

Appendix A

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

Product Name: APP Controller



Trade Mark:

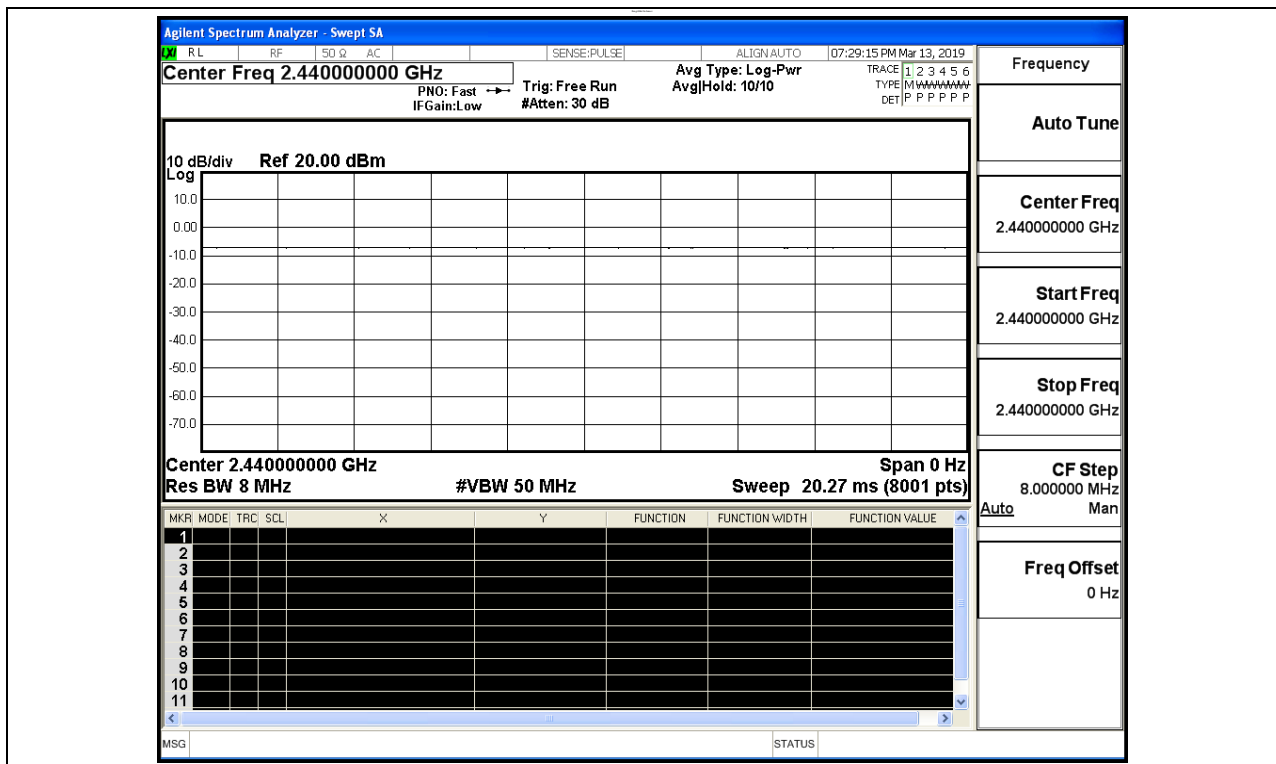
Test Model: 2468

Environmental Conditions

Temperature:	22.4 ° C
Relative Humidity:	53.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Diamond.Lu
Supervised by:	Tom.Liu

