

8.3 MAXIMUM PEAK CONDUCTED OUTPUT POWER

8.3.1 Applicable Standard

According to FCC Part 15.247(b)(3) and KDB 558074 D01 15.247 Meas Guidance v05r02
According to RSS-247, 5.4(d) and RSS-Gen6.12

8.3.2 Conformance Limit

The maximum peak conducted output power of the intentional radiator for systems using digital modulation in the 2400 - 2483.5 MHz bands shall not exceed: 1 Watt (30dBm).

8.3.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.3.4 Test Procedure

As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. For smart system, Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Set the RBW \geq DTS bandwidth (about 2MHz).

Set VBW = 3*RBW (about 6MHz)

Set the span \geq 3*RBW

Set Sweep time = auto couple.

Set Detector = peak.

Set Trace mode = max hold.

Allow trace to fully stabilize. Use peak marker function to determine the peak amplitude level.

Conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

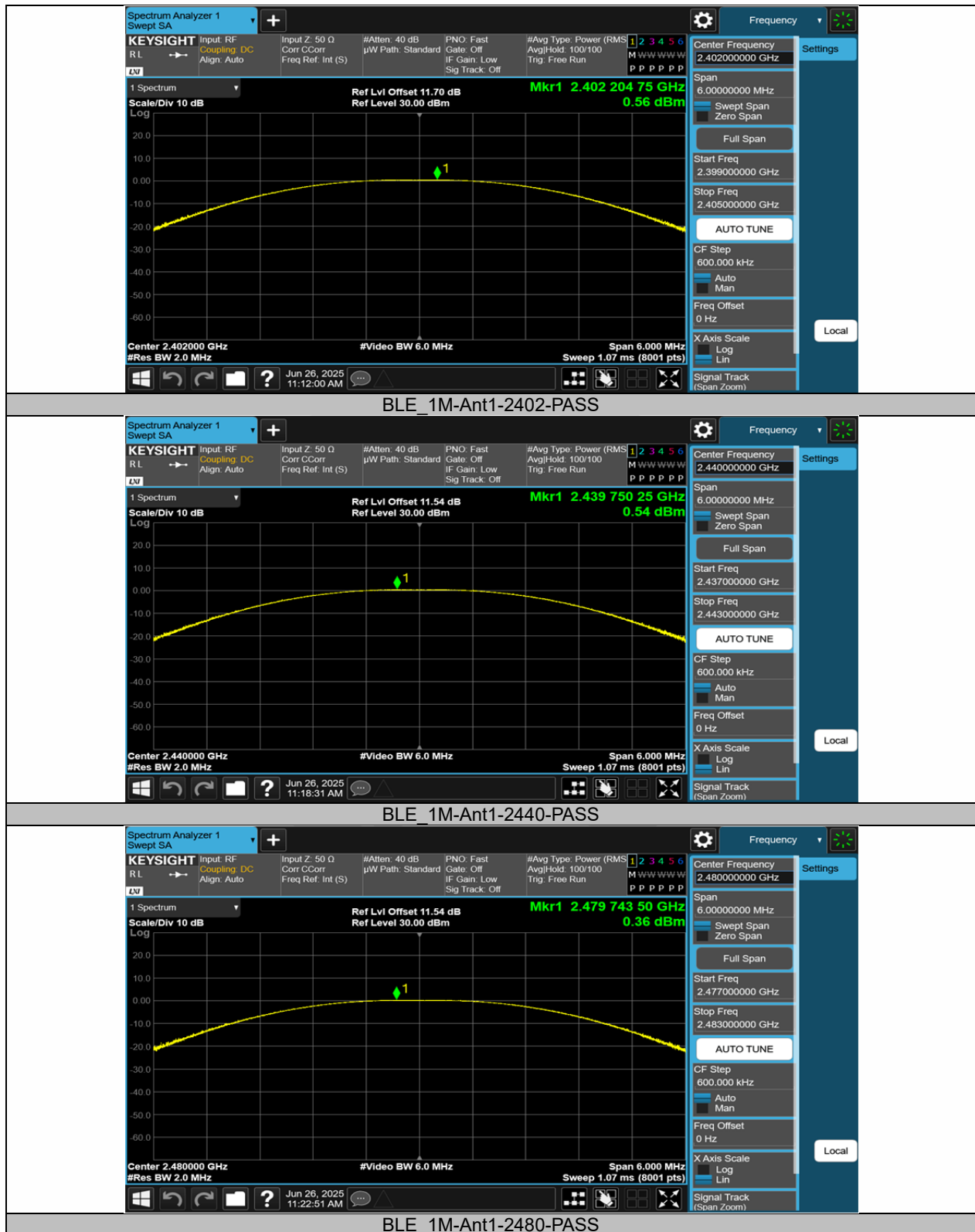
8.3.5 Test Results

Temperature:	26°C
Relative Humidity:	65%
ATM Pressure:	1011 mbar

Note: N/A

TestMode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
BLE 1M	Ant1	2402	0.56	≤30	6.08	≤36	PASS
BLE 1M	Ant1	2440	0.54	≤30	6.06	≤36	PASS
BLE 1M	Ant1	2480	0.36	≤30	5.88	≤36	PASS
BLE 2M	Ant1	2402	0.76	≤30	6.28	≤36	PASS
BLE 2M	Ant1	2440	0.64	≤30	6.16	≤36	PASS
BLE 2M	Ant1	2480	0.49	≤30	5.71	≤36	PASS







BLE 2M-Ant1-2402-PASS



BLE 2M-Ant1-2440-PASS



BLE 2M-Ant1-2480-PASS

8.4 MAXIMUM POWER SPECTRAL DENSITY

8.4.1 Applicable Standard

According to FCC Part 15.247(e) and KDB 558074 D01 15.247 Meas Guidance v05r02
According to RSS-247, 5.2(b) and RSS-Gen6.12

8.4.2 Conformance Limit

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.4.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.4.4 Test Procedure

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance

The transmitter output (antenna port) was connected to the spectrum analyzer

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.

Set Detector = peak.

Set Sweep time = auto couple.

Set Trace mode = max hold.

Allow trace to fully stabilize.

