

Appendix B

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

Product Name: Portable Bluetooth Speaker with Wireless Charging

Trade Mark: i-box

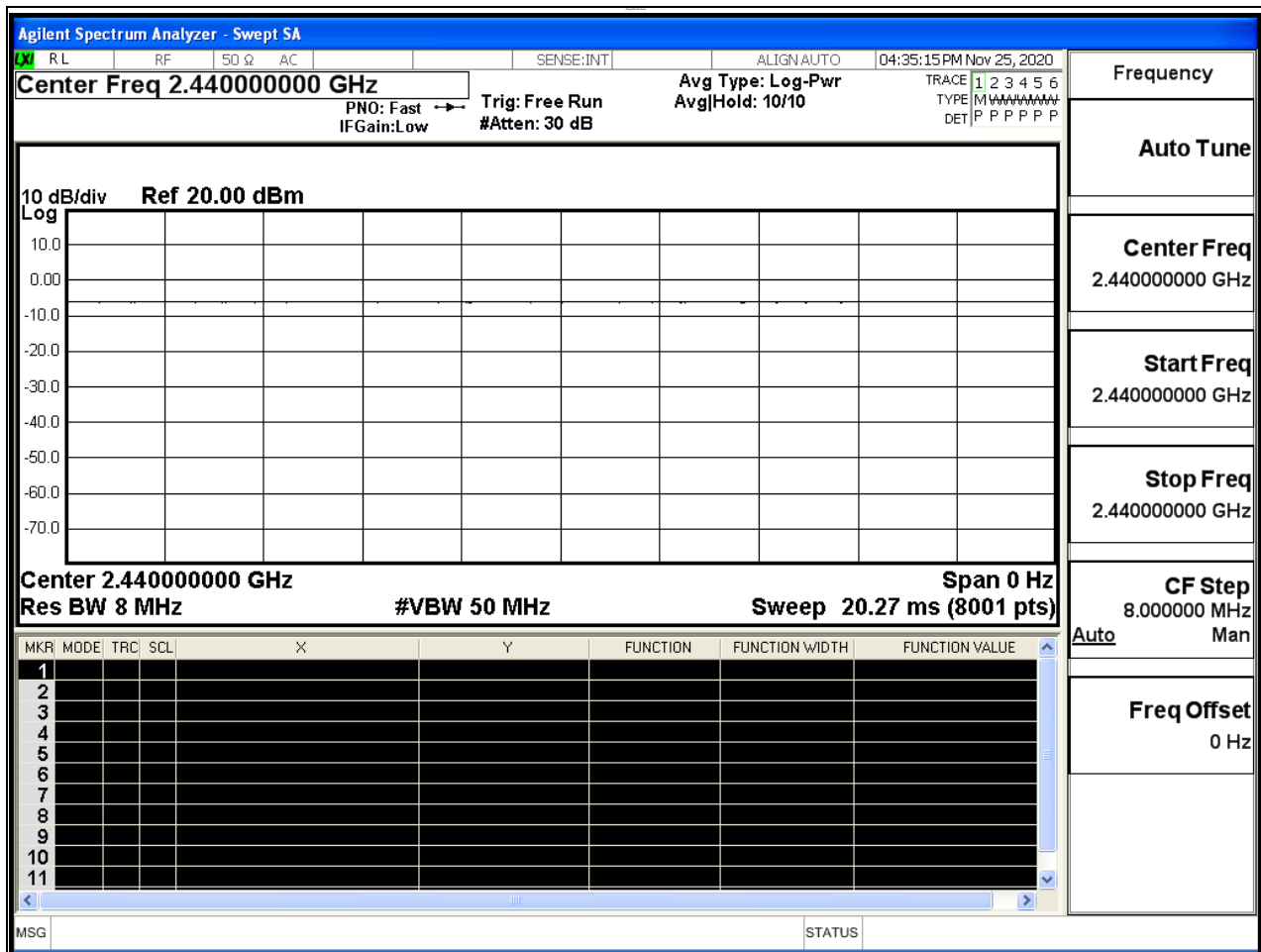
Test Model: WJ-202

Environmental Conditions

Temperature:	25.3 ° C
Relative Humidity:	53.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan

