Appendix A

RF Test Data for BT 4.1(BLE) (Conducted Measurement)

Product Name: TPMS

Trade Mark: BIT

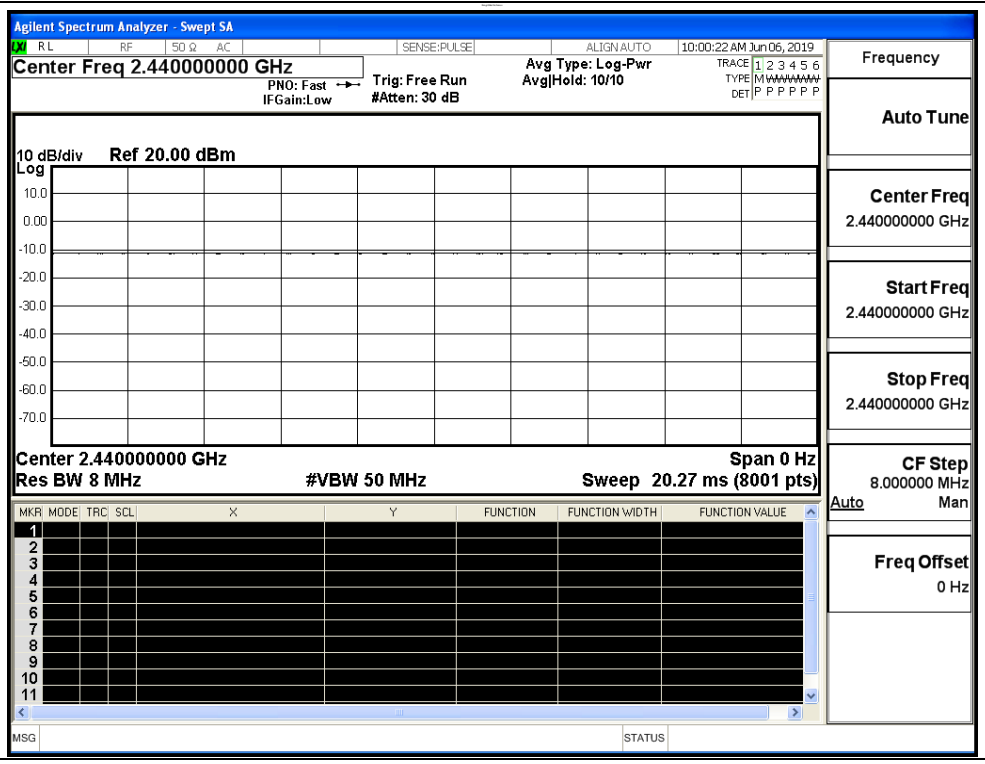
Test Model: TPMS Sensor

Environmental Conditions

Temperature:	23.6 ° C
Relative Humidity:	53.9%
ATM Pressure:	100.0 kPa
Test Engineer:	LI HUAN
Supervised by:	WangChuang

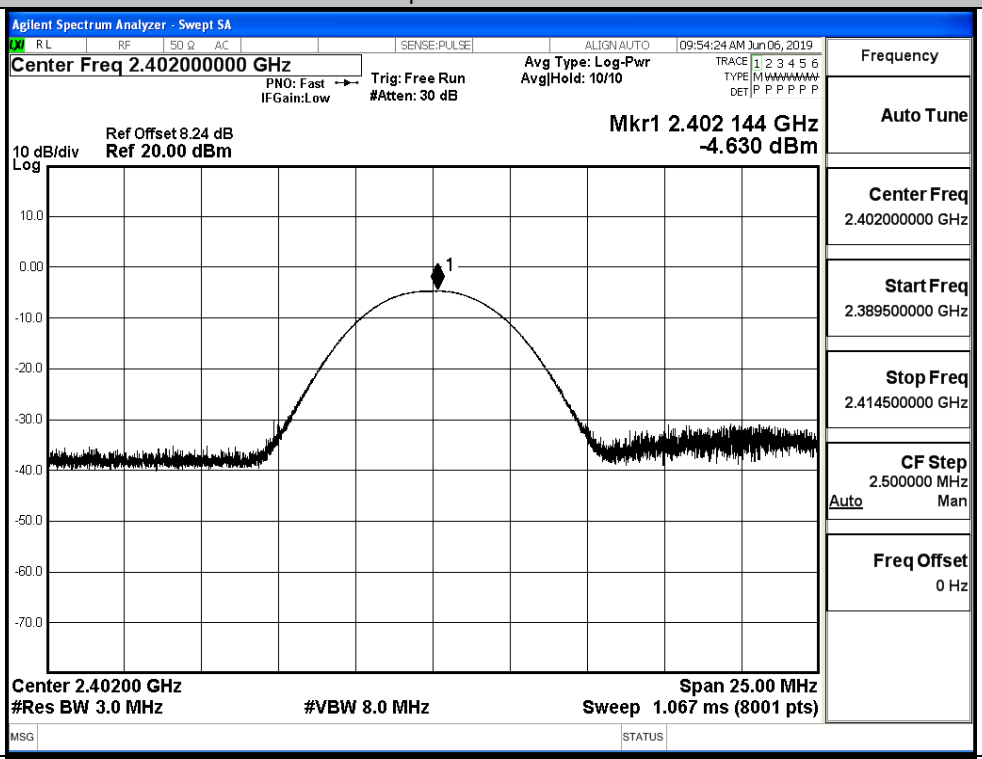
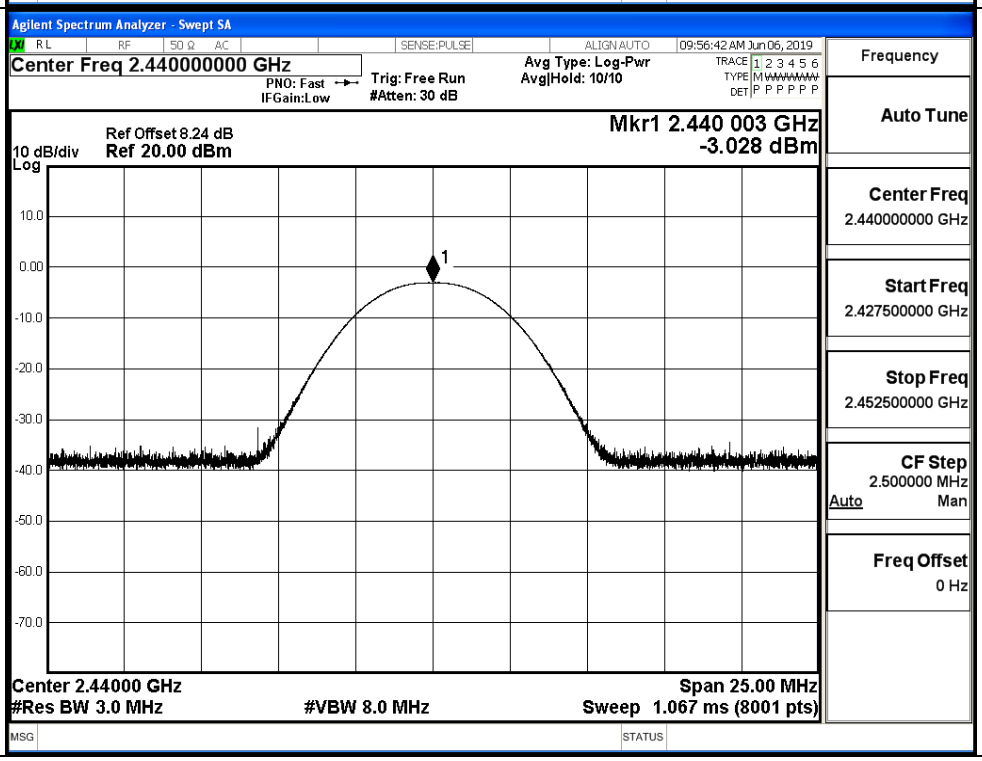
A.1 Duty Cycle

