

## Appendix A

### RF Test Data for BT LE V5.0(BDR/EDR) (Conducted Measurement)

Product Name: Aquarium Luminaire

Trade Mark: Fluval

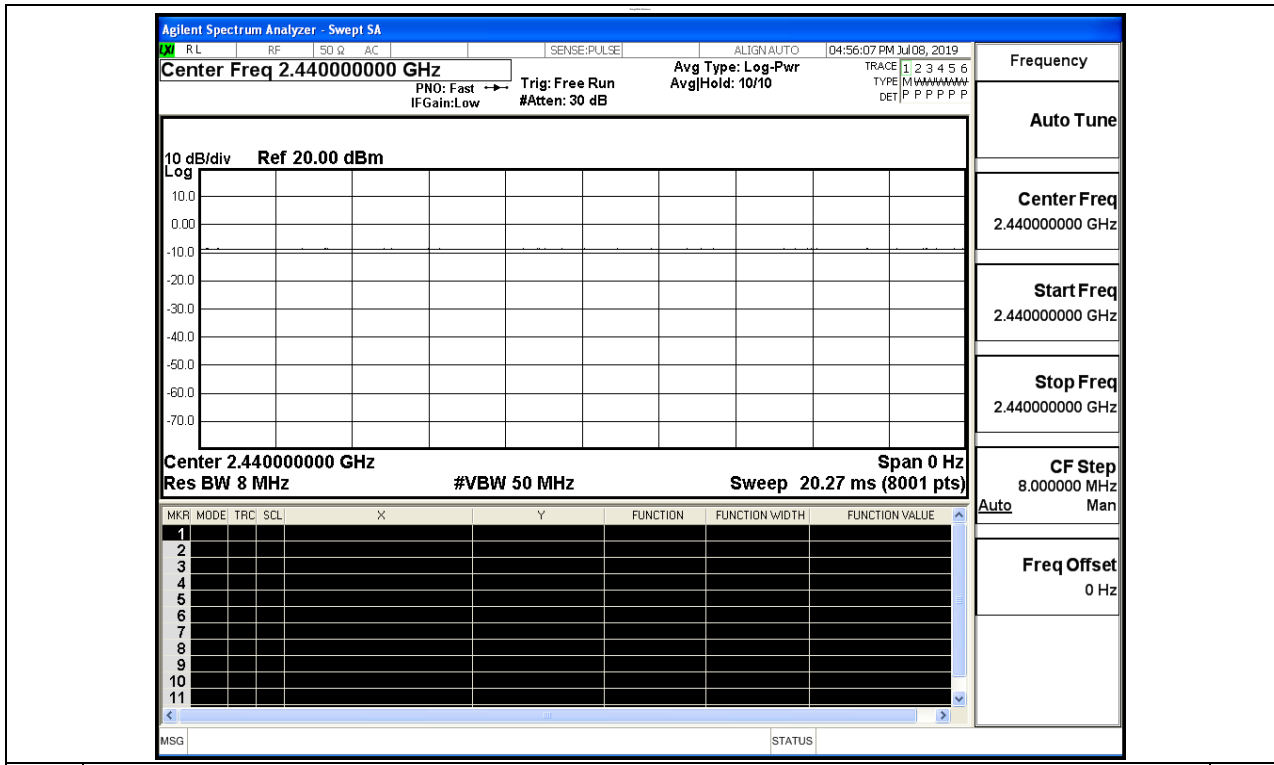
Test Model: 14513

#### Environmental Conditions

Temperature:	24.1 ° C
Relative Humidity:	53.6%
ATM Pressure:	100.0 kPa
Test Engineer:	David Luo
Supervised by:	Wang.Chuang

