

Appendix D

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

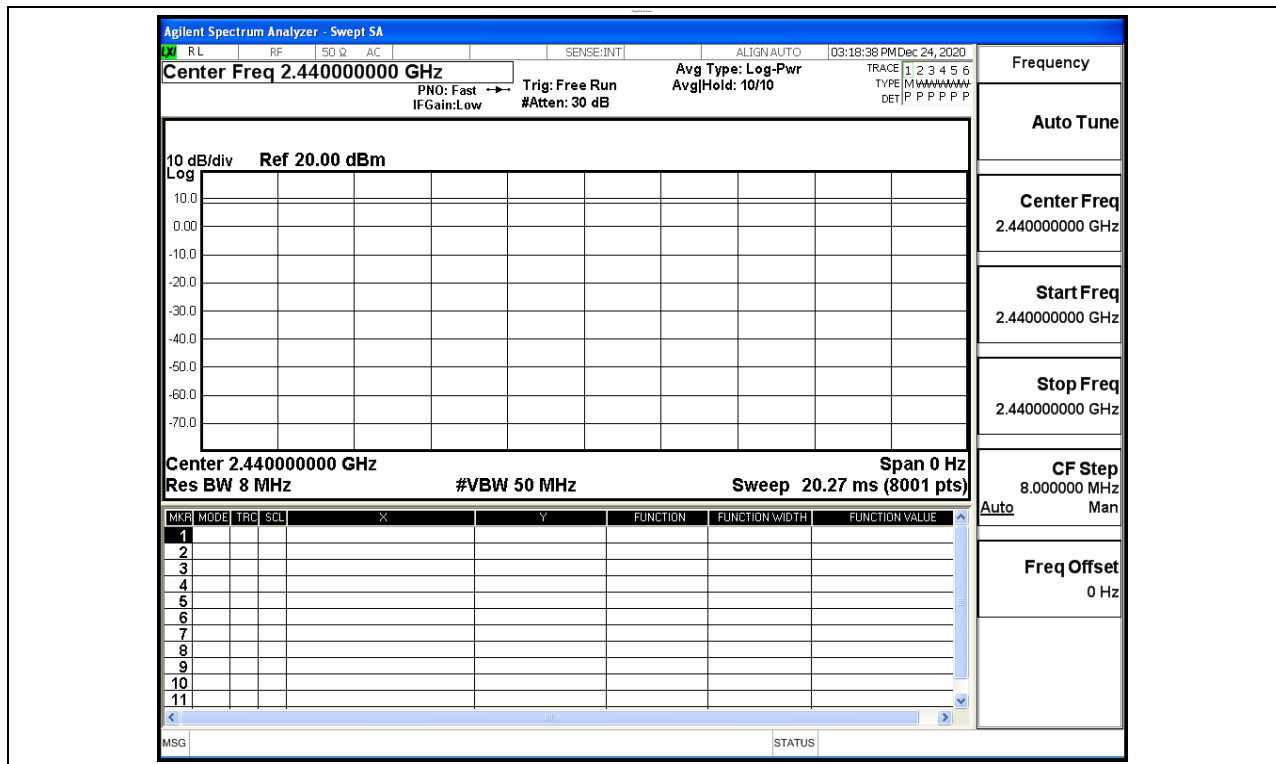
Product Name: KE2 Edge Manager Plus
Trade Mark: KE2, KE2 Connect, KE2 Therm
Test Model: KE2EM-Plus

Environmental Conditions

Temperature:	23.7 ° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Li
Supervised by:	Li Huan

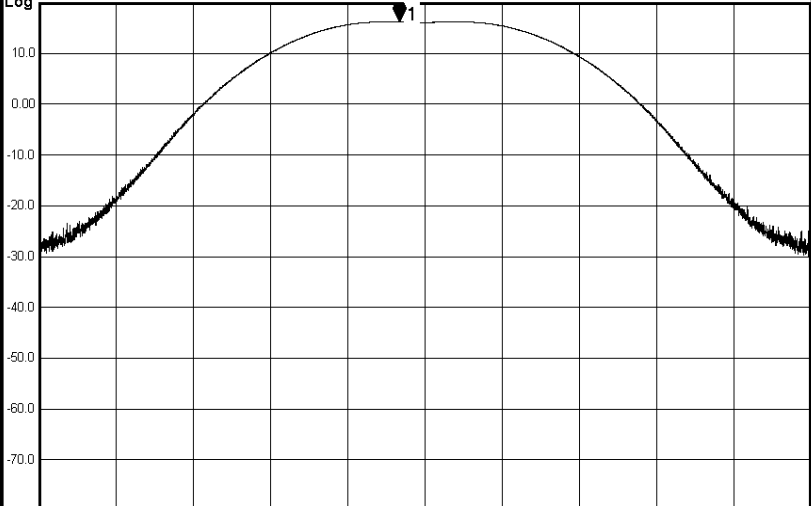
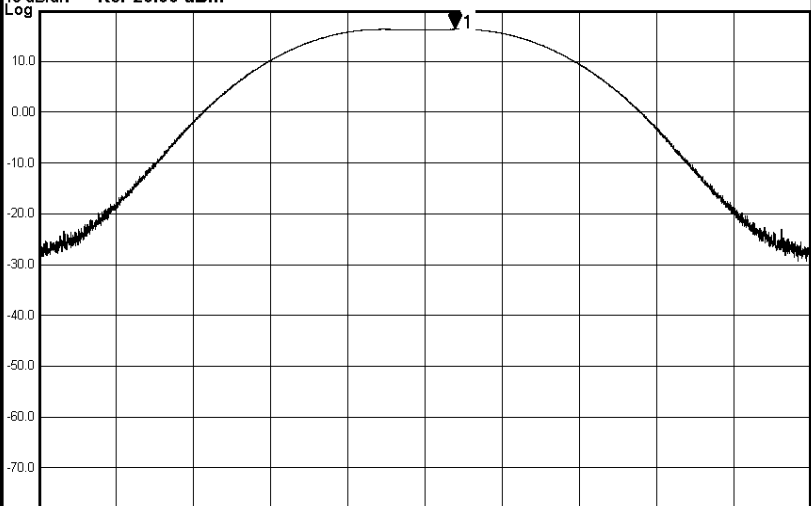
D.1 Duty Cycle

