

## Appendix B

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

**Product Name: TWS Earbuds with Cylinder Casing**

**Trade Mark: N/A**

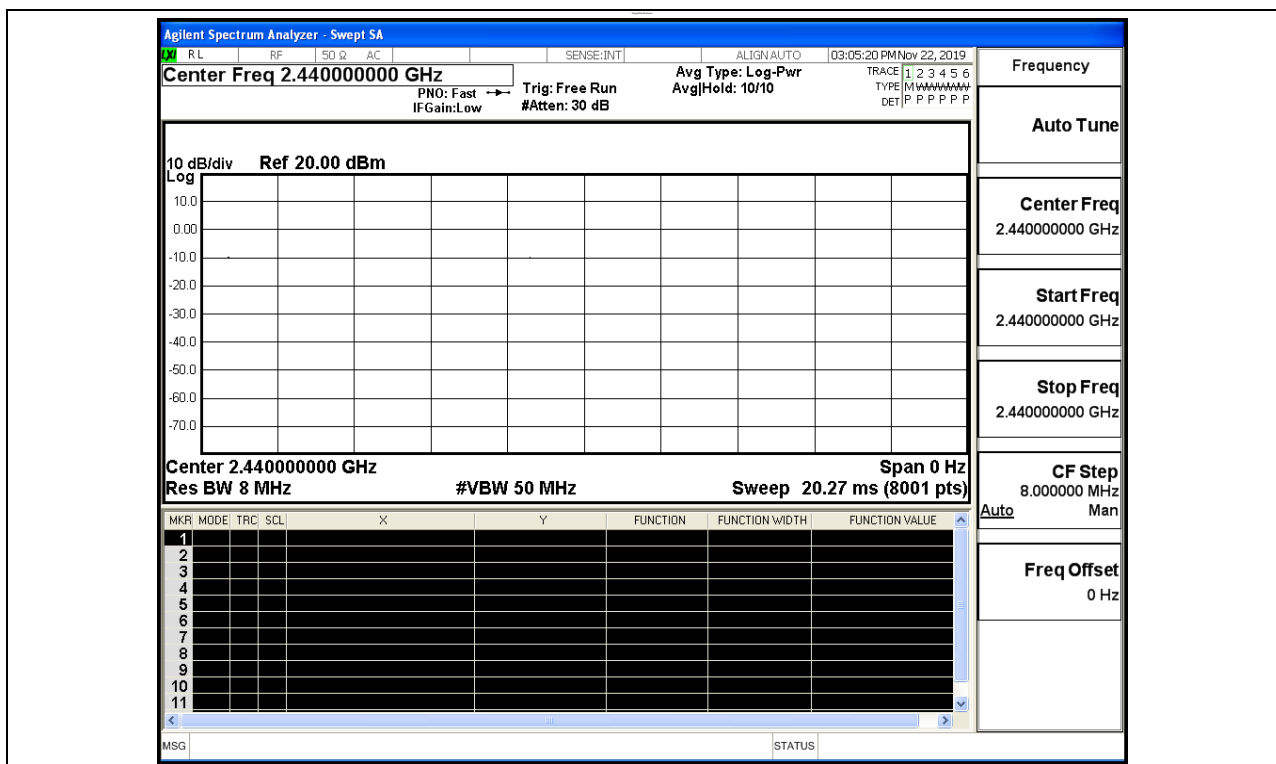
**Test Model: 23906**

#### Environmental Conditions

Temperature:	23.7 ° C
Relative Humidity:	53.2%
ATM Pressure:	100.0 kPa
Test Engineer:	QuXin
Supervised by:	Tom.Liu