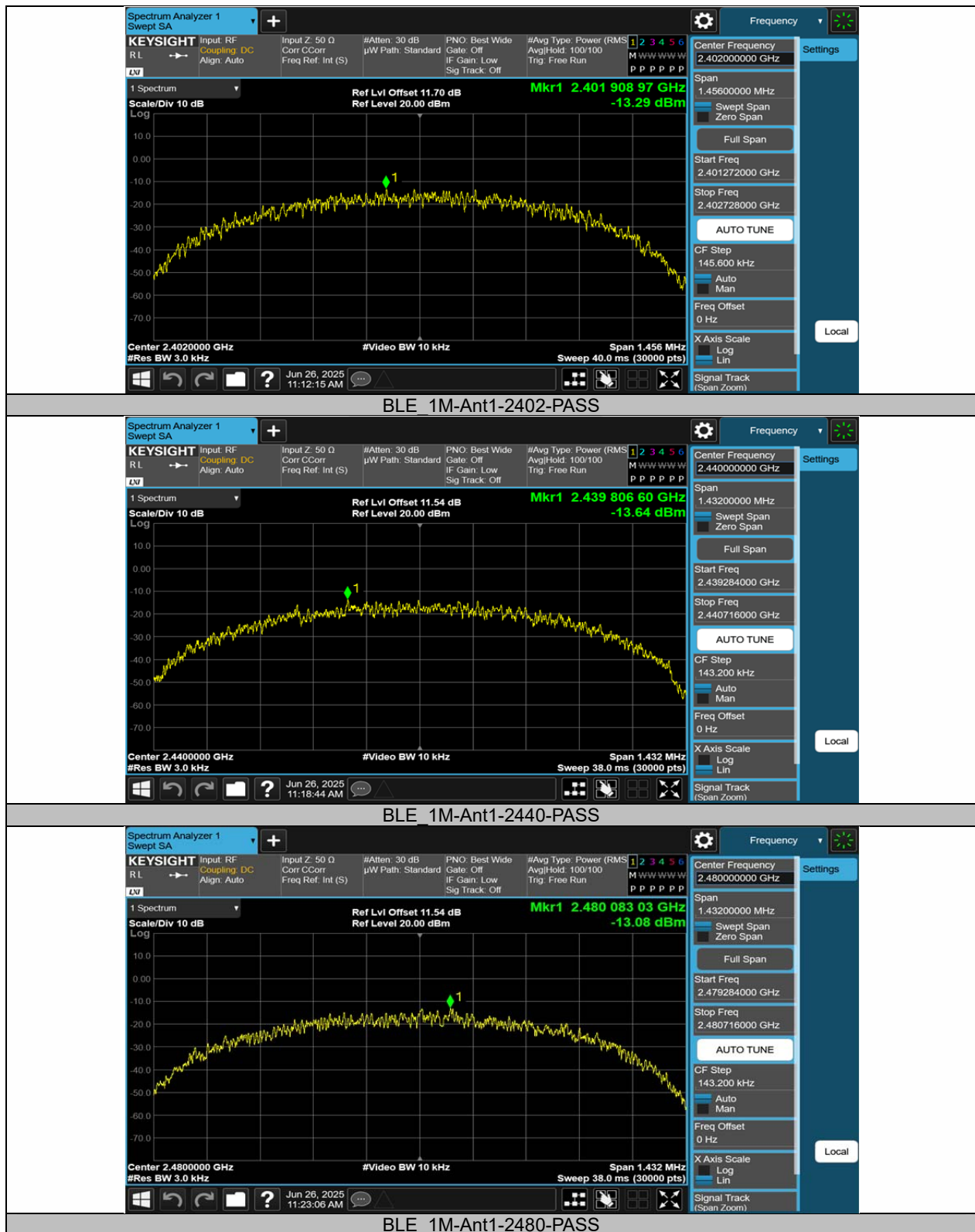
Use the peak marker function to determine the maximum amplitude level within the RBW.

