Appendix A

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

Product Name: Door Sense

Trade Mark: Phillips Connect Technologies

Test Model: DoorSense

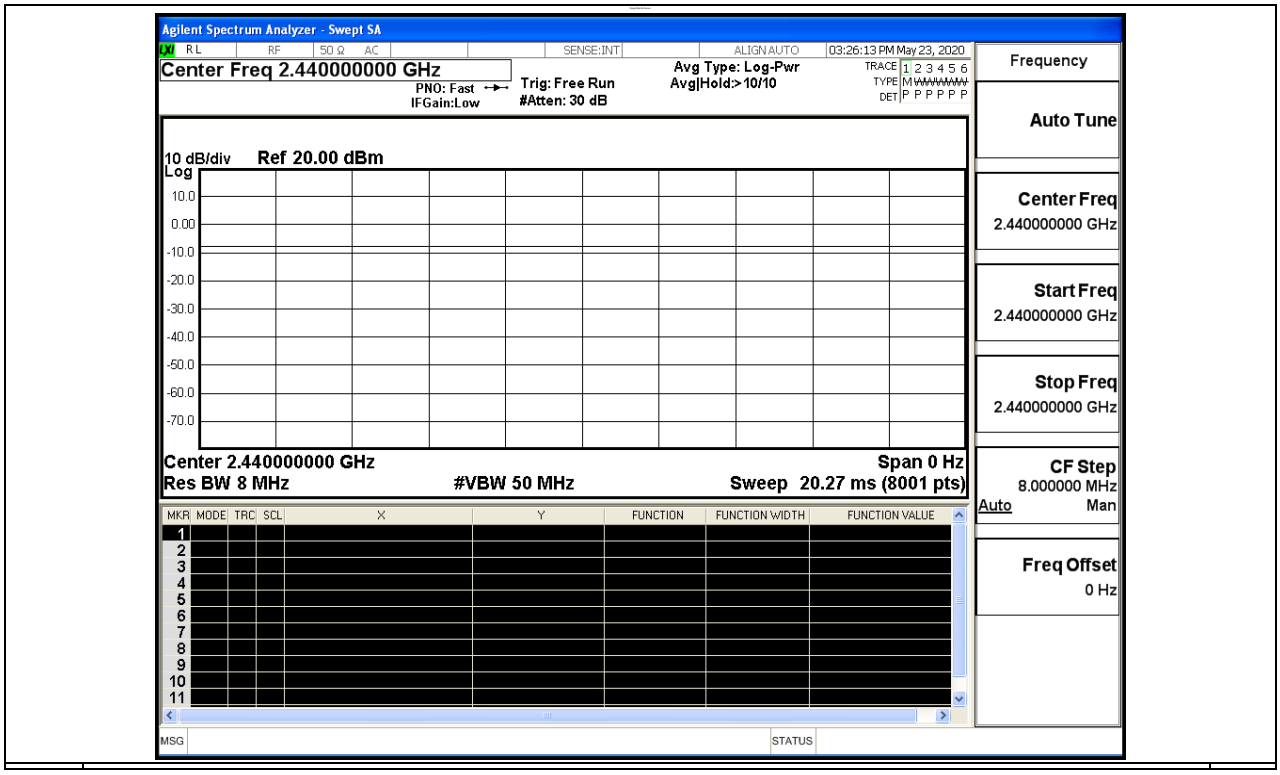
Environmental Conditions

Temperature:	23.3 ° C
Relative Humidity:	52.7%
ATM Pressure:	100.0 kPa
Test Engineer:	SCOUT WU
Supervised by:	Li Huan

A.1 Duty Cycle

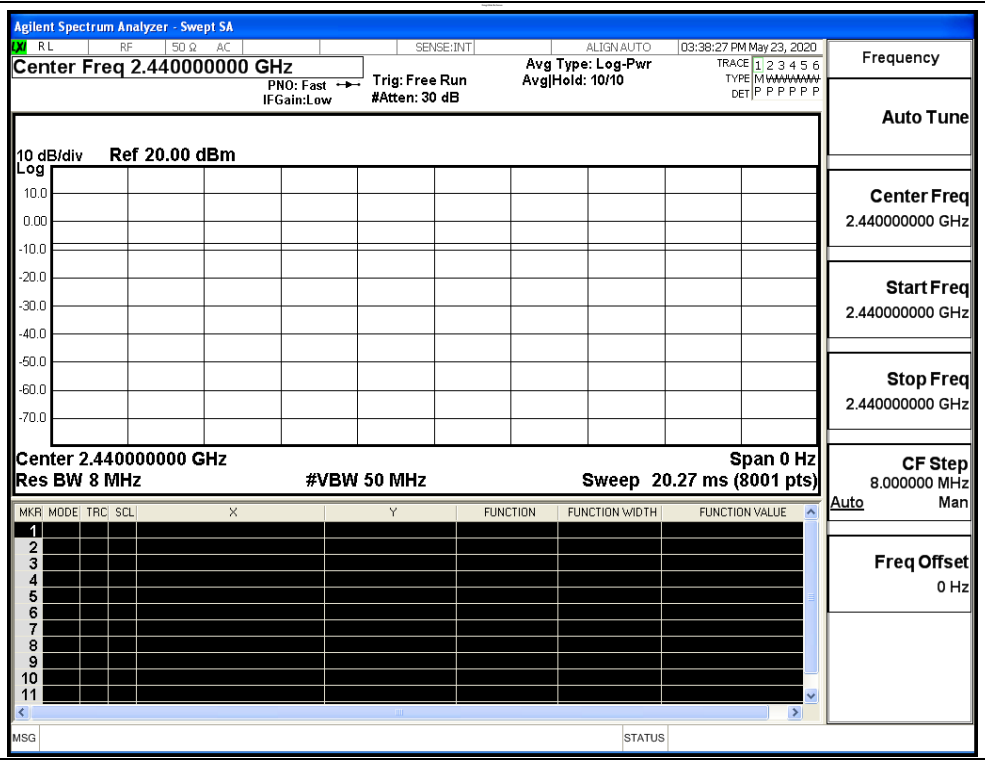
BT LE

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



BT 2LE

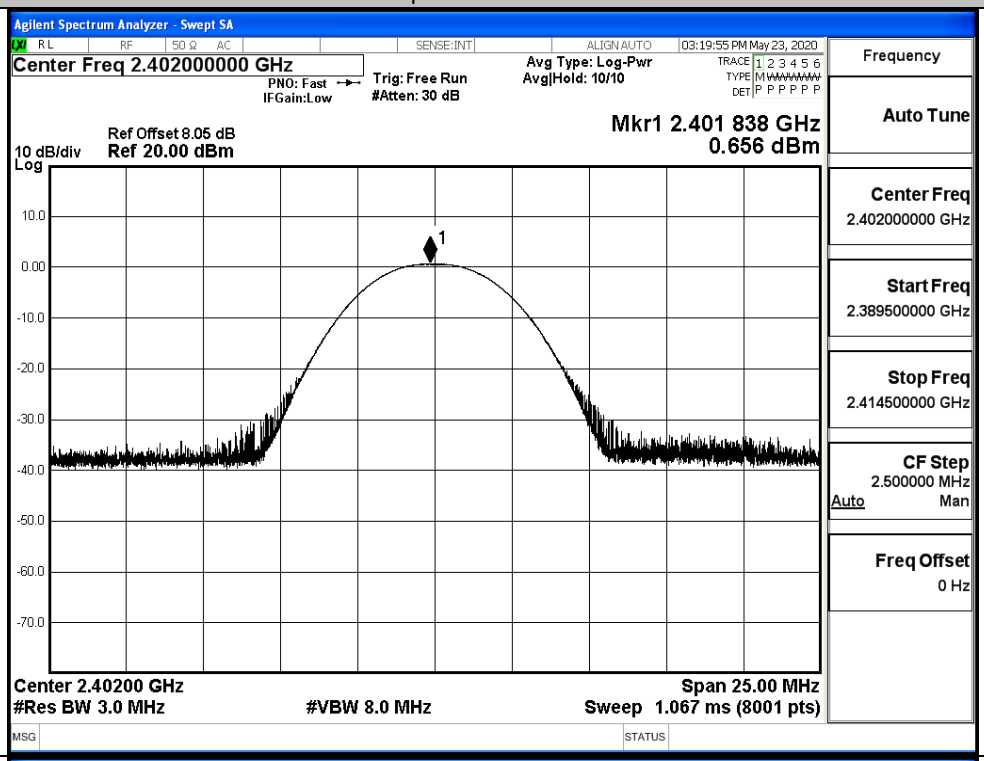
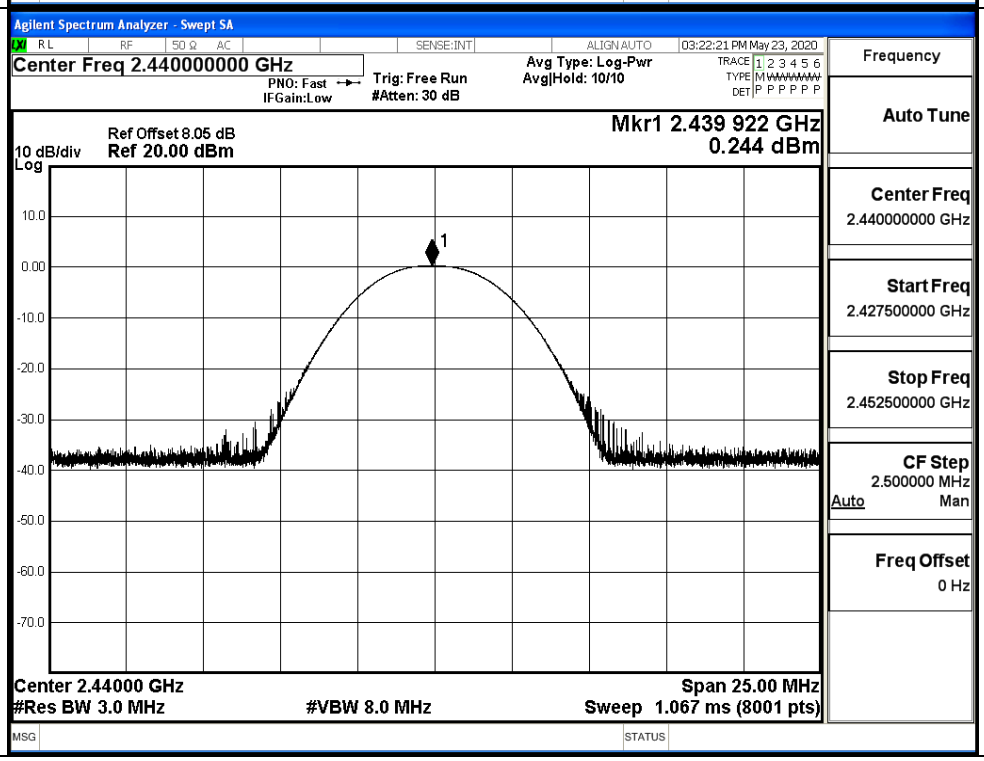
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS

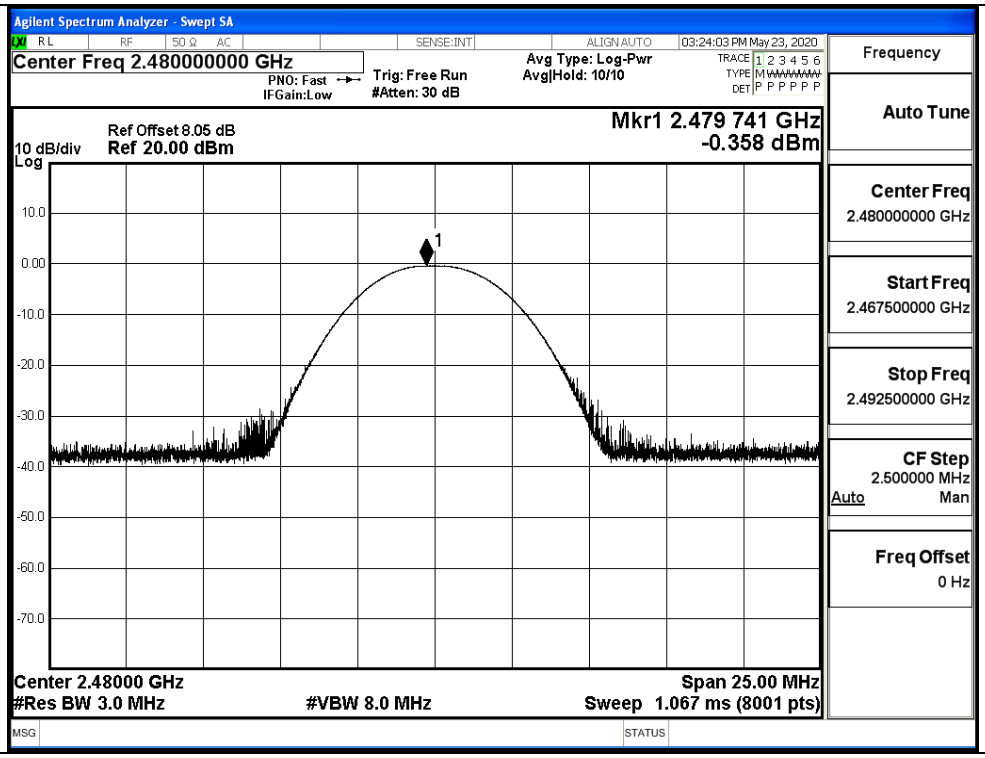


A.2 Maximum Conducted Peak Output Power

BT LE

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.656	30	PASS
BT LE	MCH	0.244	30	PASS
BT LE	HCH	-0.358	30	PASS

