

Appendix A

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

Product Name: keyless padlock

Trade Mark: HIZIMA 

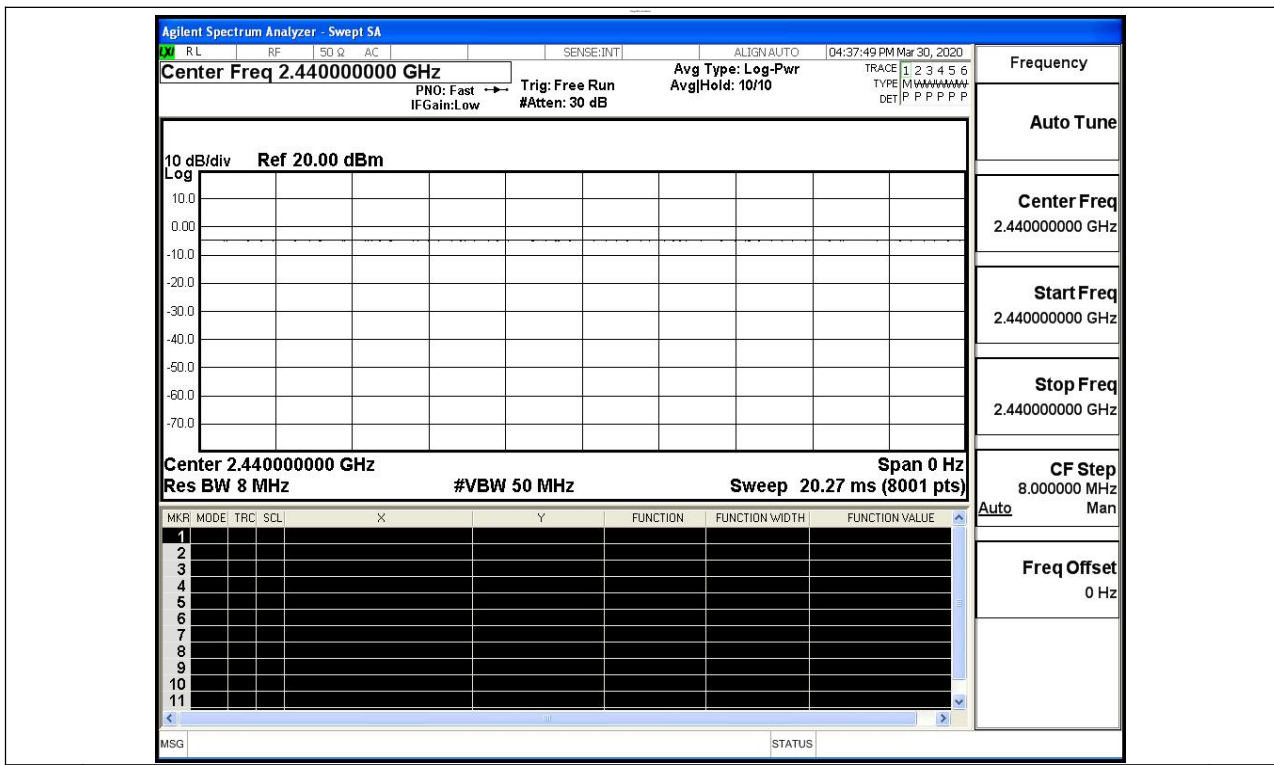
Test Model: ZMP-40K

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

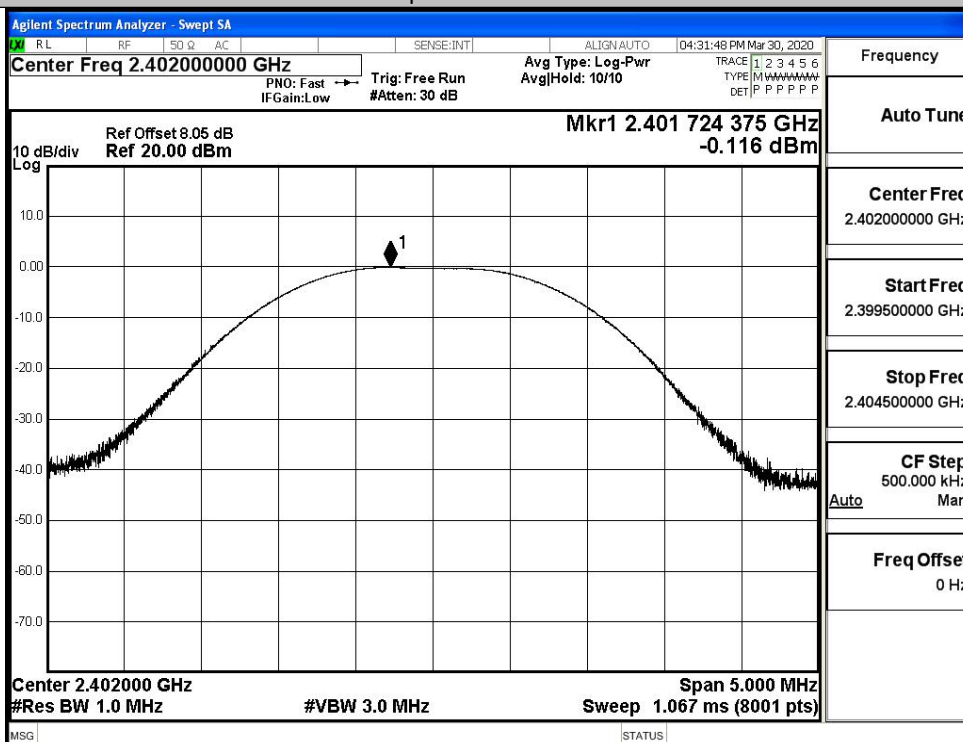


A.2 Maximum Conducted Peak Output Power

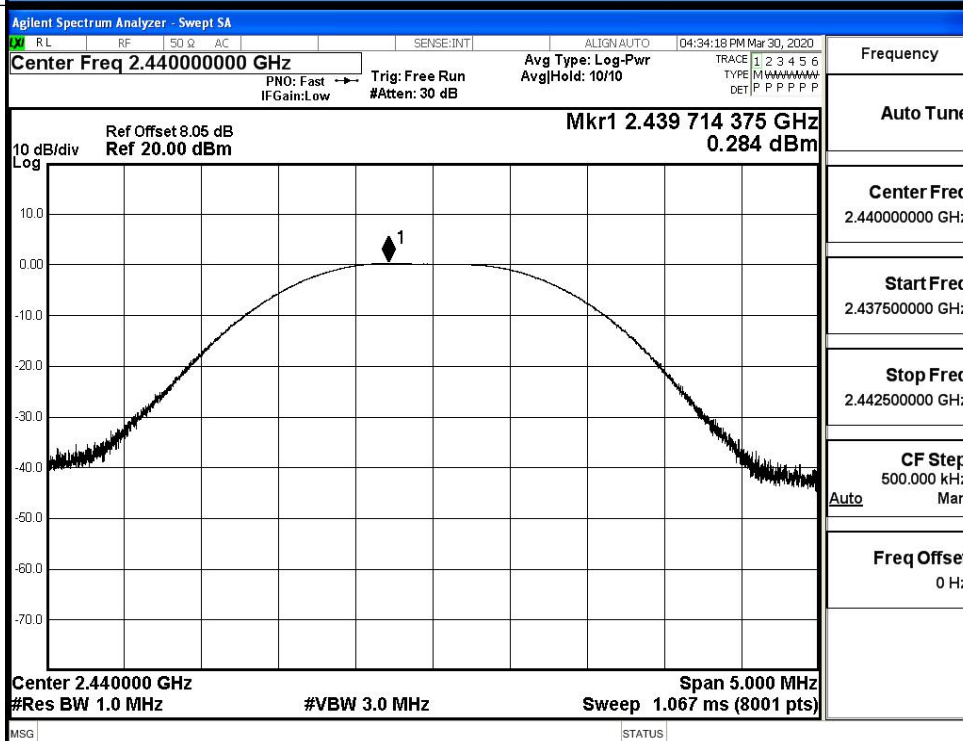
Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.116	30	PASS
BT LE	MCH	0.284	30	PASS
BT LE	HCH	0.473	30	PASS