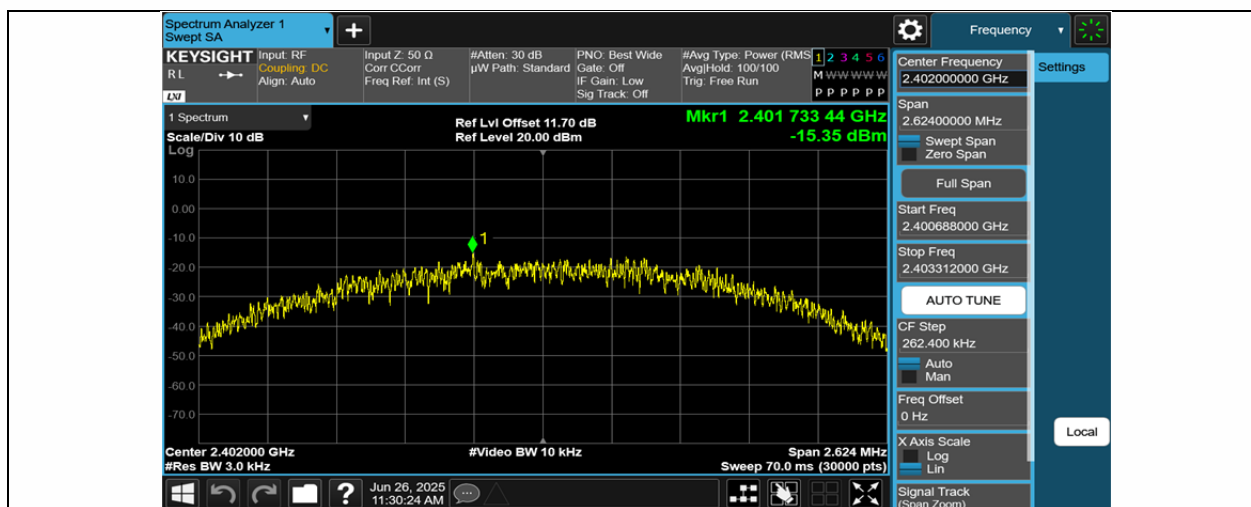
8.4.5 Test Results

Temperature:	26°C
Relative Humidity:	65%
ATM Pressure:	1011 mbar

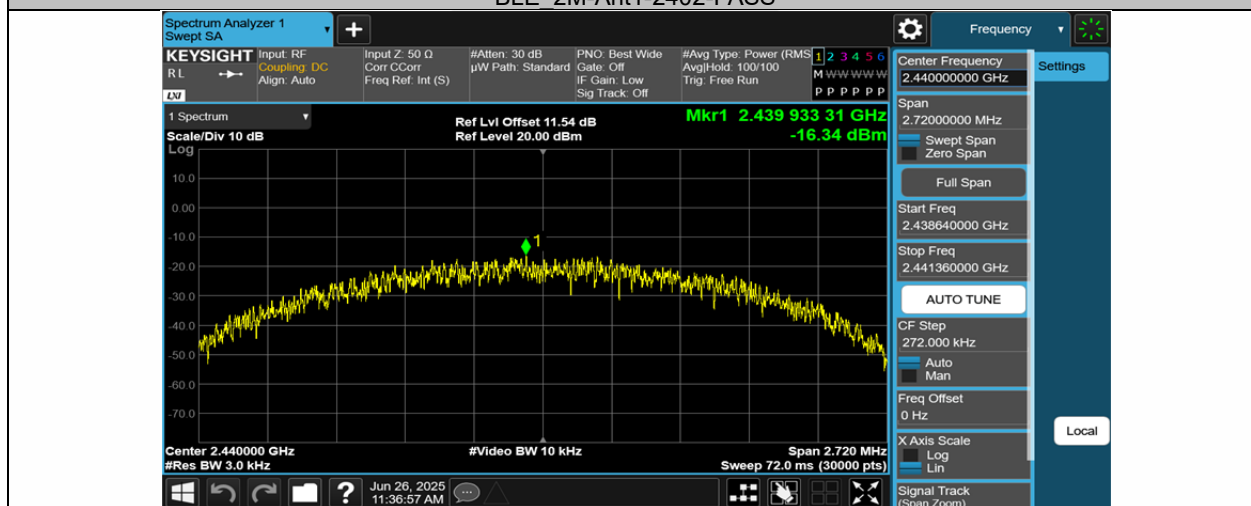
Note: N/A

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-13.29	≤8.00	PASS
BLE_1M	Ant1	2440	-13.64	≤8.00	PASS
BLE_1M	Ant1	2480	-13.08	≤8.00	PASS
BLE_2M	Ant1	2402	-15.35	≤8.00	PASS
BLE_2M	Ant1	2440	-16.34	≤8.00	PASS
BLE_2M	Ant1	2480	-15.86	≤8.00	PASS

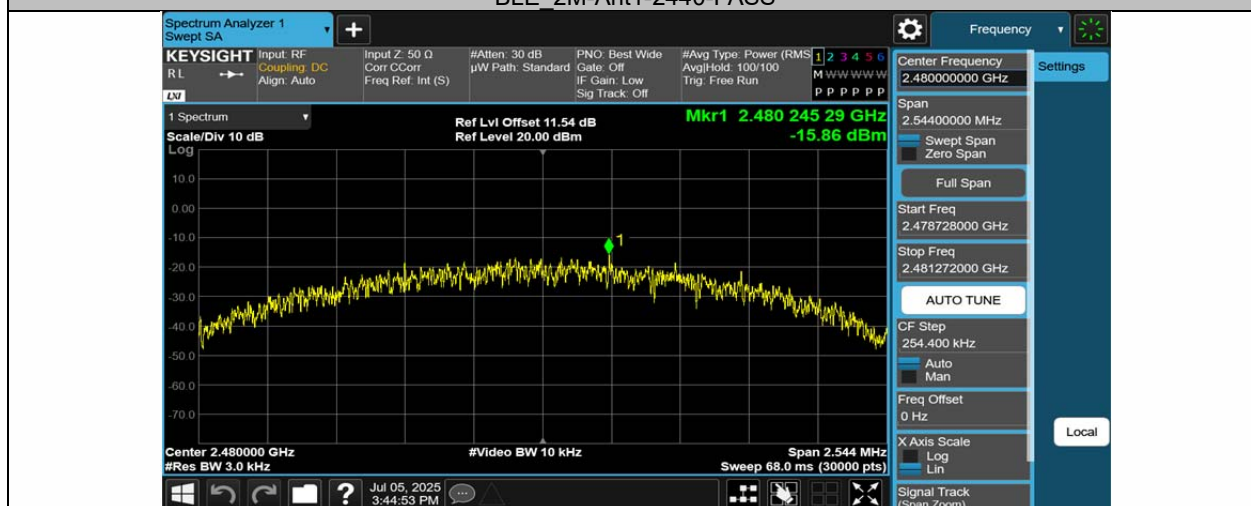




BLE 2M-Ant1-2402-PASS



BLE 2M-Ant1-2440-PASS



BLE 2M-Ant1-2480-PASS

8.5 UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

8.5.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02
According to RSS-247, 5.5

8.5.2 Conformance Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

8.5.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.5.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

■ Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to = 1.5 times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW $\geq 3 \times$ RBW.

Set Detector = peak.

Set Sweep time = auto couple.

Set Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

■ Band-edge measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation

Set RBW $\geq 1\%$ of the span=100kHz Set VBW $\geq 3 \times$ RBW

Set Sweep = auto Set Detector function = peak Set Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.

■ Emission level measurement

Set the center frequency and span to encompass frequency range to be measured.

Set the RBW = 100 kHz.

Set the VBW = 300 kHz.

Set Detector = peak

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements. Report the three highest emissions relative to the limit.

