CTC Laboratories, Inc.

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TEST REPORT

Report No. ·························: CTC2024205901

FCC ID·······························: 2AQ5R-HM-5U

Applicant···························: Shenzhen KTC Commercial Display Technology Co.,LTD.

Address······························: No.4023,Northern Wuhe Road,Bantian Street, Longgang District,Shenzhen City,Guangdong Province,P.R.

Manufacturer························: Shenzhen Bluesource Electronics Technology Co., Ltd

Address······························: Building 5A1103, Huaqiang IdeaPark, Guangming District, Shenzhen, China

Product Name·····················: Speakerphone

Trade Mark··························: /

Model/Type reference············: HM-5U

Listed Model(s) ····················: /

Standard····························: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of receipt of test sample…: Aug. 23, 2024

Date of testing…………………..: Aug. 23, 2024 ~ Sept. 25, 2024

Date of issue…………………....: Sept. 26, 2024

Result……………………………: PASS

Compiled by:
(Printed name+signature) Jim Jiang Jim Jiang

Supervised by:
(Printed name+signature) Eric Zhang Eric zhang

Approved by:
(Printed name+signature) Totti Zhao

Testing Laboratory Name……: CTC Laboratories, Inc.

Address…………………………..: Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

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1. 7TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report Version

Revised No.	Report No.	Date of issue	Description
01	CTC2024205901	Sept. 26, 2024	Original

1.3. Test Description

FCC Part 15 Subpart C (15.247)			
Test Item	**Standard Section**	**Result**	**Test Engineer**
	FCC		
Antenna Requirement	15.203	Pass	Jim Jiang
Conducted Emission	15.207	Pass	Jim Jiang
Conducted Band Edge and Spurious Emissions	15.247(d)	Pass	Jim Jiang
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	Pass	Jim Jiang
6dB Bandwidth	15.247(a)(2)	Pass	Jim Jiang
Conducted Max Output Power	15.247(b)(3)	Pass	Jim Jiang
Power Spectral Density	15.247(e)	Pass	Jim Jiang
Transmitter Radiated Spurious	15.209&15.247(d)	Pass	Jim Jiang

Note: The measurement uncertainty is not included in the test result.

1.4. Test Facility

CTC Laboratories, Inc.

Add: Room 101 of Building B, Room 107, 108, 207, 208 of Building A, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

Laboratory accreditation

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

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained inour files. Registration 951311, Aug 26, 2017.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.

Test Items	**Measurement Uncertainty**	**Notes**
RF output power	± 1.24 dB	(1)
Power Spectral Density	±1.88 dB	(1)
Duty Cycle	±0.566 dB	(1)
Tx-sequence	±0.566 dB	(1)
Tx-gap	±0.566 dB	(1)
Medium Utilization (MU) factor	±0.566 dB	(1)
Dwell time	±0.028%	(1)
Minimum Frequency Occupation	±0.028%	(1)
Hopping Sequence	±1.9%	(1)
Hopping Frequency Separation	±1.9%	(1)
Occupied Channel Bandwidth	±0.0196%	(1)
Transmitter unwanted emissions in the out-of-band domain	±1.328dB	(1)
Transmitter unwanted emissions in the spurious domain	30MHz~1GHz: ±0.746dB 1GHz~12.75GHz: ±1.328dB	(1)
Receiver spurious emissions	30MHz~1GHz: ±0.746dB 1GHz~12.75GHz: ±1.328dB	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.6. Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	21°C ~ 27°C
Relative Humidity:	40% ~ 60%
Air Pressure:	101kPa

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Shenzhen KTC Commercial Display Technology Co.,LTD.
Address:	No.4023,Northern Wuhe Road,Bantian Street, Longgang District,Shenzhen City,Guangdong Province,P.R.
Manufacturer:	Shenzhen Bluesource Electronics Technology Co., Ltd
Address:	Building 5A1103, Huaqiang IdeaPark, Guangming District, Shenzhen, China

2.2. General Description of EUT

Product Name:	Speakerphone
Trade Mark:	/
Model/Type reference:	HM-5U
Listed Model(s):	/
Model Difference:	/
Power supply:	DC 15V 2.4A from adapter
Hardware version:	/
Software version:	/
BT 5.0/ BLE	
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Data rate:	1Mbps, 2Mbps
Antenna type:	PCB Antenna
Antenna gain:	1.72dBi

Note: The EUT contains two Bluetooth modules with the same PCB, layout and electrical circuit. This report only records the test data of one module.

2.3. Accessory Equipment Information

Equipment Information			
Name	Model	S/N	Manufacturer
Notebook	ThinkBook 14 G3 ACL	/	Lenovo
USB TO TTL	/	/	/
Adapter	FJ-SW248G1502400N	/	FUJIA
Cable Information			
Name	Shielded Type	Ferrite Core	Length
USB Cable	Unshielded	Without	100cm
Test Software Information			
Name	/	/	/
FCC assist	1.0.2.2	/	/

2.4. Operation State

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. BT BLE, 40 channels are provided to the EUT. Channels 00/19/39 were selected for testing.

Operation Frequency List:

Channel	Frequency (MHz)
00	**2402**
01	2404
⋮	⋮
18	2438
19	**2440**
20	2442
⋮	⋮
38	2478
39	**2480**

Note: The display in grey were the channel selected for testing.

Test mode

For RF test items:
The engineering test program was provided and enabled to make EUT continuous transmit.
For AC power line conducted emissions:
The EUT was set to connect with the Bluetooth instrument under large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

2.5. Measurement Instruments List

RF Test System - SRD					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Spectrum Analyzer	Keysight	N9020A	MY52091402	Aug. 21, 2025
2	USB Wideband Power Sensor	Keysight	U2021XA	MY55130004	Mar. 21 2025
3	USB Wideband Power Sensor	Keysight	U2021XA	MY55130006	Mar. 21 2025
4	Test Software	Tonscend	JS1120-3	V3.3.38	/

Radiated emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9163	01026	Dec. 18, 2024
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Sep. 25, 2025
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 12, 2024
4	Broadband Amplifier	SCHWARZBECK	BBV9743B	259	Dec. 12, 2024
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 12, 2024
6	3m chamber 3	YIHENG	EE106	/	Aug. 28, 2026
7	Test Software	FARA	EZ-EMC	FA-03A2	/

Conducted emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 12, 2024
2	LISN	R&S	ENV216	101113	Dec. 12, 2024
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 12, 2024
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 12, 2024
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 12, 2024
6	Test Software	R&S	EMC32	6.10.10	/

Note:1. The Cal. Interval was one year.
2. The cable loss has calculated in test result which connection between each test instruments.

3. TEST ITEM AND RESULTS

3.1. Conducted Emission

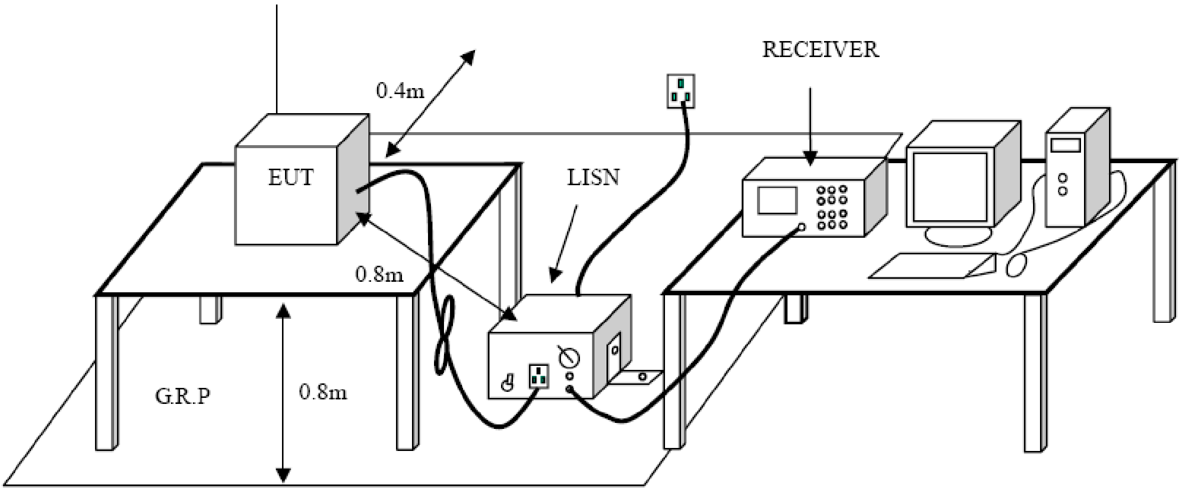
Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Configuration



Test Procedure

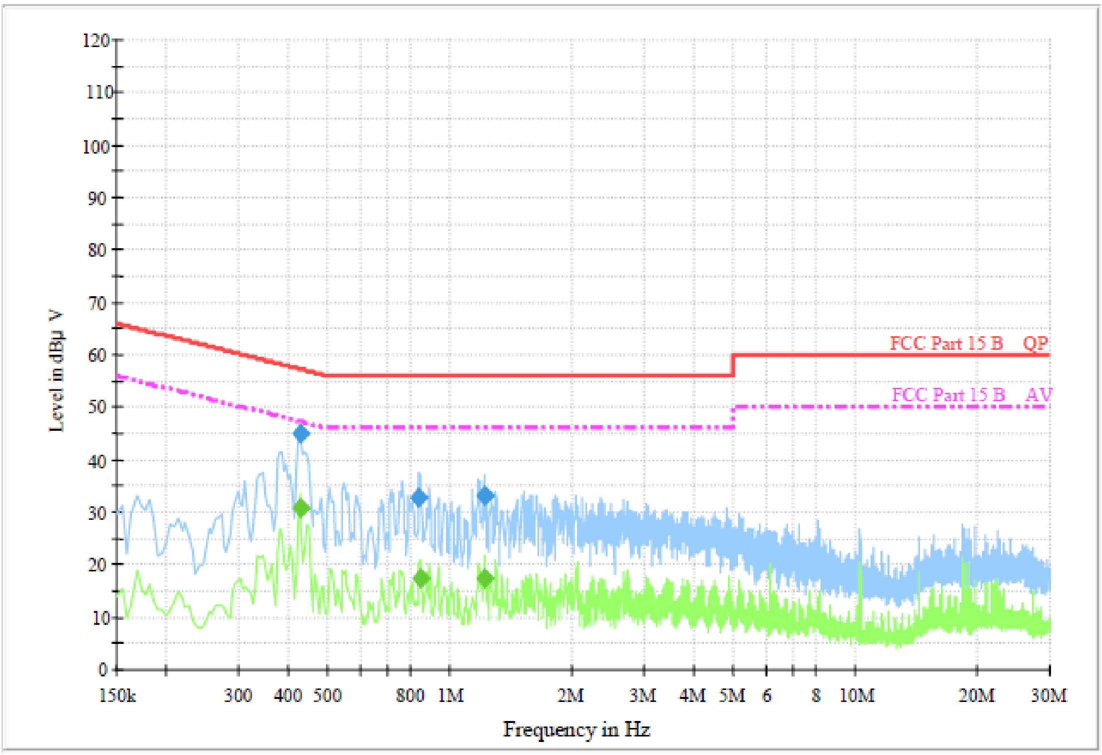
1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode:

Please refer to the clause 2.4.

Test Results

Test Voltage:	AC 120V/60 Hz
Terminal:	Line



Final Measurement Detector 1

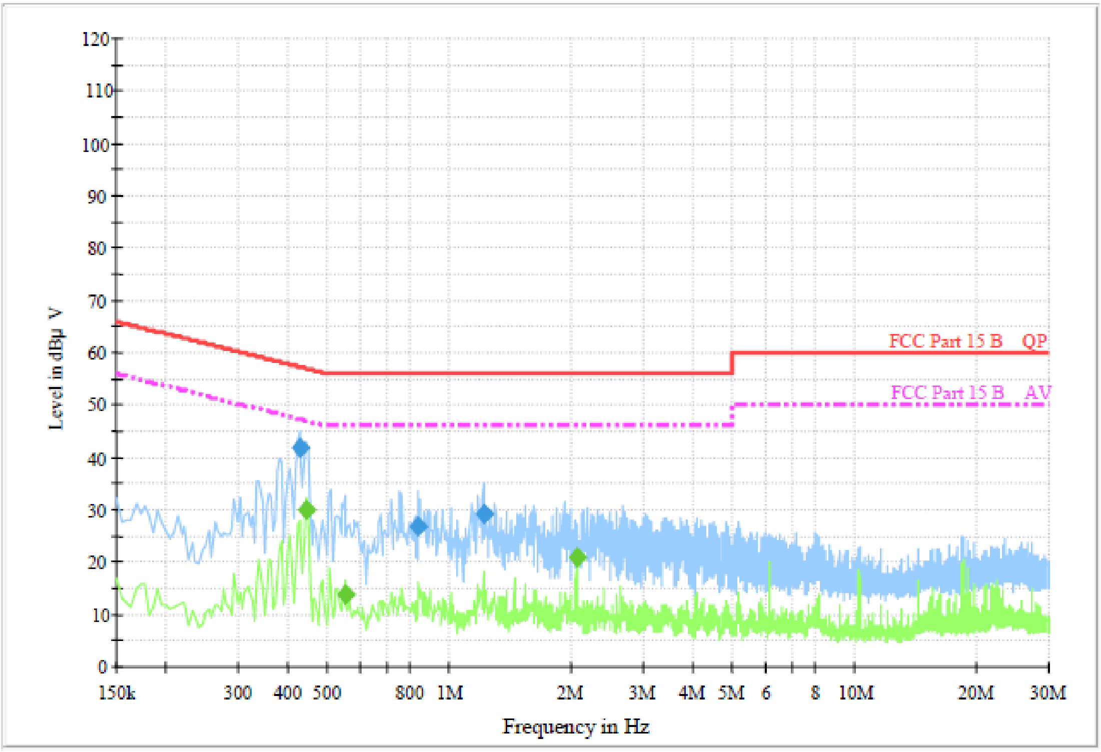
Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.424500	44.9	1000.00	9.000	On	L1	9.5	12.5	57.4	
0.838500	32.8	1000.00	9.000	On	L1	9.5	23.2	56.0	
1.207500	33.0	1000.00	9.000	On	L1	9.7	23.0	56.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.424500	30.8	1000.00	9.000	On	L1	9.5	16.6	47.4	
0.843000	17.2	1000.00	9.000	On	L1	9.5	28.8	46.0	
1.212000	17.3	1000.00	9.000	On	L1	9.7	28.7	46.0	

Emission Level= Read Level+ Correct Factor

Test Voltage:	AC 120V/60 Hz
Terminal:	Neutral



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.424500	42.0	1000.00	9.000	On	N	9.4	15.4	57.4	
0.834000	26.7	1000.00	9.000	On	N	9.4	29.3	56.0	
1.207500	29.4	1000.00	9.000	On	N	9.6	26.6	56.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.442500	30.2	1000.00	9.000	On	N	9.4	16.8	47.0	
0.550500	13.9	1000.00	9.000	On	N	9.4	32.1	46.0	
2.049000	20.8	1000.00	9.000	On	N	9.4	25.2	46.0	

Emission Level= Read Level+ Correct Factor

3.2. Radiated Emission

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS – Gen 8.9

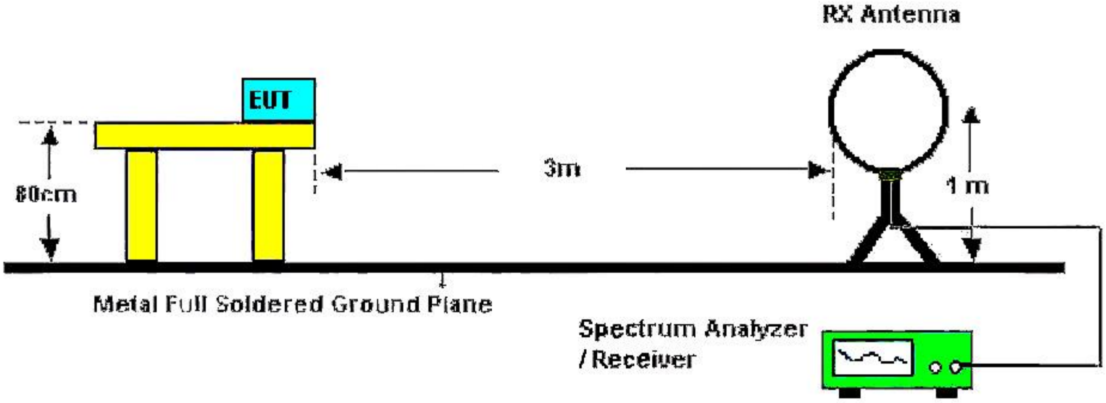
Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
Above 1 GHz	54.00	Average
	74.00	Peak

Note:

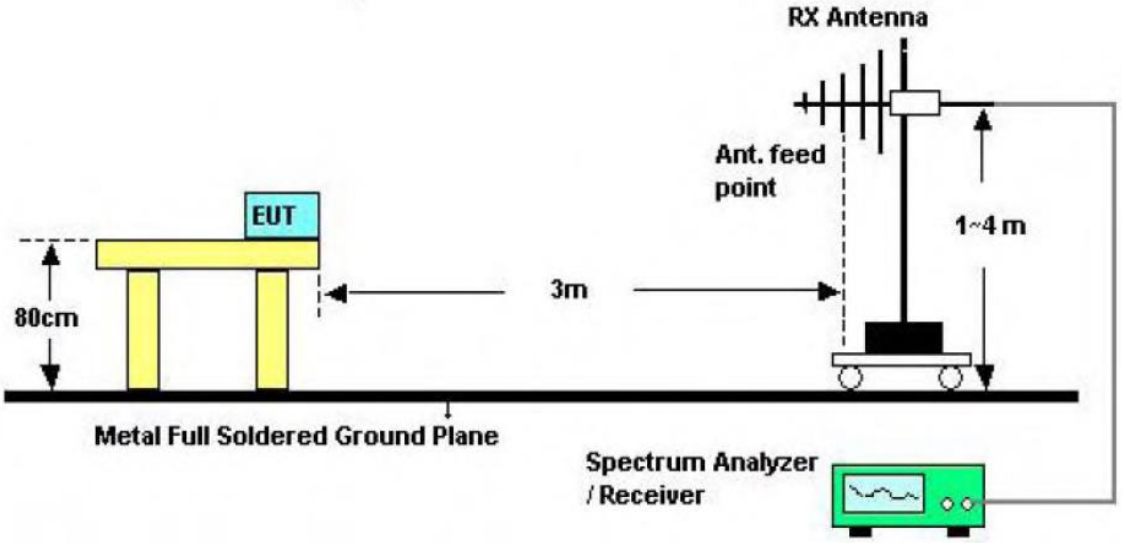
(1) The tighter limit applies at the band edges.

(2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

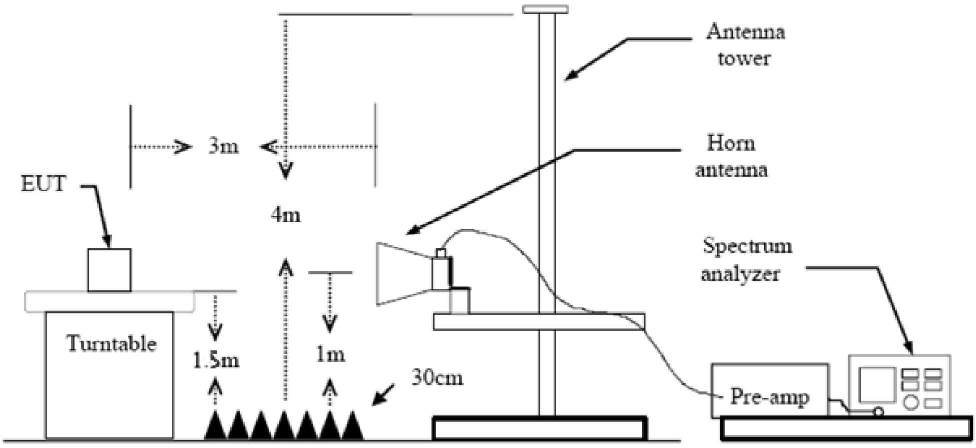
Test Configuration


RX Antenna
EUT
80cm
3m
1 m
Metal Full Soldered Ground Plane
Spectrum Analyzer
/ Receiver

Below 30MHz Test Setup


RX Antenna
Ant. feed
point
EUT
1~4 m
80cm
3m
Metal Full Soldered Ground Plane
Spectrum Analyzer
/ Receiver

Below 1000MHz Test Setup



Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings

(1) Span shall wide enough to fully capture the emission being measured;
(2) 9k – 150kHz:
RBW=300 Hz, VBW=1 kHz, Sweep=auto, Detector function=peak, Trace=max hold
(3) 0.15M – 30MHz:
RBW=10 kHz, VBW=30 kHz, Sweep=auto, Detector function=peak, Trace=max hold
(4) 30M - 1 GHz:
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
(5) From 1 GHz to 10th harmonic:
RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.
Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

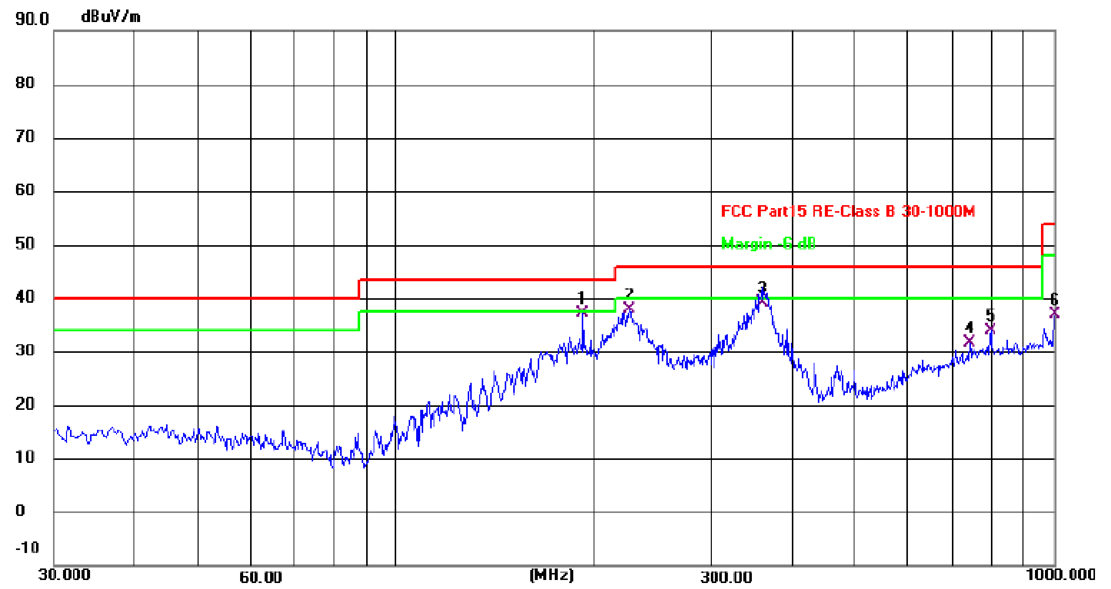
9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

30MHz-1GHz

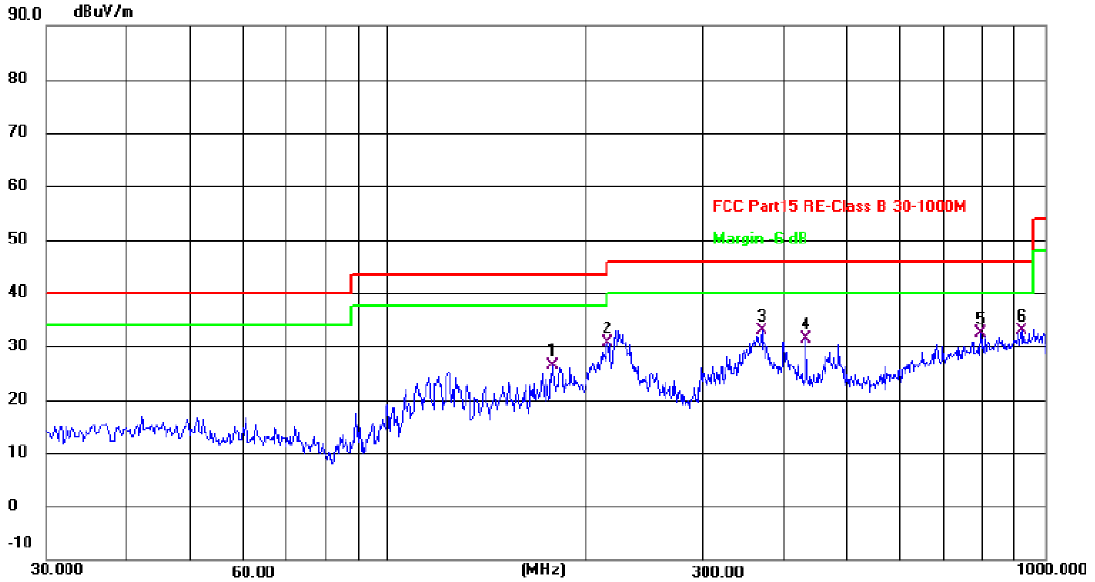
Ant. Pol.	Horizontal
Test Mode:	TX BLE 1Mbps Mode 2402MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	191.9900	56.16	-18.97	37.19	43.50	-6.31	QP
2	225.9400	56.43	-18.46	37.97	46.00	-8.03	QP
3	360.4466	53.12	-14.05	39.07	46.00	-6.93	QP
4	742.6266	36.65	-4.95	31.70	46.00	-14.30	QP
5	799.5333	37.56	-3.79	33.77	46.00	-12.23	QP
6	1000.0000	37.88	-1.07	36.81	54.00	-17.19	QP

