

Appendix A

RF Test Data for BT V4.2 (BT LE) (Conducted Measurement)

Product Name: Remote control

Trade Mark: VIOFO

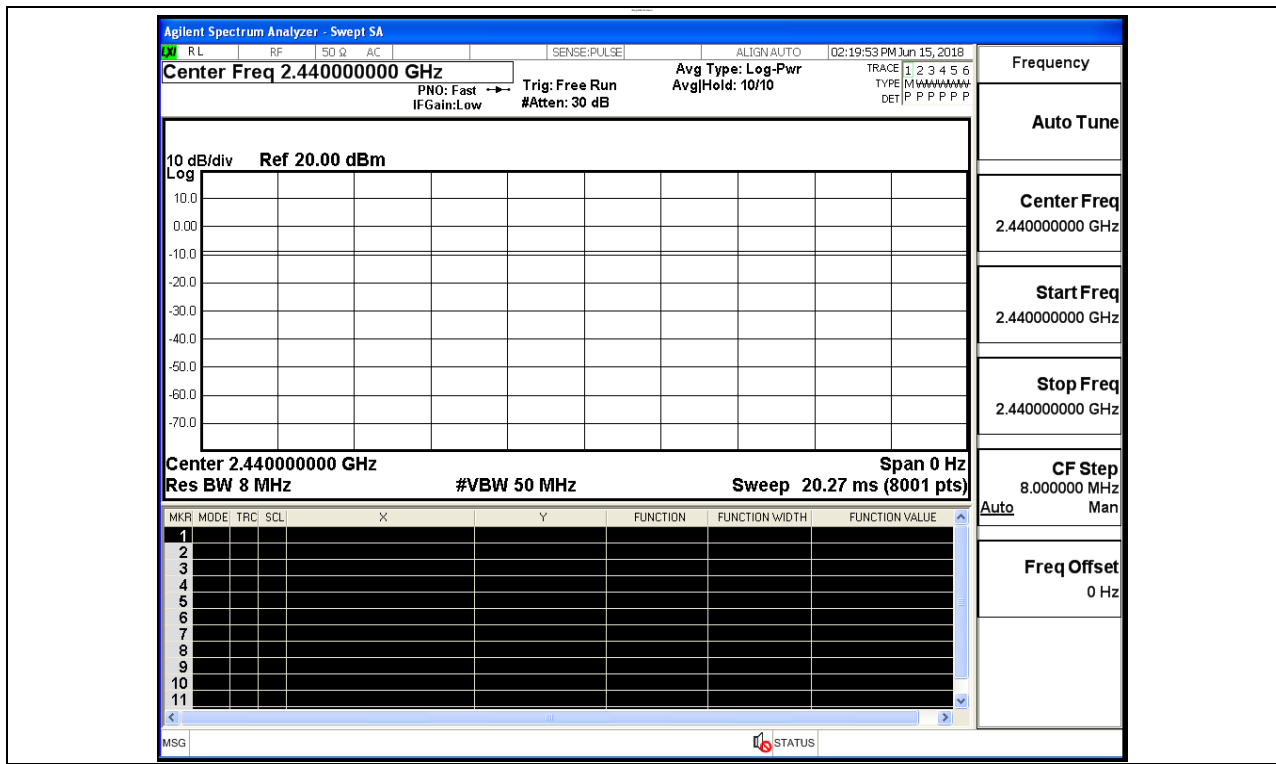
Test Model: rm100

Environmental Conditions

Temperature:	22.6 ° C
Relative Humidity:	53.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Ryan.Hu
Supervised by:	Jayden.Zhuo

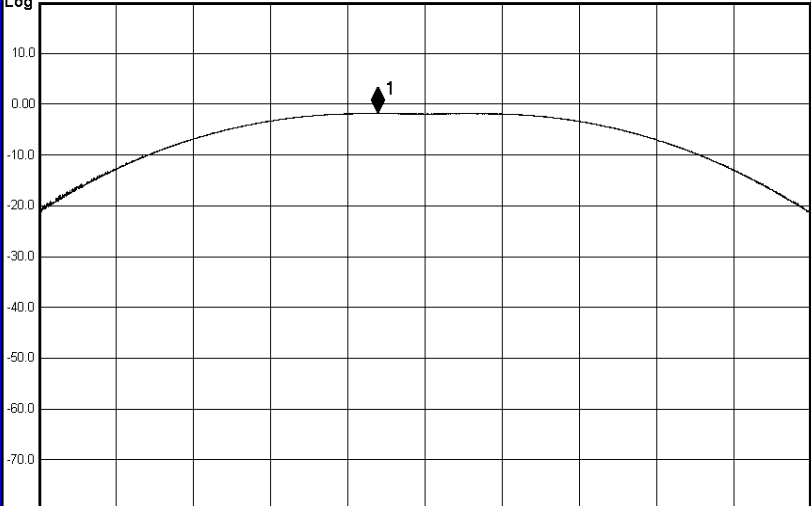
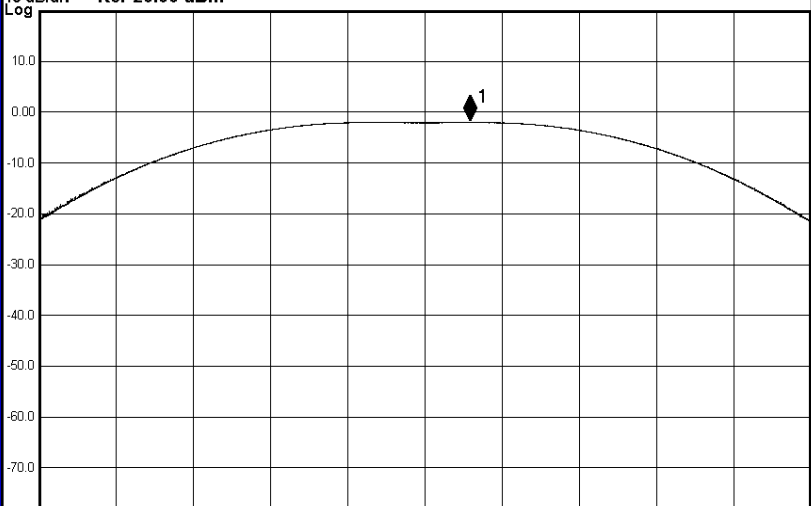
A.1 Duty Cycle