8.5.5 Test Results

Temperature:	26 °C
Relative Humidity:	65%
ATM Pressure:	1011 mbar

Note: N/A

Reference level measurement

TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
BLE_1M	Ant1	2402	2401.74	-0.24
BLE_1M	Ant1	2440	2439.71	-0.22
BLE_1M	Ant1	2480	2479.73	-0.53
BLE_2M	Ant1	2402	2401.98	-1.42
BLE_2M	Ant1	2440	2439.98	-0.95
BLE_2M	Ant1	2480	2479.99	-1.40

Band edge measurements

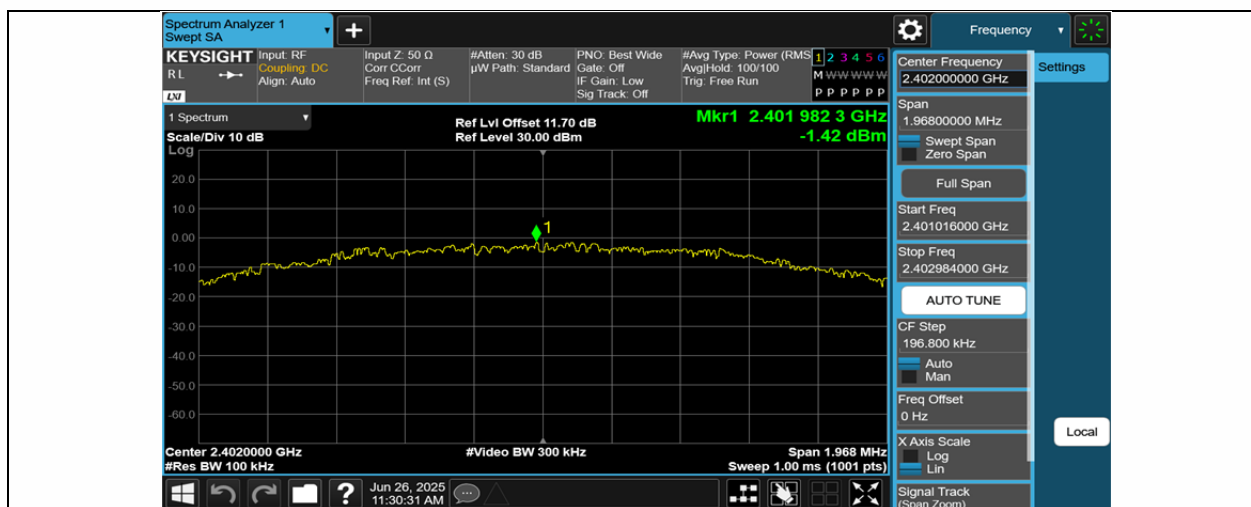
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-0.24	-48.41	≤-20.24	PASS
BLE_1M	Ant1	High	2480	-0.53	-47.81	≤-20.53	PASS
BLE_2M	Ant1	Low	2402	-1.42	-32.28	≤-21.42	PASS
BLE_2M	Ant1	High	2480	-1.40	-48.67	≤-21.4	PASS

Conducted Spurious Emission

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	30~1000	-0.24	-61.17	≤-20.24	PASS
BLE_1M	Ant1	2402	1000~26500	-0.24	-49.09	≤-20.24	PASS
BLE_1M	Ant1	2440	30~1000	-0.22	-60.52	≤-20.22	PASS
BLE_1M	Ant1	2440	1000~26500	-0.22	-48.76	≤-20.22	PASS
BLE_1M	Ant1	2480	30~1000	-0.53	-61.36	≤-20.53	PASS
BLE_1M	Ant1	2480	1000~26500	-0.53	-49.16	≤-20.53	PASS
BLE_2M	Ant1	2402	30~1000	-1.42	-61.06	≤-21.42	PASS
BLE_2M	Ant1	2402	1000~26500	-1.42	-48.15	≤-21.42	PASS
BLE_2M	Ant1	2440	30~1000	-0.95	-61.09	≤-20.95	PASS
BLE_2M	Ant1	2440	1000~26500	-0.95	-49.13	≤-20.95	PASS
BLE_2M	Ant1	2480	30~1000	-1.40	-61.05	≤-21.4	PASS
BLE_2M	Ant1	2480	1000~26500	-1.40	-48.94	≤-21.4	PASS

