

Appendix A

RF Test Data for BT LE 4.2(DTS) (Conducted Measurement)

Product Name: smart light switch

Trade Mark: Grde

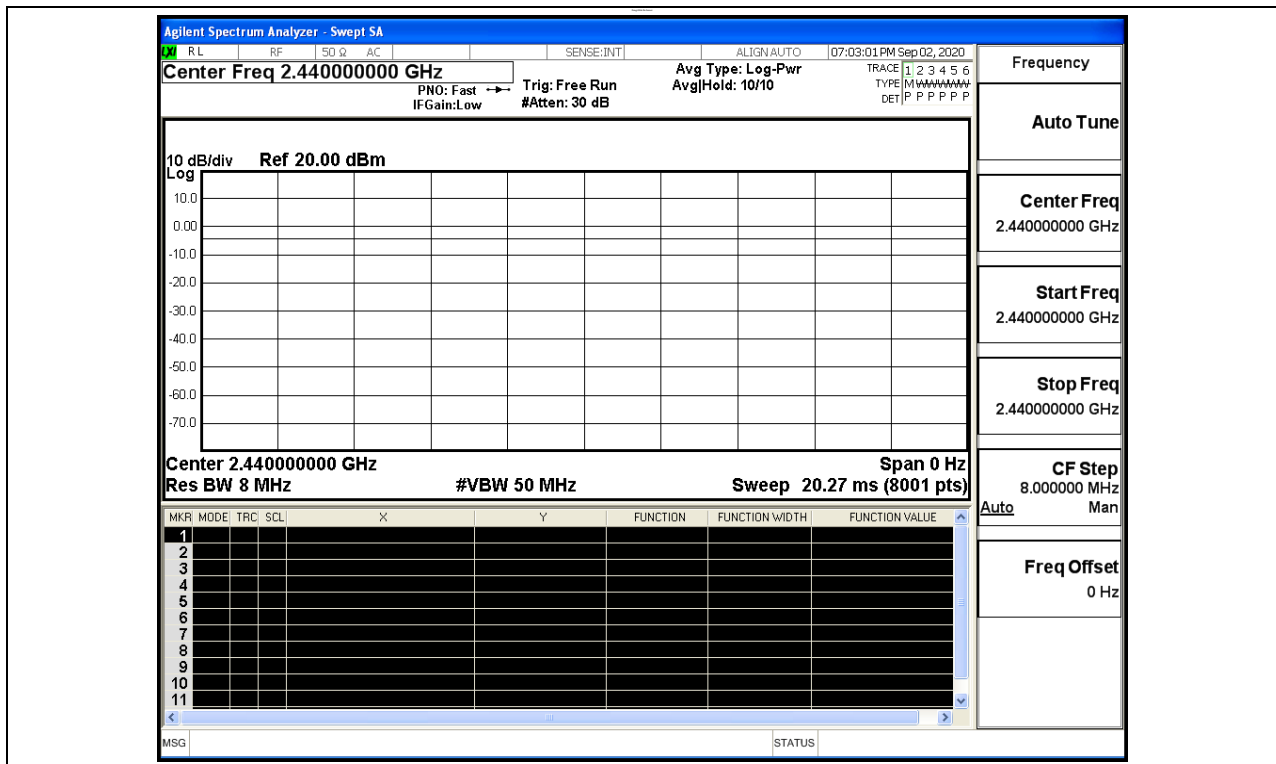
Test Model: LS01

Environmental Conditions

Temperature:	24.5 ° C
Relative Humidity:	53.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan

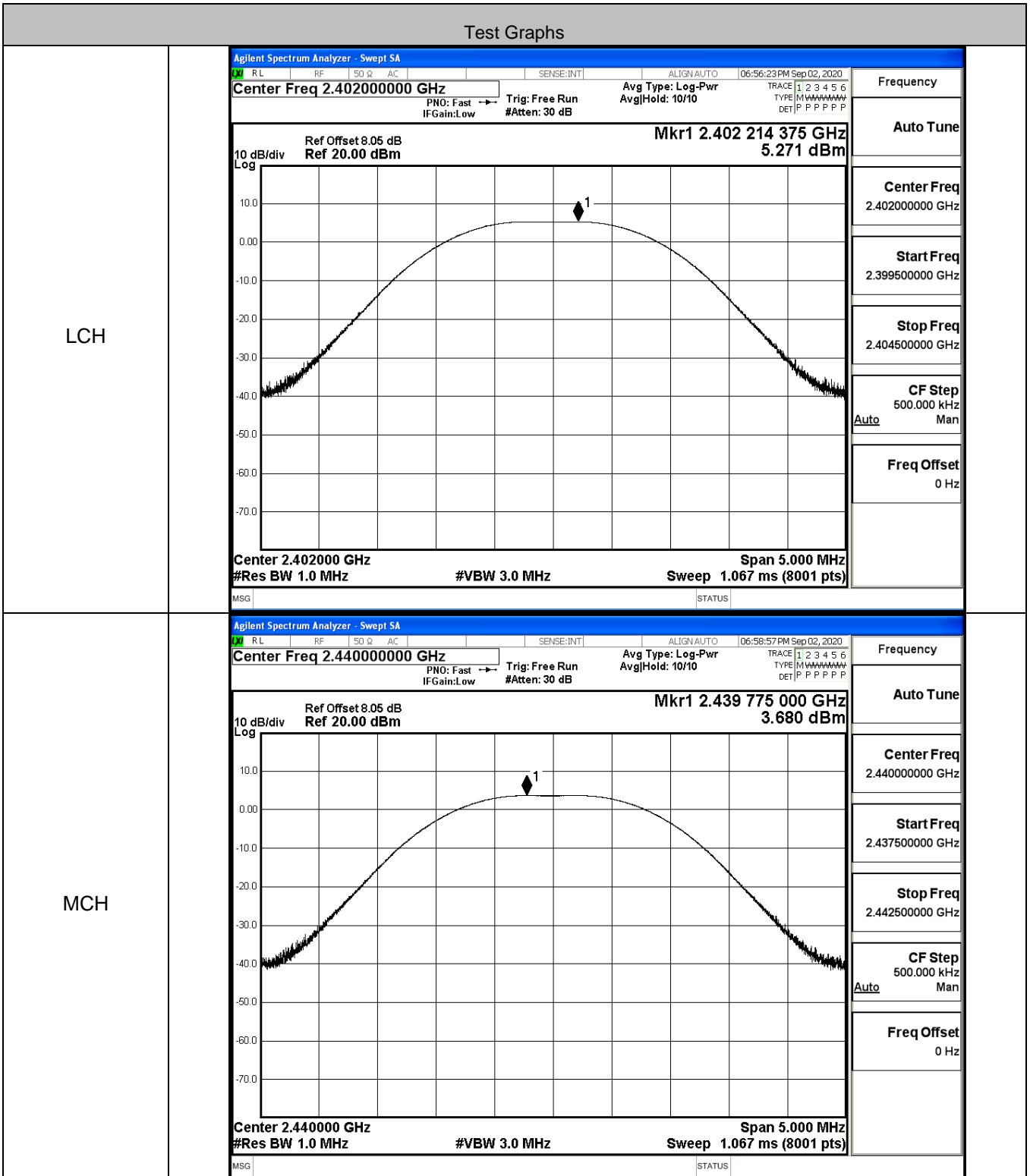
A.1 Duty Cycle

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

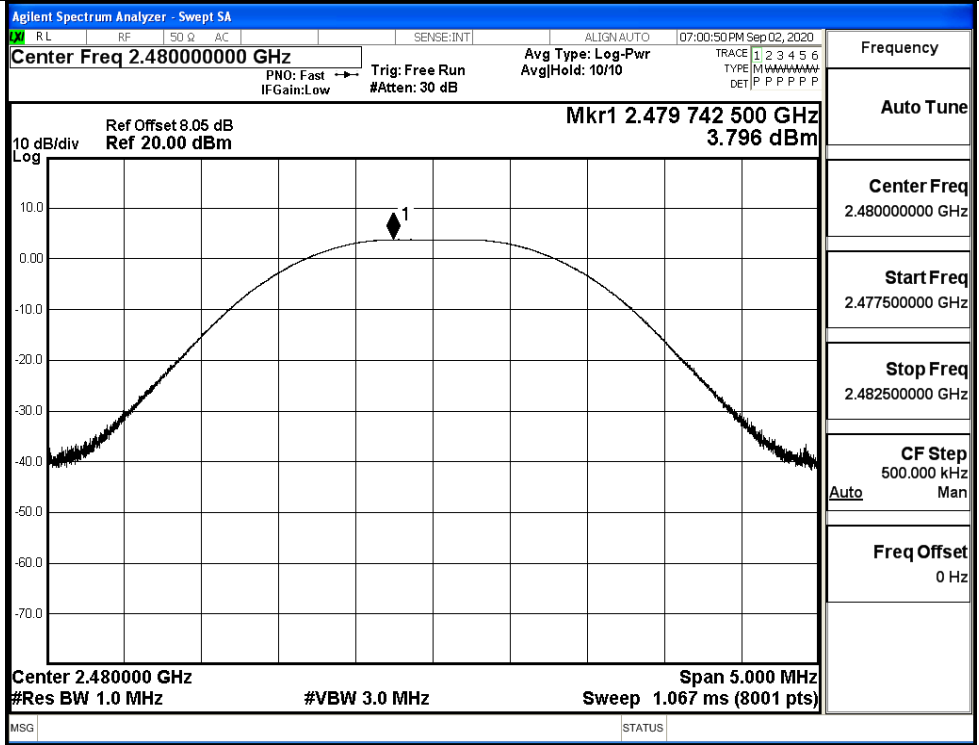


A.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	5.271	30	PASS
BT LE	MCH	3.680	30	PASS
BT LE	HCH	3.796	30	PASS