Test Graphs

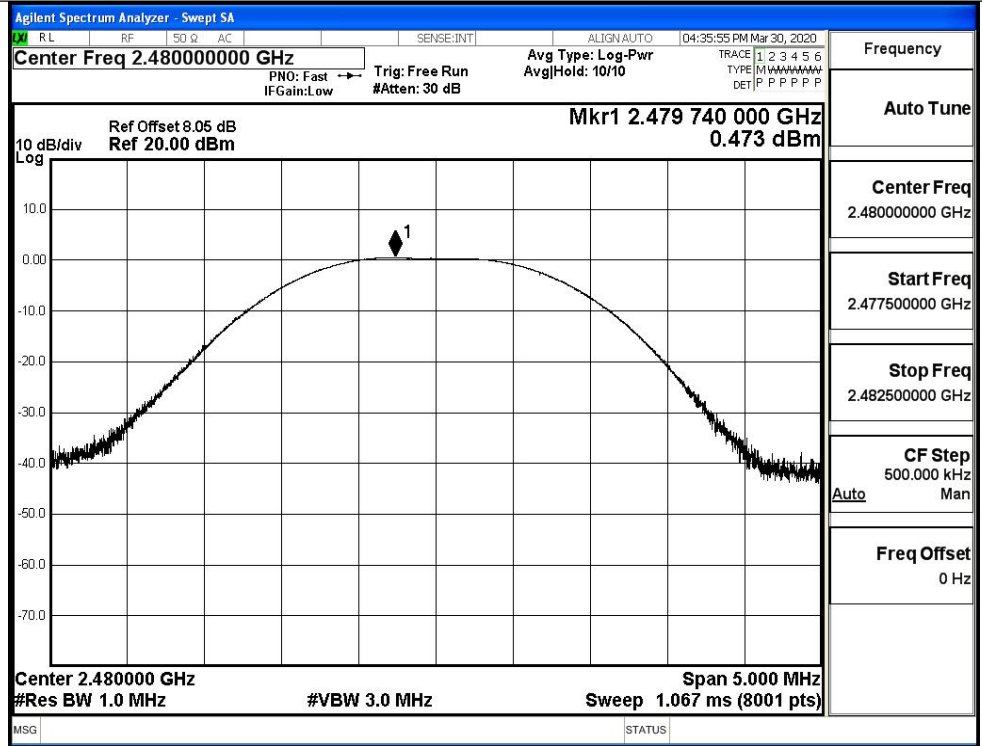
LCH



MCH

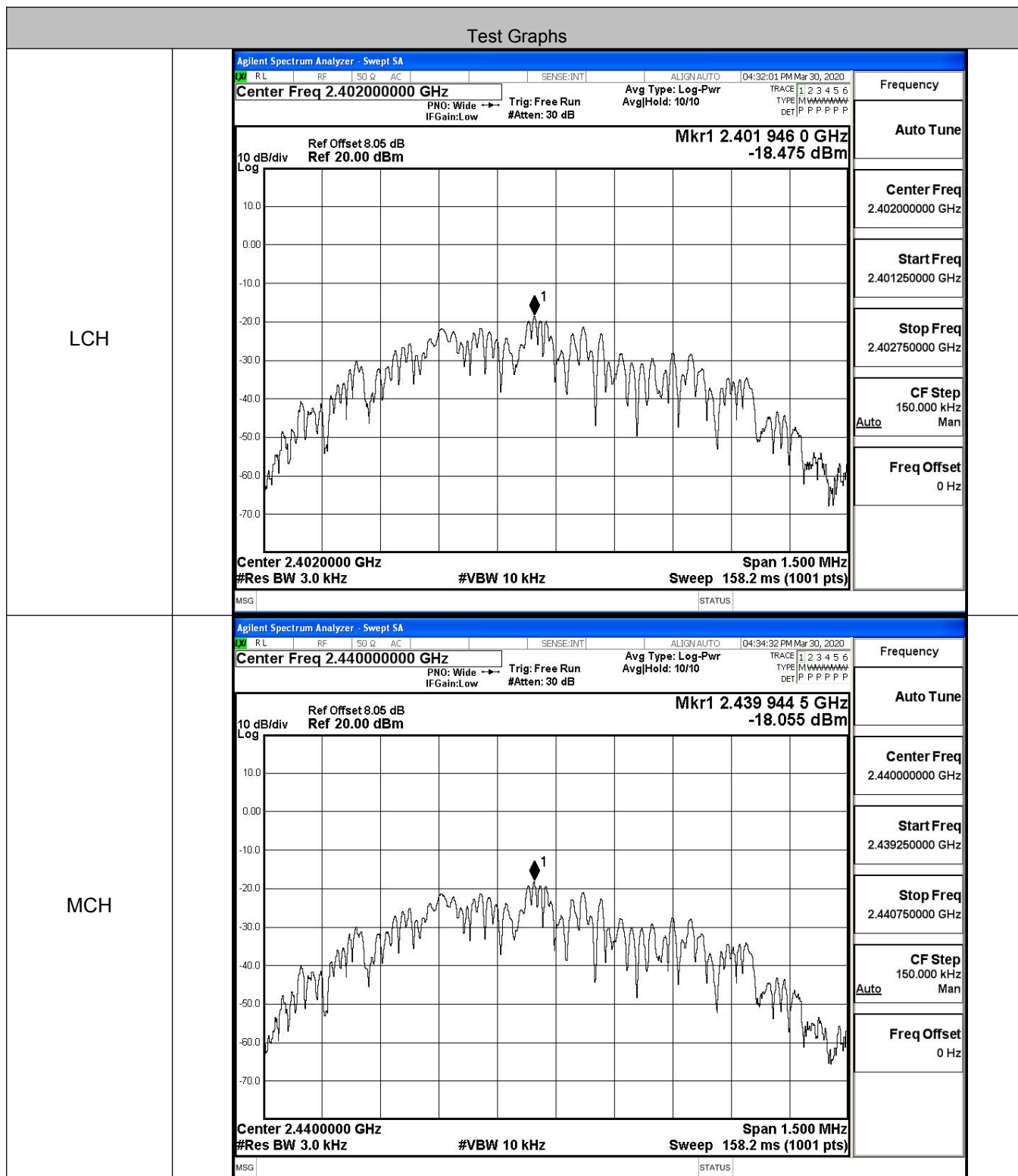


HCH

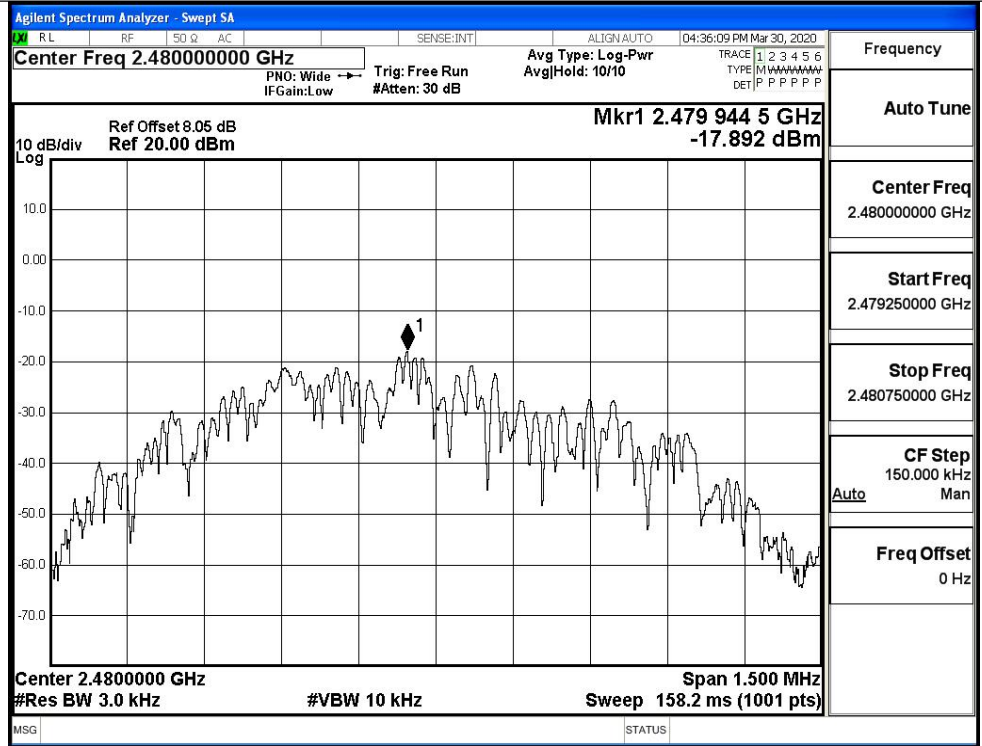


A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-18.475	8	PASS
BT LE	MCH	-18.055	8	PASS
BT LE	HCH	-17.892	8	PASS



