

Appendix B

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

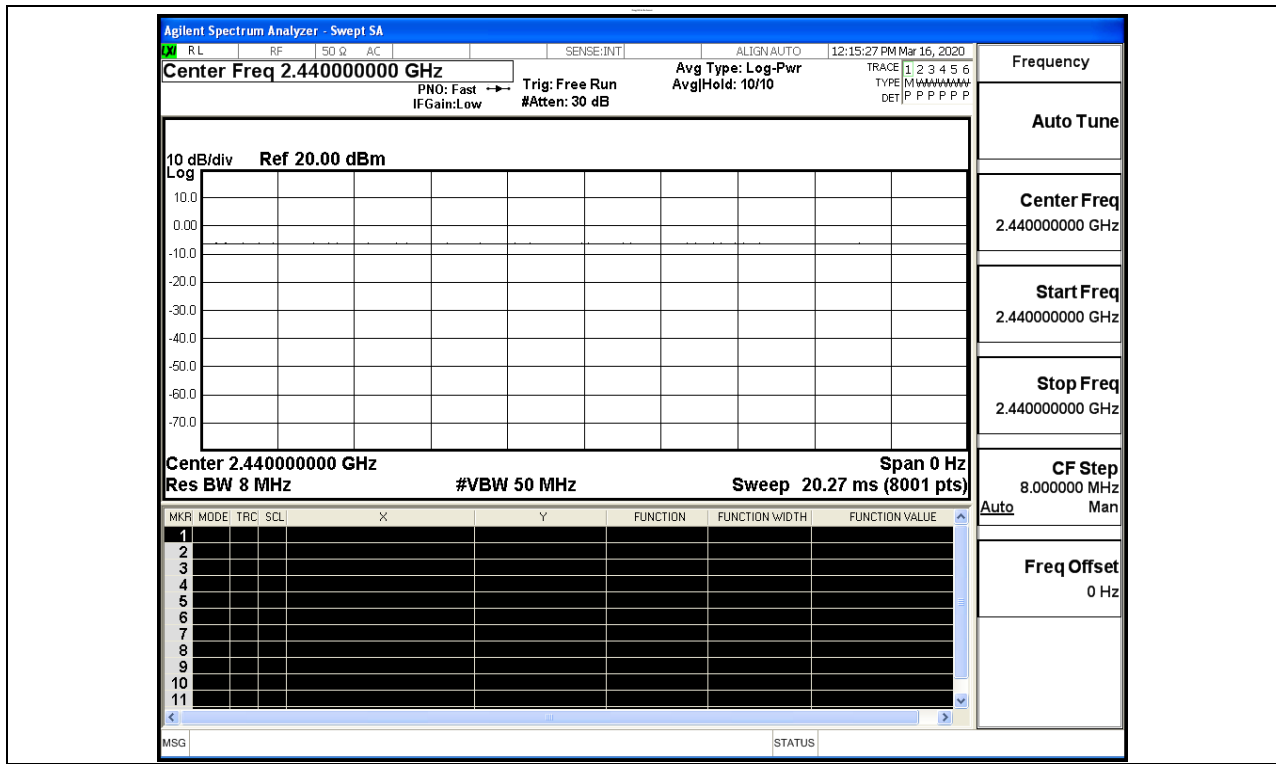
Product Name: Bluetooth Speaker
Trade Mark: Origaudio
Test Model: THUMPAH

Environmental Conditions

Temperature:	22.3 ° C
Relative Humidity:	53.0%
ATM Pressure:	100.0 kPa
Test Engineer:	Qu Xin
Supervised by:	Tom Liu