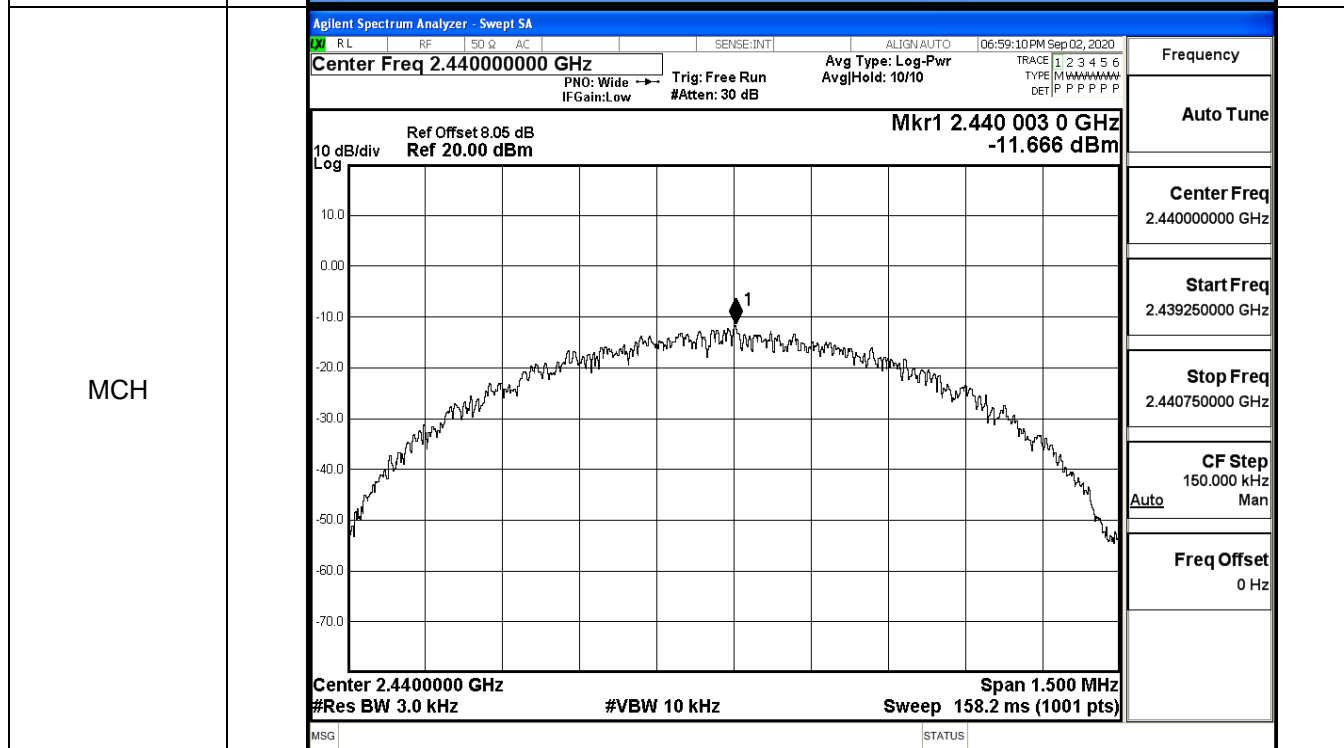
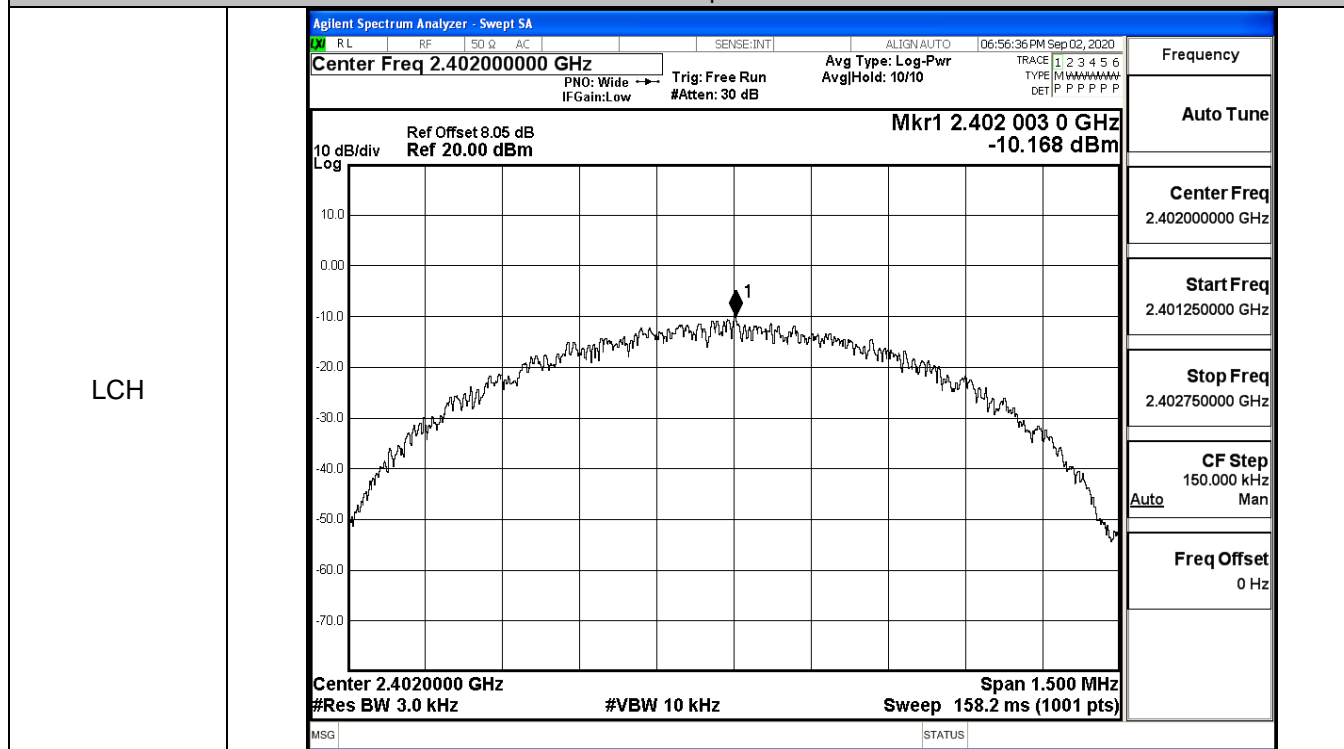
HCH