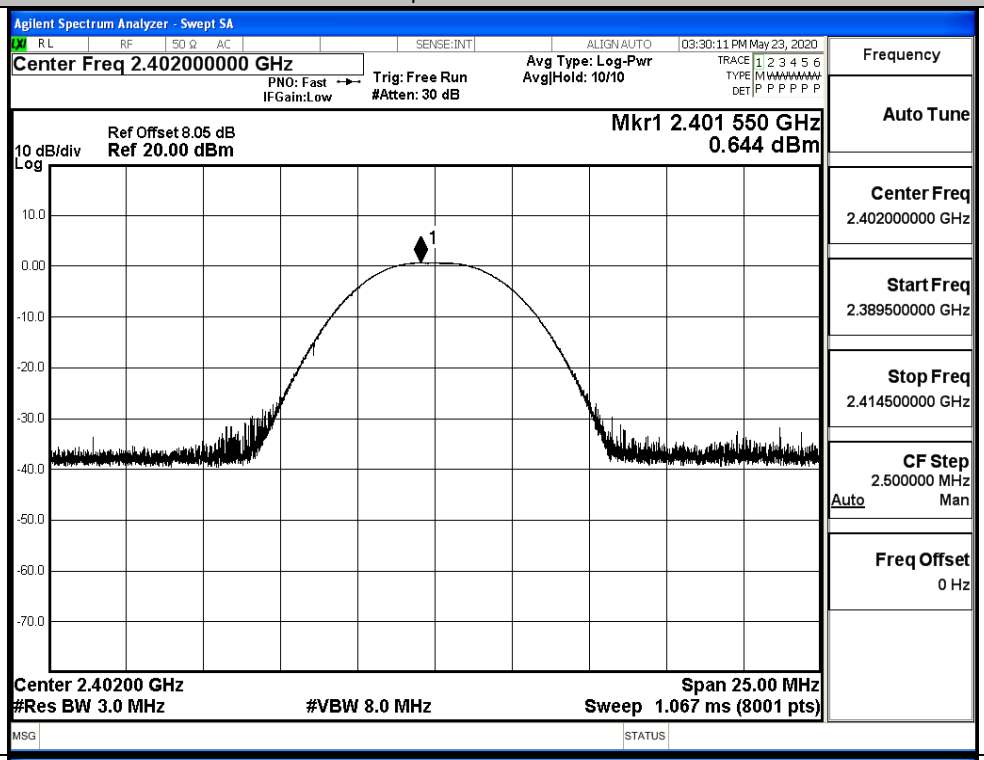
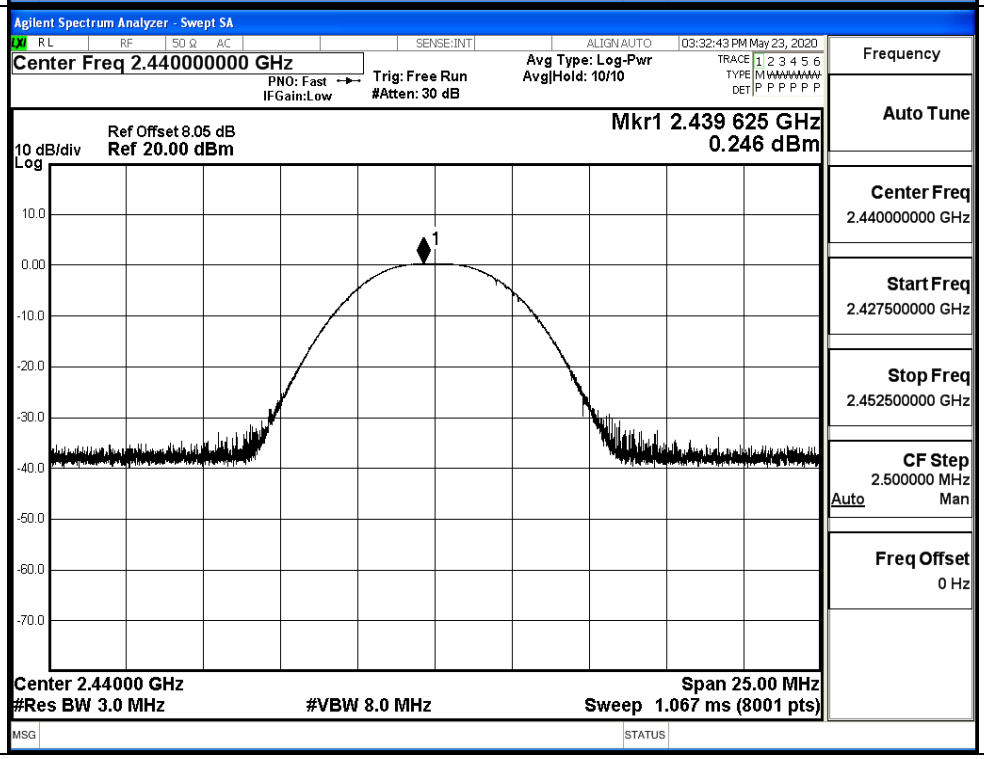
Test Graphs		
LCH		
MCH		

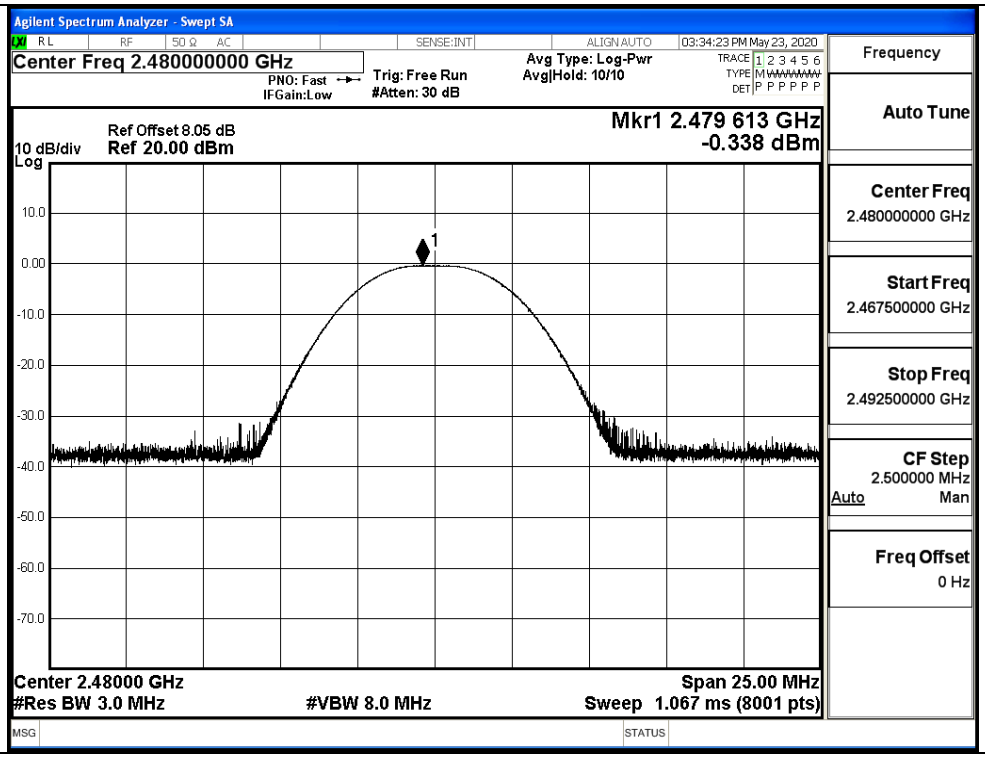
HCH		

Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:24:03 PM May 23, 2020
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P P P P P
Ref Offset 8.05 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 741 GHz
-0.358 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 2.48000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 25.00 MHz
Sweep 1.067 ms (8001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.467500000 GHz
Stop Freq
2.492500000 GHz
CF Step
2.500000 MHz
Auto
Man
Freq Offset
0 Hz

BT 2LE

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.644	30	PASS
BT LE	MCH	0.246	30	PASS
BT LE	HCH	-0.338	30	PASS

Test Graphs		
LCH		
MCH		

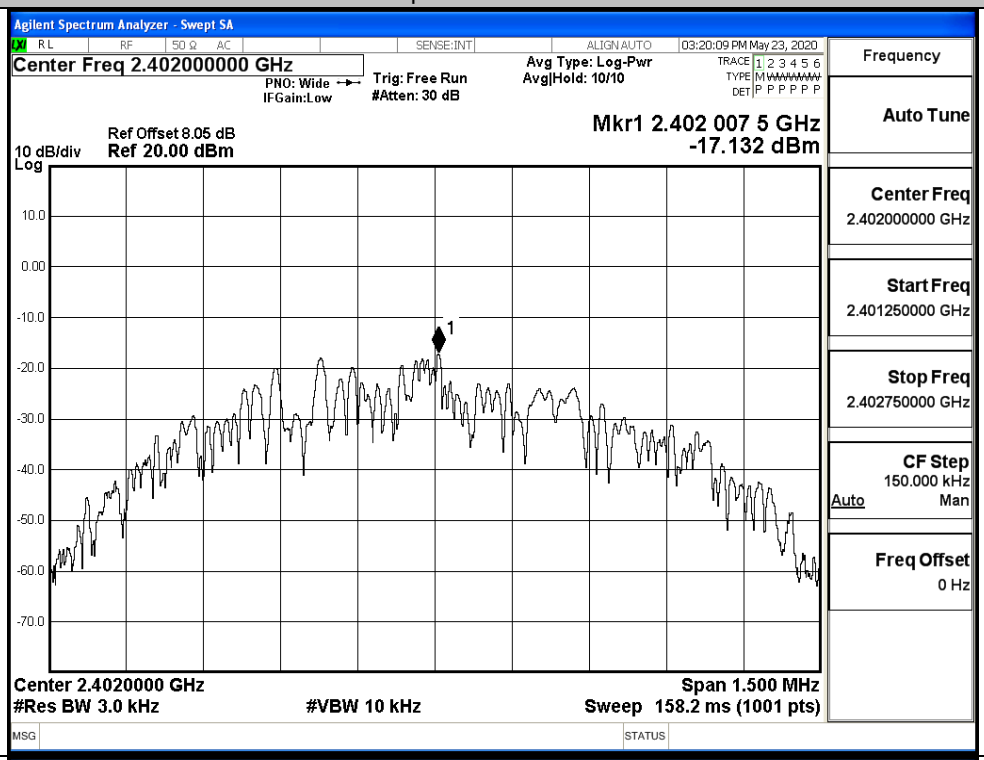
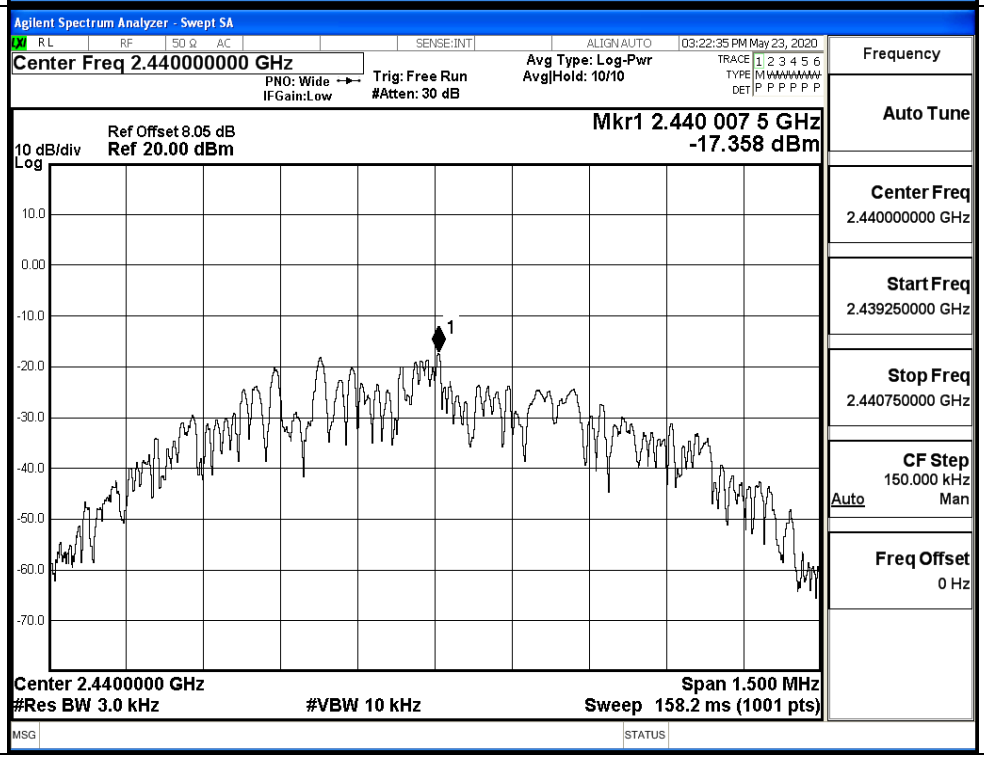
HCH		

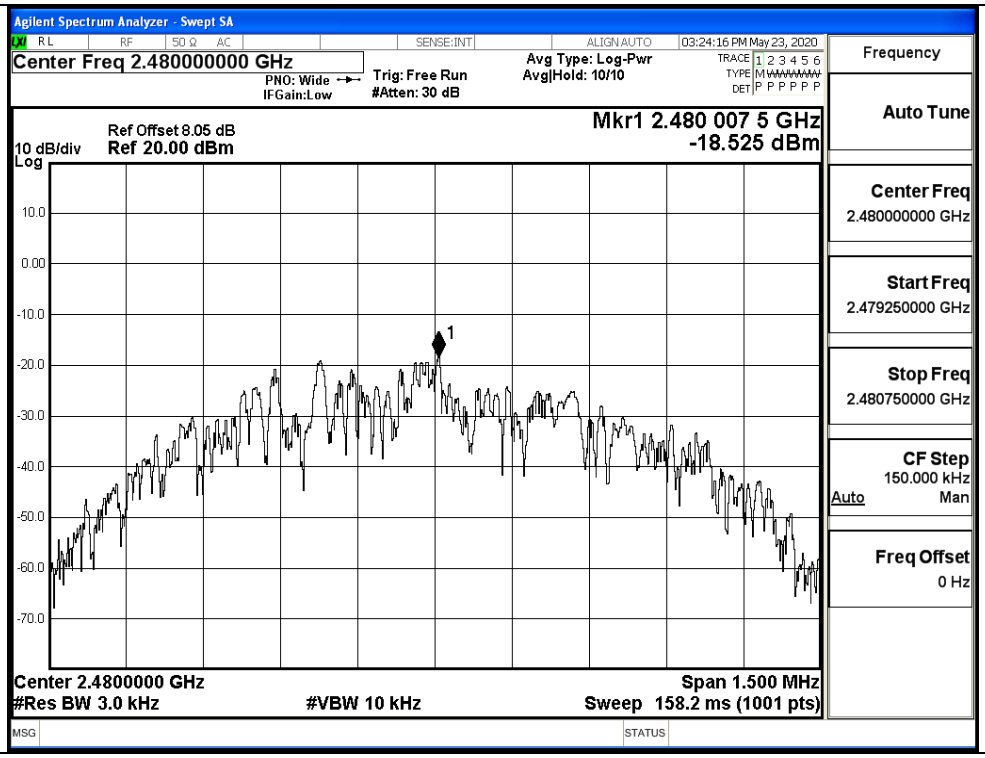
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:34:23 PM May 23, 2020
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P P P P P
Ref Offset 8.05 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 613 GHz
-0.338 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 2.48000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 25.00 MHz
Sweep 1.067 ms (8001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.467500000 GHz
Stop Freq
2.492500000 GHz
CF Step
2.500000 MHz
Auto
Man
Freq Offset
0 Hz

A.3 Maximum Power Spectral Density

BT LE

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-17.132	8	PASS
BT LE	MCH	-17.358	8	PASS
BT LE	HCH	-18.525	8	PASS

Test Graphs		
LCH		
MCH		

HCH		

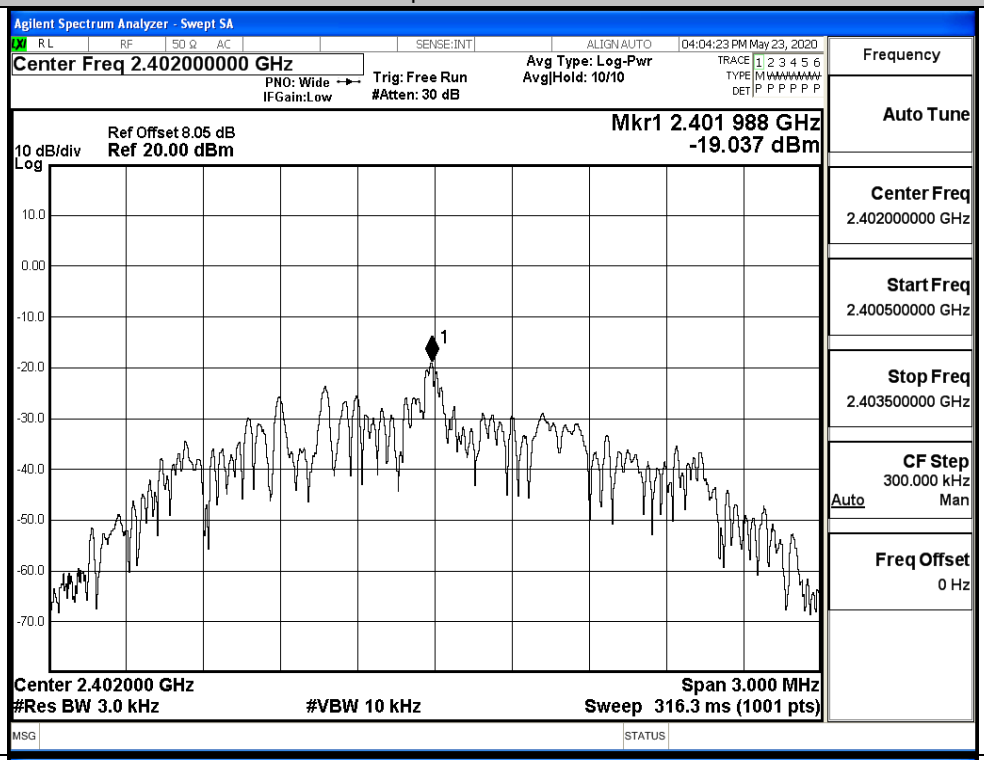
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:24:16 PM May 23, 2020
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P P P P P
Ref Offset 8.05 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.480 007 5 GHz
-18.525 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.500 MHz
Sweep 158.2 ms (1001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479250000 GHz
Stop Freq
2.480750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz

