

Appendix B

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

Product Name: Wireless Speaker

Trade Mark: billboard

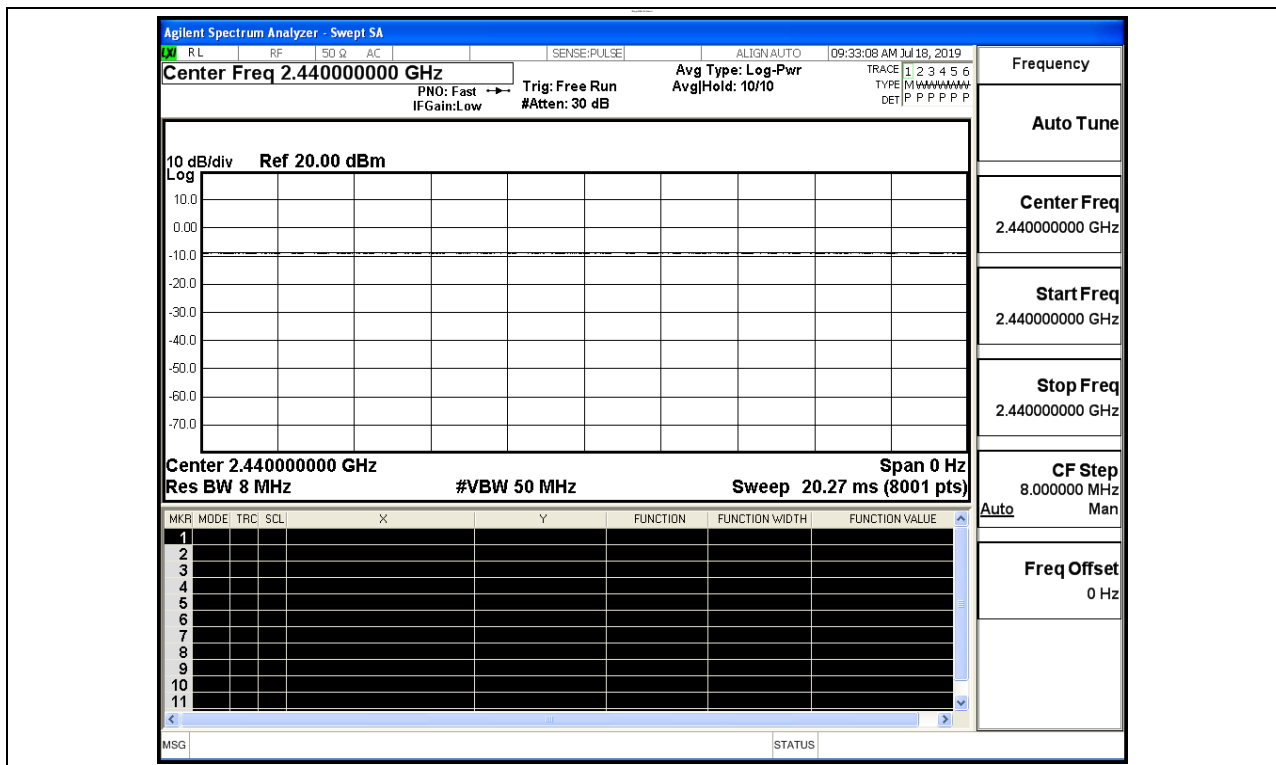
Test Model: BB1001

Environmental Conditions

Temperature:	23.4° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	SCENT HU
Supervised by:	Wang.Chuang