A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-10.168	8	PASS
BT LE	MCH	-11.666	8	PASS
BT LE	HCH	-11.621	8	PASS

Test Graphs



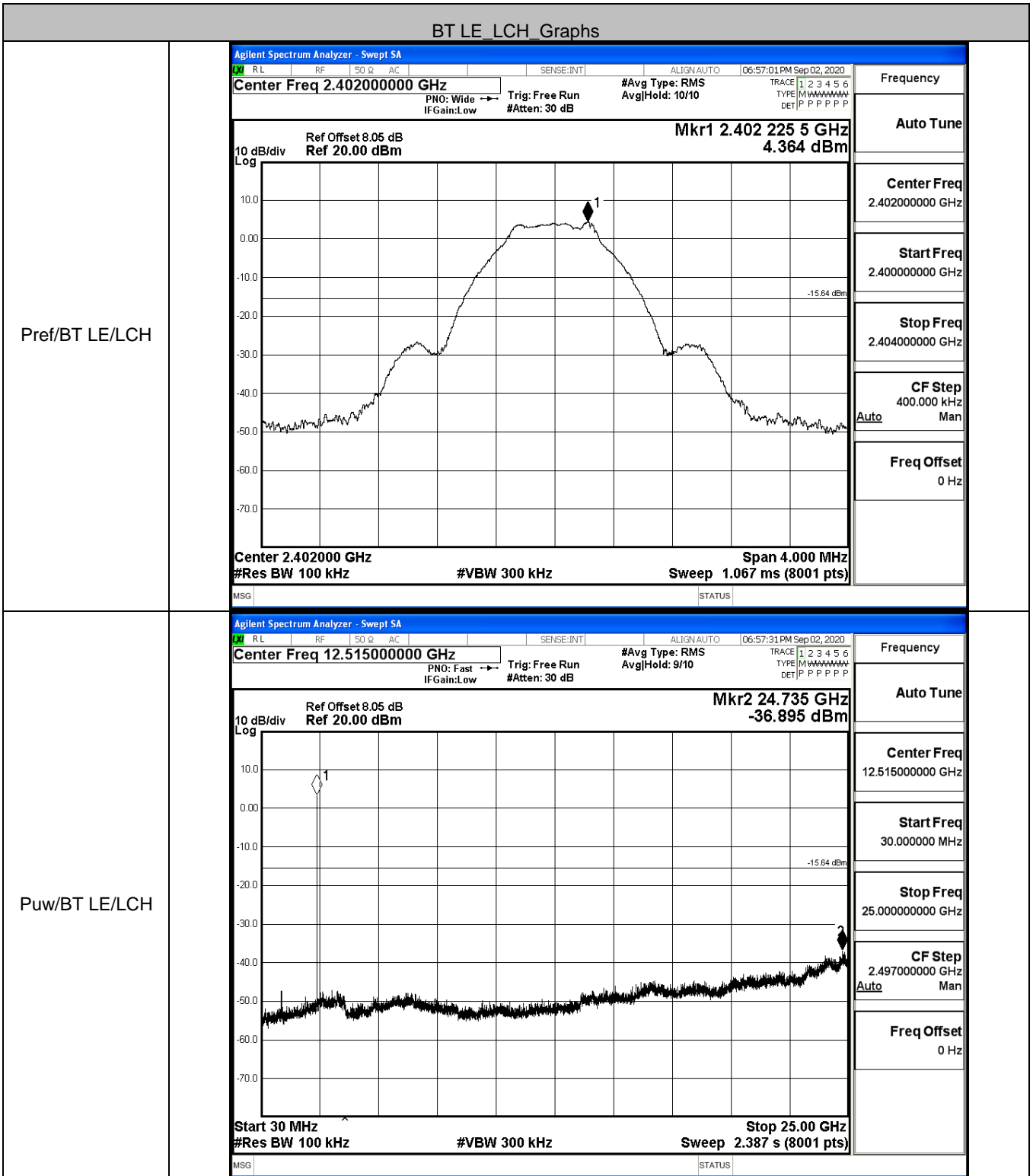
A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6792	≥0.5	PASS
BT LE	MCH	0.6841	≥0.5	PASS
BT LE	HCH	0.6729	≥0.5	PASS

