

Appendix B

RF Test Data for BT V4.0(BT LE) (Conducted Measurement)

Product Name: POS Terminal

Trade Mark: SmartPeak

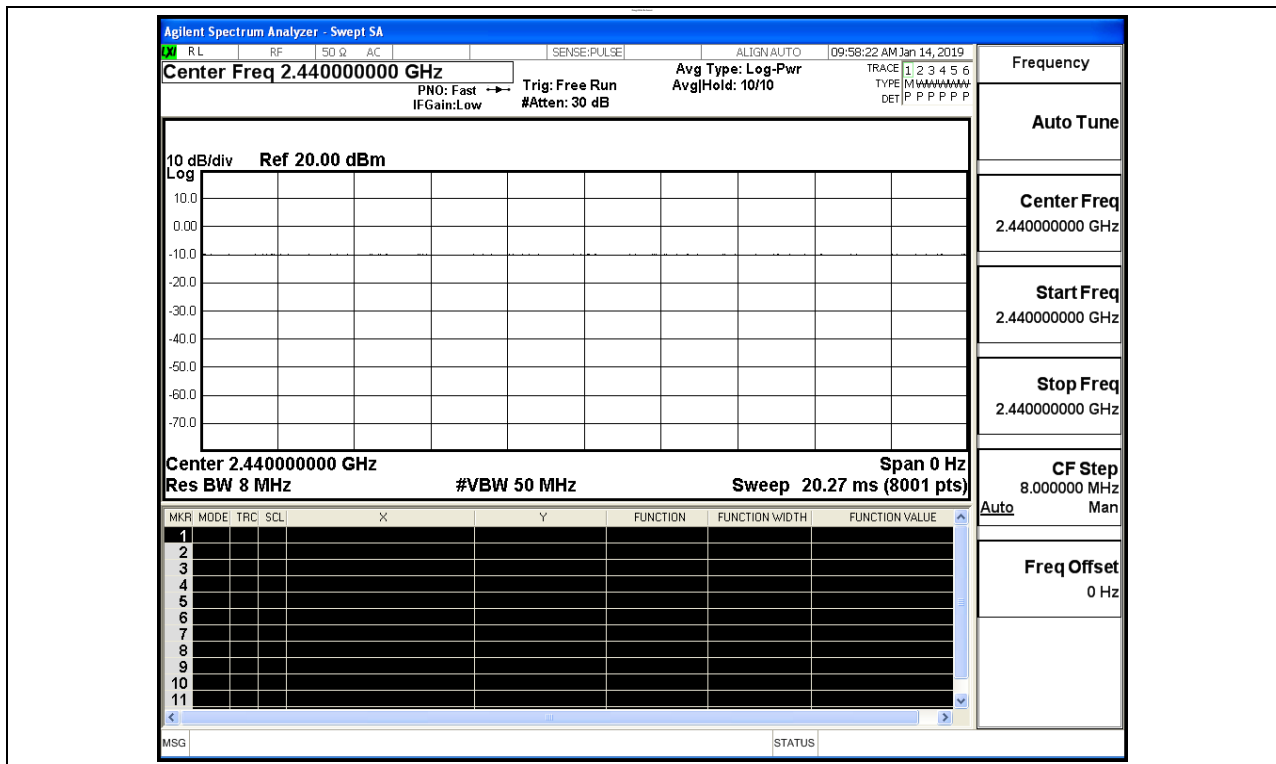
Test Model: P500

Environmental Conditions

Temperature:	23.9 ° C
Relative Humidity:	52.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Tom Liu
Supervised by:	Jayden Zhuo

