

Appendix B

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

Product Name: DUOSmart Turntable Audio Station

Trade Mark: HYM originals

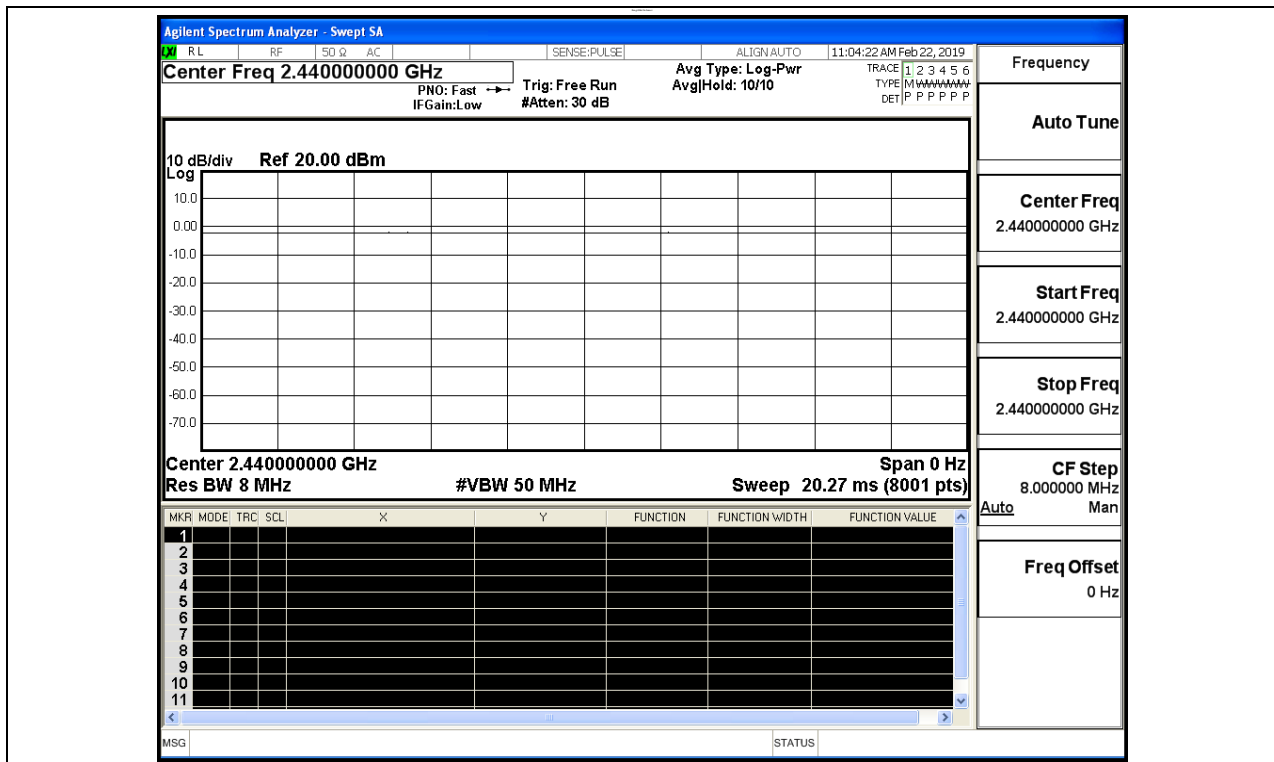
Test Model: H1-onc01

Environmental Conditions

Temperature:	23.4 ° C
Relative Humidity:	52.9%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

B.1 Duty Cycle

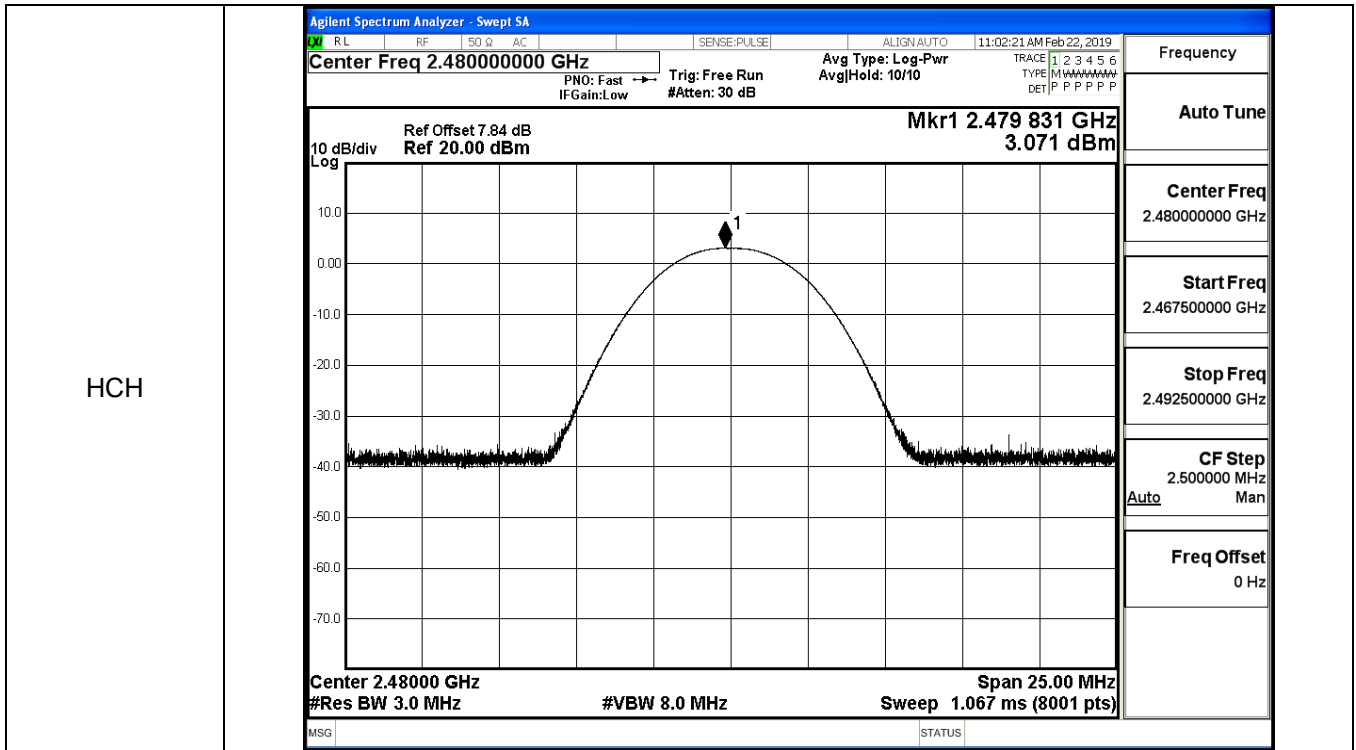
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS



B.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	3.387	30	PASS
BT LE	MCH	2.996	30	PASS
BT LE	HCH	3.071	30	PASS

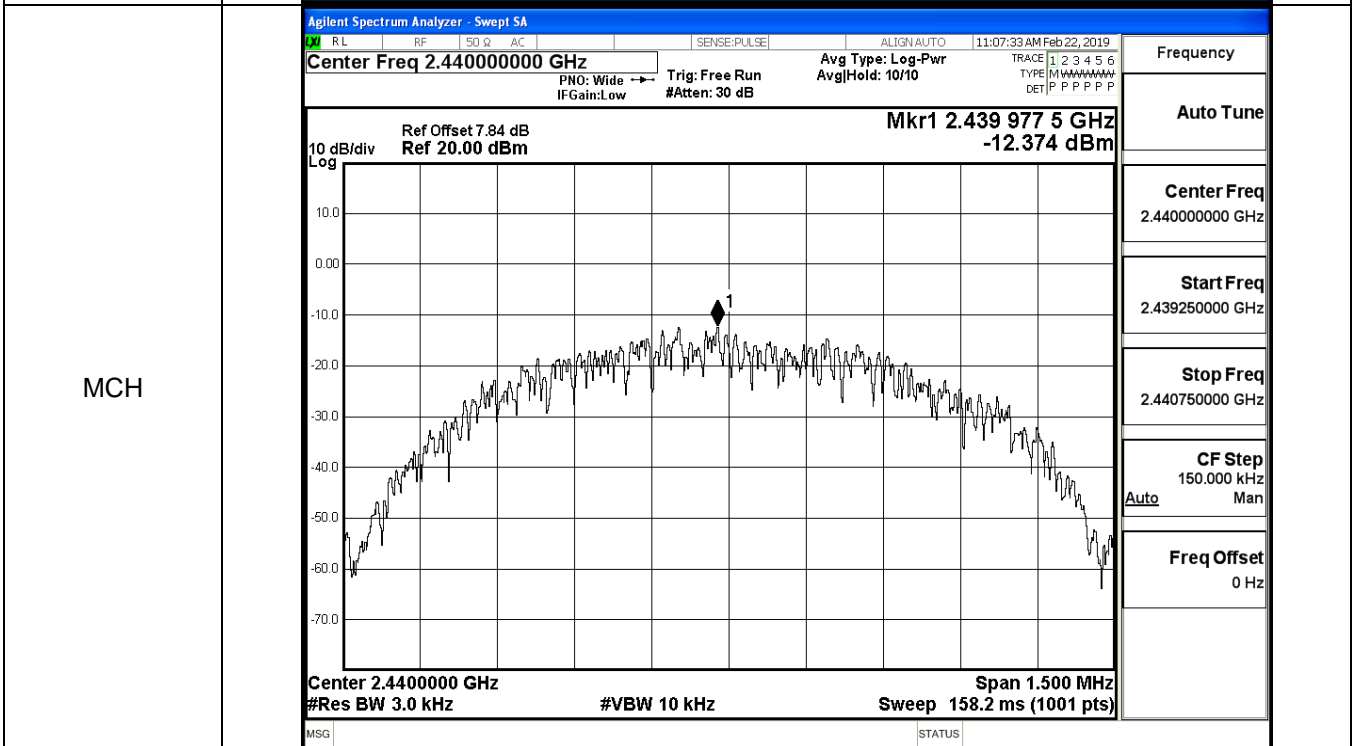
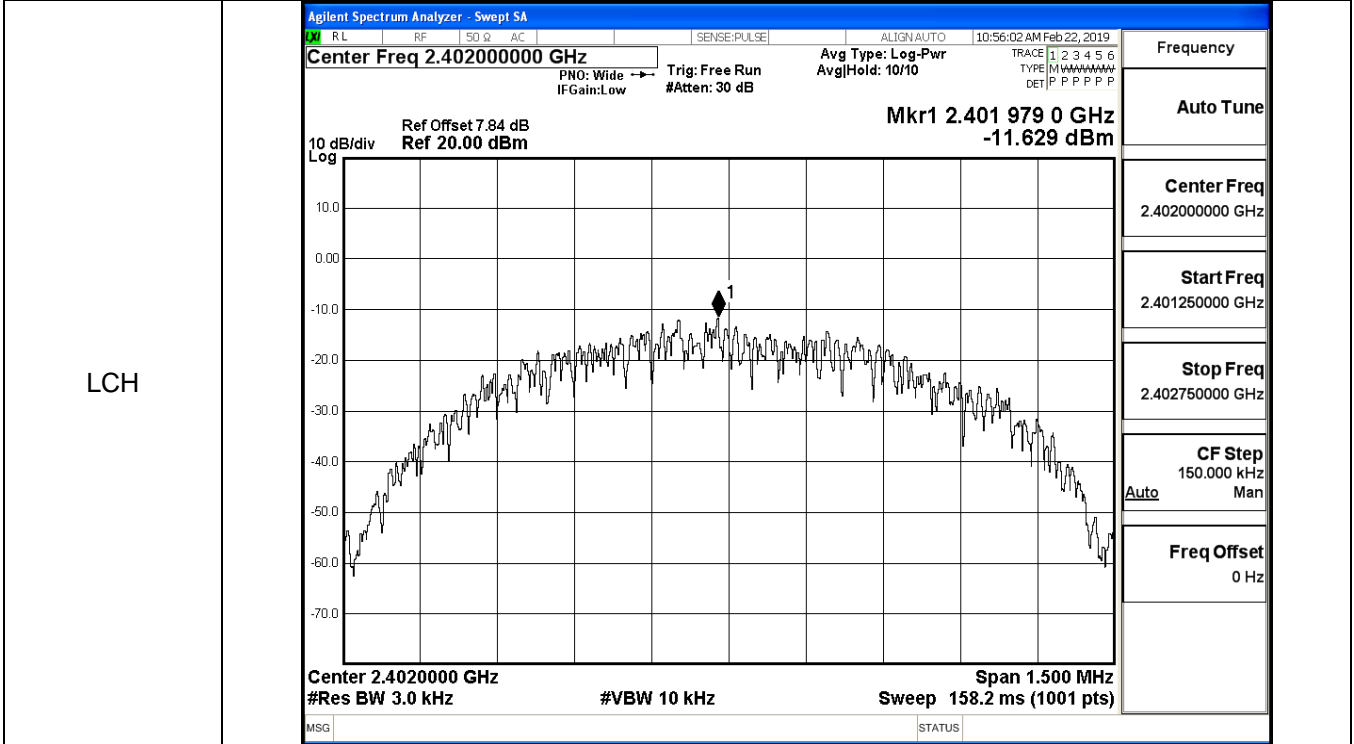
Test Graphs	
LCH	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.40200000 GHz</p> <p>Mkr1 2.402 253 GHz 3.387 dBm</p> <p>Ref Offset 7.84 dB Ref 20.00 dBm</p> <p>Center 2.40200 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts)</p>
MCH	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.44000000 GHz</p> <p>Mkr1 2.439 703 GHz 2.996 dBm</p> <p>Ref Offset 7.84 dB Ref 20.00 dBm</p> <p>Center 2.44000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts)</p>