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. Pol.	Vertical
Test Mode:	TX BLE 1Mbps Mode 2402MHz
Remark:	Only worse case is reported

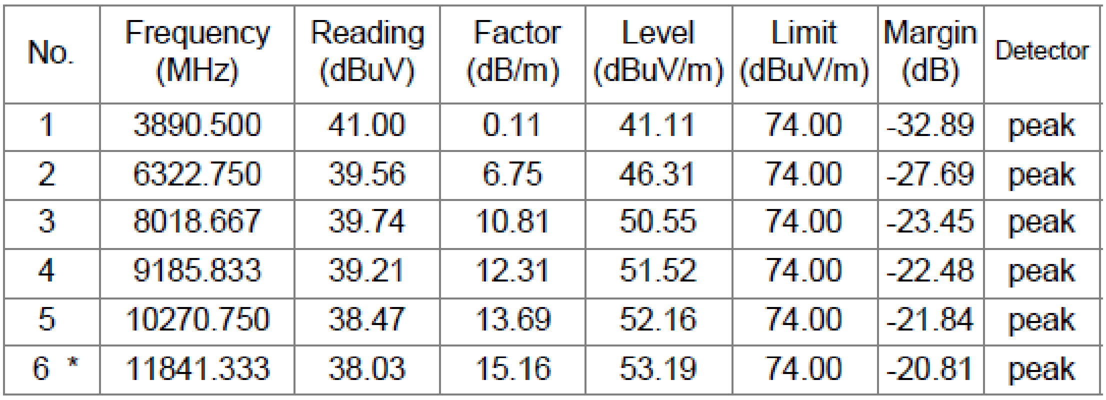


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	177.7633	43.87	-17.46	26.41	43.50	-17.09	QP
2 *	215.2700	49.56	-18.83	30.73	43.50	-12.77	QP
3	370.4700	46.55	-13.77	32.78	46.00	-13.22	QP
4	433.1966	43.23	-11.92	31.31	46.00	-14.69	QP
5	797.2700	36.32	-3.83	32.49	46.00	-13.51	QP
6	922.7233	35.05	-2.25	32.80	46.00	-13.20	QP

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Above 1GHz

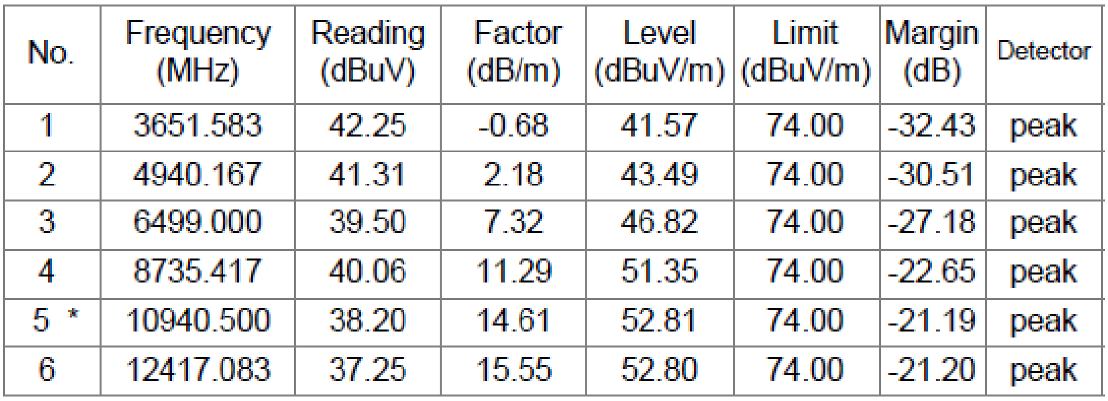
Ant. Pol.	Horizontal
Test Mode:	TX BLE 1Mbps Mode 2402MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3890.500	41.00	0.11	41.11	74.00	-32.89	peak
2	6322.750	39.56	6.75	46.31	74.00	-27.69	peak
3	8018.667	39.74	10.81	50.55	74.00	-23.45	peak
4	9185.833	39.21	12.31	51.52	74.00	-22.48	peak
5	10270.750	38.47	13.69	52.16	74.00	-21.84	peak
6 *	11841.333	38.03	15.16	53.19	74.00	-20.81	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

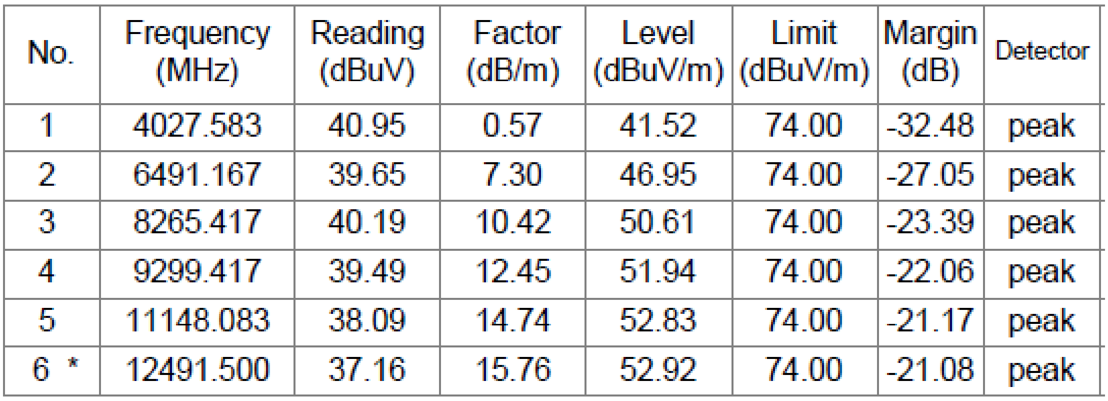
Ant. Pol.	Vertical
Test Mode:	TX BLE 1Mbps Mode 2402MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3651.583	42.25	-0.68	41.57	74.00	-32.43	peak
2	4940.167	41.31	2.18	43.49	74.00	-30.51	peak
3	6499.000	39.50	7.32	46.82	74.00	-27.18	peak
4	8735.417	40.06	11.29	51.35	74.00	-22.65	peak
5 *	10940.500	38.20	14.61	52.81	74.00	-21.19	peak
6	12417.083	37.25	15.55	52.80	74.00	-21.20	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

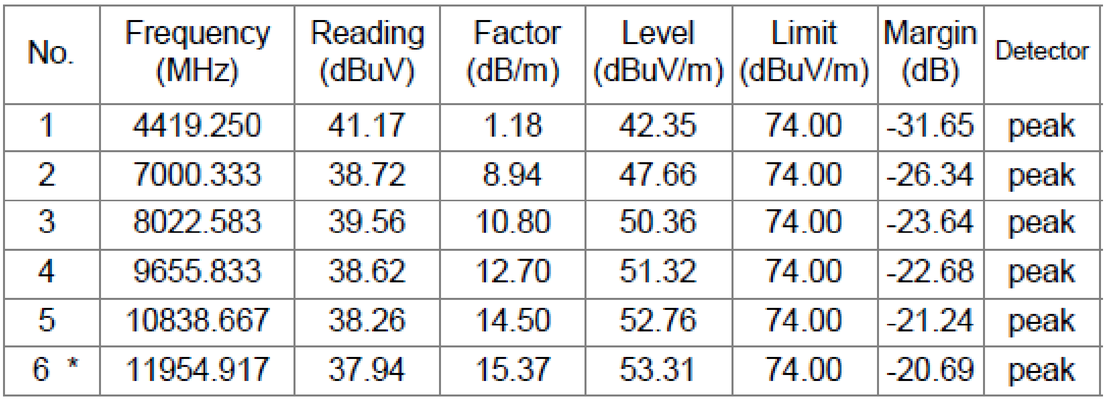
Ant. Pol.	Horizontal
Test Mode:	TX BLE 1Mbps Mode 2440MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4027.583	40.95	0.57	41.52	74.00	-32.48	peak
2	6491.167	39.65	7.30	46.95	74.00	-27.05	peak
3	8265.417	40.19	10.42	50.61	74.00	-23.39	peak
4	9299.417	39.49	12.45	51.94	74.00	-22.06	peak
5	11148.083	38.09	14.74	52.83	74.00	-21.17	peak
6 *	12491.500	37.16	15.76	52.92	74.00	-21.08	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

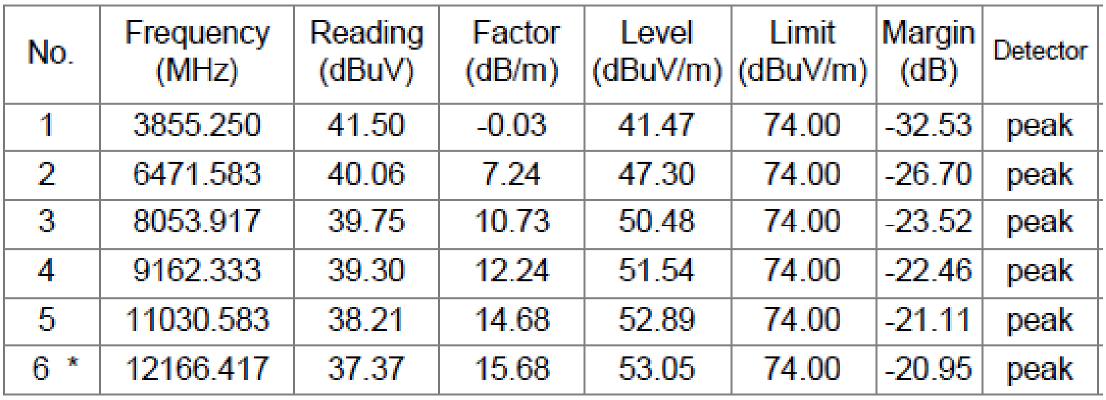
Ant. Pol.	Vertical
Test Mode:	TX BLE 1Mbps Mode 2440MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4419.250	41.17	1.18	42.35	74.00	-31.65	peak
2	7000.333	38.72	8.94	47.66	74.00	-26.34	peak
3	8022.583	39.56	10.80	50.36	74.00	-23.64	peak
4	9655.833	38.62	12.70	51.32	74.00	-22.68	peak
5	10838.667	38.26	14.50	52.76	74.00	-21.24	peak
6 *	11954.917	37.94	15.37	53.31	74.00	-20.69	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

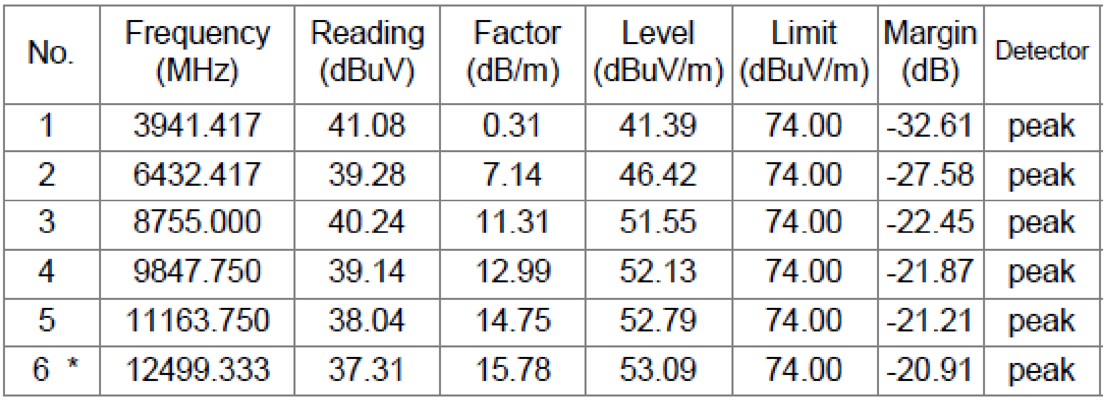
Ant. Pol.	Horizontal
Test Mode:	TX BLE 1Mbps Mode 2480MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3855.250	41.50	-0.03	41.47	74.00	-32.53	peak
2	6471.583	40.06	7.24	47.30	74.00	-26.70	peak
3	8053.917	39.75	10.73	50.48	74.00	-23.52	peak
4	9162.333	39.30	12.24	51.54	74.00	-22.46	peak
5	11030.583	38.21	14.68	52.89	74.00	-21.11	peak
6 *	12166.417	37.37	15.68	53.05	74.00	-20.95	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

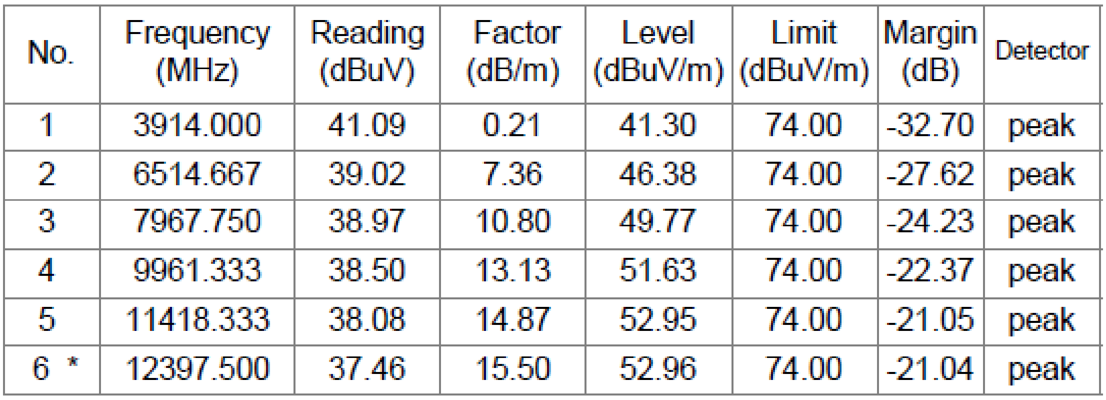
Ant. Pol.	Vertical
Test Mode:	TX BLE 1Mbps Mode 2480MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3941.417	41.08	0.31	41.39	74.00	-32.61	peak
2	6432.417	39.28	7.14	46.42	74.00	-27.58	peak
3	8755.000	40.24	11.31	51.55	74.00	-22.45	peak
4	9847.750	39.14	12.99	52.13	74.00	-21.87	peak
5	11163.750	38.04	14.75	52.79	74.00	-21.21	peak
6 *	12499.333	37.31	15.78	53.09	74.00	-20.91	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

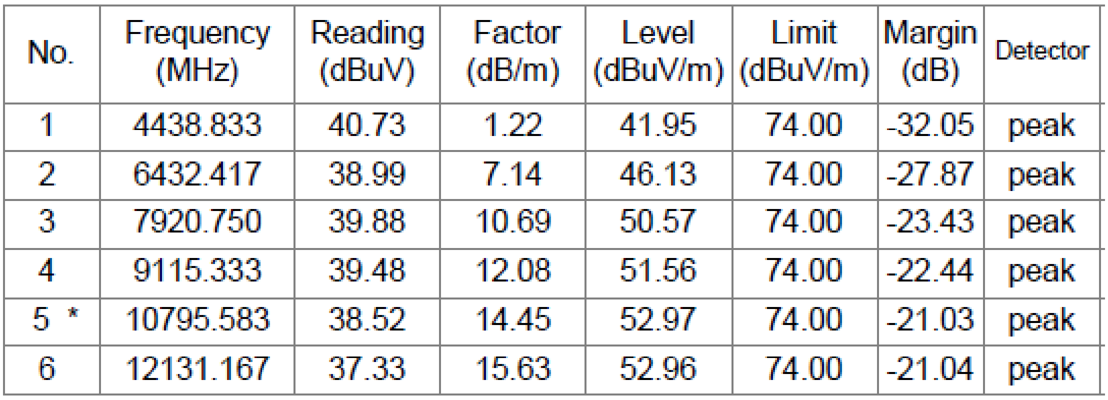
Ant. Pol.	Horizontal
Test Mode:	TX BLE 2Mbps Mode 2402MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3914.000	41.09	0.21	41.30	74.00	-32.70	peak
2	6514.667	39.02	7.36	46.38	74.00	-27.62	peak
3	7967.750	38.97	10.80	49.77	74.00	-24.23	peak
4	9961.333	38.50	13.13	51.63	74.00	-22.37	peak
5	11418.333	38.08	14.87	52.95	74.00	-21.05	peak
6 *	12397.500	37.46	15.50	52.96	74.00	-21.04	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

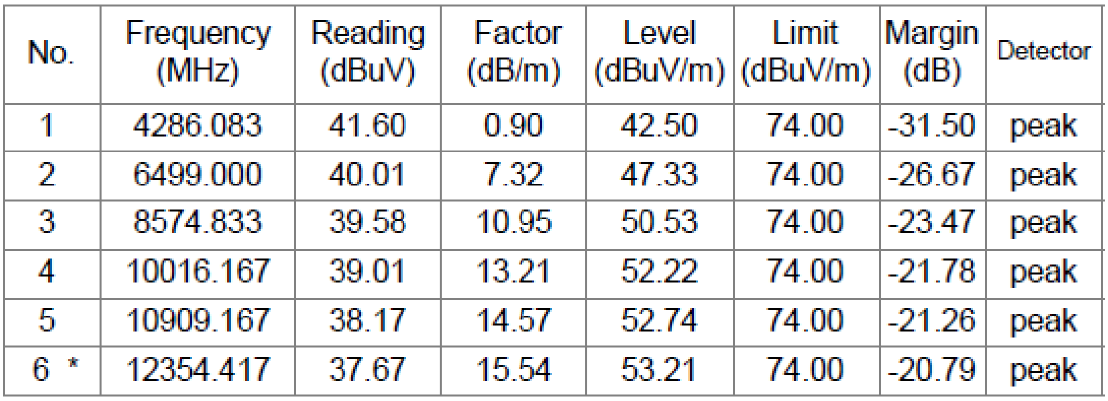
Ant. Pol.	Vertical
Test Mode:	TX BLE 2Mbps Mode 2402MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4438.833	40.73	1.22	41.95	74.00	-32.05	peak
2	6432.417	38.99	7.14	46.13	74.00	-27.87	peak
3	7920.750	39.88	10.69	50.57	74.00	-23.43	peak
4	9115.333	39.48	12.08	51.56	74.00	-22.44	peak
5 *	10795.583	38.52	14.45	52.97	74.00	-21.03	peak
6	12131.167	37.33	15.63	52.96	74.00	-21.04	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

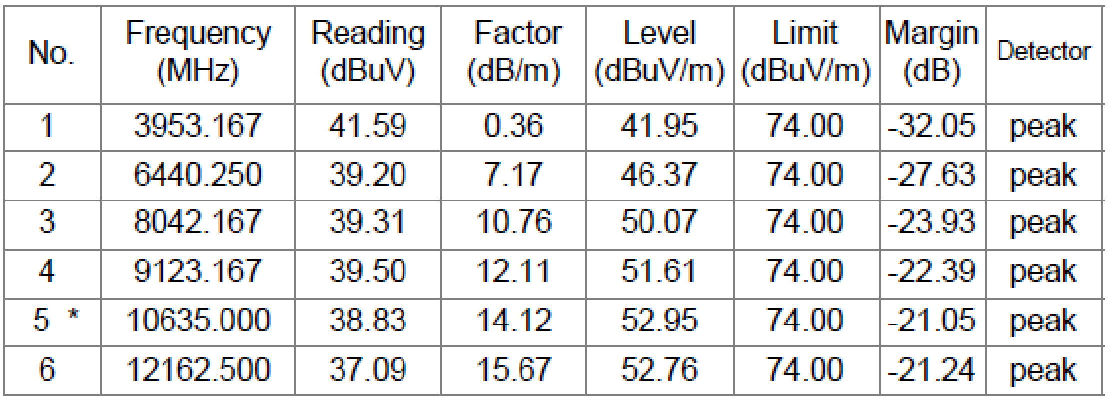
Ant. Pol.	Horizontal
Test Mode:	TX BLE 2Mbps Mode 2440MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4286.083	41.60	0.90	42.50	74.00	-31.50	peak
2	6499.000	40.01	7.32	47.33	74.00	-26.67	peak
3	8574.833	39.58	10.95	50.53	74.00	-23.47	peak
4	10016.167	39.01	13.21	52.22	74.00	-21.78	peak
5	10909.167	38.17	14.57	52.74	74.00	-21.26	peak
6 *	12354.417	37.67	15.54	53.21	74.00	-20.79	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

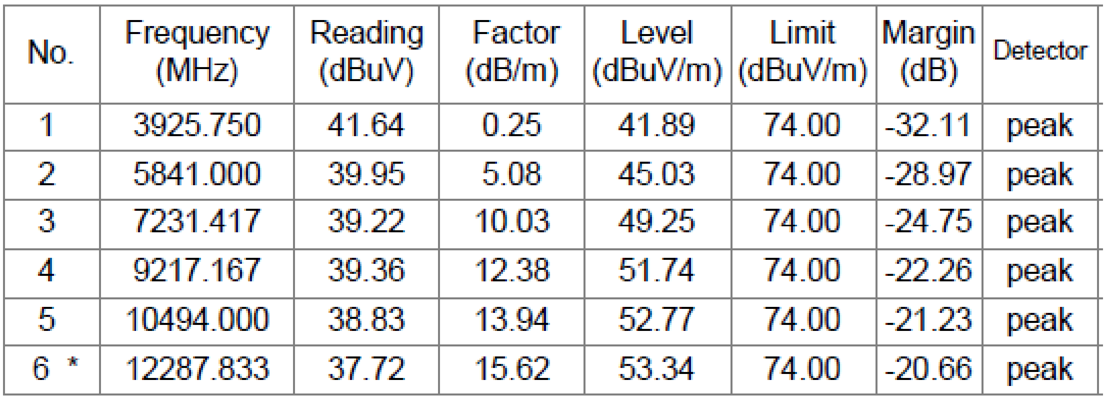
Ant. Pol.	Vertical
Test Mode:	TX BLE 2Mbps Mode 2440MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3953.167	41.59	0.36	41.95	74.00	-32.05	peak
2	6440.250	39.20	7.17	46.37	74.00	-27.63	peak
3	8042.167	39.31	10.76	50.07	74.00	-23.93	peak
4	9123.167	39.50	12.11	51.61	74.00	-22.39	peak
5 *	10635.000	38.83	14.12	52.95	74.00	-21.05	peak
6	12162.500	37.09	15.67	52.76	74.00	-21.24	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

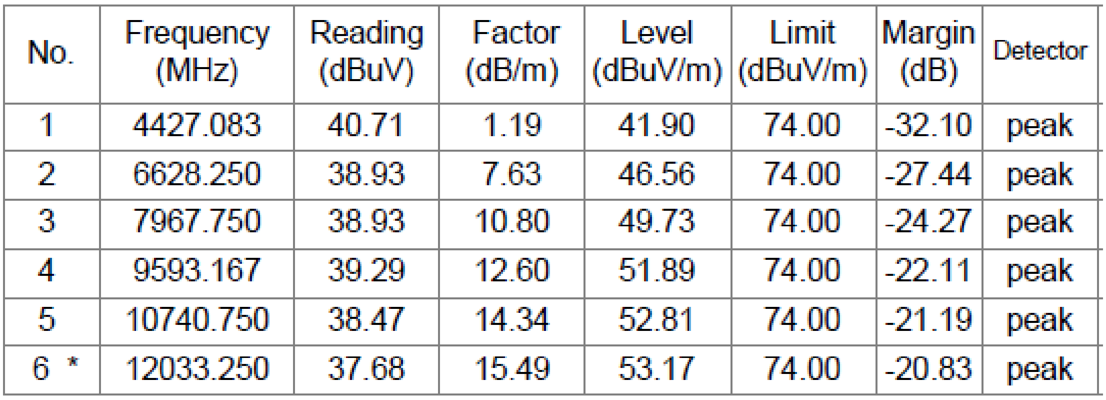
Ant. Pol.	Horizontal
Test Mode:	TX BLE 2Mbps Mode 2480MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3925.750	41.64	0.25	41.89	74.00	-32.11	peak
2	5841.000	39.95	5.08	45.03	74.00	-28.97	peak
3	7231.417	39.22	10.03	49.25	74.00	-24.75	peak
4	9217.167	39.36	12.38	51.74	74.00	-22.26	peak
5	10494.000	38.83	13.94	52.77	74.00	-21.23	peak
6 *	12287.833	37.72	15.62	53.34	74.00	-20.66	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

