FCC/ISED - TEST REPORT

Report Number	:	**68.950.23.0679.01**	Date of Issue:	**2023-09-05**
Model/HVIN	:	**NCBG1**		
Product Type	:	NC° Band		
Applicant	:	Xiamen Intretech Inc.		
Address	:	No. 100, Dongfu West Road, Haicang District, Xiamen, China PEOPLE'S REPUBLIC OF CHINA		
Manufacturer	:	Xiamen Intretech Inc.		
Address	:	No. 100, Dongfu West Road, Haicang District, Xiamen, China		
Test Result	:	■ **Positive** ☐ **Negative**		
Total pages including Appendices	:	**54**		

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production. For further details, please see testing and certification regulation, chapter A-3.4.

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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, Guangdong, China
Telephone:	86 755 8828 6998
Fax:	86 755 8828 5299
FCC Registration No.:	514049
FCC Designation Number:	CN5009
IC Registration No.:	10320A

3 Description of the Equipment Under Test

Product:	NC° Band
Model no.:	NCBG1
Hardware Version Identification No. (HVIN)	NCBG1
Product Marketing Name (PMN)	NCBG1
FCC ID:	S960000B1
IC:	22175-0B1
Options and accessories:	N/A
Rating:	5VDC charging by adaptor
Battery information:	3.7Vdc, 42mAh supplied by built Li-ion battery
RF Transmission Frequency:	2402MHz-2480MHz
No. of Operated Channel:	40
Modulation:	GFSK
Antenna Type:	Internal antenna
Antenna	Gain: 1.5dBi
Description of the EUT:	The Equipment Under Test (EUT) is a NC° Band which support Bluetooth Low Energy function

NOTE 1: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2021 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators
RSS-Gen Issue 5, Amendment 2, February 2021	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 2 February 2017	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 (2013).

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5 Summary of Test Results

Technical Requirements			
FCC Part 15 Subpart C/ RSS-247 Issue 2/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)	Conducted peak output power	Site 1	Pass
RSS-247 5.4(b)	Equivalent Isotropic Radiated Power	Site 1	Pass
§15.247(e) & RSS-247 5.2(b)	Power spectral density	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(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 & 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 antenna, which gain is 1.5dBi. 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: S960000B1, IC: 22175-0B1, complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C rules and RSS-247, RSS-GEN.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment under Test

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

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

Sample Received Date:	2023-07-13
Testing Start Date:	2023-07-13
Testing End Date:	2023-07-24

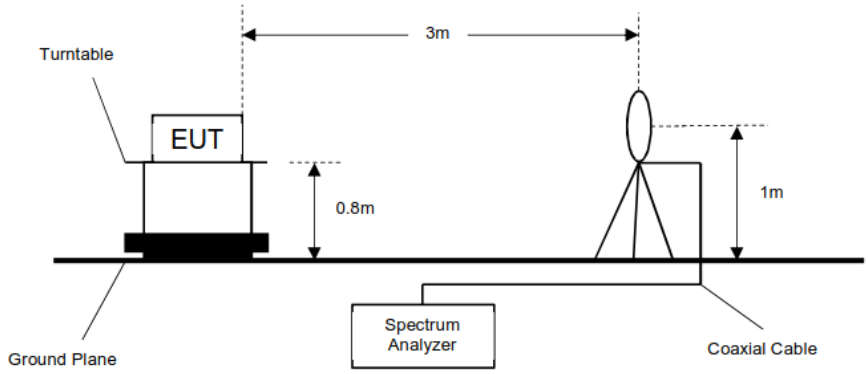
- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch -

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

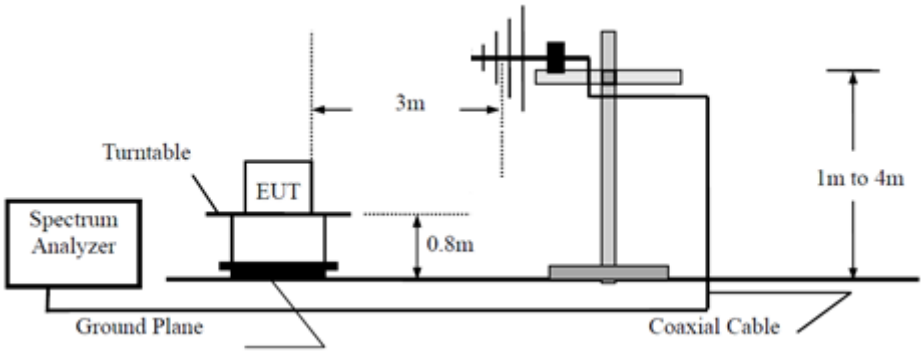
7 Test Setups

7.1 Radiated test setups

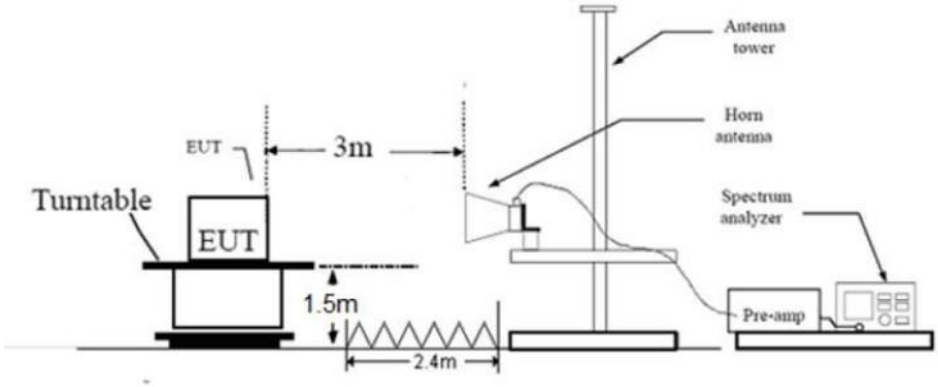
9KHz - 30MHz



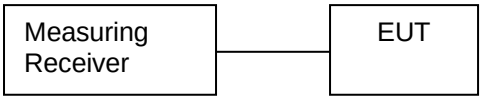
30MHz - 1GHz



Above 1GHz



7.2 Conducted RF test setups



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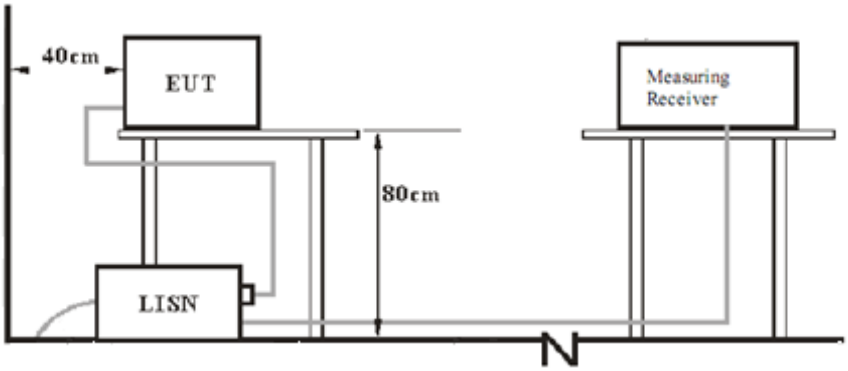
7.3 AC Power Line Conducted Emission test setups



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8 Systems Test Configuration

Auxiliary Equipment Used during Test:

Equipment	Brand	Model/Type No.	Series No.
Type-C cable	---	---	---
Adaptor	Apple	A1357	---
iPhone	Apple	iPhone 6	---

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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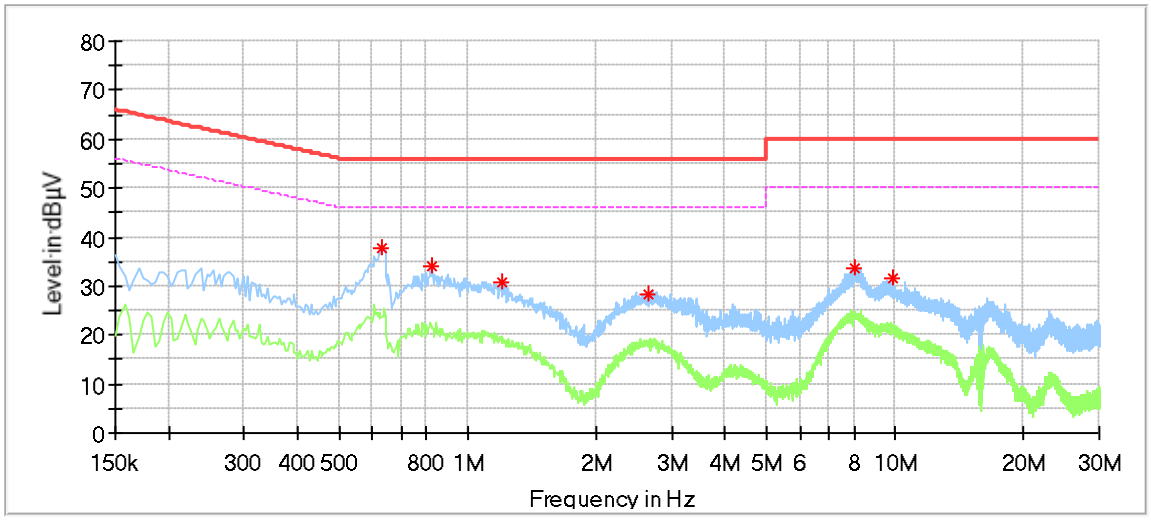
Conducted Emission

Product Type : NC° Band
M/N : NCBG1
Operating Condition : Transmit
Test Specification : Line
Comment : AC 120V/60Hz (External adapter)



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.630000	37.59	---	56.00	18.41	L1	9.63
0.826000	34.08	---	56.00	21.92	L1	9.64
1.202000	30.90	---	56.00	25.10	L1	9.64
2.634000	28.20	---	56.00	27.80	L1	9.68
8.078000	33.83	---	60.00	26.17	L1	9.89
9.854000	31.65	---	60.00	28.35	L1	9.92

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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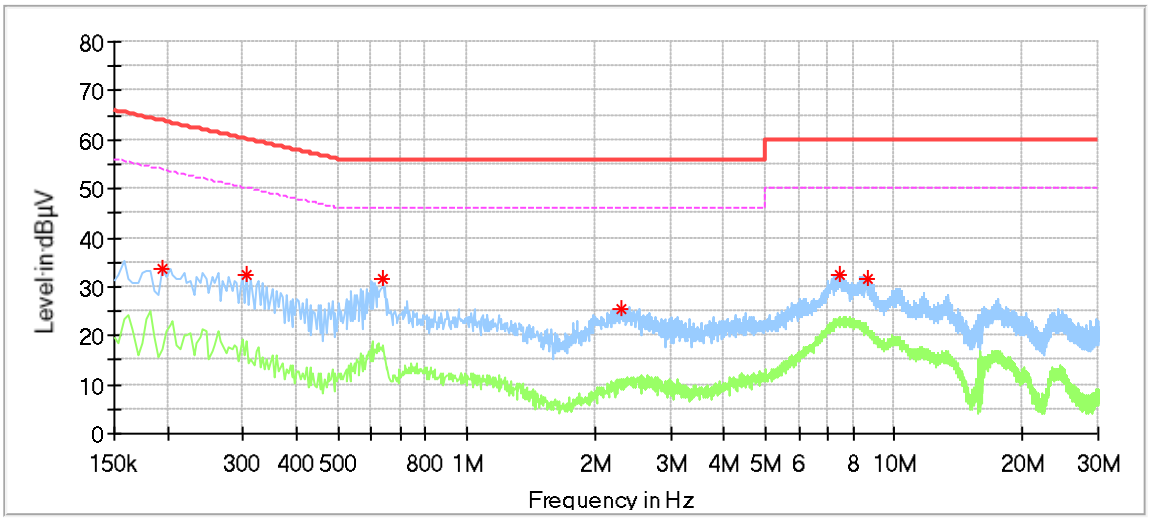
Conducted Emission

Product Type : NC° Band
M/N : NCBG1
Operating Condition : Transmit
Test Specification : Neutral
Comment : AC 120V/60Hz (External adapter)



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.194000	33.53	---	63.86	30.33	N	9.58
0.306000	32.37	---	60.08	27.71	N	9.61
0.638000	31.45	---	56.00	24.55	N	9.64
2.290000	25.30	---	56.00	30.70	N	9.67
7.470000	32.50	---	60.00	27.50	N	9.86
8.654000	31.64	---	60.00	28.36	N	9.89

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 Peak Output Power & EIRP

Test Method

1. The RF output of EUT was connected to the test receiver 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 hopping channel
   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 peak 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 Peak Output Power & EIRP

Frequency MHz	Mode	Conducted Peak Output Power dBm	Antenna Gain dBi	EIRP dBm	Result
Bottom channel 2402MHz	LE 1Mbps	-0.85	1.5	0.65	Pass
Middle channel 2440MHz	LE 1Mbps	-1.13	1.5	0.37	Pass
Top channel 2480MHz	LE 1Mbps	-1.42	1.5	0.08	Pass
Bottom channel 2402MHz	LE 2Mbps	-0.93	1.5	0.57	Pass
Middle channel 2440MHz	LE 2Mbps	-1.2	1.5	0.30	Pass
Top channel 2480MHz	LE 2Mbps	-1.52	1.5	-0.02	Pass

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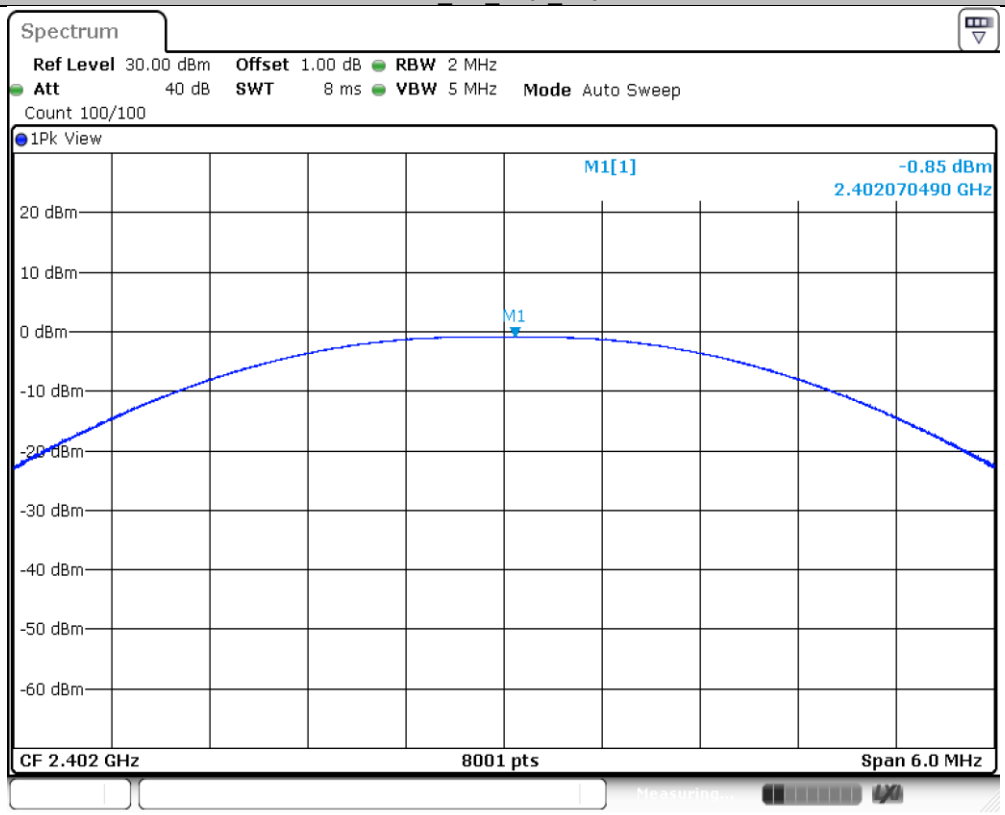

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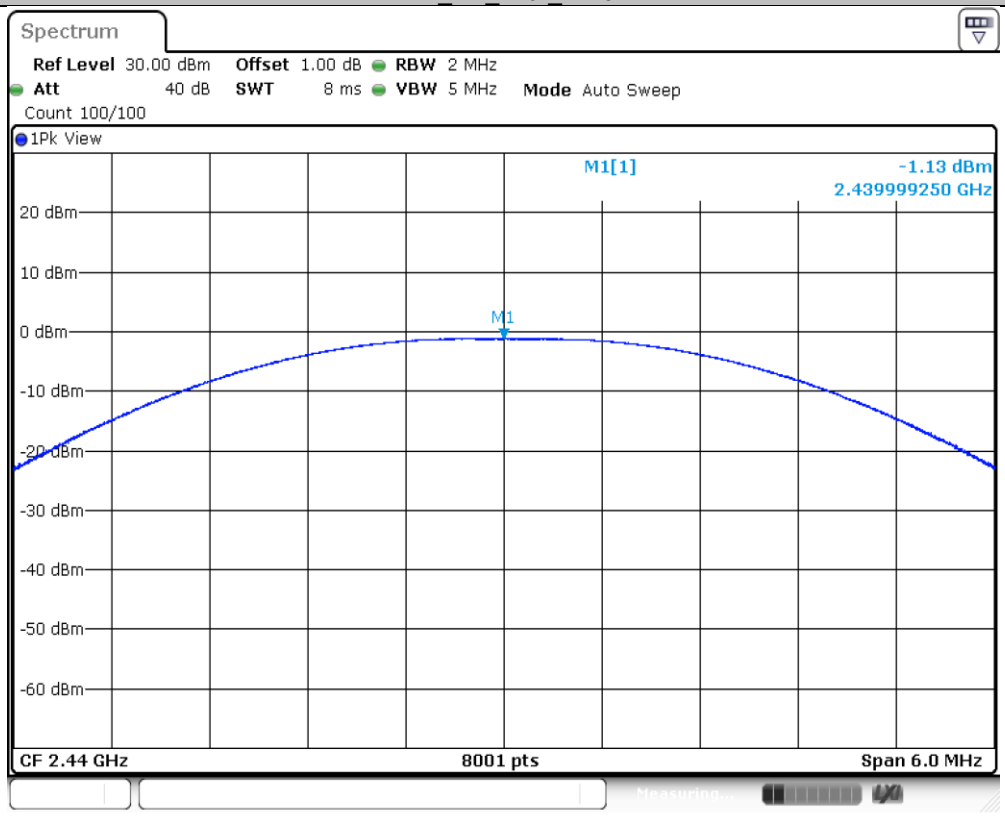

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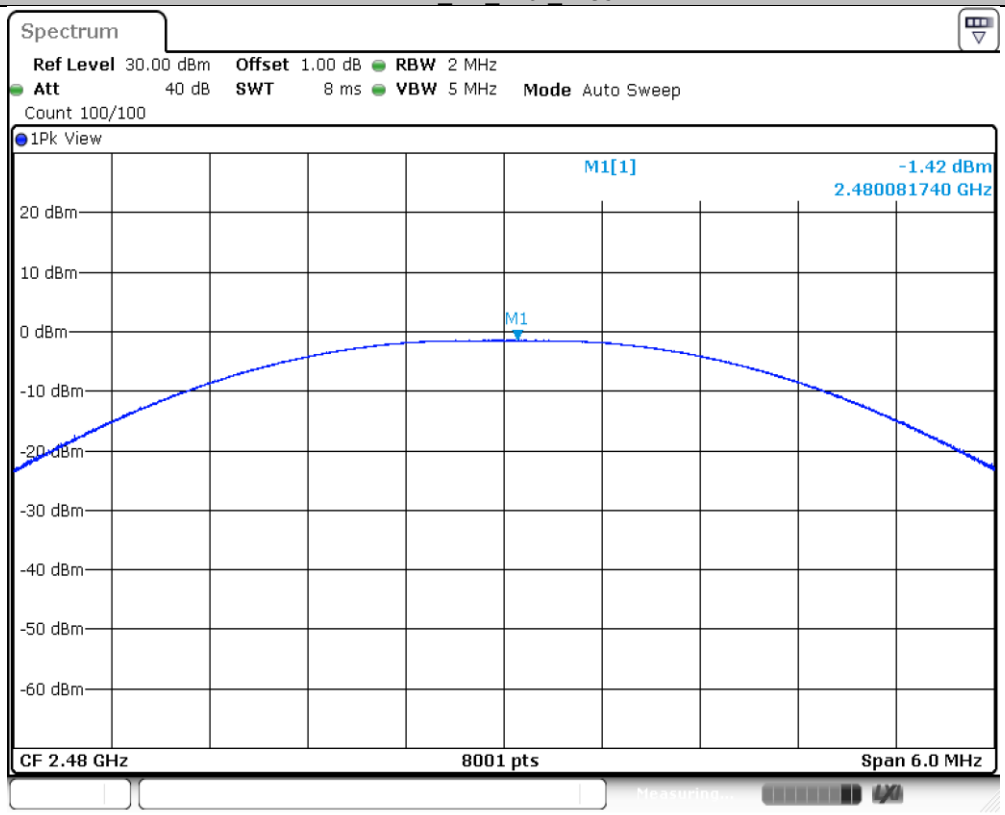