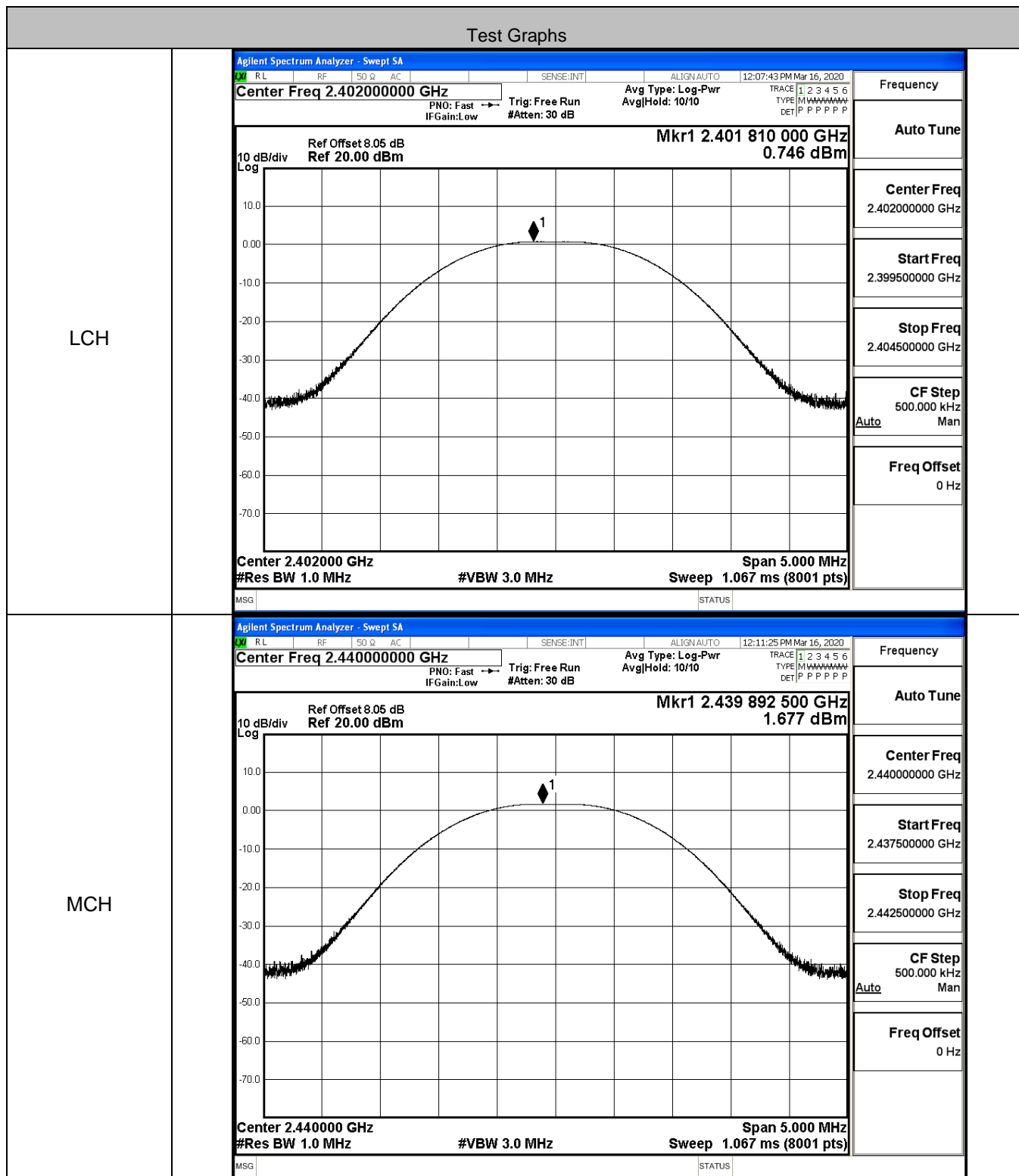
B.1 Duty Cycle

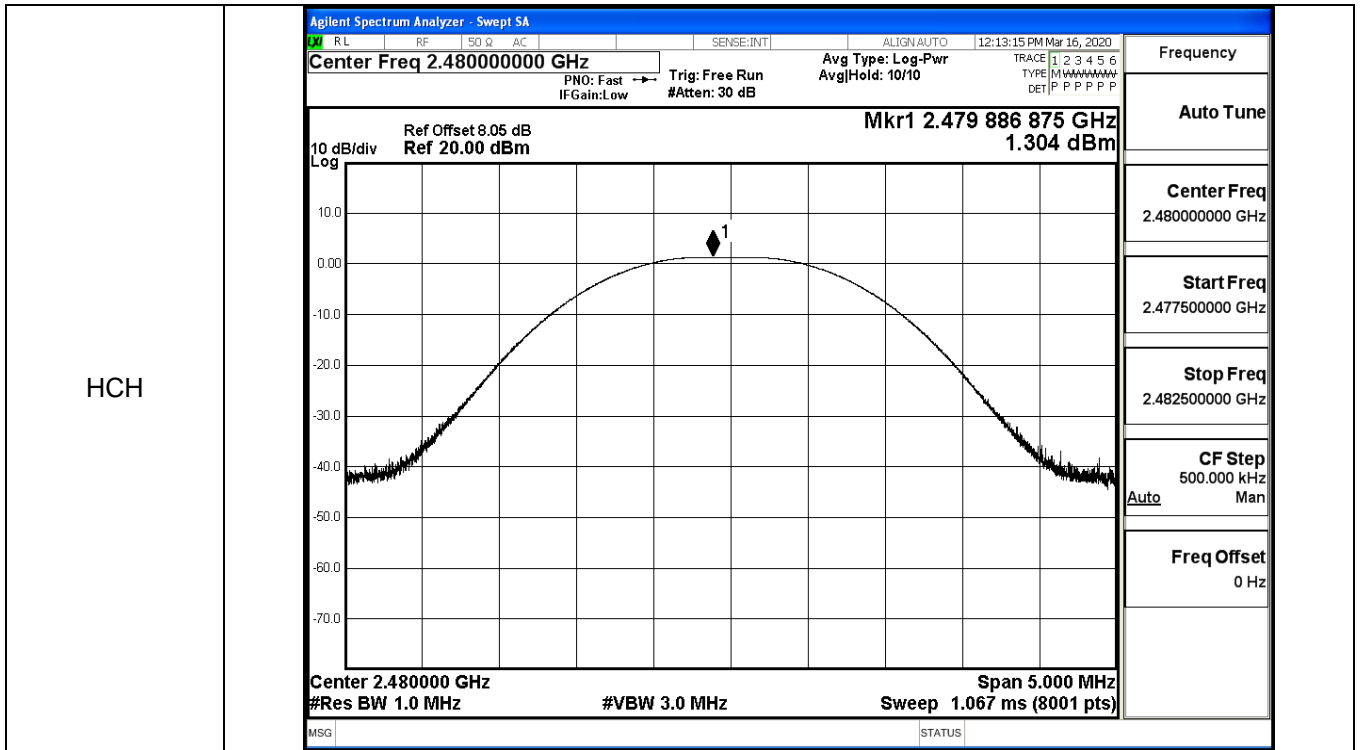
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS



B.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.746	30	PASS
BT LE	MCH	1.677	30	PASS
BT LE	HCH	1.304	30	PASS