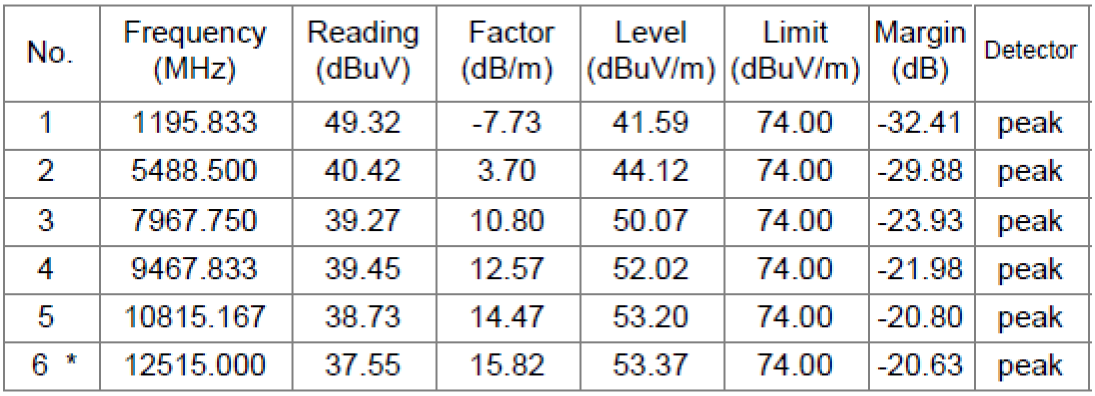
Ant. Pol.	Vertical
Test Mode:	TX BLE 2Mbps Mode 2480MHz (BT Module 1)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4427.083	40.71	1.19	41.90	74.00	-32.10	peak
2	6628.250	38.93	7.63	46.56	74.00	-27.44	peak
3	7967.750	38.93	10.80	49.73	74.00	-24.27	peak
4	9593.167	39.29	12.60	51.89	74.00	-22.11	peak
5	10740.750	38.47	14.34	52.81	74.00	-21.19	peak
6 *	12033.250	37.68	15.49	53.17	74.00	-20.83	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

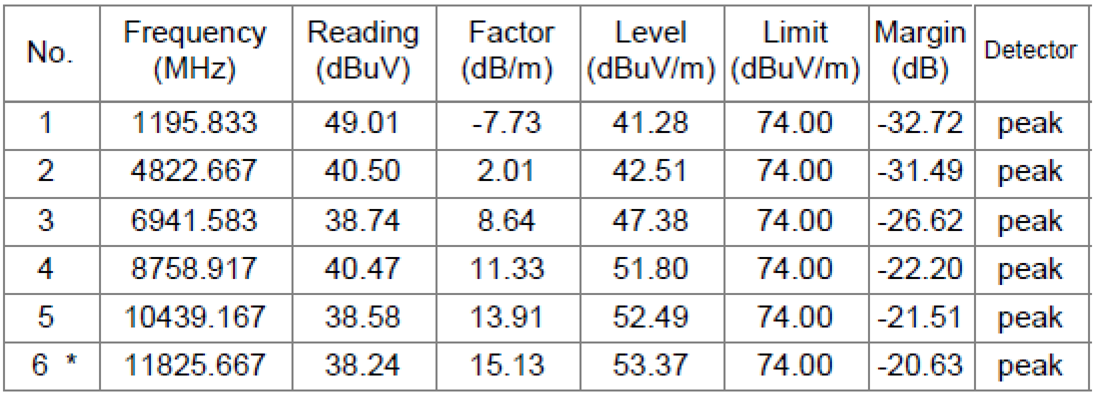
Ant. Pol.	Horizontal
Test Mode:	TX BLE 1Mbps Mode 2402MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1195.833	49.32	-7.73	41.59	74.00	-32.41	peak
2	5488.500	40.42	3.70	44.12	74.00	-29.88	peak
3	7967.750	39.27	10.80	50.07	74.00	-23.93	peak
4	9467.833	39.45	12.57	52.02	74.00	-21.98	peak
5	10815.167	38.73	14.47	53.20	74.00	-20.80	peak
6 *	12515.000	37.55	15.82	53.37	74.00	-20.63	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

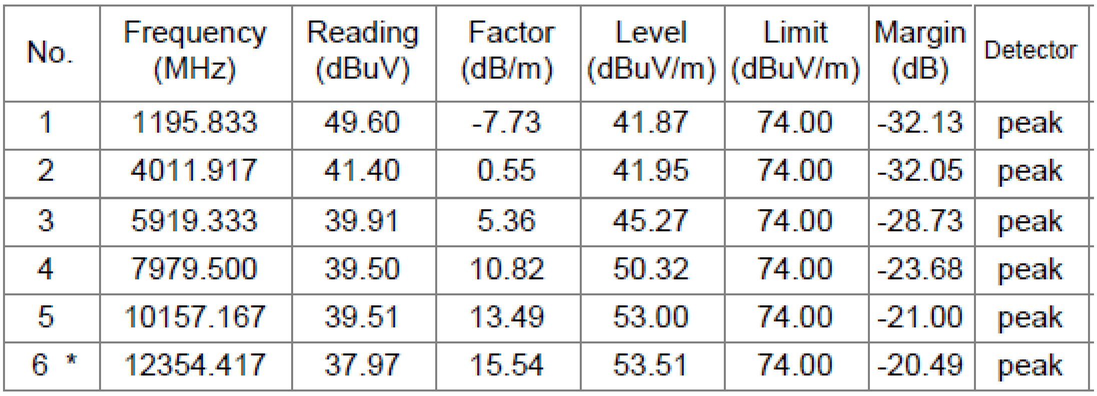
Ant. Pol.	Vertical
Test Mode:	TX BLE 1Mbps Mode 2402MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1195.833	49.01	-7.73	41.28	74.00	-32.72	peak
2	4822.667	40.50	2.01	42.51	74.00	-31.49	peak
3	6941.583	38.74	8.64	47.38	74.00	-26.62	peak
4	8758.917	40.47	11.33	51.80	74.00	-22.20	peak
5	10439.167	38.58	13.91	52.49	74.00	-21.51	peak
6 *	11825.667	38.24	15.13	53.37	74.00	-20.63	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

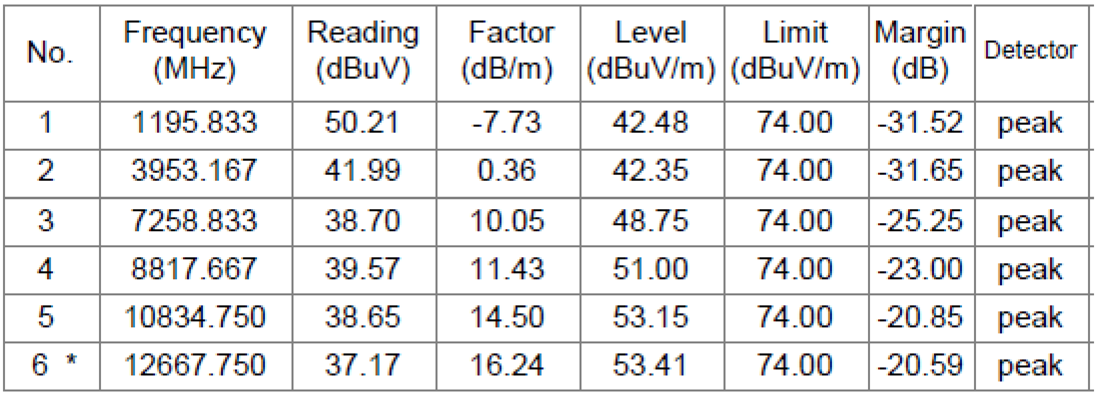
Ant. Pol.	Horizontal
Test Mode:	TX BLE 1Mbps Mode 2440MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1195.833	49.60	-7.73	41.87	74.00	-32.13	peak
2	4011.917	41.40	0.55	41.95	74.00	-32.05	peak
3	5919.333	39.91	5.36	45.27	74.00	-28.73	peak
4	7979.500	39.50	10.82	50.32	74.00	-23.68	peak
5	10157.167	39.51	13.49	53.00	74.00	-21.00	peak
6 *	12354.417	37.97	15.54	53.51	74.00	-20.49	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

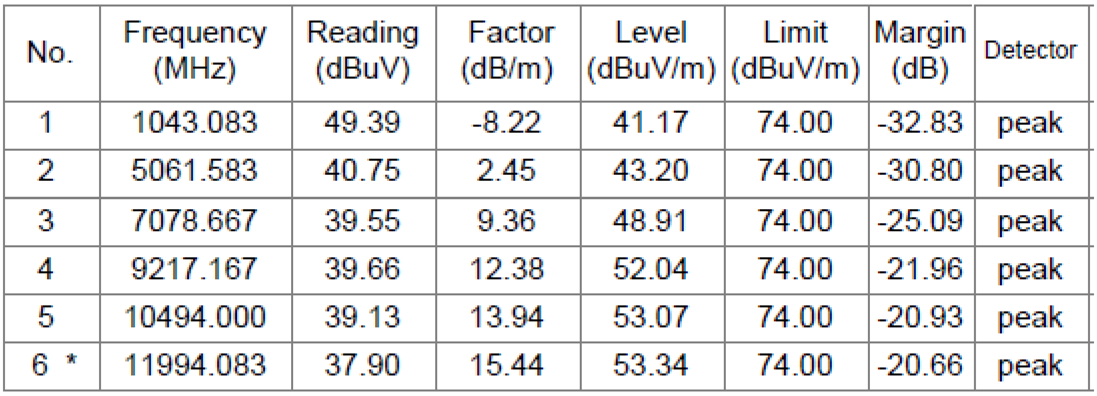
Ant. Pol.	Vertical
Test Mode:	TX BLE 1Mbps Mode 2440MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1195.833	50.21	-7.73	42.48	74.00	-31.52	peak
2	3953.167	41.99	0.36	42.35	74.00	-31.65	peak
3	7258.833	38.70	10.05	48.75	74.00	-25.25	peak
4	8817.667	39.57	11.43	51.00	74.00	-23.00	peak
5	10834.750	38.65	14.50	53.15	74.00	-20.85	peak
6 *	12667.750	37.17	16.24	53.41	74.00	-20.59	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

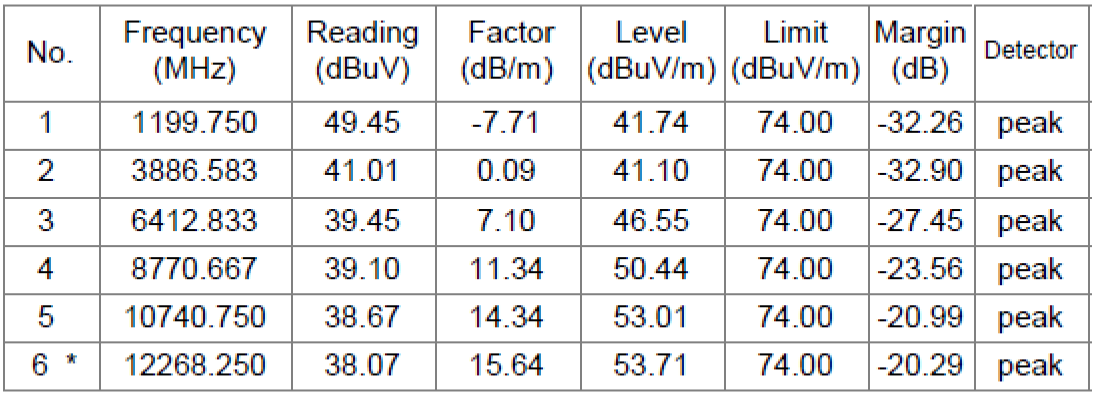
Ant. Pol.	Horizontal
Test Mode:	TX BLE 1Mbps Mode 2480MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1043.083	49.39	-8.22	41.17	74.00	-32.83	peak
2	5061.583	40.75	2.45	43.20	74.00	-30.80	peak
3	7078.667	39.55	9.36	48.91	74.00	-25.09	peak
4	9217.167	39.66	12.38	52.04	74.00	-21.96	peak
5	10494.000	39.13	13.94	53.07	74.00	-20.93	peak
6 *	11994.083	37.90	15.44	53.34	74.00	-20.66	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

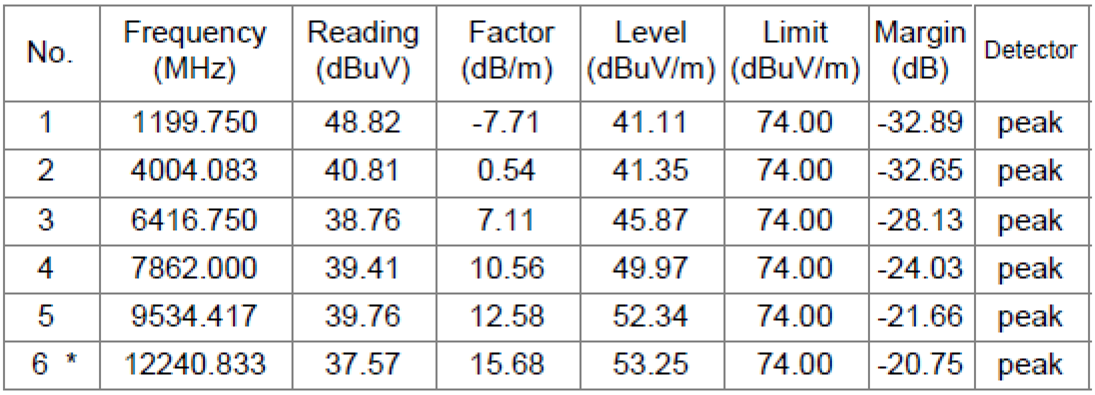
Ant. Pol.	Vertical
Test Mode:	TX BLE 1Mbps Mode 2480MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1199.750	49.45	-7.71	41.74	74.00	-32.26	peak
2	3886.583	41.01	0.09	41.10	74.00	-32.90	peak
3	6412.833	39.45	7.10	46.55	74.00	-27.45	peak
4	8770.667	39.10	11.34	50.44	74.00	-23.56	peak
5	10740.750	38.67	14.34	53.01	74.00	-20.99	peak
6 *	12268.250	38.07	15.64	53.71	74.00	-20.29	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

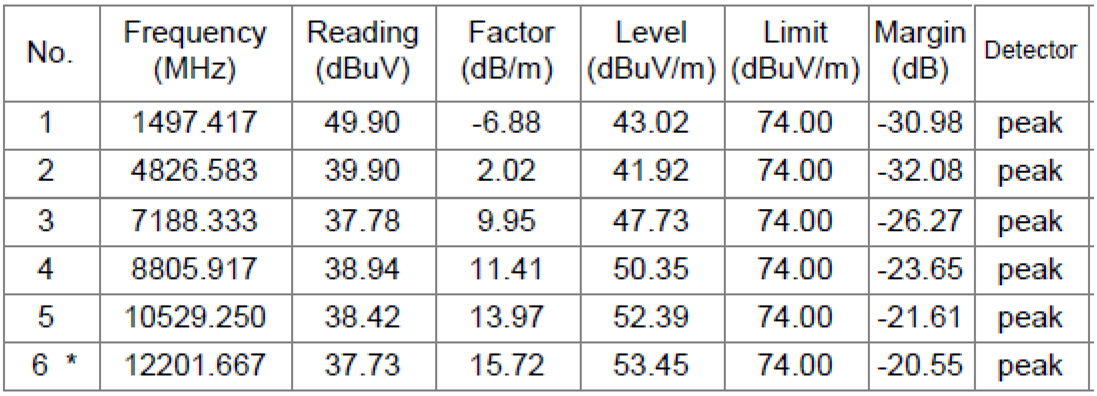
Ant. Pol.	Horizontal
Test Mode:	TX BLE 2Mbps Mode 2402MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1199.750	48.82	-7.71	41.11	74.00	-32.89	peak
2	4004.083	40.81	0.54	41.35	74.00	-32.65	peak
3	6416.750	38.76	7.11	45.87	74.00	-28.13	peak
4	7862.000	39.41	10.56	49.97	74.00	-24.03	peak
5	9534.417	39.76	12.58	52.34	74.00	-21.66	peak
6 *	12240.833	37.57	15.68	53.25	74.00	-20.75	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

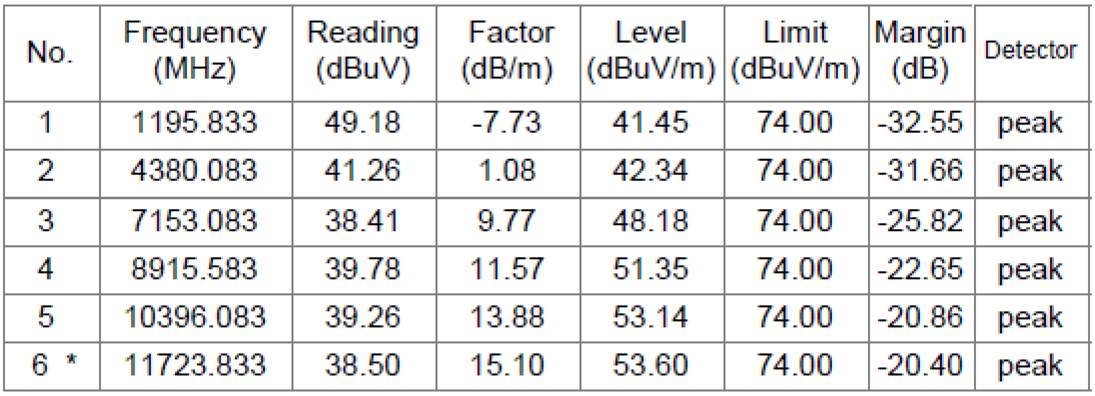
Ant. Pol.	Vertical
Test Mode:	TX BLE 2Mbps Mode 2402MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	49.90	-6.88	43.02	74.00	-30.98	peak
2	4826.583	39.90	2.02	41.92	74.00	-32.08	peak
3	7188.333	37.78	9.95	47.73	74.00	-26.27	peak
4	8805.917	38.94	11.41	50.35	74.00	-23.65	peak
5	10529.250	38.42	13.97	52.39	74.00	-21.61	peak
6 *	12201.667	37.73	15.72	53.45	74.00	-20.55	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

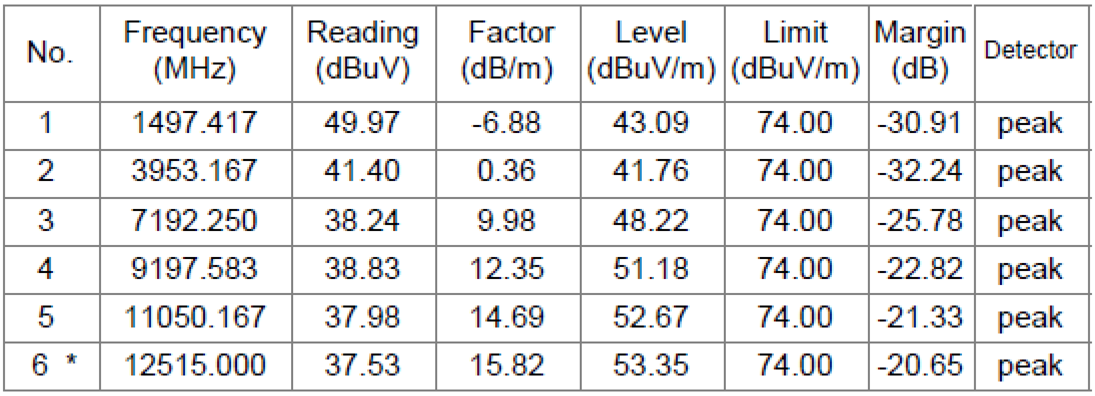
Ant. Pol.	Horizontal
Test Mode:	TX BLE 2Mbps Mode 2440MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1195.833	49.18	-7.73	41.45	74.00	-32.55	peak
2	4380.083	41.26	1.08	42.34	74.00	-31.66	peak
3	7153.083	38.41	9.77	48.18	74.00	-25.82	peak
4	8915.583	39.78	11.57	51.35	74.00	-22.65	peak
5	10396.083	39.26	13.88	53.14	74.00	-20.86	peak
6 *	11723.833	38.50	15.10	53.60	74.00	-20.40	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

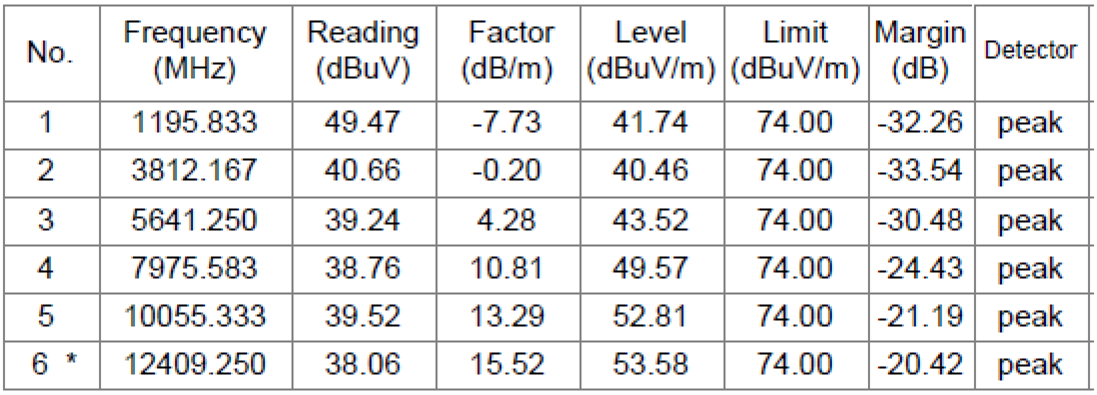
Ant. Pol.	Vertical
Test Mode:	TX BLE 2Mbps Mode 2440MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	49.97	-6.88	43.09	74.00	-30.91	peak
2	3953.167	41.40	0.36	41.76	74.00	-32.24	peak
3	7192.250	38.24	9.98	48.22	74.00	-25.78	peak
4	9197.583	38.83	12.35	51.18	74.00	-22.82	peak
5	11050.167	37.98	14.69	52.67	74.00	-21.33	peak
6 *	12515.000	37.53	15.82	53.35	74.00	-20.65	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

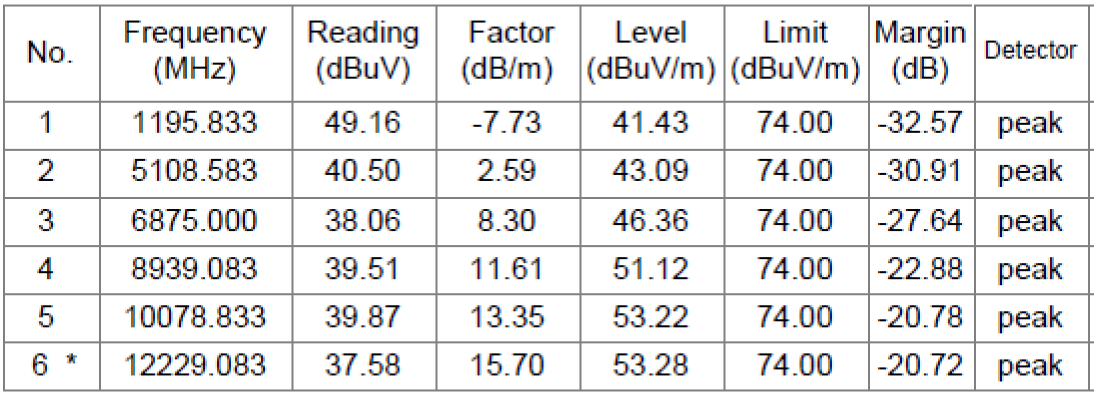
Ant. Pol.	Horizontal
Test Mode:	TX BLE 2Mbps Mode 2480MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1195.833	49.47	-7.73	41.74	74.00	-32.26	peak
2	3812.167	40.66	-0.20	40.46	74.00	-33.54	peak
3	5641.250	39.24	4.28	43.52	74.00	-30.48	peak
4	7975.583	38.76	10.81	49.57	74.00	-24.43	peak
5	10055.333	39.52	13.29	52.81	74.00	-21.19	peak
6 *	12409.250	38.06	15.52	53.58	74.00	-20.42	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. Pol.	Vertical
Test Mode:	TX BLE 2Mbps Mode 2480MHz (BT Module 2)
Remark:	No report for the emission which more than 20 dB below the prescribed limit.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1195.833	49.16	-7.73	41.43	74.00	-32.57	peak
2	5108.583	40.50	2.59	43.09	74.00	-30.91	peak
3	6875.000	38.06	8.30	46.36	74.00	-27.64	peak
4	8939.083	39.51	11.61	51.12	74.00	-22.88	peak
5	10078.833	39.87	13.35	53.22	74.00	-20.78	peak
6 *	12229.083	37.58	15.70	53.28	74.00	-20.72	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

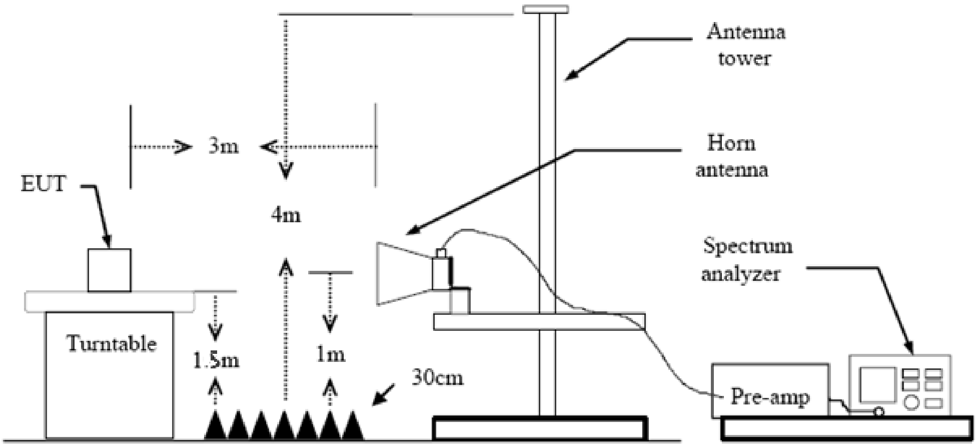
3.3. Band Edge Emissions (Radiated)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):

