# Appendix B

## RF Test Data for BT V5.0 (BT LE & 2LE) (Conducted Measurement)

**Product Name: TWS Bluetooth Headset**

**Trade Mark: Urbanista**

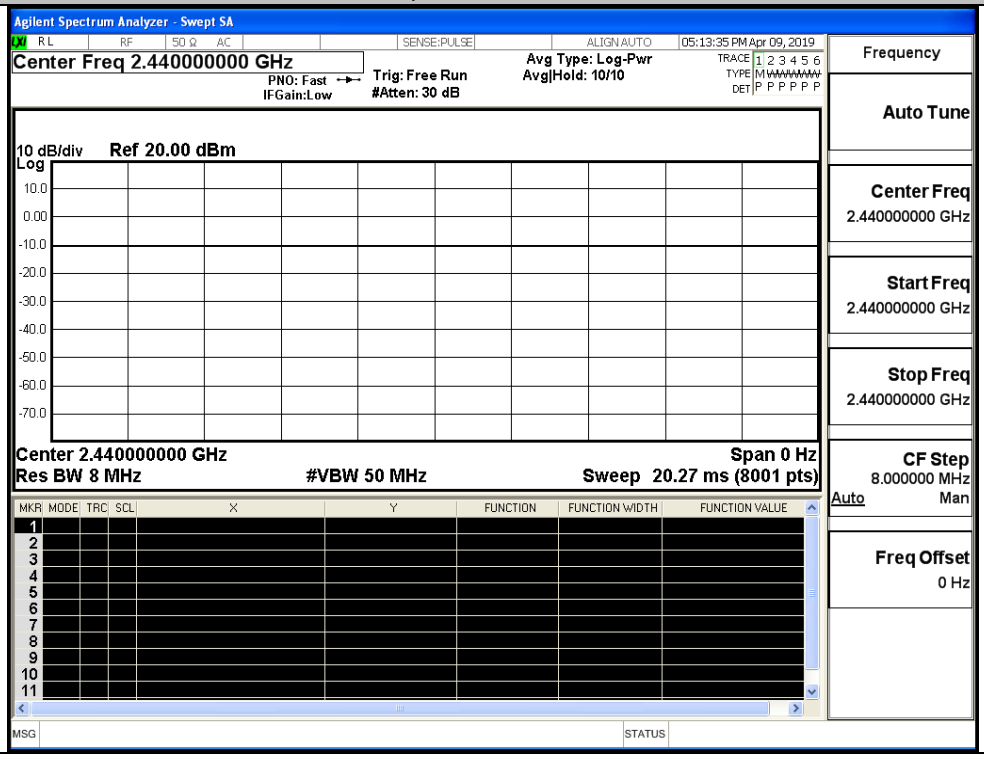
**Test Model: Urbanista Stockholm**

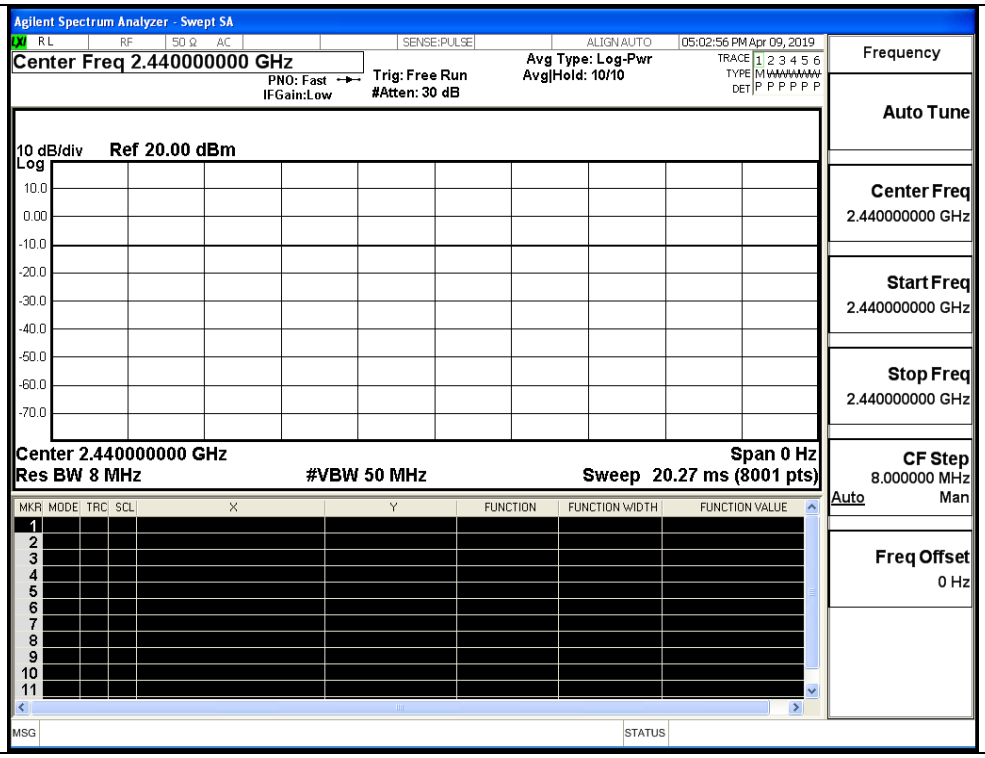
### Environmental Conditions

| | |
|---|---|
| Temperature: | 24.5 ° C |
| Relative Humidity: | 52.3% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Mina.Xu |
| Supervised by: | Wang Chuang |

## B.1 Duty Cycle

| Test Mode | Test Channel | Ant | Duty Cycle[%] | Verdict |
|---|---|---|---|---|
| BT LE | 2440 | Ant1 | 100 | PASS |
| BT 2LE | 2440 | Ant1 | 100 | PASS |

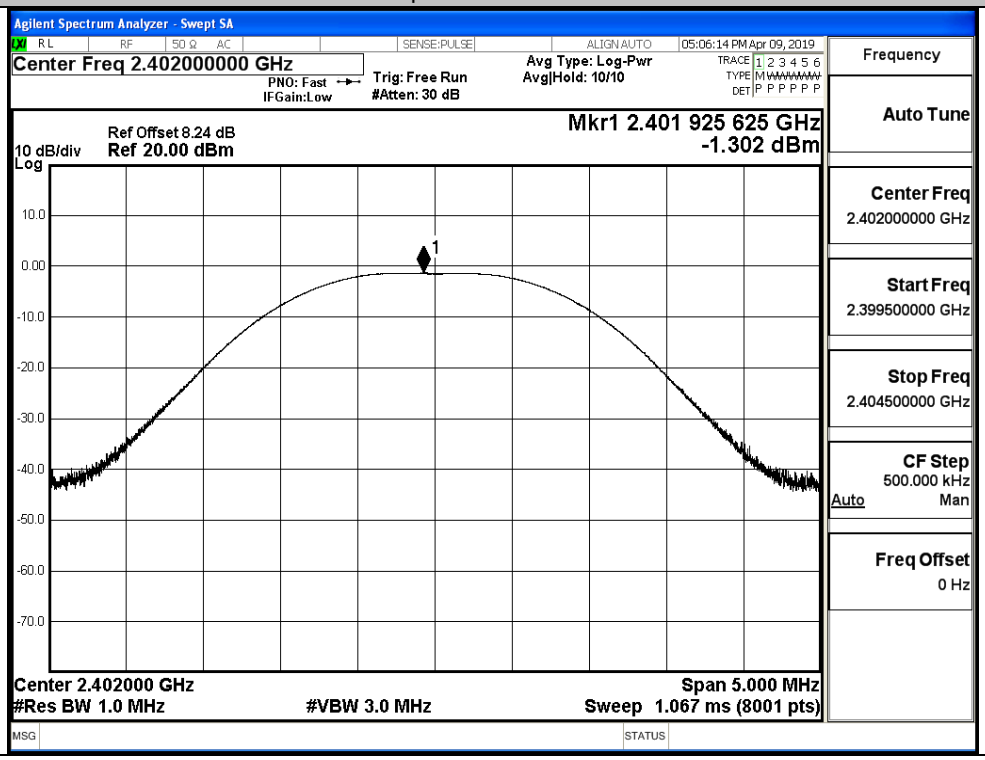
| Test Graphs | | |
|---|---|---|
| BT LE | |  |

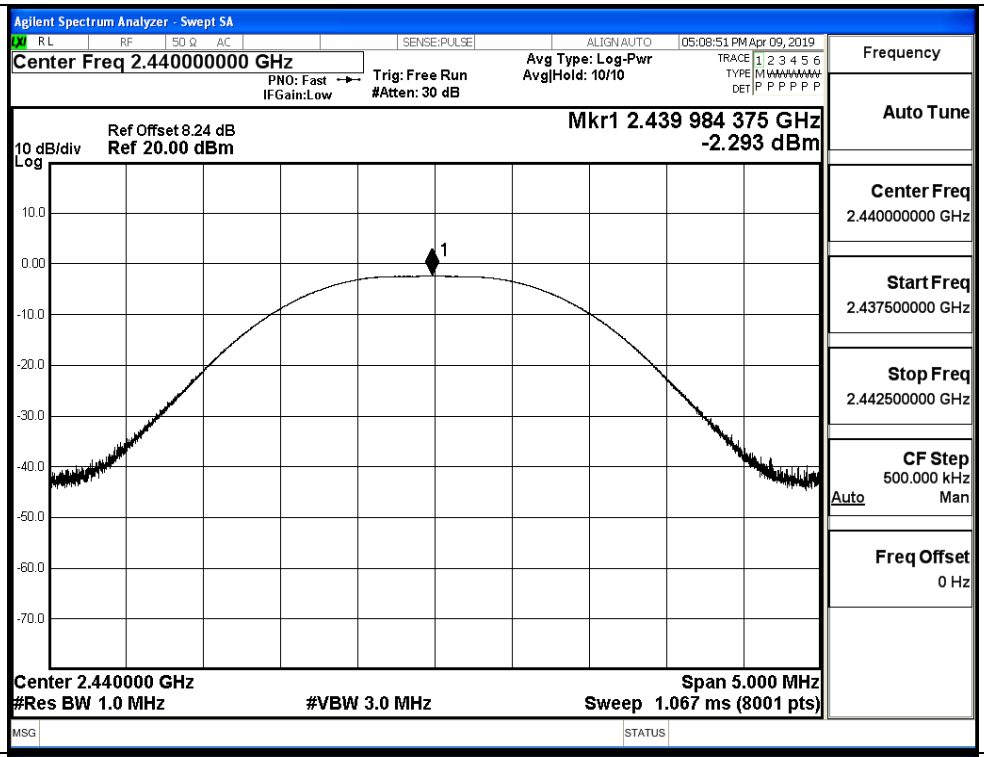
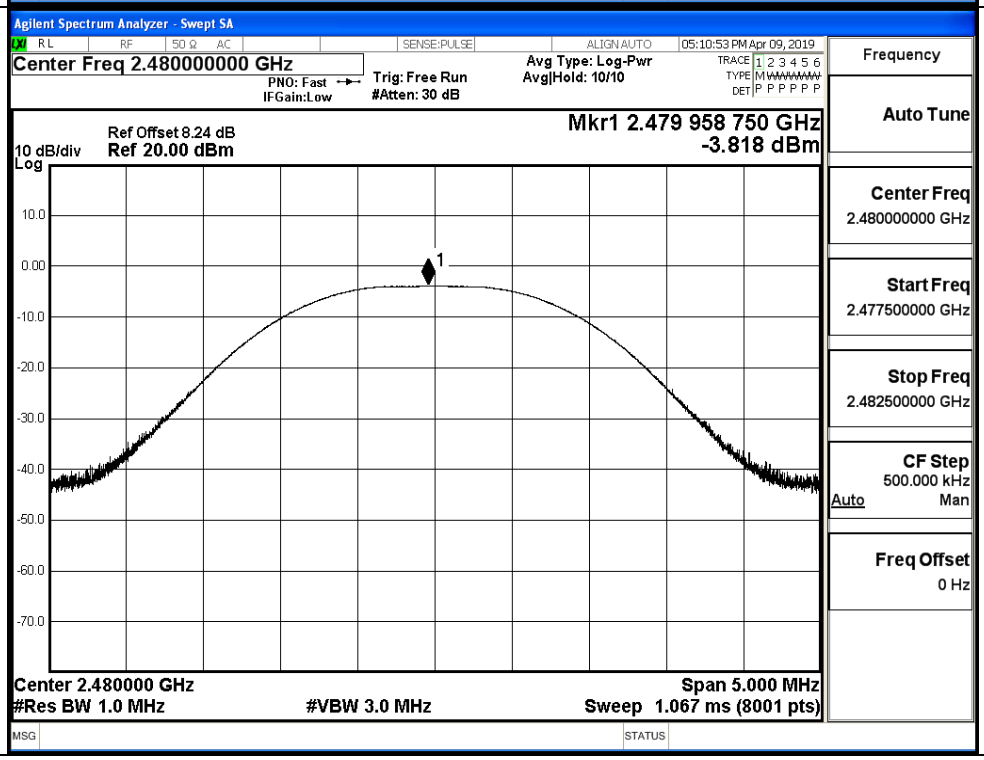
| | | |
|---|---|---|
| BT 2LE | |  |

