

Appendix B

RF Test Data for BT V4.2 (LE) (Conducted Measurement)

Product Name: Shower Speaker

Trade Mark: atomi

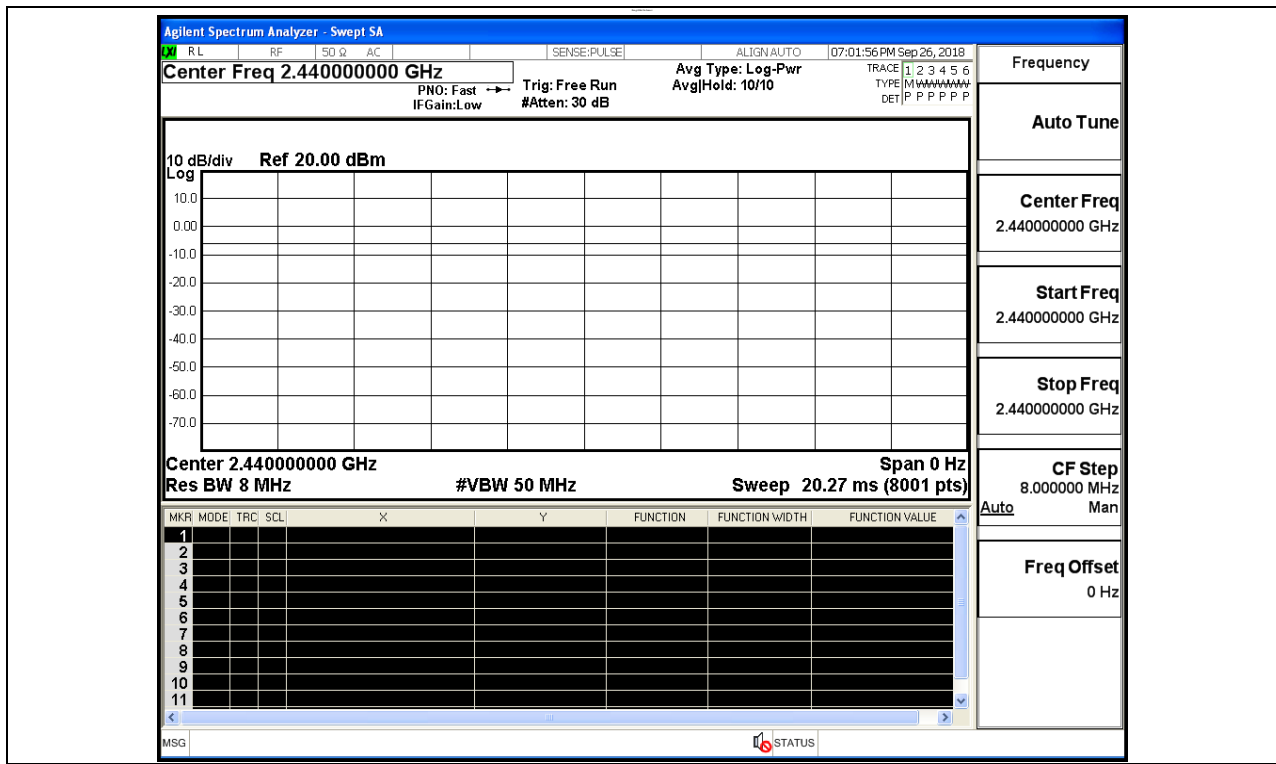
Test Model: AT1225

Environmental Conditions

Temperature:	24.3 ° C
Relative Humidity:	53.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