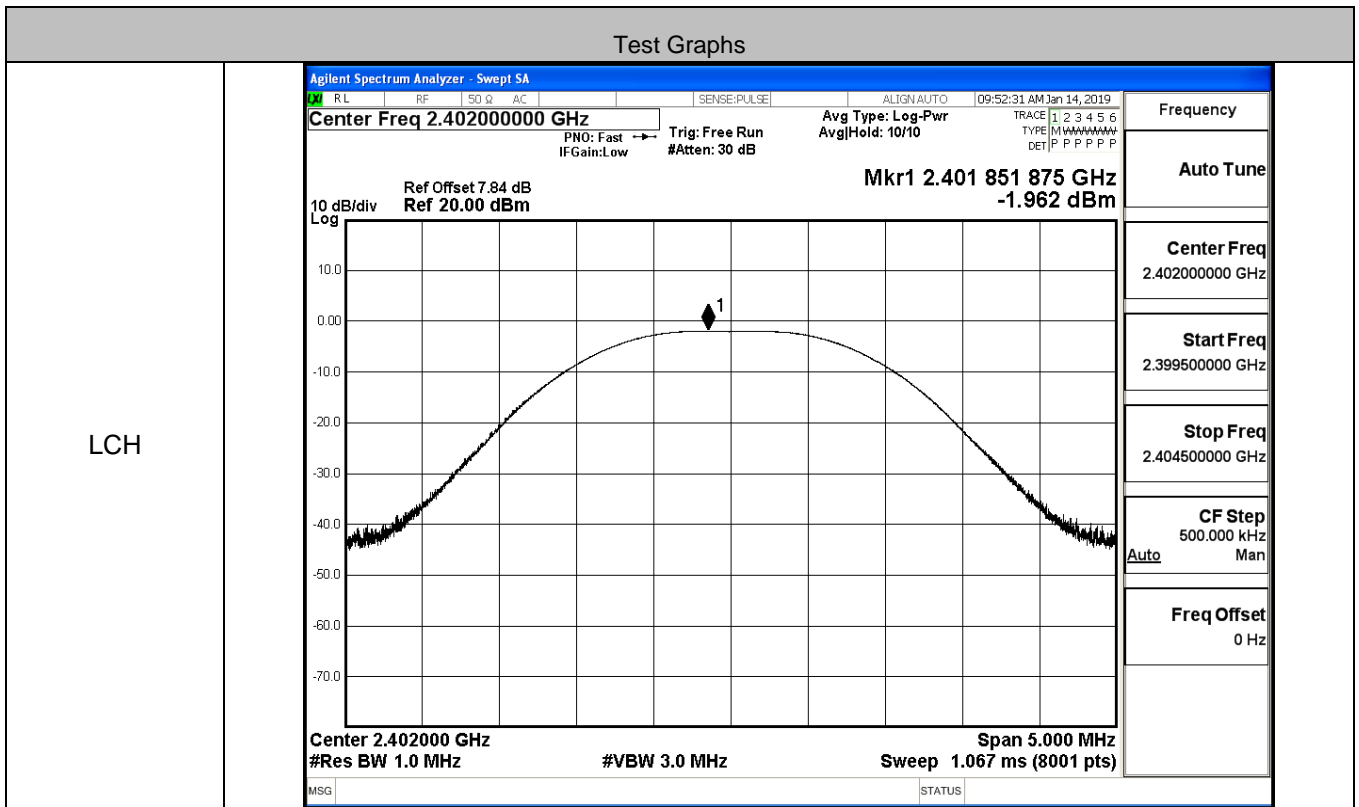
B.1 Duty Cycle

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

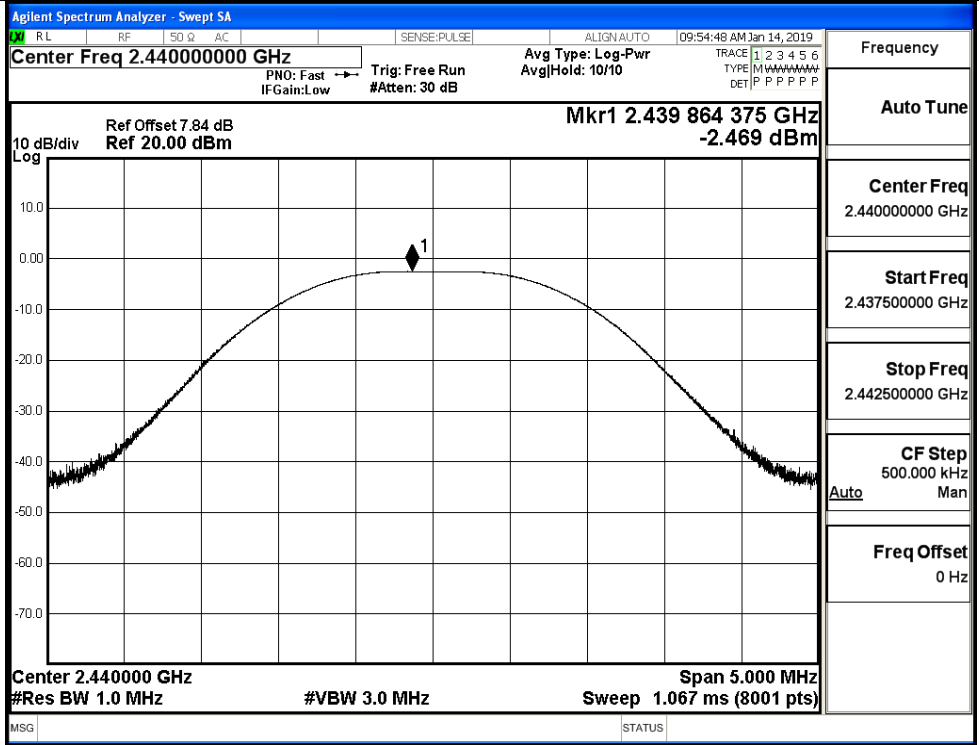


B.2 Maximum Conducted Peak Output Power

