

## Appendix A

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

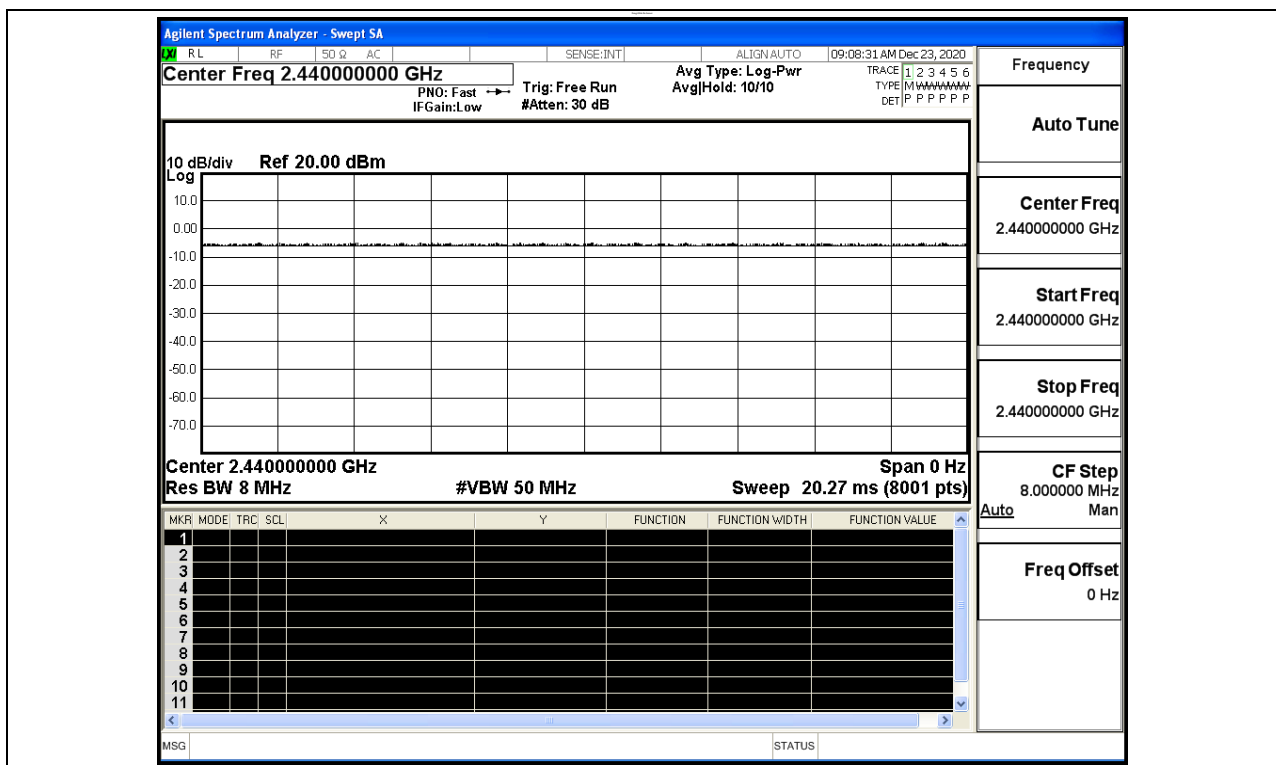
**Product Name: Atmosic BLE module**  
**Trade Mark: N/A**  
**Test Model: GTI-ATM2022-1M**

#### Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	53.6%
ATM Pressure:	101.0 kPa
Test Engineer:	Ken He
Supervised by:	Li Huan

