

## Appendix A

### RF Test Data for BT V4.0 (Conducted Measurement)

Product Name: Smart Cabinet Lock

Trade Mark: HIZIMA 

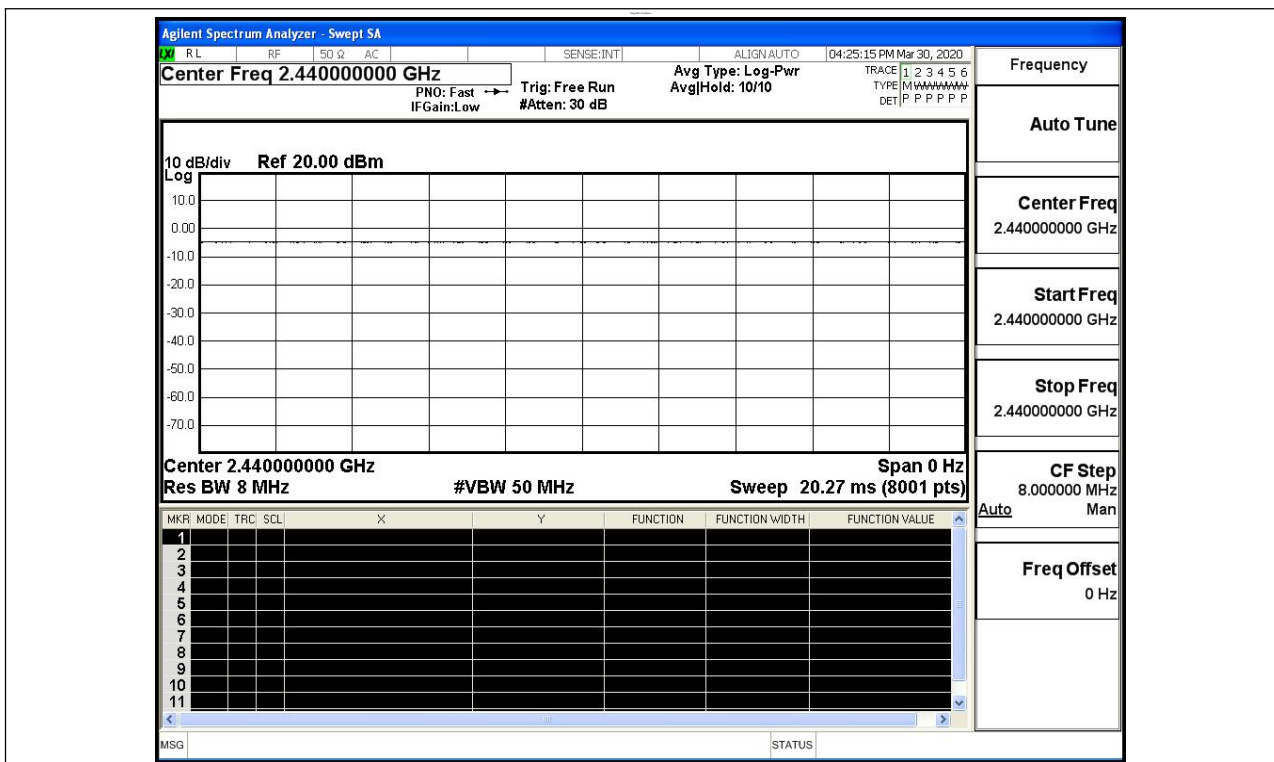
Test Model: ZMB-2BK

#### Environmental Conditions

Temperature:	23.5 ° C
Relative Humidity:	54.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Alisa Huang
Supervised by:	Tom.Liu