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

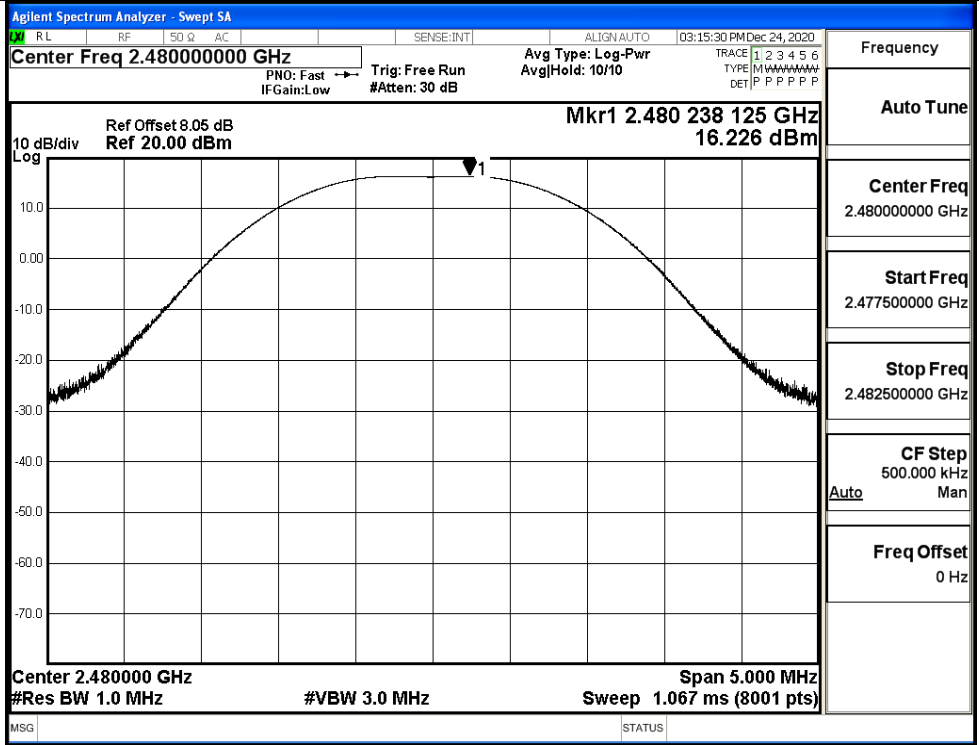


D.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	16.188	30	PASS
BT LE	MCH	16.309	30	PASS
BT LE	HCH	16.226	30	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:INT ALIGN:AUTO 03:08:06 PM Dec 24, 2020</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: Fast IFGain:Low Trig: Free Run #Atten: 30 dB AvgHold: 10/10 TYPE M W M M M M M M M M</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 70%;"> <p style="font-size: small; margin: 0;">Ref Offset 8.05 dB Mkr1 2.401 832 500 GHz</p> <p style="font-size: small; margin: 0;">Ref 20.00 dBm 16.188 dBm</p>  <p style="font-size: x-small; margin: 0;">Center 2.402000 GHz Span 5.000 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.067 ms (8001 pts)</p> </div> <div style="width: 25%; font-size: x-small;"> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.402000000 GHz</p> <p>Start Freq 2.399500000 GHz</p> <p>Stop Freq 2.404500000 GHz</p> <p>CF Step 500.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p> </div> </div> <p style="font-size: x-small; margin: 0;">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:INT ALIGN:AUTO 03:11:55 PM Dec 24, 2020</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: Fast IFGain:Low Trig: Free Run #Atten: 30 dB AvgHold: 10/10 TYPE M W M M M M M M M M</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 70%;"> <p style="font-size: small; margin: 0;">Ref Offset 8.05 dB Mkr1 2.440 194 375 GHz</p> <p style="font-size: small; margin: 0;">Ref 20.00 dBm 16.309 dBm</p>  <p style="font-size: x-small; margin: 0;">Center 2.440000 GHz Span 5.000 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.067 ms (8001 pts)</p> </div> <div style="width: 25%; font-size: x-small;"> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.440000000 GHz</p> <p>Start Freq 2.437500000 GHz</p> <p>Stop Freq 2.442500000 GHz</p> <p>CF Step 500.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p> </div> </div> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>

