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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.88	60.64	74	-22.12	31.75	5.86	46.37	100	195	Peak
2390	44.55	53.31	54	-9.45	31.75	5.86	46.37	100	195	Average
2440	93.04	101.57	/	/	31.91	5.93	46.37	100	195	Peak
2440	92.32	100.85	/	/	31.91	5.93	46.37	100	195	Average
2483.5	52.48	60.81	74	-21.52	32.05	5.99	46.37	100	195	Peak
2483.5	44.98	53.31	54	-9.02	32.05	5.99	46.37	100	195	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.87	61.24	74	-21.13	32.14	5.86	46.37	100	175	Peak
2390	44.81	53.18	54	-9.19	32.14	5.86	46.37	100	175	Average
2440	86.16	94.34	/	/	32.26	5.93	46.37	100	175	Peak
2440	84.66	92.84	/	/	32.26	5.93	46.37	100	175	Average
2483.5	52.33	60.35	74	-21.67	32.36	5.99	46.37	100	175	Peak
2483.5	44.59	52.61	54	-9.41	32.36	5.99	46.37	100	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
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										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.94	61.7	74	-21.06	31.75	5.86	46.37	100	195	Peak
2390	44.86	53.62	54	-9.14	31.75	5.86	46.37	100	195	Average
2480	93.6	101.95	/	/	32.04	5.98	46.37	100	195	Peak
2480	92.01	100.36	/	/	32.04	5.98	46.37	100	195	Average
2483.5	52.56	60.89	74	-21.44	32.05	5.99	46.37	100	195	Peak
2483.5	45.2	53.53	54	-8.8	32.05	5.99	46.37	100	195	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.41	59.78	74	-22.59	32.14	5.86	46.37	100	175	Peak
2390	44.27	52.64	54	-9.73	32.14	5.86	46.37	100	175	Average
2480	86.6	94.64	/	/	32.35	5.98	46.37	100	175	Peak
2480	84.62	92.66	/	/	32.35	5.98	46.37	100	175	Average
2483.5	52.83	60.85	74	-21.17	32.36	5.99	46.37	100	175	Peak
2483.5	44.63	52.65	54	-9.37	32.36	5.99	46.37	100	175	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
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.
Power Meter	ANRITSU	ML2495A	1506002	Feb. 25,21	Feb. 24,22
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 25,21	Feb. 24,22
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	Apr. 26,21	Apr. 25,22
Power Sensor	ANRITSU	MA2411B	1339352	Feb. 25,21	Feb. 24,22

NOTE:

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

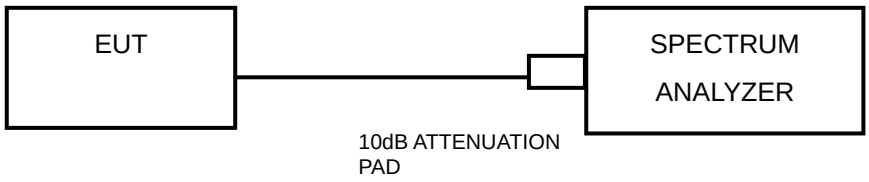
3.3.3 TEST PROCEDURE

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

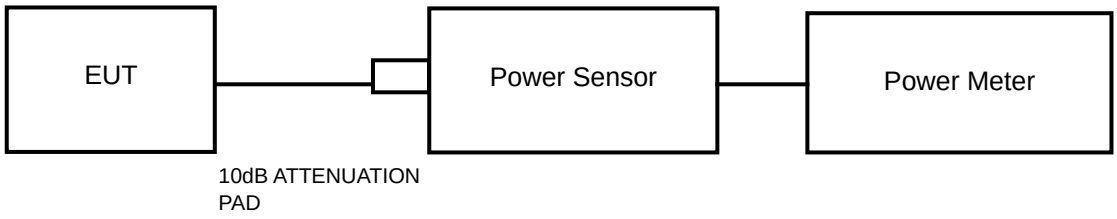
Please Refer to Appendix A Of this test report.

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



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 A 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.

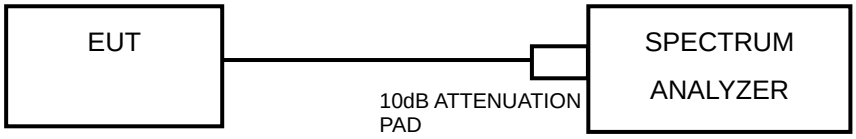
Please Refer to Appendix A Of this test report.

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

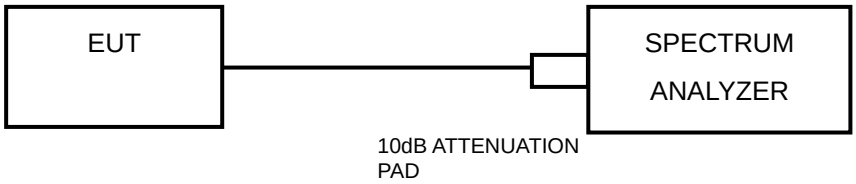
Please Refer to Appendix A Of this test report.