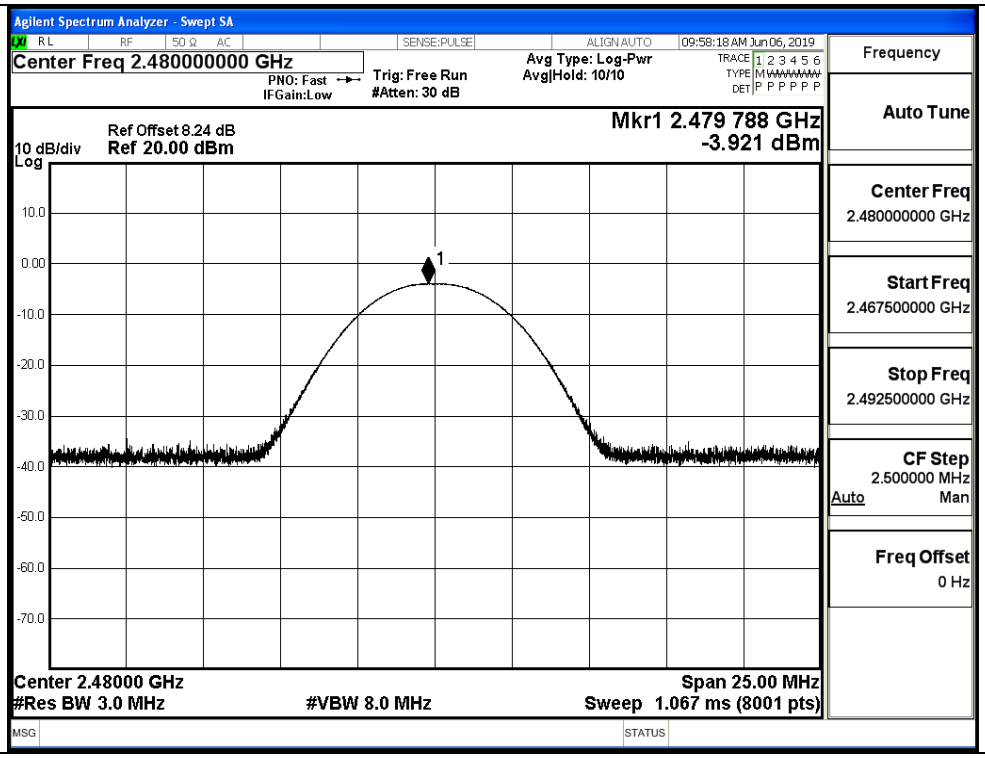
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS



A.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-4.63	30	PASS
BT LE	MCH	-3.028	30	PASS
BT LE	HCH	-3.921	30	PASS

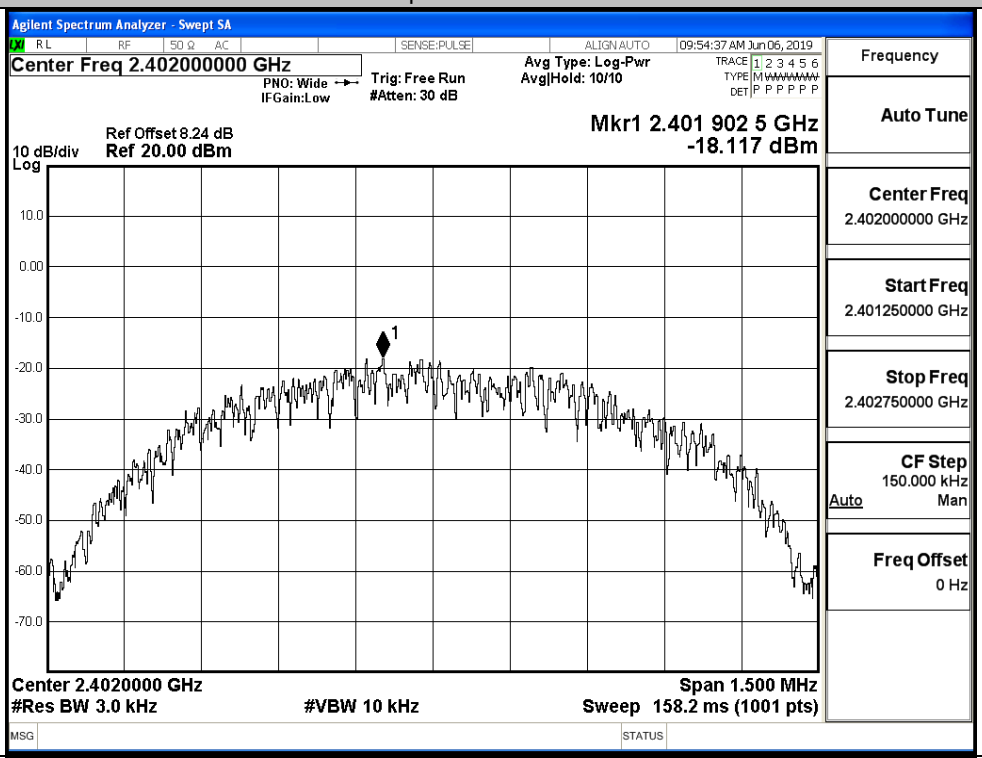
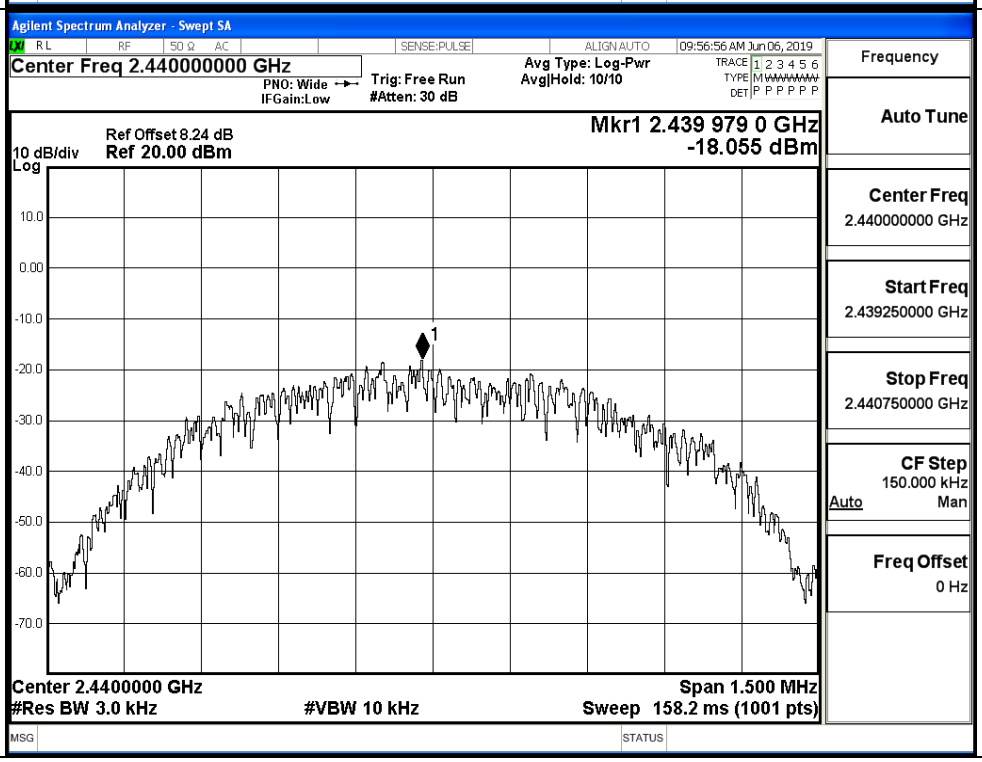
Test Graphs		
LCH		
MCH		