BT 2LE

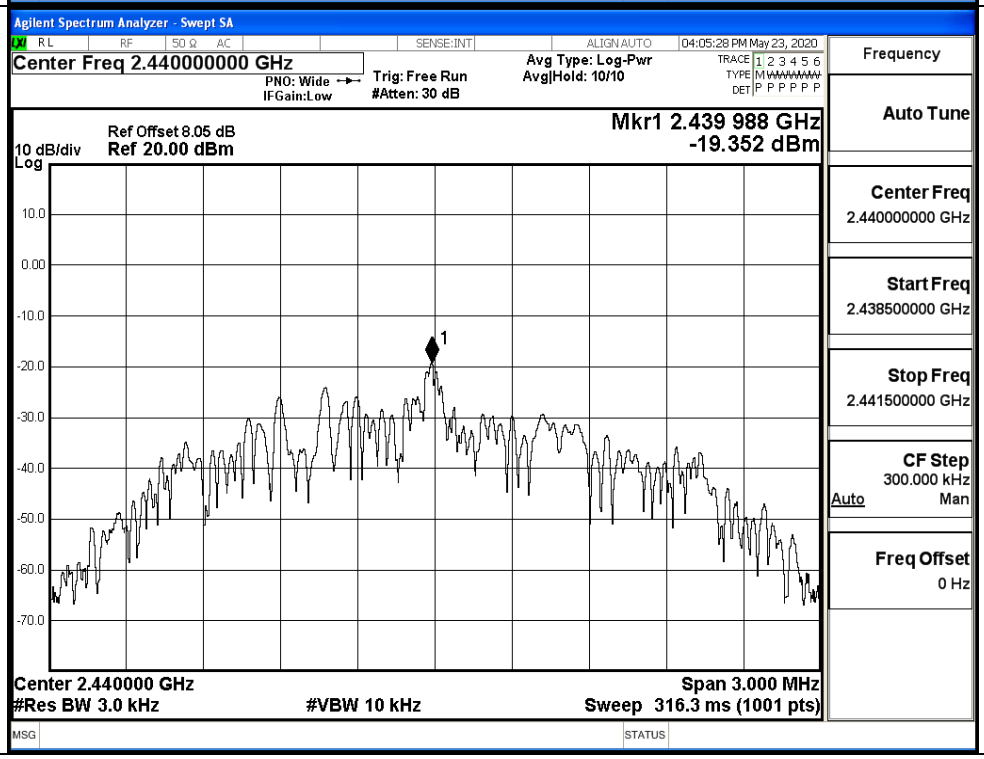
Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-19.037	8	PASS
BT LE	MCH	-19.352	8	PASS
BT LE	HCH	-20.066	8	PASS

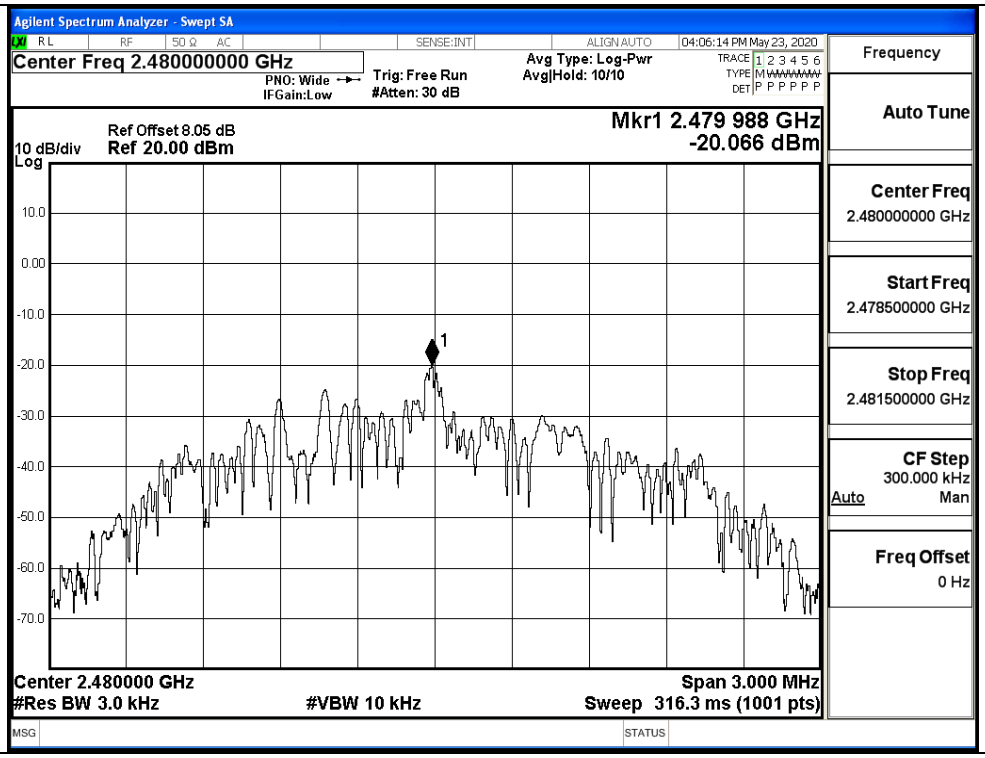
Test Graphs

LCH



MCH



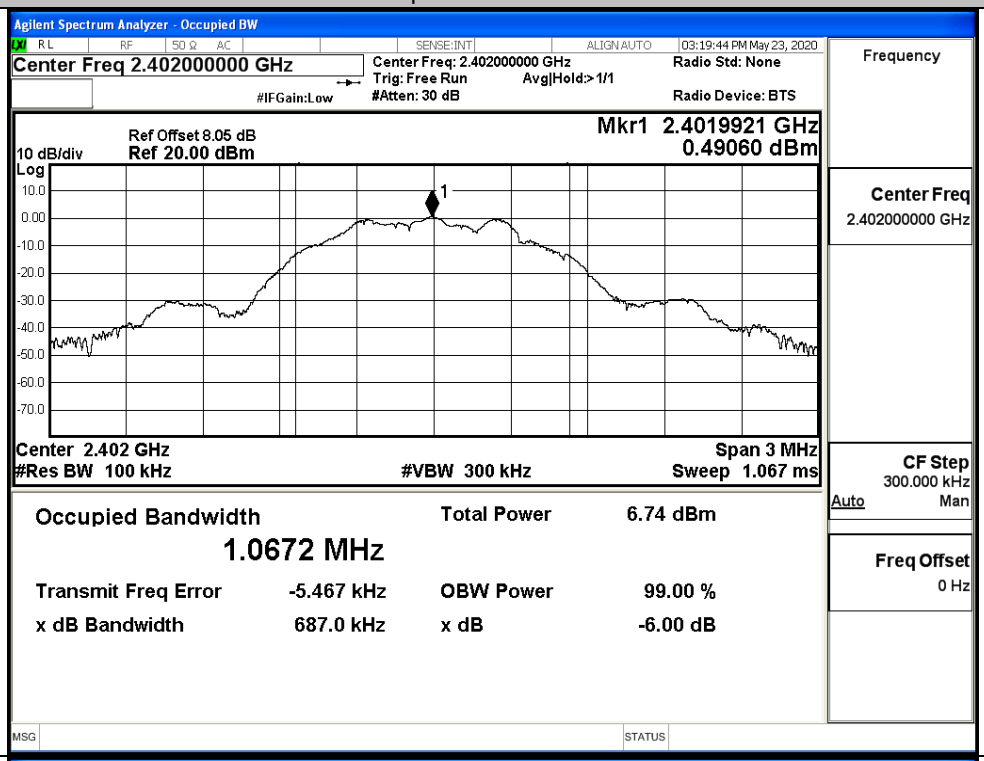
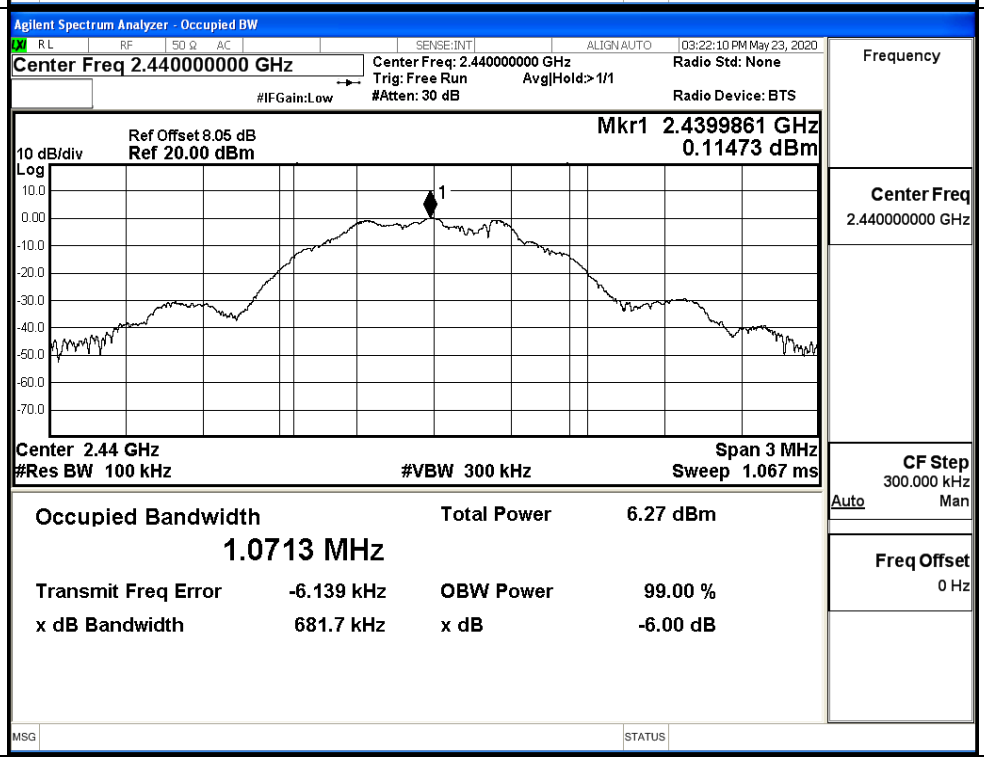
HCH		

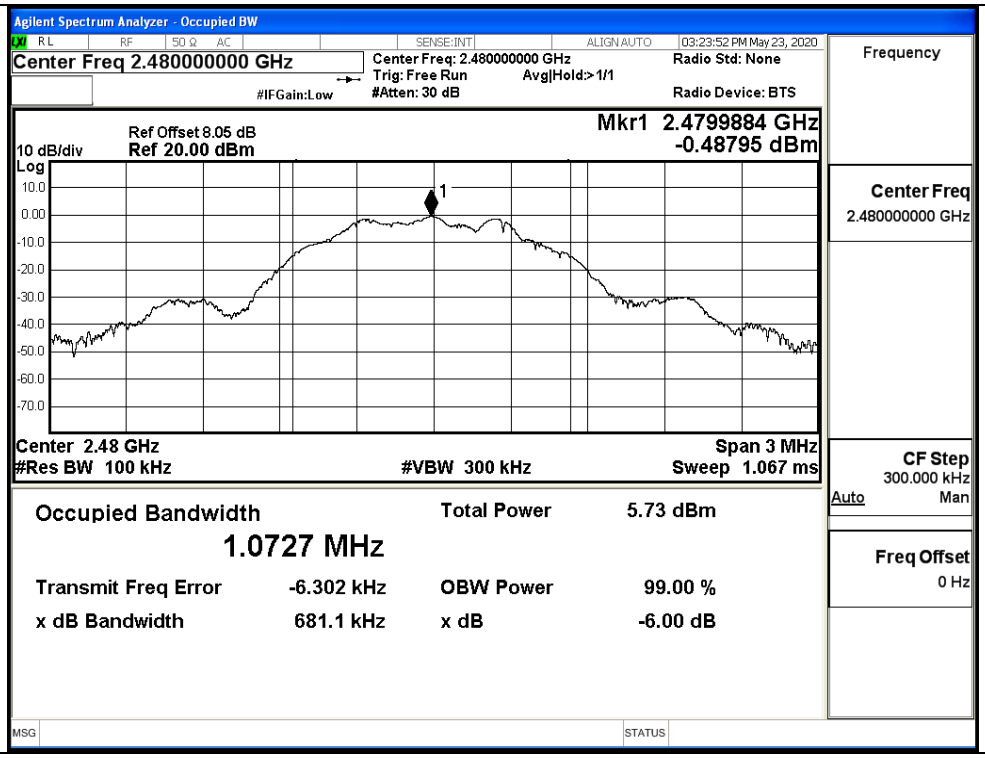
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
04:06:14 PM May 23, 2020
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P P P P P
Ref Offset 8.05 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 988 GHz
-20.066 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 2.480000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 3.000 MHz
Sweep 316.3 ms (1001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.481500000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz

A.4 6dB Bandwidth

BT LE

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6870	⩾0.5	PASS
BT LE	MCH	0.6817	⩾0.5	PASS
BT LE	HCH	0.6811	⩾0.5	PASS