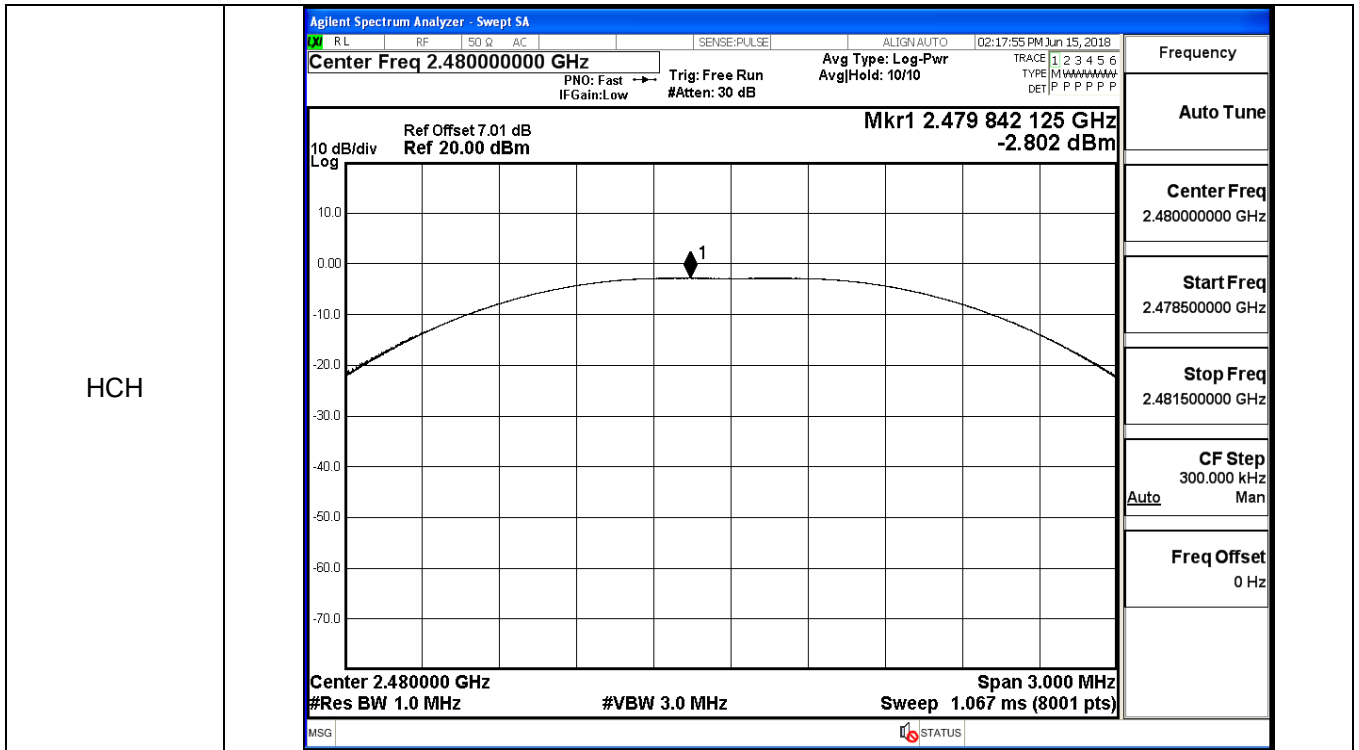
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS



A.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-1.827	30	PASS
BT LE	MCH	-1.982	30	PASS
BT LE	HCH	-2.802	30	PASS