HCH



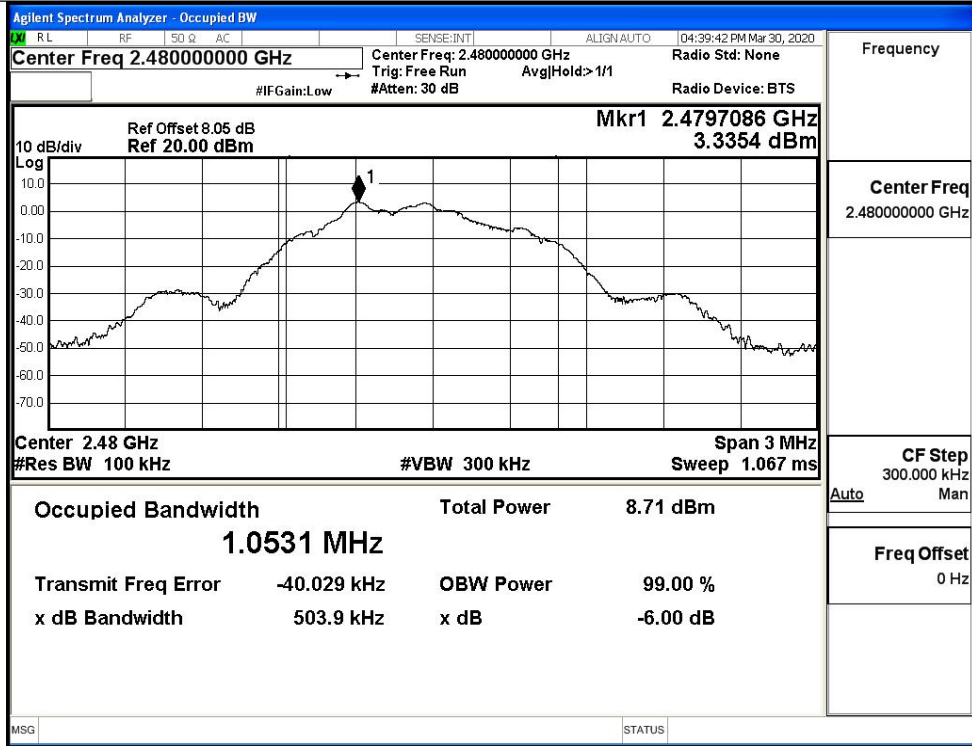
A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.5011	≥0.5	PASS
BT LE	MCH	0.5025	≥0.5	PASS
BT LE	HCH	0.5039	≥0.5	PASS

Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq 2.40200000 GHz Center Freq: 2.402000000 GHz Mkr1 2.4017105 GHz -0.17517 dBm 10 dB/div Log Ref Offset 8.05 dB Ref 20.00 dBm Center 2.402 GHz #Res BW 100 kHz #VBW 300 kHz Span 3 MHz Sweep 1.067 ms Occupied Bandwidth 1.0593 MHz Total Power 5.05 dBm Transmit Freq Error -38.869 kHz OBW Power 99.00 % x dB Bandwidth 501.1 kHz x dB -6.00 dB</p>	Frequency 2.402000000 GHz CF Step 300.000 kHz Auto Man Freq Offset 0 Hz
	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq 2.440000000 GHz Center Freq: 2.440000000 GHz Mkr1 2.4397064 GHz 0.19610 dBm 10 dB/div Log Ref Offset 8.05 dB Ref 20.00 dBm Center 2.44 GHz #Res BW 100 kHz #VBW 300 kHz Span 3 MHz Sweep 1.067 ms Occupied Bandwidth 1.0540 MHz Total Power 5.59 dBm Transmit Freq Error -38.447 kHz OBW Power 99.00 % x dB Bandwidth 502.5 kHz x dB -6.00 dB</p>	Frequency 2.440000000 GHz CF Step 300.000 kHz Auto Man Freq Offset 0 Hz

