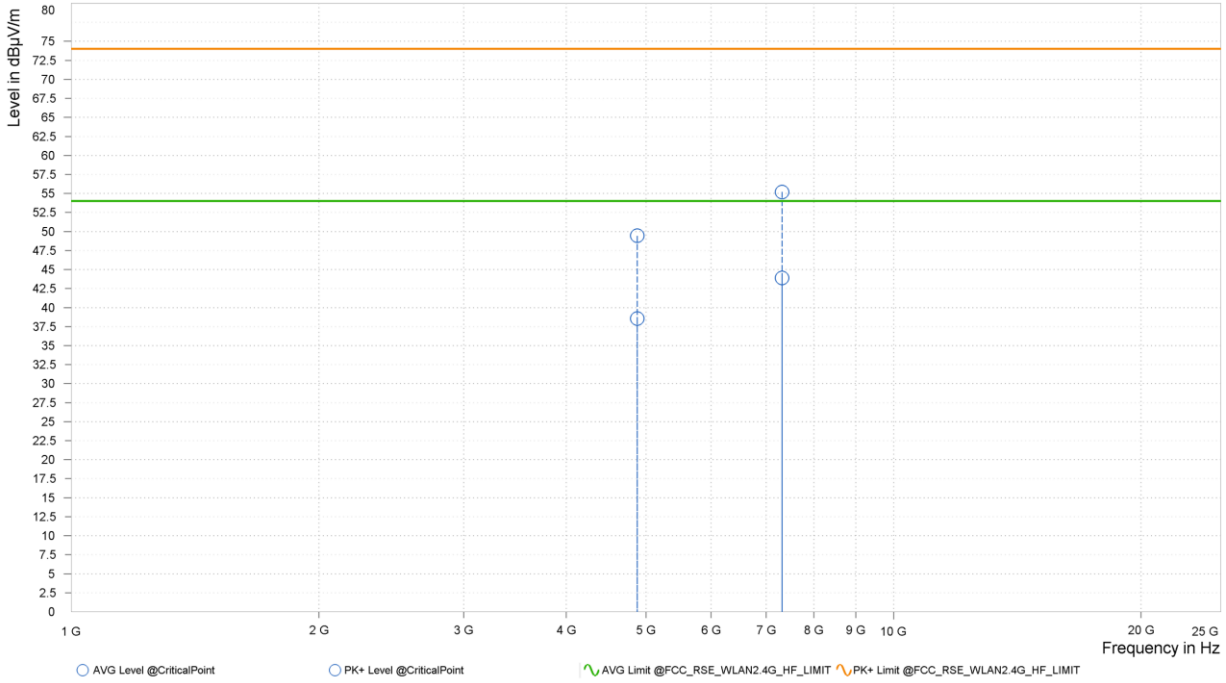
CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

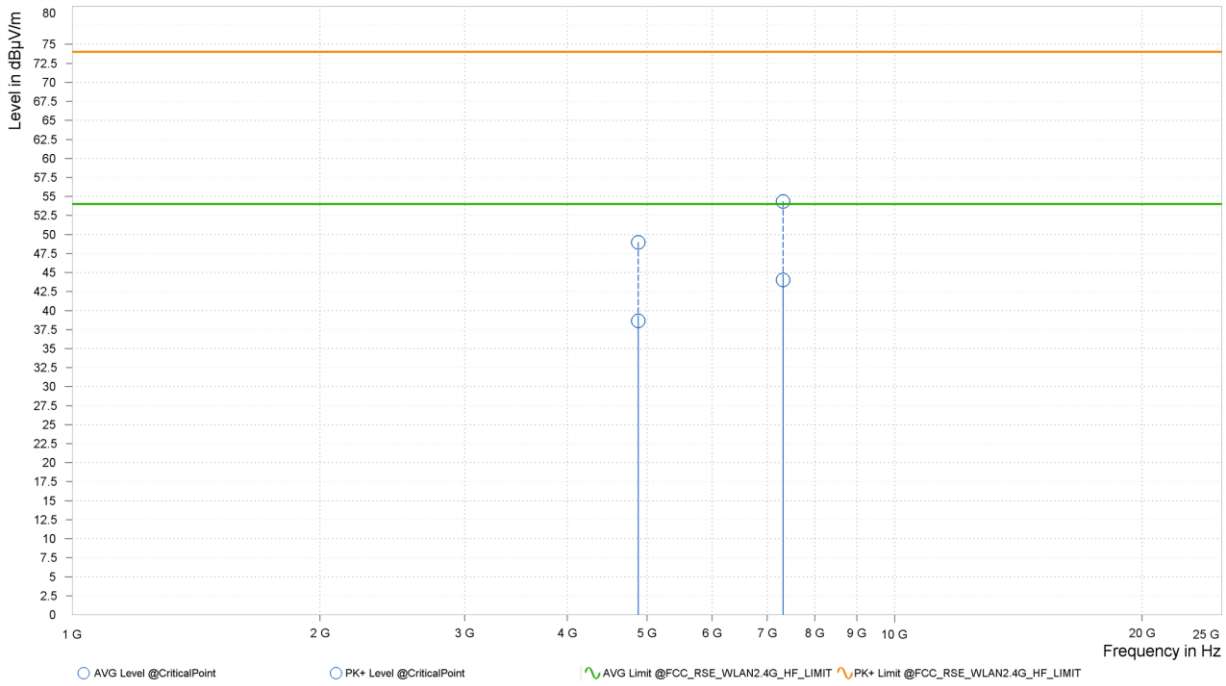
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,880.000	49.44	74.00	24.56	38.56	54.00	15.44	13.54	H	330.4	1.00
2	7,320.000	55.21	74.00	18.79	43.90	54.00	10.10	18.90	H	272.3	2.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,880.000	48.97	74.00	25.03	38.64	54.00	15.36	13.54	V	359	2.00
2	7,320.000	54.36	74.00	19.64	44.02	54.00	9.98	18.90	V	359	2.00



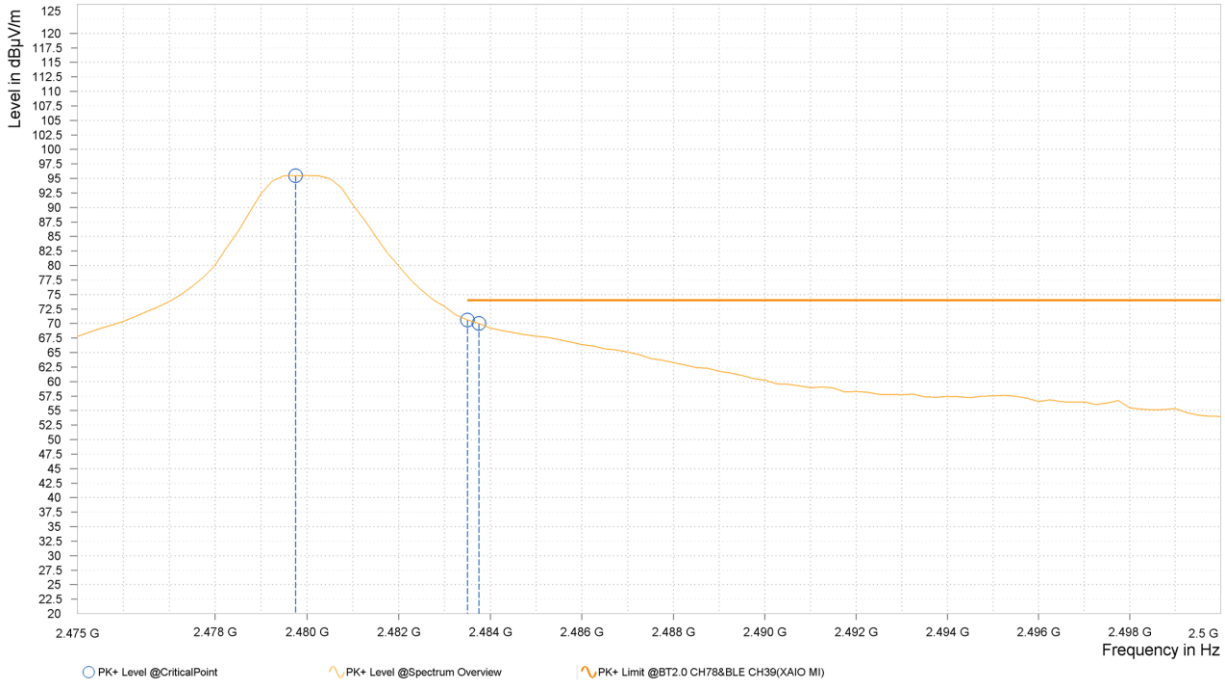
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Limit value–Emission level.
2. 2440MHz: Fundamental frequency.

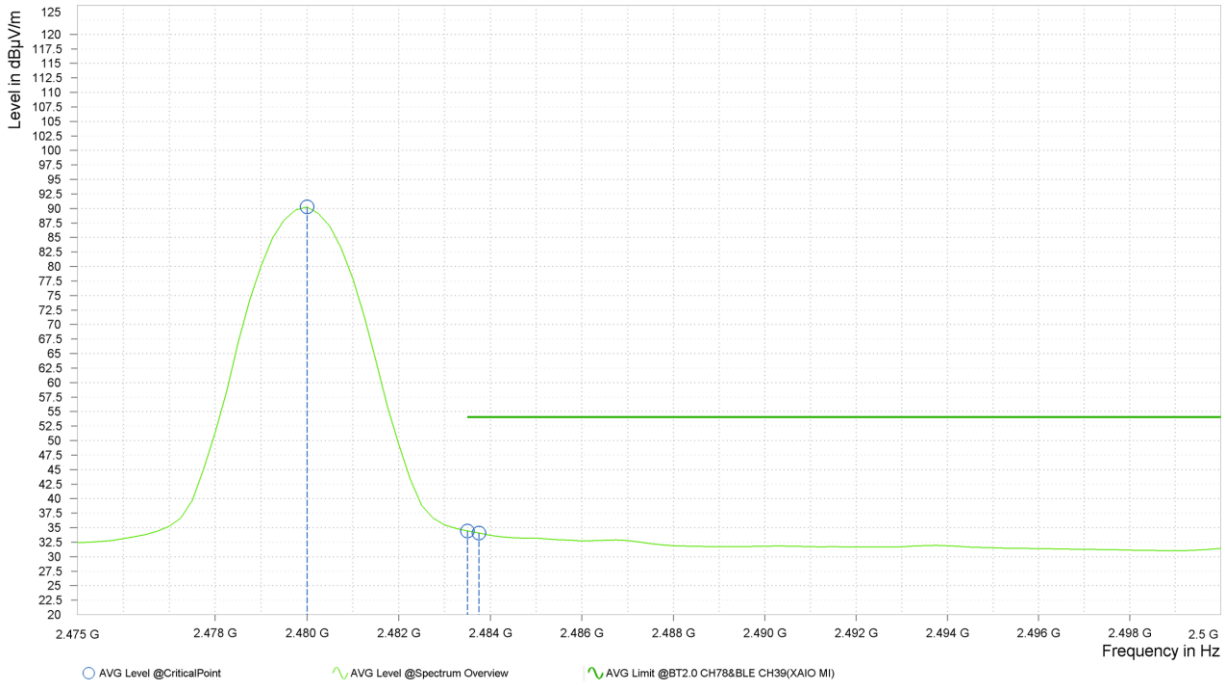
CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.750	95.48			5.89	H	69	1.00
6	2,483.500	70.60	74.00	3.40	5.91	H	4.9	2.00
6	2,483.750	70.01	74.00	3.99	5.92	H	4.9	2.00

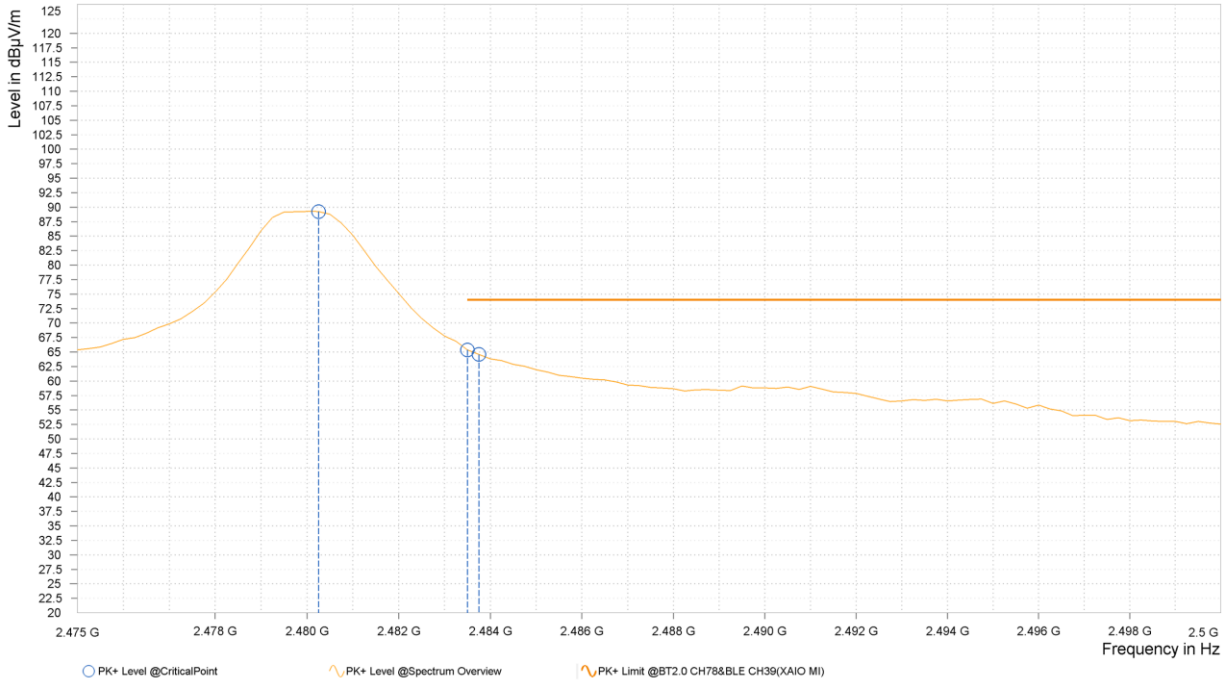


Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.000	90.25			5.89	H	359	2.00
6	2,483.500	34.44	54.00	19.56	5.91	H	4.9	1.00
6	2,483.750	34.09	54.00	19.91	5.92	H	4.9	1.00

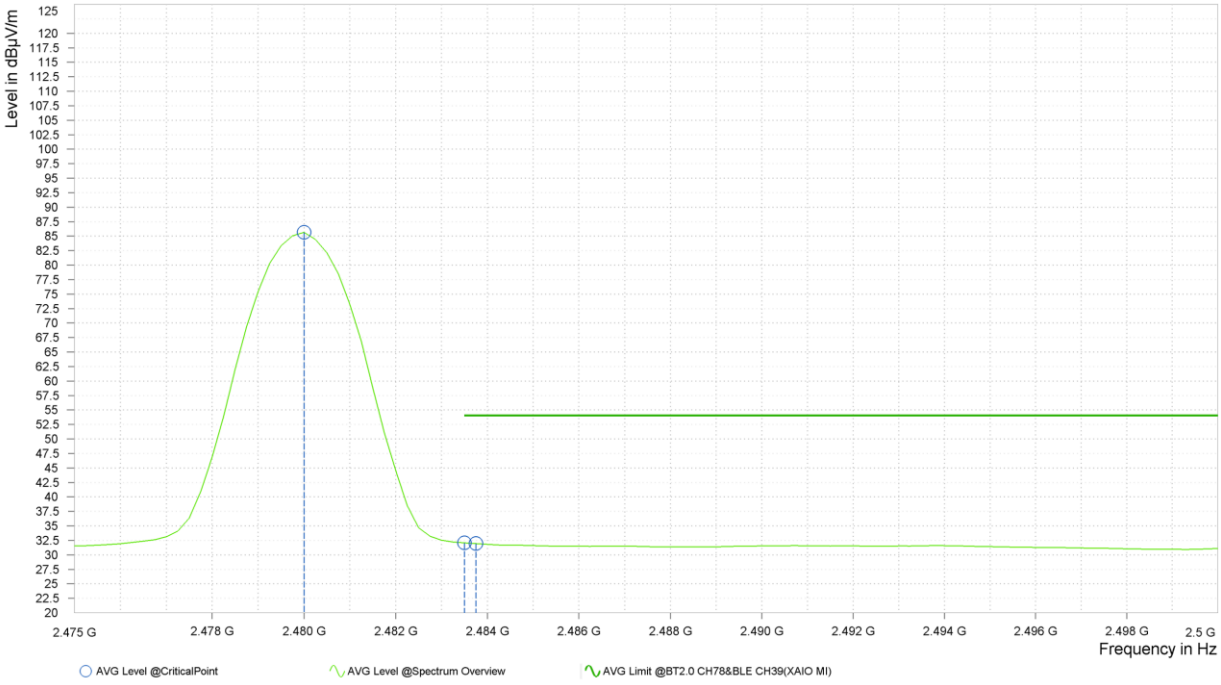


ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.250	89.25			5.89	V	355.7	1.00
6	2,483.500	65.36	74.00	8.64	5.91	V	359.1	1.00
6	2,483.750	64.58	74.00	9.42	5.92	V	355.7	1.00