#### A.1 Duty Cycle

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

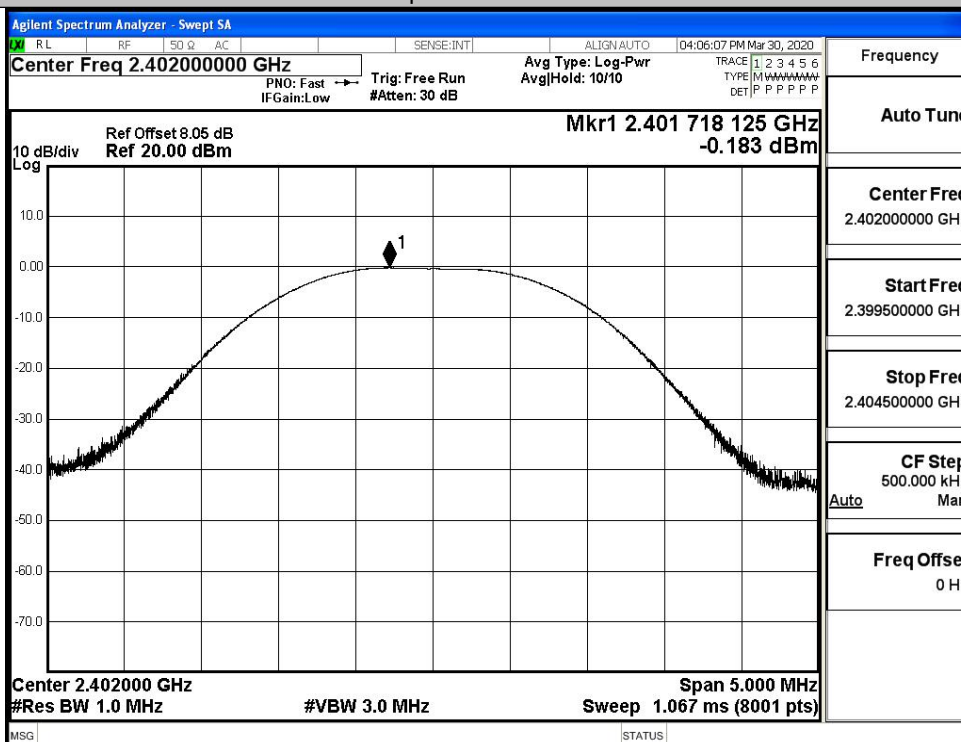


### A.2 Maximum Conducted Peak Output Power

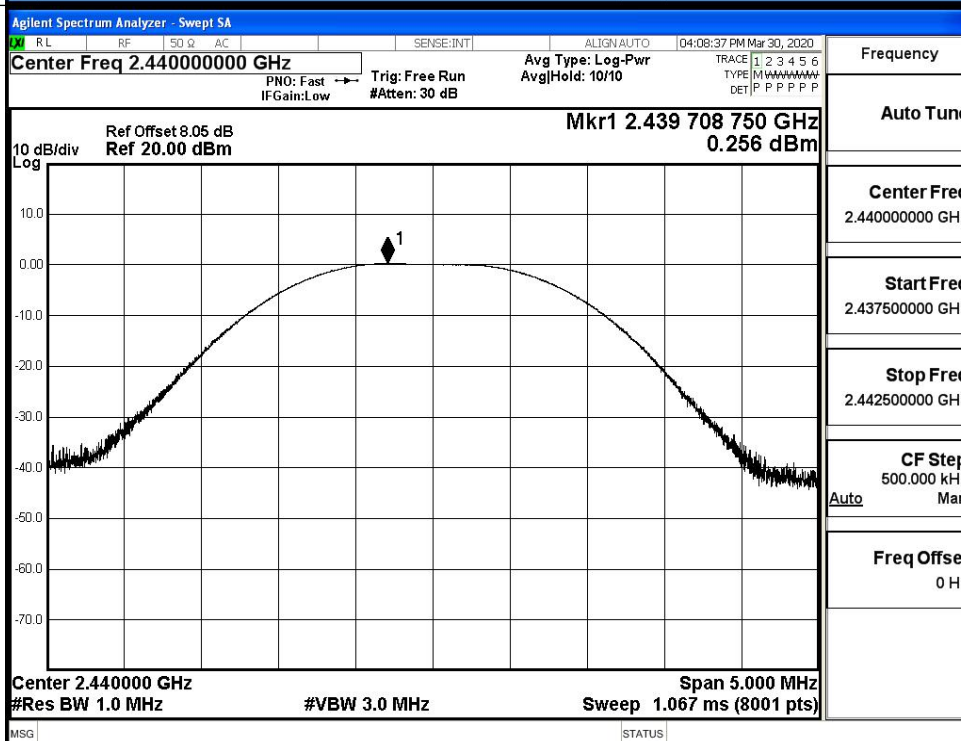
Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.183	30	PASS
BT LE	MCH	0.256	30	PASS
BT LE	HCH	0.403	30	PASS