#### B.1 Duty Cycle

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

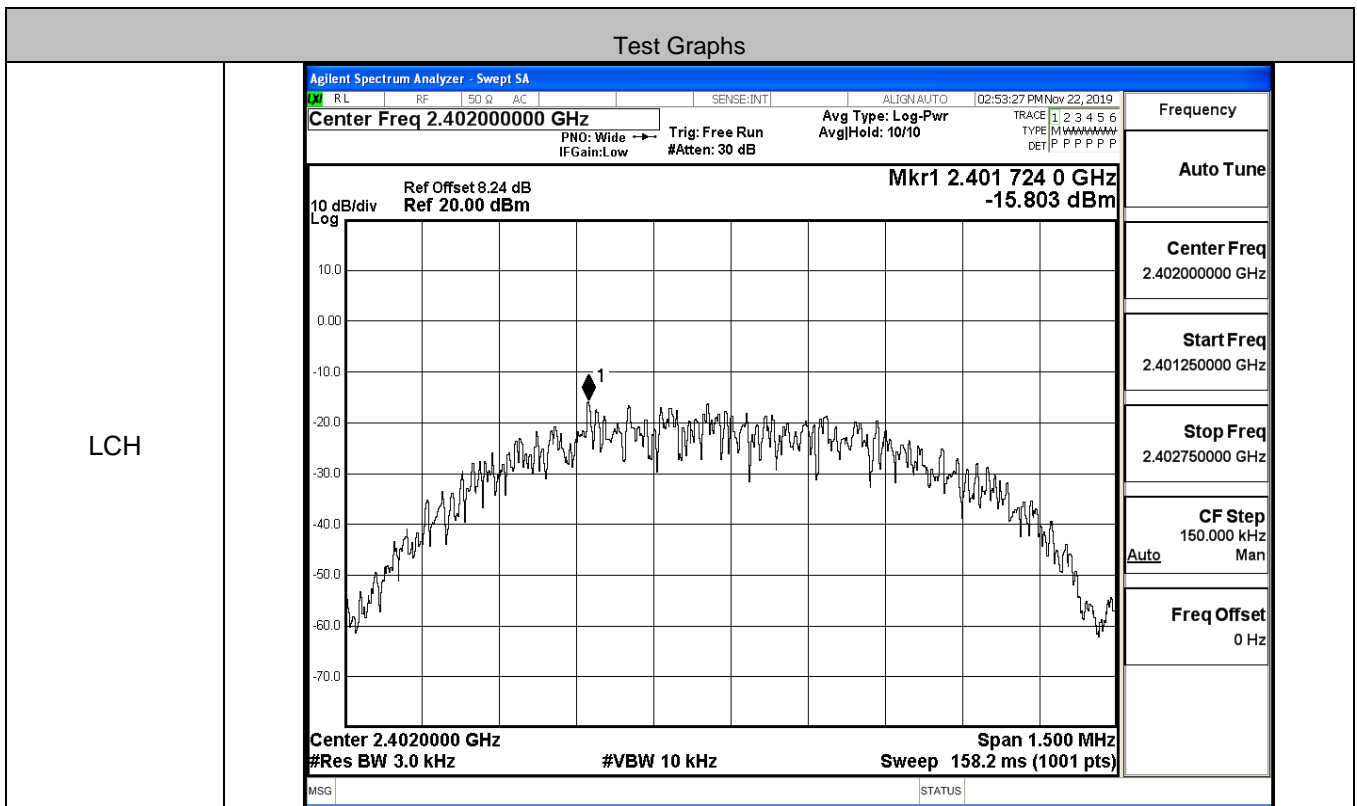


### B.2 Maximum Conducted Peak Output Power

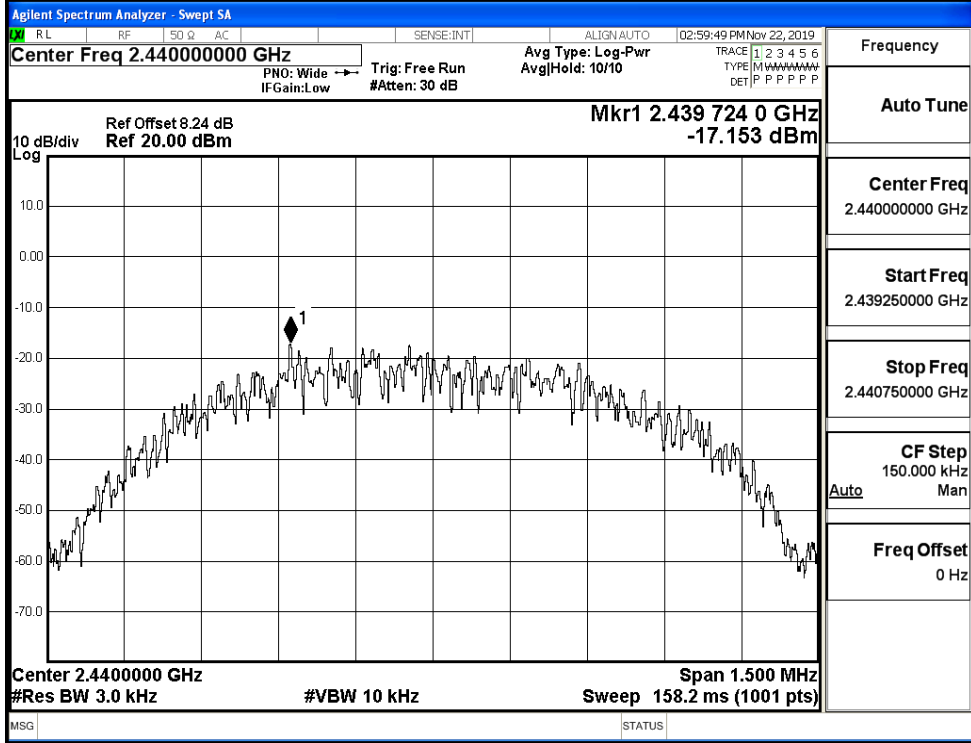
Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.574	30	PASS
BT LE	MCH	-1.961	30	PASS
BT LE	HCH	-3.457	30	PASS