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.000	85.65			5.89	V	355.8	2.00
6	2,483.500	32.07	54.00	21.93	5.91	V	354.2	1.00
6	2,483.750	31.94	54.00	22.06	5.92	V	69	2.00



REMARKS:

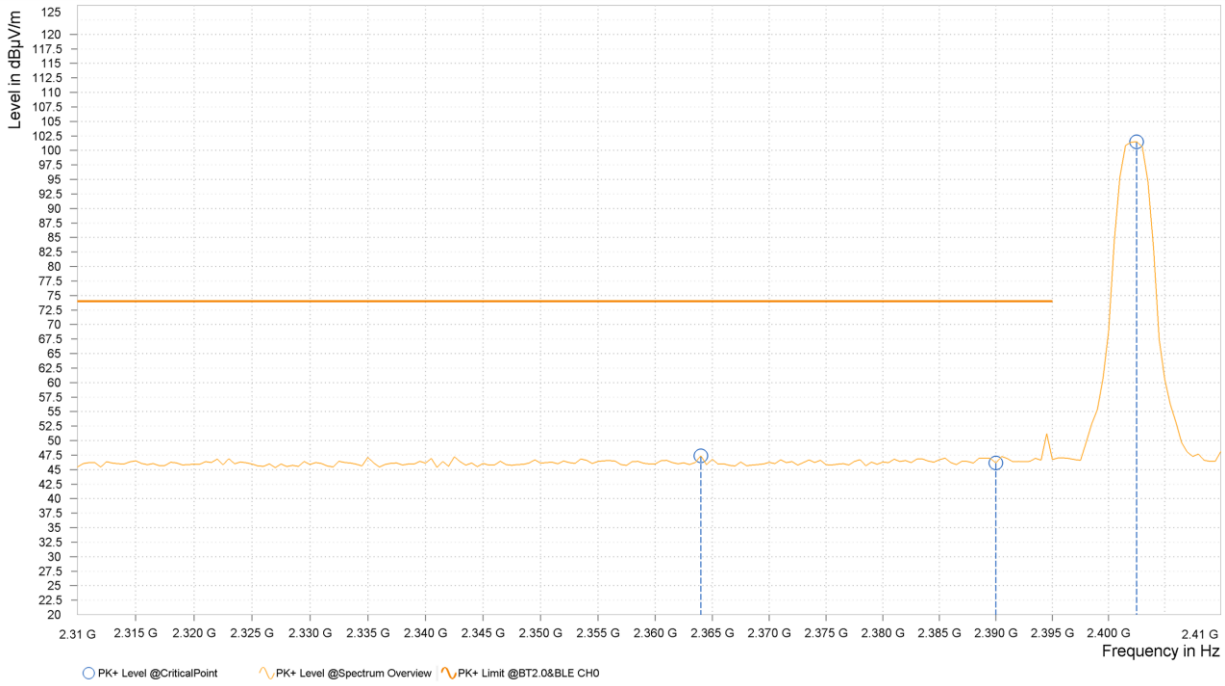
1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Limit value–Emission level.
2. 2480MHz: Fundamental frequency.

BT-LE _S8

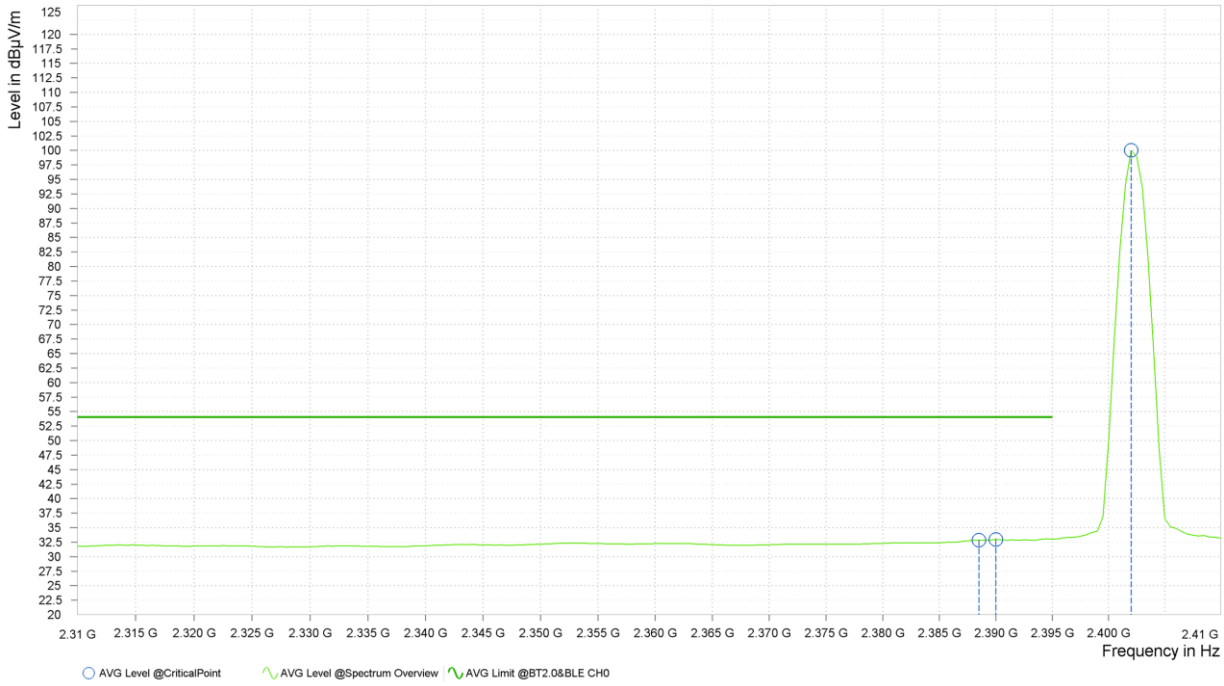
CHANNEL	TX Channel 0	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,364.000	47.39	74.00	26.61	7.10	H	359.1	1.00
5	2,390.000	46.14	74.00	27.86	7.08	H	5	1.00
5	2,402.500	101.50			7.09	H	206.6	2.00

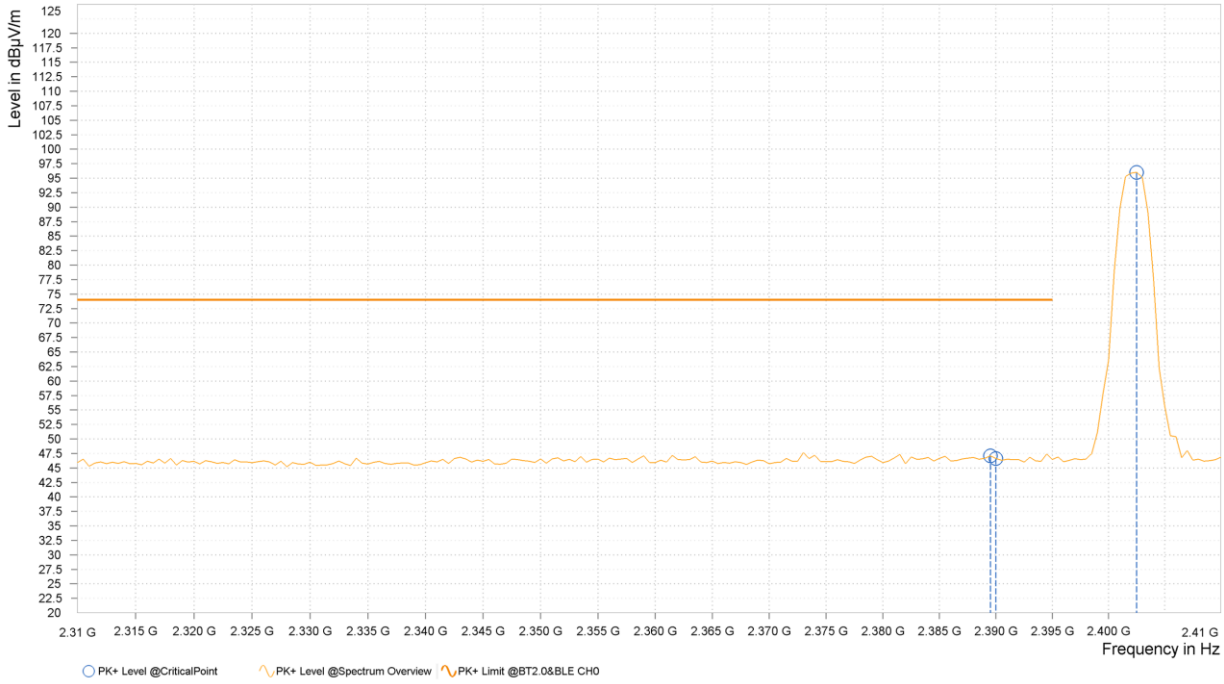


Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,388.500	32.86	54.00	21.14	7.08	H	206.5	2.00
5	2,390.000	32.98	54.00	21.02	7.08	H	206.5	2.00
5	2,402.000	100.01			7.08	H	206.5	2.00

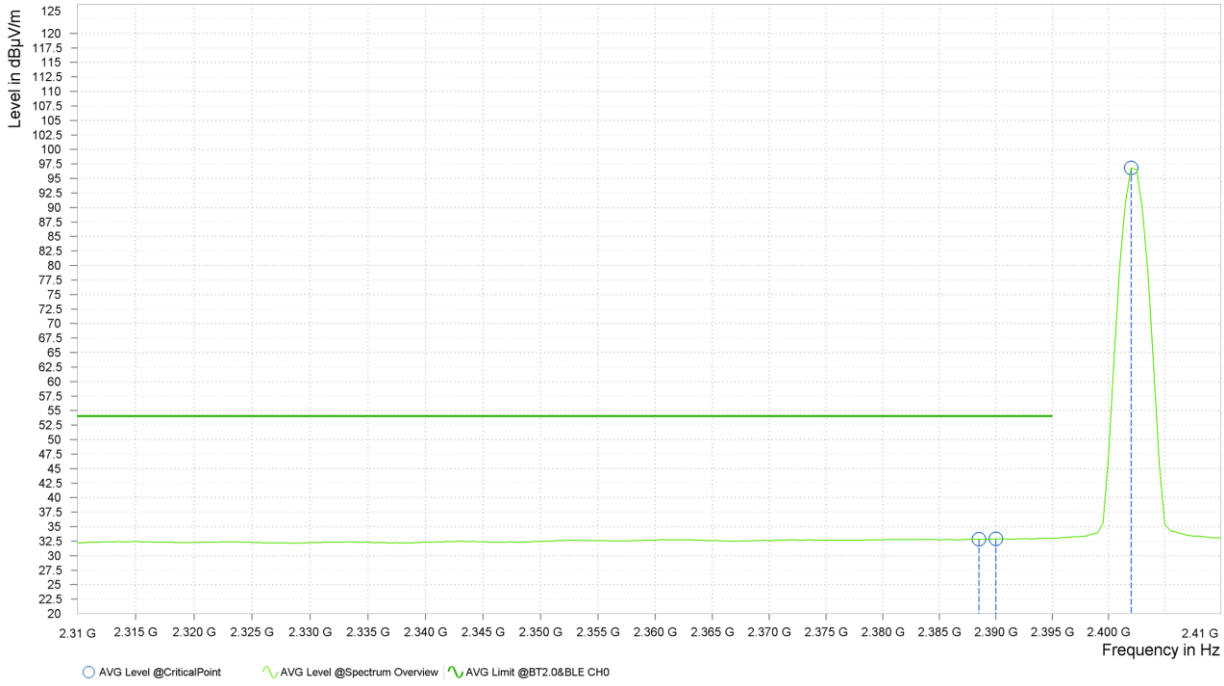


ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,389.500	47.08	74.00	26.92	7.08	V	1	2.00
5	2,390.000	46.63	74.00	27.37	7.08	V	21.5	2.00
5	2,402.500	96.01			7.09	V	359.1	1.00



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,388.500	32.82	54.00	21.18	7.08	V	21.5	2.00
5	2,390.000	32.87	54.00	21.13	7.08	V	233.9	2.00
5	2,402.000	96.82			7.08	V	233.9	2.00



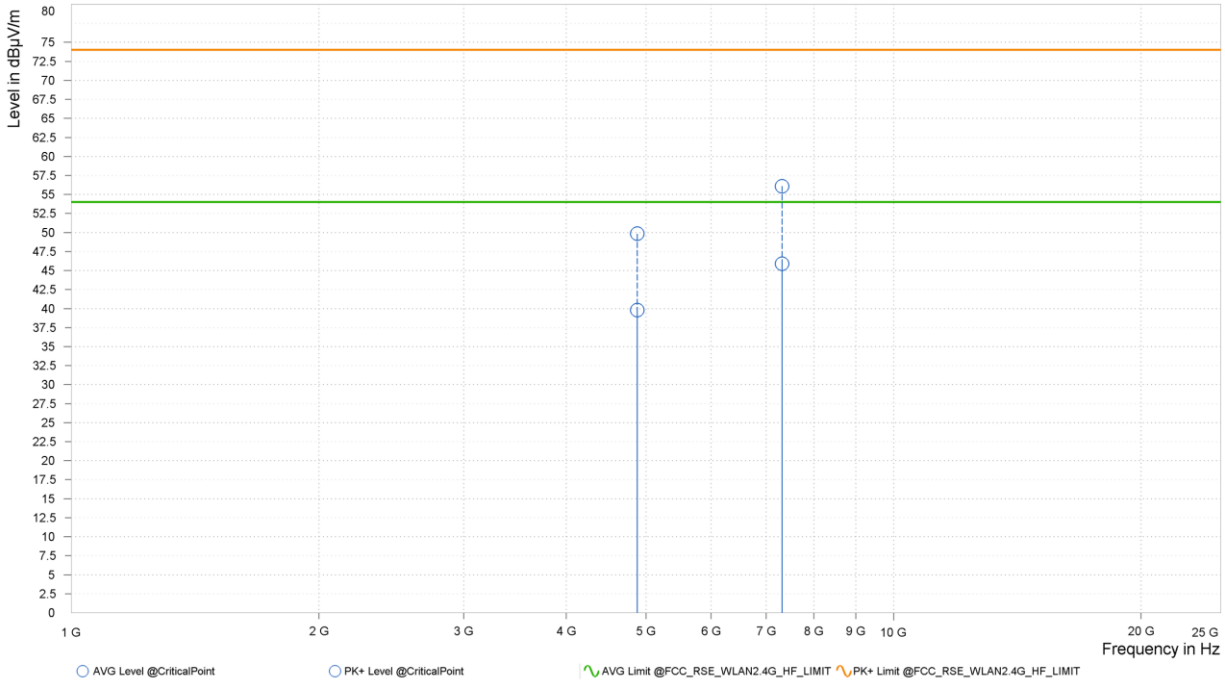
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Limit value–Emission level.
2. 2402MHz: Fundamental frequency.

