Environmental Conditions

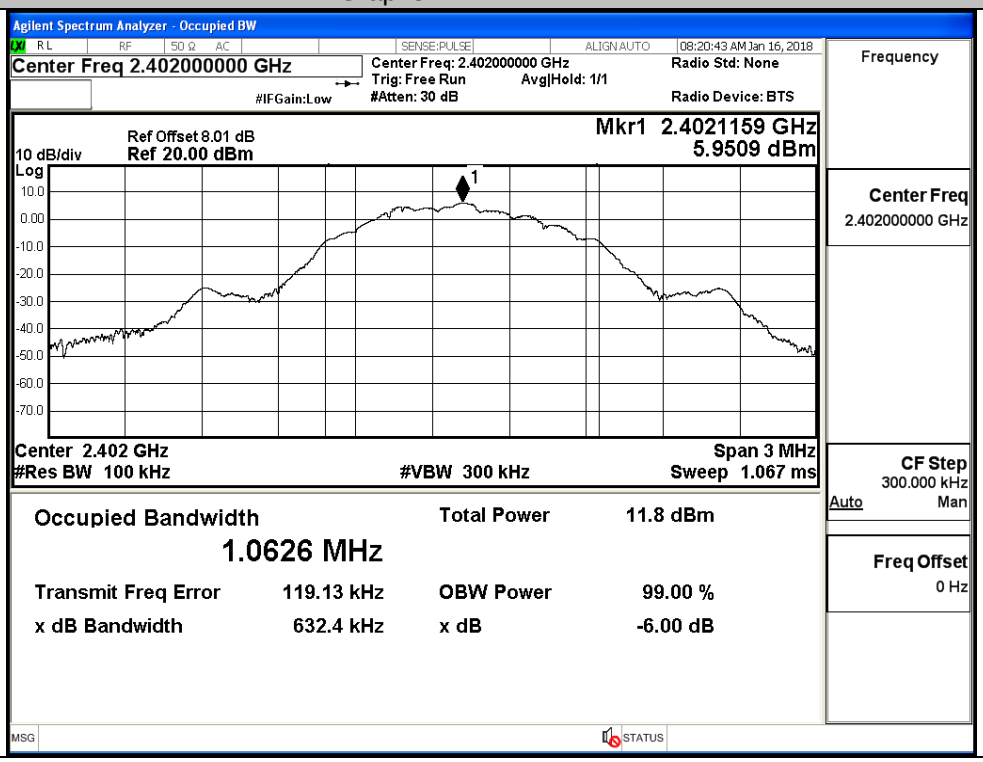
Temperature:	24.6 ° C
Relative Humidity:	48%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.xu
Supervised by:	Tom.Liu

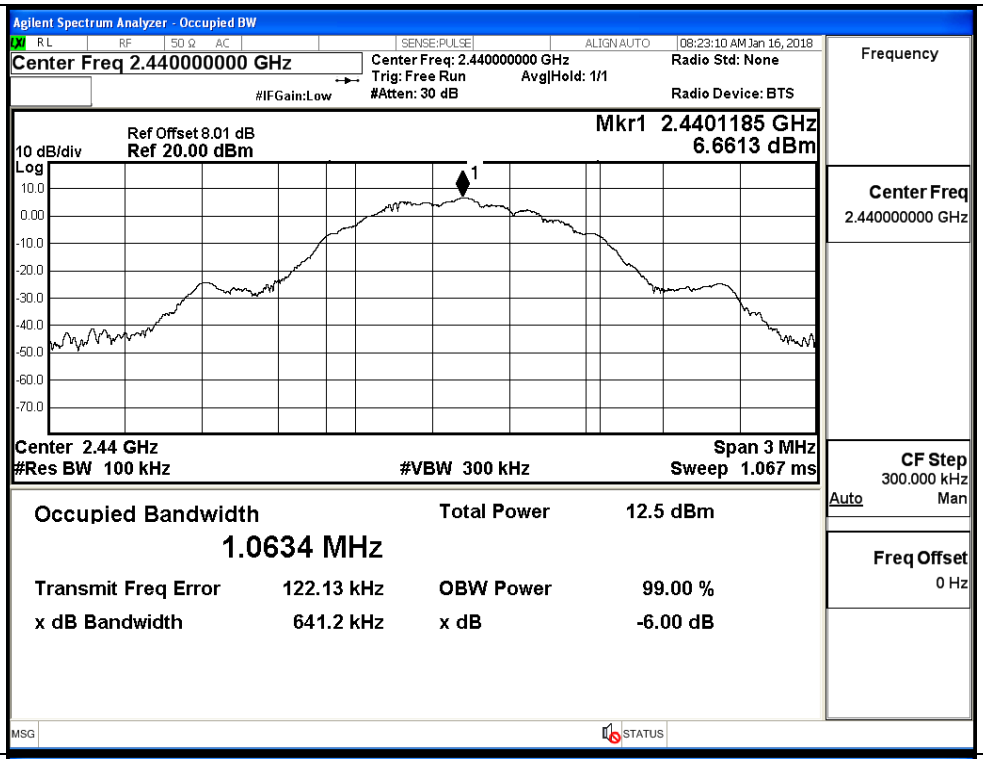
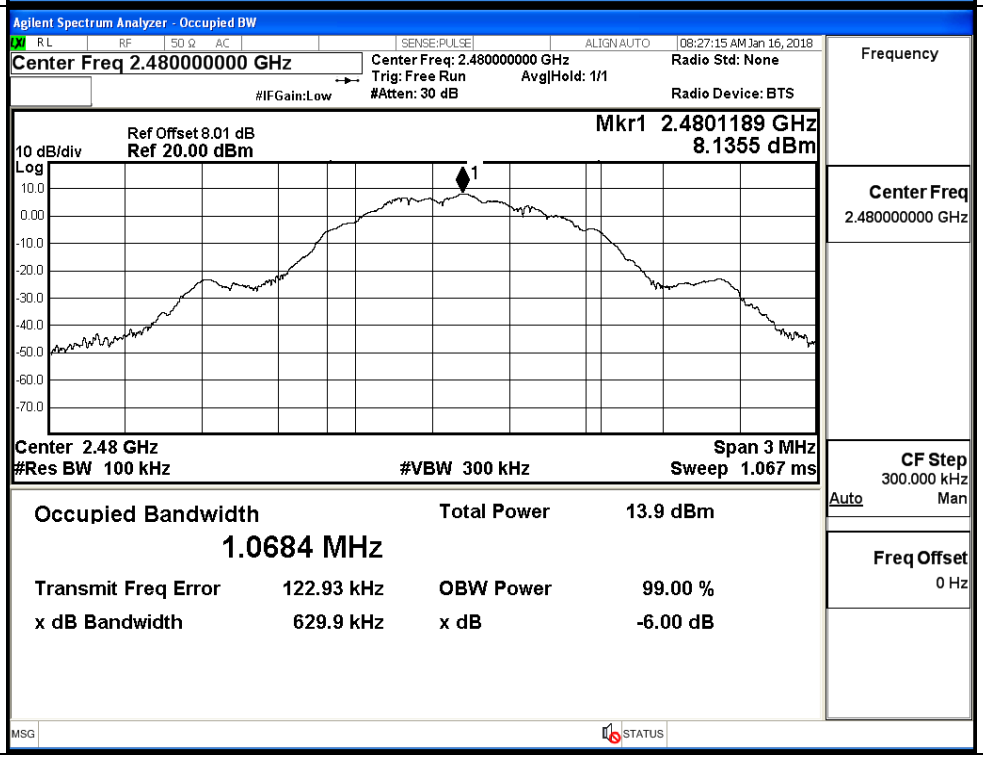
Appendix A): 6dB Bandwidth