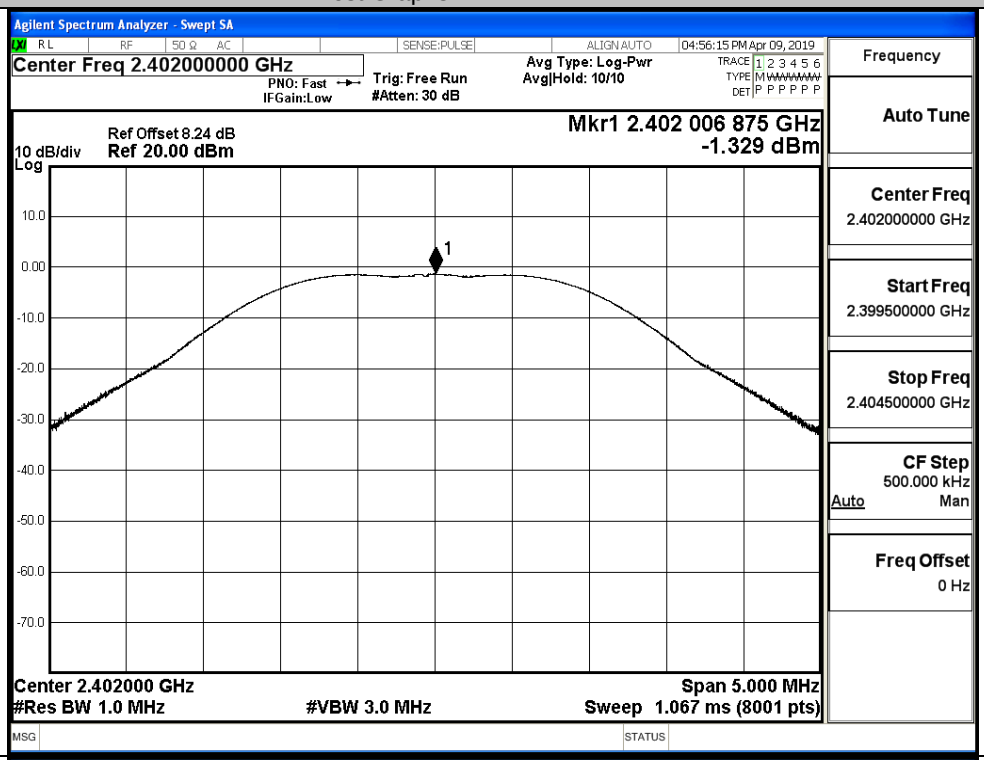
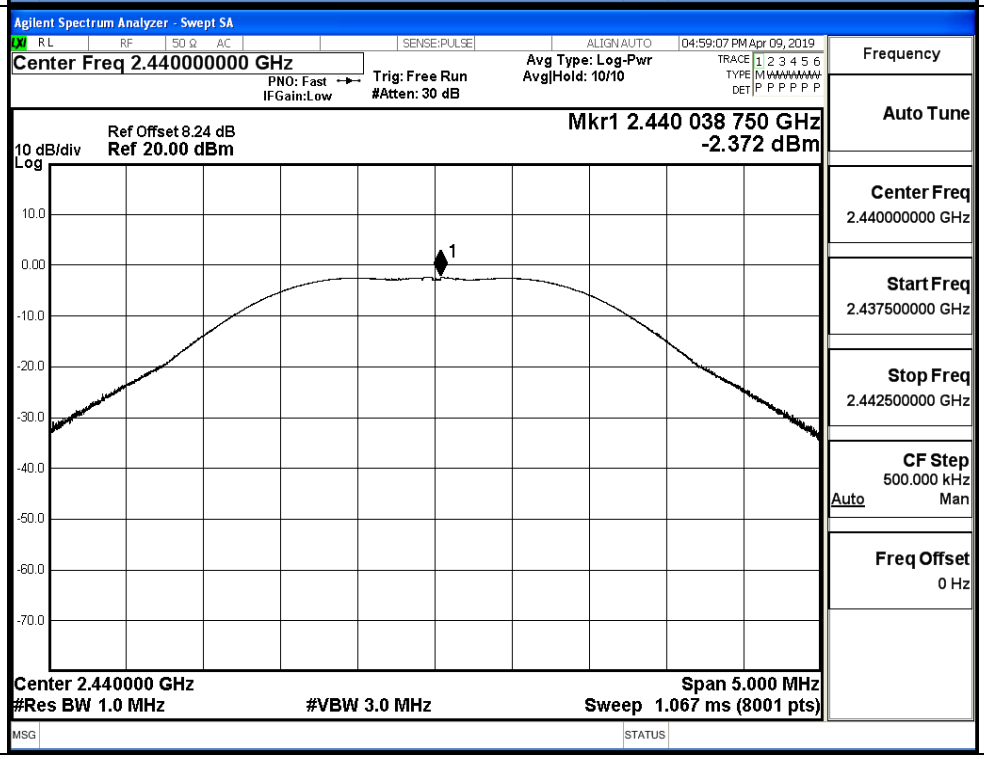
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
05:02:56 PM Apr 09, 2019
Center Freq 2.440000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P P P P P
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.440000000 GHz
Res BW 8 MHz
#VBW 50 MHz
Span 0 Hz
Sweep 20.27 ms (8001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1
2
3
4
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.440000000 GHz
Start Freq
2.440000000 GHz
Stop Freq
2.440000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz

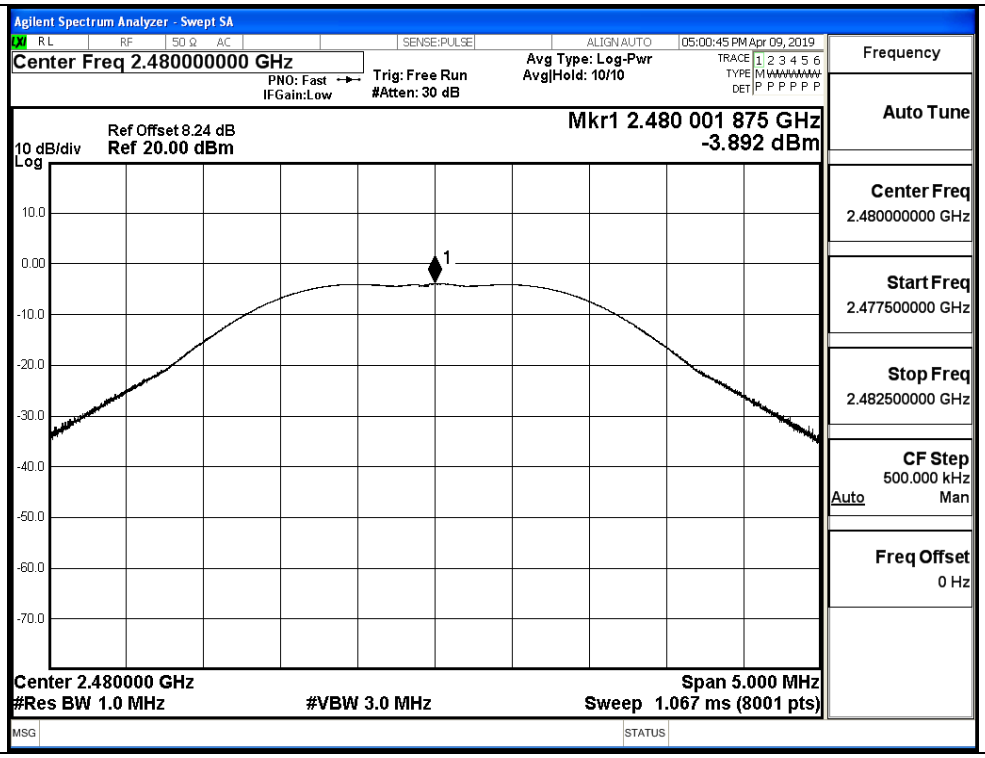
## B.2 Maximum Conducted Peak Output Power

| Mode | Channel | Conduct Peak Power[dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|
| BT LE | LCH | -1.302 | 30 | PASS |
| BT LE | MCH | -2.293 | 30 | PASS |
| BT LE | HCH | -3.818 | 30 | PASS |
| BT 2LE | LCH | -1.329 | 30 | PASS |
| BT 2LE | MCH | -2.372 | 30 | PASS |
| BT 2LE | HCH | -3.892 | 30 | PASS |

| Test Graphs | |
|---|---|
| BT LE - LCH |  |

| | | |
|---|---|---|
| BT LE -MCH | |  |
| BT LE -HCH | |  |

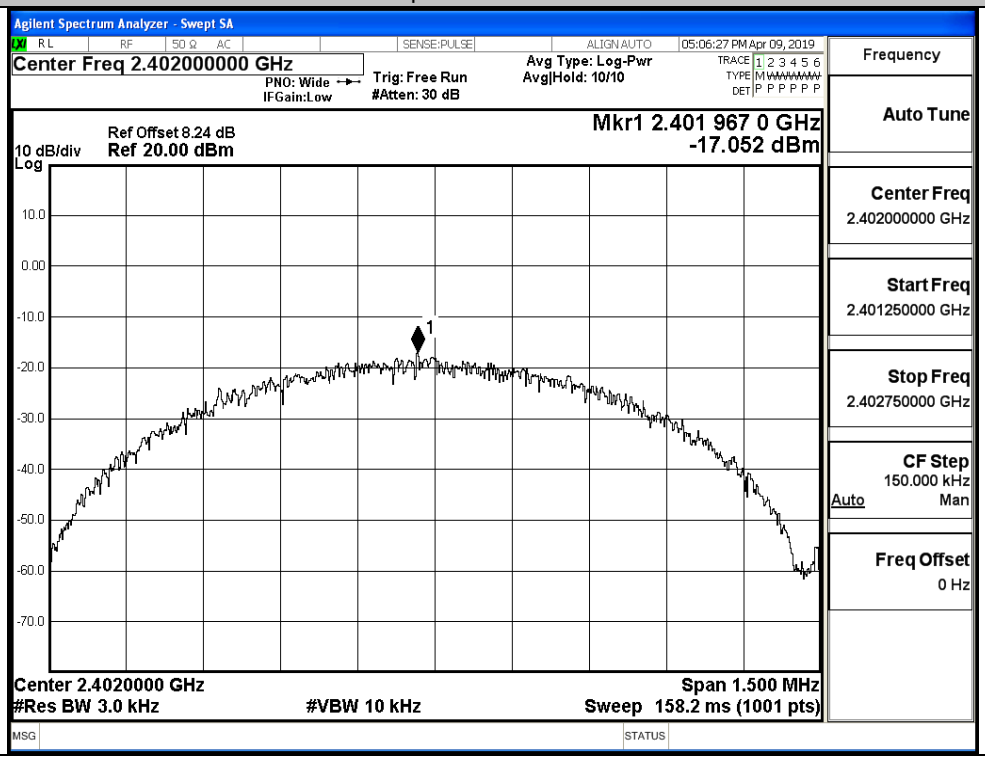
| Test Graphs | | |
|---|---|---|
| BT 2LE - LCH | |  |
| BT 2LE -MCH | |  |