Test Graphs																			
LCH	<div data-bbox="416 562 1390 1294"> <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 1/1 Radio Device: BTS</p> <p>#IFGain:Low #Atten: 30 dB</p> <p>Ref Offset 8.05 dB Mkr1 2.4022239 GHz</p> <p>Ref 20.00 dBm 4.3491 dBm</p> <p>Center 2.402 GHz Span 3 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table border="1"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>11.5 dBm</td> </tr> <tr> <td>1.0343 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>-10.774 kHz</td> <td>x dB</td> <td>-6.00 dB</td> </tr> <tr> <td>x dB Bandwidth</td> <td></td> <td></td> </tr> <tr> <td>679.2 kHz</td> <td></td> <td></td> </tr> </table> <p>MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	11.5 dBm	1.0343 MHz			Transmit Freq Error	OBW Power	99.00 %	-10.774 kHz	x dB	-6.00 dB	x dB Bandwidth			679.2 kHz		
Occupied Bandwidth	Total Power	11.5 dBm																	
1.0343 MHz																			
Transmit Freq Error	OBW Power	99.00 %																	
-10.774 kHz	x dB	-6.00 dB																	
x dB Bandwidth																			
679.2 kHz																			
MCH	<div data-bbox="416 1308 1390 2042"> <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.440000000 GHz Center Freq: 2.440000000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 1/1 Radio Device: BTS</p> <p>#IFGain:Low #Atten: 30 dB</p> <p>Ref Offset 8.05 dB Mkr1 2.4402288 GHz</p> <p>Ref 20.00 dBm 2.7392 dBm</p> <p>Center 2.44 GHz Span 3 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table border="1"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>9.89 dBm</td> </tr> <tr> <td>1.0412 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>-11.594 kHz</td> <td>x dB</td> <td>-6.00 dB</td> </tr> <tr> <td>x dB Bandwidth</td> <td></td> <td></td> </tr> <tr> <td>684.1 kHz</td> <td></td> <td></td> </tr> </table> <p>MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	9.89 dBm	1.0412 MHz			Transmit Freq Error	OBW Power	99.00 %	-11.594 kHz	x dB	-6.00 dB	x dB Bandwidth			684.1 kHz		
Occupied Bandwidth	Total Power	9.89 dBm																	
1.0412 MHz																			
Transmit Freq Error	OBW Power	99.00 %																	
-11.594 kHz	x dB	-6.00 dB																	
x dB Bandwidth																			
684.1 kHz																			

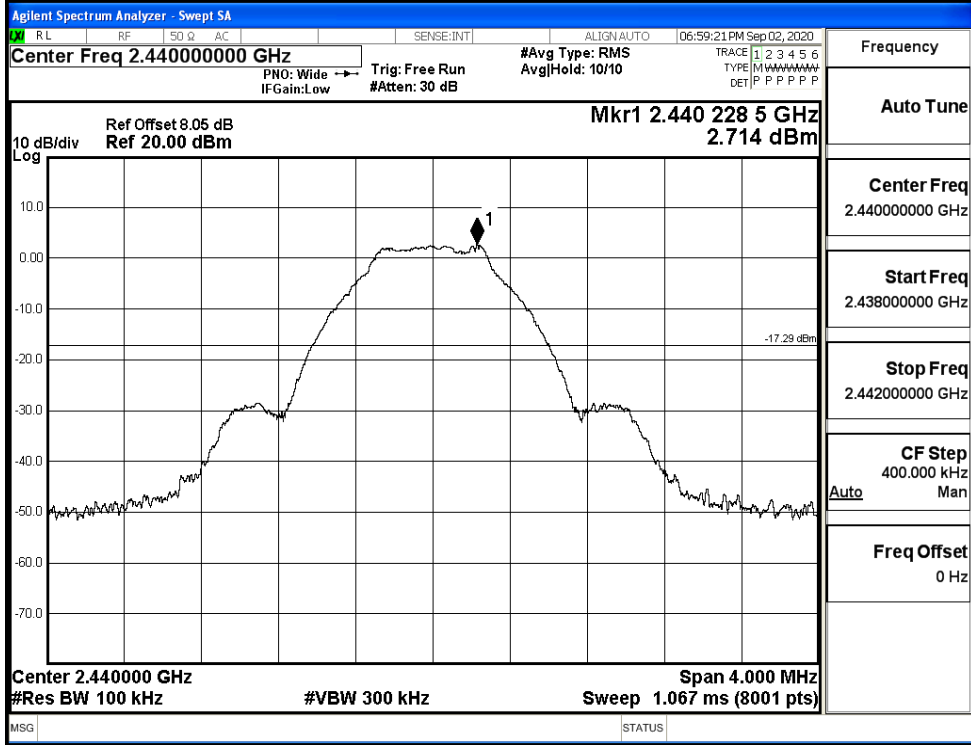
A.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	4.364	-36.895	-15.636	PASS
BT LE	MCH	2.714	-37.366	-17.286	PASS
BT LE	HCH	2.82	-37.533	-17.180	PASS