Test Result

Mode	Channel	6dB Bandwidth [MHz]	Verdict
BLE	LCH	0.6324	PASS
BLE	MCH	0.6412	PASS
BLE	HCH	0.6299	PASS

Test Graphs

Graphs	
LCH	

MCH		
HCH		

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.440000000 GHz
Center Freq: 2.440000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:23:10 AM Jan 16, 2018
Ref Offset 8.01 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.4401185 GHz
6.6613 dBm
Center 2.44 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1.067 ms
Occupied Bandwidth
1.0634 MHz
Total Power 12.5 dBm
Transmit Freq Error 122.13 kHz
OBW Power 99.00 %
x dB Bandwidth 641.2 kHz
x dB -6.00 dB
Frequency
Center Freq
2.440000000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

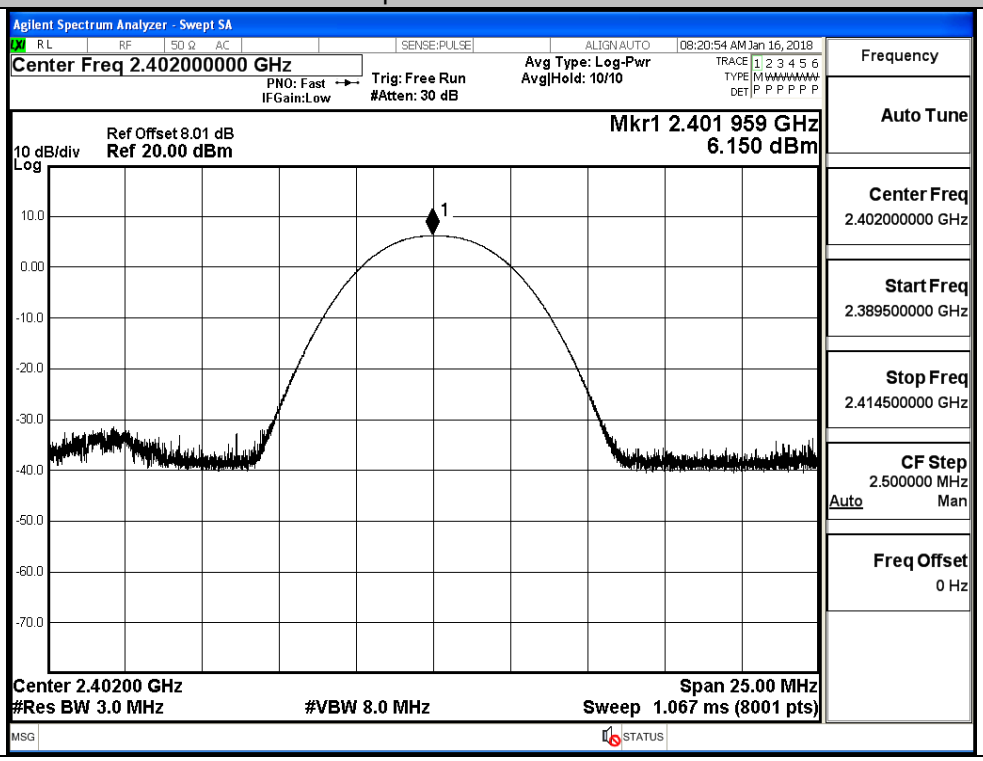
Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:27:15 AM Jan 16, 2018
Ref Offset 8.01 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.4801189 GHz
8.1355 dBm
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1.067 ms
Occupied Bandwidth
1.0684 MHz
Total Power 13.9 dBm
Transmit Freq Error 122.93 kHz
OBW Power 99.00 %
x dB Bandwidth 629.9 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

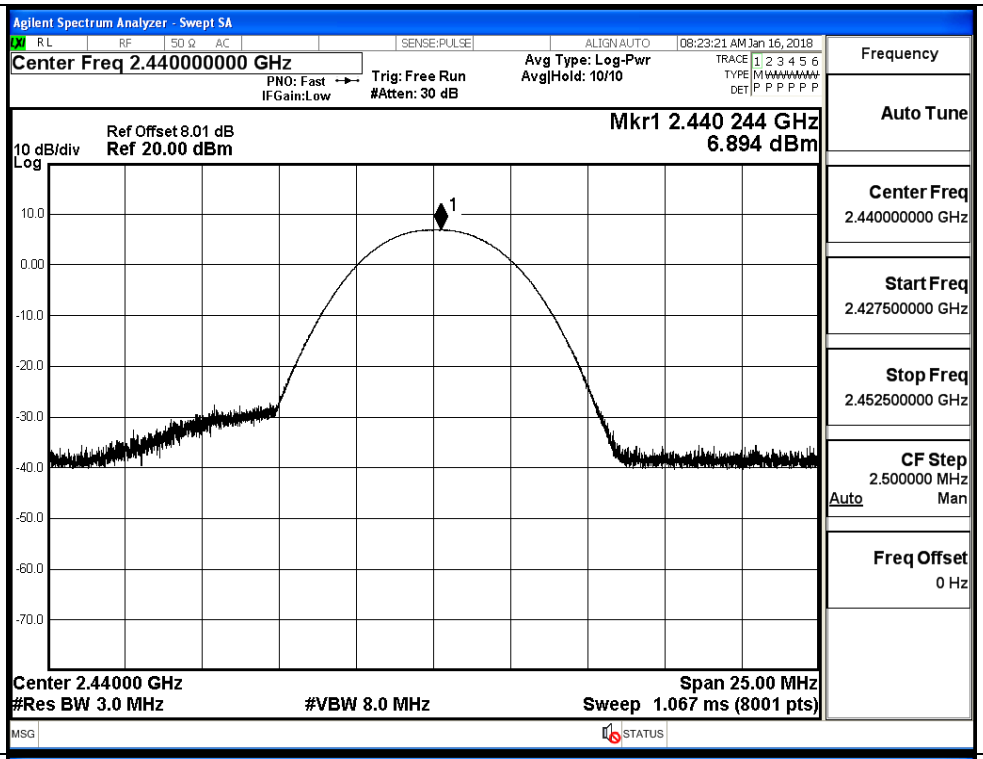
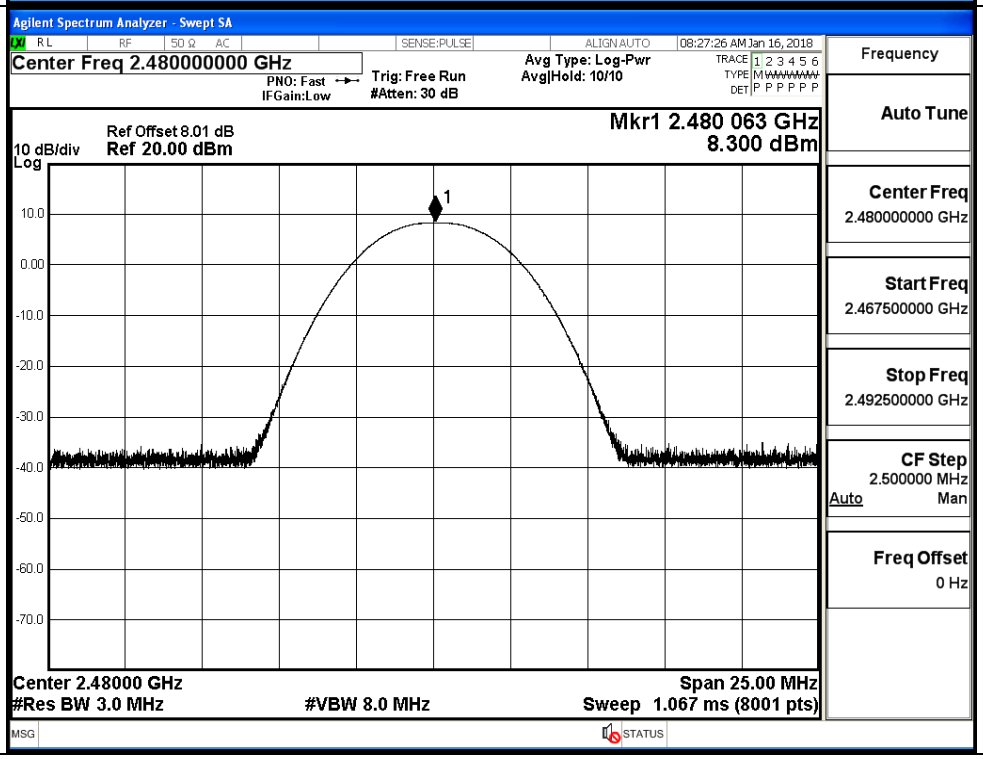
Appendix B): Conducted Peak Output Power