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 A Of this test report.

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

5 APPENDIX A - 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.

Please Refer to Appendix A Of this test report.

APPENDIX A:

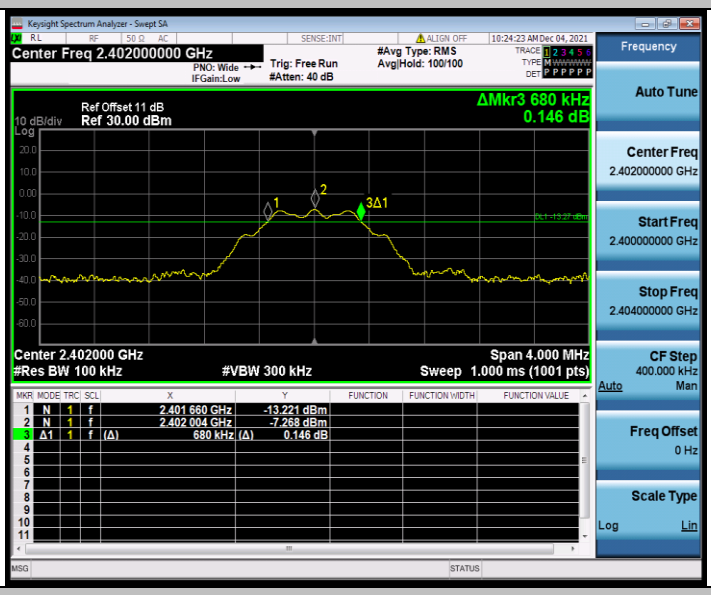
DTS BANDWIDTH

TEST RESULT

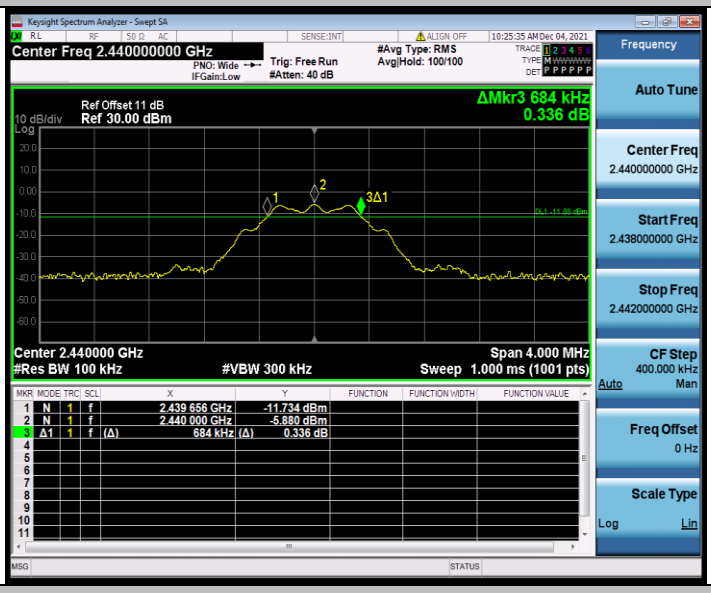
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_125K	Ant1	2402	0.680	2401.660	2402.340	0.5	PASS
		2440	0.684	2439.656	2440.340	0.5	PASS
		2480	0.684	2479.656	2480.340	0.5	PASS
BLE_1M	Ant1	2402	0.668	2401.664	2402.332	0.5	PASS
		2440	0.688	2439.652	2440.340	0.5	PASS
		2480	0.724	2479.632	2480.356	0.5	PASS
BLE_2M	Ant1	2402	1.128	2401.440	2402.568	0.5	PASS
		2440	1.156	2439.440	2440.596	0.5	PASS
		2480	1.148	2479.440	2480.588	0.5	PASS
BLE_500K	Ant1	2402	0.684	2401.664	2402.348	0.5	PASS
		2440	0.652	2439.676	2440.328	0.5	PASS
		2480	0.656	2479.672	2480.328	0.5	PASS