#### Test Graphs

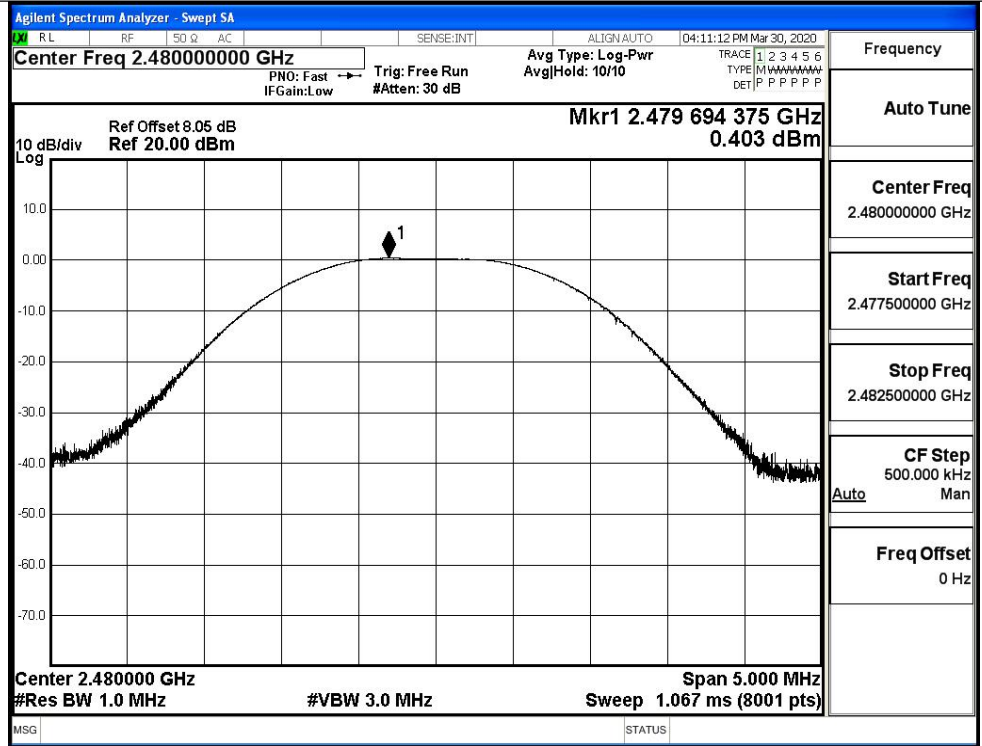
LCH



MCH

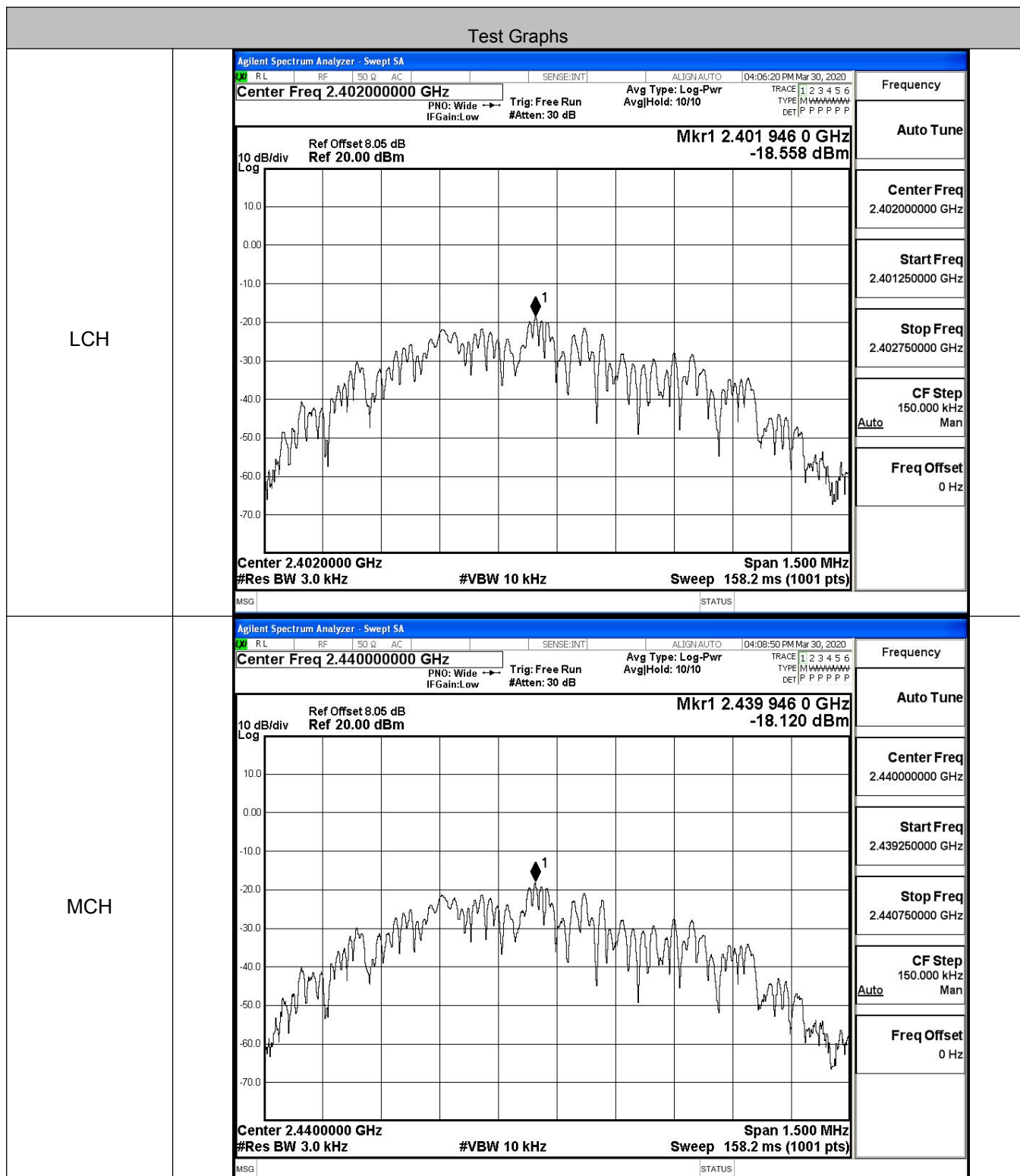


HCH

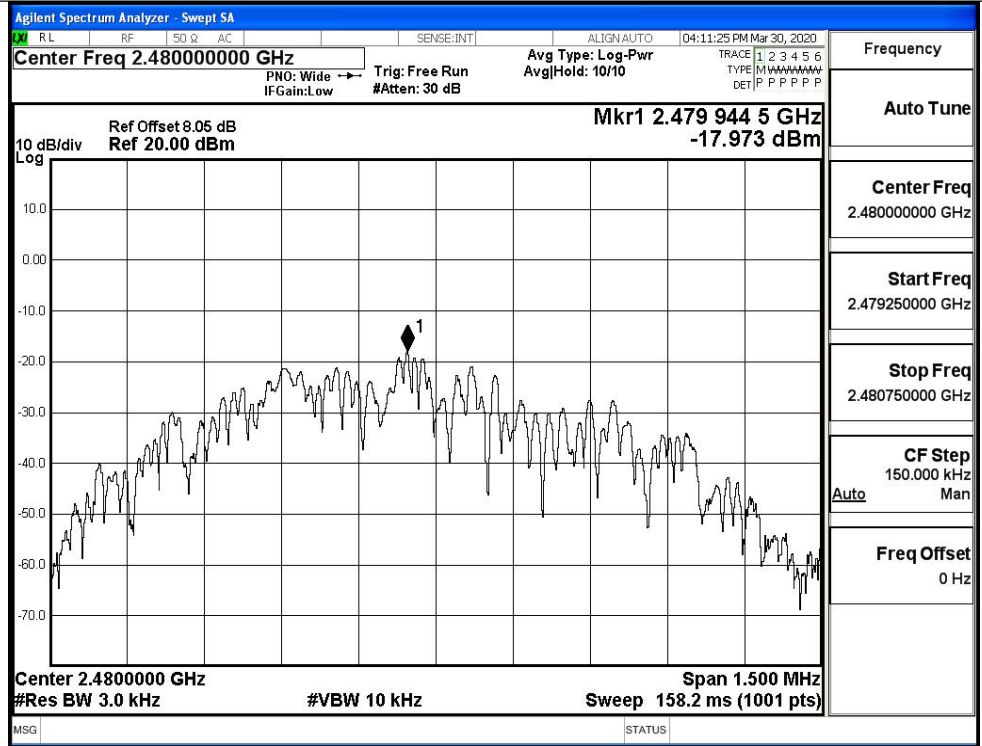


### A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-18.558	8	PASS
BT LE	MCH	-18.120	8	PASS
BT LE	HCH	-17.973	8	PASS