### B.3 Maximum Power Spectral Density

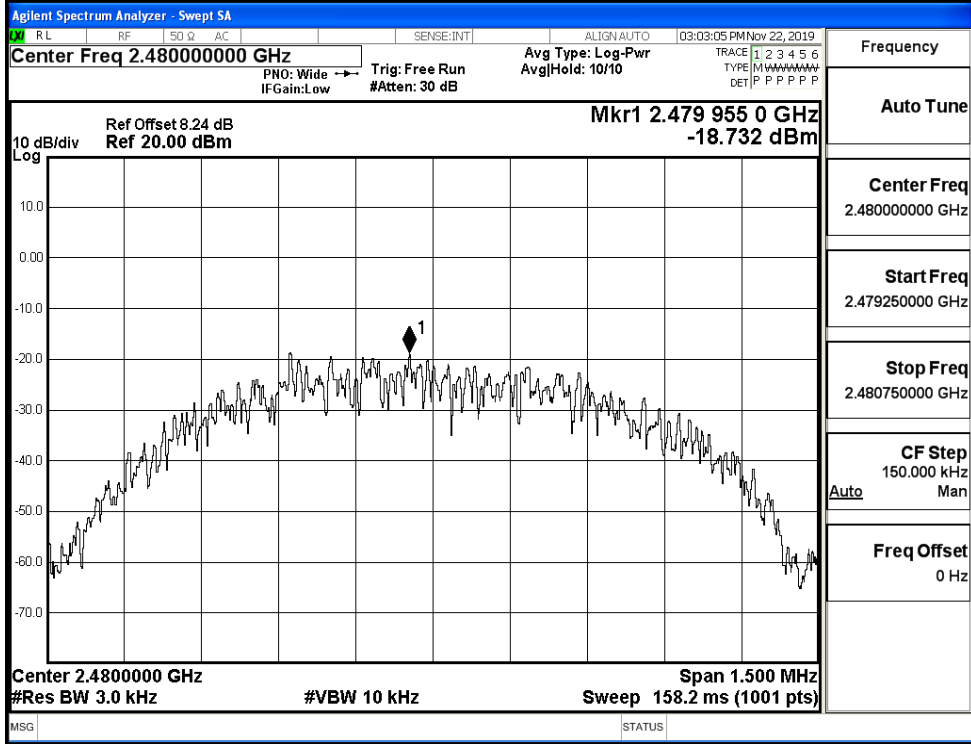
Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-15.803	8	PASS
BT LE	MCH	-17.153	8	PASS
BT LE	HCH	-18.732	8	PASS



MCH


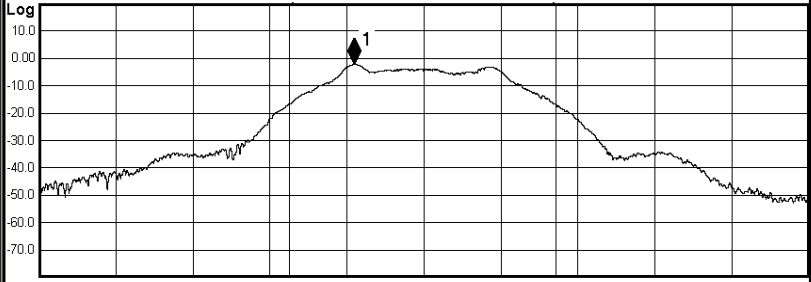


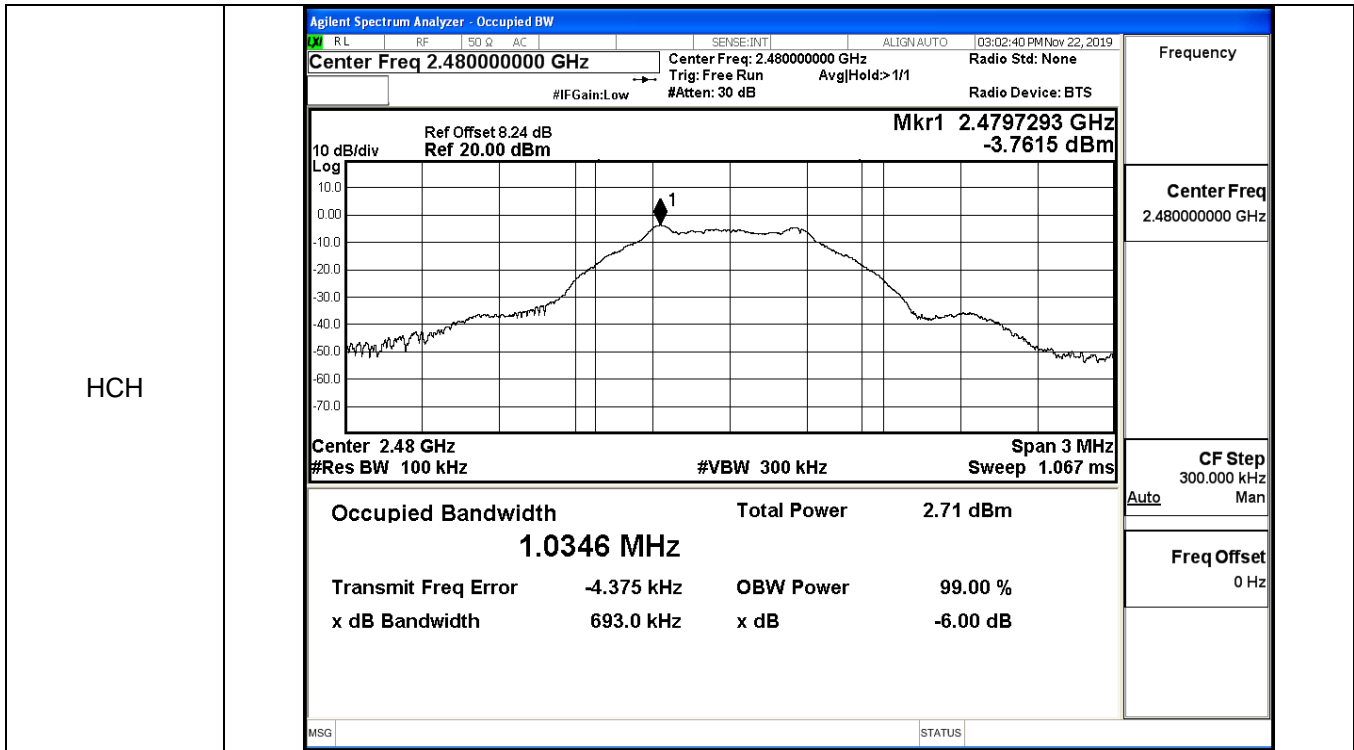
HCH



**B.4 6dB Bandwidth**

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6887	≥0.5	PASS
BT LE	MCH	0.6929	≥0.5	PASS
BT LE	HCH	0.6930	≥0.5	PASS