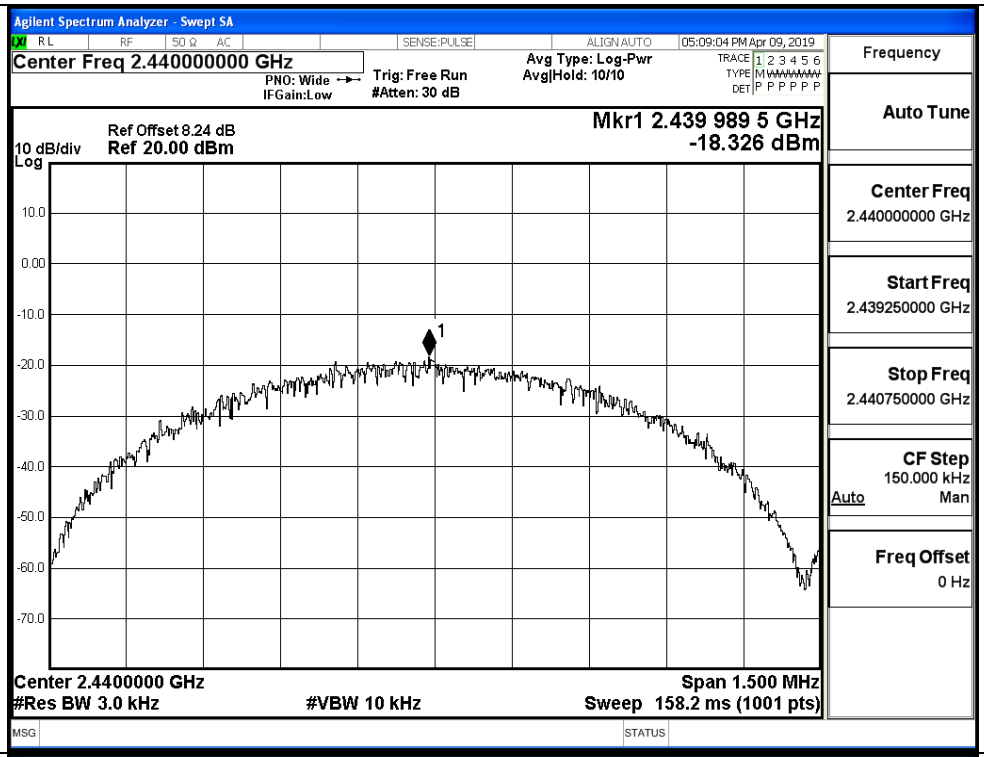
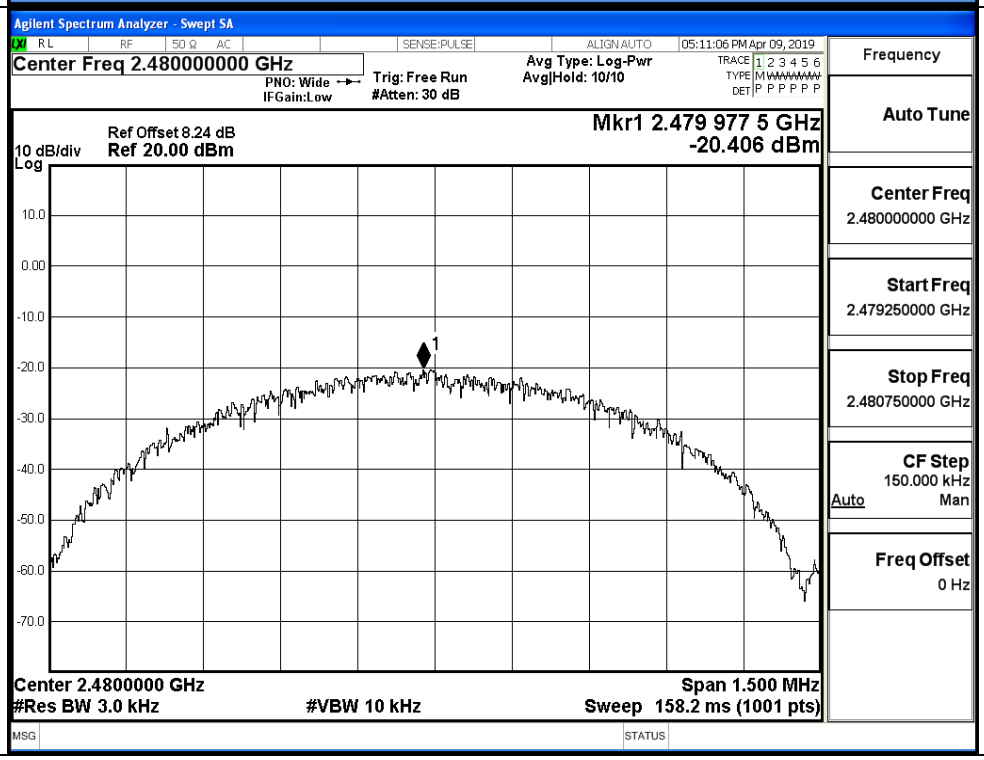
| | | |
|---|---|---|
| BT 2LE -HCH | |  |

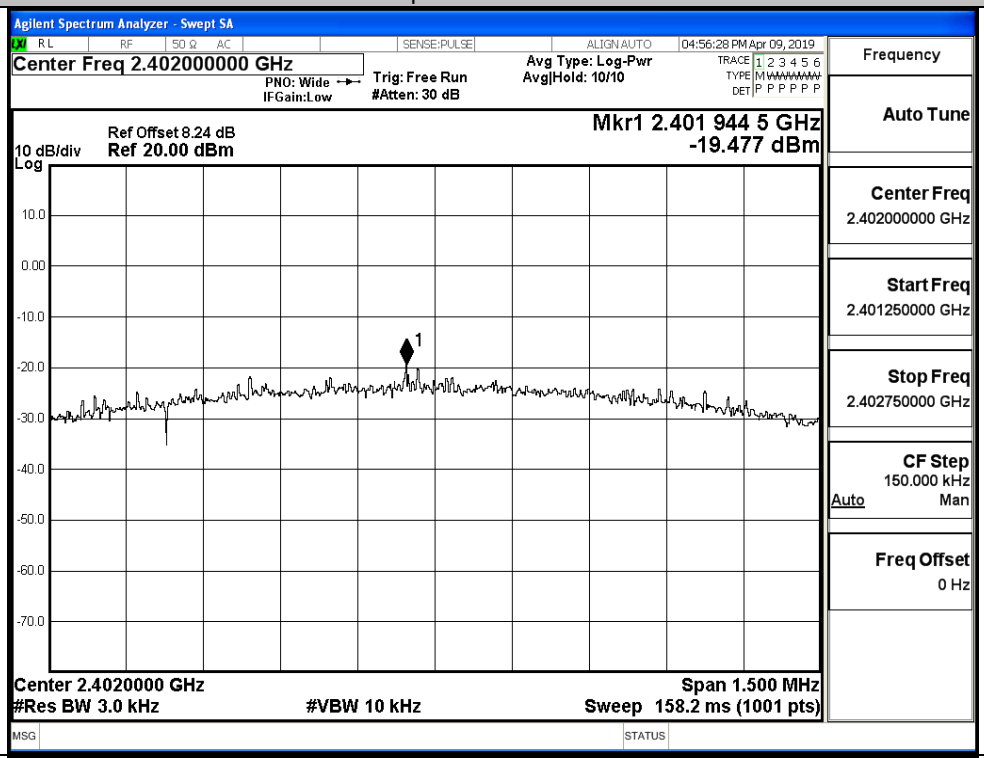
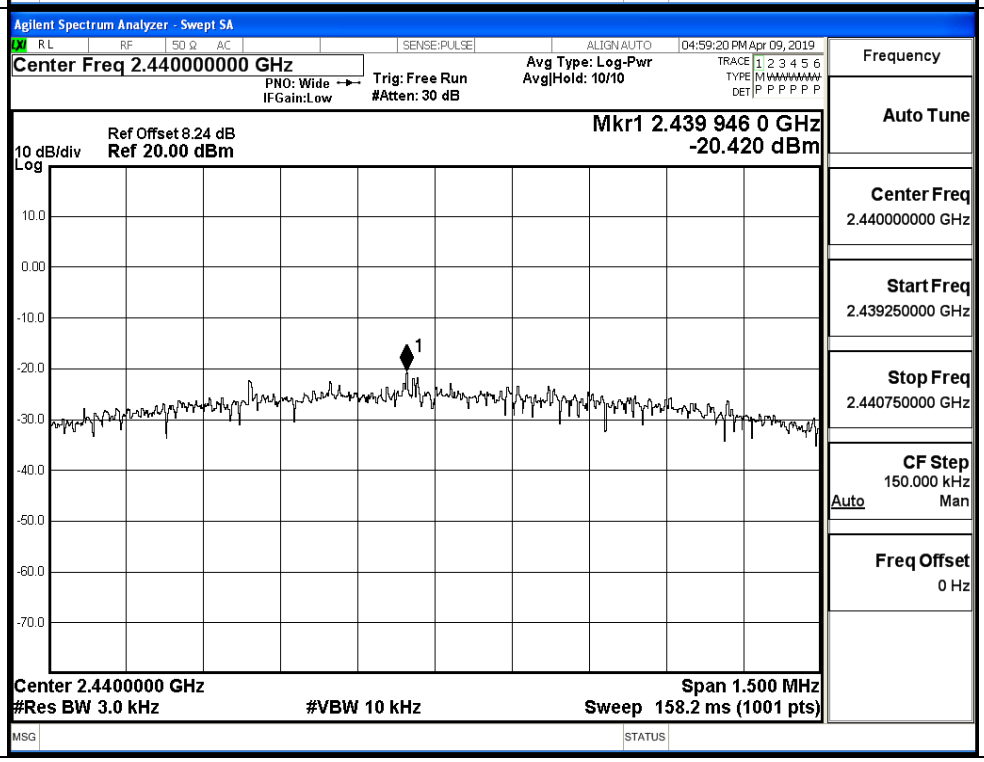
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
05:00:45 PM Apr 09, 2019
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P P P P P
Ref Offset 8.24 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.480 001 875 GHz
-3.892 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 1.0 MHz
#VBW 3.0 MHz
Span 5.000 MHz
Sweep 1.067 ms (8001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.477500000 GHz
Stop Freq
2.482500000 GHz
CF Step
500.000 kHz
Auto
Man
Freq Offset
0 Hz