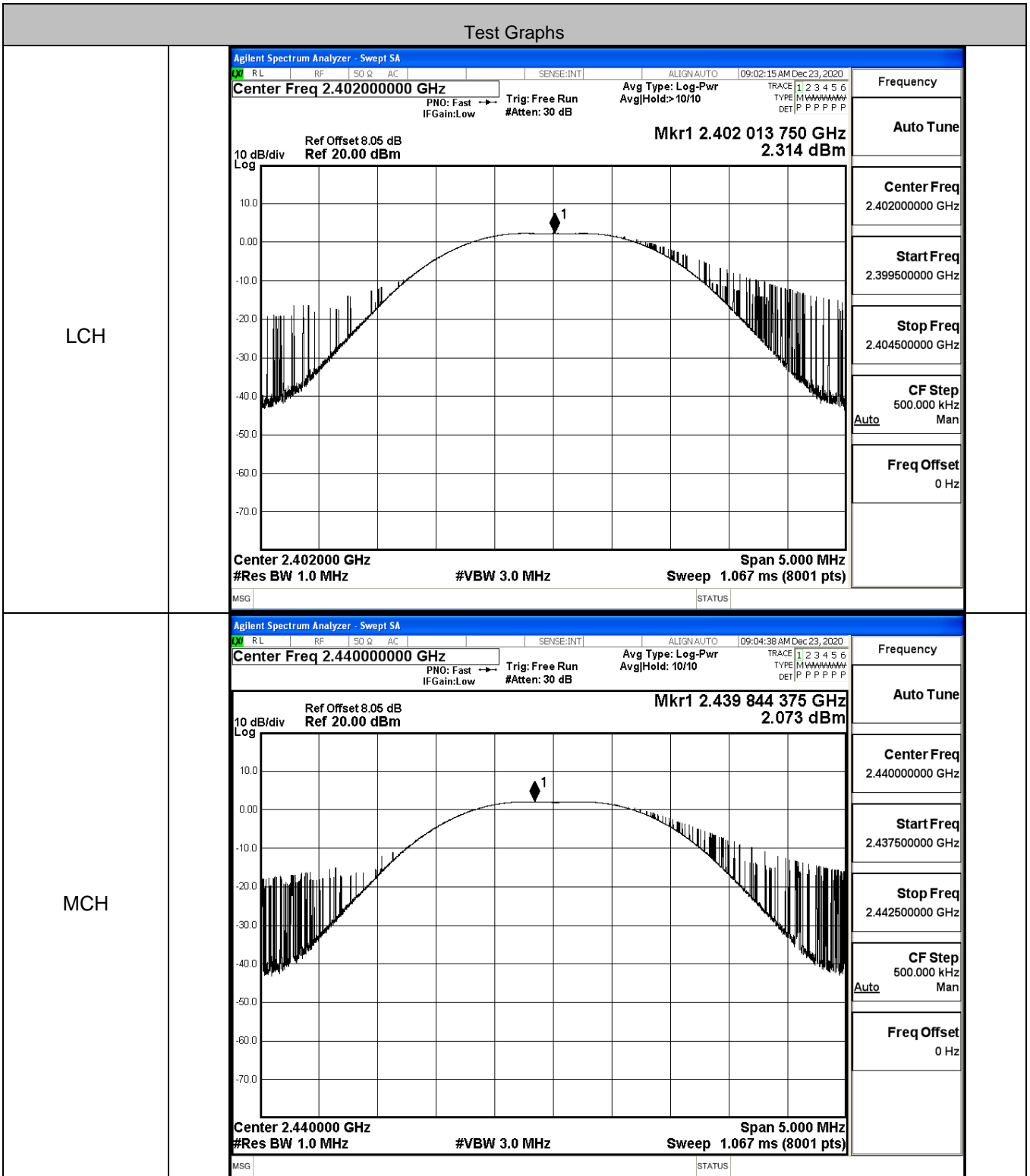
#### A.1 Duty Cycle

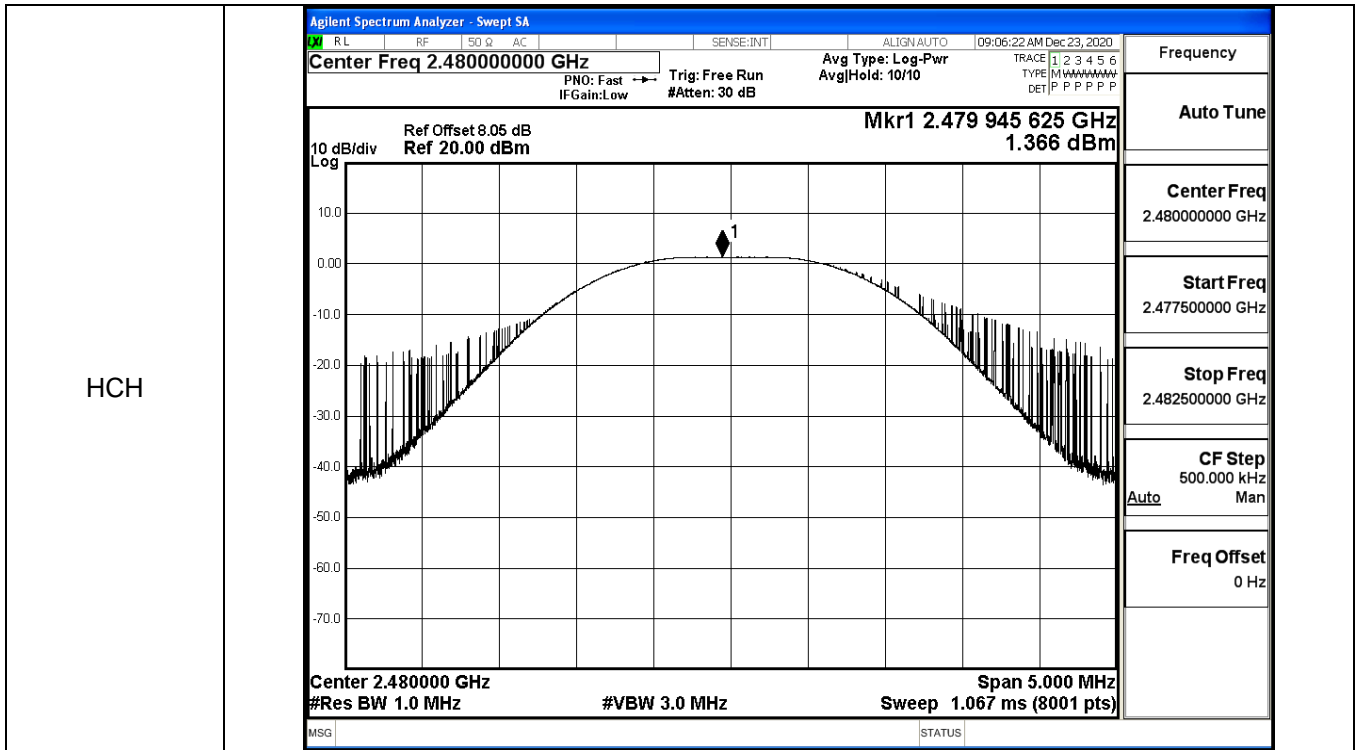
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS



### A.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	2.314	30	PASS
BT LE	MCH	2.073	30	PASS
BT LE	HCH	1.366	30	PASS