B.1 Duty Cycle

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



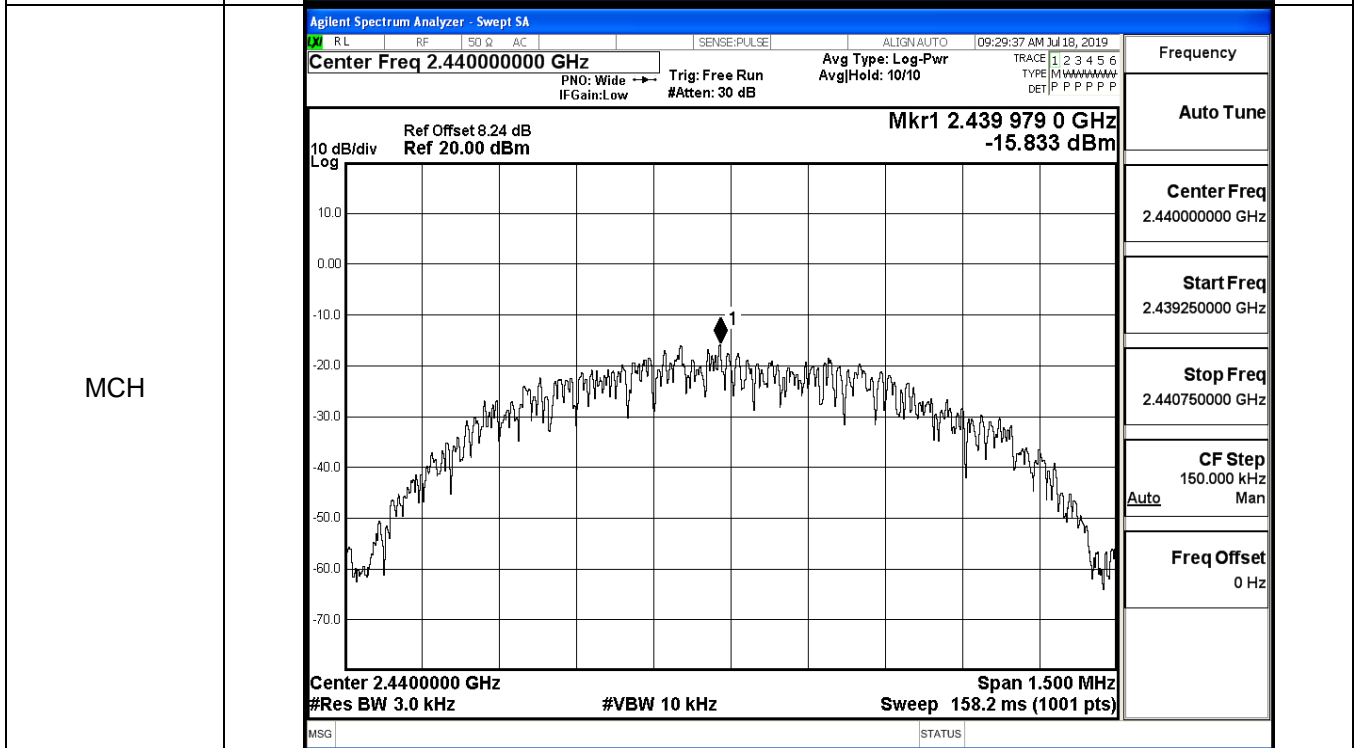
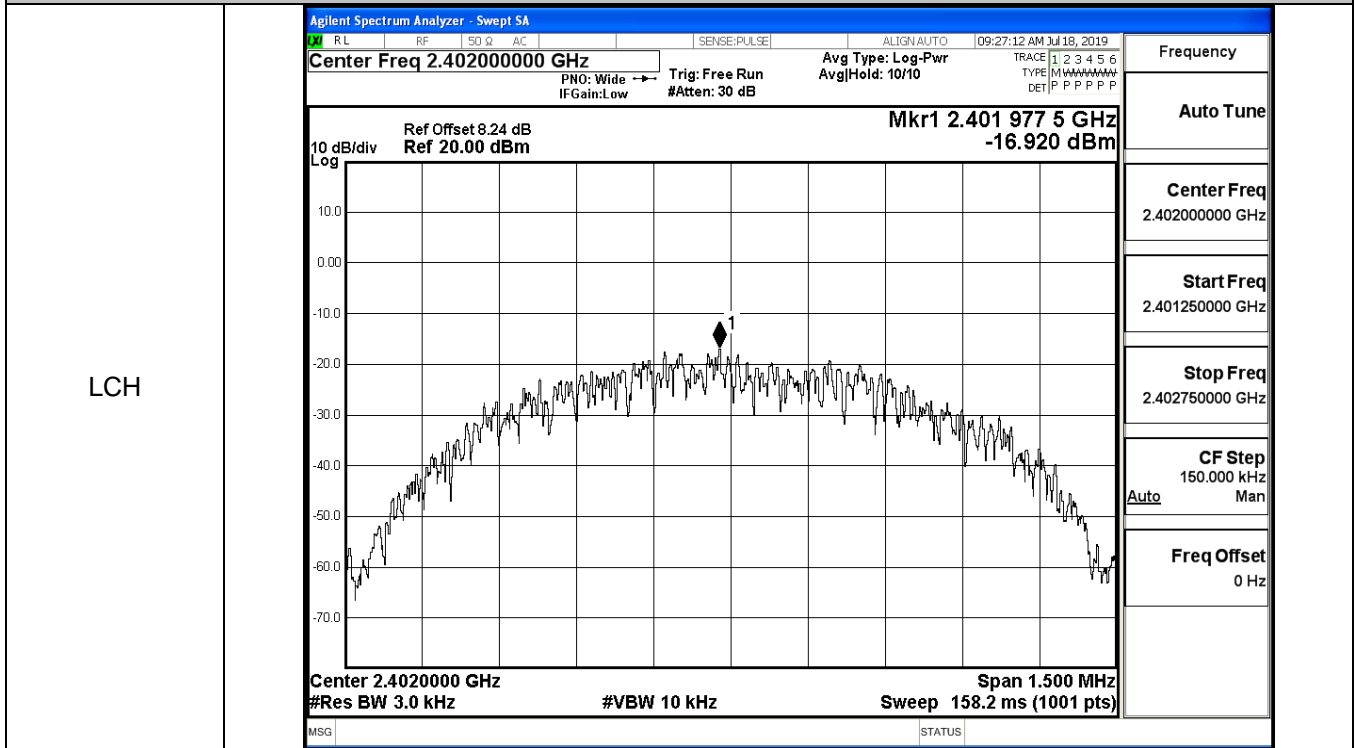
B.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-1.557	30	PASS
BT LE	MCH	-0.787	30	PASS
BT LE	HCH	-1.851	30	PASS