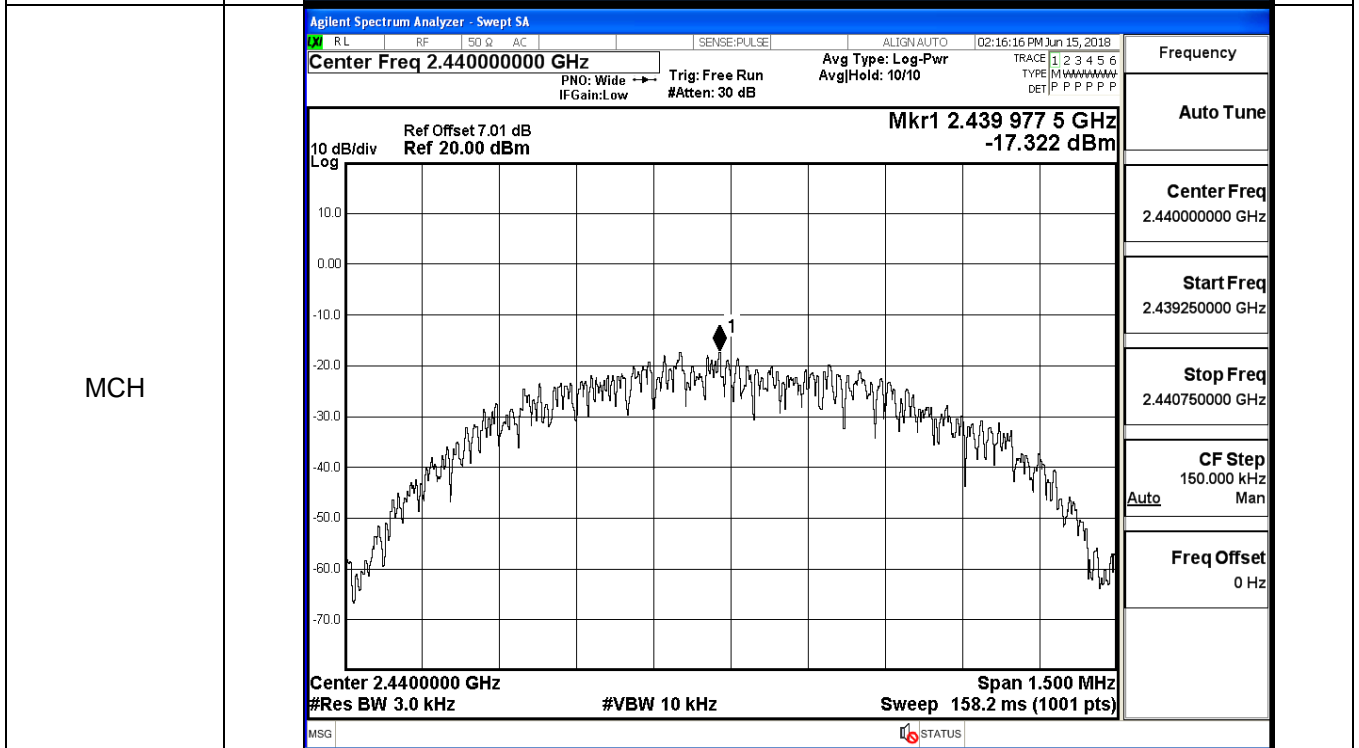
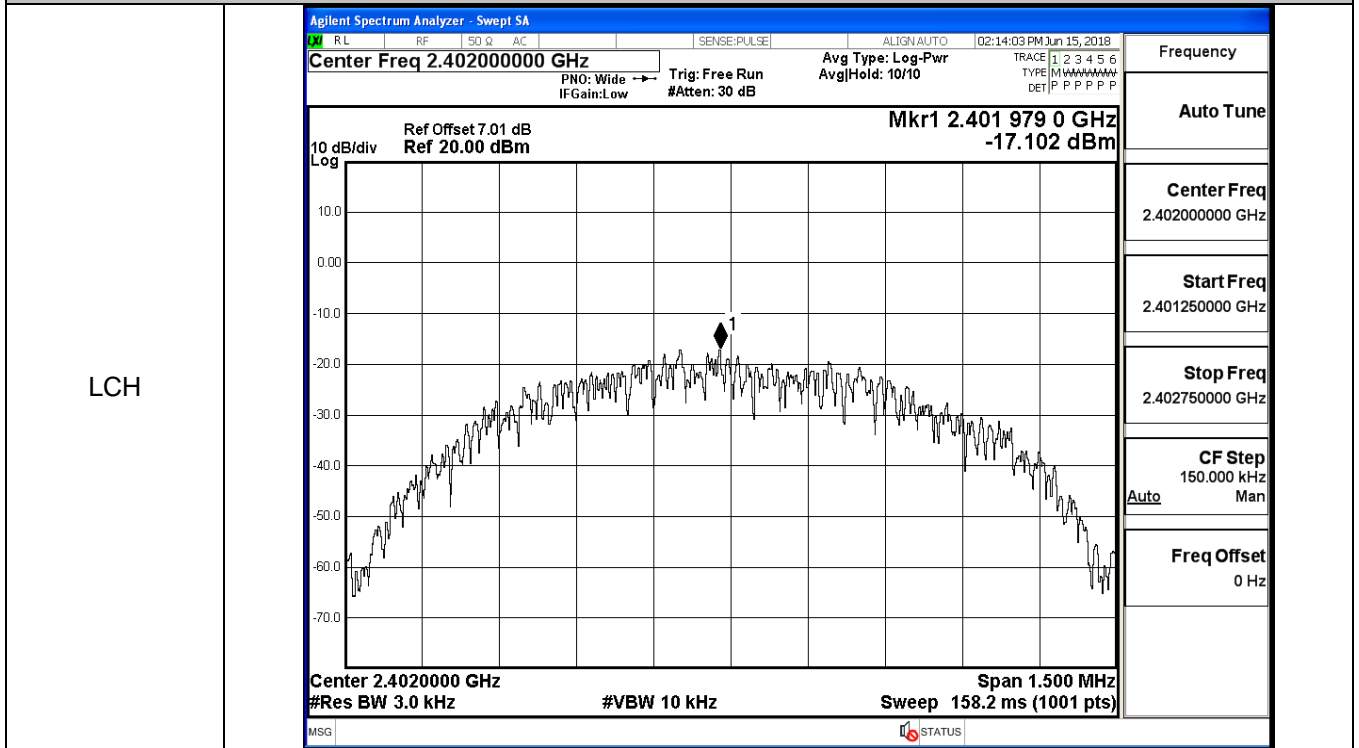
Test Graphs								
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Swept SA</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 02:13:50 PM Jun 15, 2018</p> <p style="font-size: small; margin: 0;">Center Freq 2.40200000 GHz Avg Type: Log-Pwr TRACE 1 2 3 4 5 6</p> <p style="font-size: x-small; margin: 0;">PNO: Fast Trig: Free Run AvgHold: 10/10 TYPE M W M M M M M M</p> <p style="font-size: x-small; margin: 0;">IFGain: Low #Atten: 30 dB DET P P P P P P</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="font-size: x-small; margin: 0;">Ref Offset 7.01 dB Mkr1 2.401 817 375 GHz</p> <p style="font-size: x-small; margin: 0;">Ref 20.00 dBm -1.827 dBm</p> </div>  <p style="font-size: x-small; margin: 0;">Center 2.402000 GHz Span 3.000 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.067 ms (8001 pts)</p> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr><td>Frequency</td></tr> <tr><td>Auto Tune</td></tr> <tr><td>Center Freq 2.402000000 GHz</td></tr> <tr><td>Start Freq 2.400500000 GHz</td></tr> <tr><td>Stop Freq 2.403500000 GHz</td></tr> <tr><td>CF Step 300.000 kHz Auto Man</td></tr> <tr><td>Freq Offset 0 Hz</td></tr> </table>	Frequency	Auto Tune	Center Freq 2.402000000 GHz	Start Freq 2.400500000 GHz	Stop Freq 2.403500000 GHz	CF Step 300.000 kHz Auto Man	Freq Offset 0 Hz
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MCH	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Swept SA</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 02:16:03 PM Jun 15, 2018</p> <p style="font-size: small; margin: 0;">Center Freq 2.440000000 GHz Avg Type: Log-Pwr TRACE 1 2 3 4 5 6</p> <p style="font-size: x-small; margin: 0;">PNO: Fast Trig: Free Run AvgHold: 10/10 TYPE M W M M M M M M</p> <p style="font-size: x-small; margin: 0;">IFGain: Low #Atten: 30 dB DET P P P P P P</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="font-size: x-small; margin: 0;">Ref Offset 7.01 dB Mkr1 2.440 177 375 GHz</p> <p style="font-size: x-small; margin: 0;">Ref 20.00 dBm -1.982 dBm</p> </div>  <p style="font-size: x-small; margin: 0;">Center 2.440000 GHz Span 3.000 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.067 ms (8001 pts)</p> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr><td>Frequency</td></tr> <tr><td>Auto Tune</td></tr> <tr><td>Center Freq 2.440000000 GHz</td></tr> <tr><td>Start Freq 2.438500000 GHz</td></tr> <tr><td>Stop Freq 2.441500000 GHz</td></tr> <tr><td>CF Step 300.000 kHz Auto Man</td></tr> <tr><td>Freq Offset 0 Hz</td></tr> </table>	Frequency	Auto Tune	Center Freq 2.440000000 GHz	Start Freq 2.438500000 GHz	Stop Freq 2.441500000 GHz	CF Step 300.000 kHz Auto Man	Freq Offset 0 Hz
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A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-17.102	8	PASS
BT LE	MCH	-17.322	8	PASS
BT LE	HCH	-18.182	8	PASS