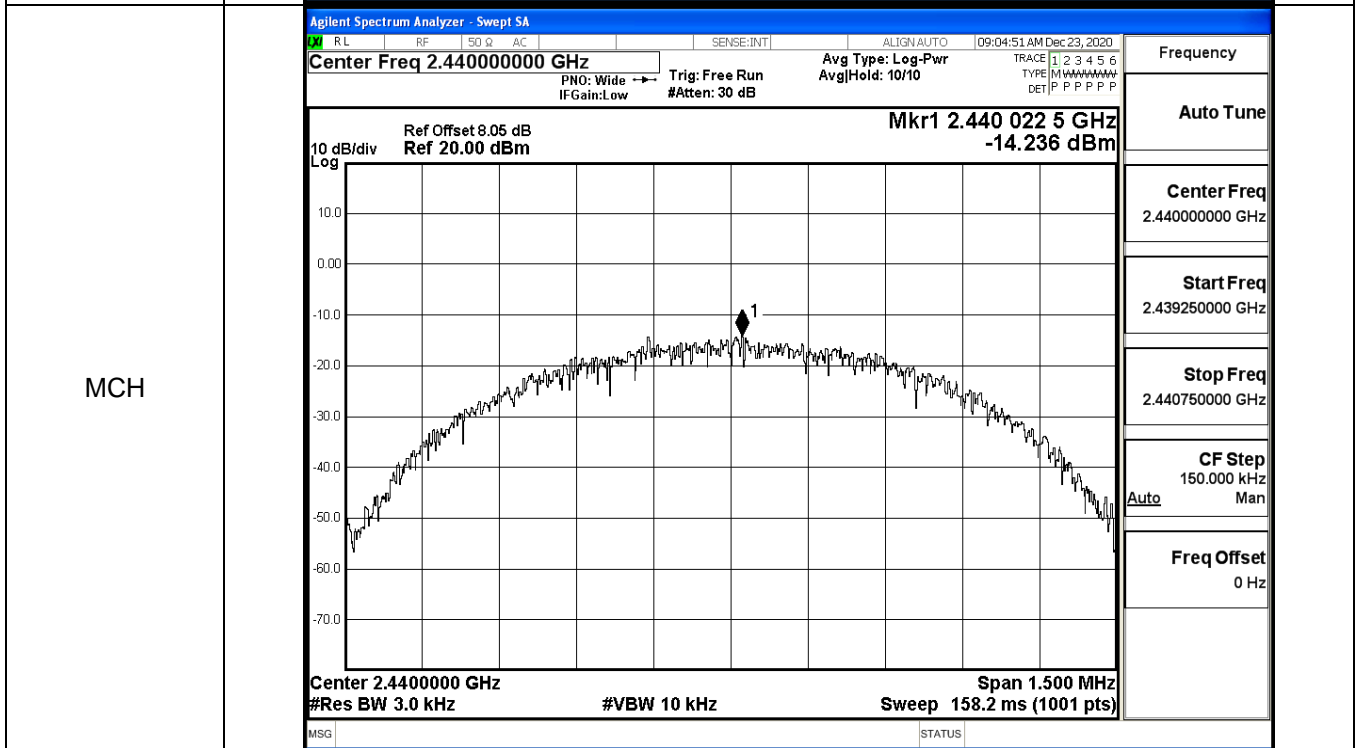
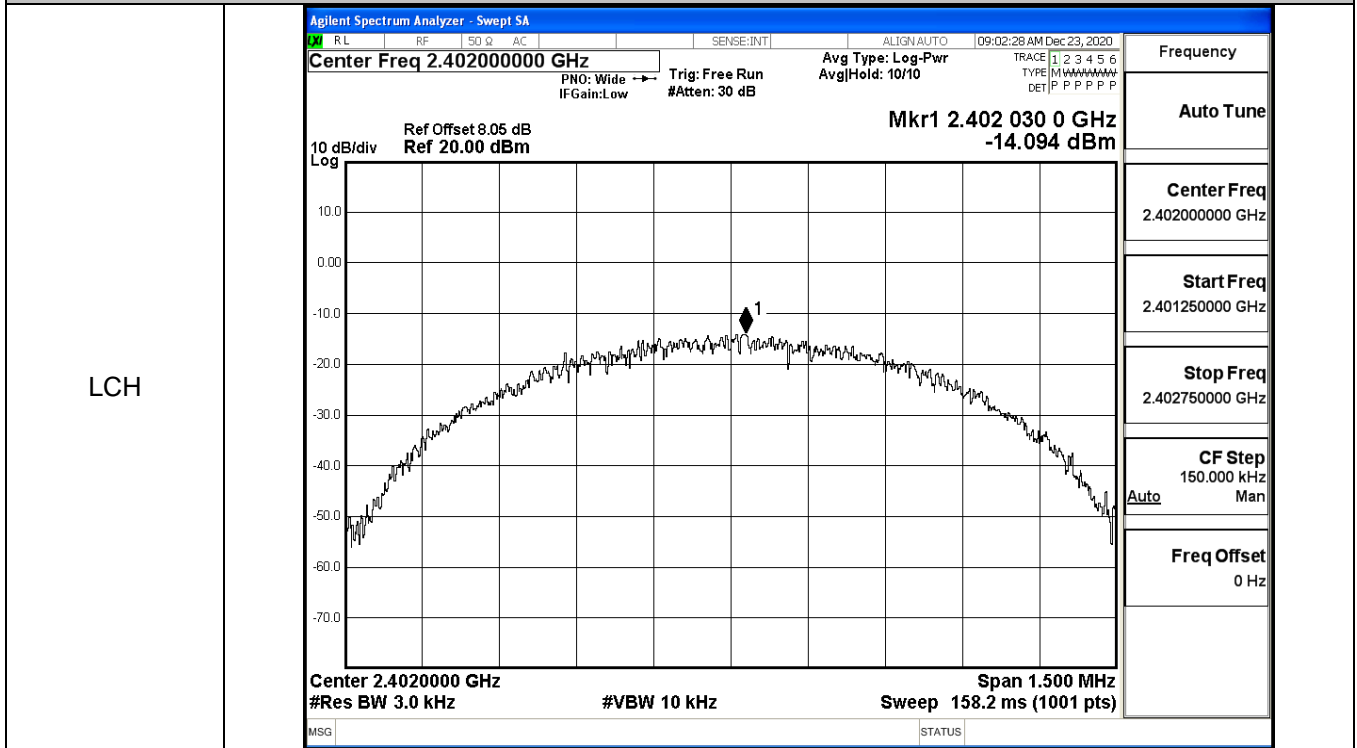