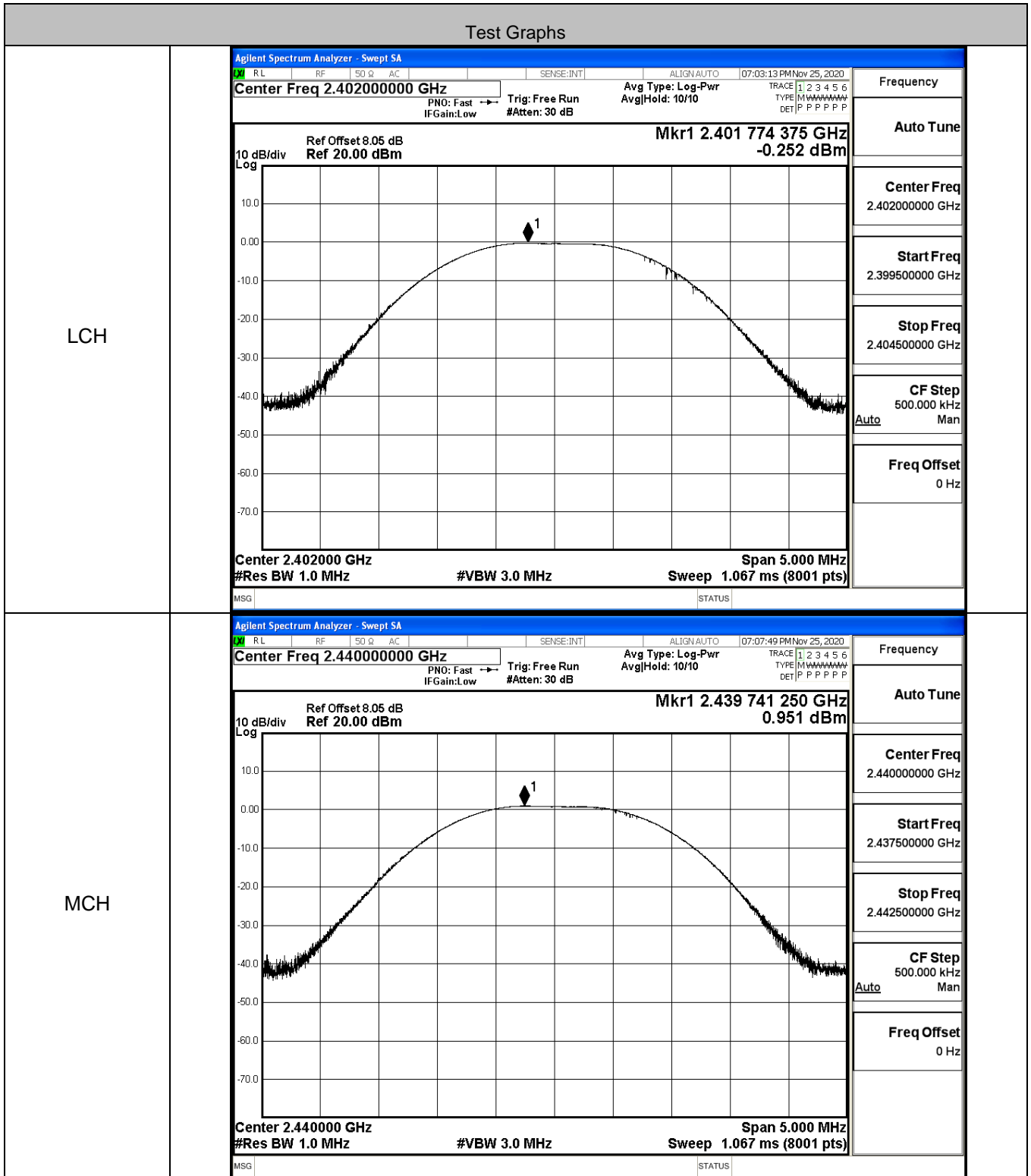
B.1 Duty Cycle

Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100.00	PASS



B.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.252	30	PASS
BT LE	MCH	0.951	30	PASS
BT LE	HCH	-3.119	30	PASS



B.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-18.715	8	PASS
BT LE	MCH	-17.359	8	PASS
BT LE	HCH	-19.347	8	PASS

Test Graphs

LCH		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.40200000 GHz</p> <p>Mkr1 2.401 992 5 GHz -18.715 dBm</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>Center 2.4020000 GHz #Res BW 3.0 kHz</p> <p>#VBW 10 kHz</p> <p>Span 1.500 MHz Sweep 158.2 ms (1001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.402000000 GHz</p> <p>Start Freq 2.401250000 GHz</p> <p>Stop Freq 2.402750000 GHz</p> <p>CF Step 150.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p>
	MCH		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.44000000 GHz</p> <p>Mkr1 2.439 992 5 GHz -17.359 dBm</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>Center 2.4400000 GHz #Res BW 3.0 kHz</p> <p>#VBW 10 kHz</p> <p>Span 1.500 MHz Sweep 158.2 ms (1001 pts)</p>

