

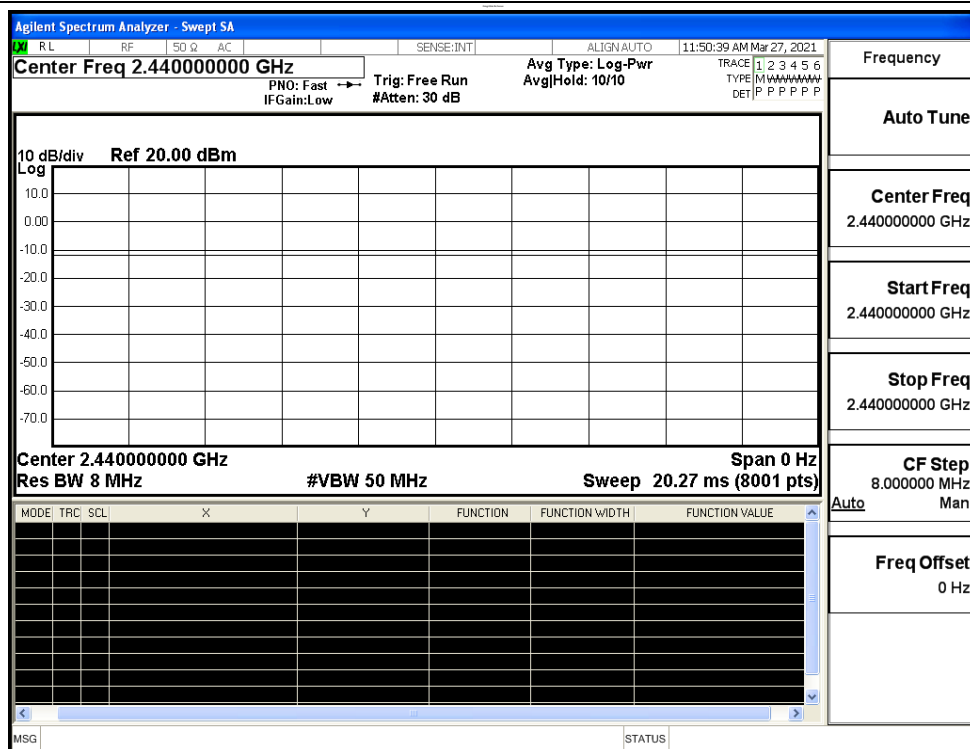
Appendix A
RF Test Data for BT LE V5.0 (Conducted Measurement)
Product Name: LED light bulb
Trade Mark: SPERLL
Test Model: SP611E

Environmental Conditions

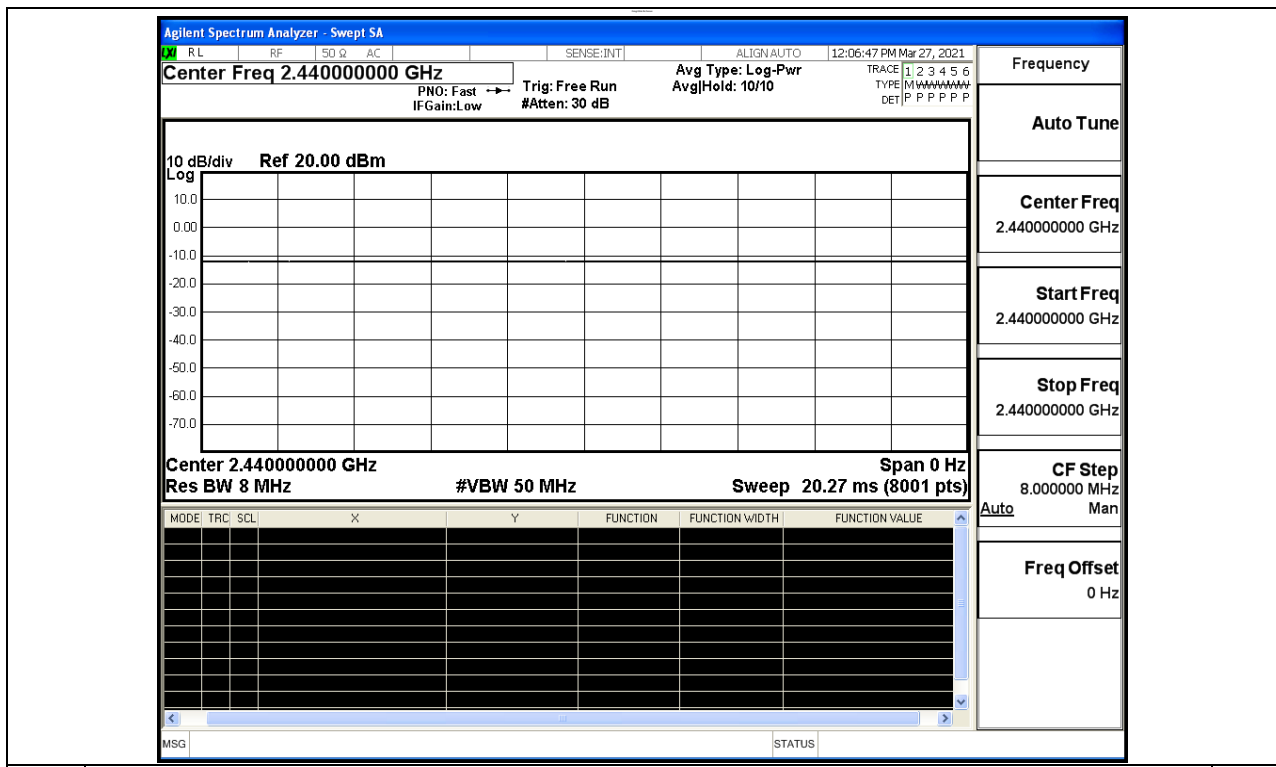
Temperature:	22.2 ° C
Relative Humidity:	53.1%
ATM Pressure:	101.0 kPa
Test Engineer:	Diamond Lu
Supervised by:	Li Huan

A.1 Duty Cycle

Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS



Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT 2LE	2440	Ant1	100	PASS

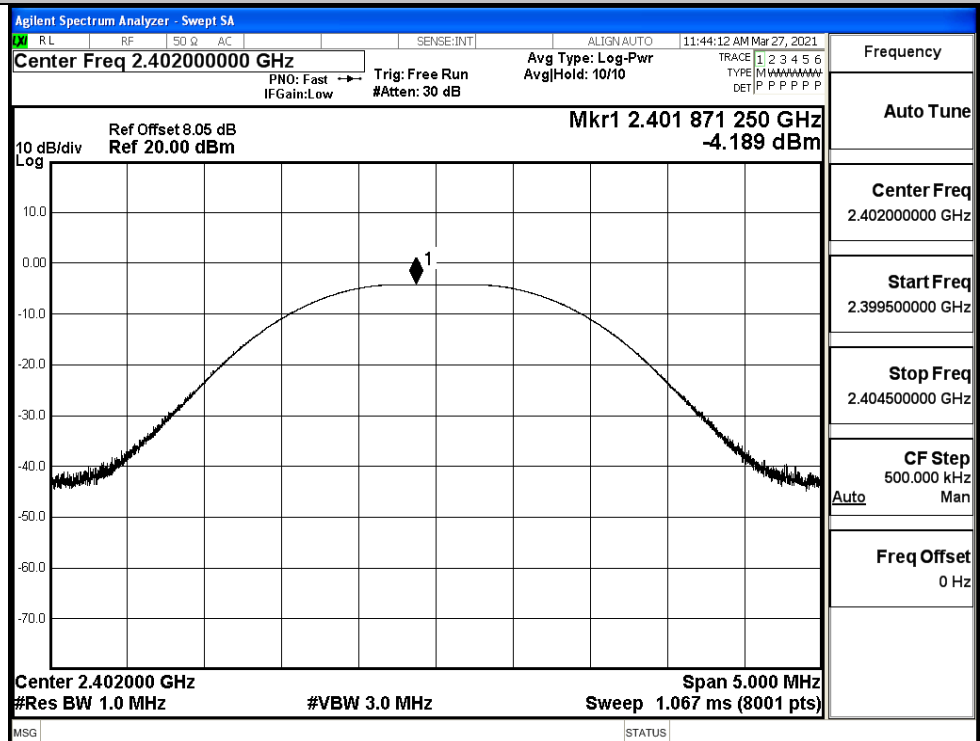


A.2 Maximum Conducted Peak Output Power

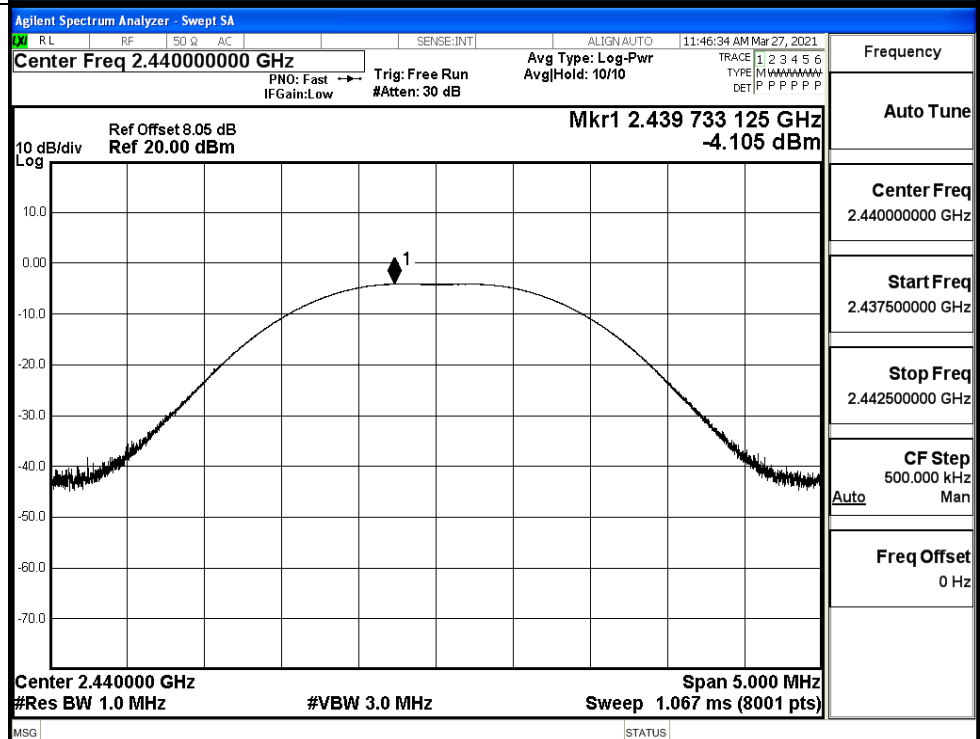
Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-4.189	30	PASS
BT LE	MCH	-4.105	30	PASS
BT LE	HCH	-4.577	30	PASS