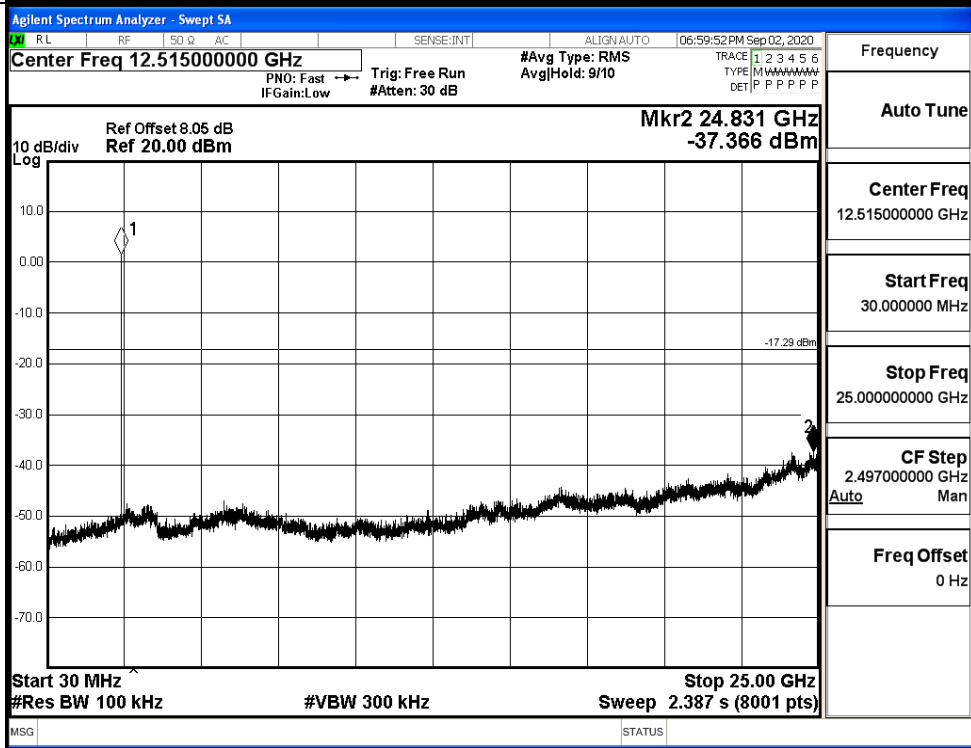


BT LE_MCH_Graphs

Pref/BT LE/MCH

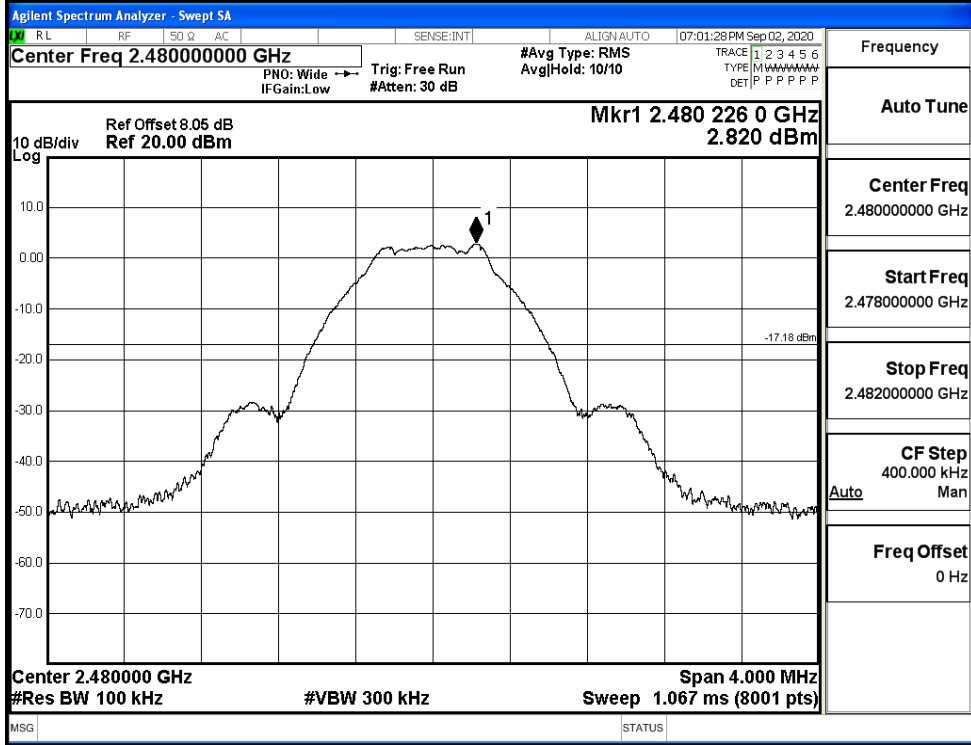


Puw/BT LE/MCH

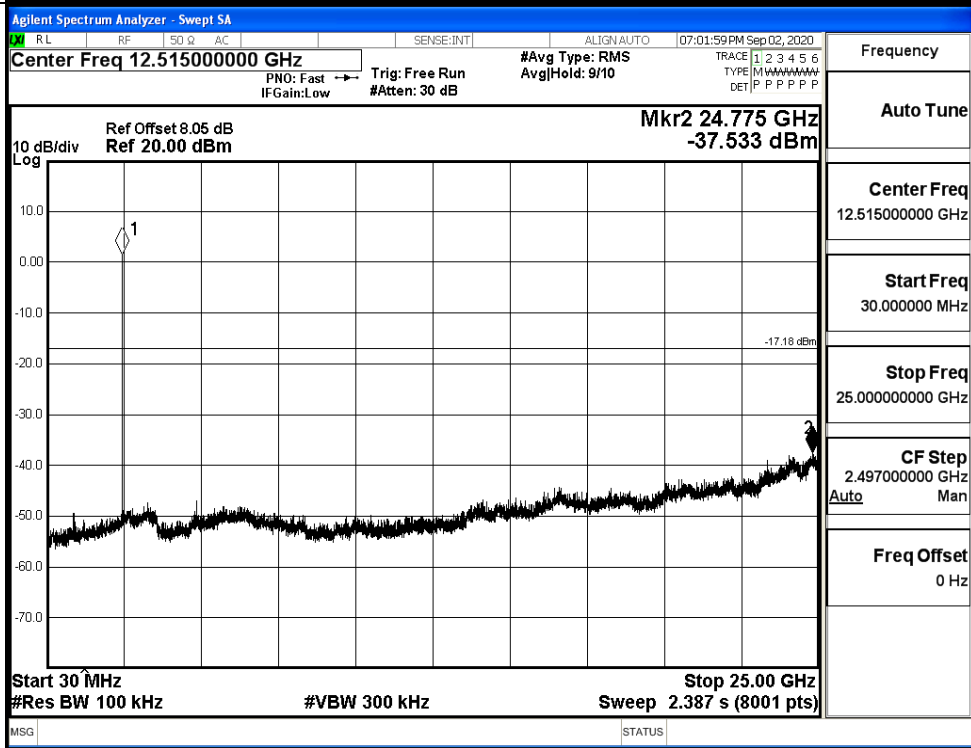


BT LE_HCH_Graphs

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	4.490	-49.854	-15.51	PASS
BT LE	HCH	3.087	-48.190	-16.91	PASS