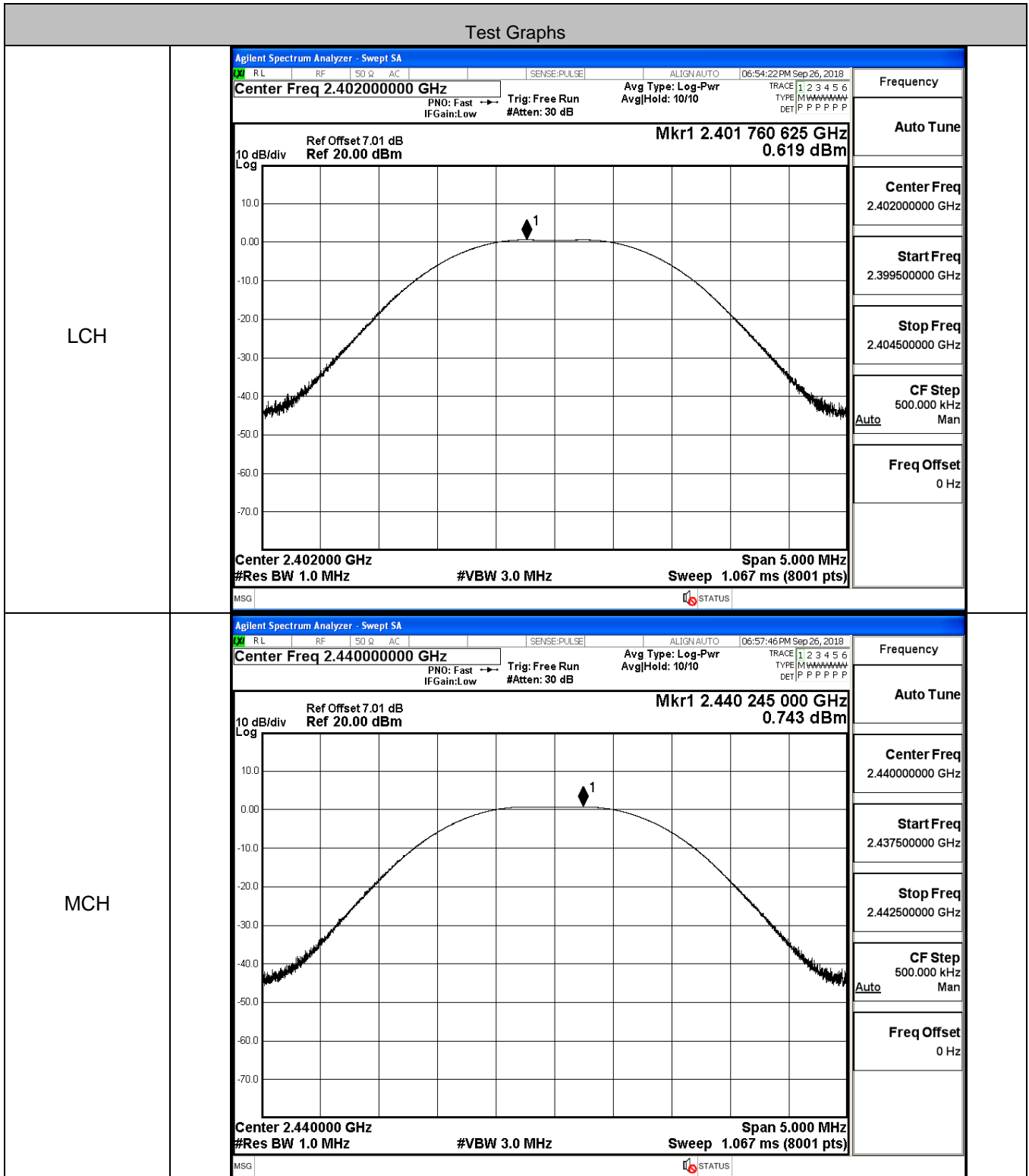
B.1 Duty Cycle

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

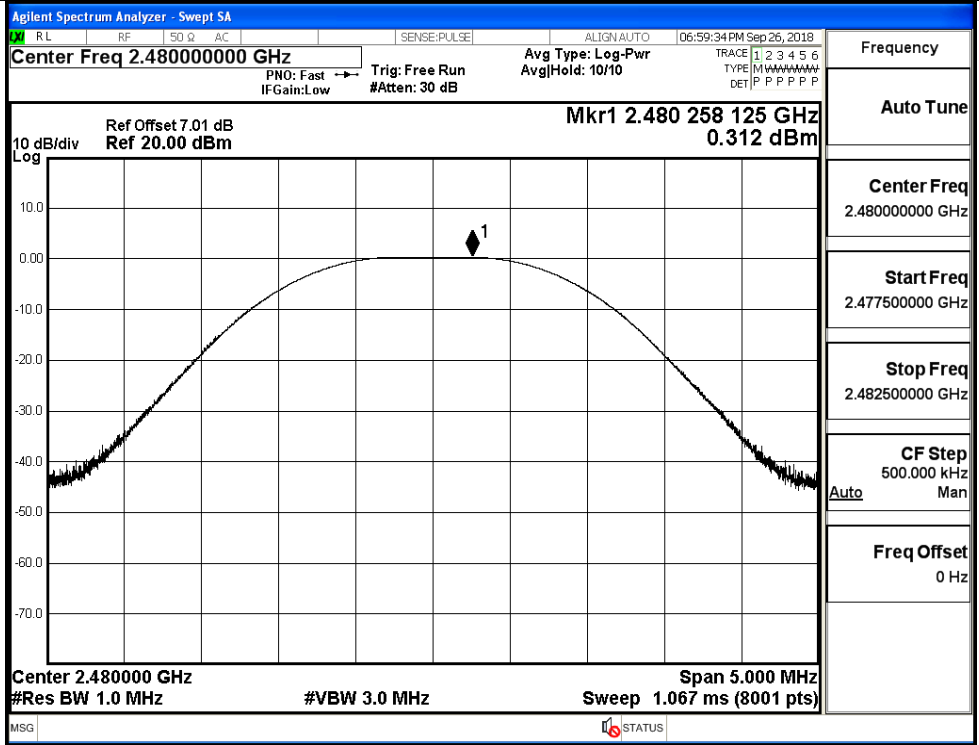


B.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.619	30	PASS
BT LE	MCH	0.743	30	PASS
BT LE	HCH	0.312	30	PASS