B.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-16.920	8	PASS
BT LE	MCH	-15.833	8	PASS
BT LE	HCH	-16.893	8	PASS

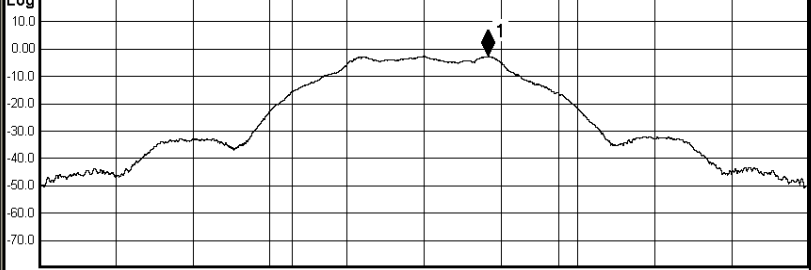
Test Graphs



B.4 6dB Bandwidth

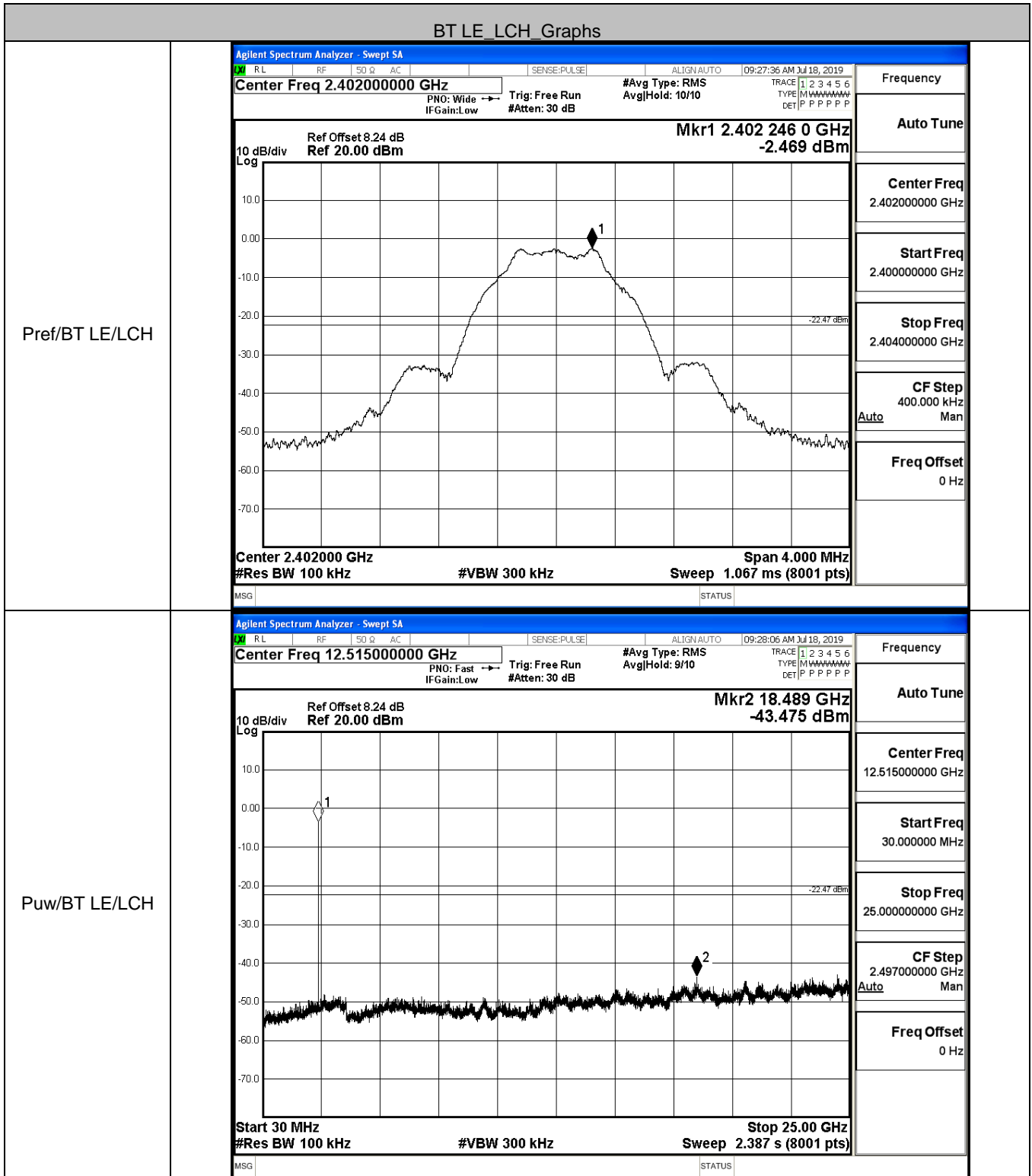
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6888	≥0.5	PASS
BT LE	MCH	0.6813	≥0.5	PASS
BT LE	HCH	0.6890	≥0.5	PASS