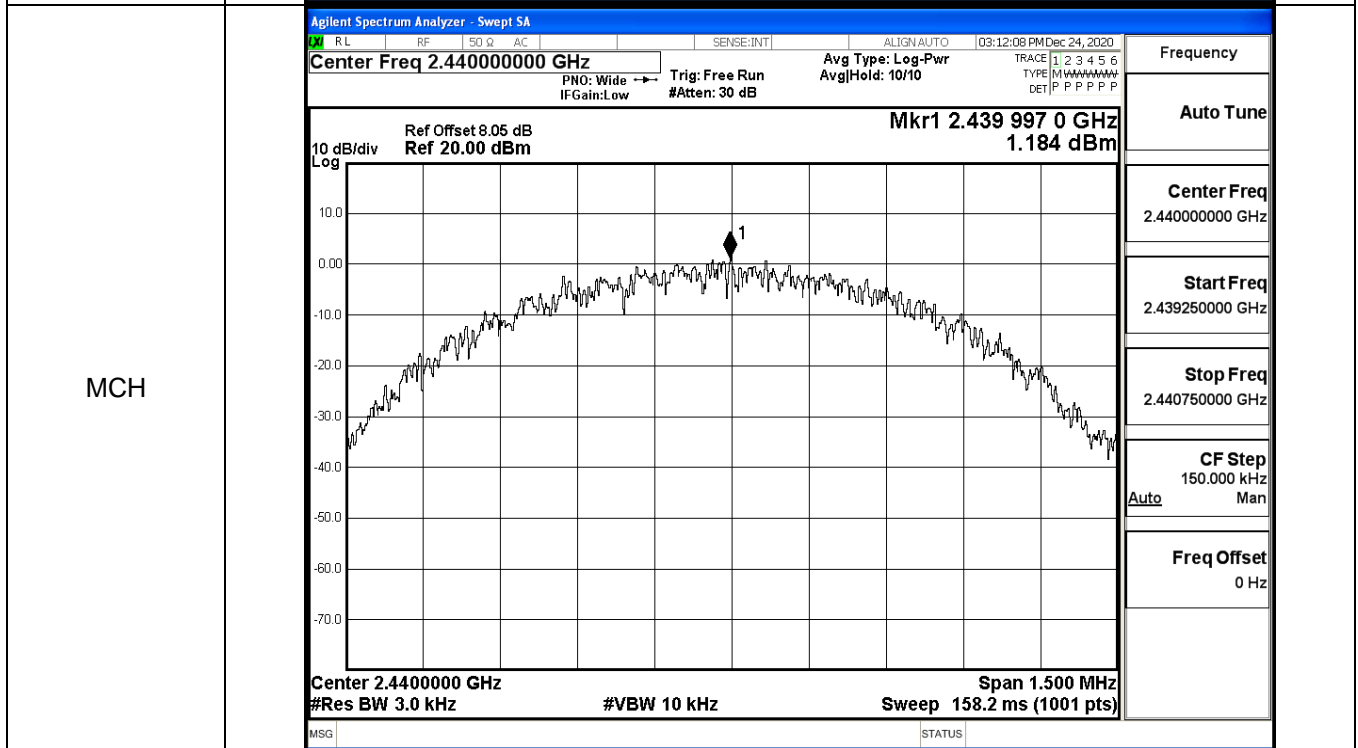
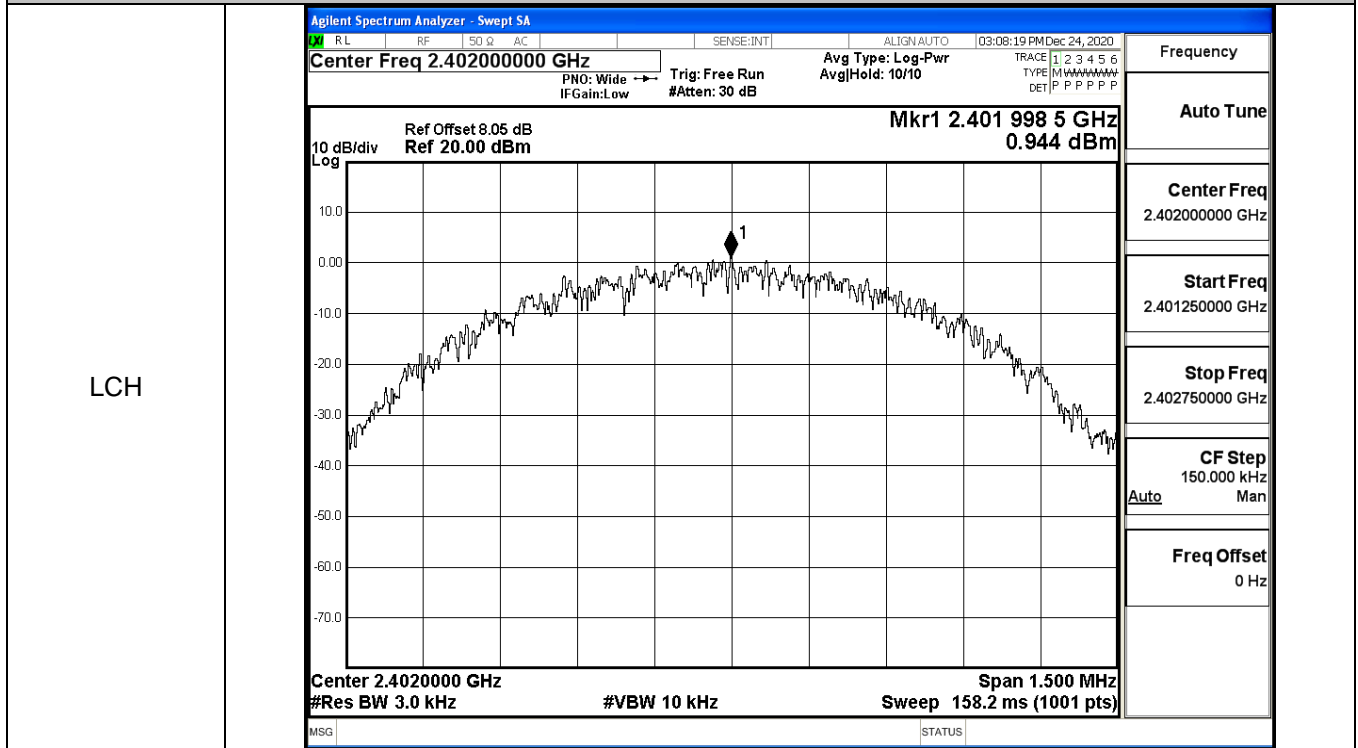
HCH



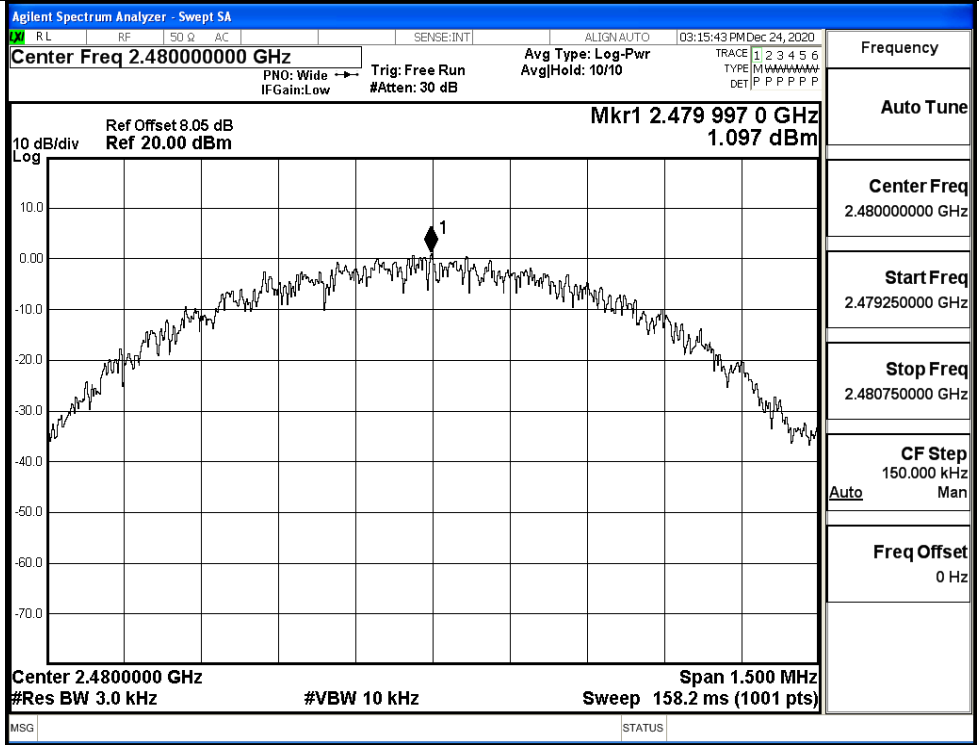
D.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	0.944	8	PASS
BT LE	MCH	1.184	8	PASS
BT LE	HCH	1.097	8	PASS