B.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6996	≥0.5	PASS
BT LE	MCH	0.5003	≥0.5	PASS
BT LE	HCH	0.6650	≥0.5	PASS

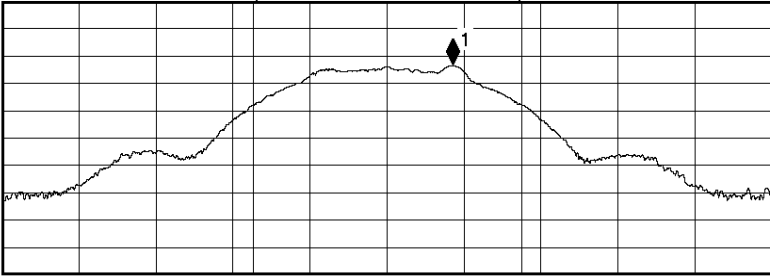
Test Graphs	
LCH	<div data-bbox="416 562 1390 1294"> <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None</p> <p>Trig: Free Run AvgHold: 1/1</p> <p>#IFGain:Low #Atten: 30 dB Radio Device: BTS</p> <p>Ref Offset 8.05 dB Mkr1 2.4017281 GHz</p> <p>Ref 20.00 dBm 1.9109 dBm</p> <p>Center 2.402 GHz Span 3 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <p>Occupied Bandwidth 1.0581 MHz</p> <p>Total Power 8.38 dBm</p> <p>Transmit Freq Error -13.485 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 699.6 kHz x dB -6.00 dB</p> <p>MSG STATUS</p> </div>
MCH	<div data-bbox="416 1305 1390 2042"> <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 AvgHold: 1/1</p> <p>#IFGain:Low #Atten: 30 dB Radio Device: BTS</p> <p>Ref Offset 8.05 dB Mkr1 2.4397574 GHz</p> <p>Ref 20.00 dBm 0.88552 dBm</p> <p>Center 2.44 GHz Span 3 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <p>Occupied Bandwidth 1.0572 MHz</p> <p>Total Power 6.21 dBm</p> <p>Transmit Freq Error 7.290 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 500.3 kHz x dB -6.00 dB</p> <p>MSG STATUS</p> </div>

HCH

Agilent Spectrum Analyzer - Occupied BW

RL	RF	50 Ω	AC	SENSE:INT	ALIGN:AUTO	07:14:36 PM Nov 25, 2020
Center Freq 2.480000000 GHz				Center Freq: 2.480000000 GHz	Radio Std: None	Frequency
				Trig: Free Run	AvgHold>1/1	Center Freq 2.480000000 GHz
				#IFGain:Low	#Atten: 30 dB	Radio Device: BTS