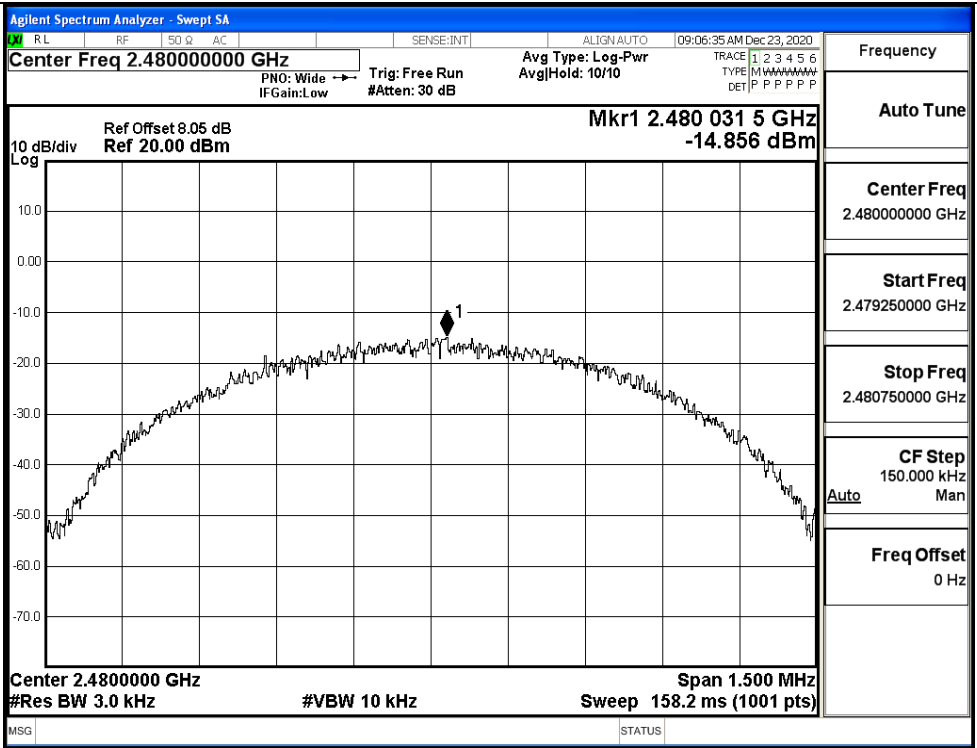
### A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-14.094	8	PASS
BT LE	MCH	-14.236	8	PASS
BT LE	HCH	-14.856	8	PASS

#### Test Graphs



HCH

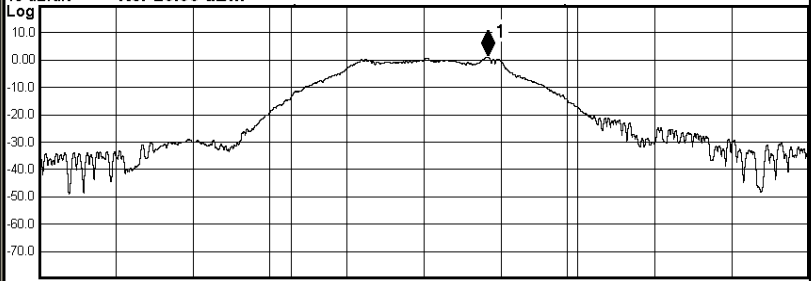


Frequency
Auto Tune
Center Freq 2.480000000 GHz
Start Freq 2.479250000 GHz
Stop Freq 2.480750000 GHz
CF Step 150.000 kHz Auto Man
Freq Offset 0 Hz

**A.4 6dB Bandwidth**

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6592	≥0.5	PASS
BT LE	MCH	0.6736	≥0.5	PASS
BT LE	HCH	0.6716	≥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</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    Ref 20.00 dBm    Mkr1 2.4022618 GHz    2.1814 dBm</p> <p>Center 2.402 GHz    #Res BW 100 kHz    #VBW 300 kHz    Span 3 MHz    Sweep 1.067 ms</p> <table border="1"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>8.73 dBm</td> </tr> <tr> <td><b>1.0792 MHz</b></td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>21.547 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>659.2 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>MSG    STATUS</p>	Occupied Bandwidth	Total Power	8.73 dBm	<b>1.0792 MHz</b>			Transmit Freq Error	21.547 kHz	OBW Power	x dB Bandwidth	659.2 kHz	x dB			99.00 %			-6.00 dB
	Occupied Bandwidth	Total Power	8.73 dBm																
<b>1.0792 MHz</b>																			
Transmit Freq Error	21.547 kHz	OBW Power																	
x dB Bandwidth	659.2 kHz	x dB																	
		99.00 %																	
		-6.00 dB																	
MCH	<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    Ref 20.00 dBm    Mkr1 2.4402468 GHz    1.6783 dBm</p> <p>Center 2.44 GHz    #Res BW 100 kHz    #VBW 300 kHz    Span 3 MHz    Sweep 1.067 ms</p> <table border="1"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>8.44 dBm</td> </tr> <tr> <td><b>1.0781 MHz</b></td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>19.812 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>673.6 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>MSG    STATUS</p>	Occupied Bandwidth	Total Power	8.44 dBm	<b>1.0781 MHz</b>			Transmit Freq Error	19.812 kHz	OBW Power	x dB Bandwidth	673.6 kHz	x dB			99.00 %			-6.00 dB
Occupied Bandwidth	Total Power	8.44 dBm																	
<b>1.0781 MHz</b>																			
Transmit Freq Error	19.812 kHz	OBW Power																	
x dB Bandwidth	673.6 kHz	x dB																	
		99.00 %																	
		-6.00 dB																	

HCH	Agilent Spectrum Analyzer - Occupied BW			RL	RF	50 Ω	AC	SENSE:INT	ALIGN:AUTO	09:06:11 AM Dec 23, 2020
	Center Freq 2.480000000 GHz				Center Freq: 2.480000000 GHz			Radio Std: None		Frequency
					Trig: Free Run		AvgHold: 1/1		Radio Device: BTS	
					#IFGain: Low		#Atten: 30 dB			
		Ref Offset 8.05 dB		Mkr1 2.4802486 GHz						
10 dB/div		Ref 20.00 dBm		1.0233 dBm						
 <p>The plot shows a signal centered at 2.48 GHz with a bandwidth of approximately 1.07 MHz. The y-axis represents power in dBm, ranging from -70 to 10. The signal level is around -10 dBm. A marker is placed at the peak of the signal.</p>										
		Center 2.48 GHz		#VBW 300 kHz		Span 3 MHz				
		#Res BW 100 kHz		Sweep 1.067 ms						
Occupied Bandwidth			Total Power			7.73 dBm			CF Step	
1.0736 MHz									300.000 kHz	
Transmit Freq Error			21.001 kHz		OBW Power		99.00 %		Auto	
x dB Bandwidth			671.6 kHz		x dB		-6.00 dB		Man	
									Freq Offset	
									0 Hz	
<div style="display: flex; justify-content: space-between; width: 100%;"> <span>MSG</span> <span>STATUS</span> </div>										