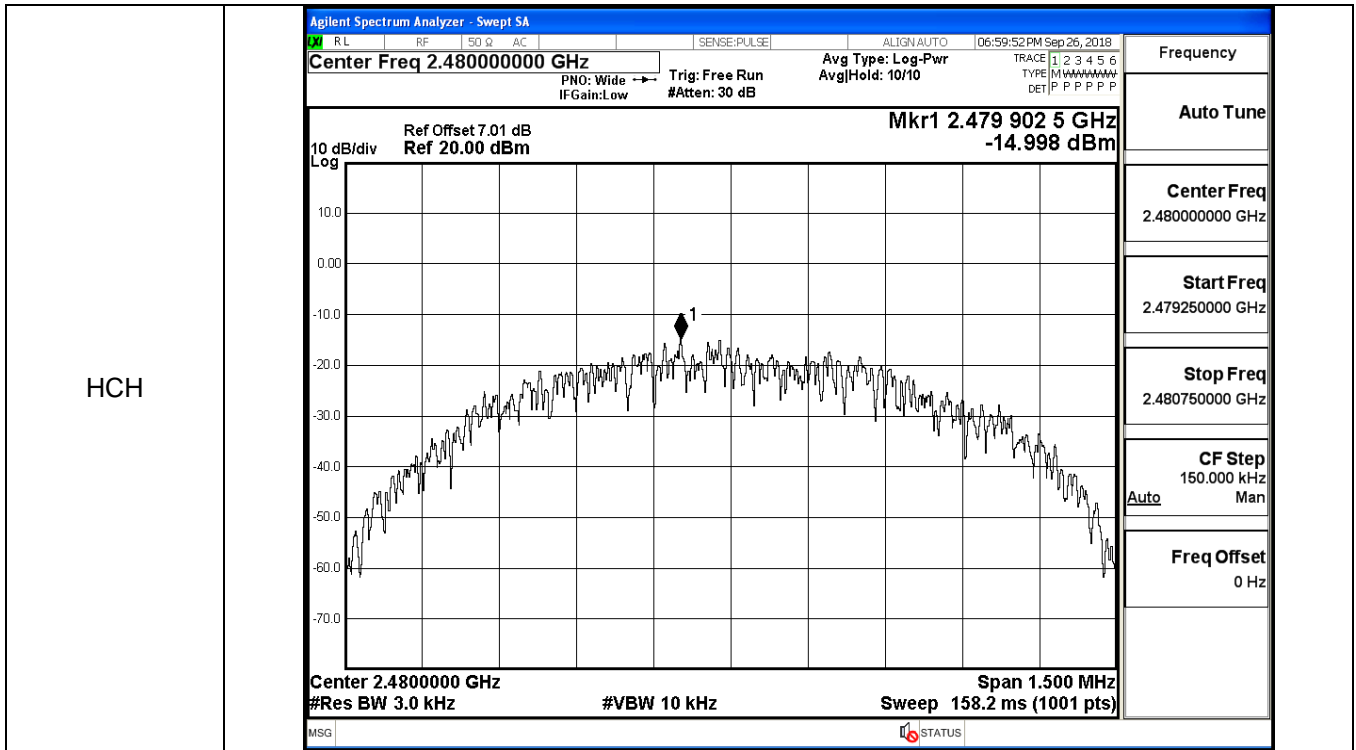
HCH



B.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-14.591	8	PASS
BT LE	MCH	-14.399	8	PASS
BT LE	HCH	-14.998	8	PASS

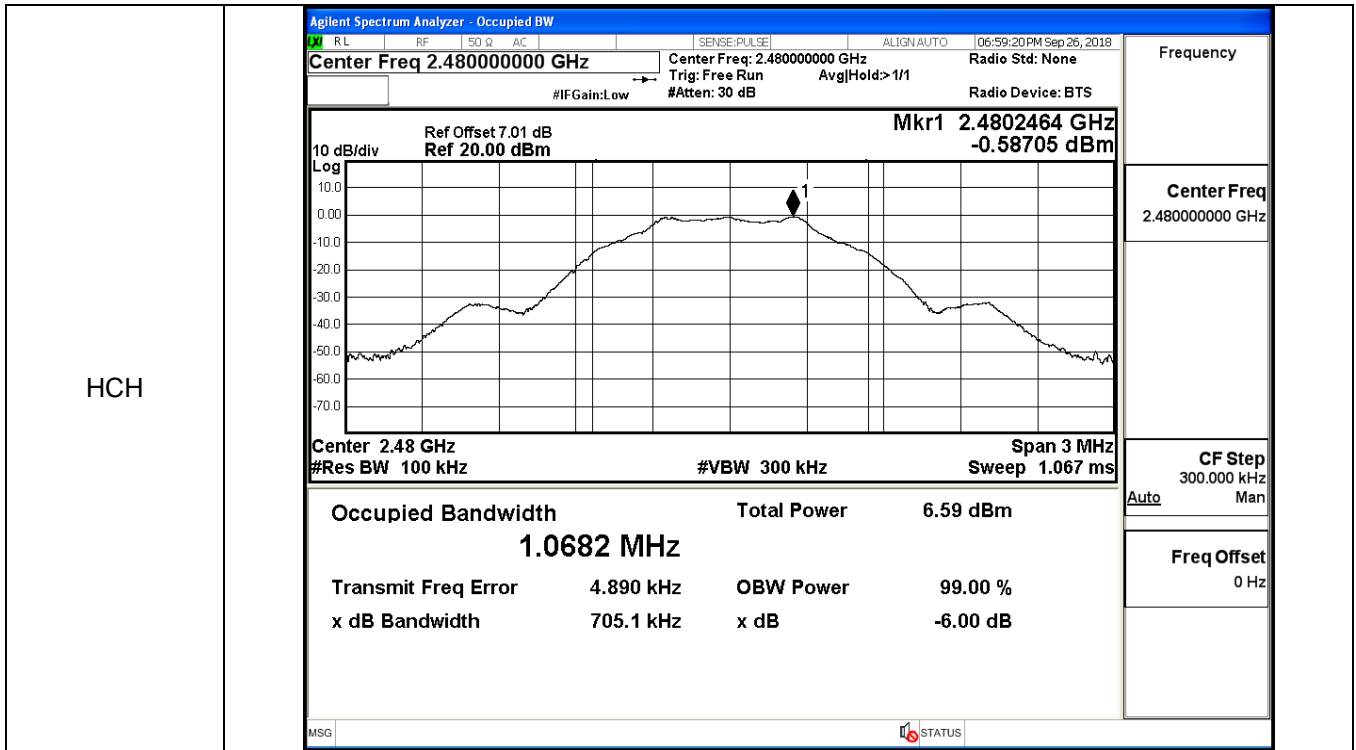
Test Graphs									
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Swept SA</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 06:54:39 PM Sep 26, 2018</p> <p style="font-size: small; margin: 0;">Center Freq 2.40200000 GHz Avg Type: Log-Pwr TRACE 1 2 3 4 5 6</p> <p style="font-size: x-small; margin: 0;">PNO: Wide → Trig: Free Run AvgHold: 10/10 TYPE M W W W W W W W</p> <p style="font-size: x-small; margin: 0;">IFGain:Low #Atten: 30 dB DET P P P P P P P</p> <div style="display: flex; justify-content: space-between; font-size: small;"> Ref Offset 7.01 dB Mkr1 2.401 979 0 GHz </div> <div style="display: flex; justify-content: space-between; font-size: small;"> Ref 20.00 dBm -14.591 dBm </div> <div style="display: flex; justify-content: space-between; font-size: x-small; margin-top: 10px;"> Center 2.4020000 GHz Span 1.500 MHz </div> <div style="display: flex; justify-content: space-between; font-size: x-small; margin-top: 5px;"> #Res BW 3.0 kHz #VBW 10 kHz Sweep 158.2 ms (1001 pts) </div> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small; margin-top: 5px;"> <tr><td>Frequency</td></tr> <tr><td>Auto Tune</td></tr> <tr><td>Center Freq 2.40200000 GHz</td></tr> <tr><td>Start Freq 2.401250000 GHz</td></tr> <tr><td>Stop Freq 2.402750000 GHz</td></tr> <tr><td>CF Step 150.000 kHz</td></tr> <tr><td>Auto</td></tr> <tr><td>Freq Offset 0 Hz</td></tr> </table>	Frequency	Auto Tune	Center Freq 2.40200000 GHz	Start Freq 2.401250000 GHz	Stop Freq 2.402750000 GHz	CF Step 150.000 kHz	Auto	Freq Offset 0 Hz
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Stop Freq 2.440750000 GHz									
CF Step 150.000 kHz									
Auto									
Freq Offset 0 Hz									