HCH



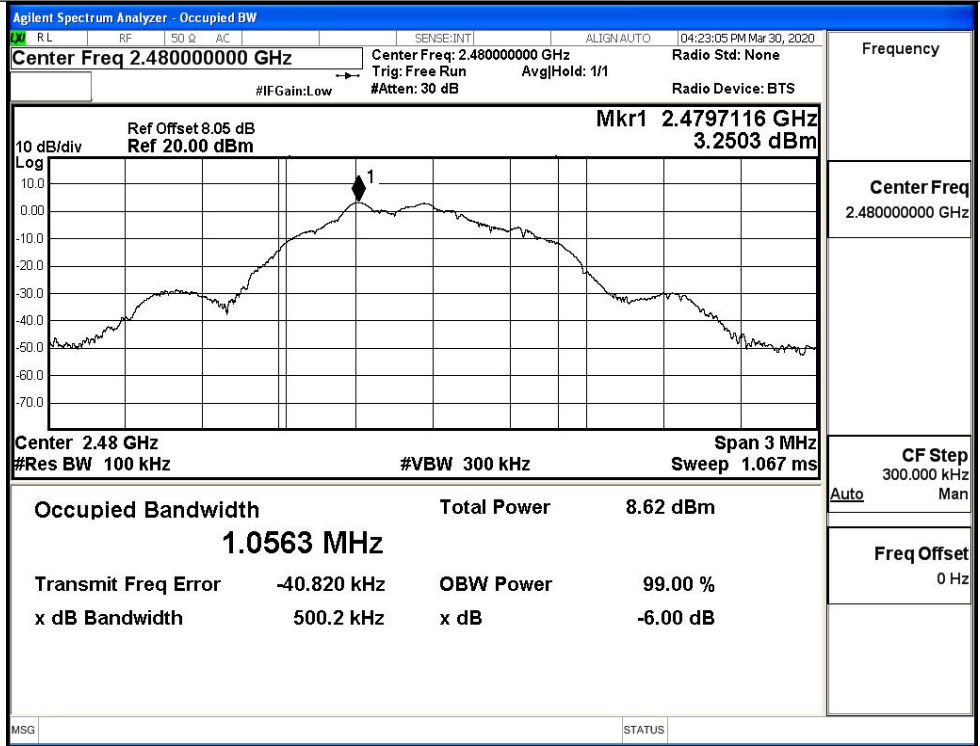
**A.4 6dB Bandwidth**

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.5017	≥0.5	PASS
BT LE	MCH	0.5003	≥0.5	PASS
BT LE	HCH	0.5002	≥0.5	PASS

Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Occupied BW                  Center Freq 2.40200000 GHz                  Center Freq: 2.402000000 GHz                  Trig: Free Run                  AvgHold: &gt; 1/1                  Radio Std: None                  Radio Device: BTS                  #IFGain: Low                  #Atten: 30 dB</p> <p>Ref Offset 8.05 dB                  Ref 20.00 dBm                  Mkr1 2.4017098 GHz                  -0.26716 dBm</p> <p>10 dB/div                  Log</p> <p>Center 2.402 GHz                  #Res BW 100 kHz                  #VBW 300 kHz                  Span 3 MHz                  Sweep 1.067 ms</p> <p>Occupied Bandwidth 1.0576 MHz                  Total Power 5.04 dBm</p> <p>Transmit Freq Error -39.107 kHz                  OBW Power 99.00 %                  x dB Bandwidth 501.7 kHz                  x dB -6.00 dB</p>	Frequency Center Freq 2.402000000 GHz CF Step 300.000 kHz Auto Man Freq Offset 0 Hz
	MCH	<p>Agilent Spectrum Analyzer - Occupied BW                  Center Freq 2.44000000 GHz                  Center Freq: 2.440000000 GHz                  Trig: Free Run                  AvgHold: &gt; 1/1                  Radio Std: None                  Radio Device: BTS                  #IFGain: Low                  #Atten: 30 dB</p> <p>Ref Offset 8.05 dB                  Ref 20.00 dBm                  Mkr1 2.4397098 GHz                  0.21794 dBm</p> <p>10 dB/div                  Log</p> <p>Center 2.44 GHz                  #Res BW 100 kHz                  #VBW 300 kHz                  Span 3 MHz                  Sweep 1.067 ms</p> <p>Occupied Bandwidth 1.0528 MHz                  Total Power 5.52 dBm</p> <p>Transmit Freq Error -41.348 kHz                  OBW Power 99.00 %                  x dB Bandwidth 500.3 kHz                  x dB -6.00 dB</p>

