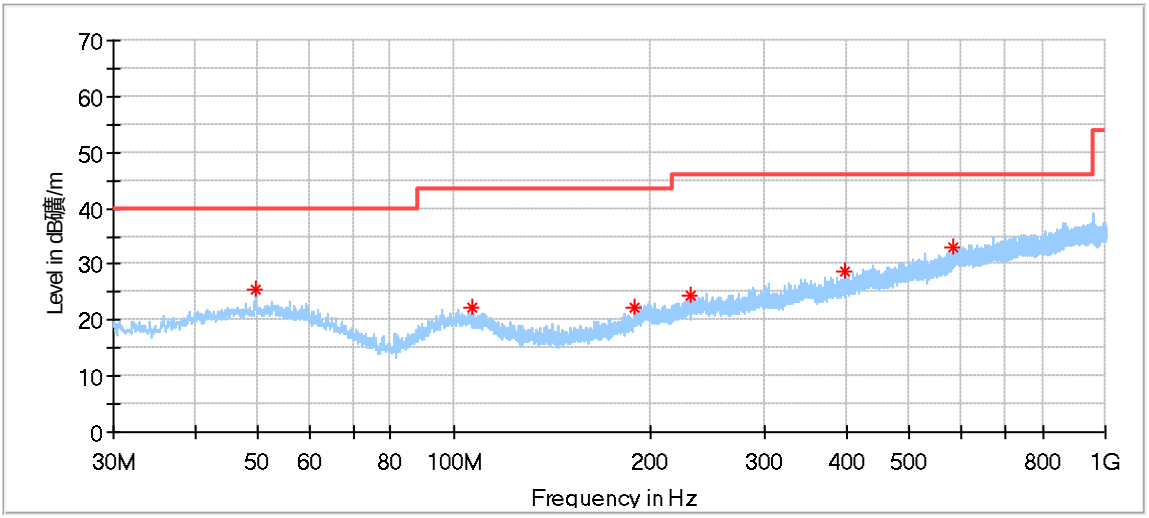
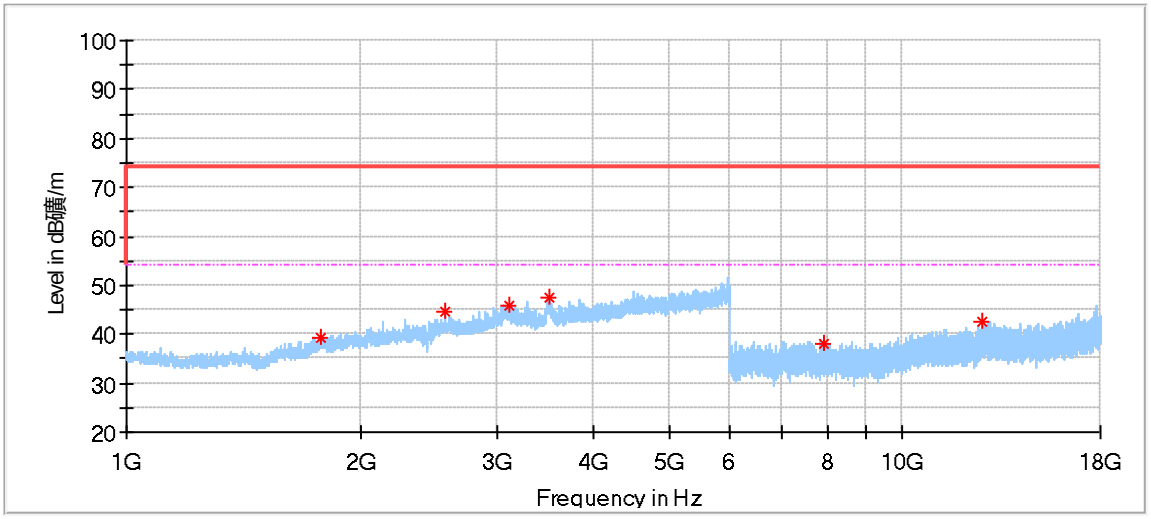
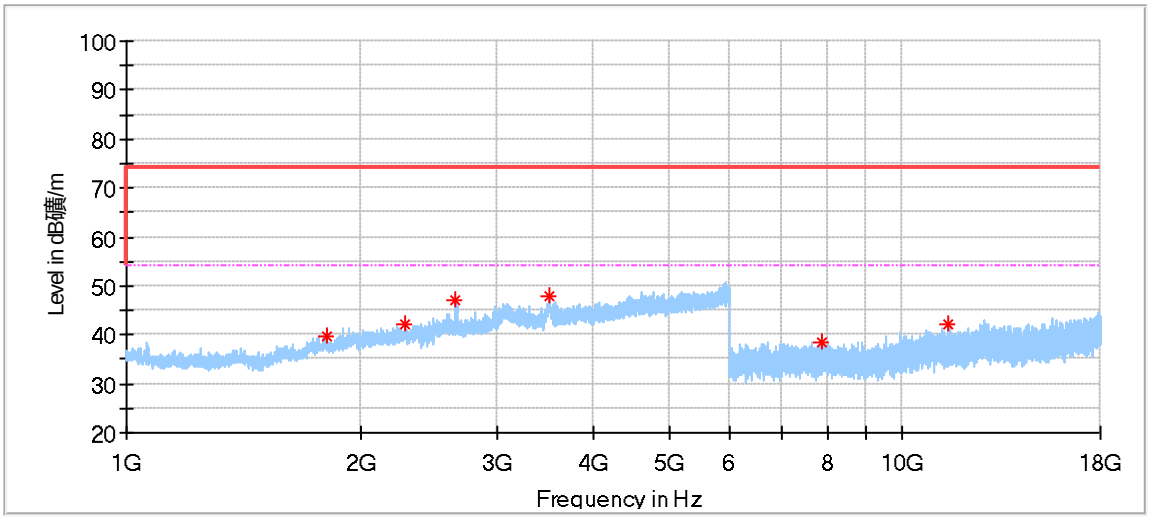