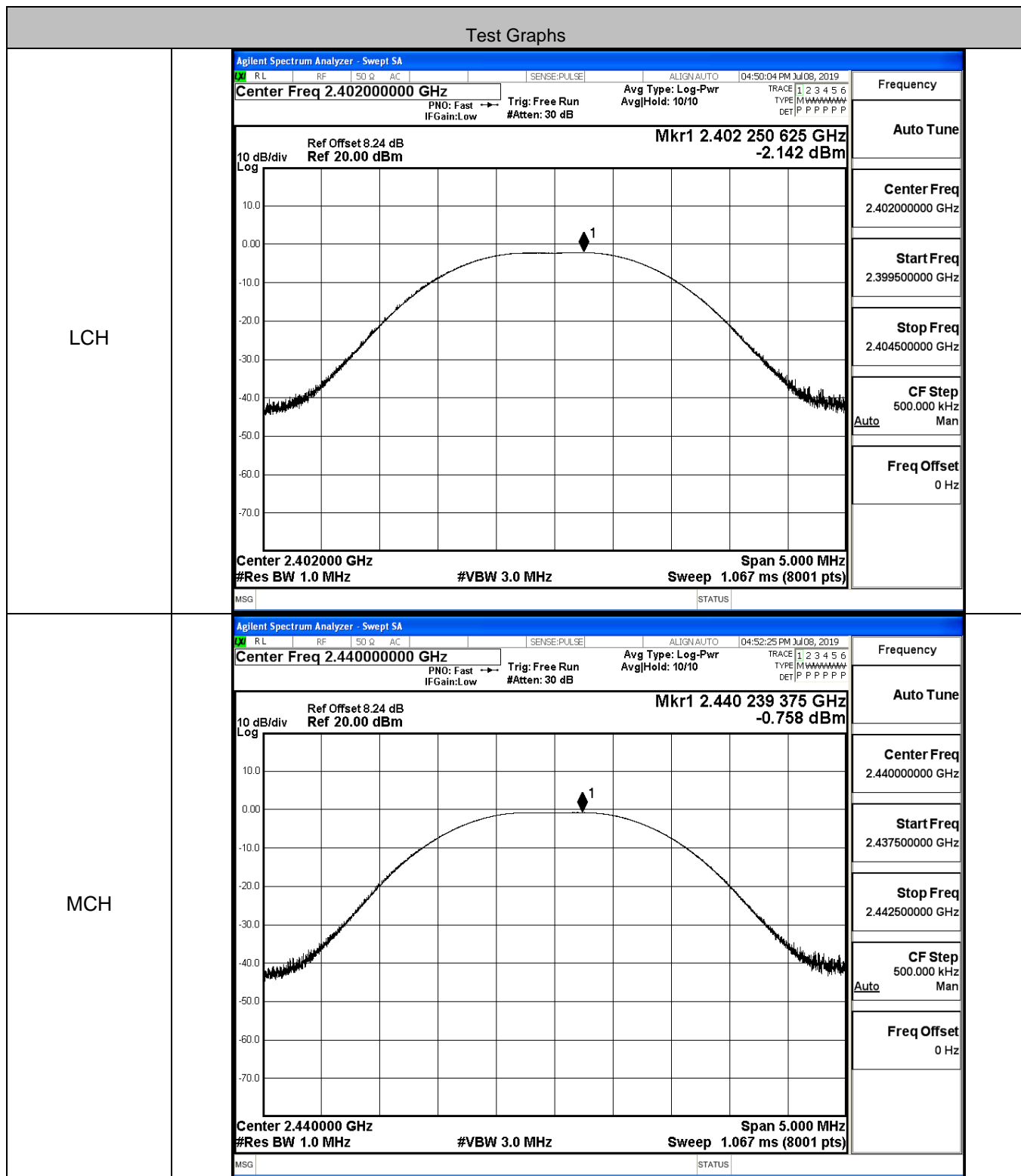
#### B.1 Duty Cycle

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

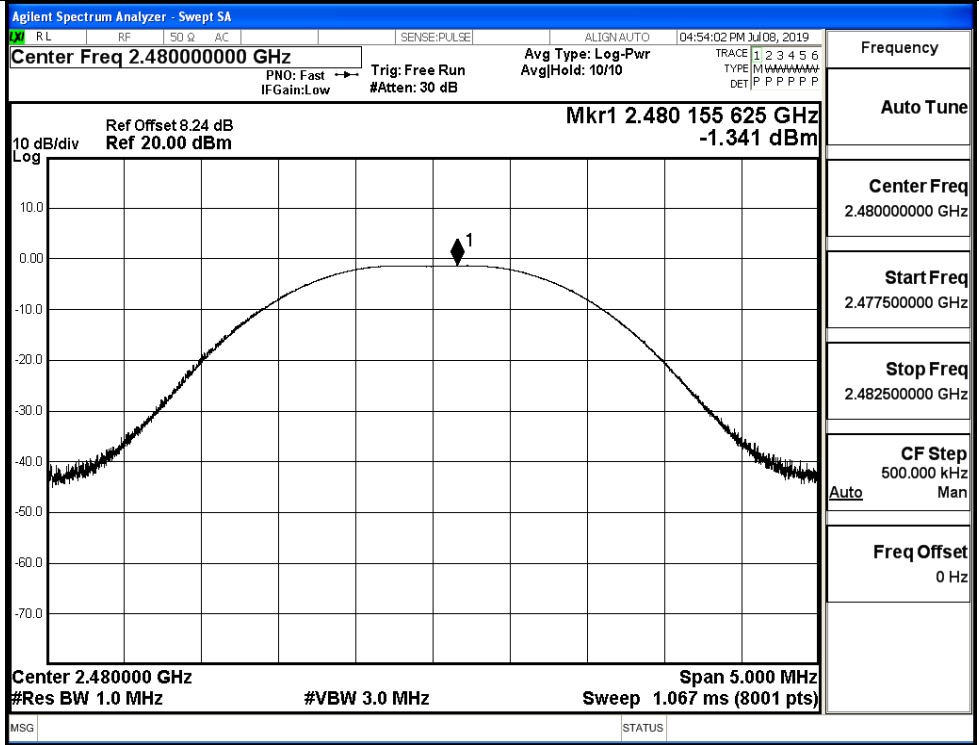


### B.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.142	30	PASS
BT LE	MCH	-0.758	30	PASS
BT LE	HCH	-1.341	30	PASS