Test Graphs

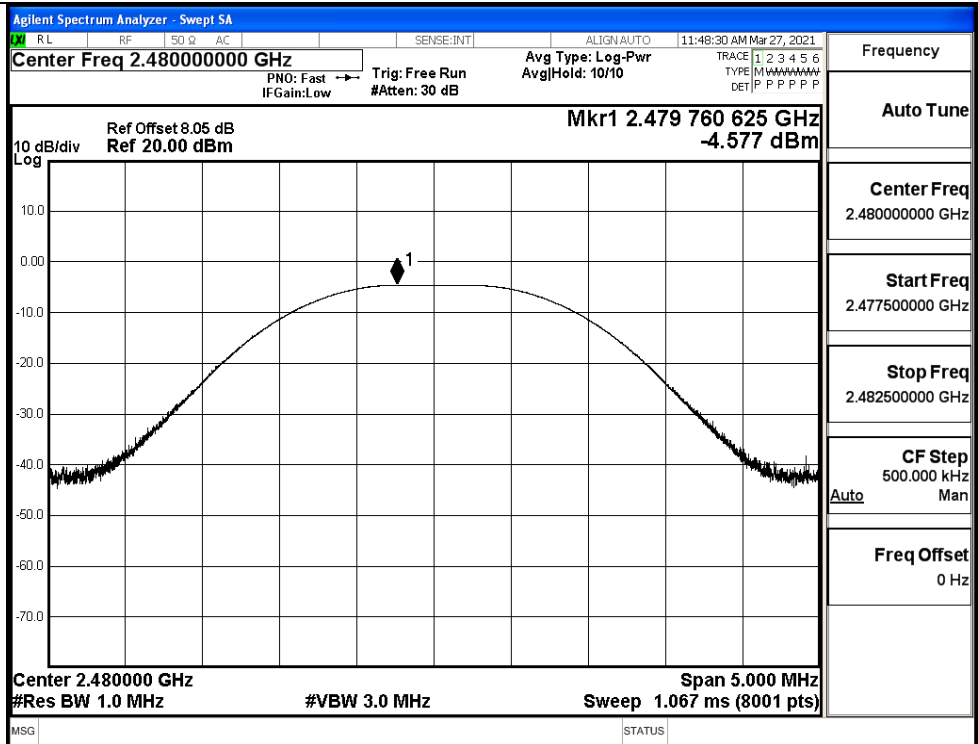
LCH



MCH



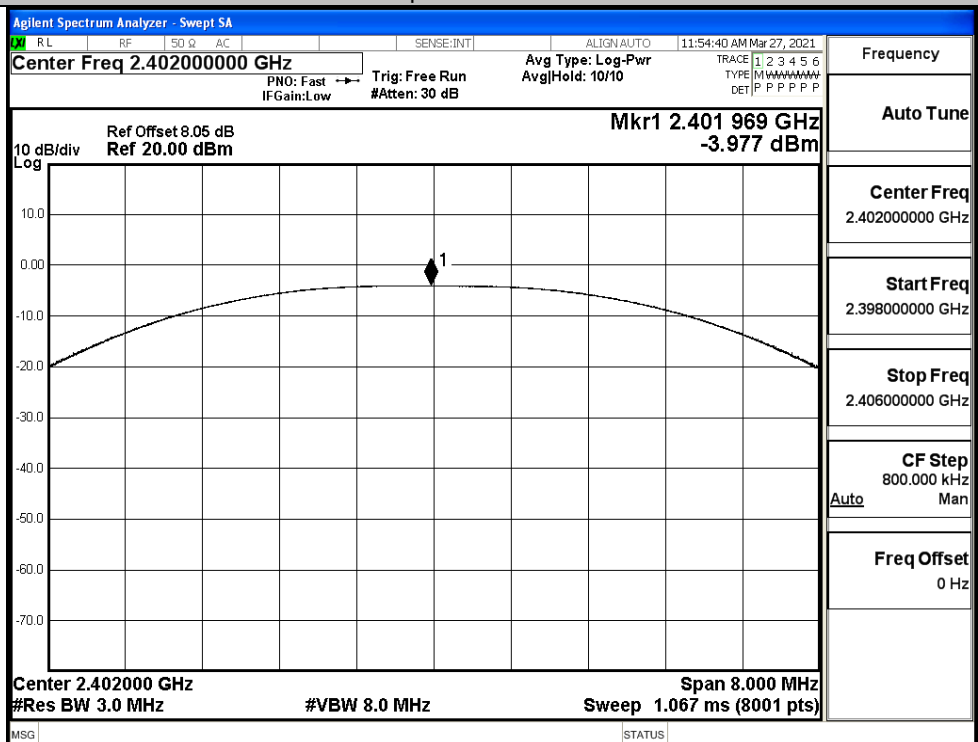
HCH



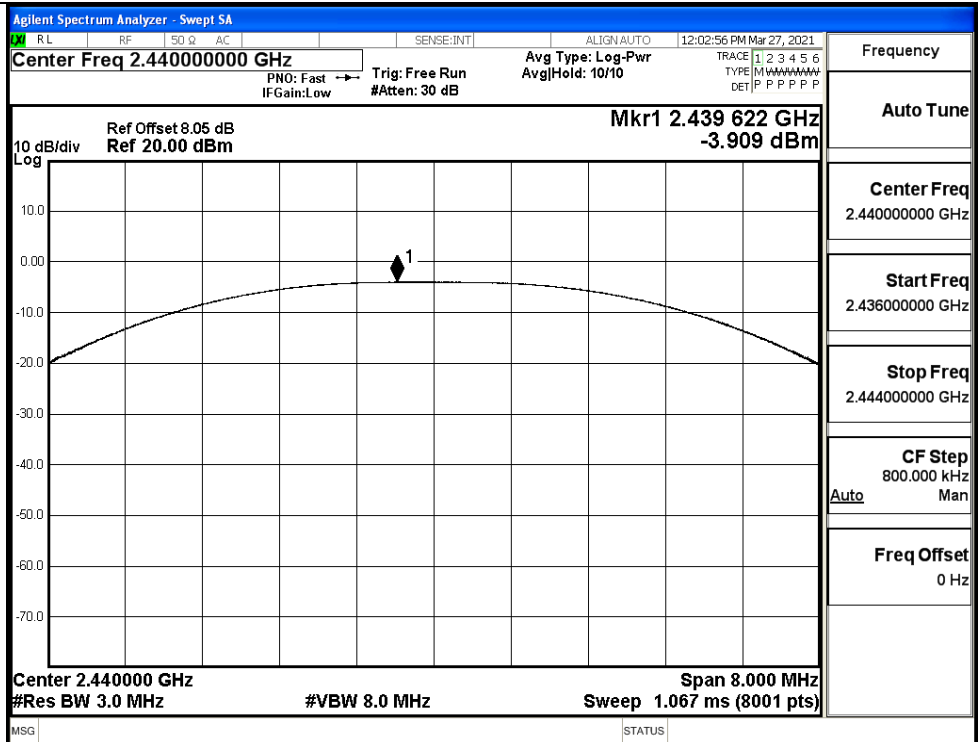
Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT 2LE	LCH	-3.977	30	PASS
BT 2LE	MCH	-3.909	30	PASS
BT 2LE	HCH	-4.434	30	PASS

Test Graphs

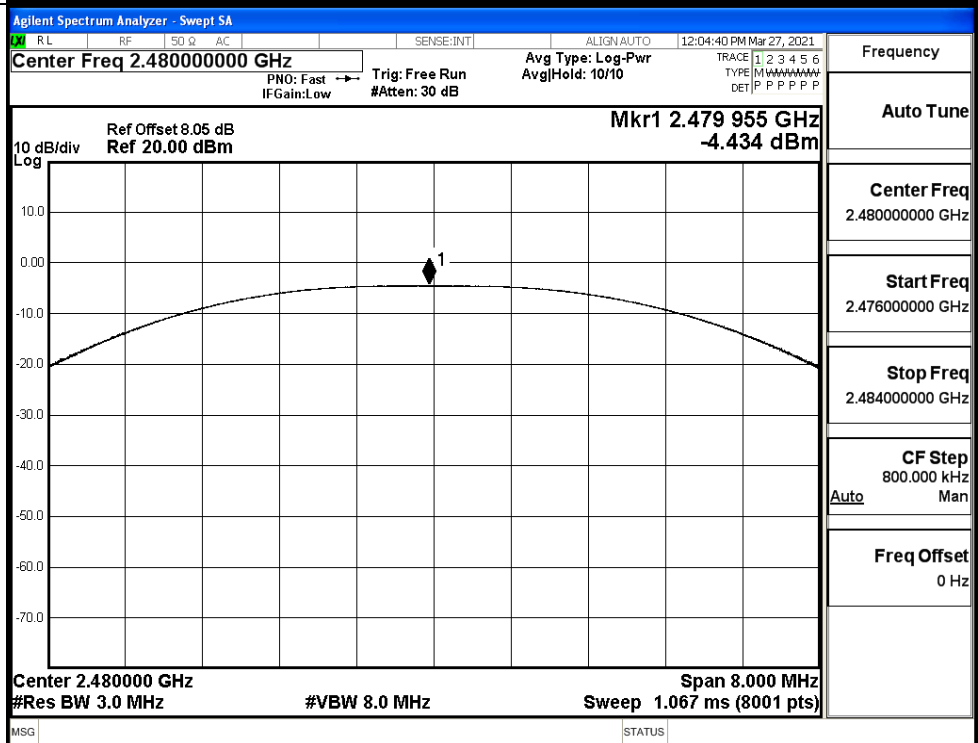
LCH



MCH



HCH

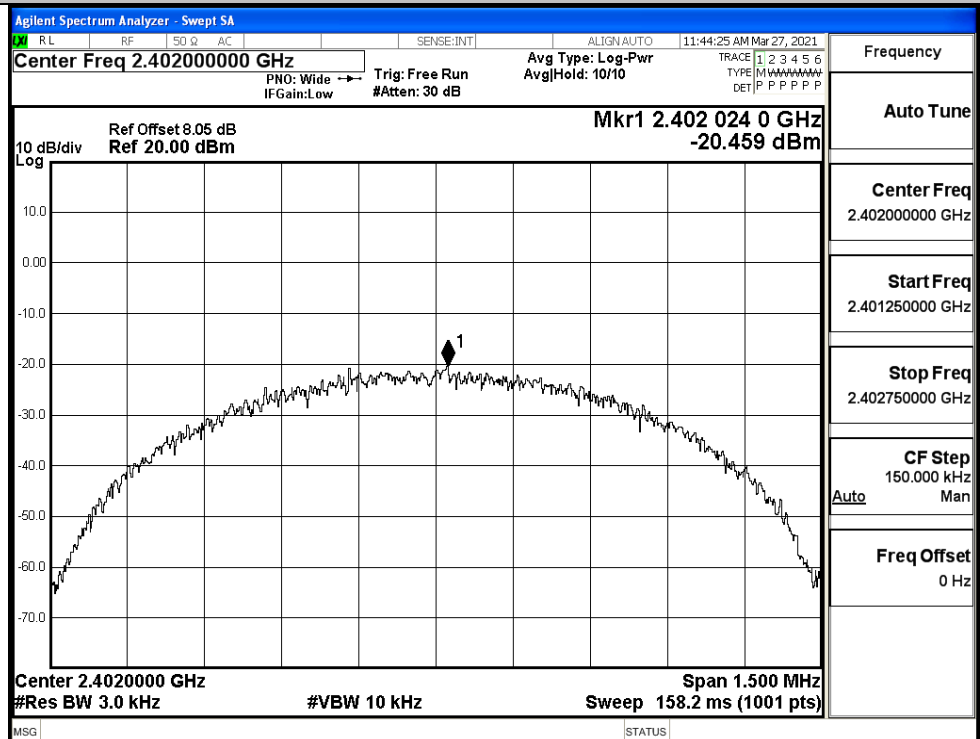


A.3 Maximum Power Spectral Density

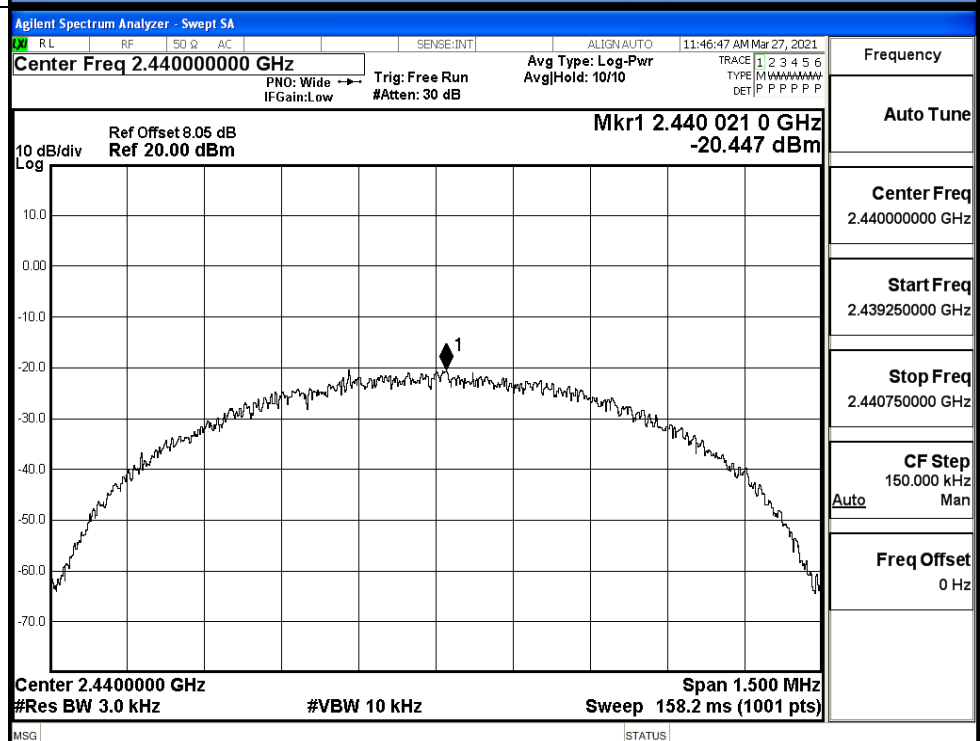
Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-20.459	8	PASS
BT LE	MCH	-20.447	8	PASS
BT LE	HCH	-21.057	8	PASS