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.723333	25.38	40.00	14.62	200.0	V	241.0	18.04
106.414444	22.14	43.50	21.36	200.0	V	4.0	16.15
189.241667	22.08	43.50	21.42	200.0	V	0.0	15.31
231.005556	24.47	46.00	21.53	200.0	V	90.0	16.95
396.929444	28.72	46.00	17.28	200.0	V	341.0	21.04
582.846111	33.09	46.00	12.91	200.0	V	73.0	24.59

Test data 1GHz to 18GHz:
BLE_1Mbps_Low Channel:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1780.500000	39.48	74.00	34.52	150.0	H	321.0	-5.60
2572.000000	44.49	74.00	29.51	150.0	H	3.0	-1.47
3107.500000	46.02	74.00	27.98	150.0	H	185.0	1.41
3516.500000	47.52	74.00	26.48	150.0	H	226.0	2.82
7899.500000	38.18	74.00	35.82	150.0	H	251.0	6.38
12695.500000	42.75	74.00	31.25	150.0	H	251.0	11.60



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1810.500000	39.60	74.00	34.40	150.0	V	321.0	-5.34
2290.000000	42.04	74.00	31.96	150.0	V	8.0	-3.57
2658.000000	46.95	74.00	27.05	150.0	V	144.0	-1.83
3501.500000	47.93	74.00	26.07	150.0	V	347.0	3.68
7892.500000	38.37	74.00	35.63	150.0	V	60.0	6.38
11443.000000	42.28	74.00	31.72	150.0	V	302.0	10.46