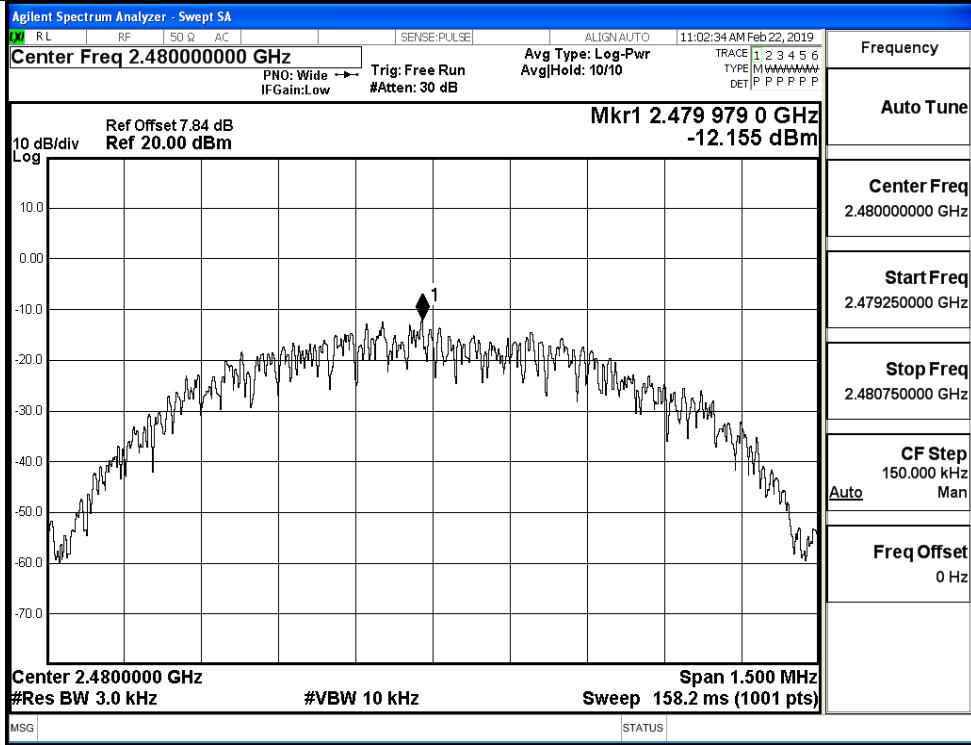
B.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-11.629	8	PASS
BT LE	MCH	-12.374	8	PASS
BT LE	HCH	-12.155	8	PASS

Test Graphs



HCH



B.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6899	≥0.5	PASS
BT LE	MCH	0.6852	≥0.5	PASS
BT LE	HCH	0.6901	≥0.5	PASS