Reference level measurement





BLE 2M-Ant1-2402-PASS

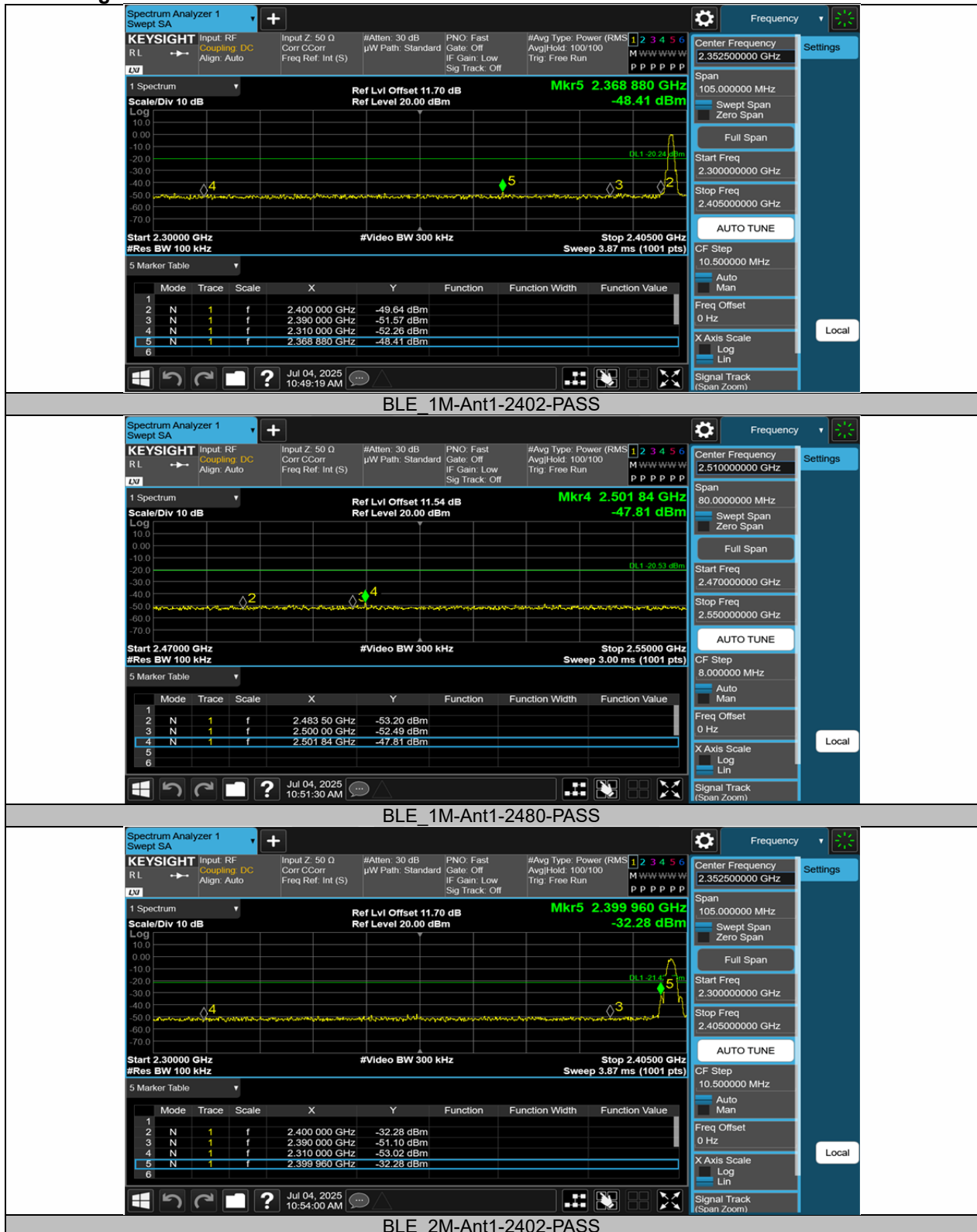


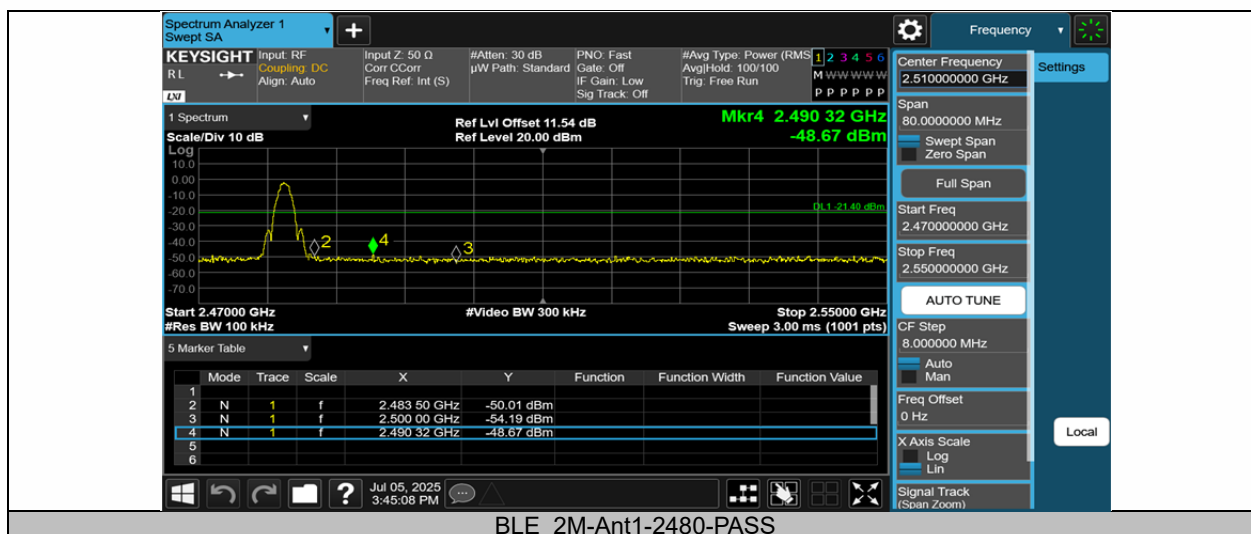
BLE 2M-Ant1-2440-PASS



BLE 2M-Ant1-2480-PASS

Band edge measurements



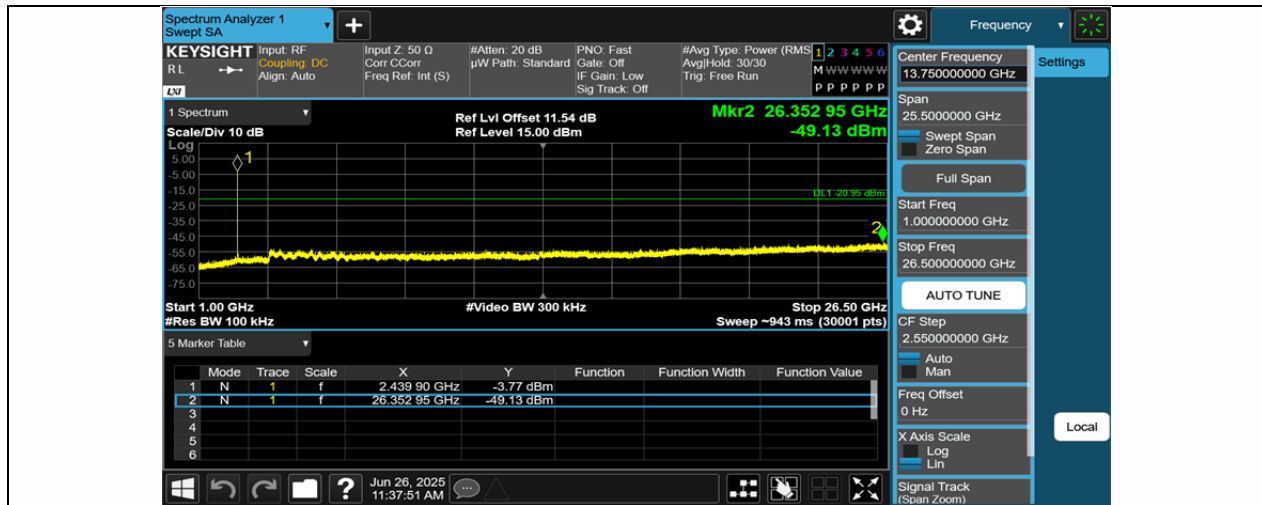


Conducted Spurious Emission

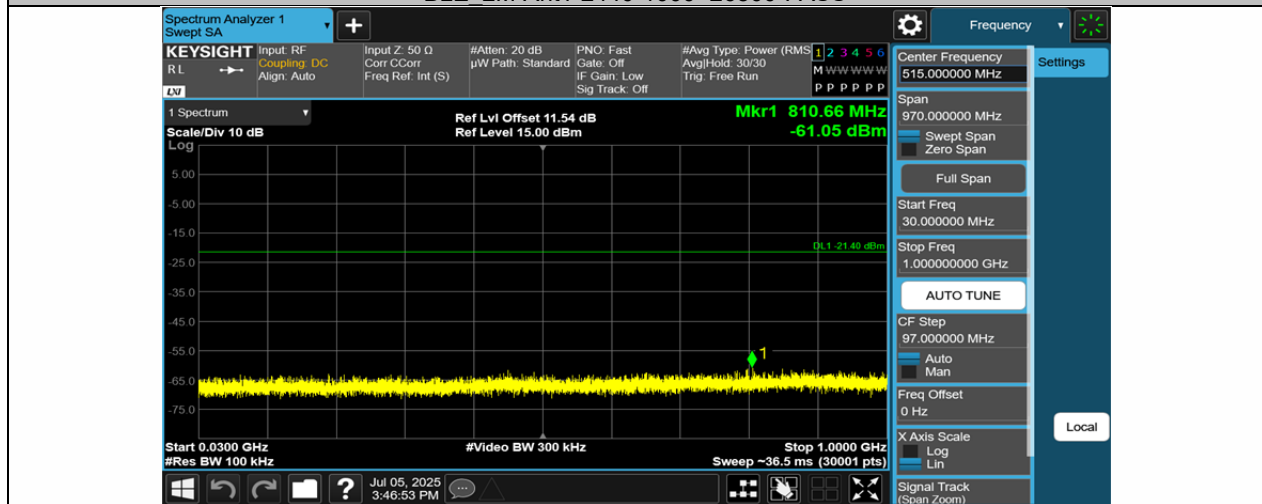




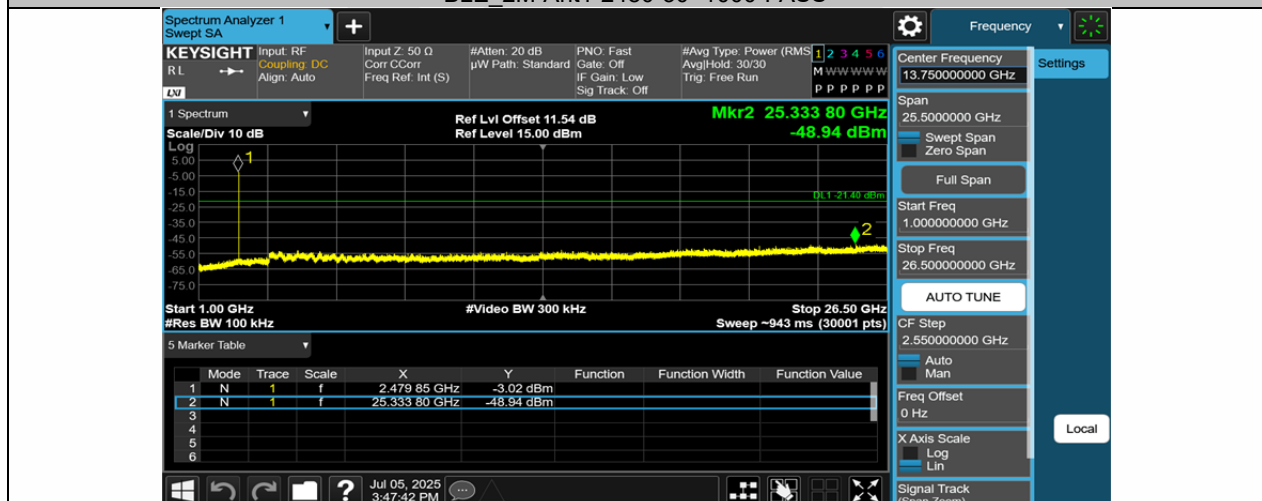




BLE 2M-Ant1-2440-1000~26500-PASS



BLE 2M-Ant1-2480-30~1000-PASS



BLE 2M-Ant1-2480-1000~26500-PASS

8.6 RADIATED SPURIOUS EMISSION

8.6.1 Applicable Standard

According to FCC Part 15.247(d), 15.205, 15.209 and KDB 558074 D01 15.247 Meas Guidance v05r02
According to IC RSS-Gen and RSS-247

8.6.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part 15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F (KHz)	20 log (uV/m)	300
0.490-1.705	24000/F (KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

8.6.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

8.6.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1$ GHz (1GHz to 25GHz), 100 kHz for $f < 1$ GHz (30MHz to 1GHz)

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

8.6.5 Test Results

Temperature:	18° C
Relative Humidity:	67%
ATM Pressure:	1011 mbar

■ Spurious Emission below 30MHz(9KHz to 30MHz)

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
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Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor = $40\log(\text{Specific distance}/\text{test distance})$ (dB);

Limit line = Specific limits(dBuV) + distance extrapolation factor

■ Spurious Emission Above 1GHz(1GHz to 25GHz)

All the antenna(Antenna 1) and modes(BLE 1M, BLE 2M) mode have been tested, and the worst(Antenna 1,BLE_1M) result recorded was report as below:

Test mode: BLE_1M Frequency: Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4804.00	V	34.74	24.05	74.00	54.00	-39.26	-29.95
7206.00	V	36.42	25.40	74.00	54.00	-37.58	-28.60
9608.00	V	38.54	26.93	74.00	54.00	-35.46	-27.07
4804.00	H	38.50	27.99	74.00	54.00	-35.50	-26.01
7206.00	H	37.95	27.40	74.00	54.00	-36.05	-26.60
9608.00	H	37.72	26.45	74.00	54.00	-36.28	-27.55