Restricted Frequency Band (MHz)	(dBuV/m)(at 3m)	
	Peak	Average
2310 ~ 2390	74	54
2483.5 ~ 2500	74	54

Test Configuration



Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:
   RBW=1MHz, VBW=3MHz Peak detector for Peak value.
   RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

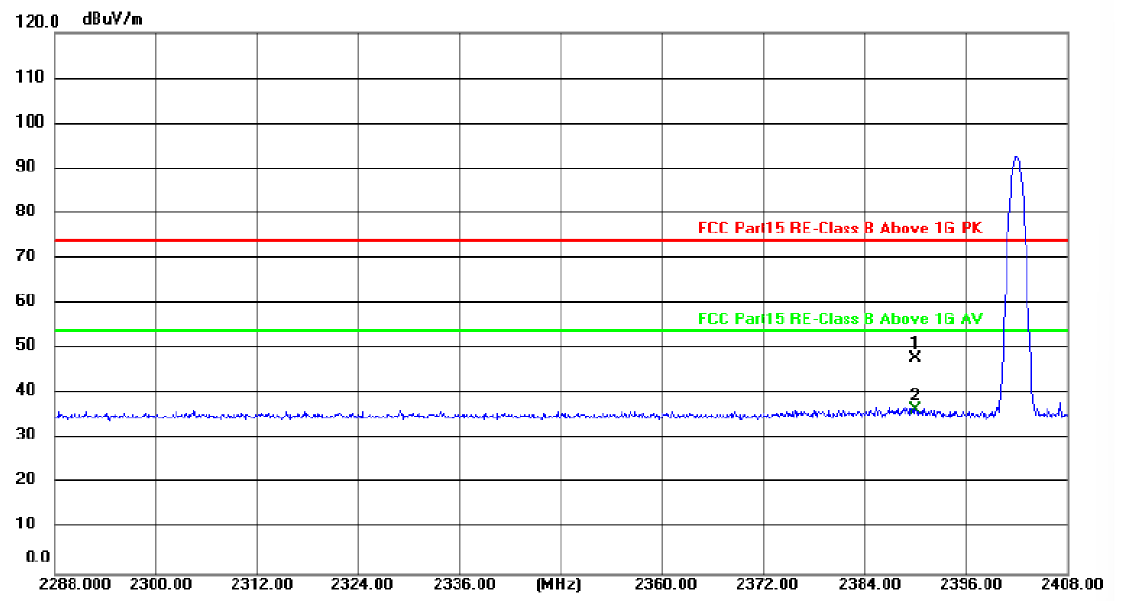
   Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Results

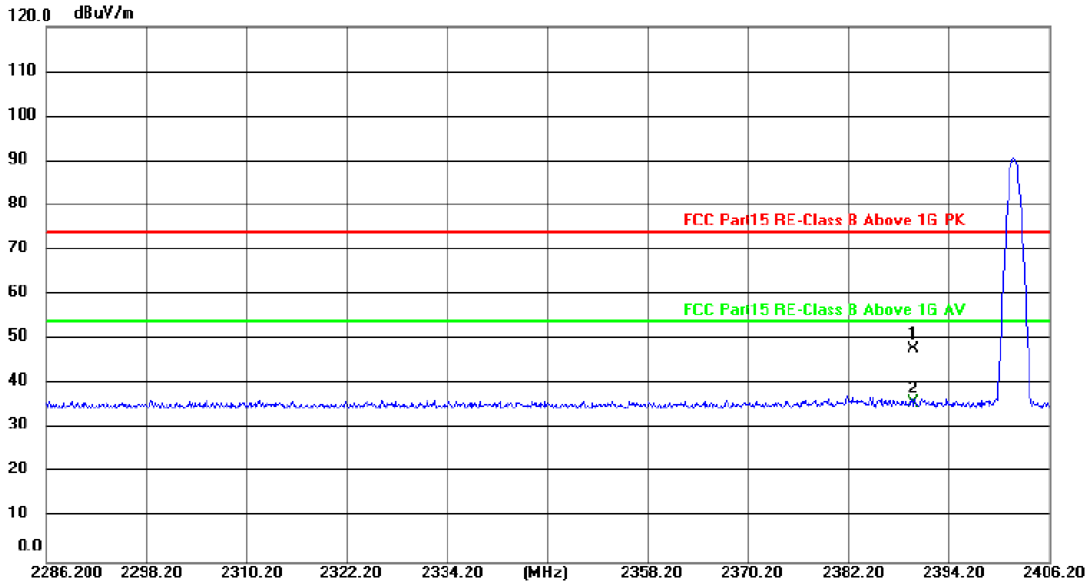
Ant. Pol.	Horizontal
Test Mode:	BLE 1Mbps Mode 2402MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	16.61	31.31	47.92	74.00	-26.08	peak
2 *	2390.000	5.15	31.31	36.46	54.00	-17.54	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

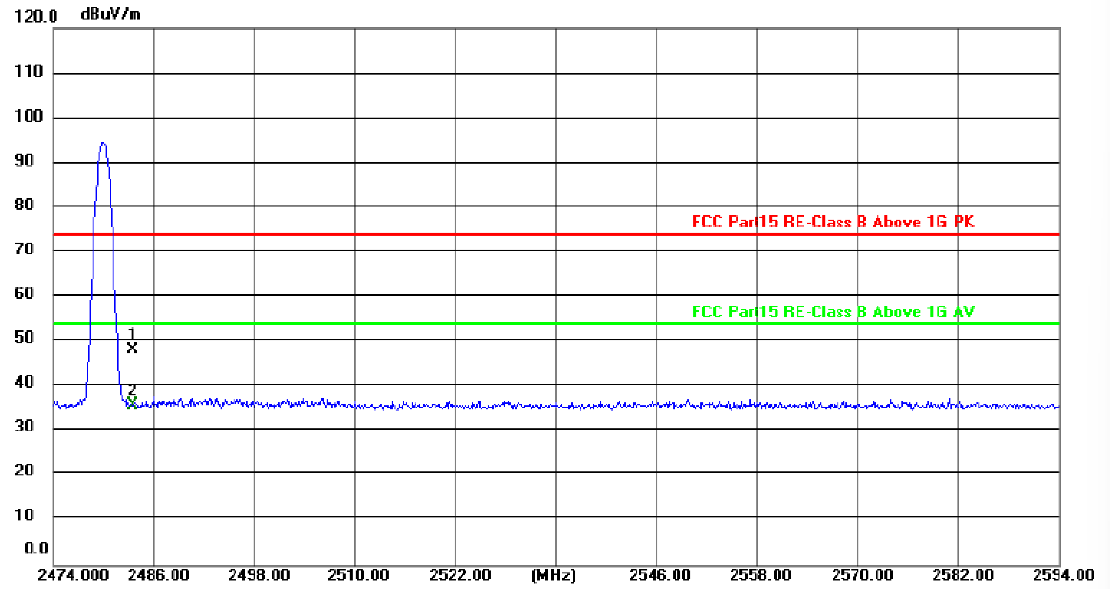
Ant. Pol.	Vertical
Test Mode:	BLE 1Mbps Mode 2402MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	16.52	31.31	47.83	74.00	-26.17	peak
2 *	2390.000	4.65	31.31	35.96	54.00	-18.04	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

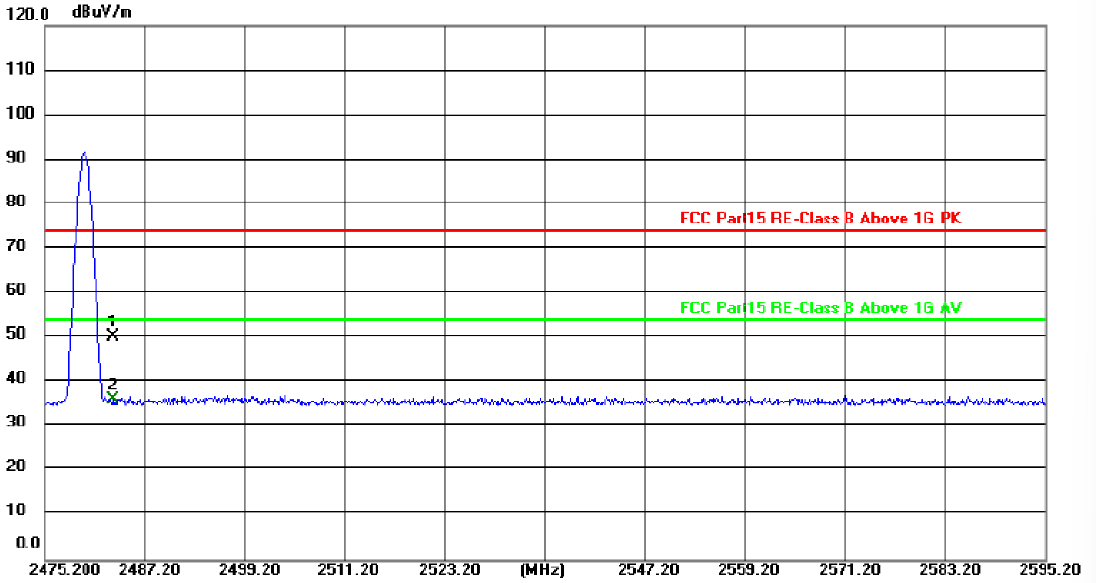
Ant. Pol.	Horizontal
Test Mode:	BLE 1Mbps Mode 2480 MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	16.60	31.48	48.08	74.00	-25.92	peak
2 *	2483.500	4.28	31.48	35.76	54.00	-18.24	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

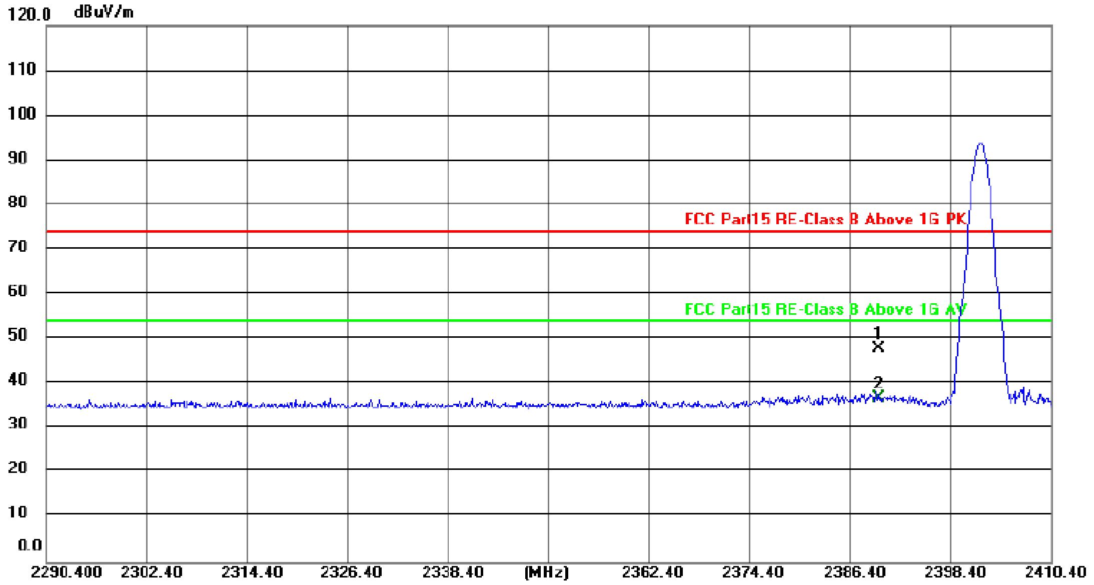
Ant. Pol.	Vertical
Test Mode:	BLE 1Mbps Mode 2480 MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	18.82	31.48	50.30	74.00	-23.70	peak
2 *	2483.500	4.67	31.48	36.15	54.00	-17.85	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

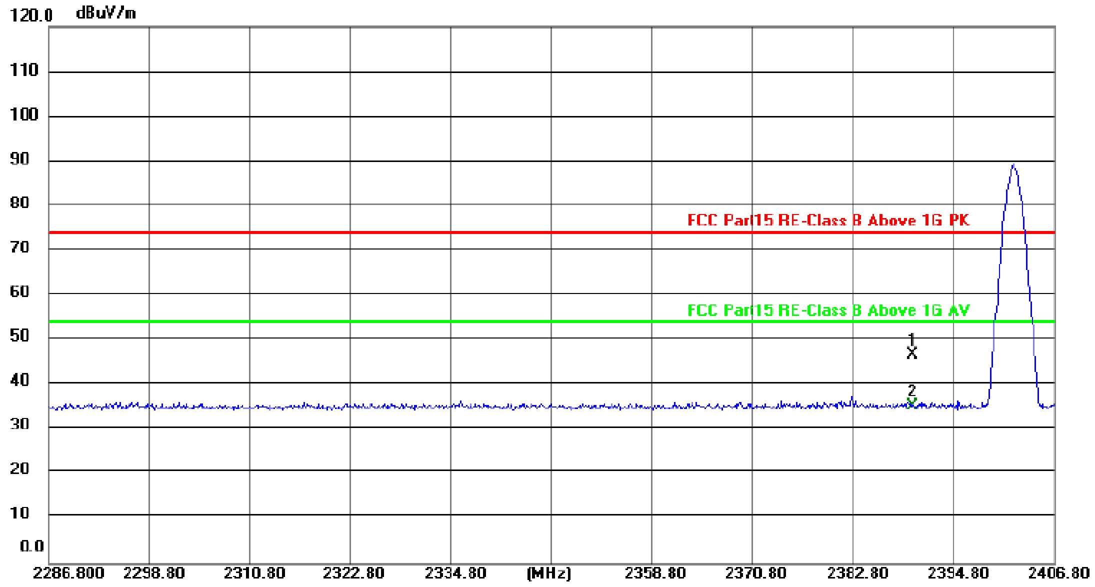
Ant. Pol.	Horizontal
Test Mode:	BLE 2Mbps Mode 2402 MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	16.61	31.31	47.92	74.00	-26.08	peak
2 *	2390.000	5.33	31.31	36.64	54.00	-17.36	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

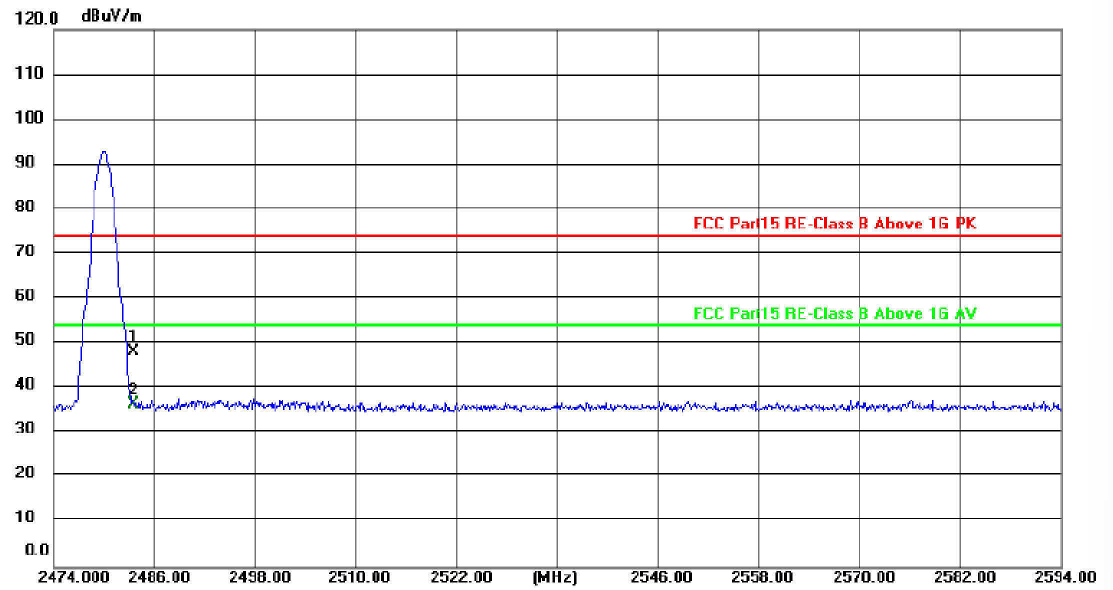
Ant. Pol.	Vertical
Test Mode:	BLE 2Mbps Mode 2402 MHz

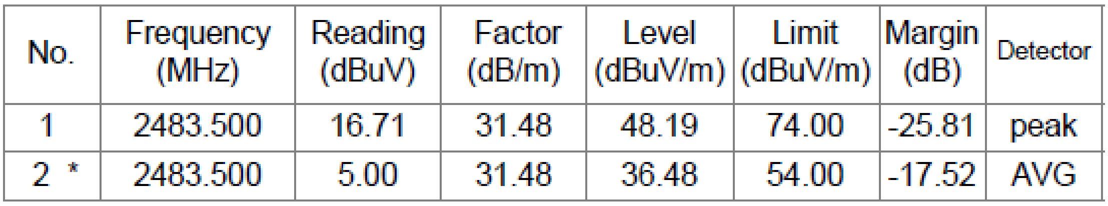


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	15.37	31.31	46.68	74.00	-27.32	peak
2 *	2390.000	4.02	31.31	35.33	54.00	-18.67	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. Pol.	Horizontal
Test Mode:	BLE 2Mbps Mode 2480 MHz

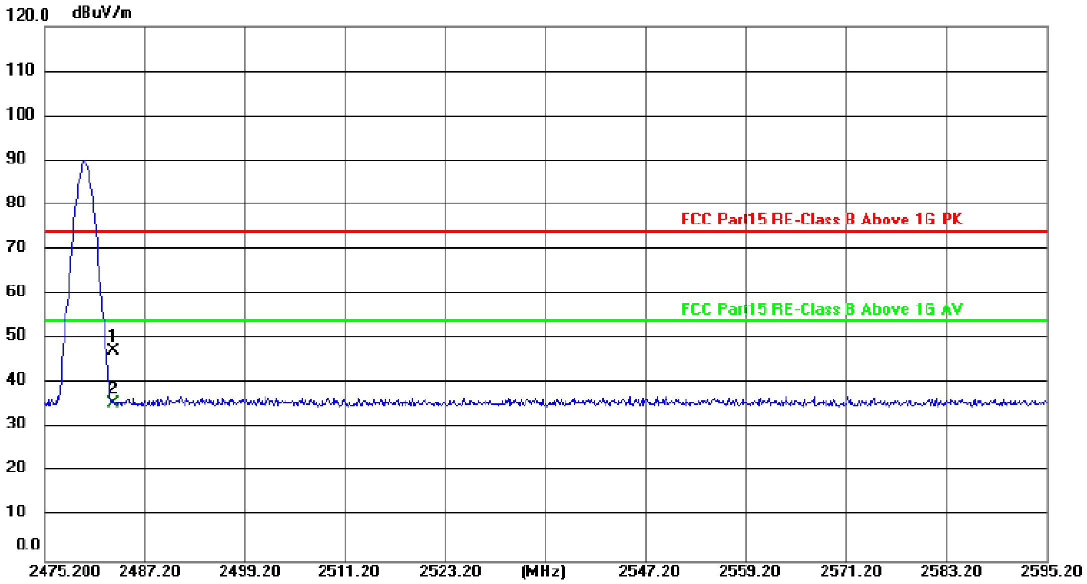




No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	16.71	31.48	48.19	74.00	-25.81	peak
2 *	2483.500	5.00	31.48	36.48	54.00	-17.52	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. Pol.	Vertical
Test Mode:	BLE 2Mbps Mode 2480 MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	15.78	31.48	47.26	74.00	-26.74	peak
2 *	2483.500	4.19	31.48	35.67	54.00	-18.33	AVG

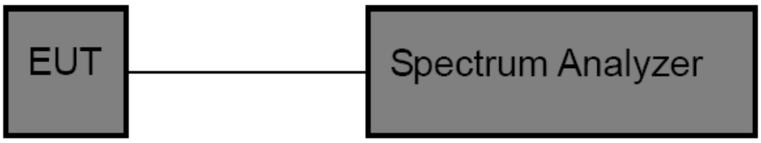
Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

3.4. Band edge and Spurious Emissions (Conducted)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Test Configuration



Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, 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 spectrum analyzer settings:
   RBW = 100 kHz, VBW ≥ RBW, scan up through 10th harmonic.
   Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

Test Mode

Please refer to the clause 2.4.

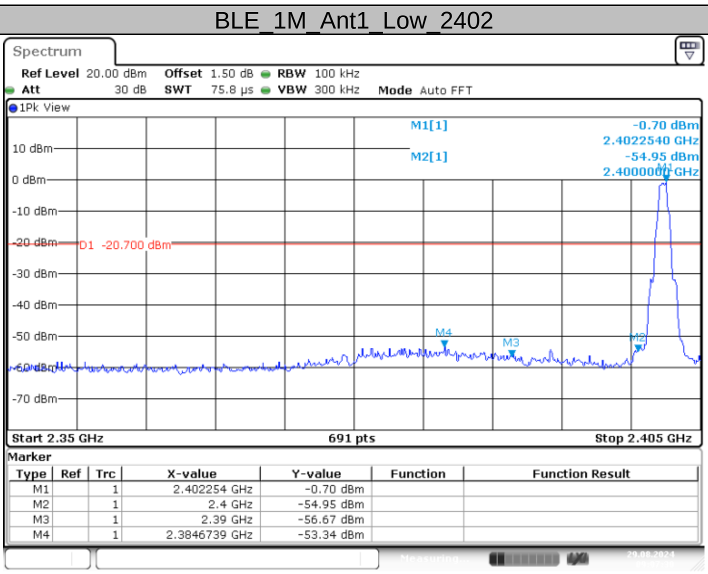
Test Results

(1) Band edge Conducted Test

Test Mode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-0.70	-53.34	≤-20.70	PASS
		High	2480	0.73	-52.51	≤-19.27	PASS
BLE_2M	Ant1	Low	2402	-3.38	-36.03	≤-23.38	PASS
		High	2480	-5.22	-51.04	≤-25.22	PASS

Test Graphs

BLE_1M_Ant1_Low_2402


Spectrum
1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -20.700 dBm
M1
M2
M3
M4
Measuring...
29.08.2024

Ref Level 20.00 dBm　Offset 1.50 dB　RBW 100 kHz
Att 30 dB　SWT 75.8 µs　VBW 300 kHz　Mode Auto FFT

M1[1] -0.70 dBm 2.4022540 GHz
M2[1] -54.95 dBm 2.4000000 GHz

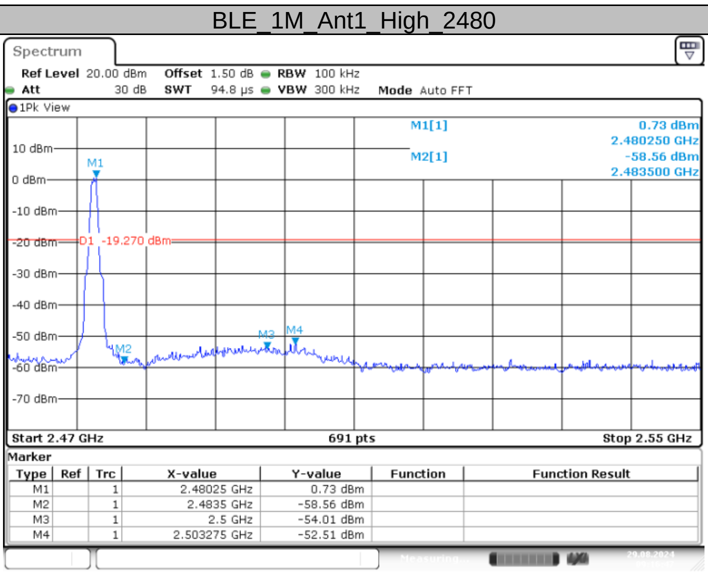
Start 2.35 GHz　691 pts　Stop 2.405 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402254 GHz	-0.70 dBm		
M2		1	2.4 GHz	-54.95 dBm		
M3		1	2.39 GHz	-56.67 dBm		
M4		1	2.3846739 GHz	-53.34 dBm		

Date: 29.AUG.2024 09:07:30

BLE_1M_Ant1_High_2480


Spectrum
1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -19.270 dBm
M1
M2
M3
M4
Measuring...
29.08.2024

Ref Level 20.00 dBm　Offset 1.50 dB　RBW 100 kHz
Att 30 dB　SWT 94.8 µs　VBW 300 kHz　Mode Auto FFT

M1[1] 0.73 dBm 2.480250 GHz
M2[1] -58.56 dBm 2.483500 GHz

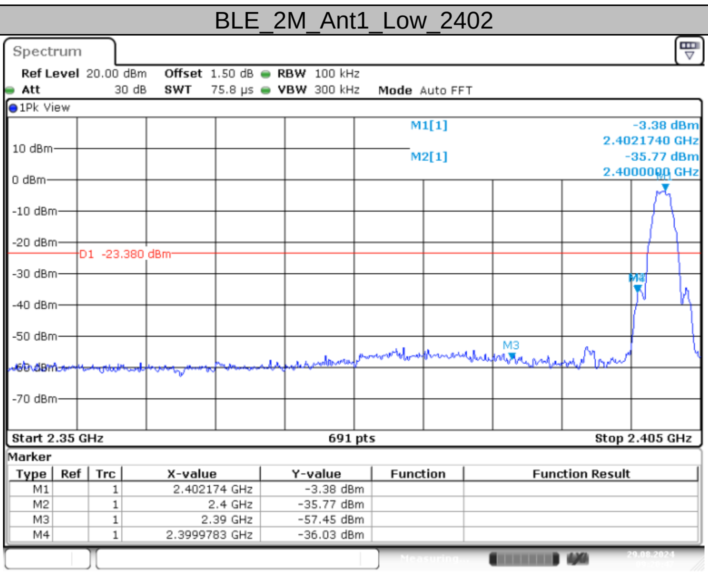
Start 2.47 GHz　691 pts　Stop 2.55 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48025 GHz	0.73 dBm		
M2		1	2.4835 GHz	-58.56 dBm		
M3		1	2.5 GHz	-54.01 dBm		
M4		1	2.503275 GHz	-52.51 dBm		