Test Graphs		
LCH		
MCH		

HCH		

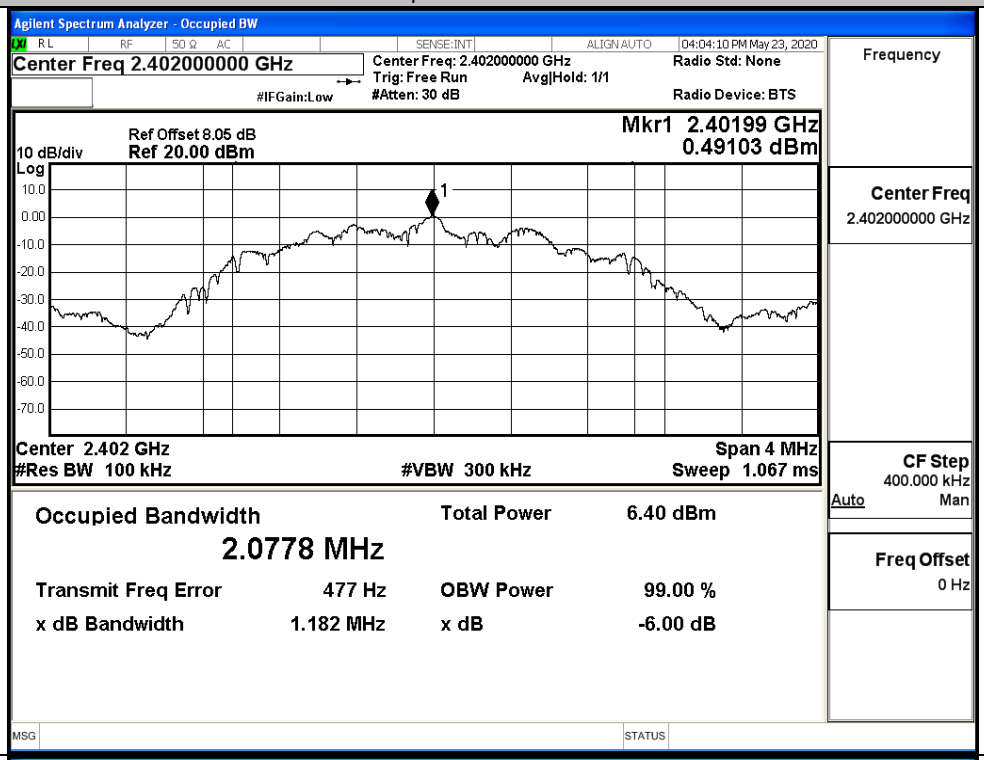
Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:23:52 PM May 23, 2020
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>1/1
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.4799884 GHz
-0.48795 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1.067 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.0727 MHz
Total Power 5.73 dBm
Transmit Freq Error -6.302 kHz
OBW Power 99.00 %
x dB Bandwidth 681.1 kHz
x dB -6.00 dB
Freq Offset
0 Hz
MSG
STATUS

BT 2LE

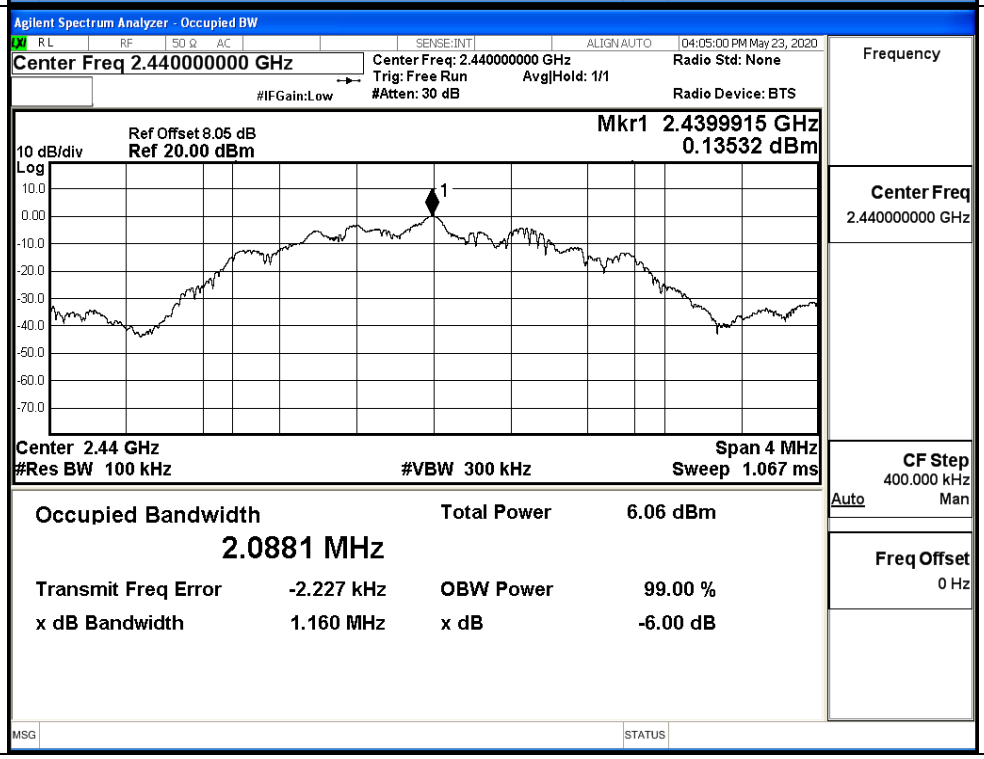
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	1.182	⩾0.5	PASS
BT LE	MCH	1.160	⩾0.5	PASS
BT LE	HCH	1.163	⩾0.5	PASS

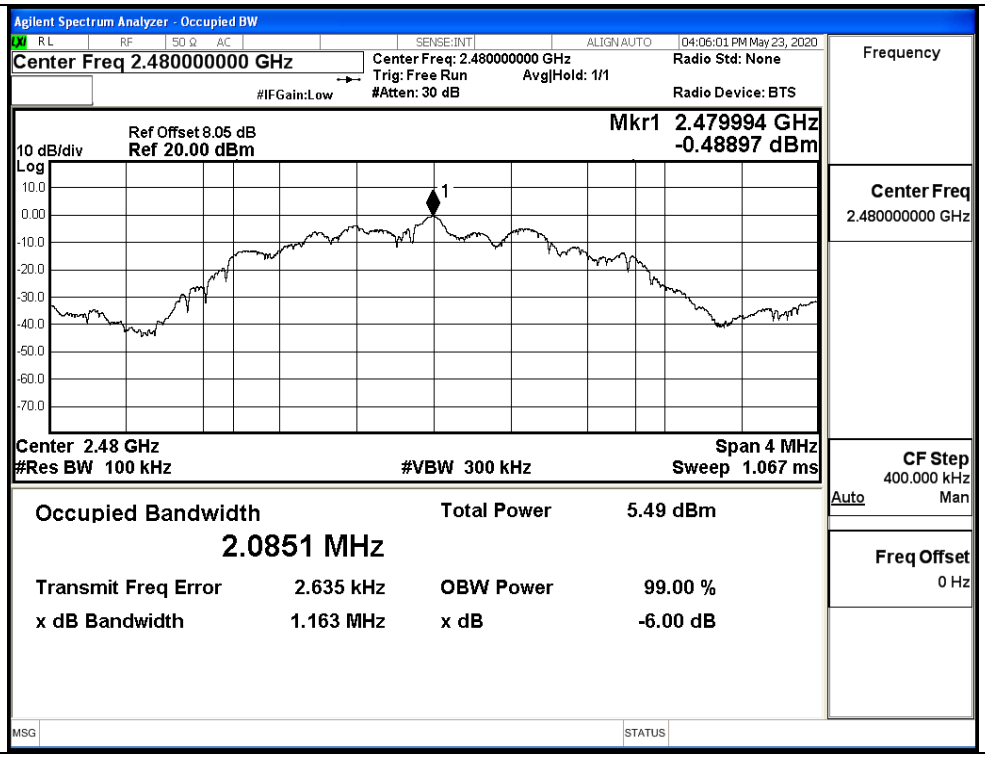
Test Graphs

LCH



MCH



HCH		

Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
04:06:01 PM May 23, 2020
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479994 GHz
-0.48897 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4 MHz
Sweep 1.067 ms
CF Step
400.000 kHz
Auto
Man
Occupied Bandwidth
2.0851 MHz
Total Power
5.49 dBm
Freq Offset
0 Hz
Transmit Freq Error
2.635 kHz
OBW Power
99.00 %
x dB Bandwidth
1.163 MHz
x dB
-6.00 dB
MSG
STATUS

A.5 Occupied Bandwidth

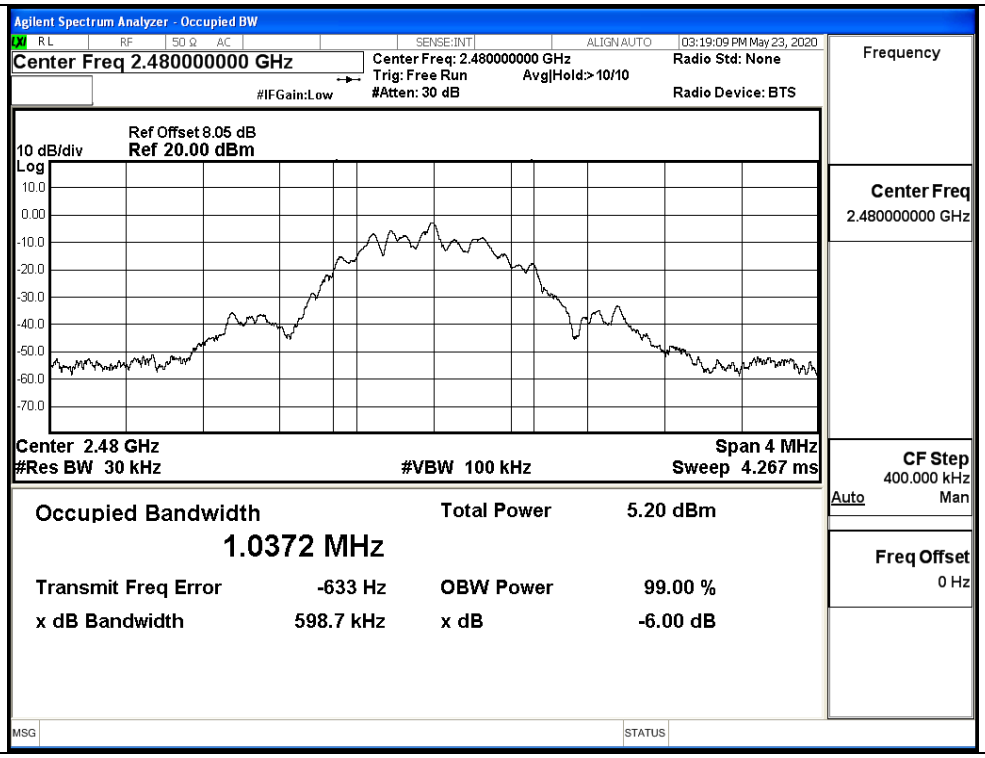
BT LE

Mode	Channel	Occupied Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	1.0333	⩾0.5	PASS
BT LE	MCH	1.0384	⩾0.5	PASS
BT LE	HCH	1.0372	⩾0.5	PASS

Test Graphs

LCH

MCH

HCH		

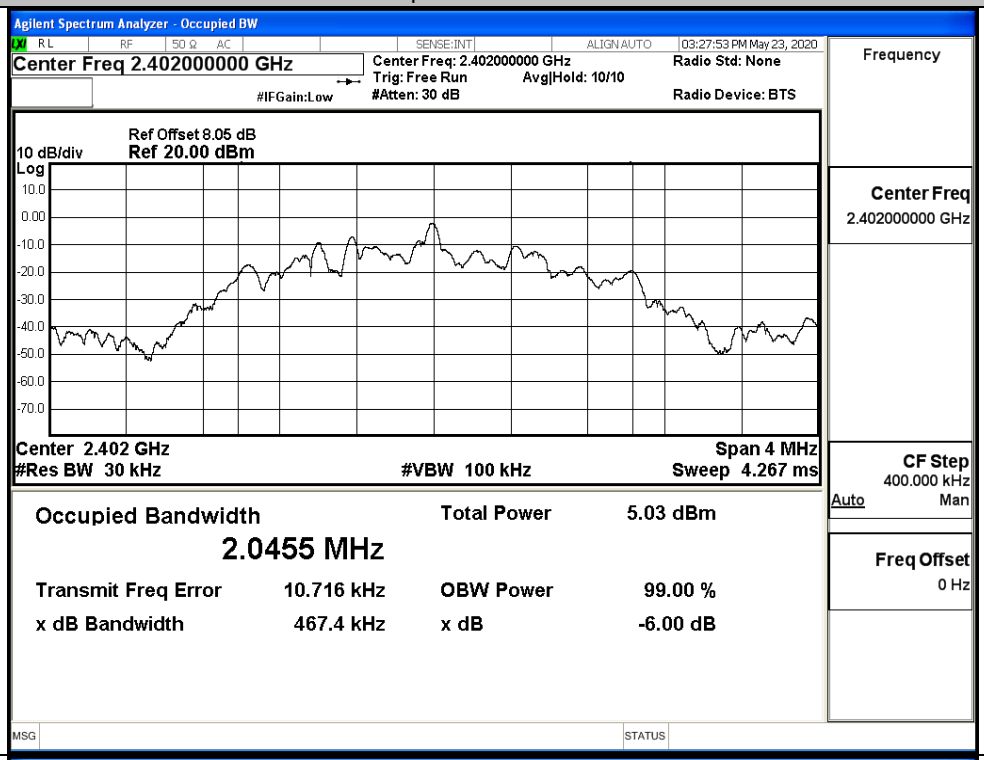
Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:19:09 PM May 23, 2020
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 4 MHz
Sweep 4.267 ms
Occupied Bandwidth
1.0372 MHz
Total Power 5.20 dBm
Transmit Freq Error -633 Hz
OBW Power 99.00 %
x dB Bandwidth 598.7 kHz
x dB -6.00 dB
MSG
STATUS
Frequency
Center Freq
2.480000000 GHz
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz

BT 2LE

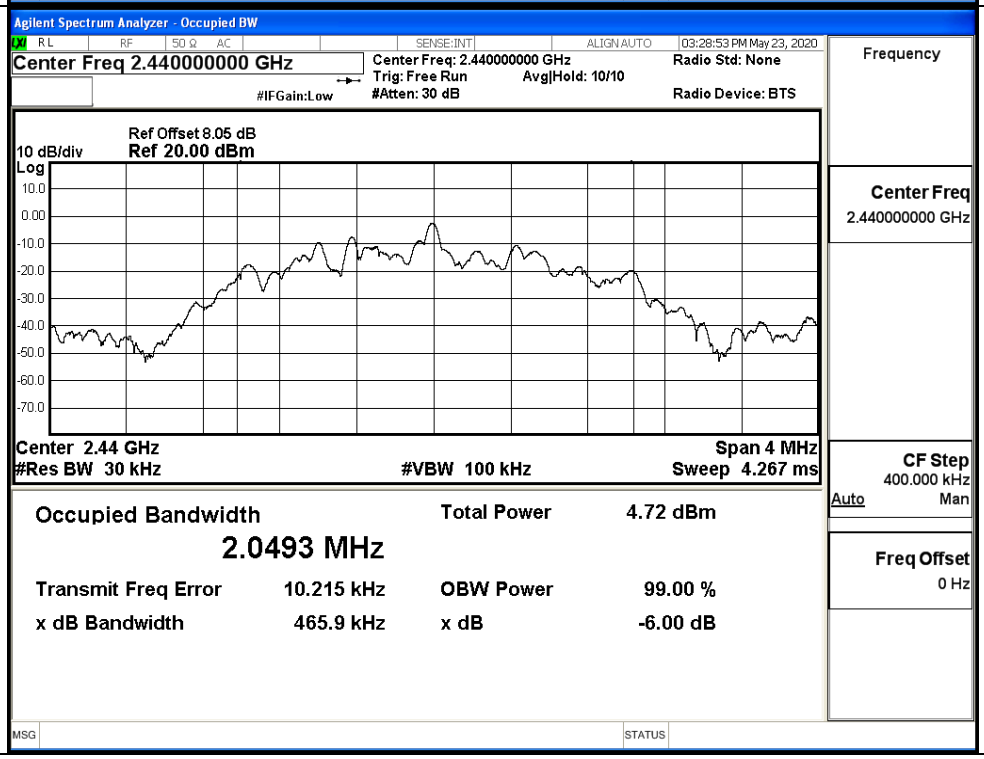
Mode	Channel	Occupied Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	2.0455	⩾0.5	PASS
BT LE	MCH	2.0493	⩾0.5	PASS
BT LE	HCH	2.0503	⩾0.5	PASS