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

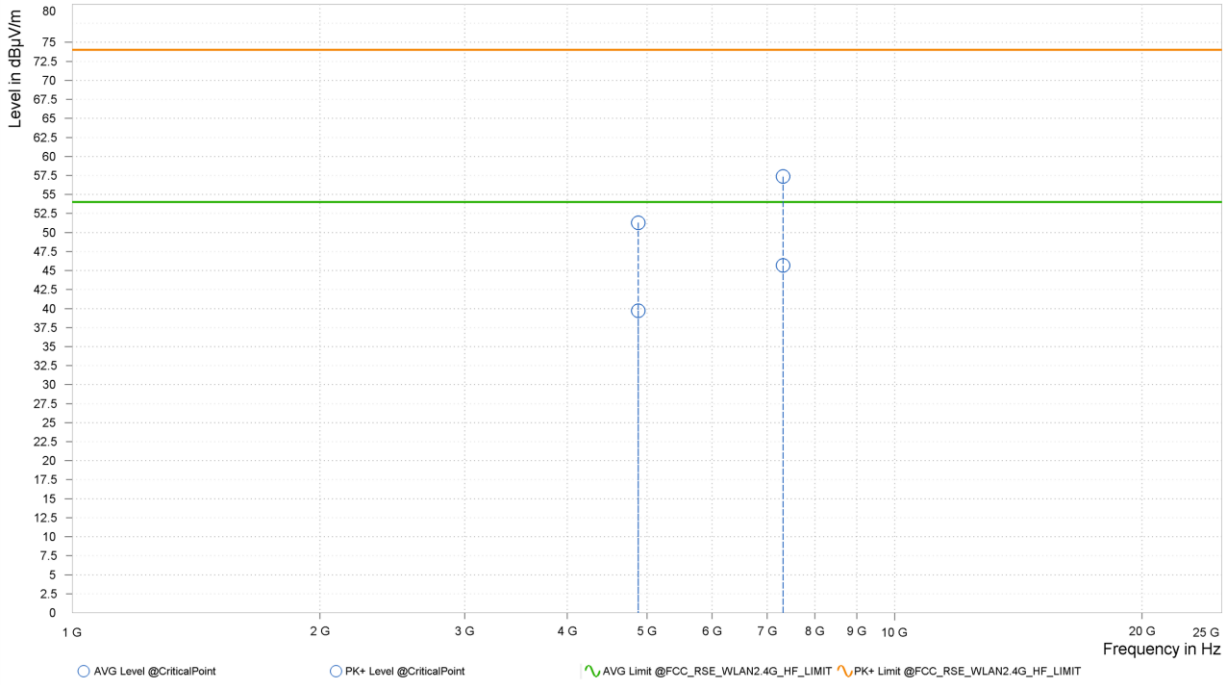
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,880.000	49.85	74.00	24.15	39.79	54.00	14.21	15.30	H	91.3	2.00
2	7,320.000	56.09	74.00	17.91	45.90	54.00	8.10	21.10	H	359	2.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,880.000	51.28	74.00	22.72	39.73	54.00	14.27	15.30	V	90.1	2.00
2	7,320.000	57.35	74.00	16.65	45.65	54.00	8.35	21.10	V	337.4	2.00



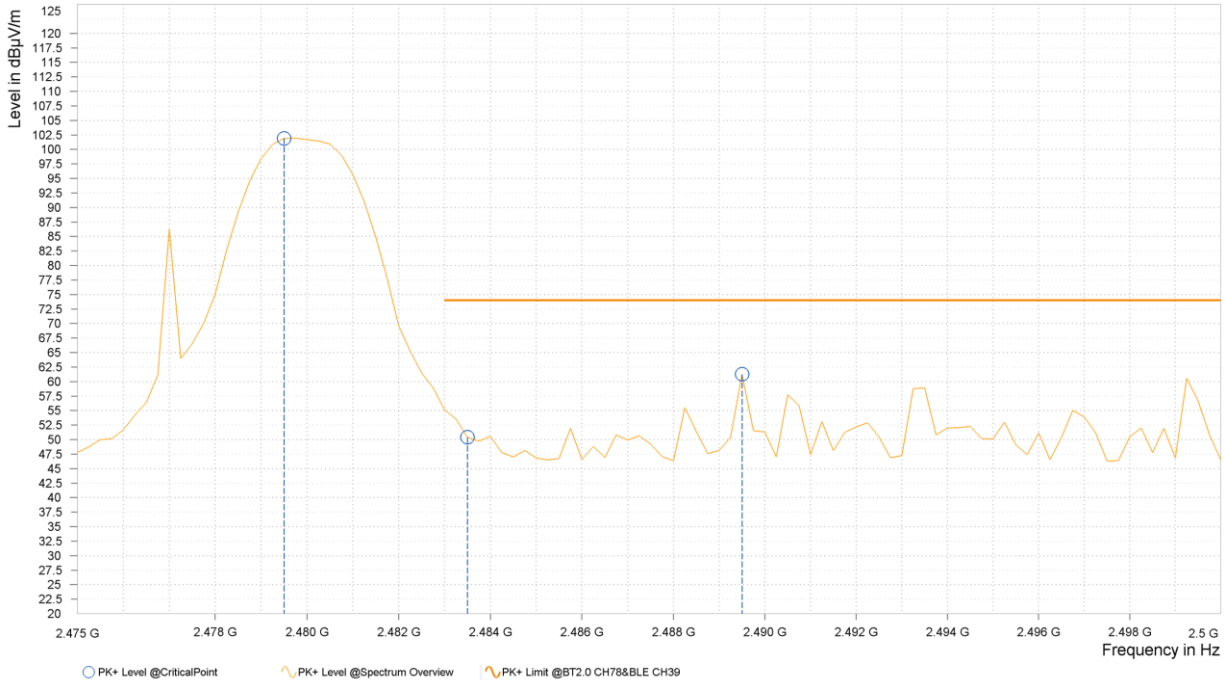
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Limit value–Emission level.
2. 2440MHz: Fundamental frequency.

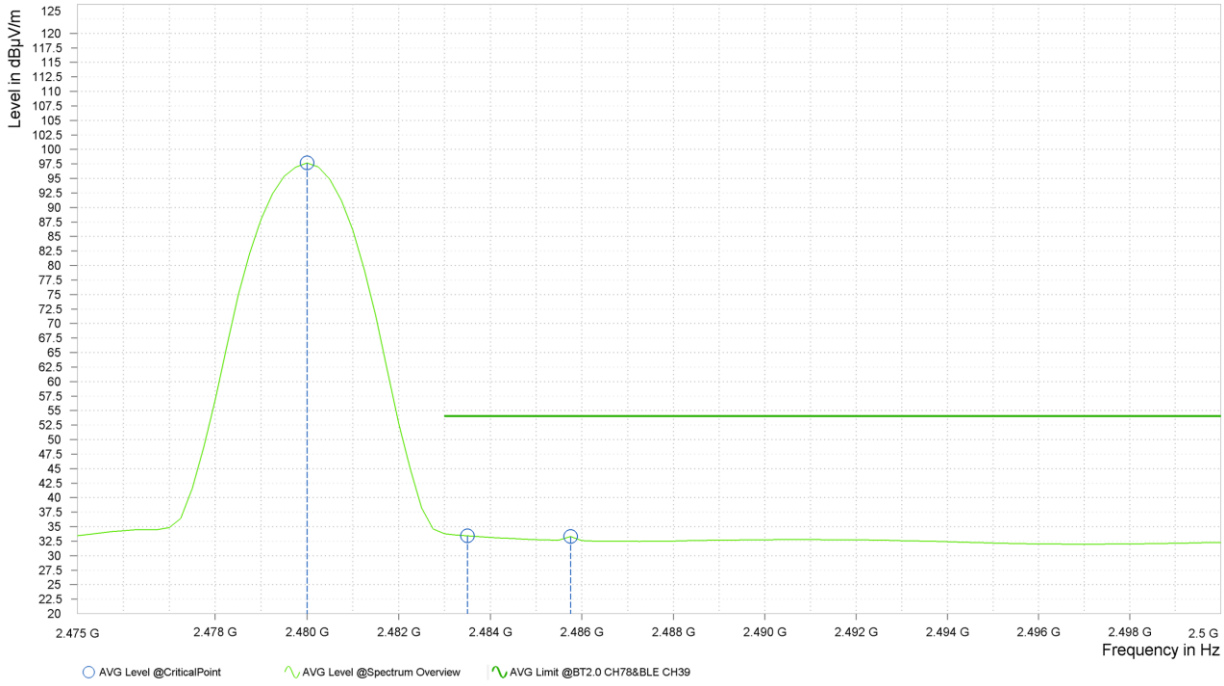
CHANNEL	TX Channel 39	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.500	101.89			7.36	H	141.5	1.00
6	2,483.500	50.38	74.00	23.62	7.36	H	141.5	1.00
6	2,489.500	61.25	74.00	12.75	7.37	H	158.6	2.00



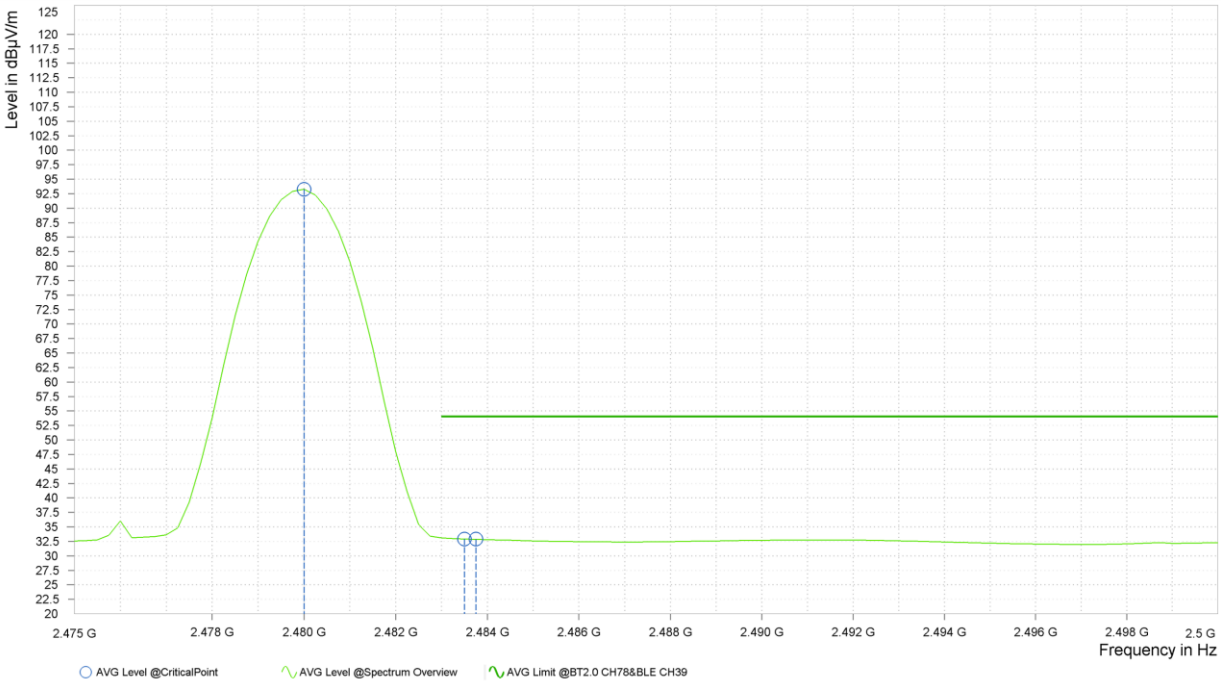
Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.000	97.67			7.36	H	208.9	2.00
6	2,483.500	33.41	54.00	20.59	7.36	H	208.9	2.00
6	2,485.750	33.30	54.00	20.70	7.36	H	208.9	2.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.500	95.35			7.36	V	210.1	2.00
6	2,483.500	48.18	74.00	25.82	7.36	V	1	2.00
6	2,495.750	55.95	74.00	18.05	7.37	V	132.4	2.00

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.000	93.26			7.36	V	2.4	2.00
6	2,483.500	32.92	54.00	21.08	7.36	V	0.9	2.00
6	2,483.750	32.88	54.00	21.12	7.36	V	0.9	2.00



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Limit value–Emission level.
2. 2480MHz: Fundamental frequency.

3.3 6 dB BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	R&S	ESW 44	101973	Feb.24,24	Feb.23,26
Open Switch and Control Unit	R&S	OSP-B157W8	100836	N/A	N/A
Vector Signal Generator	R&S	SMBV100B	102176	Feb.15,24	Feb.14,26
Signal Generator	R&S	SMB100A03	182185	Feb.15,24	Feb.14,26
Wideband Radio Communication	R&S	CMW500	169399	Jun.26,22	Jun.25,24
Hygrothermograph	DELI	20210528	SZ015	Sep.06,22	Sep.05,24
PC	LENOVO	E14	HRSW0024	N/A	N/A
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.28,23	Apr.27,24
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.28,23	Apr.27,24
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,24	Apr.26,25
Test Software	EMC32	EMC32	N/A	N/A	N/A
Temperature Chamber	votsch	VT4002	585660781000050	May.31,22	May.30,24
Power Meter	R&S	NRX	102380	Feb.14,24	Feb.13,26
Power Meter probe	R&S	NRP6A	102942	Feb.14,24	Feb.13,26

NOTE:

1. The calibration interval of the above test instruments is 12 /24months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

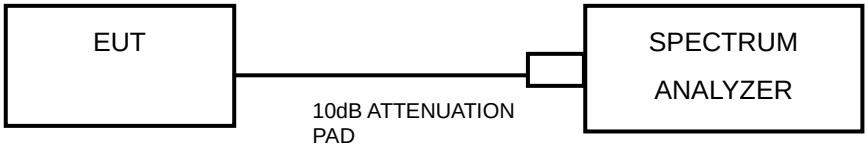
3.3.3 TEST PROCEDURE

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.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

3.3.5 TEST SETUP



3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.3.7 TEST RESULTS

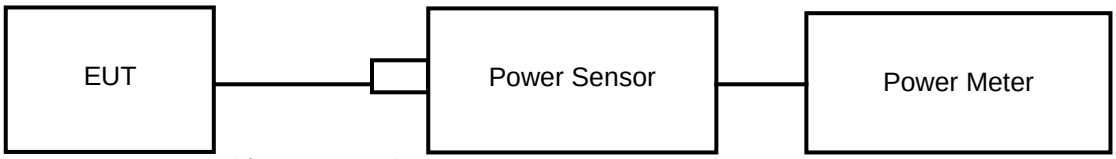
Please Refer to Appendix Of this test report.

3.4 CONDUCTED OUTPUT POWER

3.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

3.4.2 TEST SETUP



10dB ATTENUATION PAD

3.4.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

Please Refer to Appendix Of this test report.

3.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

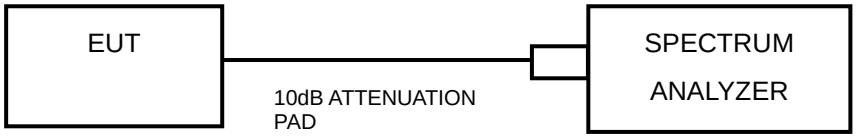
Please Refer to Appendix Of this test report.

3.5 POWER SPECTRAL DENSITY MEASUREMENT

3.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.5.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW ≥ 3 x RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

3.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.5.7 TEST RESULTS

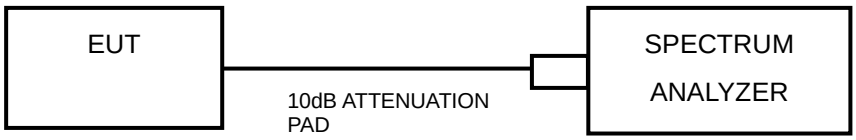
Please Refer to Appendix Of this test report.

3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

3.6.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

Please Refer to Appendix Of this test report.

3.7 ANTENNA REQUIREMENTS

3.7.1 STANDARD APPLICABLE

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.7.2 ANTENNA CONNECTED CONSTRUCTION

An embedded-in antenna design is used.