Test Graphs

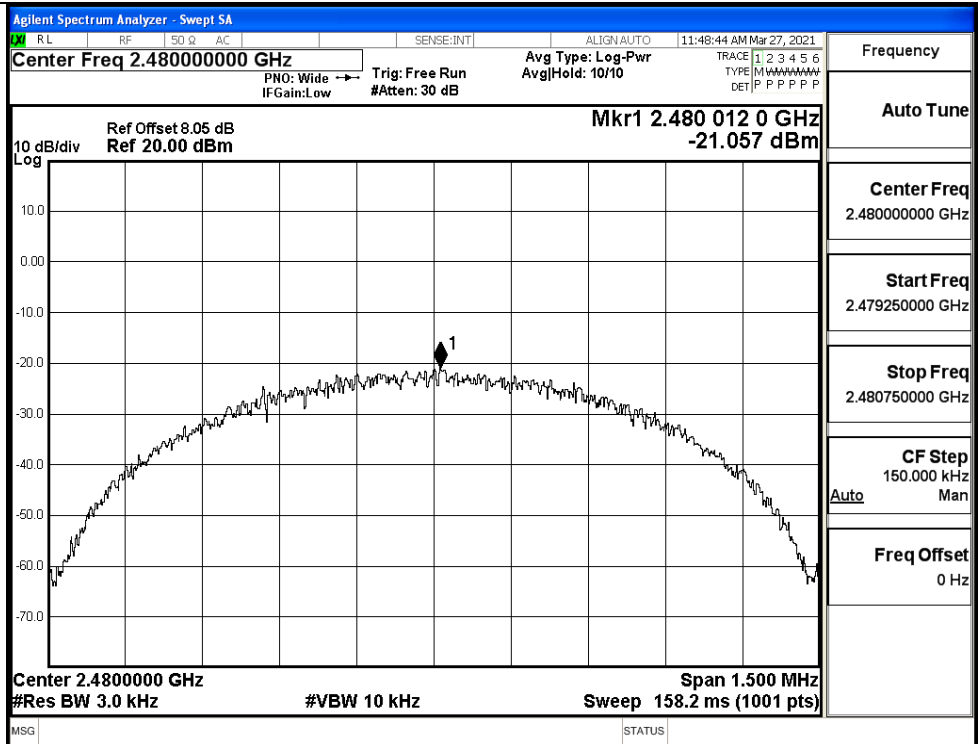
LCH



MCH



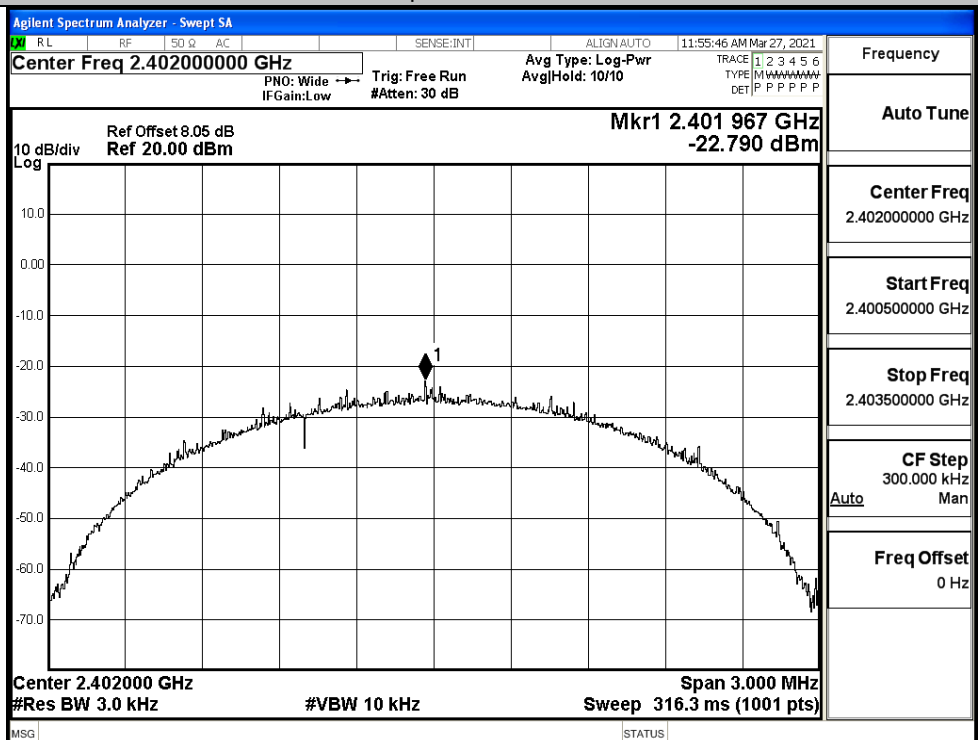
HCH



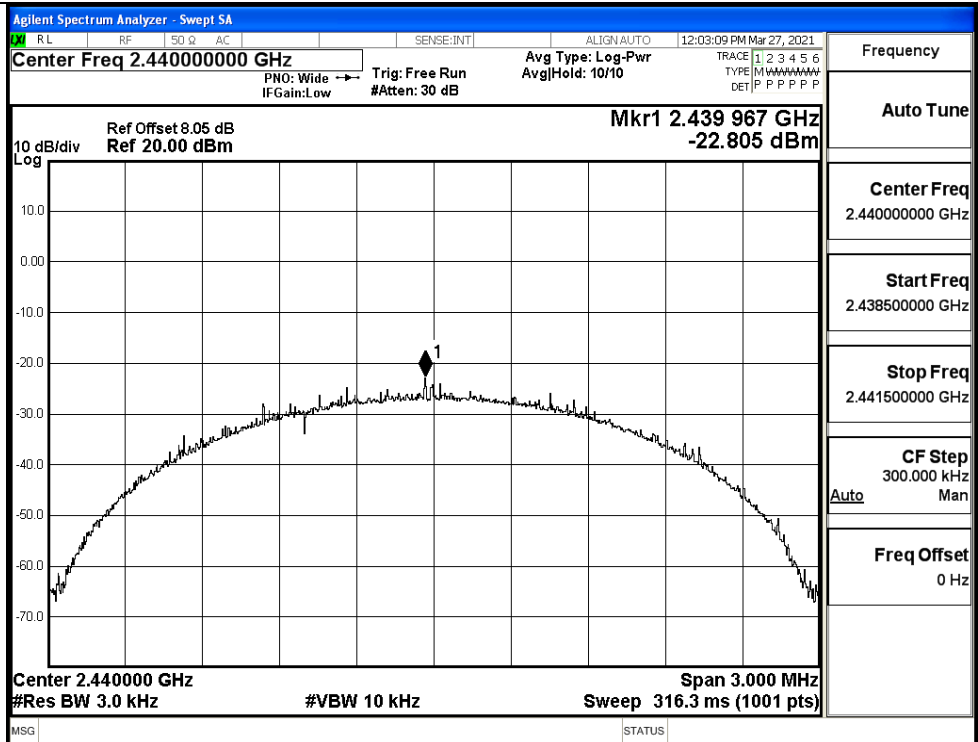
Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT 2LE	LCH	-22.790	8	PASS
BT 2LE	MCH	-22.805	8	PASS
BT 2LE	HCH	-24.222	8	PASS

Test Graphs

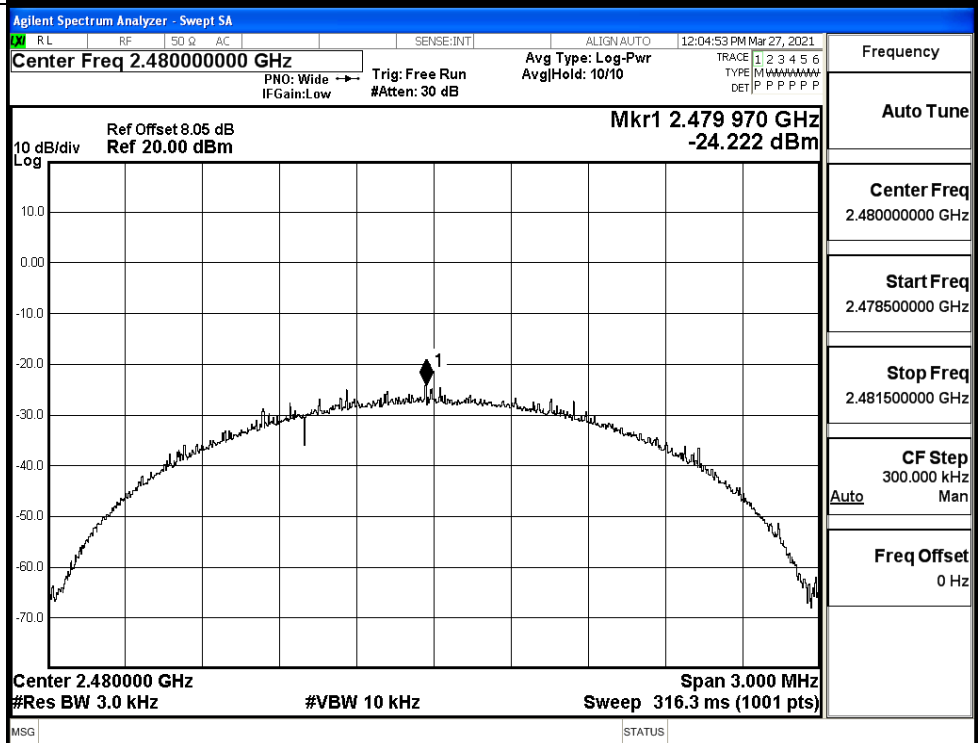
LCH



MCH



HCH

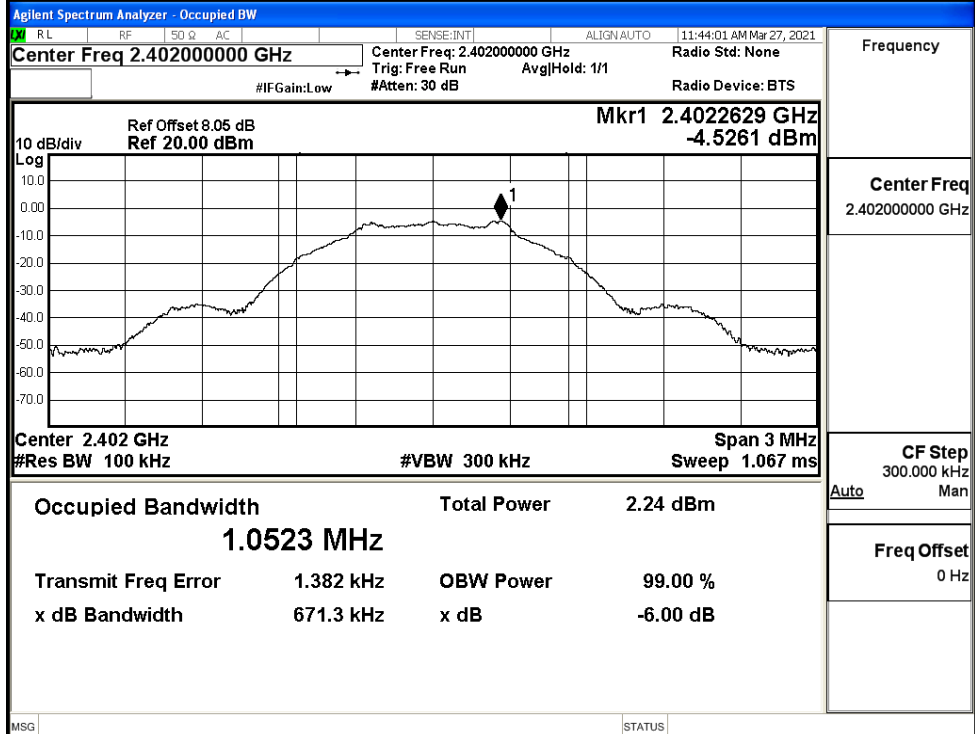


A.4 6dB Bandwidth

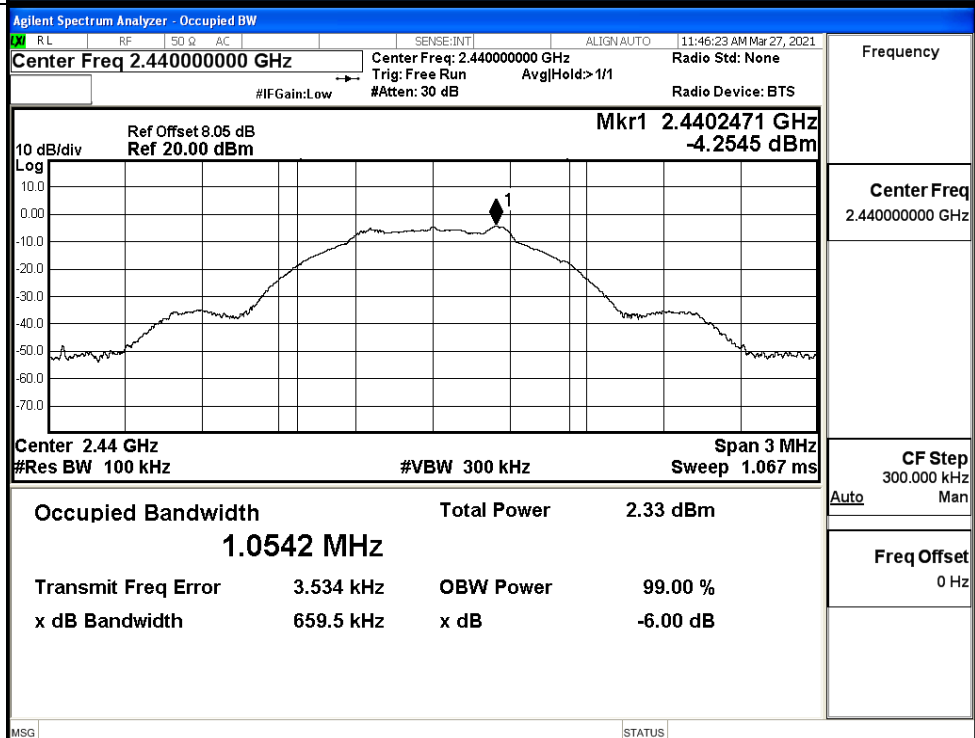
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6713	≥ 0.5	PASS
BT LE	MCH	0.6595	≥ 0.5	PASS
BT LE	HCH	0.7030	≥ 0.5	PASS