Test Result

Mode	Channel	Conduct Peak Power[dBm]	Verdict
BLE	LCH	6.15	PASS
BLE	MCH	6.894	PASS
BLE	HCH	8.3	PASS

Test Graphs

Graphs		
LCH		

MCH		
HCH		

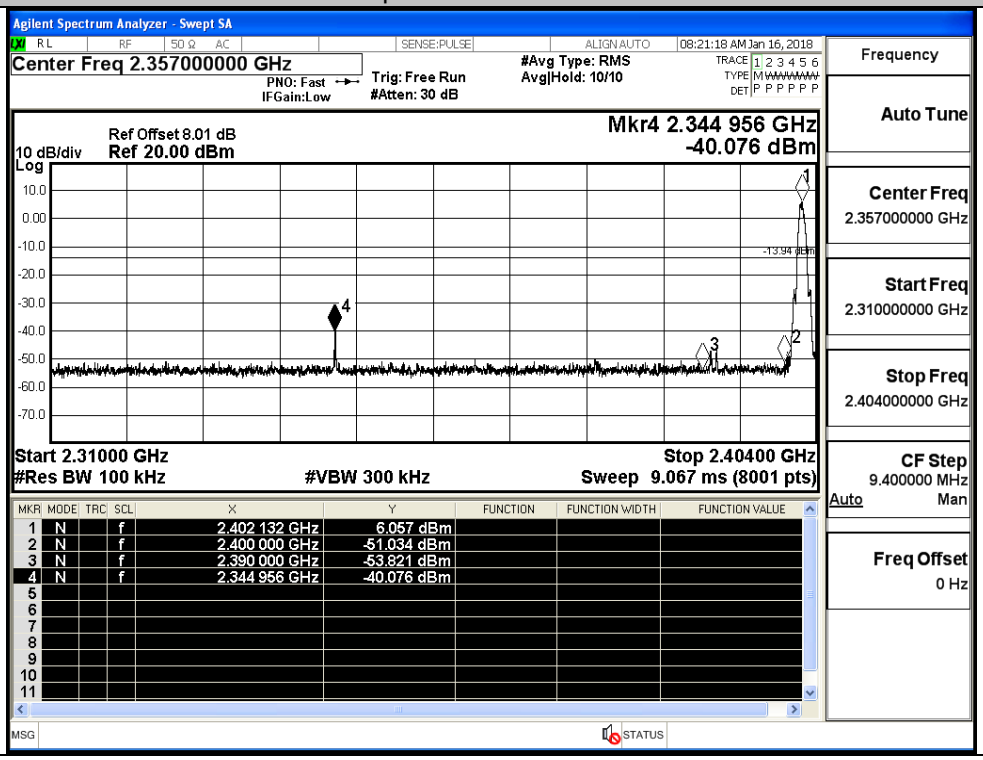
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.440000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
08:23:21 AM Jan 16, 2018
Ref Offset 8.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.440 244 GHz
6.894 dBm
Center 2.44000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 25.00 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.440000000 GHz
Start Freq
2.427500000 GHz
Stop Freq
2.452500000 GHz
CF Step
2.500000 MHz
Auto
Man
Freq Offset
0 Hz
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
08:27:26 AM Jan 16, 2018
Ref Offset 8.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.480 063 GHz
8.300 dBm
Center 2.48000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 25.00 MHz
Sweep 1.067 ms (8001 pts)
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

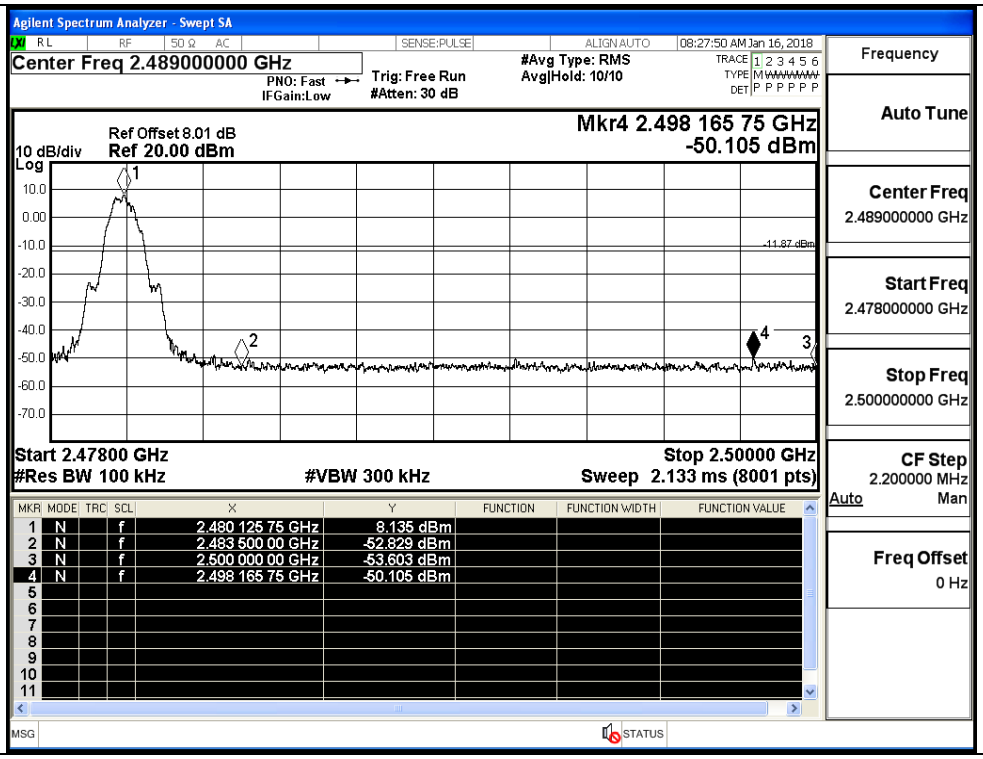
Appendix C): Band-edge for RF Conducted Emissions