B.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.7038	≥0.5	PASS
BT LE	MCH	0.7023	≥0.5	PASS
BT LE	HCH	0.7051	≥0.5	PASS

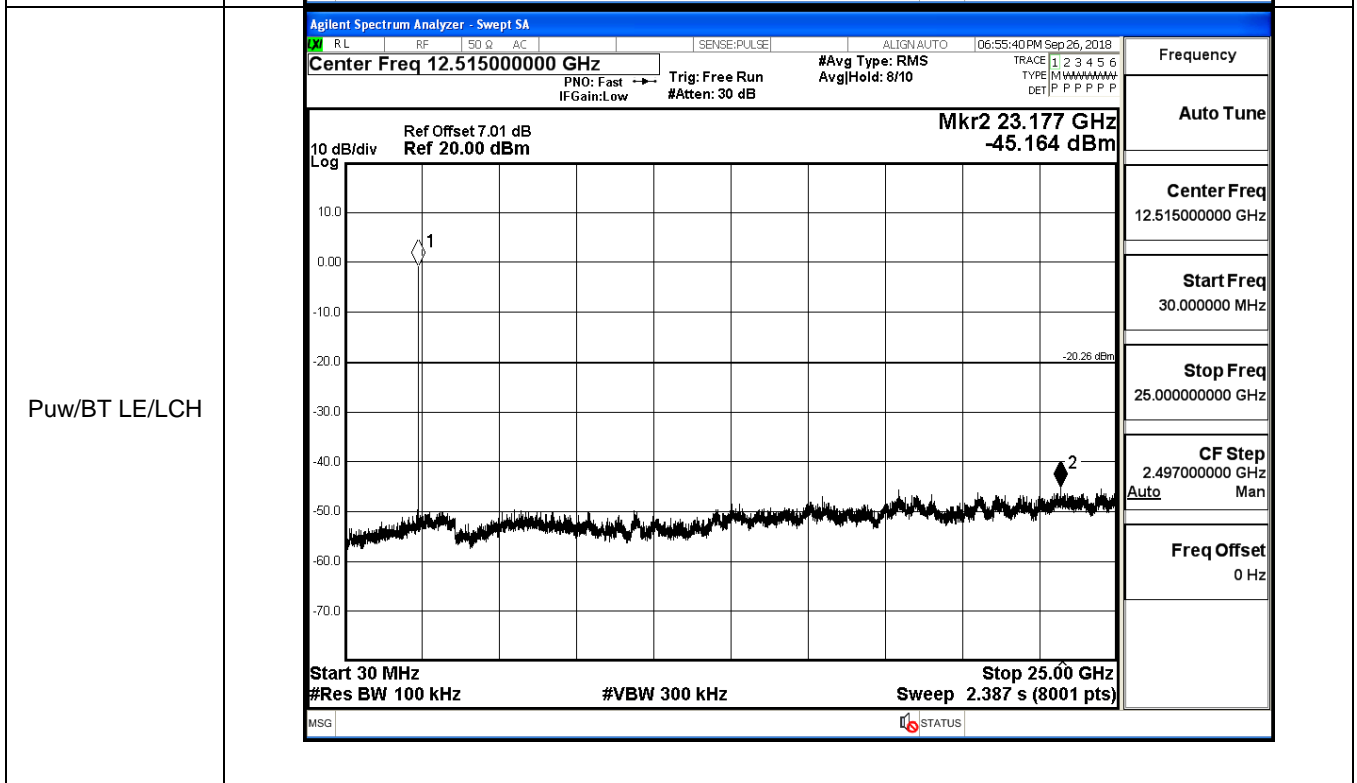
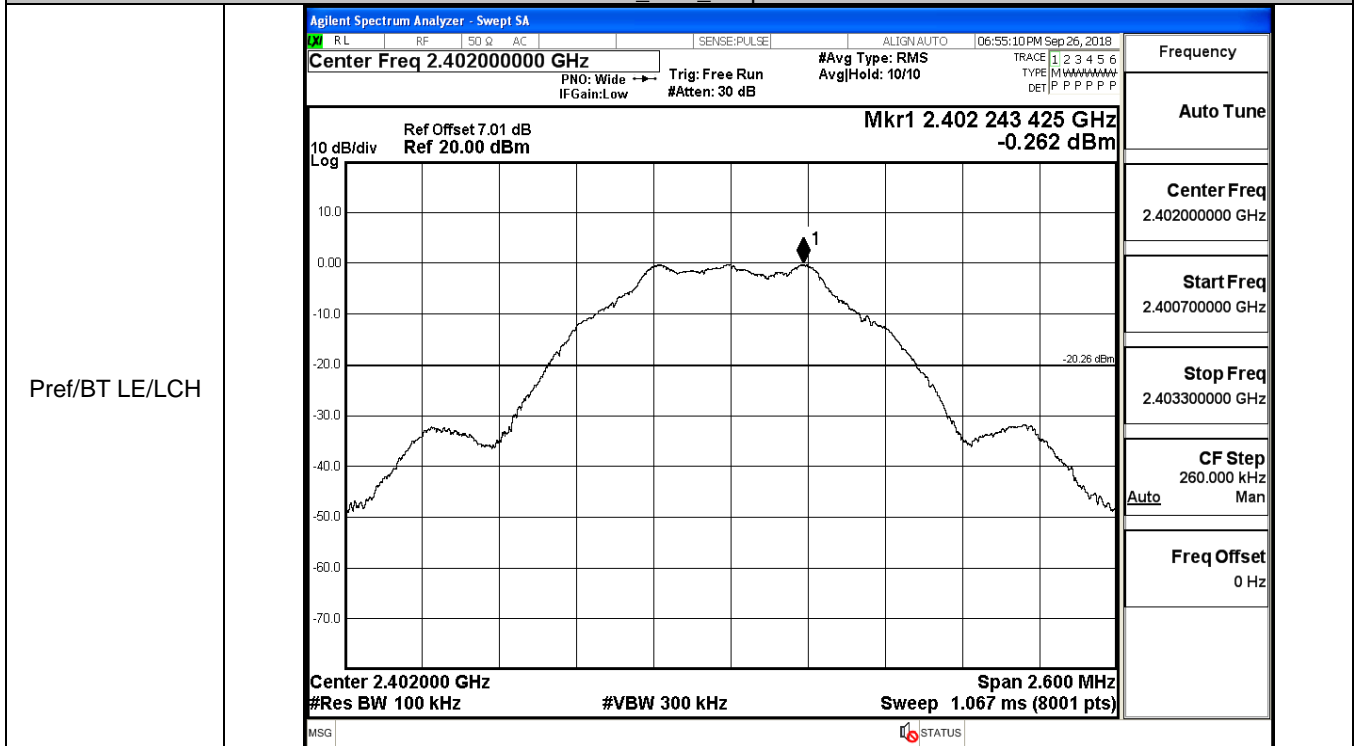
Test Graphs																			
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 06:54:07 PM Sep 26, 2018</p> <p style="margin: 0;">Center 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>6.90 dBm</td> </tr> <tr> <td style="text-align: center;">1.0703 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>3.870 