Test Graphs

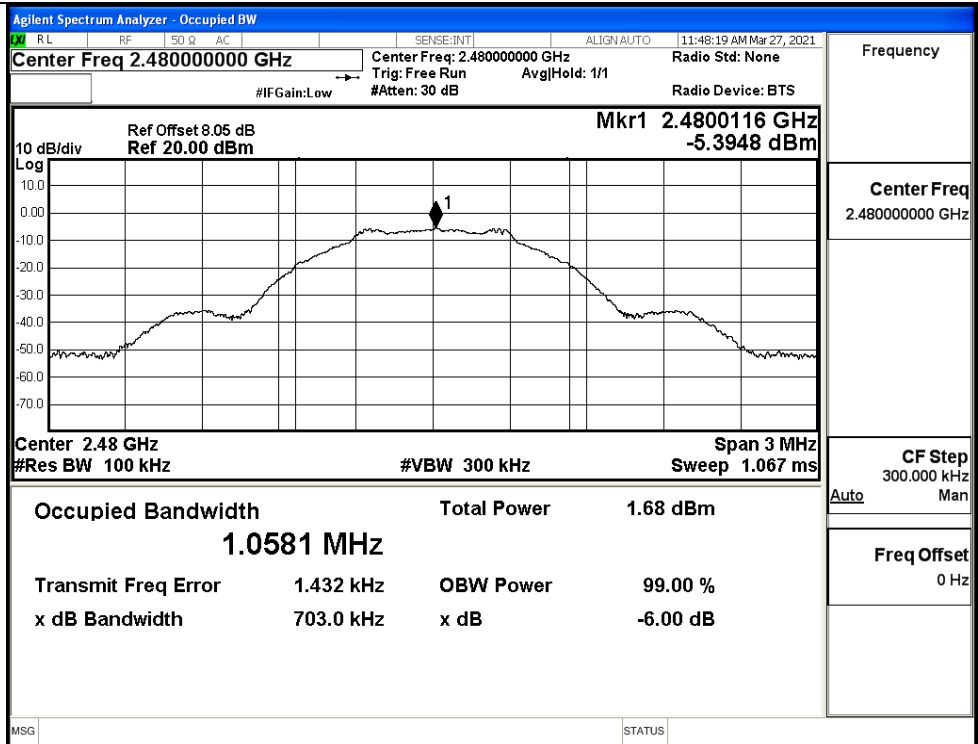
LCH



MCH



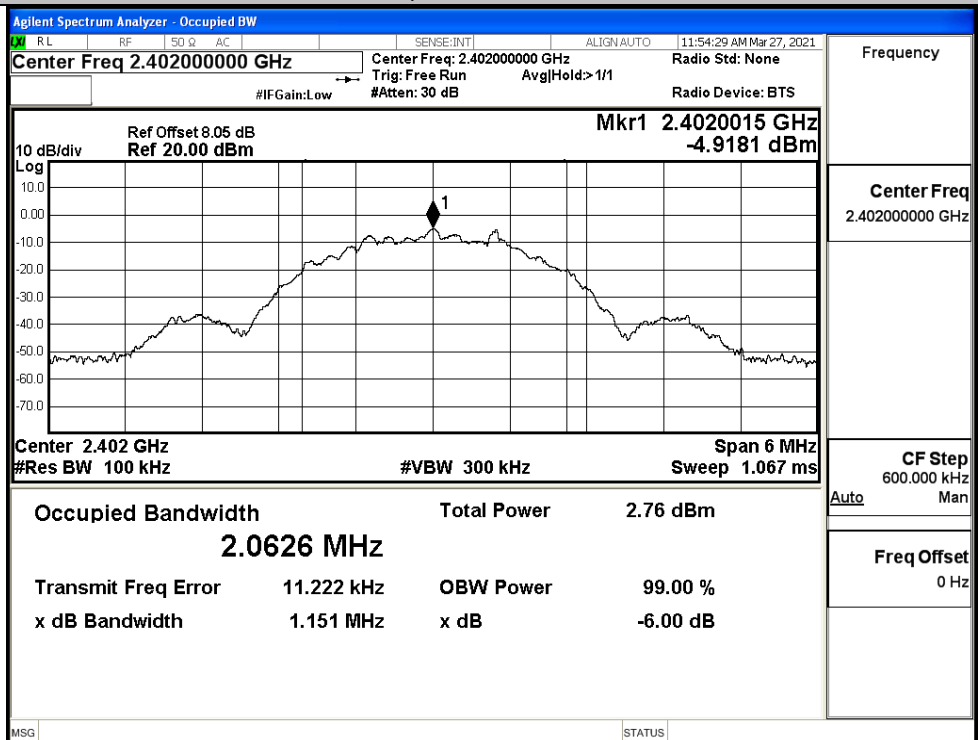
HCH



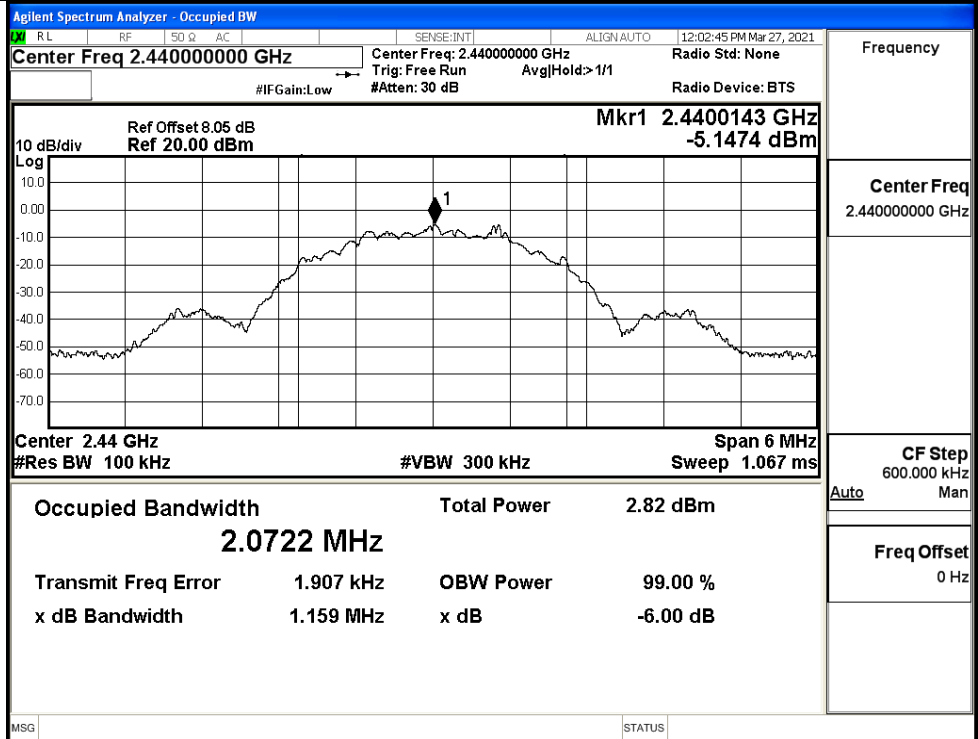
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT 2LE	LCH	1.151	≥ 0.5	PASS
BT 2LE	MCH	1.159	≥ 0.5	PASS
BT 2LE	HCH	1.157	≥ 0.5	PASS