3.7.3 ANTENNA GAIN

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit and PSD limit

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

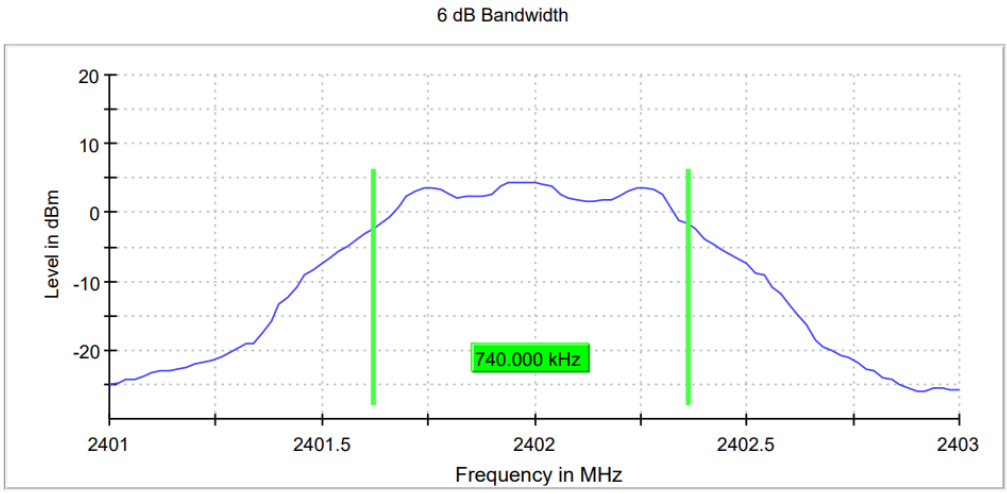
6 APPENDIX

DTS BANDWIDTH

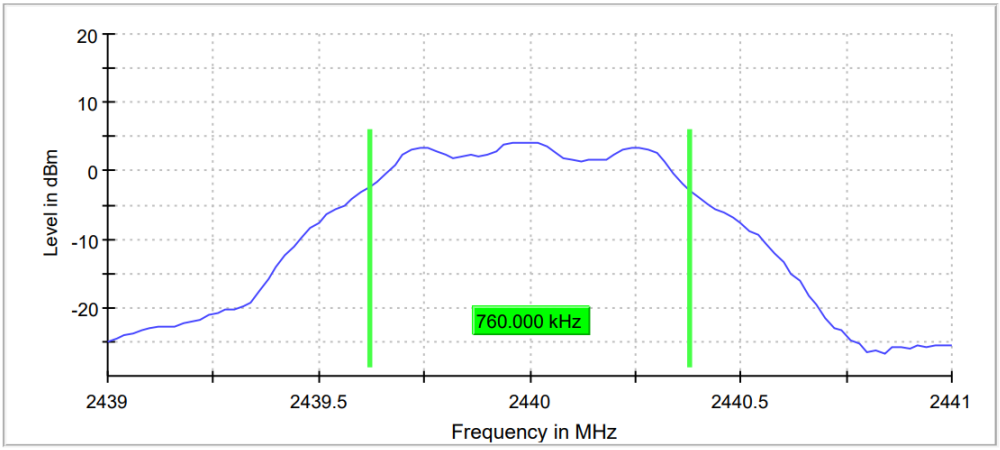
TEST RESULT

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant5	2402	0.740	2401.620	2402.360	0.5	PASS
		2440	0.760	2439.620	2440.380	0.5	PASS
		2480	0.740	2479.620	2480.360	0.5	PASS
BLE_2M	Ant5	2404	1.240	2403.360	2404.600	0.5	PASS
		2440	1.280	2439.360	2440.640	0.5	PASS
		2478	1.280	2477.360	2478.640	0.5	PASS
BLE_S8	Ant5	2402	0.640	2401.680	2402.320	0.5	PASS
		2440	0.660	2439.660	2440.320	0.5	PASS
		2480	0.660	2479.660	2480.320	0.5	PASS

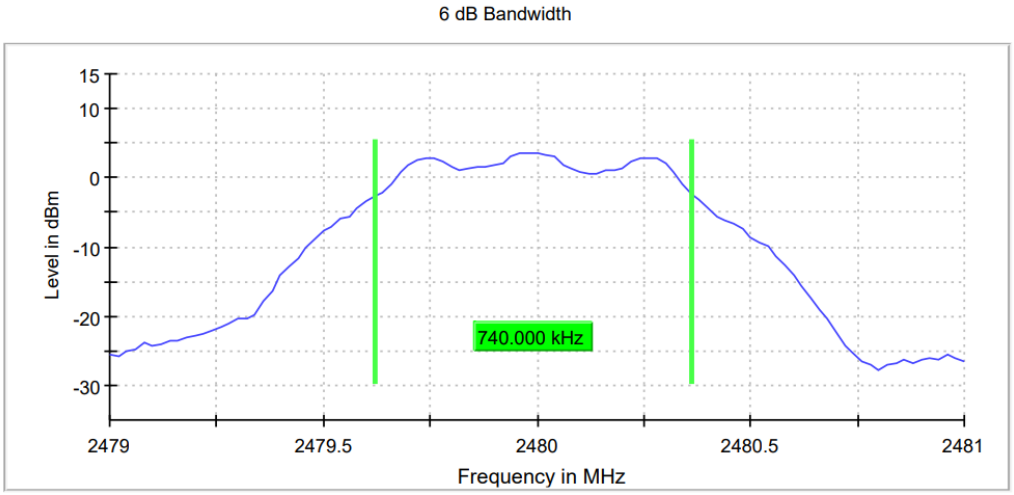
TEST GRAPHS



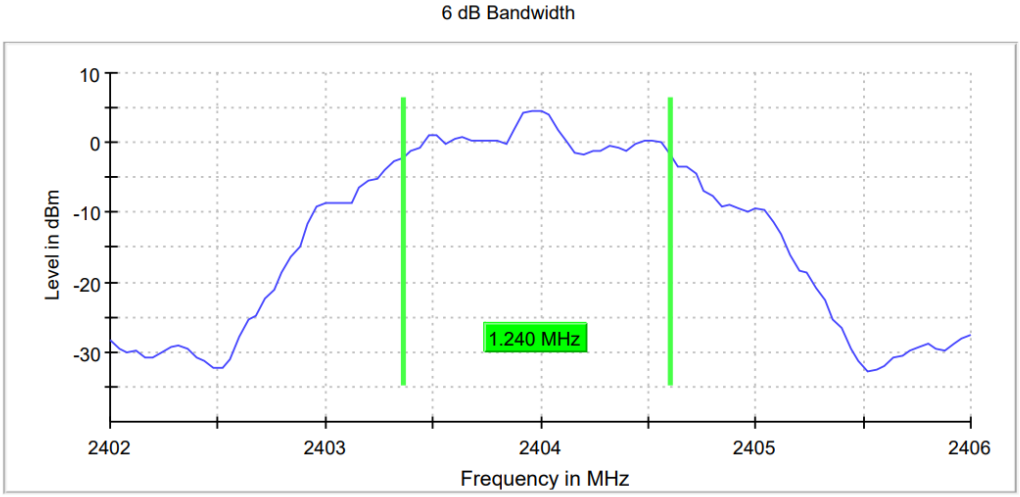
BLE_1M_Ant1_2402



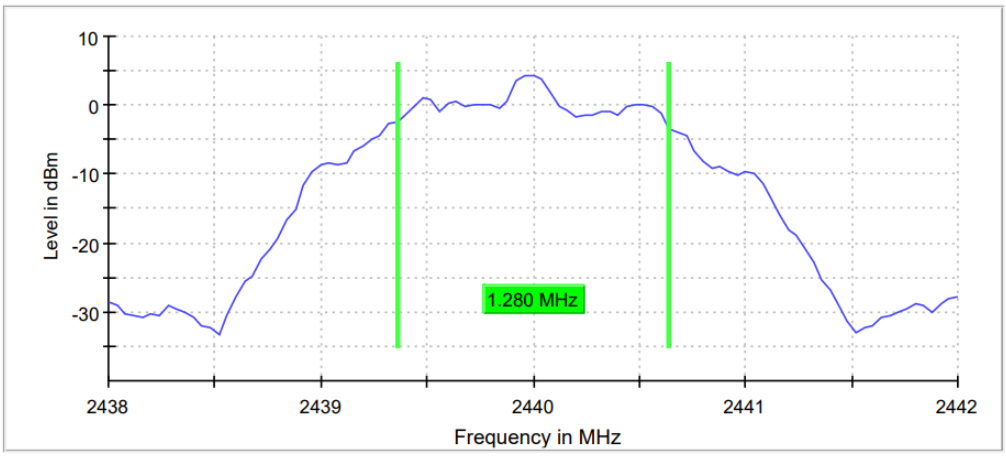
BLE_1M_Ant1_2440



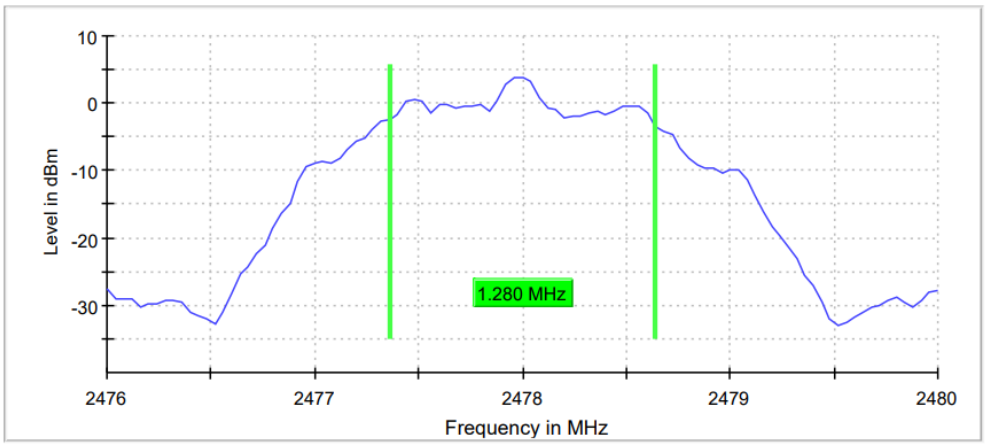
BLE_1M_Ant1_2480



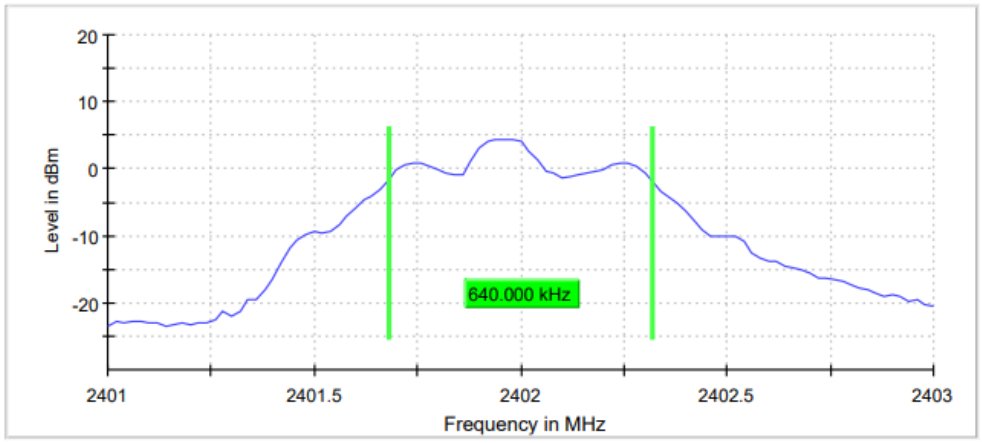
BLE_2M_Ant1_2404



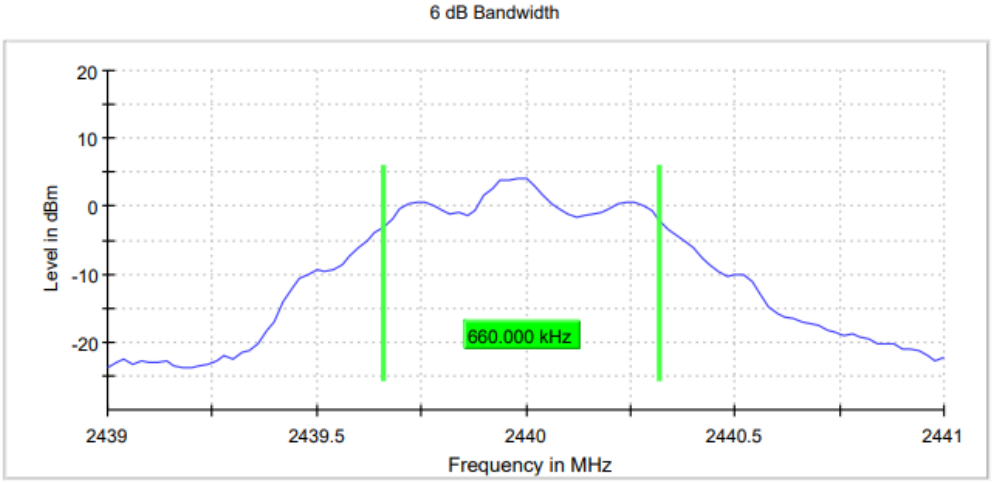
BLE_2M_Ant1_2440



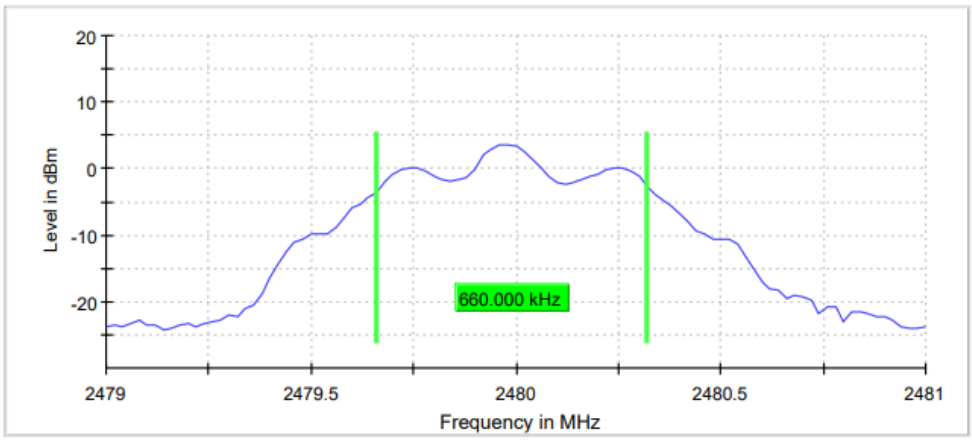
BLE_2M_Ant1_2478



BLE_S8_Ant1_2402



BLE_S8_Ant1_2440



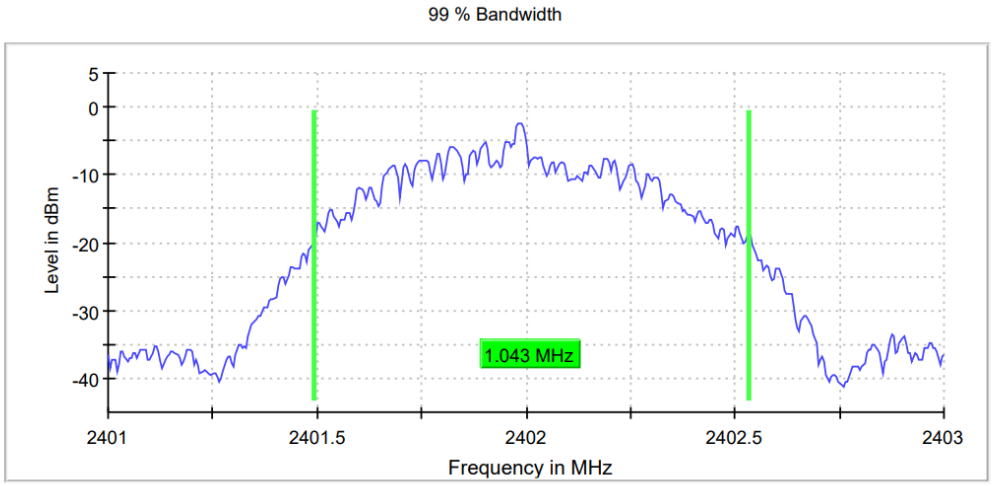
BLE_S8_Ant1_2480
RBW 100.000 kHz VBW 300.000 kHz

OCCUPIED CHANNEL BANDWIDTH

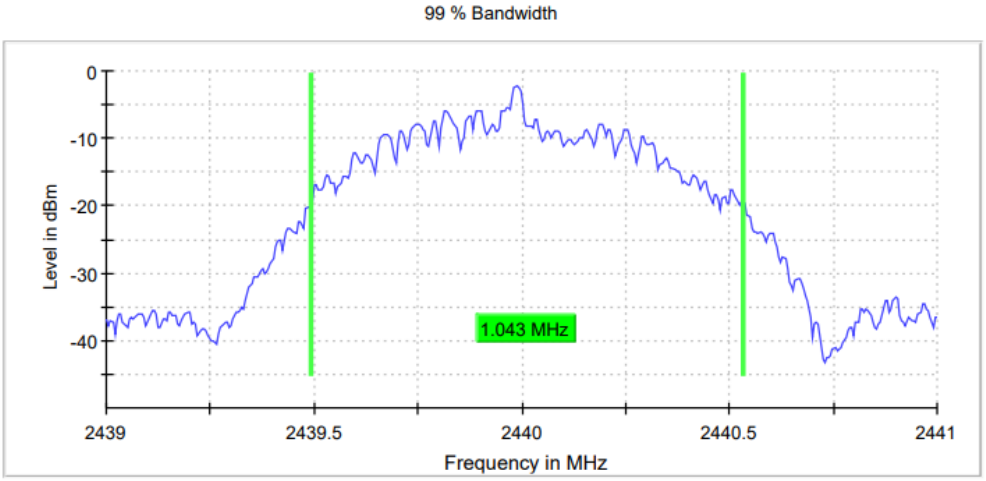
TEST RESULT

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant5	2402	1.043	2401.491	2402.534	---	PASS
		2440	1.043	2439.491	2440.534	---	PASS
		2480	1.043	2479.491	2480.534	---	PASS
BLE_2M	Ant5	2404	2.035	2403.003	2405.038	---	PASS
		2440	2.025	2439.003	2441.028	---	PASS
		2478	2.035	2477.003	2479.038	---	PASS
BLE_S8	Ant5	2402	1.068	2401.466	2402.534	---	PASS
		2440	1.073	2439.461	2440.534	---	PASS
		2480	1.073	2479.461	2480.534	---	PASS