Date: 29.AUG.2024 09:16:47

BLE_2M_Ant1_Low_2402


Spectrum
1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -23.380 dBm
M1
M4
M3
Measuring...
29.08.2024

Ref Level 20.00 dBm　Offset 1.50 dB　RBW 100 kHz
Att 30 dB　SWT 75.8 µs　VBW 300 kHz　Mode Auto FFT

M1[1] -3.38 dBm 2.4021740 GHz
M2[1] -35.77 dBm 2.4000000 GHz

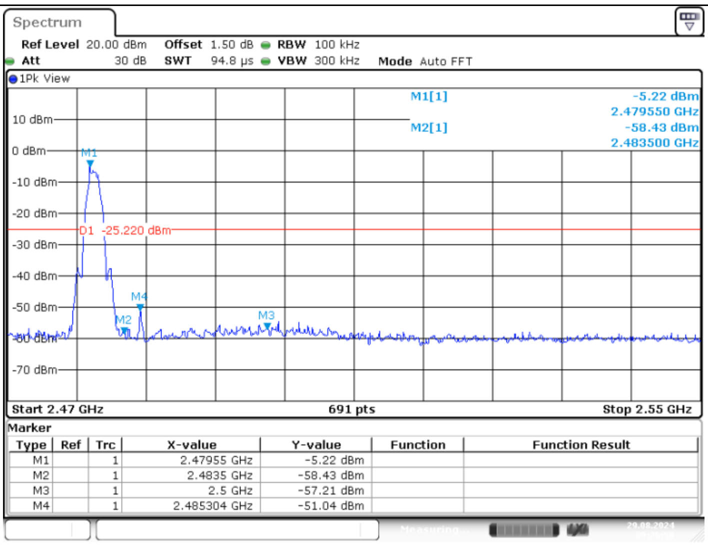
Start 2.35 GHz　691 pts　Stop 2.405 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402174 GHz	-3.38 dBm		
M2		1	2.4 GHz	-35.77 dBm		
M3		1	2.39 GHz	-57.45 dBm		
M4		1	2.3999783 GHz	-36.03 dBm		

Date: 29.AUG.2024 09:20:47

BLE_2M_Ant1_High_2480


Spectrum
1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
M3
M4
D1 -25.220 dBm
Measuring...
29.08.2024

Ref Level 20.00 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT

M1[1] -5.22 dBm
2.479550 GHz
M2[1] -58.43 dBm
2.483500 GHz

Start 2.47 GHz 691 pts Stop 2.55 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47955 GHz	-5.22 dBm		
M2		1	2.4835 GHz	-58.43 dBm		
M3		1	2.5 GHz	-57.21 dBm		
M4		1	2.485304 GHz	-51.04 dBm		

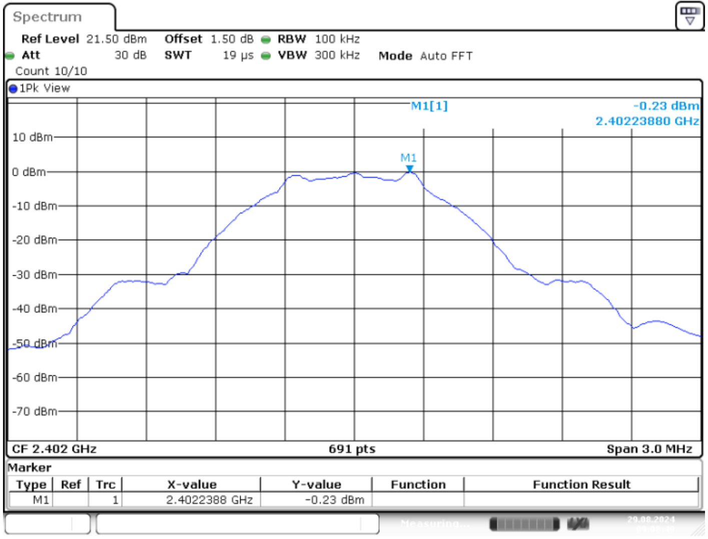
Date: 29.AUG.2024 09:26:50

(2) Conducted Spurious Emissions Test

Test Mode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-0.23	-0.23	---	PASS
			30~1000	-0.23	-58.25	≤-20.23	PASS
			1000~26500	-0.23	-45.84	≤-20.23	PASS
		2440	Reference	0.39	0.39	---	PASS
			30~1000	0.39	-58.16	≤-19.61	PASS
			1000~26500	0.39	-46.83	≤-19.61	PASS
		2480	Reference	0.76	0.76	---	PASS
			30~1000	0.76	-57.92	≤-19.24	PASS
			1000~26500	0.76	-45.44	≤-19.24	PASS
BLE_2M	Ant1	2402	Reference	-0.47	-0.47	---	PASS
			30~1000	-0.47	-57.39	≤-20.47	PASS
			1000~26500	-0.47	-46.07	≤-20.47	PASS
		2440	Reference	-4.35	-4.35	---	PASS
			30~1000	-4.35	-58.22	≤-24.35	PASS
			1000~26500	-4.35	-47.23	≤-24.35	PASS
		2480	Reference	-3.85	-3.85	---	PASS
			30~1000	-3.85	-57.89	≤-23.85	PASS
			1000~26500	-3.85	-45.86	≤-23.85	PASS

Test Graphs

BLE_1M_Ant1_2402_0~Reference


Spectrum
1Pk View
M1[1]
-0.23 dBm
2.40223880 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.402 GHz
691 pts
Span 3.0 MHz

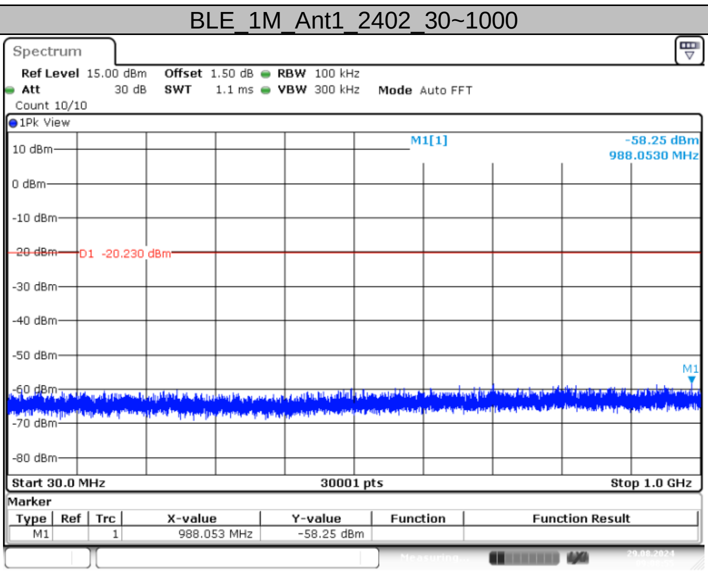
Ref Level 21.50 dBm **Offset** 1.50 dB **RBW** 100 kHz
Att 30 dB **SWT** 19 µs **VBW** 300 kHz **Mode** Auto FFT
Count 10/10

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4022388 GHz	-0.23 dBm		

Date: 29.AUG.2024 09:08:40

BLE_1M_Ant1_2402_30~1000


Spectrum
1Pk View
M1[1]
-58.25 dBm
988.0530 MHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -20.230 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 30.0 MHz
30001 pts
Stop 1.0 GHz

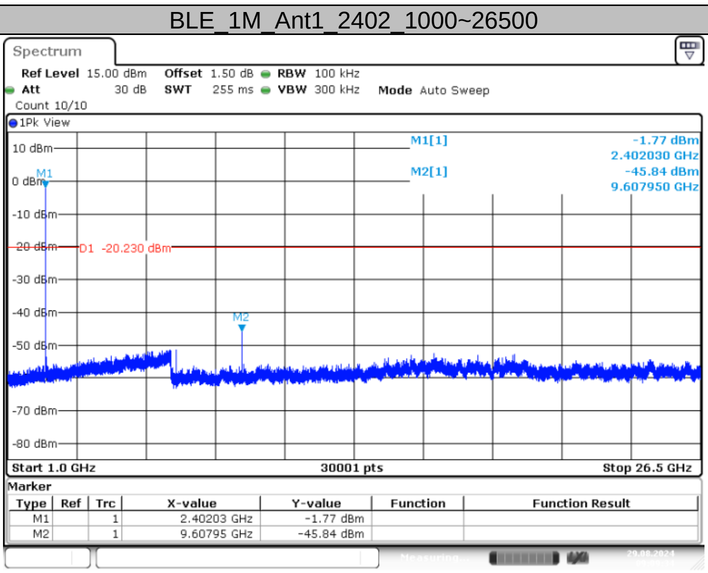
Ref Level 15.00 dBm **Offset** 1.50 dB **RBW** 100 kHz
Att 30 dB **SWT** 1.1 ms **VBW** 300 kHz **Mode** Auto FFT
Count 10/10

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	988.053 MHz	-58.25 dBm		

Date: 29.AUG.2024 09:08:55

BLE_1M_Ant1_2402_1000~26500


Spectrum
1Pk View
M1[1]
-1.77 dBm
2.402030 GHz
M2[1]
-45.84 dBm
9.607950 GHz
M1
M2
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -20.230 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
Start 1.0 GHz
30001 pts
Stop 26.5 GHz

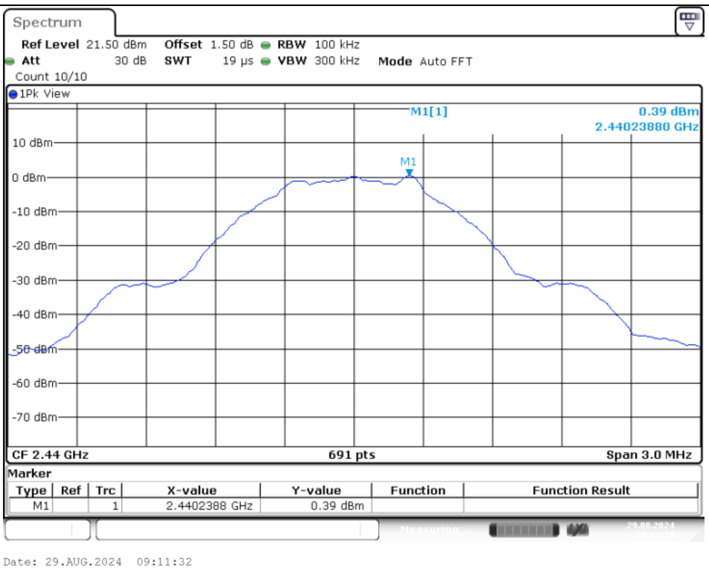
Ref Level 15.00 dBm **Offset** 1.50 dB **RBW** 100 kHz
Att 30 dB **SWT** 255 ms **VBW** 300 kHz **Mode** Auto Sweep
Count 10/10

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40203 GHz	-1.77 dBm		
M2		1	9.60795 GHz	-45.84 dBm		

Date: 29.AUG.2024 09:09:34

BLE_1M_Ant1_2440_0~Reference


Spectrum
M1[1]
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT
Count 10/10
1Pk View

M1[1] 0.39 dBm 2.44023880 GHz

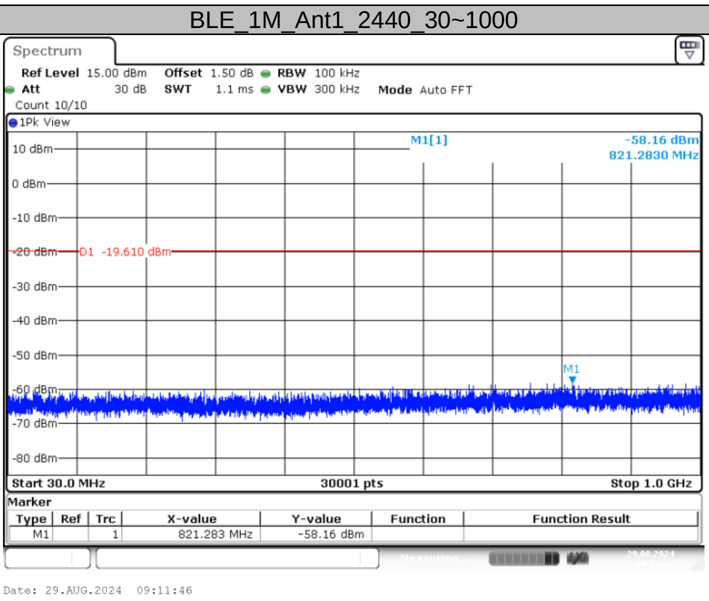
CF 2.44 GHz 691 pts Span 3.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4402388 GHz	0.39 dBm		

Date: 29.AUG.2024 09:11:32

BLE_1M_Ant1_2440_30~1000


Spectrum
M1[1]
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm

Ref Level 15.00 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 1.1 ms VBW 300 kHz Mode Auto FFT
Count 10/10
1Pk View

M1[1] -58.16 dBm 821.2830 MHz

D1 -19.610 dBm

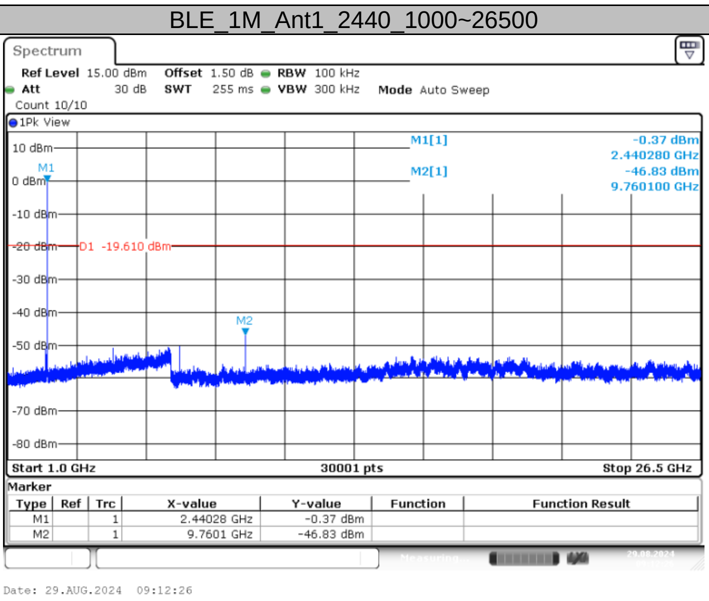
Start 30.0 MHz 30001 pts Stop 1.0 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	821.283 MHz	-58.16 dBm		

Date: 29.AUG.2024 09:11:46

BLE_1M_Ant1_2440_1000~26500


Spectrum
M1[1]
M2[1]
M1
M2
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm

Ref Level 15.00 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 255 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk View

M1[1] -0.37 dBm 2.440280 GHz
M2[1] -46.83 dBm 9.760100 GHz

D1 -19.610 dBm

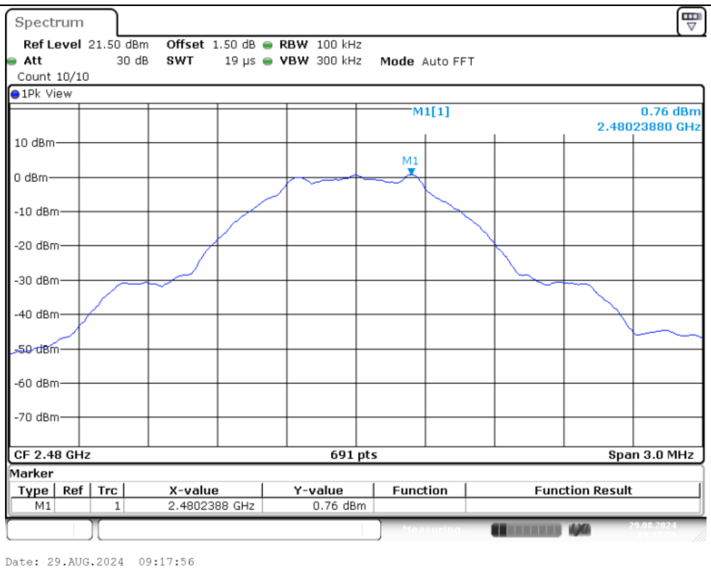
Start 1.0 GHz 30001 pts Stop 26.5 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.44028 GHz	-0.37 dBm		
M2		1	9.7601 GHz	-46.83 dBm		

Date: 29.AUG.2024 09:12:26

BLE_1M_Ant1_2480_0~Reference



Spectrum

Ref Level 21.50 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT
Count 10/10
1Pk View

M1[1] 0.76 dBm 2.48023880 GHz

CF 2.48 GHz 691 pts Span 3.0 MHz

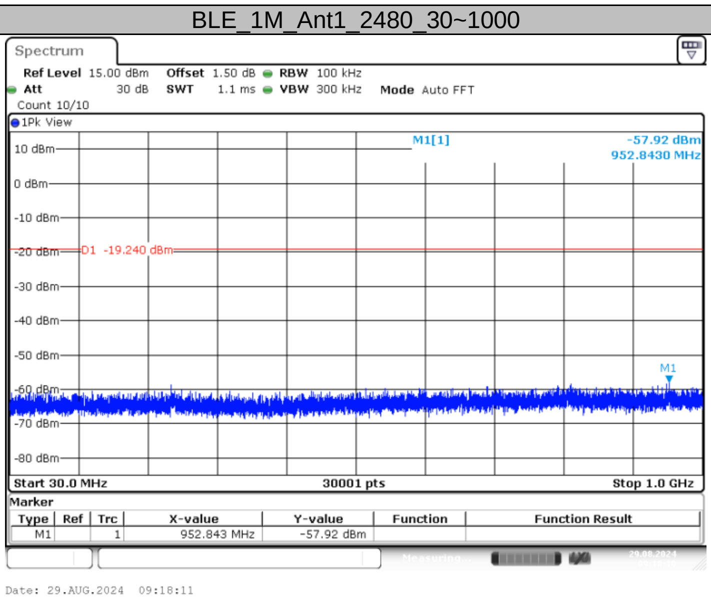
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4802388 GHz	0.76 dBm		

Date: 29.AUG.2024 09:17:56

10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1

BLE_1M_Ant1_2480_30~1000



Spectrum

Ref Level 15.00 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 1.1 ms VBW 300 kHz Mode Auto FFT
Count 10/10
1Pk View

M1[1] -57.92 dBm 952.8430 MHz

D1 -19.240 dBm

Start 30.0 MHz 30001 pts Stop 1.0 GHz

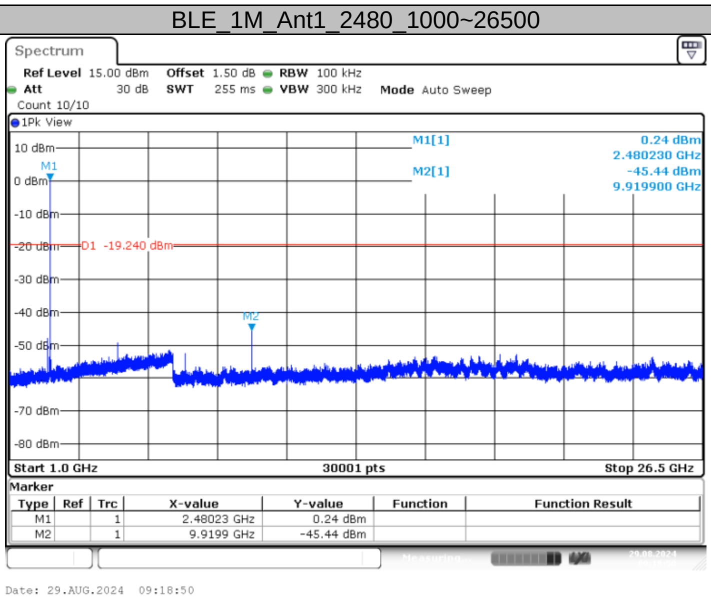
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	952.843 MHz	-57.92 dBm		

Date: 29.AUG.2024 09:18:11

10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1

BLE_1M_Ant1_2480_1000~26500



Spectrum

Ref Level 15.00 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 255 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk View

M1[1] 0.24 dBm 2.480230 GHz
M2[1] -45.44 dBm 9.919900 GHz

D1 -19.240 dBm

Start 1.0 GHz 30001 pts Stop 26.5 GHz

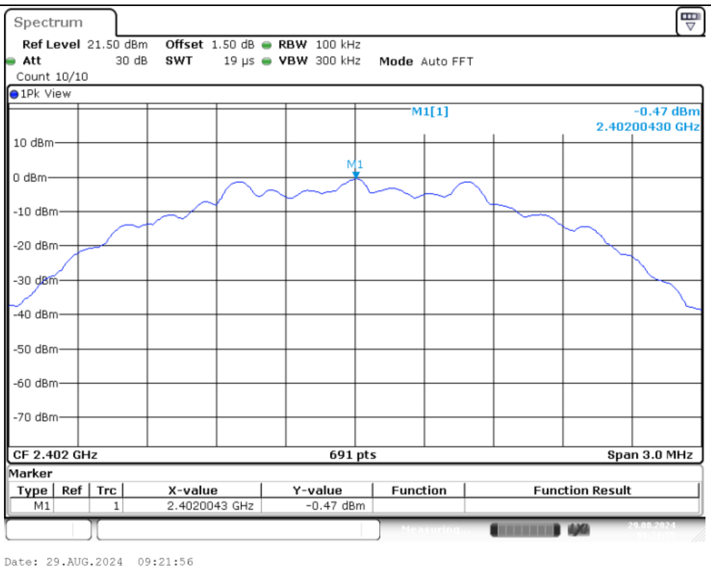
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48023 GHz	0.24 dBm		
M2		1	9.9199 GHz	-45.44 dBm		

Date: 29.AUG.2024 09:18:50

10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
M1
M2

BLE_2M_Ant1_2402_0~Reference



Spectrum

Ref Level 21.50 dBm Offset 1.50 dB ● RBW 100 kHz
● Att 30 dB SWT 19 µs ● VBW 300 kHz Mode Auto FFT
Count 10/10
●1Pk View

M1[1] -0.47 dBm 2.40200430 GHz

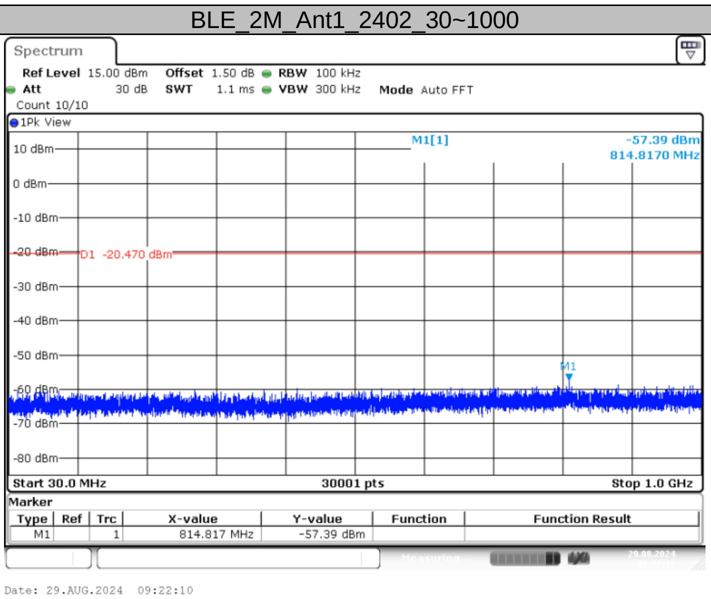
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.402 GHz
691 pts
Span 3.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4020043 GHz	-0.47 dBm		

Date: 29.AUG.2024 09:21:56

BLE_2M_Ant1_2402_30~1000



Spectrum

Ref Level 15.00 dBm Offset 1.50 dB ● RBW 100 kHz
● Att 30 dB SWT 1.1 ms ● VBW 300 kHz Mode Auto FFT
Count 10/10
●1Pk View

M1[1] -57.39 dBm 814.8170 MHz

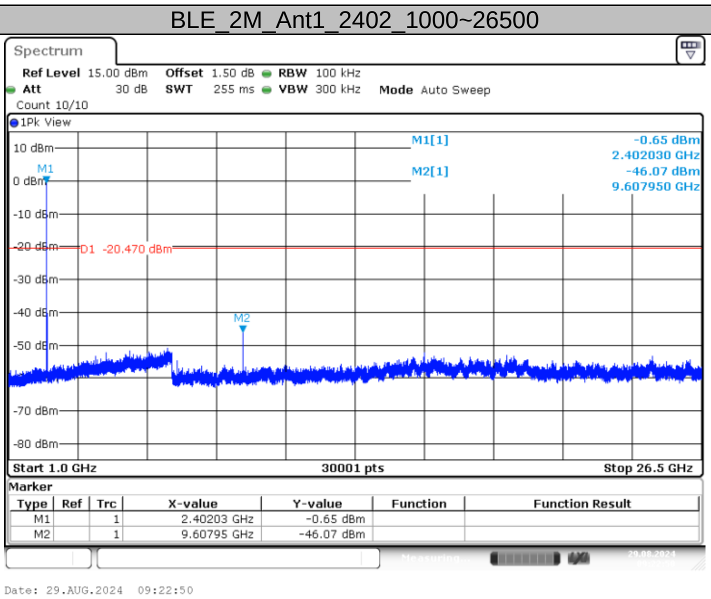
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -20.470 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
Start 30.0 MHz
30001 pts
Stop 1.0 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	814.817 MHz	-57.39 dBm		