A.1 Duty Cycle

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

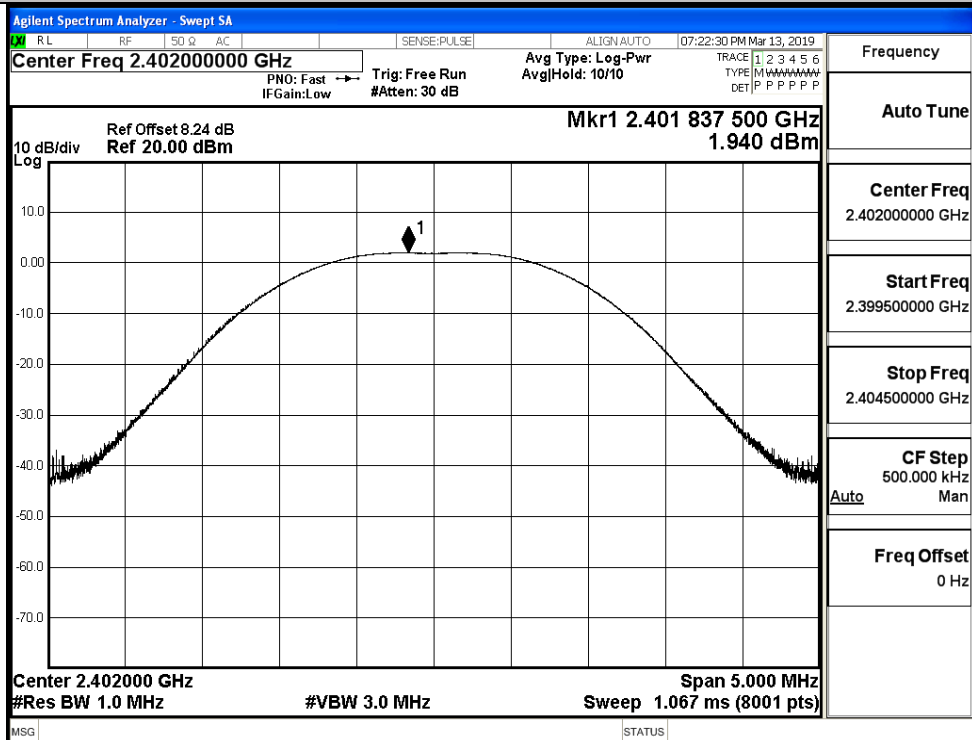


A.2 Maximum Conducted Peak Output Power

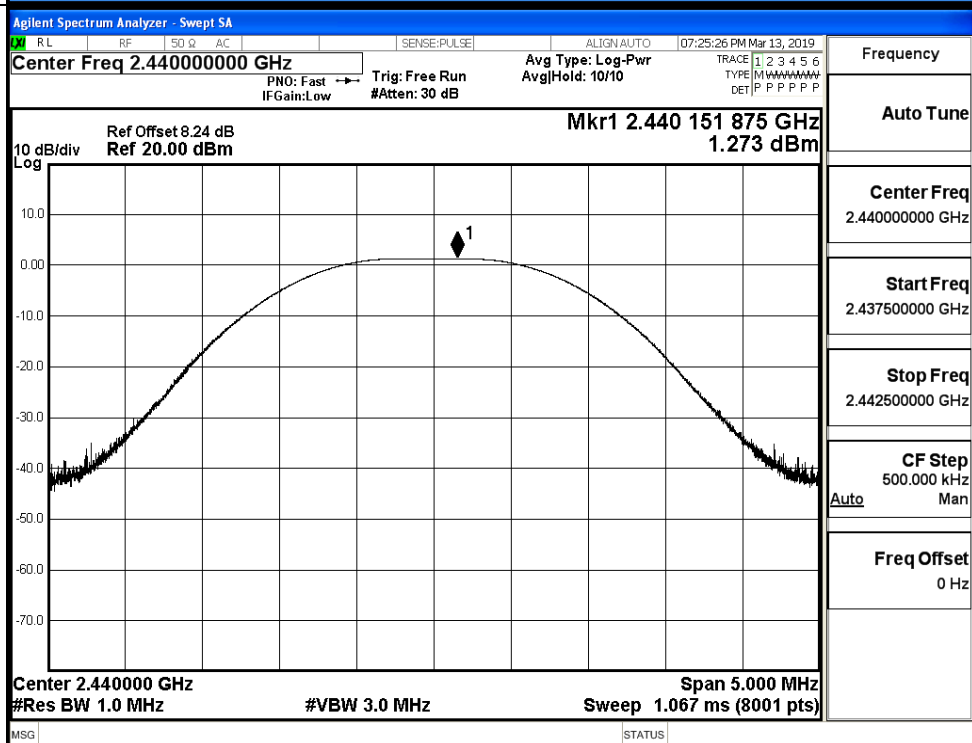
Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	1.94	30	PASS
BT LE	MCH	1.273	30	PASS
BT LE	HCH	0.648	30	PASS