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>703.8 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	6.90 dBm	1.0703 MHz			Transmit Freq Error	3.870 kHz	OBW Power	x dB Bandwidth	703.8 kHz	x dB			99.00 %			-6.00 dB
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B.5 RF Conducted Spurious Emissions

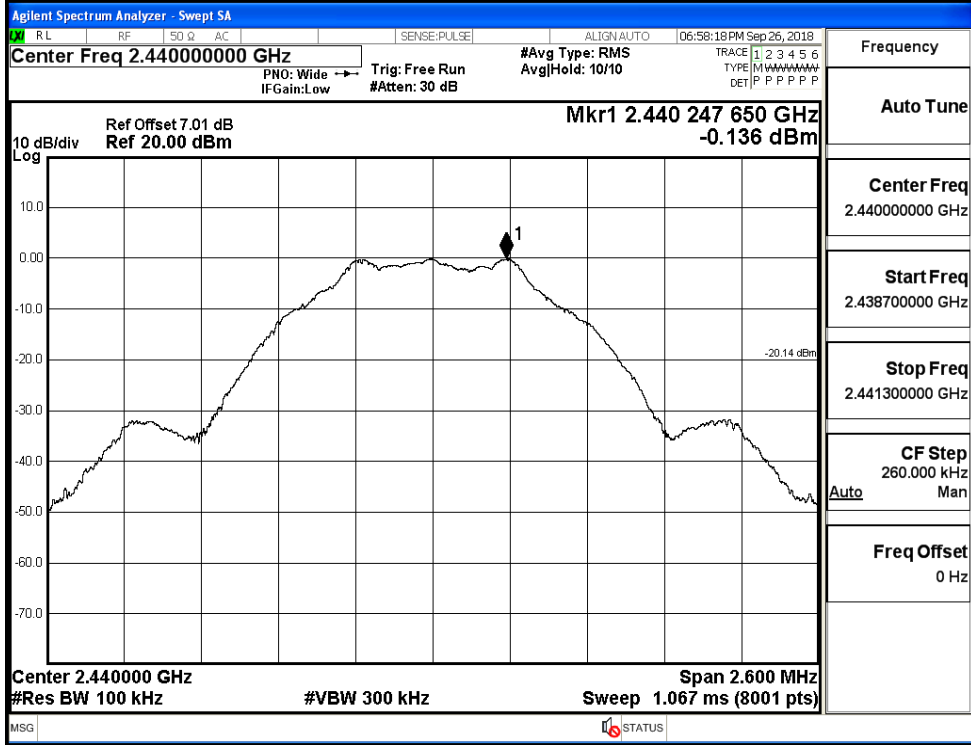
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.262	-45.164	-20.262	PASS
BT LE	MCH	-0.136	-45.510	-20.136	PASS
BT LE	HCH	-0.565	-44.403	-20.565	PASS