Test Graphs



HCH



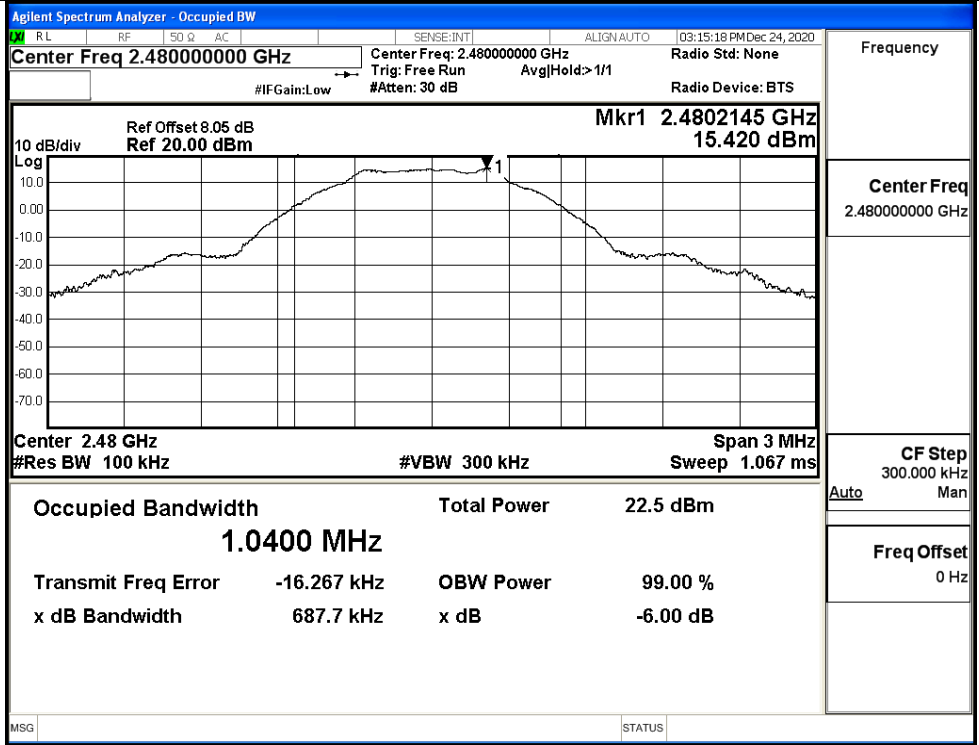
D.4 6dB Bandwidth&99% Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	99% Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6855	1.0415	≥0.5	PASS
BT LE	MCH	0.6830	1.0412	≥0.5	PASS
BT LE	HCH	0.6877	1.0430	≥0.5	PASS

Test Graphs(6dB Bandwidth)

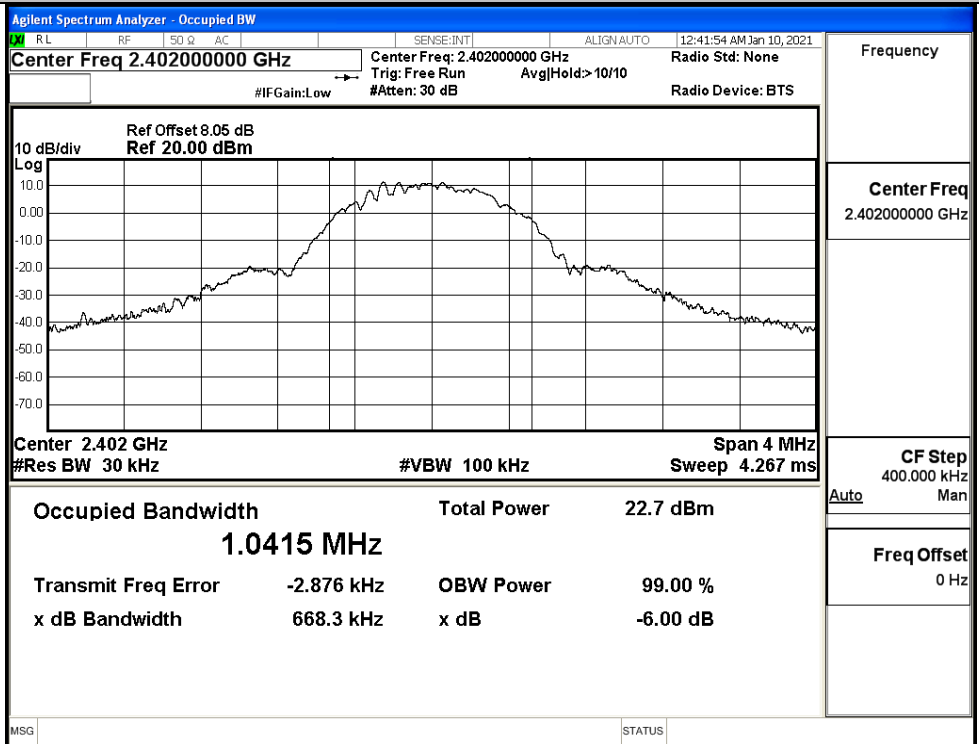
LCH	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq 2.40200000 GHz Center Freq: 2.402000000 GHz Mkr1 2.4022183 GHz 12.317 dBm Occupied Bandwidth 1.0415 MHz Total Power 19.4 dBm Transmit Freq Error -12.902 kHz x dB Bandwidth 685.5 kHz</p>	Frequency 2.402000000 GHz Center Freq 2.402000000 GHz CF Step 300.000 kHz Freq Offset 0 Hz
	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq 2.440000000 GHz Center Freq: 2.440000000 GHz Mkr1 2.4402104 GHz 15.482 dBm Occupied Bandwidth 1.0424 MHz Total Power 22.6 dBm Transmit Freq Error -16.414 kHz x dB Bandwidth 683.0 kHz</p>	Frequency 2.440000000 GHz Center Freq 2.440000000 GHz CF Step 300.000 kHz Freq Offset 0 Hz

HCH

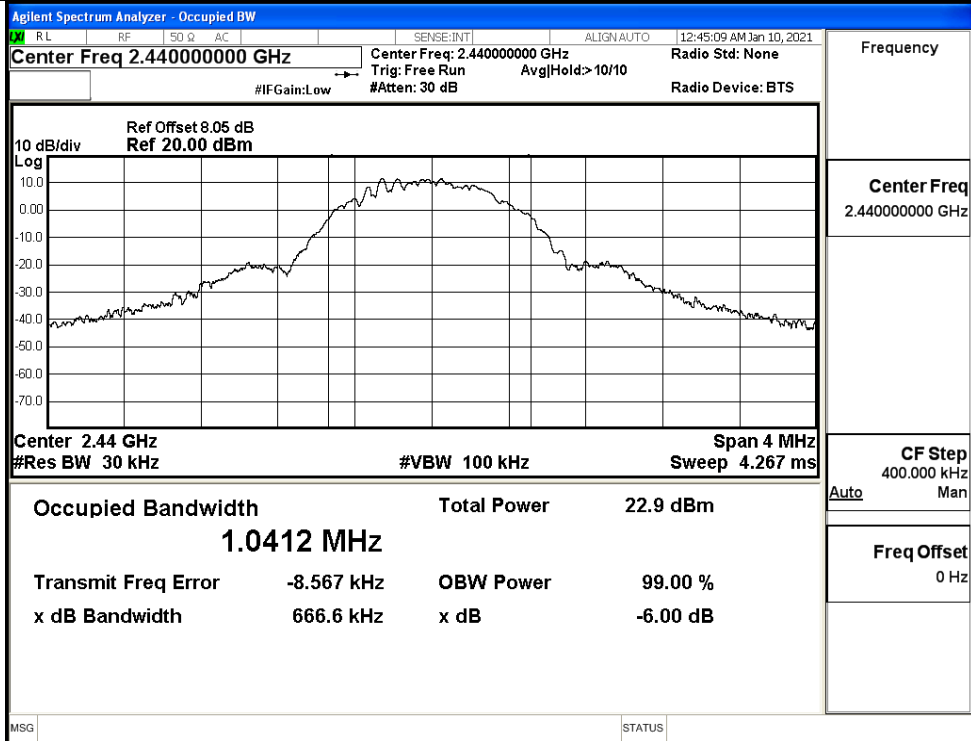


Test Graphs(99% Bandwidth)