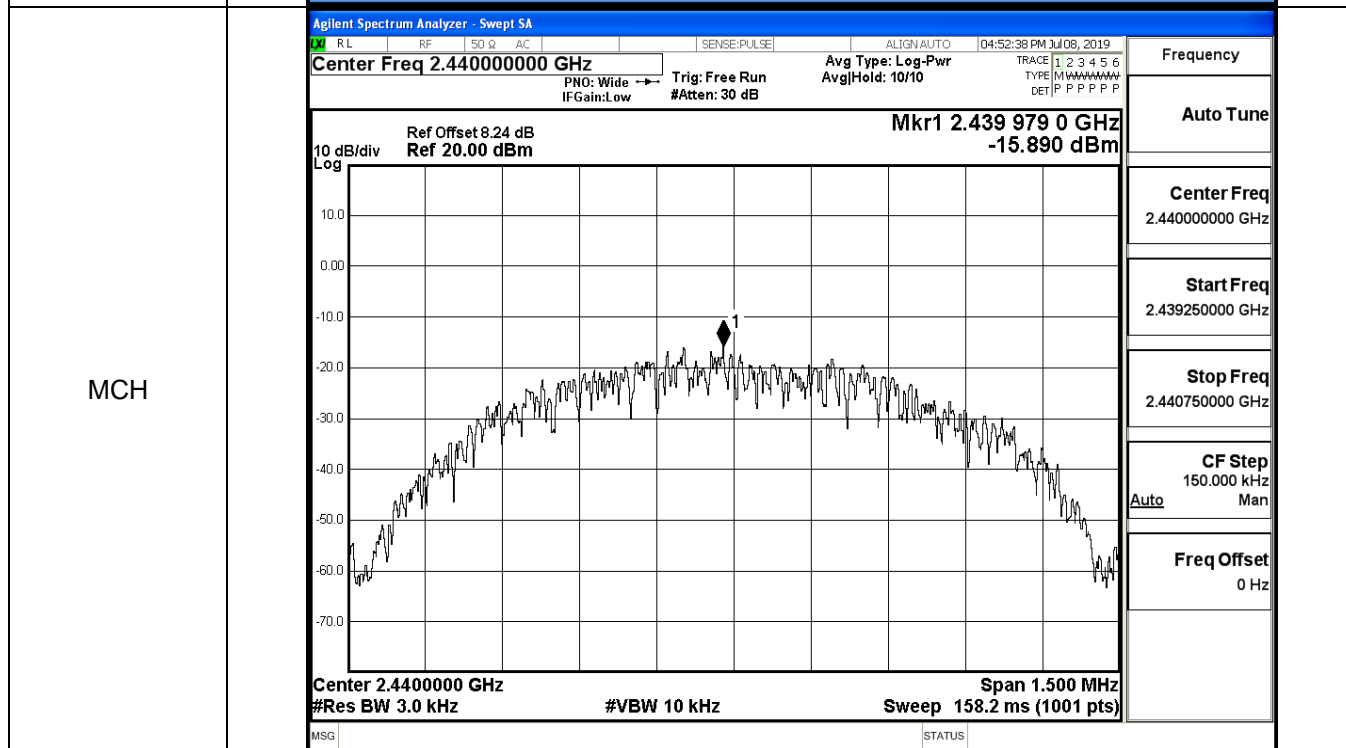
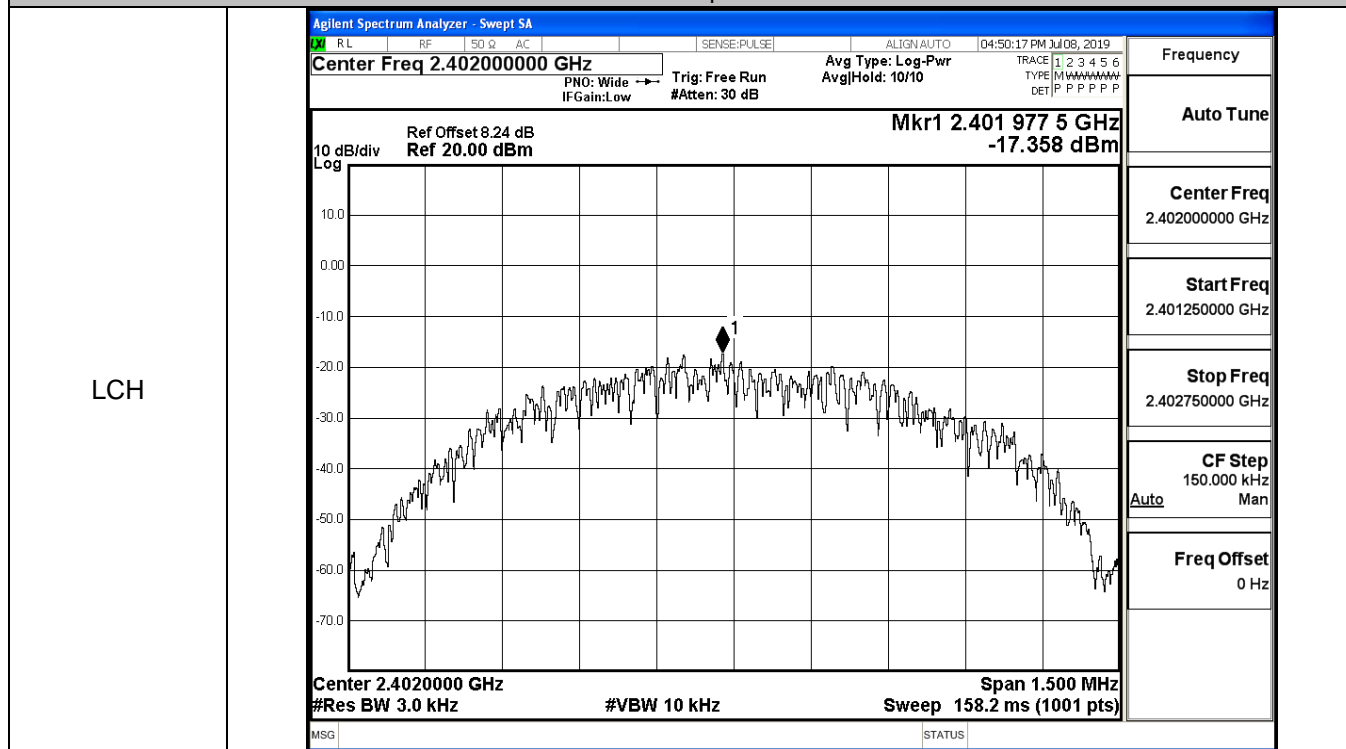
HCH