Date: 29.AUG.2024 09:22:10

BLE_2M_Ant1_2402_1000~26500



Spectrum

Ref Level 15.00 dBm Offset 1.50 dB ● RBW 100 kHz
● Att 30 dB SWT 255 ms ● VBW 300 kHz Mode Auto Sweep
Count 10/10
●1Pk View

M1[1] -0.65 dBm 2.402030 GHz
M2[1] -46.07 dBm 9.607950 GHz

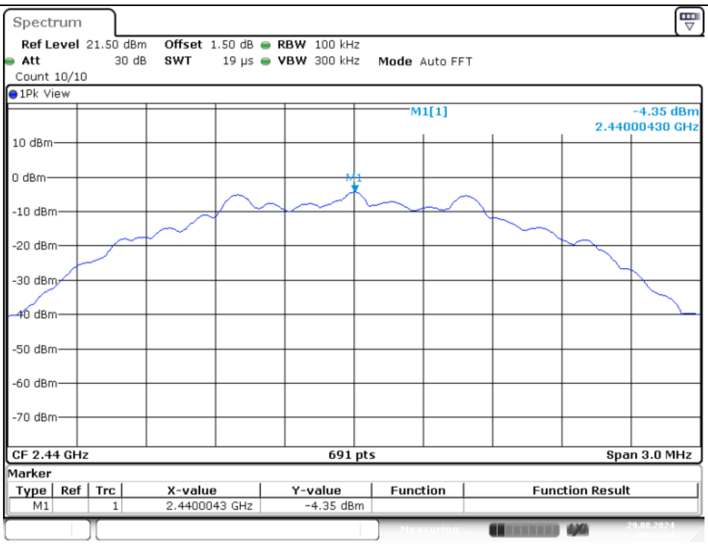
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -20.470 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
M1
M2
Start 1.0 GHz
30001 pts
Stop 26.5 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40203 GHz	-0.65 dBm		
M2		1	9.60795 GHz	-46.07 dBm		

Date: 29.AUG.2024 09:22:50

BLE_2M_Ant1_2440_0~Reference


10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1

Spectrum

Ref Level 21.50 dBm **Offset** 1.50 dB ● **RBW** 100 kHz
Att 30 dB **SWT** 19 µs ● **VBW** 300 kHz **Mode** Auto FFT
Count 10/10
1Pk View

M1[1] -4.35 dBm 2.44000430 GHz

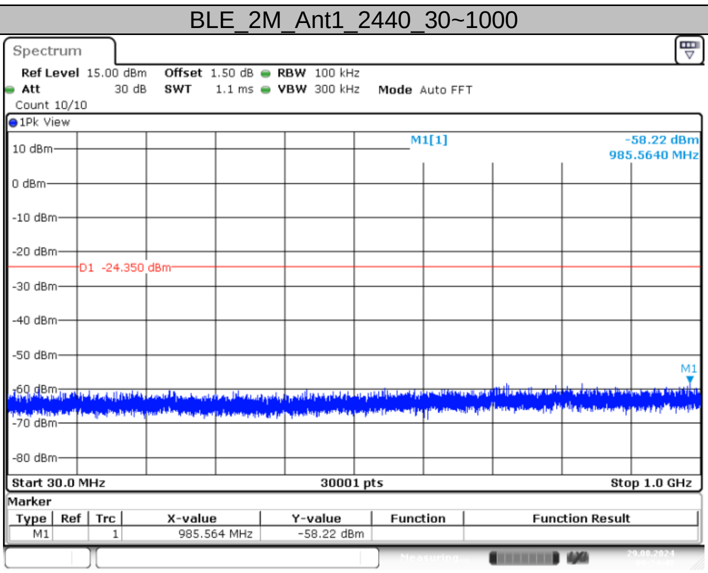
CF 2.44 GHz 691 pts Span 3.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4400043 GHz	-4.35 dBm		

Date: 29.AUG.2024 09:24:34

BLE_2M_Ant1_2440_30~1000


10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1

Spectrum

Ref Level 15.00 dBm **Offset** 1.50 dB ● **RBW** 100 kHz
Att 30 dB **SWT** 1.1 ms ● **VBW** 300 kHz **Mode** Auto FFT
Count 10/10
1Pk View

M1[1] -58.22 dBm 985.5640 MHz

D1 -24.350 dBm

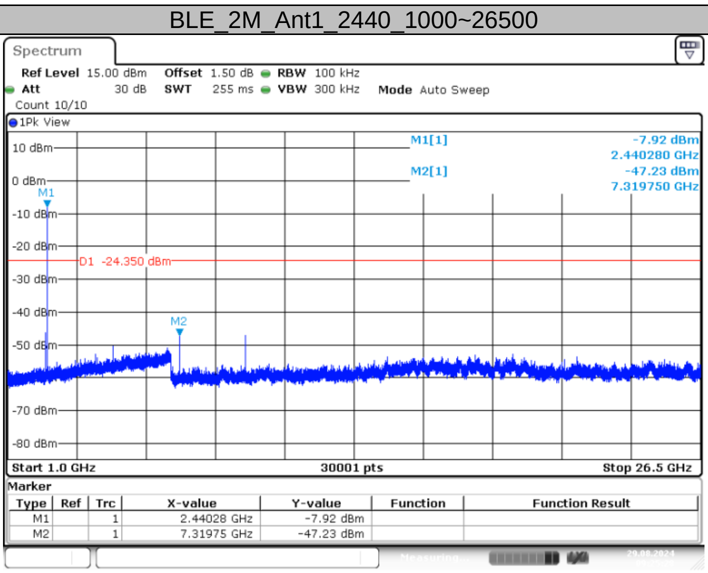
Start 30.0 MHz 30001 pts Stop 1.0 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	985.564 MHz	-58.22 dBm		

Date: 29.AUG.2024 09:24:48

BLE_2M_Ant1_2440_1000~26500


10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
M1
M2

Spectrum

Ref Level 15.00 dBm **Offset** 1.50 dB ● **RBW** 100 kHz
Att 30 dB **SWT** 255 ms ● **VBW** 300 kHz **Mode** Auto Sweep
Count 10/10
1Pk View

M1[1] -7.92 dBm 2.440280 GHz
M2[1] -47.23 dBm 7.319750 GHz

D1 -24.350 dBm

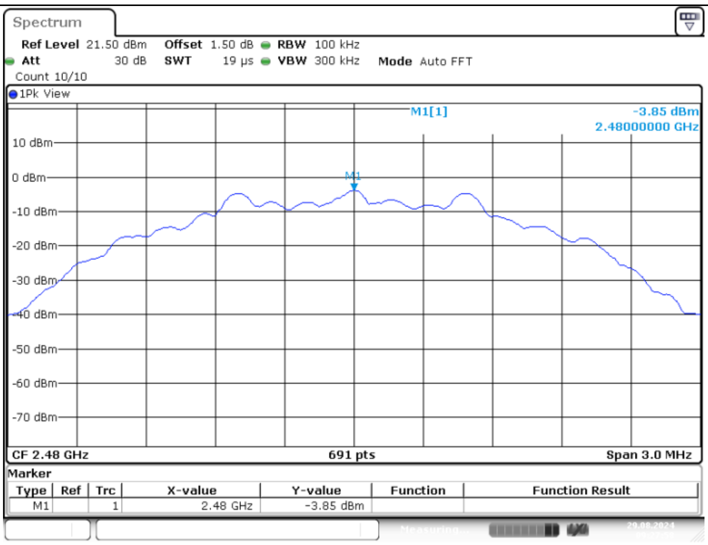
Start 1.0 GHz 30001 pts Stop 26.5 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.44028 GHz	-7.92 dBm		
M2		1	7.31975 GHz	-47.23 dBm		

Date: 29.AUG.2024 09:25:28

BLE_2M_Ant1_2480_0~Reference


10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1

Spectrum

Ref Level 21.50 dBm **Offset** 1.50 dB **RBW** 100 kHz
Att 30 dB **SWT** 19 µs **VBW** 300 kHz **Mode** Auto FFT
Count 10/10
1Pk View

M1[1] -3.85 dBm
2.48000000 GHz

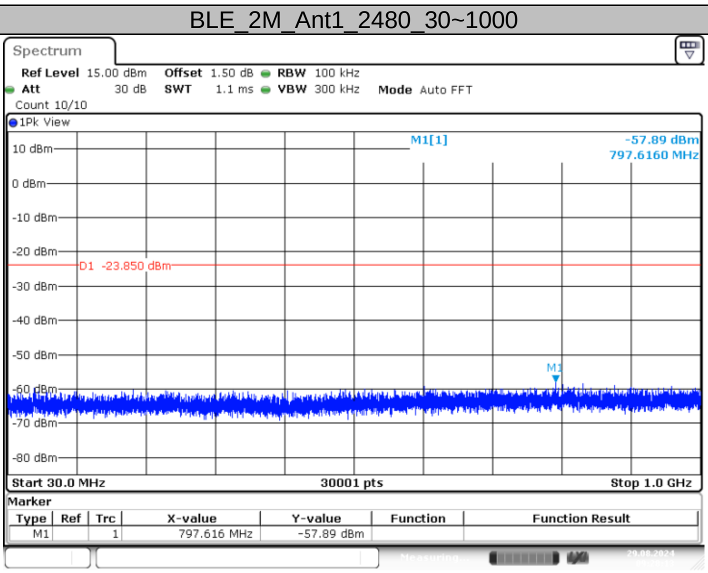
CF 2.48 GHz 691 pts Span 3.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48 GHz	-3.85 dBm		

Date: 29.AUG.2024 09:27:58

BLE_2M_Ant1_2480_30~1000


10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
D1 -23.850 dBm
M1

Spectrum

Ref Level 15.00 dBm **Offset** 1.50 dB **RBW** 100 kHz
Att 30 dB **SWT** 1.1 ms **VBW** 300 kHz **Mode** Auto FFT
Count 10/10
1Pk View

M1[1] -57.89 dBm
797.6160 MHz

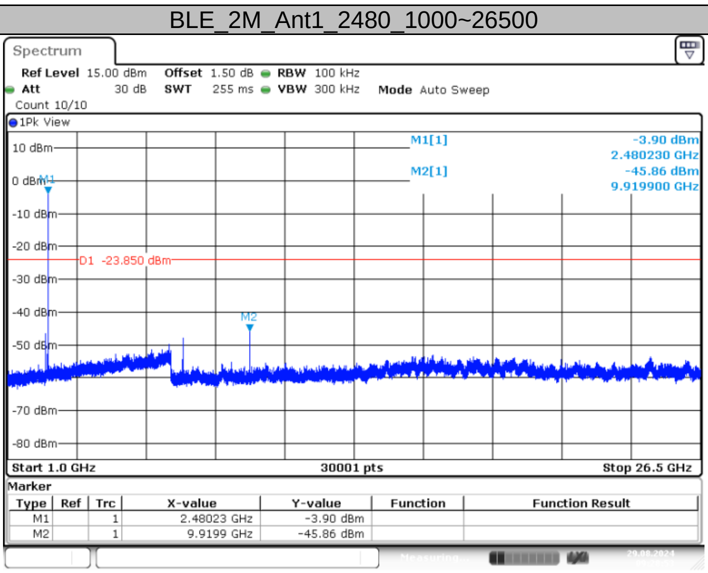
Start 30.0 MHz 30001 pts Stop 1.0 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	797.616 MHz	-57.89 dBm		

Date: 29.AUG.2024 09:28:13

BLE_2M_Ant1_2480_1000~26500


10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
D1 -23.850 dBm
M1
M2

Spectrum

Ref Level 15.00 dBm **Offset** 1.50 dB **RBW** 100 kHz
Att 30 dB **SWT** 255 ms **VBW** 300 kHz **Mode** Auto Sweep
Count 10/10
1Pk View

M1[1] -3.90 dBm
2.480230 GHz
M2[1] -45.86 dBm
9.919900 GHz

Start 1.0 GHz 30001 pts Stop 26.5 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48023 GHz	-3.90 dBm		
M2		1	9.9199 GHz	-45.86 dBm		

Date: 29.AUG.2024 09:28:53

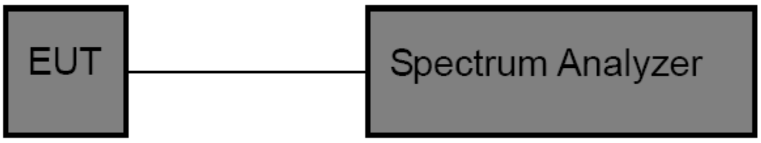
3.5. DTS Bandwidth

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2):

Test Item	Limit	Frequency Range(MHz)
DTS Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. DTS Spectrum Setting:
   (1) Set RBW = 100 kHz.
   (2) Set the video bandwidth (VBW) ≥ 3 RBW.
   (3) Detector = Peak.
   (4) Trace mode = Max hold.
   (5) Sweep = Auto couple.
   OCB Spectrum Setting:
   (1) Set RBW = 1% ~ 5% occupied bandwidth.
   (2) Set the video bandwidth (VBW) ≥ 3 RBW.
   (3) Detector = Peak.
   (4) Trace mode = Max hold.
   (5) Sweep = Auto couple.

Test Mode

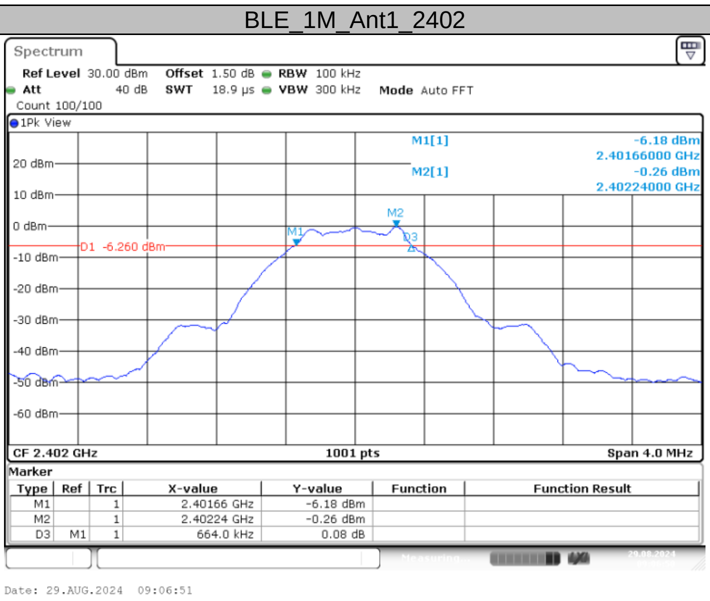
Please refer to the clause 2.4.

Test Results

Test Mode	Antenna	Freq(MHz)	OCB [MHz]	DTS BW [MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.023	0.664	0.5	PASS
		2440	1.031	0.672	0.5	PASS
		2480	1.027	0.668	0.5	PASS
BLE_2M	Ant1	2402	2.038	1.144	0.5	PASS
		2440	2.030	1.148	0.5	PASS
		2480	2.026	1.152	0.5	PASS

DTS Bandwidth

BLE_1M_Ant1_2402



Spectrum

Ref Level 30.00 dBm Offset 1.50 dB ● RBW 100 kHz
Att 40 dB SWT 18.9 µs ● VBW 300 kHz Mode Auto FFT
Count 100/100

1Pk View

M1[1] -6.18 dBm 2.40166000 GHz
M2[1] -0.26 dBm 2.40224000 GHz

D1 -6.260 dBm

CF 2.402 GHz 1001 pts Span 4.0 MHz

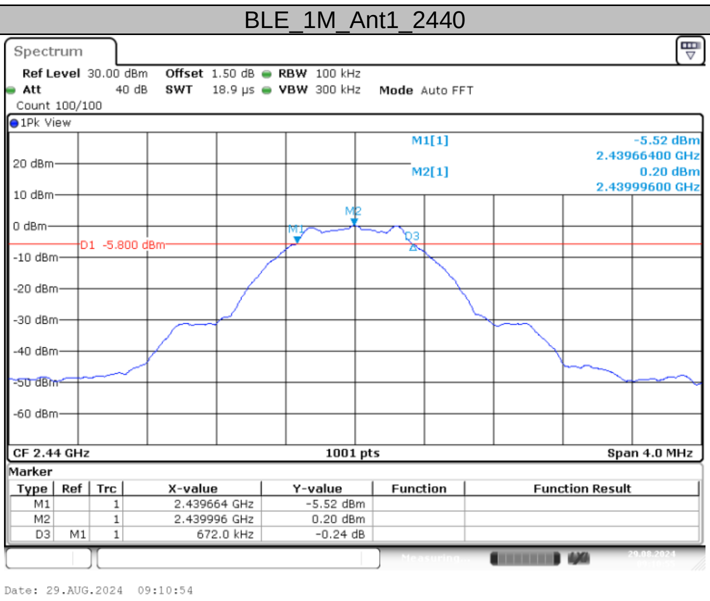
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40166 GHz	-6.18 dBm		
M2		1	2.40224 GHz	-0.26 dBm		
D3	M1	1	664.0 kHz	0.08 dB		

Date: 29.AUG.2024 09:06:51

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
M2
D3

BLE_1M_Ant1_2440



Spectrum

Ref Level 30.00 dBm Offset 1.50 dB ● RBW 100 kHz
Att 40 dB SWT 18.9 µs ● VBW 300 kHz Mode Auto FFT
Count 100/100

1Pk View

M1[1] -5.52 dBm 2.43966400 GHz
M2[1] 0.20 dBm 2.43999600 GHz

D1 -5.800 dBm

CF 2.44 GHz 1001 pts Span 4.0 MHz

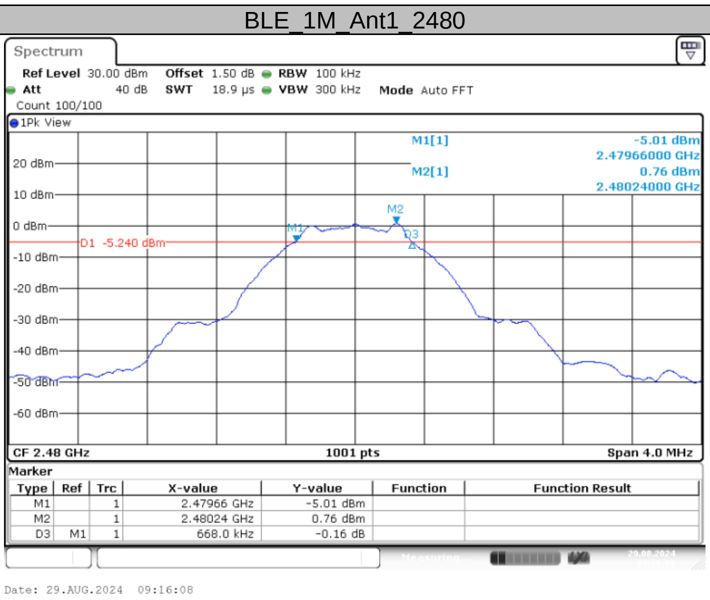
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.439664 GHz	-5.52 dBm		
M2		1	2.439996 GHz	0.20 dBm		
D3	M1	1	672.0 kHz	-0.24 dB		

Date: 29.AUG.2024 09:10:54

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
M2
D3

BLE_1M_Ant1_2480



Spectrum

Ref Level 30.00 dBm Offset 1.50 dB ● RBW 100 kHz
Att 40 dB SWT 18.9 µs ● VBW 300 kHz Mode Auto FFT
Count 100/100

1Pk View

M1[1] -5.01 dBm 2.47966000 GHz
M2[1] 0.76 dBm 2.48024000 GHz

D1 -5.240 dBm

CF 2.48 GHz 1001 pts Span 4.0 MHz

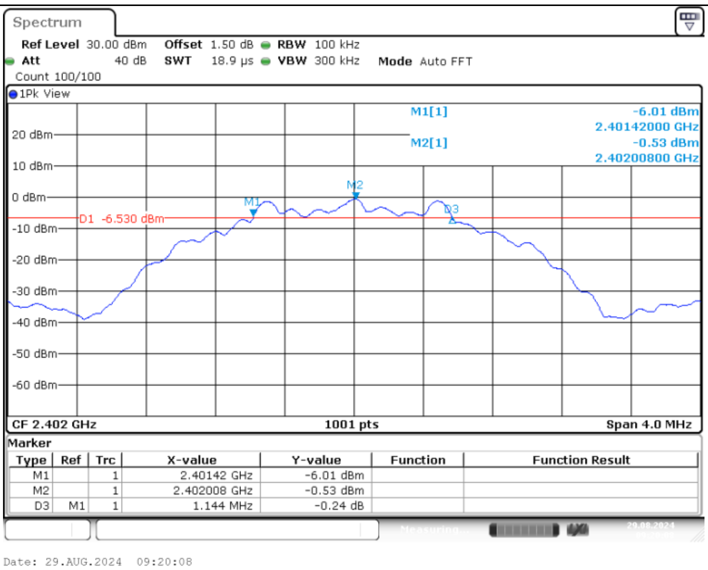
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47966 GHz	-5.01 dBm		
M2		1	2.48024 GHz	0.76 dBm		
D3	M1	1	668.0 kHz	-0.16 dB		

Date: 29.AUG.2024 09:16:08

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
M2
D3

BLE_2M_Ant1_2402



Spectrum

Ref Level 30.00 dBm Offset 1.50 dB RBW 100 kHz
Att 40 dB SWT 18.9 µs VBW 300 kHz Mode Auto FFT
Count 100/100

1Pk View

M1[1] -6.01 dBm 2.40142000 GHz
M2[1] -0.53 dBm 2.40200800 GHz

CF 2.402 GHz 1001 pts Span 4.0 MHz

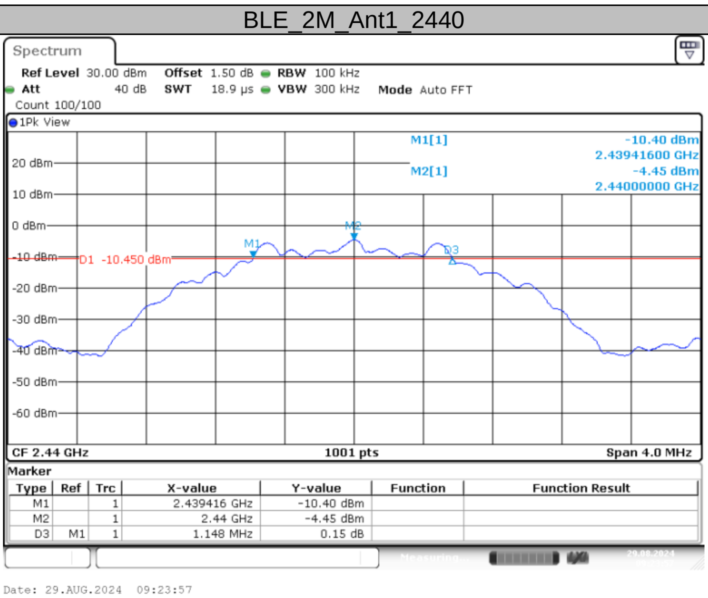
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40142 GHz	-6.01 dBm		
M2		1	2.402008 GHz	-0.53 dBm		
D3	M1	1	1.144 MHz	-0.24 dB		

Date: 29.AUG.2024 09:20:08

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -6.530 dBm
M1
M2
D3

BLE_2M_Ant1_2440



Spectrum

Ref Level 30.00 dBm Offset 1.50 dB RBW 100 kHz
Att 40 dB SWT 18.9 µs VBW 300 kHz Mode Auto FFT
Count 100/100

1Pk View

M1[1] -10.40 dBm 2.43941600 GHz
M2[1] -4.45 dBm 2.44000000 GHz

CF 2.44 GHz 1001 pts Span 4.0 MHz

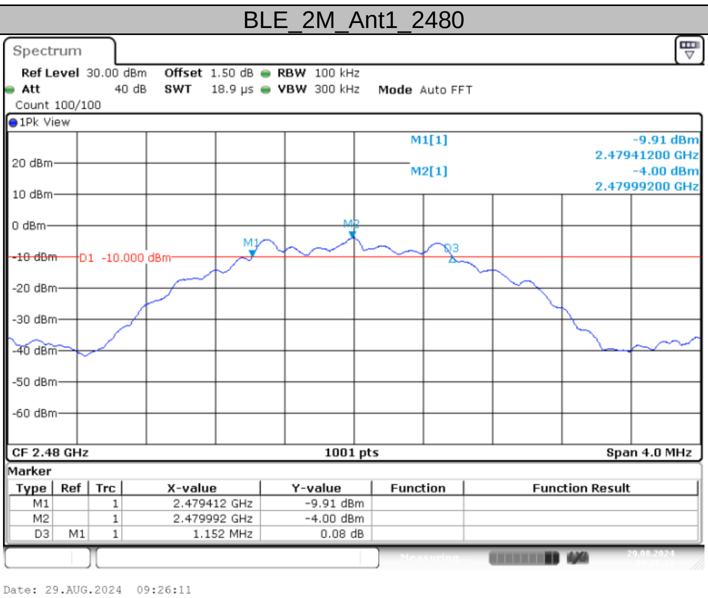
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.439416 GHz	-10.40 dBm		
M2		1	2.44 GHz	-4.45 dBm		
D3	M1	1	1.148 MHz	0.15 dB		