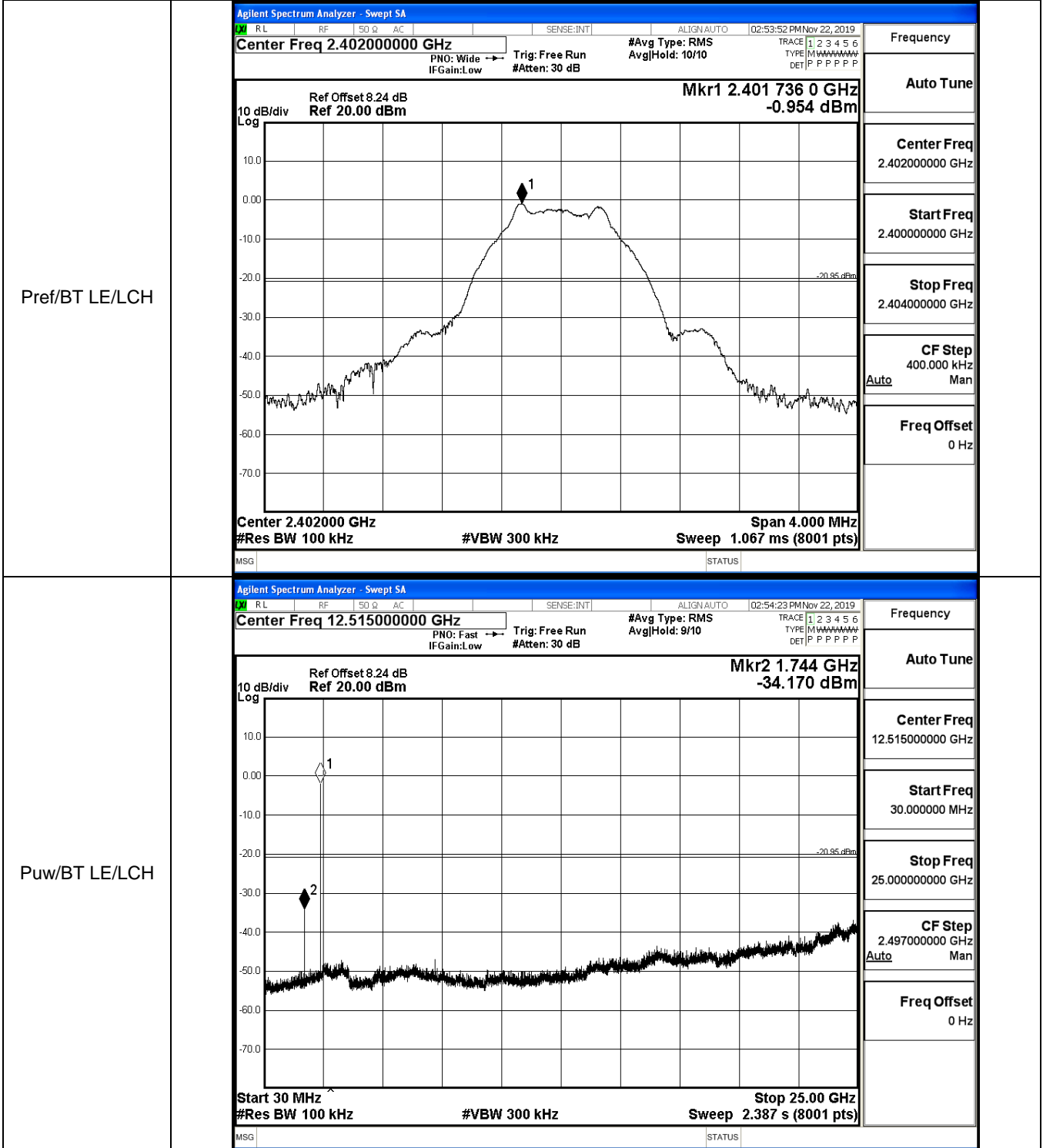
Test Graphs																																					
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 02:53:03 PM Nov 22, 2019</p> <p style="font-size: small; margin: 0;">Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None</p> <p style="font-size: x-small; margin: 0;">Trig: Free Run AvgHold&gt;1/1</p> <p style="font-size: x-small; margin: 0;">#IFGain:Low #Atten: 30 dB Radio Device: BTS</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="font-size: x-small; margin: 0;">10 dB/div Ref Offset 8.24 dB Mkr1 2.4017311 GHz</p> <p style="font-size: x-small; margin: 0;">Log Ref 20.00 dBm -0.85204 dBm</p>  </div> <p style="font-size: x-small; margin: 0;">Center 2.402 GHz Span 3 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: x-small; border-collapse: collapse;"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>5.62 dBm</td> </tr> <tr> <td style="text-align: center;"><b>1.0335 MHz</b></td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-5.083 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>688.7 kHz</td> <td>x dB</td> </tr> <tr> <td></td> <td></td> <td>99.00 %</td> </tr> <tr> <td></td> <td></td> <td>-6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p style="font-size: x-small; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 02:59:24 PM Nov 22, 2019</p> <p style="font-size: small; margin: 0;">Center Freq 2.440000000 GHz Center Freq: 2.440000000 GHz Radio Std: None</p> <p style="font-size: x-small; margin: 0;">Trig: Free Run AvgHold&gt;1/1</p> <p style="font-size: x-small; margin: 0;">#IFGain:Low #Atten: 30 dB Radio Device: BTS</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="font-size: x-small; margin: 0;">10 dB/div Ref Offset 8.24 dB Mkr1 2.4397293 GHz</p> <p style="font-size: x-small; margin: 0;">Log Ref 20.00 dBm -2.2605 dBm</p>  </div> <p style="font-size: x-small; margin: 0;">Center 2.44 GHz Span 3 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: x-small; border-collapse: collapse;"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>4.21 dBm</td> </tr> <tr> <td style="text-align: center;"><b>1.0341 MHz</b></td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-4.634 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>692.9 kHz</td> <td>x dB</td> </tr> <tr> <td></td> <td></td> <td>99.00 %</td> </tr> <tr> <td></td> <td></td> <td>-6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	5.62 dBm	<b>1.0335 MHz</b>			Transmit Freq Error	-5.083 kHz	OBW Power	x dB Bandwidth	688.7 kHz	x dB			99.00 %			-6.00 dB	Occupied Bandwidth	Total Power	4.21 dBm	<b>1.0341 MHz</b>			Transmit Freq Error	-4.634 kHz	OBW Power	x dB Bandwidth	692.9 kHz	x dB			99.00 %			-6.00 dB
Occupied Bandwidth	Total Power	5.62 dBm																																			
<b>1.0335 MHz</b>																																					
Transmit Freq Error	-5.083 kHz	OBW Power																																			
x dB Bandwidth	688.7 kHz	x dB																																			
		99.00 %																																			
		-6.00 dB																																			
Occupied Bandwidth	Total Power	4.21 dBm																																			
<b>1.0341 MHz</b>																																					
Transmit Freq Error	-4.634 kHz	OBW Power																																			
x dB Bandwidth	692.9 kHz	x dB																																			
		99.00 %																																			
		-6.00 dB																																			



