

## Appendix A

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

Product Name: Remote Shutter

Trade Mark: NEEWER

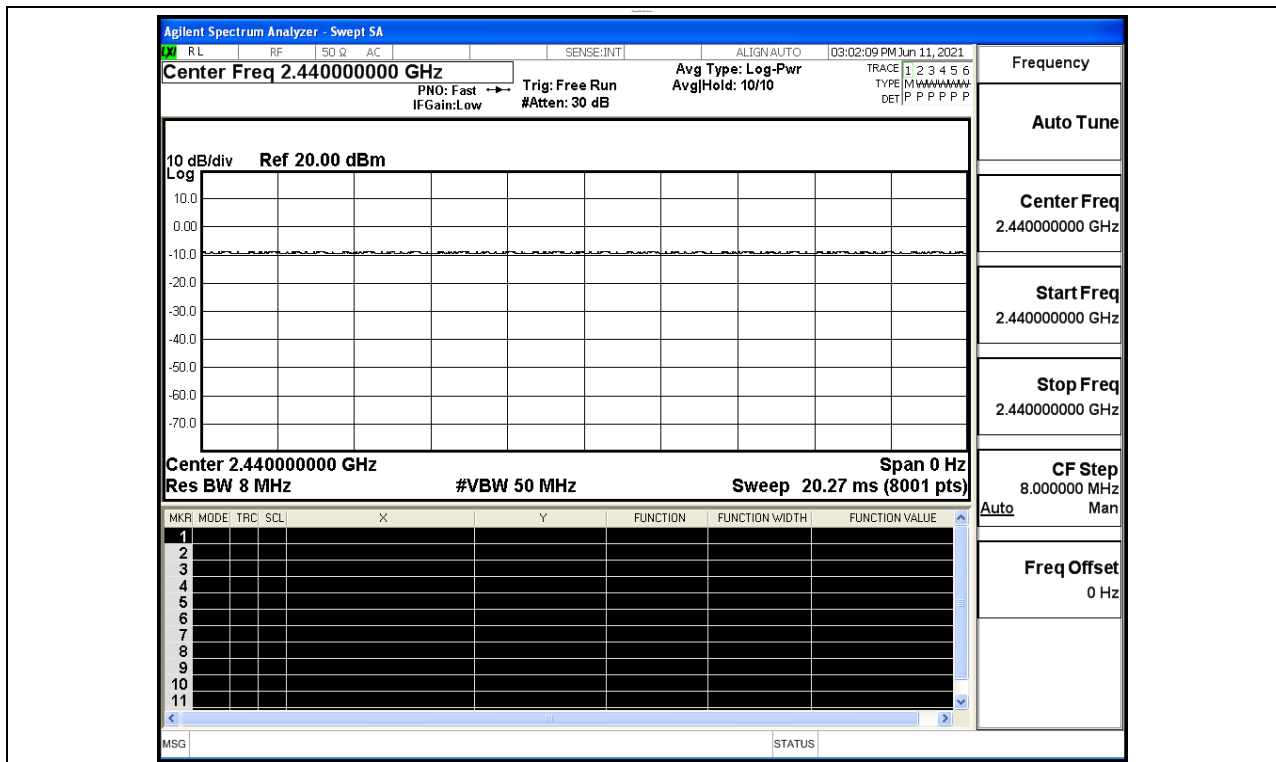
Test Model: RT-107

#### Environmental Conditions

Temperature:	24.6 ° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Carl Fu
Supervised by:	Li Huan

#### A.1 Duty Cycle

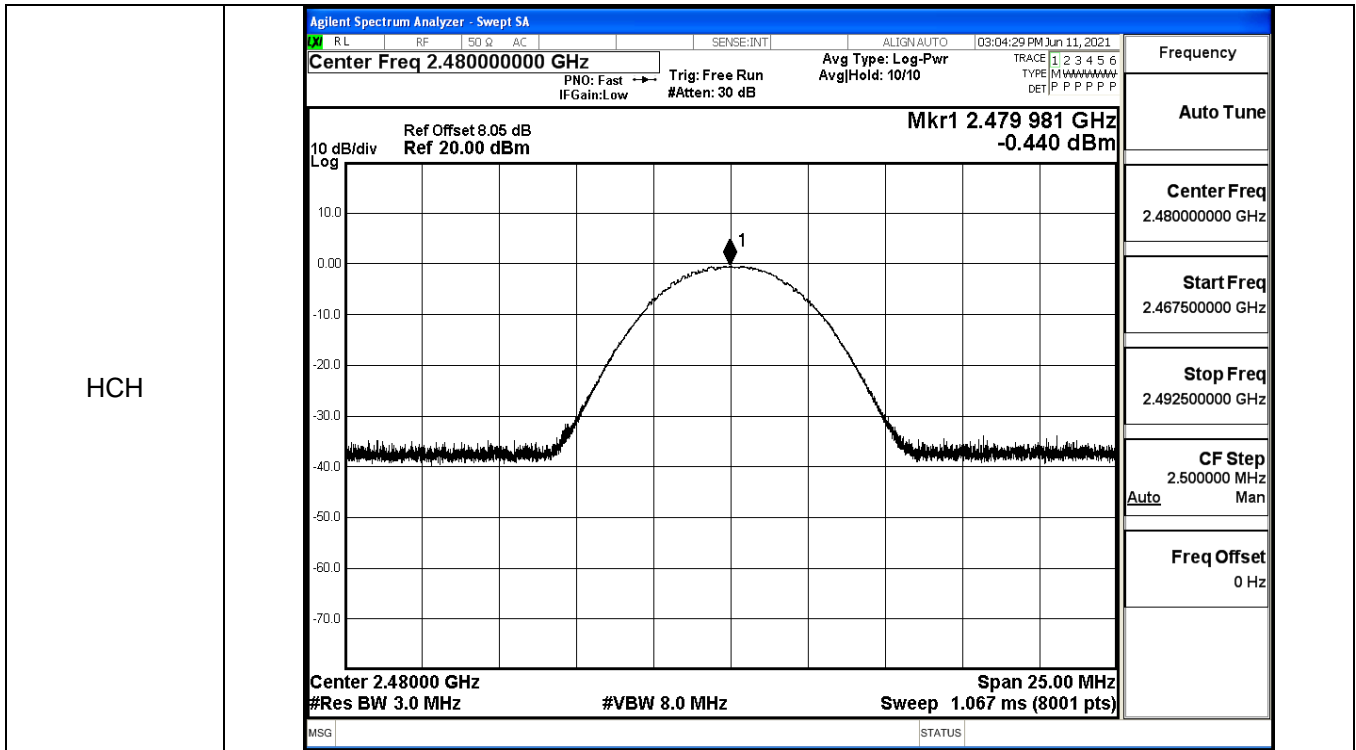
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS



**A.2 Maximum Conducted Peak Output Power**

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.784	30	PASS
BT LE	MCH	-0.867	30	PASS
BT LE	HCH	-0.440	30	PASS

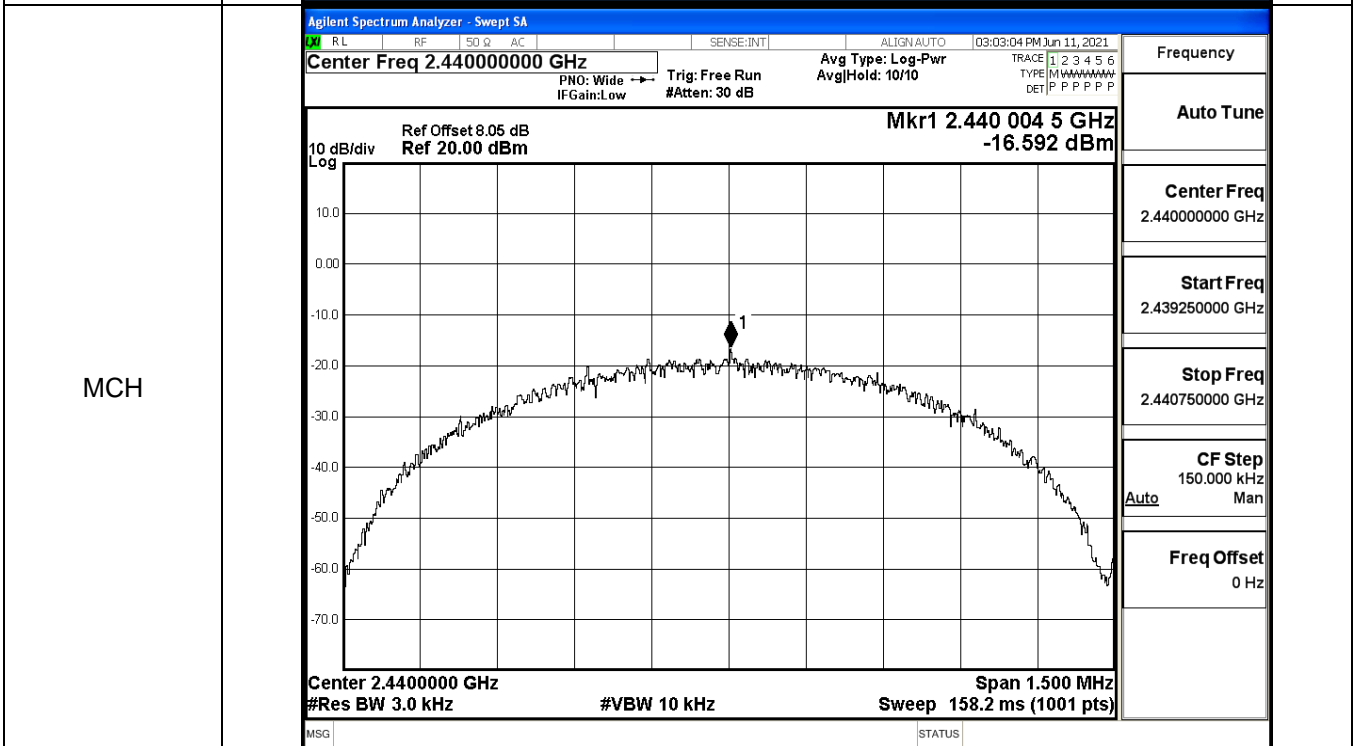
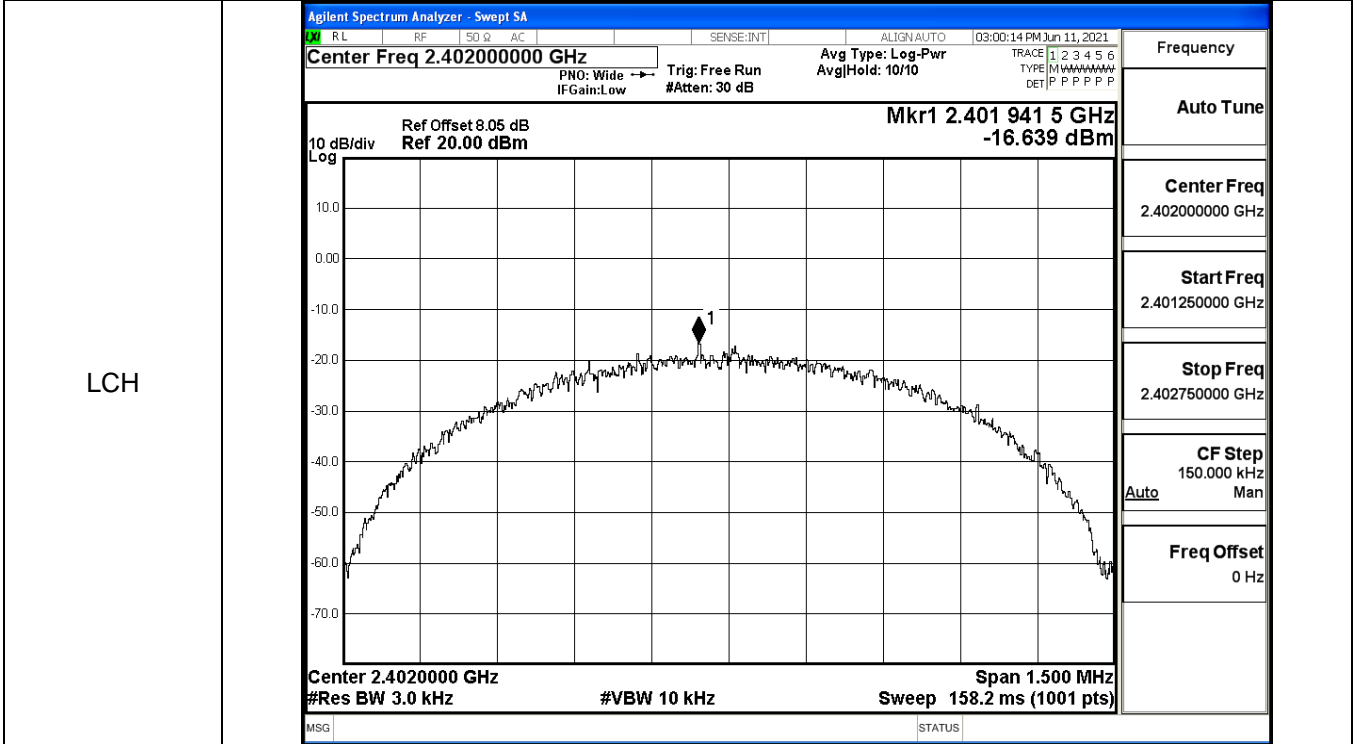
Test Graphs	
LCH	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.40200000 GHz</p> <p>Mkr1 2.401 772 GHz -0.784 dBm</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>Center 2.40200 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Span 25.00 MHz Sweep 1.067 ms (8001 pts)</p>
MCH	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.44000000 GHz</p> <p>Mkr1 2.440 144 GHz -0.867 dBm</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>Center 2.44000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Span 25.00 MHz Sweep 1.067 ms (8001 pts)</p>