Test Graphs



A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.7015	≥0.5	PASS
BT LE	MCH	0.6908	≥0.5	PASS
BT LE	HCH	0.7014	≥0.5	PASS

Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None Trig: Free Run AvgHold: 1/1 #IFGain: Low #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref Offset 7.01 dB Mkr1 2.401997 GHz Log Ref 20.00 dBm -2.6979 dBm</p> <p>Center 2.402 GHz Span 3 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <p>Occupied Bandwidth Total Power 4.44 dBm 1.0499 MHz</p> <p>Transmit Freq Error 3.934 kHz OBW Power 99.00 % x dB Bandwidth 701.5 kHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.402000000 GHz</p> <p>CF Step 300.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p>
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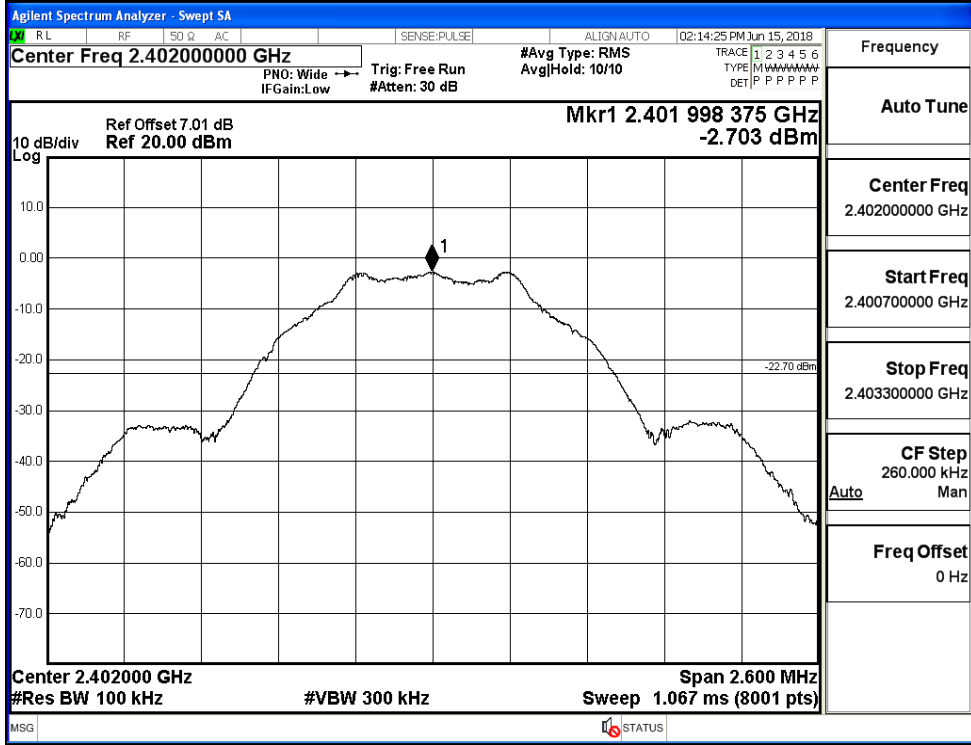
MCH	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.440000000 GHz Center Freq: 2.440000000 GHz Radio Std: None Trig: Free Run AvgHold: 1/1 #IFGain: Low #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref Offset 7.01 dB Mkr1 2.4399925 GHz Log Ref 20.00 dBm -2.8650 dBm</p> <p>Center 2.44 GHz Span 3 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <p>Occupied Bandwidth Total Power 4.26 dBm 1.0509 MHz</p> <p>Transmit Freq Error 4.525 kHz OBW Power 99.00 % x dB Bandwidth 690.8 kHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.440000000 GHz</p> <p>CF Step 300.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p>
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A.5 RF Conducted Spurious Emissions