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 09:26:47 AM Jul 18, 2019</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="width: 60%;"> <p style="font-size: small;">10 dB/div Ref Offset 8.24 dB Mkr1 2.4022464 GHz Log Ref 20.00 dBm -2.4558 dBm</p> <p style="font-size: small;">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>4.63 dBm</td> </tr> <tr> <td colspan="3" style="text-align: center;">1.0497 MHz</td> </tr> <tr> <td>Transmit Freq Error</td> <td>7.013 kHz</td> <td>OBW Power 99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>688.8 kHz</td> <td>x dB -6.00 dB</td> </tr> </table> </div> <div style="width: 35%; border-left: 1px solid black; padding-left: 5px;"> <p style="font-size: small;">Frequency</p> <p style="text-align: center;">Center Freq 2.402000000 GHz</p> <hr/> <p style="font-size: small;">CF Step 300.000 kHz Auto Man</p> <p style="font-size: small;">Freq Offset 0 Hz</p> </div> </div> <p style="font-size: x-small; margin-top: 5px;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	4.63 dBm	1.0497 MHz			Transmit Freq Error	7.013 kHz	OBW Power 99.00 %	x dB Bandwidth	688.8 kHz	x dB -6.00 dB
Occupied Bandwidth	Total Power	4.63 dBm											
1.0497 MHz													
Transmit Freq Error	7.013 kHz	OBW Power 99.00 %											
x dB Bandwidth	688.8 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:PULSE ALIGN:AUTO 09:29:13 AM Jul 18, 2019</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="width: 60%;"> <p style="font-size: small;">10 dB/div Ref Offset 8.24 dB Mkr1 2.4399944 GHz Log Ref 20.00 dBm -1.5509 dBm</p> <p style="font-size: small;">Center 2.44 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>5.50 dBm</td> </tr> <tr> <td colspan="3" style="text-align: center;">1.0466 MHz</td> </tr> <tr> <td>Transmit Freq Error</td> <td>5.486 kHz</td> <td>OBW Power 99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>681.3 kHz</td> <td>x dB -6.00 dB</td> </tr> </table> </div> <div style="width: 35%; border-left: 1px solid black; padding-left: 5px;"> <p style="font-size: small;">Frequency</p> <p style="text-align: center;">Center Freq 2.440000000 GHz</p> <hr/> <p style="font-size: small;">CF Step 300.000 kHz Auto Man</p> <p style="font-size: small;">Freq Offset 0 Hz</p> </div> </div> <p style="font-size: x-small; margin-top: 5px;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	5.50 dBm	1.0466 MHz			Transmit Freq Error	5.486 kHz	OBW Power 99.00 %	x dB Bandwidth	681.3 kHz	x dB -6.00 dB
Occupied Bandwidth	Total Power	5.50 dBm											
1.0466 MHz													
Transmit Freq Error	5.486 kHz	OBW Power 99.00 %											
x dB Bandwidth	681.3 kHz	x dB -6.00 dB											

HCH	Agilent Spectrum Analyzer - Occupied BW			RL	RF	50 Ω	AC	SENSE: PULSE	ALIGN: AUTO	09:30:50 AM Jul 18, 2019
	Center Freq 2.480000000 GHz				Center Freq: 2.480000000 GHz			Radio Std: None		Frequency
					Trig: Free Run		AvgJHold: 1/1		Radio Device: BTS	
					#IFGain: Low		#Atten: 30 dB			
<div style="display: flex; justify-content: space-between;"> 10 dB/div Ref Offset 8.24 dB Mkr1 2.4802505 GHz </div> <div style="display: flex; justify-content: space-between;"> Log Ref 20.00 dBm -2.6539 dBm </div>  <div style="display: flex; justify-content: space-between; font-size: small;"> Center 2.48 GHz #VBW 300 kHz Span 3 MHz </div> <div style="display: flex; justify-content: space-between; font-size: small;"> #Res BW 100 kHz Sweep 1.067 ms </div>										
Occupied Bandwidth				Total Power		4.45 dBm				
1.0404 MHz										
Transmit Freq Error		5.960 kHz		OBW Power		99.00 %				
x dB Bandwidth		689.0 kHz		x dB		-6.00 dB				
MSG STATUS										