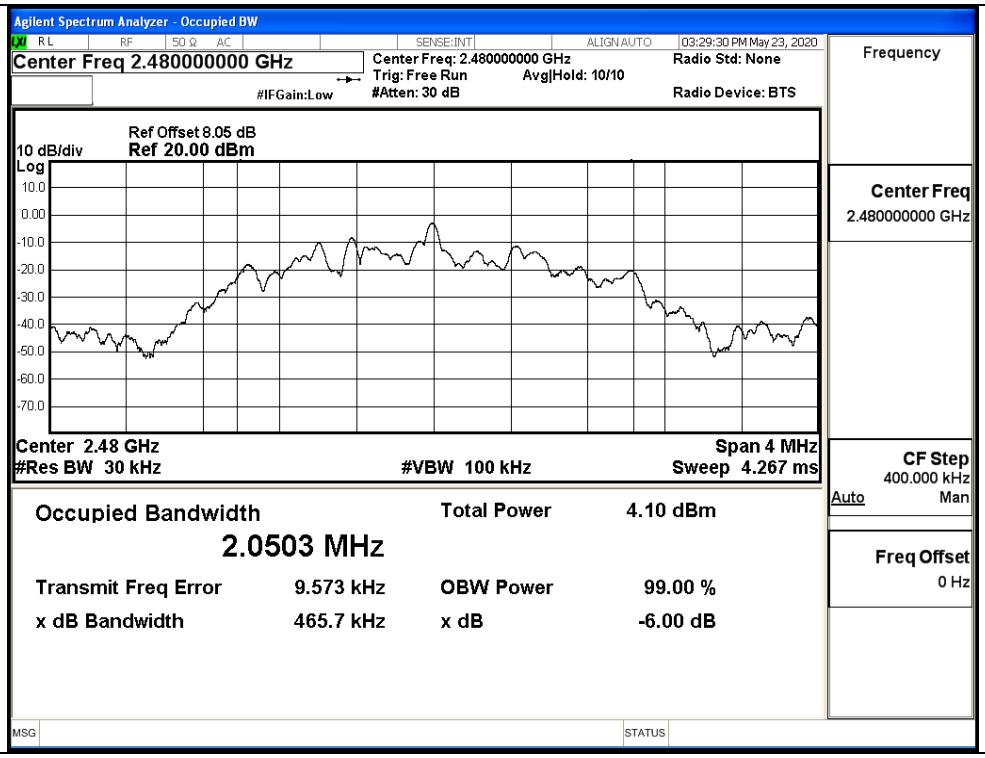
Test Graphs

LCH



MCH



HCH		

Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:29:30 PM May 23, 2020
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 4 MHz
Sweep 4.267 ms
Occupied Bandwidth
2.0503 MHz
Total Power 4.10 dBm
Transmit Freq Error 9.573 kHz
OBW Power 99.00 %
x dB Bandwidth 465.7 kHz
x dB -6.00 dB
MSG
STATUS
Frequency
Center Freq
2.480000000 GHz
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz

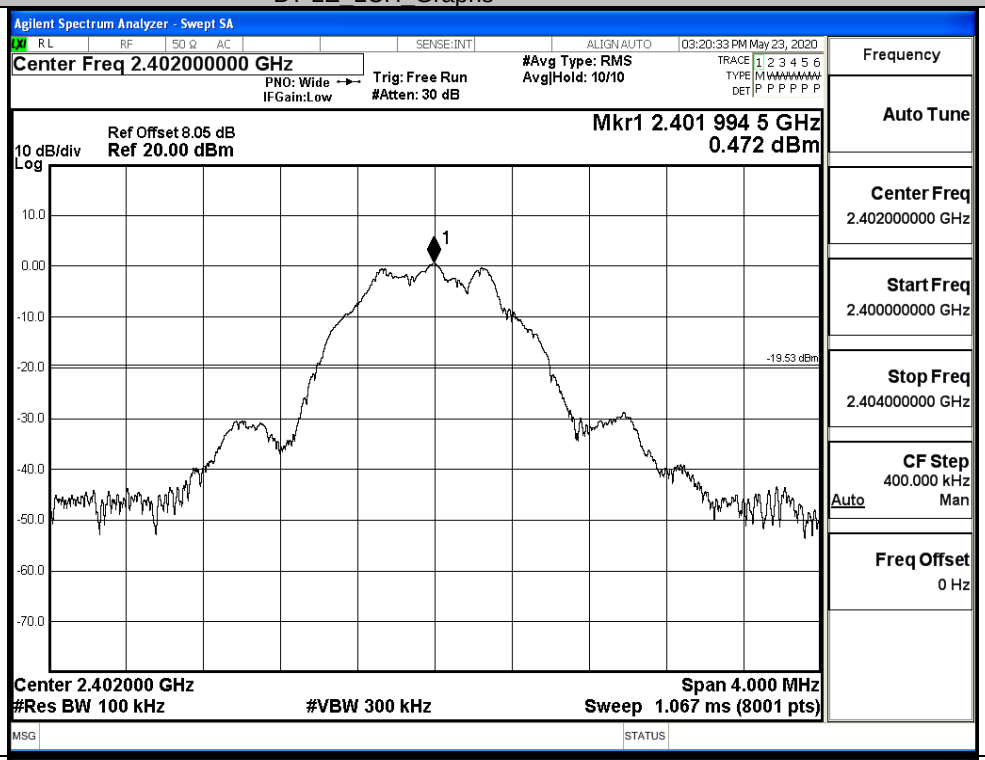
A.6 RF Conducted Spurious Emissions

BT LE

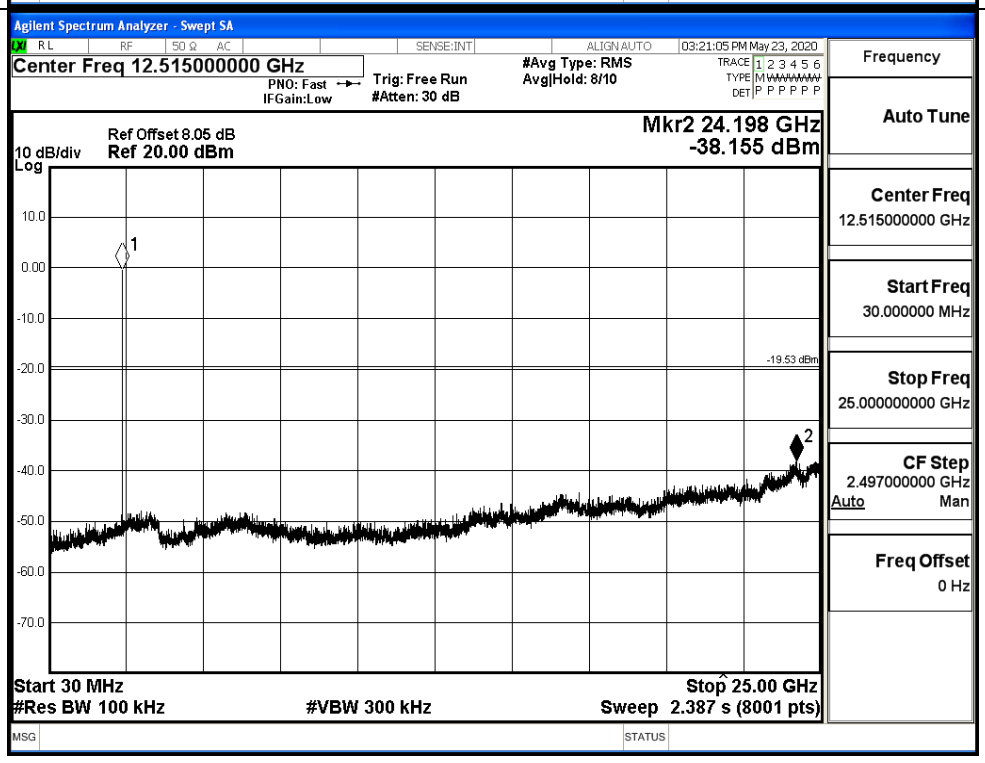
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.472	-38.155	-19.528	PASS
BT LE	MCH	0.126	-36.779	-19.874	PASS
BT LE	HCH	-0.352	-36.989	-20.352	PASS

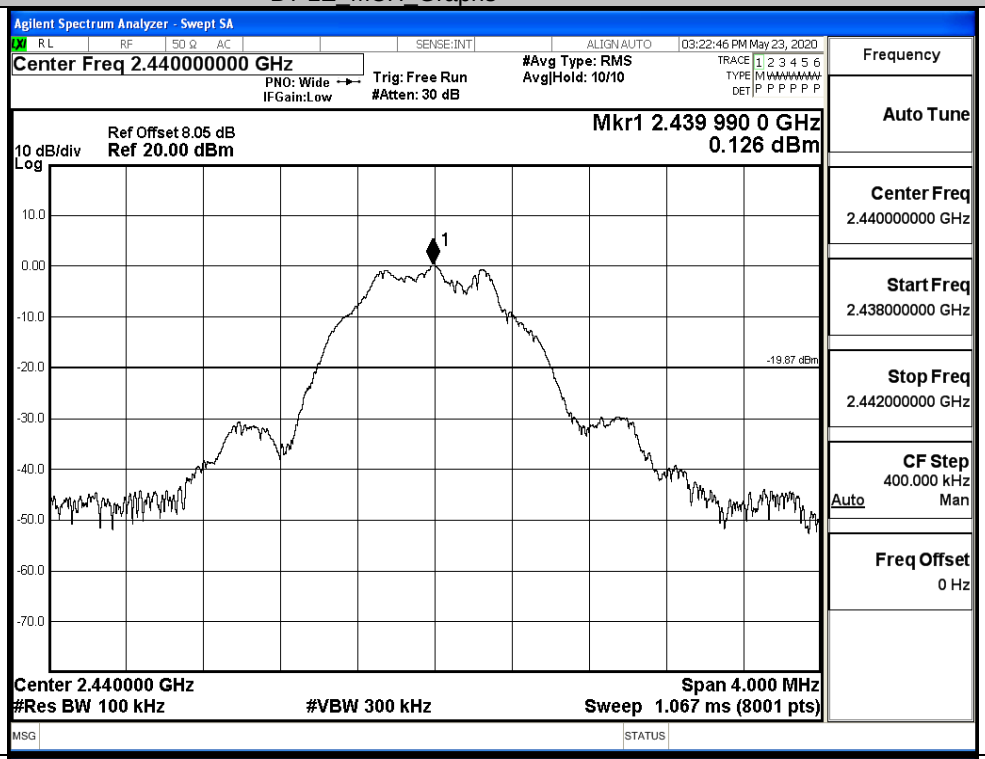
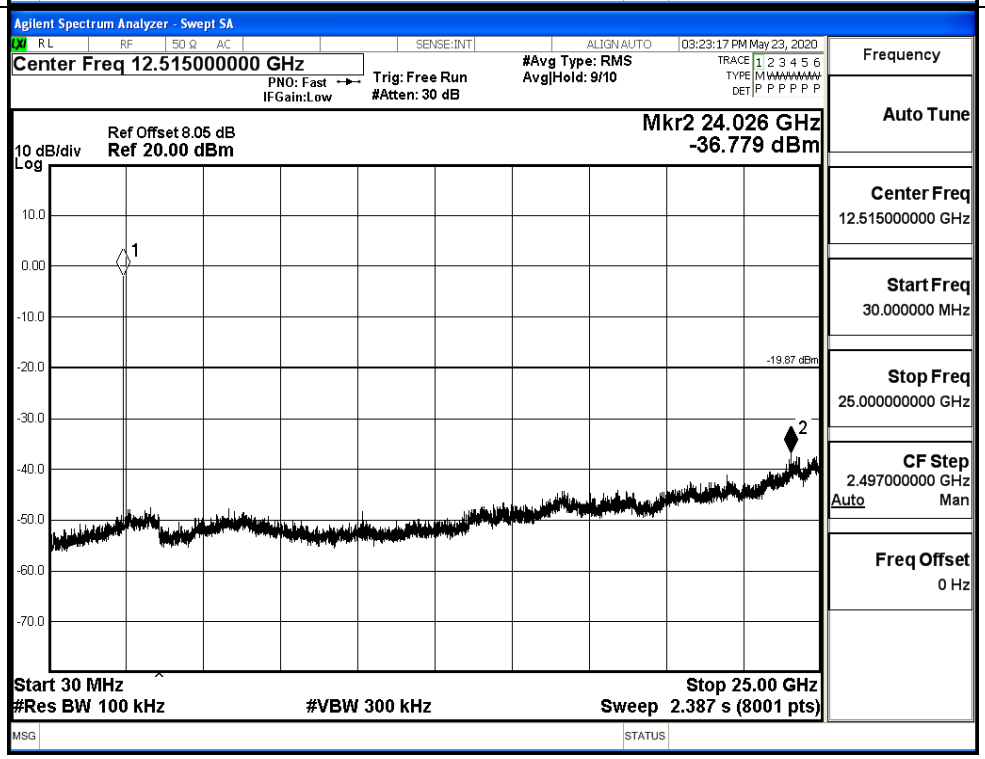
BT LE_LCH_Graphs