Result Table

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BLE	LCH	6.057	-40.076	-13.94	PASS
BLE	HCH	8.135	-50.105	-11.87	PASS

Test Graphs

Graphs	
LCH	

HCH		

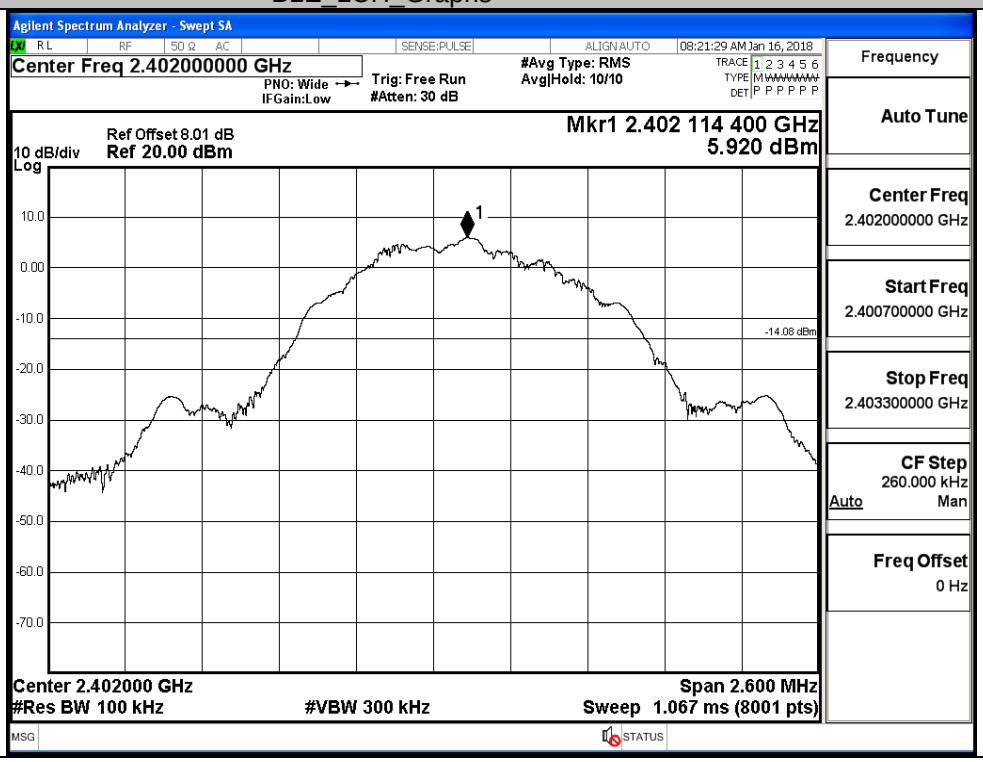
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.489000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
08:27:50 AM Jan 16, 2018
Ref Offset 8.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr4 2.498 165 75 GHz
-50.105 dBm
-11.87 dBm
Start 2.47800 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 2.133 ms (8001 pts)
1 N 1 f 2.480 125 75 GHz 8.135 dBm
2 N 1 f 2.483 500 00 GHz -52.829 dBm
3 N 1 f 2.500 000 00 GHz -53.603 dBm
4 N 1 f 2.498 165 75 GHz -50.105 dBm
Frequency
Auto Tune
Center Freq
2.489000000 GHz
Start Freq
2.478000000 GHz
Stop Freq
2.500000000 GHz
CF Step
2.200000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

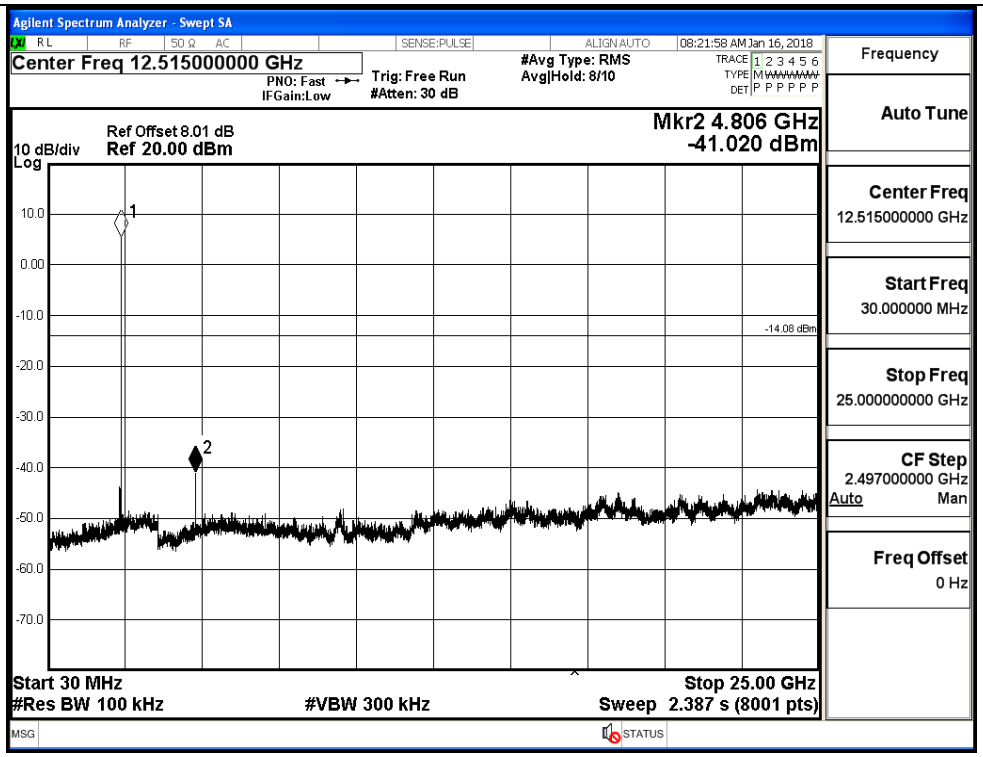
Appendix D): RF Conducted Spurious Emissions