Test Graphs

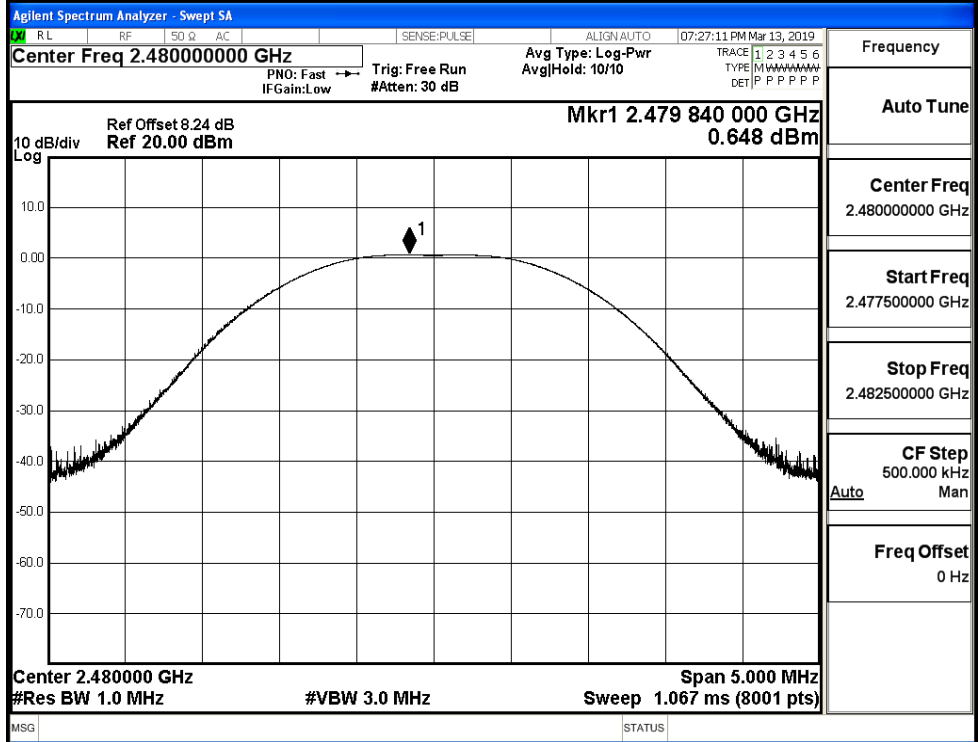
LCH



MCH

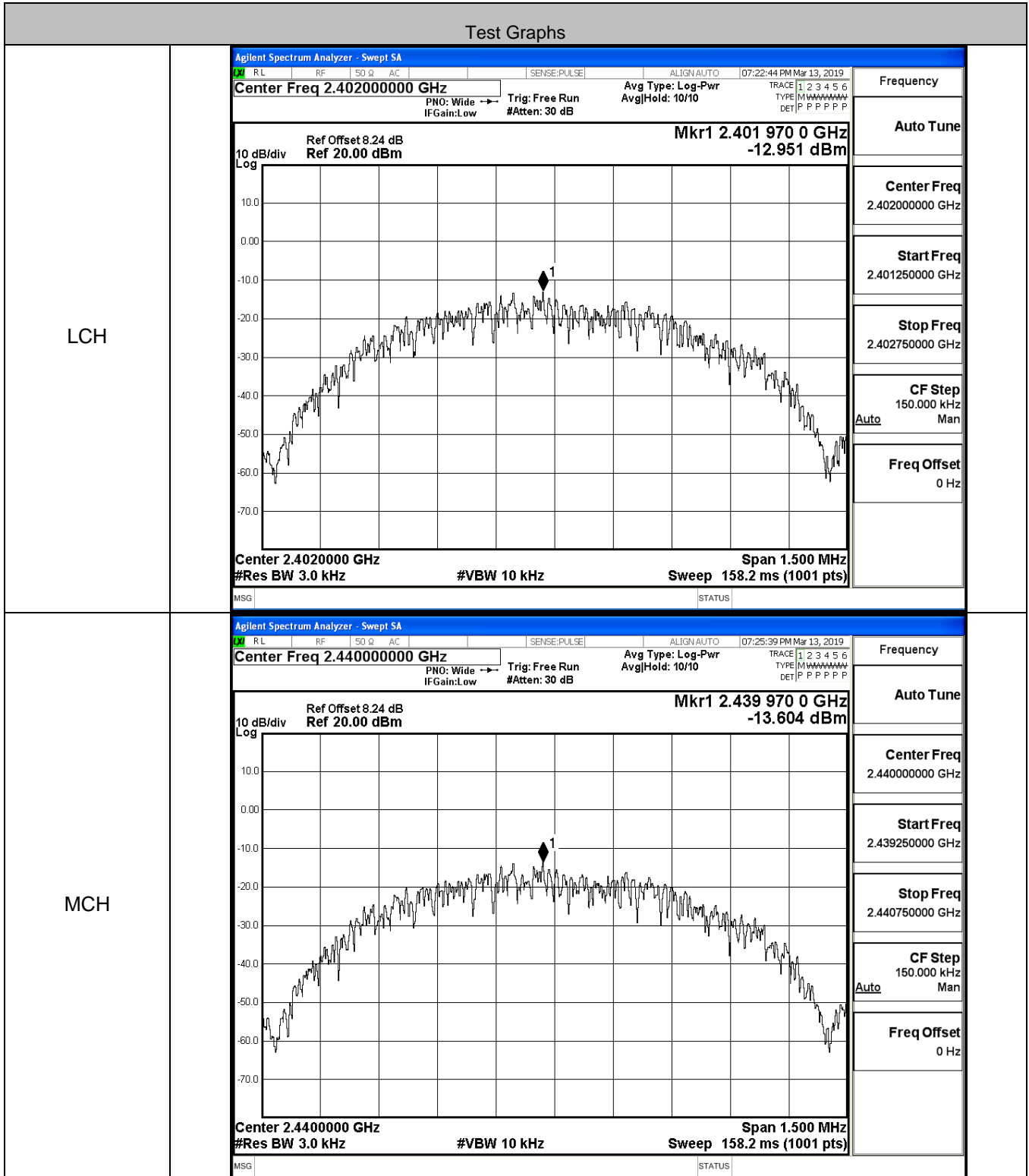


HCH

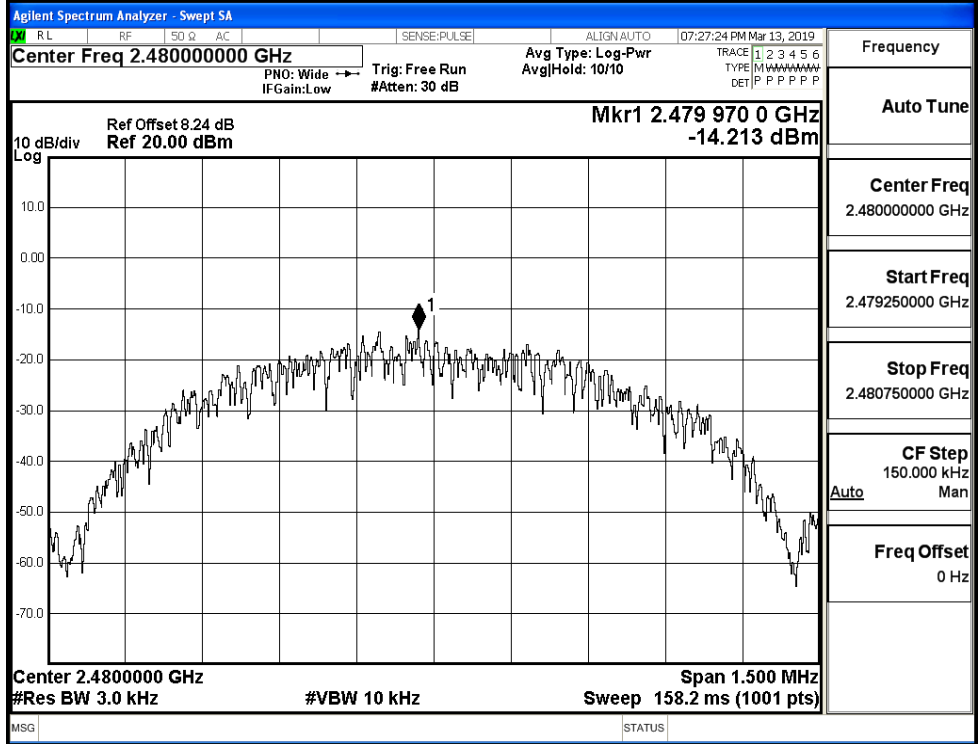


A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-12.951	8	PASS
BT LE	MCH	-13.604	8	PASS
BT LE	HCH	-14.213	8	PASS