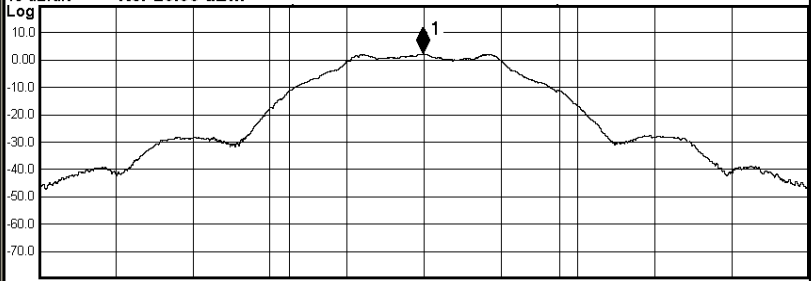
Test Graphs																			
LCH	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN: AUTO 10:55:37 AM Feb 22, 2019</p> <p style="margin: 0;">Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None</p> <p style="margin: 0;">Trig: Free Run AvgHold: 1/1</p> <p style="margin: 0;">#IFGain: Low #Atten: 30 dB Radio Device: BTS</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="text-align: right; margin: 0;">Mkr1 2.4019981 GHz 2.4780 dBm</p> </div> <p style="margin: 0;">Center 2.402 GHz Span 3 MHz</p> <p style="margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; border-collapse: collapse; font-size: small;"> <tr> <td style="width: 33%;">Occupied Bandwidth</td> <td style="width: 33%;">Total Power</td> <td style="width: 33%;">9.58 dBm</td> </tr> <tr> <td style="text-align: center;">1.0520 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>7.274 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>689.9 kHz</td> <td>x dB</td> </tr> <tr> <td></td> <td></td> <td>99.00 %</td> </tr> <tr> <td></td> <td></td> <td>-6.00 dB</td> </tr> </table> <p style="margin: 0; font-size: x-small;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	9.58 dBm	1.0520 MHz			Transmit Freq Error	7.274 kHz	OBW Power	x dB Bandwidth	689.9 kHz	x dB			99.00 %			-6.00 dB
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1.0520 MHz																			
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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 11:07:09 AM Feb 22, 2019</p> <p style="margin: 0;">Center Freq 2.440000000 GHz Center Freq: 2.440000000 GHz Radio Std: None</p> <p style="margin: 0;">Trig: Free Run AvgHold: 1/1</p> <p style="margin: 0;">#IFGain: Low #Atten: 30 dB Radio Device: BTS</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="text-align: right; margin: 0;">Mkr1 2.4399974 GHz 2.1522 dBm</p> </div> <p style="margin: 0;">Center 2.44 GHz Span 3 MHz</p> <p style="margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; border-collapse: collapse; font-size: small;"> <tr> <td style="width: 33%;">Occupied Bandwidth</td> <td style="width: 33%;">Total Power</td> <td style="width: 33%;">9.25 dBm</td> </tr> <tr> <td style="text-align: center;">1.0475 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>5.246 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>685.2 kHz</td> <td>x dB</td> </tr> <tr> <td></td> <td></td> <td>99.00 %</td> </tr> <tr> <td></td> <td></td> <td>-6.00 dB</td> </tr> </table> <p style="margin: 0; font-size: x-small;">MSG STATUS</p> </div>	Occupied Bandwidth	Total Power	9.25 dBm	1.0475 MHz			Transmit Freq Error	5.246 kHz	OBW Power	x dB Bandwidth	685.2 kHz	x dB			99.00 %			-6.00 dB
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x dB Bandwidth	685.2 kHz	x dB																	
		99.00 %																	
		-6.00 dB																	

HCH

Agilent Spectrum Analyzer - Occupied BW

RL	RF	50 Ω	AC	SENSE:PULSE	ALIGN:AUTO	11:02:10 AM Feb 22, 2019
Center Freq 2.480000000 GHz			Center Freq: 2.480000000 GHz		Radio Std: None	
			Trig: Free Run		AvgHold> 1/1	
#IFGain:Low			#Atten: 30 dB		Radio Device: BTS	

10 dB/div	Ref Offset 7.84 dB	Mkr1 2.479997 GHz
Log	Ref 20.00 dBm	2.2421 dBm



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

Occupied Bandwidth	Total Power	9.32 dBm
1.0450 MHz		
Transmit Freq Error	5.313 kHz	OBW Power 99.00 %
x dB Bandwidth	690.1 kHz	x dB -6.00 dB

Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	300.000 kHz
Auto	Man
Freq Offset	0 Hz

MSG
STATUS

B.5 Occupied Bandwidth

Mode	Channel	Occupied Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	1.0404	No Limit	PASS
BT LE	MCH	1.0384	No Limit	PASS
BT LE	HCH	1.0347	No Limit	PASS

Test Graphs

LCH		<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.40200000 GHz</p> <p>Center Freq: 2.402000000 GHz</p> <p>Radio Std: None</p> <p>Trig: Free Run AvgHold: 10/10</p> <p>#IFGain:Low #Atten: 30 dB</p> <p>Radio Device: BTS</p> <p>Ref Offset 7.84 dB</p> <p>Ref 20.00 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Center 2.402 GHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 4 MHz</p> <p>Sweep 4.267 ms</p> <p>Occupied Bandwidth 1.0404 MHz</p> <p>Total Power 9.62 dBm</p> <p>Transmit Freq Error 10.178 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 661.1 kHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.402000000 GHz</p> <p>CF Step 400.000 kHz</p> <p>Auto Man</p> <p>Freq Offset 0 Hz</p>
		<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.440000000 GHz</p> <p>Center Freq: 2.440000000 GHz</p> <p>Radio Std: None</p> <p>Trig: Free Run AvgHold: 10/10</p> <p>#IFGain:Low #Atten: 30 dB</p> <p>Radio Device: BTS</p> <p>Ref Offset 7.84 dB</p> <p>Ref 20.00 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Center 2.44 GHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 4 MHz</p> <p>Sweep 4.267 ms</p> <p>Occupied Bandwidth 1.0384 MHz</p> <p>Total Power 9.23 dBm</p> <p>Transmit Freq Error 9.059 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 658.4 kHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.440000000 GHz</p> <p>CF Step 400.000 kHz</p> <p>Auto Man</p> <p>Freq Offset 0 Hz</p>

HCH

Agilent Spectrum Analyzer - Occupied BW

<input type="checkbox"/> RL	<input type="checkbox"/> RF	<input type="checkbox"/> 50 Ω	<input type="checkbox"/> AC	<input type="checkbox"/> SENSE:PULSE	<input type="checkbox"/> ALIGN:AUTO	10:55:13 AM Feb 22, 2019
Center Freq 2.480000000 GHz				Center Freq: 2.480000000 GHz	Radio Std: None	Frequency
				Trig: Free Run	AvgHold: 10/10	
				#IFGain:Low	#Atten: 30 dB	Radio Device: BTS

10 dB/div
Log

Ref Offset 7.84 dB
Ref 20.00 dBm

Center 2.48 GHz Span 4 MHz
#Res BW 30 kHz #VBW 100 kHz Sweep 4.267 ms

Occupied Bandwidth		Total Power	
1.0347 MHz		9.39 dBm	
Transmit Freq Error	9.724 kHz	OBW Power	99.00 %
x dB Bandwidth	658.5 kHz	x dB	-6.00 dB