### B.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-17.358	8	PASS
BT LE	MCH	-15.890	8	PASS
BT LE	HCH	-16.450	8	PASS

#### Test Graphs





**B.4 6dB Bandwidth**

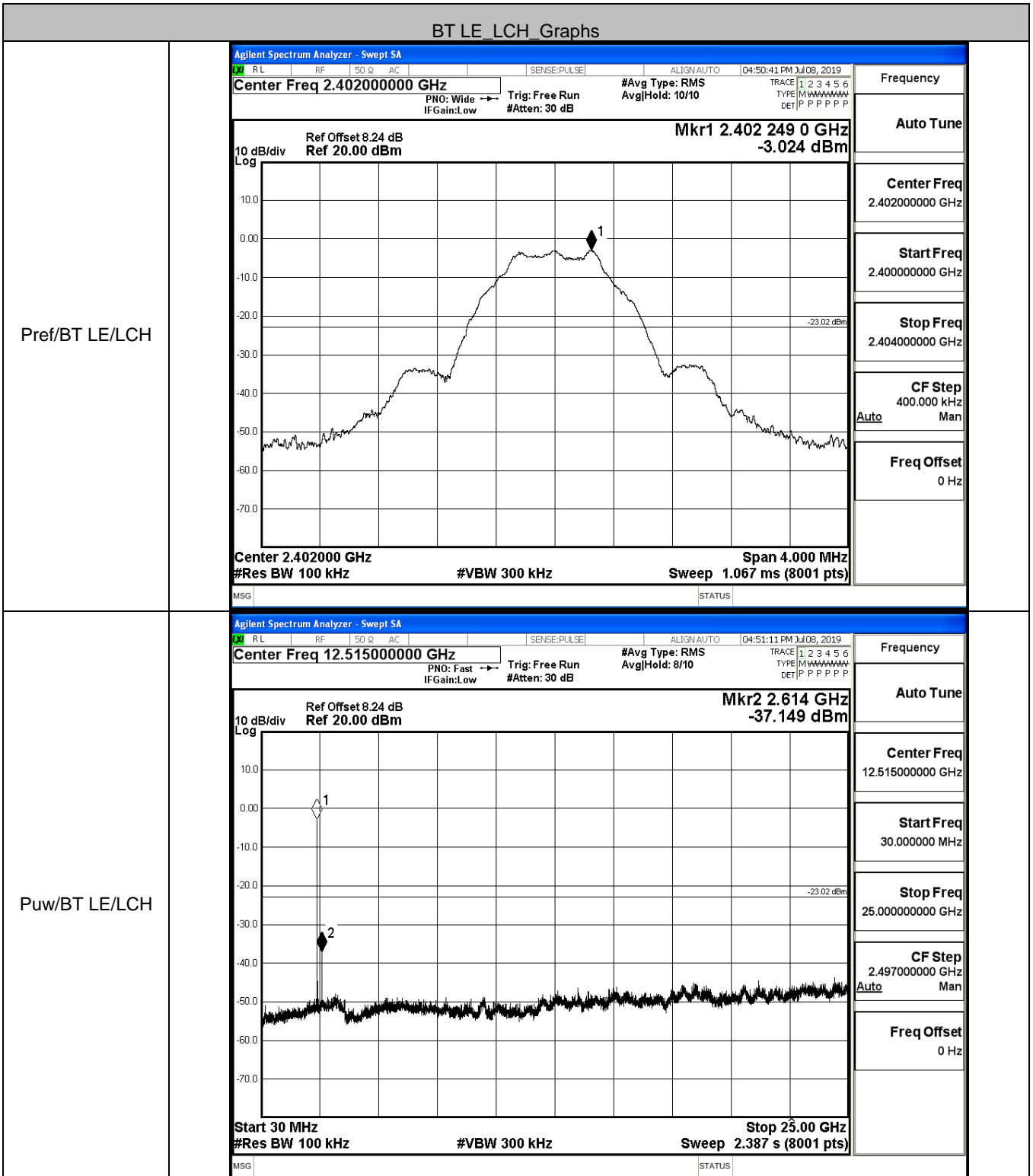
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6956	≥0.5	PASS
BT LE	MCH	0.6868	≥0.5	PASS
BT LE	HCH	0.6842	≥0.5	PASS