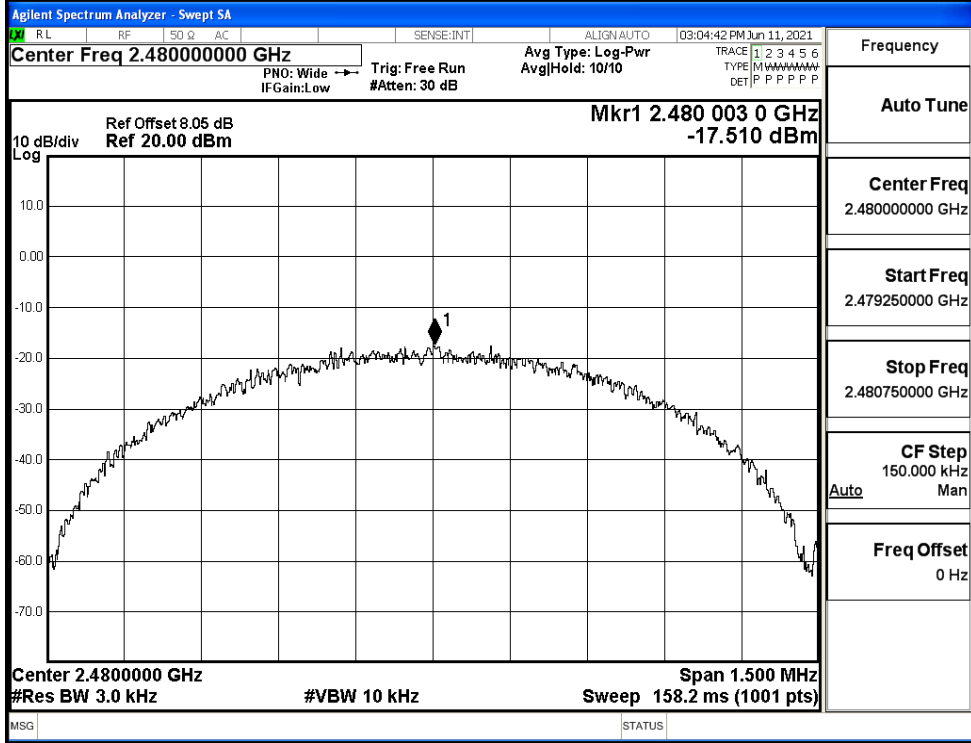
### A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-16.639	8	PASS
BT LE	MCH	-16.592	8	PASS
BT LE	HCH	-17.510	8	PASS