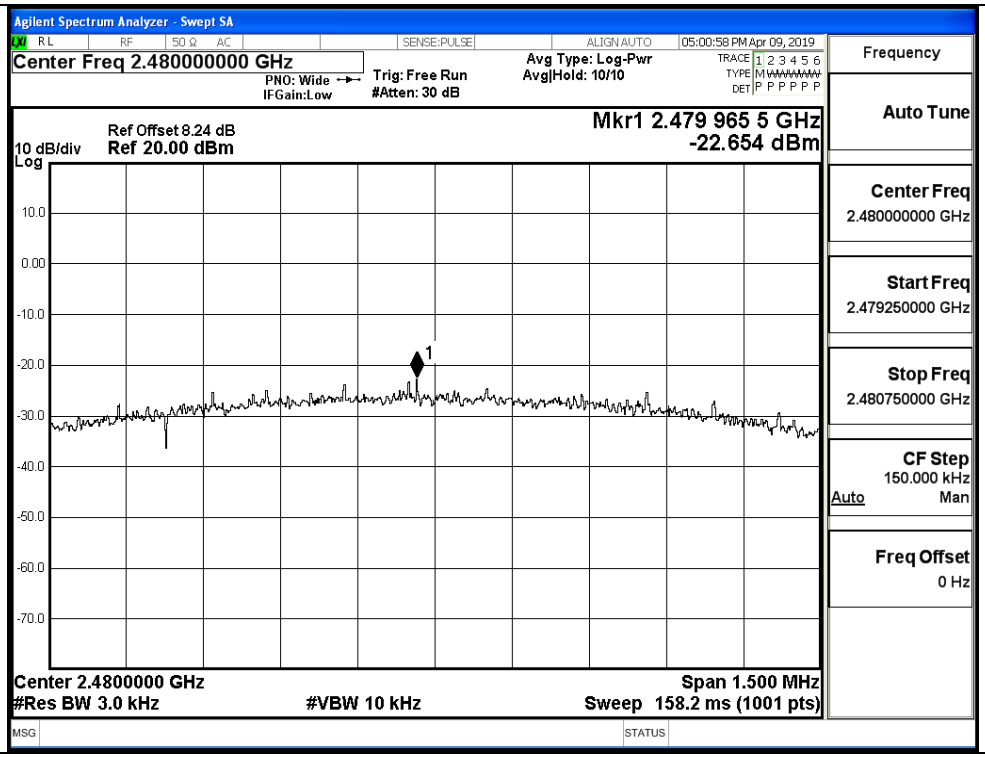
## B.3 Maximum Power Spectral Density

| Mode | Channel | PSD [dBm/3KHz] | Limit [dBm/3KHz] | Verdict |
|---|---|---|---|---|
| BT LE | LCH | -17.052 | 8 | PASS |
| BT LE | MCH | -18.326 | 8 | PASS |
| BT LE | HCH | -20.406 | 8 | PASS |
| BT 2LE | LCH | -19.477 | 8 | PASS |
| BT 2LE | MCH | -20.420 | 8 | PASS |
| BT 2LE | HCH | -22.654 | 8 | PASS |

| Test Graphs | |
|---|---|
| BT LE - LCH |  |

| | | |
|---|---|---|
| BT LE - MCH | |  |
| BT LE - HCH | |  |

| Test Graphs | | |
|---|---|---|
| BT 2LE - LCH | |  |
| BT 2LE - MCH | |  |

| | | |
|---|---|---|
| BT 2LE - HCH | |  |

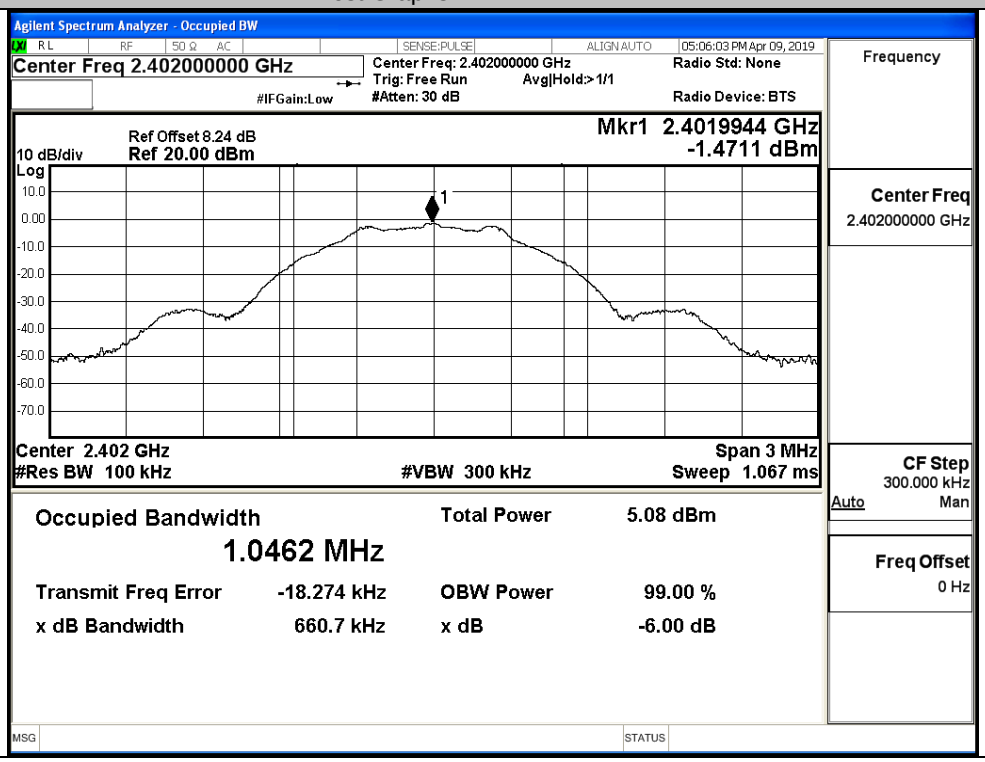
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
05:00:58 PM Apr 09, 2019
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P P P P P
Ref Offset 8.24 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 965 5 GHz
-22.654 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
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

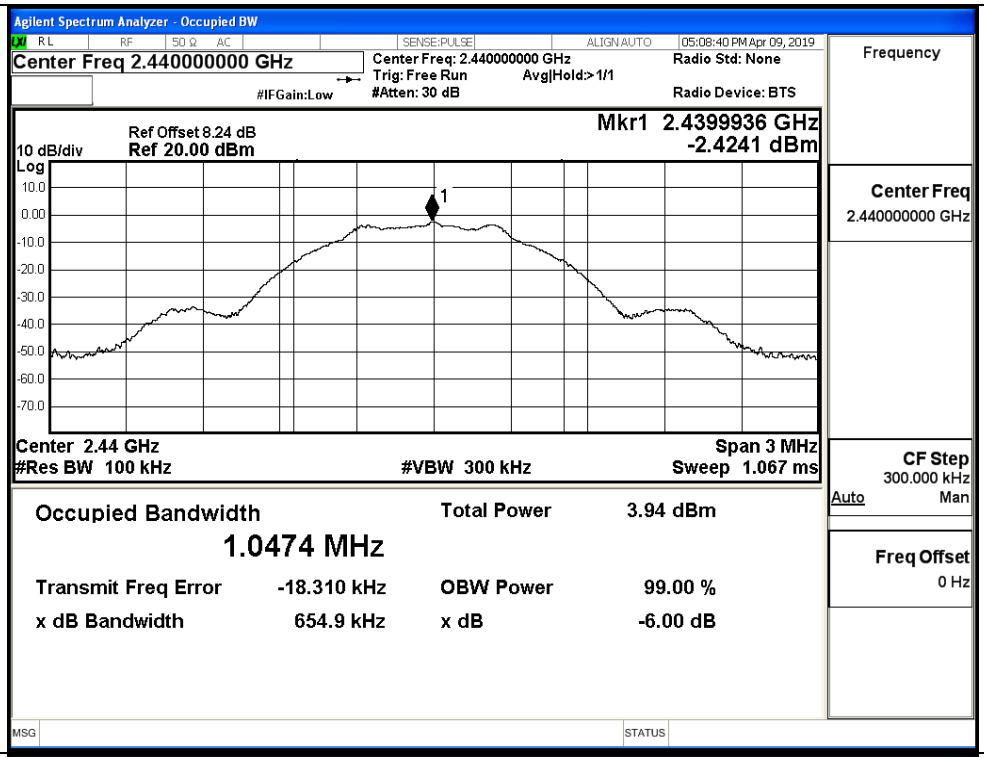
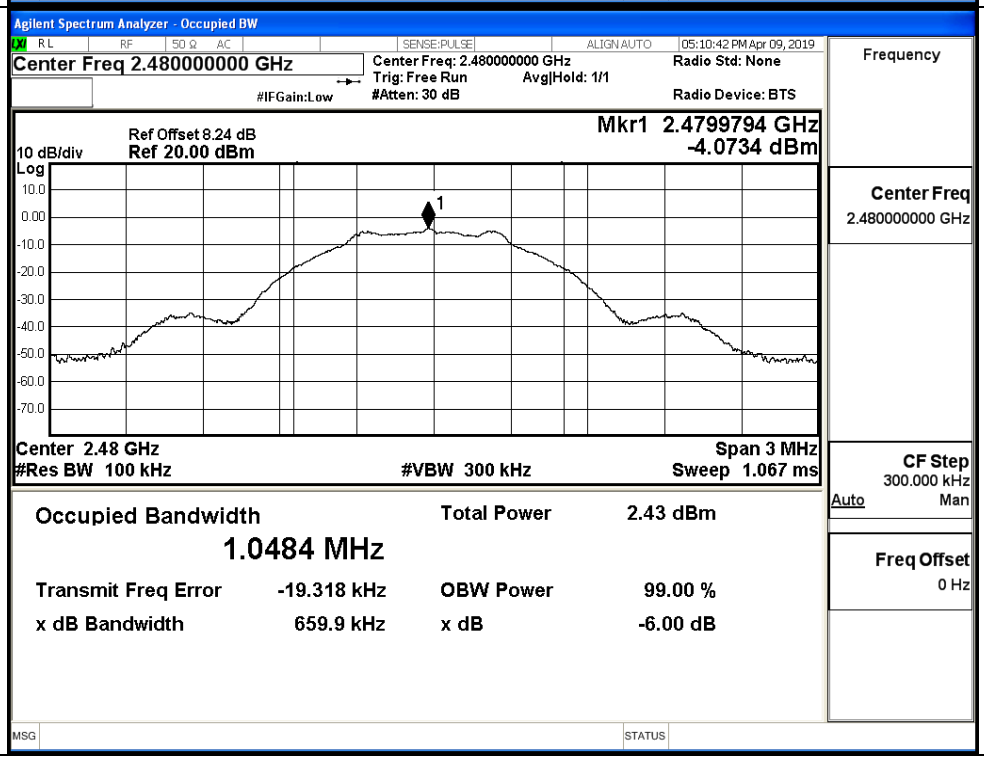
## B.4 6dB Bandwidth