Test Graphs

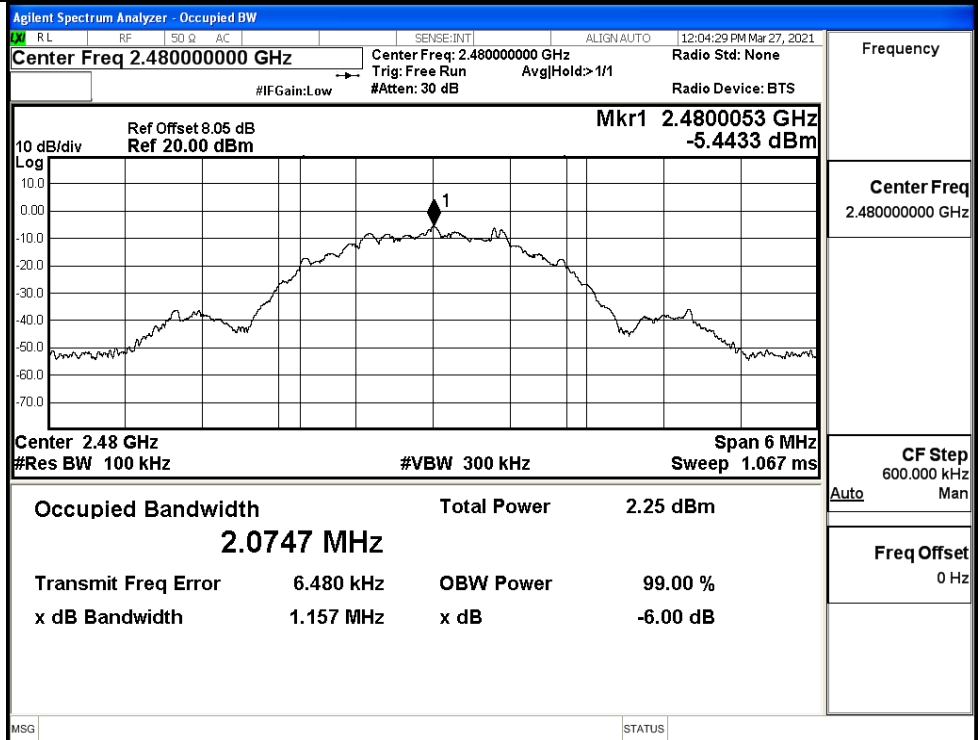
LCH



MCH



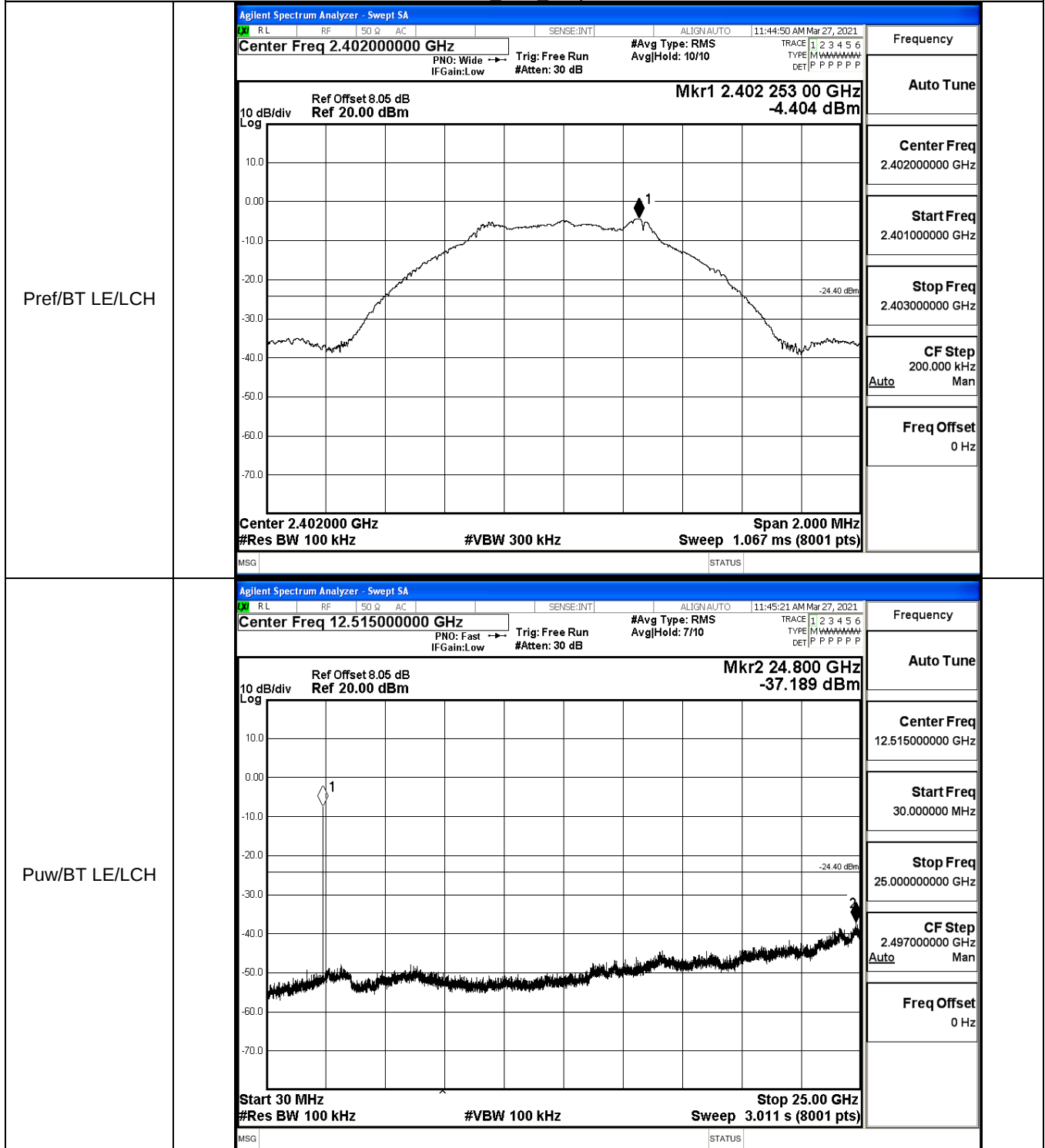
HCH



A.5 RF Conducted Spurious Emissions

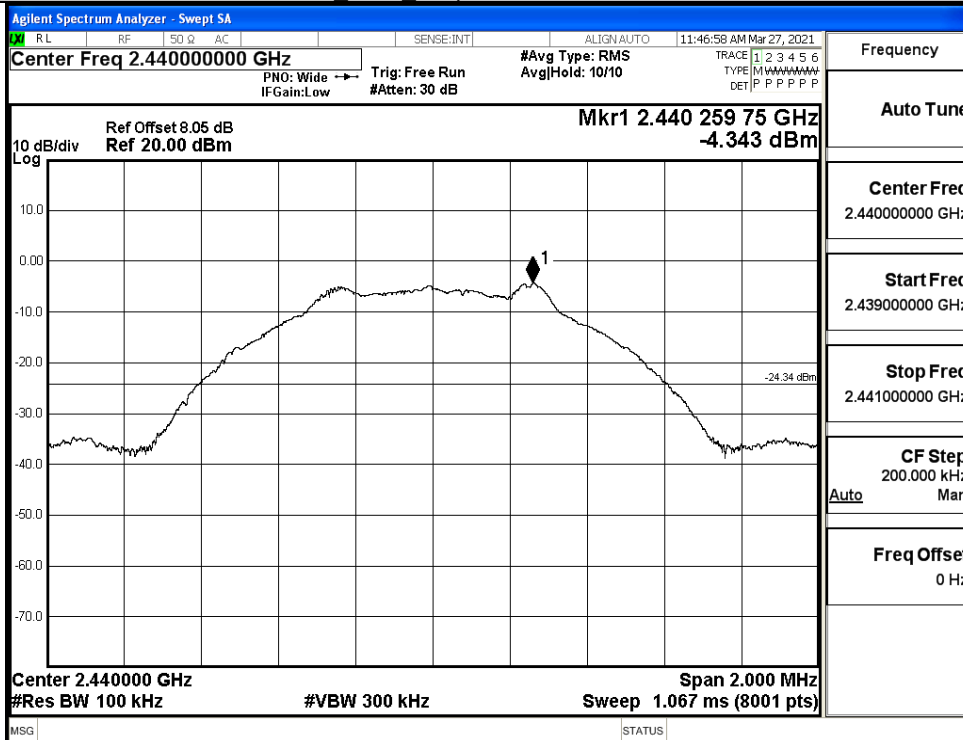
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-4.404	-37.189	-24.404	PASS
BT LE	MCH	-4.343	-37.323	-24.343	PASS
BT LE	HCH	-5.186	-36.789	-25.186	PASS