10 dB/div	Ref Offset 8.05 dB		Mkr1 2.4802573 GHz
Log	Ref 20.00 dBm		-3.4139 dBm



Center 2.48 GHz	#Res BW 100 kHz	#VBW 300 kHz	Span 3 MHz
		Sweep 1.067 ms	

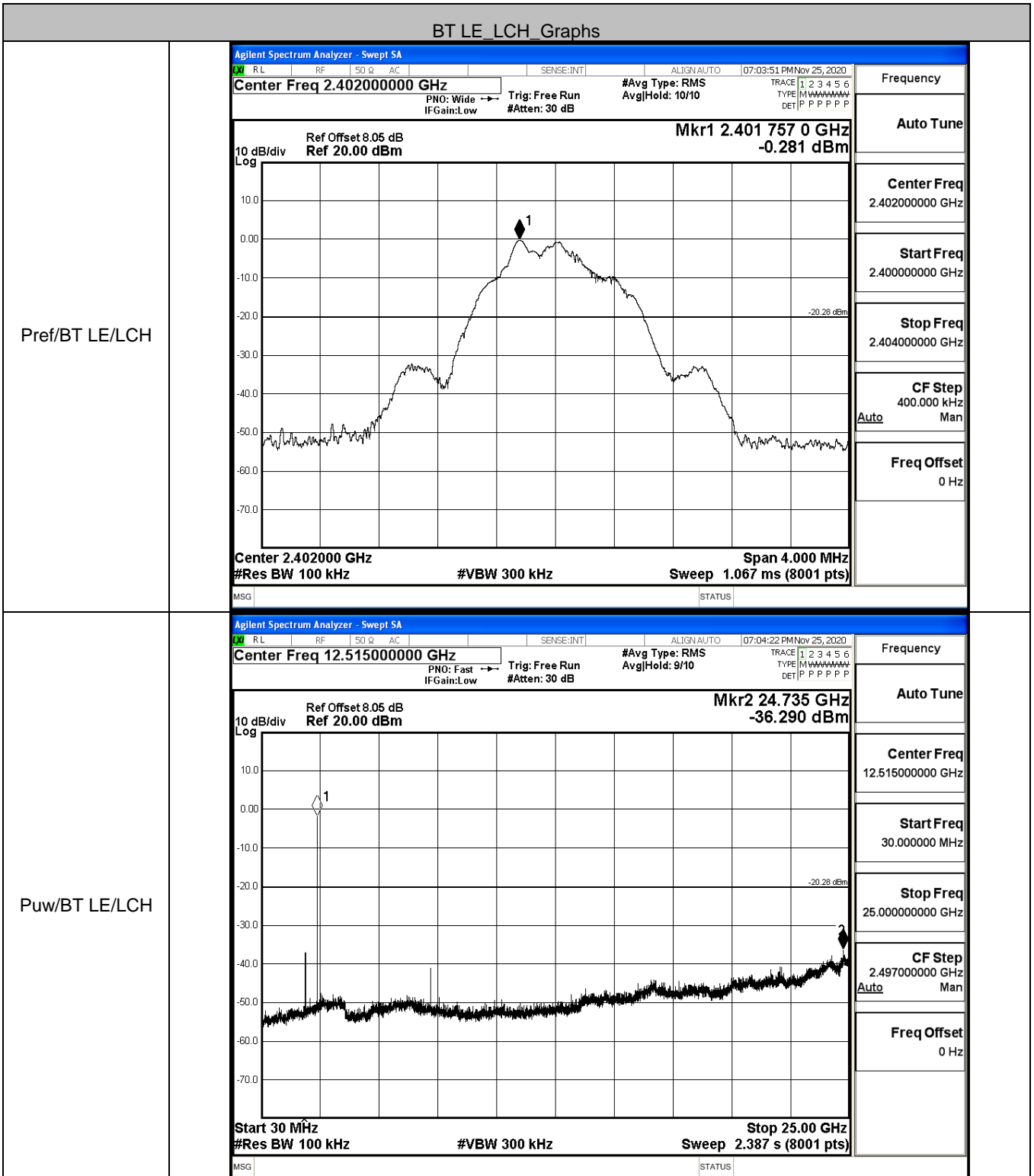
Occupied Bandwidth	Total Power	3.20 dBm
1.0386 MHz		
Transmit Freq Error	3.373 kHz	OBW Power 99.00 %
x dB Bandwidth	665.0 kHz	x dB -6.00 dB

MSG
STATUS

CF Step 300.000 kHz Auto Man
Freq Offset 0 Hz

B.5 RF Conducted Spurious Emissions

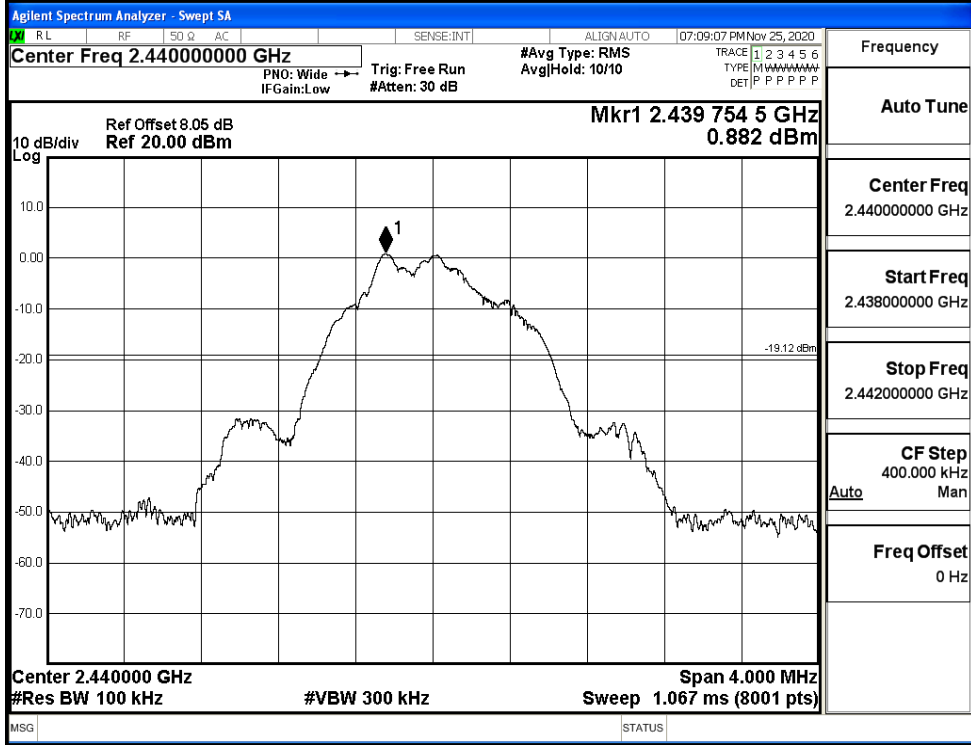
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.281	-36.290	-20.281	PASS
BT LE	MCH	0.882	-37.245	-19.118	PASS
BT LE	HCH	-3.437	-36.666	-23.437	PASS