### A.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	1.573	-36.785	-18.427	PASS
BT LE	MCH	1.966	-36.499	-18.034	PASS
BT LE	HCH	1.249	-37.245	-18.751	PASS

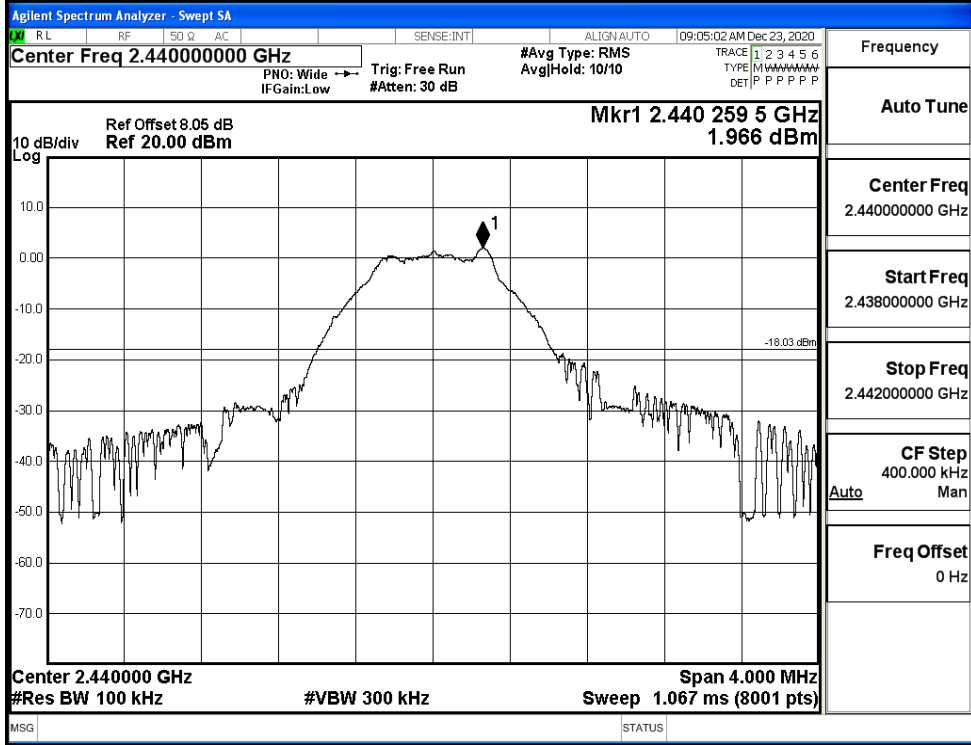
BT LE\_LCH\_Graphs

Pref/BT LE/LCH		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Frequency</td></tr> <tr><td>Auto Tune</td></tr> <tr><td>Center Freq 2.402000000 GHz</td></tr> <tr><td>Start Freq 2.400000000 GHz</td></tr> <tr><td>Stop Freq 2.404000000 GHz</td></tr> <tr><td>CF Step 400.000 kHz Auto Man</td></tr> <tr><td>Freq Offset 0 Hz</td></tr> </table>	Frequency	Auto Tune	Center Freq 2.402000000 GHz	Start Freq 2.400000000 GHz	Stop Freq 2.404000000 GHz	CF Step 400.000 kHz Auto Man	Freq Offset 0 Hz
Frequency									
Auto Tune									
Center Freq 2.402000000 GHz									
Start Freq 2.400000000 GHz									
Stop Freq 2.404000000 GHz									
CF Step 400.000 kHz Auto Man									
Freq Offset 0 Hz									
Puw/BT LE/LCH		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Frequency</td></tr> <tr><td>Auto Tune</td></tr> <tr><td>Center Freq 12.515000000 GHz</td></tr> <tr><td>Start Freq 30.0000000 MHz</td></tr> <tr><td>Stop Freq 25.000000000 GHz</td></tr> <tr><td>CF Step 2.497000000 GHz Auto Man</td></tr> <tr><td>Freq Offset 0 Hz</td></tr> </table>	Frequency	Auto Tune	Center Freq 12.515000000 GHz	Start Freq 30.0000000 MHz	Stop Freq 25.000000000 GHz	CF Step 2.497000000 GHz Auto Man	Freq Offset 0 Hz
Frequency									
Auto Tune									
Center Freq 12.515000000 GHz									
Start Freq 30.0000000 MHz									
Stop Freq 25.000000000 GHz									
CF Step 2.497000000 GHz Auto Man									
Freq Offset 0 Hz									