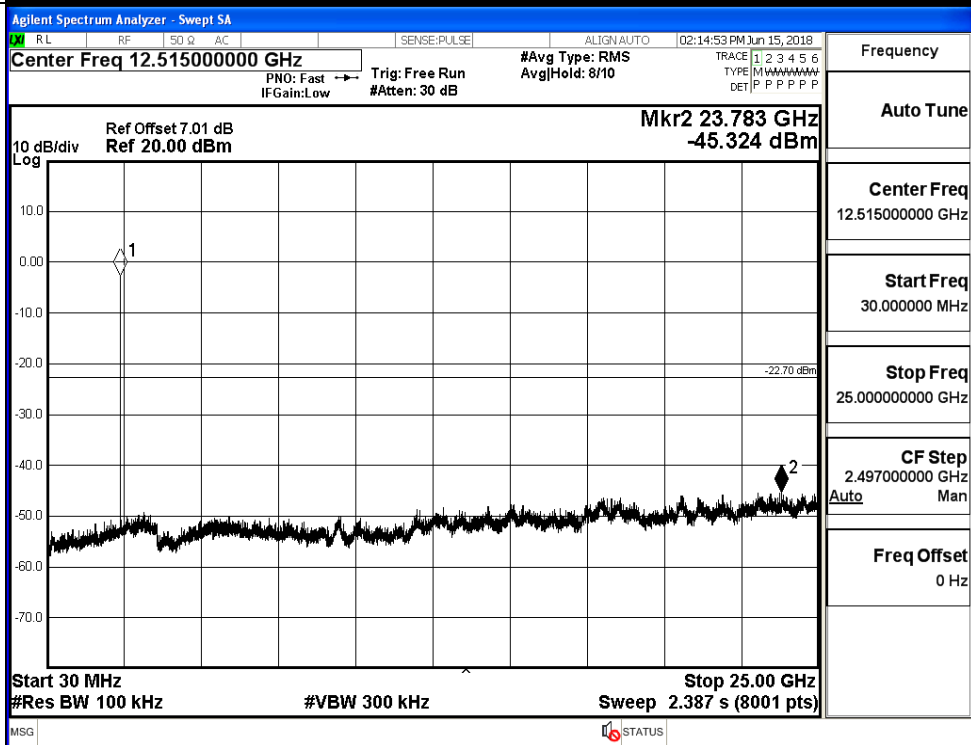
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.703	-45.324	-22.703	PASS
BT LE	MCH	-2.886	-45.593	-22.886	PASS
BT LE	HCH	-3.767	-44.349	-23.767	PASS