Center Freq 2.480000000 GHz
CF Step 400.000 kHz Auto Man
Freq Offset 0 Hz

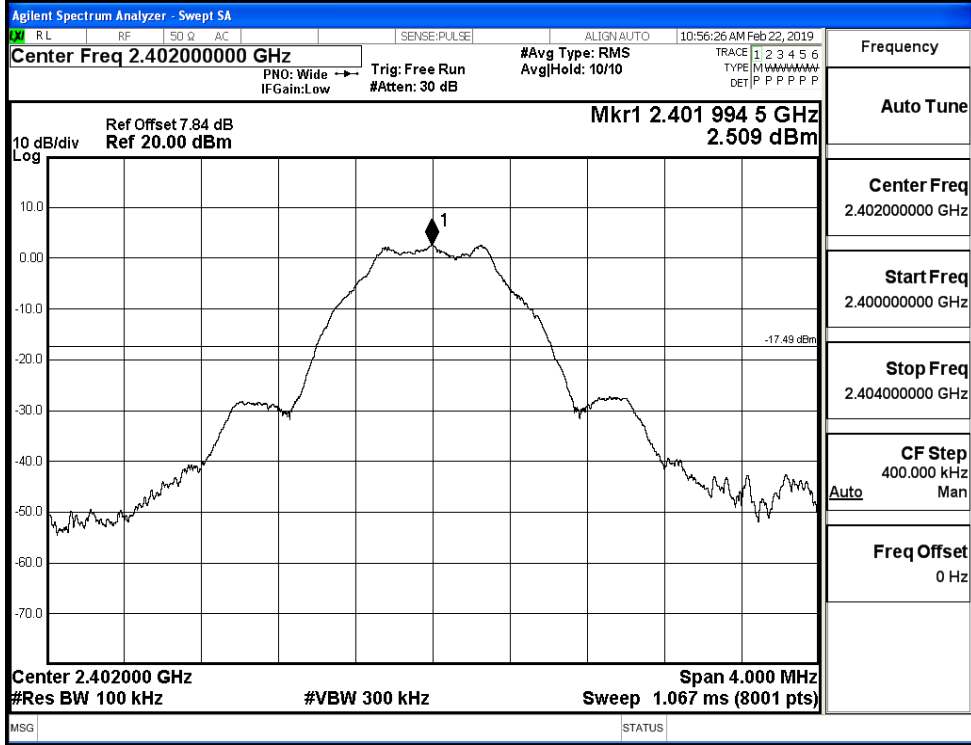
MSG
STATUS

B.6 RF Conducted Spurious Emissions

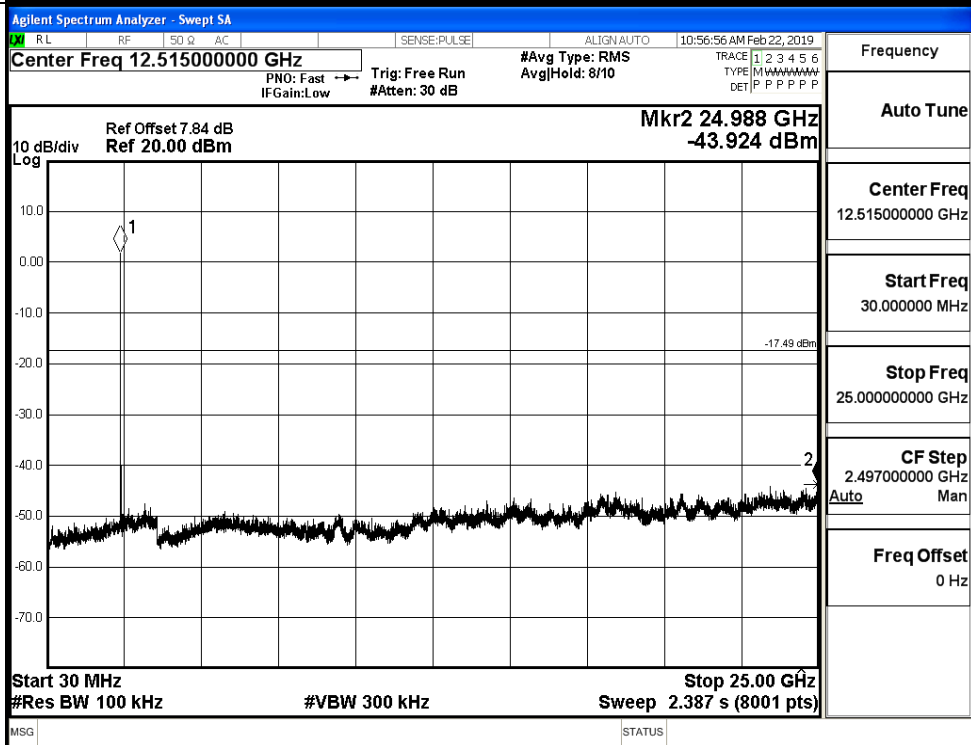
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	2.509	-43.924	-17.491	PASS
BT LE	MCH	2.129	-44.032	-17.871	PASS
BT LE	HCH	2.255	-44.616	-17.745	PASS