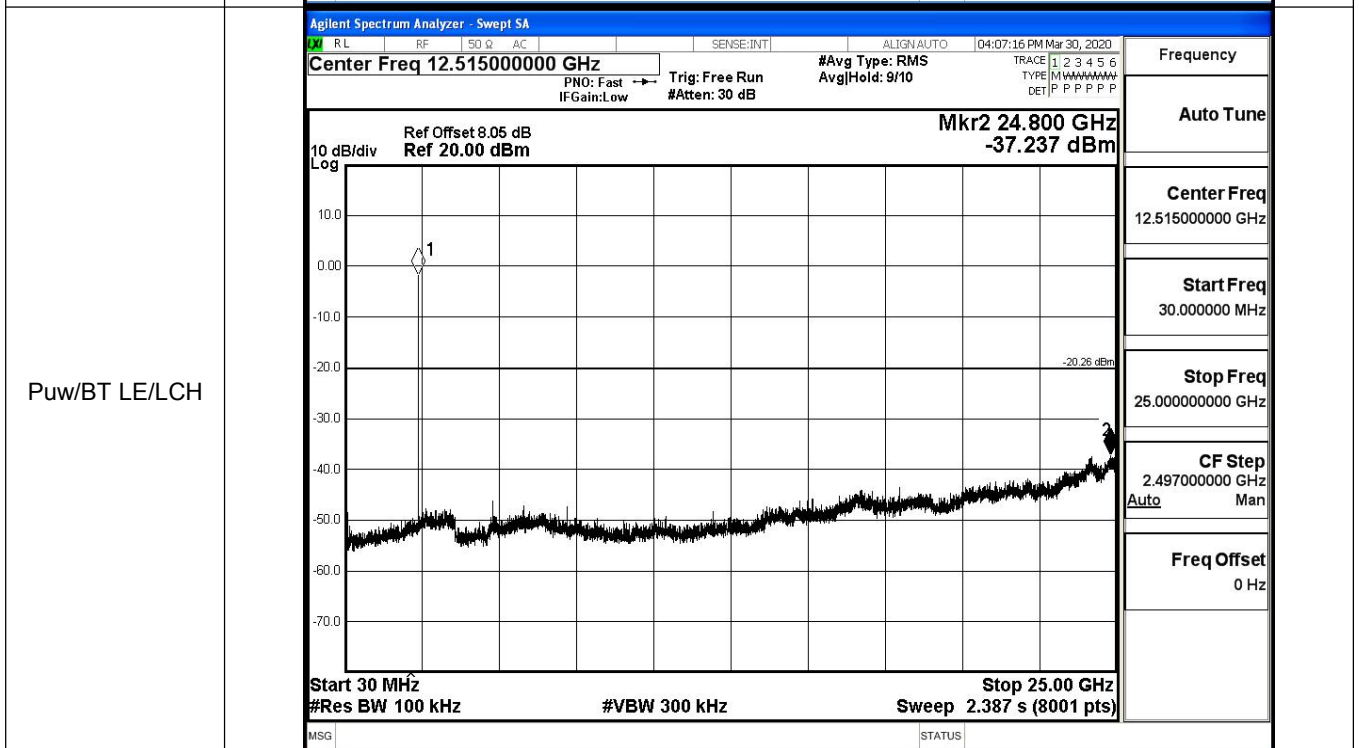
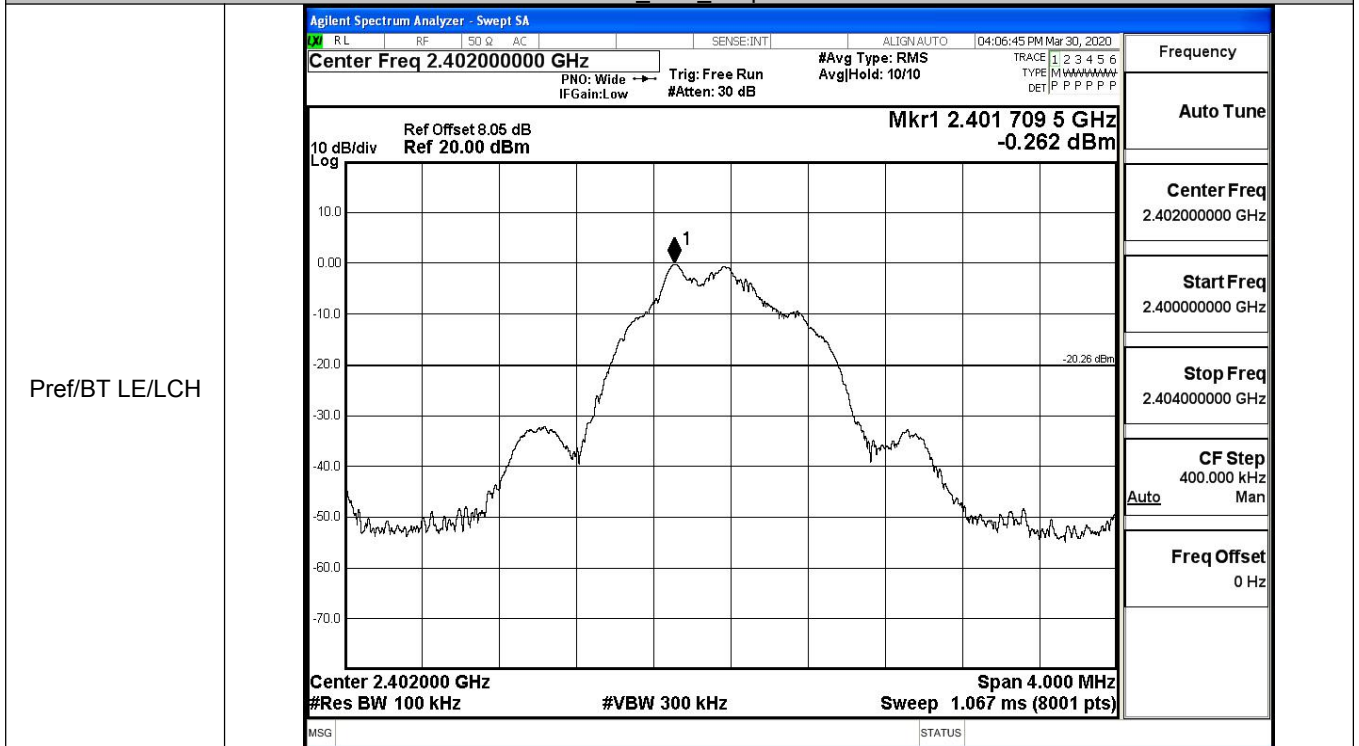
HCH



### A.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.262	-37.237	-20.262	PASS
BT LE	MCH	0.169	-37.205	-19.831	PASS
BT LE	HCH	3.26	-37.074	-16.740	PASS