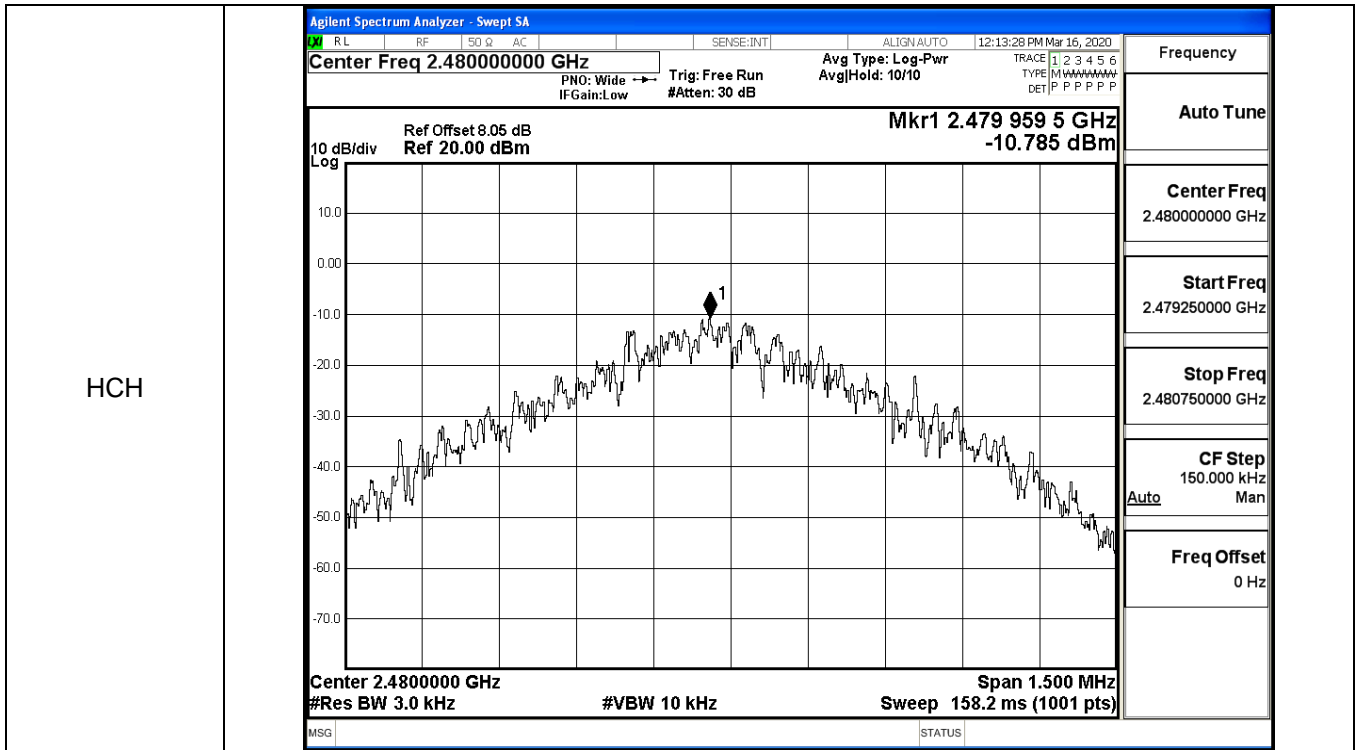




B.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-11.862	8	PASS
BT LE	MCH	-10.547	8	PASS
BT LE	HCH	-10.785	8	PASS

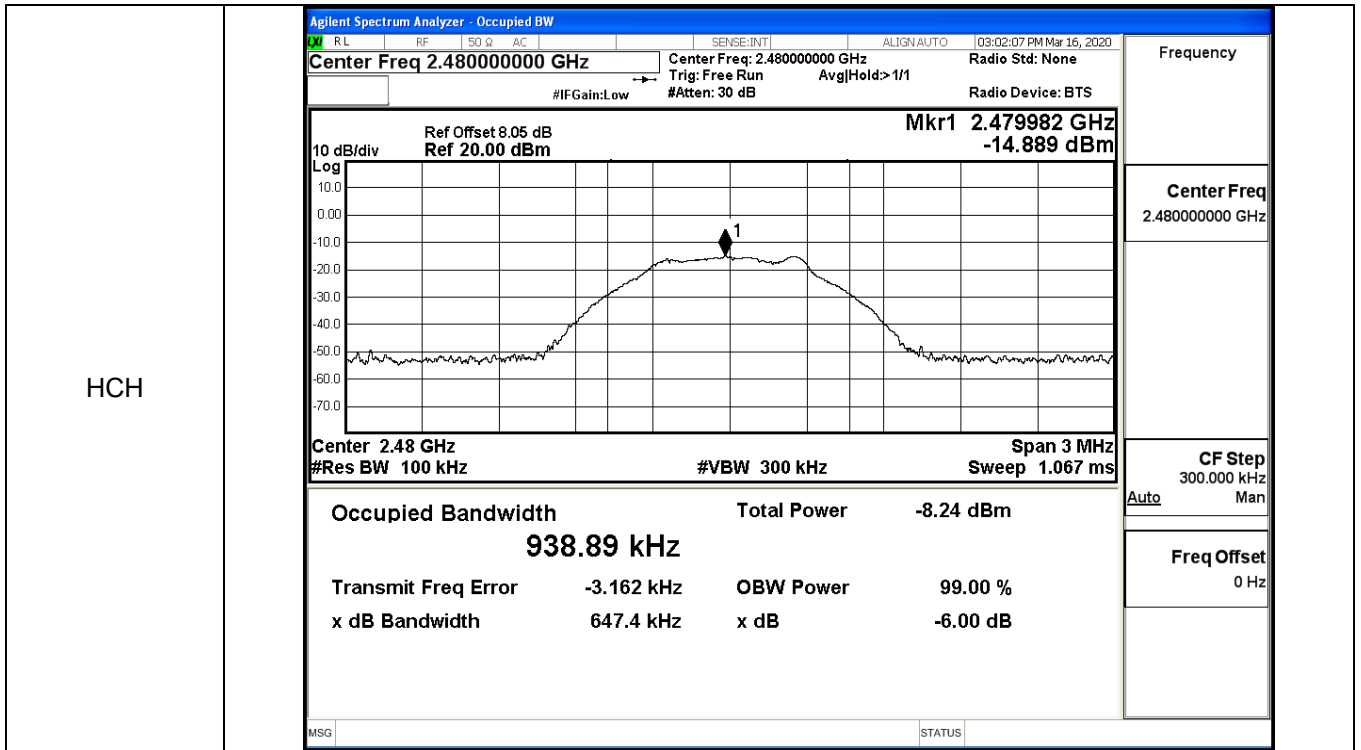
Test Graphs																	
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Swept SA</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 12:07:56 PM Mar 16, 2020</p> <p style="font-size: small; 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 IFGain:Low Trig: Free Run #Atten: 30 dB AvgHold: 10/10 TYPE M W W W W W W W</p> <p style="font-size: x-small; margin: 0;">Mkr1 2.401 995 5 GHz -11.862 dBm</p> <p style="font-size: small; margin: 0;">Ref Offset 8.05 dB Ref 20.00 dBm</p> <p style="font-size: small; margin: 0;">10 dB/div Log</p> <p style="font-size: small; margin: 0;">Center 2.4020000 GHz Span 1.500 MHz</p> <p style="font-size: small; margin: 0;">#Res BW 3.0 kHz #VBW 10 kHz Sweep 158.2 ms (1001 pts)</p> <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;"> <tr><td>Frequency</td><td></td></tr> <tr><td>Auto Tune</td><td></td></tr> <tr><td>Center Freq</td><td>2.402000000 GHz</td></tr> <tr><td>Start Freq</td><td>2.401250000 GHz</td></tr> <tr><td>Stop Freq</td><td>2.402750000 GHz</td></tr> <tr><td>CF Step</td><td>150.000 kHz</td></tr> <tr><td>Auto</td><td>Man</td></tr> <tr><td>Freq Offset</td><td>0 Hz</td></tr> </table>	Frequency		Auto Tune		Center Freq	2.402000000 GHz	Start Freq	2.401250000 GHz	Stop Freq	2.402750000 GHz	CF Step	150.000 kHz	Auto	Man	Freq Offset	0 Hz
Frequency																	
Auto Tune																	
Center Freq	2.402000000 GHz																
Start Freq	2.401250000 GHz																
Stop Freq	2.402750000 GHz																
CF Step	150.000 kHz																
Auto	Man																
Freq Offset	0 Hz																
MCH	<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:INT ALIGN: AUTO 12:11:38 PM Mar 16, 2020</p> <p style="font-size: small; margin: 0;">Center Freq 2.440000000 GHz Avg Type: Log-Pwr TRACE 1 2 3 4 5 6</p> <p style="font-size: x-small; margin: 0;">PNO: Wide IFGain:Low Trig: Free Run #Atten: 30 dB AvgHold: 10/10 TYPE M W W W W W W W</p> <p style="font-size: small; margin: 0;">Mkr1 2.439 949 0 GHz -10.547 dBm</p> <p style="font-size: small; margin: 0;">Ref Offset 8.05 dB Ref 20.00 dBm</p> <p style="font-size: small; margin: 0;">10 dB/div Log</p> <p style="font-size: small; margin: 0;">Center 2.4400000 GHz Span 1.500 MHz</p> <p style="font-size: small; margin: 0;">#Res BW 3.0 kHz #VBW 10 kHz Sweep 158.2 ms (1001 pts)</p> <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;"> <tr><td>Frequency</td><td></td></tr> <tr><td>Auto Tune</td><td></td></tr> <tr><td>Center Freq</td><td>2.440000000 GHz</td></tr> <tr><td>Start Freq</td><td>2.439250000 GHz</td></tr> <tr><td>Stop Freq</td><td>2.440750000 GHz</td></tr> <tr><td>CF Step</td><td>150.000 kHz</td></tr> <tr><td>Auto</td><td>Man</td></tr> <tr><td>Freq Offset</td><td>0 Hz</td></tr> </table>	Frequency		Auto Tune		Center Freq	2.440000000 GHz	Start Freq	2.439250000 GHz	Stop Freq	2.440750000 GHz	CF Step	150.000 kHz	Auto	Man	Freq Offset	0 Hz
Frequency																	
Auto Tune																	
Center Freq	2.440000000 GHz																
Start Freq	2.439250000 GHz																
Stop Freq	2.440750000 GHz																
CF Step	150.000 kHz																
Auto	Man																
Freq Offset	0 Hz																