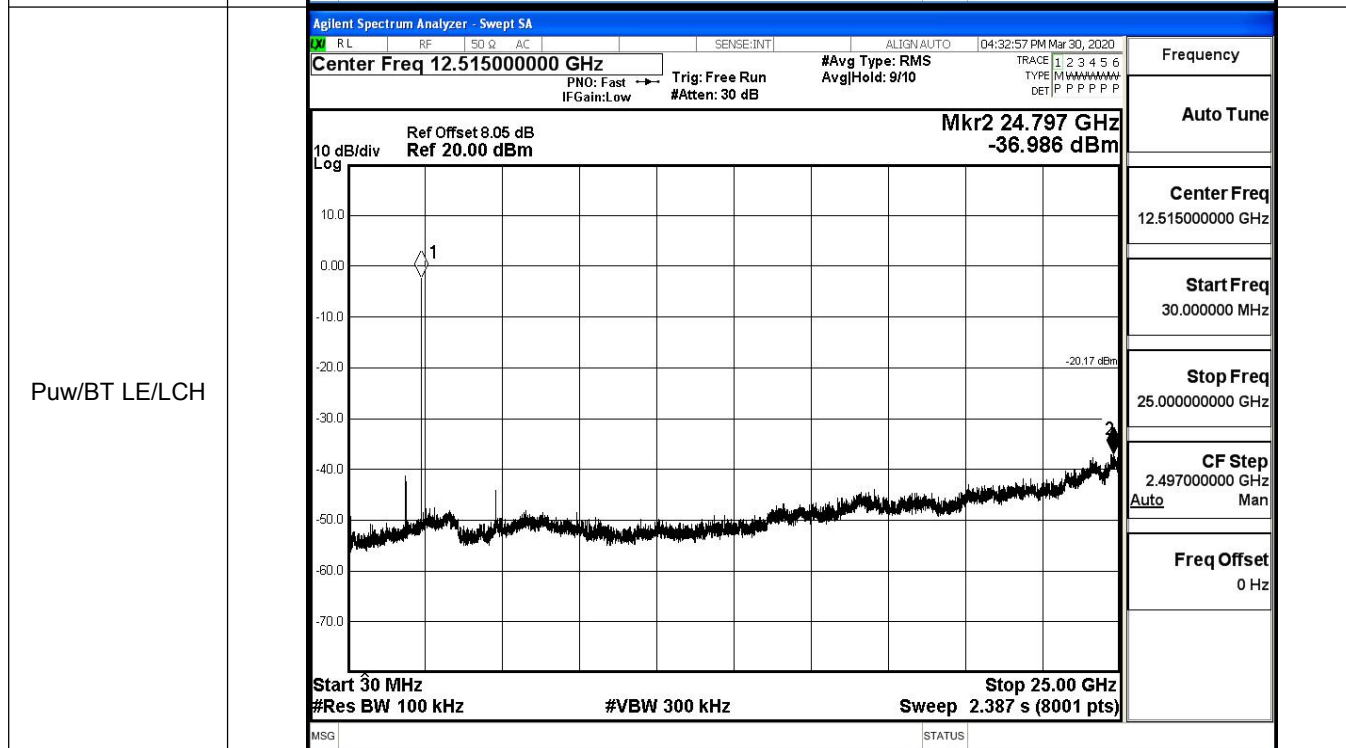
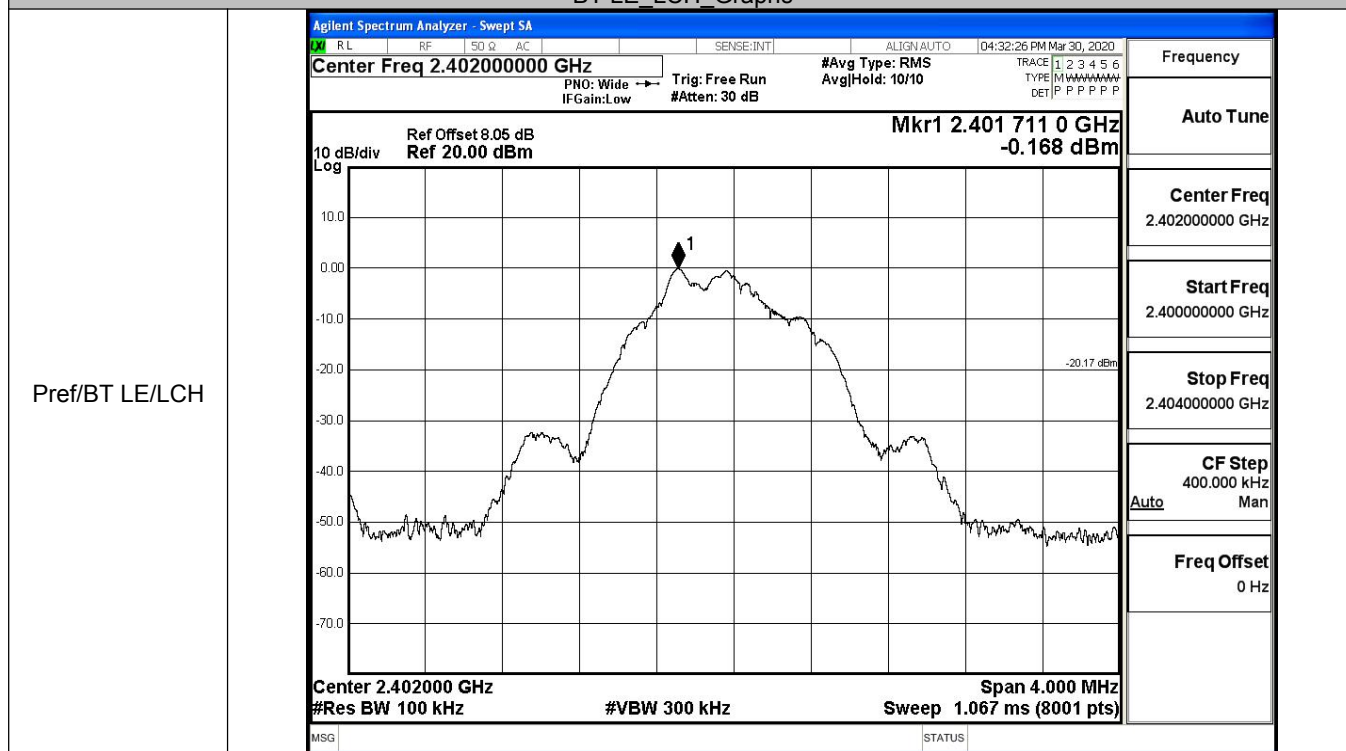
HCH



A.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.168	-36.986	-20.168	PASS
BT LE	MCH	0.252	-37.037	-19.748	PASS
BT LE	HCH	3.37	-37.143	-16.630	PASS