#### Test Graphs



HCH

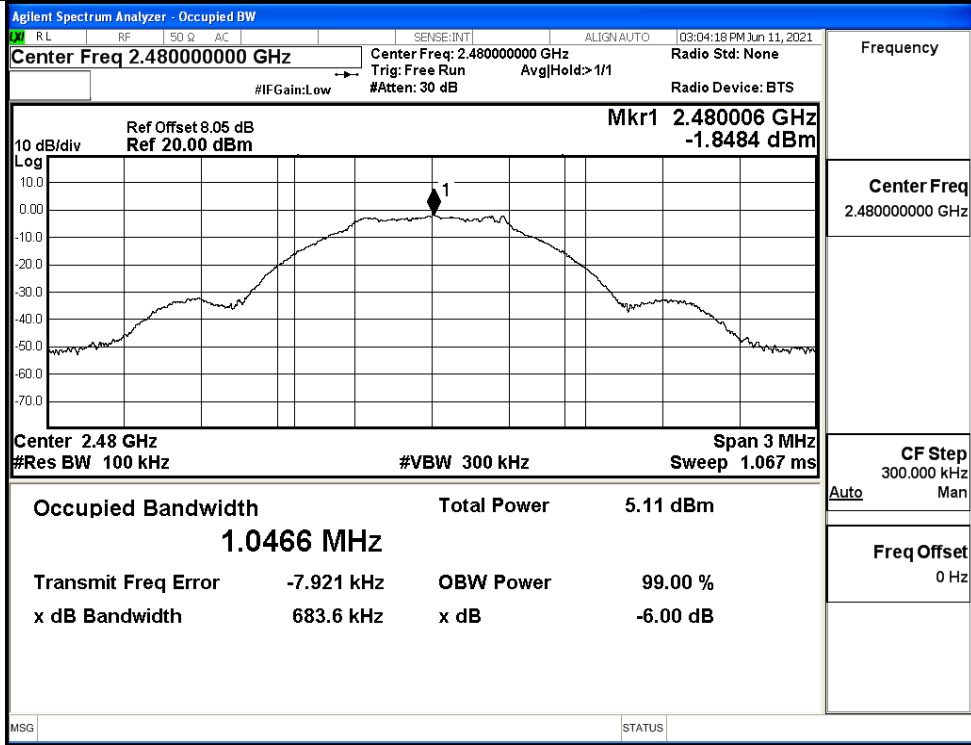


**A.4 6dB Bandwidth**

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6921	≥0.5	PASS
BT LE	MCH	0.7047	≥0.5	PASS
BT LE	HCH	0.6836	≥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:INT ALIGN:AUTO 02:59:50 PM Jun 11, 2021</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> <div style="border: 1px solid black; padding: 2px;"> <p style="text-align: right; margin: 0;">Mkr1 2.402015 GHz -2.3648 dBm</p> </div> <p style="margin: 0;">Center 2.402 GHz Span 3 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: small; border-collapse: collapse;"> <tr> <td style="width: 50%;">Occupied Bandwidth</td> <td style="width: 50%;">Total Power</td> <td style="width: 50%;">4.73 dBm</td> </tr> <tr> <td style="text-align: center;"><b>1.0485 MHz</b></td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-1.946 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>692.1 kHz</td> <td>x dB</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">99.00 %</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">-6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	4.73 dBm	<b>1.0485 MHz</b>			Transmit Freq Error	-1.946 kHz	OBW Power	x dB Bandwidth	692.1 kHz	x dB			99.00 %			-6.00 dB
Occupied Bandwidth	Total Power	4.73 dBm																	
<b>1.0485 MHz</b>																			
Transmit Freq Error	-1.946 kHz	OBW Power																	
x dB Bandwidth	692.1 kHz	x dB																	
		99.00 %																	
		-6.00 dB																	
MCH	<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:INT ALIGN:AUTO 03:02:26 PM Jun 11, 2021</p> <p style="margin: 0;">Center Freq 2.440000000 GHz Center Freq: 2.440000000 GHz Radio Std: None                      Trig: Free Run AvgHold: &gt;1/1                      #IFGain:Low #Atten: 30 dB Radio Device: BTS</p> <div style="border: 1px solid black; padding: 2px;"> <p style="text-align: right; margin: 0;">Mkr1 2.4399955 GHz -2.4729 dBm</p> </div> <p style="margin: 0;">Center 2.44 GHz Span 3 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: small; border-collapse: collapse;"> <tr> <td style="width: 50%;">Occupied Bandwidth</td> <td style="width: 50%;">Total Power</td> <td style="width: 50%;">4.61 dBm</td> </tr> <tr> <td style="text-align: center;"><b>1.0512 MHz</b></td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-6.086 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>704.7 kHz</td> <td>x dB</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">99.00 %</td> </tr> <tr> <td></td> <td></td> <td style="text-align: right;">-6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	4.61 dBm	<b>1.0512 MHz</b>			Transmit Freq Error	-6.086 kHz	OBW Power	x dB Bandwidth	704.7 kHz	x dB			99.00 %			-6.00 dB
Occupied Bandwidth	Total Power	4.61 dBm																	
<b>1.0512 MHz</b>																			
Transmit Freq Error	-6.086 kHz	OBW Power																	
x dB Bandwidth	704.7 kHz	x dB																	
		99.00 %																	
		-6.00 dB																	

HCH



### A.5 Occupied Bandwidth

Mode	Channel	Occupied Bandwidth [MHz]	Verdict
BT LE	LCH	1.0406	PASS
BT LE	MCH	1.0426	PASS
BT LE	HCH	1.0360	PASS

#### Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.40200000 GHz</p> <p>Center Freq: 2.40200000 GHz Trig: Free Run #IFGain: Low #Atten: 30 dB</p> <p>Radio Std: None AvgHold &gt; 10/10 Radio Device: BTS</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>Center 2.402 GHz #Res BW 30 kHz</p> <p>Span 2 MHz Sweep 2.133 ms</p> <p>#VBW 100 kHz</p> <table border="1"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>4.63 dBm</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>1.0406 MHz</b></td> </tr> <tr> <td>Transmit Freq Error</td> <td>4.475 kHz</td> <td>OBW Power 99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>646.2 kHz</td> <td>x dB -6.00 dB</td> </tr> </table> <p>MSG STATUS</p>	Occupied Bandwidth	Total Power	4.63 dBm	<b>1.0406 MHz</b>			Transmit Freq Error	4.475 kHz	OBW Power 99.00 %	x dB Bandwidth	646.2 kHz	x dB -6.00 dB	<p>Frequency</p> <p>Center Freq 2.40200000 GHz</p> <p>CF Step 200.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p>
	Occupied Bandwidth	Total Power	4.63 dBm											
<b>1.0406 MHz</b>														
Transmit Freq Error	4.475 kHz	OBW Power 99.00 %												
x dB Bandwidth	646.2 kHz	x dB -6.00 dB												
MCH	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.44000000 GHz</p> <p>Center Freq: 2.44000000 GHz Trig: Free Run #IFGain: Low #Atten: 30 dB</p> <p>Radio Std: None AvgHold &gt; 10/10 Radio Device: BTS</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>Center 2.44 GHz #Res BW 30 kHz</p> <p>Span 2 MHz Sweep 2.133 ms</p> <p>#VBW 100 kHz</p> <table border="1"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>5.04 dBm</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>1.0426 MHz</b></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-3.224 kHz</td> <td>OBW Power 99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>637.6 kHz</td> <td>x dB -6.00 dB</td> </tr> </table> <p>MSG STATUS</p>	Occupied Bandwidth	Total Power	5.04 dBm	<b>1.0426 MHz</b>			Transmit Freq Error	-3.224 kHz	OBW Power 99.00 %	x dB Bandwidth	637.6 kHz	x dB -6.00 dB	<p>Frequency</p> <p>Center Freq 2.44000000 GHz</p> <p>CF Step 200.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p>
	Occupied Bandwidth	Total Power	5.04 dBm											
<b>1.0426 MHz</b>														
Transmit Freq Error	-3.224 kHz	OBW Power 99.00 %												
x dB Bandwidth	637.6 kHz	x dB -6.00 dB												