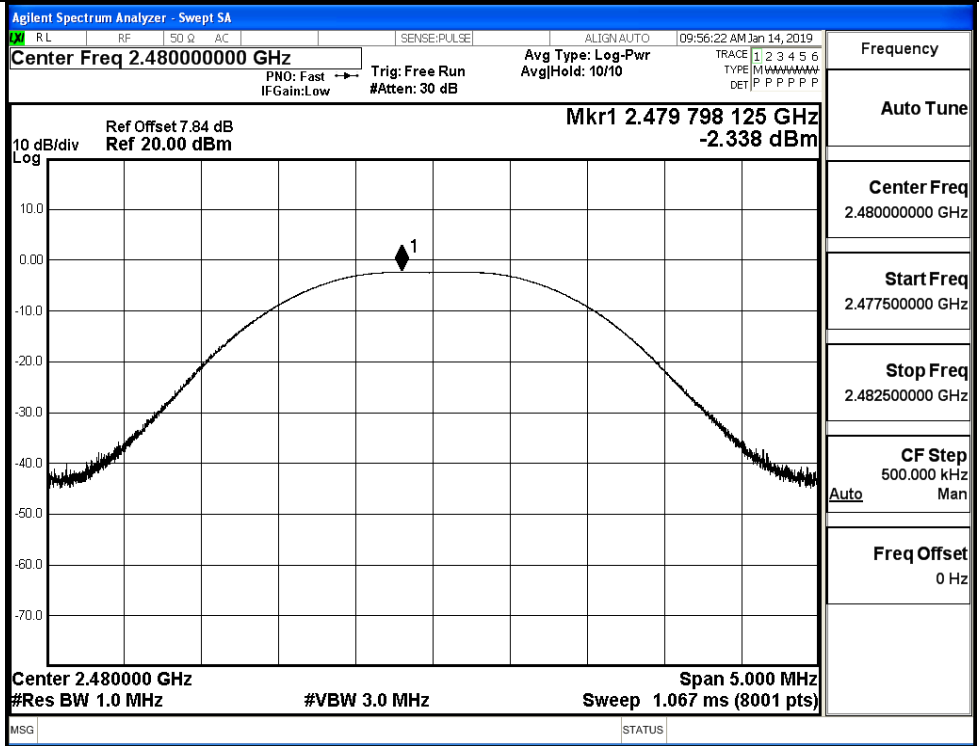
Mode	Channel	Conduct Peak Power[dBm]	Conduct Average Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-1.962	-2.141	30	PASS
BT LE	MCH	-2.469	-2.658	30	PASS
BT LE	HCH	-2.338	-2.495	30	PASS