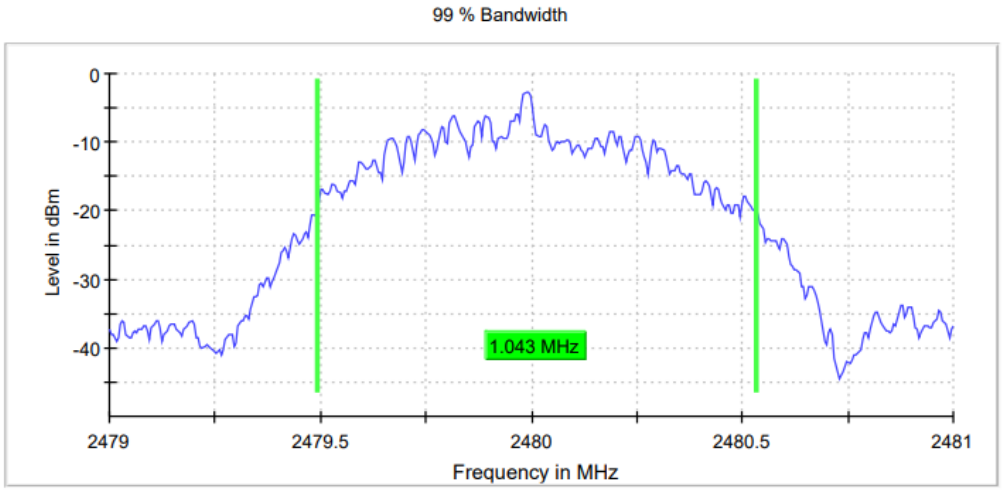
TEST GRAPHS



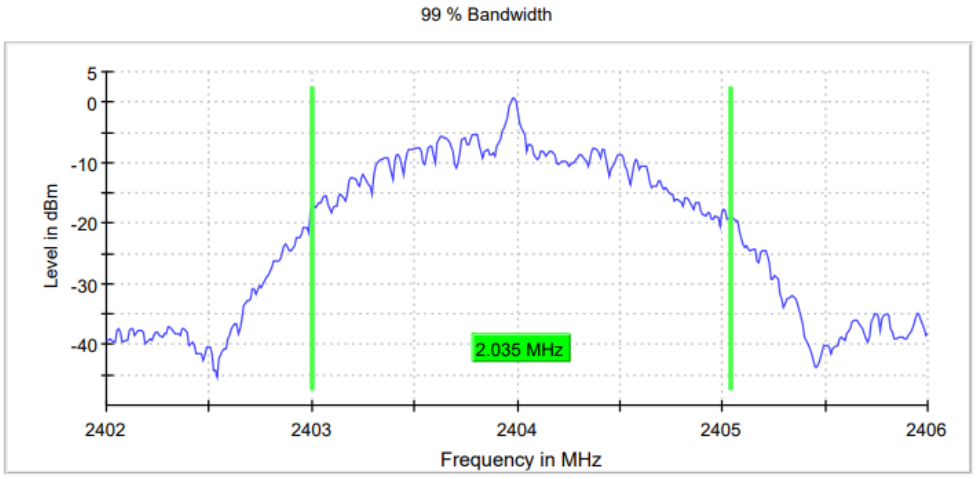
BLE_1M_Ant1_2402



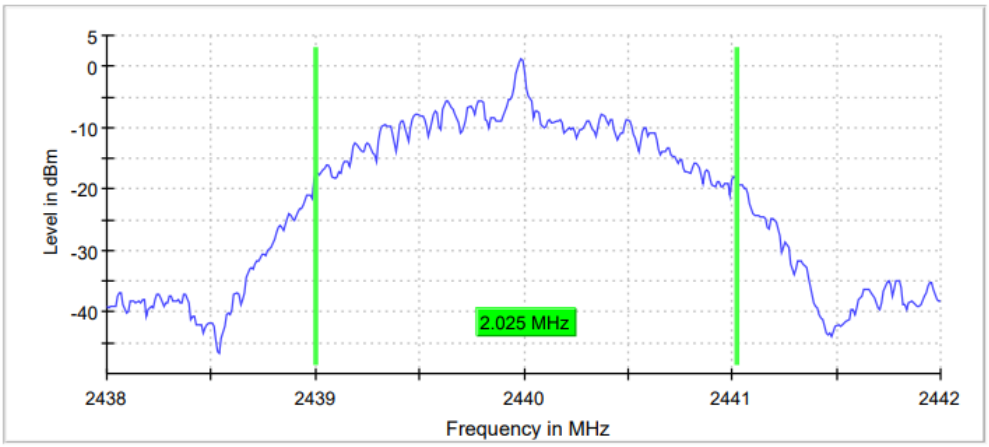
BLE_1M_Ant1_2440



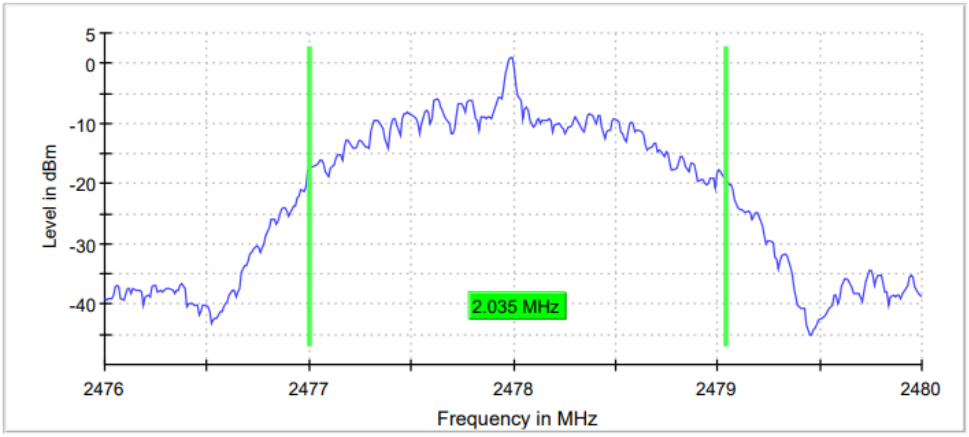
BLE_1M_Ant1_2480



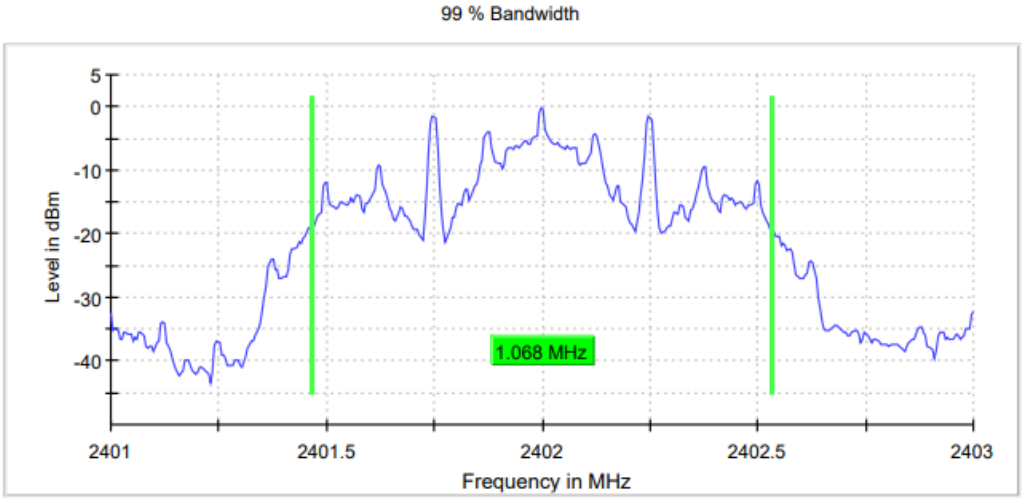
BLE_2M_Ant1_2404



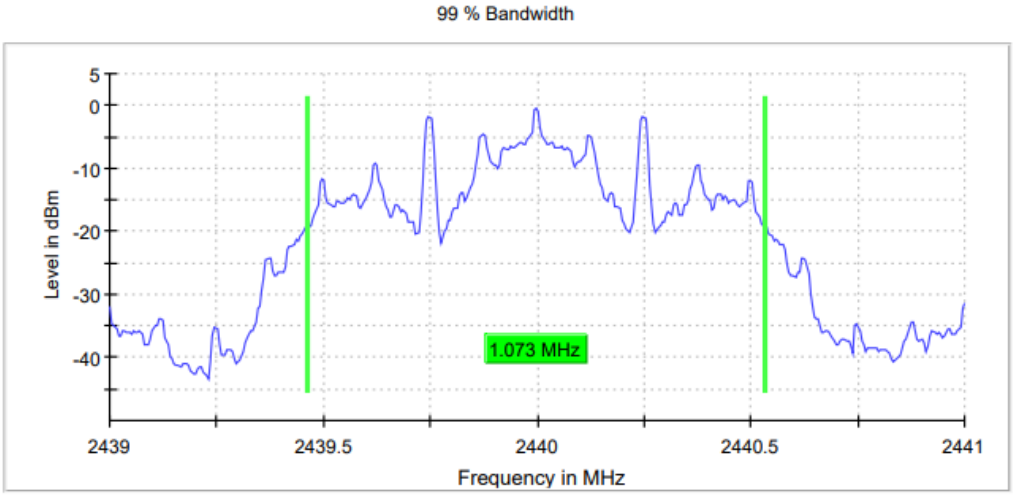
BLE_2M_Ant1_2440



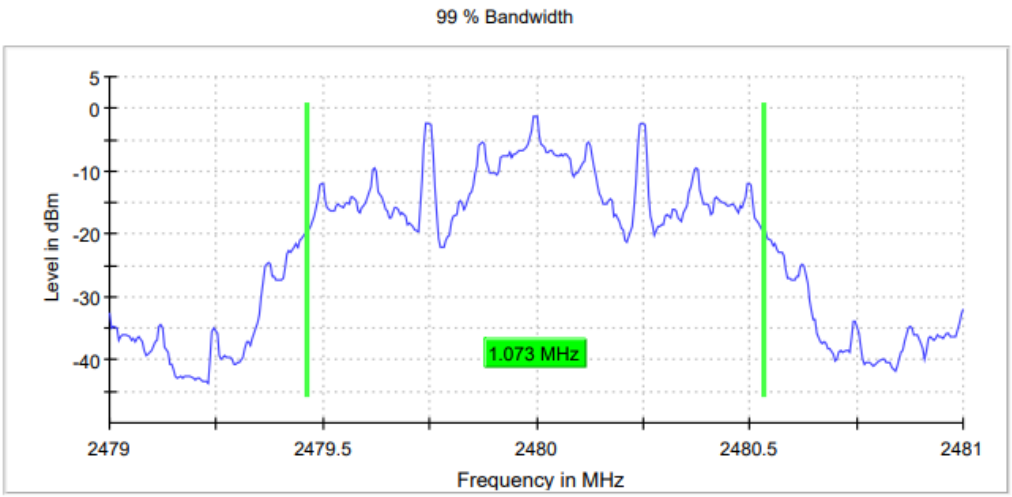
BLE_2M_Ant1_2478



BLE_S8_Ant1_2402



BLE_S8_Ant1_2440



BLE_S8_Ant1_2480

1M:

RBW 10.000 kHz

VBW 30.000 kHz

1M:

RBW 20.000 kHz

VBW 100.000 kHz

MAXIMUM CONDUCTED OUTPUT POWER

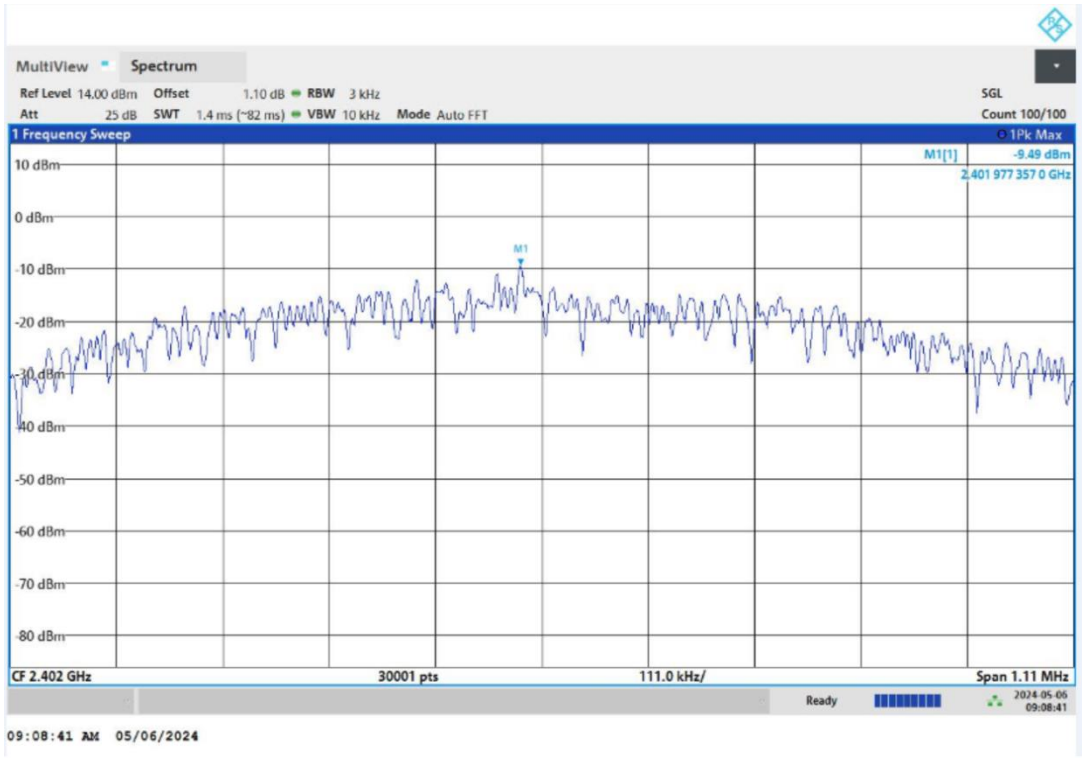
TestMode	Antenna	Channel	Average power [dBm]	Peak power [dBm]	Conducted Limit [dBm]	Verdict	Power Setting
BLE_1M	Ant1	2402	3.055	4.968	≤30	PASS	Defult
		2440	2.606	4.992	≤30	PASS	Defult
		2480	2.054	4.659	≤30	PASS	Defult
BLE_2M	Ant1	2402	2.934	5.002	≤30	PASS	Defult
		2440	2.534	**5.049**	≤30	PASS	Defult
		2480	2.298	4.738	≤30	PASS	Defult
BLE_125k	Ant1	2402	3.094	4.344	≤30	PASS	Defult
		2440	2.605	4.102	≤30	PASS	Defult
		2480	2.146	3.697	≤30	PASS	Defult

MAXIMUM POWER SPECTRAL DENSITY

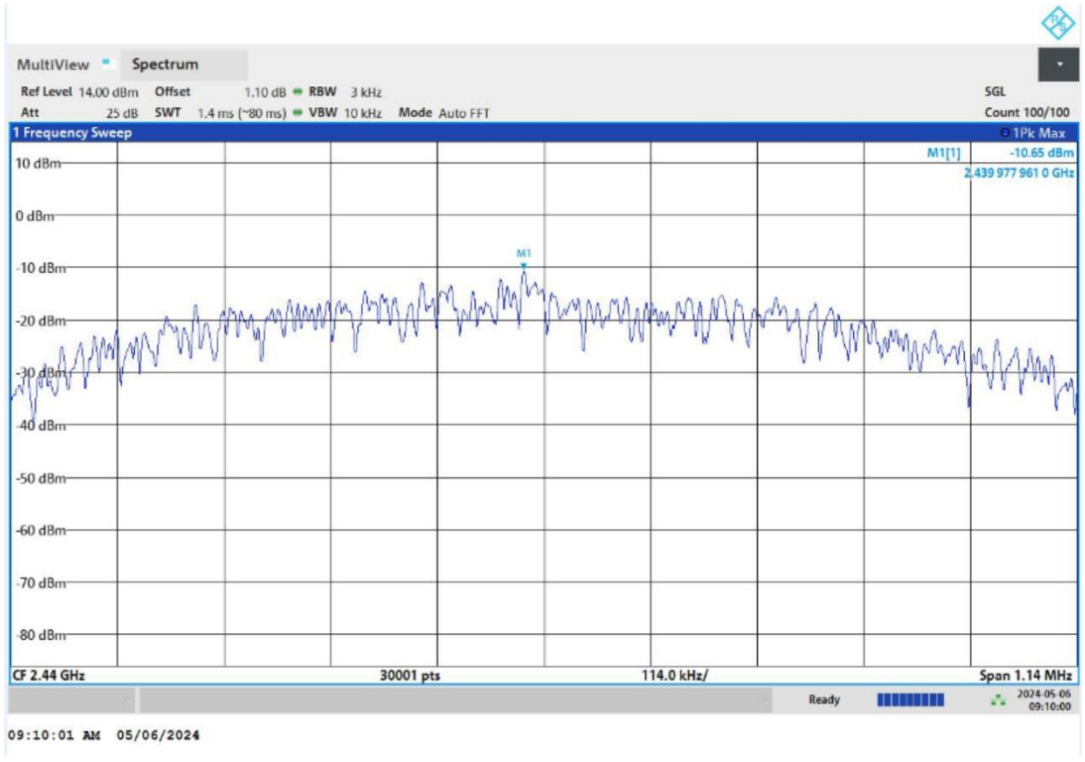
TEST RESULT

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-9.49	≤8	PASS
		2440	-10.65	≤8	PASS
		2480	-11.17	≤8	PASS
BLE_2M	Ant5	2404	-12.80	≤8	PASS
		2440	-13.19	≤8	PASS
		2478	-12.86	≤8	PASS
BLE_S8	Ant5	2402	-2.53	≤8	PASS
		2440	-3.12	≤8	PASS
		2480	-3.33	≤8	PASS