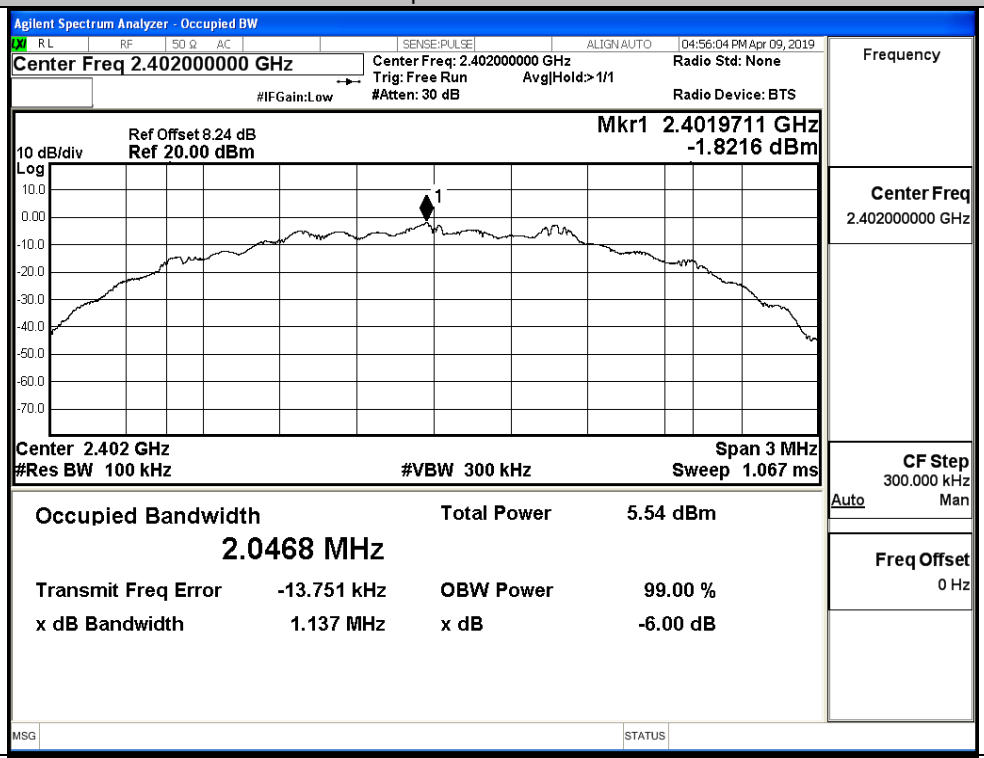
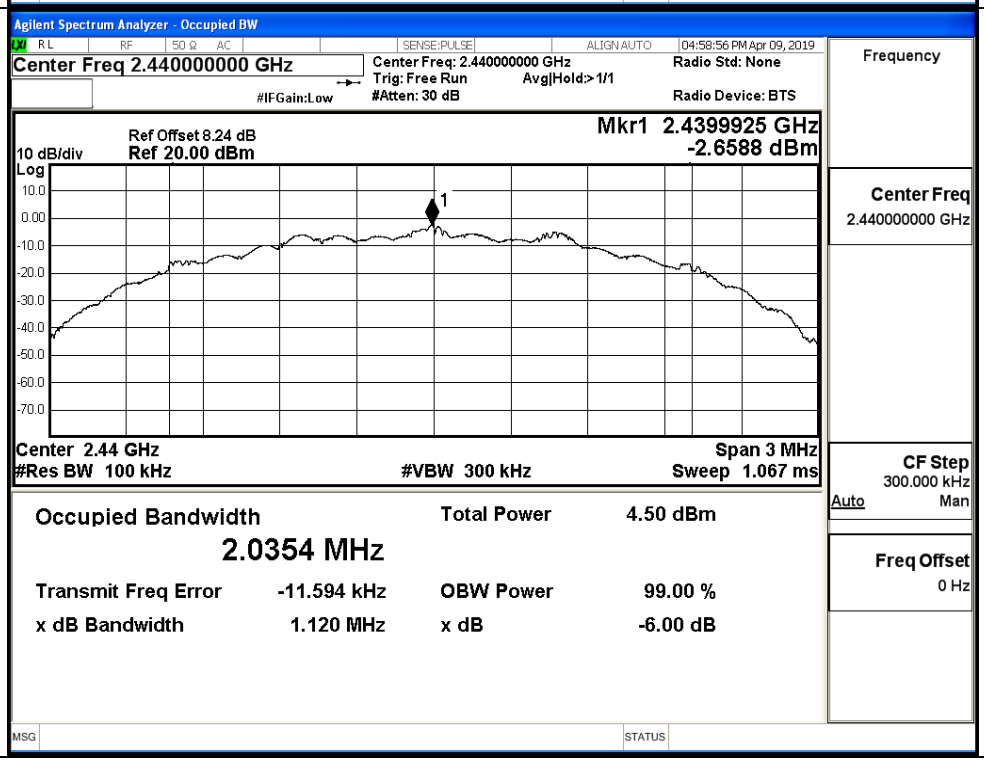
| Mode | Channel | 6dB Bandwidth [MHz] | Limit [MHz] | Verdict |
|---|---|---|---|---|
| BT LE | LCH | 0.6607 | ≥0.5 | PASS |
| BT LE | MCH | 0.6549 | ≥0.5 | PASS |
| BT LE | HCH | 0.6599 | ≥0.5 | PASS |
| BT 2LE | LCH | 1.137 | ≥0.5 | PASS |
| BT 2LE | MCH | 1.120 | ≥0.5 | PASS |
| BT 2LE | HCH | 1.126 | ≥0.5 | PASS |

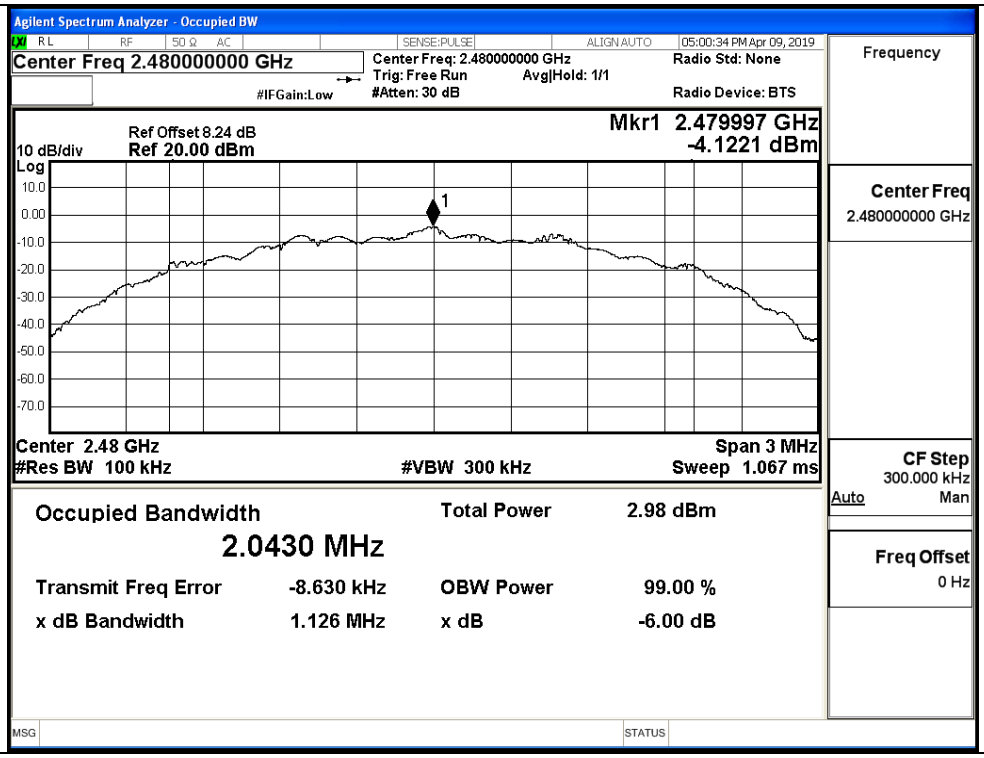
Test Graphs

BT LE - LCH



| | | |
|---|---|---|
| BT LE - MCH | |  |
| BT LE - HCH | |  |

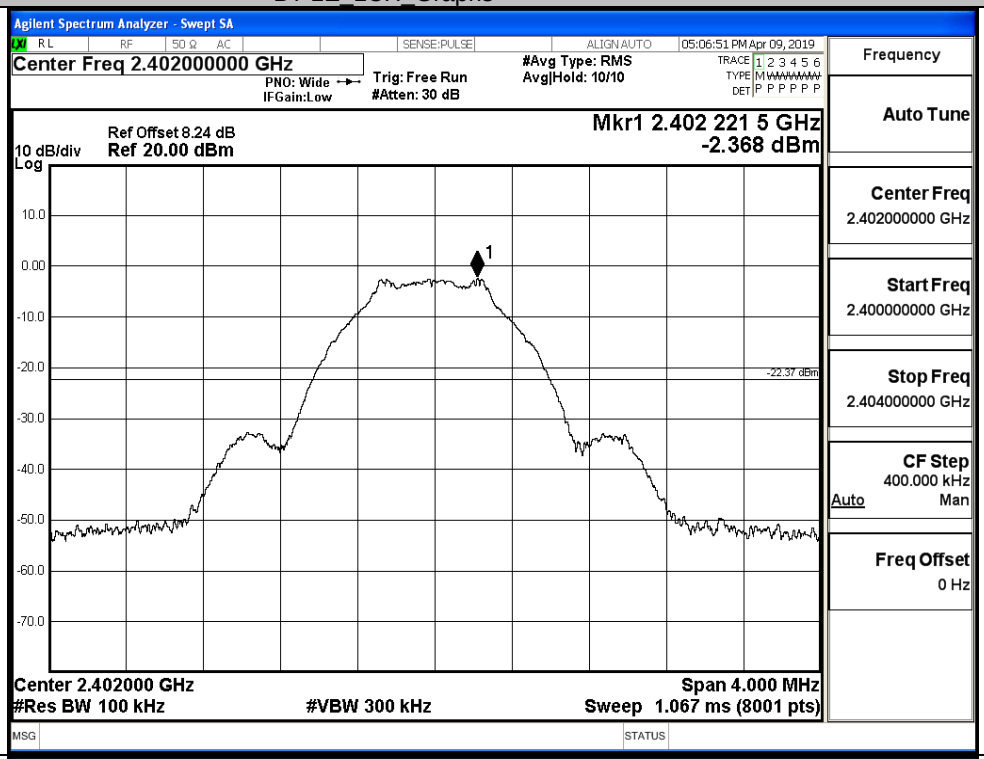
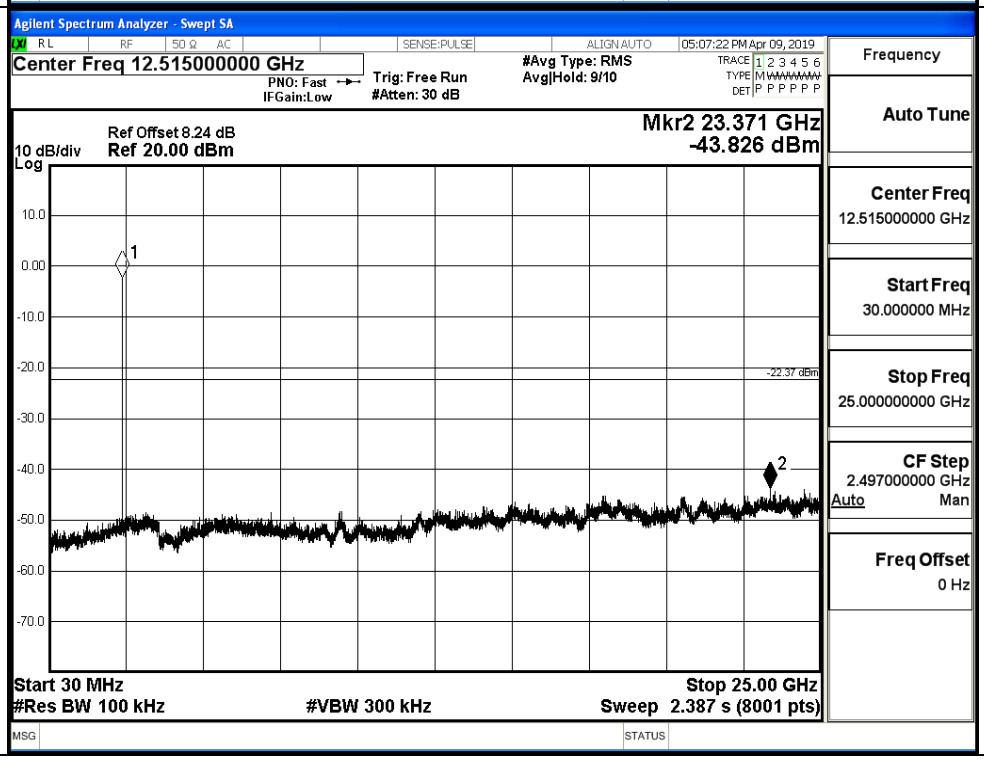
| Test Graphs | | |
|---|---|---|
| BT 2LE - LCH | |  |
| BT 2LE - MCH | |  |