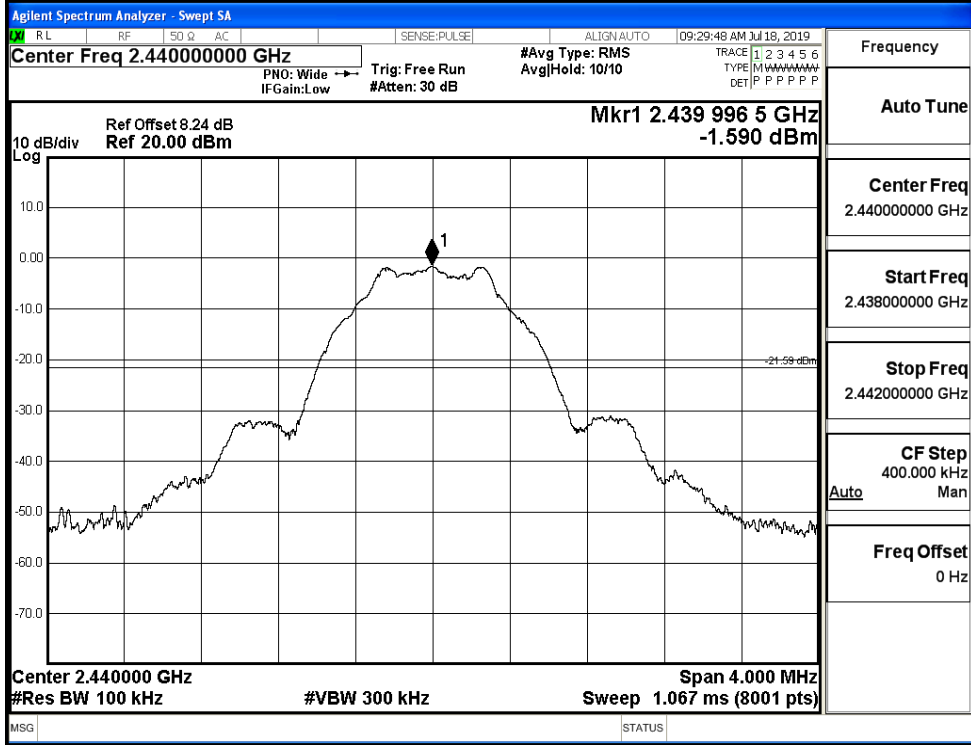
B.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.469	-43.475	-22.469	PASS
BT LE	MCH	-1.59	-43.827	-21.590	PASS
BT LE	HCH	-2.555	-43.860	-22.555	PASS