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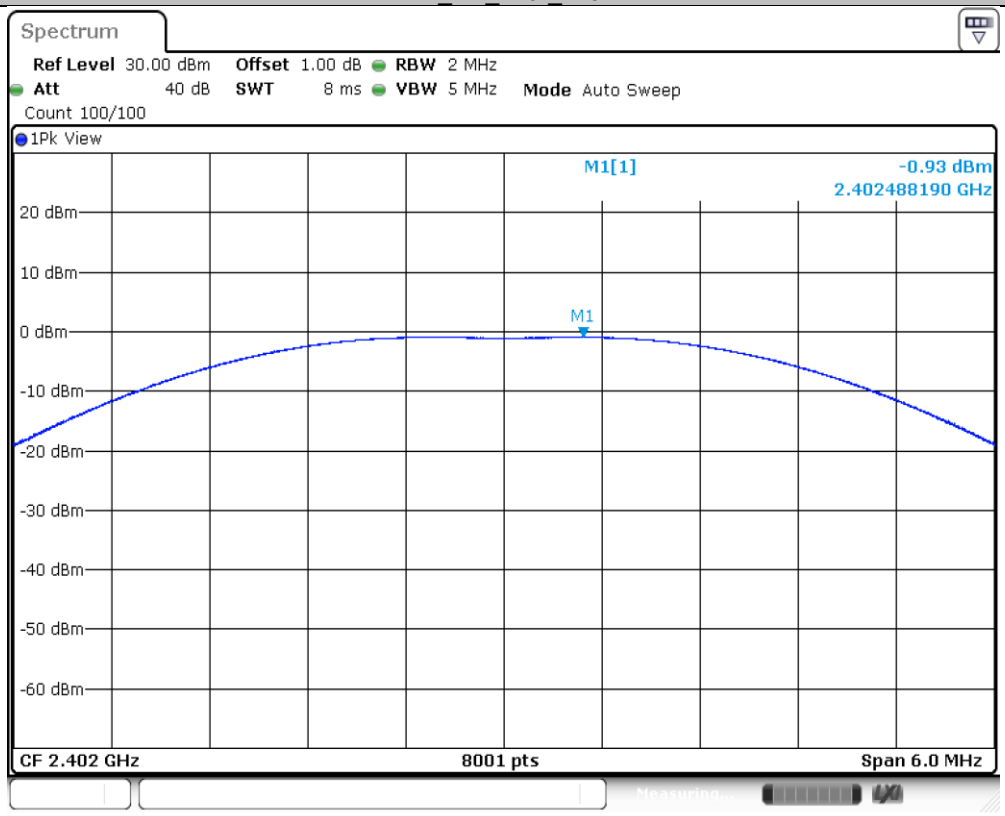

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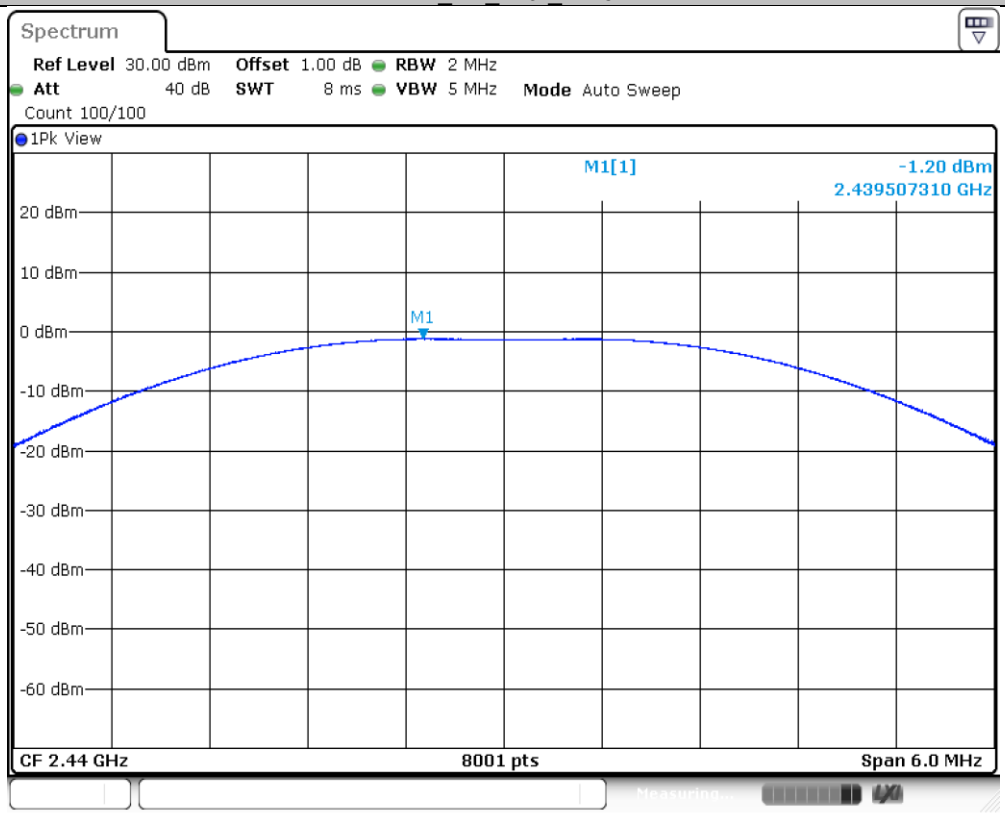

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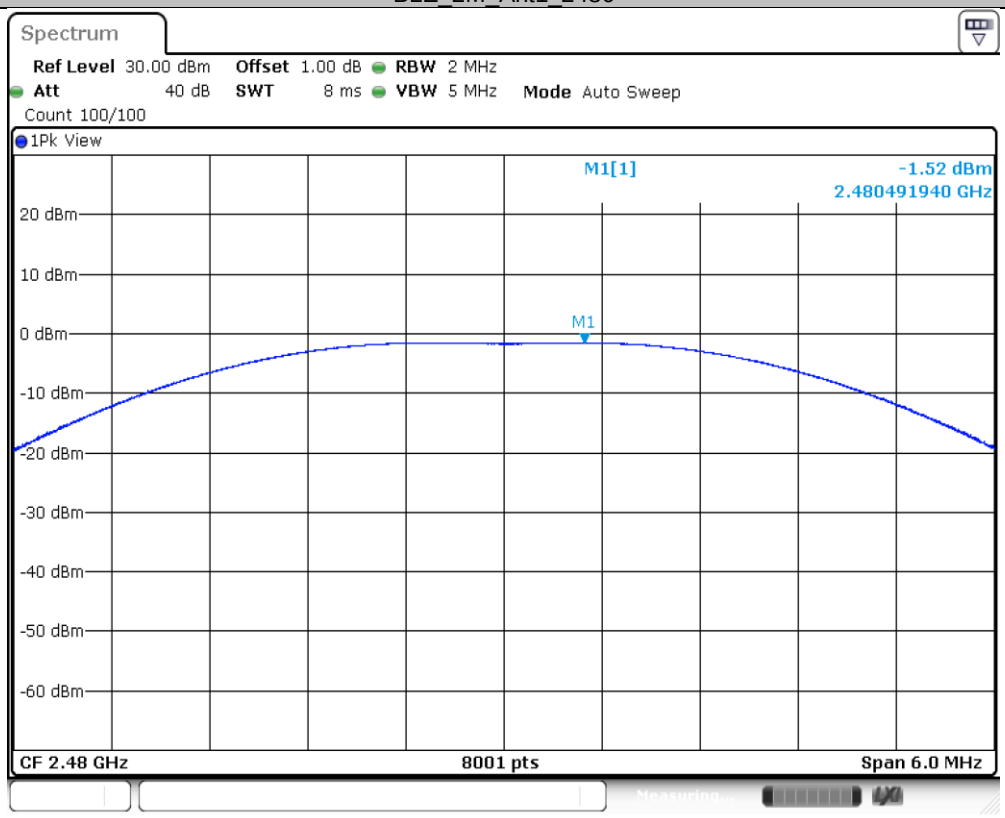

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9.3 Power Spectral Density

Test Method

1. The RF output of EUT was connected to the test receiver. 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	-19.07	Pass
Middle channel 2440MHz	LE 1Mbps	-19.65	Pass
Top channel 2480MHz	LE 1Mbps	-19.84	Pass
Bottom channel 2402MHz	LE 2Mbps	-15.09	Pass
Middle channel 2440MHz	LE 2Mbps	-14.8	Pass
Top channel 2480MHz	LE 2Mbps	-15.1	Pass

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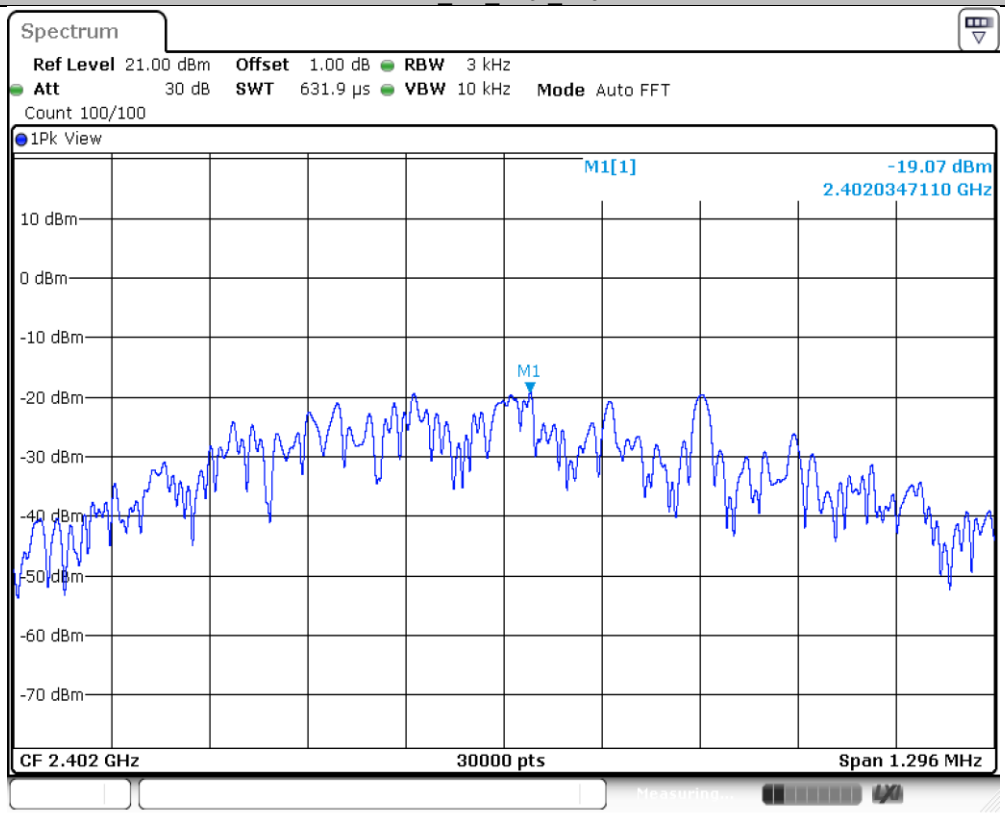
BLE_1M_Ant1_2402



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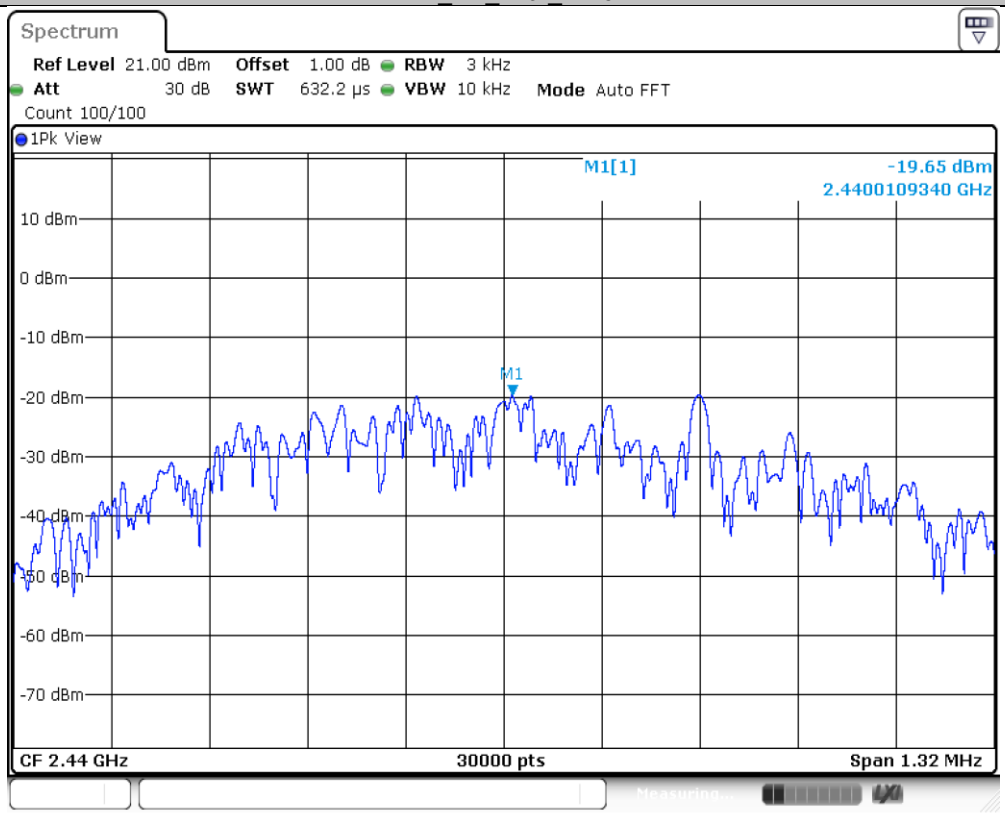

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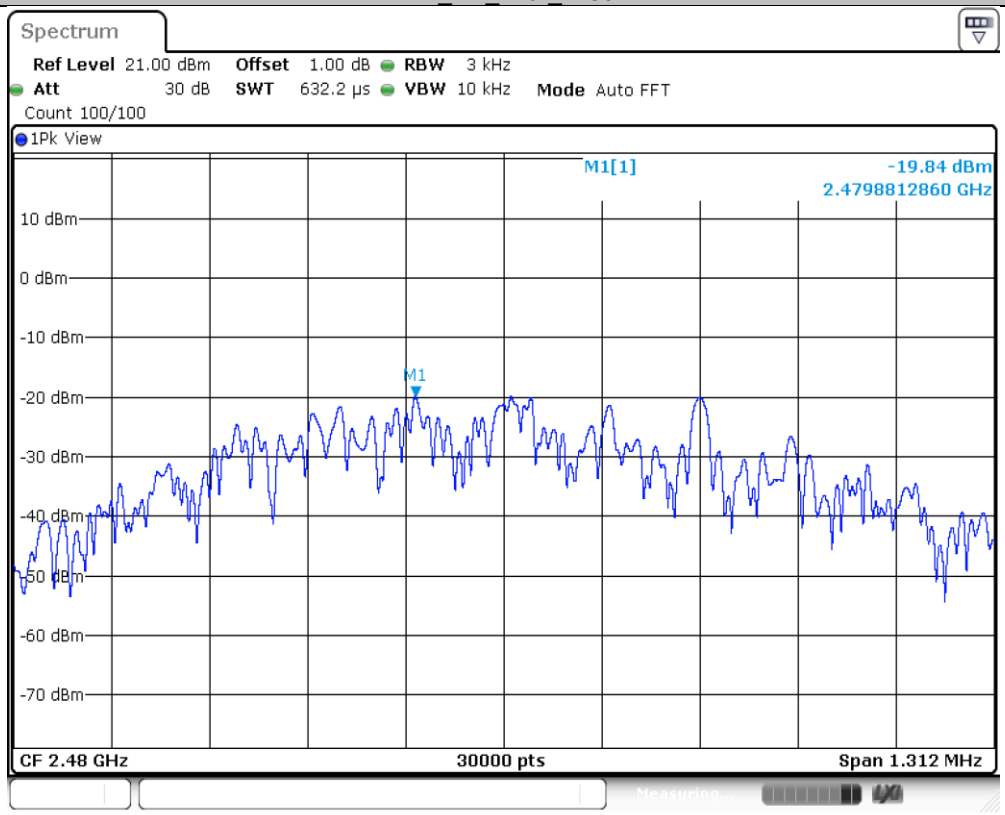

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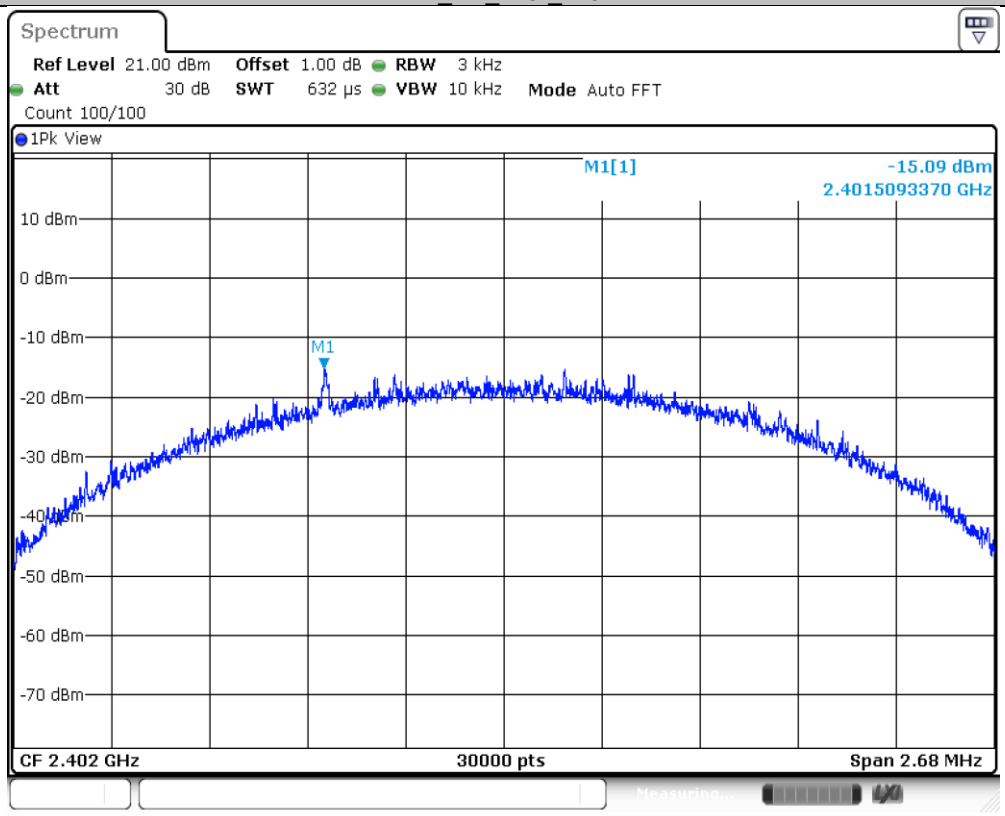