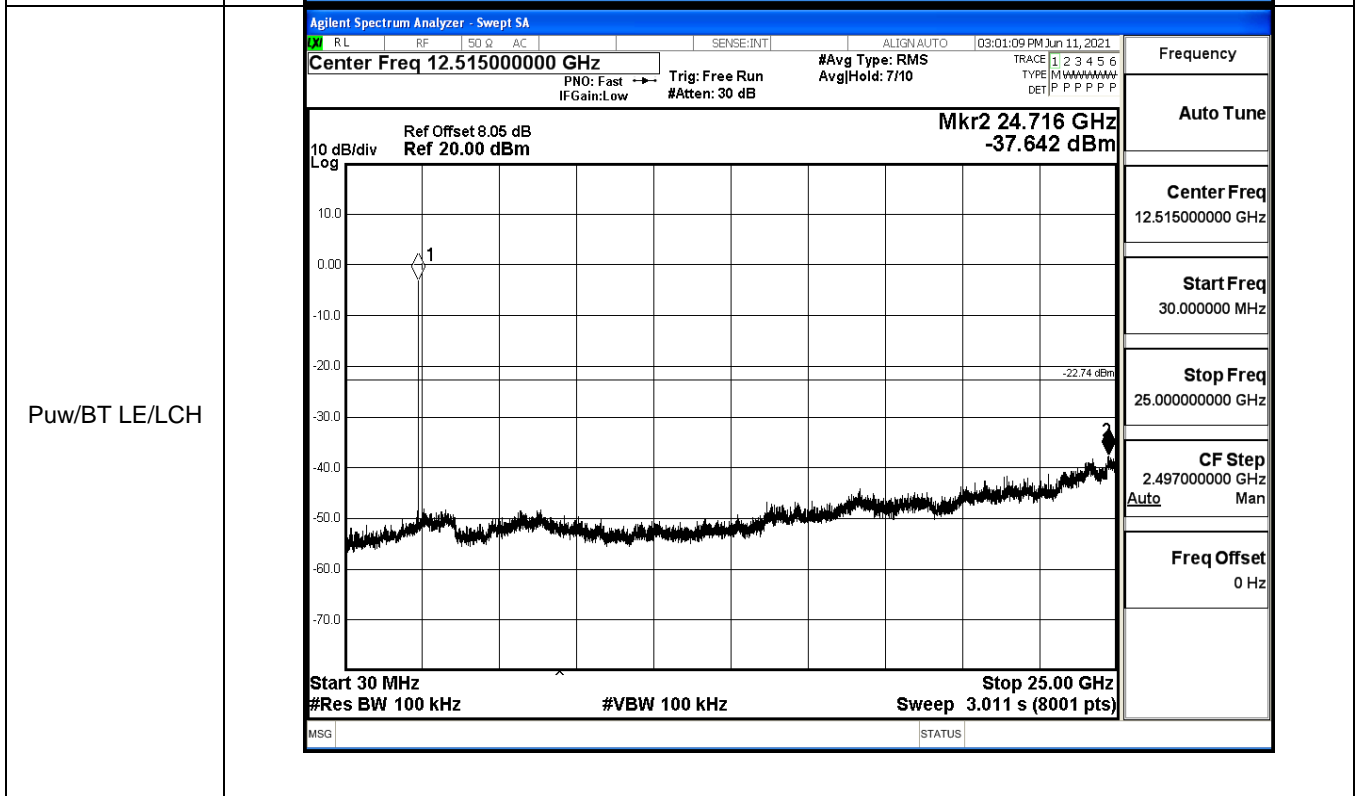
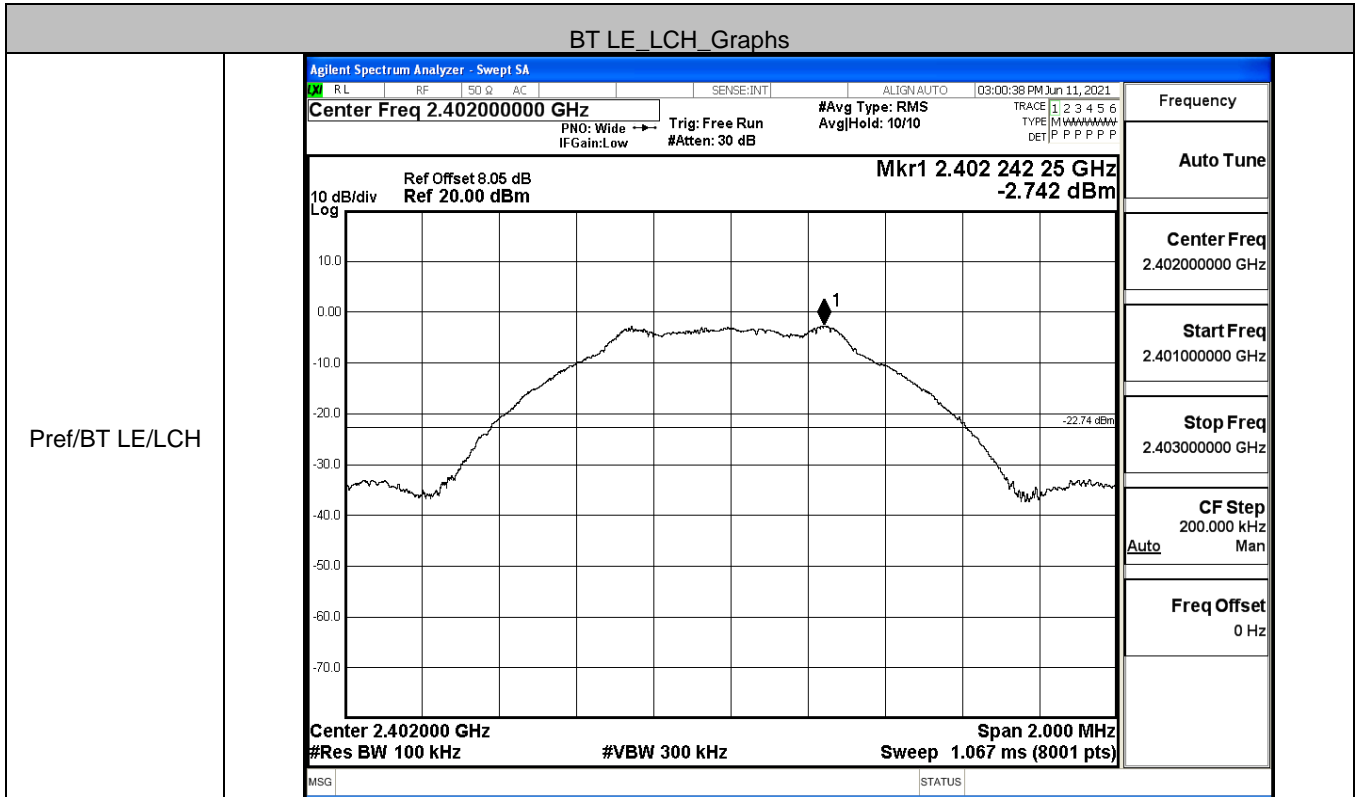


HCH	Agilent Spectrum Analyzer - Occupied BW			RL	RF	50 Ω	AC	SENSE:INT	ALIGN:AUTO	03:06:25 PM Jun 11, 2021
	Center Freq 2.480000000 GHz				Center Freq: 2.480000000 GHz			Radio Std: None		Frequency
					Trig: Free Run		AvgJHold: 10/10		Radio Device: BTS	
					#IFGain:Low		#Atten: 30 dB			
<div style="display: flex; justify-content: space-between;"> <span>10 dB/div</span> <span>Ref Offset 8.05 dB</span> </div> <div style="text-align: center; font-weight: bold;">Log</div> <div style="text-align: center; font-weight: bold;">Ref 20.00 dBm</div> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>Center 2.48 GHz</span> <span>#VBW 100 kHz</span> <span>Span 2 MHz</span> </div> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>#Res BW 30 kHz</span> <span>Sweep 2.133 ms</span> </div>										
Occupied Bandwidth				Total Power		5.57 dBm				
1.0360 MHz										
Transmit Freq Error		-3.316 kHz		OBW Power		99.00 %				
x dB Bandwidth		654.3 kHz		x dB		-6.00 dB				
MSG										STATUS