TEST GRAPHS

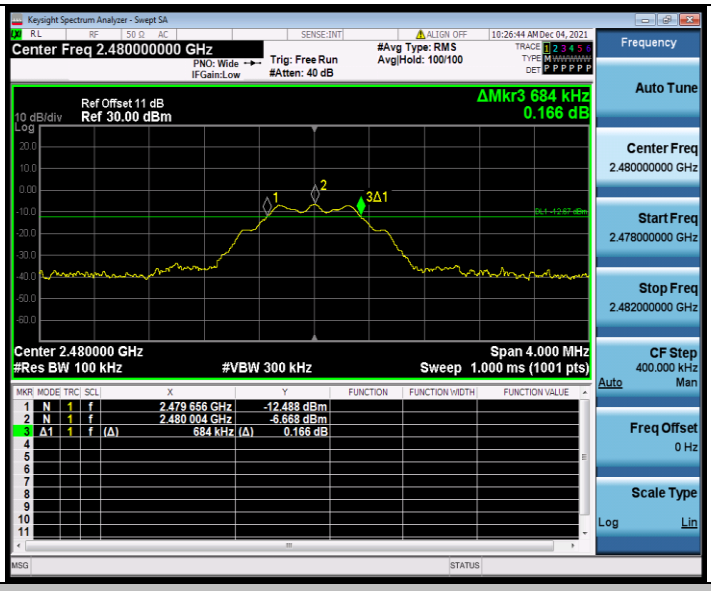
BLE_125K_Ant1_2402



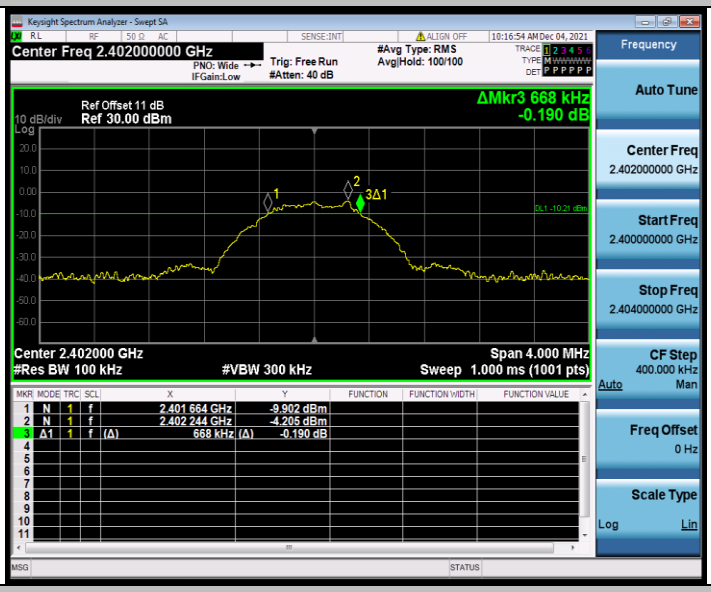
BLE_125K_Ant1_2440



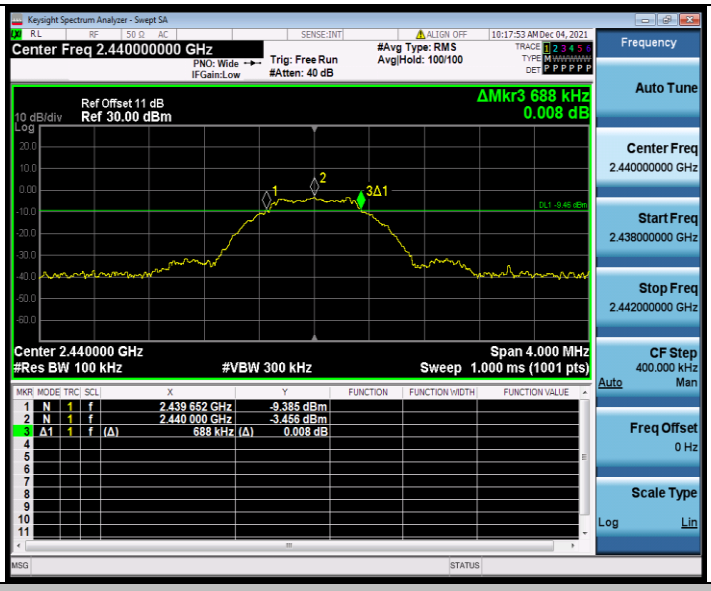
BLE_125K_Ant1_2480



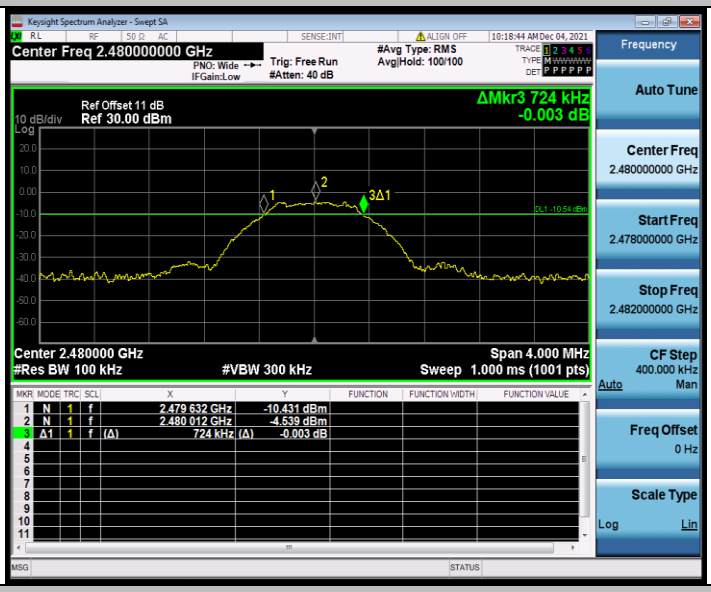
BLE_1M_Ant1_2402



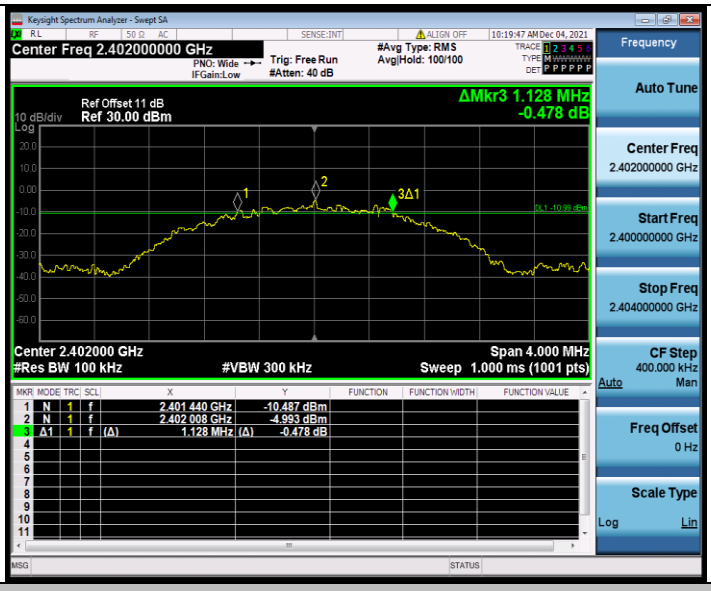
BLE_1M_Ant1_2440



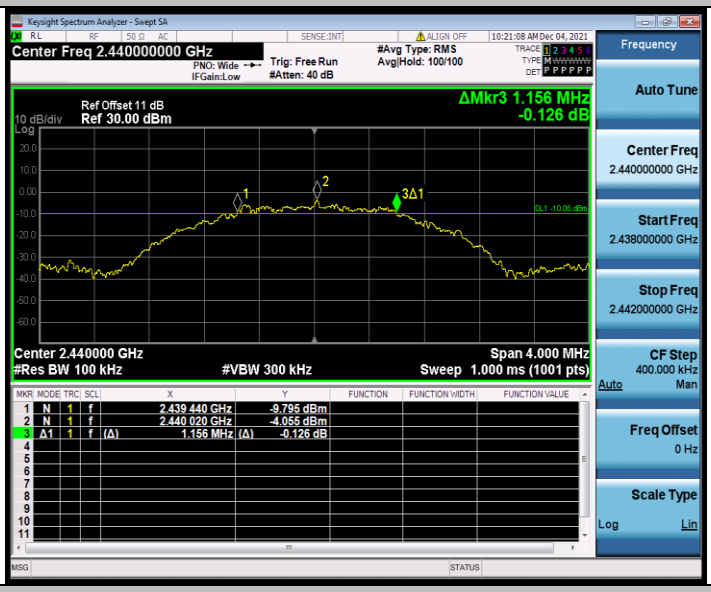