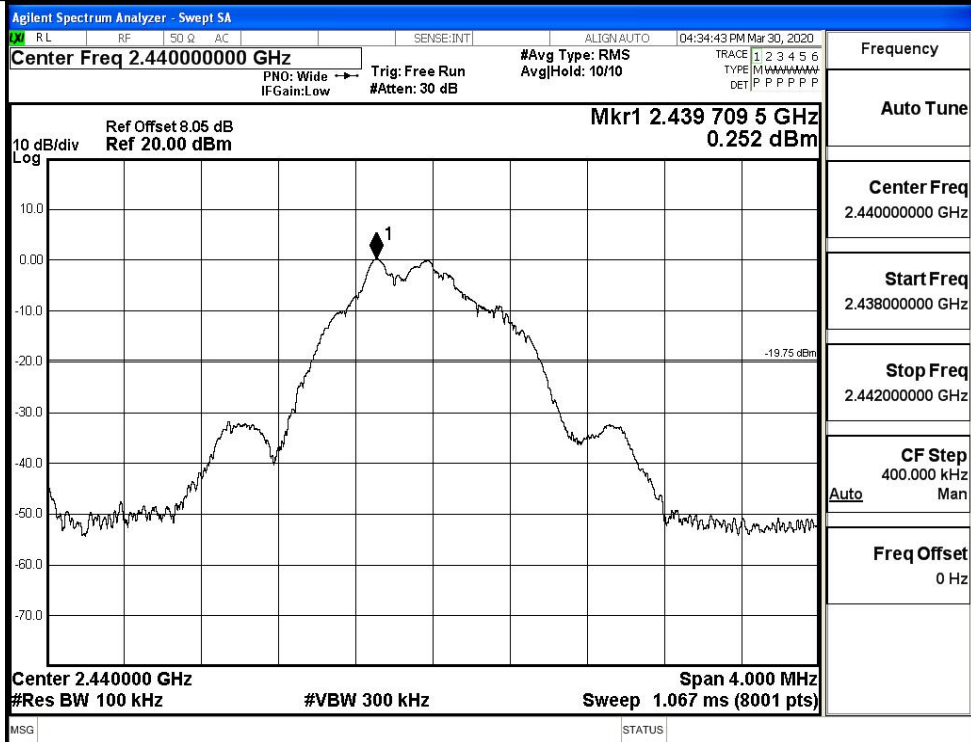
BT LE_LCH_Graphs



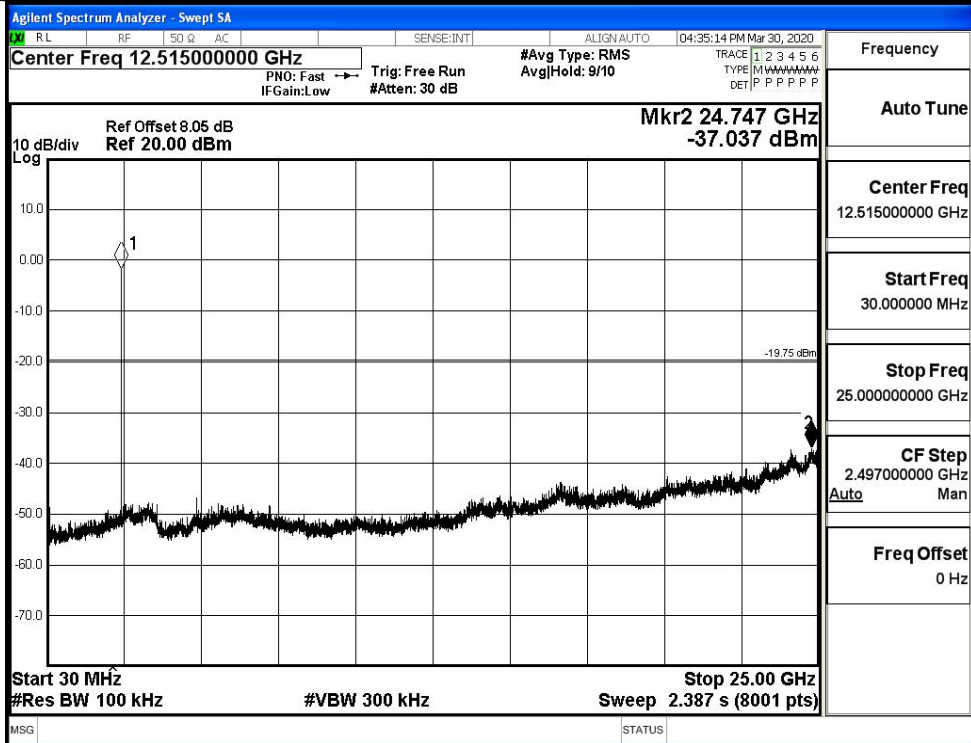
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BT LE MCH Graphs