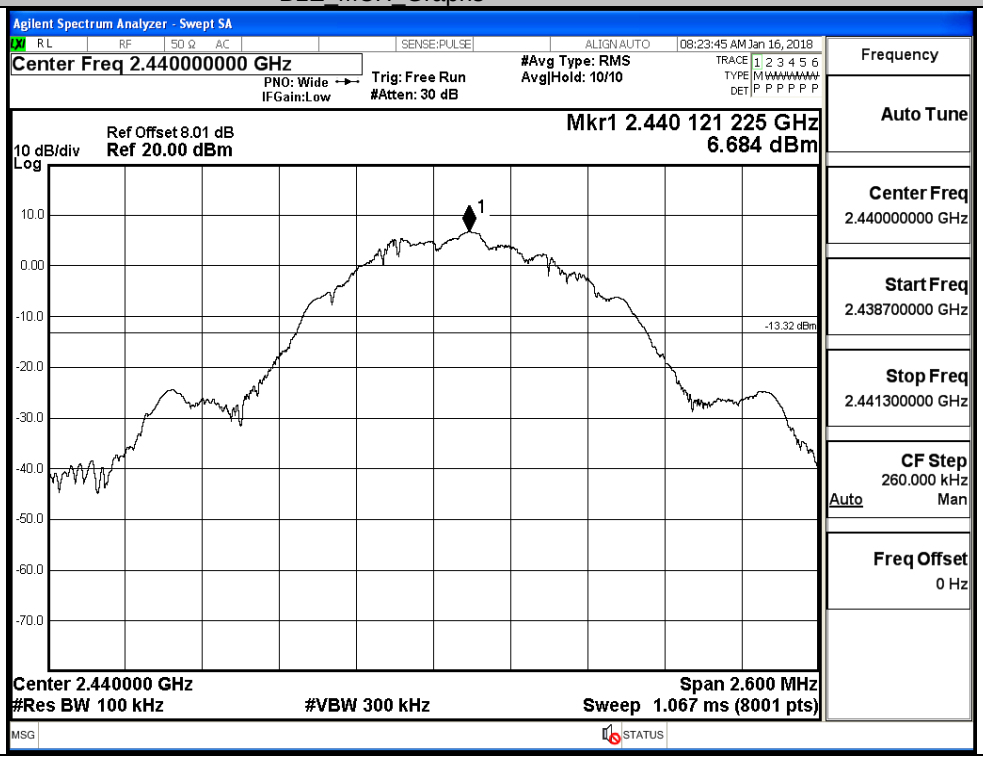
Result Table

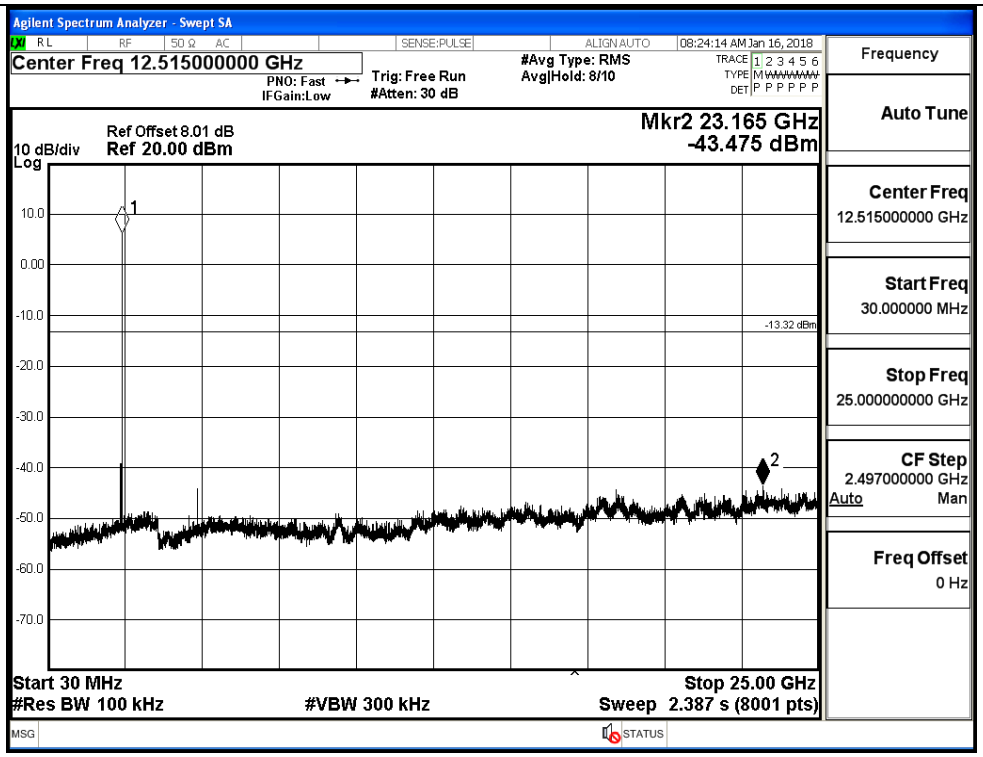
Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
BLE	LCH	5.92	<Limit	PASS
BLE	MCH	6.684	<Limit	PASS
BLE	HCH	8.029	<Limit	PASS