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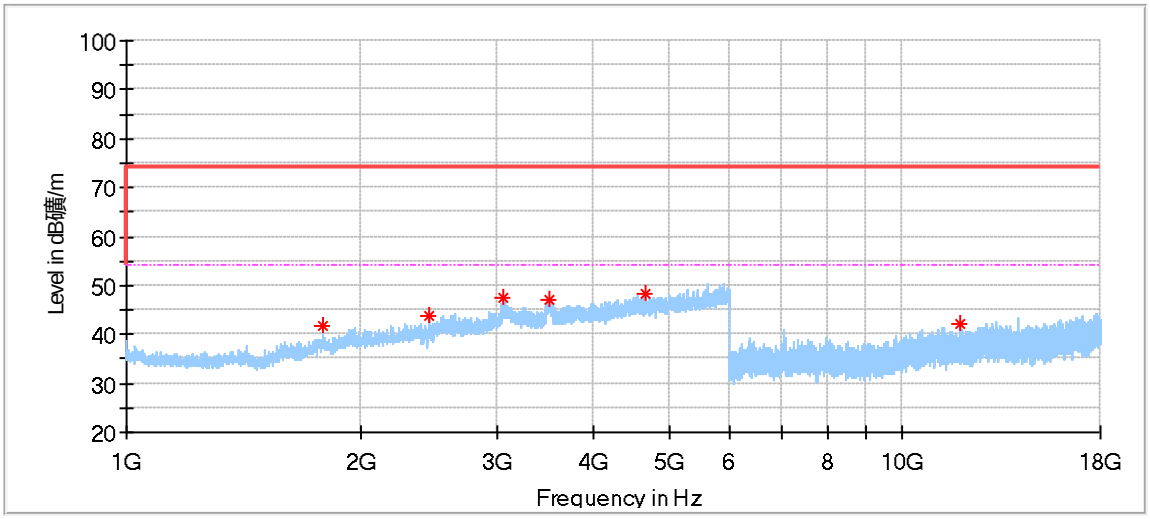
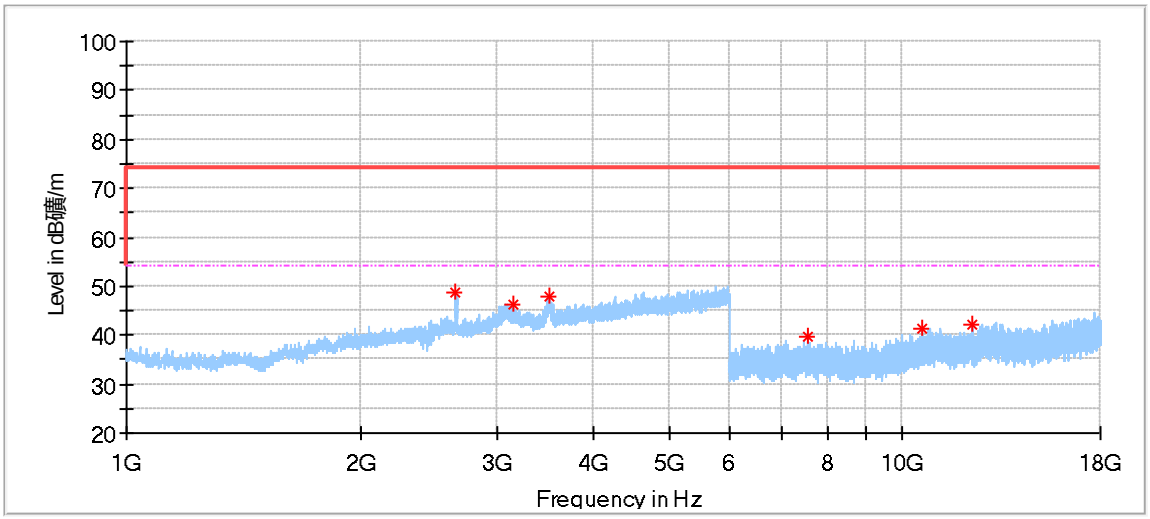
BLE_1Mbps _Middle Channel:

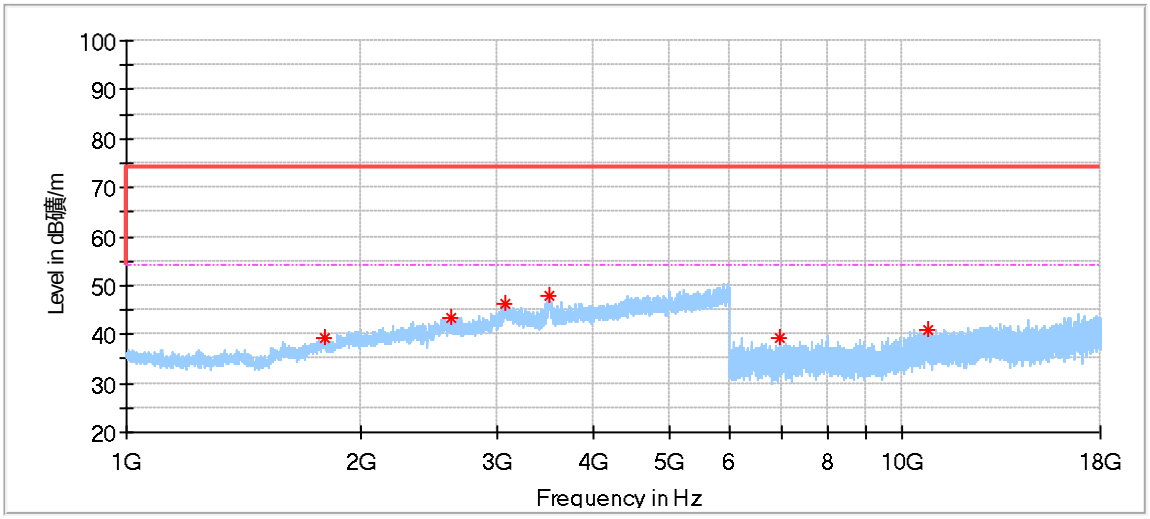


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1791.000000	41.55	74.00	32.45	150.0	H	212.0	-5.41
2456.500000	43.81	74.00	30.19	150.0	H	198.0	-2.10
3066.500000	47.30	74.00	26.70	150.0	H	308.0	1.35
3500.000000	47.01	74.00	26.99	150.0	H	45.0	3.76
4652.500000	48.39	74.00	25.61	150.0	H	253.0	3.76
11838.500000	42.12	74.00	31.88	150.0	H	114.0	10.70