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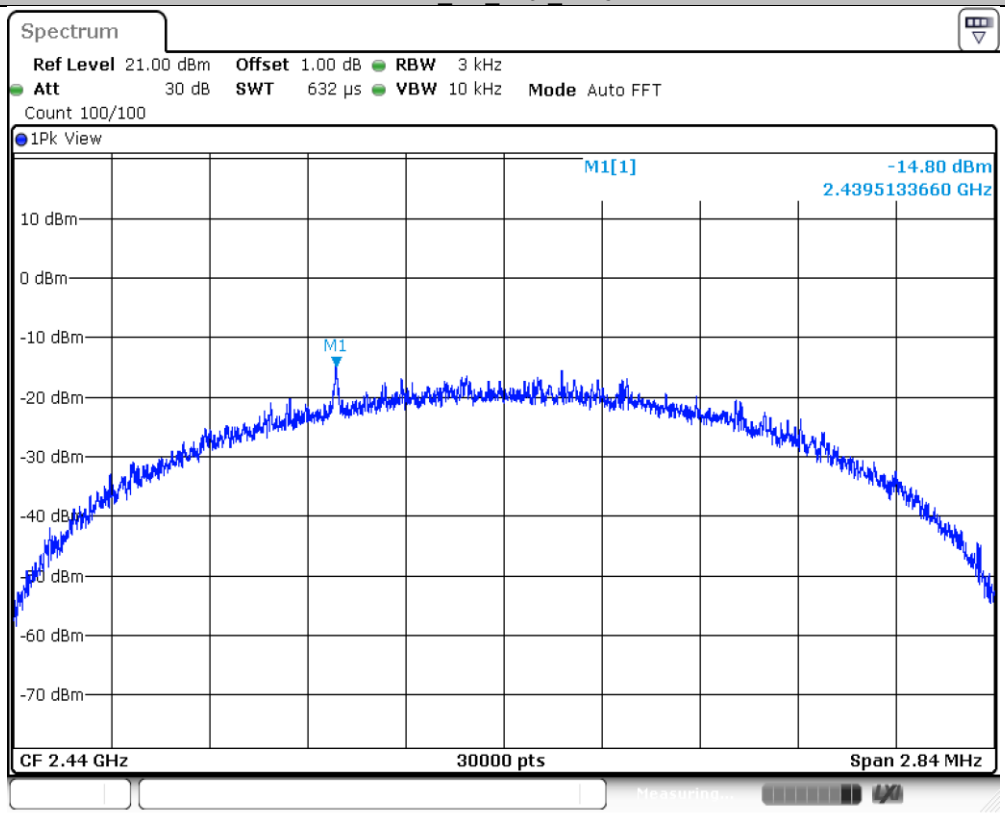
BLE_2M_Ant1_2440



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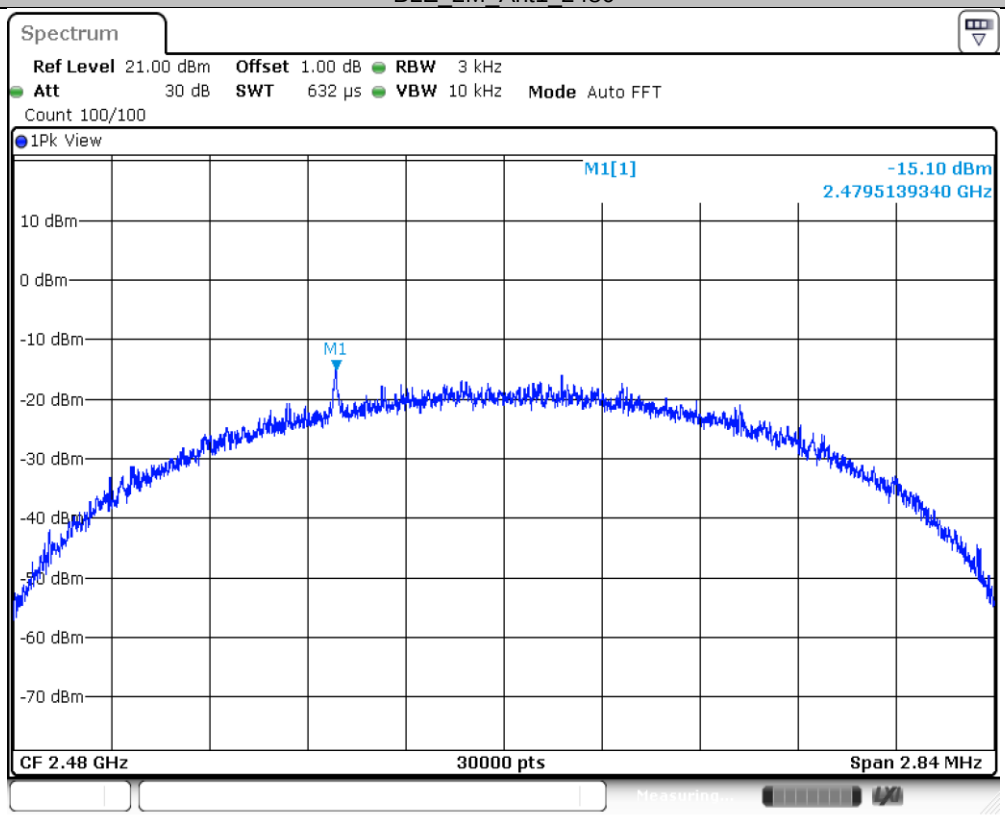

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9.4 6 dB Bandwidth and 99% Occupied Bandwidth

Test Method for 6 dB Bandwidth

1. Use the following spectrum analyzer settings:
RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

Limit [kHz]
≥500

Test Method for 99 % Bandwidth

1. Use the following spectrum analyzer settings:
RBW=1% to 5% of the actual occupied, VBW≥3RBW, Sweep = auto,
Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

Limit [kHz]

Test result

Frequency MHz	Mode	6dB bandwidth MHz	99% bandwidth MHz	Result
Bottom channel 2402MHz	LE 1M	0.648	1.071	Pass
Middle channel 2440MHz	LE 1M	0.660	1.083	Pass
Top channel 2480MHz	LE 1M	0.656	1.079	Pass
Bottom channel 2402MHz	LE 2M	1.340	2.054	Pass
Middle channel 2440MHz	LE 2M	1.420	2.078	Pass
Top channel 2480MHz	LE 2M	1.420	2.082	Pass

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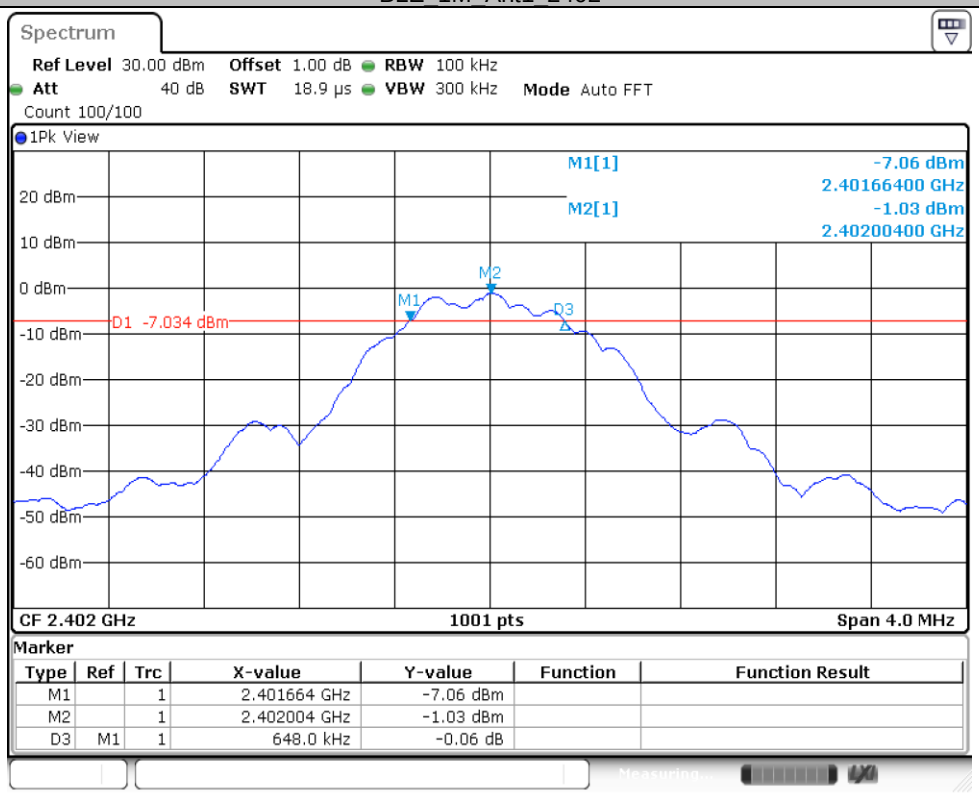
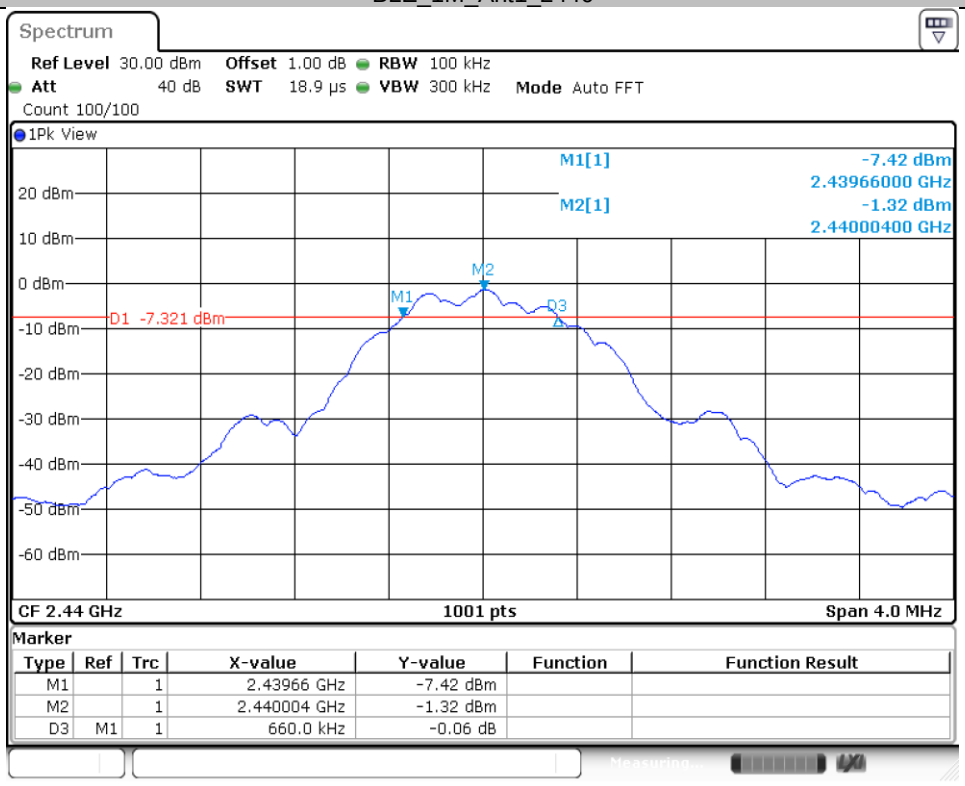
6 dB Bandwidth

BLE_1M_Ant1_2402



Date: 18.JUL.2023 17:32:39

BLE_1M_Ant1_2440



Date: 18.JUL.2023 17:35:18

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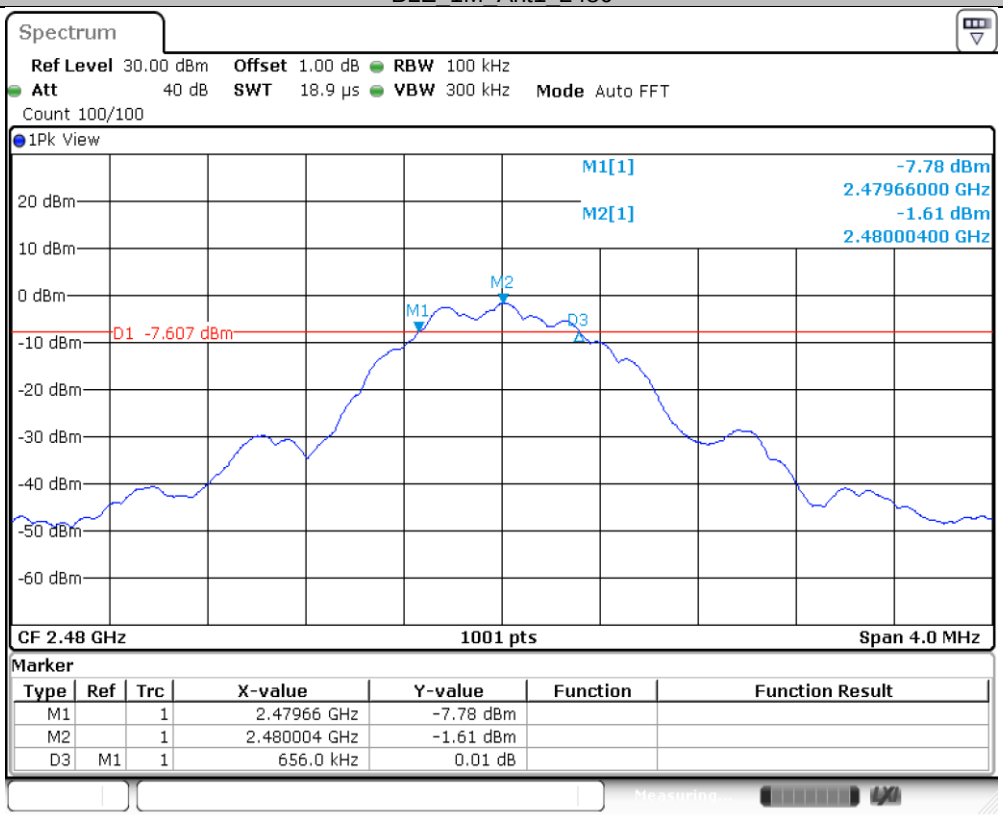
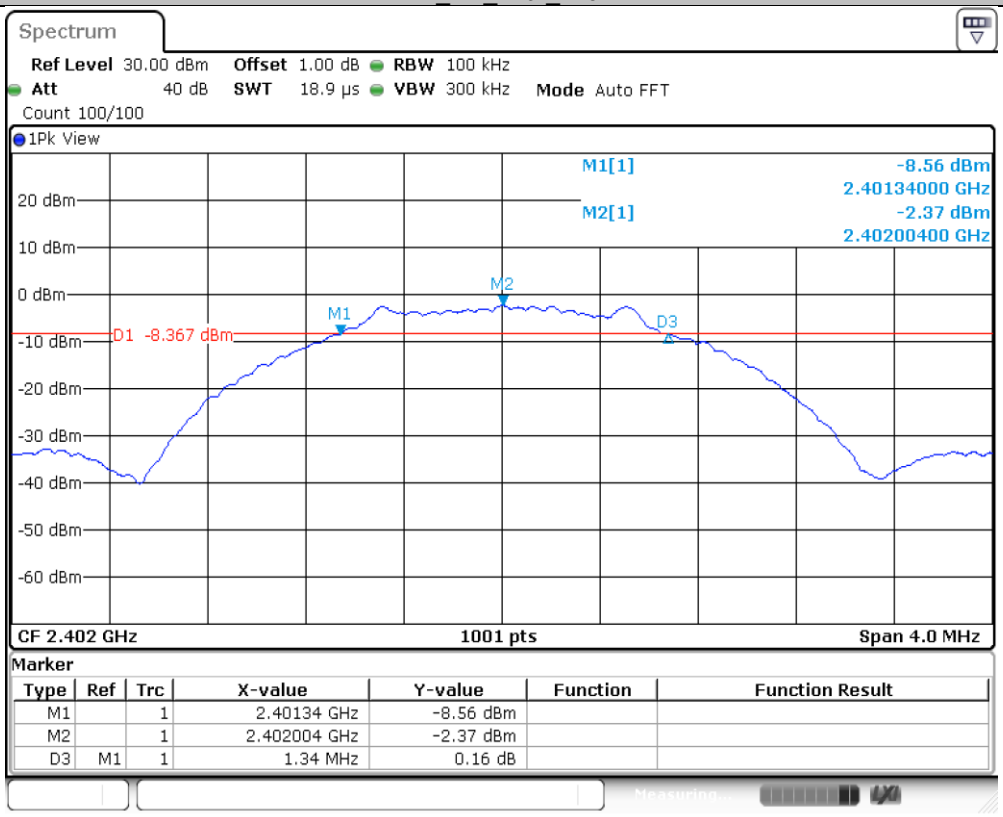
BLE_1M_Ant1_2480