MCH



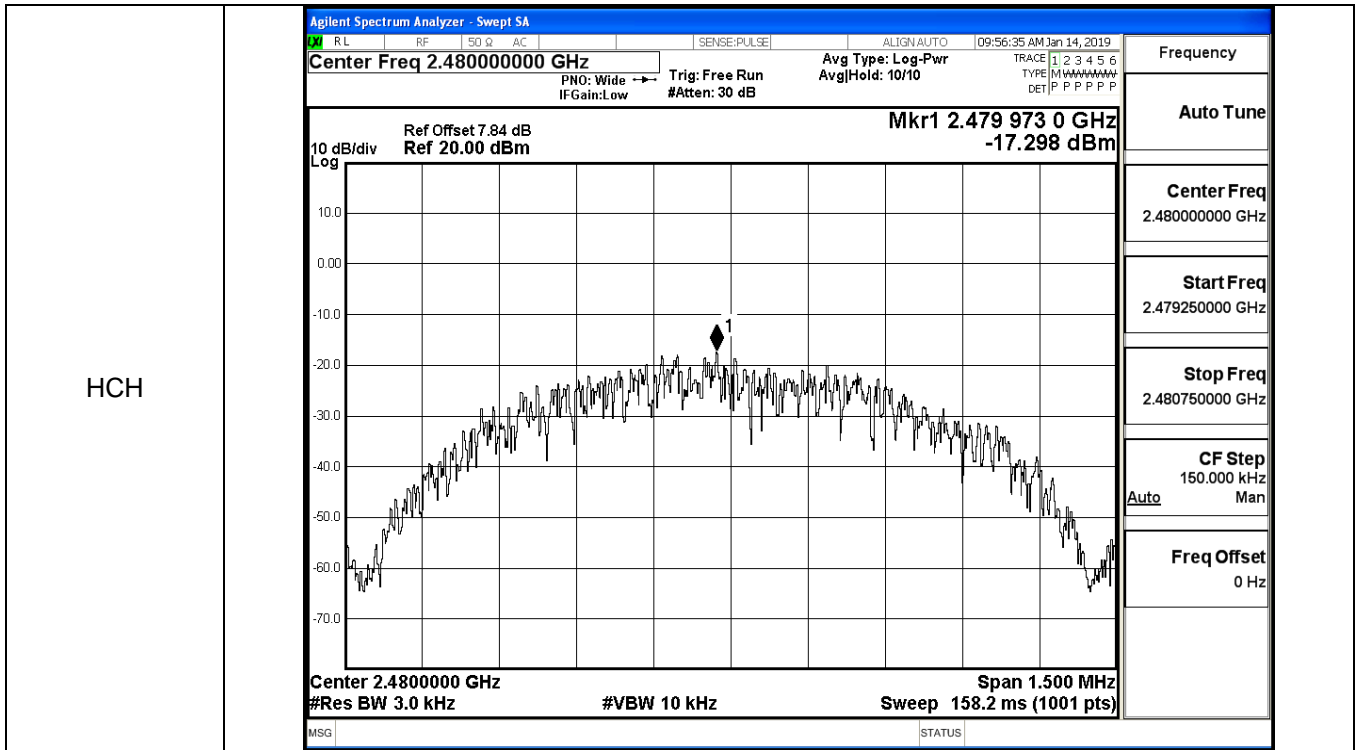
HCH



B.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-17.065	8	PASS
BT LE	MCH	-17.475	8	PASS
BT LE	HCH	-17.298	8	PASS