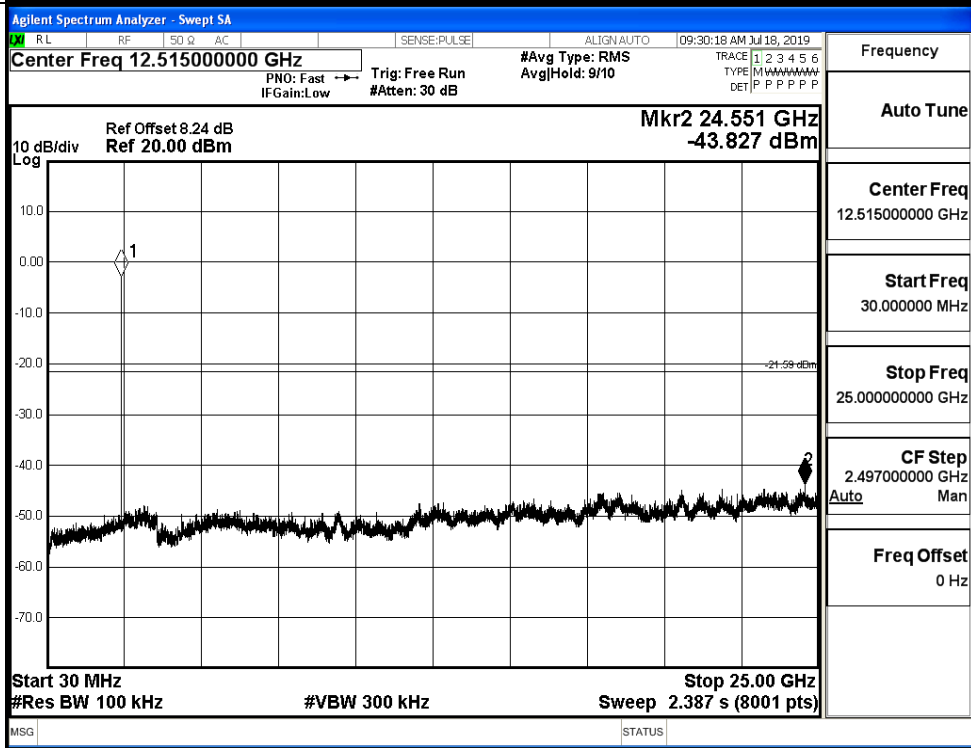


BT LE_MCH_Graphs

Pref/BT LE/MCH

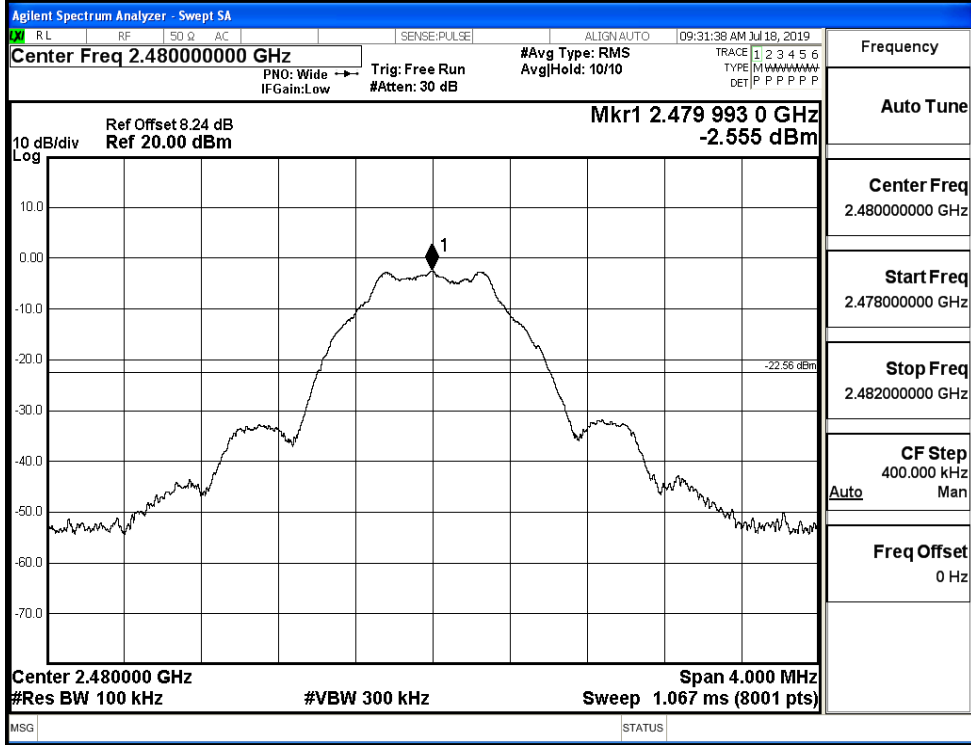


Puw/BT LE/MCH

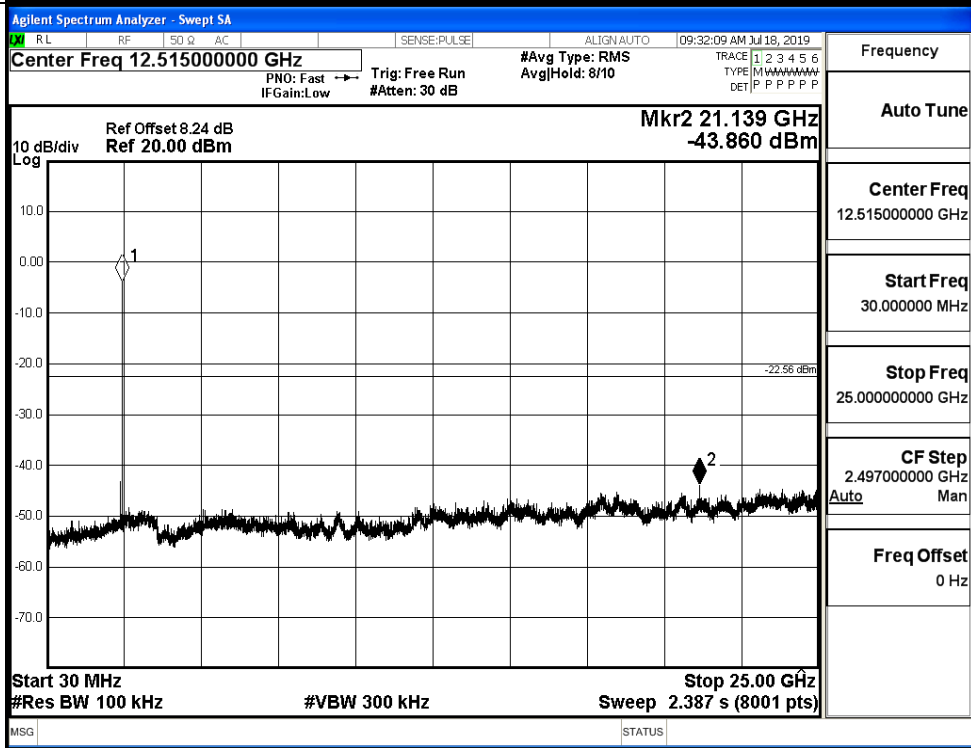


BT LE_HCH_Graphs

Pref/BT LE/HCH