BLE_1M_Ant1_2480



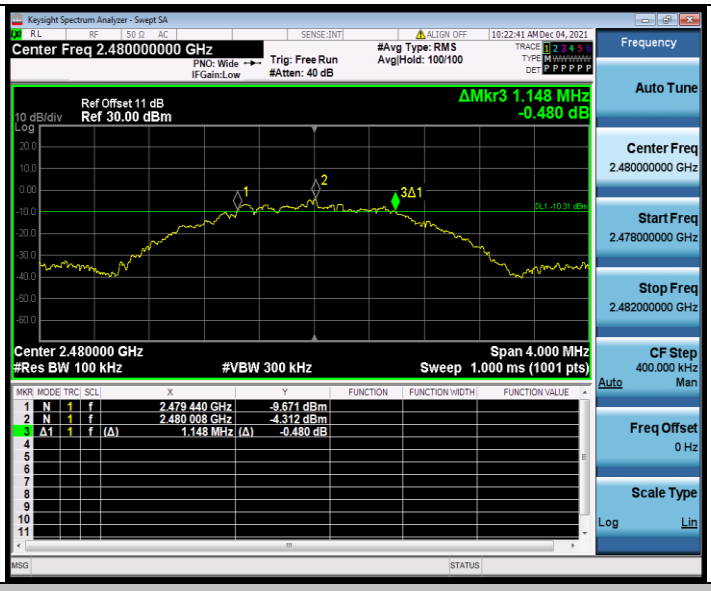
BLE_2M_Ant1_2402



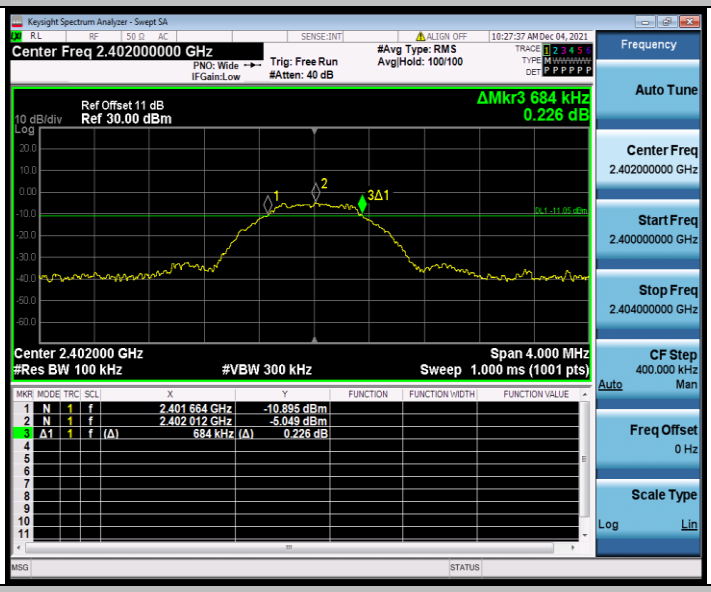
BLE_2M_Ant1_2440



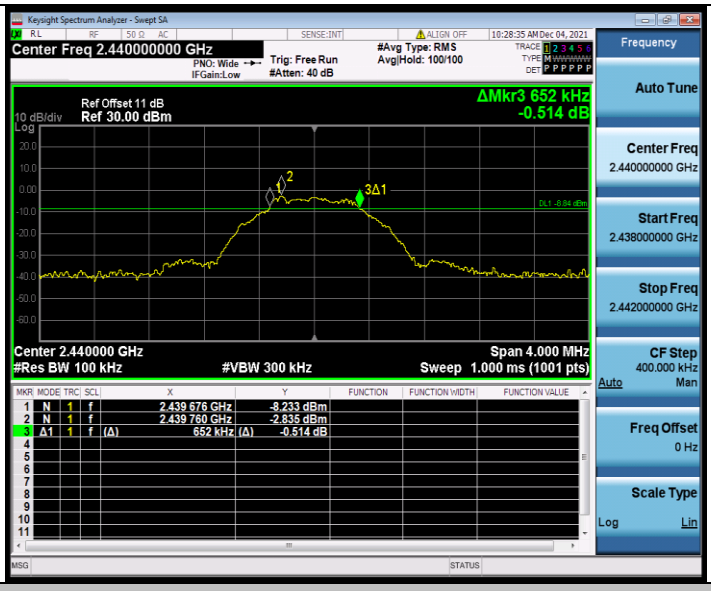
BLE_2M_Ant1_2480



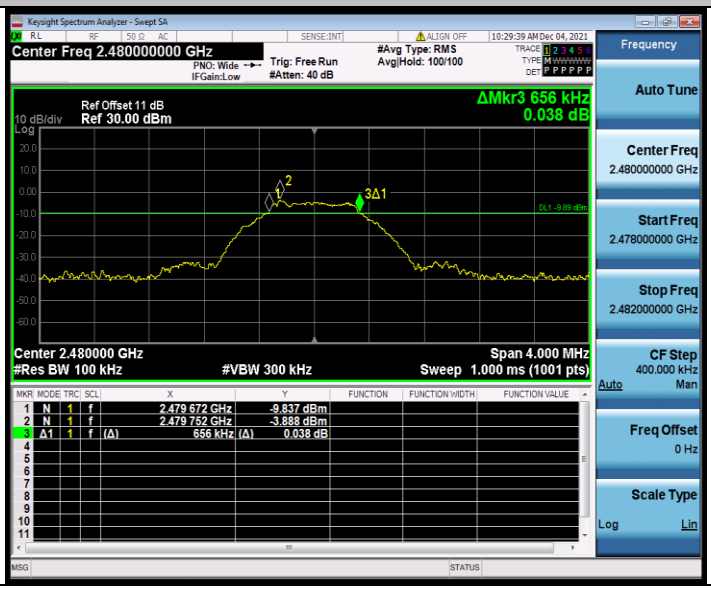
BLE_500K_Ant1_2402



BLE_500K_Ant1_2440



BLE_500K_Ant1_2480