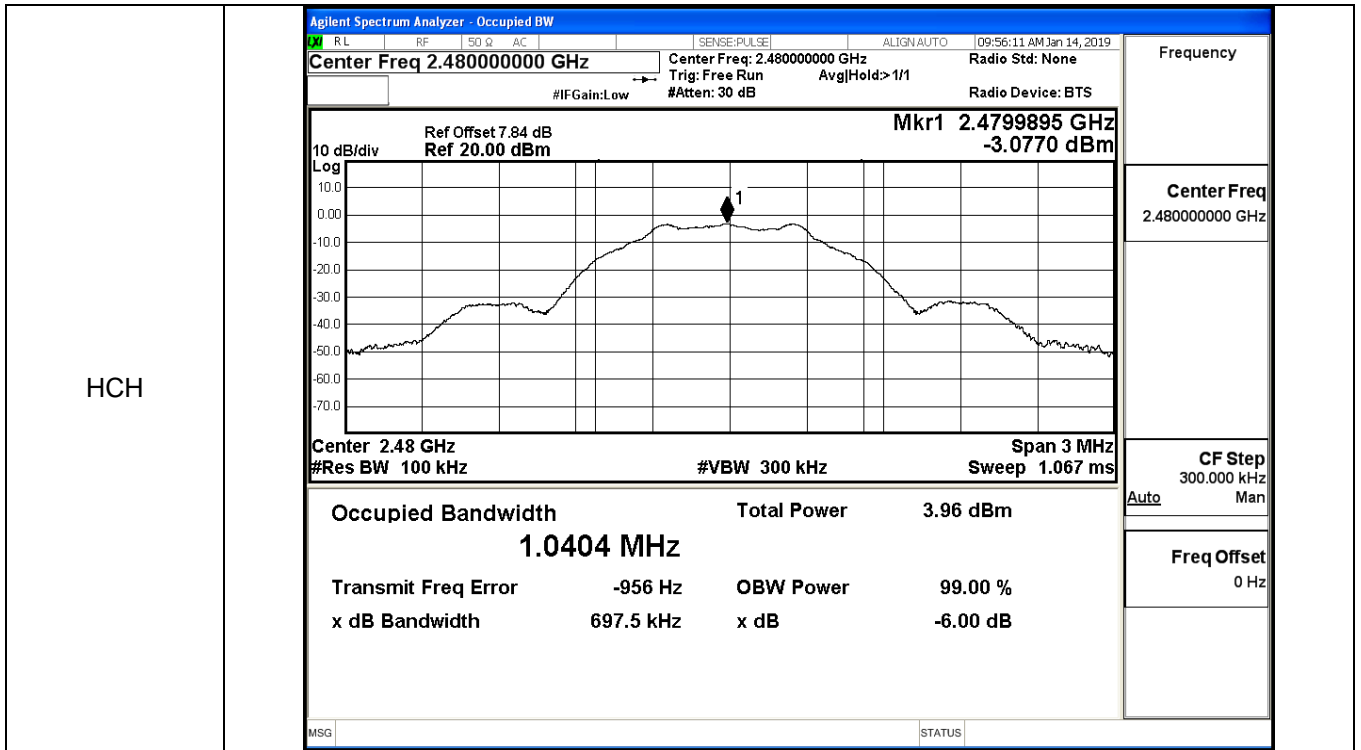
Test Graphs	
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Swept SA</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 09:52:44 AM Jan 14, 2019</p> <p style="font-size: small; margin: 0;">Center 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 #Atten: 30 dB AvgHold: 10/10 TYPE M W W W W W W W</p> <p style="font-size: x-small; margin: 0;">IFGain:Low DET P P P P P P P</p> <div style="display: flex; justify-content: space-between; align-items: flex-start; margin-top: 10px;"> <div style="width: 60%;"> <p style="font-size: small; margin: 0;">Ref Offset 7.84 dB Ref 20.00 dBm</p> <p style="font-size: small; margin: 0;">Mkr1 2.401 973 0 GHz -17.065 dBm</p> <p style="font-size: small; margin: 0;">Center 2.4020000 GHz Span 1.500 MHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 158.2 ms (1001 pts)</p> </div> <div style="width: 35%; border-left: 1px solid black; padding-left: 5px;"> <p style="font-size: x-small; margin: 0;">Frequency</p> <p style="font-size: x-small; margin: 0;">Auto Tune</p> <p style="font-size: x-small; margin: 0;">Center Freq 2.402000000 GHz</p> <p style="font-size: x-small; margin: 0;">Start Freq 2.401250000 GHz</p> <p style="font-size: x-small; margin: 0;">Stop Freq 2.402750000 GHz</p> <p style="font-size: x-small; margin: 0;">CF Step 150.000 kHz Auto Man</p> <p style="font-size: x-small; margin: 0;">Freq Offset 0 Hz</p> </div> </div> <p style="font-size: x-small; margin: 0; display: flex; justify-content: space-between;">MSG STATUS</p> </div>
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:PULSE ALIGN:AUTO 09:55:01 AM Jan 14, 2019</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 → 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;">IFGain:Low DET P P P P P P P</p> <div style="display: flex; justify-content: space-between; align-items: flex-start; margin-top: 10px;"> <div style="width: 60%;"> <p style="font-size: small; margin: 0;">Ref Offset 7.84 dB Ref 20.00 dBm</p> <p style="font-size: small; margin: 0;">Mkr1 2.439 973 0 GHz -17.475 dBm</p> <p style="font-size: small; margin: 0;">Center 2.4400000 GHz Span 1.500 MHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 158.2 ms (1001 pts)</p> </div> <div style="width: 35%; border-left: 1px solid black; padding-left: 5px;"> <p style="font-size: x-small; margin: 0;">Frequency</p> <p style="font-size: x-small; margin: 0;">Auto Tune</p> <p style="font-size: x-small; margin: 0;">Center Freq 2.440000000 GHz</p> <p style="font-size: x-small; margin: 0;">Start Freq 2.439250000 GHz</p> <p style="font-size: x-small; margin: 0;">Stop Freq 2.440750000 GHz</p> <p style="font-size: x-small; margin: 0;">CF Step 150.000 kHz Auto Man</p> <p style="font-size: x-small; margin: 0;">Freq Offset 0 Hz</p> </div> </div> <p style="font-size: x-small; margin: 0; display: flex; justify-content: space-between;">MSG STATUS</p> </div>