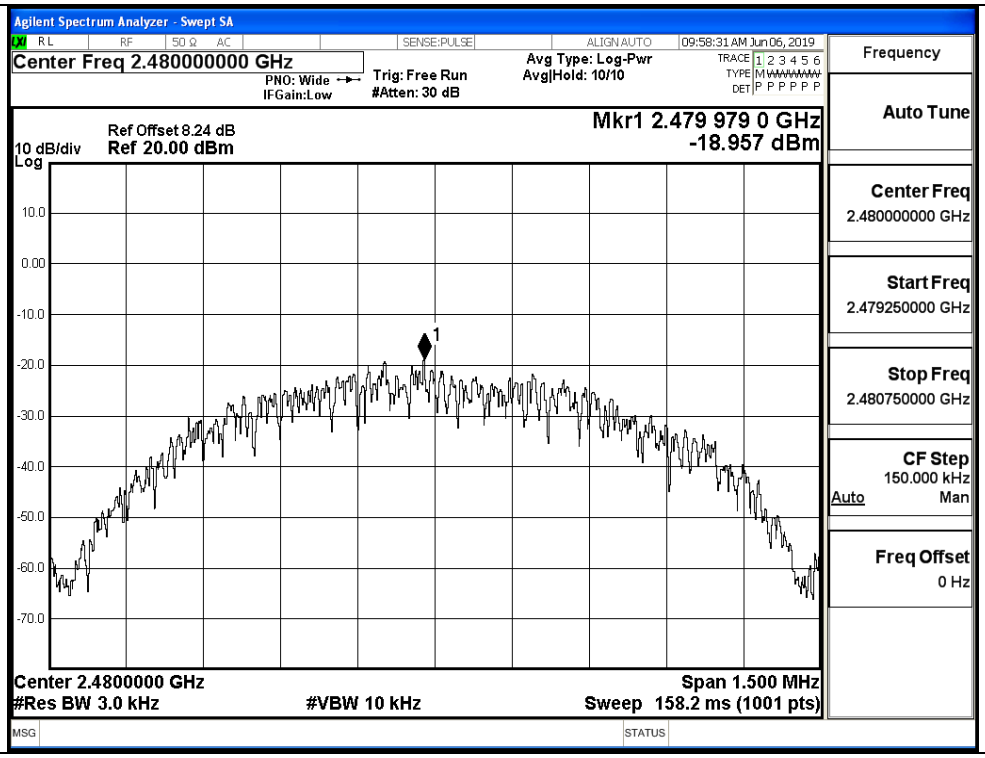
HCH		

Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
09:58:18 AM Jun 06, 2019
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
DET P P P P P
Ref Offset 8.24 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 788 GHz
-3.921 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

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-18.117	8	PASS
BT LE	MCH	-18.055	8	PASS
BT LE	HCH	-18.957	8	PASS

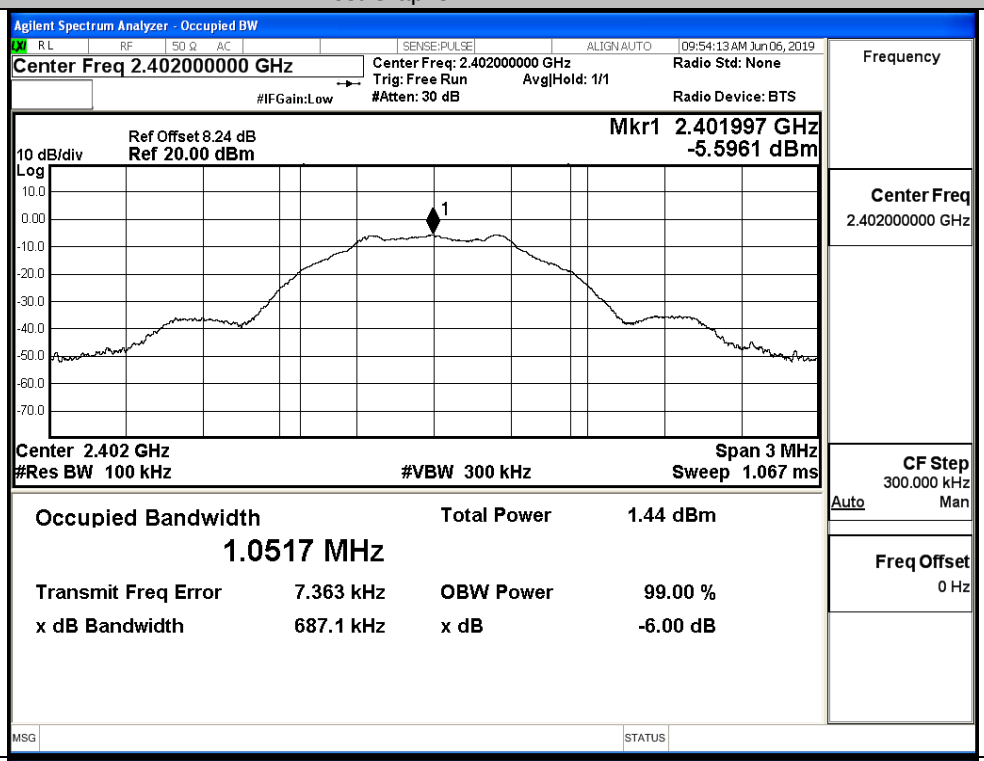
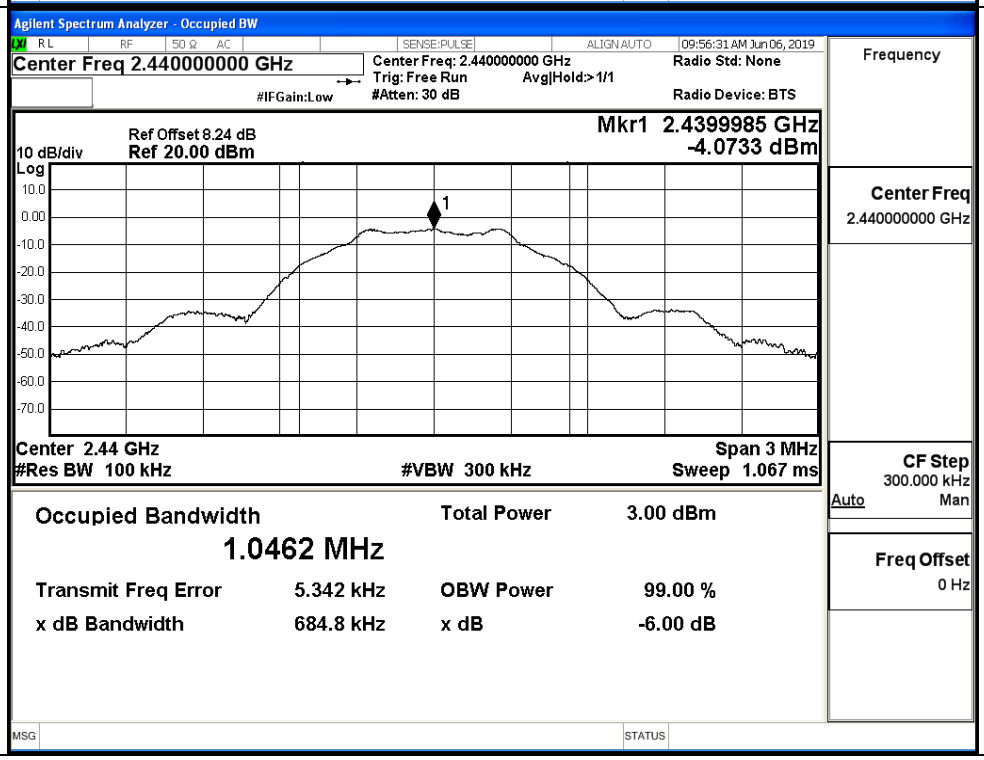
Test Graphs		
LCH		
MCH		