BT LE_LCH_Graphs

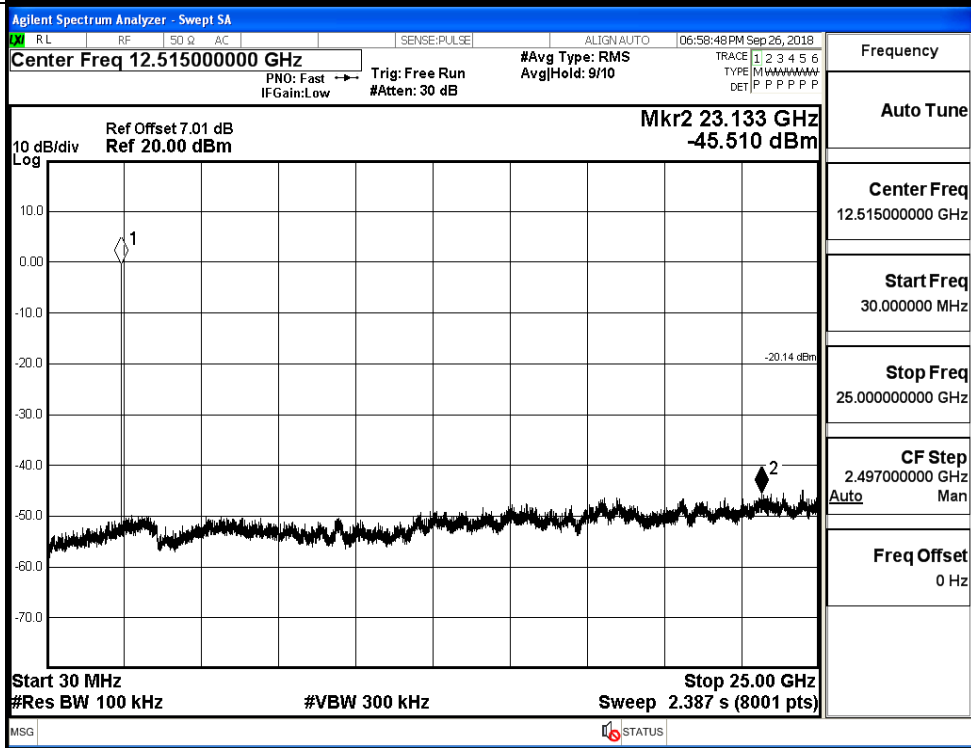


BT LE_MCH_Graphs

Pref/BT LE/MCH

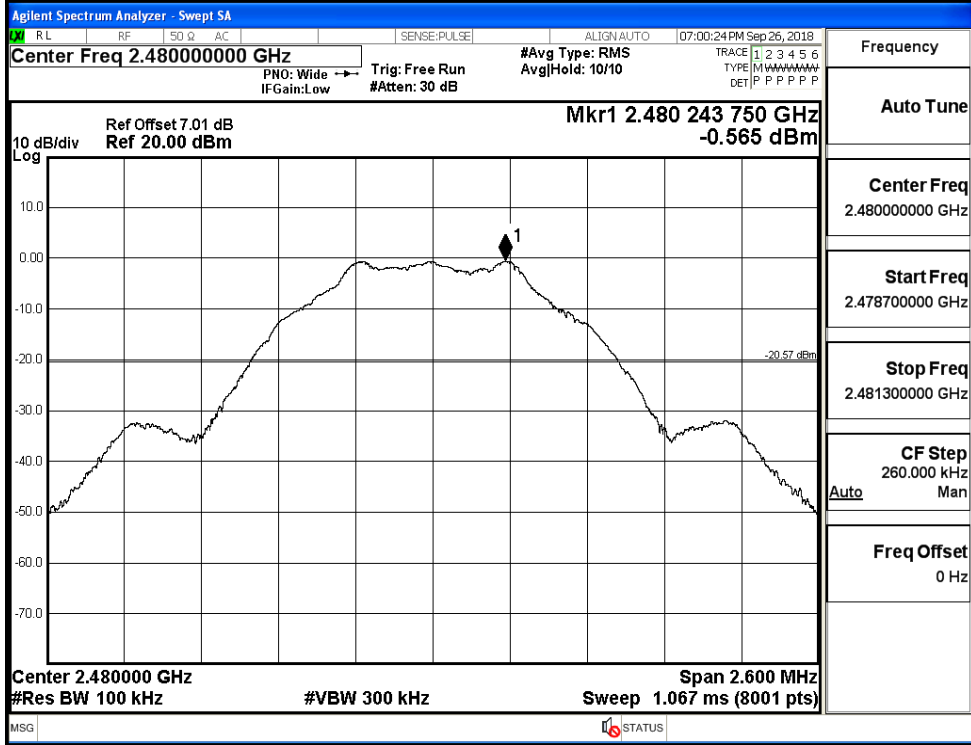


Puw/BT LE/MCH

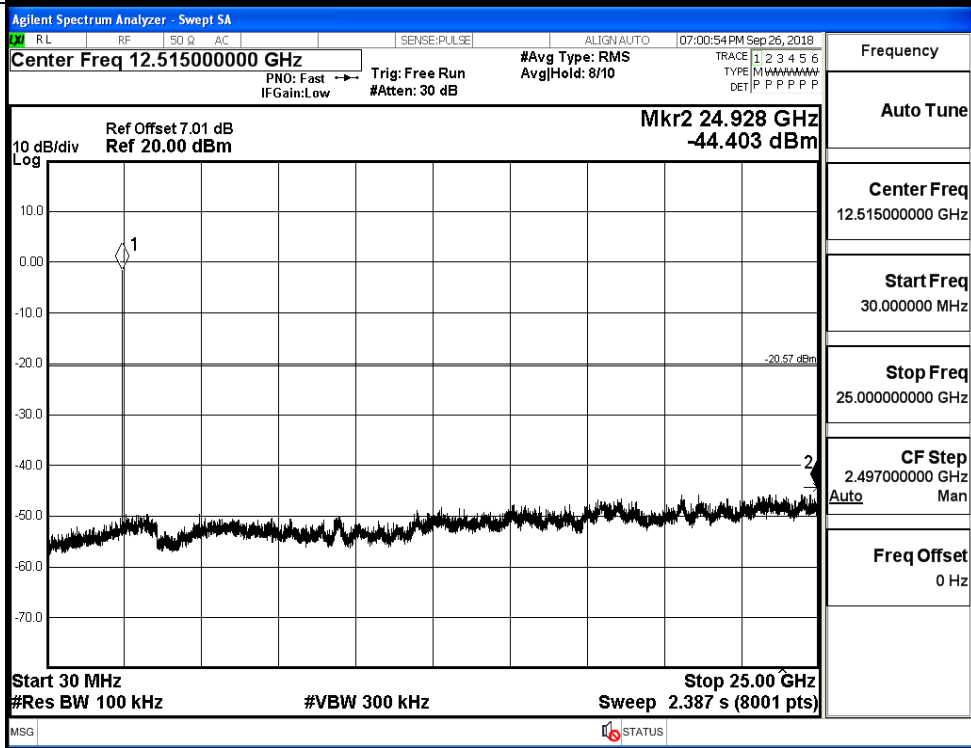


BT LE_HCH_Graphs

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	-0.087	-50.745	-20.09	PASS
BT LE	HCH	-0.325	-50.655	-20.33	PASS

Test Graphs

LCH

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.402 238 GHz	-0.087 dBm			
2	N	f		2.400 000 GHz	-53.142 dBm			
3	N	f		2.390 000 GHz	-54.445 dBm			
4	N	f		2.330 668 GHz	-50.745 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

HCH

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.480 249 50 GHz	-0.325 dBm			
2	N	f		2.483 500 00 GHz	-55.285 dBm			
3	N	f		2.500 000 00 GHz	-54.173 dBm			
4	N	f		2.487 306 00 GHz	-50.655 dBm			