LCH

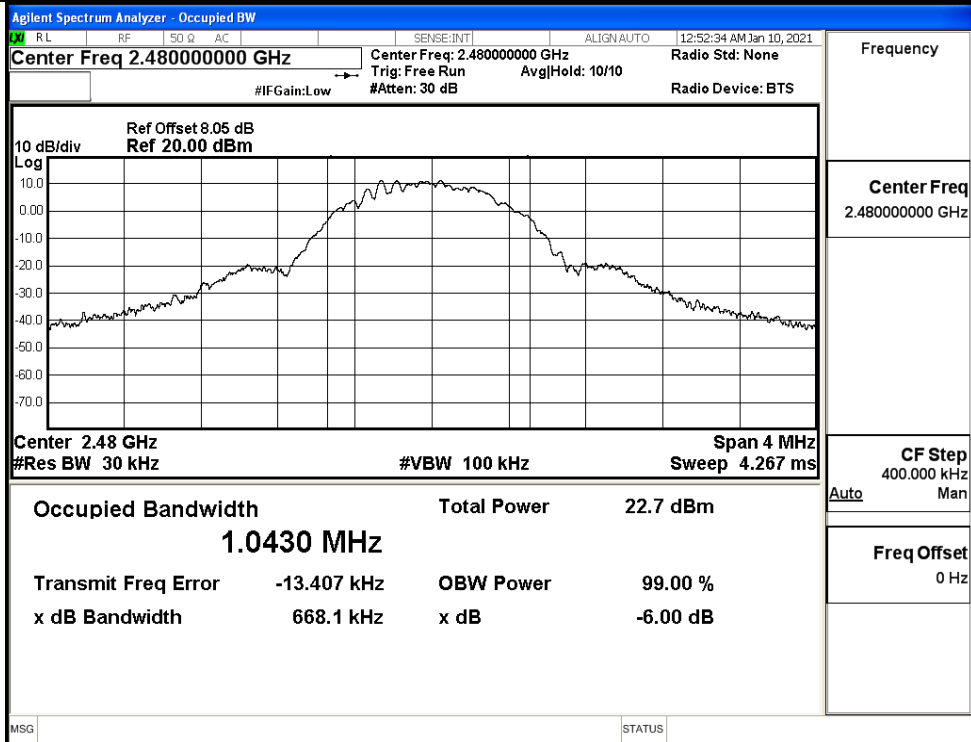


MCH



Frequency	2.44000000 GHz
Center Freq	2.44000000 GHz
CF Step	400.000 kHz
Auto	Man
Freq Offset	0 Hz