HCH

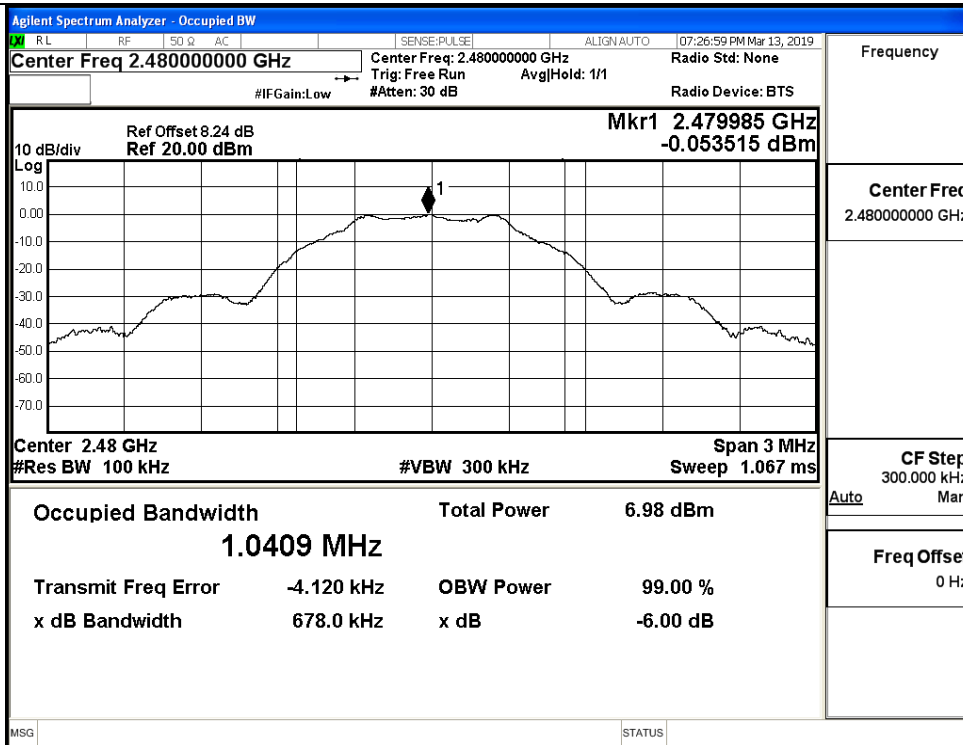


A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6884	≥0.5	PASS
BT LE	MCH	0.6886	≥0.5	PASS
BT LE	HCH	0.6780	≥0.5	PASS

Test Graphs													
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 07:22:19 PM Mar 13, 2019</p> <p style="font-size: small; margin: 0;">Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None</p> <p style="font-size: x-small; margin: 0;">#IFGain:Low Trig: Free Run AvgHold> 1/1 Radio Device: BTS</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="font-size: x-small; margin: 0;">Ref Offset 8.24 dB Mkr1 2.4019903 GHz</p> <p style="font-size: x-small; margin: 0;">Ref 20.00 dBm 1.1558 dBm</p> </div> <p style="font-size: x-small; margin: 0;">Center 2.402 GHz Span 3 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: x-small; border-collapse: collapse;"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>8.22 dBm</td> </tr> <tr> <td style="text-align: center;">1.0449 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-4.108 kHz</td> <td>OBW Power 99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>688.4 kHz</td> <td>x dB -6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	8.22 dBm	1.0449 MHz			Transmit Freq Error	-4.108 kHz	OBW Power 99.00 %	x dB Bandwidth	688.4 kHz	x dB -6.00 dB
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1.0449 MHz													
Transmit Freq Error	-4.108 kHz	OBW Power 99.00 %											
x dB Bandwidth	688.4 kHz	x dB -6.00 dB											
MCH	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 07:24:40 PM Mar 13, 2019</p> <p style="font-size: small; margin: 0;">Center Freq 2.440000000 GHz Center Freq: 2.440000000 GHz Radio Std: None</p> <p style="font-size: x-small; margin: 0;">#IFGain:Low Trig: Free Run AvgHold> 1/1 Radio Device: BTS</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="font-size: x-small; margin: 0;">Ref Offset 8.24 dB Mkr1 2.4399839 GHz</p> <p style="font-size: x-small; margin: 0;">Ref 20.00 dBm 0.56499 dBm</p> </div> <p style="font-size: x-small; margin: 0;">Center 2.44 GHz Span 3 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: x-small; border-collapse: collapse;"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>7.64 dBm</td> </tr> <tr> <td style="text-align: center;">1.0436 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-4.095 kHz</td> <td>OBW Power 99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>688.6 kHz</td> <td>x dB -6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	7.64 dBm	1.0436 MHz			Transmit Freq Error	-4.095 kHz	OBW Power 99.00 %	x dB Bandwidth	688.6 kHz	x dB -6.00 dB
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x dB Bandwidth	688.6 kHz	x dB -6.00 dB											