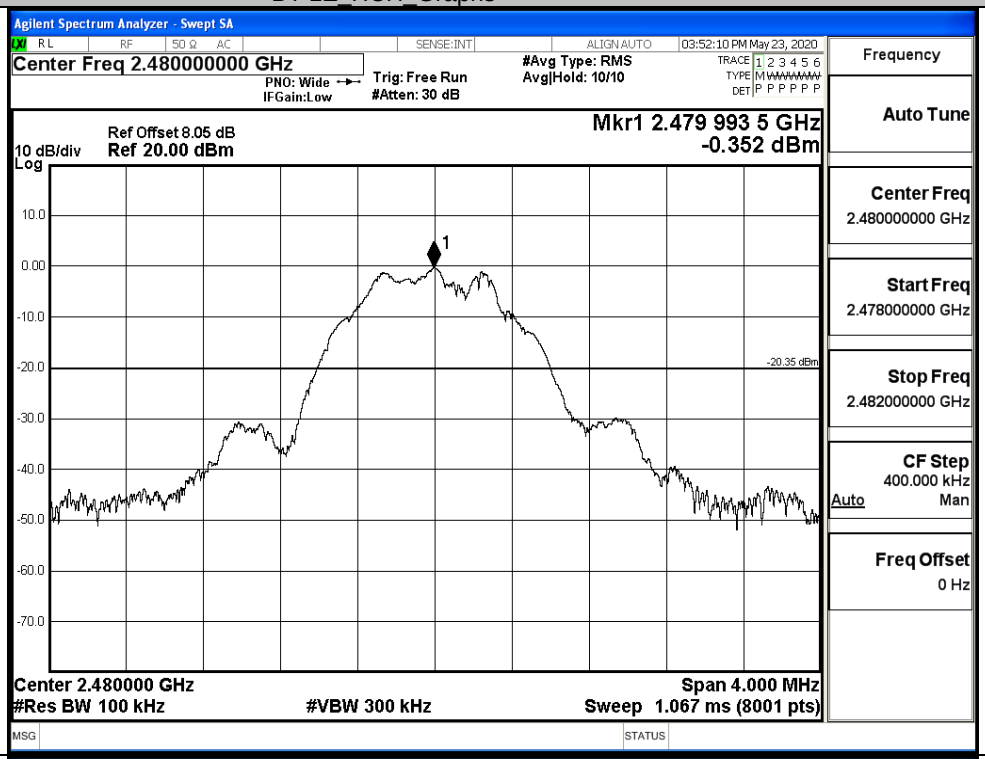
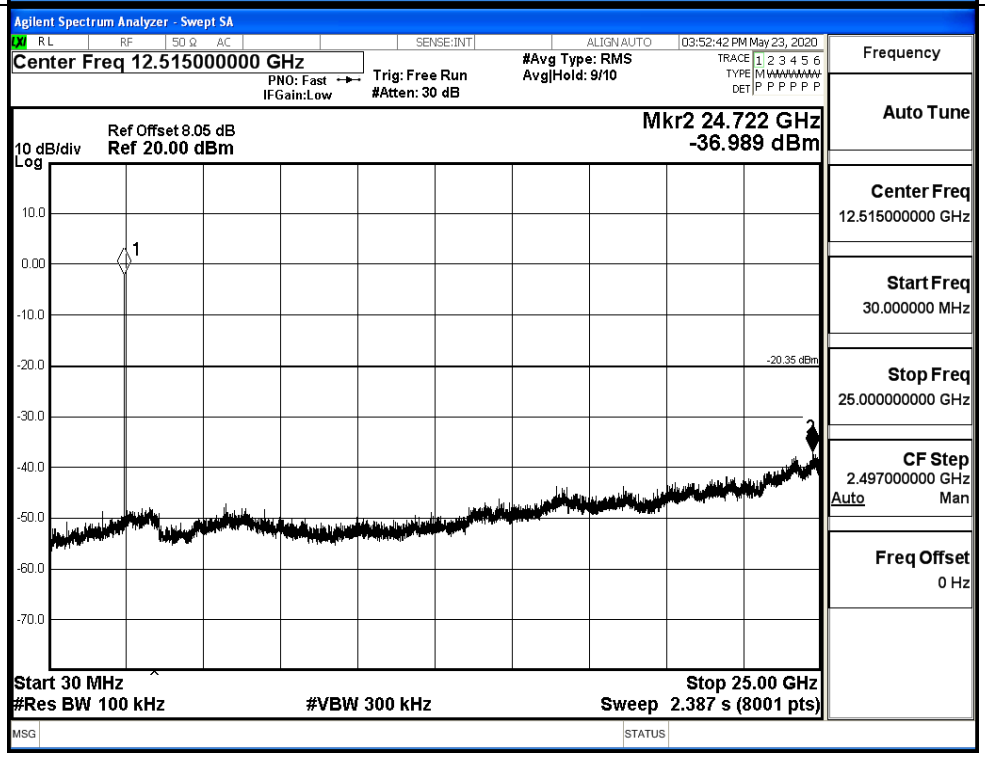
Pref/BT LE/LCH



Puw/BT LE/LCH

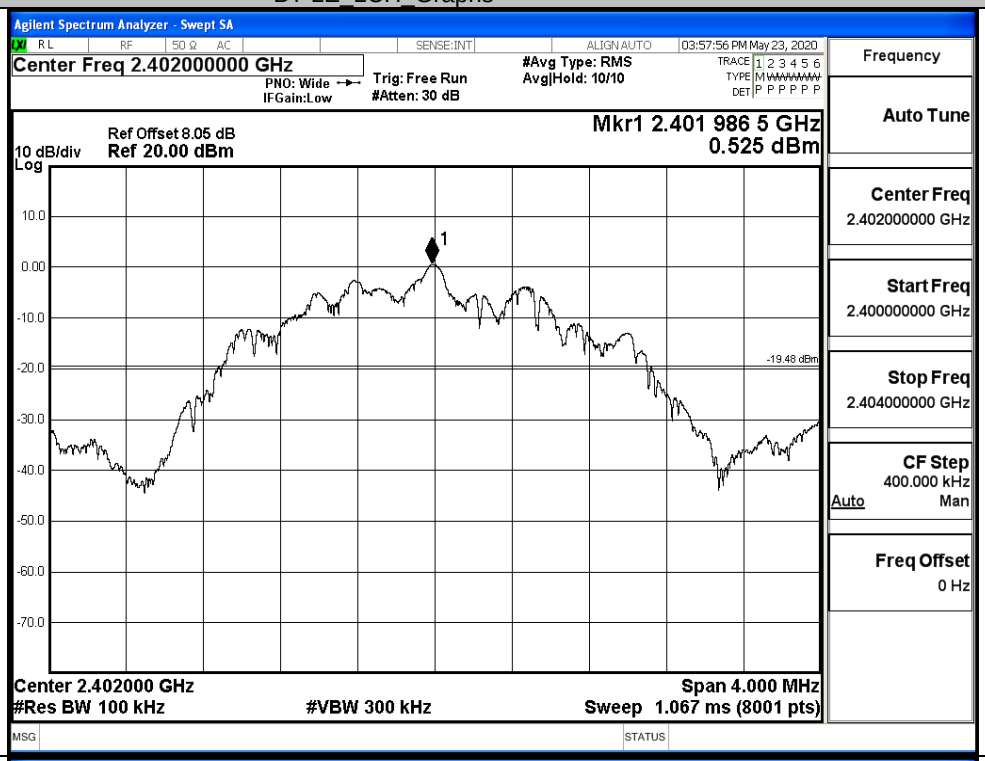
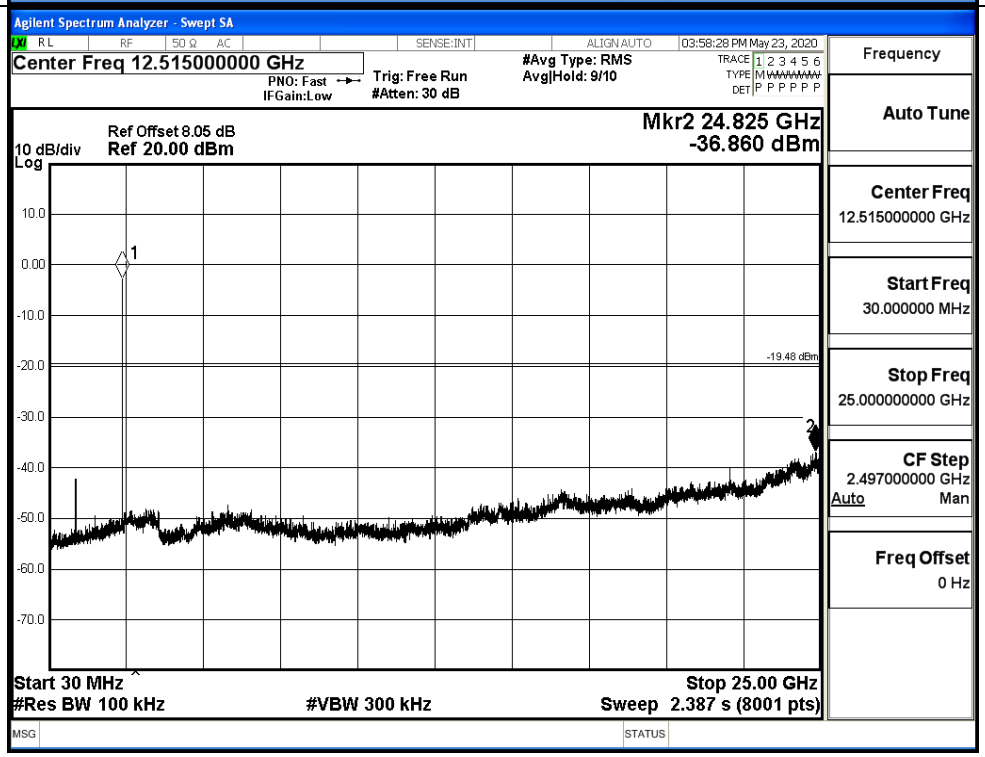


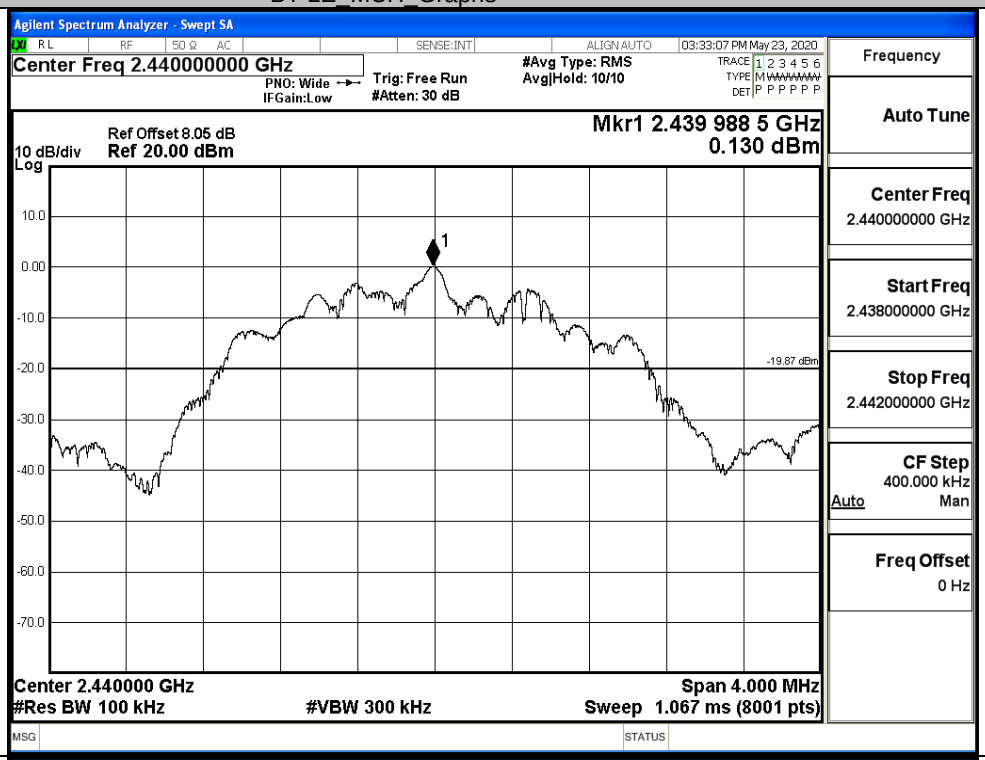
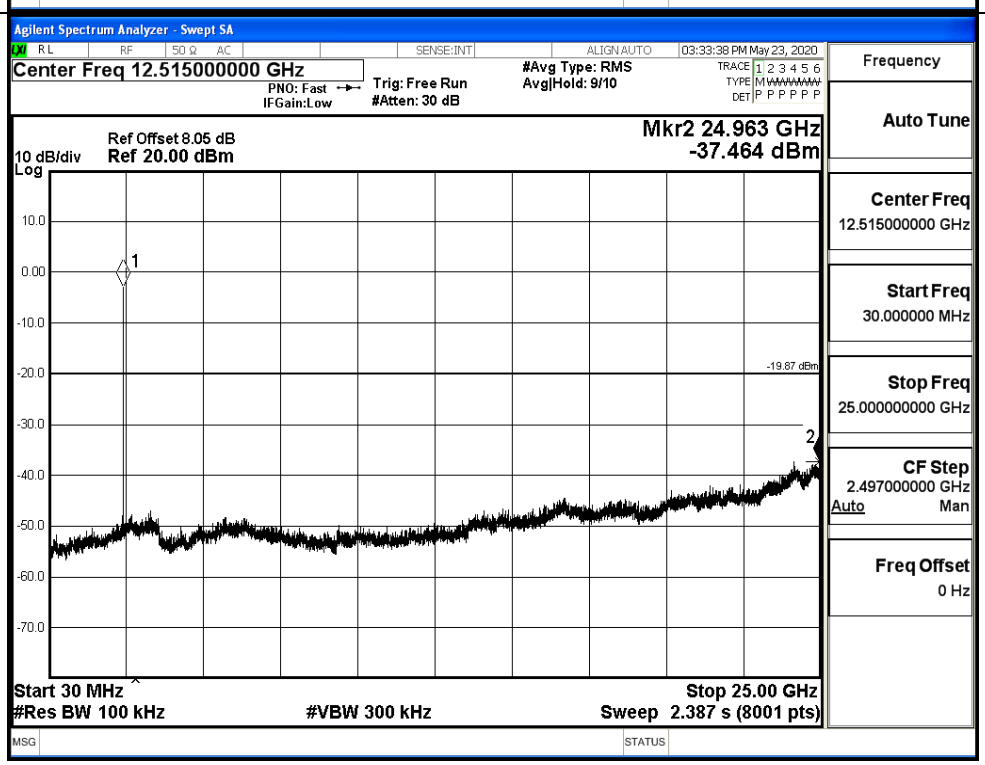
BT LE_MCH_Graphs	
Pref/BT LE/MCH	
Puw/BT LE/MCH	

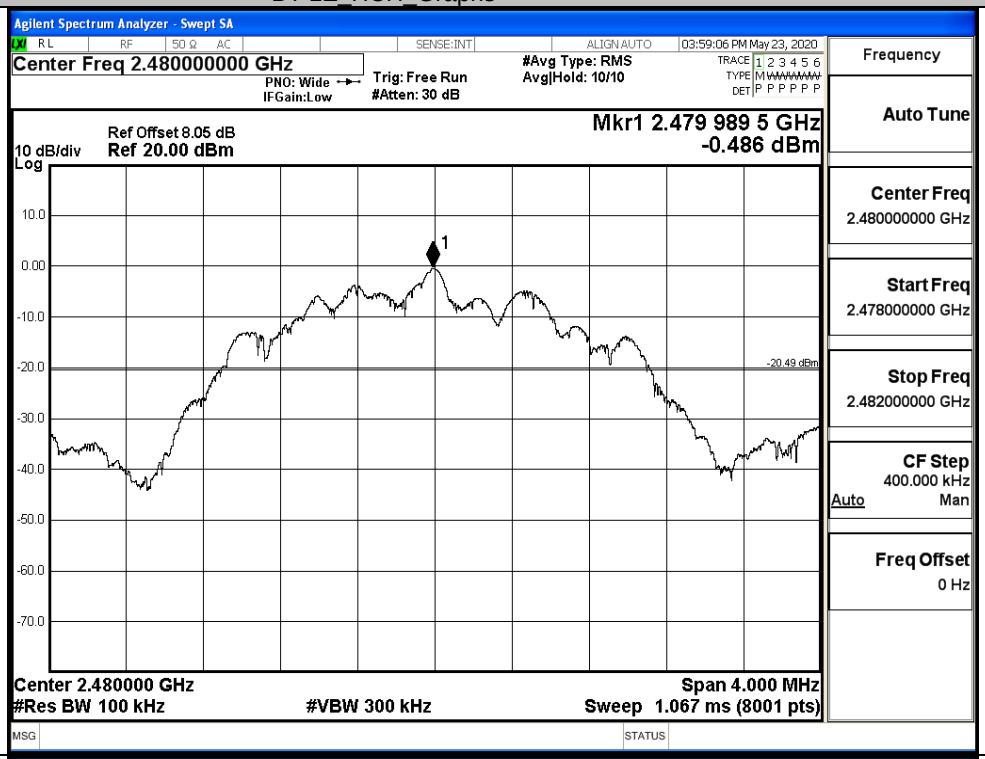
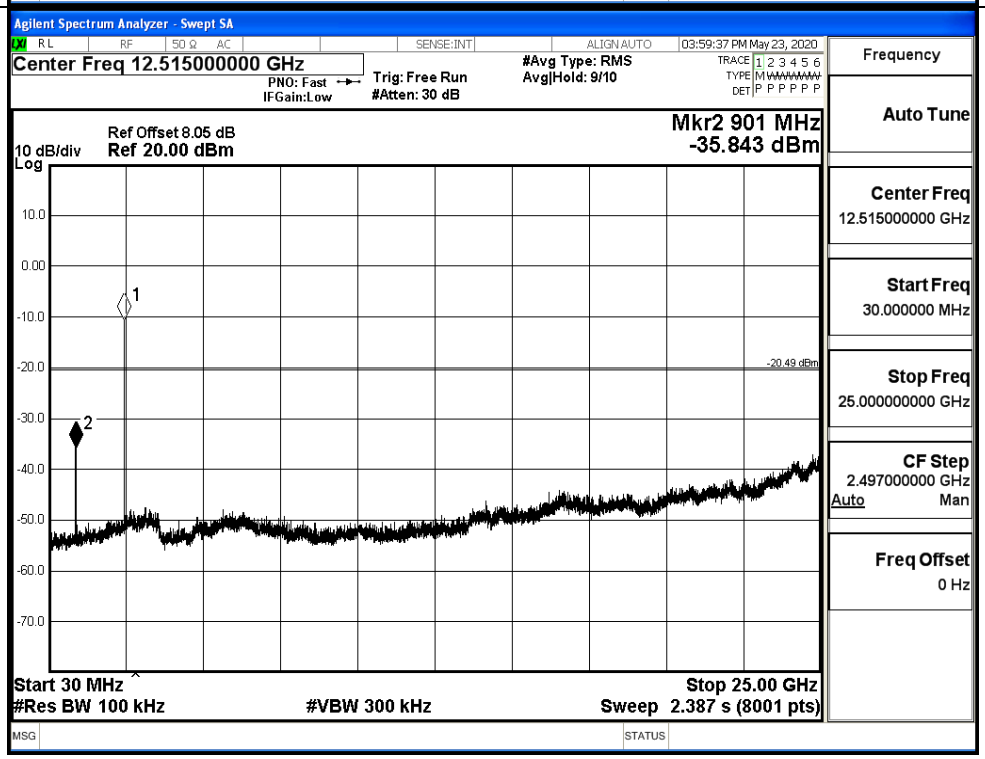
BT LE_HCH_Graphs	
Pref/BT LE/HCH	
Puw/BT LE/HCH	