Pref/BT LE/MCH

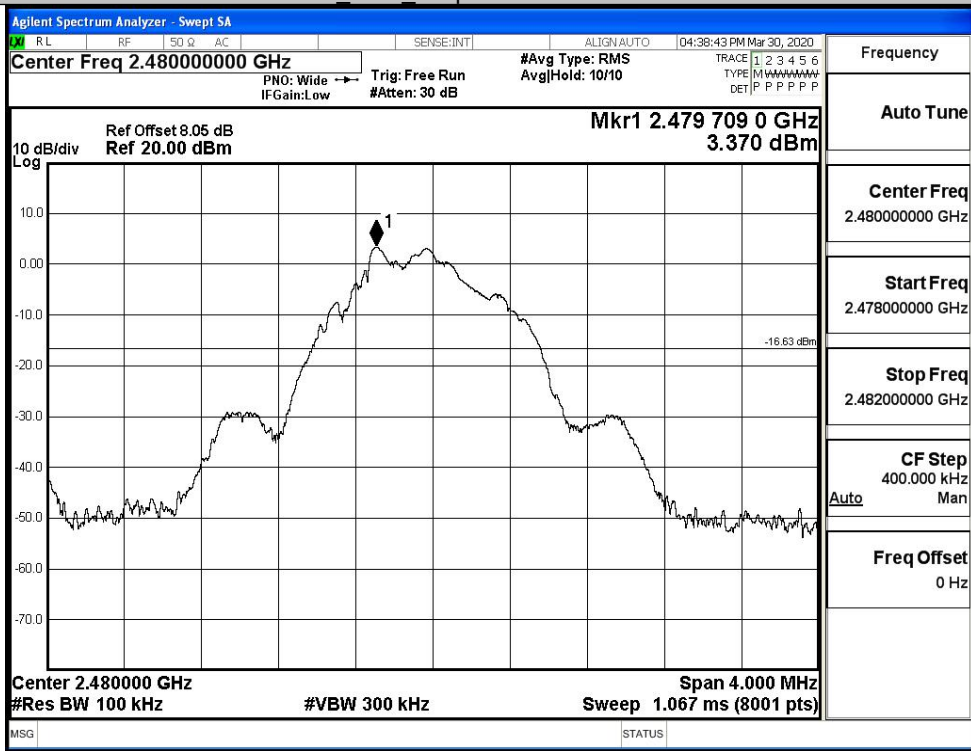


Puw/BT LE/MCH

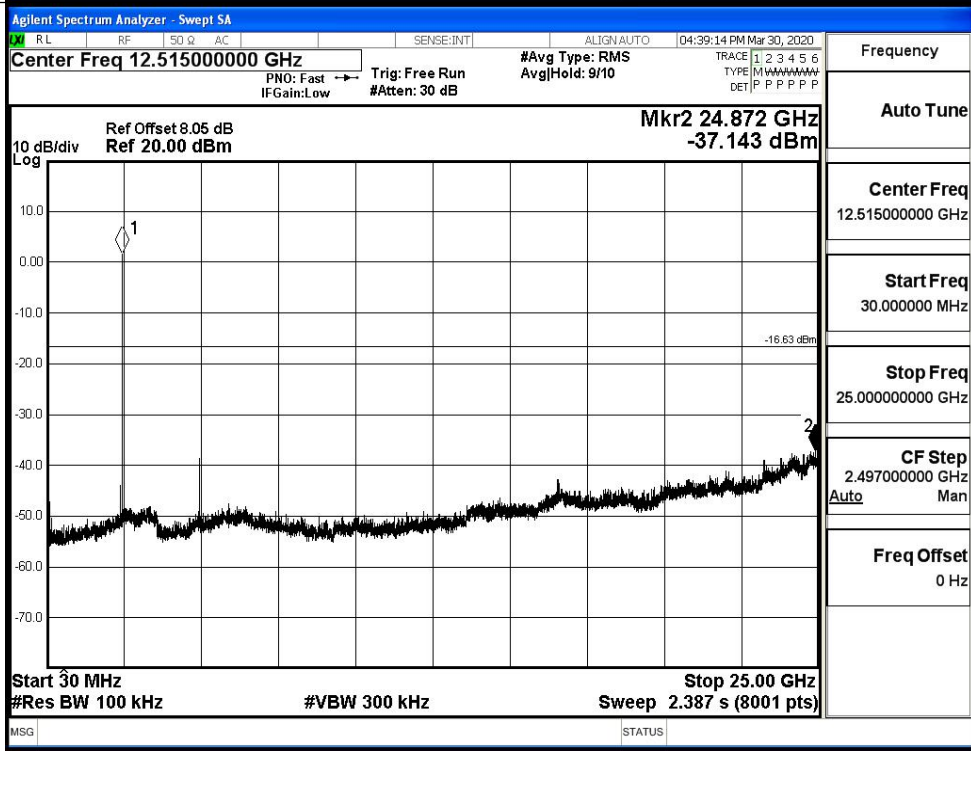


BT LE HCH Graphs

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	-0.232	-49.836	-20.23	PASS
BT LE	HCH	0.510	-46.078	-19.49	PASS