### B.5 RF Conducted Spurious Emissions

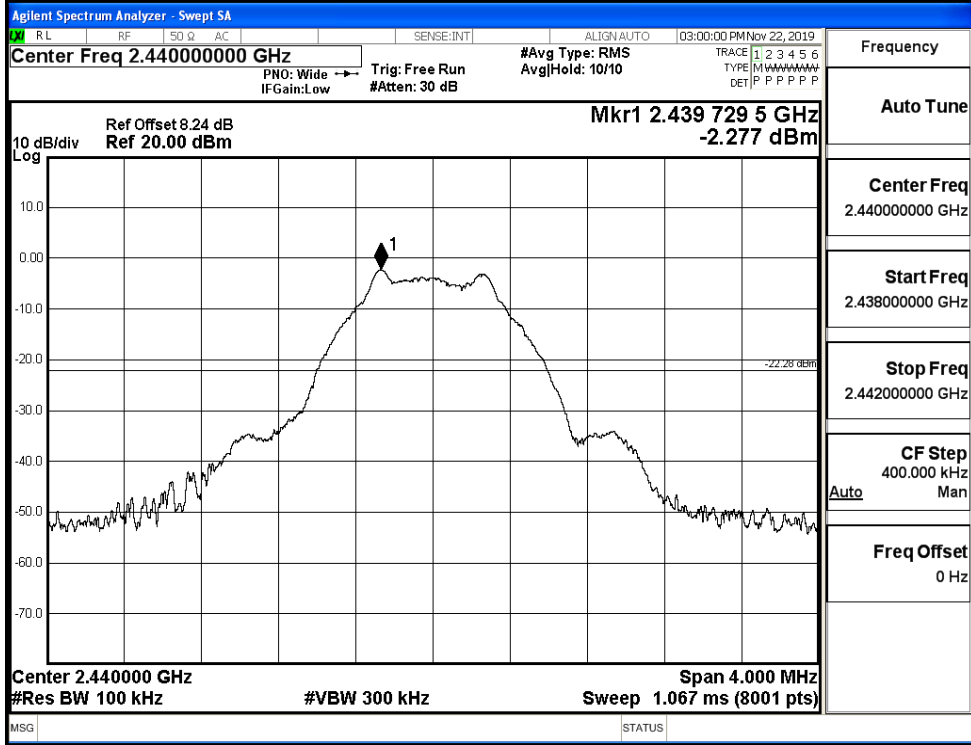
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.954	-34.170	-20.954	PASS
BT LE	MCH	-2.277	-37.131	-22.277	PASS
BT LE	HCH	-3.755	-37.112	-23.755	PASS