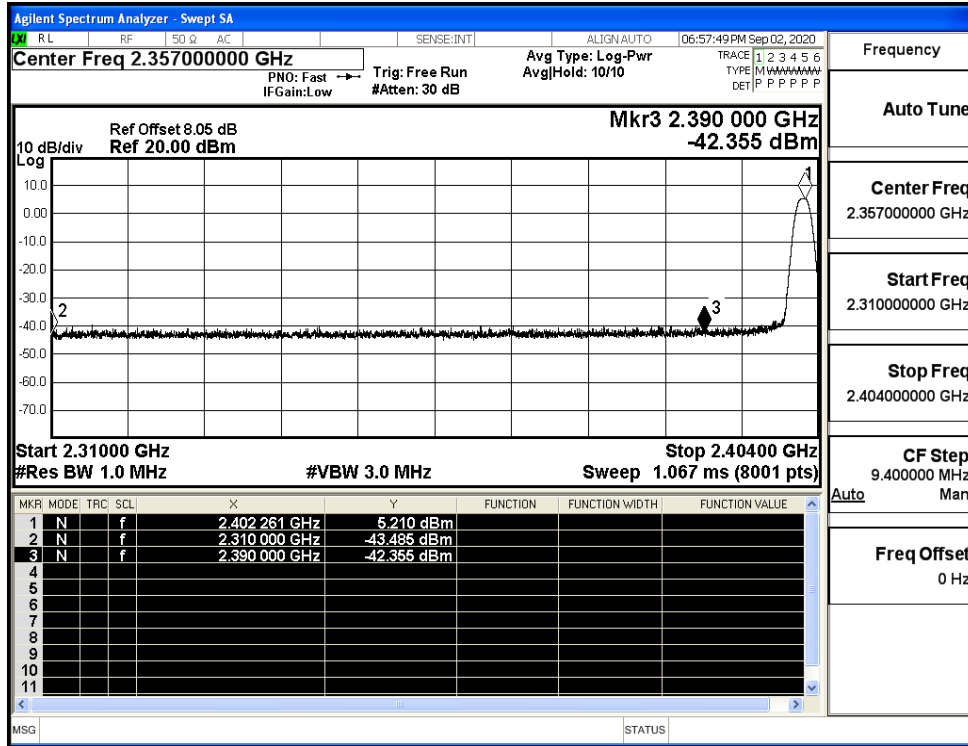
Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.35700000 GHz #Avg Type: RMS AvgHold: 10/10 Mkr4 2.325 569 GHz -49.854 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="width: 100%; border-collapse: collapse; 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>2.401 991 GHz</td><td>4.490 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>-48.904 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>-52.931 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.325 569 GHz</td><td>-49.854 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		2.401 991 GHz	4.490 dBm				2	N	f		2.400 000 GHz	-48.904 dBm				3	N	f		2.390 000 GHz	-52.931 dBm				4	N	f		2.325 569 GHz	-49.854 dBm				Frequency Auto Tune Center Freq 2.35700000 GHz Start Freq 2.310000000 GHz Stop Freq 2.404000000 GHz CF Step 9.400000 MHz Freq Offset 0 Hz
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																							
1	N	f		2.401 991 GHz	4.490 dBm																																										
2	N	f		2.400 000 GHz	-48.904 dBm																																										
3	N	f		2.390 000 GHz	-52.931 dBm																																										
4	N	f		2.325 569 GHz	-49.854 dBm																																										
HCH	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.48900000 GHz #Avg Type: RMS AvgHold: 10/10 Mkr4 2.484 047 25 GHz -48.190 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="width: 100%; border-collapse: collapse; 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>3.087 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>-51.799 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>-52.397 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.484 047 25 GHz</td><td>-48.190 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	3.087 dBm				2	N	f		2.483 500 00 GHz	-51.799 dBm				3	N	f		2.500 000 00 GHz	-52.397 dBm				4	N	f		2.484 047 25 GHz	-48.190 dBm				Frequency Auto Tune Center Freq 2.48900000 GHz Start Freq 2.478000000 GHz Stop Freq 2.500000000 GHz CF Step 2.200000 MHz Freq Offset 0 Hz
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																							
1	N	f		2.479 993 75 GHz	3.087 dBm																																										
2	N	f		2.483 500 00 GHz	-51.799 dBm																																										
3	N	f		2.500 000 00 GHz	-52.397 dBm																																										
4	N	f		2.484 047 25 GHz	-48.190 dBm																																										