BT LE\_LCH\_Graphs

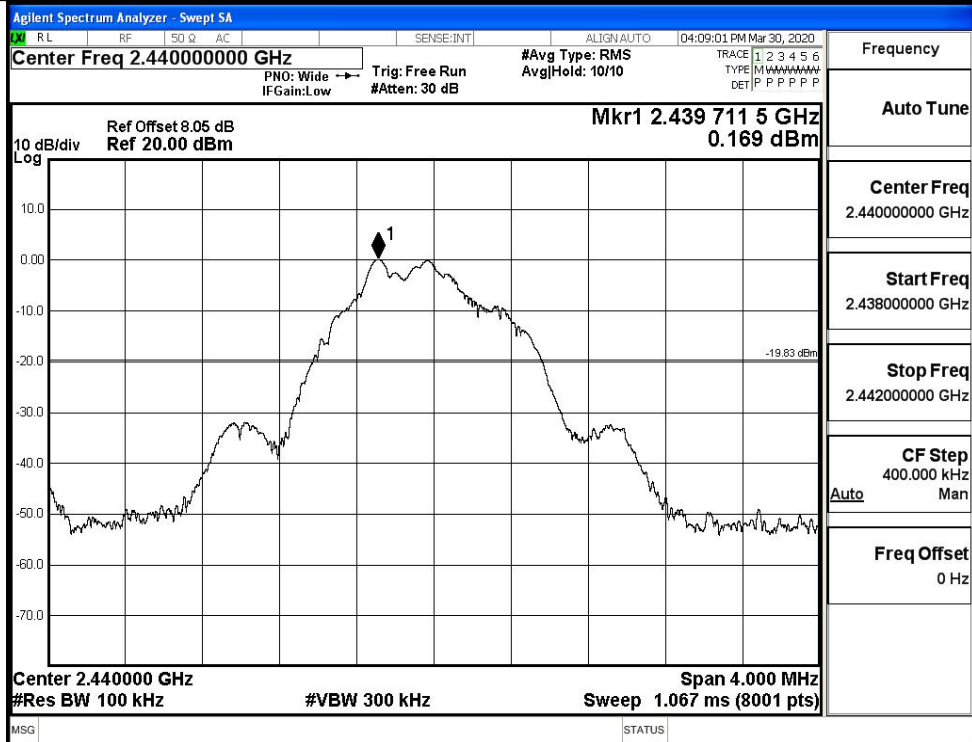




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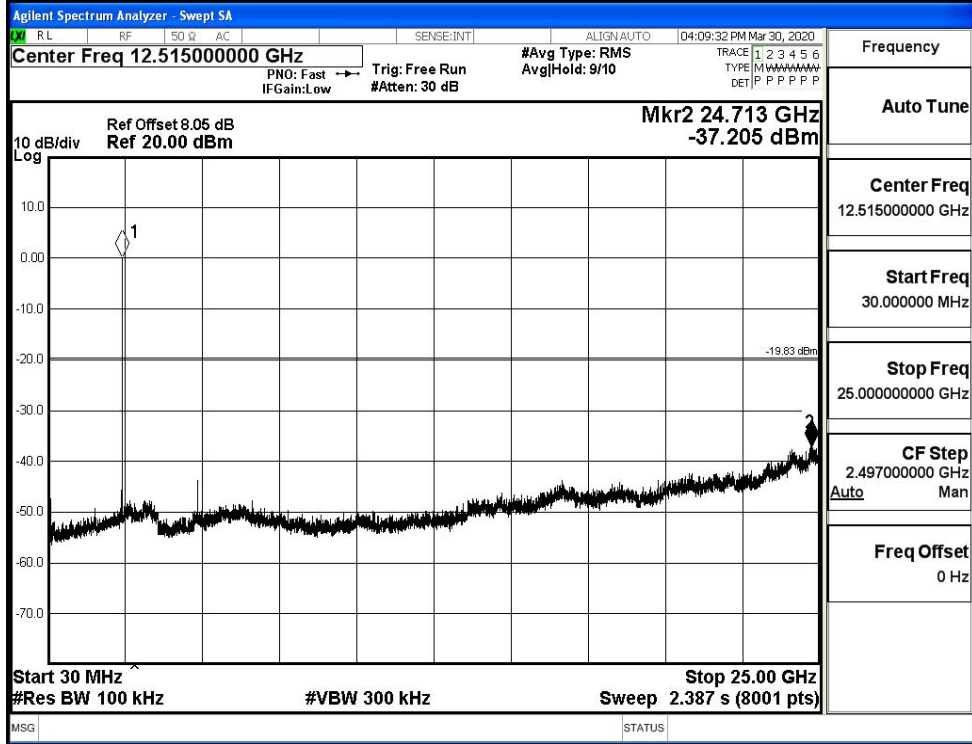
BT LE MCH Graphs

Pref/BT LE/MCH



Frequency
Auto Tune
Center Freq 2.440000000 GHz
Start Freq 2.438000000 GHz
Stop Freq 2.442000000 GHz
CF Step 400.000 kHz Auto Man
Freq Offset 0 Hz