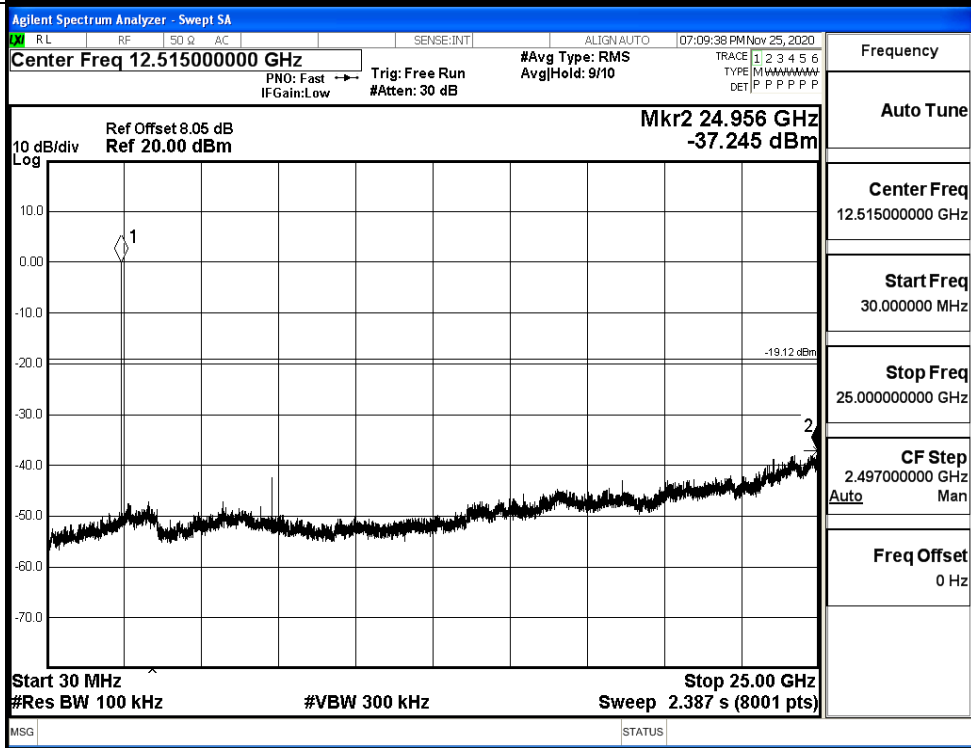
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BT LE_MCH_Graphs