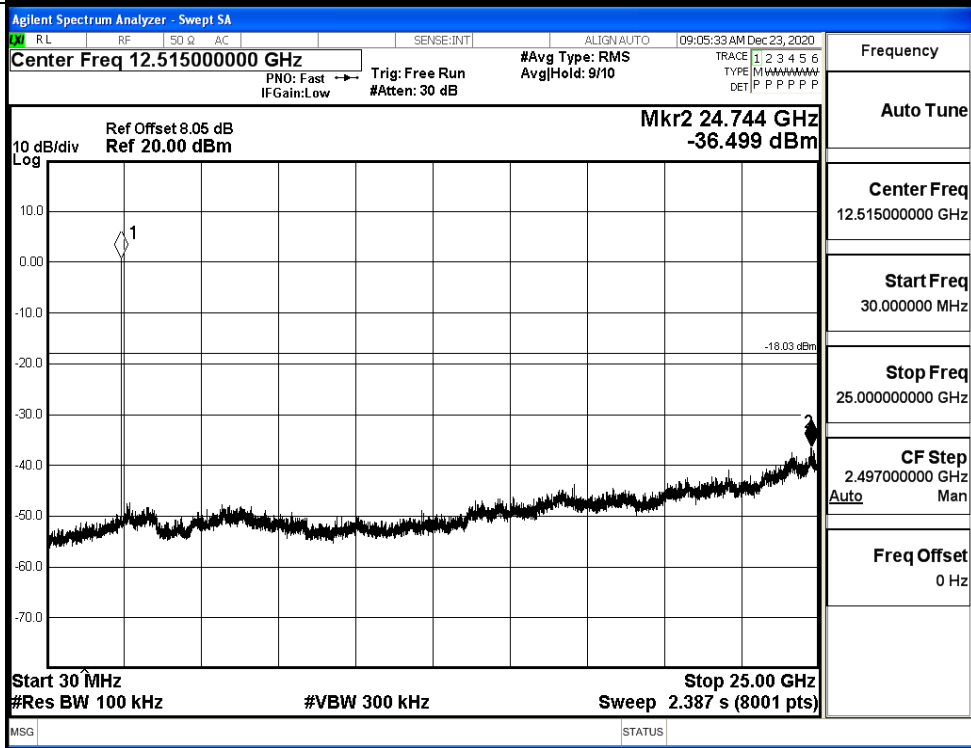


BT LE\_MCH\_Graphs

Pref/BT LE/MCH

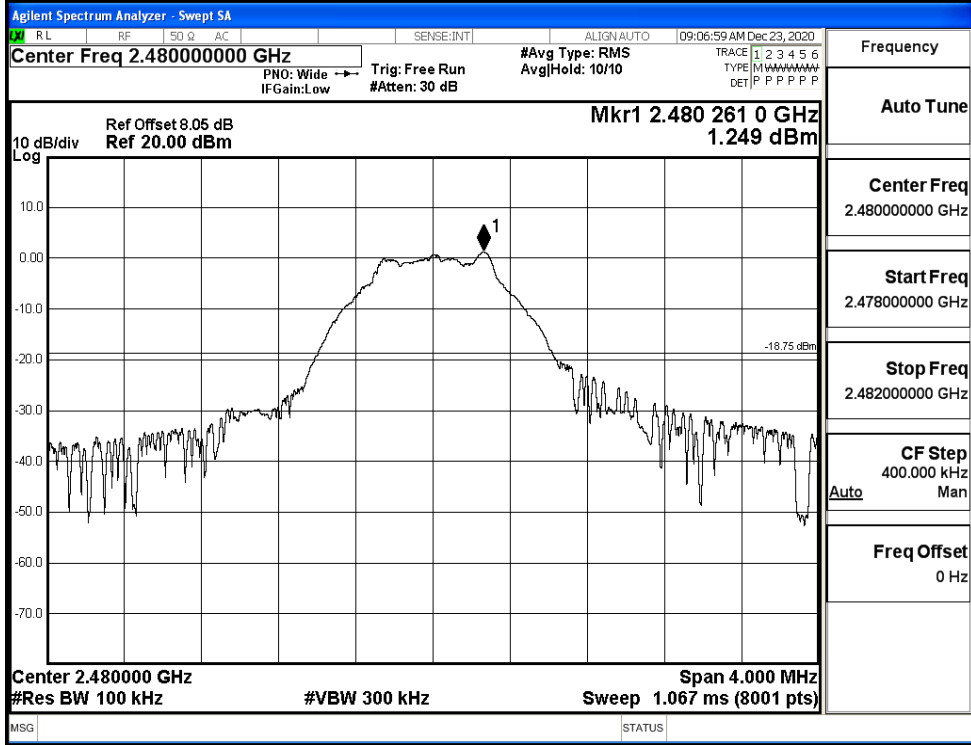


Puw/BT LE/MCH

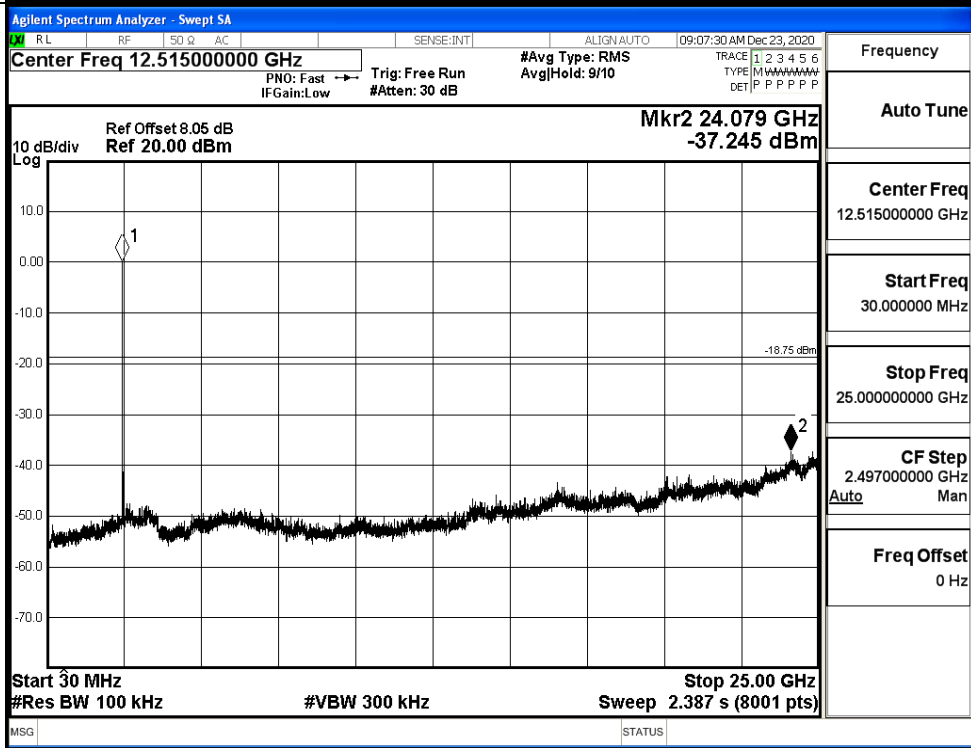


BT LE\_HCH\_Graphs

Pref/BT LE/HCH



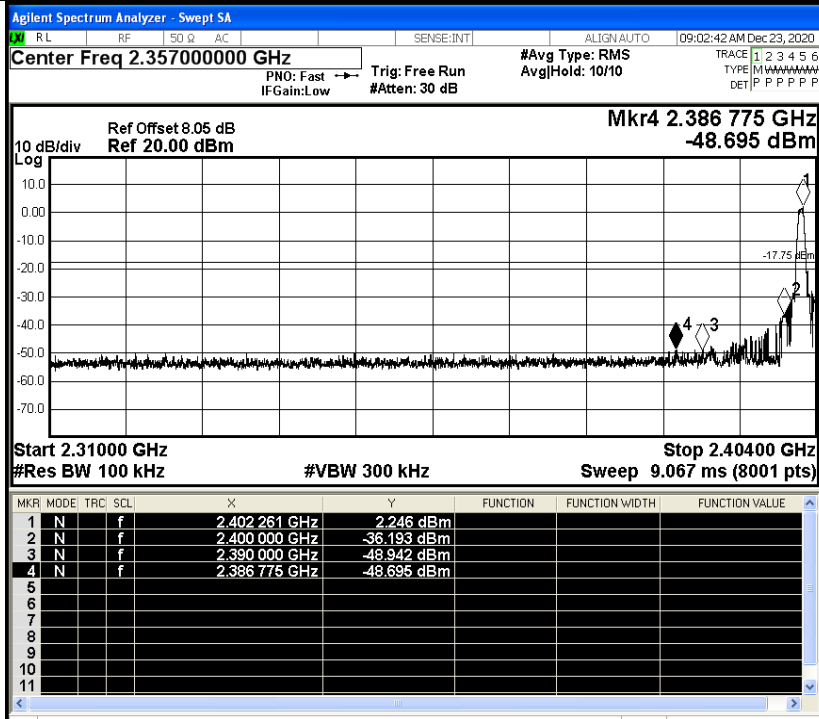
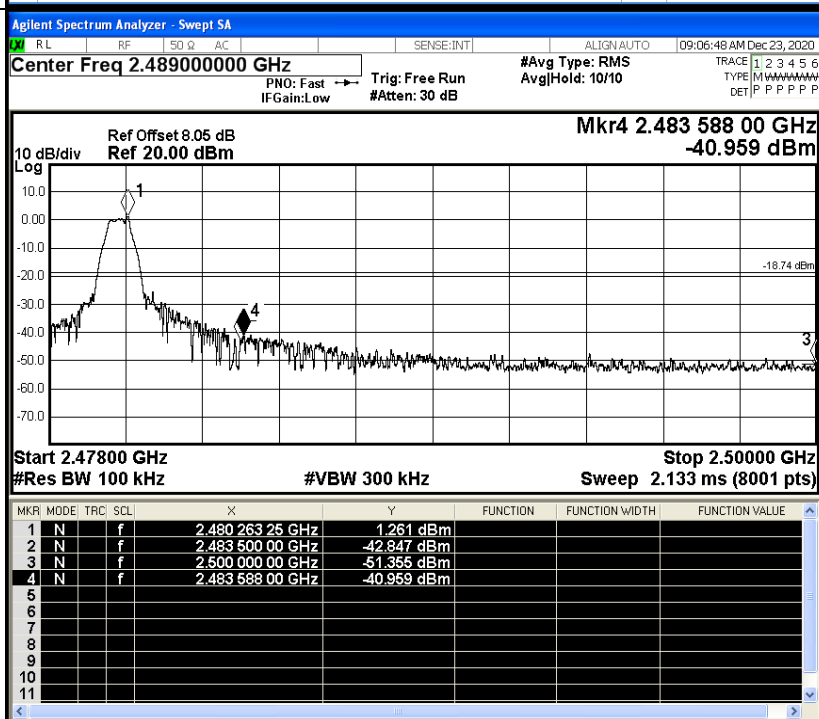
Puw/BT LE/HCH