HCH

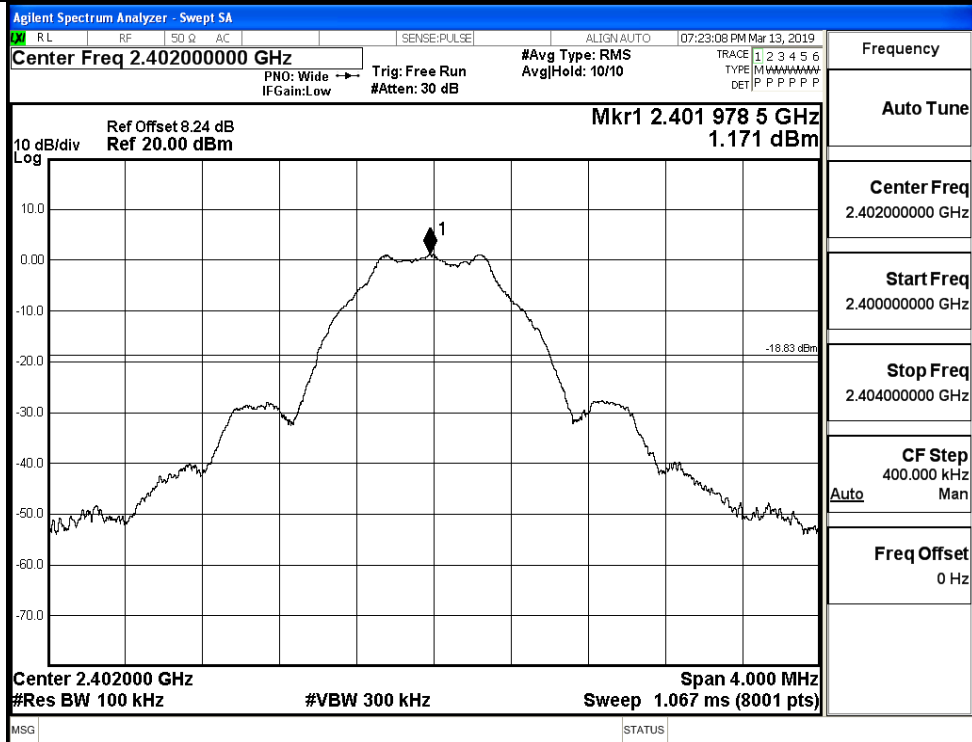


A.5 RF Conducted Spurious Emissions

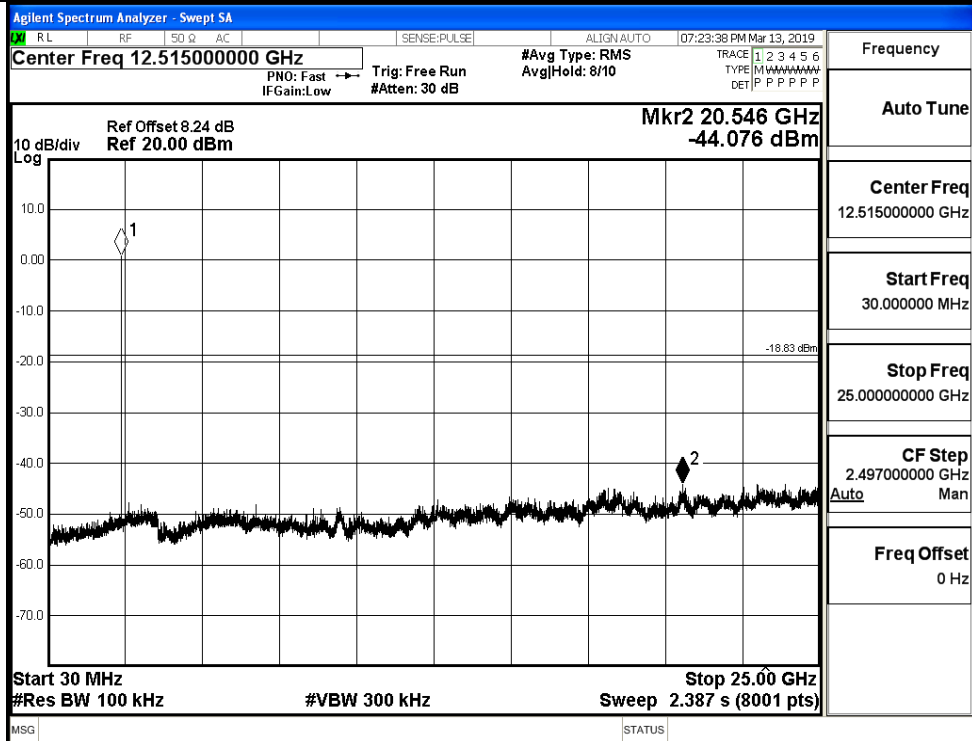
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	1.171	-44.076	-18.829	PASS
BT LE	MCH	0.53	-43.468	-19.470	PASS
BT LE	HCH	-0.145	-42.849	-20.145	PASS