Date: 18.JUL.2023 17:37:48

BLE_2M_Ant1_2402



Date: 18.JUL.2023 18:57:51

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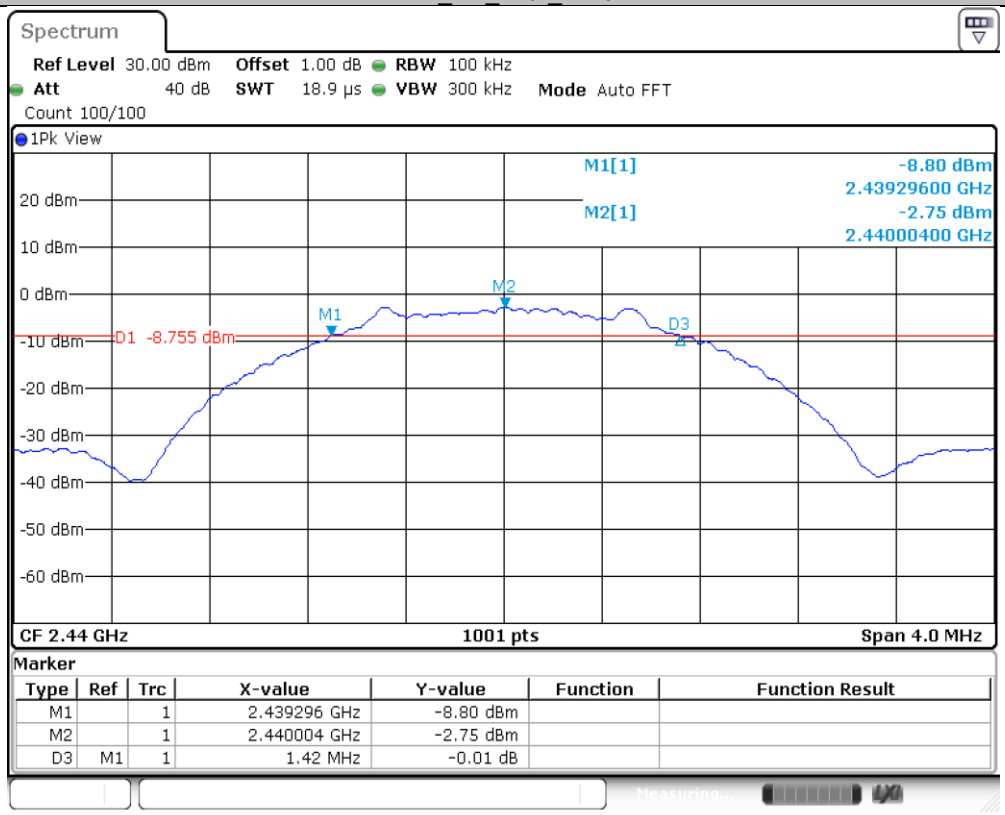
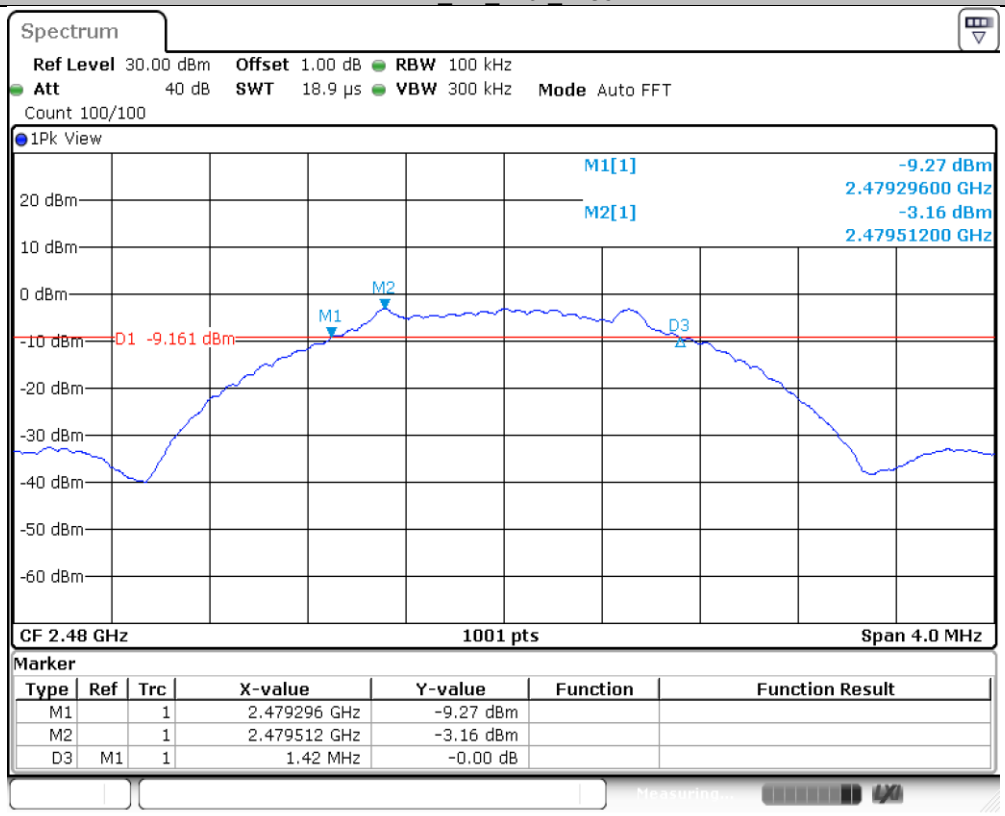
BLE_2M_Ant1_2440



Date: 18.JUL.2023 18:59:24

BLE_2M_Ant1_2480



Date: 18.JUL.2023 18:53:09

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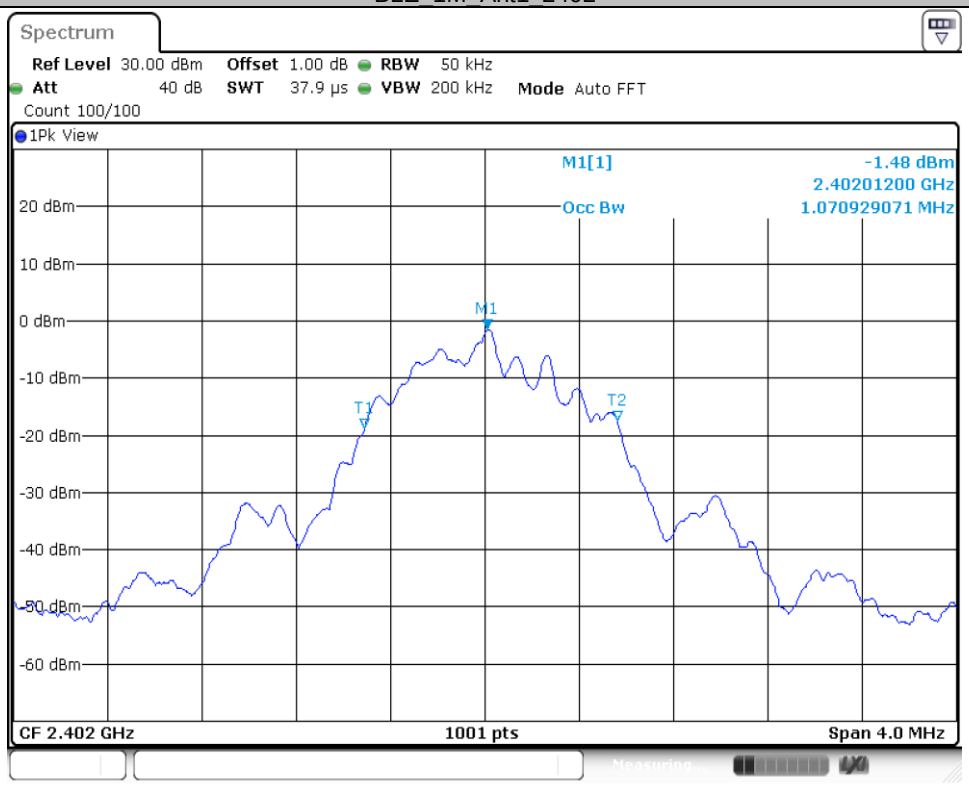
99% Bandwidth

BLE_1M_Ant1_2402



Date: 18.JUL.2023 17:32:49

BLE_1M_Ant1_2440

Date: 18.JUL.2023 17:35:29

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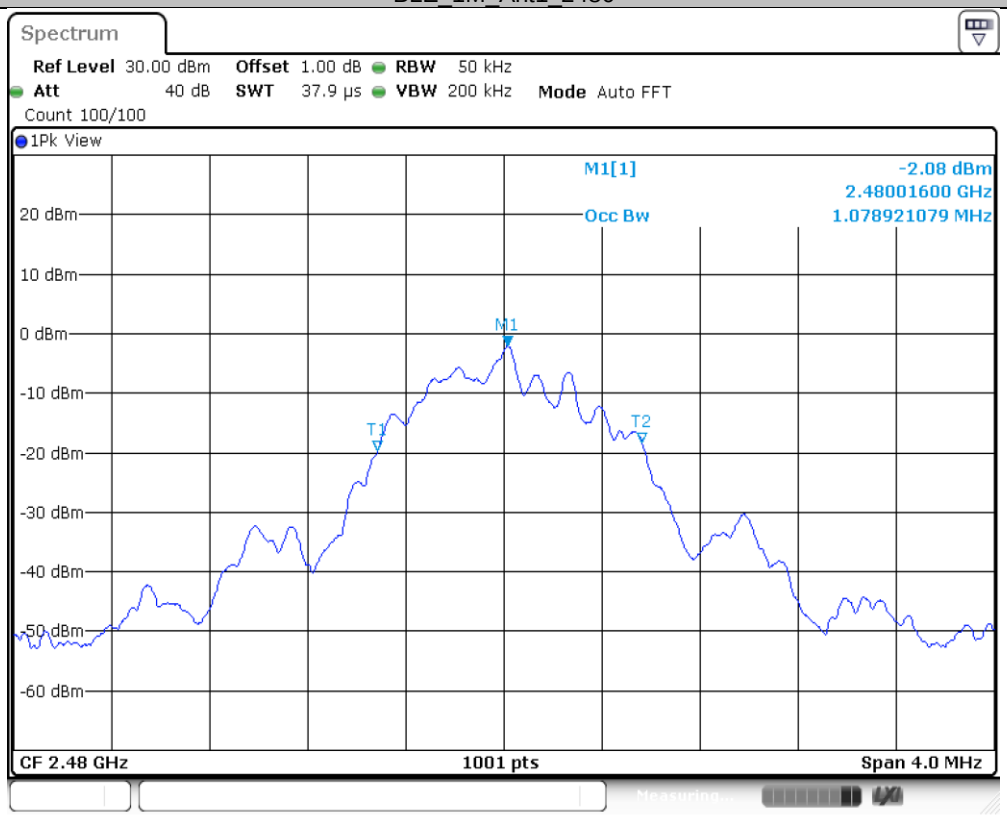
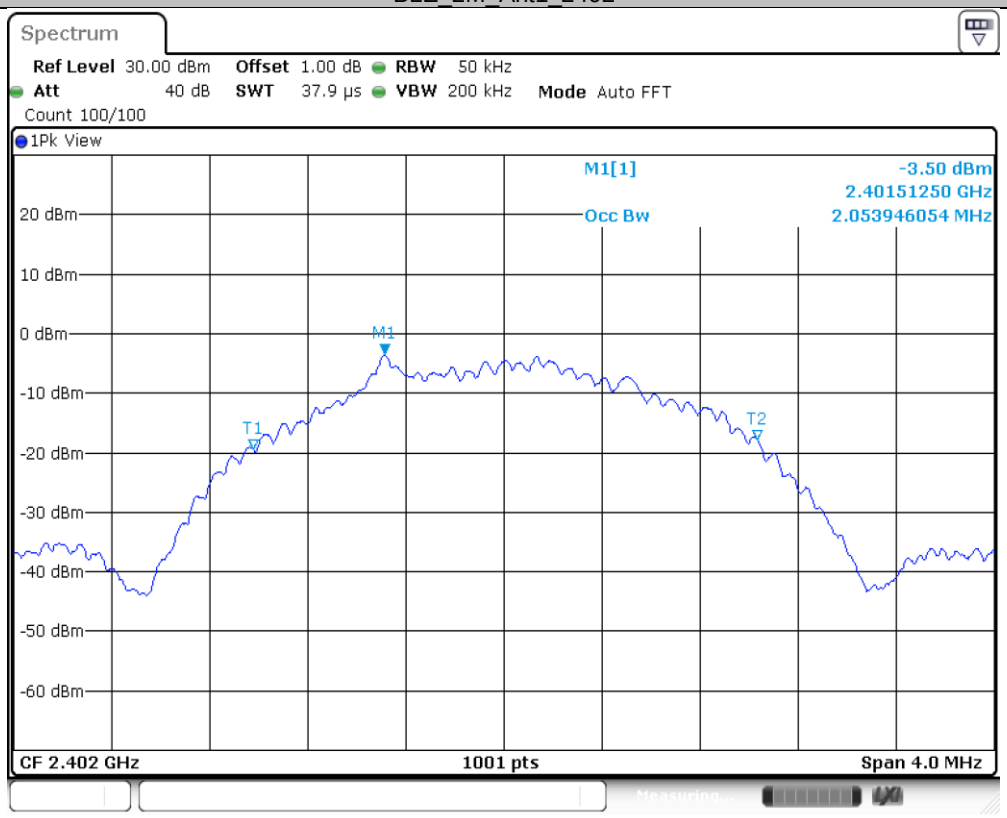
BLE_1M_Ant1_2480



Date: 18.JUL.2023 17:37:59

BLE_2M_Ant1_2402



Date: 18.JUL.2023 18:58:02

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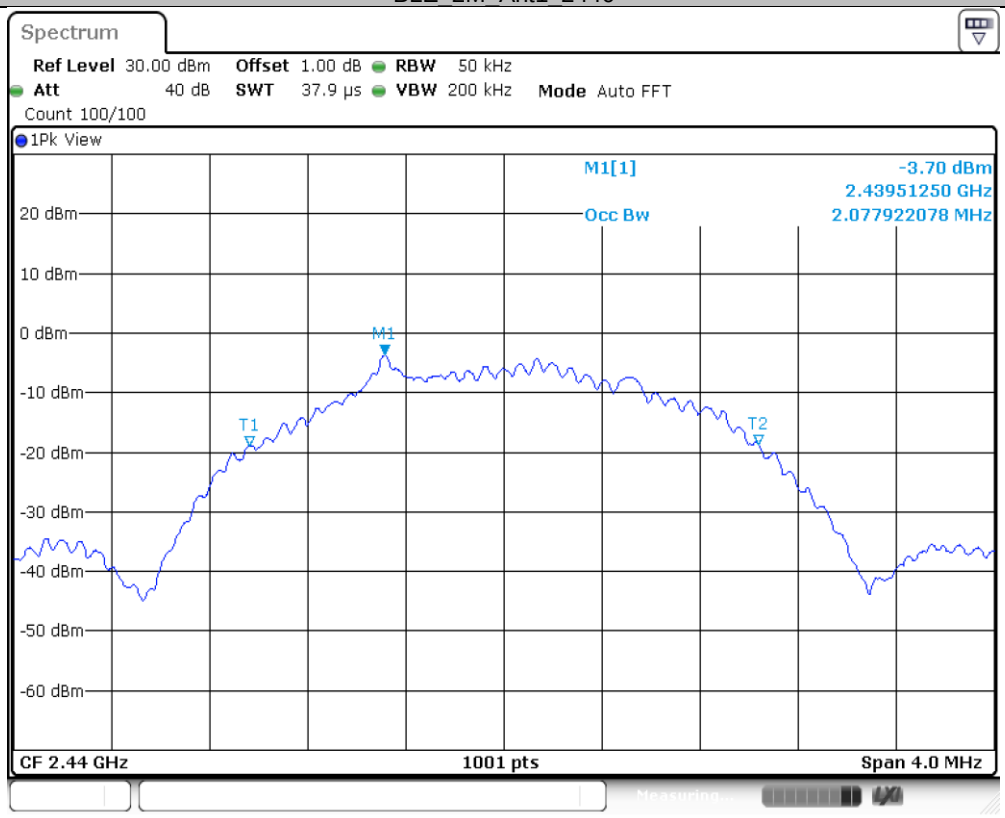
BLE_2M_Ant1_2440



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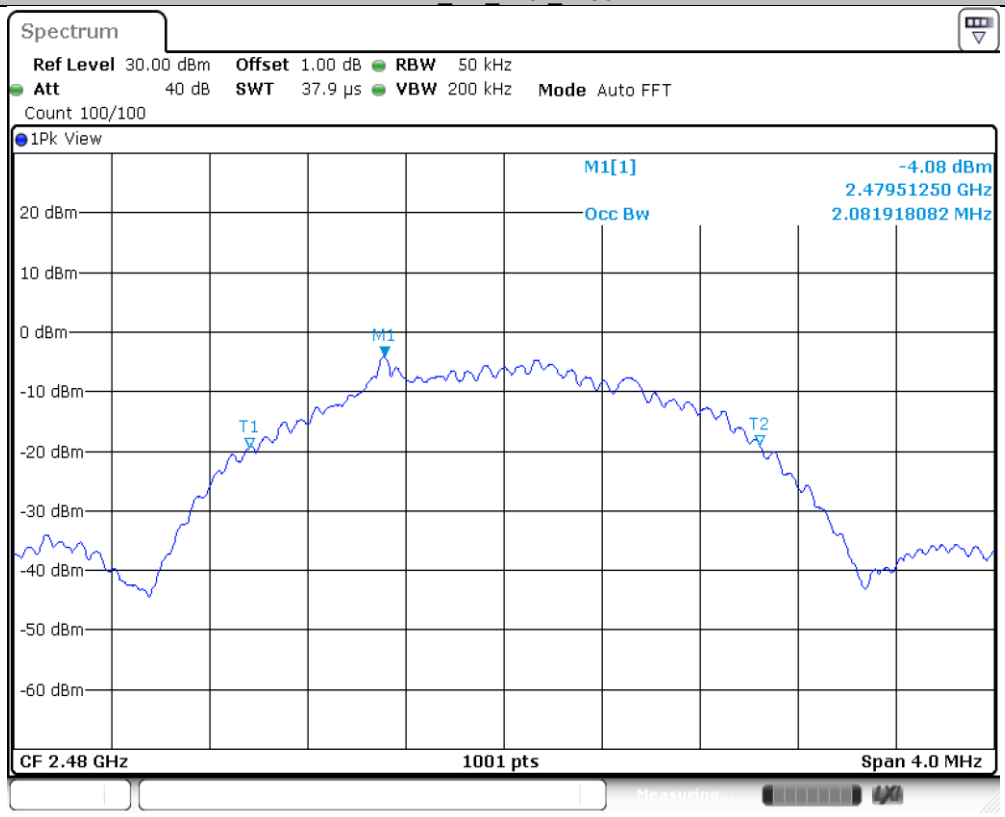
BLE_2M_Ant1_2480



Date: 18.JUL.2023 18:53:20

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9.5 Spurious RF Conducted Emissions

Test Method

1. The RF output of EUT was connected to the test receiver 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

Test Mode	Channel (MHz)	Frequency Range (MHz)	Result (dBm)	Limit (dBm)	Verdict
BLE_1Mbps	2402	Reference	-1.03	---	PASS
		30~1000	-67.48	<=-21.03	PASS
		1000~26500	-46.82	<=-21.03	PASS
	2440	Reference	-1.38	---	PASS
		30~1000	-67.95	<=-21.38	PASS
		1000~26500	-52.78	<=-21.38	PASS
	2480	Reference	-1.57	---	PASS
		30~1000	-68.67	<=-21.57	PASS
		1000~26500	-52.16	<=-21.57	PASS
BLE_2Mbps	2402	Reference	-2.54	---	PASS
		30~1000	-49.32	<=-22.54	PASS
		1000~26500	-36.3	<=-22.54	PASS
	2440	Reference	-2.95	---	PASS
		30~1000	-52.5	<=-22.95	PASS
		1000~26500	-52.28	<=-22.95	PASS
	2480	Reference	-3.04	---	PASS
		30~1000	-67.23	<=-23.04	PASS
		1000~26500	-51.79	<=-23.04	PASS