BT LE_LCH_Graphs

Pref/BT LE/LCH

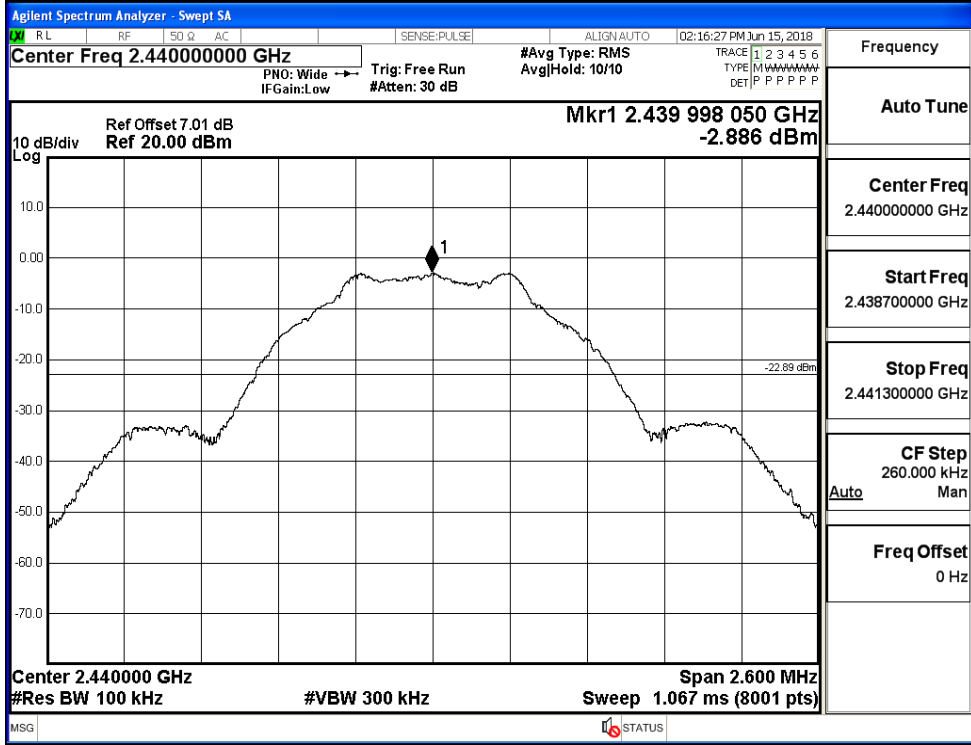


Puw/BT LE/LCH

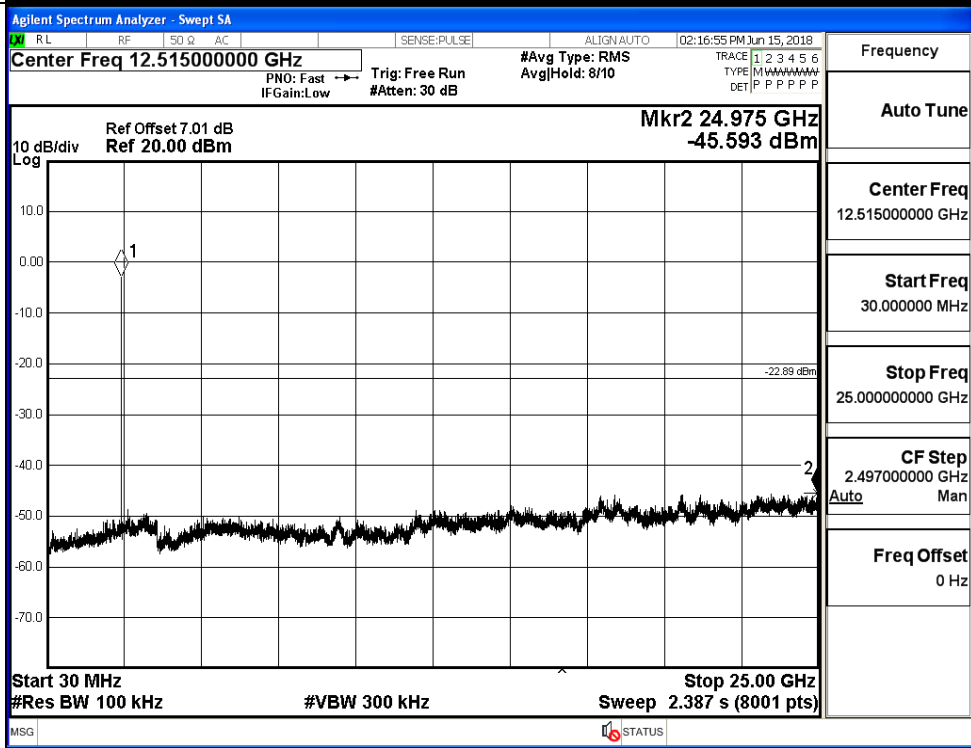


BT LE_MCH_Graphs

Pref/BT LE/MCH

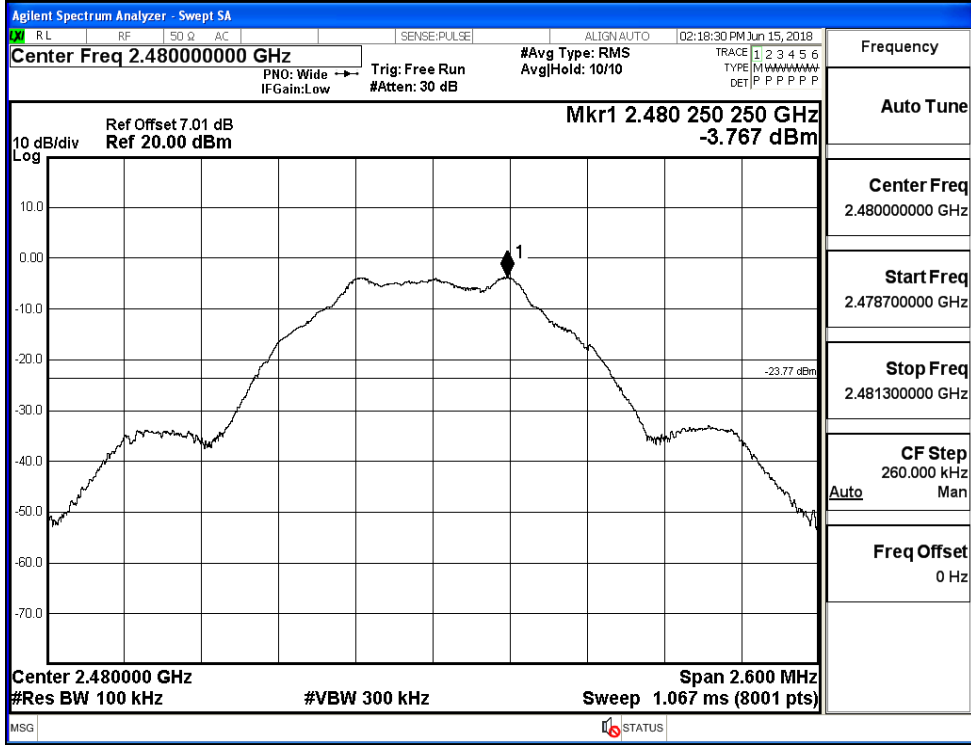


Puw/BT LE/MCH

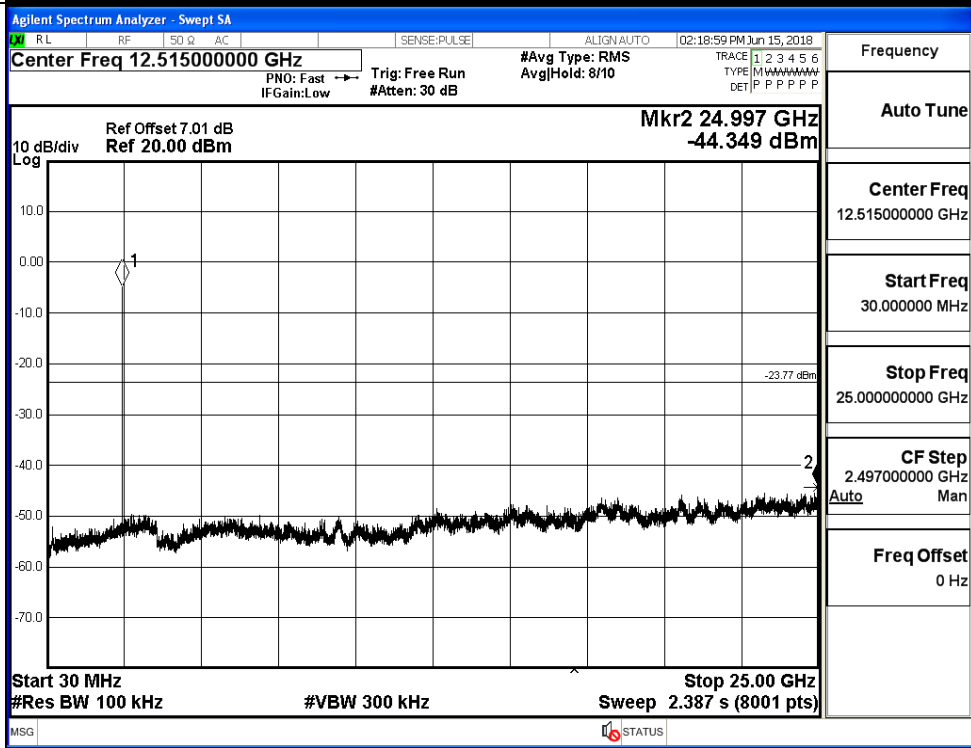


BT LE_HCH_Graphs

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	-2.627	-50.632	-22.63	PASS
BT LE	HCH	-3.544	-51.172	-23.54	PASS

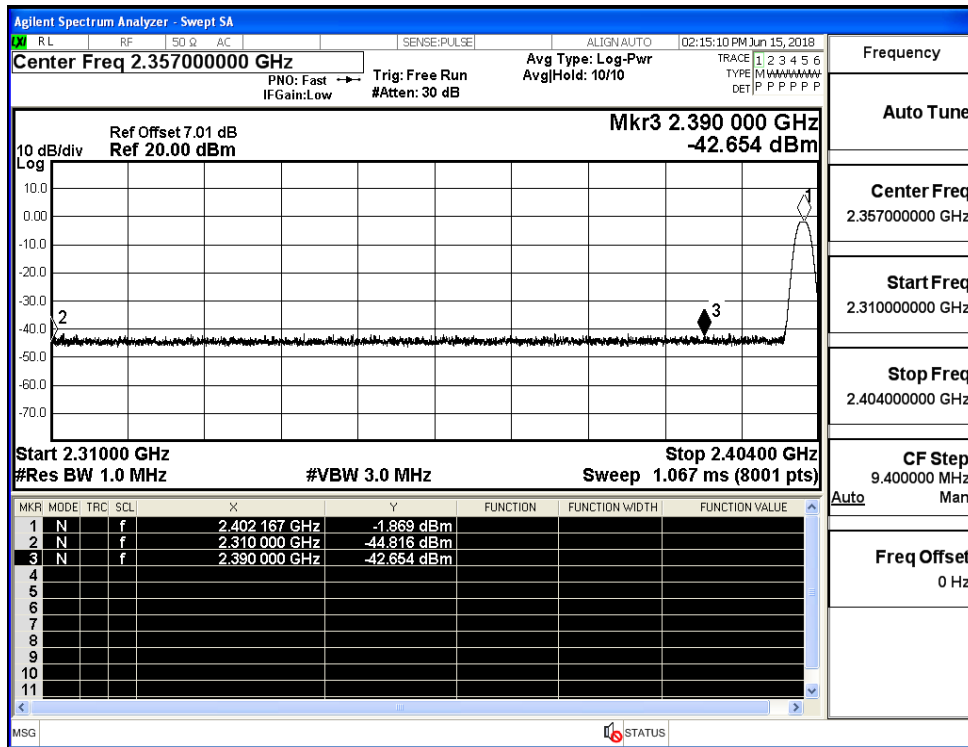
Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.35700000 GHz Mkr4 2.326 004 GHz -50.632 dBm Start 2.31000 GHz Stop 2.40400 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.067 ms (8001 pts)</p> <table border="1" style="font-size: small;"> <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>2.402 261 GHz</td><td>-2.627 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>-55.266 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>-55.378 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.326 004 GHz</td><td>-50.632 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		2.402 261 GHz	-2.627 dBm				2	N	f		2.400 000 GHz	-55.266 dBm				3	N	f		2.390 000 GHz	-55.378 dBm				4	N	f		2.326 004 GHz	-50.632 dBm				<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.35700000 GHz</p> <p>Start Freq 2.31000000 GHz</p> <p>Stop Freq 2.40400000 GHz</p> <p>CF Step 9.400000 MHz</p> <p>Freq Offset 0 Hz</p>