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

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	2.246	-48.695	-17.75	PASS
BT LE	HCH	1.261	-40.959	-18.74	PASS

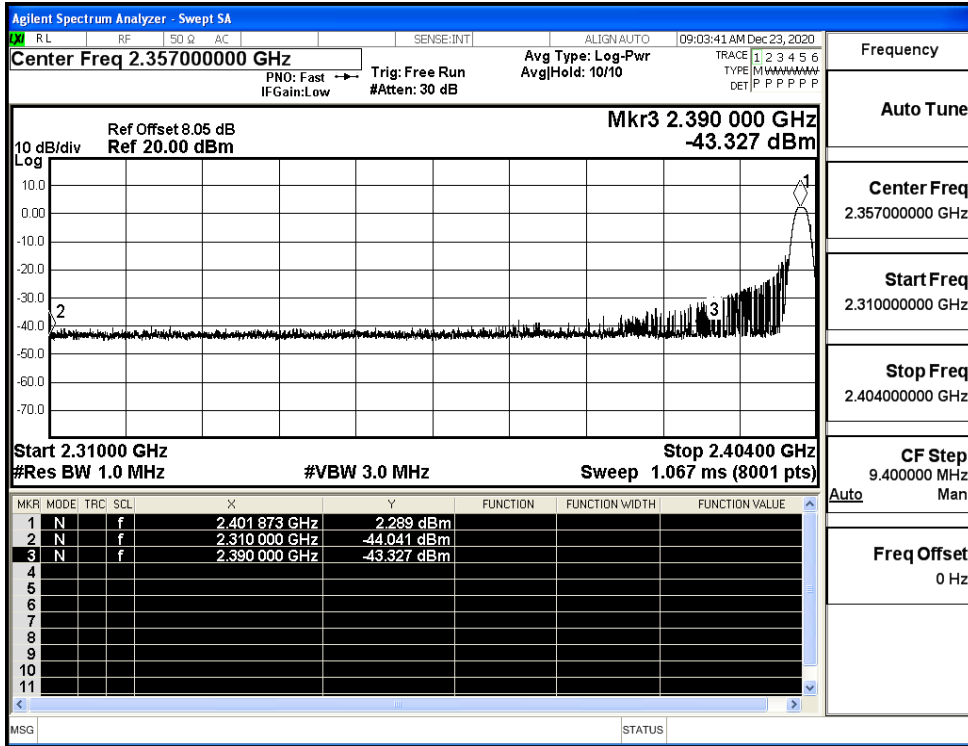
Test Graphs

LCH		<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>
HCH		<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>