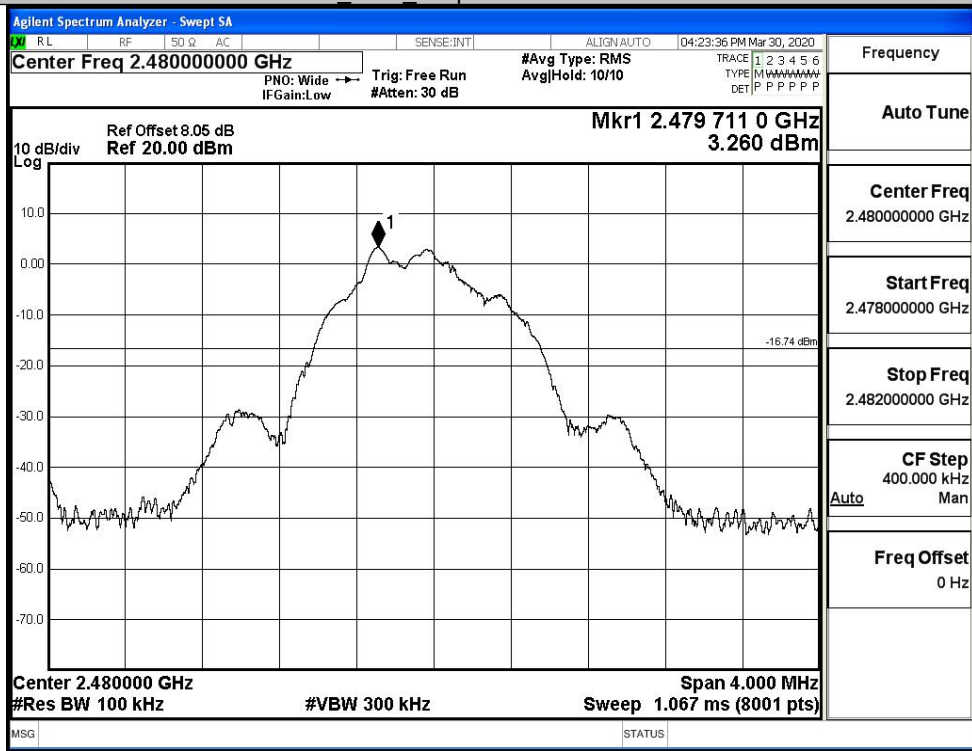
Puw/BT LE/MCH



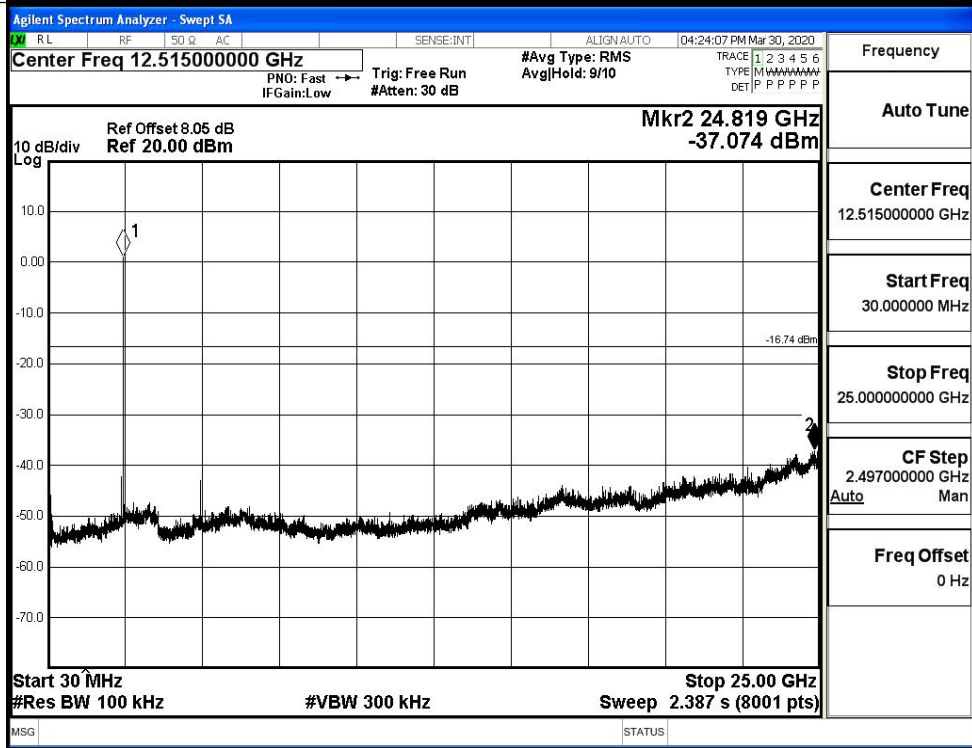
Frequency
Auto Tune
Center Freq 12.515000000 GHz
Start Freq 30.0000000 MHz
Stop Freq 25.000000000 GHz
CF Step 2.497000000 GHz Auto Man
Freq Offset 0 Hz