BT LE LCH Graphs



BT LE MCH Graphs

Pref/BT LE/MCH

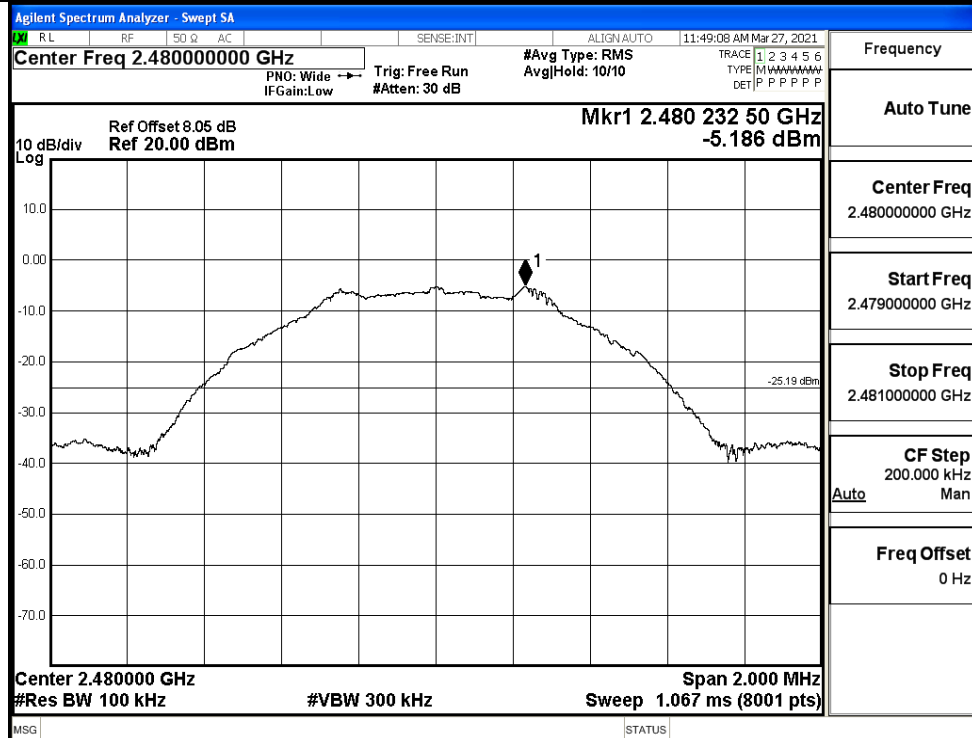


Puw/BT LE/MCH

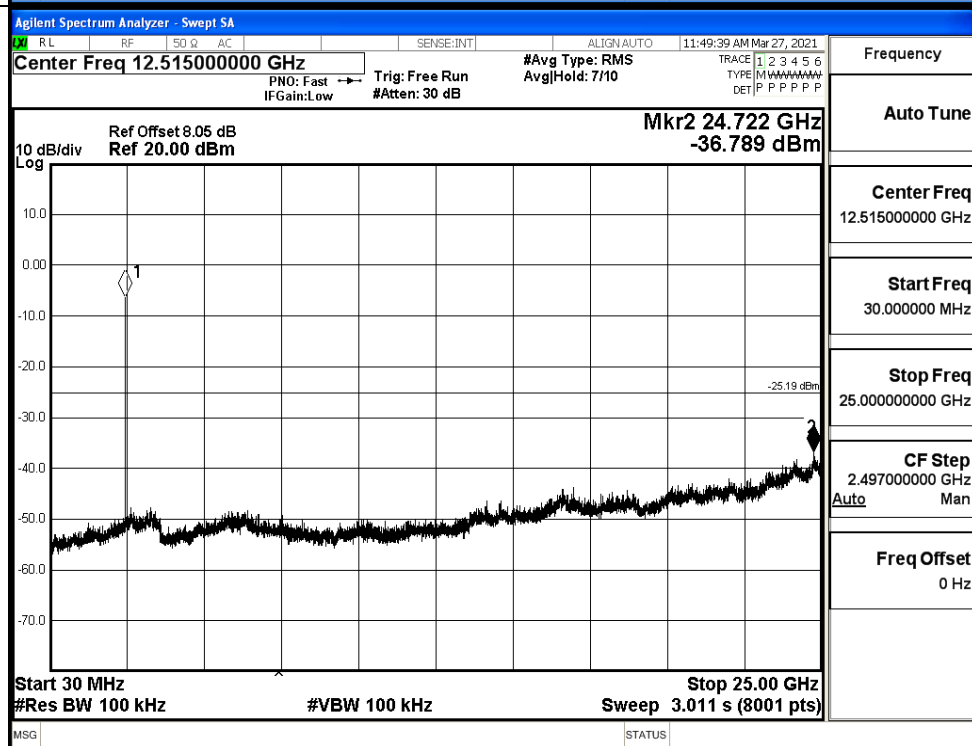


BT LE HCH Graphs

Pref/BT LE/HCH

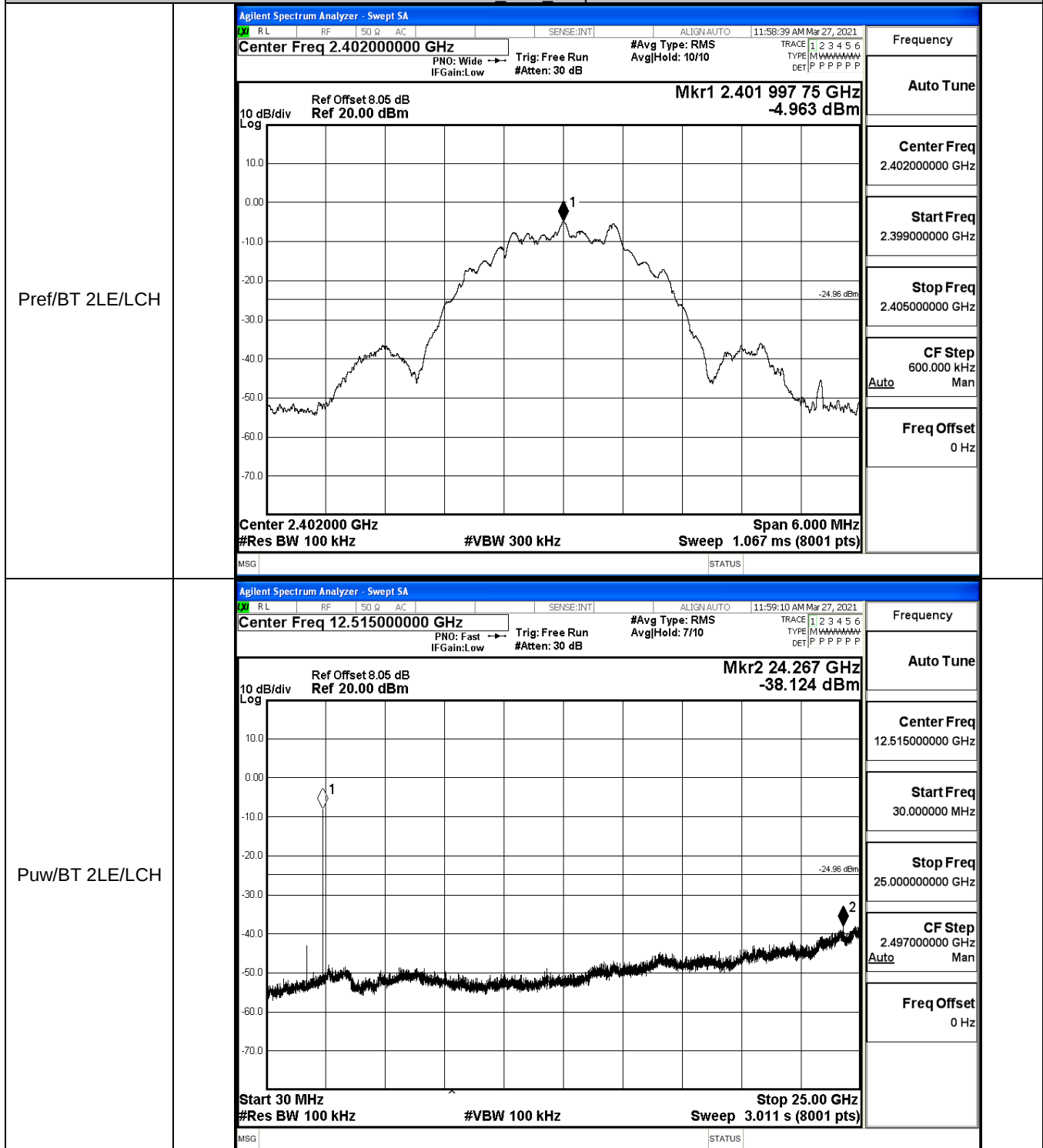


Puw/BT LE/HCH

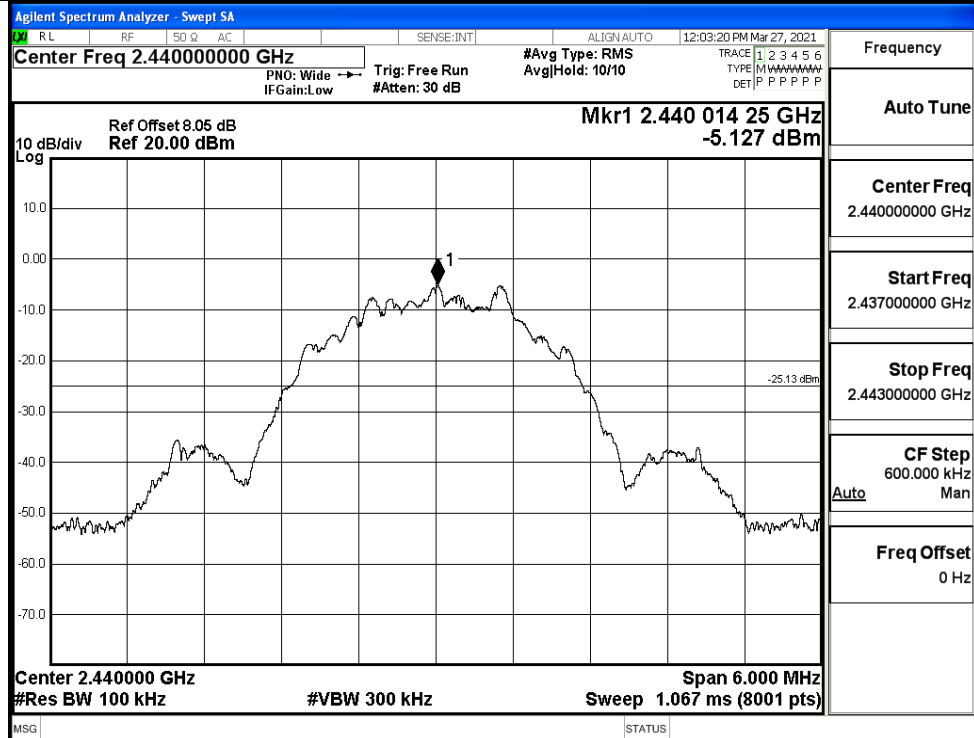
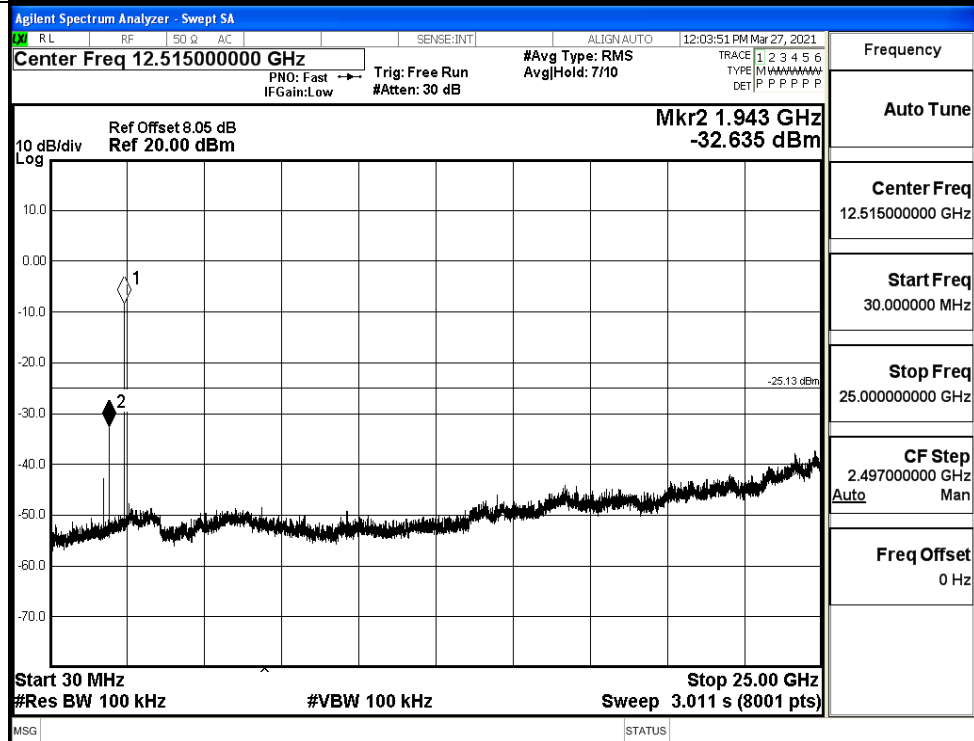


Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT 2LE	LCH	-4.963	-38.124	-24.963	PASS
BT 2LE	MCH	-5.127	-32.635	-25.127	PASS
BT 2LE	HCH	-5.43	-38.158	-25.430	PASS

BT 2LE LCH Graphs

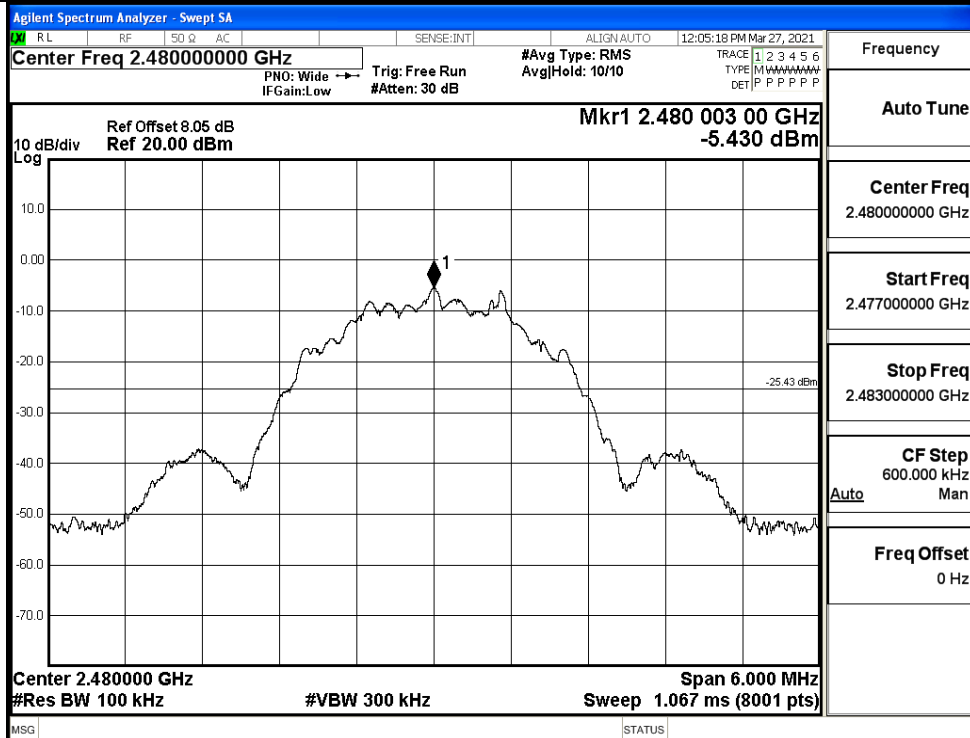
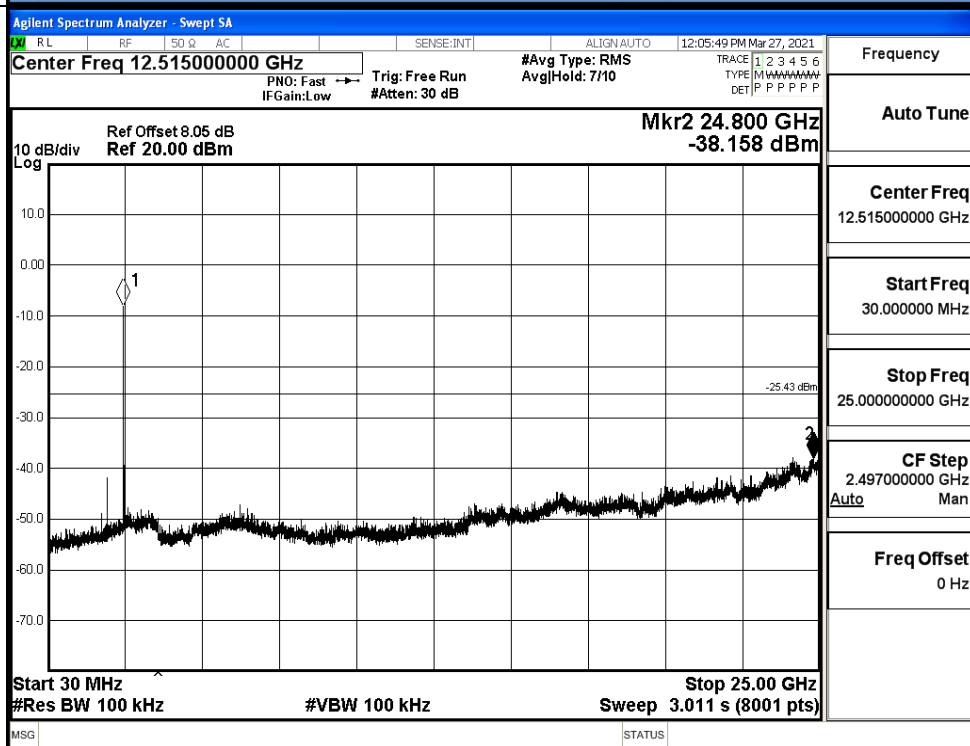


BT 2LE_MCH_Graphs

Pref/BT
2LE/MCHPuw/BT
2LE/MCH

BT 2LE HCH Graphs

Pref/BT 2LE/HCH

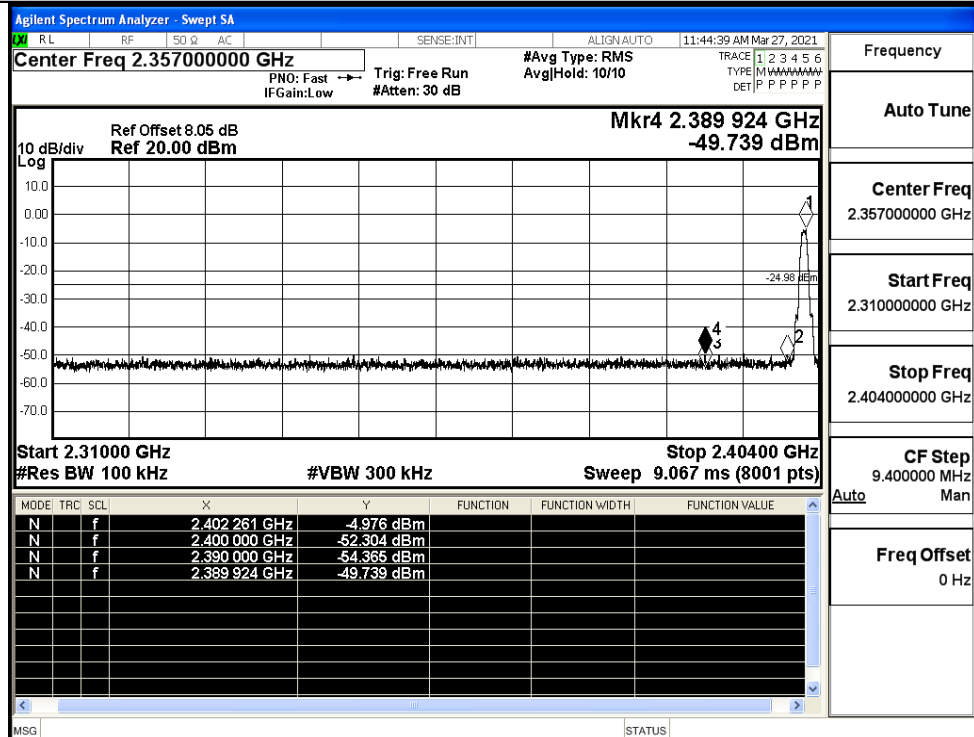
Puw/BT
2LE/HCH

A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-4.976	-49.739	-24.98	PASS
BT LE	HCH	-4.742	-49.100	-24.74	PASS