### A.6 RF Conducted Spurious Emissions

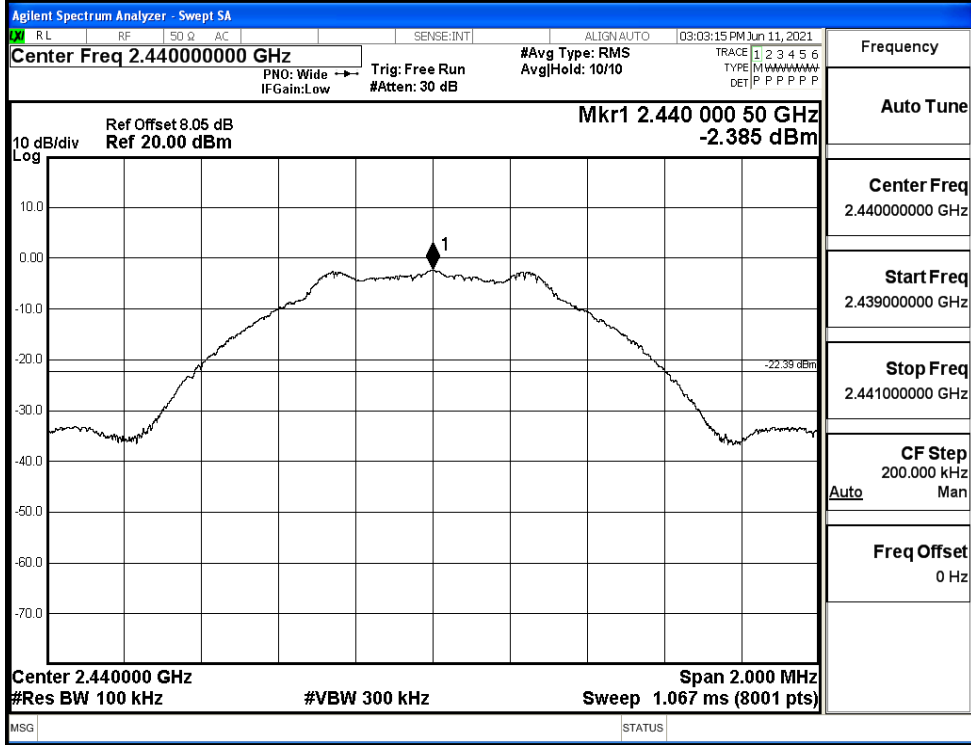
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.742	-37.642	-22.742	PASS
BT LE	MCH	-2.385	-37.322	-22.385	PASS
BT LE	HCH	-1.426	-37.071	-21.426	PASS