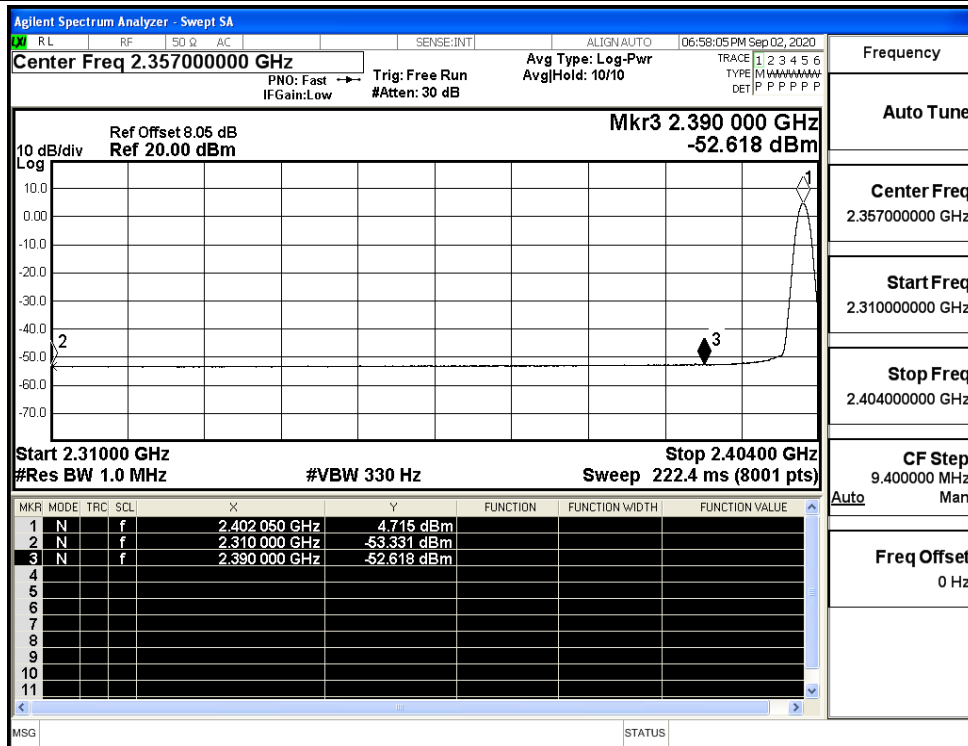
A.7 Restrict-band band-edge measurements

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	-43.49	2.0	0	53.74	PEAK	74	PASS
		Ant1	2310.0	-53.33	2.0	0	43.90	AV	54	PASS
		Ant1	2390.0	-42.36	2.0	0	54.87	PEAK	74	PASS
		Ant1	2390.0	-52.62	2.0	0	44.61	AV	54	PASS
	2480	Ant1	2483.5	-40.66	2.0	0	56.57	PEAK	74	PASS
		Ant1	2483.5	-50.82	2.0	0	46.41	AV	54	PASS
		Ant1	2500.0	-41.72	2.0	0	55.51	PEAK	74	PASS
		Ant1	2500.0	-52.30	2.0	0	44.93	AV	54	PASS

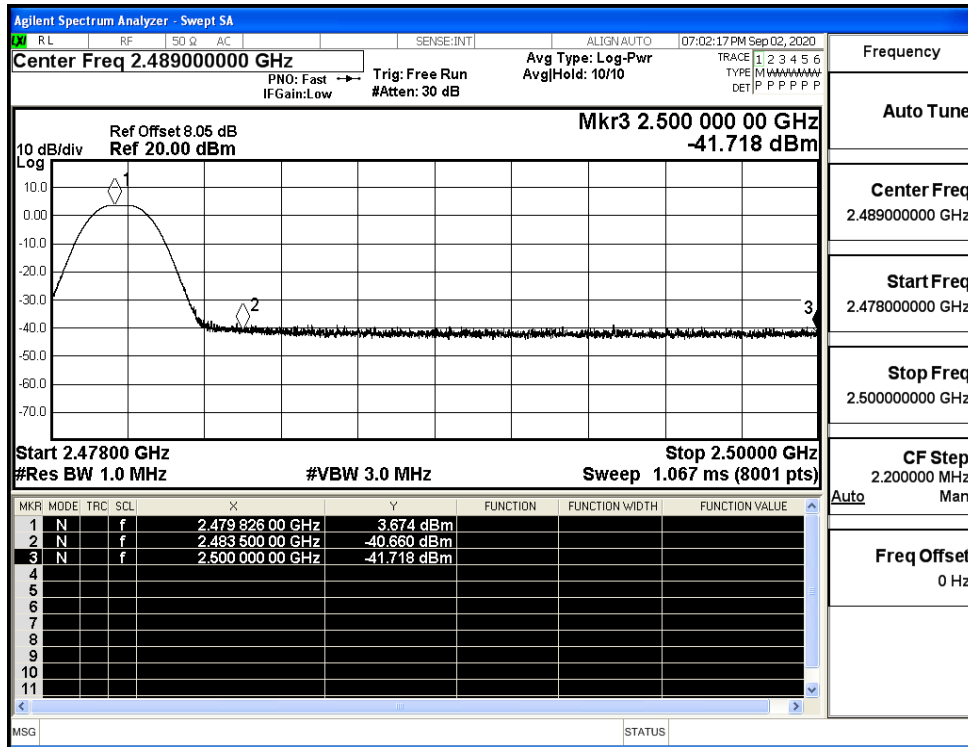
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