Test Graphs

LCH



Frequency

Auto Tune

Center Freq

2.357000000 GHz

Start Freq

2.310000000 GHz

Stop Freq

2.404000000 GHz

CF Step

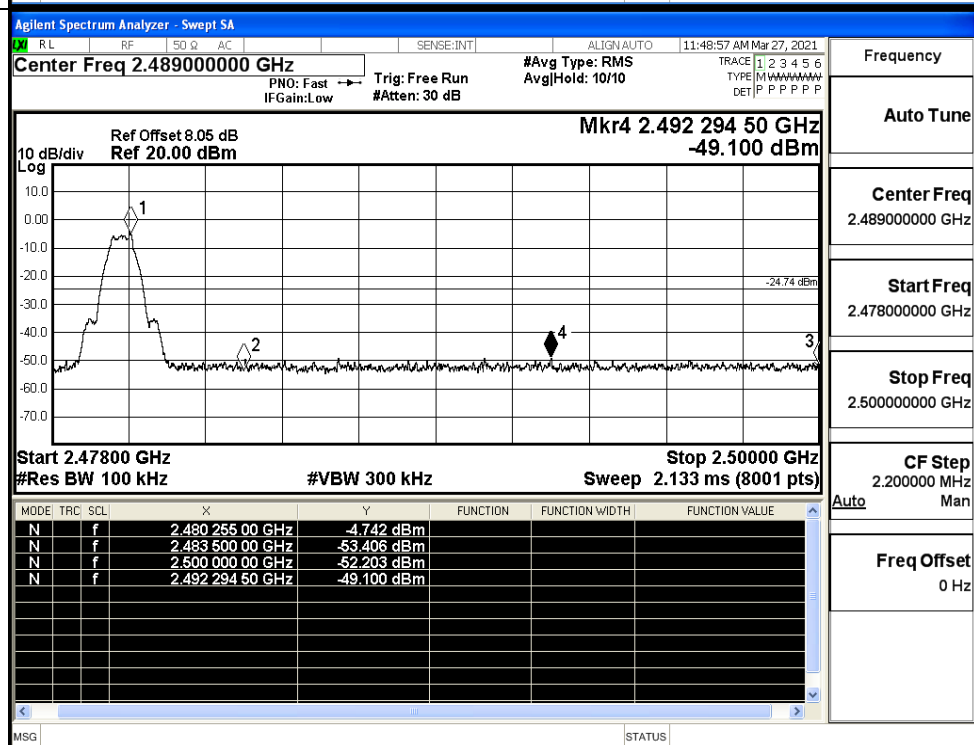
9.400000 MHz

Auto Man

Freq Offset

0 Hz

HCH



Frequency

Auto Tune

Center Freq

2.489000000 GHz

Start Freq

2.478000000 GHz

Stop Freq

2.500000000 GHz

CF Step

2.200000 MHz

Auto Man

Freq Offset

0 Hz

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT 2LE	LCH	-4.990	-49.478	-24.99	PASS
BT 2LE	HCH	-5.318	-49.563	-25.32	PASS

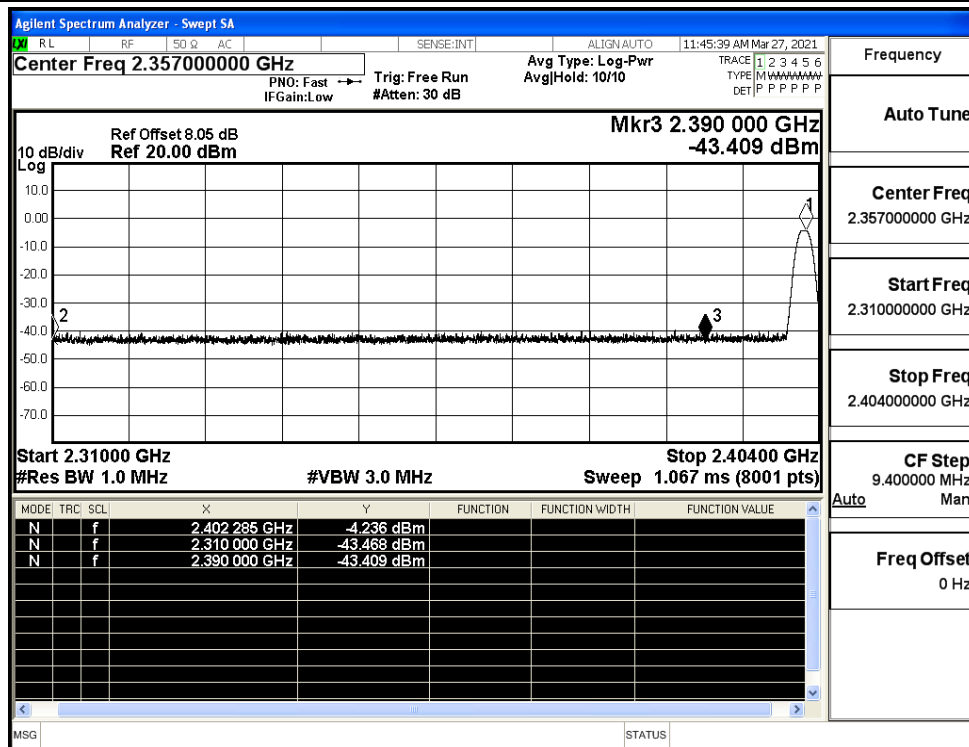
Test Graphs

LCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 11:56:00 AM Mar 27, 2021 Center Freq 2.357000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS AvglHold: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P Frequency Auto Tune Center Freq 2.357000000 GHz Start Freq 2.310000000 GHz Stop Freq 2.404000000 GHz CF Step 9.400000 MHz Auto Man Freq Offset 0 Hz 10 dB/div Log Ref Offset 8.05 dB Ref 20.00 dBm Mkr4 2.381 217 GHz -49.478 dBm Start 2.31000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.40400 GHz Sweep 9.067 ms (8001 pts) <table><thead><tr><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>N</td><td>f</td><td></td><td>2.402 014 GHz</td><td>-4.990 dBm</td><td></td><td></td><td></td></tr><tr><td>N</td><td>f</td><td></td><td>2.400 000 GHz</td><td>-36.402 dBm</td><td></td><td></td><td></td></tr><tr><td>N</td><td>f</td><td></td><td>2.390 000 GHz</td><td>-53.057 dBm</td><td></td><td></td><td></td></tr><tr><td>N</td><td>f</td><td></td><td>2.381 217 GHz</td><td>-49.478 dBm</td><td></td><td></td><td></td></tr></tbody></table> MSG STATUS <tr><td rowspan="5">HCH</td><td> Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 12:05:07 PM Mar 27, 2021 Center Freq 2.489000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS AvglHold: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P Frequency Auto Tune Center Freq 2.489000000 GHz Start Freq 2.478000000 GHz Stop Freq 2.500000000 GHz CF Step 2.200000 MHz Auto Man Freq Offset 0 Hz 10 dB/div Log Ref Offset 8.05 dB Ref 20.00 dBm Mkr4 2.488 010 00 GHz -49.563 dBm Start 2.47800 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.50000 GHz Sweep 2.133 ms (8001 pts) <table><thead><tr><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>N</td><td>f</td><td></td><td>2.480 002 00 GHz</td><td>-5.318 dBm</td><td></td><td></td><td></td></tr><tr><td>N</td><td>f</td><td></td><td>2.483 500 00 GHz</td><td>-52.758 dBm</td><td></td><td></td><td></td></tr><tr><td>N</td><td>f</td><td></td><td>2.500 000 00 GHz</td><td>-52.435 dBm</td><td></td><td></td><td></td></tr><tr><td>N</td><td>f</td><td></td><td>2.488 010 00 GHz</td><td>-49.563 dBm</td><td></td><td></td><td></td></tr></tbody></table> MSG STATUS </td></tr>	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	N	f		2.402 014 GHz	-4.990 dBm				N	f		2.400 000 GHz	-36.402 dBm				N	f		2.390 000 GHz	-53.057 dBm				N	f		2.381 217 GHz	-49.478 dBm				HCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 12:05:07 PM Mar 27, 2021 Center Freq 2.489000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS AvglHold: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P Frequency Auto Tune Center Freq 2.489000000 GHz Start Freq 2.478000000 GHz Stop Freq 2.500000000 GHz CF Step 2.200000 MHz Auto Man Freq Offset 0 Hz 10 dB/div Log Ref Offset 8.05 dB Ref 20.00 dBm Mkr4 2.488 010 00 GHz -49.563 dBm Start 2.47800 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.50000 GHz Sweep 2.133 ms (8001 pts) <table><thead><tr><th>MODE</th><th>TRC</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>N</td><td>f</td><td></td><td>2.480 002 00 GHz</td><td>-5.318 dBm</td><td></td><td></td><td></td></tr><tr><td>N</td><td>f</td><td></td><td>2.483 500 00 GHz</td><td>-52.758 dBm</td><td></td><td></td><td></td></tr><tr><td>N</td><td>f</td><td></td><td>2.500 000 00 GHz</td><td>-52.435 dBm</td><td></td><td></td><td></td></tr><tr><td>N</td><td>f</td><td></td><td>2.488 010 00 GHz</td><td>-49.563 dBm</td><td></td><td></td><td></td></tr></tbody></table> MSG STATUS	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	N	f		2.480 002 00 GHz	-5.318 dBm				N	f		2.483 500 00 GHz	-52.758 dBm				N	f		2.500 000 00 GHz	-52.435 dBm				N	f		2.488 010 00 GHz	-49.563 dBm			
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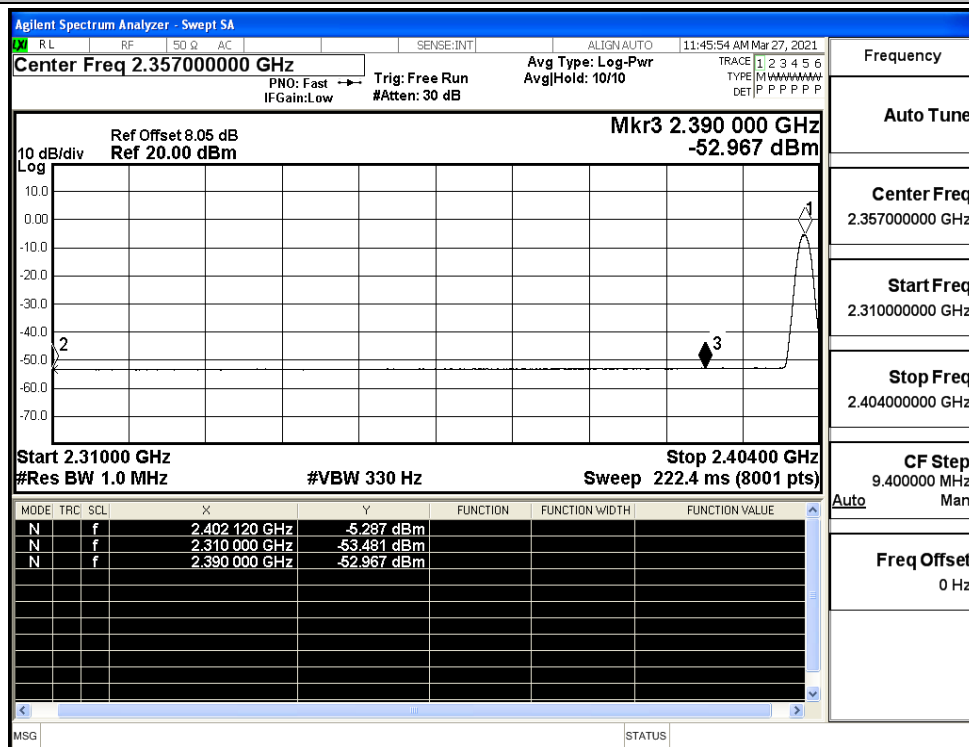
A.7 Restrict-band band-edge measurements

Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdi
BT LE	2402	Ant1	2310.0	-43.47	2.0	0	53.79	PEAK	74	PASS
		Ant1	2310.0	-53.48	2.0	0	43.78	AV	54	PASS
		Ant1	2390.0	-43.41	2.0	0	53.85	PEAK	74	PASS
		Ant1	2390.0	-52.97	2.0	0	44.29	AV	54	PASS
	2480	Ant1	2483.5	-43.01	2.0	0	54.25	PEAK	74	PASS
		Ant1	2483.5	-52.50	2.0	0	44.76	AV	54	PASS
		Ant1	2500.0	-40.75	2.0	0	56.51	PEAK	74	PASS
		Ant1	2500.0	-52.36	2.0	0	44.9	AV	54	PASS