Test Graphs													
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 04:49:53 PM Jul 08, 2019</p> <p style="margin: 0;">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 style="margin: 0;">Center 2.402 GHz Span 3 MHz                      #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table border="0" style="width: 100%; font-size: small;"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>4.10 dBm</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>1.0504 MHz</b></td> </tr> <tr> <td>Transmit Freq Error</td> <td>7.404 kHz</td> <td>OBW Power 99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>695.6 kHz</td> <td>x dB -6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	4.10 dBm	<b>1.0504 MHz</b>			Transmit Freq Error	7.404 kHz	OBW Power 99.00 %	x dB Bandwidth	695.6 kHz	x dB -6.00 dB
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x dB Bandwidth	686.8 kHz	x dB -6.00 dB											

HCH	Agilent Spectrum Analyzer - Occupied BW			RL	RF	50 Ω	AC	SENSE: PULSE	ALIGN: AUTO	04:53:50 PM Jul 08, 2019	
	<b>Center Freq 2.480000000 GHz</b>			Center Freq: 2.480000000 GHz			Radio Std: None			Frequency	
	#IFGain: Low			Trig: Free Run			AvgHold: >1/1			Radio Device: BTS	
	#Atten: 30 dB			Mkr1 2.4799981 GHz			-2.1665 dBm			Center Freq 2.480000000 GHz	
	Ref Offset 8.24 dB			Ref 20.00 dBm			Span 3 MHz			CF Step 300.000 kHz	
10 dB/div			Log			#Res BW 100 kHz			Auto		
#VBW 300 kHz			Sweep 1.067 ms			Occupied Bandwidth			Man		
Total Power			4.90 dBm			1.0431 MHz			Freq Offset 0 Hz		
Transmit Freq Error			5.220 kHz			OBW Power					
x dB Bandwidth			684.2 kHz			x dB					
MSG						STATUS					

### B.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-3.024	-37.149	-23.024	PASS
BT LE	MCH	-1.56	-37.052	-21.560	PASS
BT LE	HCH	-2.179	-44.498	-22.179	PASS