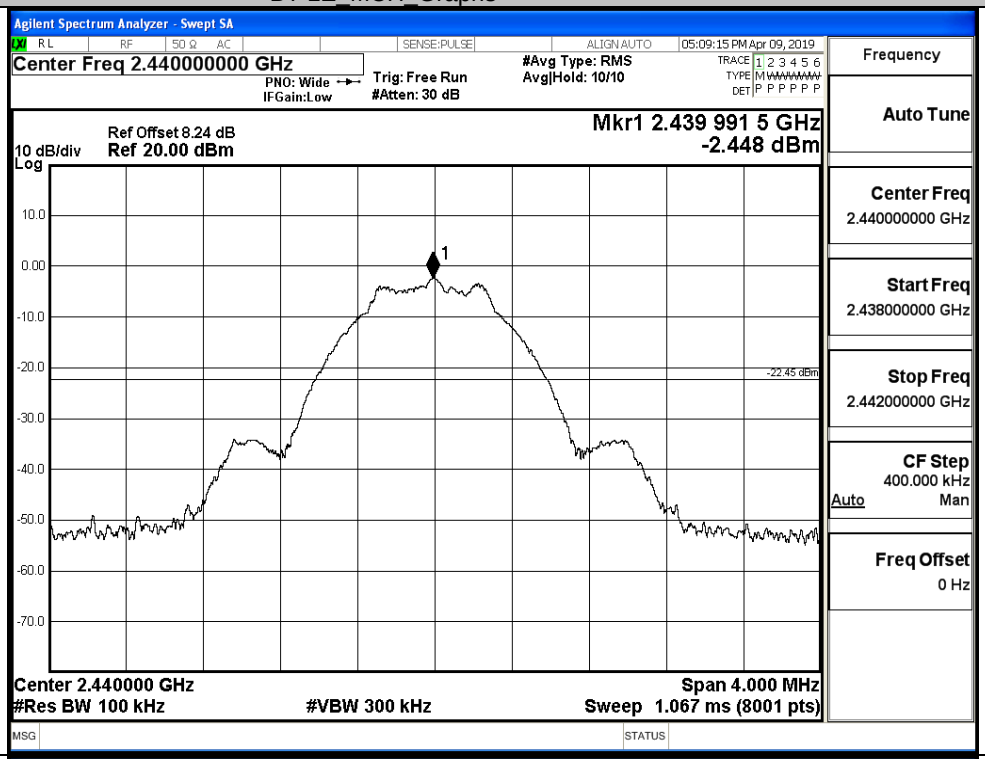
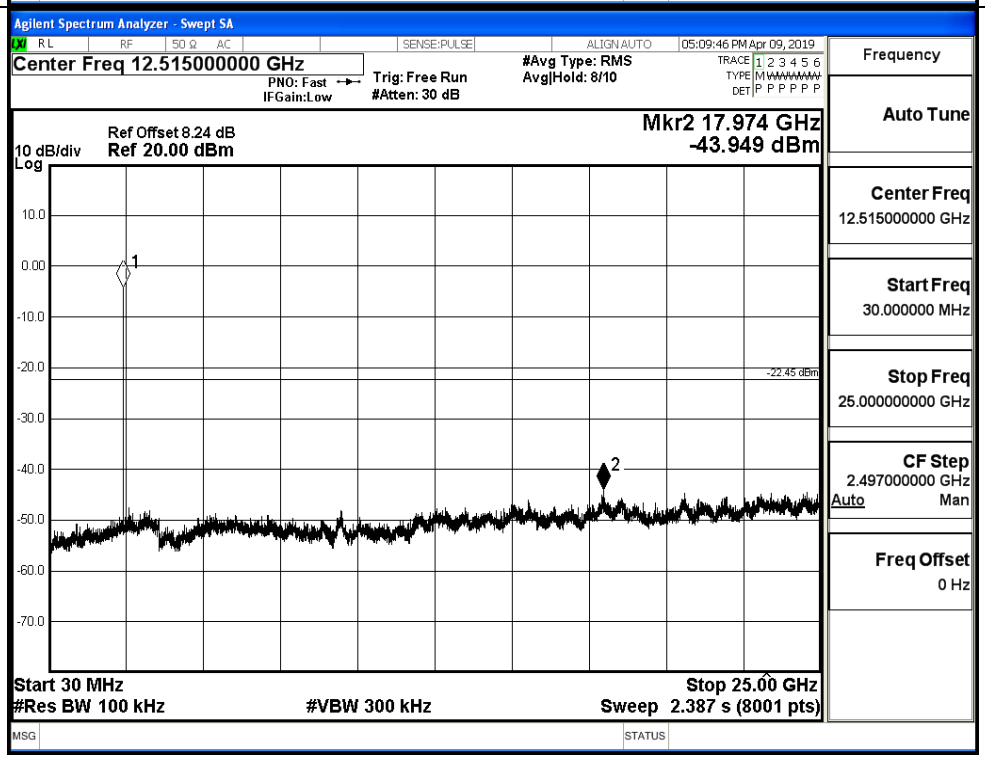
| | | |
|---|---|---|
| BT 2LE - HCH | |  |

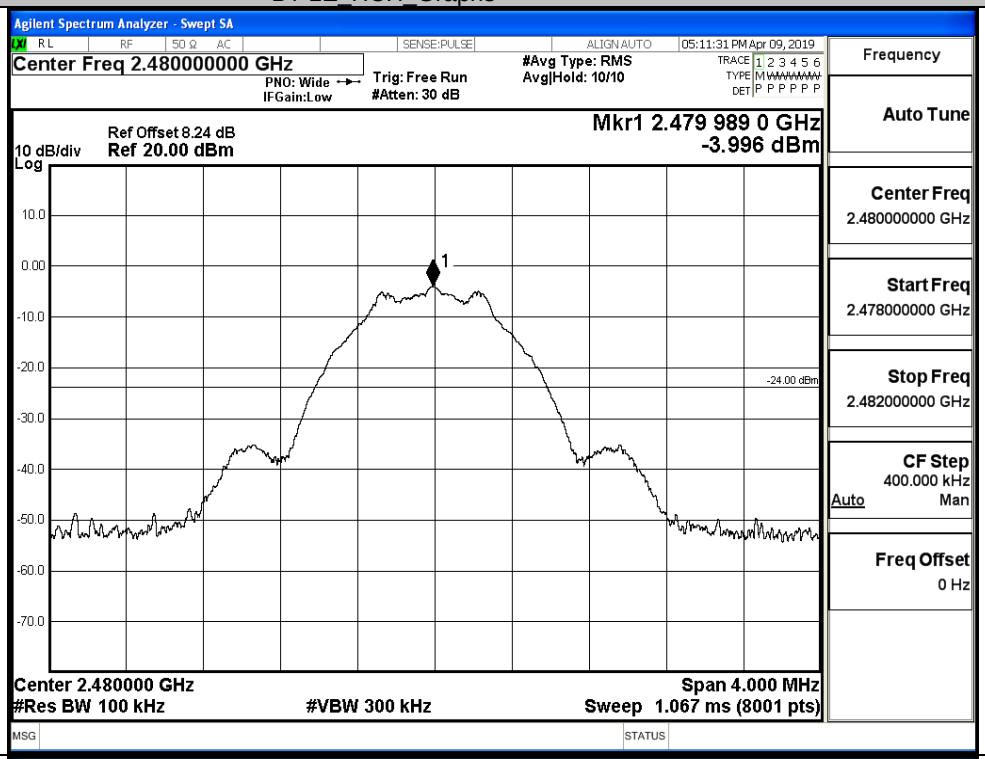
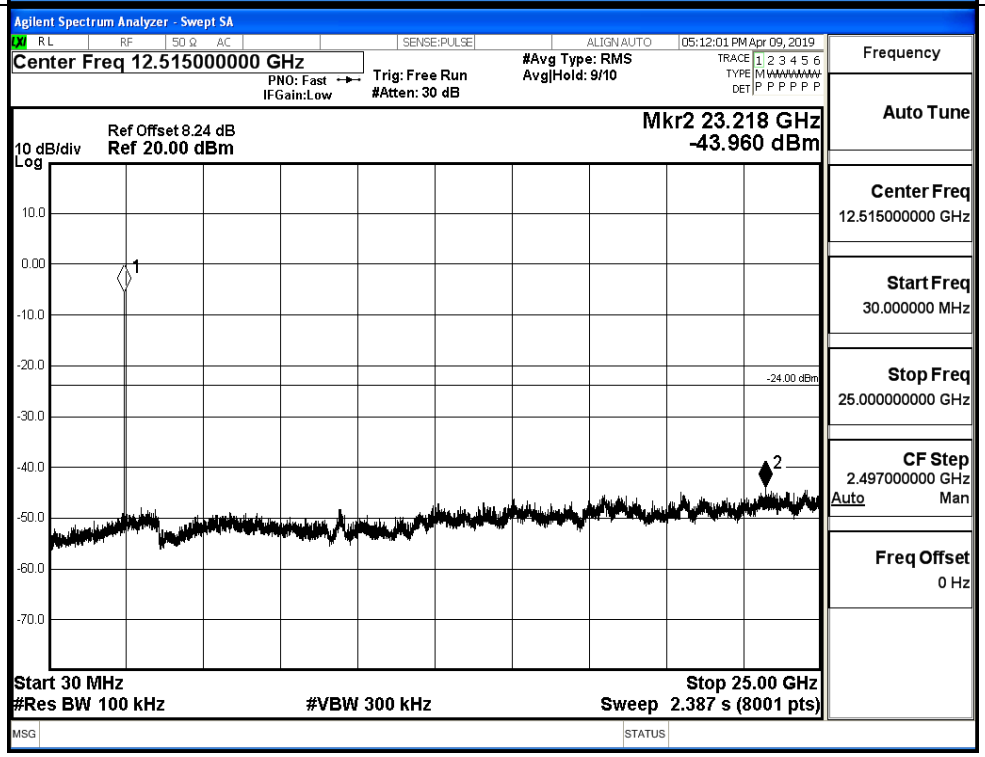
Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN AUTO
05:00:34 PM Apr 09, 2019
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 8.24 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479997 GHz
-4.1221 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
2.0430 MHz
Total Power
2.98 dBm
Freq Offset
0 Hz
Transmit Freq Error
-8.630 kHz
OBW Power
99.00 %
x dB Bandwidth
1.126 MHz
x dB
-6.00 dB
MSG
STATUS