BT LE\_LCH\_Graphs

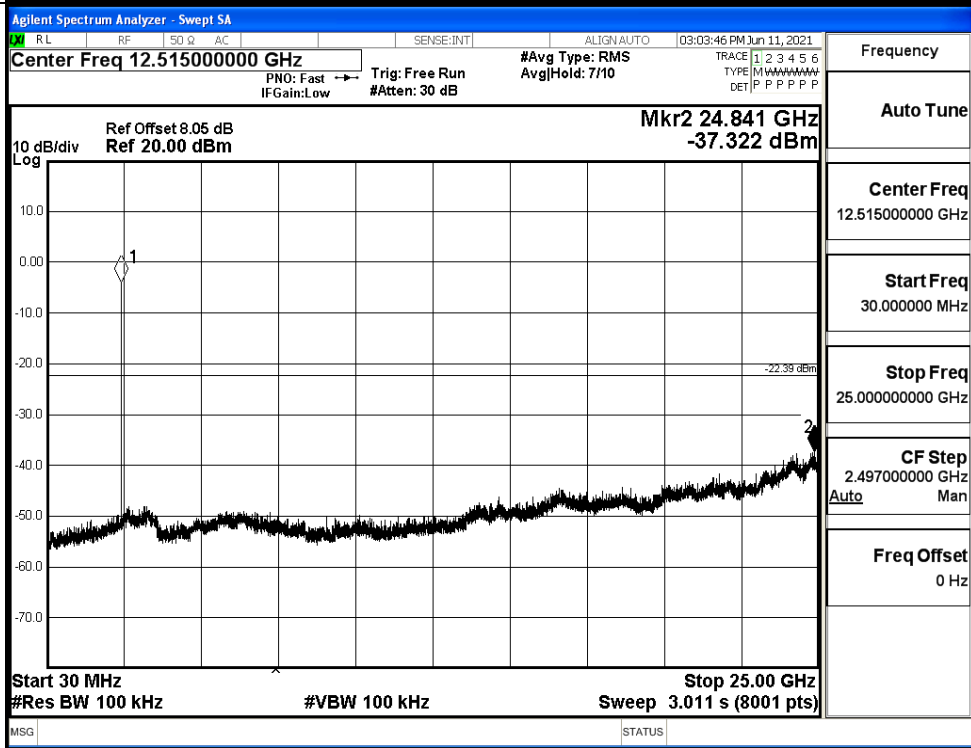


BT LE\_MCH\_Graphs

Pref/BT LE/MCH

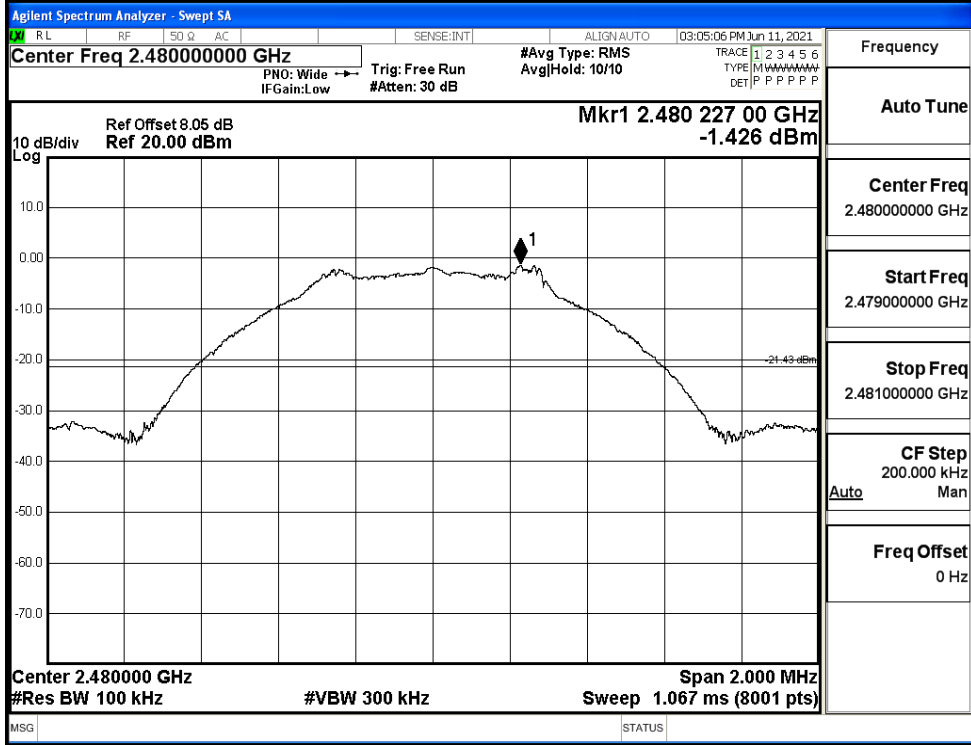


Puw/BT LE/MCH

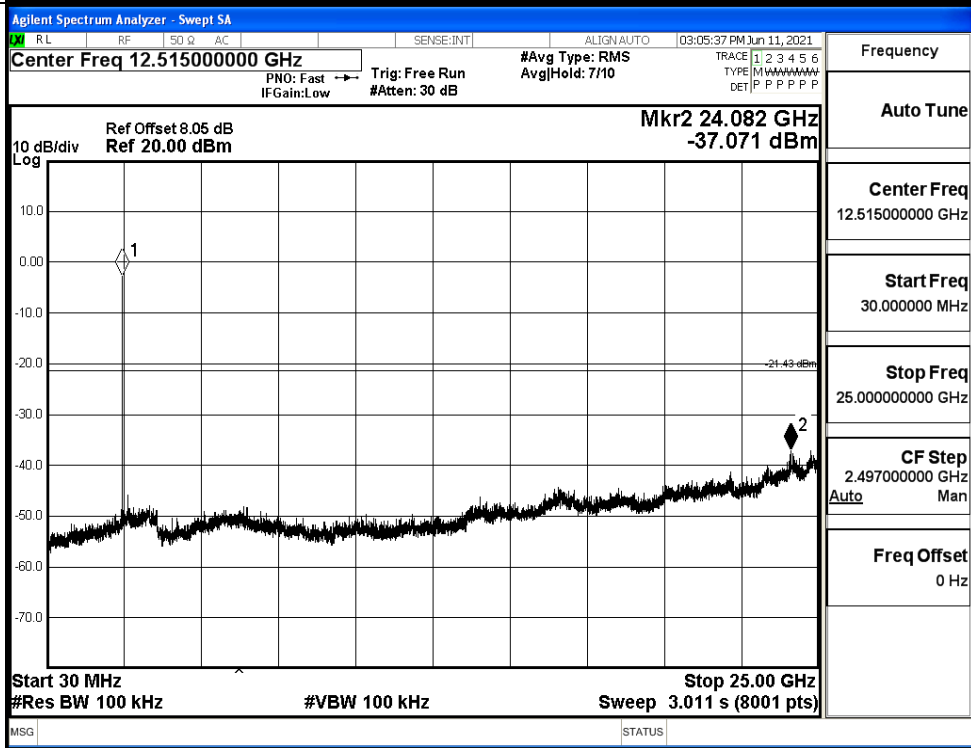


BT LE\_HCH\_Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



### A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.600	-49.613	-22.6	PASS
BT LE	HCH	-1.015	-48.535	-21.02	PASS

Test Graphs

LCH

Agilent Spectrum Analyzer - Swept SA  
 Center Freq 2.357000000 GHz  
 Mkr4 2.336 684 GHz -49.613 dBm  
 Start 2.31000 GHz Stop 2.40400 GHz  
 #Res BW 100 kHz #VBW 300 kHz Sweep 9.067 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.402 003 GHz	-2.600 dBm			
2	N	f		2.400 000 GHz	-53.210 dBm			
3	N	f		2.390 000 GHz	-53.789 dBm			
4	N	f		2.336 684 GHz	-49.613 dBm			

Frequency

Auto Tune

Center Freq  
2.357000000 GHz

Start Freq  
2.310000000 GHz

Stop Freq  
2.404000000 GHz

CF Step  
9.400000 MHz

Freq Offset  
0 Hz

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HCH

Agilent Spectrum Analyzer - Swept SA  
 Center Freq 2.489000000 GHz  
 Mkr4 2.486 483 75 GHz -48.535 dBm  
 Start 2.47800 GHz Stop 2.50000 GHz  
 #Res BW 100 kHz #VBW 300 kHz Sweep 2.133 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.480 249 50 GHz	-1.015 dBm			
2	N	f		2.483 500 00 GHz	-51.506 dBm			
3	N	f		2.500 000 00 GHz	-51.021 dBm			
4	N	f		2.486 483 75 GHz	-48.535 dBm			