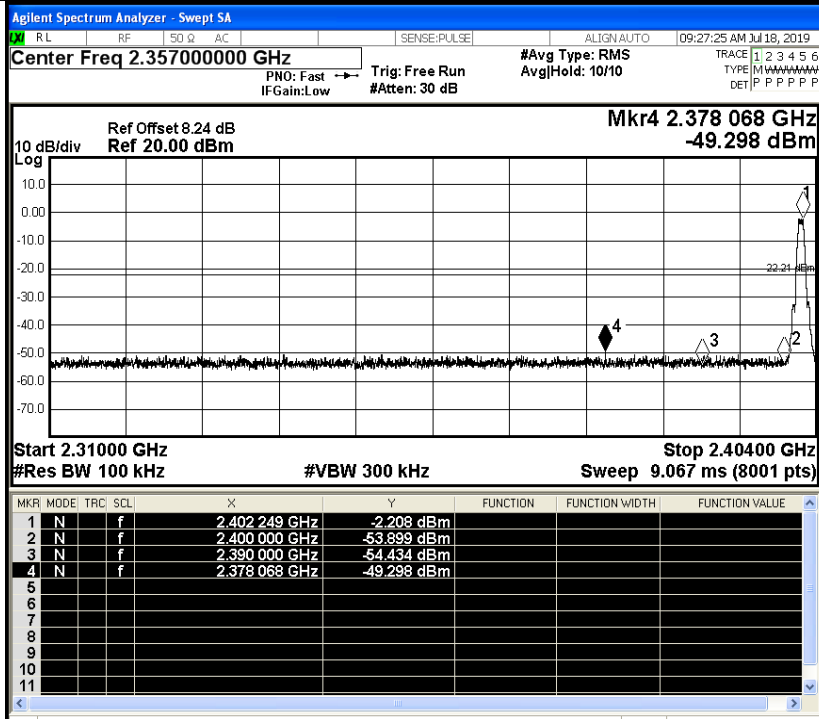
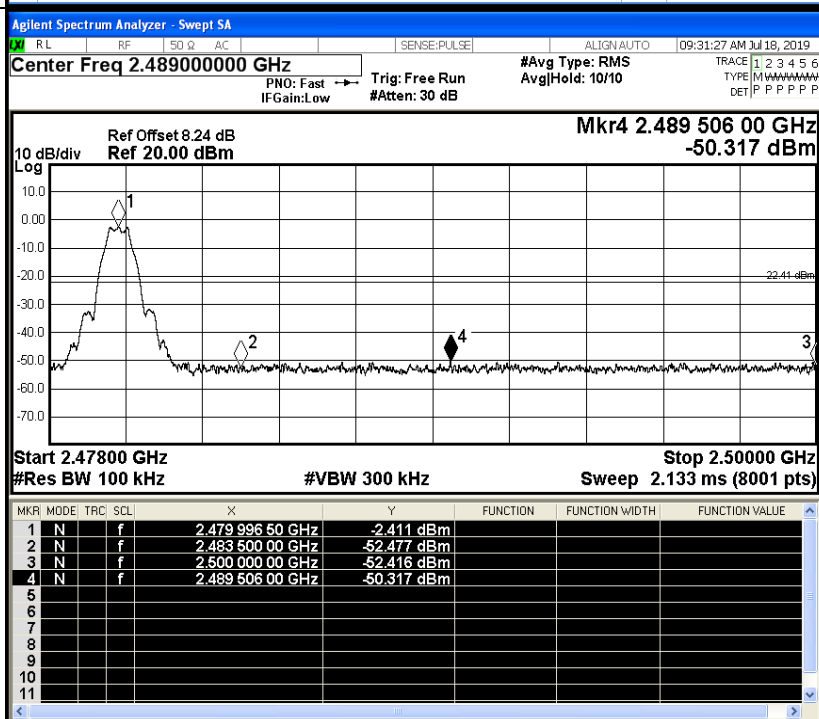
Puw/BT LE/HCH



B.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.208	-49.298	-22.21	PASS
BT LE	HCH	-2.411	-50.317	-22.41	PASS