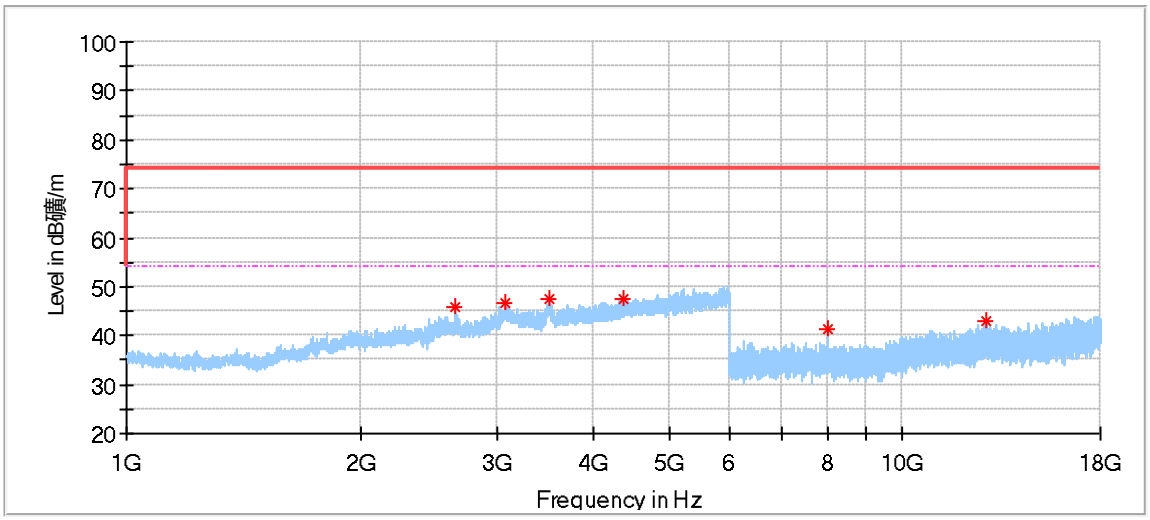


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2659.000000	48.90	74.00	25.10	150.0	V	140.0	-1.83
3149.500000	46.33	74.00	27.67	150.0	V	18.0	0.67
3497.500000	47.83	74.00	26.17	150.0	V	99.0	3.58
7562.500000	39.61	74.00	34.39	150.0	V	60.0	6.14
10584.500000	41.45	74.00	32.55	150.0	V	221.0	9.31
12302.500000	42.22	74.00	31.78	150.0	V	60.0	11.06

BLE_1Mbps _High Channel:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1804.500000	39.38	74.00	34.62	150.0	H	0.0	-5.29
2627.000000	43.48	74.00	30.52	150.0	H	48.0	-1.47
3078.000000	46.36	74.00	27.64	150.0	H	356.0	1.35
3516.000000	47.83	74.00	26.17	150.0	H	0.0	2.85
6953.000000	39.12	74.00	34.88	150.0	H	88.0	5.66
10804.500000	40.91	74.00	33.09	150.0	H	226.0	9.73



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2655.000000	45.99	74.00	28.01	150.0	V	140.0	-1.81
3073.000000	46.87	74.00	27.13	150.0	V	18.0	1.35
3503.000000	47.43	74.00	26.57	150.0	V	72.0	3.60
4362.500000	47.38	74.00	26.62	150.0	V	181.0	2.75
8005.000000	41.16	74.00	32.84	150.0	V	30.0	6.72
12831.000000	42.98	74.00	31.02	150.0	V	58.0	11.76