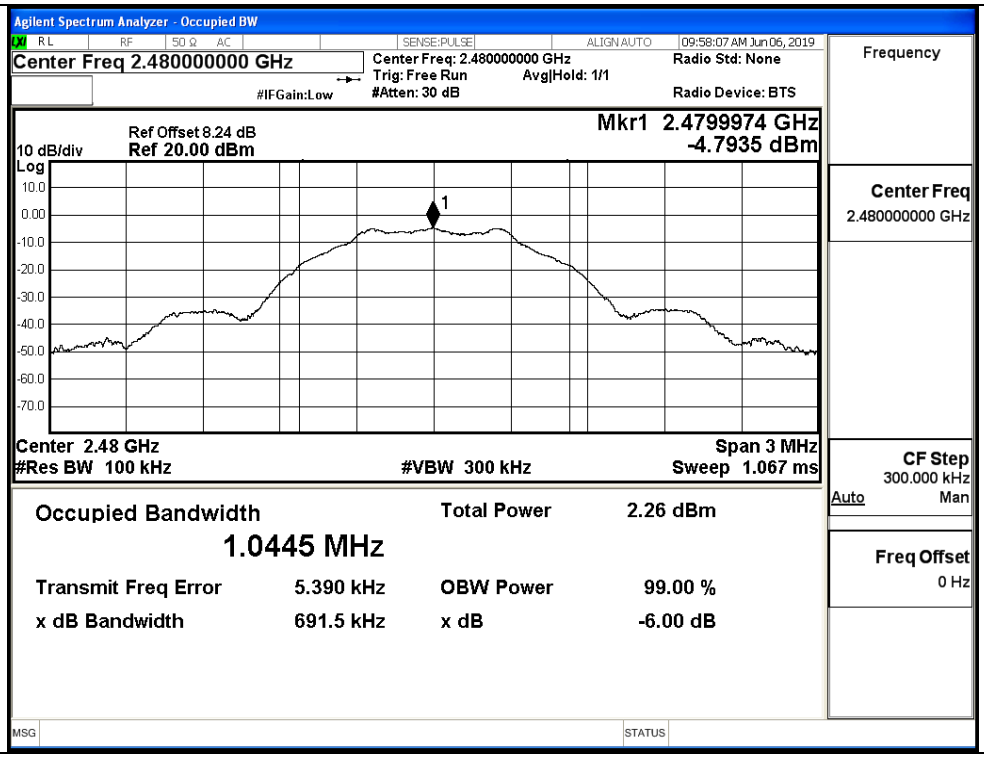
HCH		

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
09:58:31 AM Jun 06, 2019
Ref Offset 8.24 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 979 0 GHz
-18.957 dBm
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.500 MHz
Sweep 158.2 ms (1001 pts)
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

A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6871	≥0.5	PASS
BT LE	MCH	0.6848	≥0.5	PASS
BT LE	HCH	0.6915	≥0.5	PASS

Test Graphs		
LCH		
MCH		

HCH		

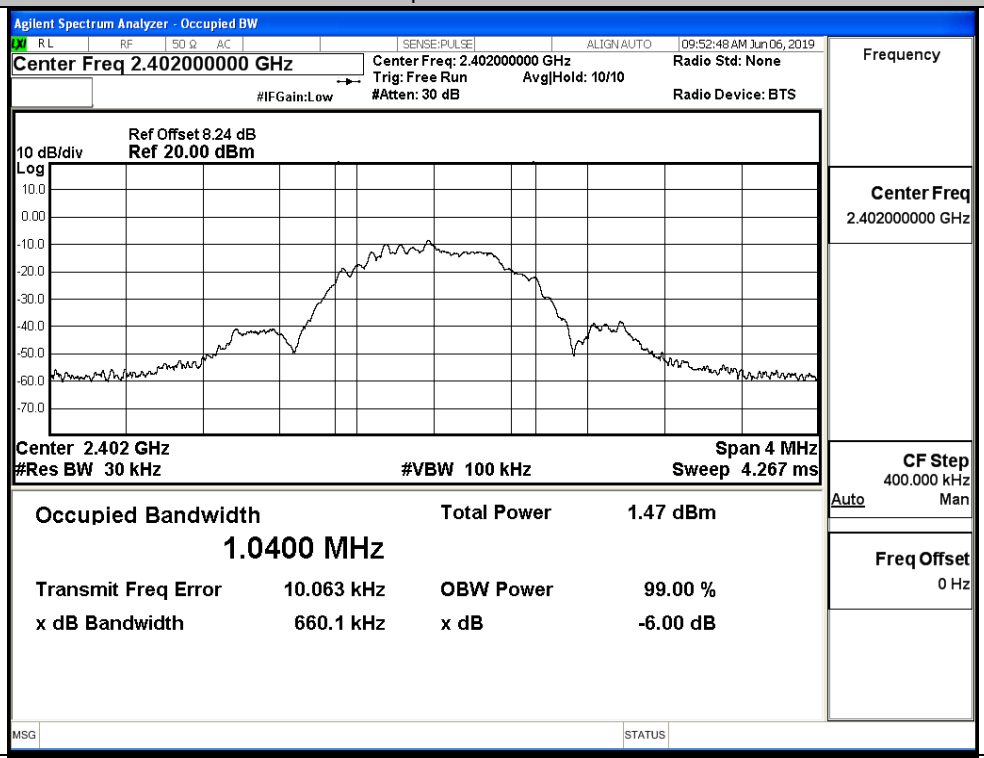
Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
09:58:07 AM Jun 06, 2019
Ref Offset 8.24 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.4799974 GHz
-4.7935 dBm
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1.067 ms
Occupied Bandwidth
1.0445 MHz
Total Power 2.26 dBm
Transmit Freq Error 5.390 kHz
OBW Power 99.00 %
x dB Bandwidth 691.5 kHz
x dB -6.00 dB
Frequency
Center Freq
2.480000000 GHz
CF Step
300.000 kHz
Auto Man
Freq Offset
0 Hz
MSG
STATUS

A.5 Occupied Bandwidth

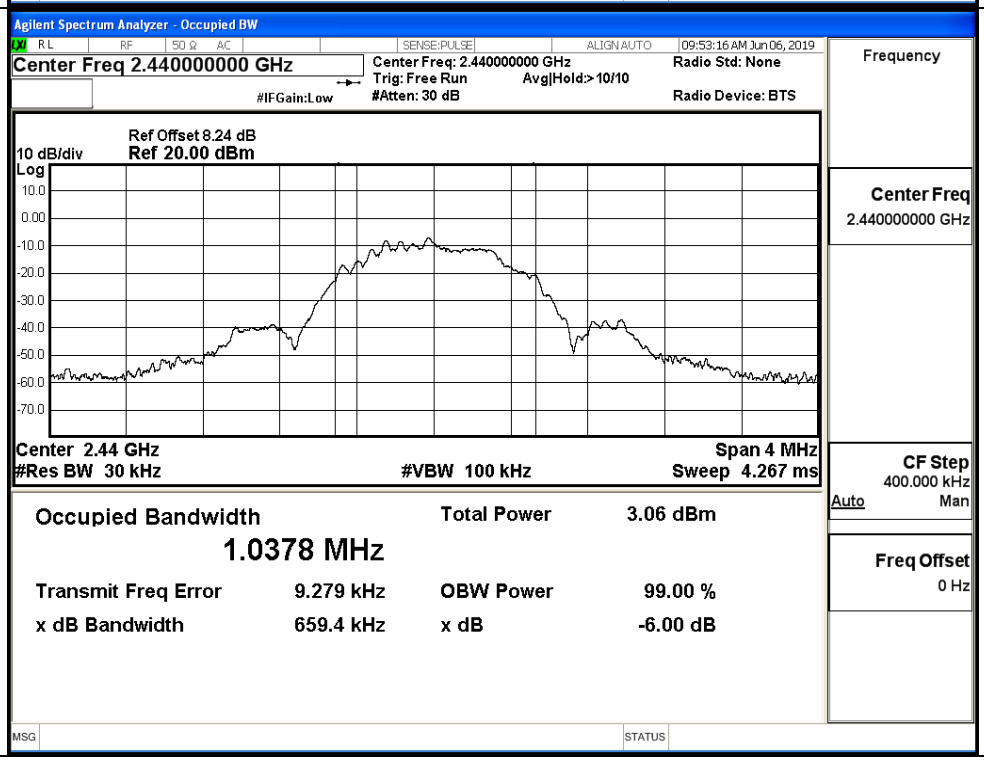
Mode	Channel	Occupied Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	1.0400	No Limit	PASS
BT LE	MCH	1.0378	No Limit	PASS
BT LE	HCH	1.0344	No Limit	PASS