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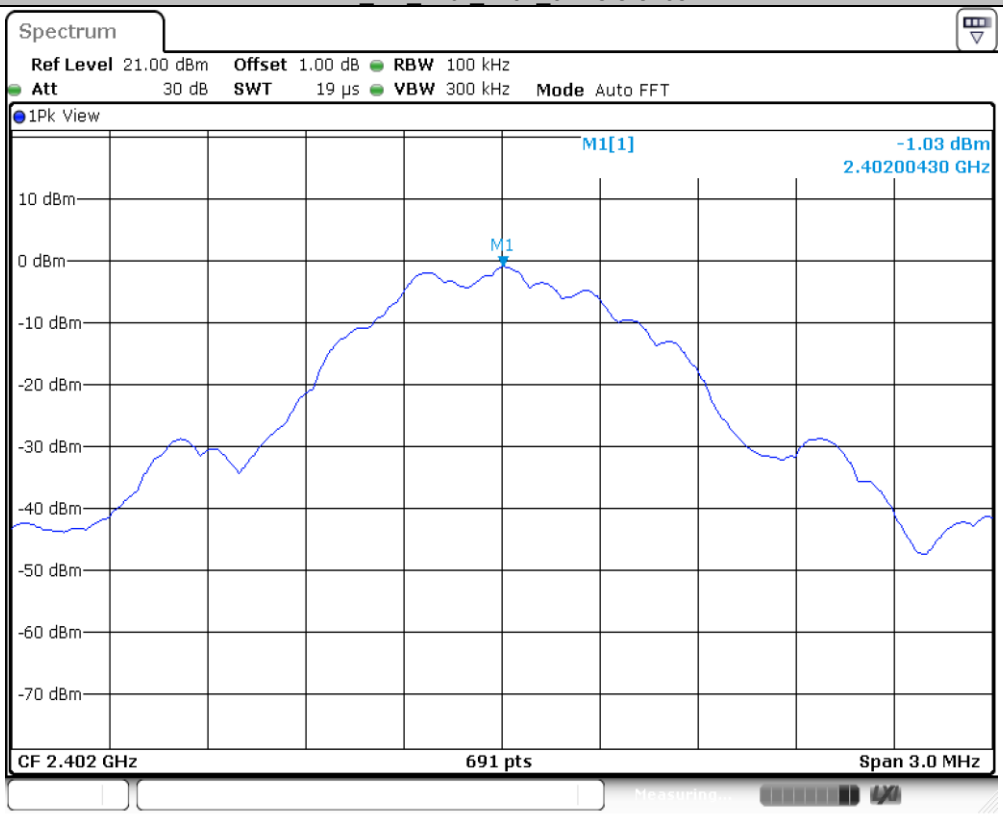
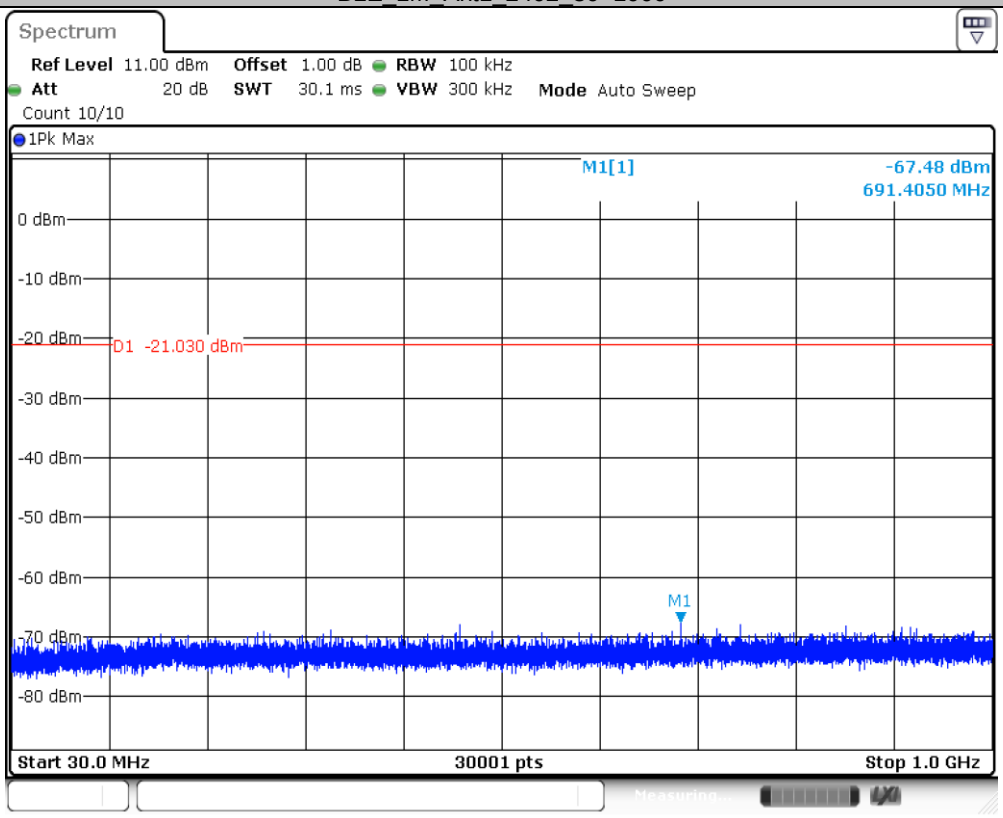
BLE_1M_Ant1_2402_0~Reference



Date: 18.JUL.2023 17:33:17

BLE_1M_Ant1_2402_30~1000



Date: 18.JUL.2023 17:33:23

BLE_1M_Ant1_2402_1000~26500

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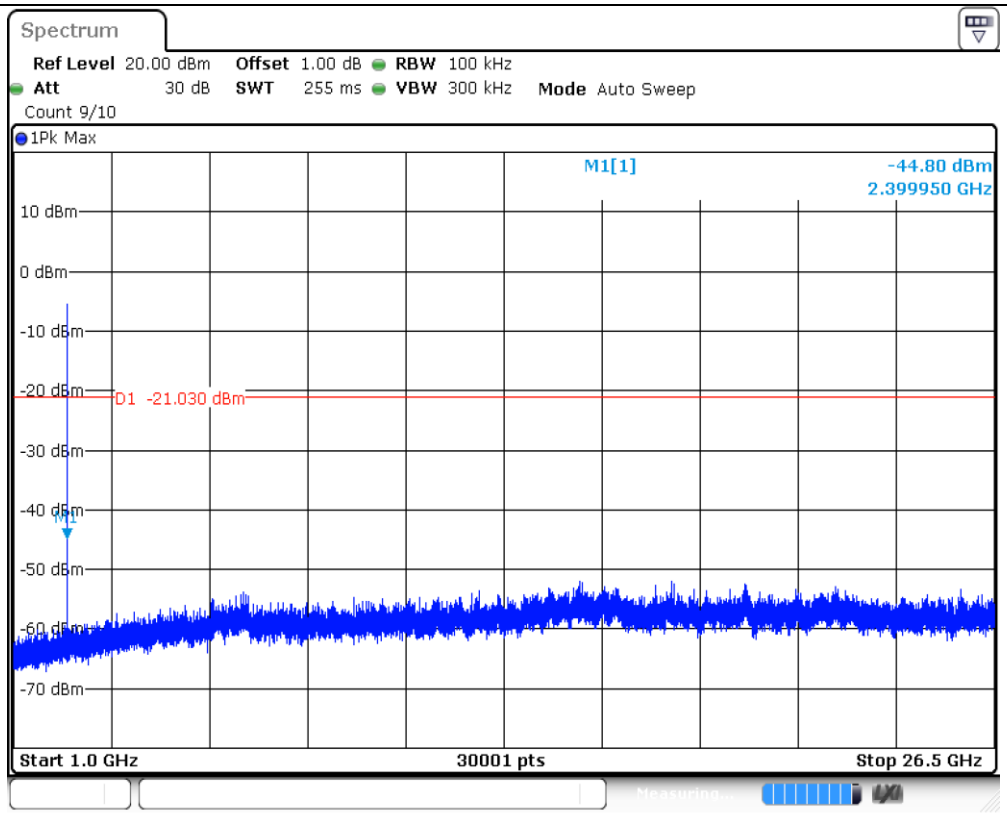
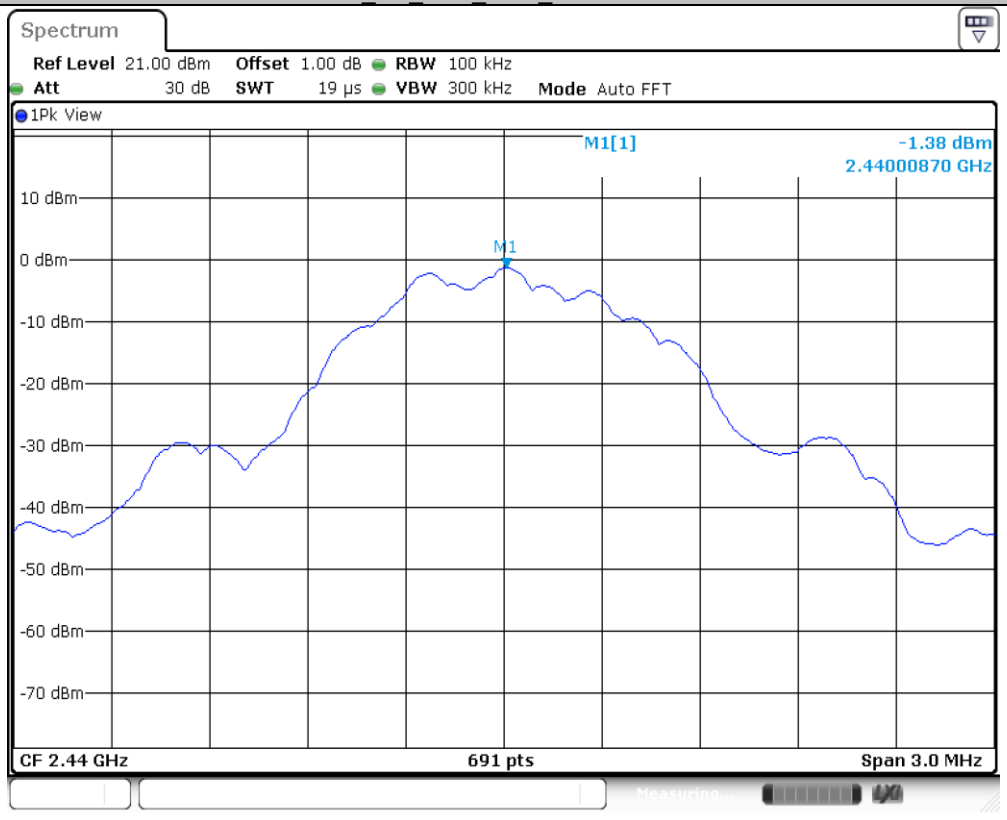


Date: 18.JUL.2023 17:33:31

BLE_1M_Ant1_2440_0~Reference



Date: 18.JUL.2023 17:35:47

BLE_1M_Ant1_2440_30~1000

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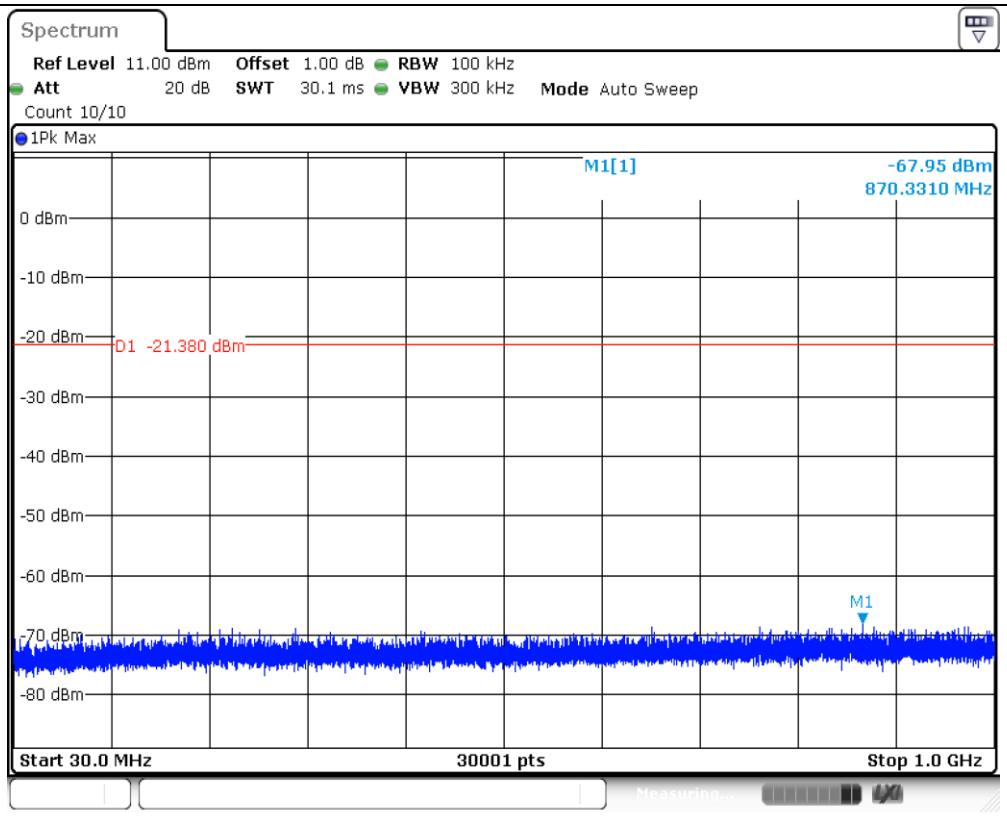
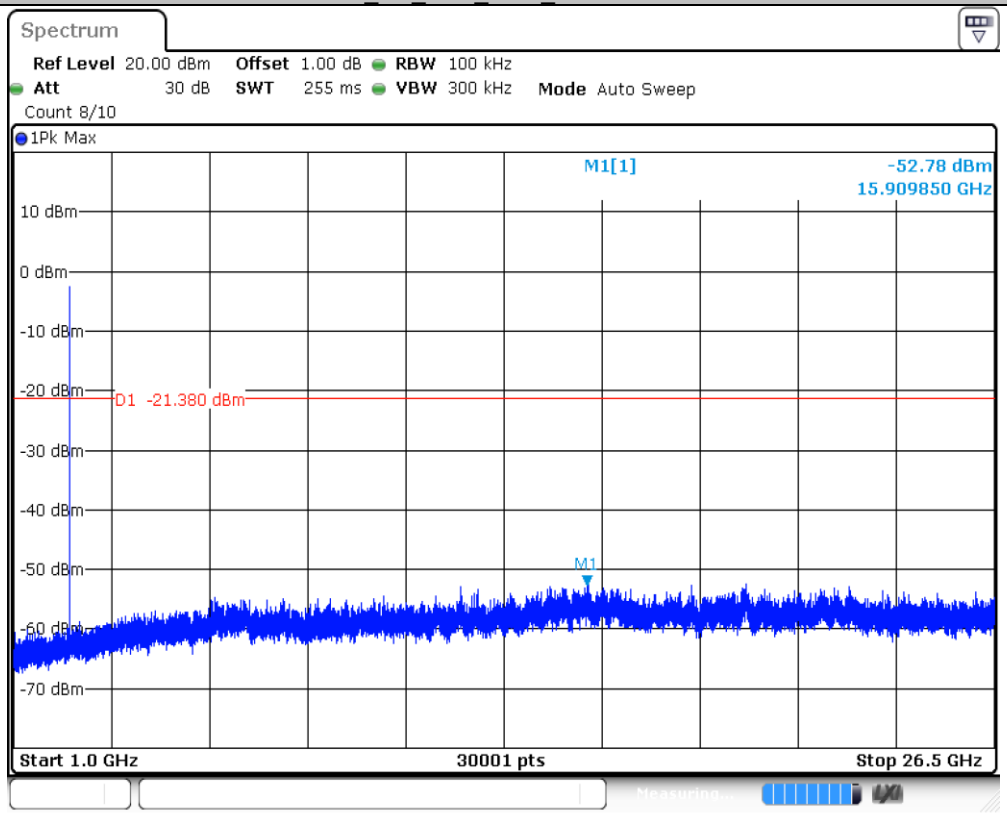


BLE_1M_Ant1_2440_1000~26500



BLE_1M_Ant1_2480_0~Reference

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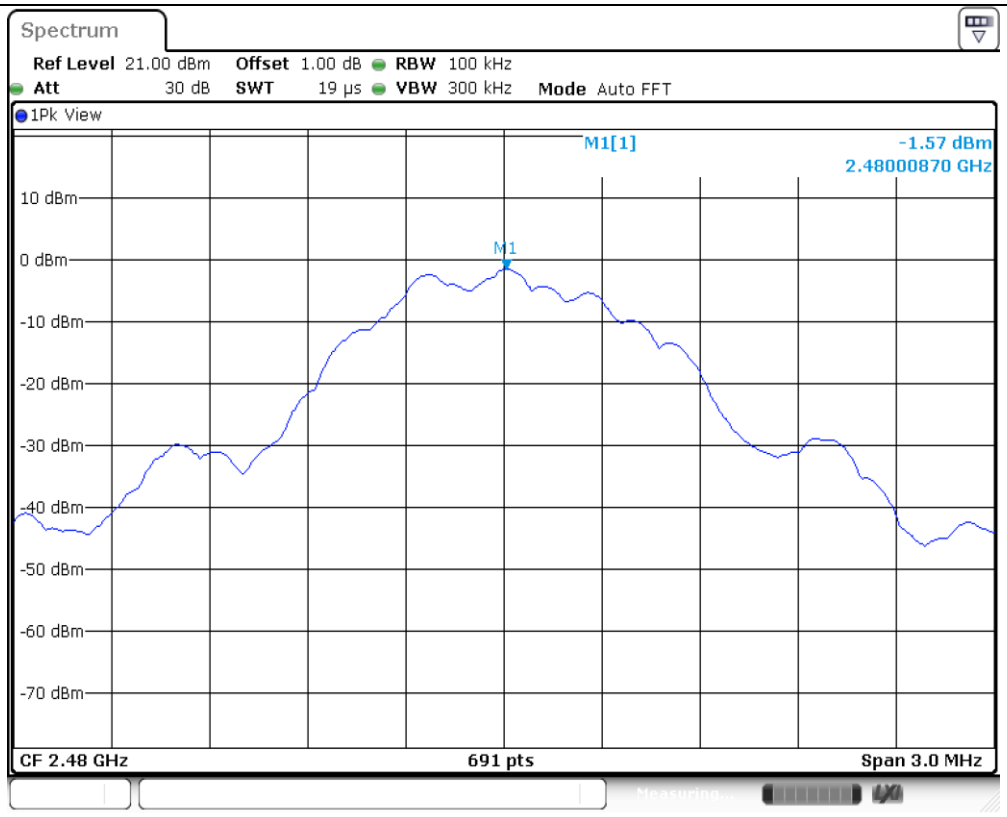
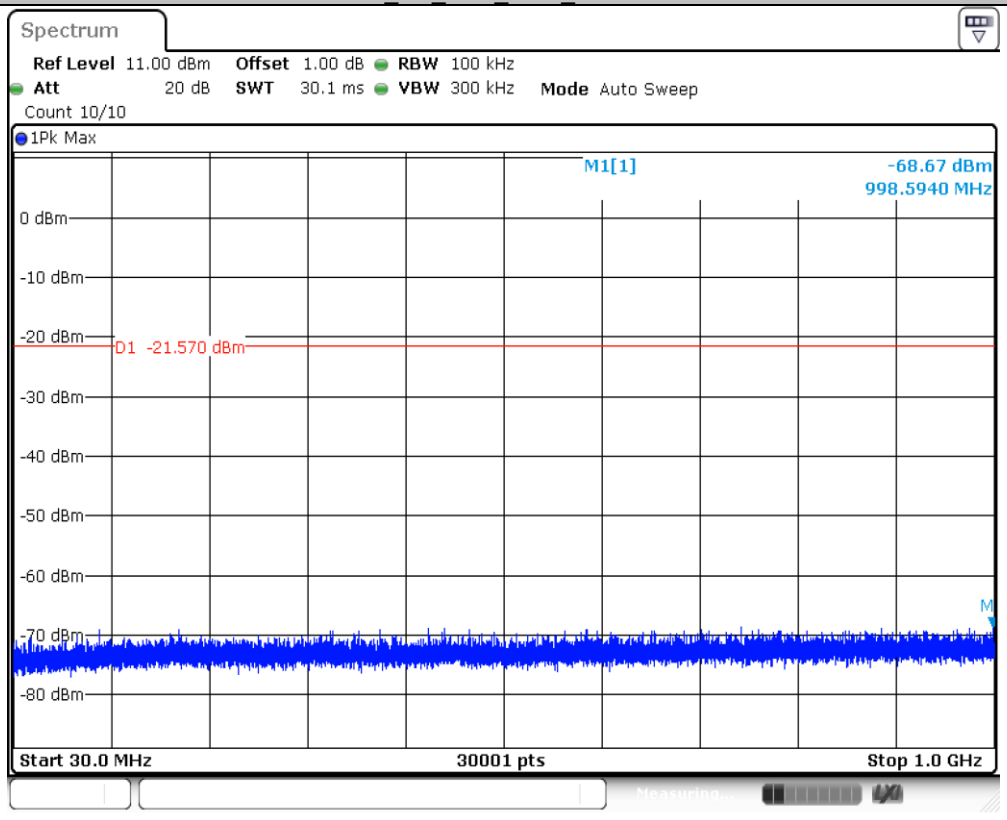


BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500

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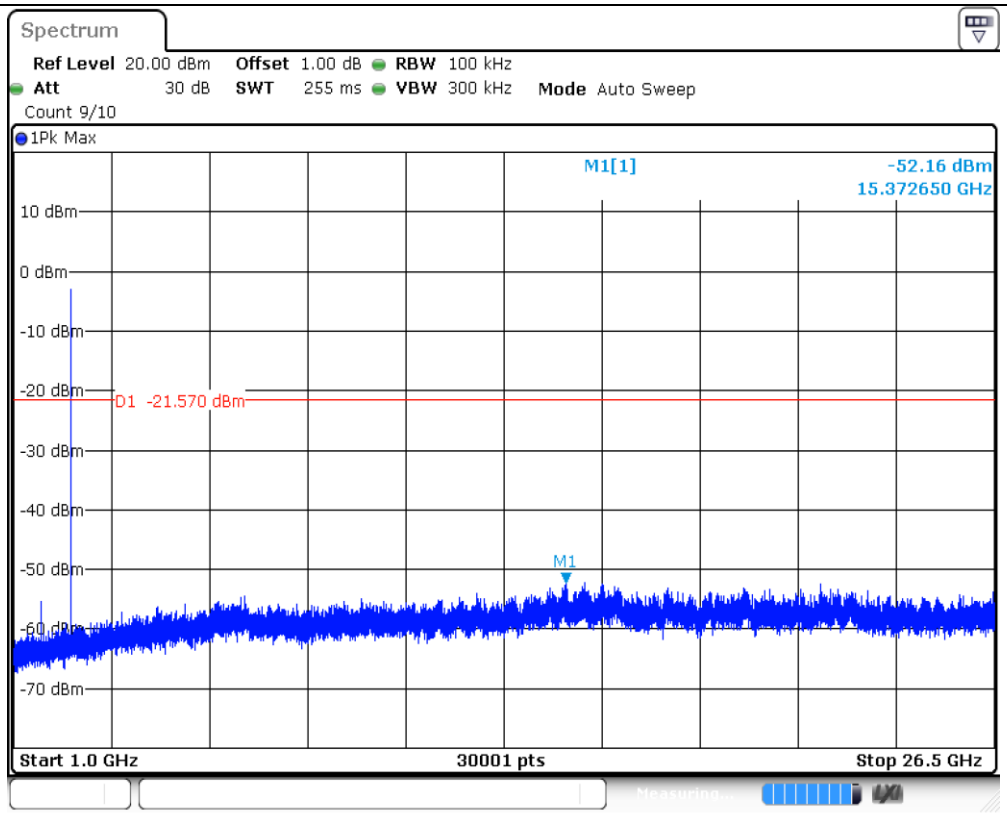

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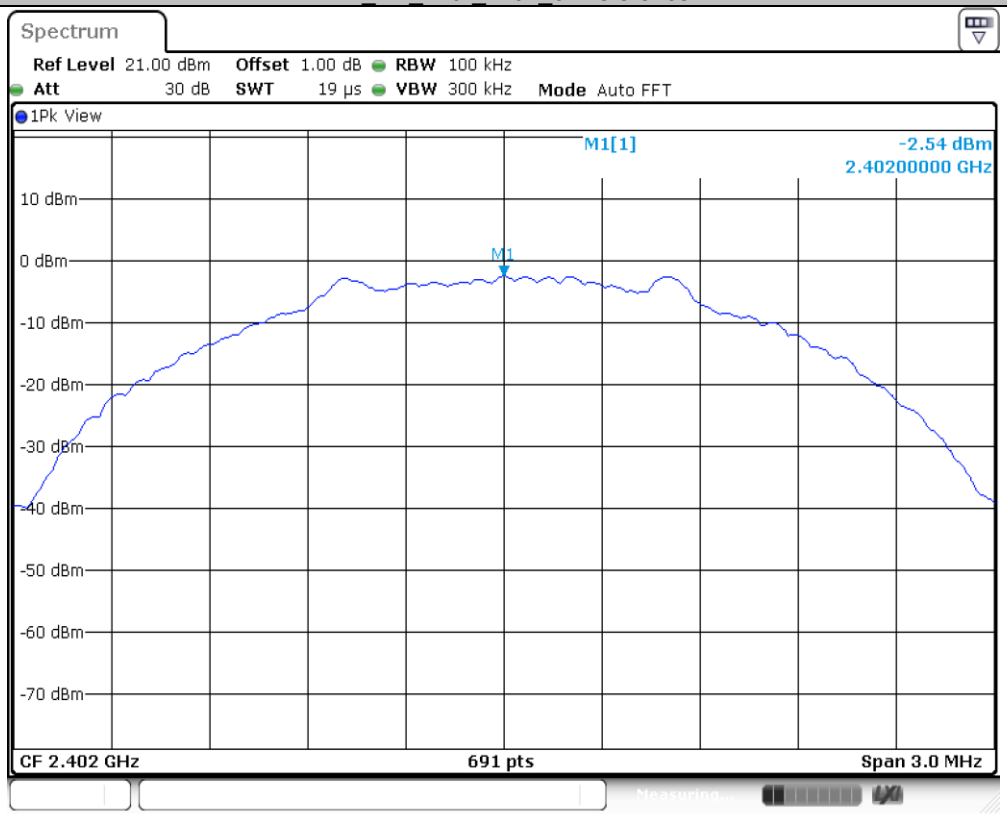

BLE_2M_Ant1_2402_30~1000

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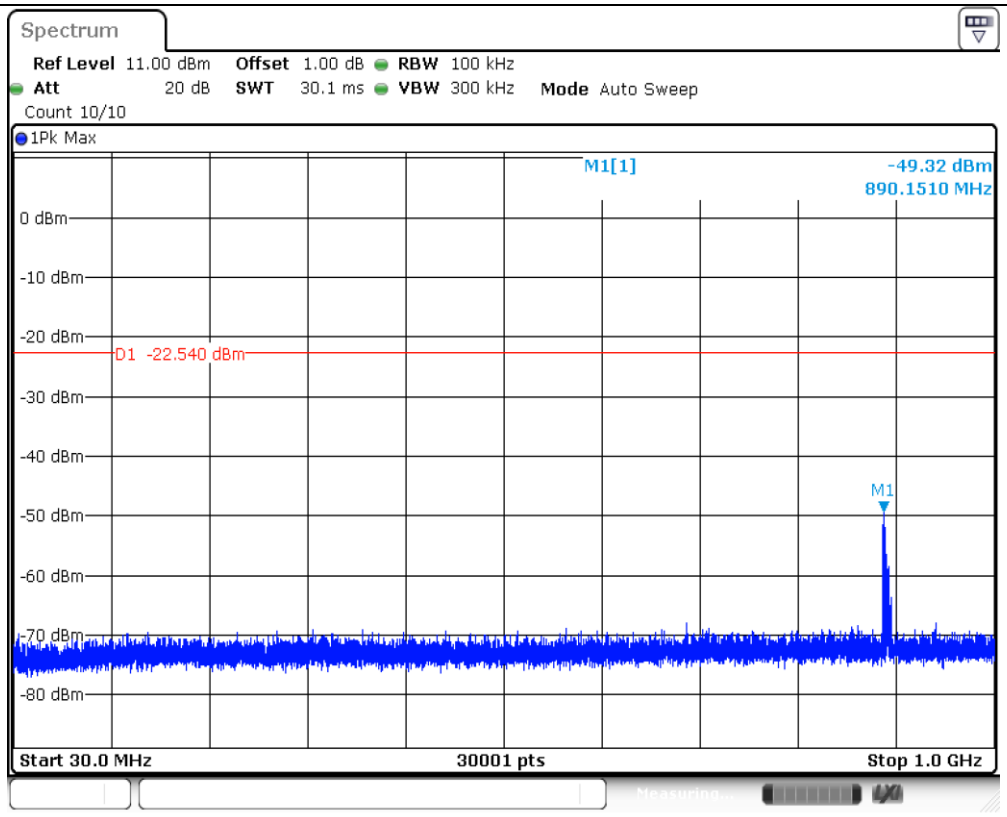
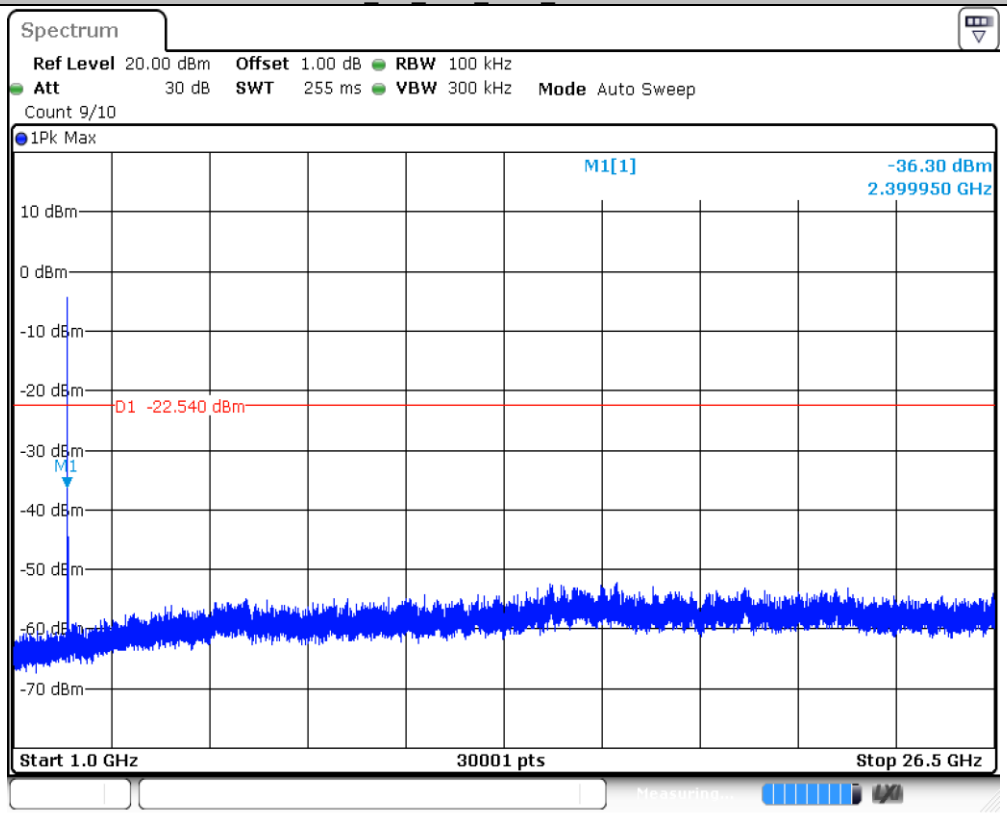


BLE_2M_Ant1_2402_1000~26500



BLE_2M_Ant1_2440_0~Reference

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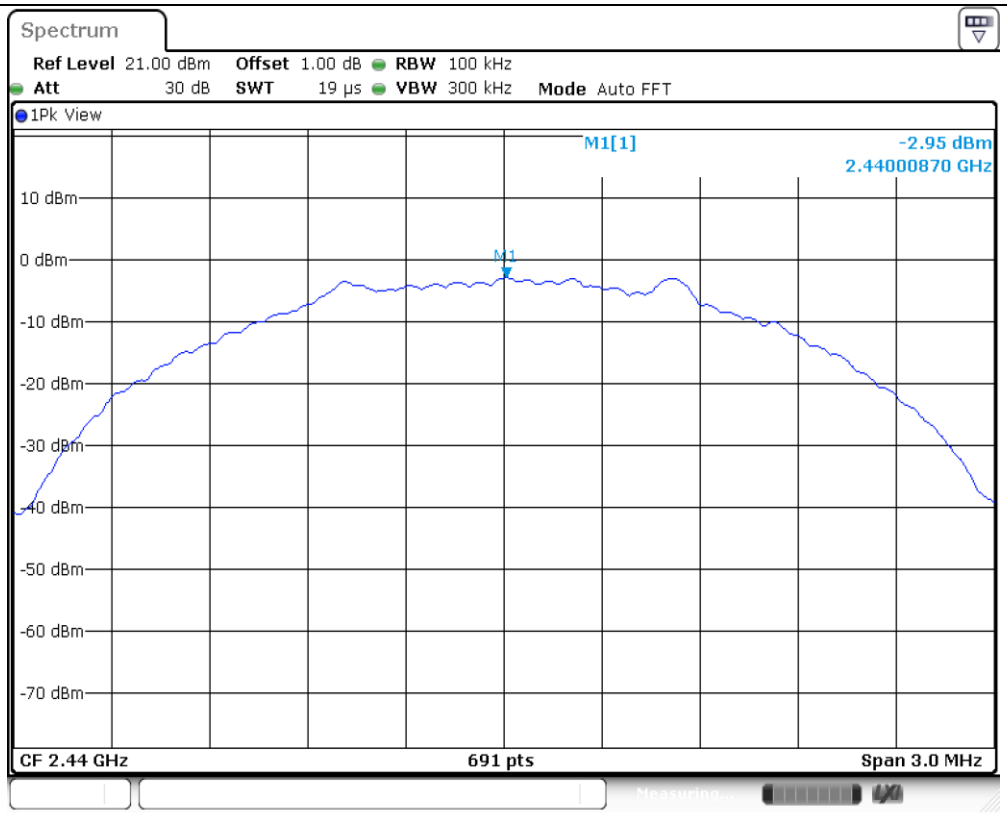
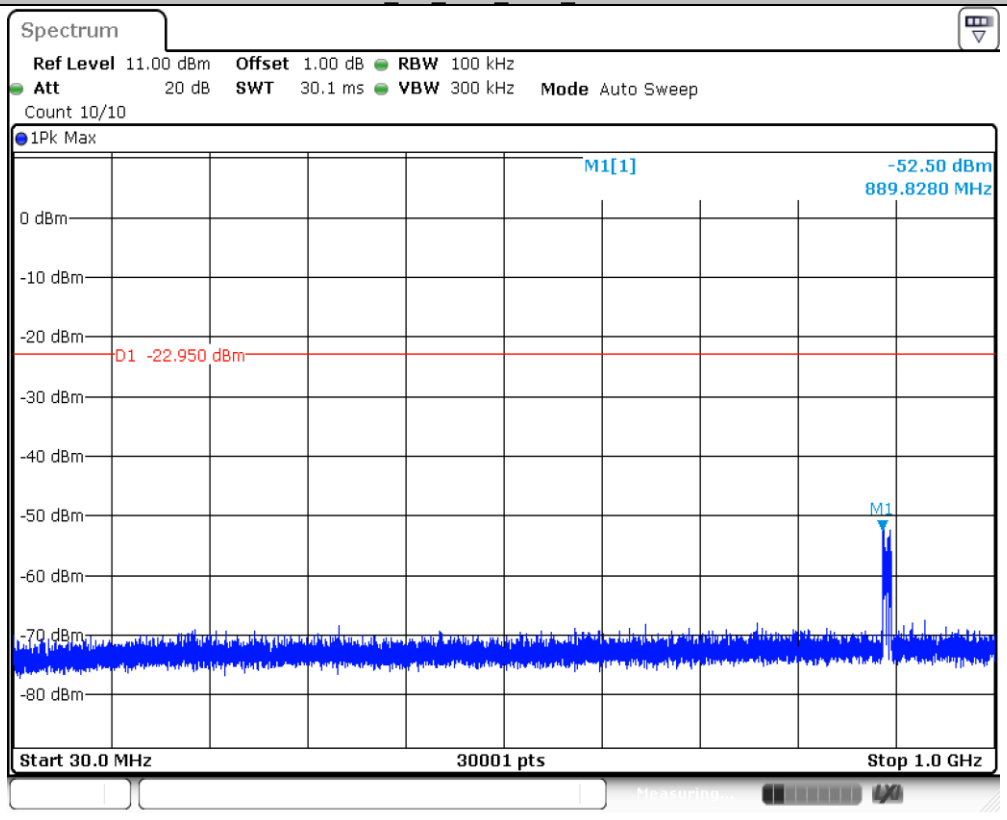


BLE_2M_Ant1_2440_30~1000



BLE_2M_Ant1_2440_1000~26500

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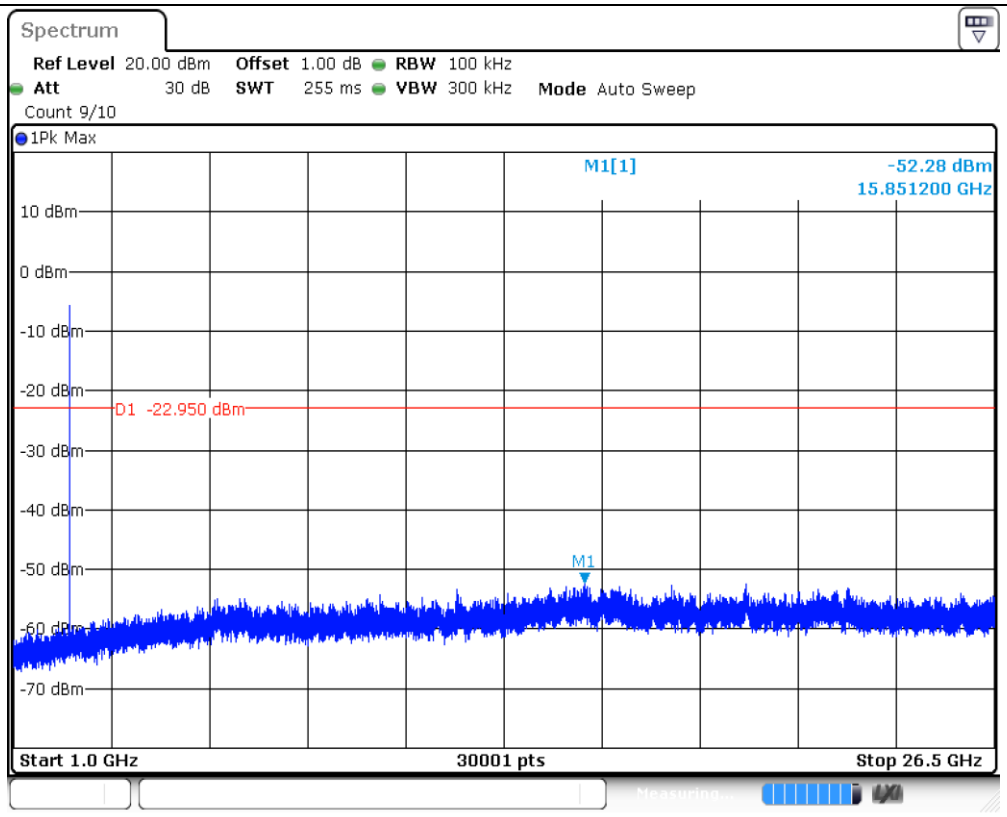
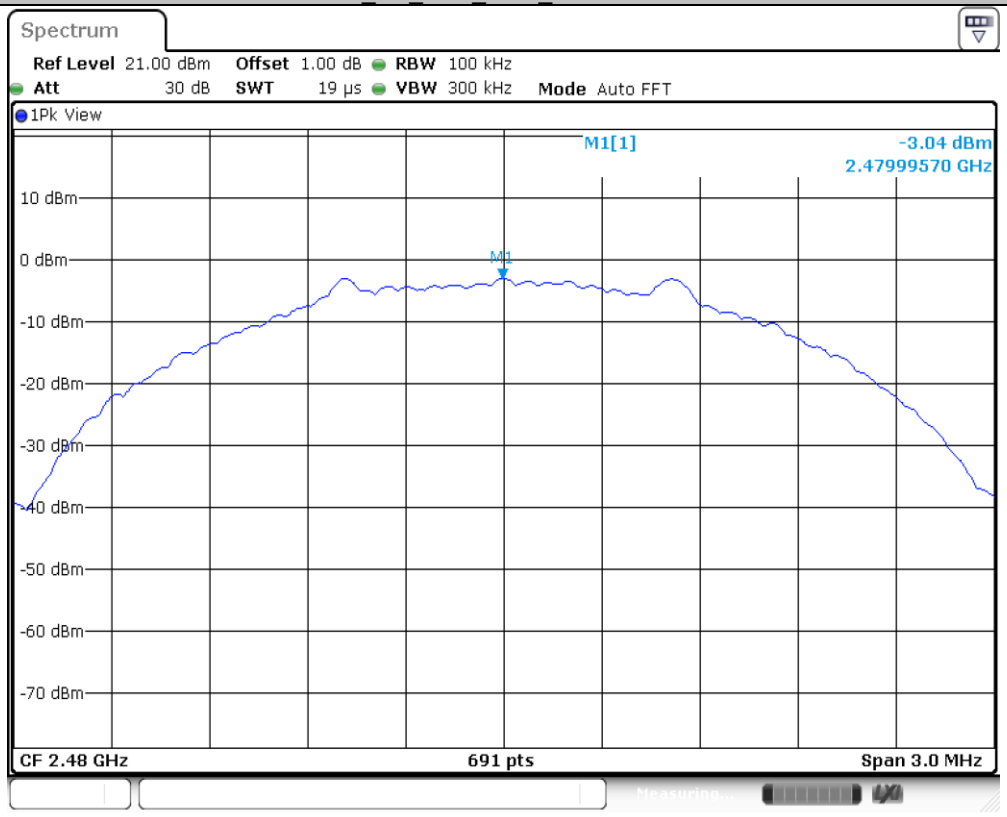