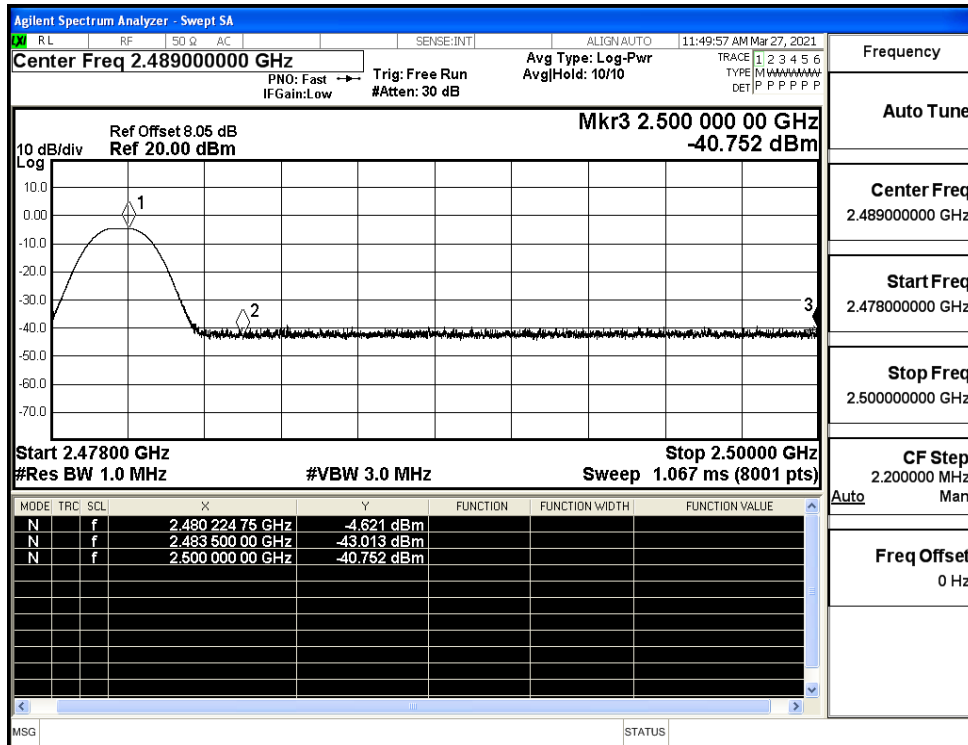
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



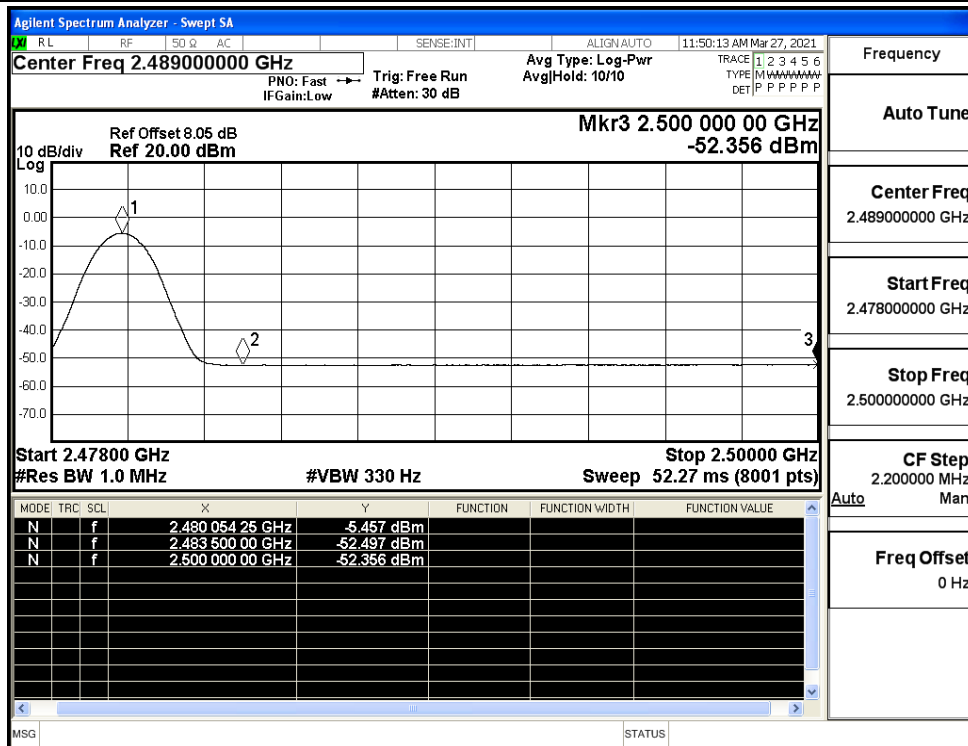
Restrict-band band-edge measurements_BT LE_2402_Ant1_AV



Restrict-band band-edge measurements_BT LE_2480_Ant1_PEAK

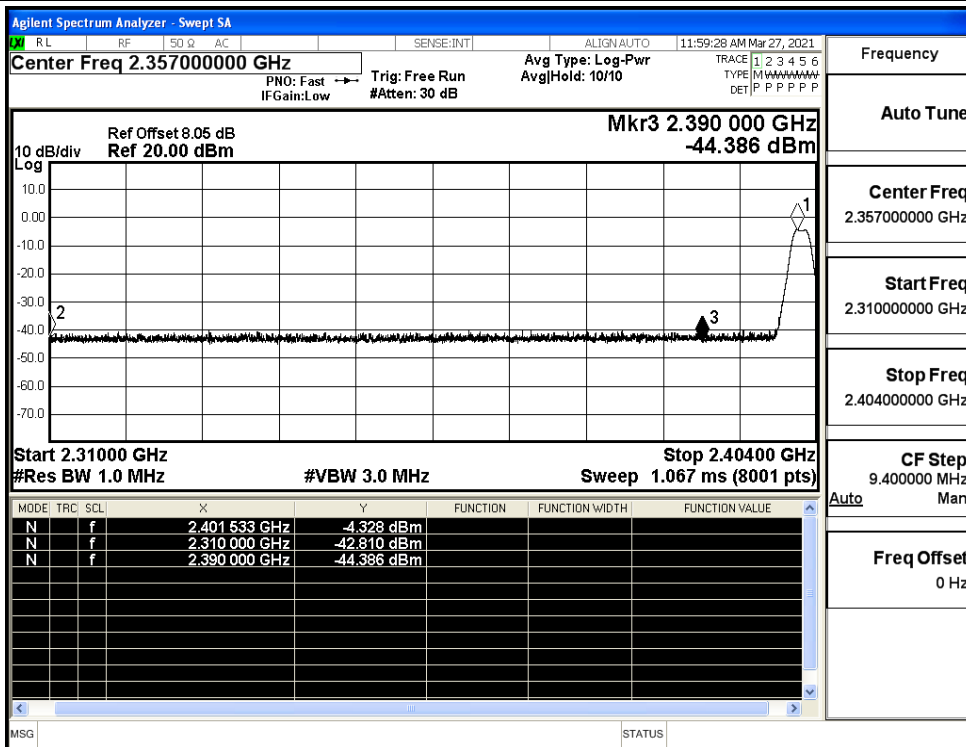


Restrict-band band-edge measurements_BT LE_2480_Ant1_AV

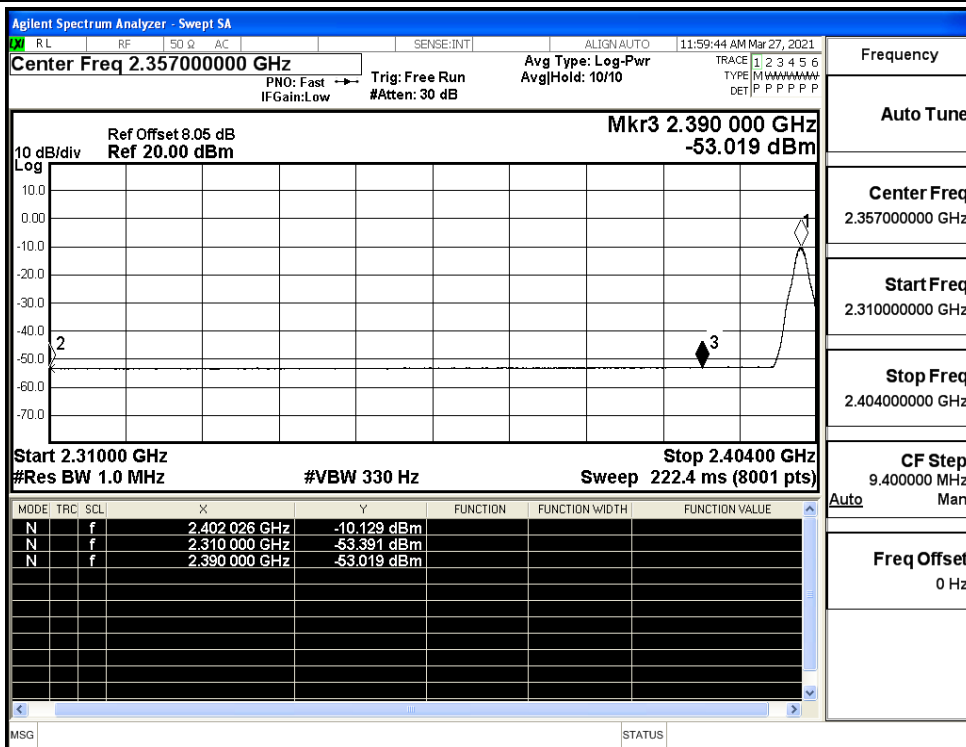


Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdi
BT 2LE	2402	Ant1	2310.0	-42.81	2.0	0	54.45	PEAK	74	PASS
		Ant1	2310.0	-53.39	2.0	0	43.87	AV	54	PASS
		Ant1	2390.0	-44.39	2.0	0	52.87	PEAK	74	PASS
		Ant1	2390.0	-53.02	2.0	0	44.24	AV	54	PASS
	2480	Ant1	2483.5	-40.20	2.0	0	57.06	PEAK	74	PASS
		Ant1	2483.5	-52.44	2.0	0	44.82	AV	54	PASS
		Ant1	2500.0	-42.46	2.0	0	54.8	PEAK	74	PASS
		Ant1	2500.0	-52.41	2.0	0	44.85	AV	54	PASS

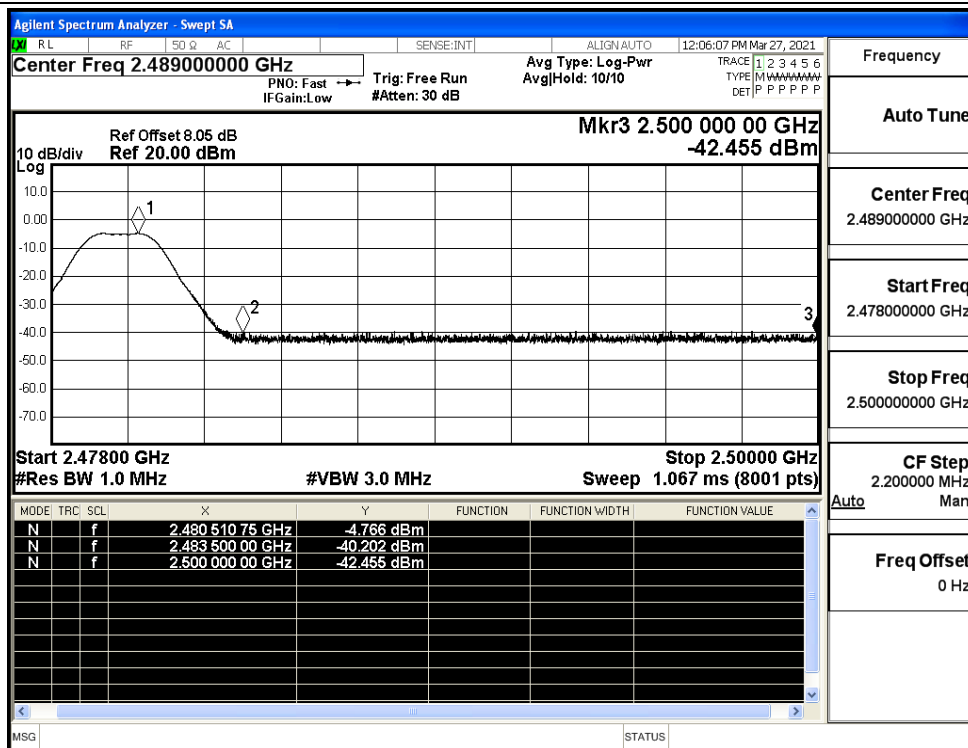
Restrict-band band-edge measurements_BT 2LE_2402_Ant1_PEAK



Restrict-band band-edge measurements_BT 2LE_2402_Ant1_AV



Restrict-band band-edge measurements_BT 2LE_2480_Ant1_PEAK



Restrict-band band-edge measurements_BT 2LE_2480_Ant1_AV