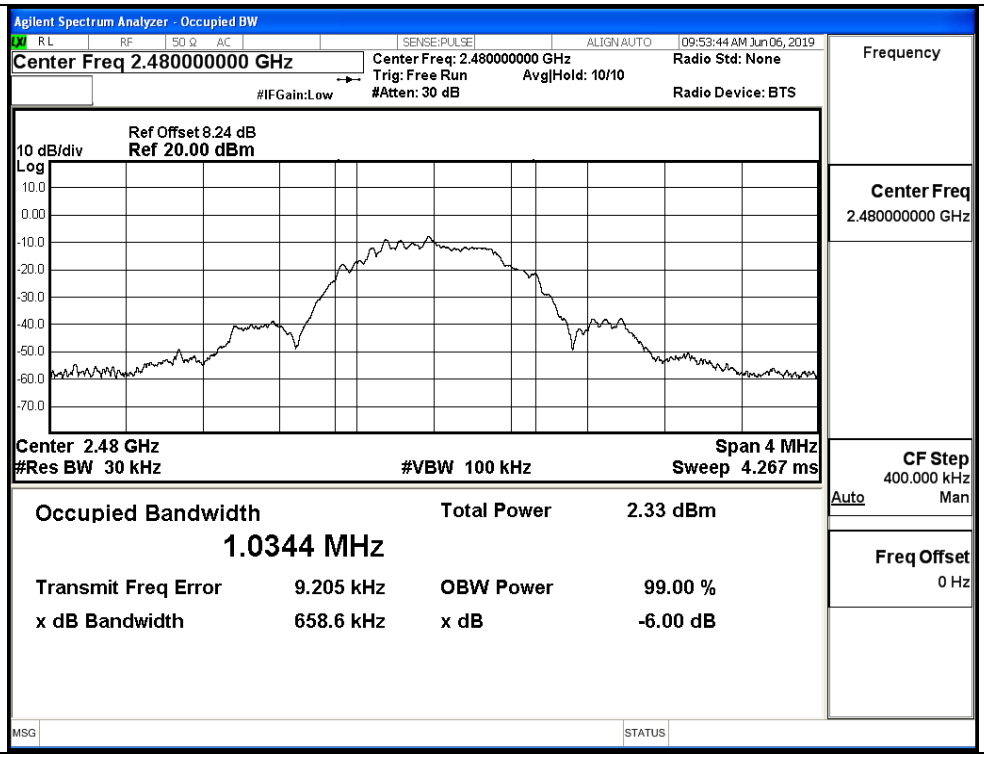
Test Graphs

LCH



MCH

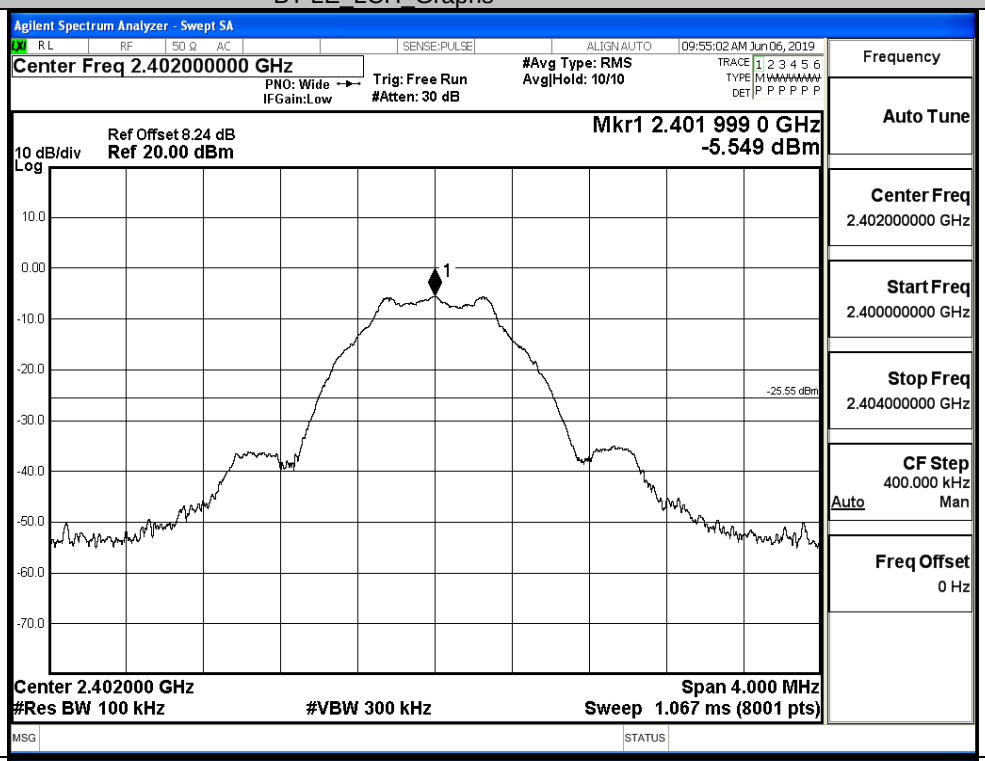
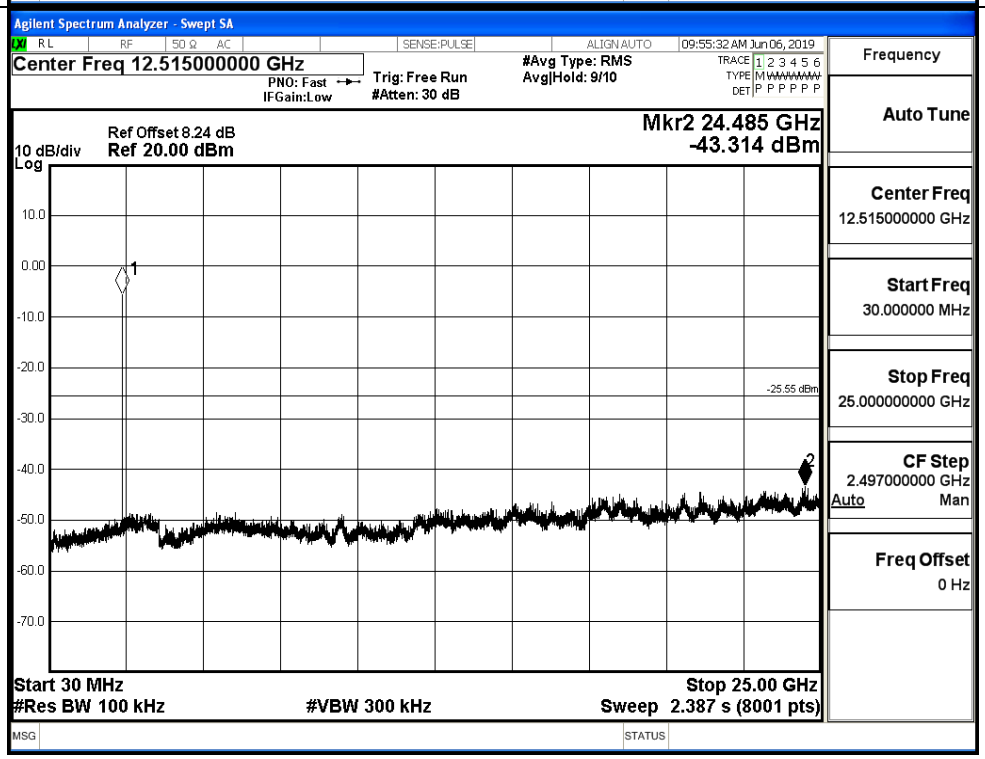