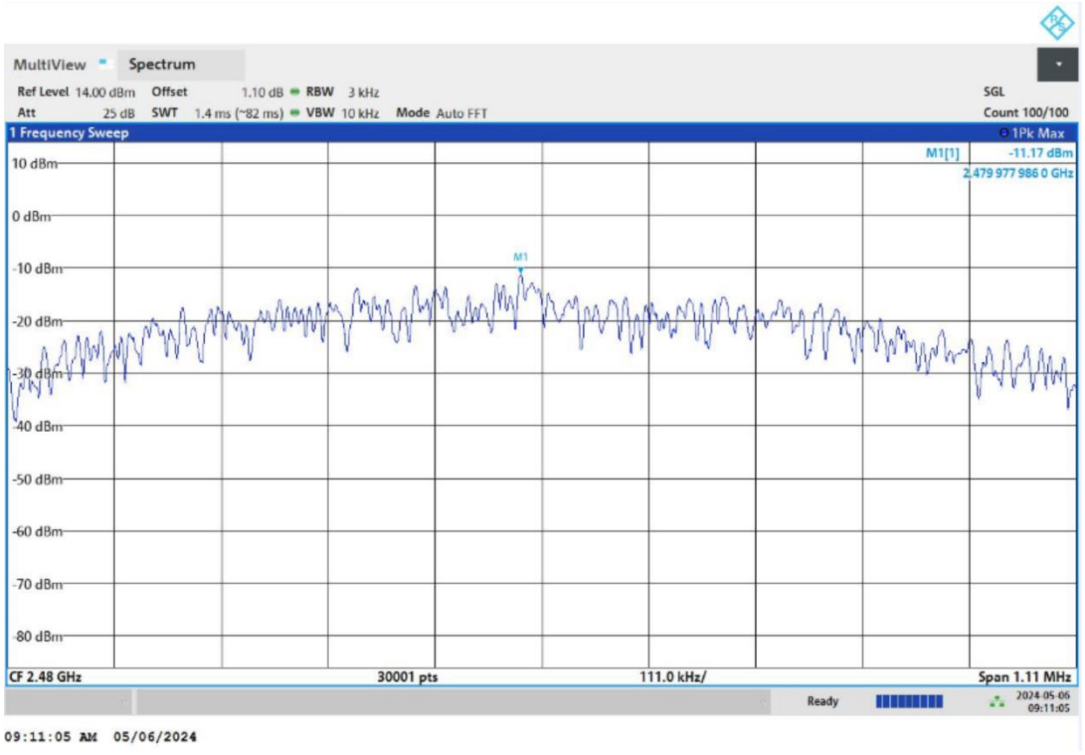
TEST GRAPHS



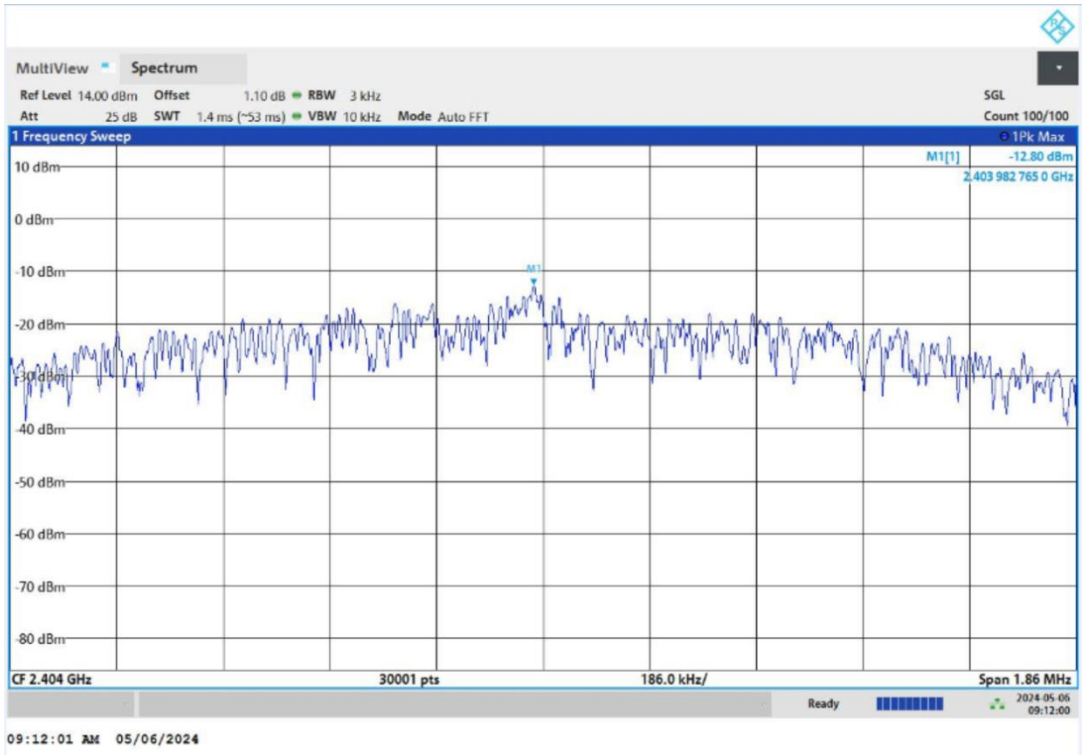
BLE_1M_Ant1_2402



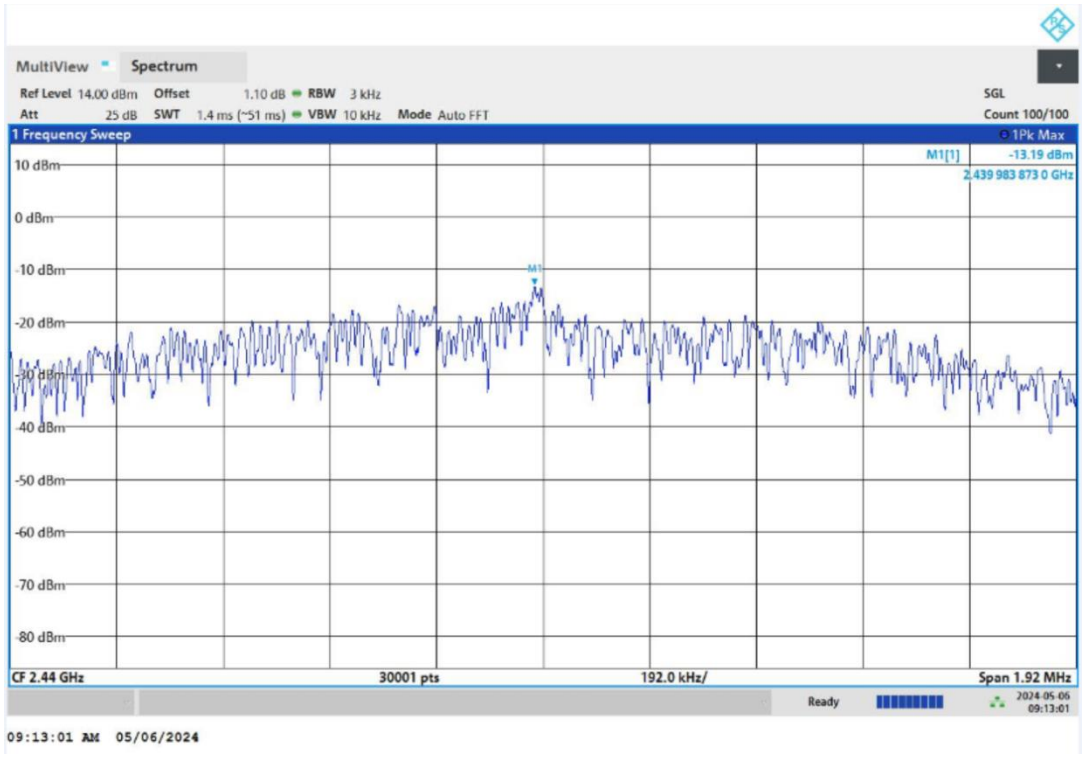
BLE_1M_Ant1_2440



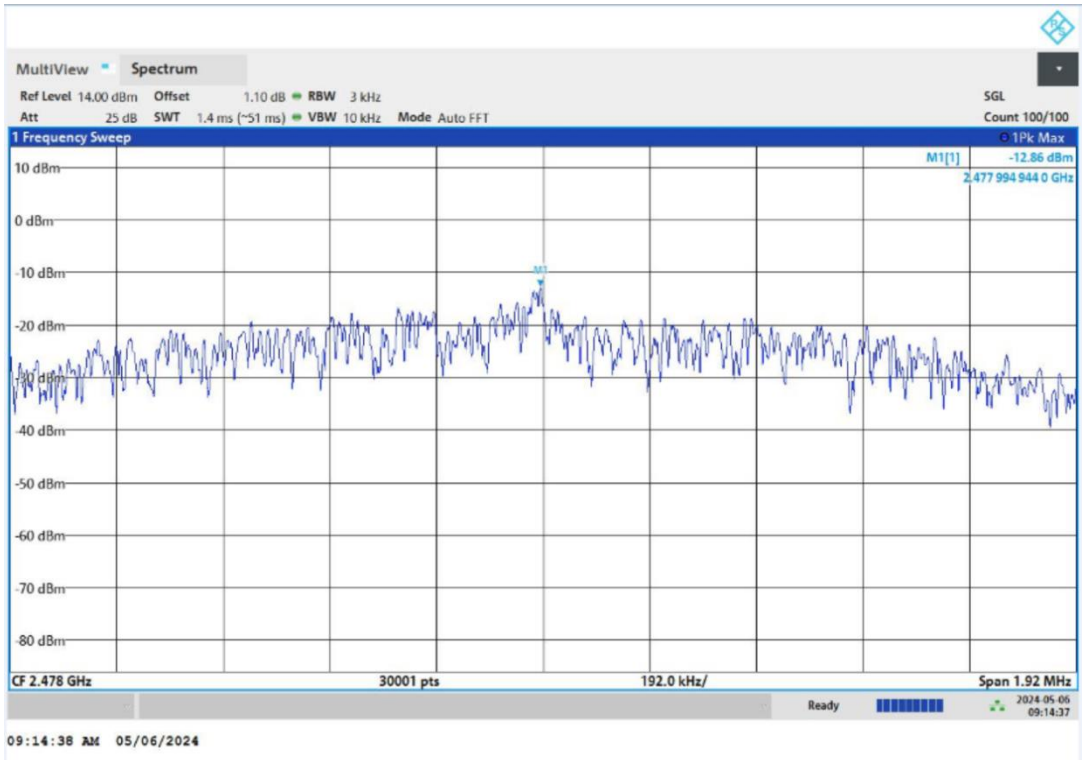
BLE_1M_Ant1_2480



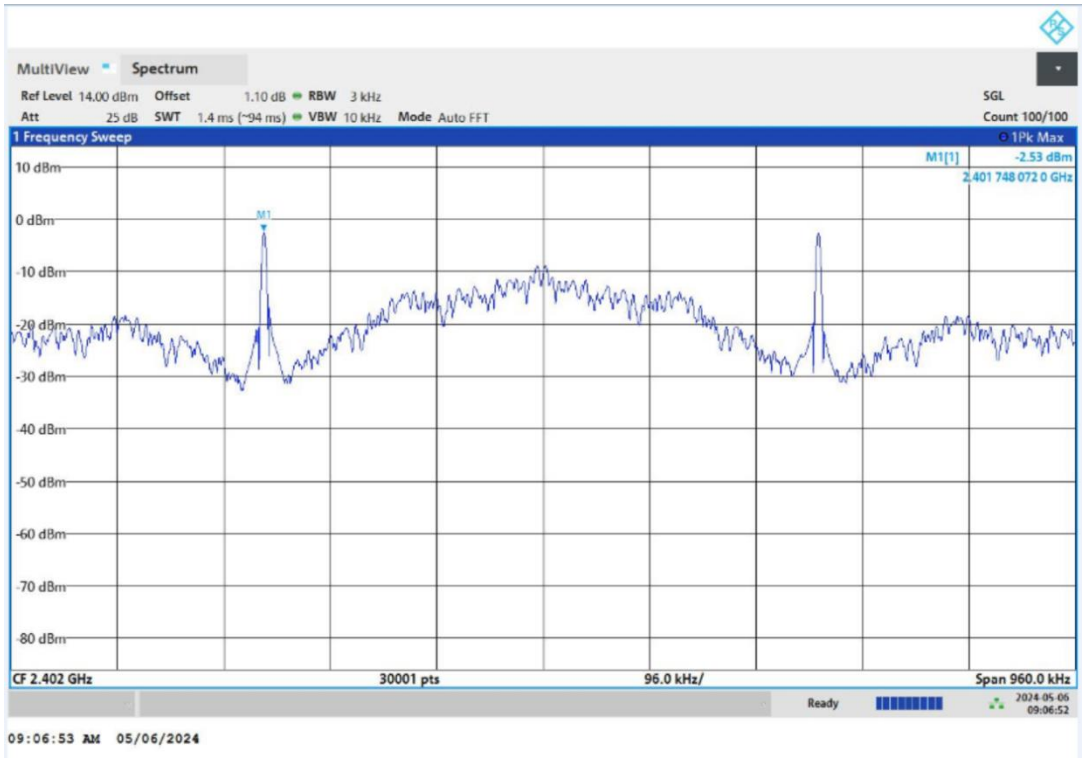
BLE_2M_Ant1_2404



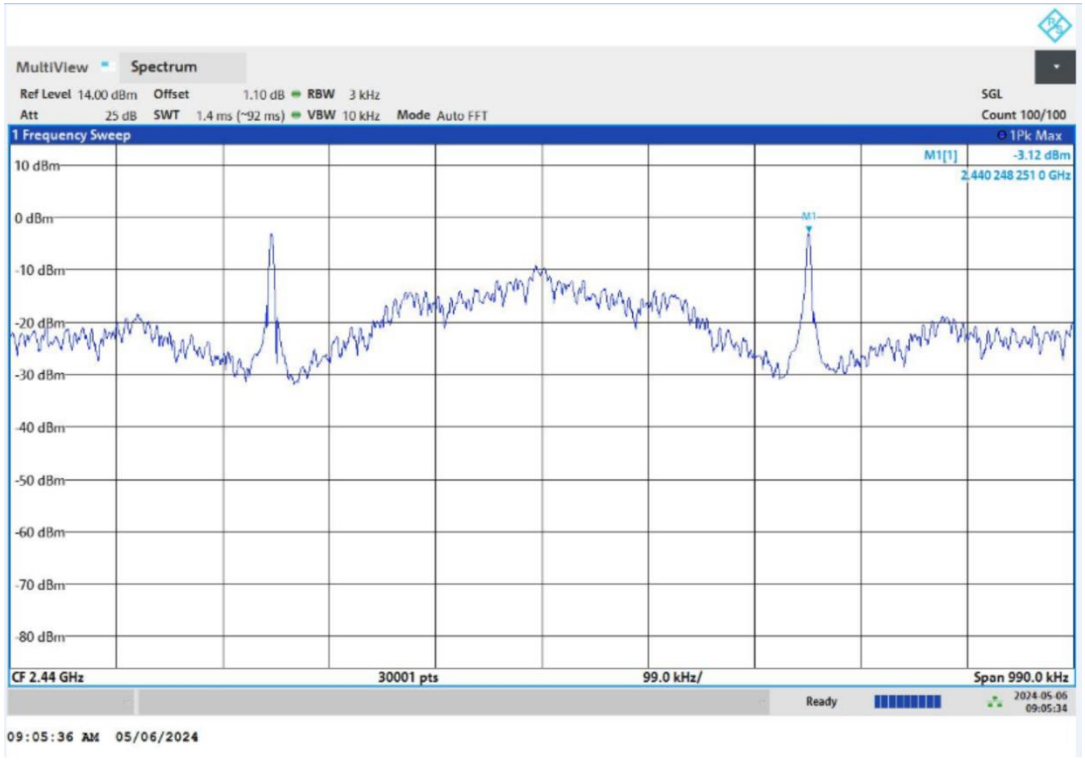
BLE_2M_Ant1_2440



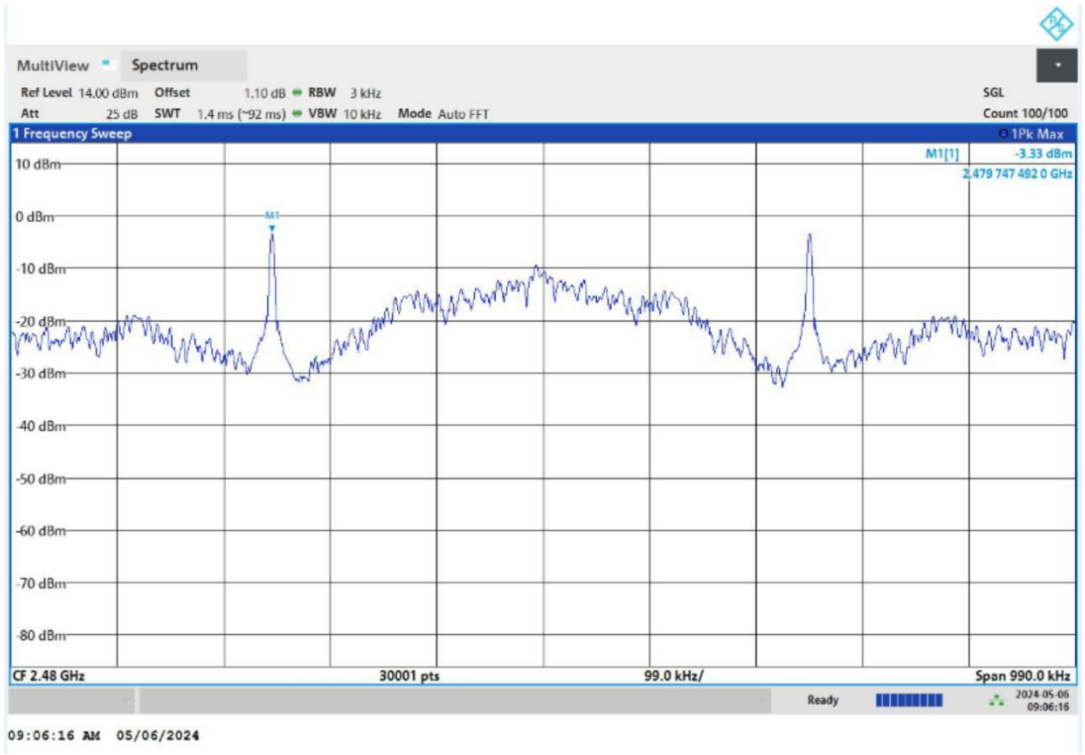
BLE_2M_Ant1_2478



BLE_S8_Ant1_2402



BLE_S8_Ant1_2440



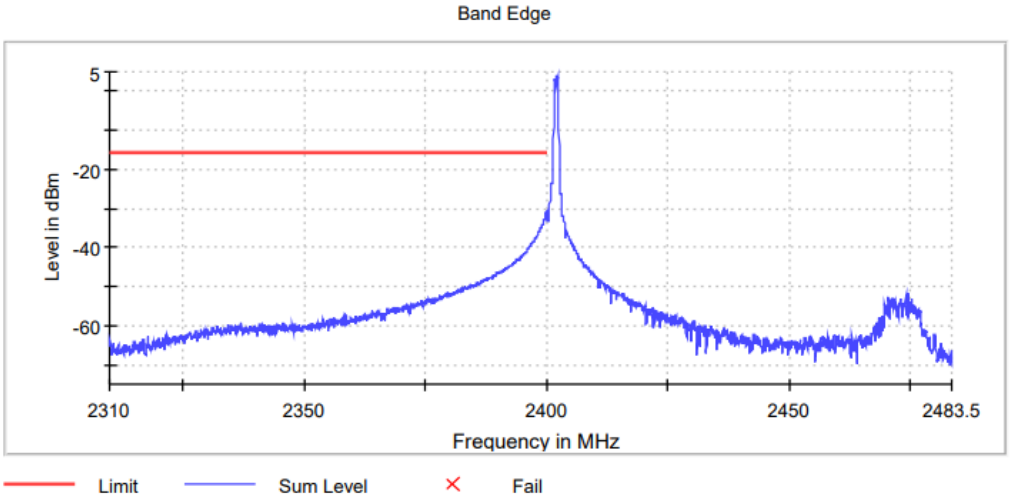
BLE_S8_Ant1_2480

BAND EDGE MEASUREMENTS

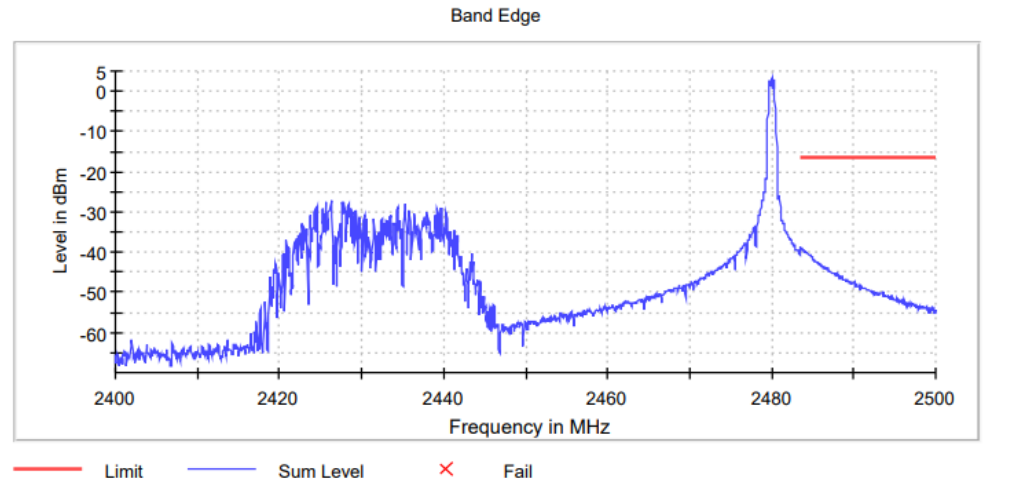
TEST RESULT

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant5	Low	2402	See test graph	See test graph	See test graph	PASS
		High	2480	See test graph	See test graph	See test graph	PASS
BLE_2M	Ant5 Ant5	Low	2404	See test graph	See test graph	See test graph	PASS
		High	2478	See test graph	See test graph	See test graph	PASS
BLE_S8	Ant5	Low	2402	See test graph	See test graph	See test graph	PASS
		High	2480	See test graph	See test graph	See test graph	PASS

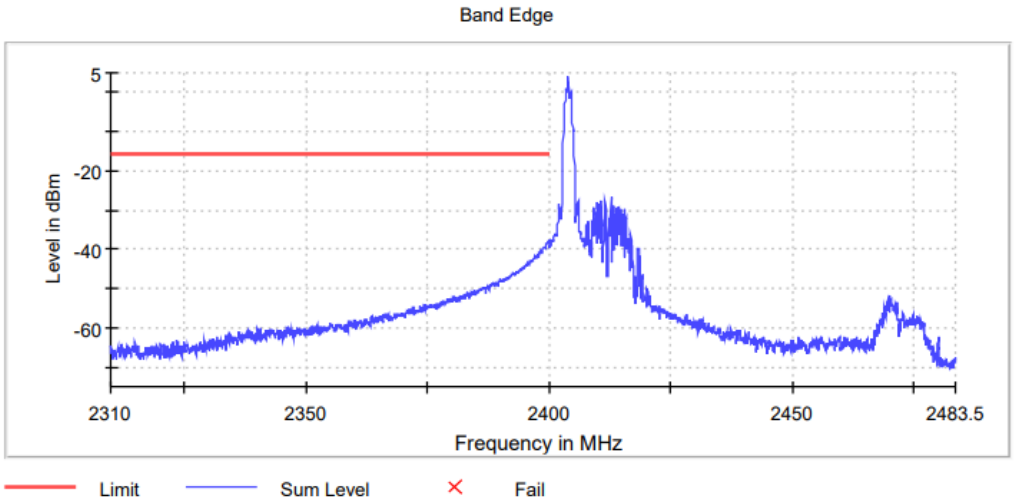