B.4 6dB Bandwidth

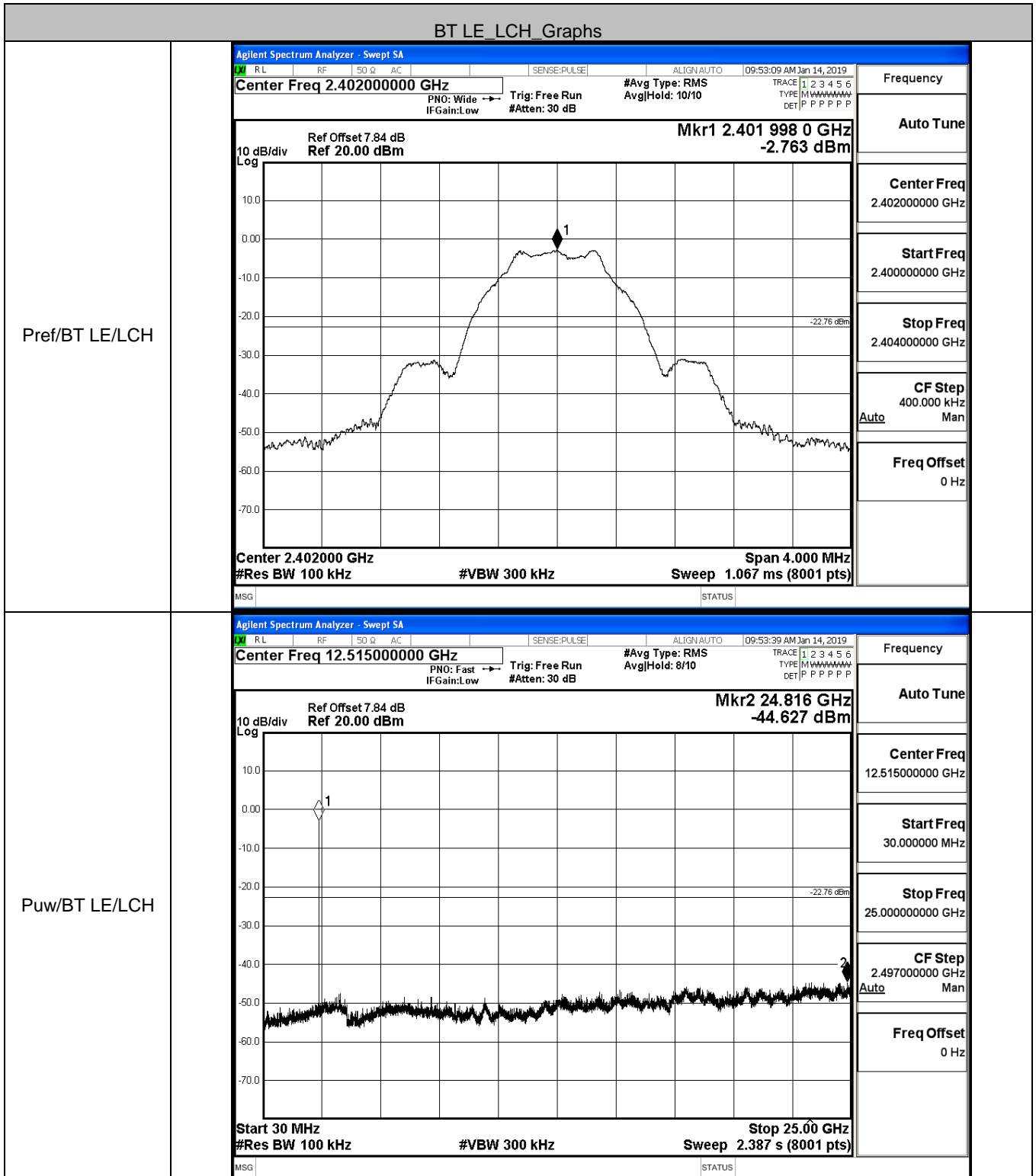
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6817	≥0.5	PASS
BT LE	MCH	0.6883	≥0.5	PASS
BT LE	HCH	0.6975	≥0.5	PASS

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 09:52:20 AM Jan 14, 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="border: 1px solid black; padding: 2px;"> <p style="text-align: right; margin: 0;">Mkr1 2.4019921 GHz -2.7214 dBm</p> </div> <p style="font-size: small; margin: 0;">Center 2.402 GHz #Res BW 100 kHz #VBW 300 kHz Span 3 MHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: small;"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>4.32 dBm</td> </tr> <tr> <td style="text-align: center;">1.0414 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-412 Hz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>681.7 kHz</td> <td>x dB</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	4.32 dBm	1.0414 MHz			Transmit Freq Error	-412 Hz	OBW Power	x dB Bandwidth	681.7 kHz	x dB			-6.00 dB
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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 09:54:38 AM Jan 14, 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="border: 1px solid black; padding: 2px;"> <p style="text-align: right; margin: 0;">Mkr1 2.4399914 GHz -3.2150 dBm</p> </div> <p style="font-size: small; margin: 0;">Center 2.44 GHz #Res BW 100 kHz #VBW 300 kHz Span 3 MHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: small;"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>3.79 dBm</td> </tr> <tr> <td style="text-align: center;">1.0416 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-693 Hz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>688.3 kHz</td> <td>x dB</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	3.79 dBm	1.0416 MHz			Transmit Freq Error	-693 Hz	OBW Power	x dB Bandwidth	688.3 kHz	x dB			-6.00 dB
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		-6.00 dB														



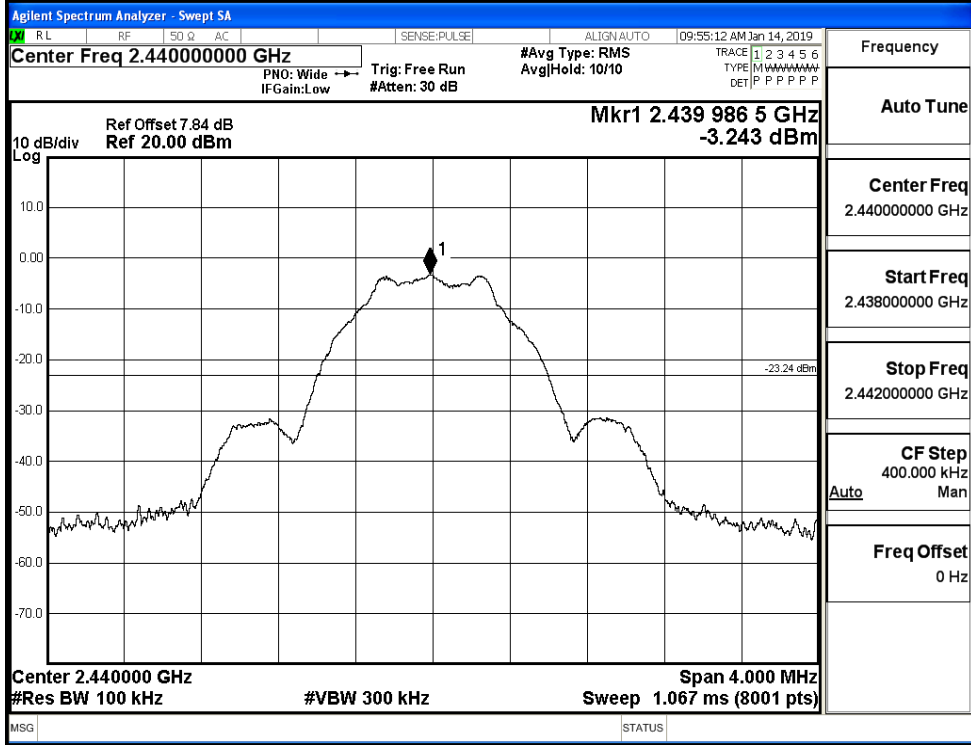
B.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.763	-44.627	-22.763	PASS
BT LE	MCH	-3.243	-44.018	-23.243	PASS
BT LE	HCH	-3.112	-43.958	-23.112	PASS