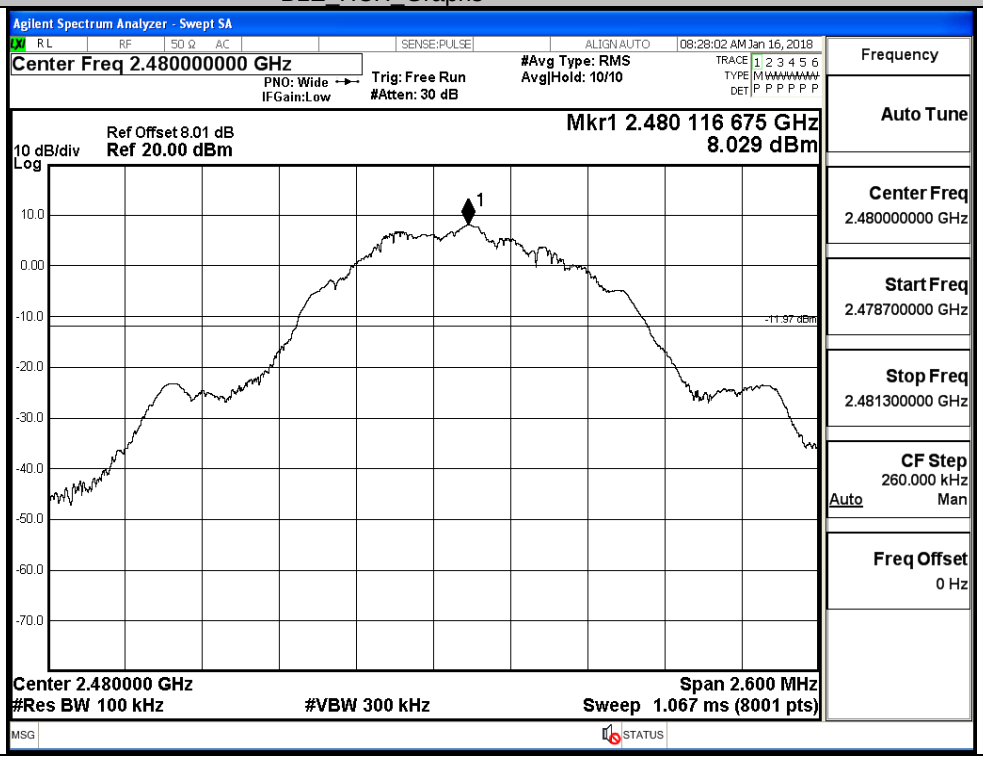
Test Graphs

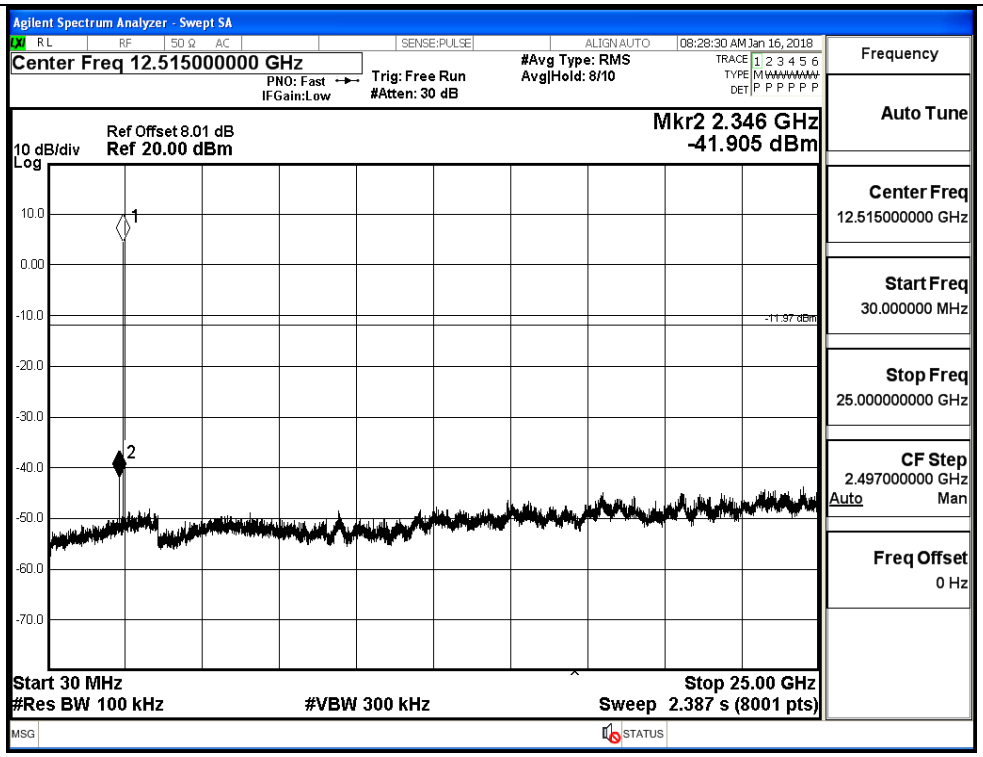
BLE_LCH_Graphs		
Pref/BLE/LCH		

Puw/BLE/LCH	

BLE_MCH_Graphs	
Pref/BLE/MCH	

Puw/BLE/MCH	

BLE_HCH_Graphs	
Pref/BLE/HCH	

Puw/BLE/HCH	

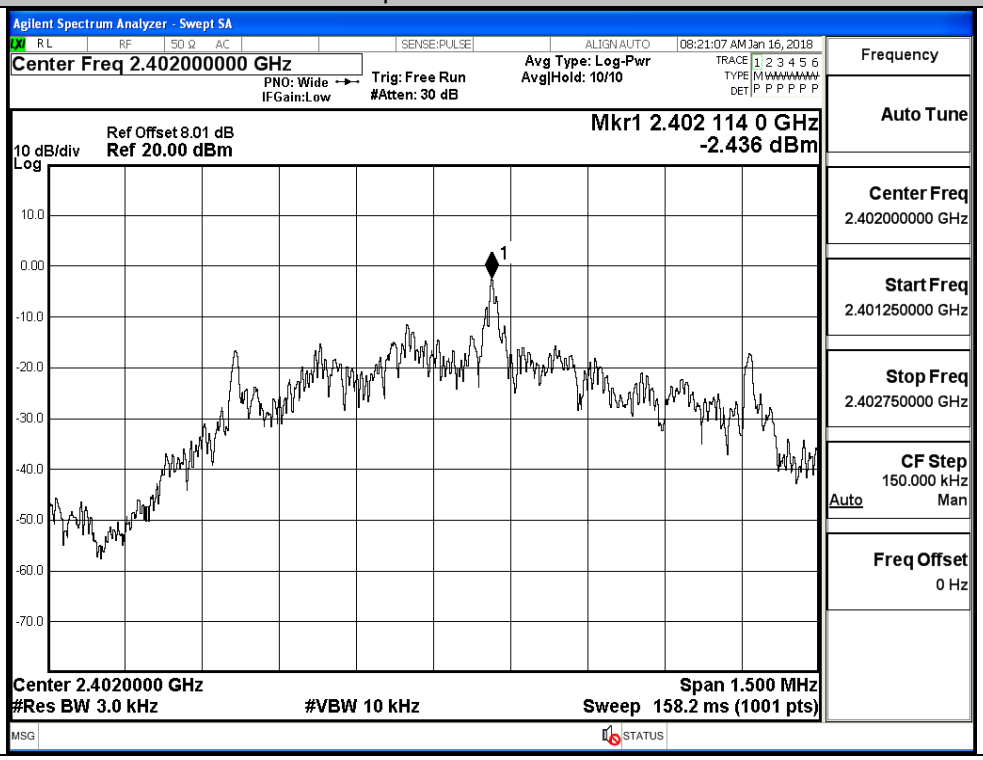
Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 8/10
08:28:30 AM Jan 16, 2018
Ref Offset 8.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr2 2.346 GHz
-41.905 dBm
-11.97 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.387 s (8001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz

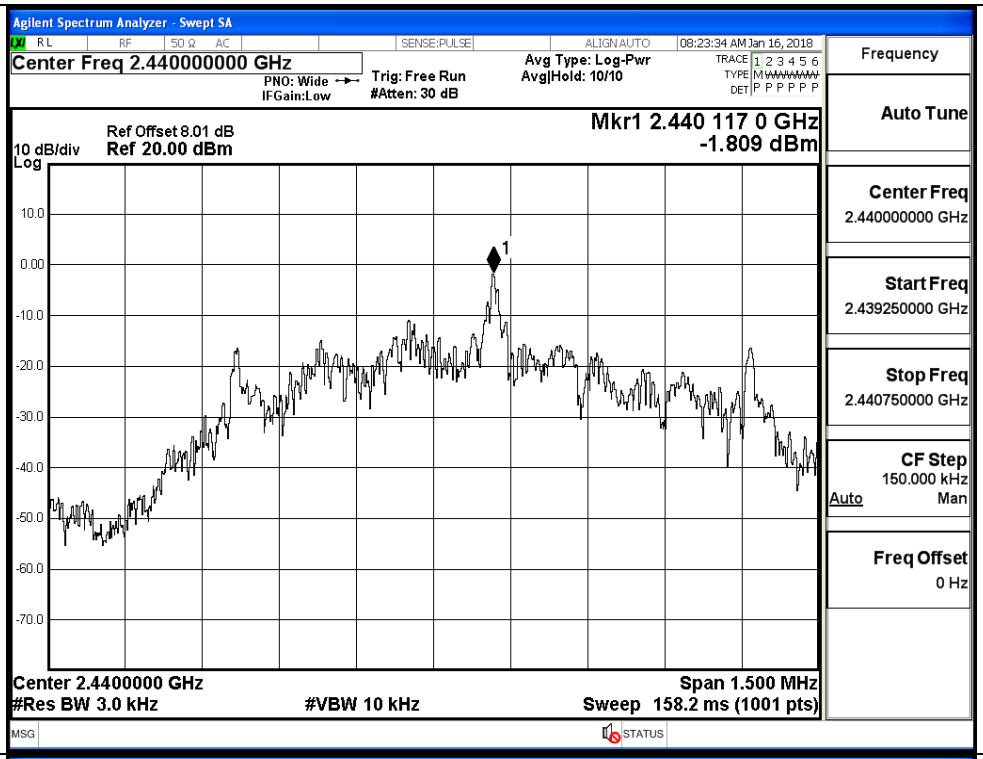
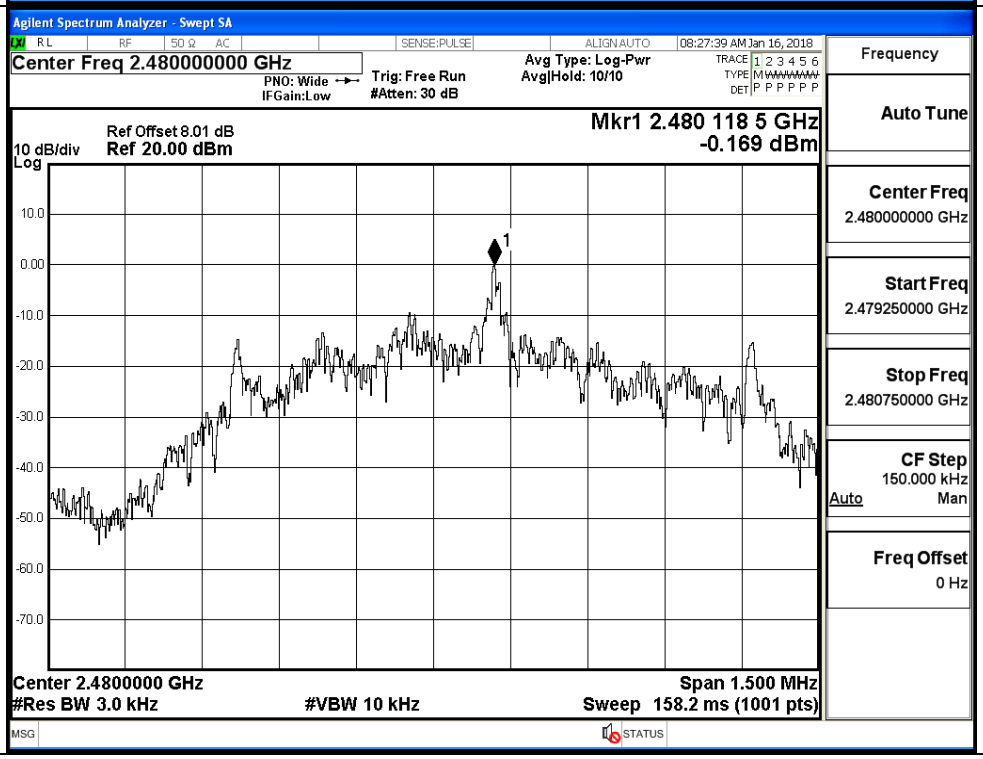
Appendix E): Power Spectral Density