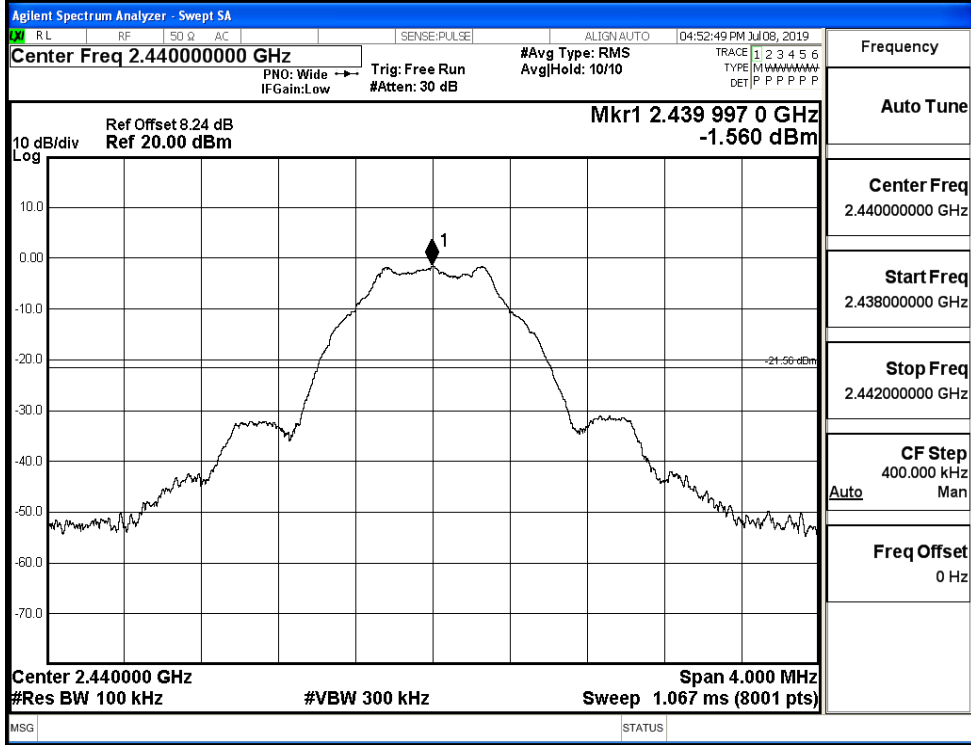




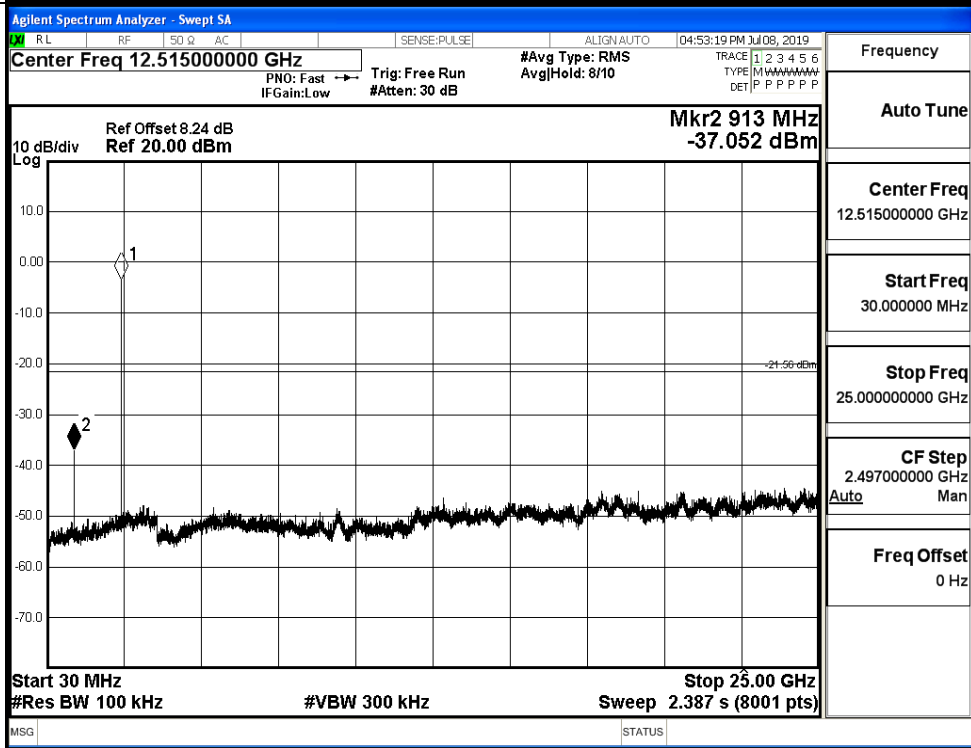
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BT LE\_MCH\_Graphs