TEST GRAPHS



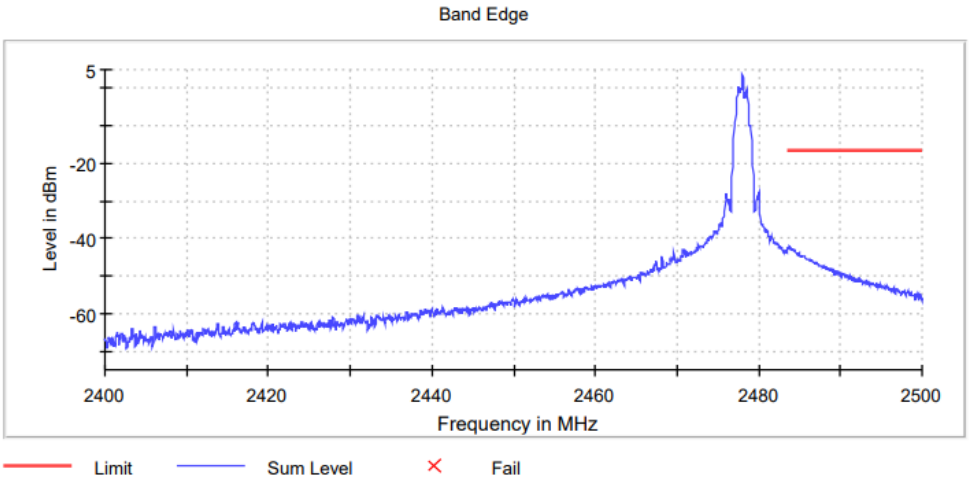
BLE_1M_Ant1_Low_2402



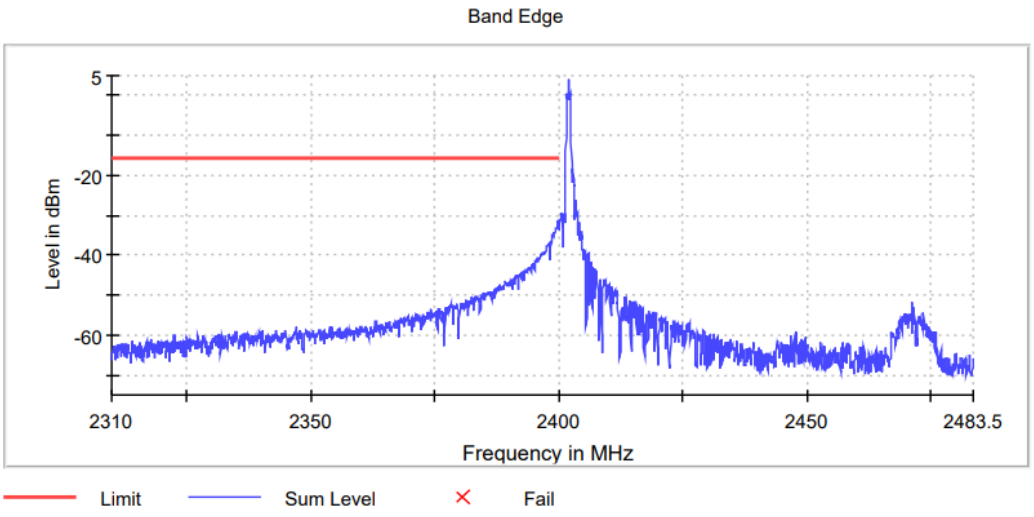
BLE_1M_Ant1_High_2480



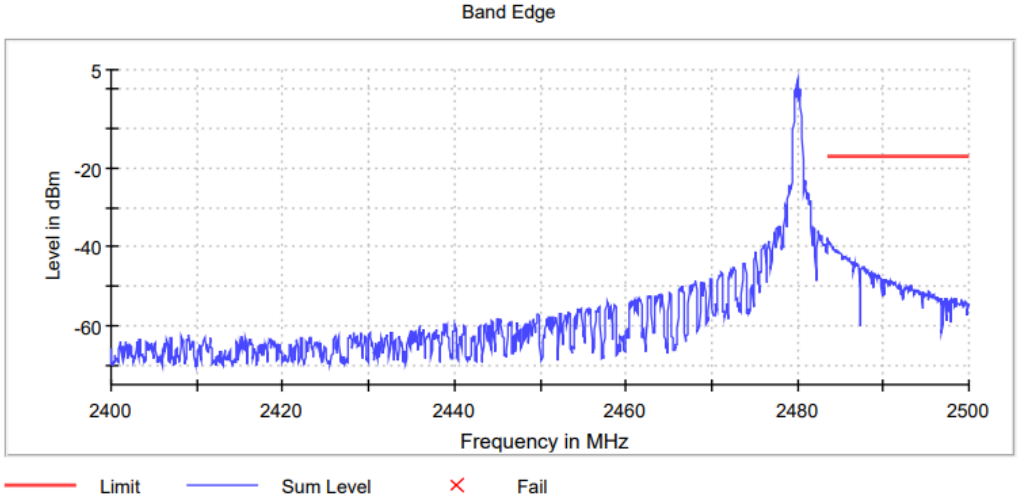
BLE_2M_Ant1_Low_2404



BLE_2M_Ant1_High_2478



BLE_S8_Ant1_Low_2402



BLE_S8_Ant1_High_2480

RBW 100.000 kHz

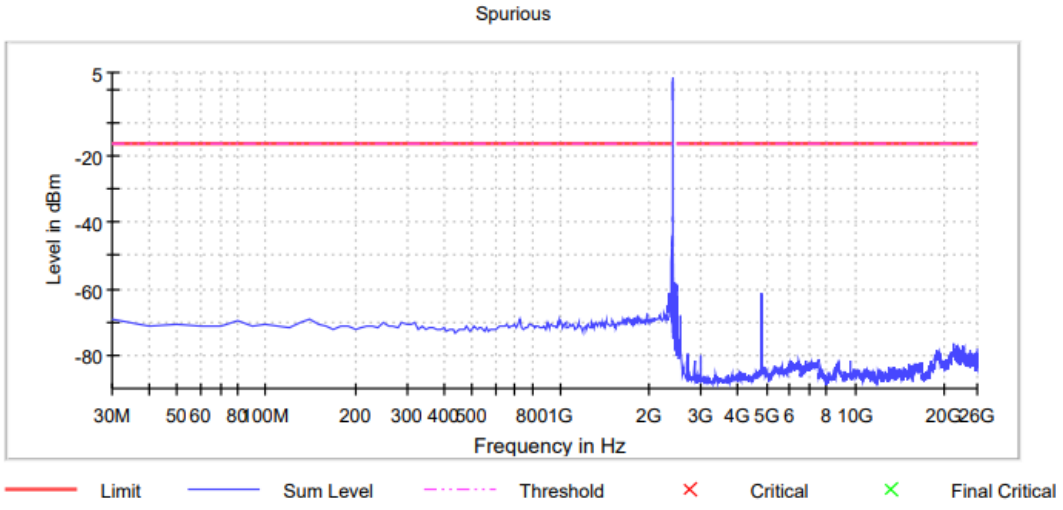
VBW 300.000 kHz

CONDUCTED SPURIOUS EMISSION

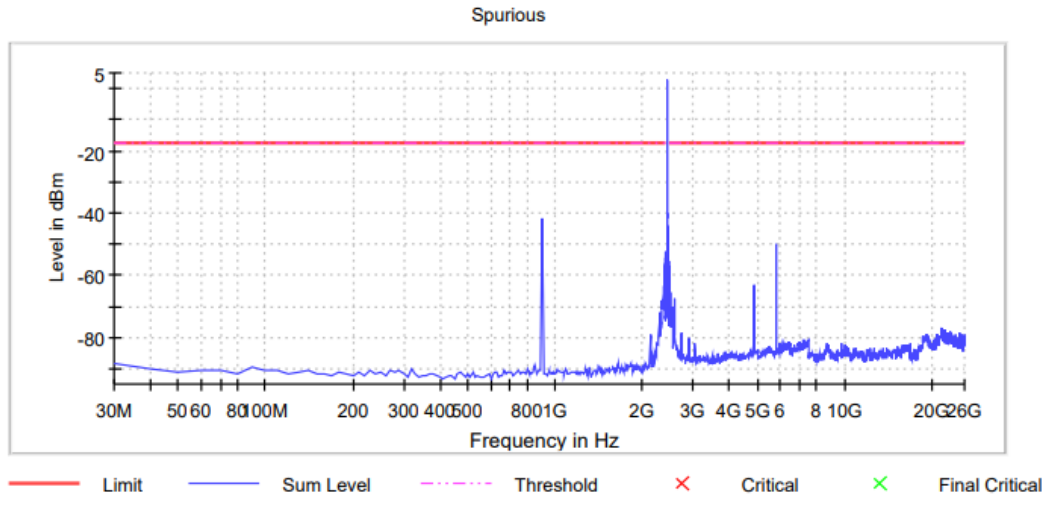
TEST RESULT

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	30~26000	See test graph	See test graph	See test graph	PASS
		2440	30~26000	See test graph	See test graph	See test graph	PASS
		2480	30~26000	See test graph	See test graph	See test graph	PASS
BLE_2M	Ant1	2404	30~26000	See test graph	See test graph	See test graph	PASS
		2440	30~26000	See test graph	See test graph	See test graph	PASS
		2478	30~26000	See test graph	See test graph	See test graph	PASS
BLE_S8	Ant1	2402	30~26000	See test graph	See test graph	See test graph	PASS
		2440	30~26000	See test graph	See test graph	See test graph	PASS
		2480	30~26000	See test graph	See test graph	See test graph	PASS