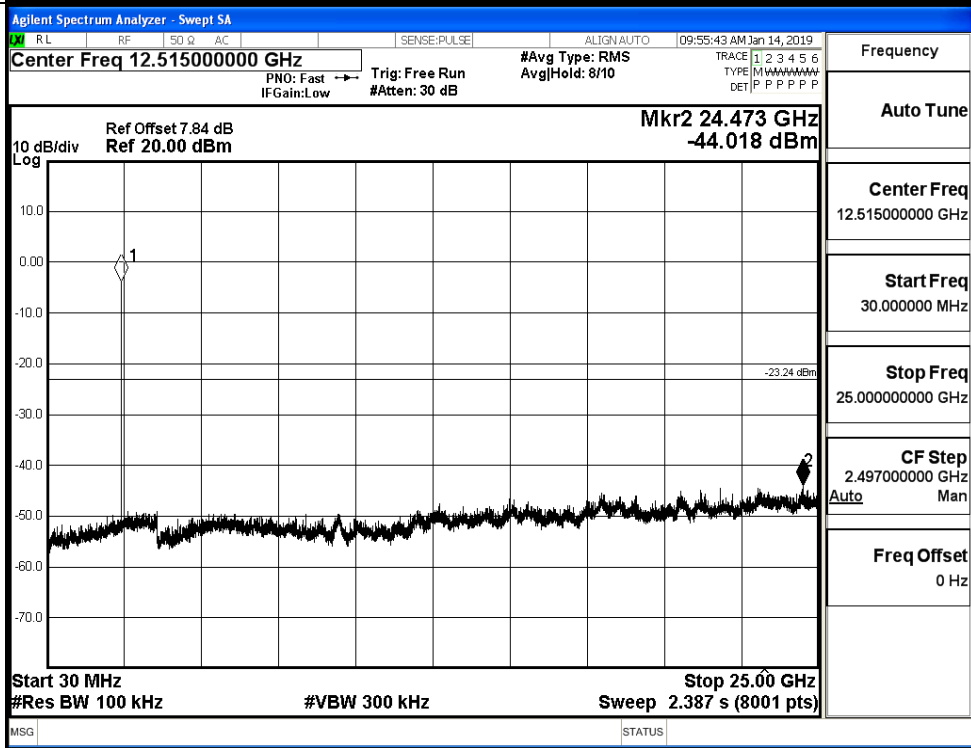


BT LE_MCH_Graphs

Pref/BT LE/MCH

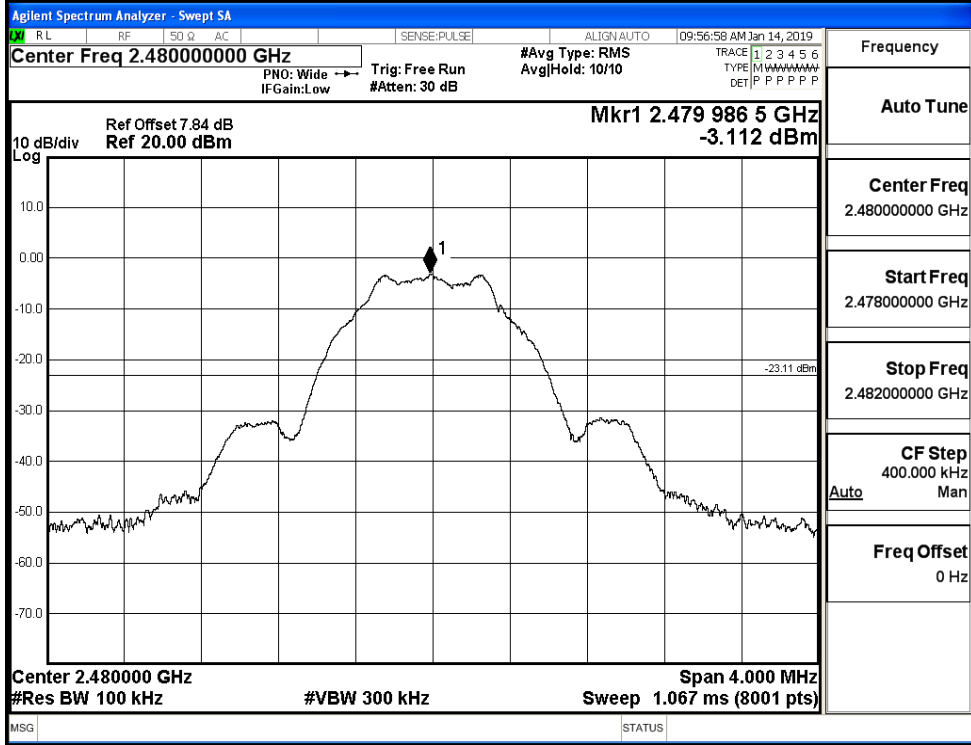


Puw/BT LE/MCH

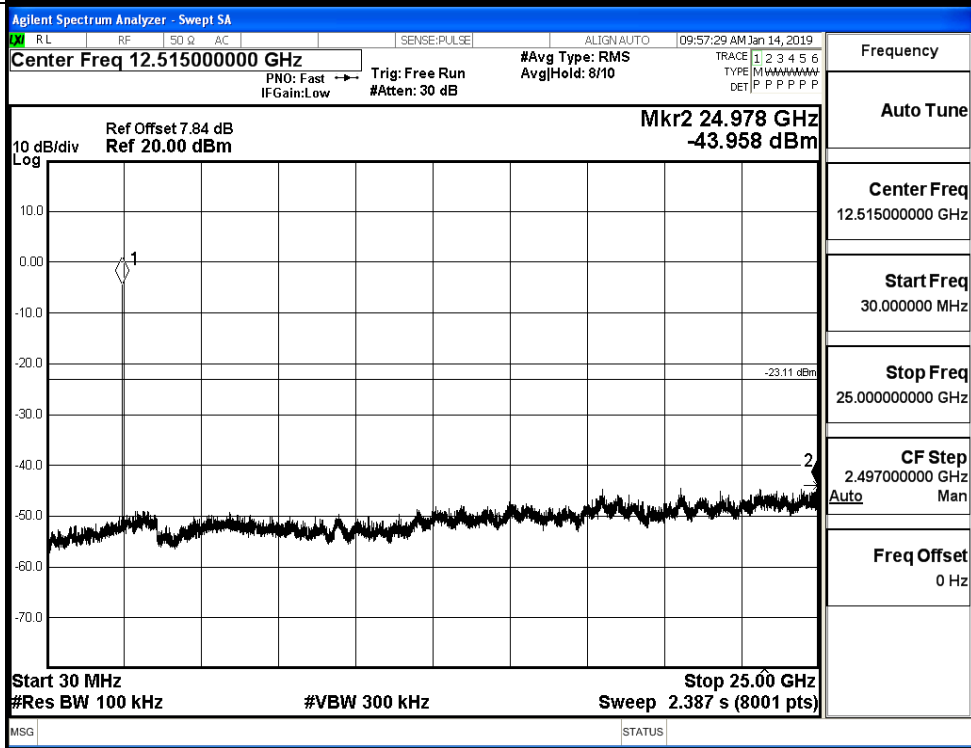


BT LE_HCH_Graphs

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	-2.643	-50.479	-22.64	PASS
BT LE	HCH	-2.920	-50.221	-22.92	PASS

Test Graphs

LCH

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.402 003 GHz	-2.643 dBm			
2	N	f		2.400 000 GHz	-53.063 dBm			
3	N	f		2.390 000 GHz	-53.795 dBm			
4	N	f		2.372 545 GHz	-50.479 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		2.479 996 50 GHz	-2.920 dBm			
2	N	f		2.483 500 00 GHz	-52.721 dBm			
3	N	f		2.500 000 00 GHz	-53.933 dBm			
4	N	f		2.499 524 25 GHz	-50.221 dBm			