BT LE_LCH_Graphs

Pref/BT LE/LCH

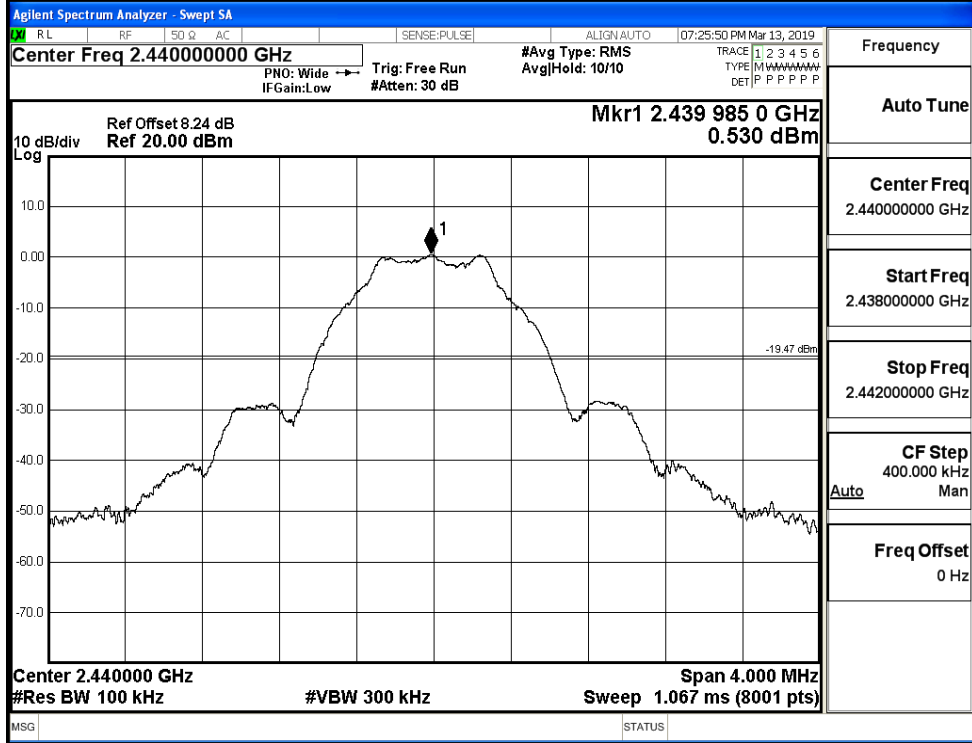


Puw/BT LE/LCH

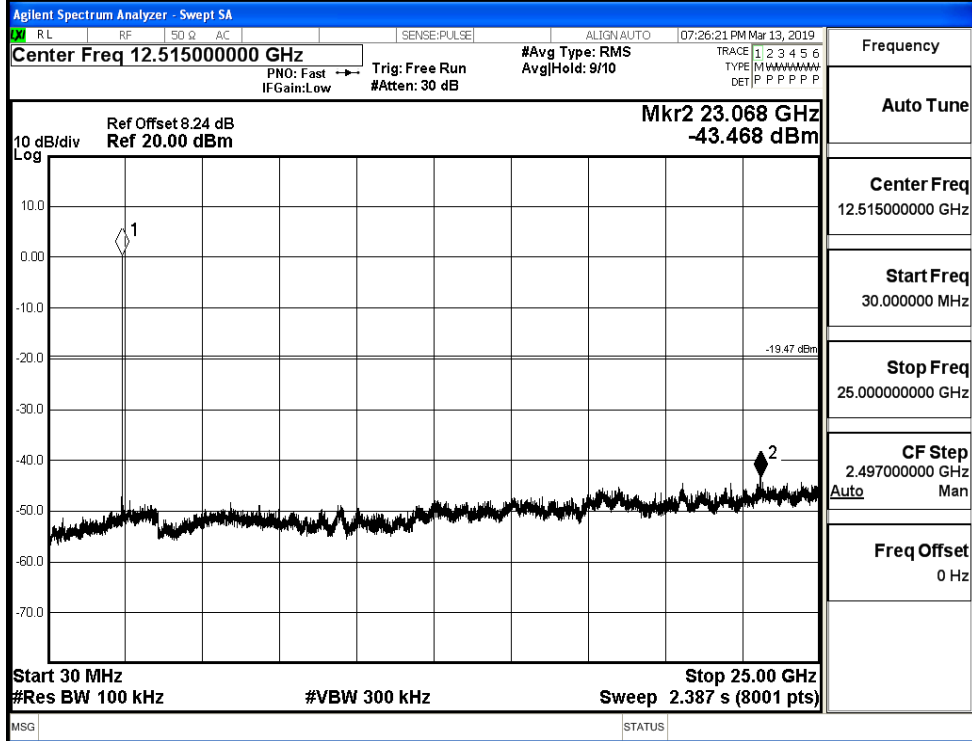


BT LE_MCH_Graphs

Pref/BT LE/MCH

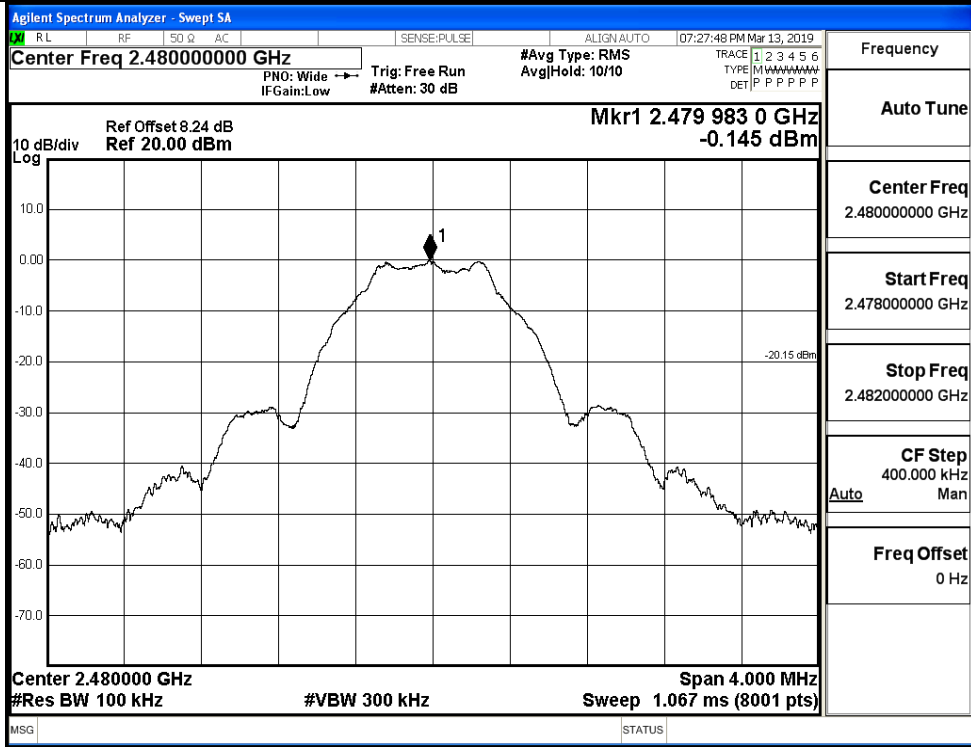


Puw/BT LE/MCH

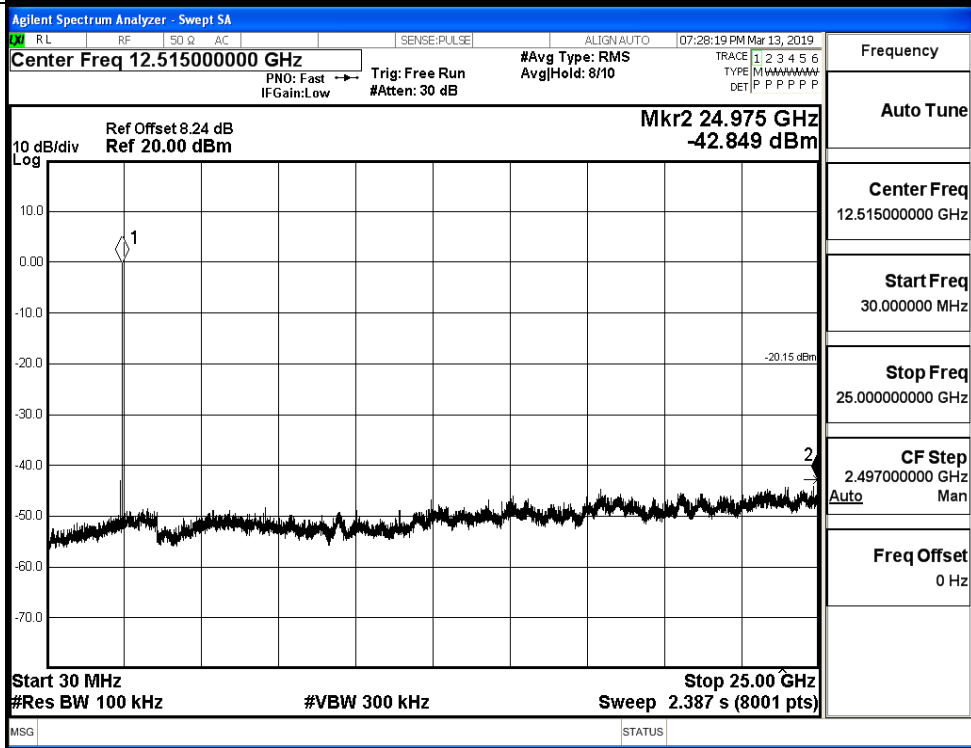


BT LE_HCH_Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	1.375	-50.360	-18.63	PASS
BT LE	HCH	-0.011	-49.363	-20.01	PASS

Test Graphs

LCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.357000000 GHz

Mkr4 2.332 595 GHz -50.360 dBm

Start 2.31000 GHz Stop 2.40400 GHz

#Res BW 100 kHz #VBW 300 kHz Sweep 9.067 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.401 991 GHz	1.375 dBm			
2	N	f		2.400 000 GHz	-52.783 dBm			
3	N	f		2.380 000 GHz	-52.936 dBm			
4	N	f		2.332 595 GHz	-50.360 dBm			

Frequency

Auto Tune

Center Freq
2.357000000 GHz

Start Freq
2.310000000 GHz

Stop Freq
2.404000000 GHz

CF Step
9.400000 MHz

Freq Offset
0 Hz

HCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.489000000 GHz

Mkr4 2.497 621 25 GHz -49.363 dBm

Start 2.47800 GHz Stop 2.50000 GHz

#Res BW 100 kHz #VBW 300 kHz Sweep 2.133 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.479 760 00 GHz	-0.011 dBm			
2	N	f		2.483 500 00 GHz	-53.302 dBm			
3	N	f		2.500 000 00 GHz	-51.065 dBm			
4	N	f		2.497 621 25 GHz	-49.363 dBm			