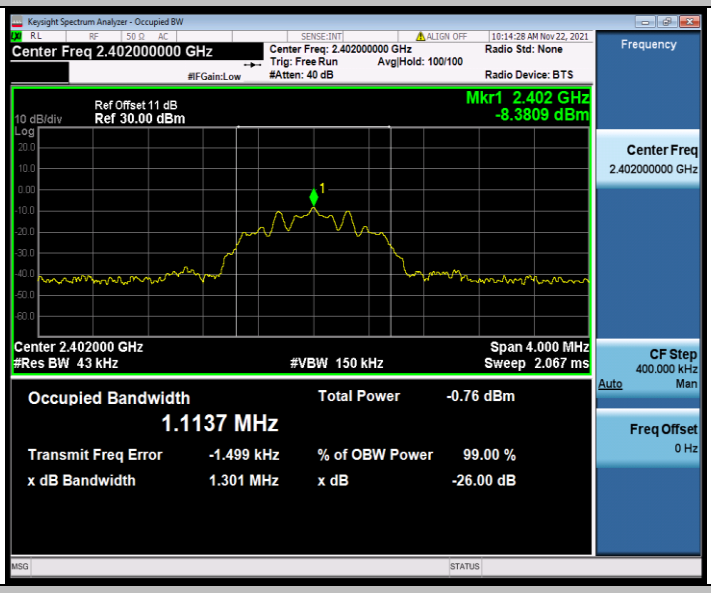
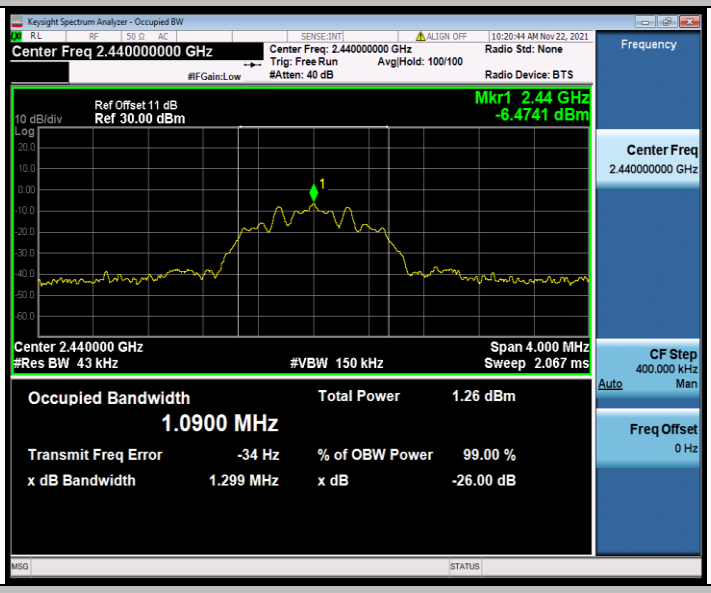


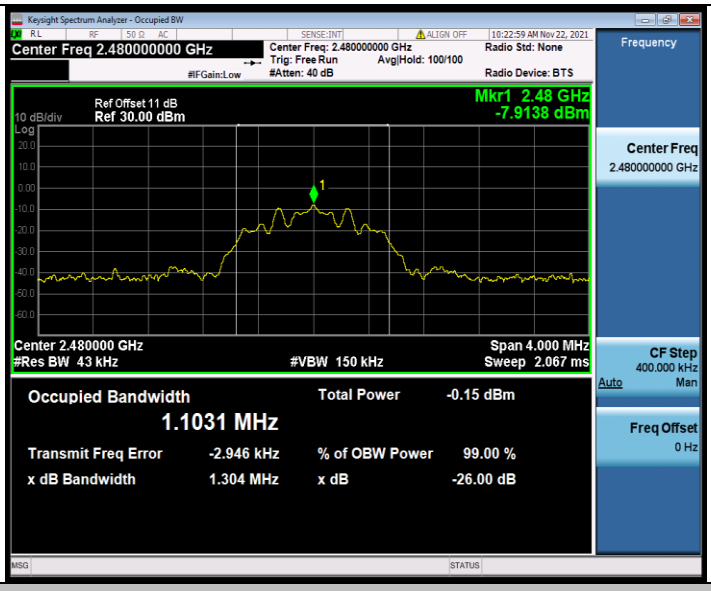
OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_125K	Ant1	2402	1.1137	2401.442	2402.555	---	PASS
		2440	1.0900	2439.455	2440.545	---	PASS
		2480	1.1031	2479.446	2480.549	---	PASS
BLE_1M	Ant1	2402	1.0678	2401.469	2402.537	---	PASS
		2440	1.0643	2439.472	2440.536	---	PASS
		2480	1.0701	2479.469	2480.539	---	PASS
BLE_2M	Ant1	2402	2.1148	2400.962	2403.077	---	PASS
		2440	2.1100	2438.963	2441.073	---	PASS
		2480	2.1100	2478.952	2481.062	---	PASS
BLE_500K	Ant1	2402	1.0565	2401.471	2402.528	---	PASS
		2440	1.0529	2439.473	2440.526	---	PASS
		2480	1.0538	2479.470	2480.524	---	PASS