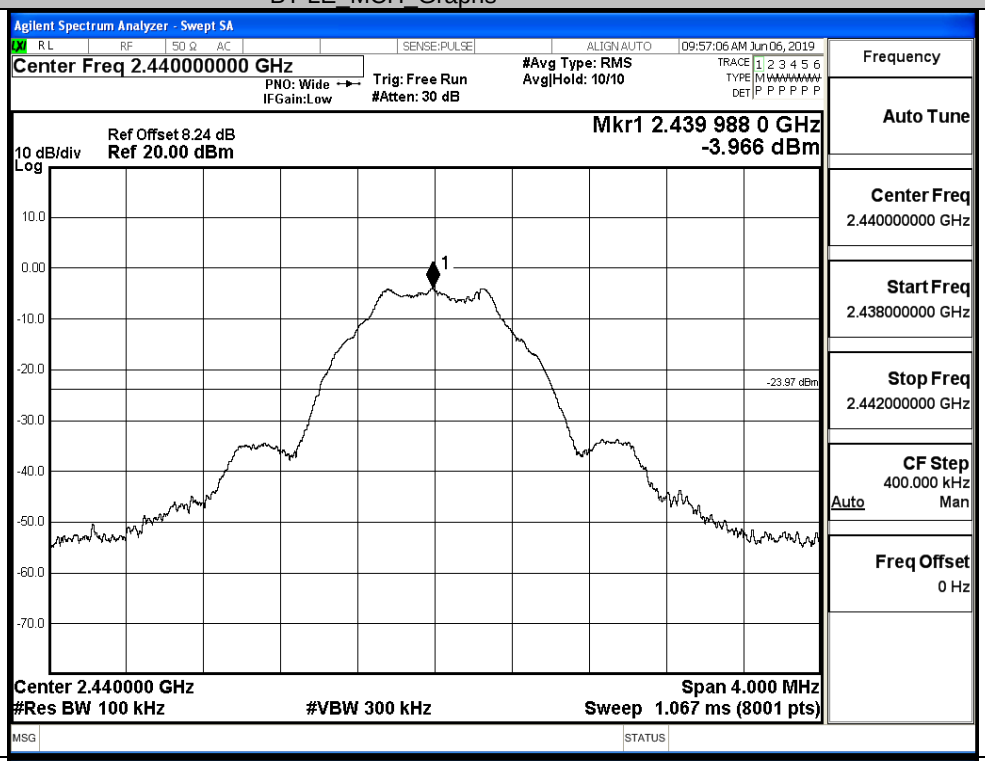
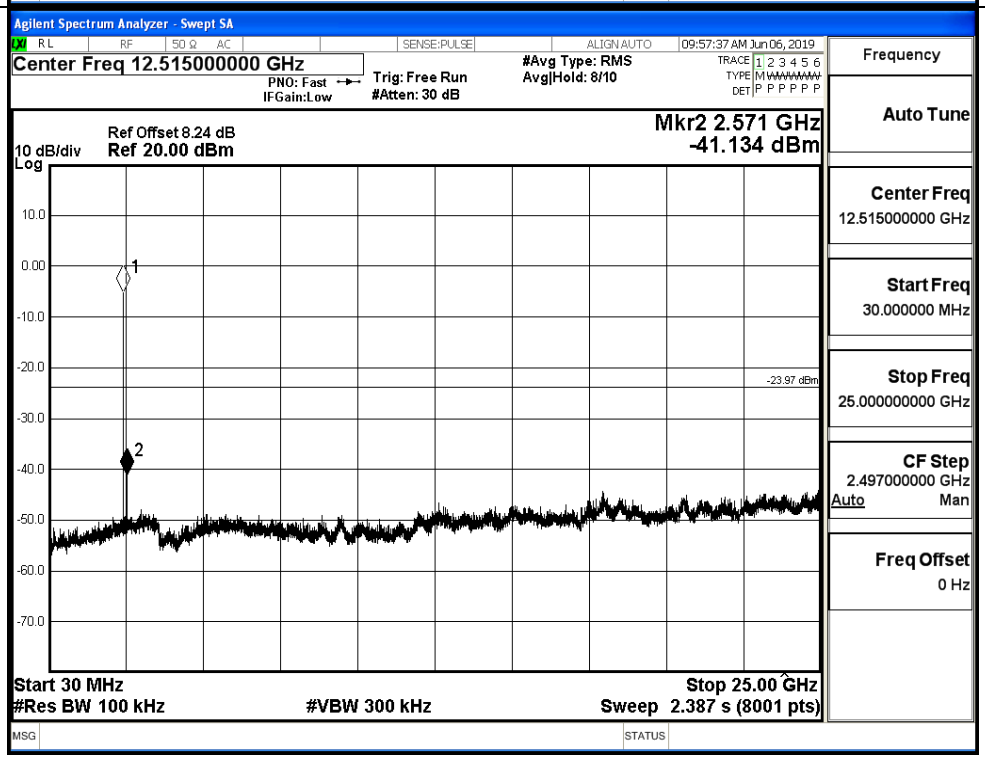
HCH		

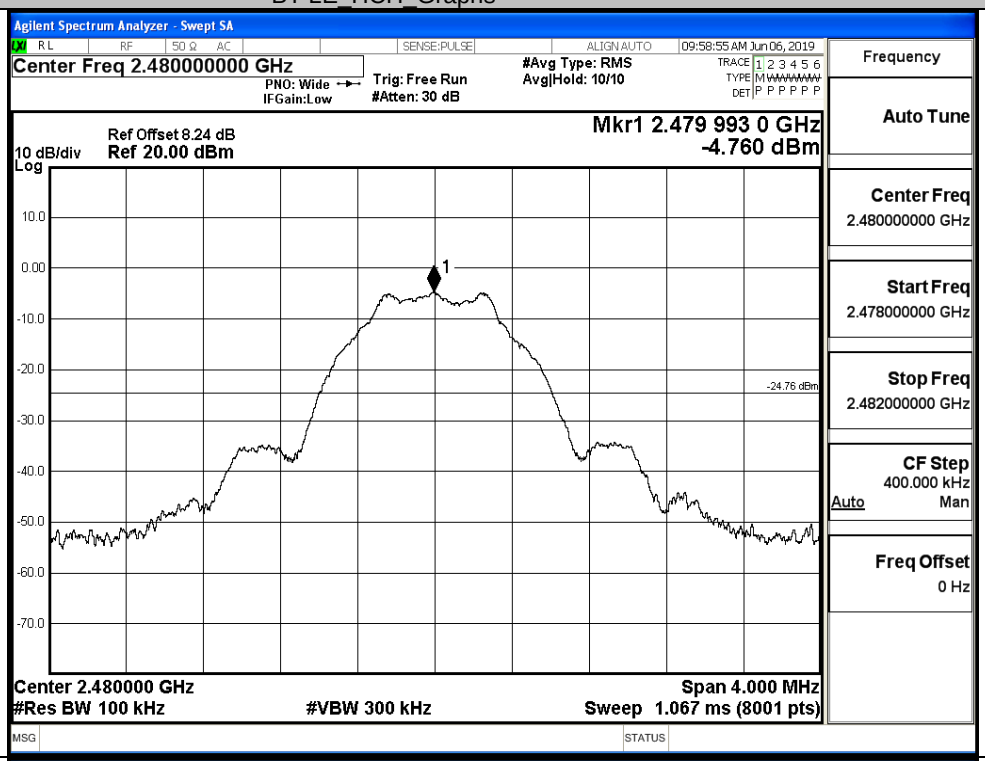
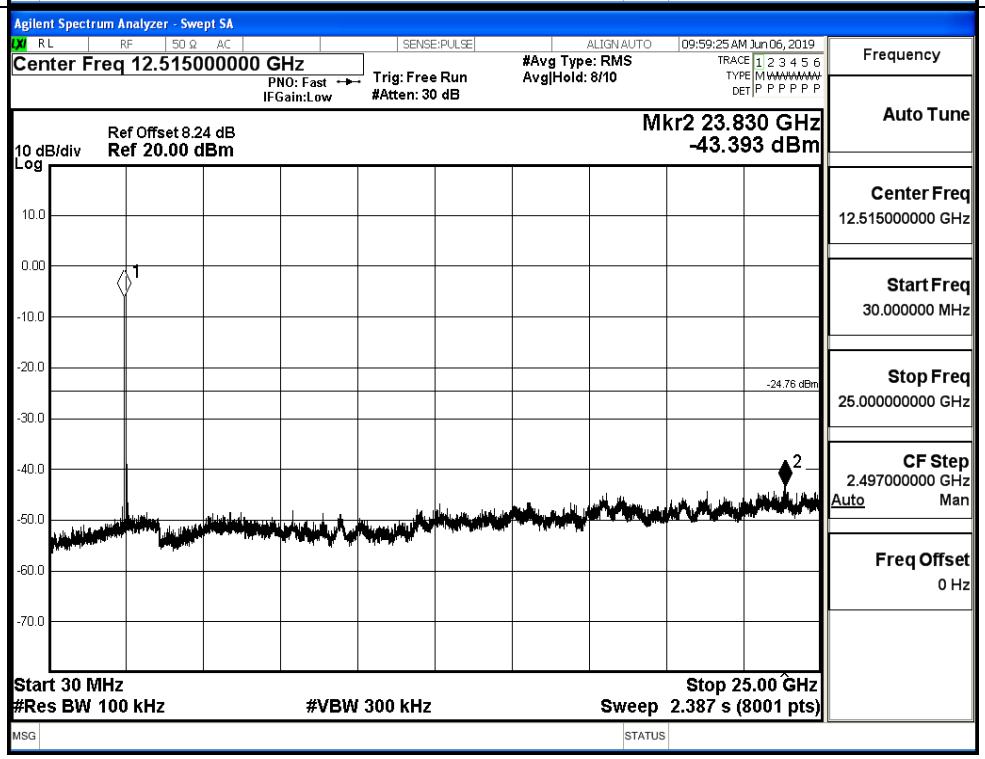
Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
09:53:44 AM Jun 06, 2019
Ref Offset 8.24 dB
10 dB/div
Ref 20.00 dBm
Log
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 4 MHz
Sweep 4.267 ms
Occupied Bandwidth
1.0344 MHz
Total Power 2.33 dBm
Transmit Freq Error 9.205 kHz
OBW Power 99.00 %
x dB Bandwidth 658.6 kHz
x dB -6.00 dB
Frequency
Center Freq
2.480000000 GHz
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-5.549	-43.314	-25.549	PASS
BT LE	MCH	-3.966	-41.134	-23.966	PASS
BT LE	HCH	-4.76	-43.393	-24.760	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		