Frequency

Auto Tune

Center Freq
2.489000000 GHz

Start Freq
2.478000000 GHz

Stop Freq
2.500000000 GHz

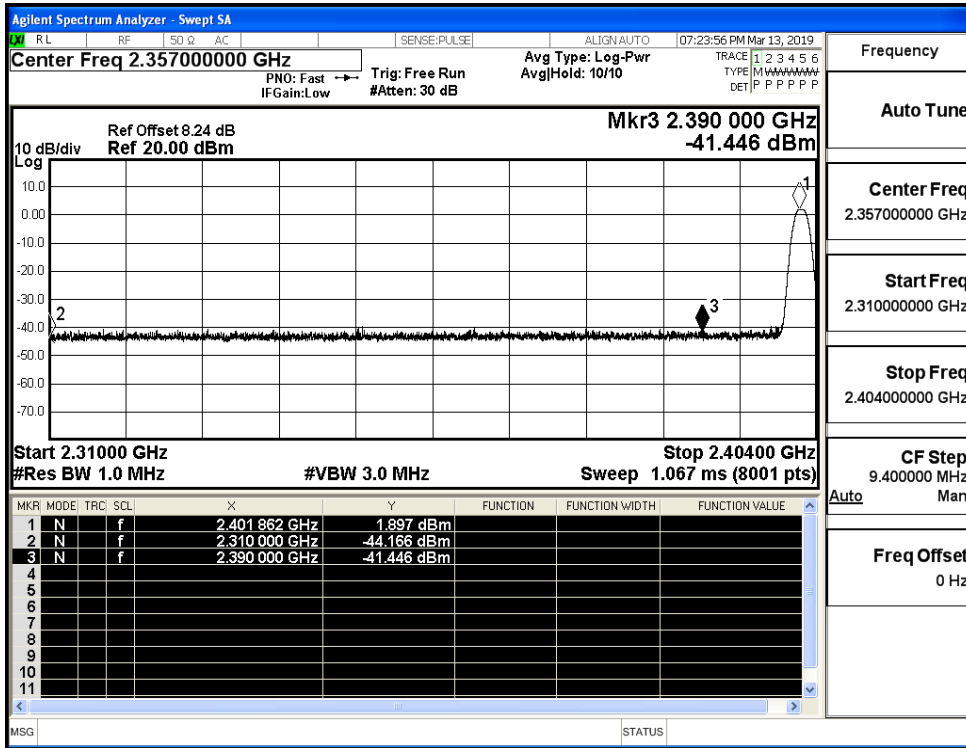
CF Step
2.200000 MHz

Freq Offset
0 Hz

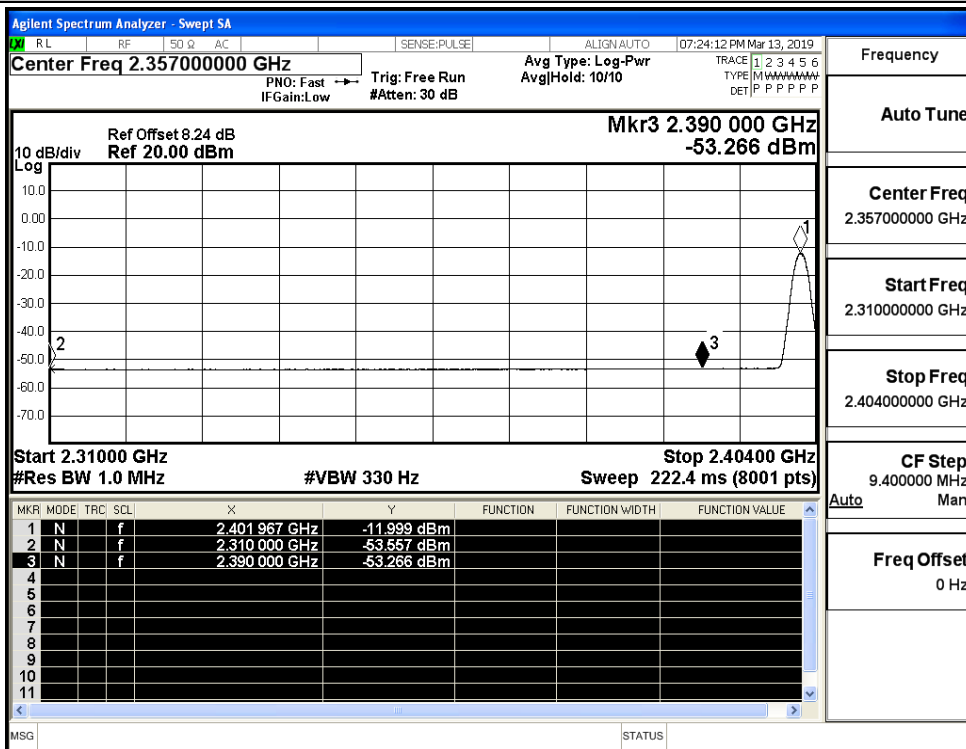
A.7 Restrict-band band-edge measurements

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	-44.17	2.0	0	51.09	PEAK	74	PASS
		Ant1	2310.0	-53.56	2.0	0	41.70	AV	54	PASS
		Ant1	2390.0	-41.45	2.0	0	53.81	PEAK	74	PASS
		Ant1	2390.0	-53.27	2.0	0	41.99	AV	54	PASS
	2480	Ant1	2483.5	-40.84	2.0	0	54.42	PEAK	74	PASS
		Ant1	2483.5	-52.93	2.0	0	42.33	AV	54	PASS
		Ant1	2500.0	-42.29	2.0	0	52.96	PEAK	74	PASS
		Ant1	2500.0	-52.91	2.0	0	42.34	AV	54	PASS

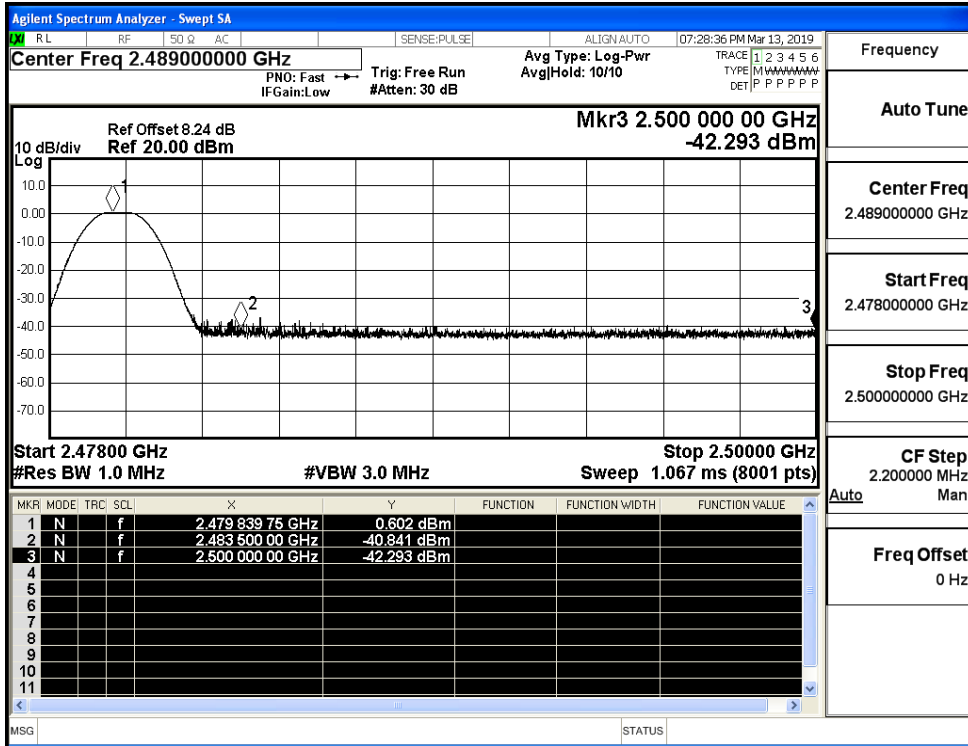
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