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HCH	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.48900000 GHz Mkr1 2.479 993 75 GHz -3.544 dBm Start 2.47800 GHz Stop 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.133 ms (8001 pts)</p> <table border="1" style="font-size: small;"> <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>2.479 993 75 GHz</td><td>-3.544 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>f</td><td></td><td>2.483 500 00 GHz</td><td>-55.057 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>f</td><td></td><td>2.500 000 00 GHz</td><td>-54.701 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.486 483 75 GHz</td><td>-51.172 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		2.479 993 75 GHz	-3.544 dBm				2	N	f		2.483 500 00 GHz	-55.057 dBm				3	N	f		2.500 000 00 GHz	-54.701 dBm				4	N	f		2.486 483 75 GHz	-51.172 dBm				<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.48900000 GHz</p> <p>Start Freq 2.47800000 GHz</p> <p>Stop Freq 2.50000000 GHz</p> <p>CF Step 2.200000 MHz</p> <p>Freq Offset 0 Hz</p>
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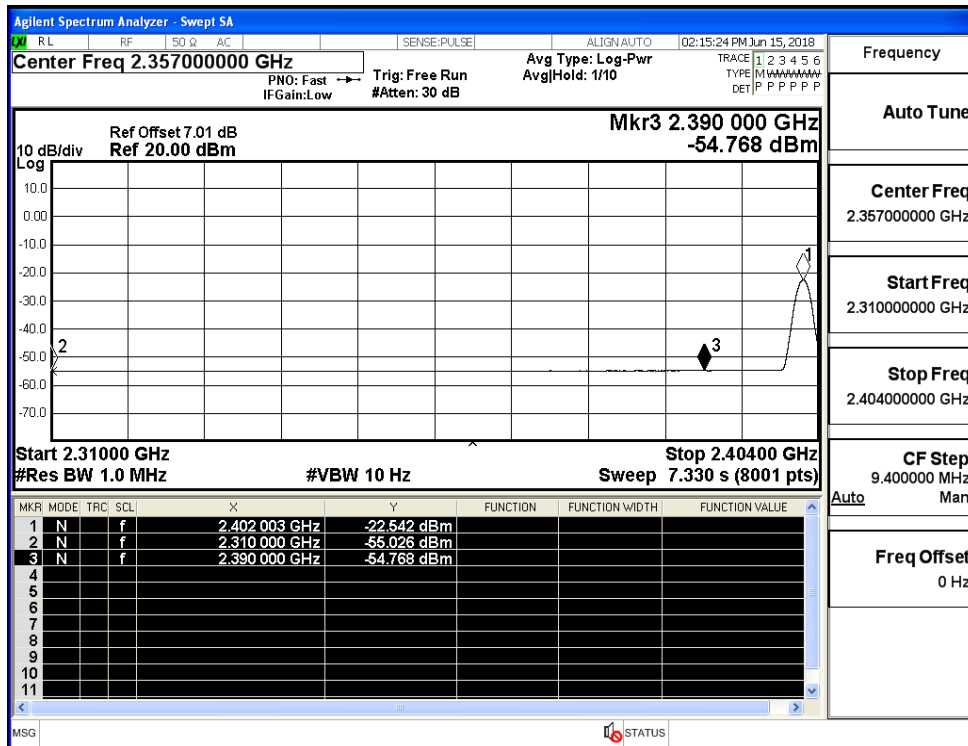
A.7 Restrict-band band-edge measurements