Pref/BT LE/MCH

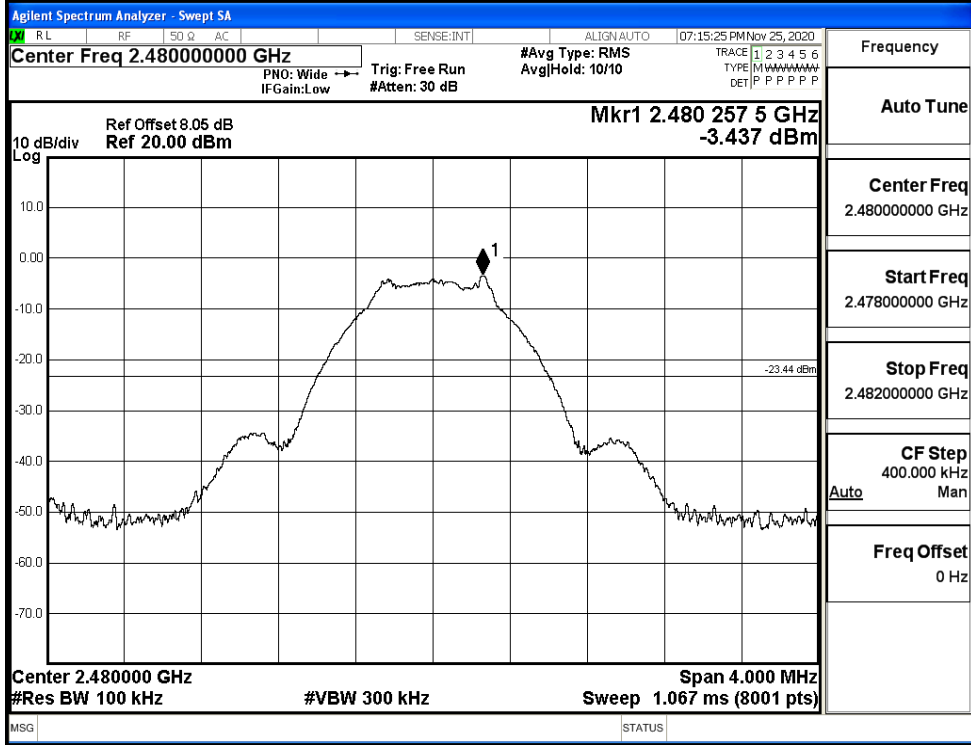


Puw/BT LE/MCH

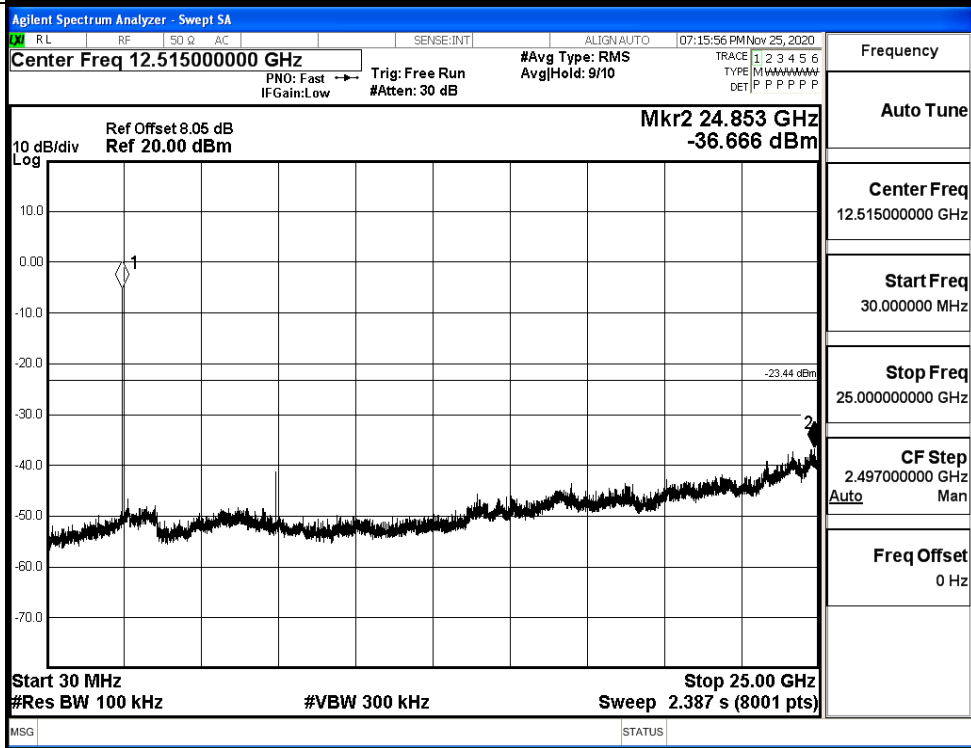


BT LE_HCH_Graphs

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	-0.259	-49.906	-20.26	PASS
BT LE	HCH	-3.726	-47.915	-23.73	PASS