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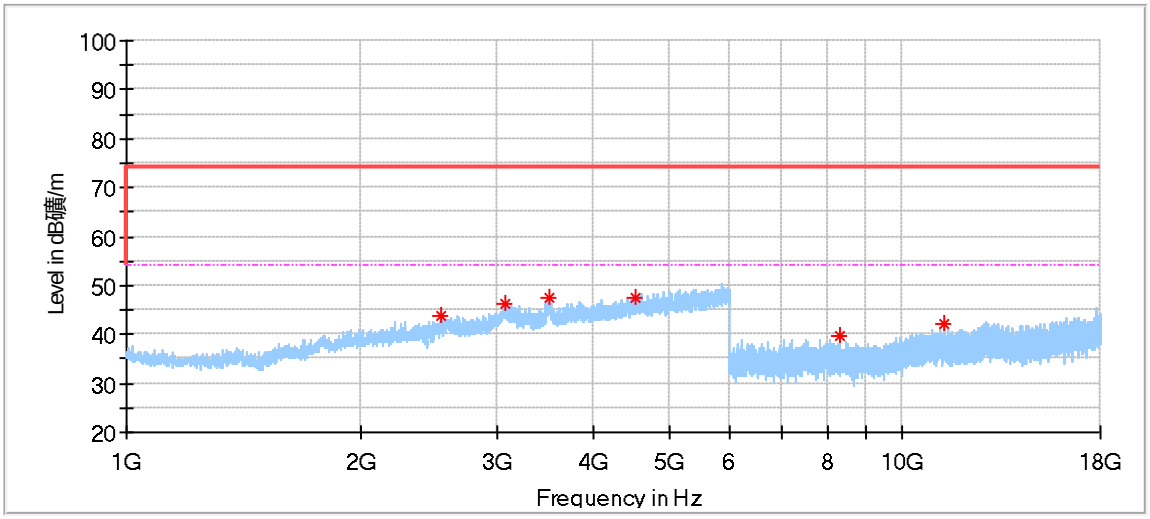
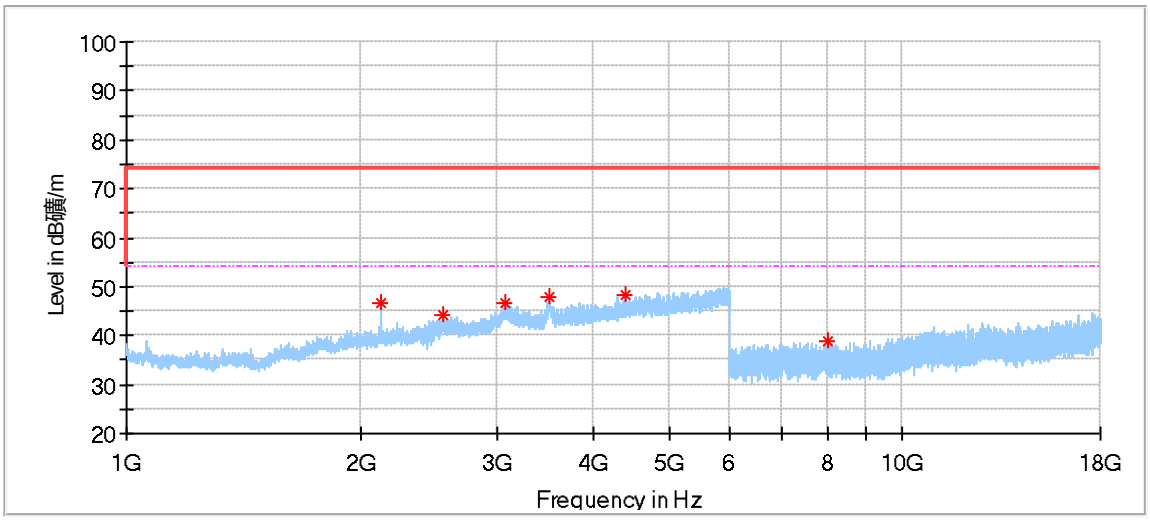
BLE_2Mbps_Low Channel:

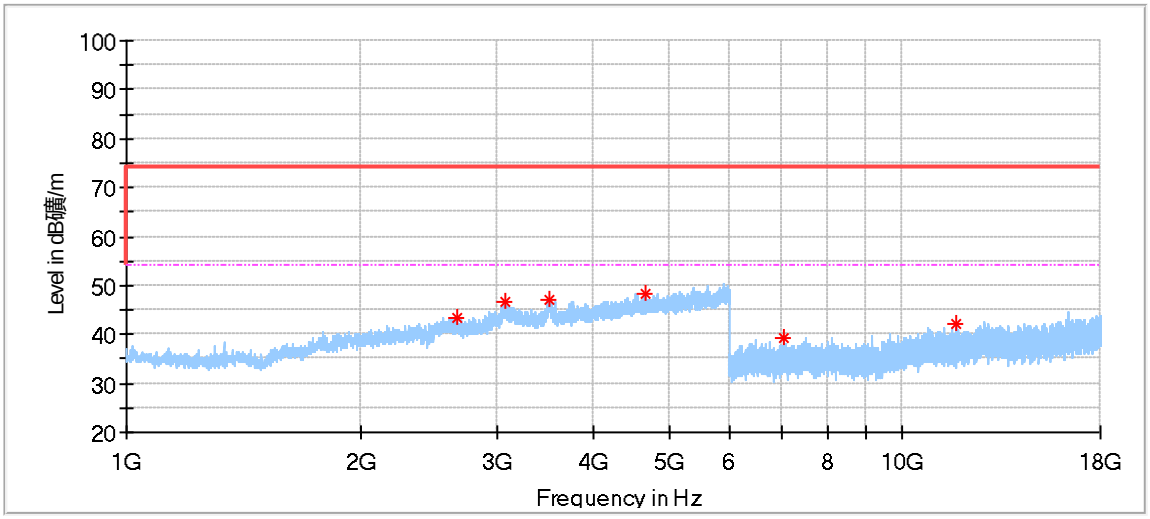


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2539.000000	43.70	74.00	30.30	150.0	H	280.0	-1.73
3076.000000	46.07	74.00	27.93	150.0	H	280.0	1.35
3499.000000	47.49	74.00	26.51	150.0	H	185.0	3.69
4522.500000	47.67	74.00	26.33	150.0	H	308.0	3.42
8329.500000	39.60	74.00	34.40	150.0	H	277.0	6.60
11343.000000	41.96	74.00	32.04	150.0	H	89.0	10.45

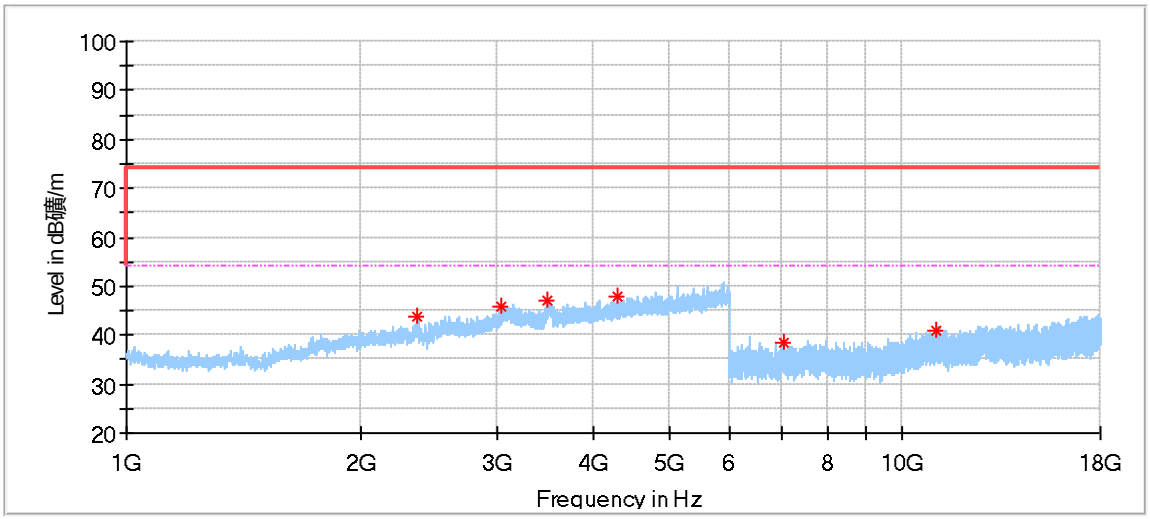


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2123.500000	46.67	74.00	27.33	150.0	V	21.0	-4.23
2563.500000	44.02	74.00	29.98	150.0	V	0.0	-1.53
3068.500000	46.78	74.00	27.22	150.0	V	21.0	1.35
3502.500000	47.85	74.00	26.15	150.0	V	294.0	3.63
4406.500000	48.12	74.00	25.88	150.0	V	130.0	3.02
8033.500000	38.93	74.00	35.07	150.0	V	328.0	6.66

BLE_2Mbps_Middle Channel:

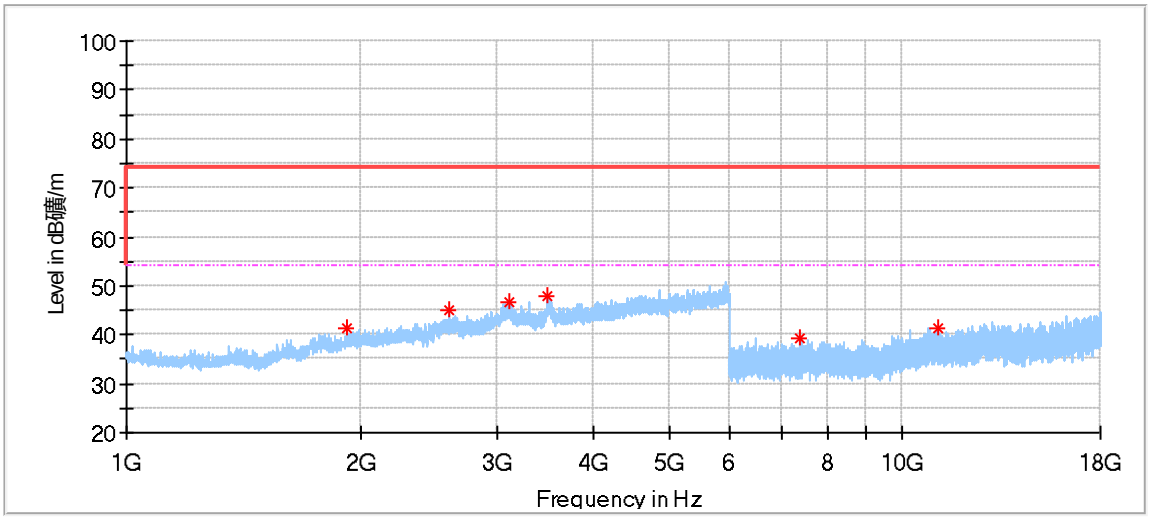


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2670.500000	43.51	74.00	30.49	150.0	H	33.0	-1.90
3072.500000	46.82	74.00	27.18	150.0	H	268.0	1.35
3501.500000	47.08	74.00	26.92	150.0	H	200.0	3.68
4675.000000	48.48	74.00	25.52	150.0	H	309.0	3.75
7018.000000	39.31	74.00	34.69	150.0	H	326.0	5.63
11725.500000	42.34	74.00	31.66	150.0	H	114.0	10.56

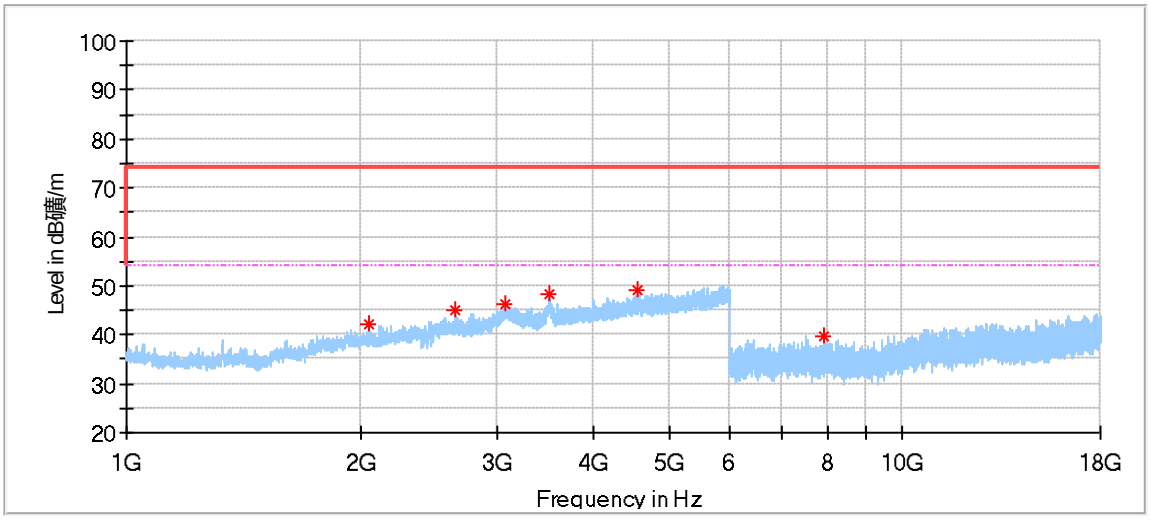


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2375.500000	43.77	74.00	30.23	150.0	V	84.0	-2.94
3043.000000	45.96	74.00	28.04	150.0	V	57.0	1.13
3491.000000	46.98	74.00	27.02	150.0	V	7.0	3.11
4301.500000	48.03	74.00	25.97	150.0	V	296.0	2.45
7014.500000	38.56	74.00	35.44	150.0	V	170.0	5.62
11060.500000	40.89	74.00	33.11	150.0	V	223.0	10.18

BLE_2Mbps_High Channel:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1921.000000	41.26	74.00	32.74	150.0	H	144.0	-4.99
2609.500000	44.84	74.00	29.16	150.0	H	21.0	-1.38
3118.500000	46.67	74.00	27.33	150.0	H	21.0	1.21
3492.500000	47.93	74.00	26.07	150.0	H	130.0	3.22
7363.500000	39.10	74.00	34.90	150.0	H	334.0	5.89
11094.000000	41.37	74.00	32.63	150.0	H	114.0	10.30