Test mode: BLE_1M Frequency: Channel 19: 2440MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4880.00	V	35.43	24.73	74.00	54.00	-38.57	-29.27
7320.00	V	36.40	25.38	74.00	54.00	-37.60	-28.62
9760.00	V	38.79	27.18	74.00	54.00	-35.21	-26.82
4880.00	H	39.19	28.68	74.00	54.00	-34.81	-25.32
7320.00	H	37.93	27.38	74.00	54.00	-36.07	-26.62
9760.00	H	37.97	26.70	74.00	54.00	-36.03	-27.30

Test mode: BLE_1M Frequency: Channel 39: 2480MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4960.00	V	35.20	24.52	74.00	54.00	-38.80	-29.48
7440.00	V	36.43	25.42	74.00	54.00	-37.57	-28.58
9920.00	V	38.61	27.01	74.00	54.00	-35.39	-26.99
4960.00	H	38.94	28.45	74.00	54.00	-35.06	-25.55
7440.00	H	37.95	27.42	74.00	54.00	-36.05	-26.58
9920.00	H	37.78	26.52	74.00	54.00	-36.22	-27.48

Note:

- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
- (2) Emission Level= Reading Level+Correct Factor.
- (3) Correct Factor= Ant_F + Cab_L- Preamp
- (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz
All the antenna(Antenna 1) and modes(BLE 1M, BLE 2M) mode have been tested, and the worst(Antenna 1,BLE_1M) result recorded was report as below:

Test mode: BLE_1M Frequency: Channel 0: 2402MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2310.00	H	36.46	74.00	26.85	54.00
2310.00	V	37.08	74.00	26.85	54.00

Test mode: BLE_1M Frequency: Channel 39: 2480MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2483.50	H	38.95	74.00	27.99	54.00
2483.50	V	39.90	74.00	28.49	54.00

Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor.
(3) Correct Factor= Ant_F + Cab_L - Preamp
(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission below 1GHz(30MHz to 1GHz)

All the antenna(Antenna 1) and modes(BLE 1M, BLE 2M) mode have been tested, and the worst(Antenna 1,BLE_1M) result recorded was report as below:

Mode:	BLE 2402
Environment:	Temp: 18°C; Humi:67%

Final Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	30.101	61.13	-24.97	36.16	PK	49.50	13.34	Vertical
2	33.843	60.09	-24.46	35.63	PK	49.50	13.87	Vertical
3	36.909	60.53	-24.47	36.06	PK	49.50	13.44	Vertical
4	42.804	59.46	-24.13	35.33	PK	49.50	14.17	Vertical
5	50.758	57.65	-23.92	33.73	PK	49.50	15.77	Vertical
6	76.657	58.55	-26.55	32.00	PK	49.50	17.50	Vertical

Final Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	41.349	52.11	-24.44	27.67	PK	49.50	21.83	Horizontal
2	75.299	59.52	-26.51	33.01	PK	49.50	16.49	Horizontal
3	105.563	57.93	-24.85	33.08	PK	54.00	20.92	Horizontal
4	113.032	60.58	-25.74	34.84	PK	54.00	19.16	Horizontal
5	172.396	62.99	-26.15	36.84	PK	54.00	17.16	Horizontal
6	188.013	62.31	-25.43	36.88	PK	54.00	17.12	Horizontal

Mode:	BLE 2440
Environment:	Temp: 18℃; Humi:67%

Final Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	30.029	59.95	-24.98	34.97	PK	49.50	14.53	Vertical
2	33.058	59.14	-24.57	34.57	PK	49.50	14.93	Vertical
3	42.657	58.80	-24.16	34.64	PK	49.50	14.86	Vertical
4	76.463	57.91	-26.54	31.37	PK	49.50	18.13	Vertical
5	83.641	55.04	-26.14	28.90	PK	49.50	20.60	Vertical
6	113.323	57.95	-25.78	32.17	PK	54.00	21.83	Vertical

Final Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	41.349	52.11	-24.44	27.67	PK	49.50	21.83	Horizontal
2	75.299	59.52	-26.51	33.01	PK	49.50	16.49	Horizontal
3	105.563	57.93	-24.85	33.08	PK	54.00	20.92	Horizontal
4	113.032	60.58	-25.74	34.84	PK	54.00	19.16	Horizontal
5	172.396	62.99	-26.15	36.84	PK	54.00	17.16	Horizontal
6	188.013	62.31	-25.43	36.88	PK	54.00	17.12	Horizontal

Mode:	BLE 2480
Environment:	Temp: 18℃; Humi:67%

Final Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	33.563	59.17	-24.5	34.67	PK	49.50	14.83	Vertical
2	42.592	57.52	-24.17	33.35	PK	49.50	16.15	Vertical
3	51.146	55.78	-23.99	31.79	PK	49.50	17.71	Vertical
4	75.687	59.14	-26.52	32.62	PK	49.50	16.88	Vertical
5	103.332	55.69	-24.62	31.07	PK	54.00	22.93	Vertical
6	172.784	61.05	-26.13	34.92	PK	54.00	19.08	Vertical

Final Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	75.008	59.43	-26.5	32.93	PK	49.50	16.57	Horizontal
2	105.466	60.24	-24.84	35.40	PK	54.00	18.60	Horizontal
3	110.219	60.22	-25.36	34.86	PK	54.00	19.14	Horizontal
4	162.017	61.80	-26.36	35.44	PK	54.00	18.56	Horizontal
5	176.082	63.55	-26.01	37.54	PK	54.00	16.46	Horizontal
6	240.490	56.72	-22.81	33.91	PK	56.90	22.99	Horizontal

8.7 CONDUCTED EMISSIONS TEST

8.7.1 Applicable Standard

According to FCC Part 15.207(a)
According to IC RSS-Gen 8.8

8.7.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

8.7.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

8.7.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

8.7.5 Test Results

Pass

The AC 120 V voltage have been tested, and the worst result recorded was report as below:

Mode:	BLE 2402
Environment:	Temp: 24°C; Humi:72%

Final_Result (Margin=Limit-Meas.(Reading +Corr.))