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	-44.82	2.0	0	52.41	PEAK	74	PASS
		Ant1	2310.0	-55.03	2.0	0	42.20	AV	54	PASS
		Ant1	2390.0	-42.65	2.0	0	54.58	PEAK	74	PASS
		Ant1	2390.0	-54.77	2.0	0	42.46	AV	54	PASS
	2480	Ant1	2483.5	-43.41	2.0	0	53.82	PEAK	74	PASS
		Ant1	2483.5	-54.54	2.0	0	42.69	AV	54	PASS
		Ant1	2500.0	-43.98	2.0	0	53.25	PEAK	74	PASS
		Ant1	2500.0	-54.42	2.0	0	42.81	AV	54	PASS

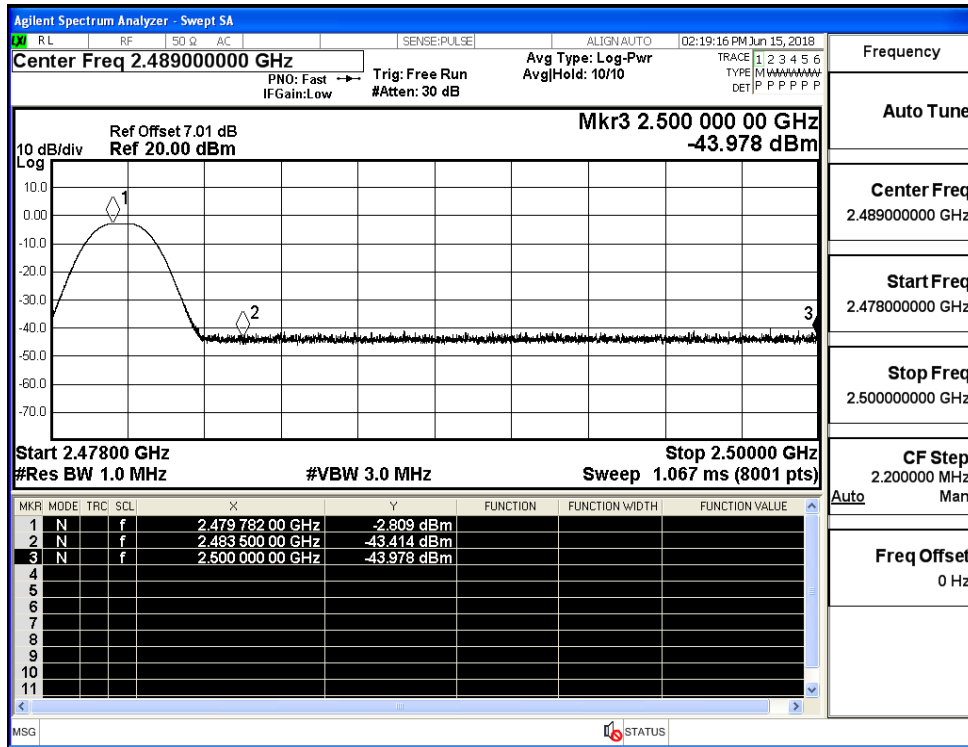
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