BT LE\_LCH\_Graphs

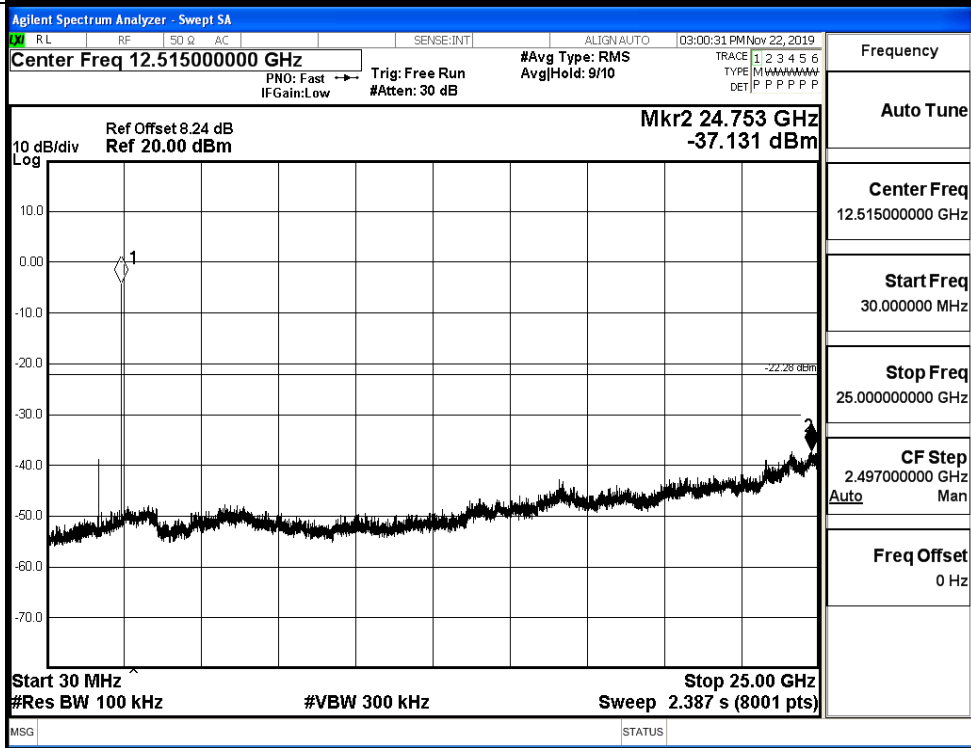


BT LE\_MCH\_Graphs

Pref/BT LE/MCH

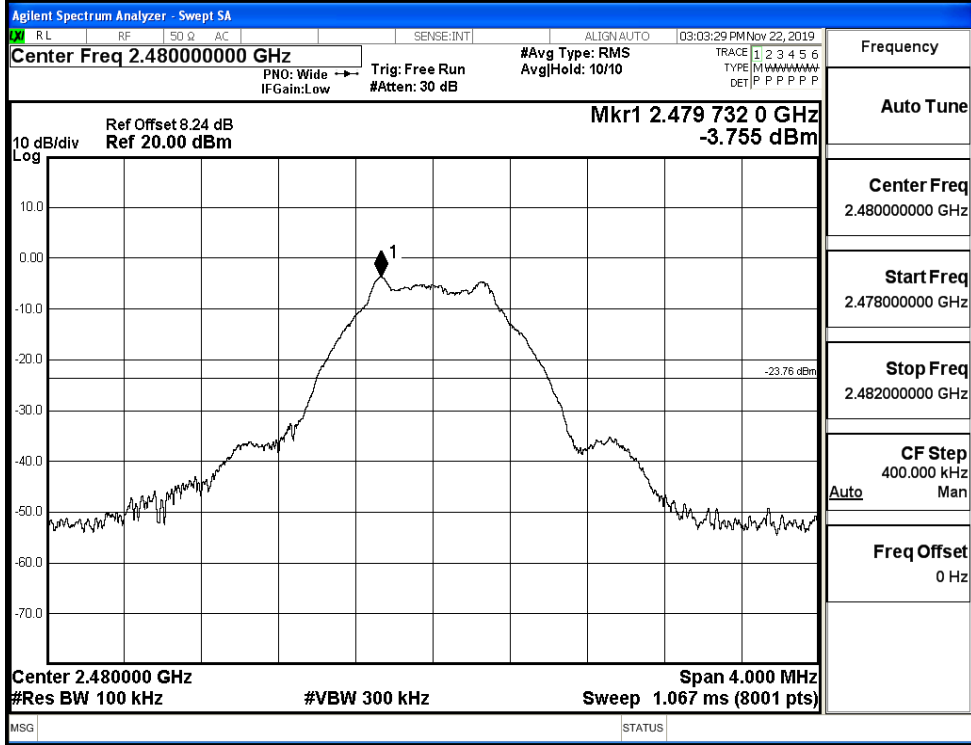


Puw/BT LE/MCH

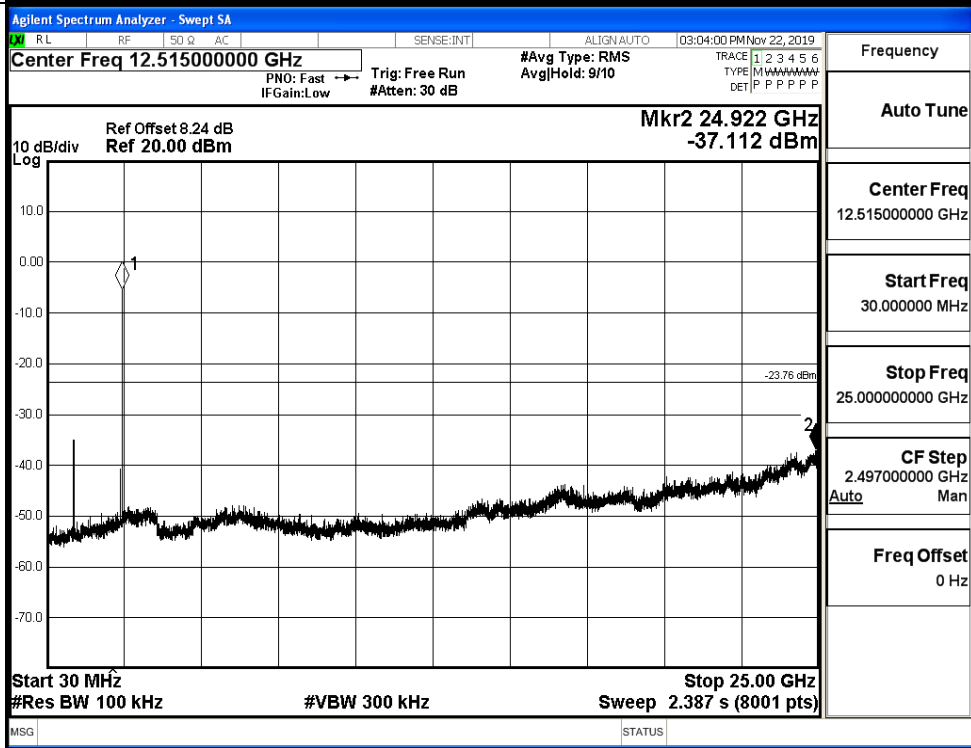


BT LE\_HCH\_Graphs

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	-0.882	-48.325	-20.88	PASS
BT LE	HCH	-3.732	-48.382	-23.73	PASS

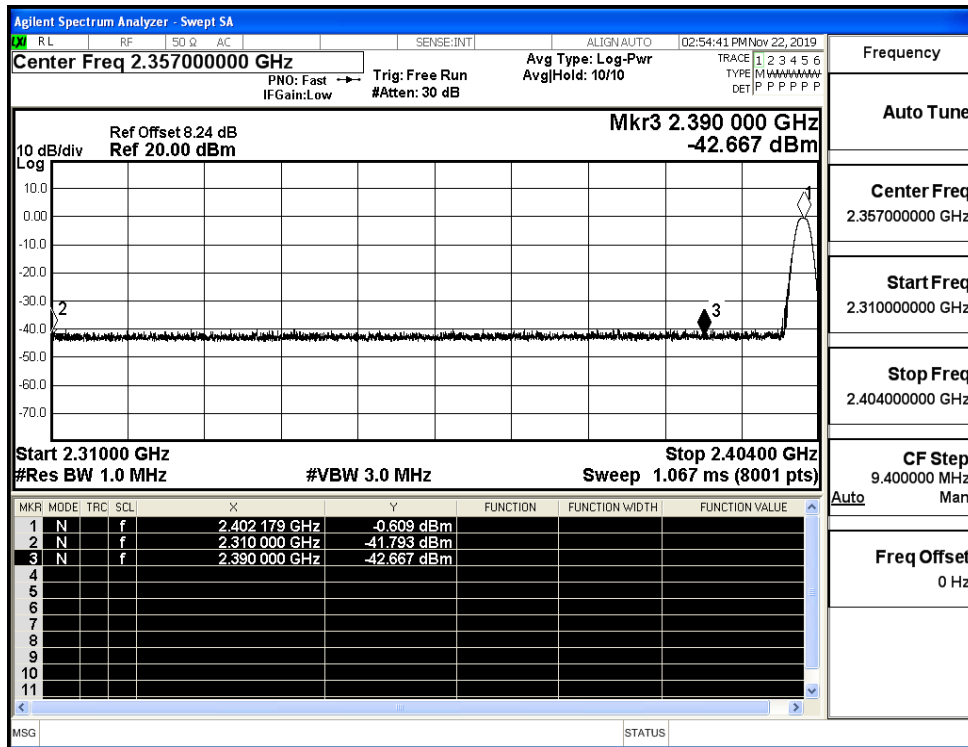
Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Swept SA                  Center Freq 2.35700000 GHz                  Ref Offset 8.24 dB, Ref 20.00 dBm                  Mkr4 2.372 545 GHz -48.325 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>2.401 732 GHz</td><td>-0.882 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>-51.527 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>-52.673 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.372 545 GHz</td><td>-48.325 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		2.401 732 GHz	-0.882 dBm				2	N	f		2.400 000 GHz	-51.527 dBm				3	N	f		2.390 000 GHz	-52.673 dBm				4	N	f		2.372 545 GHz	-48.325 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
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																							
1	N	f		2.401 732 GHz	-0.882 dBm																																										
2	N	f		2.400 000 GHz	-51.527 dBm																																										
3	N	f		2.390 000 GHz	-52.673 dBm																																										
4	N	f		2.372 545 GHz	-48.325 dBm																																										
HCH	<p>Agilent Spectrum Analyzer - Swept SA                  Center Freq 2.48900000 GHz                  Ref Offset 8.24 dB, Ref 20.00 dBm                  Mkr4 2.486 024 50 GHz -48.382 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>2.479 732 50 GHz</td><td>-3.732 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>-53.276 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>-52.126 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.486 024 50 GHz</td><td>-48.382 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		2.479 732 50 GHz	-3.732 dBm				2	N	f		2.483 500 00 GHz	-53.276 dBm				3	N	f		2.500 000 00 GHz	-52.126 dBm				4	N	f		2.486 024 50 GHz	-48.382 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
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																							
1	N	f		2.479 732 50 GHz	-3.732 dBm																																										
2	N	f		2.483 500 00 GHz	-53.276 dBm																																										
3	N	f		2.500 000 00 GHz	-52.126 dBm																																										
4	N	f		2.486 024 50 GHz	-48.382 dBm																																										