Frequency

Auto Tune

Center Freq
2.48900000 GHz

Start Freq
2.47800000 GHz

Stop Freq
2.50000000 GHz

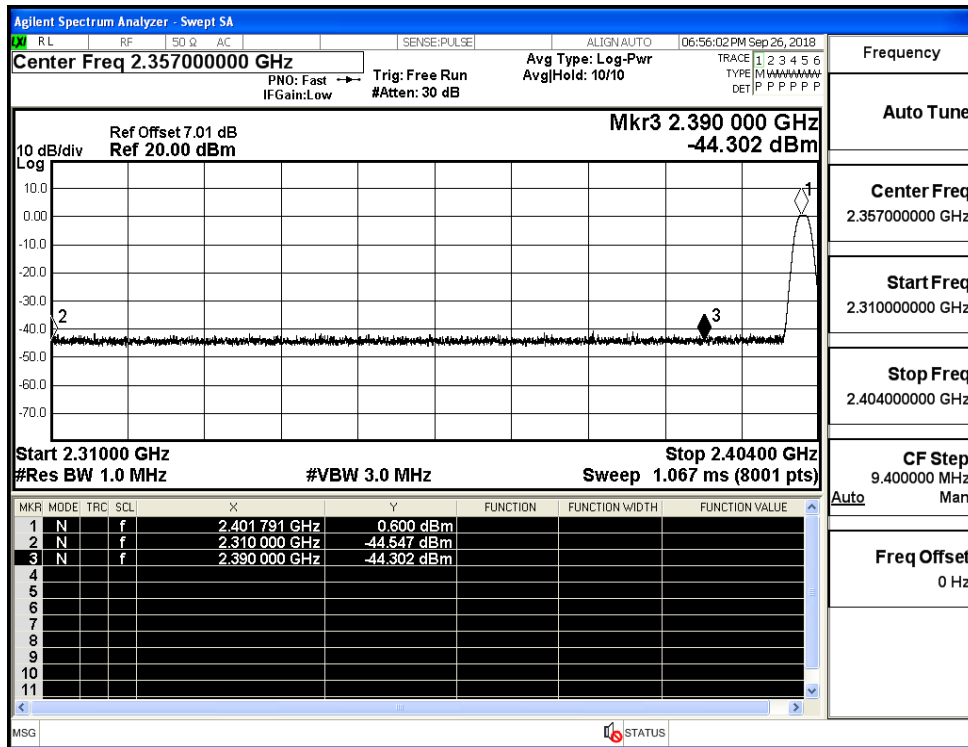
CF Step
2.200000 MHz

Freq Offset
0 Hz

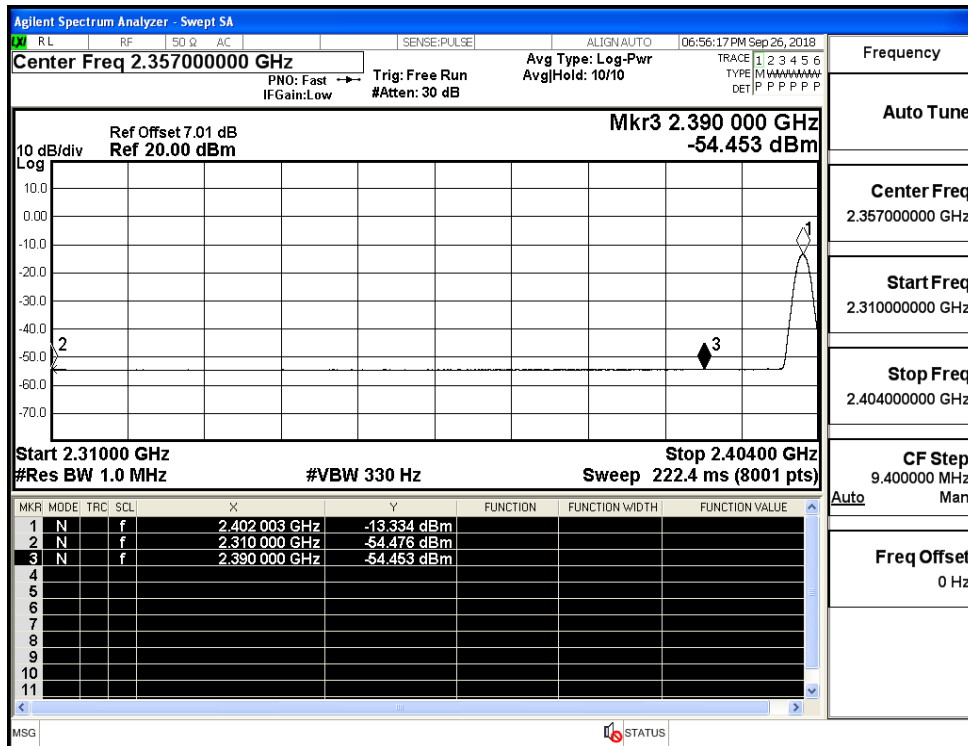
B.7 Restrict-band band-edge measurements

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	-44.55	2.0	0	52.71	PEAK	74	PASS
		Ant1	2310.0	-54.48	2.0	0	42.78	AV	54	PASS
		Ant1	2390.0	-44.30	2.0	0	52.96	PEAK	74	PASS
		Ant1	2390.0	-54.45	2.0	0	42.80	AV	54	PASS
	2480	Ant1	2483.5	-44.04	2.0	0	53.22	PEAK	74	PASS
		Ant1	2483.5	-54.05	2.0	0	43.21	AV	54	PASS
		Ant1	2500.0	-44.01	2.0	0	53.25	PEAK	74	PASS
		Ant1	2500.0	-54.00	2.0	0	43.26	AV	54	PASS

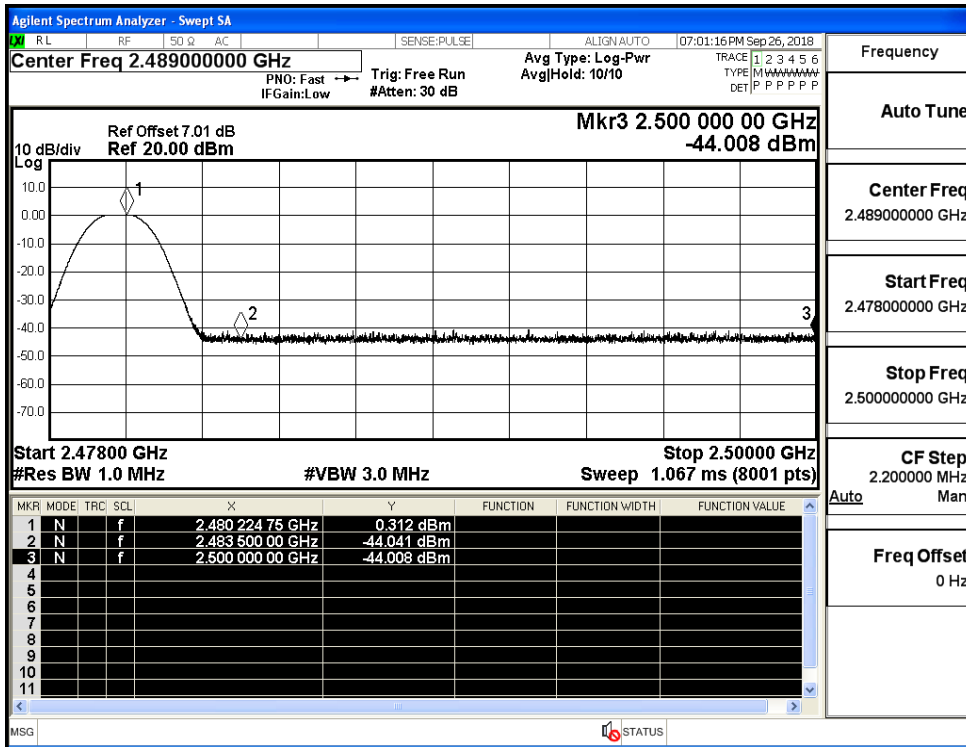
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