B.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6457	≥0.5	PASS
BT LE	MCH	0.6466	≥0.5	PASS
BT LE	HCH	0.6474	≥0.5	PASS

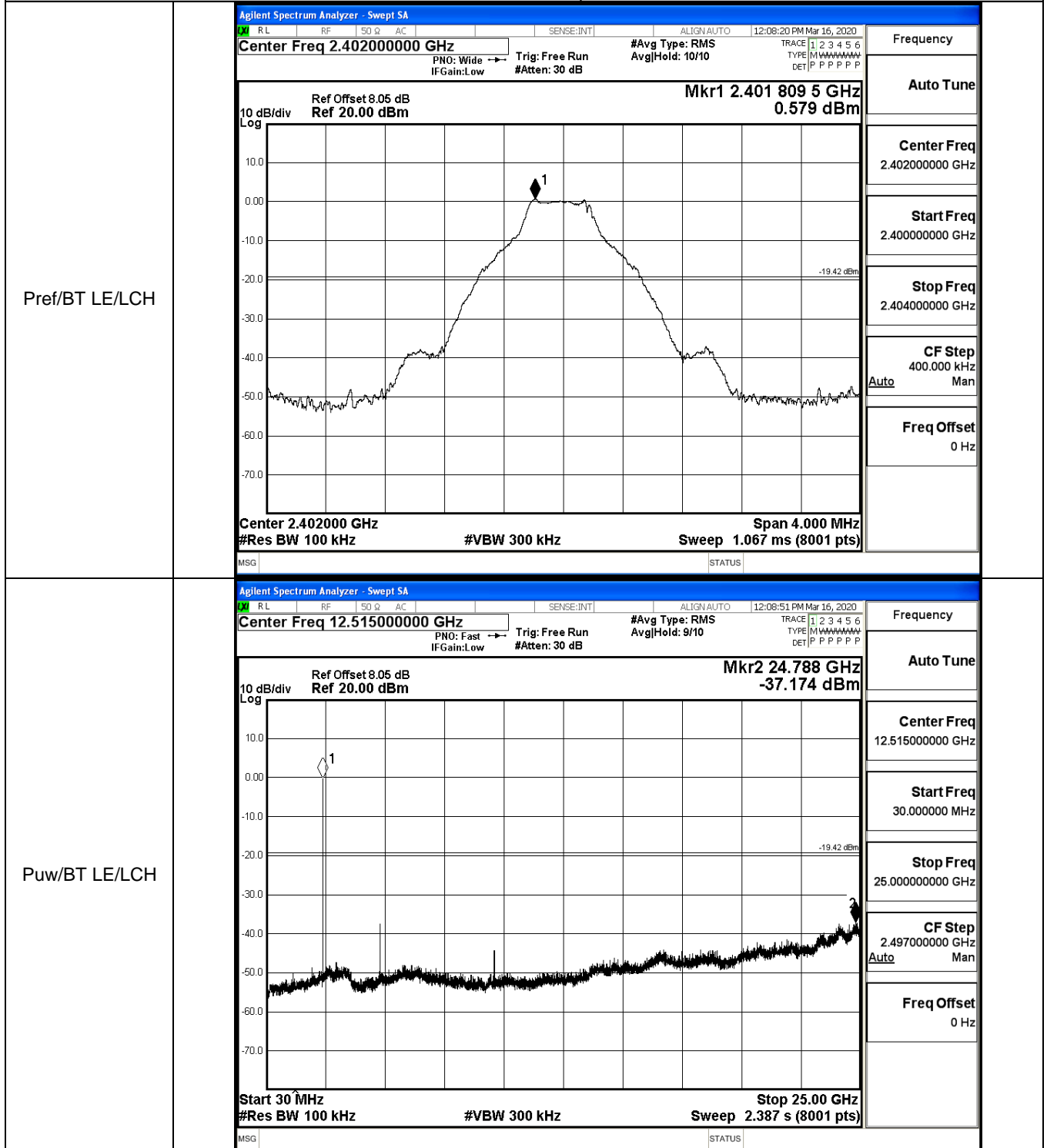
Test Graphs													
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: small; margin: 0;">RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 02:59:15 PM Mar 16, 2020</p> <p style="margin: 0;">Center 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="display: flex; justify-content: space-between;"> <div style="font-size: x-small;"> 10 dB/div Log Ref Offset 8.05 dB Ref 20.00 dBm </div> <div style="text-align: right;"> Mkr1 2.4019888 GHz -16.402 dBm </div> </div> <div style="display: flex; justify-content: space-between; font-size: x-small;"> <div>Center 2.402 GHz #Res BW 100 kHz</div> <div>#VBW 300 kHz</div> <div>Span 3 MHz Sweep 1.067 ms</div> </div> <table style="width: 100%; font-size: x-small; margin-top: 5px;"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>-9.88 dBm</td> </tr> <tr> <td style="text-align: center;">944.24 kHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-3.025 kHz</td> <td>OBW Power 99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>645.7 kHz</td> <td>x dB -6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin-top: 5px;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	-9.88 dBm	944.24 kHz			Transmit Freq Error	-3.025 kHz	OBW Power 99.00 %	x dB Bandwidth	645.7 kHz	x dB -6.00 dB
Occupied Bandwidth	Total Power	-9.88 dBm											
944.24 kHz													
Transmit Freq Error	-3.025 kHz	OBW Power 99.00 %											
x dB Bandwidth	645.7 kHz	x dB -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 03:00:46 PM Mar 16, 2020</p> <p style="margin: 0;">Center Freq 2.440000000 GHz Center Freq: 2.440000000 GHz Radio Std: None Trig: Free Run AvgHold: 1/1 #IFGain: Low #Atten: 30 dB Radio Device: BTS</p> <div style="display: flex; justify-content: space-between;"> <div style="font-size: x-small;"> 10 dB/div Log Ref Offset 8.05 dB Ref 20.00 dBm </div> <div style="text-align: right;"> Mkr1 2.4399775 GHz -14.488 dBm </div> </div> <div style="display: flex; justify-content: space-between; font-size: x-small;"> <div>Center 2.44 GHz #Res BW 100 kHz</div> <div>#VBW 300 kHz</div> <div>Span 3 MHz Sweep 1.067 ms</div> </div> <table style="width: 100%; font-size: x-small; margin-top: 5px;"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>-7.89 dBm</td> </tr> <tr> <td style="text-align: center;">940.38 kHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-4.379 kHz</td> <td>OBW Power 99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>646.6 kHz</td> <td>x dB -6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin-top: 5px;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	-7.89 dBm	940.38 kHz			Transmit Freq Error	-4.379 kHz	OBW Power 99.00 %	x dB Bandwidth	646.6 kHz	x dB -6.00 dB
Occupied Bandwidth	Total Power	-7.89 dBm											
940.38 kHz													
Transmit Freq Error	-4.379 kHz	OBW Power 99.00 %											
x dB Bandwidth	646.6 kHz	x dB -6.00 dB											