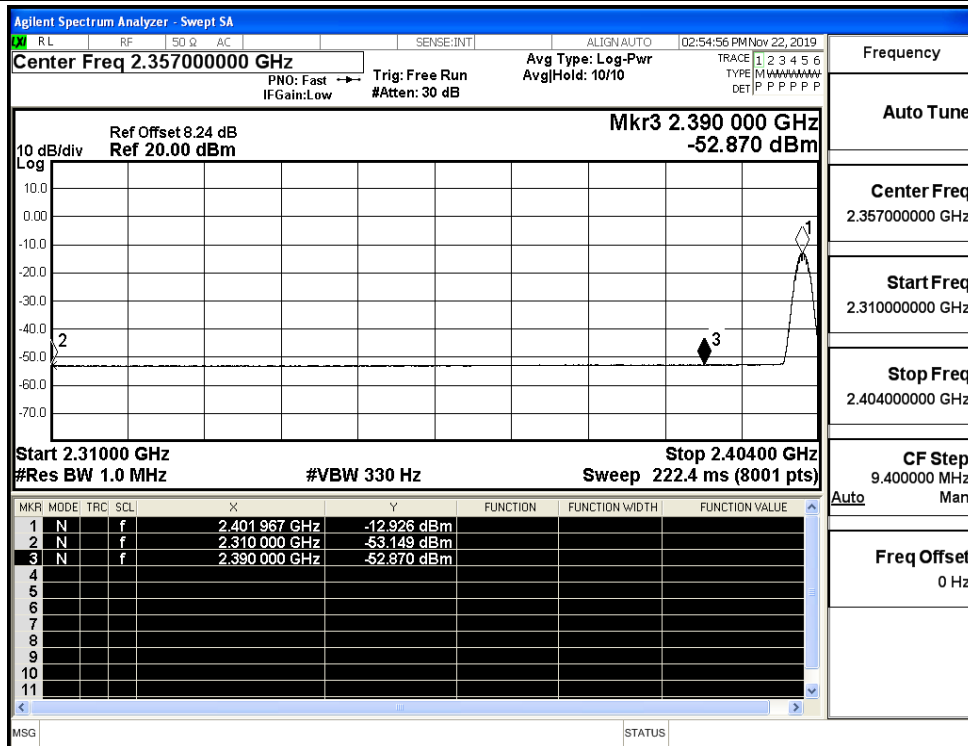
## B.7 Restrict-band band-edge measurements

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	-41.79	2.0	0	53.46	PEAK	74	PASS
		Ant1	2310.0	-53.15	2.0	0	42.11	AV	54	PASS
		Ant1	2390.0	-42.67	2.0	0	52.59	PEAK	74	PASS
		Ant1	2390.0	-52.87	2.0	0	42.39	AV	54	PASS
	2480	Ant1	2483.5	-41.92	2.0	0	53.34	PEAK	74	PASS
		Ant1	2483.5	-52.35	2.0	0	42.91	AV	54	PASS
		Ant1	2500.0	-40.91	2.0	0	54.34	PEAK	74	PASS
		Ant1	2500.0	-52.15	2.0	0	43.11	AV	54	PASS

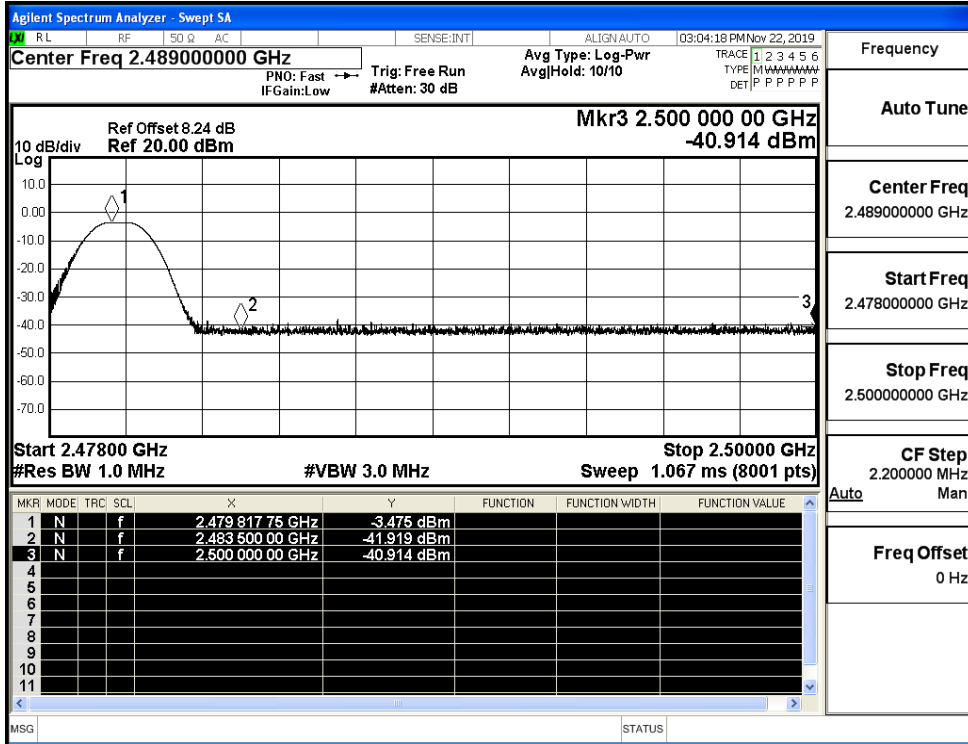
Restrict-band band-edge measurements\_BT LE\_2402\_Ant1\_PEAK



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