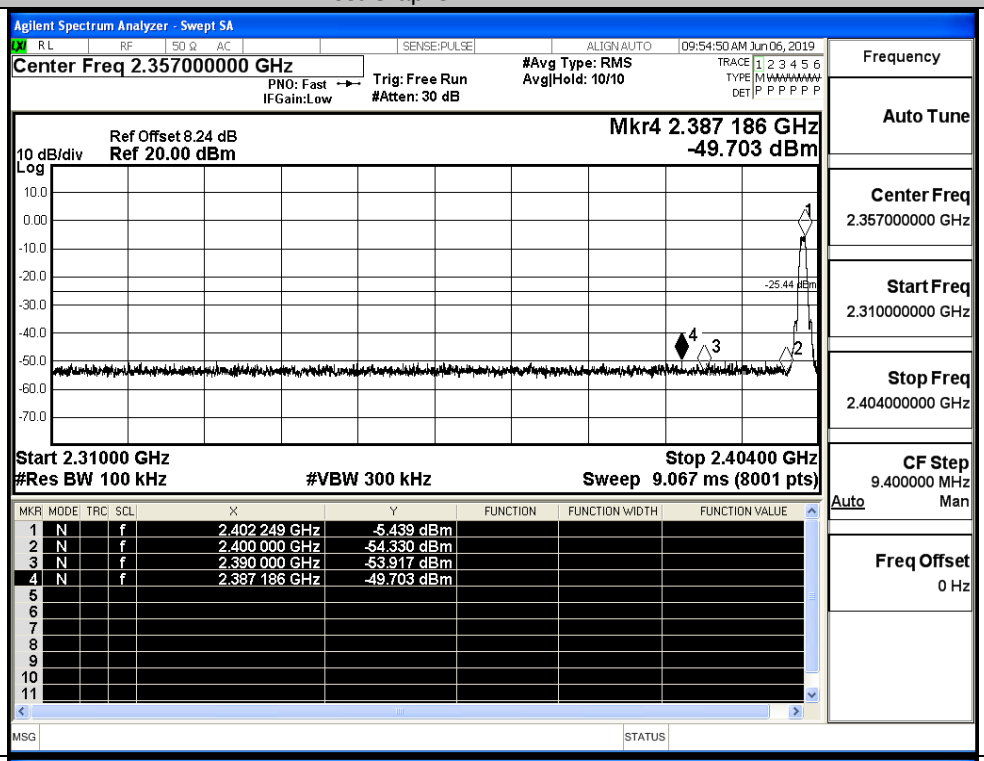
BT LE_HCH_Graphs		
Pref/BT LE/HCH		
Puw/BT LE/HCH		

A.7 Band-edge for RF Conducted Emissions

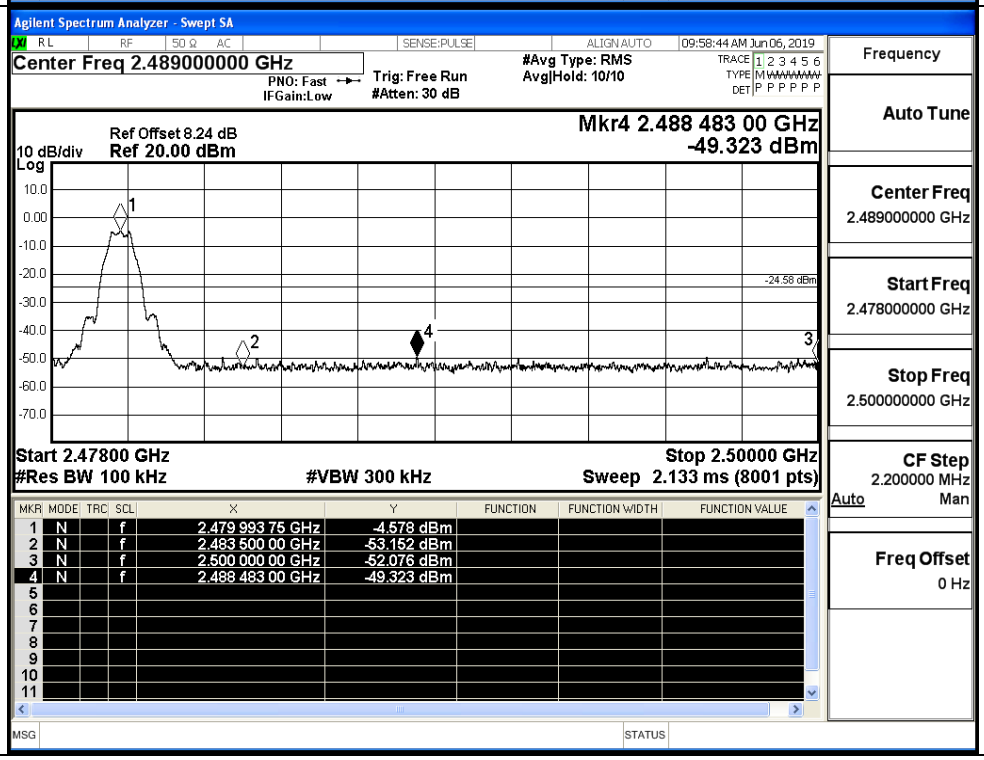
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-5.439	-49.703	-25.44	PASS
BT LE	HCH	-4.578	-49.323	-24.58	PASS