B.5 RF Conducted Spurious Emissions

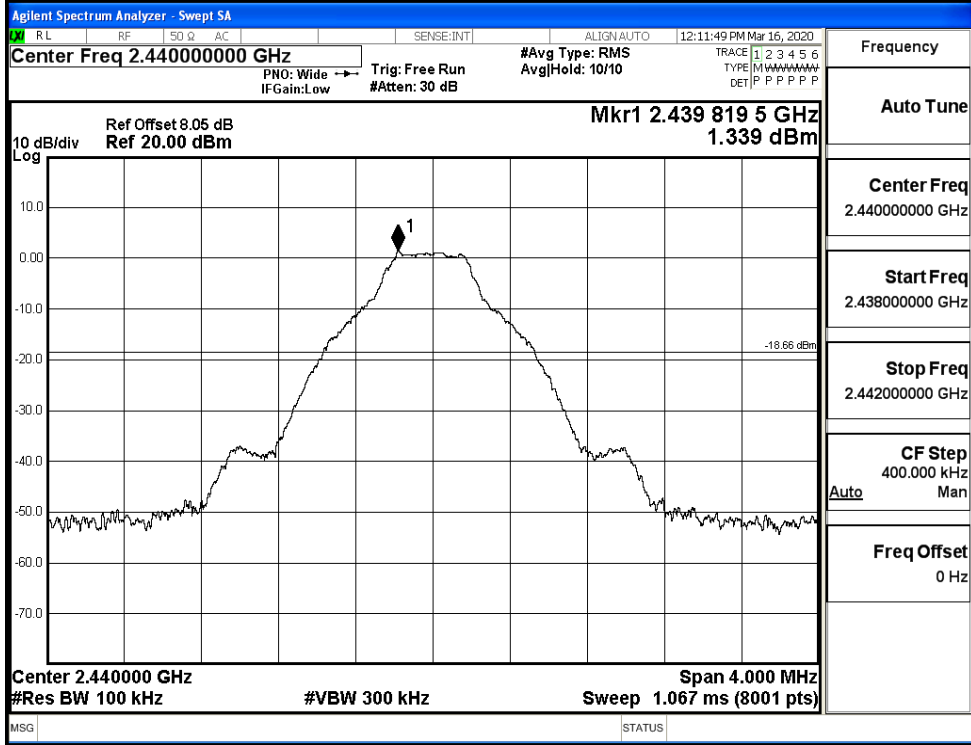
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.579	-37.174	-19.421	PASS
BT LE	MCH	1.339	-37.258	-18.661	PASS
BT LE	HCH	1.156	-37.628	-18.844	PASS