HCH

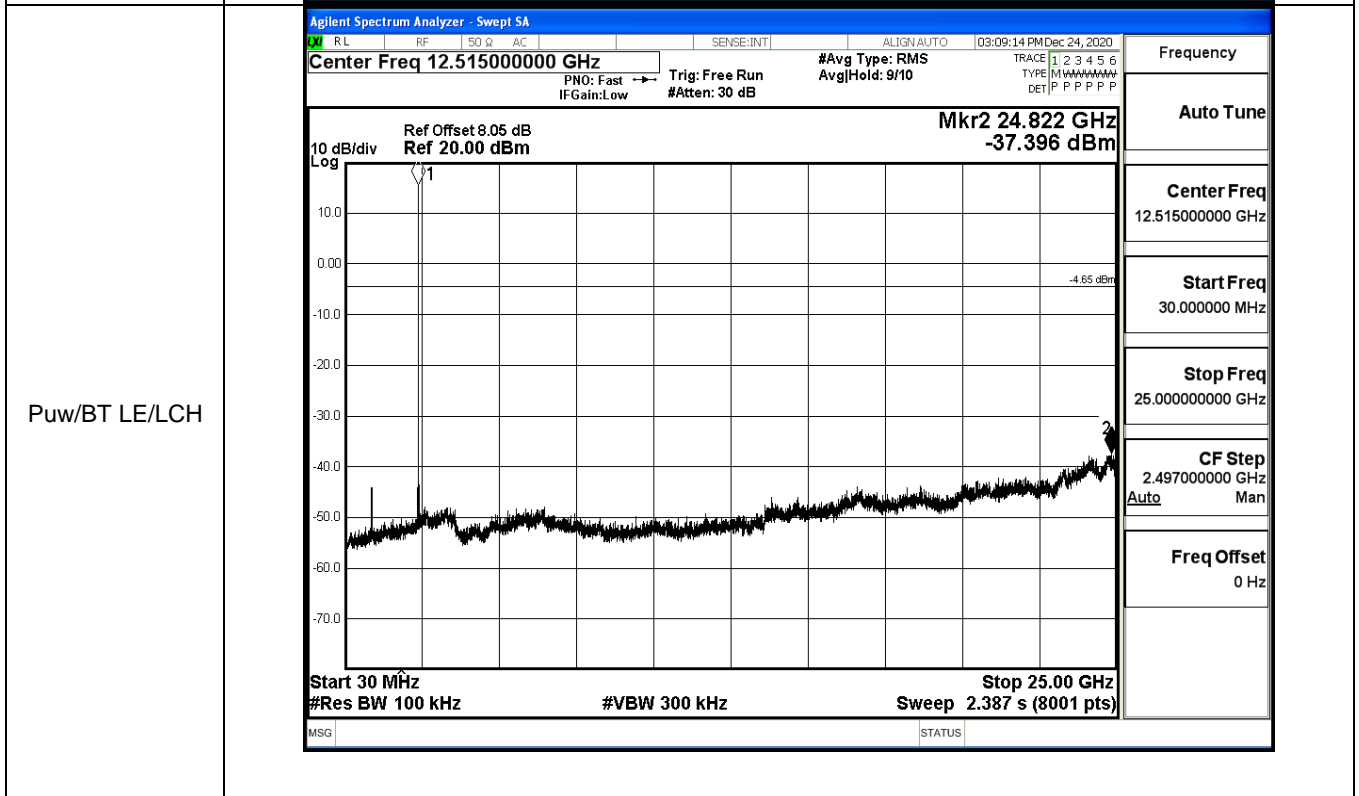
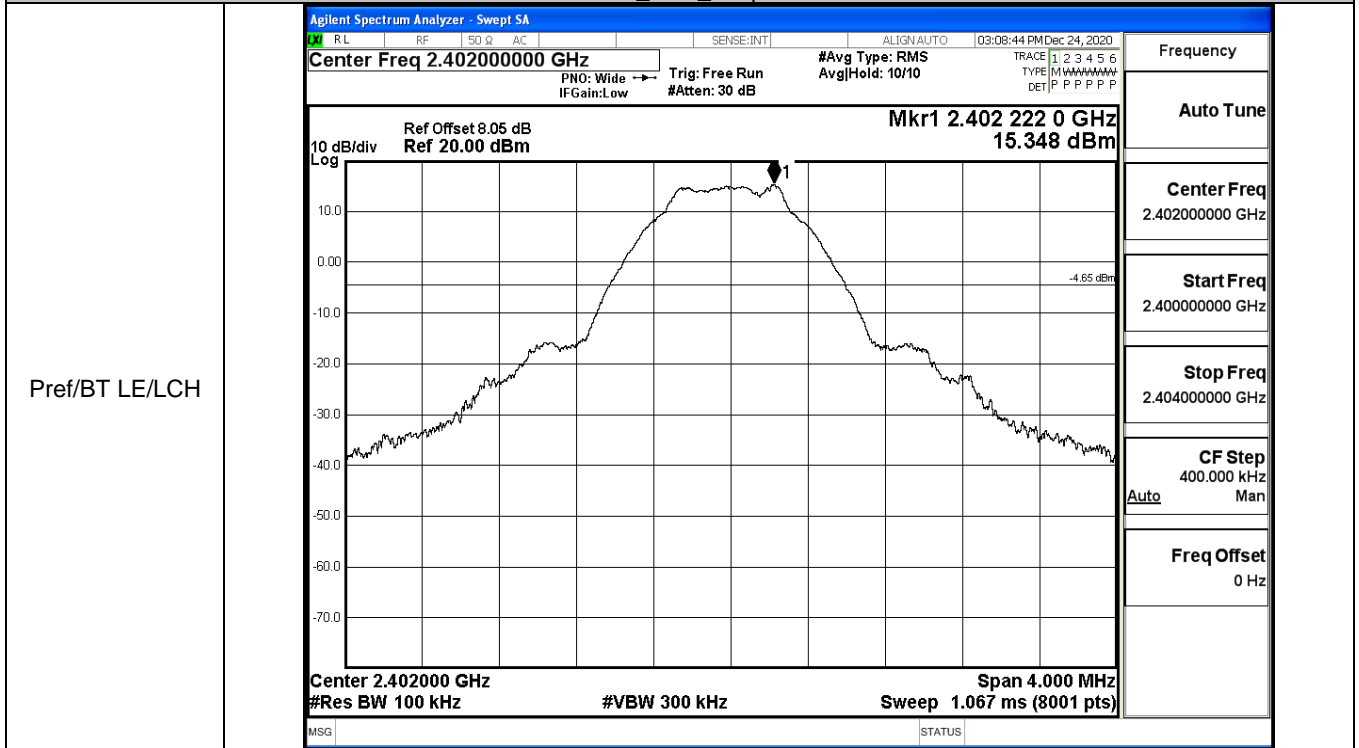


Frequency	2.48000000 GHz
Center Freq	2.48000000 GHz
CF Step	400.000 kHz
Auto	Man
Freq Offset	0 Hz

D.5 RF Conducted Spurious Emissions

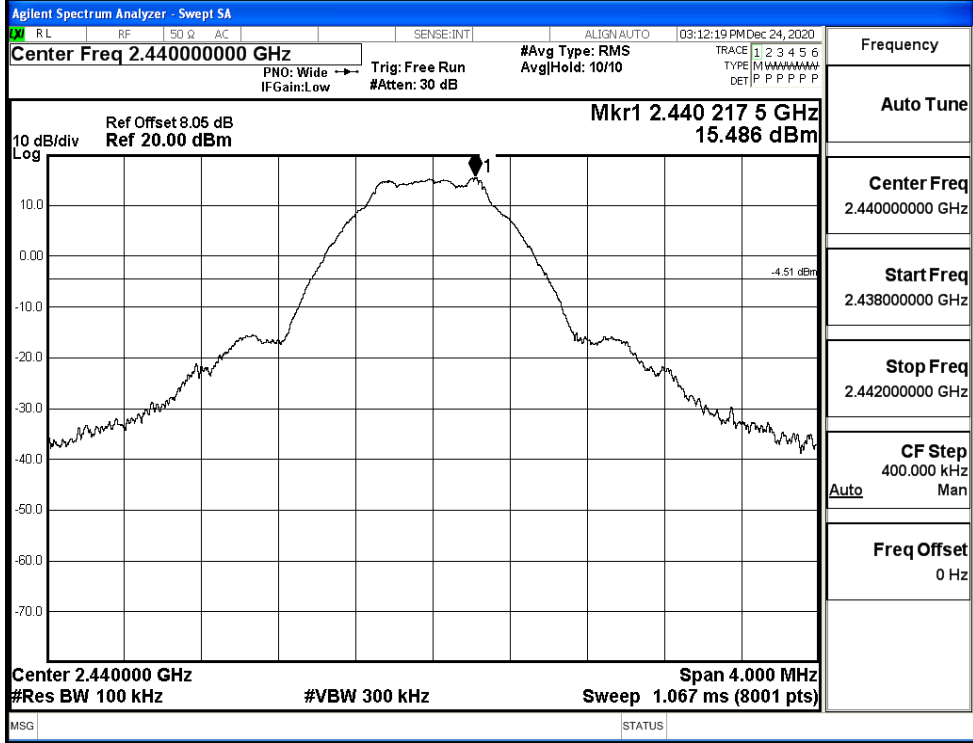
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	15.348	-37.396	-4.652	PASS
BT LE	MCH	15.486	-37.110	-4.514	PASS
BT LE	HCH	15.395	-37.732	-4.605	PASS