Frequency

Auto Tune

Center Freq
2.48900000 GHz

Start Freq
2.47800000 GHz

Stop Freq
2.50000000 GHz

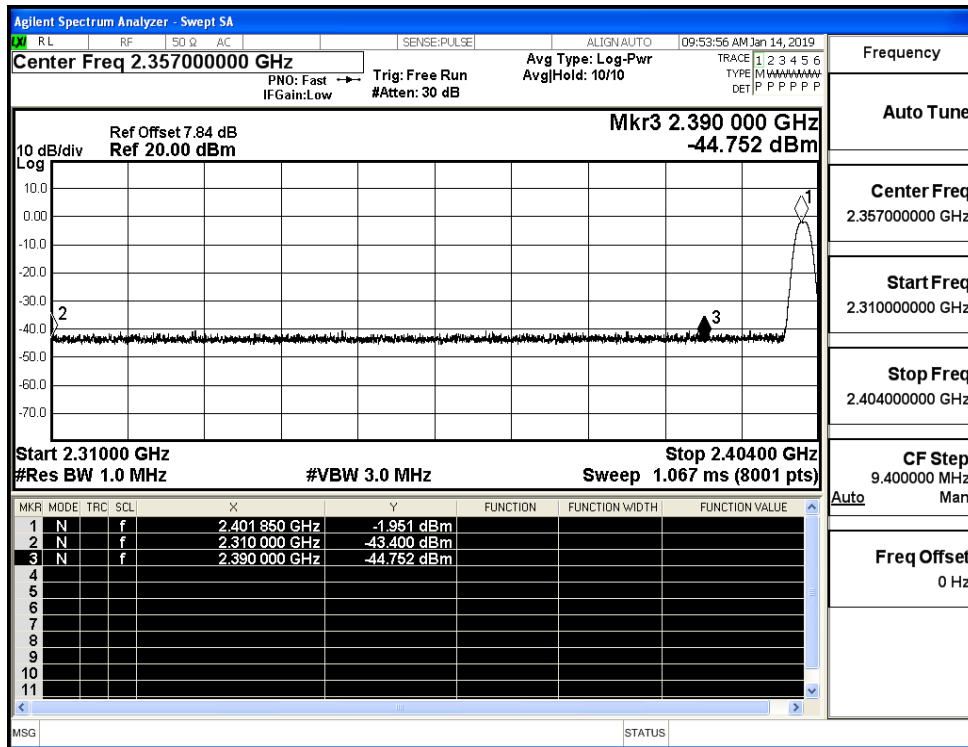
CF Step
2.200000 MHz

Freq Offset
0 Hz

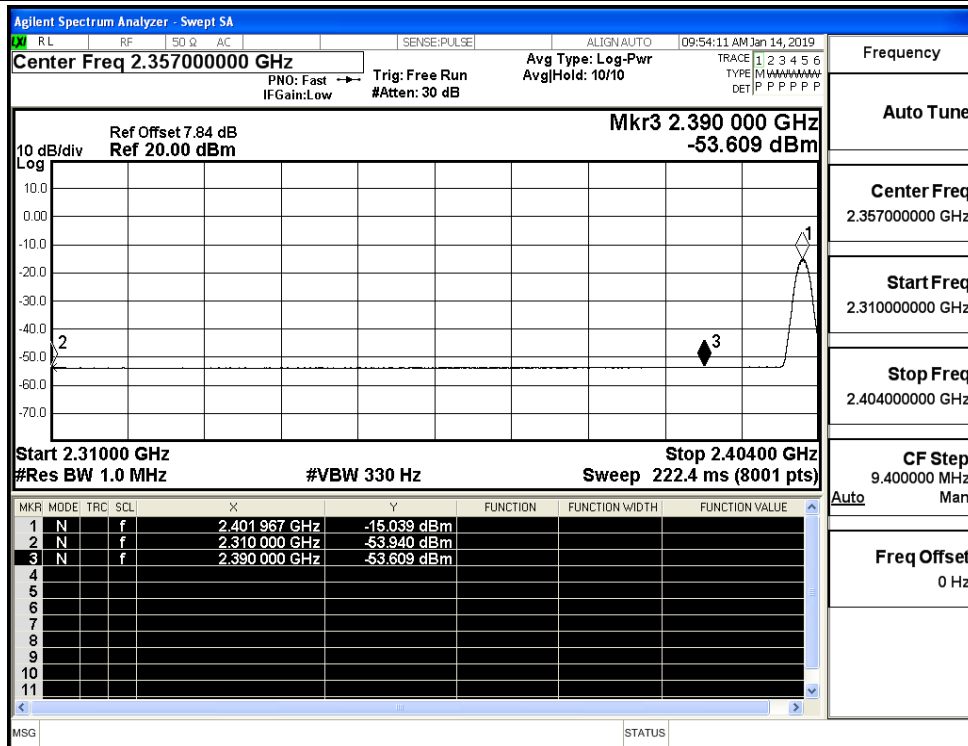
B.7 Restrict-band band-edge measurements

Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
BT LE	2402	Ant1	2310.0	-43.40	2.0	0	53.86	PEAK	74	PASS
		Ant1	2310.0	-53.94	2.0	0	43.32	AV	54	PASS
		Ant1	2390.0	-44.75	2.0	0	52.51	PEAK	74	PASS
		Ant1	2390.0	-53.61	2.0	0	43.65	AV	54	PASS
	2480	Ant1	2483.5	-43.08	2.0	0	54.17	PEAK	74	PASS
		Ant1	2483.5	-53.48	2.0	0	43.78	AV	54	PASS
		Ant1	2500.0	-43.51	2.0	0	53.74	PEAK	74	PASS
		Ant1	2500.0	-53.26	2.0	0	44.00	AV	54	PASS

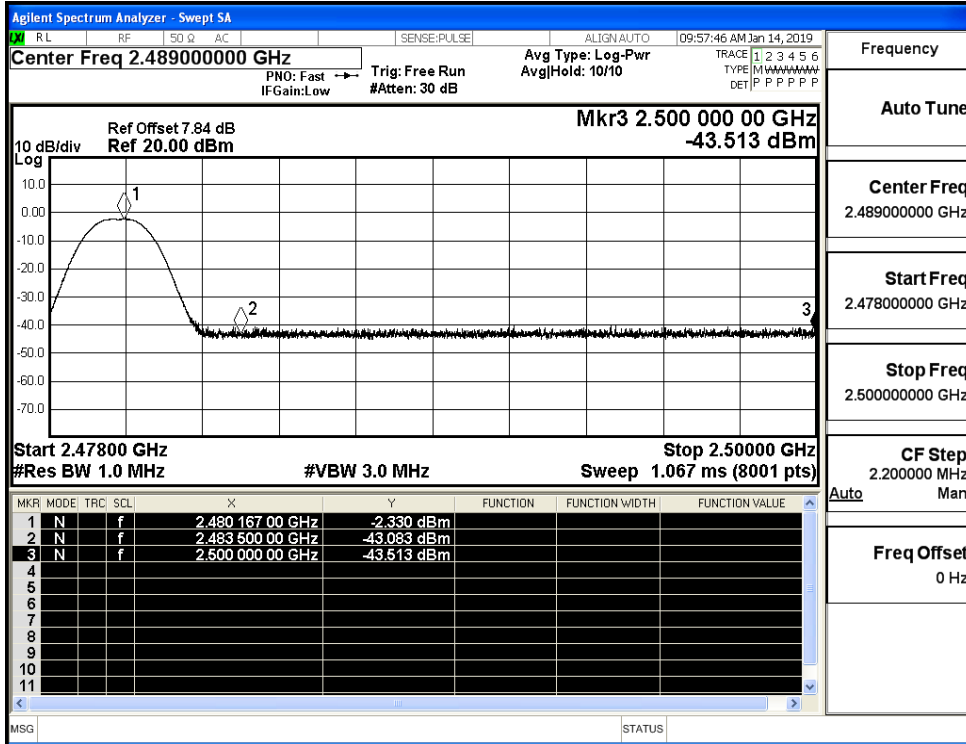
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