Pref/BT LE/MCH

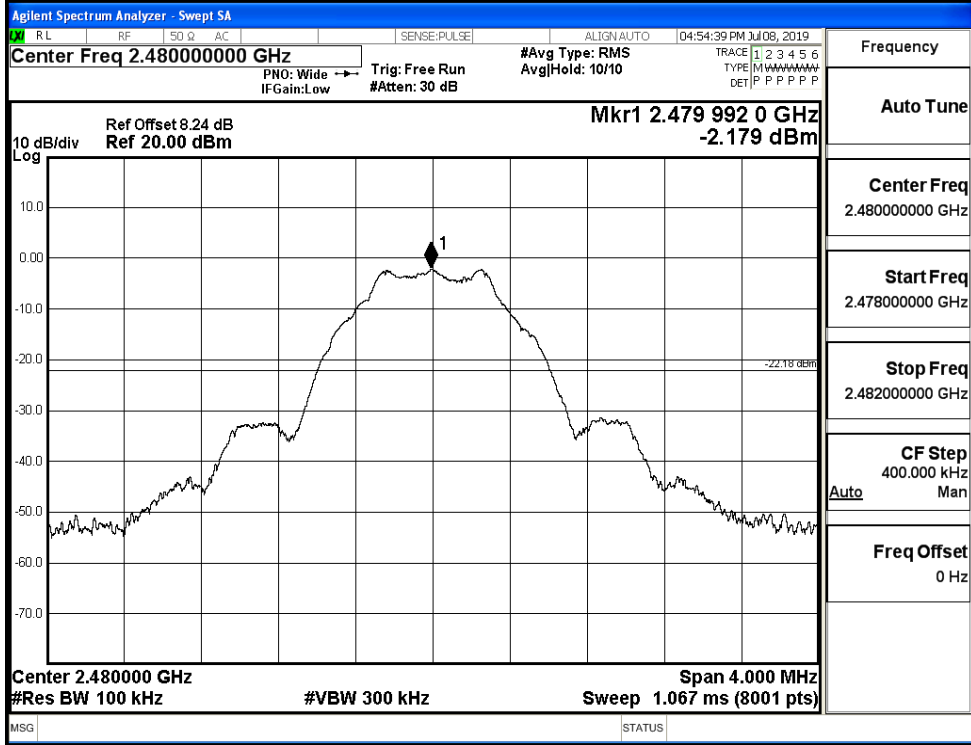


Puw/BT LE/MCH

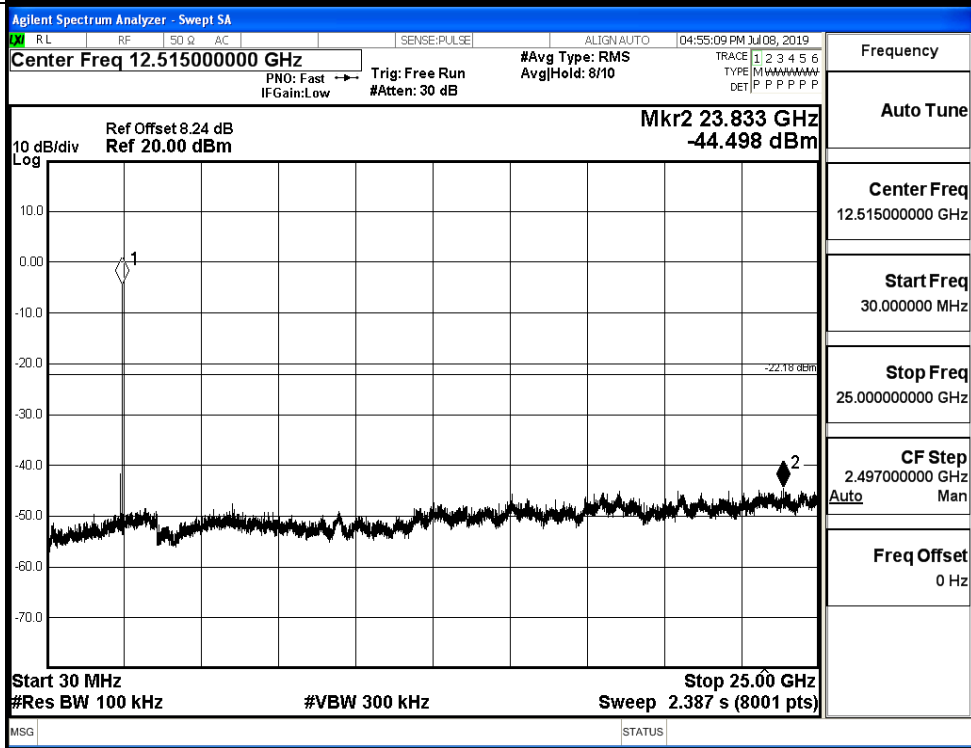


BT LE\_HCH\_Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



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

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.964	-49.711	-22.96	PASS
BT LE	HCH	-2.056	-49.693	-22.06	PASS

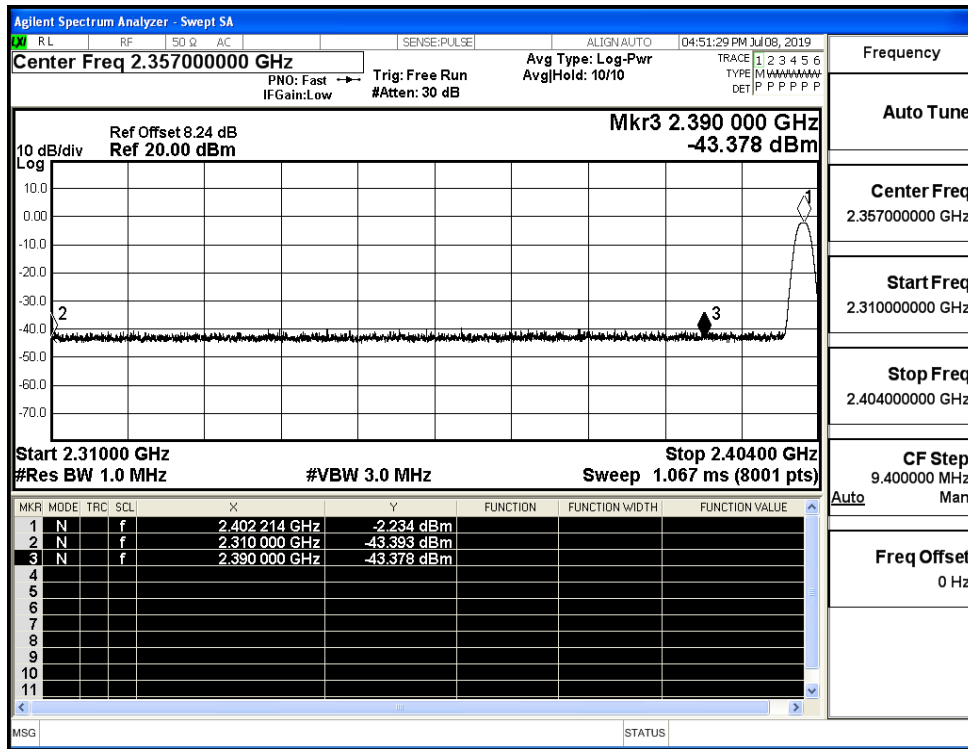
Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Swept SA                  Center Freq 2.35700000 GHz                  Mkr4 2.388 067 GHz -49.711 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>2.402 003 GHz</td><td>-2.964 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>-53.388 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>-54.064 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.388 067 GHz</td><td>-49.711 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		2.402 003 GHz	-2.964 dBm				2	N	f		2.400 000 GHz	-53.388 dBm				3	N	f		2.390 000 GHz	-54.064 dBm				4	N	f		2.388 067 GHz	-49.711 dBm				Frequency Auto Tune Center Freq 2.35700000 GHz Start Freq 2.31000000 GHz Stop Freq 2.40400000 GHz CF Step 9.400000 MHz Freq Offset 0 Hz
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HCH	<p>Agilent Spectrum Analyzer - Swept SA                  Center Freq 2.48900000 GHz                  Mkr4 2.492 833 50 GHz -49.693 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>2.480 007 50 GHz</td><td>-2.056 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>-52.341 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>-52.715 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.492 833 50 GHz</td><td>-49.693 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		2.480 007 50 GHz	-2.056 dBm				2	N	f		2.483 500 00 GHz	-52.341 dBm				3	N	f		2.500 000 00 GHz	-52.715 dBm				4	N	f		2.492 833 50 GHz	-49.693 dBm				Frequency Auto Tune Center Freq 2.48900000 GHz Start Freq 2.47800000 GHz Stop Freq 2.50000000 GHz CF Step 2.200000 MHz Freq Offset 0 Hz
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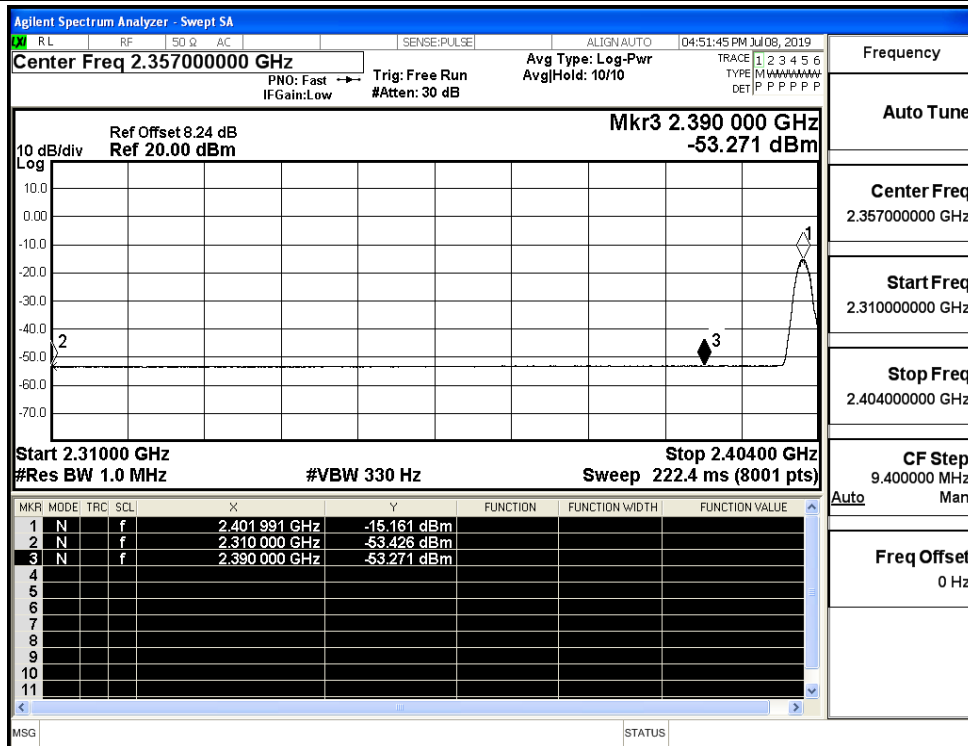
### B.7 Restrict-band band-edge measurements