BT LE_LCH_Graphs



BT LE_MCH_Graphs

Pref/BT LE/MCH

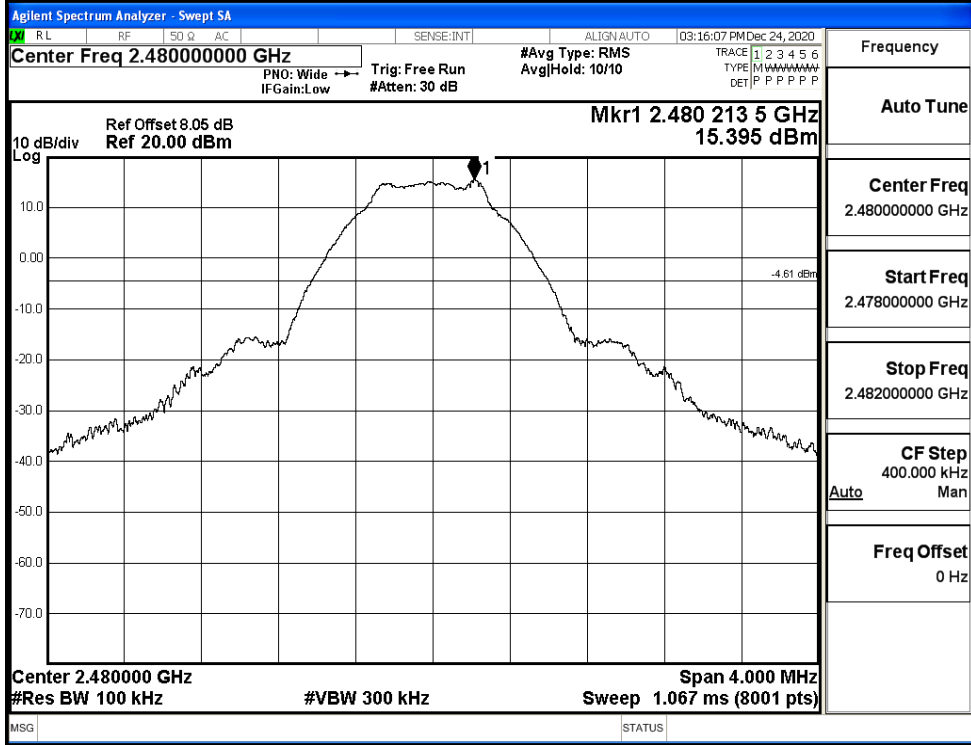


Puw/BT LE/MCH

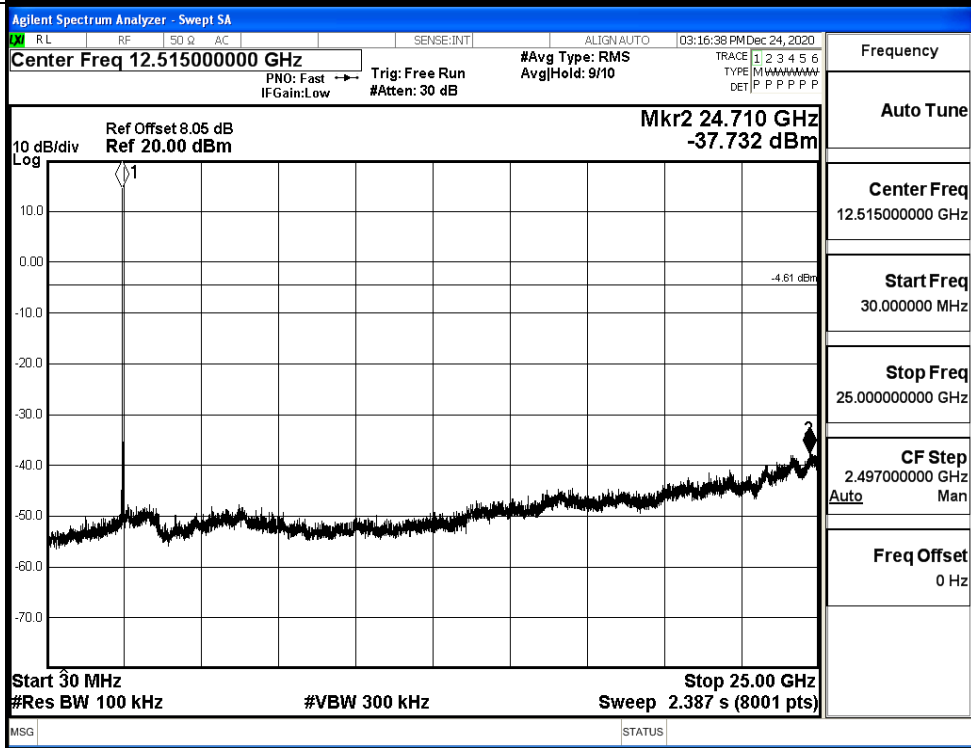


BT LE_HCH_Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



D.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	15.206	-43.707	-4.79	PASS
BT LE	HCH	15.645	-40.790	-4.36	PASS

Test Graphs

LCH

Agilent Spectrum Analyzer - Swept SA
 Center Freq 2.35700000 GHz
 Mkr4 2.363 474 GHz -43.707 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	1	f	2.401 768 GHz	15.206 dBm			
2	N	1	f	2.400 000 GHz	-37.783 dBm			
3	N	1	f	2.390 000 GHz	-53.409 dBm			
4	N	1	f	2.363 474 GHz	-43.707 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 2.483 953 75 GHz -40.790 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	1	f	2.480 222 00 GHz	15.645 dBm			
2	N	1	f	2.483 500 00 GHz	-43.465 dBm			
3	N	1	f	2.500 000 00 GHz	-52.600 dBm			
4	N	1	f	2.483 953 75 GHz	-40.790 dBm			