BT LE_LCH_Graphs

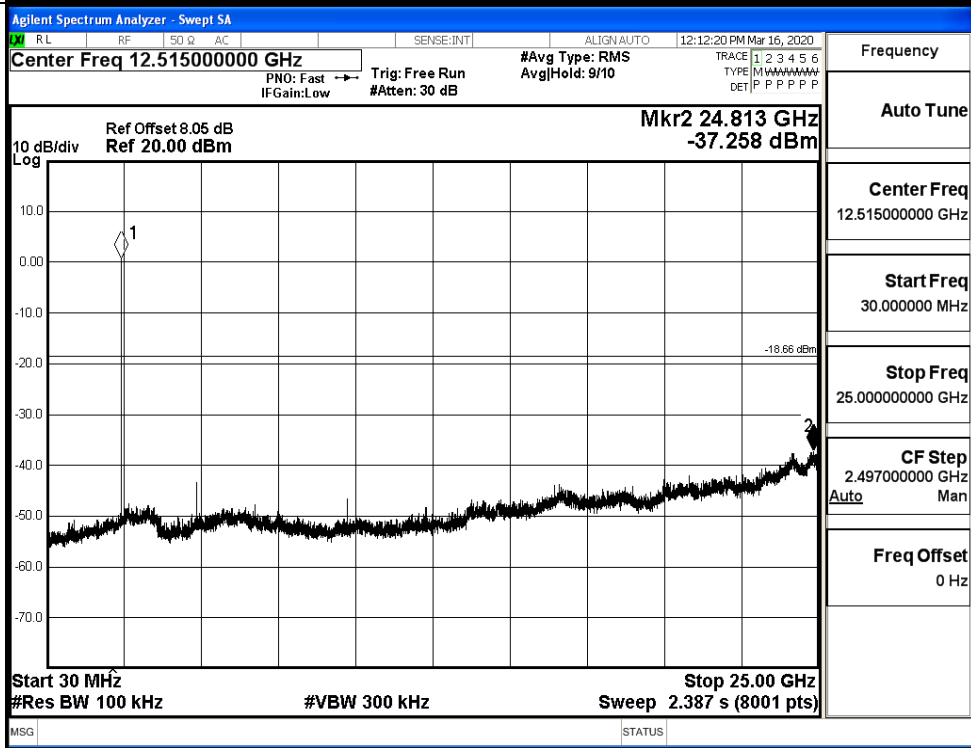


BT LE_MCH_Graphs

Pref/BT LE/MCH

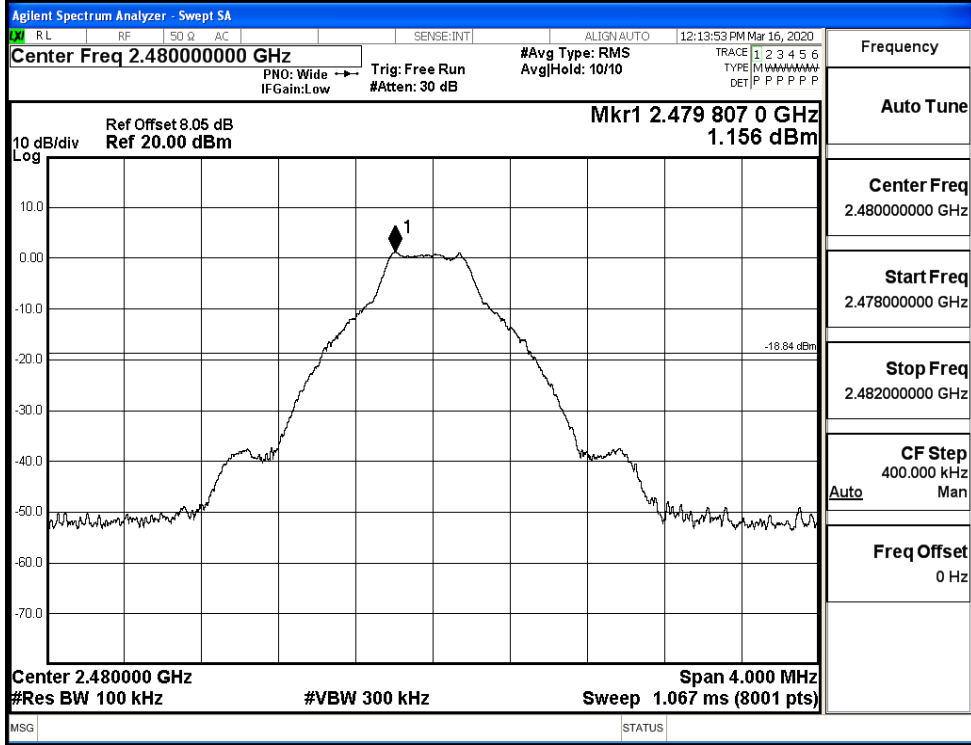


Puw/BT LE/MCH

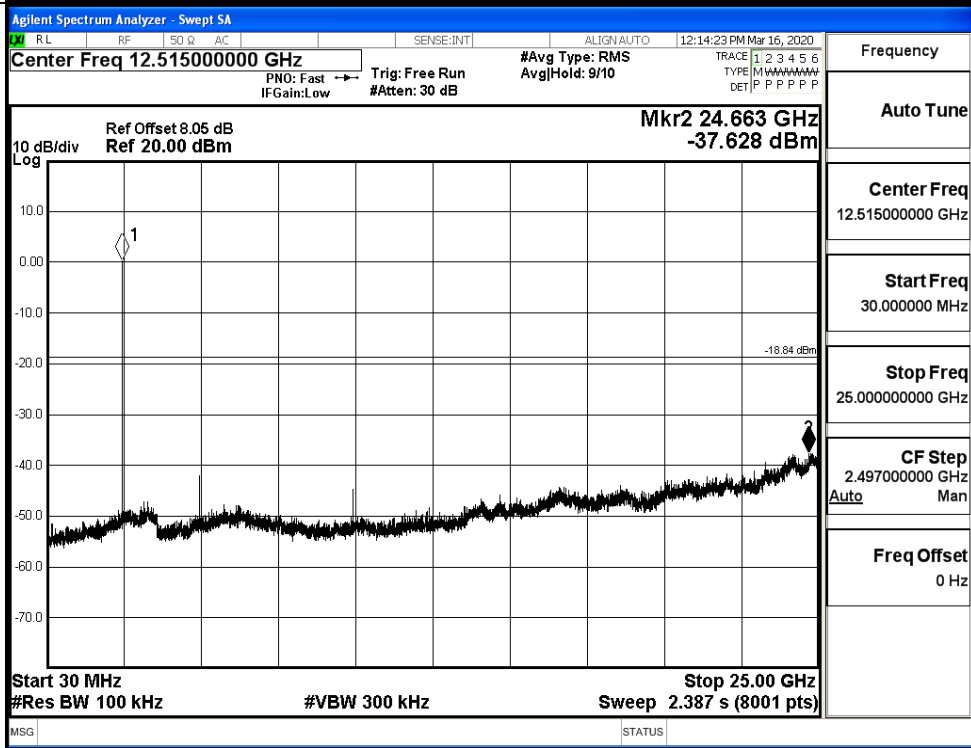


BT LE_HCH_Graphs

Pref/BT LE/HCH



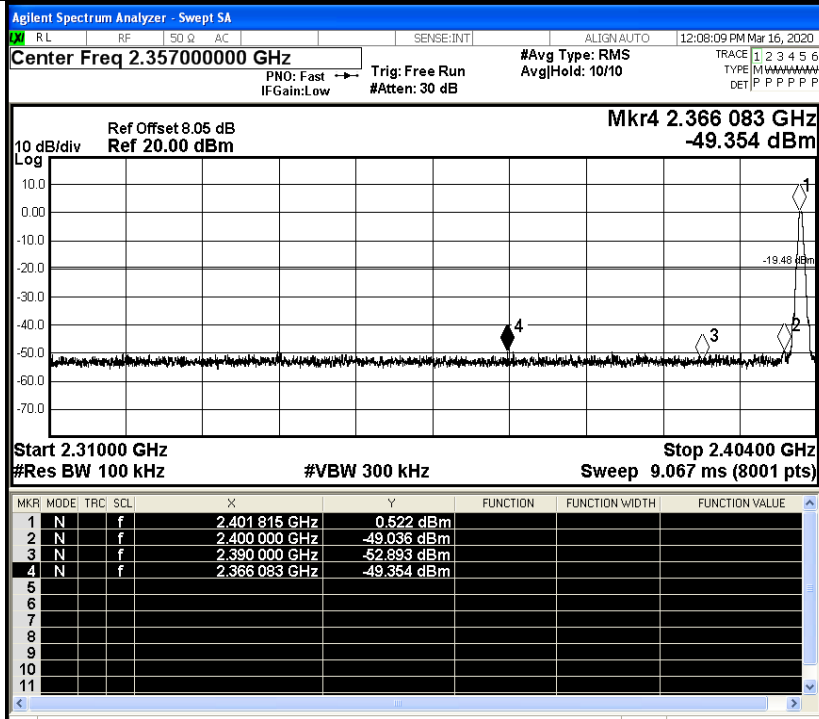
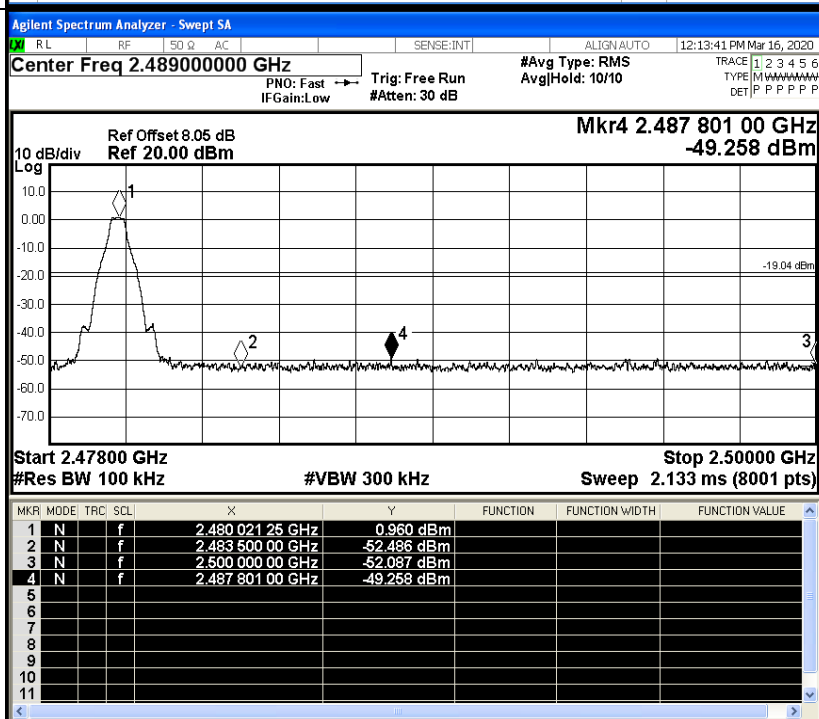
Puw/BT LE/HCH



B.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.522	-49.354	-19.48	PASS