Date: 29.AUG.2024 09:23:57

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -10.450 dBm
M1
M2
D3

BLE_2M_Ant1_2480



Spectrum

Ref Level 30.00 dBm Offset 1.50 dB RBW 100 kHz
Att 40 dB SWT 18.9 µs VBW 300 kHz Mode Auto FFT
Count 100/100

1Pk View

M1[1] -9.91 dBm 2.47941200 GHz
M2[1] -4.00 dBm 2.47999200 GHz

CF 2.48 GHz 1001 pts Span 4.0 MHz

Marker

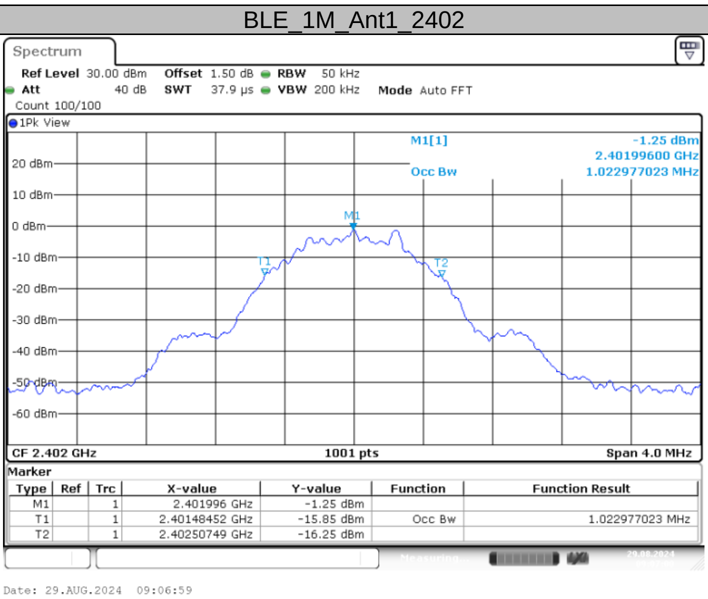
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479412 GHz	-9.91 dBm		
M2		1	2.479992 GHz	-4.00 dBm		
D3	M1	1	1.152 MHz	0.08 dB		

Date: 29.AUG.2024 09:26:11

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -10.000 dBm
M1
M2
D3

Occupied Channel Bandwidth

BLE_1M_Ant1_2402



Spectrum
Ref Level 30.00 dBm Offset 1.50 dB RBW 50 kHz
Att 40 dB SWT 37.9 µs VBW 200 kHz Mode Auto FFT
Count 100/100
1Pk View

M1[1] -1.25 dBm
2.40199600 GHz
Occ Bw 1.022977023 MHz

CF 2.402 GHz 1001 pts Span 4.0 MHz

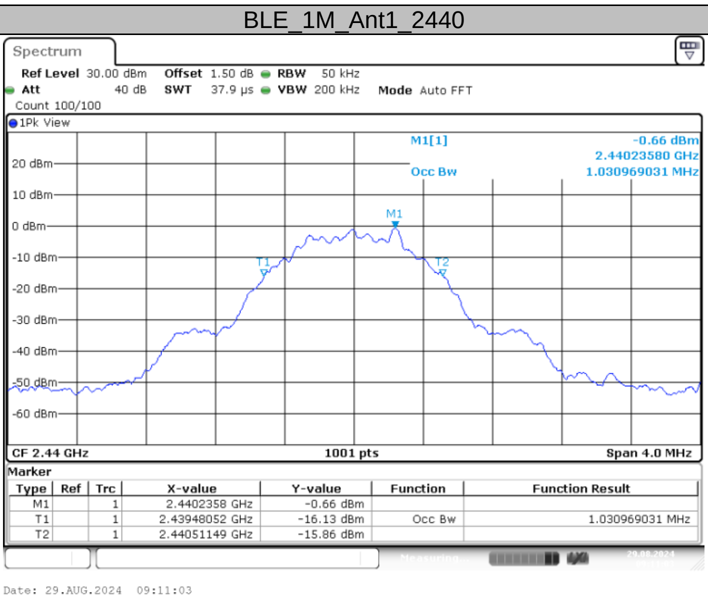
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.401996 GHz	-1.25 dBm		
T1		1	2.40148452 GHz	-15.85 dBm	Occ Bw	1.022977023 MHz
T2		1	2.40250749 GHz	-16.25 dBm		

Date: 29.AUG.2024 09:06:59

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
T1
T2

BLE_1M_Ant1_2440



Spectrum
Ref Level 30.00 dBm Offset 1.50 dB RBW 50 kHz
Att 40 dB SWT 37.9 µs VBW 200 kHz Mode Auto FFT
Count 100/100
1Pk View

M1[1] -0.66 dBm
2.44023580 GHz
Occ Bw 1.030969031 MHz

CF 2.44 GHz 1001 pts Span 4.0 MHz

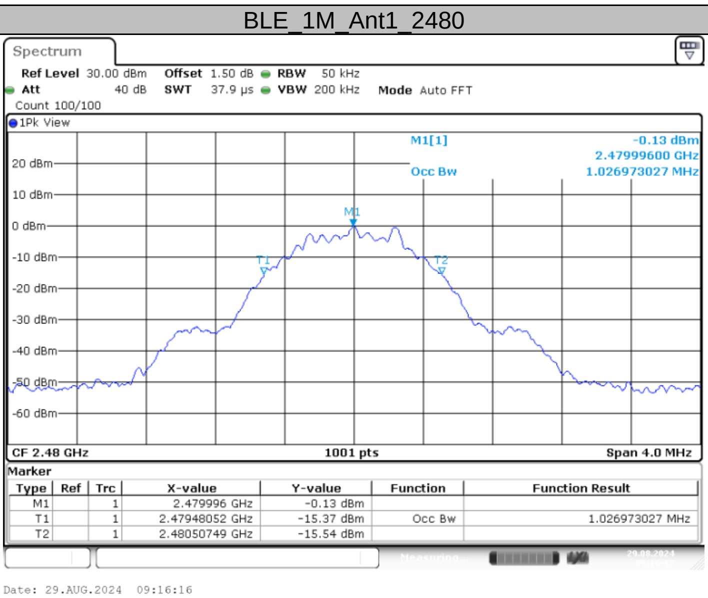
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4402358 GHz	-0.66 dBm		
T1		1	2.43948052 GHz	-16.13 dBm	Occ Bw	1.030969031 MHz
T2		1	2.44051149 GHz	-15.86 dBm		

Date: 29.AUG.2024 09:11:03

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
T1
T2

BLE_1M_Ant1_2480



Spectrum
Ref Level 30.00 dBm Offset 1.50 dB RBW 50 kHz
Att 40 dB SWT 37.9 µs VBW 200 kHz Mode Auto FFT
Count 100/100
1Pk View

M1[1] -0.13 dBm
2.47999600 GHz
Occ Bw 1.026973027 MHz

CF 2.48 GHz 1001 pts Span 4.0 MHz

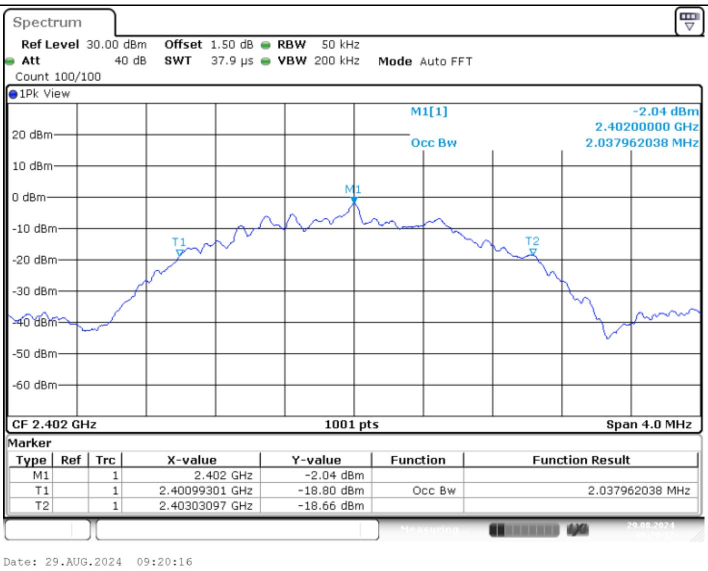
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479996 GHz	-0.13 dBm		
T1		1	2.47948052 GHz	-15.37 dBm	Occ Bw	1.026973027 MHz
T2		1	2.48050749 GHz	-15.54 dBm		

Date: 29.AUG.2024 09:16:16

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
T1
T2

BLE_2M_Ant1_2402


Spectrum
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
T1
T2

Ref Level 30.00 dBm Offset 1.50 dB ● RBW 50 kHz
● Att 40 dB SWT 37.9 µs ● VBW 200 kHz Mode Auto FFT
Count 100/100
●1Pk View

M1[1] -2.04 dBm
2.40200000 GHz
Occ Bw 2.037962038 MHz

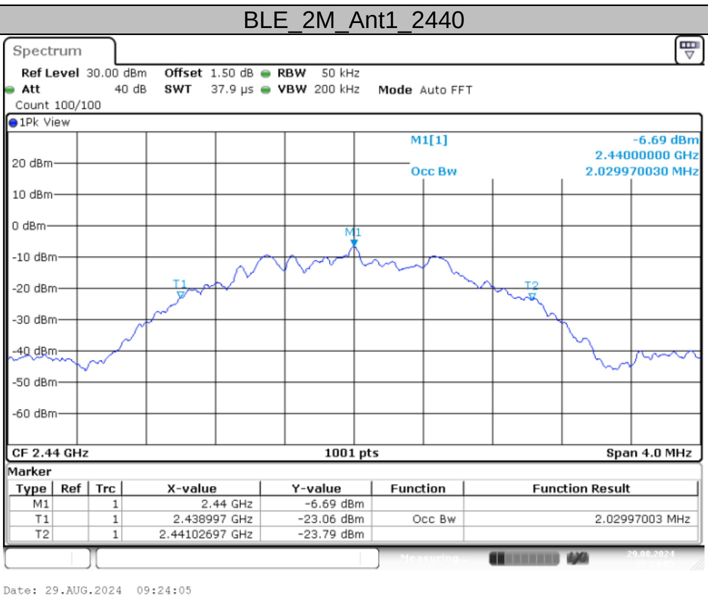
CF 2.402 GHz 1001 pts Span 4.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402 GHz	-2.04 dBm		
T1		1	2.40099301 GHz	-18.80 dBm	Occ Bw	2.037962038 MHz
T2		1	2.40303097 GHz	-18.66 dBm		

Date: 29.AUG.2024 09:20:16

BLE_2M_Ant1_2440


Spectrum
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
T1
T2

Ref Level 30.00 dBm Offset 1.50 dB ● RBW 50 kHz
● Att 40 dB SWT 37.9 µs ● VBW 200 kHz Mode Auto FFT
Count 100/100
●1Pk View

M1[1] -6.69 dBm
2.44000000 GHz
Occ Bw 2.029970030 MHz

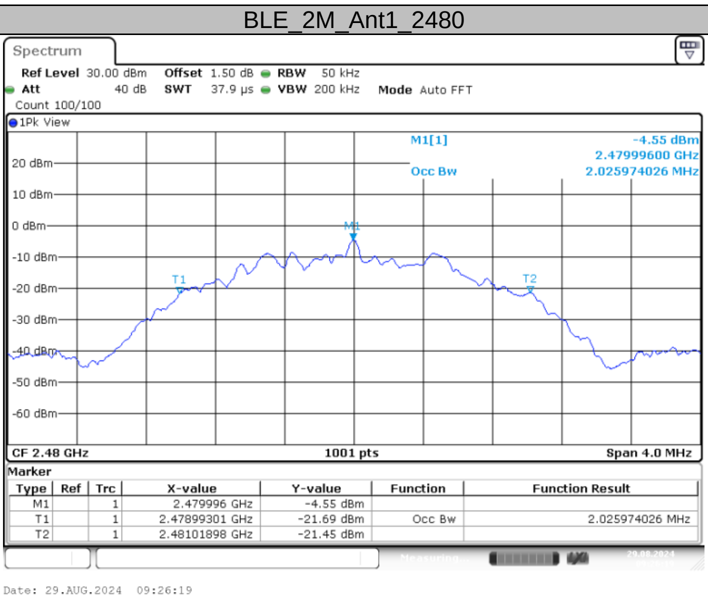
CF 2.44 GHz 1001 pts Span 4.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.44 GHz	-6.69 dBm		
T1		1	2.438997 GHz	-23.06 dBm	Occ Bw	2.02997003 MHz
T2		1	2.44102697 GHz	-23.79 dBm		

Date: 29.AUG.2024 09:24:05

BLE_2M_Ant1_2480


Spectrum
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
T1
T2

Ref Level 30.00 dBm Offset 1.50 dB ● RBW 50 kHz
● Att 40 dB SWT 37.9 µs ● VBW 200 kHz Mode Auto FFT
Count 100/100
●1Pk View

M1[1] -4.55 dBm
2.47999600 GHz
Occ Bw 2.025974026 MHz

CF 2.48 GHz 1001 pts Span 4.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479996 GHz	-4.55 dBm		
T1		1	2.47899301 GHz	-21.69 dBm	Occ Bw	2.025974026 MHz
T2		1	2.48101898 GHz	-21.45 dBm		

Date: 29.AUG.2024 09:26:19

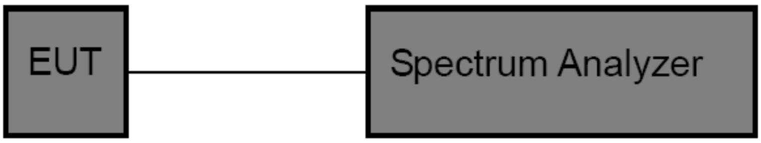
3.6. Peak Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3):

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:

Peak Detector: RBW≥DTS Bandwidth, VBW≥3*RBW.

Sweep time=Auto.
Detector= Peak.
Trace mode= Maxhold.
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

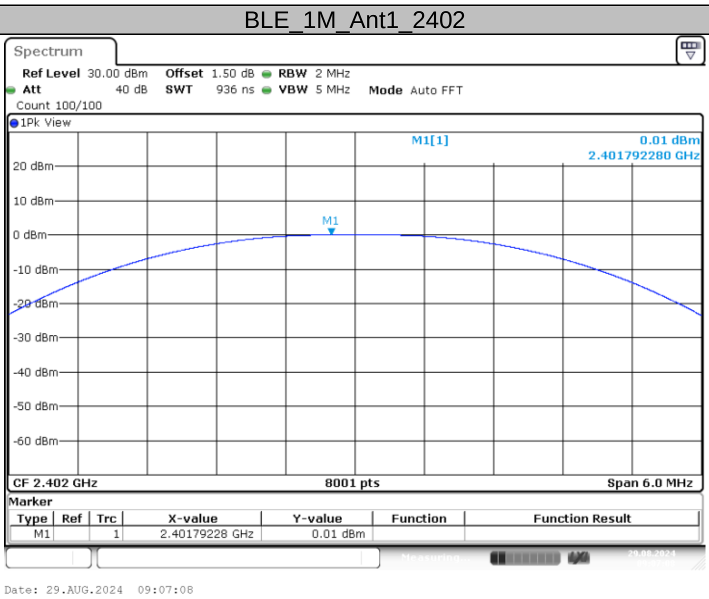
Please refer to the clause 2.4.

Test Result

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0.01	≤30	PASS
		2440	0.61	≤30	PASS
		2480	0.98	≤30	PASS
BLE_2M	Ant1	2402	0.00	≤30	PASS
		2440	-4.01	≤30	PASS
		2480	-3.17	≤30	PASS

Test plot as follows:

BLE_1M_Ant1_2402



Spectrum

Ref Level 30.00 dBm **Offset** 1.50 dB **RBW** 2 MHz
Att 40 dB **SWT** 936 ns **VBW** 5 MHz **Mode** Auto FFT
Count 100/100

1Pk View

M1[1] 0.01 dBm
2.401792280 GHz

CF 2.402 GHz 8001 pts Span 6.0 MHz

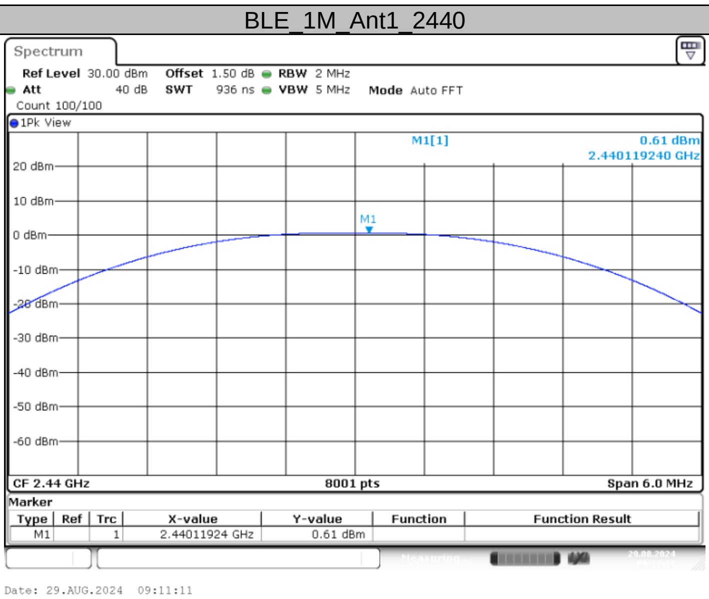
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40179228 GHz	0.01 dBm		

Date: 29.AUG.2024 09:07:08

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1

BLE_1M_Ant1_2440



Spectrum

Ref Level 30.00 dBm **Offset** 1.50 dB **RBW** 2 MHz
Att 40 dB **SWT** 936 ns **VBW** 5 MHz **Mode** Auto FFT
Count 100/100

1Pk View

M1[1] 0.61 dBm
2.440119240 GHz

CF 2.44 GHz 8001 pts Span 6.0 MHz

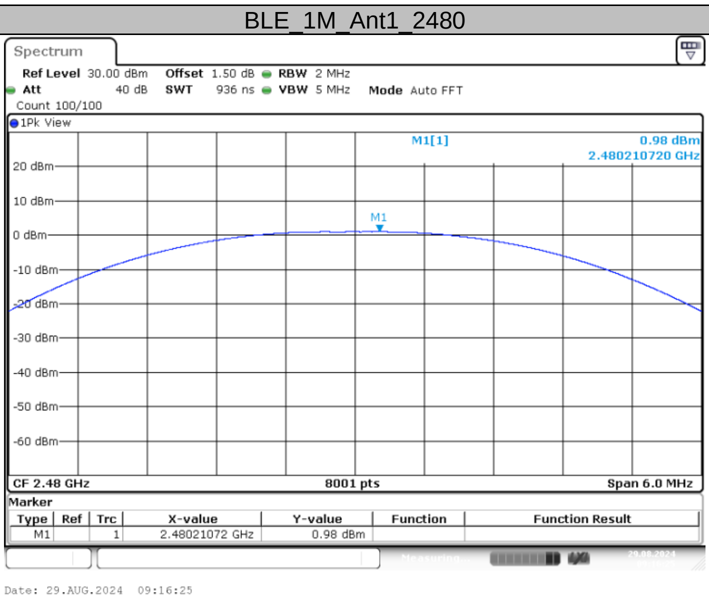
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.44011924 GHz	0.61 dBm		

Date: 29.AUG.2024 09:11:11

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1

BLE_1M_Ant1_2480



Spectrum

Ref Level 30.00 dBm **Offset** 1.50 dB **RBW** 2 MHz
Att 40 dB **SWT** 936 ns **VBW** 5 MHz **Mode** Auto FFT
Count 100/100

1Pk View

M1[1] 0.98 dBm
2.480210720 GHz

CF 2.48 GHz 8001 pts Span 6.0 MHz

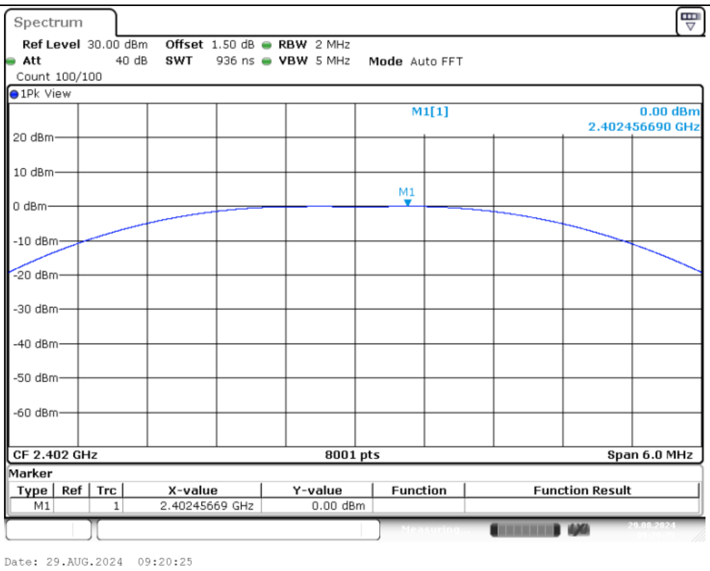
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48021072 GHz	0.98 dBm		

Date: 29.AUG.2024 09:16:25

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1

BLE_2M_Ant1_2402


Spectrum
1Pk View
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1

Ref Level 30.00 dBm Offset 1.50 dB RBW 2 MHz
Att 40 dB SWT 936 ns VBW 5 MHz Mode Auto FFT
Count 100/100

M1[1] 0.00 dBm
2.402456690 GHz

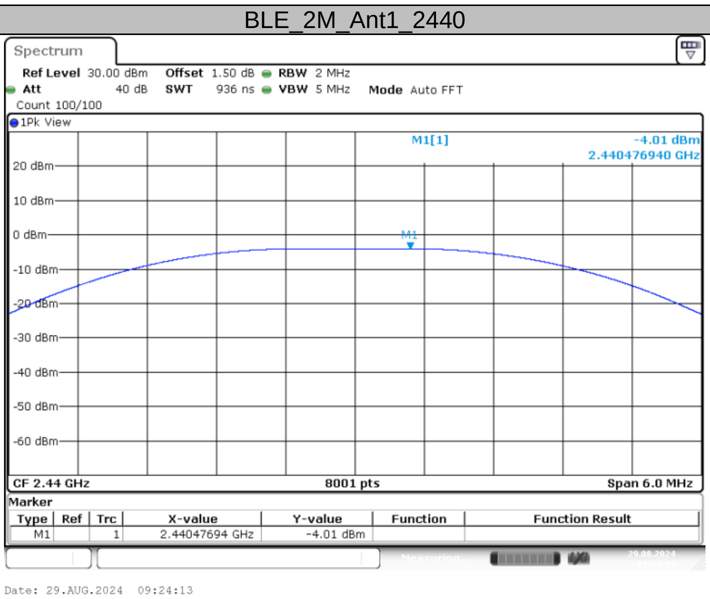
CF 2.402 GHz 8001 pts Span 6.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40245669 GHz	0.00 dBm		

Date: 29.AUG.2024 09:20:25

BLE_2M_Ant1_2440


Spectrum
1Pk View
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1

Ref Level 30.00 dBm Offset 1.50 dB RBW 2 MHz
Att 40 dB SWT 936 ns VBW 5 MHz Mode Auto FFT
Count 100/100

M1[1] -4.01 dBm
2.440476940 GHz

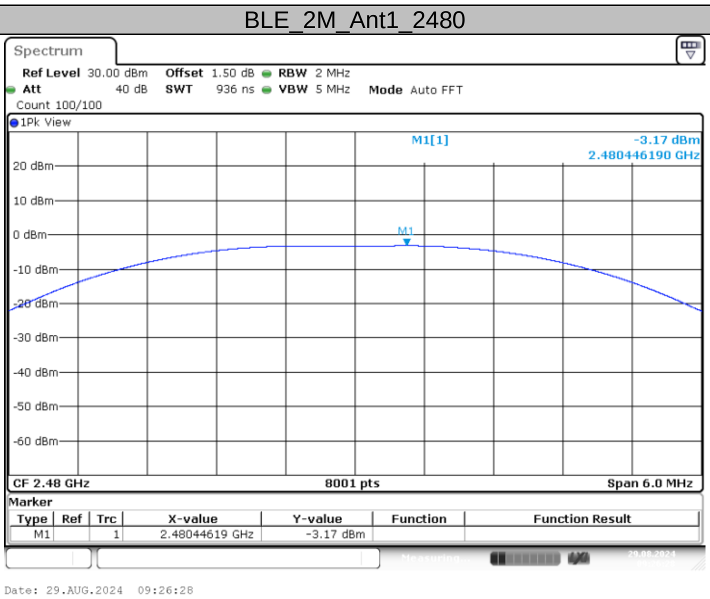
CF 2.44 GHz 8001 pts Span 6.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.44047694 GHz	-4.01 dBm		

Date: 29.AUG.2024 09:24:13

BLE_2M_Ant1_2480


Spectrum
1Pk View
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1

Ref Level 30.00 dBm Offset 1.50 dB RBW 2 MHz
Att 40 dB SWT 936 ns VBW 5 MHz Mode Auto FFT
Count 100/100

M1[1] -3.17 dBm
2.480446190 GHz

CF 2.48 GHz 8001 pts Span 6.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48044619 GHz	-3.17 dBm		

Date: 29.AUG.2024 09:26:28

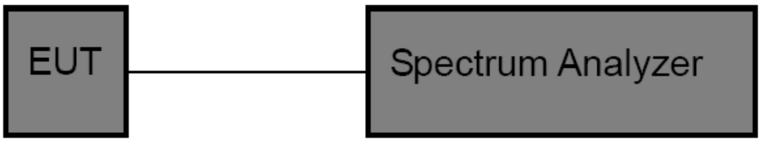
3.7. Power Spectral Density

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e):

Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:

Set analyzer center frequency to DTS channel center frequency.
Set the span to 1.5 times the DTS bandwidth.
Set the RBW to: 3 kHz
Set the VBW to: 10 kHz
Detector: peak
Sweep time: auto

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

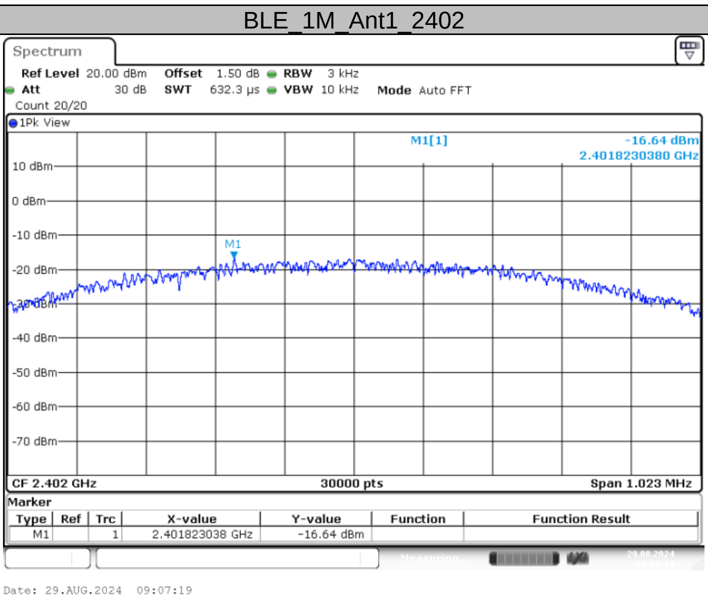
Please refer to the clause 2.4.