Date: 18.JUL.2023 19:00:06

BLE_2M_Ant1_2480_0~Reference



Date: 18.JUL.2023 18:53:46

BLE_2M_Ant1_2480_30~1000

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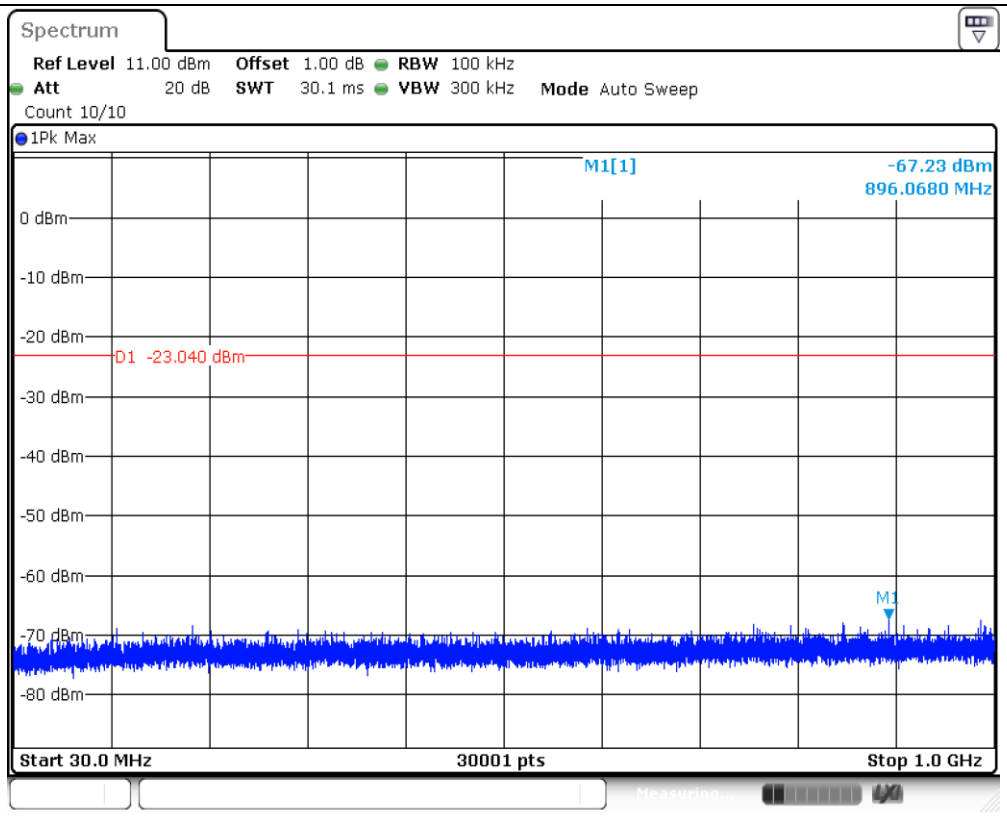
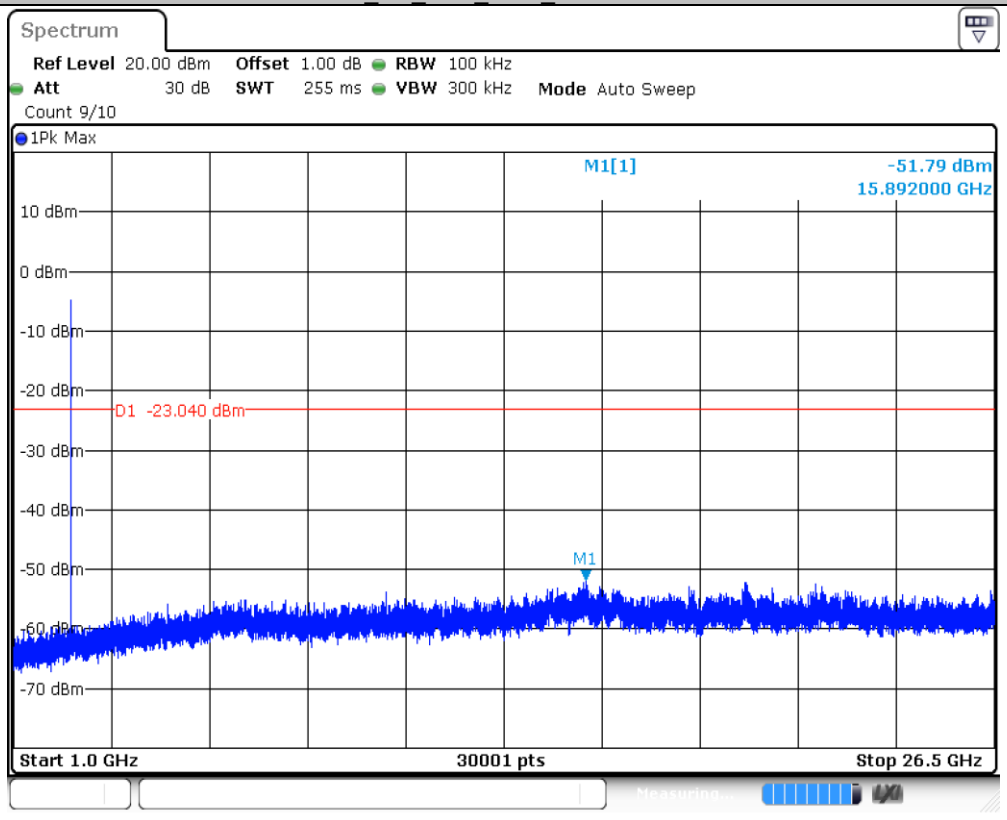


Date: 18.JUL.2023 18:53:53

BLE_2M_Ant1_2480_1000~26500



Date: 18.JUL.2023 18:54:00

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9.6 Band Edge

Test Method

1. The RF output of EUT was connected to the test receiver 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
   RBW = 100 kHz, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize, use the peak and delta measurement to record the result.
5. The level displayed must comply with the limit specified in this Section.
6. Repeat above procedures until all frequencies measured were complete and submit all the plots.

Limit

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

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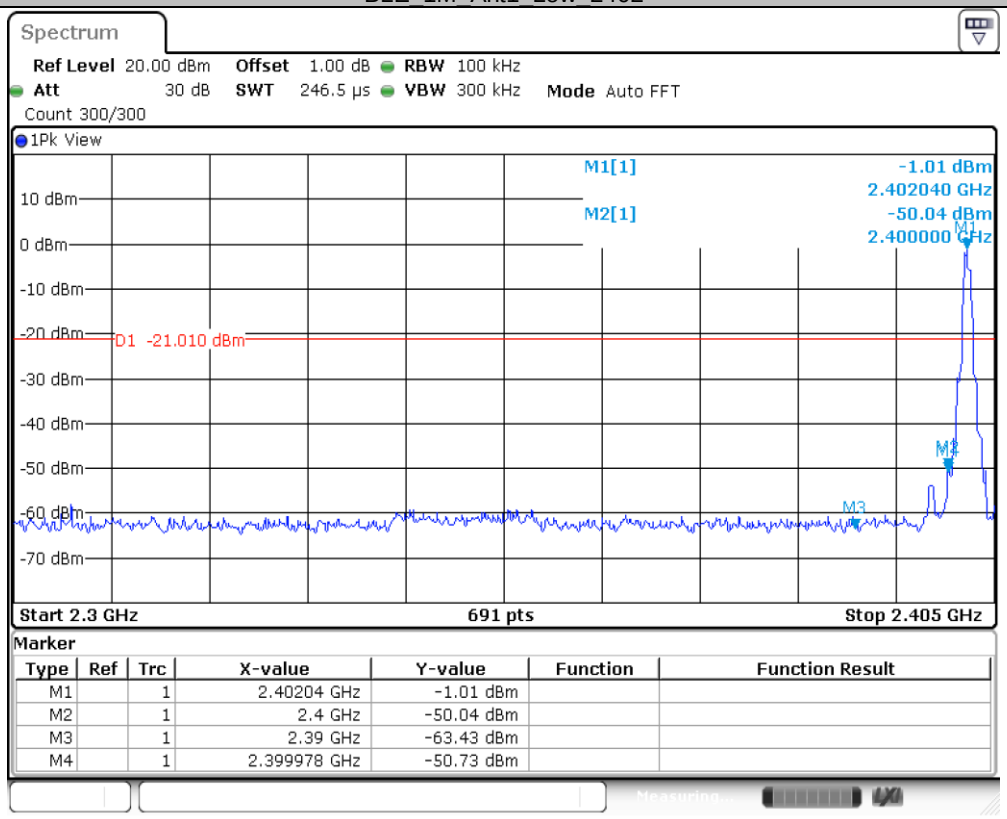
Band edge testing

Test Mode	Channel	Channel (MHz)	Reference Level (dBm)	Result (dBm)	Limit (dBm)	Verdict
BLE_1Mbps	Low	2402	-1.01	-50.73	<=-21.01	PASS
	High	2480	-1.60	-52.18	<=-21.6	PASS
BLE_2Mbps	Low	2402	-3.39	-36.5	<=-23.39	PASS
	High	2480	-3.18	-54.73	<=-23.18	PASS

BLE_1M_Ant1_Low_2402



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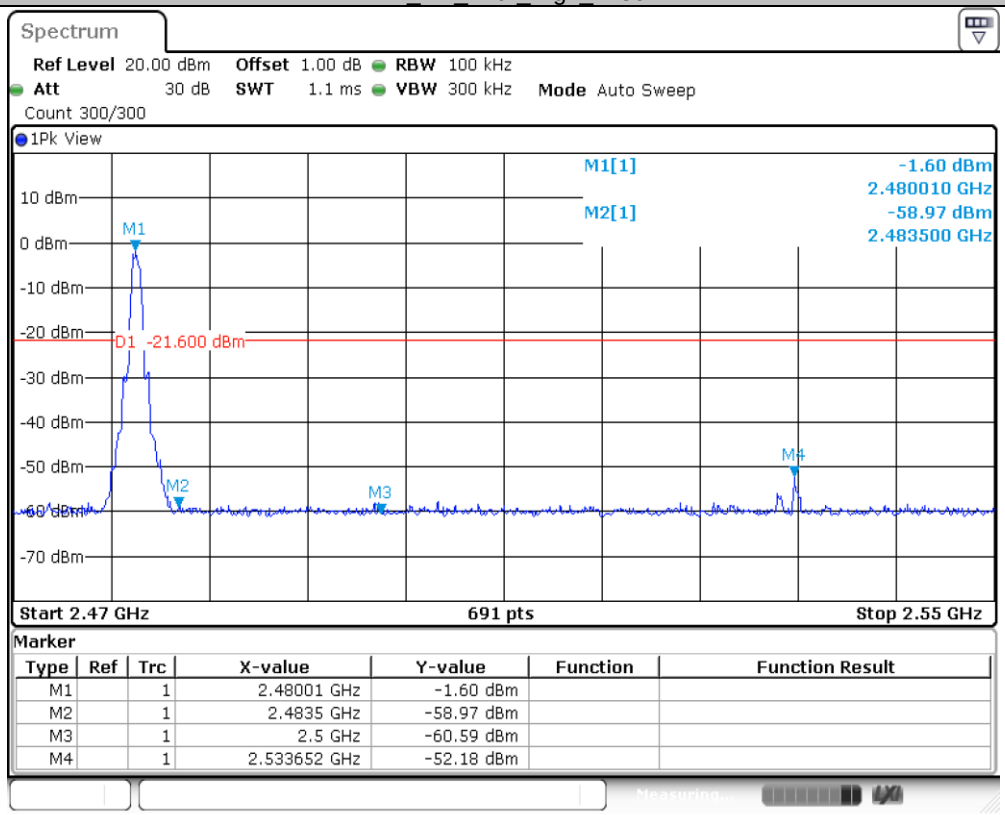
BLE_1M_Ant1_High_2480

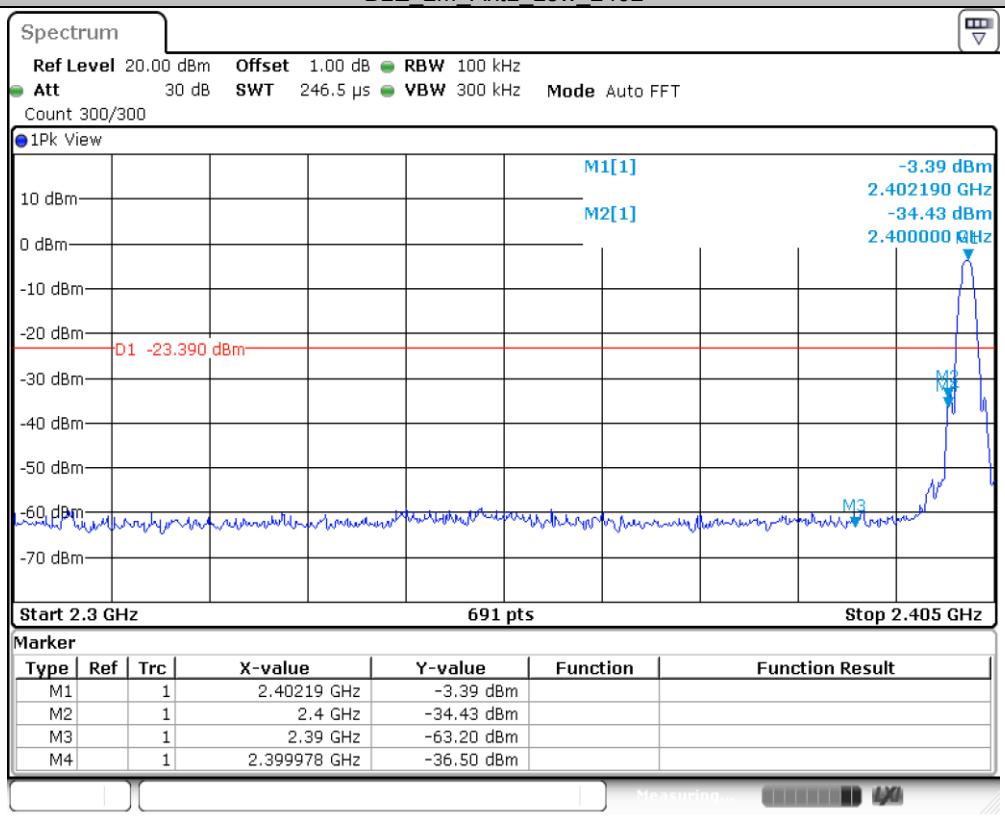


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48001 GHz	-1.60 dBm		
M2		1	2.4835 GHz	-58.97 dBm		
M3		1	2.5 GHz	-60.59 dBm		
M4		1	2.533652 GHz	-52.18 dBm		

Date: 18.JUL.2023 17:38:20

BLE_2M_Ant1_Low_2402



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40219 GHz	-3.39 dBm		
M2		1	2.4 GHz	-34.43 dBm		
M3		1	2.39 GHz	-63.20 dBm		
M4		1	2.399978 GHz	-36.50 dBm		

Date: 18.JUL.2023 18:58:23

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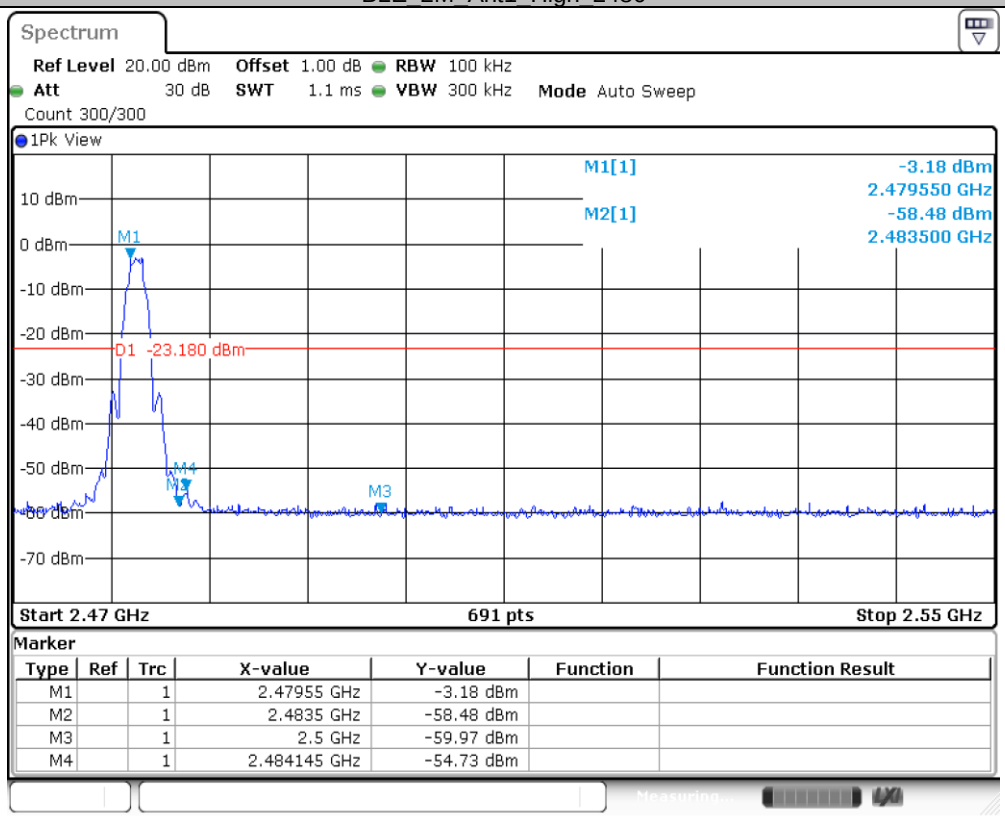
BLE_2M_Ant1_High_2480



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47955 GHz	-3.18 dBm		
M2		1	2.4835 GHz	-58.48 dBm		
M3		1	2.5 GHz	-59.97 dBm		
M4		1	2.484145 GHz	-54.73 dBm		

Date: 18.JUL.2023 18:53:41

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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

The radio emission outside the operating frequency band 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. Radiated emissions which fall in the restricted bands, as defined in section15.205 & RSS-GEN 8.10, must comply with the radiated emission limits specified in section 15.209 & RSS-Gen 6.13.