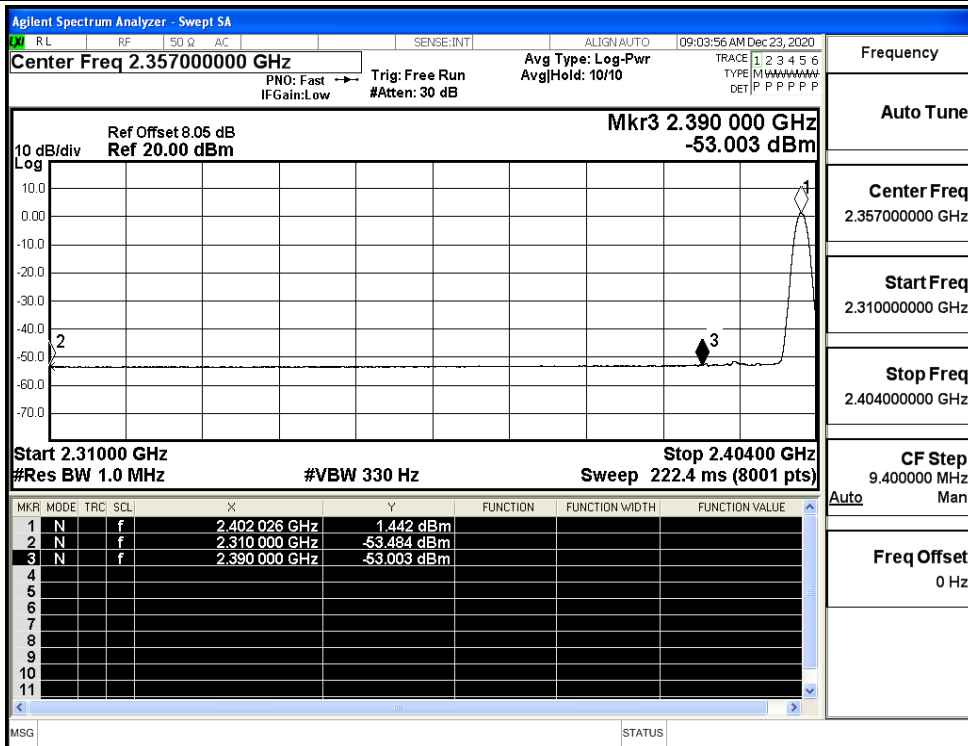
### A.7 Restrict-band band-edge measurements

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	-44.04	2.0	0	53.19	PEAK	74	PASS
		Ant1	2310.0	-53.48	2.0	0	43.75	AV	54	PASS
		Ant1	2390.0	-43.33	2.0	0	53.90	PEAK	74	PASS
		Ant1	2390.0	-53.00	2.0	0	44.23	AV	54	PASS
	2480	Ant1	2483.5	-42.50	2.0	0	54.73	PEAK	74	PASS
		Ant1	2483.5	-52.25	2.0	0	44.98	AV	54	PASS
		Ant1	2500.0	-40.06	2.0	0	57.17	PEAK	74	PASS
		Ant1	2500.0	-52.45	2.0	0	44.78	AV	54	PASS

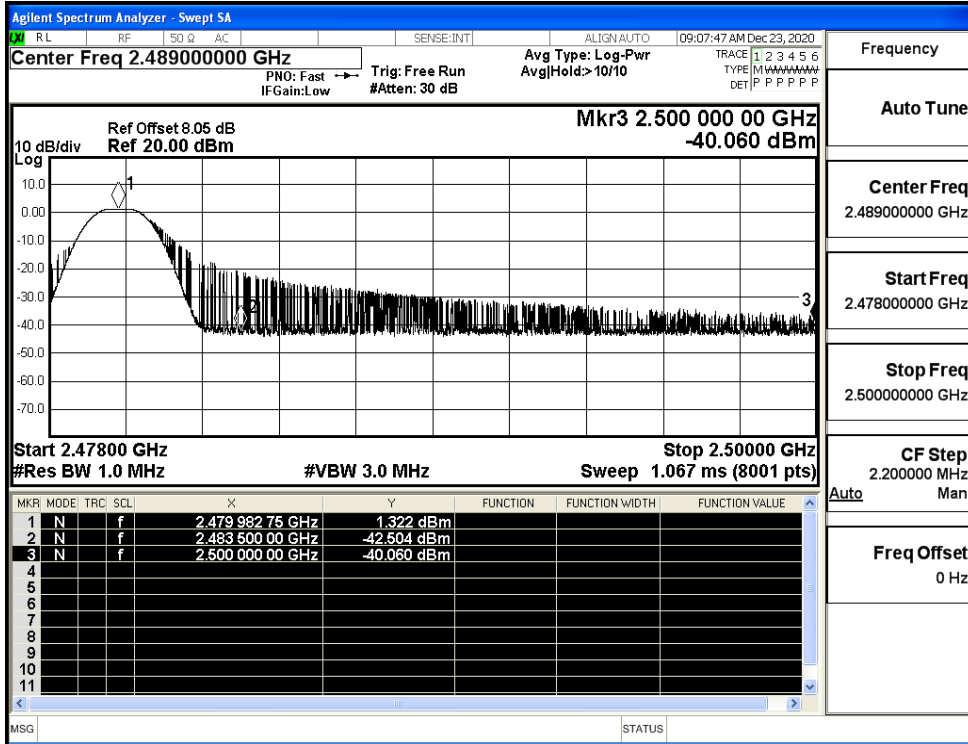
Restrict-band band-edge measurements\_BT LE\_2402\_Ant1\_PEAK



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