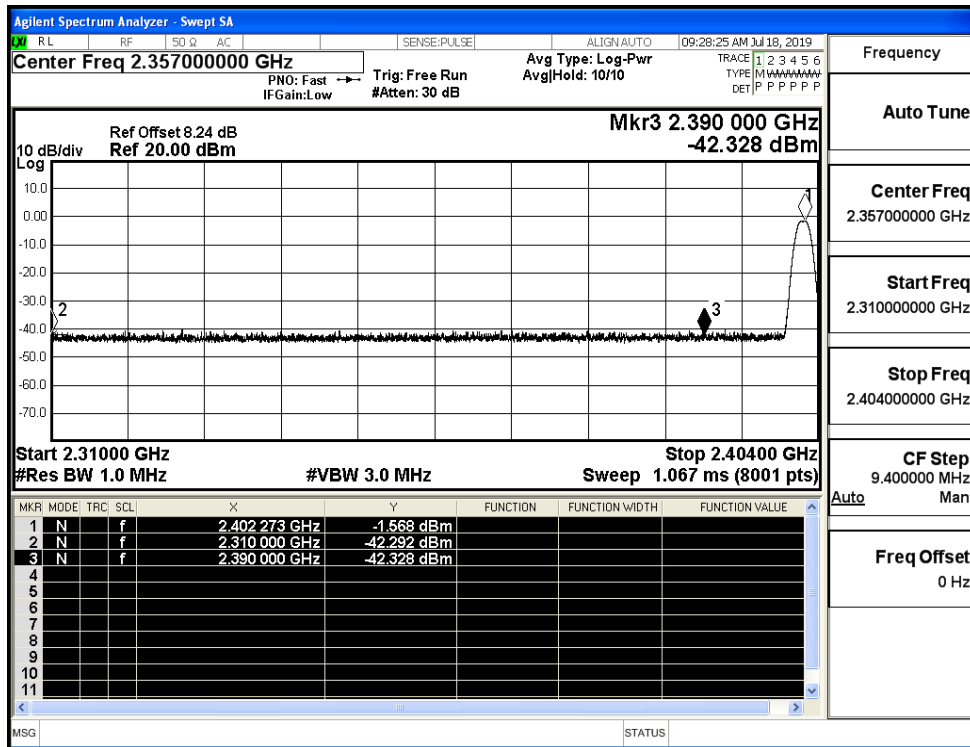
Test Graphs

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>

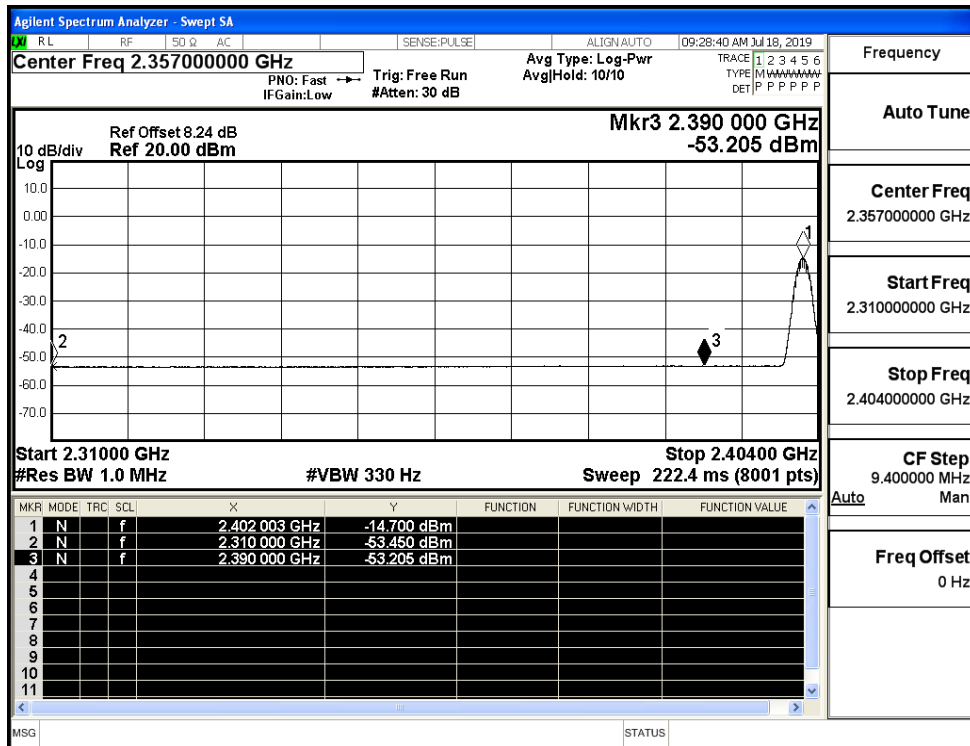
B.7 Restrict-band band-edge measurements

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	-42.29	2.0	0	52.97	PEAK	74	PASS
		Ant1	2310.0	-53.45	2.0	0	41.81	AV	54	PASS
		Ant1	2390.0	-42.33	2.0	0	52.93	PEAK	74	PASS
		Ant1	2390.0	-53.21	2.0	0	42.05	AV	54	PASS
	2480	Ant1	2483.5	-42.40	2.0	0	52.86	PEAK	74	PASS
		Ant1	2483.5	-52.97	2.0	0	42.29	AV	54	PASS
		Ant1	2500.0	-40.96	2.0	0	54.29	PEAK	74	PASS
		Ant1	2500.0	-52.84	2.0	0	42.42	AV	54	PASS

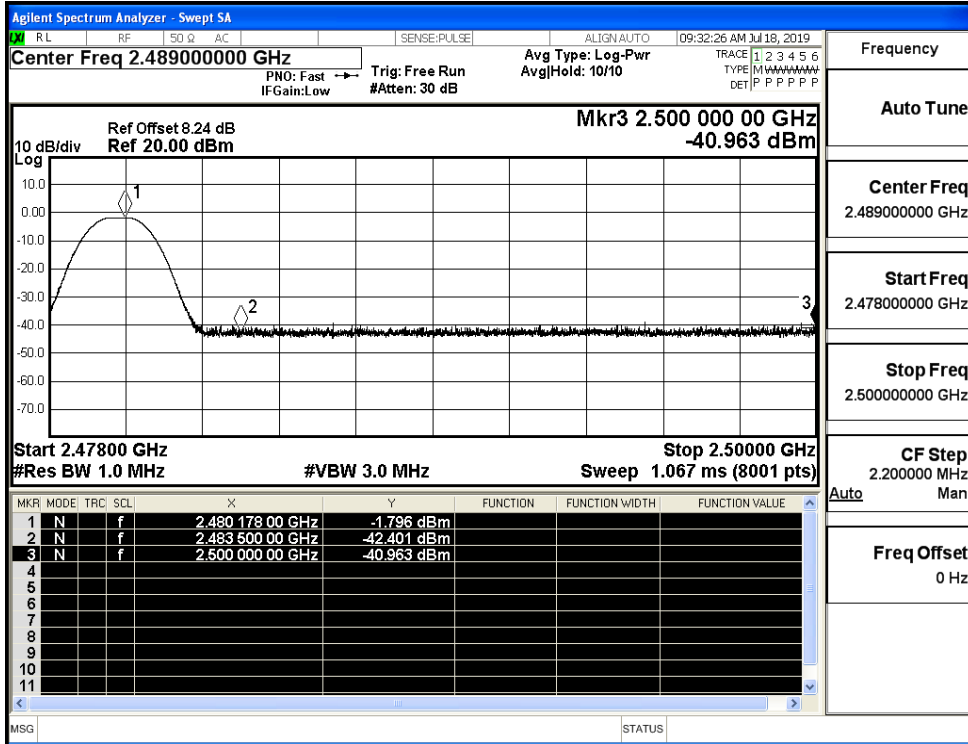
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