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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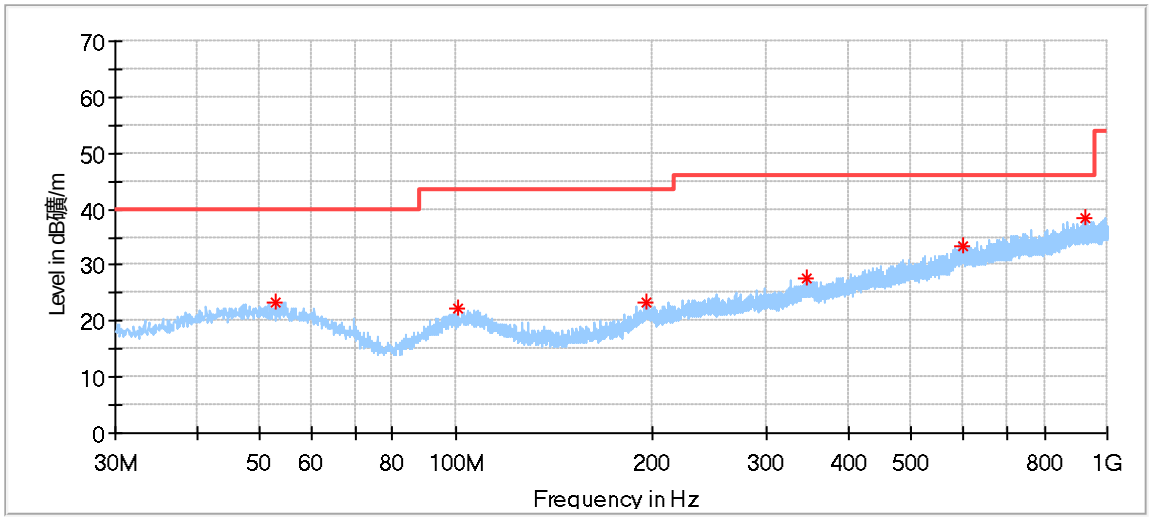
Spurious radiated emissions for transmitter

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.

The only worse case (1 Mbps) test result is listed in the report.

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)
53.010556	23.45	40.00	16.55	200.0	H	239.0	17.96
100.702222	22.25	43.50	21.25	200.0	H	357.0	16.35
195.600556	23.32	43.50	20.18	100.0	H	219.0	16.63
345.142222	27.66	46.00	18.34	200.0	H	260.0	20.54
600.737222	33.49	46.00	12.51	100.0	H	0.0	25.61
927.303889	38.51	46.00	7.49	100.0	H	124.0	29.46

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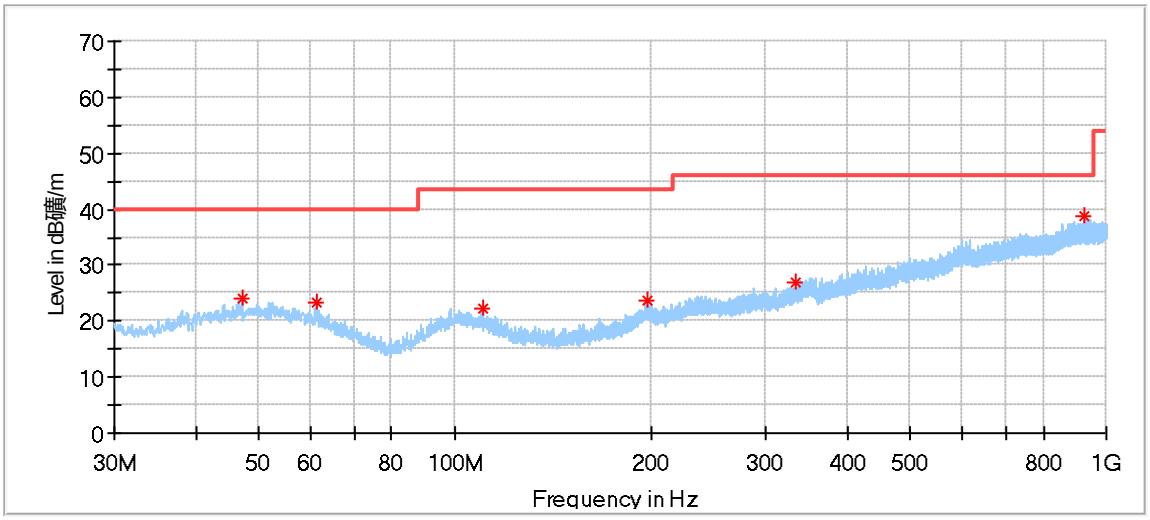

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
47.136667	23.97	40.00	16.03	200.0	V	66.0	17.83
61.309444	23.36	40.00	16.64	100.0	V	215.0	16.56
110.132778	22.25	43.50	21.25	200.0	V	89.0	15.81
196.893889	23.73	43.50	19.77	200.0	V	97.0	16.72
333.232778	26.75	46.00	19.25	100.0	V	65.0	19.89
922.615556	38.94	46.00	7.06	100.0	V	286.0	29.46

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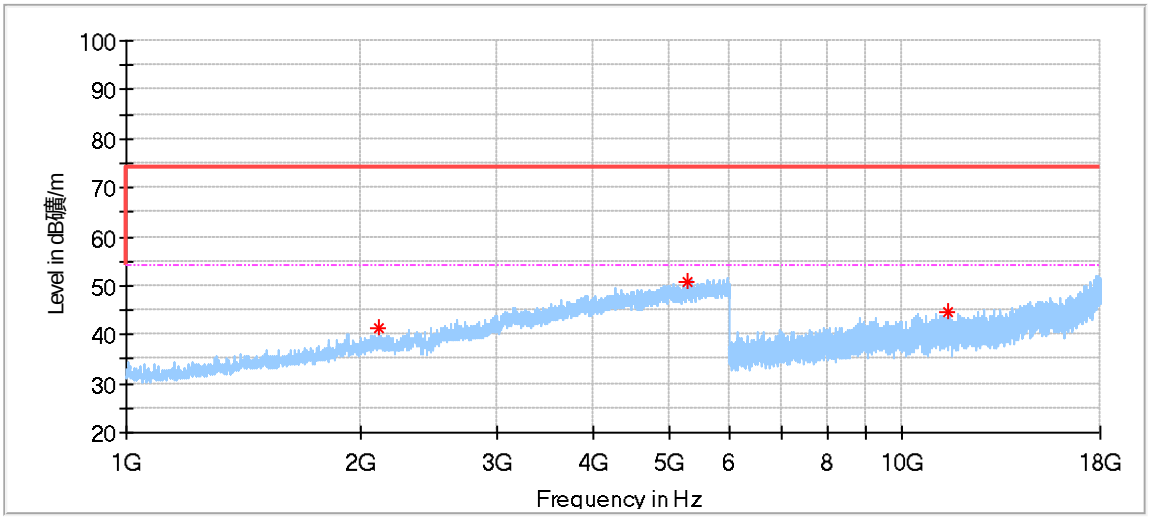
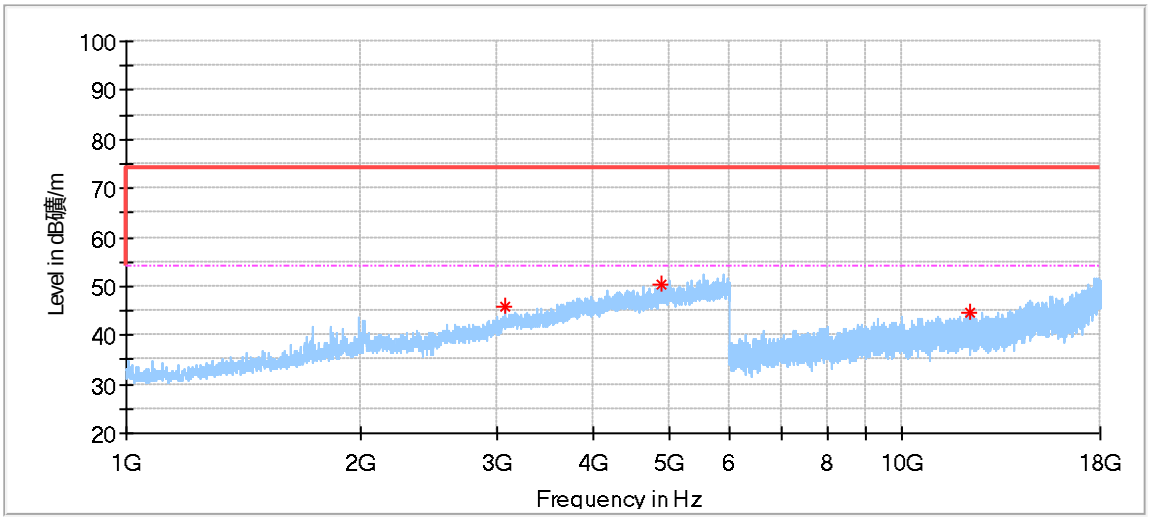
Test data 1GHz to 18GHz:
BLE_1Mbps_Low Channel:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2115.500000	41.28	74.00	32.72	150.0	H	303.0	-5.73
5296.500000	50.76	74.00	23.24	150.0	H	303.0	6.70
11473.000000*	44.52	74.00	29.48	150.0	H	356.0	14.59



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3075.000000	46.05	74.00	27.95	150.0	V	261.0	-1.01
4886.000000*	50.55	74.00	23.45	150.0	V	315.0	6.10
12208.500000*	44.77	74.00	29.23	150.0	V	215.0	15.21

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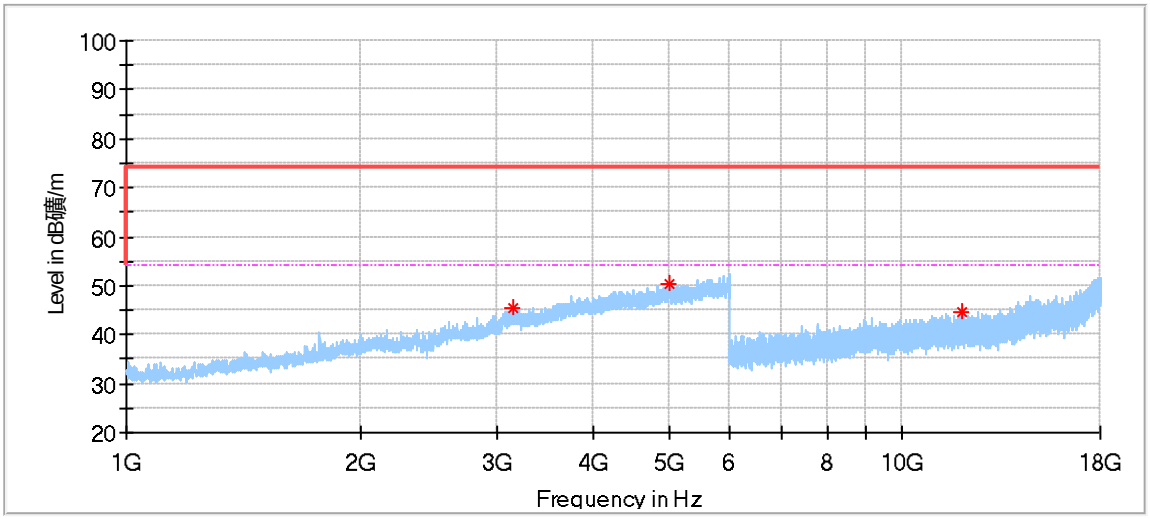
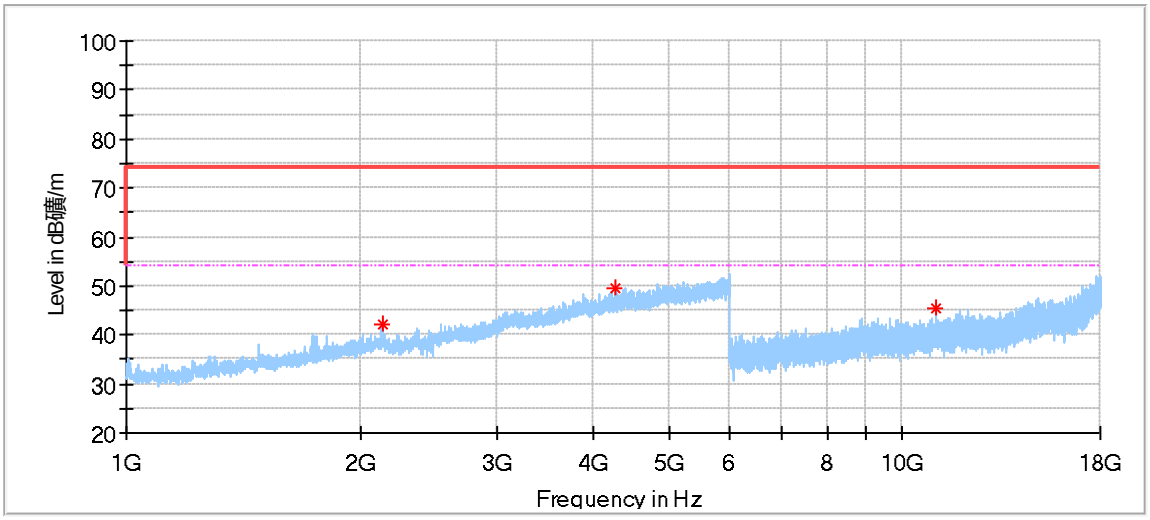
BLE_1Mbps _Middle Channel:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3143.000000	45.47	74.00	28.53	150.0	H	290.0	-0.35
4999.500000*	50.44	74.00	23.56	150.0	H	126.0	6.56
11973.500000*	44.81	74.00	29.19	150.0	H	185.0	15.21



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2144.000000	42.21	74.00	31.79	150.0	V	83.0	-5.71
4268.000000*	49.37	74.00	24.63	150.0	V	261.0	3.93
11046.500000*	45.55	74.00	28.45	150.0	V	328.0	14.02

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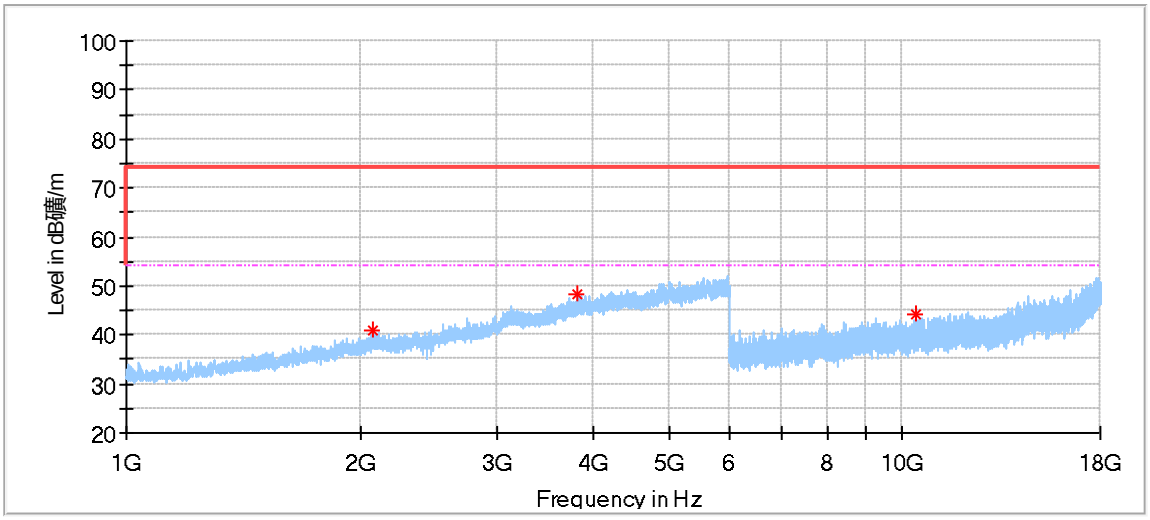
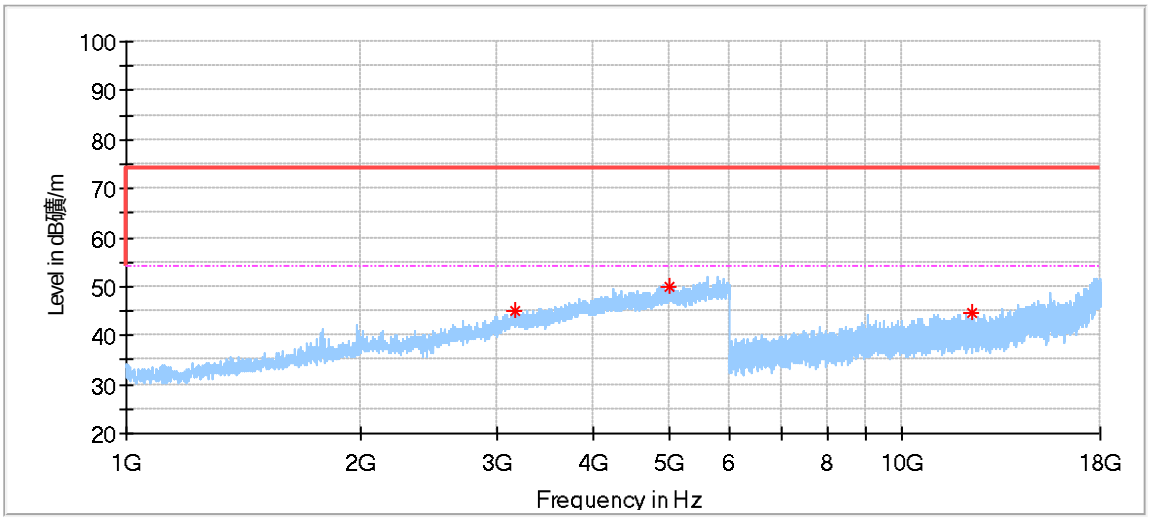
BLE_1Mbps _High Channel:



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2079.500000	40.84	74.00	33.16	150.0	H	353.0	-5.85
3822.000000*	48.15	74.00	25.85	150.0	H	333.0	2.62
10422.000000	44.28	74.00	29.72	150.0	H	144.0	13.15



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3179.000000	45.07	74.00	28.93	150.0	V	285.0	-0.34
5002.000000*	50.09	74.00	23.91	150.0	V	350.0	6.57
12305.500000*	44.66	74.00	29.34	150.0	V	299.0	15.13

Remark:

(1) "*" means 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) We test both rates for Low channel, Middle channel and High channel separately, only the worst case recorded in this report.

(4) Corrected Amplitude = Read level + Corrector factor
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

Radiated Emission Test(9K – 1GHz)

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	2024-5-19
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	68-4-80-14-002	707	1	2024-7-12
Loop Antenna	Rohde & Schwarz	HFH2-Z2	68-4-80-14-006	100398	1	2023-8-17
Pre-amplifier	Rohde & Schwarz	SCU 18	68-4-29-14-001	102230	1	2024-5-19
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

Radiated Emission 2# Test(1GHz – 40GHz)

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
Wave Guide Antenna	ETS	3117	68-4-80-19-001	00218954	1	2024-4-26
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	2024-7-12
Pre-amplifier	Rohde & Schwarz	SCU 40A	68-4-29-14-002	100432	1	2023-7-27
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

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

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Conducted RF Test System

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-NCBG157	68-4-93-14-003	101226/100851	1	2024-5-20
Power Splitter	Weinschel	1580	68-4-85-14-001	SC319	1	2024-5-19
10dB Attenuator	Weinschel	4M-10	68-4-81-14-003	43152	1	2024-5-19
10dB Attenuator	R&S	DNF	68-4-81-14-004	DNF-001	1	2024-5-19
10dB Attenuator	R&S	DNF	68-4-81-14-005	DNF-002	1	2024-5-19
10dB Attenuator	R&S	DNF	68-4-81-14-006	DNF-003	1	2024-5-19
10dB Attenuator	R&S	DNF	68-4-81-14-007	DNF-004	1	2024-5-19
Test software	Tonscend	System for BT/WIFI	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 150kHz-30MHz (for test using AMN ENV432 or ENV4200)	3.57dB
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.70dB
Uncertainty for Radiated Emission in new 3m chamber 30MHz-1000MHz	Horizontal: 4.59dB; Vertical: 4.75dB
Uncertainty for Radiated Emission in new 3m 1000MHz-18000MHz	Horizontal: 5.08dB; Vertical: 5.09dB;
Uncertainty for Radiated Emission 18000MHz-40000MHz	Horizontal: 4.52dB; Vertical: 4.51dB
Uncertainty for Conducted RF test	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.

---THE END OF REPORT---

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