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2059.000000	42.08	74.00	31.92	150.0	V	267.0	-4.46
2659.000000	44.83	74.00	29.17	150.0	V	226.0	-1.83
3080.500000	46.12	74.00	27.88	150.0	V	280.0	1.36
3505.500000	48.12	74.00	25.88	150.0	V	10.0	3.46
4567.500000	49.05	74.00	24.95	150.0	V	157.0	3.67
7926.500000	39.78	74.00	34.22	150.0	V	331.0	6.40

Remark:

(1) The emission(s) appear within the restrict bands shall follow the requirement of section 15.205 & RSS-GEN 8.10.

(2) Data of measurement within frequency range 9kHz-30MHz, 18-26GHz are the noise floor or attenuated more than 20dB below the permissible limits or the field strength is too small to be measured, so test data does not present in this report.

(3) Level= Reading Level + Correction Factor
(4) Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

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10 Test Equipment List

List of Test Instruments

Conducted Emission 2# Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	68-4-74-19-002	102590	1	2024-5-19
LISN	Rohde & Schwarz	ENV216	68-4-87-19-001	102472	1	2024-5-20
Attenuator	Shanghai Huaxiang	TS2-26-3	68-4-81-16-003	080928189	1	2024-5-19
Test software	Rohde & Schwarz	EMC32	68-4-90-19-005-A01	Version10.35.02	N/A	N/A
Shielding Room	TDK	CSR #2	68-4-90-19-005	----	3	2025-10-15

Radiated Emission 1# Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 7	68-4-74-19-001	102176	1	2024-5-20
Loop Antenna	Rohde & Schwarz	HFH2-Z2	68-4-80-14-006	100398	1	2024-8-17
3m Semi-anechoic chamber	TDK	SAC-3 #1	68-4-90-14-001	----	3	2024-5-28
Test software	Rohde & Schwarz	EMC32	68-4-90-14-001-A10	Version10.35.02	N/A	N/A

Radiated Emission 2# Test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	68-4-74-14-002	101269	1	2024-5-20
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9162	68-4-80-19-003	284	1	2025-2-22
Wave Guide Antenna	ETS	3117	68-4-80-19-001	00218954	1	2025-4-10
Pre-amplifier	Rohde & Schwarz	SCU 18F	68-4-29-19-001	100745	1	2024-5-19
Pre-amplifier	Rohde & Schwarz	SCU 18F	68-4-29-19-002	100746	1	2024-5-19
Sideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG	68-4-80-14-008	12827	1	2024-7-11
Pre-amplifier	Rohde & Schwarz	SCU 40A	68-4-29-14-002	100432	1	2024-8-1
Attenuator	Mini-circuits	UNAT-6+	68-4-81-21-002	15542	1	2024-5-19
3m Semi-anechoic chamber	TDK	SAC-3 #2	68-4-90-19-006	----	2	2024-5-28
Test software	Rohde & Schwarz	EMC32	68-4-90-19-006-A01	Version10.35.02	N/A	N/A

RF conducted test

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	68-4-74-14-004	101030	1	2024-5-19
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157W	68-4-93-14-003	101226/100929	1	2024-5-20
Test software	Tonscend	System for BT/Wi-Fi	68-4-74-14-006-A13	Version 2.6.77.0518	N/A	N/A
Shielding Room	TDK	TS8997	68-4-90-19-003	----	3	2025-10-15

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11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Conducted Emission in new shielding room (68-4-90-19-005) 150kHz-30MHz (for test using AMN ENV216)	3.15dB
Uncertainty for Radiated Emission in 3m chamber (68-4-90-14-001) 9kHz-30MHz	4.70dB
Uncertainty for Radiated Emission in 3m chamber (68-4-90-14-001) 30MHz-1000MHz	Horizontal: 4.63dB; Vertical: 4.78dB;
Uncertainty for Radiated Emission in new 3m chamber (68-4-90-19-006) 1000MHz-18000MHz	Horizontal: 5.38dB; Vertical: 5.38dB;
Uncertainty for Radiated Emission in new 3m chamber (68-4-90-19-006) 18GHz-40GHz	Horizontal: 5.29dB; Vertical: 5.29dB;
Uncertainty for Conducted RF test with TS 8997	RF Power Conducted: 1.31dB Frequency test involved: 0.6×10^{-8} or 1%

Measurement Uncertainty Decision Rule:
Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2021, clause 4.4.3 and 4.5.1.

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