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	-43.39	2.0	0	53.86	PEAK	74	PASS
		Ant1	2310.0	-53.43	2.0	0	43.83	AV	54	PASS
		Ant1	2390.0	-43.38	2.0	0	53.88	PEAK	74	PASS
		Ant1	2390.0	-53.27	2.0	0	43.99	AV	54	PASS
	2480	Ant1	2483.5	-43.18	2.0	0	54.08	PEAK	74	PASS
		Ant1	2483.5	-52.91	2.0	0	44.34	AV	54	PASS
		Ant1	2500.0	-41.81	2.0	0	55.45	PEAK	74	PASS
		Ant1	2500.0	-52.79	2.0	0	44.47	AV	54	PASS

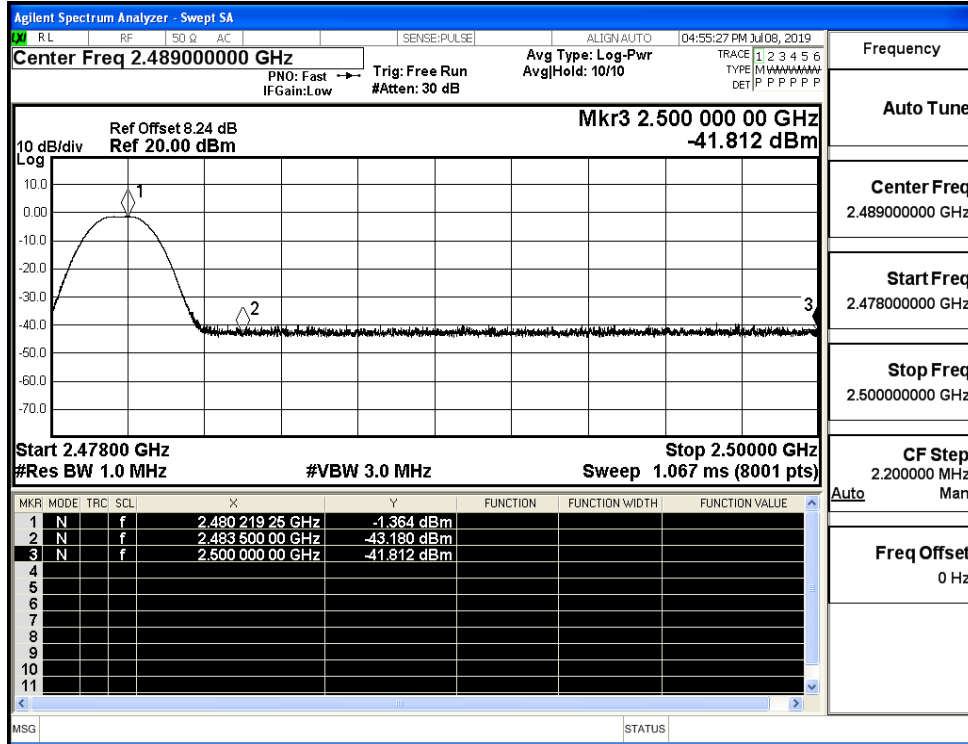
Restrict-band band-edge measurements\_BT LE\_2402\_Ant1\_PEAK



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