BT LE	HCH	0.960	-49.258	-19.04	PASS

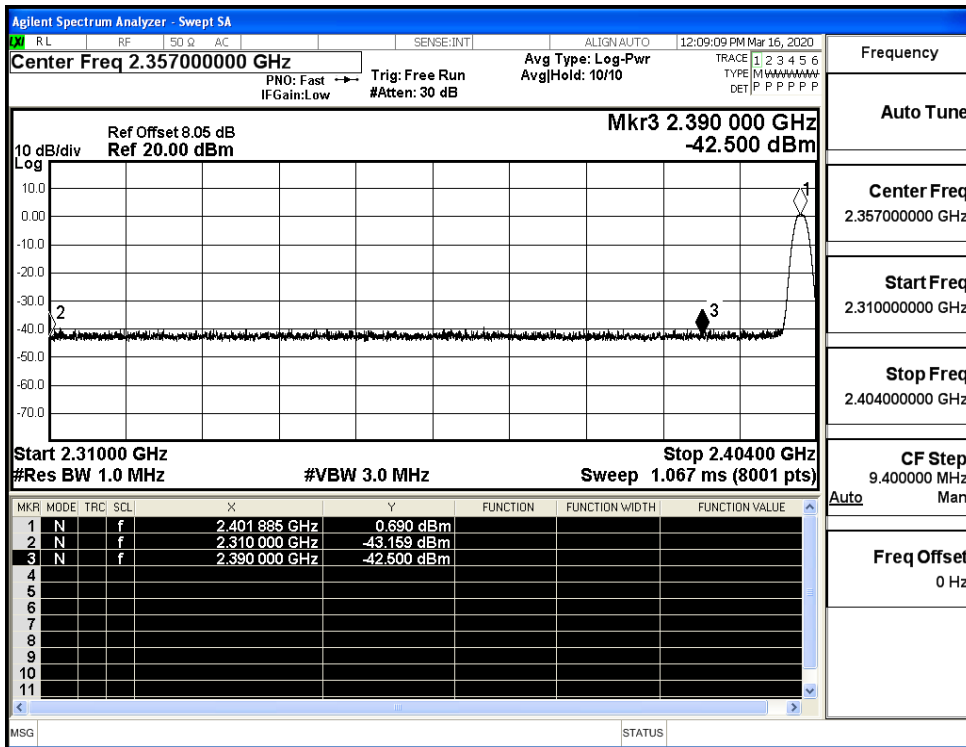
Test Graphs

LCH		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.357000000 GHz</p> <p>Start Freq 2.310000000 GHz</p> <p>Stop Freq 2.404000000 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 2.489000000 GHz</p> <p>Start Freq 2.478000000 GHz</p> <p>Stop Freq 2.500000000 GHz</p> <p>CF Step 2.200000 MHz</p> <p>Freq Offset 0 Hz</p>