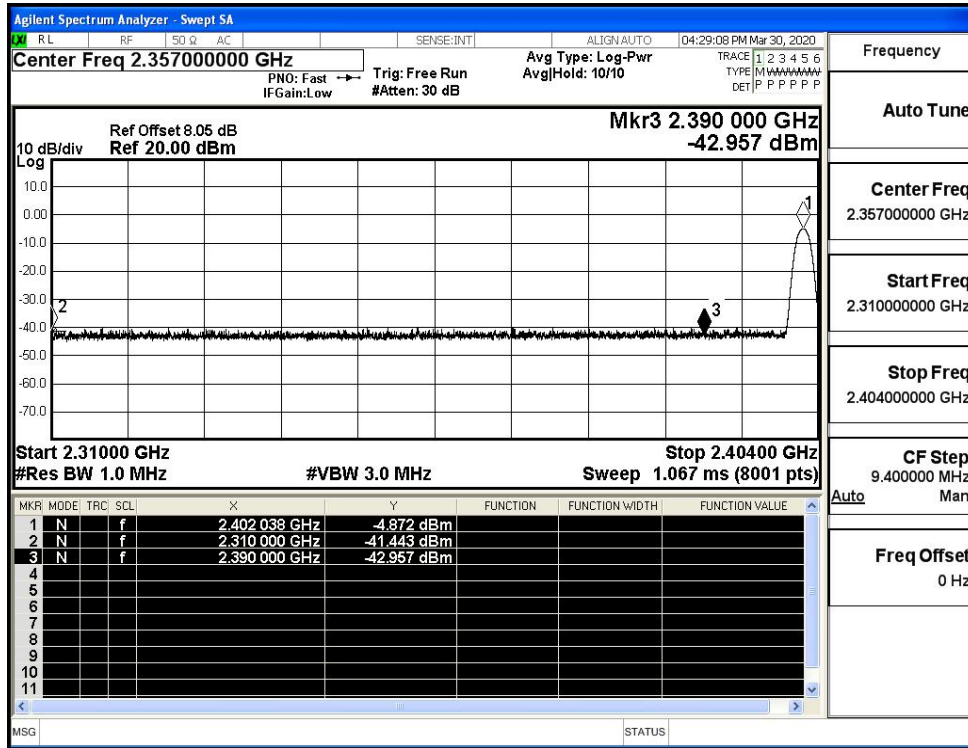
Test Graphs

LCH		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.357000000 GHz</p> <p>Mkr4 2.375 459 GHz -49.836 dBm</p> <p>Ref Offset 8.05 dB Ref 20.00 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>2.401 721 GHz</td><td>-0.232 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>f</td><td></td><td>2.400 000 GHz</td><td>-42.660 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>f</td><td></td><td>2.390 000 GHz</td><td>-53.067 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.375 459 GHz</td><td>-49.836 dBm</td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f		2.401 721 GHz	-0.232 dBm				2	N	f		2.400 000 GHz	-42.660 dBm				3	N	f		2.390 000 GHz	-53.067 dBm				4	N	f		2.375 459 GHz	-49.836 dBm				5									6									7									8									9									10									11									<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.357000000 GHz</p> <p>Start Freq 2.310000000 GHz</p> <p>Stop Freq 2.404000000 GHz</p> <p>CF Step 9.400000 MHz</p> <p>Freq Offset 0 Hz</p>
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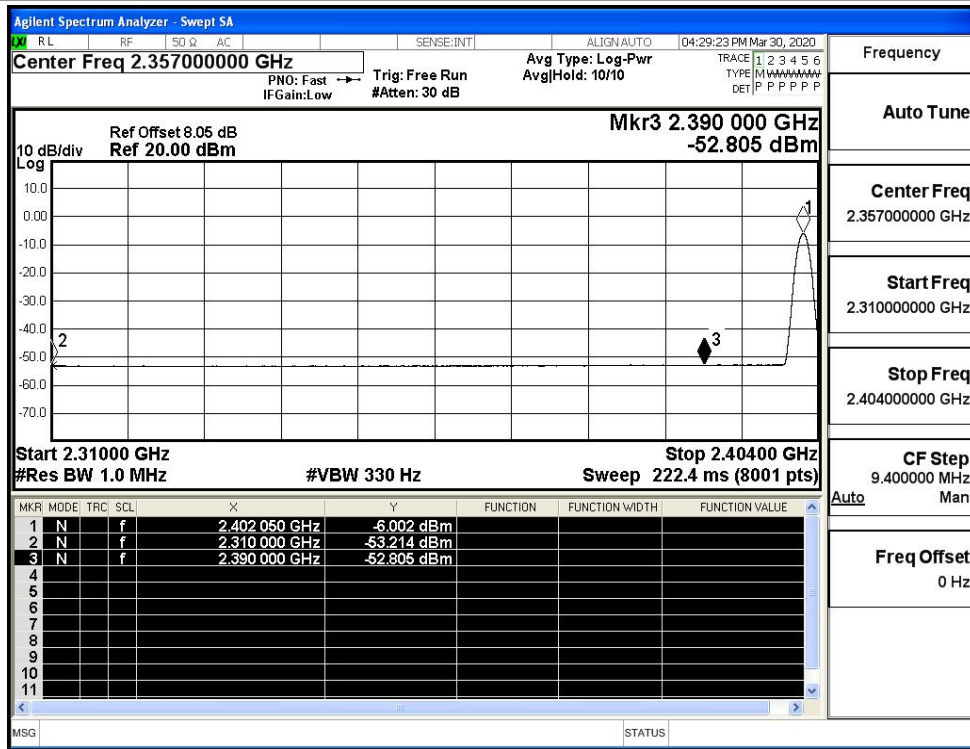
A.7 Restrict-band band-edge measurements

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	-41.44	2.0	0	55.79	PEAK	74	PASS
		Ant1	2310.0	-53.21	2.0	0	44.02	AV	54	PASS
		Ant1	2390.0	-42.96	2.0	0	54.27	PEAK	74	PASS
		Ant1	2390.0	-52.81	2.0	0	44.42	AV	54	PASS
	2480	Ant1	2483.5	-42.94	2.0	0	54.29	PEAK	74	PASS
		Ant1	2483.5	-52.43	2.0	0	44.80	AV	54	PASS
		Ant1	2500.0	-42.47	2.0	0	54.76	PEAK	74	PASS
		Ant1	2500.0	-52.24	2.0	0	44.99	AV	54	PASS

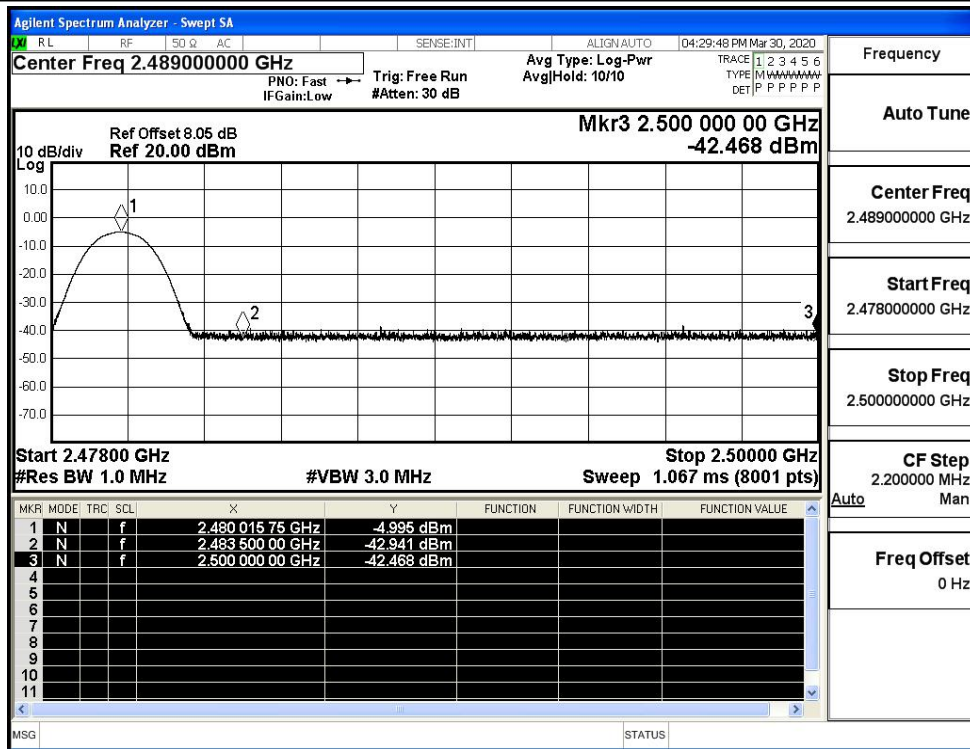
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