Frequency

Auto Tune

Center Freq
2.48900000 GHz

Start Freq
2.47800000 GHz

Stop Freq
2.50000000 GHz

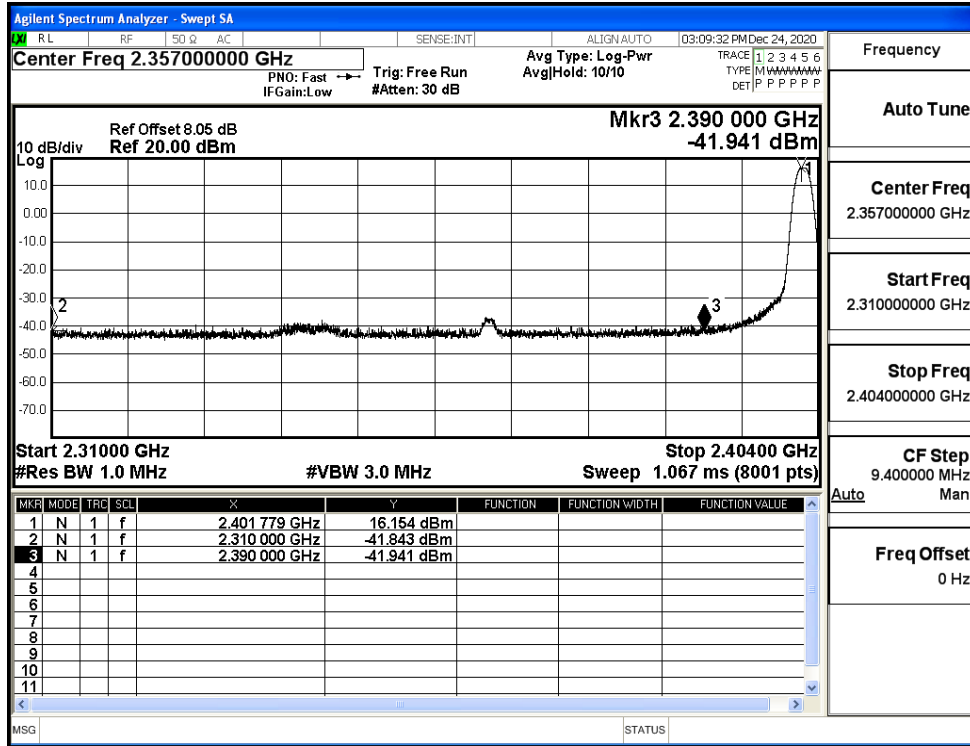
CF Step
2.200000 MHz

Freq Offset
0 Hz

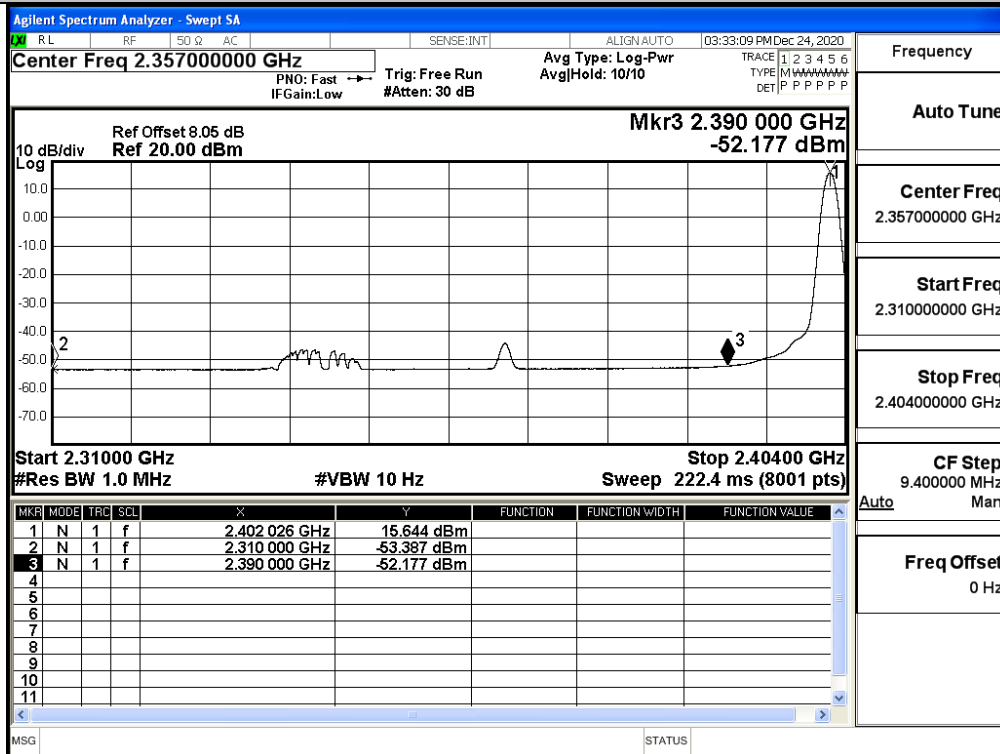
D.7 Restrict-band band-edge measurements

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	-41.84	2.0	0	55.42	PEAK	74	PASS
		Ant1	2310.0	-53.39	2.0	0	43.87	AV	54	PASS
		Ant1	2390.0	-41.94	2.0	0	55.32	PEAK	74	PASS
		Ant1	2390.0	-52.18	2.0	0	45.08	AV	54	PASS
	2480	Ant1	2483.5	-32.10	2.0	0	65.16	PEAK	74	PASS
		Ant1	2483.5	-42.14	2.0	0	55.12	AV	54	PASS
		Ant1	2500.0	-41.33	2.0	0	55.93	PEAK	74	PASS
		Ant1	2500.0	-48.85	2.0	0	48.41	AV	54	PASS

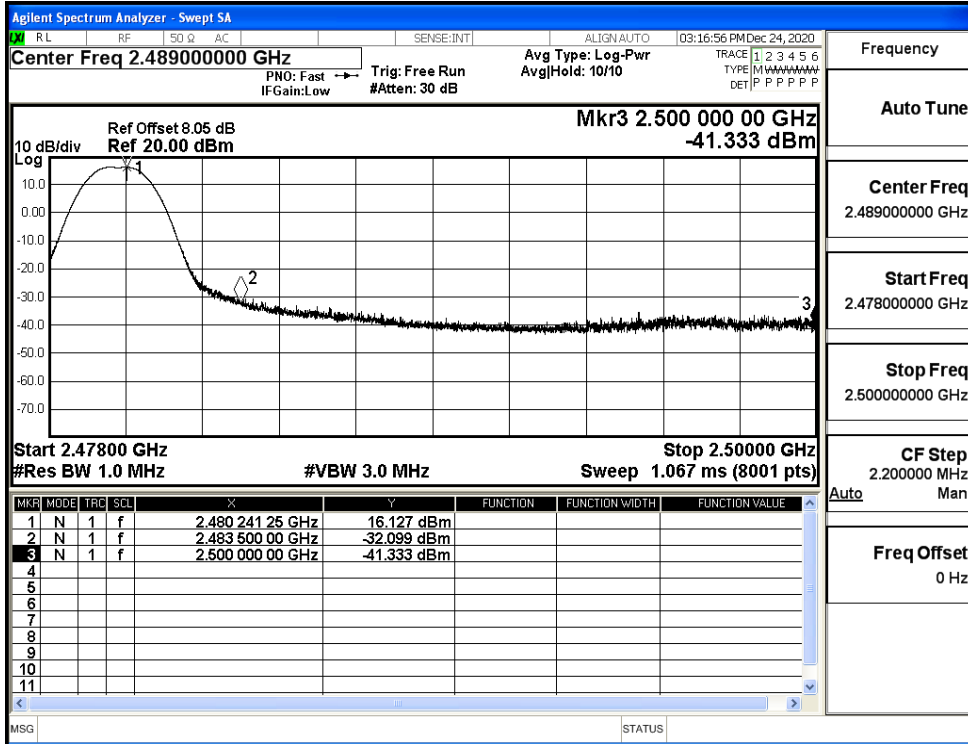
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