Result Table

Mode	Channel	PSD [dBm]	Verdict
BLE	LCH	-2.436	PASS
BLE	MCH	-1.809	PASS
BLE	HCH	-0.169	PASS

Test Graphs

Graphs		
LCH		

MCH		
HCH		

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.440000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
08:23:34 AM Jan 16, 2018
Ref Offset 8.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.440 117 0 GHz
-1.809 dBm
Center 2.4400000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.500 MHz
Sweep 158.2 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.440000000 GHz
Start Freq
2.439250000 GHz
Stop Freq
2.440750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

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
08:27:39 AM Jan 16, 2018
Ref Offset 8.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.480 118 5 GHz
-0.169 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
MSG
STATUS

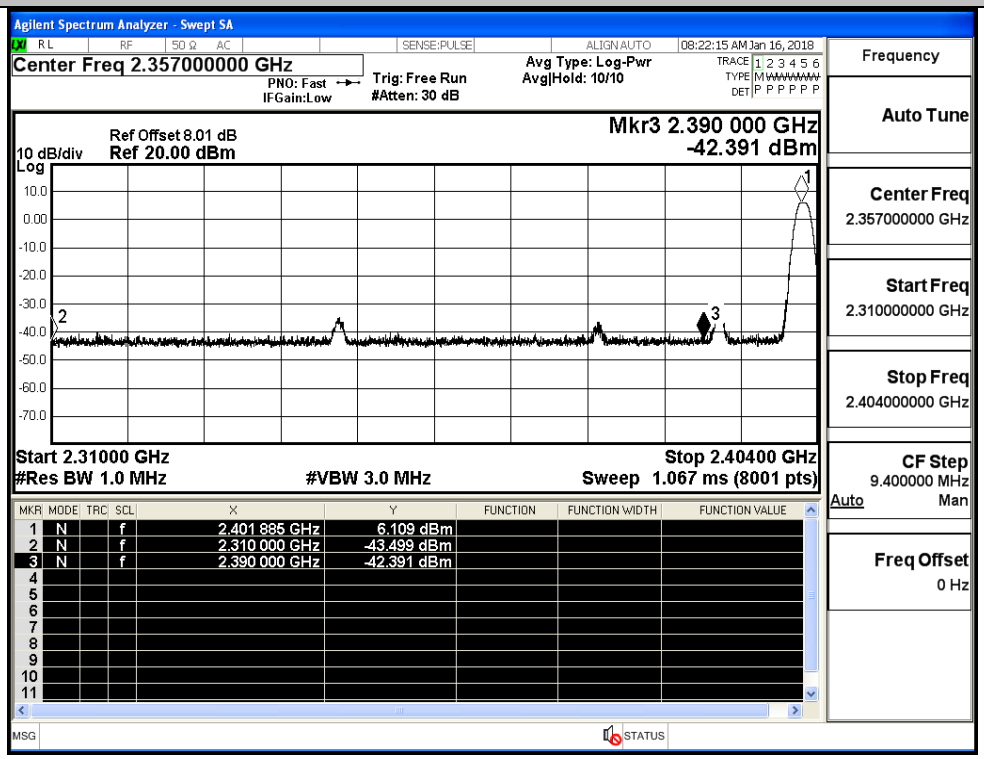
Appendix F):Restrict-band band-edge measurements

Result Table

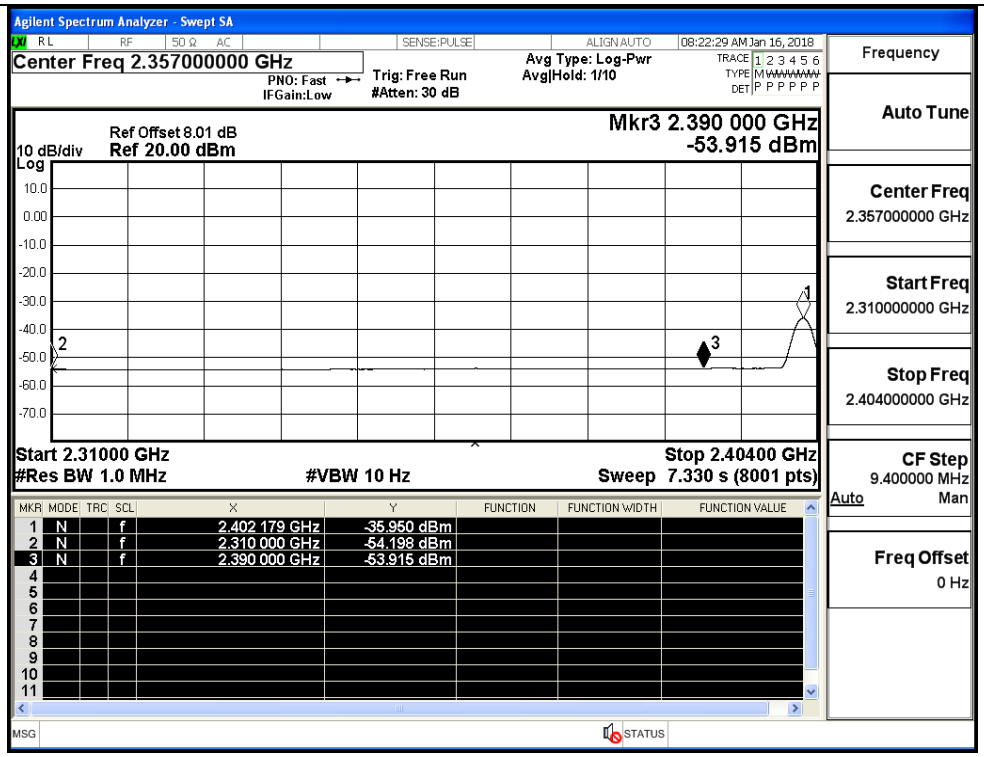
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
BLE	2402	Ant1	2310.0	-43.50	2	0	51.76	PEAK	74	PASS
BLE	2402	Ant1	2310.0	-54.20	2	0	41.06	AV	54	PASS
BLE	2402	Ant1	2390.0	-42.39	2	0	52.87	PEAK	74	PASS
BLE	2402	Ant1	2390.0	-53.92	2	0	41.34	AV	54	PASS
BLE	2480	Ant1	2483.5	-42.13	2	0	53.13	PEAK	74	PASS
BLE	2480	Ant1	2483.5	-53.28	2	0	41.97	AV	54	PASS
BLE	2480	Ant1	2500.0	-42.85	2	0	52.41	PEAK	74	PASS
BLE	2480	Ant1	2500.0	-53.58	2	0	41.68	AV	54	PASS