TEST GRAPHS

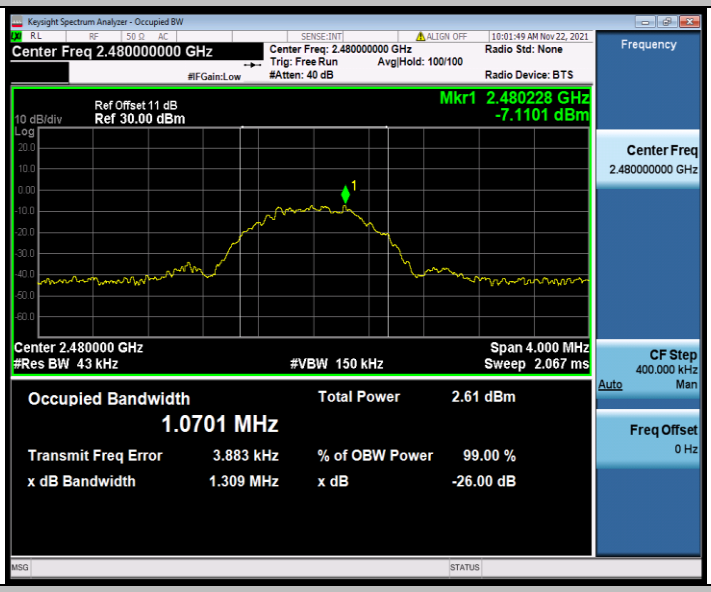
BLE_125K_Ant1_2402

BLE_125K_Ant1_2440

BLE_125K_Ant1_2480



BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480



BLE_2M_Ant1_2402

BLE_2M_Ant1_2440

BLE_2M_Ant1_2480

BLE_500K_Ant1_2402

BLE_500K_Ant1_2440

BLE_500K_Ant1_2480

MAXIMUM CONDUCTED OUTPUT POWER

PEAK POWER TEST RESULT

TestMode	Antenna	Channel	Result[dBm]	Result[mw]	Limit[dBm]	Verdict
BLE_125K	Ant1	2402	-3.84	0.41	≤30	PASS
		2441	-2.11	0.62	≤30	PASS
		2480	-2.93	0.51	≤30	PASS
BLE_1M	Ant1	2402	-3.67	0.43	≤30	PASS
		2441	-2.15	0.61	≤30	PASS
		2480	-2.88	0.52	≤30	PASS
BLE_2M	Ant1	2402	-3.72	0.42	≤30	PASS
		2441	-2.21	0.60	≤30	PASS
		2480	-2.89	0.51	≤30	PASS
BLE_500K	Ant1	2402	-3.61	0.44	≤30	PASS
		2441	-2.19	0.60	≤30	PASS
		2480	-2.99	0.50	≤30	PASS

Average Power Test Result

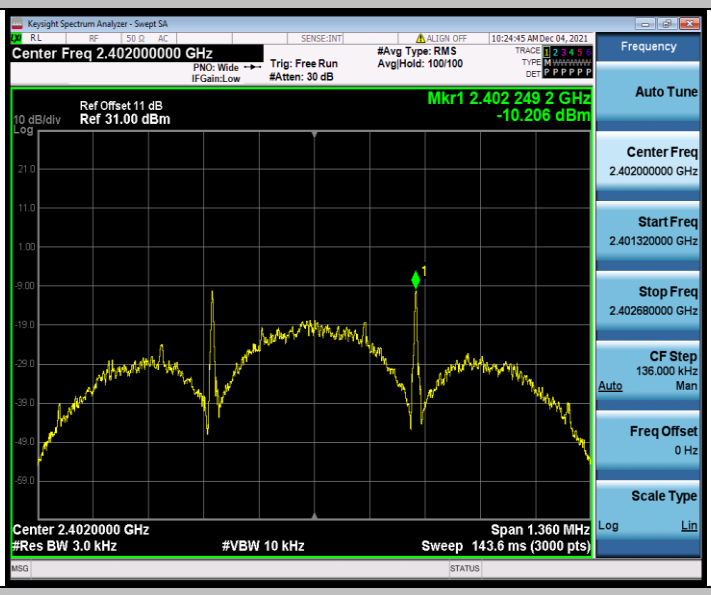
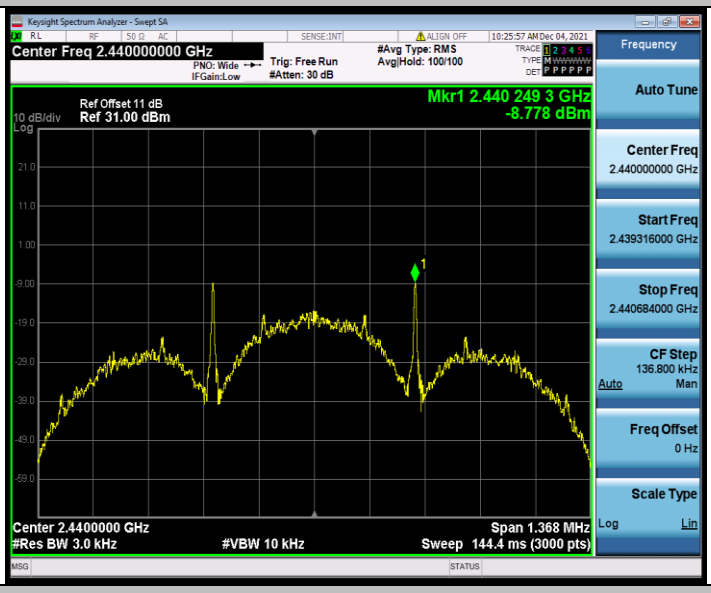
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_125K	Ant1	2402	-4.65	/	PASS
		2441	-2.88	/	PASS
		2480	-3.84	/	PASS
BLE_1M	Ant1	2402	-5.16	/	PASS
		2441	-4.09	/	PASS
		2480	-4.85	/	PASS
BLE_2M	Ant1	2402	-6.89	/	PASS
		2441	-4.86	/	PASS
		2480	-5.46	/	PASS
BLE_500K	Ant1	2402	-4.95	/	PASS
		2441	-2.94	/	PASS
		2480	-3.45	/	PASS