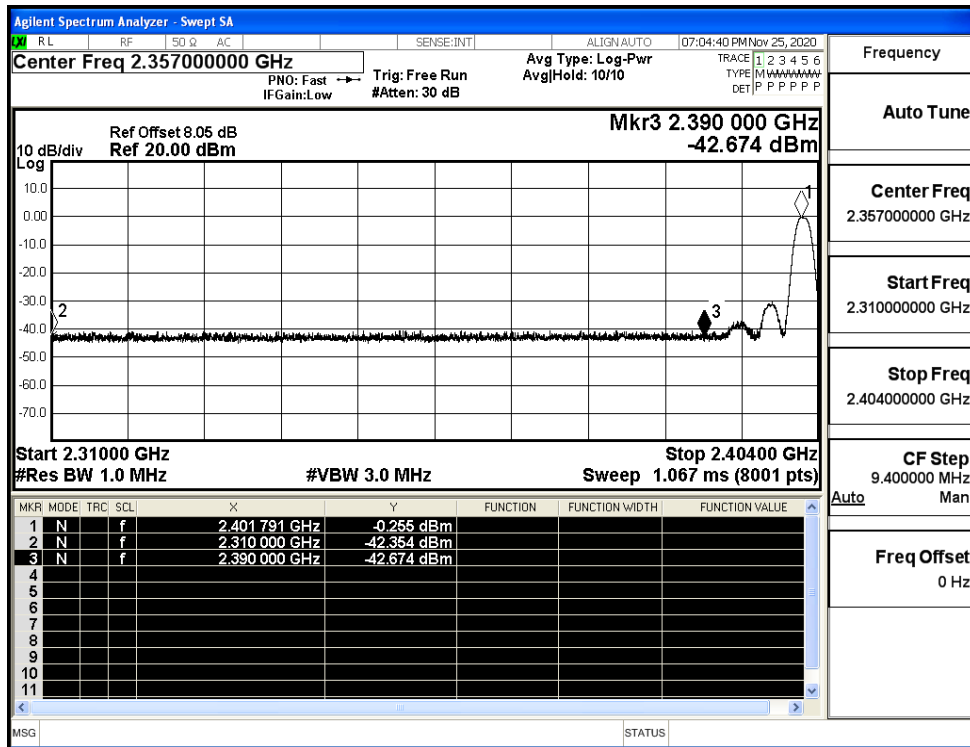
Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.35700000 GHz #Avg Type: RMS AvgHold: 10/10 Ref Offset 8.05 dB Ref 20.00 dBm Mkr4 2.319 247 GHz -49.906 dBm Start 2.31000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.40400 GHz Sweep 9.067 ms (8001 pts)</p> <table border="1"> <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>2.401 768 GHz</td><td>-0.259 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>-52.114 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>-53.515 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.319 247 GHz</td><td>-49.906 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		2.401 768 GHz	-0.259 dBm				2	N	f		2.400 000 GHz	-52.114 dBm				3	N	f		2.390 000 GHz	-53.515 dBm				4	N	f		2.319 247 GHz	-49.906 dBm				<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>
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HCH	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.48900000 GHz #Avg Type: RMS AvgHold: 10/10 Ref Offset 8.05 dB Ref 20.00 dBm Mkr4 2.484 679 75 GHz -47.915 dBm Start 2.47800 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.50000 GHz Sweep 2.133 ms (8001 pts)</p> <table border="1"> <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>2.480 268 75 GHz</td><td>-3.726 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>-51.310 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>-52.084 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.484 679 75 GHz</td><td>-47.915 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		2.480 268 75 GHz	-3.726 dBm				2	N	f		2.483 500 00 GHz	-51.310 dBm				3	N	f		2.500 000 00 GHz	-52.084 dBm				4	N	f		2.484 679 75 GHz	-47.915 dBm				<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>
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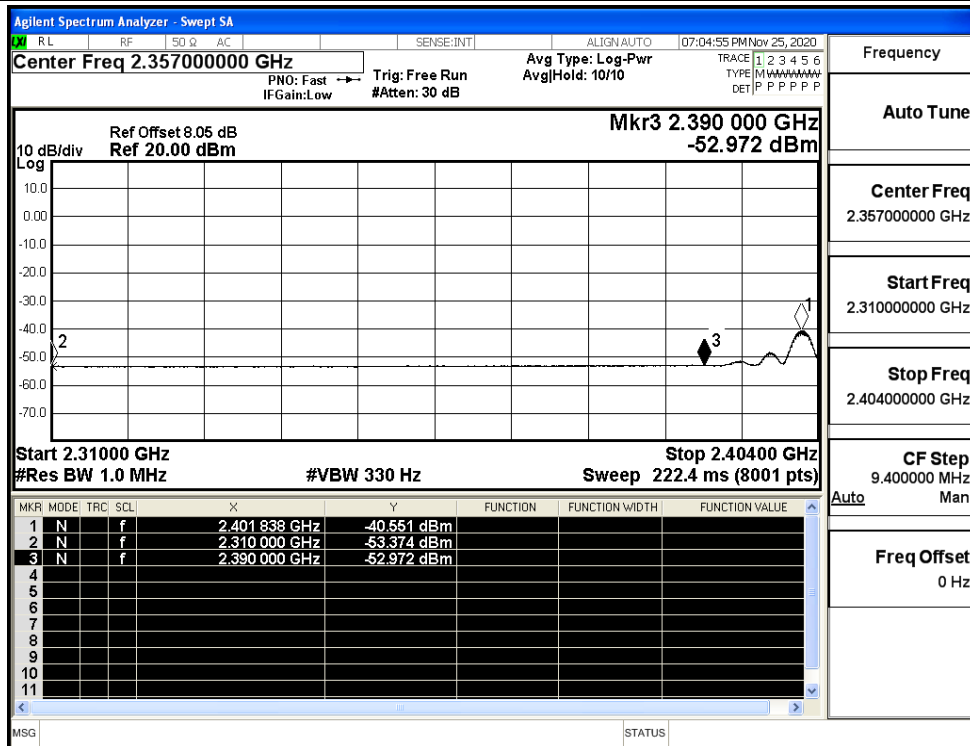
B.7 Restrict-band band-edge measurements