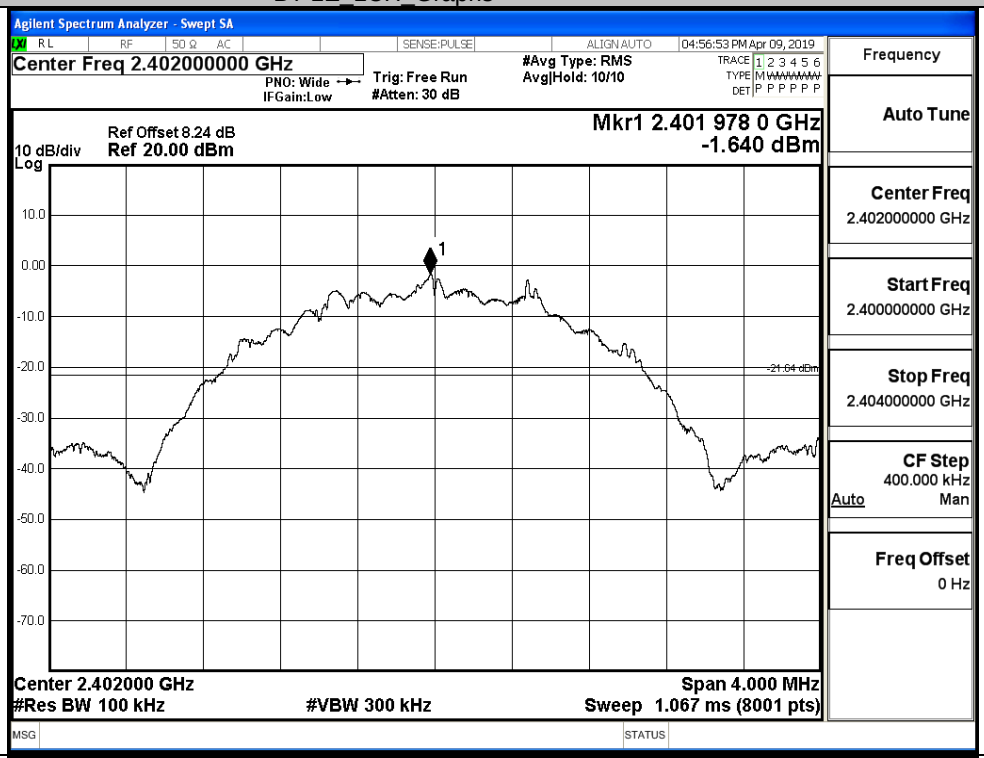
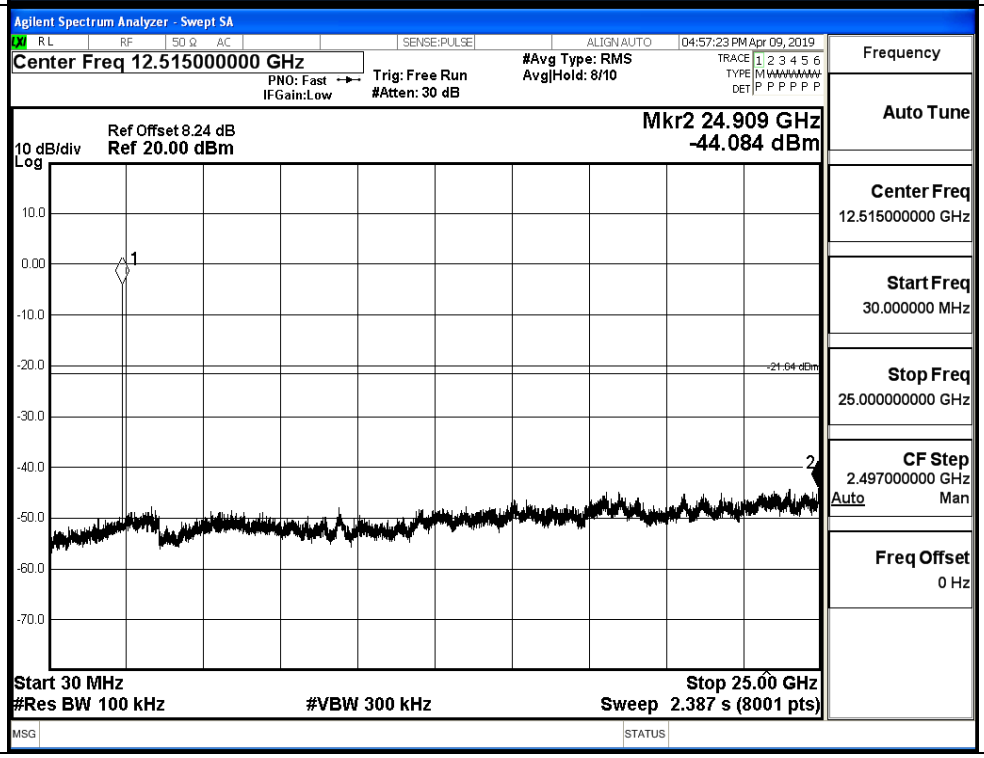
## B.5 RF Conducted Spurious Emissions

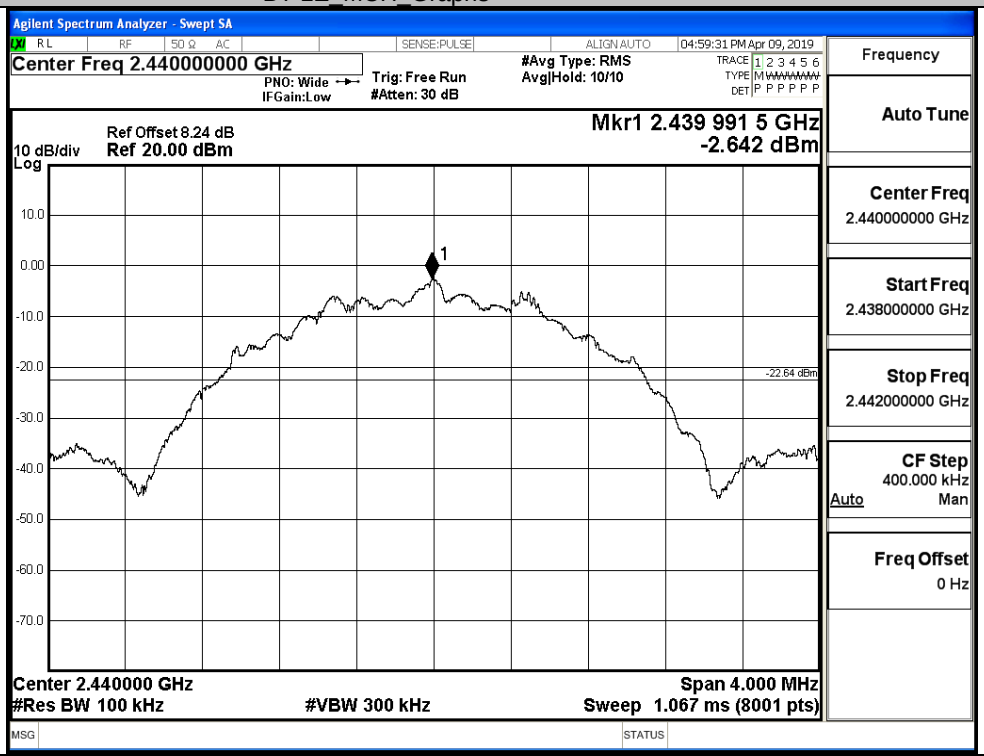
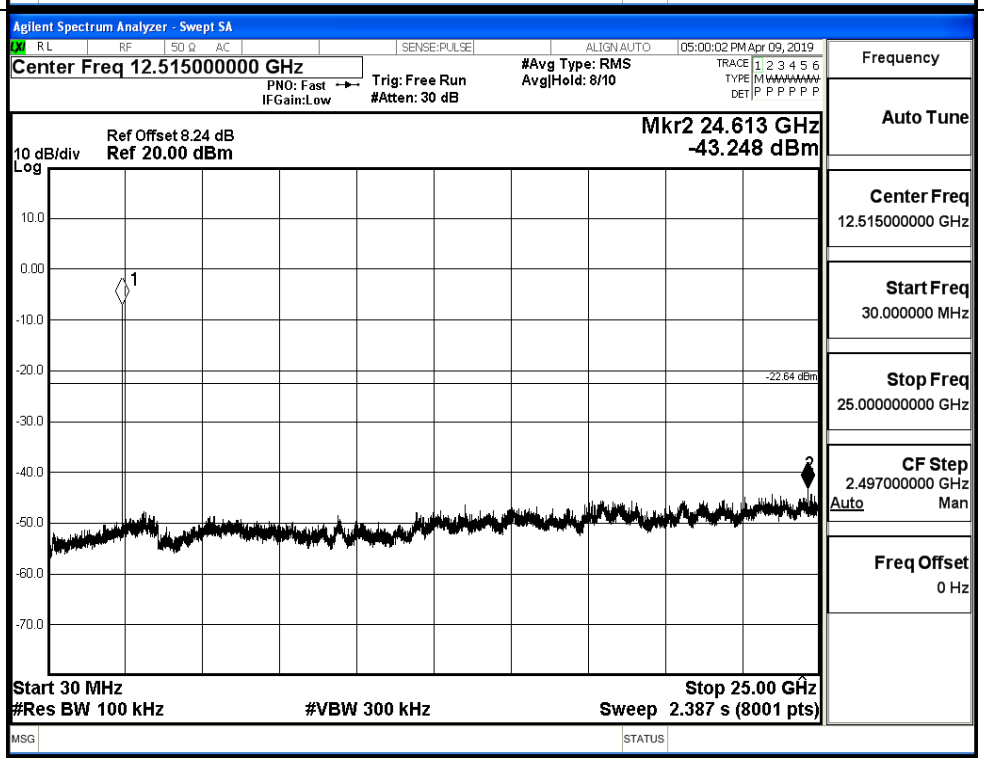
| Mode | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|
| BT LE | LCH | -2.368 | -43.826 | -22.368 | PASS |
| BT LE | MCH | -2.448 | -43.949 | -22.448 | PASS |
| BT LE | HCH | -3.996 | -43.960 | -23.996 | PASS |
| BT 2LE | LCH | -1.64 | -44.084 | -21.640 | PASS |
| BT 2LE | MCH | -2.642 | -43.248 | -22.642 | PASS |
| BT 2LE | HCH | -5.552 | -44.394 | -25.552 | PASS |