MAXIMUM POWER SPECTRAL DENSITY

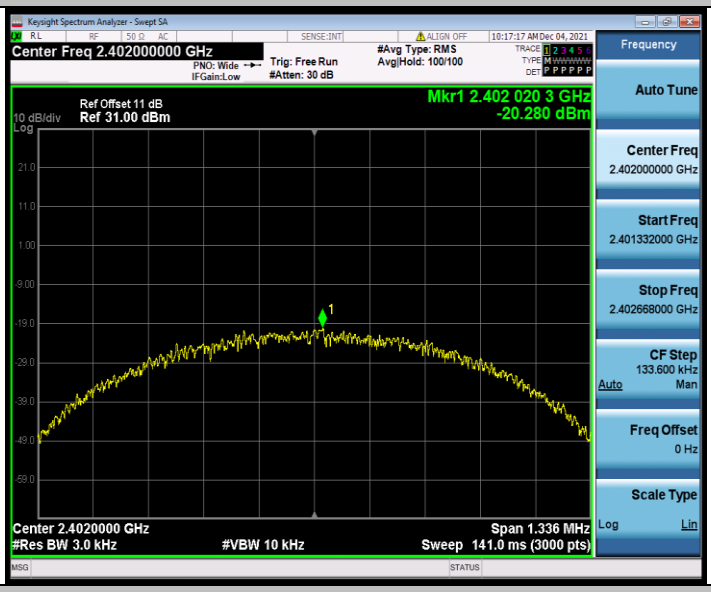
TEST RESULT

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_125K	Ant1	2402	-10.21	≤8	PASS
		2440	-8.78	≤8	PASS
		2480	-9.49	≤8	PASS
BLE_1M	Ant1	2402	-20.28	≤8	PASS
		2440	-18.71	≤8	PASS
		2480	-19.59	≤8	PASS
BLE_2M	Ant1	2402	-22.65	≤8	PASS
		2440	-21.14	≤8	PASS
		2480	-21.89	≤8	PASS
BLE_500K	Ant1	2402	-10.37	≤8	PASS
		2440	-8.8	≤8	PASS
		2480	-9.55	≤8	PASS

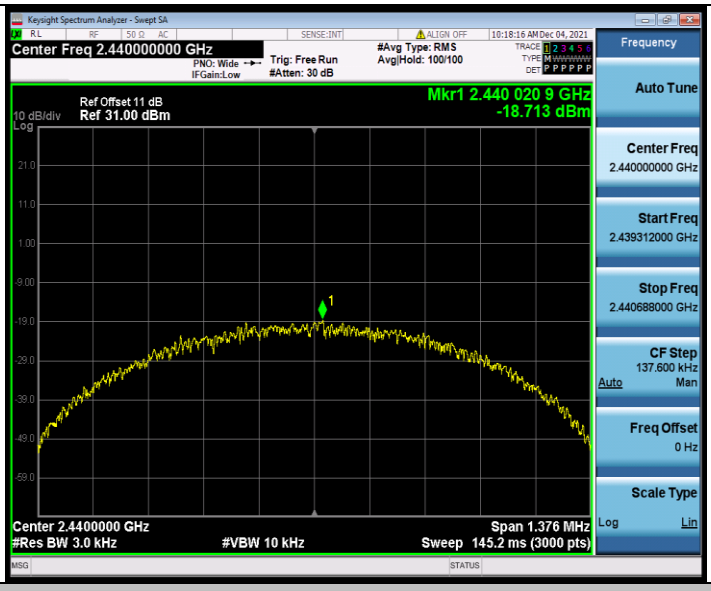
TEST GRAPHS

BLE_125K_Ant1_2402

BLE_125K_Ant1_2440

BLE_125K_Ant1_2480

BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

BLE_2M_Ant1_2402