Test Graphs

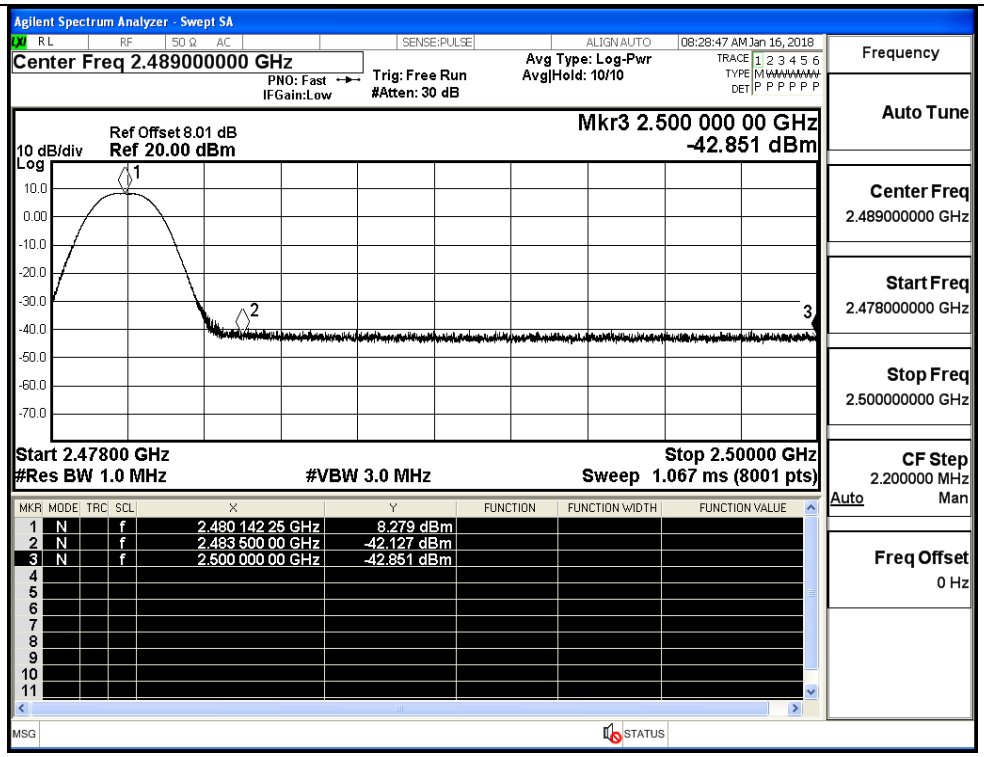
Restrict-band band-edge measurements_BLE_2402_Ant1_PEAK



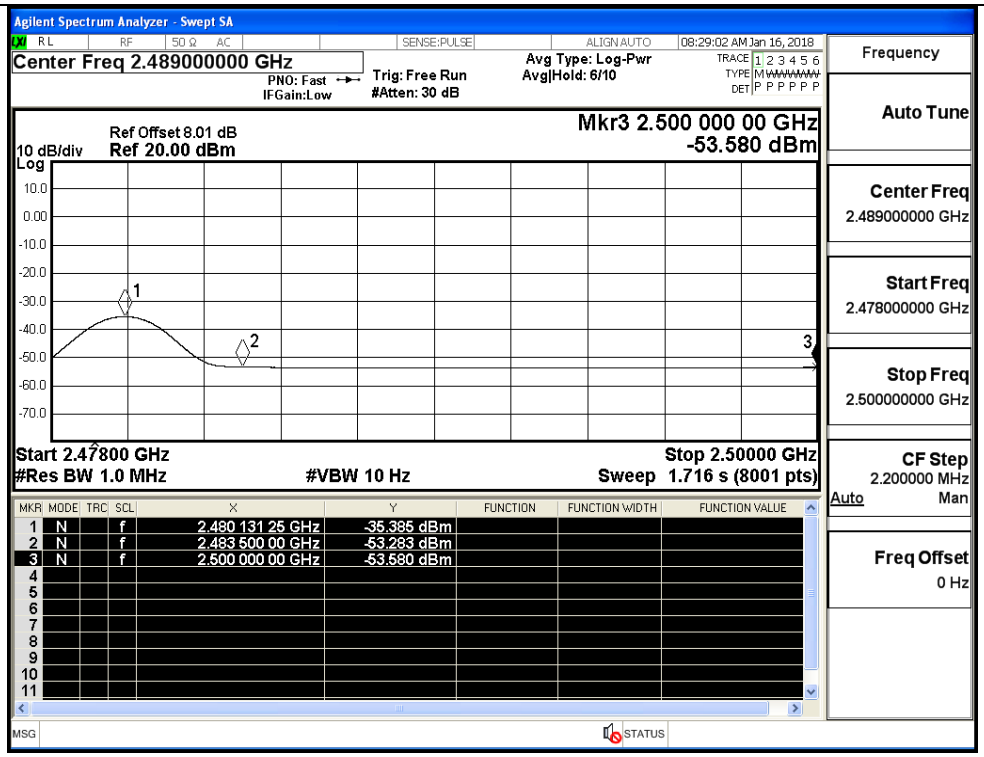
Restrict-band band-edge measurements_BLE_2402_Ant1_AV



Restrict-band band-edge measurements_BLE_2480_Ant1_PEAK



Restrict-band band-edge measurements_BLE_2480_Ant1_AV


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.489000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 6/10
08:29:02 AM Jan 16, 2018
Ref Offset 8.01 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr3 2.500 000 00 GHz
-53.580 dBm
Start 2.47800 GHz
#Res BW 1.0 MHz
#VBW 10 Hz
Stop 2.50000 GHz
Sweep 1.716 s (8001 pts)
1 N 1 f 2.480 131 25 GHz -35.385 dBm
2 N 1 f 2.483 500 00 GHz -53.283 dBm
3 N 1 f 2.500 000 00 GHz -53.580 dBm
Frequency
Auto Tune
Center Freq
2.489000000 GHz
Start Freq
2.478000000 GHz
Stop Freq
2.500000000 GHz
CF Step
2.200000 MHz
Auto
Man
Freq Offset
0 Hz

Appendix G):Duty Cycle

Result Table

Test Mode	Test	Ant	Duty Cycle[%]	Verdict
BLE	2440	Ant1	100	PASS

Test Graphs