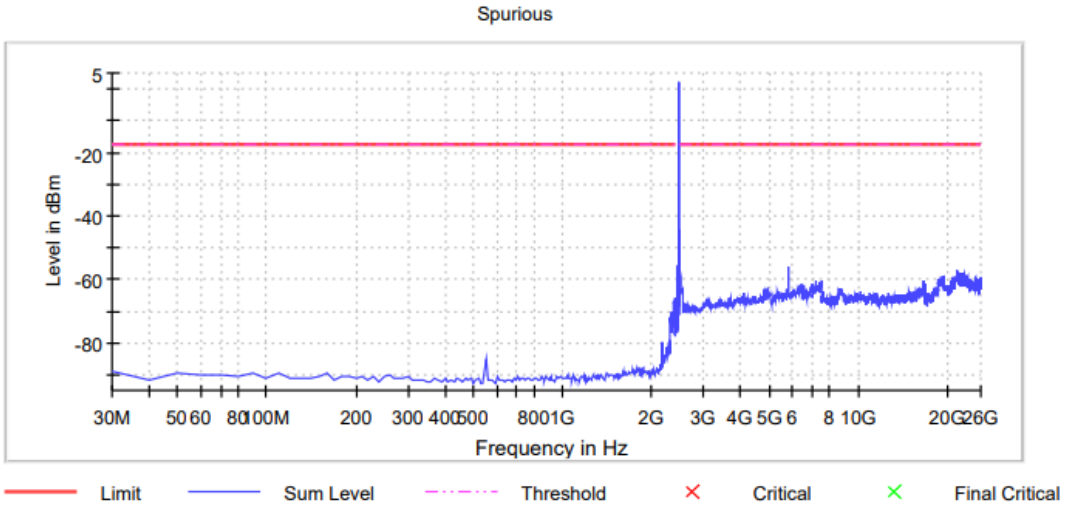
TEST GRAPHS



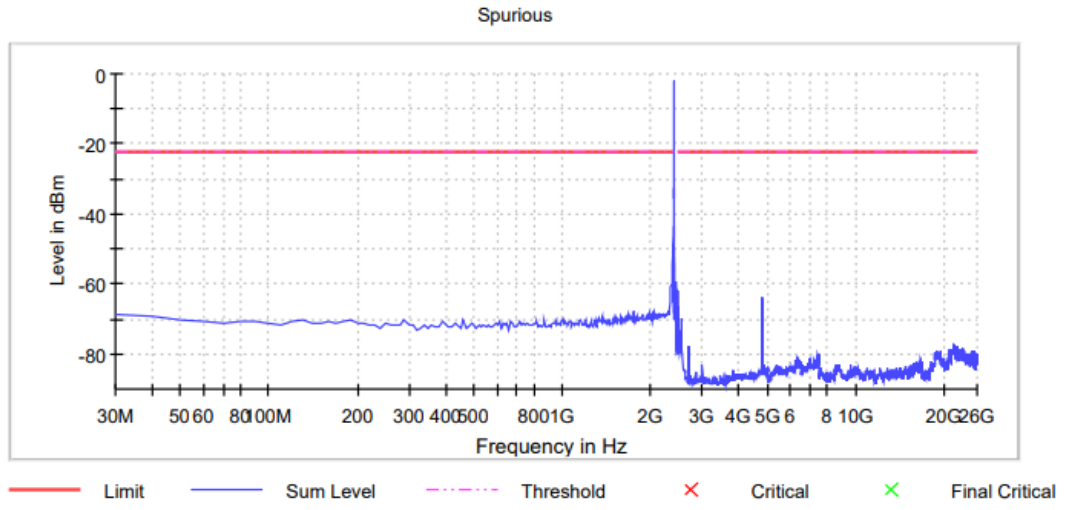
BLE_1M_Ant1_2402_30~26000



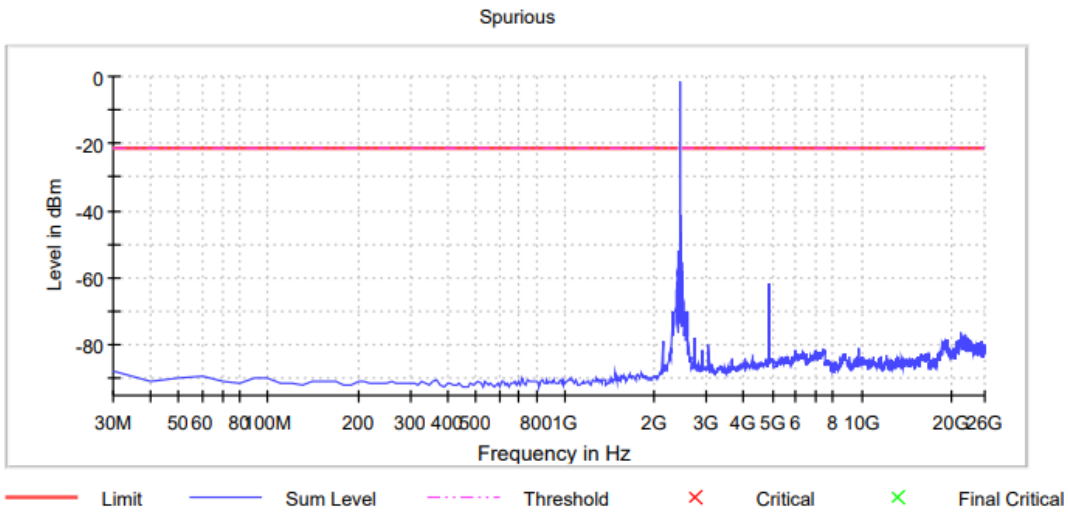
BLE_1M_Ant1_2440_30~26000



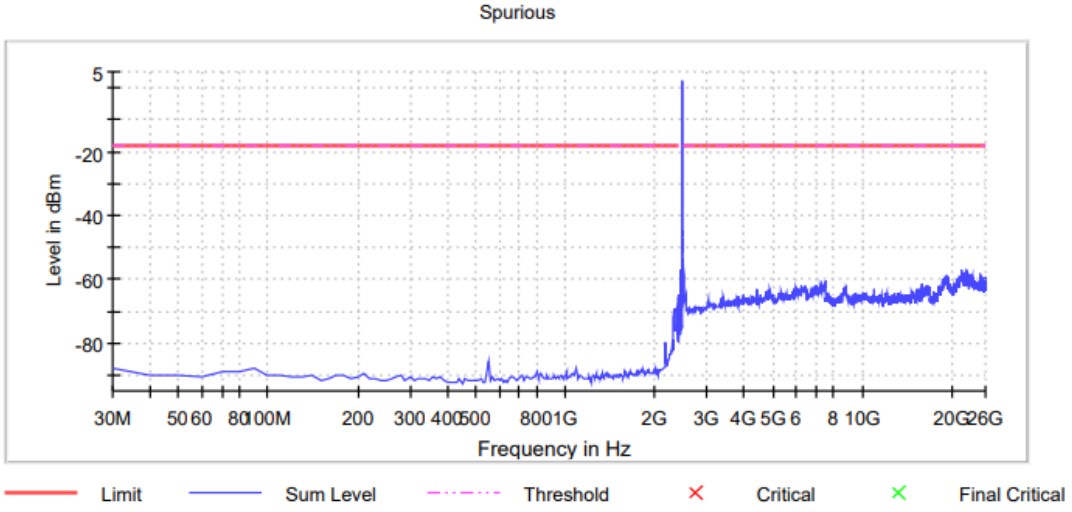
BLE_1M_Ant1_2480_30~26000



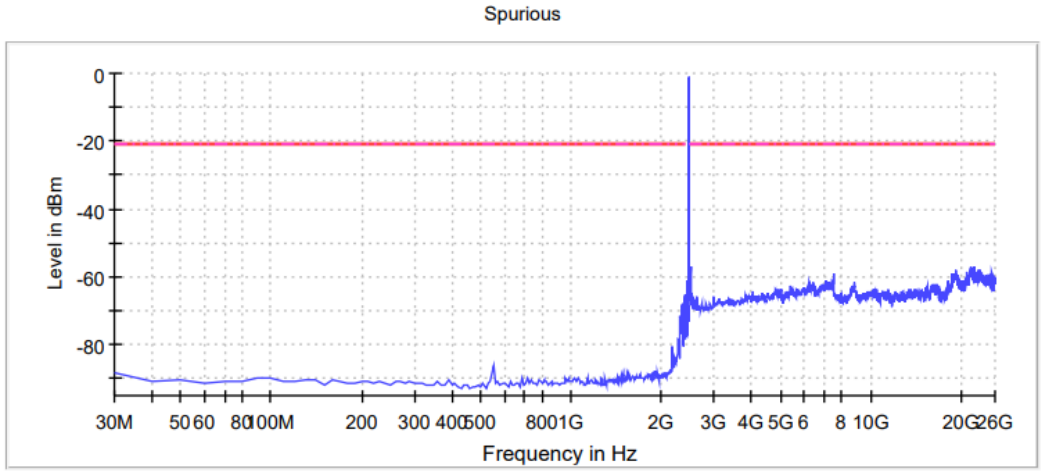
BLE_2M_Ant1_2404_30~26000



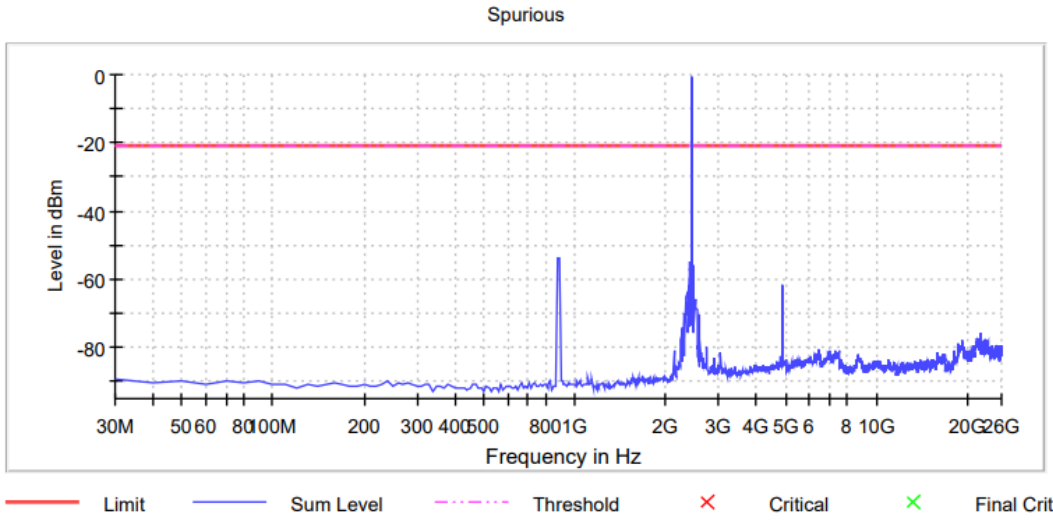
BLE_2M_Ant1_2440_30~26000



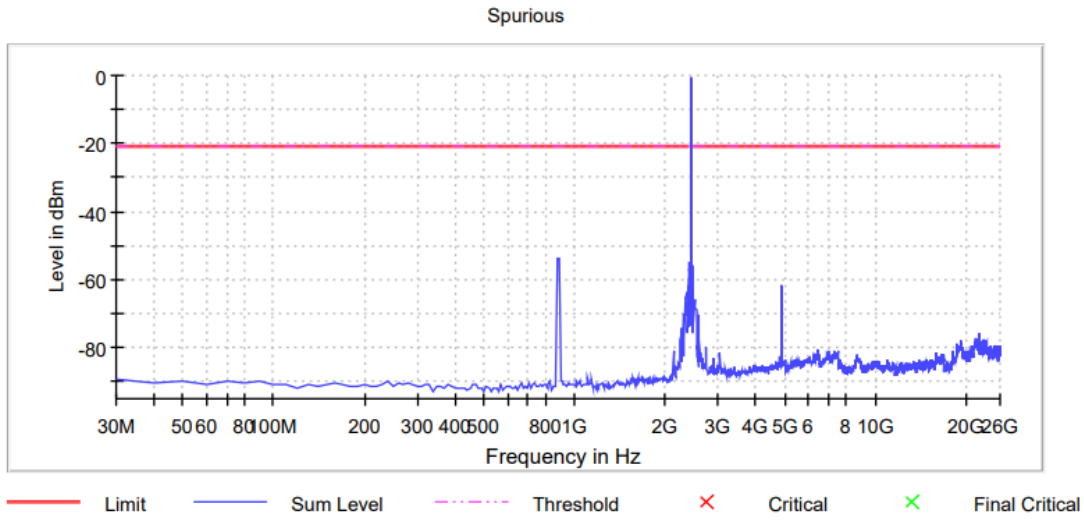
BLE_2M_Ant1_2478_30~26000



BLE_S8_Ant1_2402_30~26000



BLE_S8_Ant1_2440_30~26000



BLE_S8_Ant1_2480_30~26000

RBW 100.000 kHz

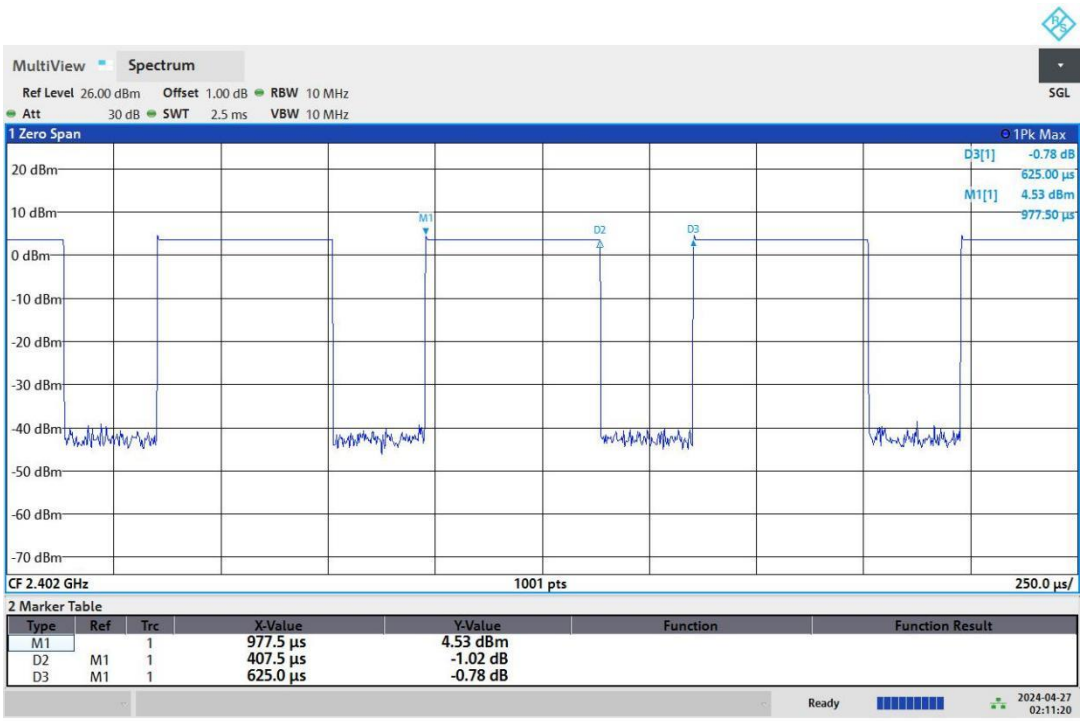
VBW 300.000 kHz

DUTY CYCLE

TEST RESULT

TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant5	2402	0.4075	0.6250	0.6250	65.20 %	1.86	---	PASS
BLE_2M	Ant5	2402	0.2189	0.6250	0.3502	35.02 %	4.56	---	PASS
BLE_S8	Ant5	2402	3.1289	3.7750	0.8288	82.88 %	0.82	---	PASS

TEST GRAPHS



BLE_1M_Ant1_2402

BLE_2M_Ant1_2404

BLE_S8_Ant1_2402

--END--