Frequency

Auto Tune

Center Freq  
2.489000000 GHz

Start Freq  
2.478000000 GHz

Stop Freq  
2.500000000 GHz

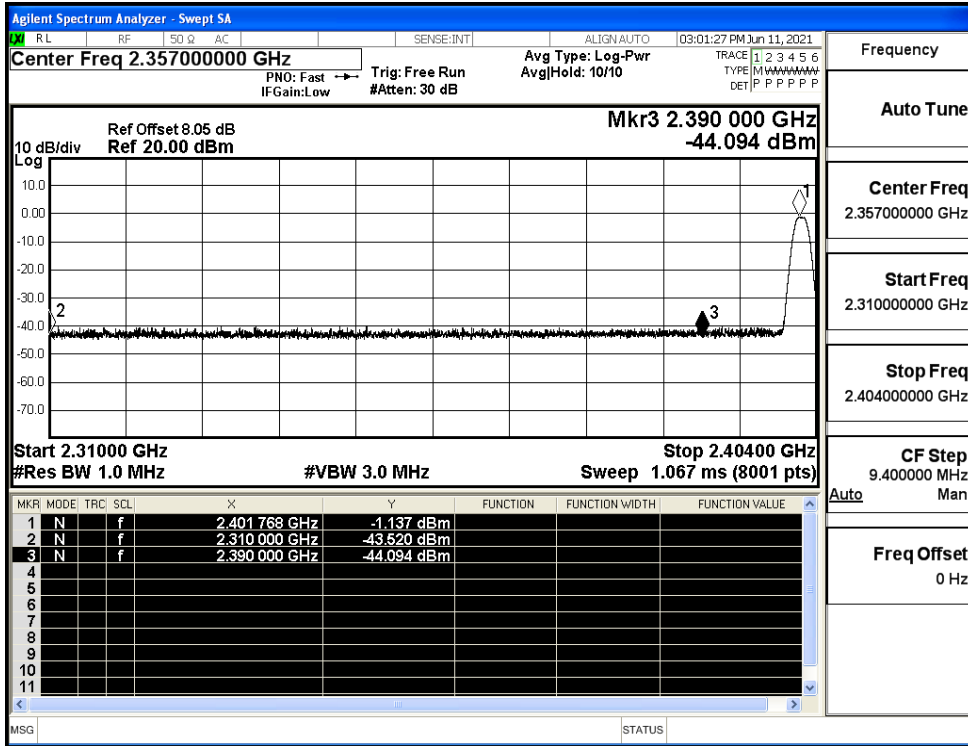
CF Step  
2.200000 MHz

Freq Offset  
0 Hz

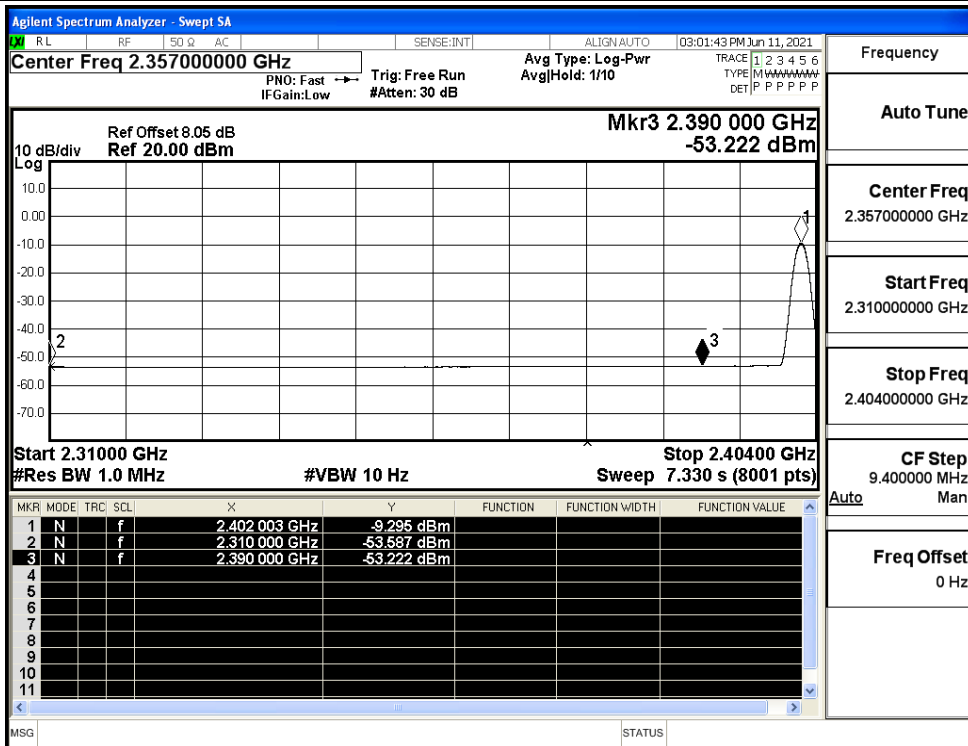
## A.8 Restrict-band band-edge measurements

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	-43.52	2.0	0	53.74	PEAK	74	PASS
		Ant1	2310.0	-53.59	2.0	0	43.67	AV	54	PASS
		Ant1	2390.0	-44.09	2.0	0	53.17	PEAK	74	PASS
		Ant1	2390.0	-53.22	2.0	0	44.04	AV	54	PASS
	2480	Ant1	2483.5	-42.34	2.0	0	54.92	PEAK	74	PASS
		Ant1	2483.5	-52.75	2.0	0	44.51	AV	54	PASS
		Ant1	2500.0	-42.63	2.0	0	54.63	PEAK	74	PASS
		Ant1	2500.0	-52.57	2.0	0	44.69	AV	54	PASS

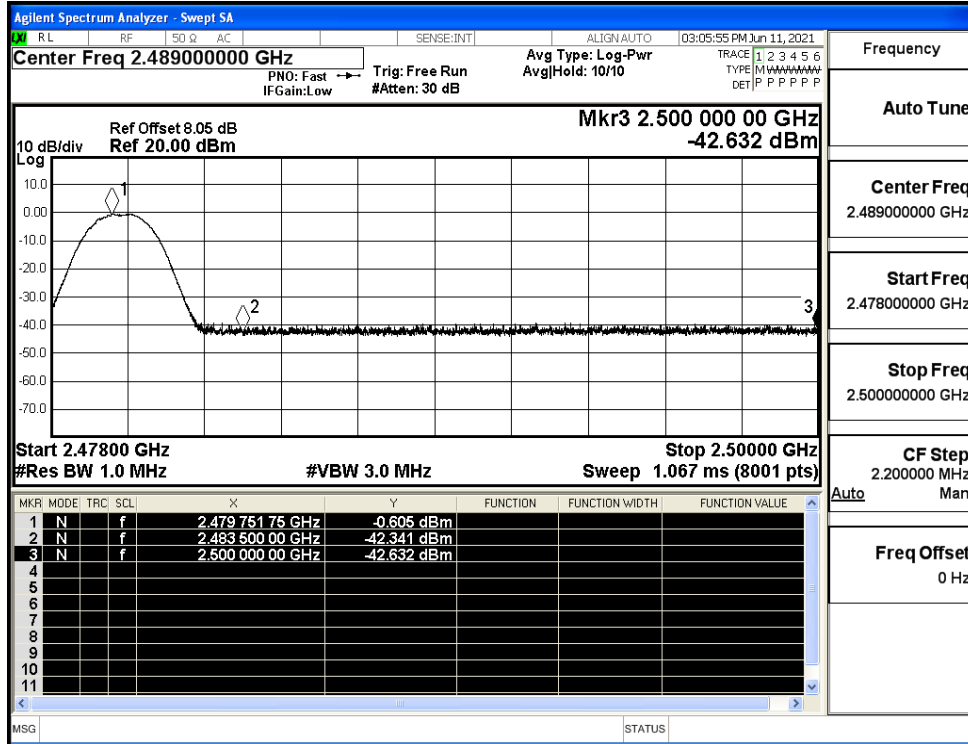
Restrict-band band-edge measurements\_BT LE\_2402\_Ant1\_PEAK



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