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	-42.35	2.0	0	54.88	PEAK	74	PASS
		Ant1	2310.0	-53.37	2.0	0	43.86	AV	54	PASS
		Ant1	2390.0	-42.67	2.0	0	54.56	PEAK	74	PASS
		Ant1	2390.0	-52.97	2.0	0	44.26	AV	54	PASS
	2480	Ant1	2483.5	-40.77	2.0	0	56.46	PEAK	74	PASS
		Ant1	2483.5	-50.89	2.0	0	46.34	AV	54	PASS
		Ant1	2500.0	-41.51	2.0	0	55.72	PEAK	74	PASS
		Ant1	2500.0	-52.30	2.0	0	44.93	AV	54	PASS

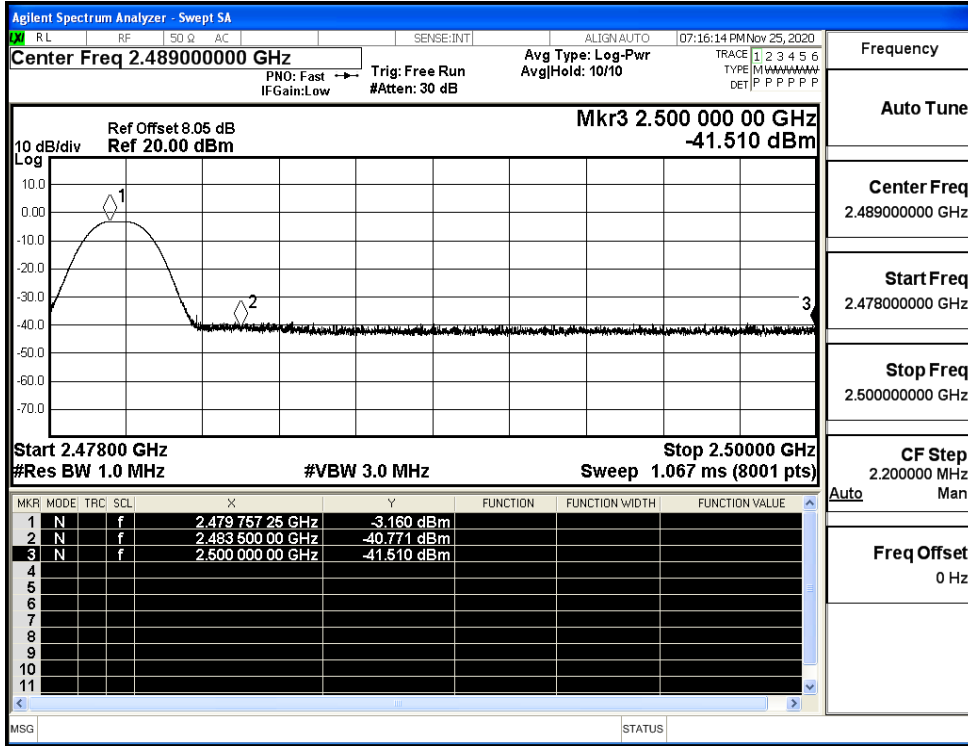
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