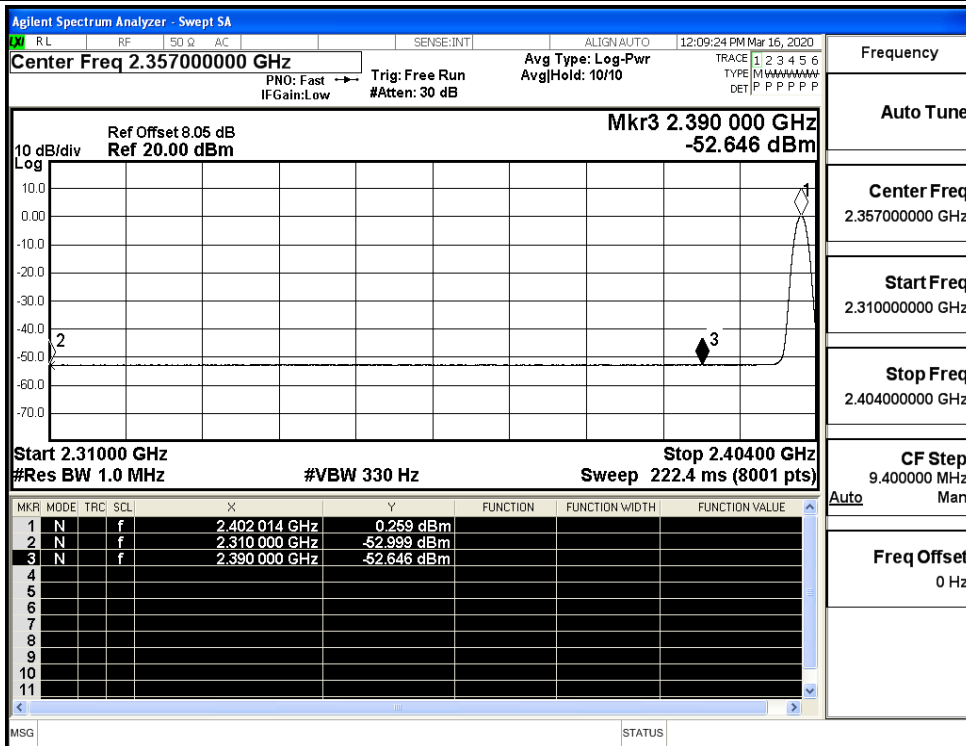
B.7 Restrict-band band-edge measurements

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	-43.16	2.0	0	54.07	PEAK	74	PASS
		Ant1	2310.0	-53.00	2.0	0	44.23	AV	54	PASS
		Ant1	2390.0	-42.50	2.0	0	54.73	PEAK	74	PASS
		Ant1	2390.0	-52.65	2.0	0	44.58	AV	54	PASS
	2480	Ant1	2483.5	-41.64	2.0	0	55.59	PEAK	74	PASS
		Ant1	2483.5	-52.21	2.0	0	45.02	AV	54	PASS
		Ant1	2500.0	-41.82	2.0	0	55.41	PEAK	74	PASS
		Ant1	2500.0	-52.27	2.0	0	44.96	AV	54	PASS

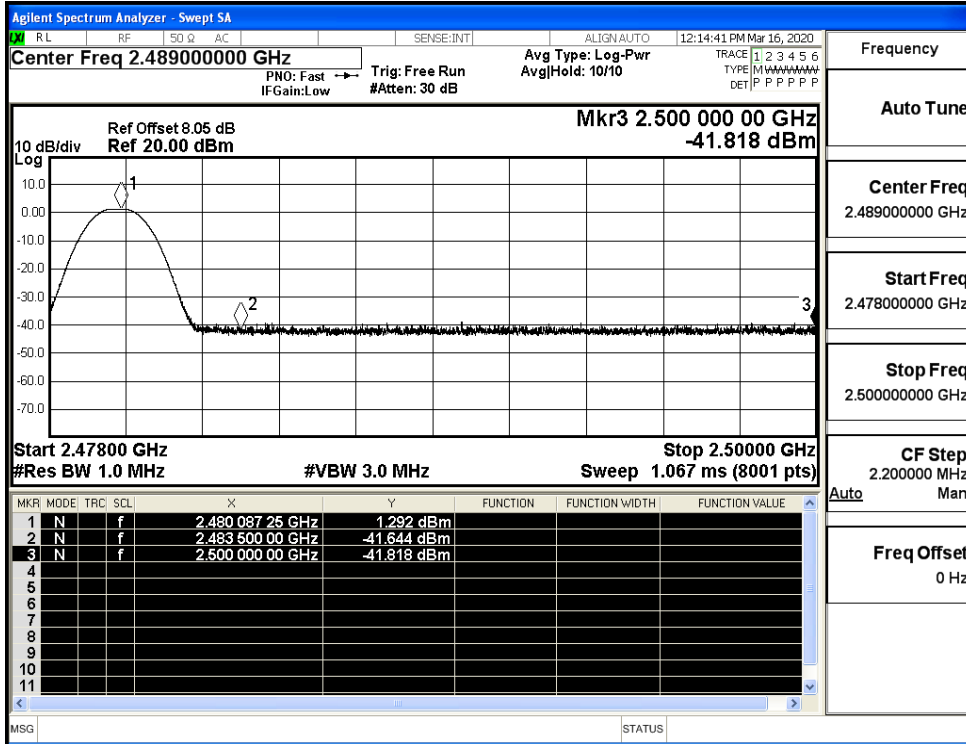
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