BT LE HCH Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



### A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.253	-49.727	-22.25	PASS
BT LE	HCH	0.379	-44.912	-19.62	PASS

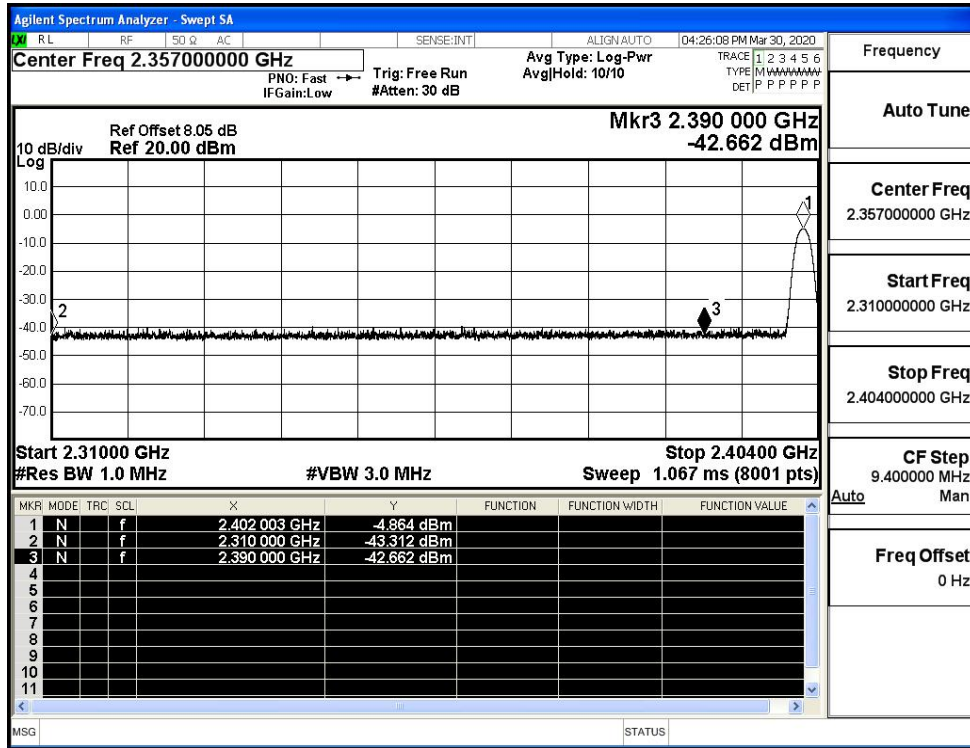
#### Test Graphs

LCH		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.357000000 GHz</p> <p>Mkr4 2.381851 GHz -49.727 dBm</p> <p>Start 2.31000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.40400 GHz Sweep 9.067 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <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>1</td><td>N</td><td>f</td><td></td><td>2.401897 GHz</td><td>-2.253 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>f</td><td></td><td>2.400000 GHz</td><td>-43.354 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>f</td><td></td><td>2.390000 GHz</td><td>-52.897 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.381851 GHz</td><td>-49.727 dBm</td><td></td><td></td><td></td></tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f		2.401897 GHz	-2.253 dBm				2	N	f		2.400000 GHz	-43.354 dBm				3	N	f		2.390000 GHz	-52.897 dBm				4	N	f		2.381851 GHz	-49.727 dBm			
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HCH		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.489000000 GHz</p> <p>Mkr4 2.48396200 GHz -44.912 dBm</p> <p>Start 2.47800 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.50000 GHz Sweep 2.133 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <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>1</td><td>N</td><td>f</td><td></td><td>2.47971325 GHz</td><td>0.379 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>f</td><td></td><td>2.48350000 GHz</td><td>-48.843 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>f</td><td></td><td>2.50000000 GHz</td><td>-53.095 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.48396200 GHz</td><td>-44.912 dBm</td><td></td><td></td><td></td></tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f		2.47971325 GHz	0.379 dBm				2	N	f		2.48350000 GHz	-48.843 dBm				3	N	f		2.50000000 GHz	-53.095 dBm				4	N	f		2.48396200 GHz	-44.912 dBm			
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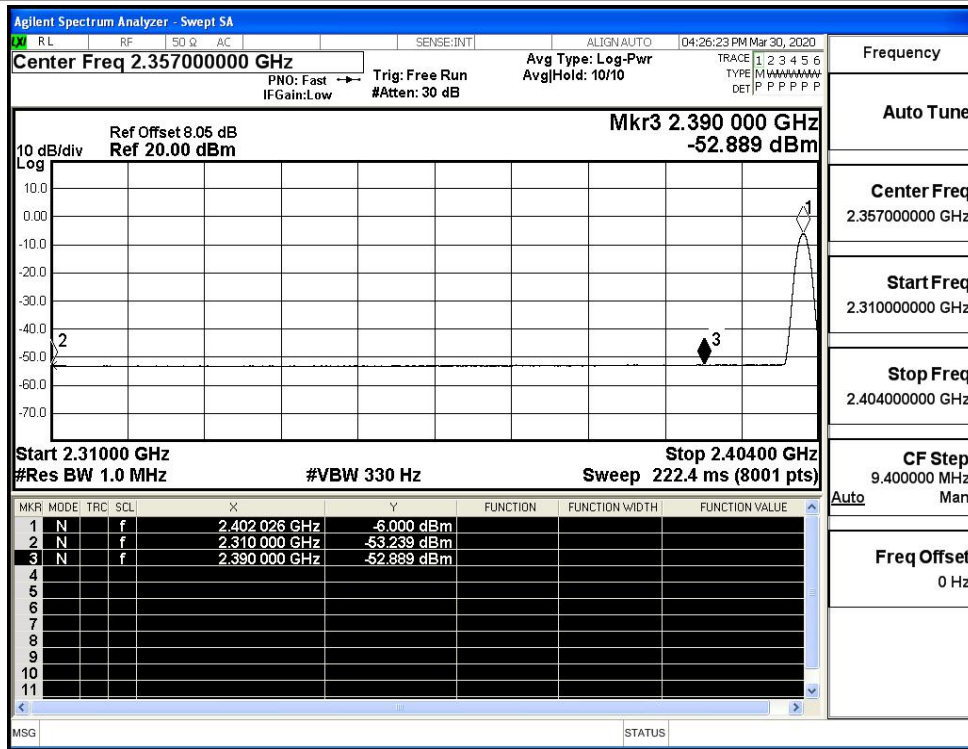
## A.7 Restrict-band band-edge measurements

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	-43.31	2.0	0	53.92	PEAK	74	PASS
		Ant1	2310.0	-53.24	2.0	0	43.99	AV	54	PASS
		Ant1	2390.0	-42.66	2.0	0	54.57	PEAK	74	PASS
		Ant1	2390.0	-52.89	2.0	0	44.34	AV	54	PASS
	2480	Ant1	2483.5	-42.23	2.0	0	55.00	PEAK	74	PASS
		Ant1	2483.5	-52.39	2.0	0	44.84	AV	54	PASS
		Ant1	2500.0	-41.43	2.0	0	55.80	PEAK	74	PASS
		Ant1	2500.0	-52.23	2.0	0	45.00	AV	54	PASS

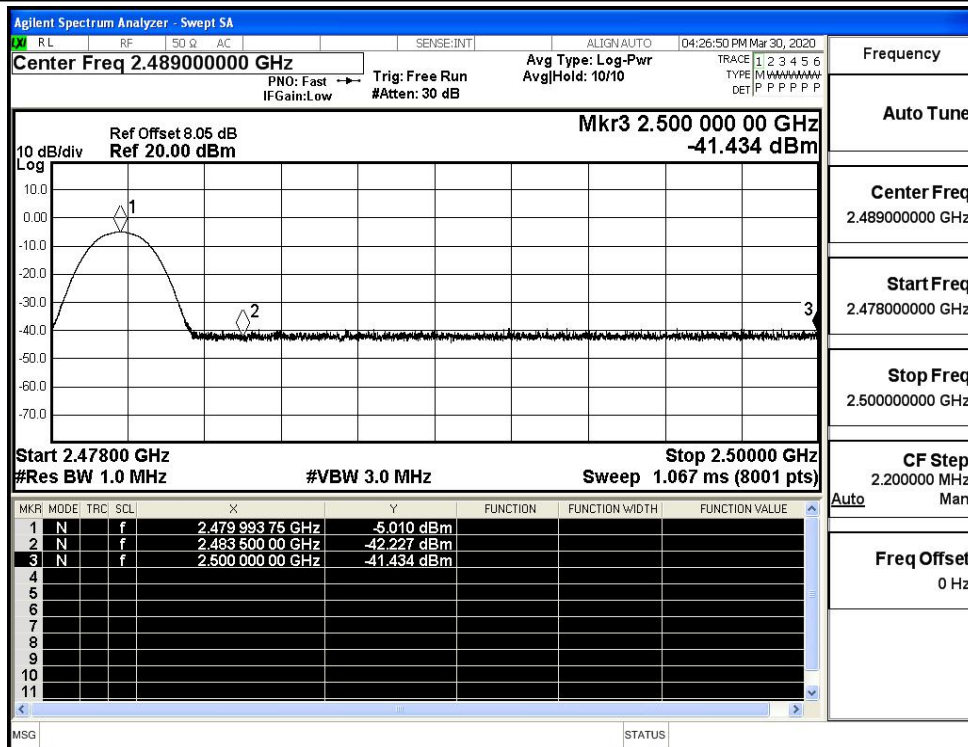
Restrict-band band-edge measurements\_BT LE\_2402\_Ant1\_PEAK



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