BT 2LE

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.525	-36.860	-19.475	PASS
BT LE	MCH	0.13	-37.464	-19.870	PASS
BT LE	HCH	-0.486	-35.843	-20.486	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	

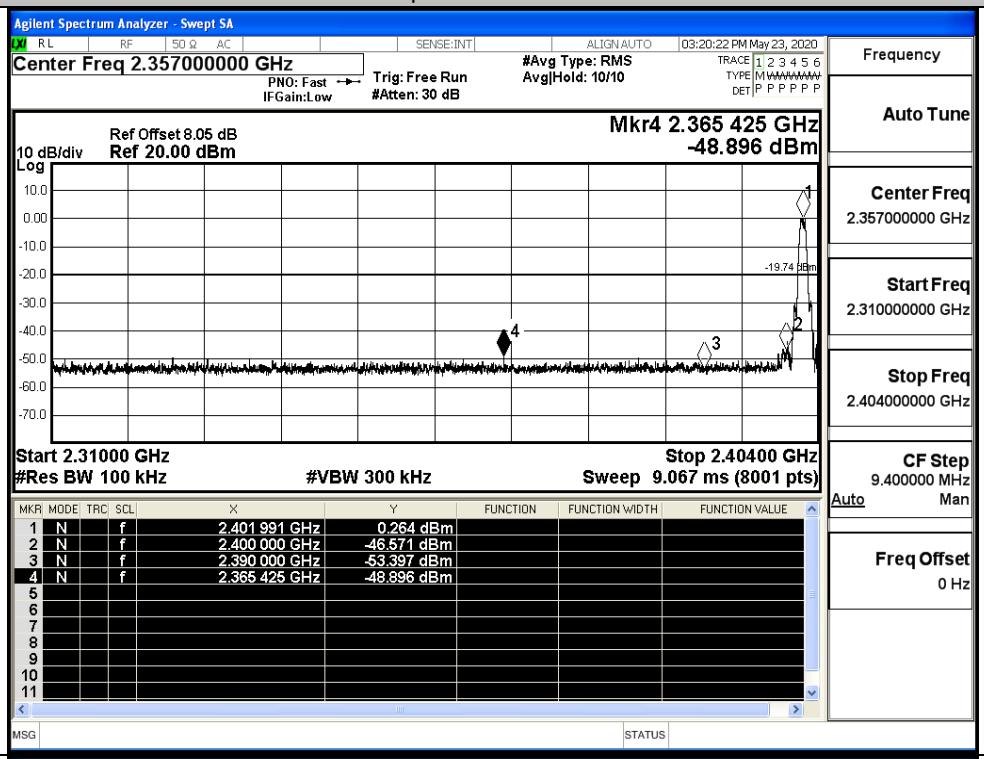
A.7 Band-edge for RF Conducted Emissions

BT LE

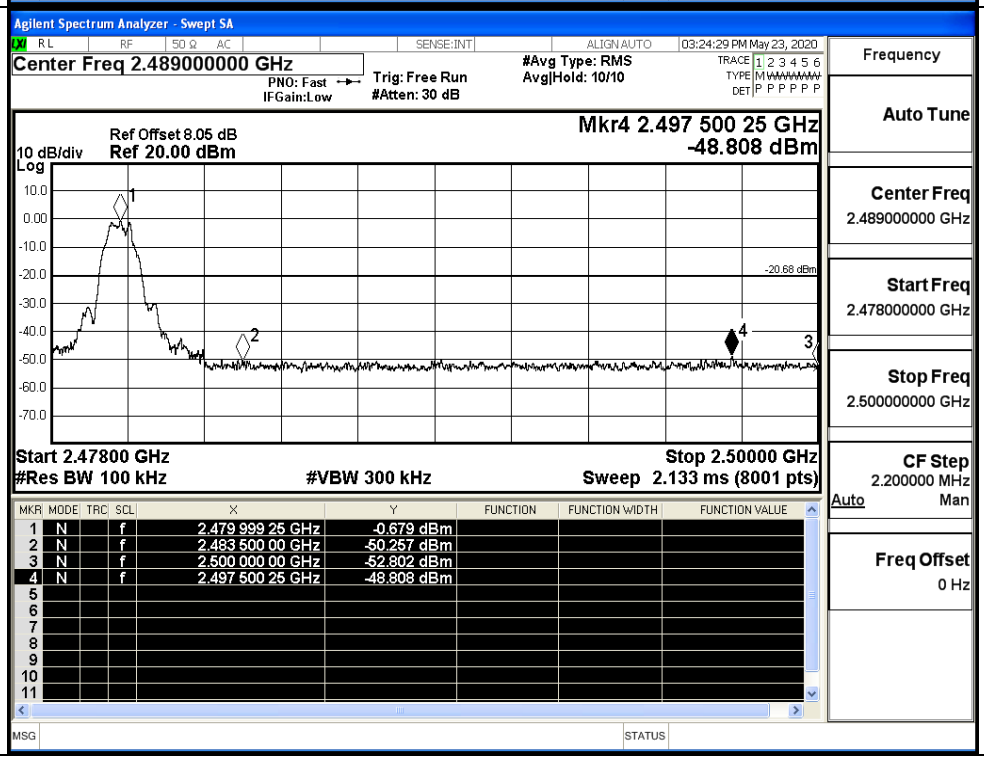
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.264	-48.896	-19.74	PASS
BT LE	HCH	-0.679	-48.808	-20.68	PASS

Test Graphs

LCH



HCH

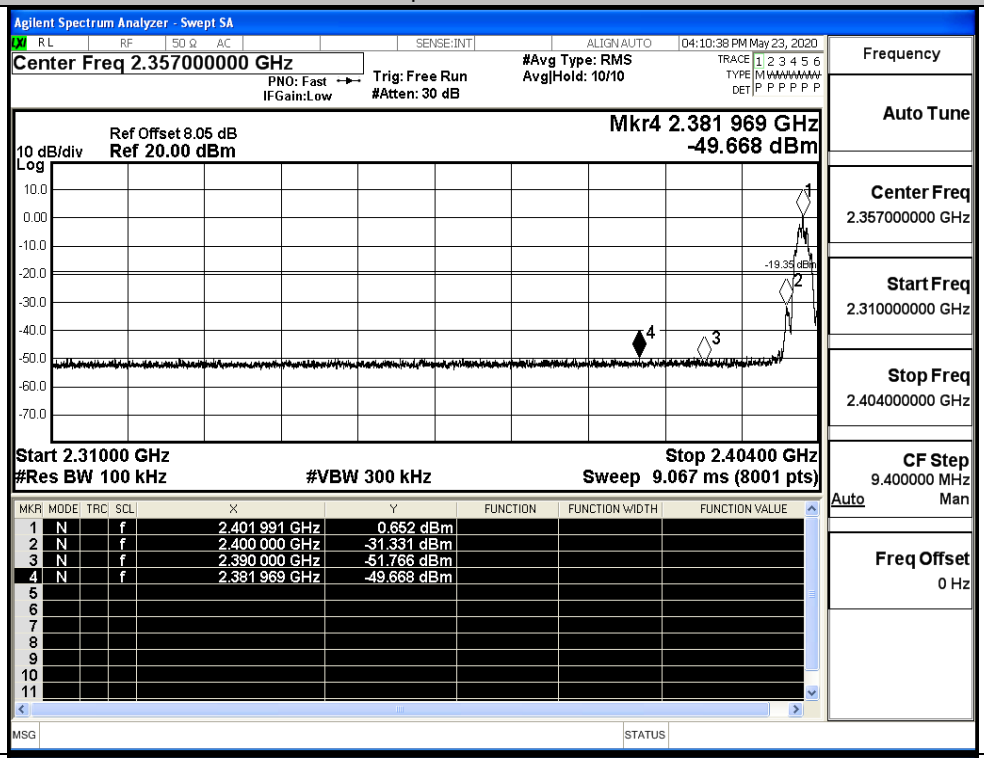


BT 2LE

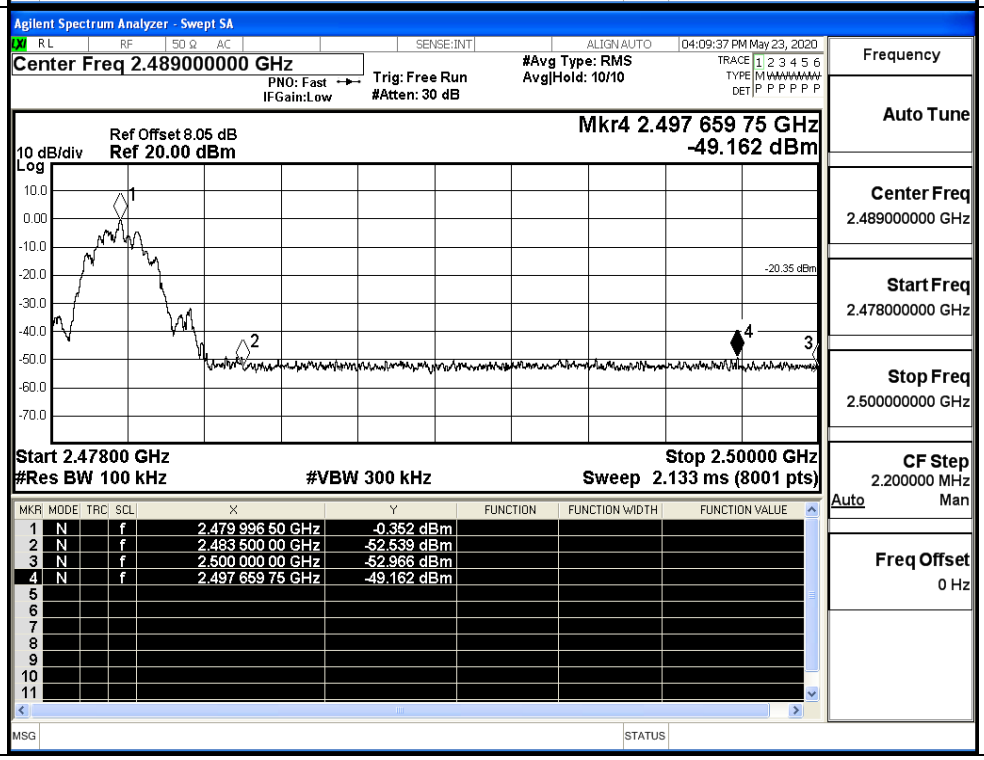
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.652	-49.668	-19.35	PASS
BT LE	HCH	-0.352	-49.162	-20.35	PASS