Test Result

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-16.64	≤8	PASS
		2440	-16.10	≤8	PASS
		2480	-15.72	≤8	PASS
BLE_2M	Ant1	2402	-18.81	≤8	PASS
		2440	-22.78	≤8	PASS
		2480	-22.21	≤8	PASS

Test plot as follows:

BLE_1M_Ant1_2402



Spectrum

Ref Level 20.00 dBm **Offset** 1.50 dB **RBW** 3 kHz
Att 30 dB **SWT** 632.3 µs **VBW** 10 kHz **Mode** Auto FFT
Count 20/20

M1[1] -16.64 dBm
2.4018230380 GHz

CF 2.402 GHz 30000 pts Span 1.023 MHz

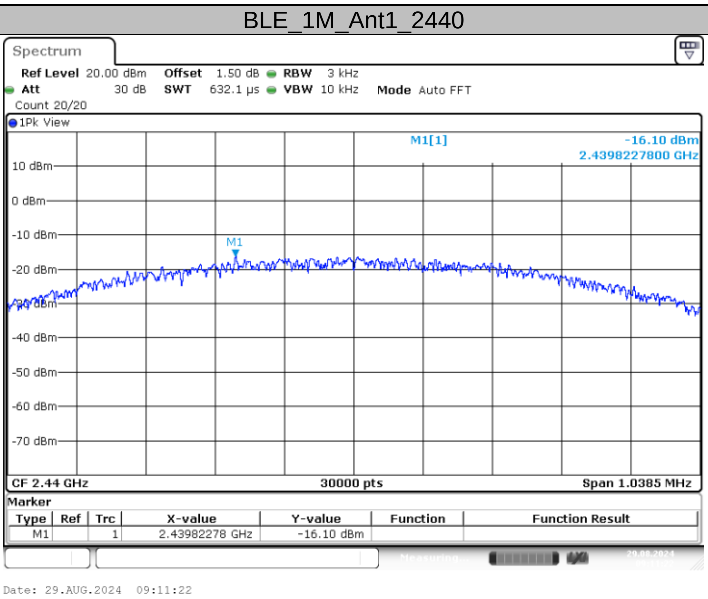
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.401823038 GHz	-16.64 dBm		

Date: 29.AUG.2024 09:07:19

1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1

BLE_1M_Ant1_2440



Spectrum

Ref Level 20.00 dBm **Offset** 1.50 dB **RBW** 3 kHz
Att 30 dB **SWT** 632.1 µs **VBW** 10 kHz **Mode** Auto FFT
Count 20/20

M1[1] -16.10 dBm
2.4398227800 GHz

CF 2.44 GHz 30000 pts Span 1.0385 MHz

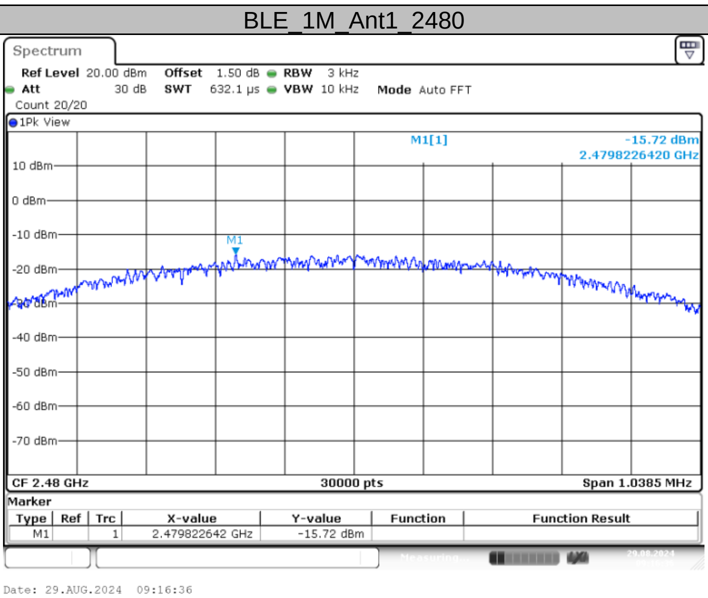
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.43982278 GHz	-16.10 dBm		

Date: 29.AUG.2024 09:11:22

1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1

BLE_1M_Ant1_2480



Spectrum

Ref Level 20.00 dBm **Offset** 1.50 dB **RBW** 3 kHz
Att 30 dB **SWT** 632.1 µs **VBW** 10 kHz **Mode** Auto FFT
Count 20/20

M1[1] -15.72 dBm
2.4798226420 GHz

CF 2.48 GHz 30000 pts Span 1.0385 MHz

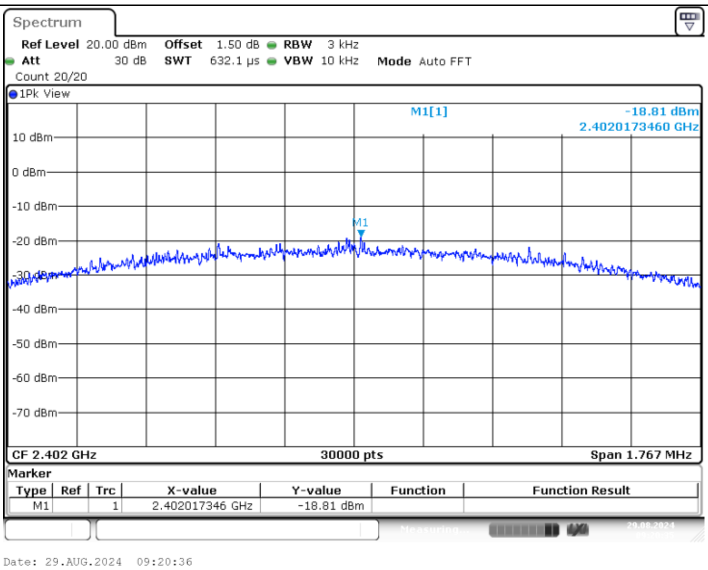
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479822642 GHz	-15.72 dBm		

Date: 29.AUG.2024 09:16:36

1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1

BLE_2M_Ant1_2402


Spectrum
1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1

Ref Level 20.00 dBm Offset 1.50 dB RBW 3 kHz
Att 30 dB SWT 632.1 µs VBW 10 kHz Mode Auto FFT
Count 20/20

M1[1] -18.81 dBm
2.4020173460 GHz

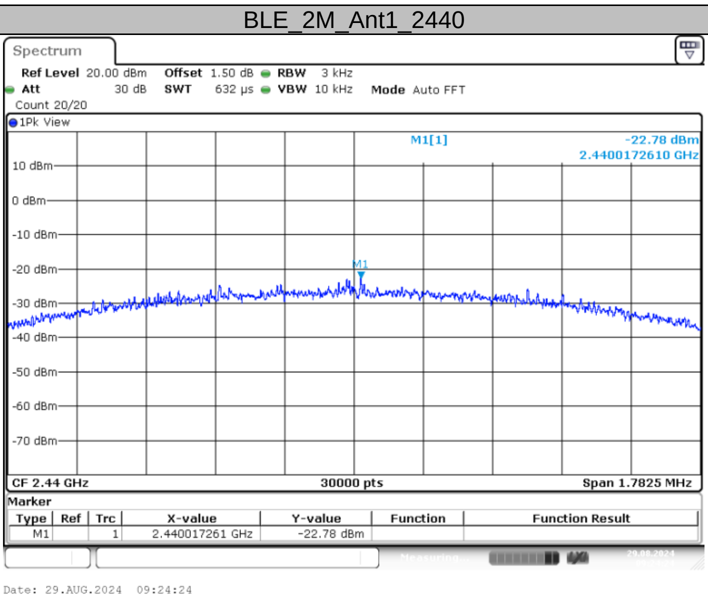
CF 2.402 GHz 30000 pts Span 1.767 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402017346 GHz	-18.81 dBm		

Date: 29.AUG.2024 09:20:36

BLE_2M_Ant1_2440


Spectrum
1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1

Ref Level 20.00 dBm Offset 1.50 dB RBW 3 kHz
Att 30 dB SWT 632 µs VBW 10 kHz Mode Auto FFT
Count 20/20

M1[1] -22.78 dBm
2.4400172610 GHz

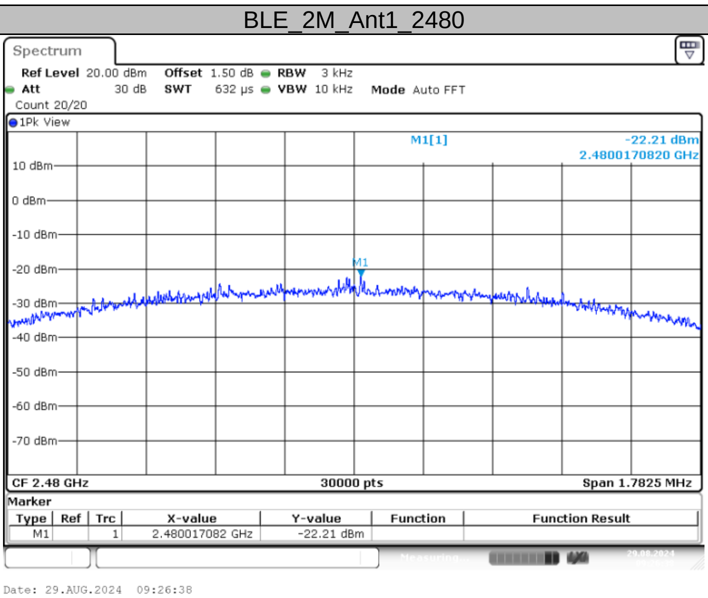
CF 2.44 GHz 30000 pts Span 1.7825 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.440017261 GHz	-22.78 dBm		

Date: 29.AUG.2024 09:24:24

BLE_2M_Ant1_2480


Spectrum
1Pk View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1

Ref Level 20.00 dBm Offset 1.50 dB RBW 3 kHz
Att 30 dB SWT 632 µs VBW 10 kHz Mode Auto FFT
Count 20/20

M1[1] -22.21 dBm
2.4800170820 GHz

CF 2.48 GHz 30000 pts Span 1.7825 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.480017082 GHz	-22.21 dBm		

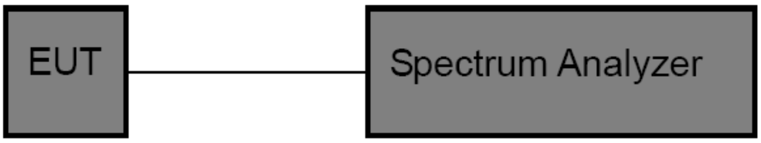
Date: 29.AUG.2024 09:26:38

3.8. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:

Set analyzer center frequency to test channel center frequency.
Set the span to 0Hz
Set the RBW to 10MHz
Set the VBW to 10MHz
Detector: Peak
Sweep time: Auto
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

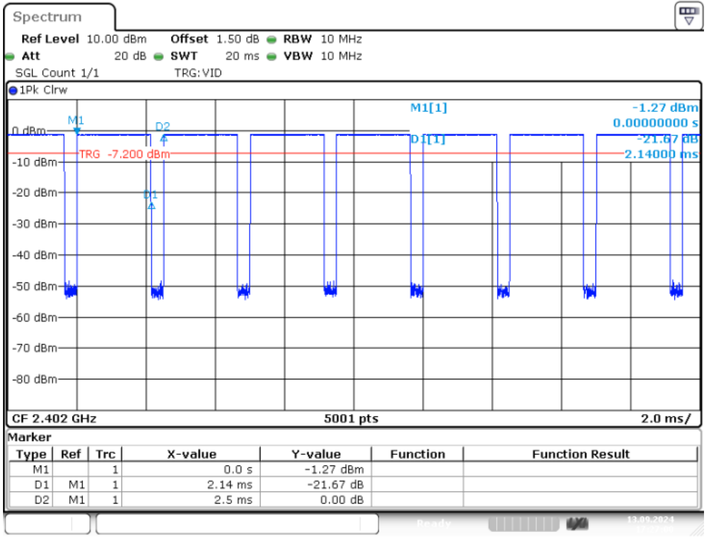
Please refer to the clause 2.4.

Test Result

Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
BLE 1M	2402	2.14	2.50	85.60	0.47	1
	2440	2.14	2.50	85.60	0.47	1
	2480	2.14	2.50	85.60	0.47	1
BLE 2M	2402	1.08	2.50	43.20	0.93	1
	2440	1.08	2.50	43.20	0.93	1
	2480	1.08	2.50	43.20	0.93	1

Test plot as follows:

BLE_1M_Ant1_2402


Spectrum

Ref Level 10.00 dBm Offset 1.50 dB ● RBW 10 MHz
● Att 20 dB ● SWT 20 ms ● VBW 10 MHz
SGL Count 1/1 TRG:VID
● 1Pk Clrw

M1[1] -1.27 dBm
0.00000000 s
D1[1] -21.67 dB
2.14000 ms

CF 2.402 GHz 5001 pts 2.0 ms/

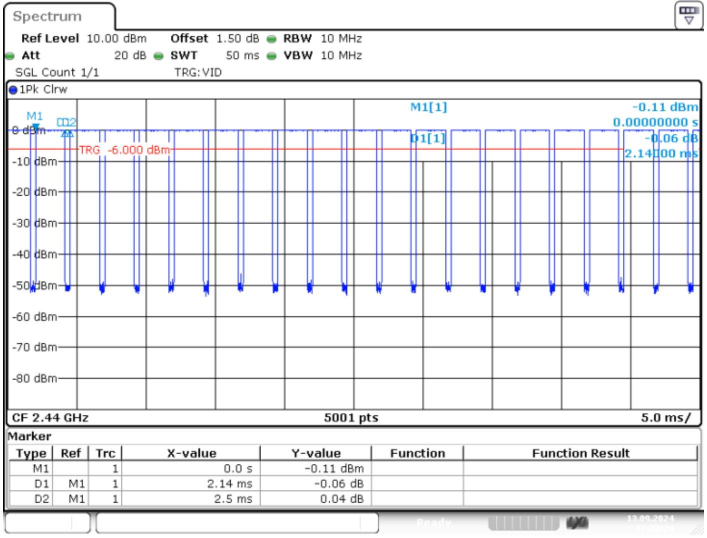
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	0.0 s	-1.27 dBm		
D1	M1	1	2.14 ms	-21.67 dB		
D2	M1	1	2.5 ms	0.00 dB		

0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
D2
D1
TRG -7.200 dBm

Date: 13.SEP.2024 17:27:00

BLE_1M_Ant1_2440


Spectrum

Ref Level 10.00 dBm Offset 1.50 dB ● RBW 10 MHz
● Att 20 dB ● SWT 50 ms ● VBW 10 MHz
SGL Count 1/1 TRG:VID
● 1Pk Clrw

M1[1] -0.11 dBm
0.00000000 s
D1[1] -0.06 dB
2.14000 ms

CF 2.44 GHz 5001 pts 5.0 ms/

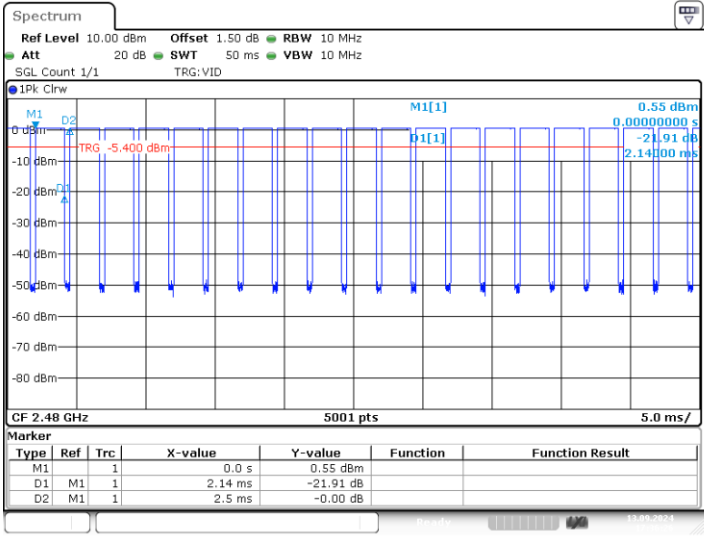
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	0.0 s	-0.11 dBm		
D1	M1	1	2.14 ms	-0.06 dB		
D2	M1	1	2.5 ms	0.04 dB		

0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
D1D2
TRG -6.000 dBm

Date: 13.SEP.2024 17:32:23

BLE_1M_Ant1_2480


Spectrum

Ref Level 10.00 dBm Offset 1.50 dB ● RBW 10 MHz
● Att 20 dB ● SWT 50 ms ● VBW 10 MHz
SGL Count 1/1 TRG:VID
● 1Pk Clrw

M1[1] 0.55 dBm
0.00000000 s
D1[1] -21.91 dB
2.14000 ms

CF 2.48 GHz 5001 pts 5.0 ms/

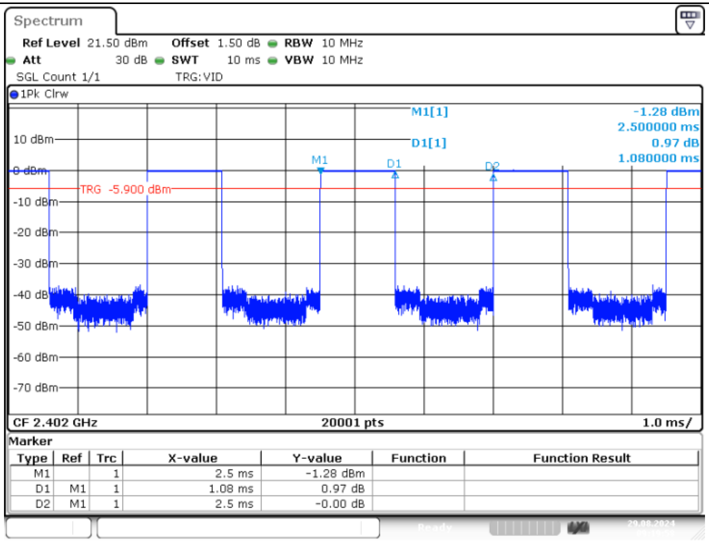
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	0.0 s	0.55 dBm		
D1	M1	1	2.14 ms	-21.91 dB		
D2	M1	1	2.5 ms	-0.00 dB		

0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
D2
D1
TRG -5.400 dBm

Date: 13.SEP.2024 17:36:26

BLE_2M_Ant1_2402



Ref Level 21.50 dBm Offset 1.50 dB RBW 10 MHz
Att 30 dB SWT 10 ms VBW 10 MHz
SGL Count 1/1 TRG:VID

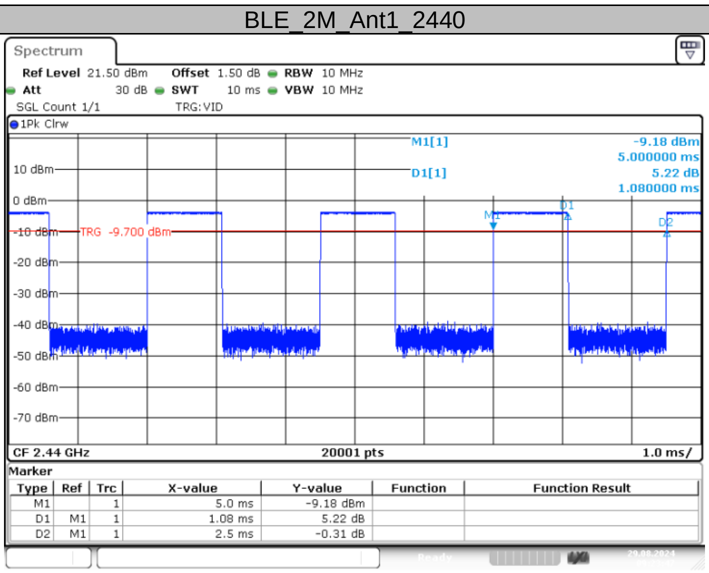
M1[1] -1.28 dBm 2.500000 ms
D1[1] 0.97 dB 1.080000 ms

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.5 ms	-1.28 dBm		
D1	M1	1	1.08 ms	0.97 dB		
D2	M1	1	2.5 ms	-0.00 dB		

Spectrum
1Pk Clrw
10 dBm
0 dBm
TRG -5.900 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
D2
CF 2.402 GHz
20001 pts
1.0 ms/
Marker

Date: 29.AUG.2024 09:19:58

BLE_2M_Ant1_2440



Ref Level 21.50 dBm Offset 1.50 dB RBW 10 MHz
Att 30 dB SWT 10 ms VBW 10 MHz
SGL Count 1/1 TRG:VID

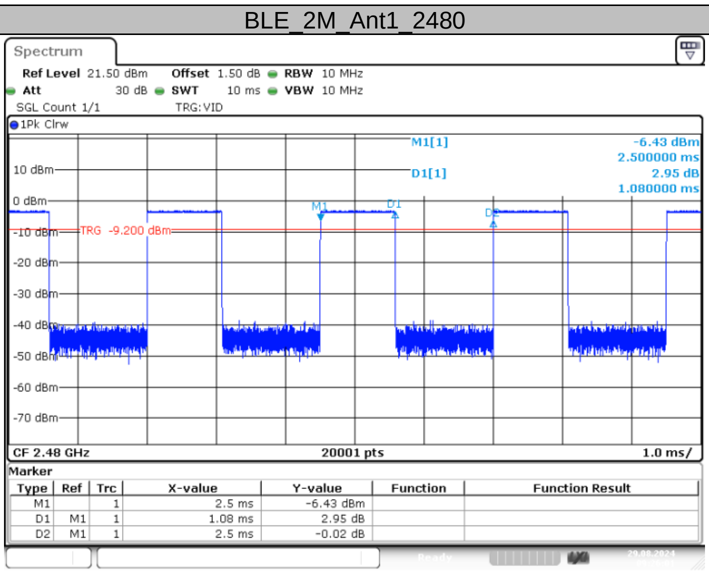
M1[1] -9.18 dBm 5.000000 ms
D1[1] 5.22 dB 1.080000 ms

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.0 ms	-9.18 dBm		
D1	M1	1	1.08 ms	5.22 dB		
D2	M1	1	2.5 ms	-0.31 dB		

Spectrum
1Pk Clrw
10 dBm
0 dBm
-10 dBm
TRG -9.700 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
D2
CF 2.44 GHz
20001 pts
1.0 ms/
Marker

Date: 29.AUG.2024 09:23:47

BLE_2M_Ant1_2480



Ref Level 21.50 dBm Offset 1.50 dB RBW 10 MHz
Att 30 dB SWT 10 ms VBW 10 MHz
SGL Count 1/1 TRG:VID

M1[1] -6.43 dBm 2.500000 ms
D1[1] 2.95 dB 1.080000 ms

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.5 ms	-6.43 dBm		
D1	M1	1	1.08 ms	2.95 dB		
D2	M1	1	2.5 ms	-0.02 dB		

Spectrum
1Pk Clrw
10 dBm
0 dBm
-10 dBm
TRG -9.200 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
D2
CF 2.48 GHz
20001 pts
1.0 ms/
Marker

Date: 29.AUG.2024 09:26:01

3.9. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):
(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result
The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

************************THE END************************