No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.691	18.00	16.32	34.32	73.00	38.68	QPK	N	GND	PASS
2	0.691	14.90	16.32	31.22	60.00	28.78	AVG	N	GND	PASS
3	2.594	19.75	16.55	36.30	73.00	36.70	QPK	N	GND	PASS
4	2.594	17.20	16.55	33.75	60.00	26.25	AVG	N	GND	PASS
5	3.825	36.24	16.64	52.88	73.00	20.12	QPK	N	GND	PASS
6	3.825	32.86	16.64	49.50	60.00	10.50	AVG	N	GND	PASS
7	4.031	30.71	16.66	47.37	73.00	25.63	QPK	N	GND	PASS
8	4.031	29.33	16.66	45.99	60.00	14.01	AVG	N	GND	PASS
9	23.075	32.61	17.16	49.77	73.00	23.23	QPK	N	GND	PASS
10	23.075	31.68	17.16	48.84	60.00	11.16	AVG	N	GND	PASS
11	24.373	24.27	17.17	41.44	73.00	31.56	QPK	N	GND	PASS
12	24.373	23.19	17.17	40.36	60.00	19.64	AVG	N	GND	PASS

No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	2.575	29.15	16.58	45.73	73.00	27.27	QPK	L1	GND	PASS
2	2.575	27.89	16.58	44.47	60.00	15.53	AVG	L1	GND	PASS
3	2.849	29.98	16.59	46.57	73.00	26.43	QPK	L1	GND	PASS
4	2.849	26.17	16.59	42.76	60.00	17.24	AVG	L1	GND	PASS
5	3.857	35.43	16.6	52.03	73.00	20.97	QPK	L1	GND	PASS
6	3.857	33.29	16.6	49.89	60.00	10.11	AVG	L1	GND	PASS
7	4.112	34.54	16.6	51.14	73.00	21.86	QPK	L1	GND	PASS
8	4.112	30.92	16.6	47.52	60.00	12.48	AVG	L1	GND	PASS
9	22.868	39.97	17.16	57.13	73.00	15.87	QPK	L1	GND	PASS
10	22.868	39.70	17.16	56.86	60.00	3.14	AVG	L1	GND	PASS
11	24.265	30.05	17.19	47.24	73.00	25.76	QPK	L1	GND	PASS
12	24.265	29.32	17.19	46.51	60.00	13.49	AVG	L1	GND	PASS

No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	2.576	26.40	16.56	42.96	73.00	30.04	QPK	L2	GND	PASS
2	2.576	26.14	16.56	42.70	60.00	17.30	AVG	L2	GND	PASS
3	3.087	26.62	16.57	43.19	73.00	29.81	QPK	L2	GND	PASS
4	3.087	25.89	16.57	42.46	60.00	17.54	AVG	L2	GND	PASS
5	3.776	39.10	16.62	55.72	73.00	17.28	QPK	L2	GND	PASS
6	3.776	36.44	16.62	53.06	60.00	6.94	AVG	L2	GND	PASS
7	4.175	34.46	16.65	51.11	73.00	21.89	QPK	L2	GND	PASS
8	4.175	29.66	16.65	46.31	60.00	13.69	AVG	L2	GND	PASS
9	4.873	32.29	16.68	48.97	73.00	24.03	QPK	L2	GND	PASS
10	4.873	24.51	16.68	41.19	60.00	18.81	AVG	L2	GND	PASS
11	22.864	33.36	17.14	50.50	73.00	22.50	QPK	L2	GND	PASS
12	22.864	32.57	17.14	49.71	60.00	10.29	AVG	L2	GND	PASS

No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	1.000	21.10	16.05	37.15	73.00	35.85	QPK	L3	GND	PASS
2	1.000	20.87	16.05	36.92	60.00	23.08	AVG	L3	GND	PASS
3	2.575	21.93	16.57	38.50	73.00	34.50	QPK	L3	GND	PASS
4	2.575	21.28	16.57	37.85	60.00	22.15	AVG	L3	GND	PASS
5	2.796	23.29	16.6	39.89	73.00	33.11	QPK	L3	GND	PASS
6	2.796	21.82	16.6	38.42	60.00	21.58	AVG	L3	GND	PASS
7	3.807	35.04	16.67	51.71	73.00	21.29	QPK	L3	GND	PASS
8	3.807	32.56	16.67	49.23	60.00	10.77	AVG	L3	GND	PASS
9	4.224	33.65	16.68	50.33	73.00	22.67	QPK	L3	GND	PASS
10	4.224	30.83	16.68	47.51	60.00	12.49	AVG	L3	GND	PASS
11	22.860	24.65	17.18	41.83	73.00	31.17	QPK	L3	GND	PASS
12	22.860	24.45	17.18	41.63	60.00	18.37	AVG	L3	GND	PASS

8.8 ANTENNA APPLICATION

8.8.1 Antenna Requirement

Standard	Requirement
FCC CRF Part15.203	<p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. 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.</p> <p>If transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.</p> <p>The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.</p> <p>If the transmitter employs an antenna system that emits multiple directional beams, but does not emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device (i.e. the sum of the power supplied to all antennas, antenna elements, staves, etc., and summed across all carriers or frequency channels) shall not exceed the applicable output power limit. However, the total conducted output power shall be reduced by 1 dB below the specified limits for each 3 dB that the directional gain of the antenna/antenna array exceeds 6 dBi. The directional antenna gain shall be computed as the sum of 10 log (number of array elements or staves) plus the directional gain of the element or stave having the highest gain.</p>
FCC 47 CFR Part 15.247 (b)	
RSS-Gen Section 6.8	
RSS-247 Section 5.4	

8.8.2 Result

PASS.

Note:

- ☒ Antenna use a permanently attached antenna which is not replaceable.
- ☐ Not using a standard antenna jack or electrical connector for antenna replacement
- ☐ The antenna has to be professionally installed (please provide method of installation)

Please refer to the attached documentInternal Photos to show the antenna connector.

----- END OF REPORT -----

9 APPENDIX PHOTOGRAPHS OF EUT

Please refer to the file of External Photo and Internal Photo.



10 APPENDIX PHOTOGRAPHS OF TEST SETUP

Please refer to the file of Test Setup Photo.