BT LE_LCH_Graphs

Pref/BT LE/LCH

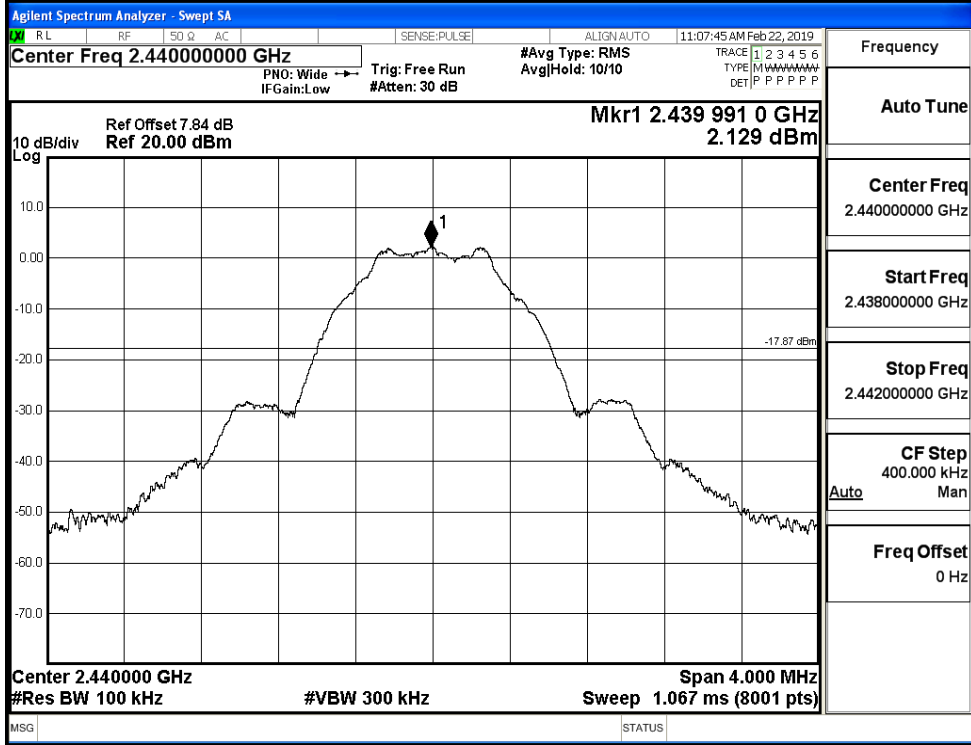


Puw/BT LE/LCH

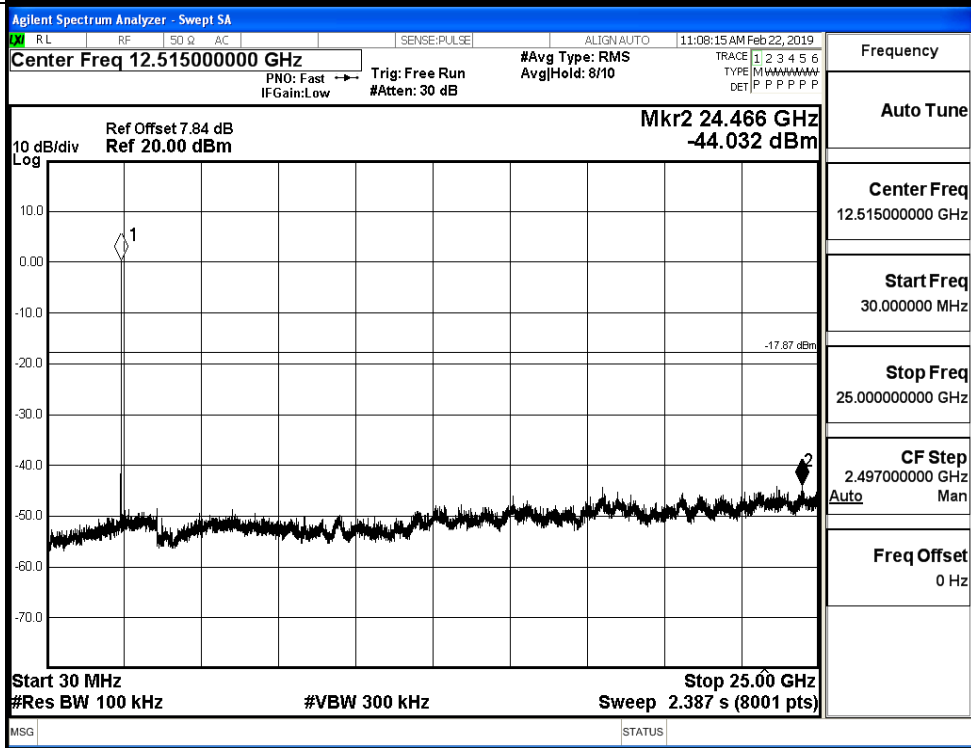


BT LE_MCH_Graphs

Pref/BT LE/MCH

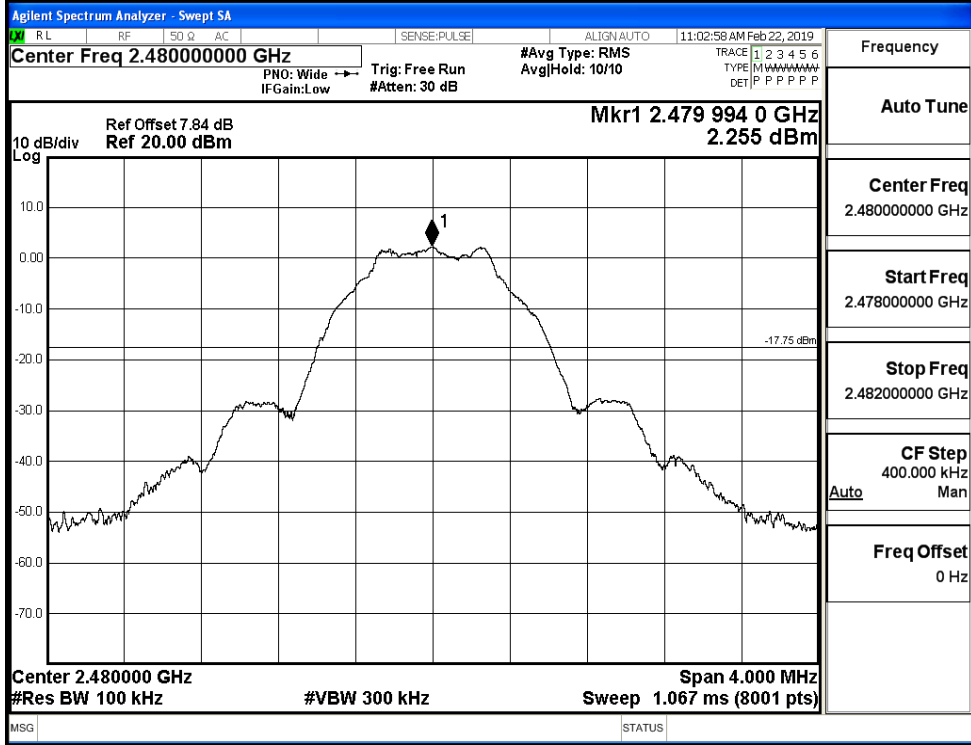


Puw/BT LE/MCH

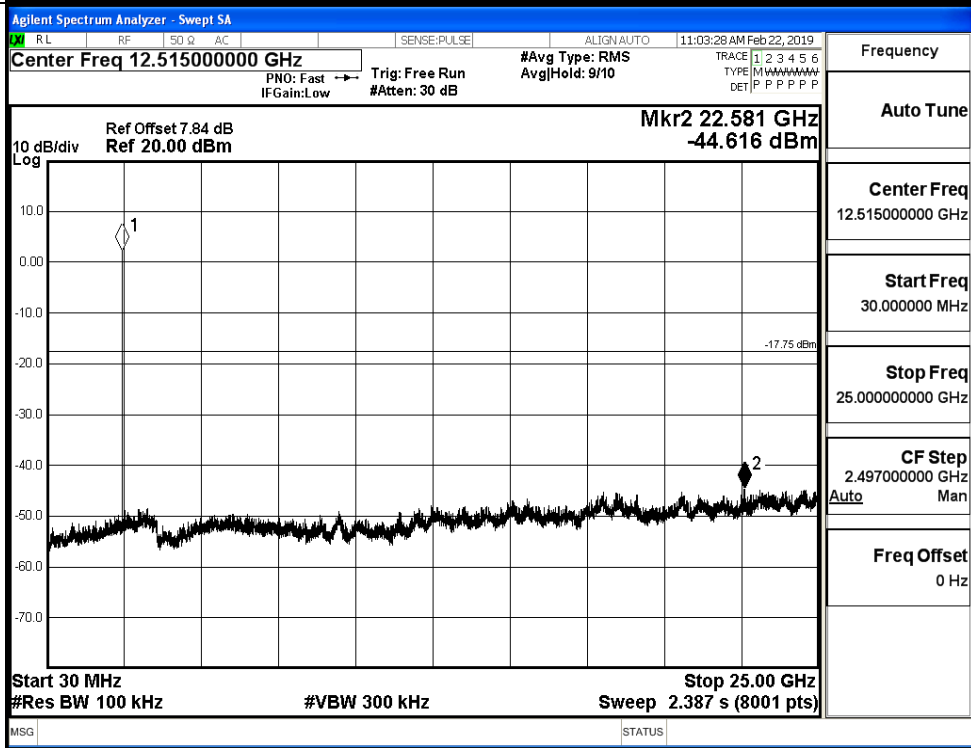


BT LE_HCH_Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



B.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	2.505	-48.381	-17.5	PASS
BT LE	HCH	2.378	-49.953	-17.62	PASS

Test Graphs

LCH

Agilent Spectrum Analyzer - Swept SA
 Center Freq 2.35700000 GHz
 Mkr4 2.371 805 GHz -48.381 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		2.402 014 GHz	2.505 dBm			
2	N	f		2.400 000 GHz	-54.152 dBm			
3	N	f		2.390 000 GHz	-52.481 dBm			
4	N	f		2.371 805 GHz	-48.381 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

Agilent Spectrum Analyzer - Swept SA
 Center Freq 2.48900000 GHz
 Mkr4 2.492 885 75 GHz -49.953 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		2.480 007 50 GHz	2.378 dBm			
2	N	f		2.483 500 00 GHz	-53.376 dBm			
3	N	f		2.500 000 00 GHz	-53.282 dBm			
4	N	f		2.492 885 75 GHz	-49.953 dBm			