Test Graphs

LCH



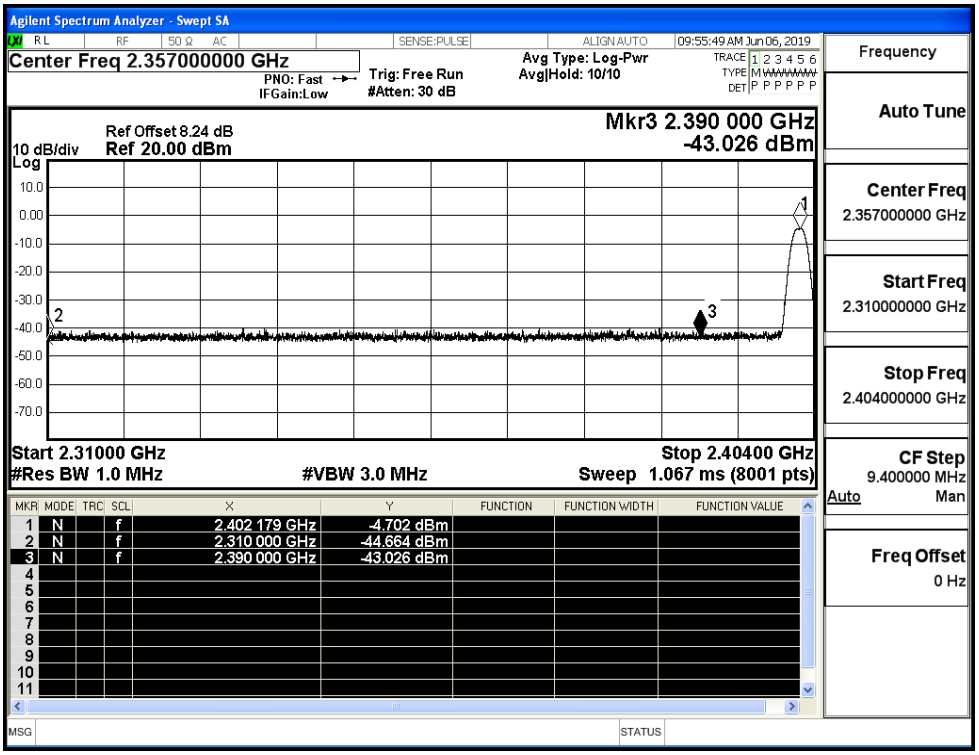
HCH



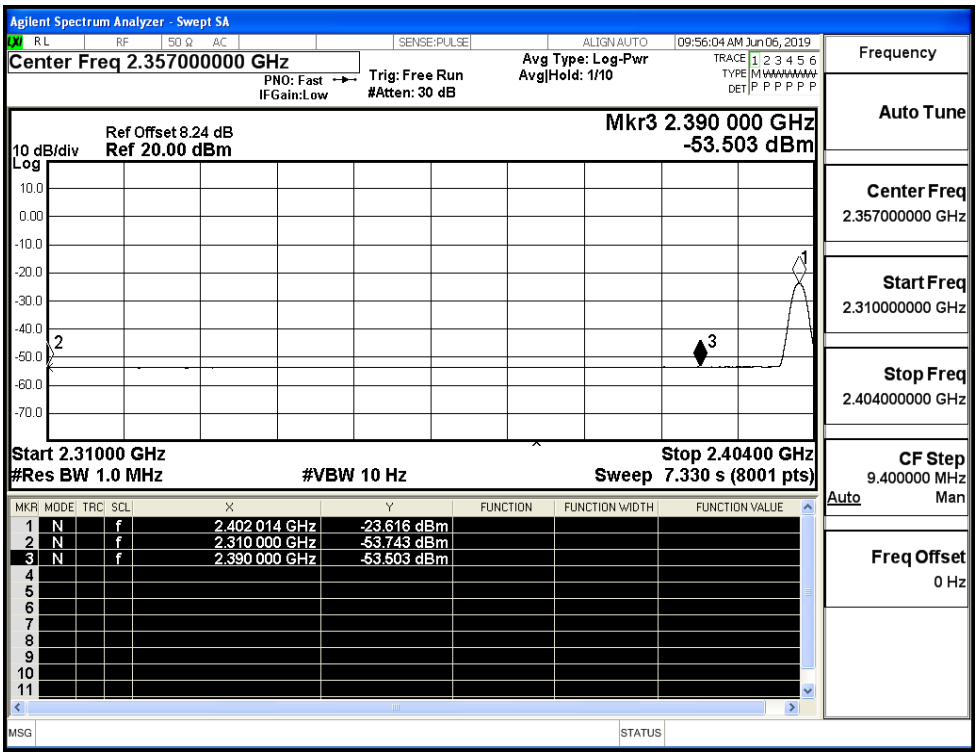
A.8 Restrict-band band-edge measurements

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	-44.66	2.0	0	50.59	PEAK	74	PASS
		Ant1	2310.0	-53.74	2.0	0	41.51	AV	54	PASS
		Ant1	2390.0	-43.03	2.0	0	52.23	PEAK	74	PASS
		Ant1	2390.0	-53.50	2.0	0	41.75	AV	54	PASS
	2480	Ant1	2483.5	-41.85	2.0	0	53.41	PEAK	74	PASS
		Ant1	2483.5	-53.25	2.0	0	42.01	AV	54	PASS
		Ant1	2500.0	-41.83	2.0	0	53.43	PEAK	74	PASS
		Ant1	2500.0	-53.09	2.0	0	42.17	AV	54	PASS

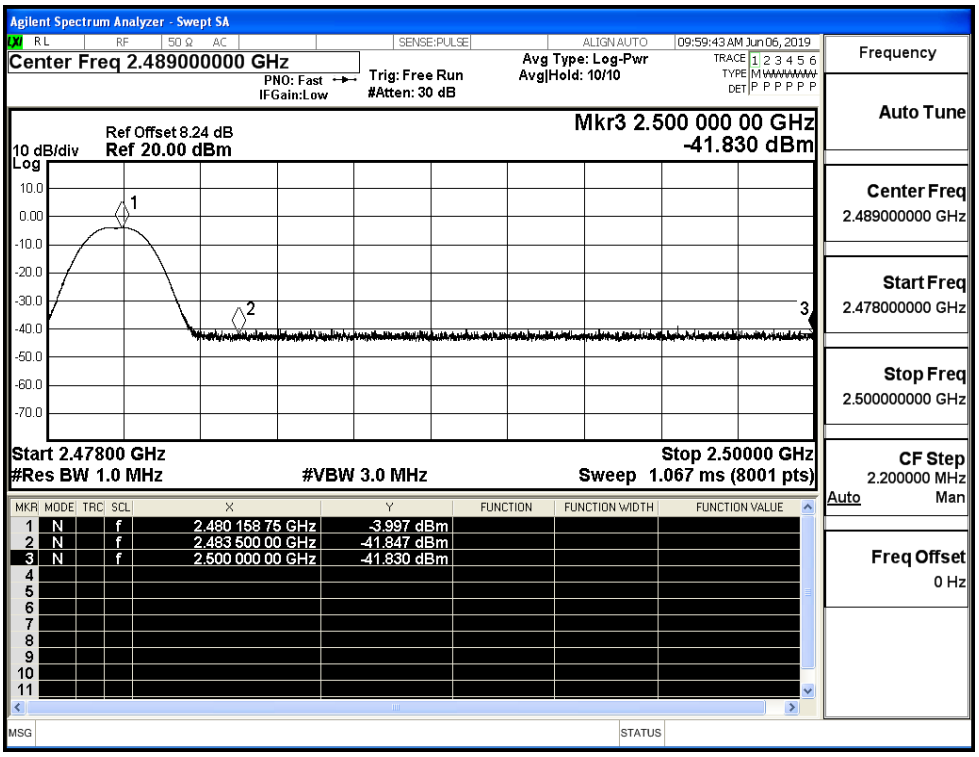
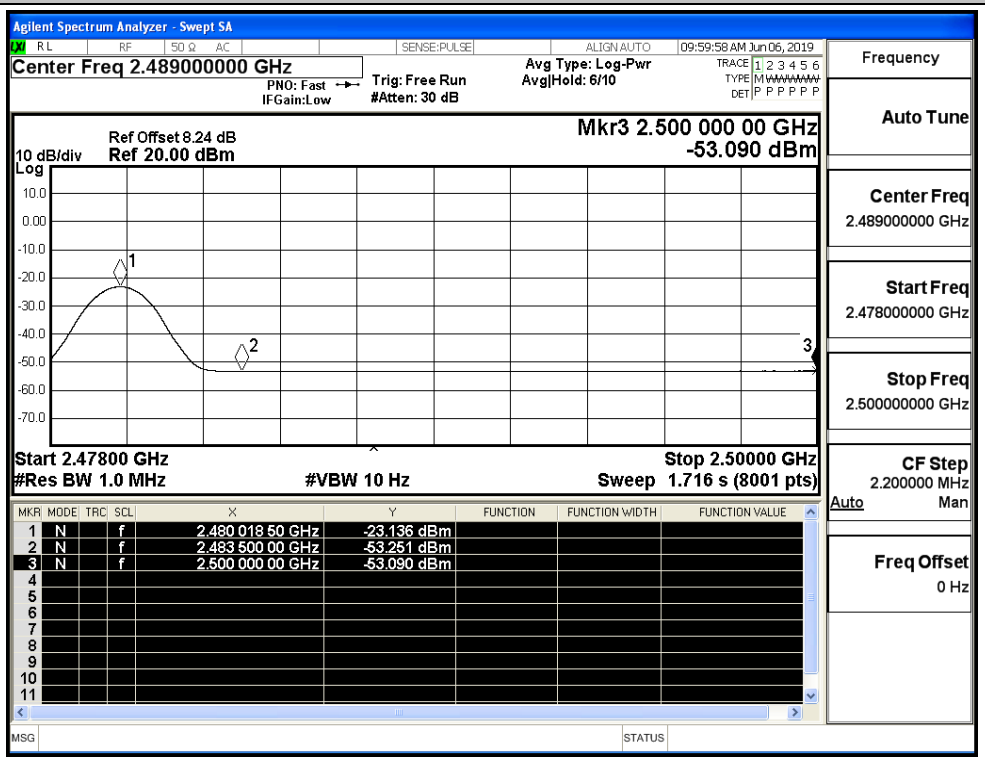
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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