Test Graphs

LCH



HCH

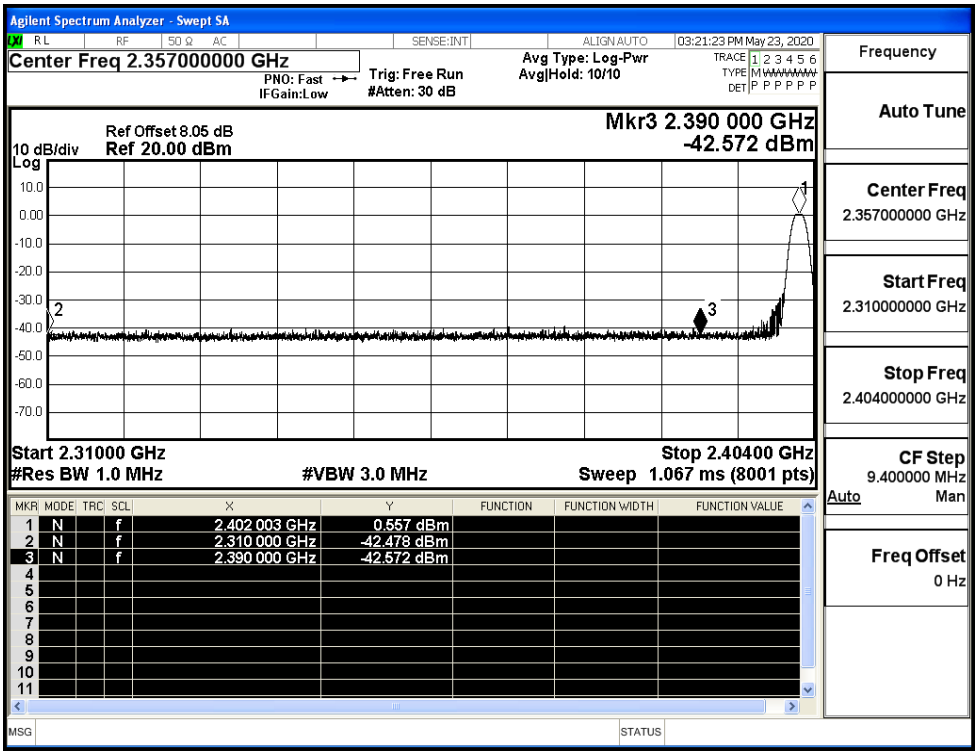


A.8 Restrict-band band-edge measurements

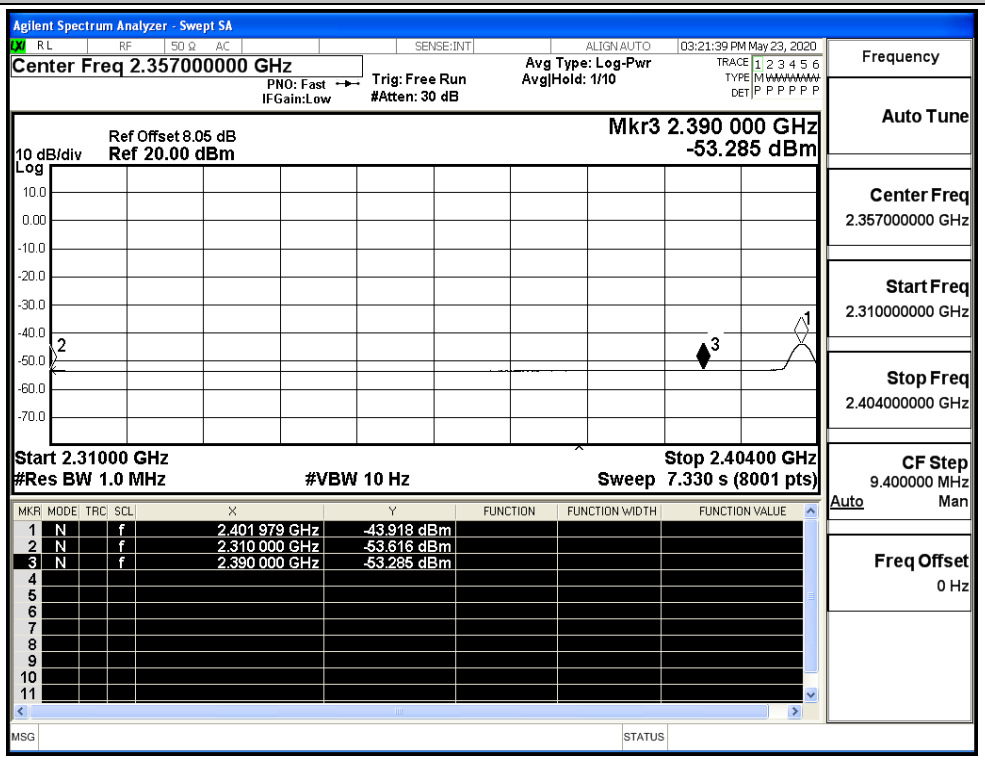
BT LE

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	-42.48	4.04	0	56.82	PEAK	74	PASS
		Ant1	2310.0	-53.62	4.04	0	45.68	AV	54	PASS
		Ant1	2390.0	-42.57	4.04	0	56.73	PEAK	74	PASS
		Ant1	2390.0	-53.29	4.04	0	46.01	AV	54	PASS
	2480	Ant1	2483.5	-42.67	4.04	0	56.63	PEAK	74	PASS
		Ant1	2483.5	-52.81	4.04	0	46.49	AV	54	PASS
		Ant1	2500.0	-42.08	4.04	0	57.22	PEAK	74	PASS
		Ant1	2500.0	-52.64	4.04	0	46.66	AV	54	PASS

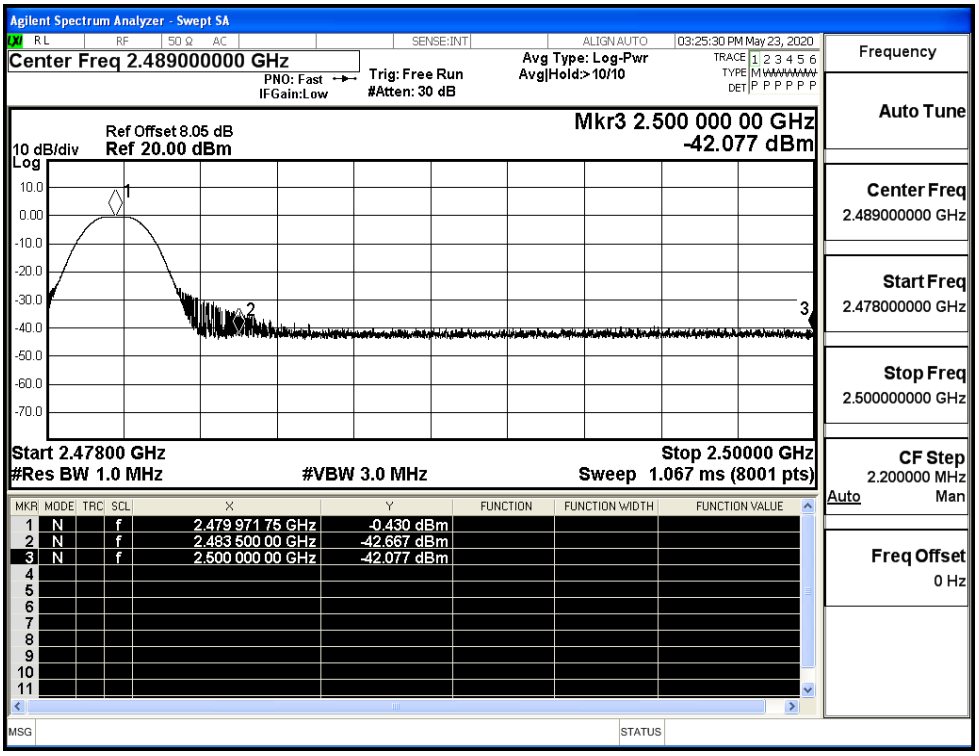
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



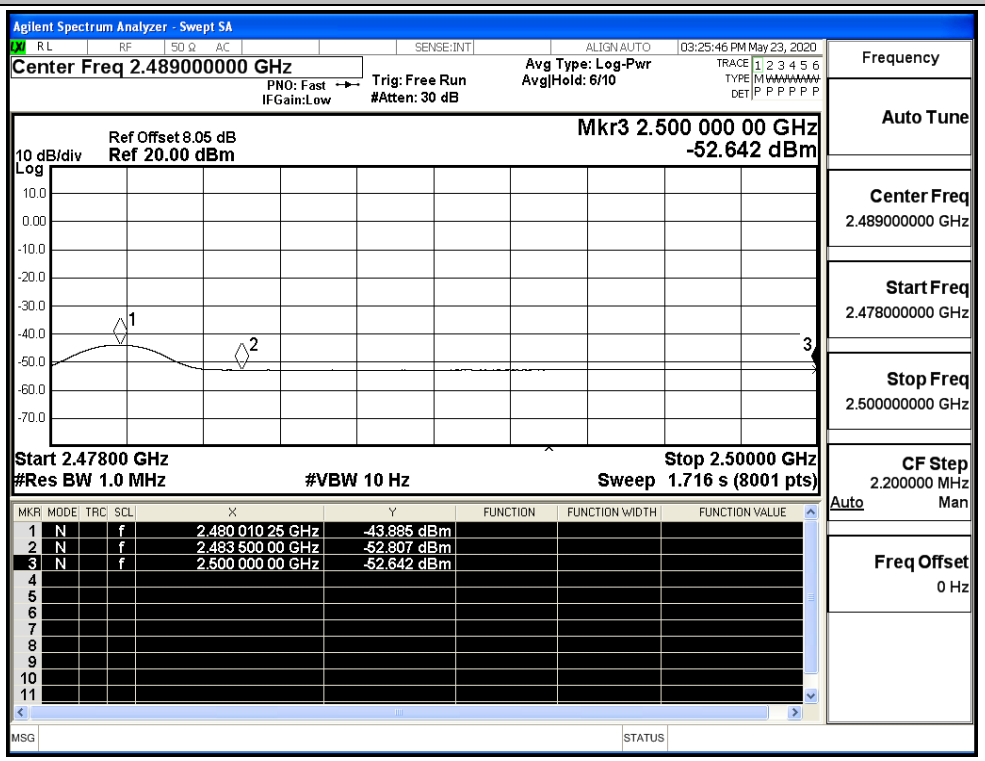
Restrict-band band-edge measurements_BT LE_2402_Ant1_AV



Restrict-band band-edge measurements_BT LE_2480_Ant1_PEAK



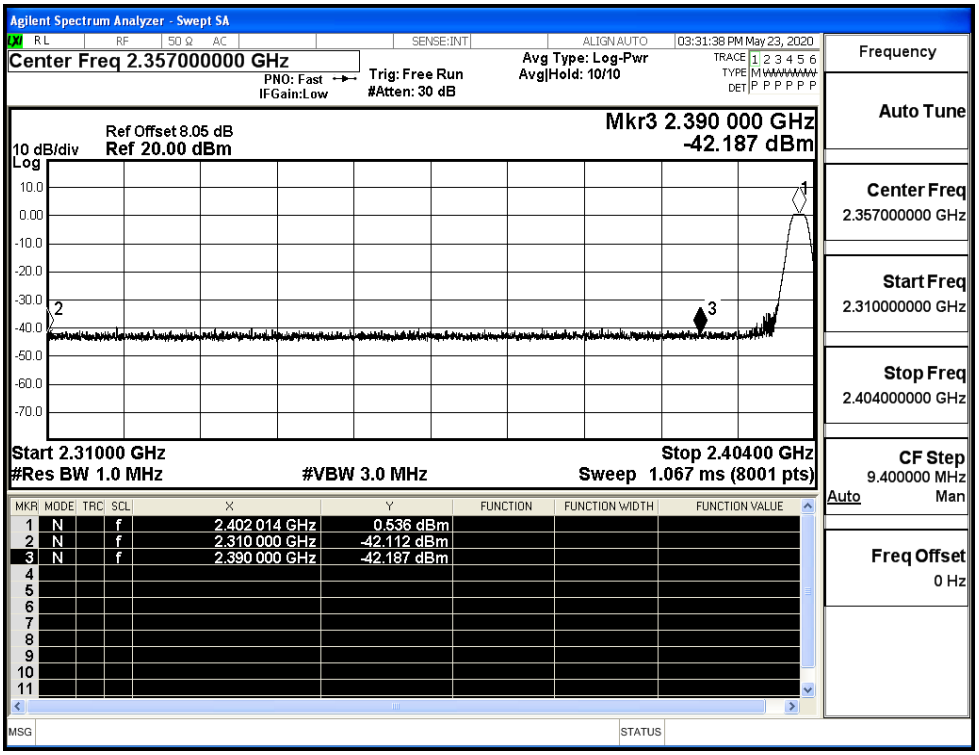
Restrict-band band-edge measurements_BT LE_2480_Ant1_AV



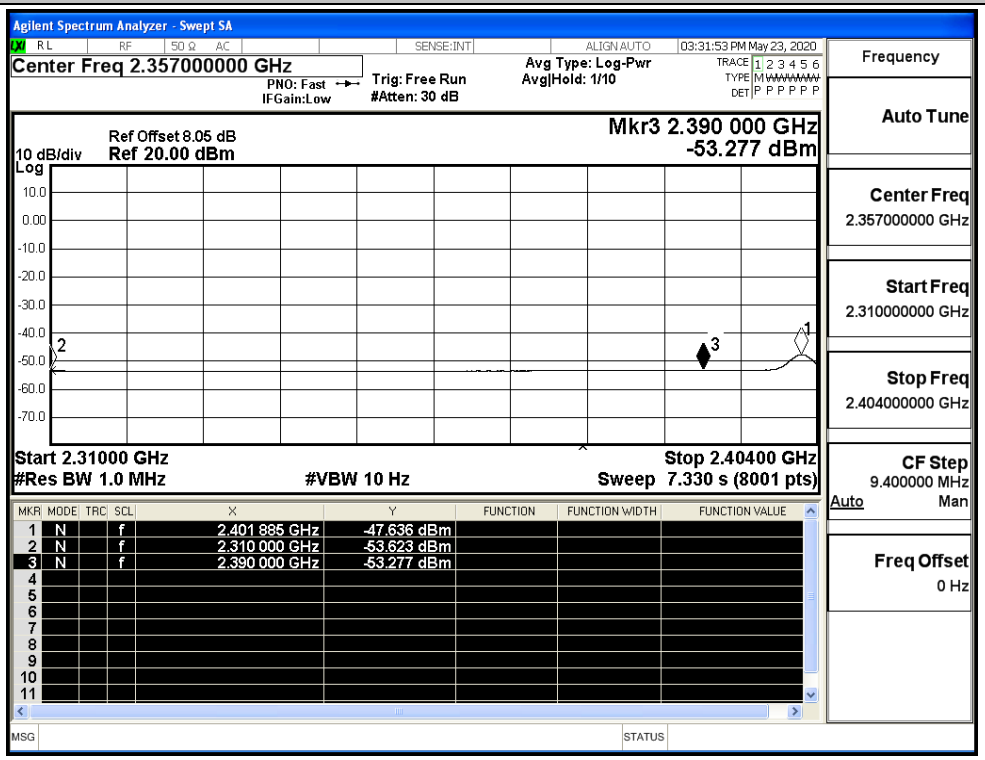
BT 2LE

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	-42.11	4.04	0	57.19	PEAK	74	PASS
		Ant1	2310.0	-53.62	4.04	0	45.68	AV	54	PASS
		Ant1	2390.0	-42.19	4.04	0	57.11	PEAK	74	PASS
		Ant1	2390.0	-53.28	4.04	0	46.02	AV	54	PASS
	2480	Ant1	2483.5	-39.09	4.04	0	60.21	PEAK	74	PASS
		Ant1	2483.5	-52.72	4.04	0	46.58	AV	54	PASS
		Ant1	2500.0	-41.17	4.04	0	58.13	PEAK	74	PASS
		Ant1	2500.0	-52.65	4.04	0	46.65	AV	54	PASS

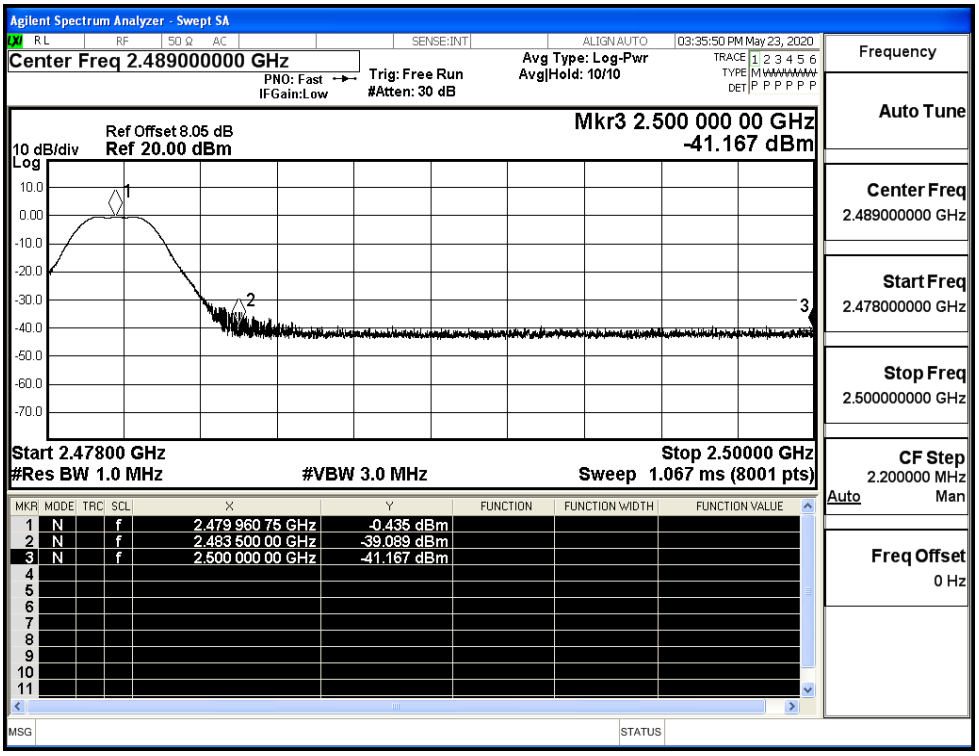
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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