Frequency

Auto Tune

Center Freq
2.48900000 GHz

Start Freq
2.47800000 GHz

Stop Freq
2.50000000 GHz

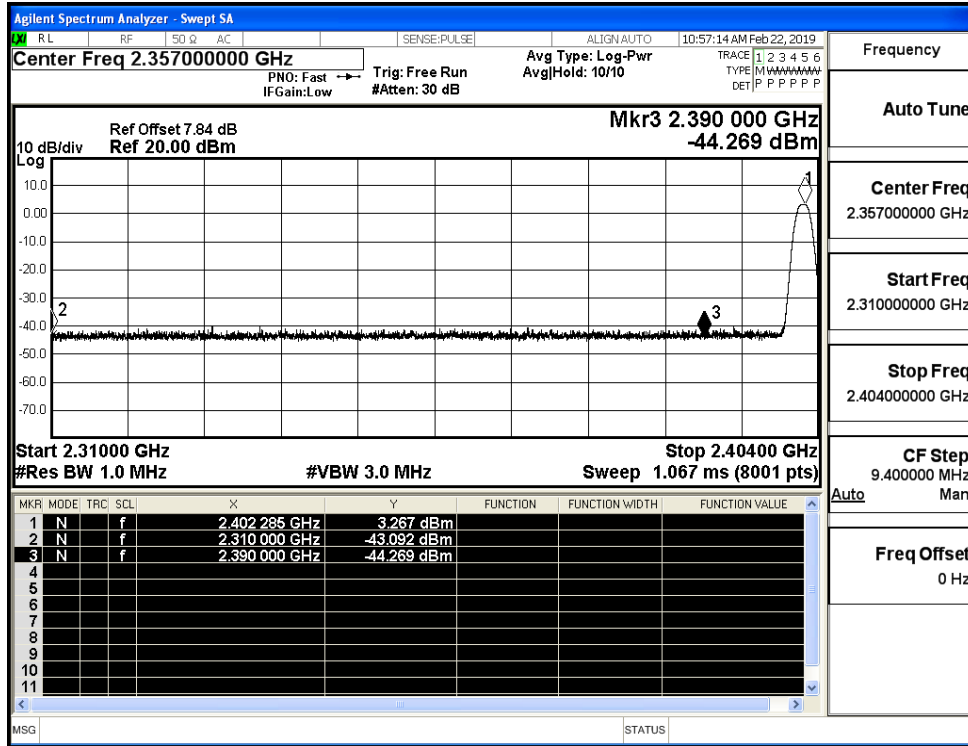
CF Step
2.200000 MHz

Freq Offset
0 Hz

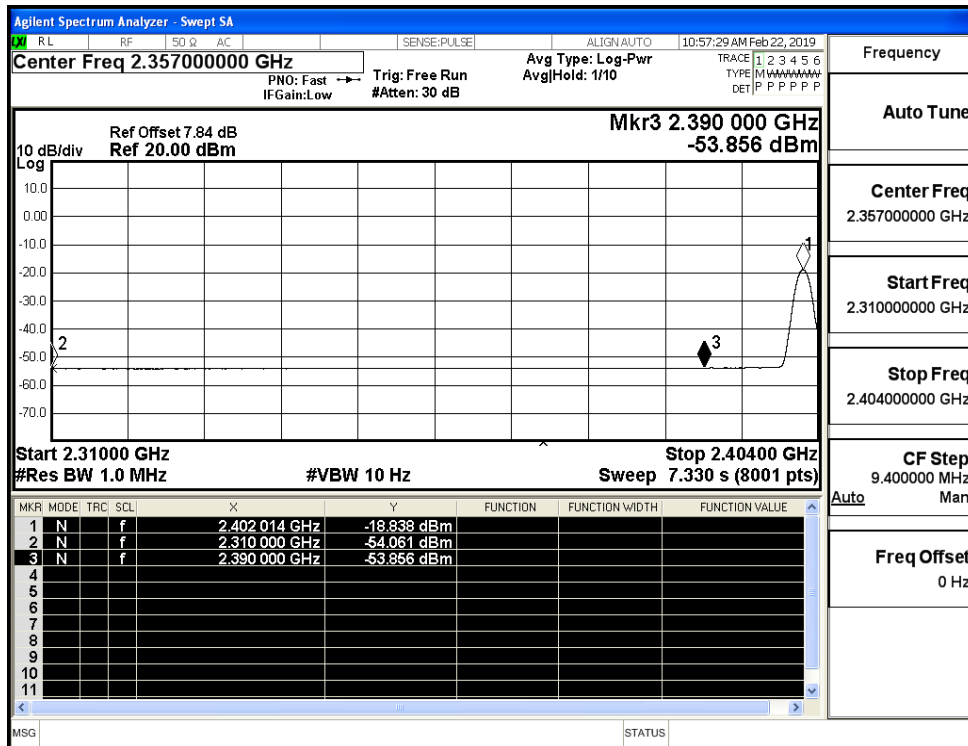
B.8 Restrict-band band-edge measurements

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	-43.09	2.0	0	54.17	PEAK	74	PASS
		Ant1	2310.0	-54.06	2.0	0	43.20	AV	54	PASS
		Ant1	2390.0	-44.27	2.0	0	52.99	PEAK	74	PASS
		Ant1	2390.0	-53.86	2.0	0	43.40	AV	54	PASS
	2480	Ant1	2483.5	-43.84	2.0	0	53.42	PEAK	74	PASS
		Ant1	2483.5	-53.54	2.0	0	43.72	AV	54	PASS
		Ant1	2500.0	-43.61	2.0	0	53.64	PEAK	74	PASS
		Ant1	2500.0	-53.48	2.0	0	43.78	AV	54	PASS

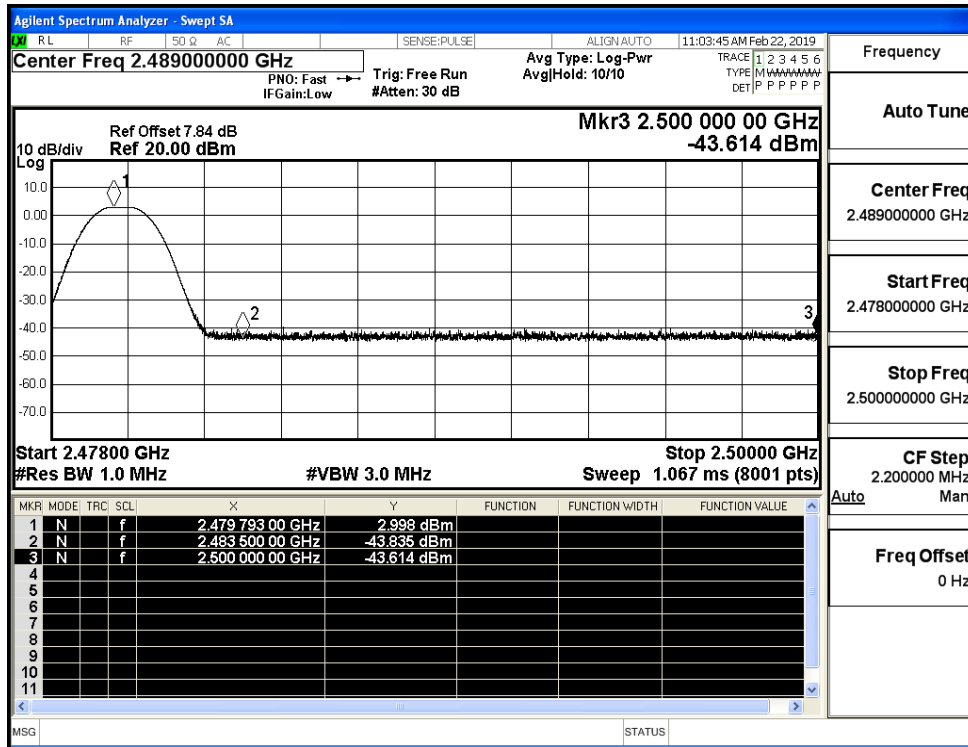
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