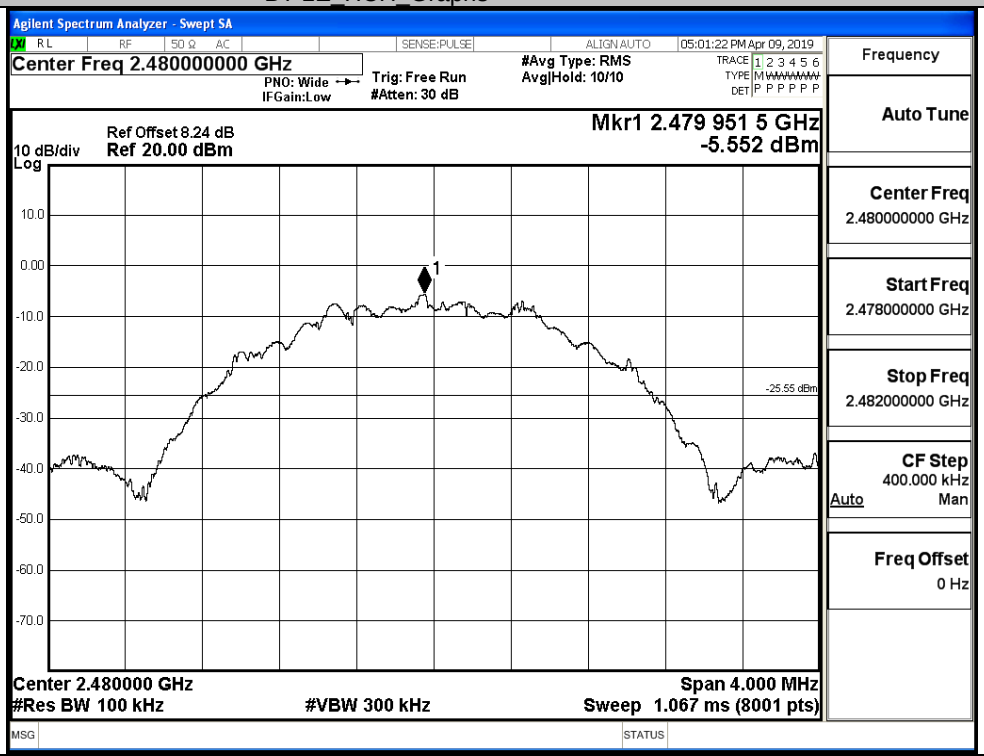
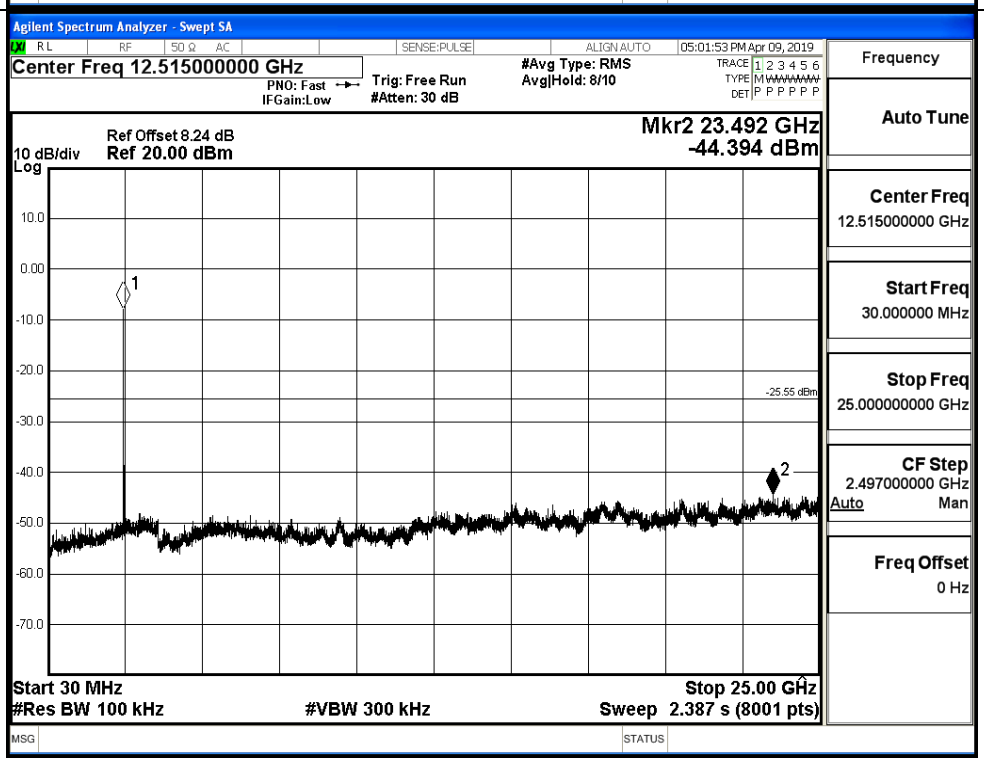
| BT LE_LCH_Graphs | | |
|---|---|---|
| Pref/BT LE/LCH | |  |
| Puw/BT LE/LCH | |  |

| BT LE_MCH_Graphs | |
|---|---|
| Pref/BT LE/MCH |  |
| Puw/BT LE/MCH |  |

| BT LE_HCH_Graphs | |
|---|---|
| Pref/BT LE/HCH |  |
| Puw/BT LE/HCH |  |

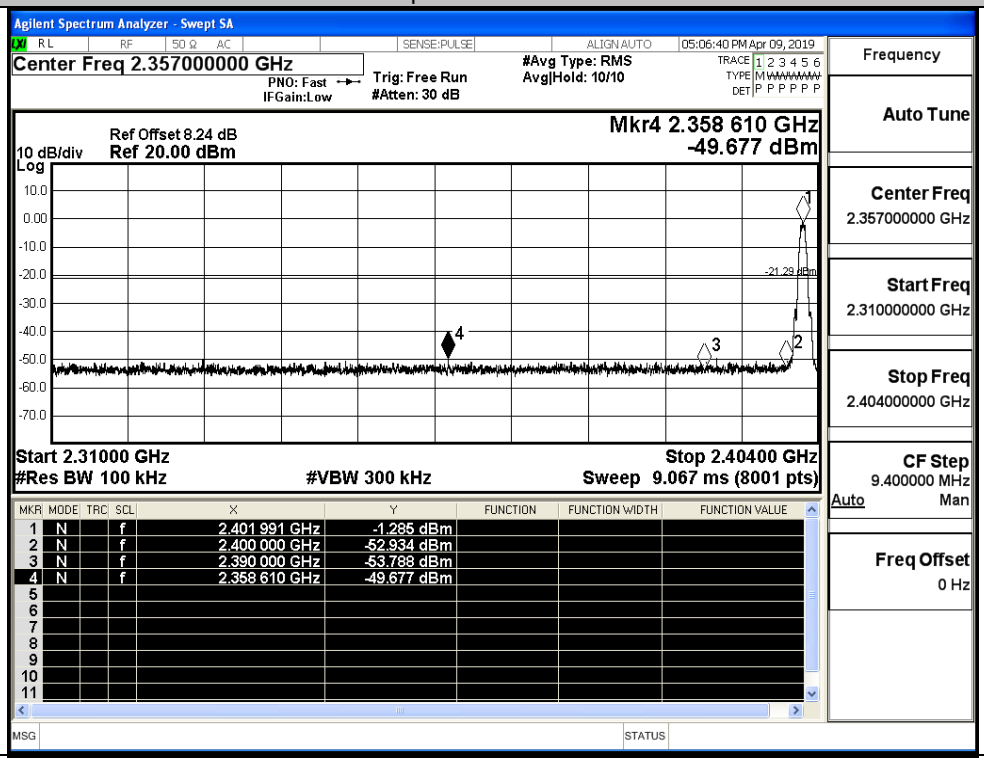
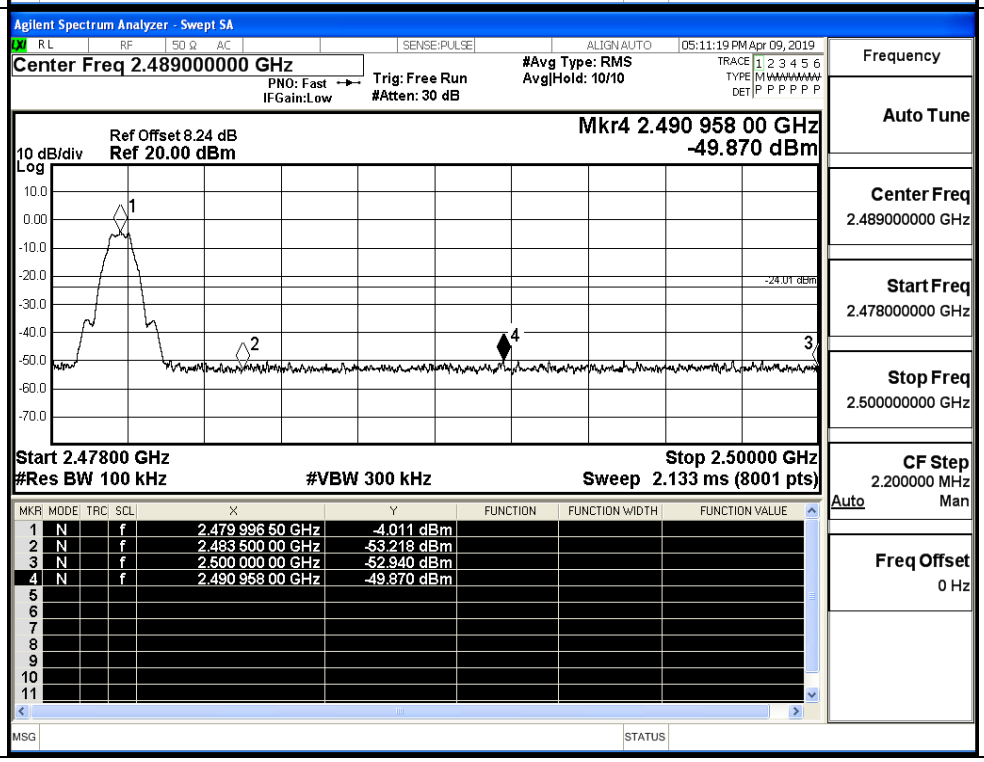
| BT LE_LCH_Graphs | | |
|---|---|---|
| Pref/BT 2LE/LCH | |  |
| Puw/BT 2LE/LCH | |  |

| BT LE_MCH_Graphs | |
|---|---|
| Pref/BT 2LE/MCH |  |
| Puw/BT 2LE/MCH |  |

| BT LE_HCH_Graphs | |
|---|---|
| Pref/BT 2LE/HCH |  |
| Puw/BT 2LE/HCH |  |

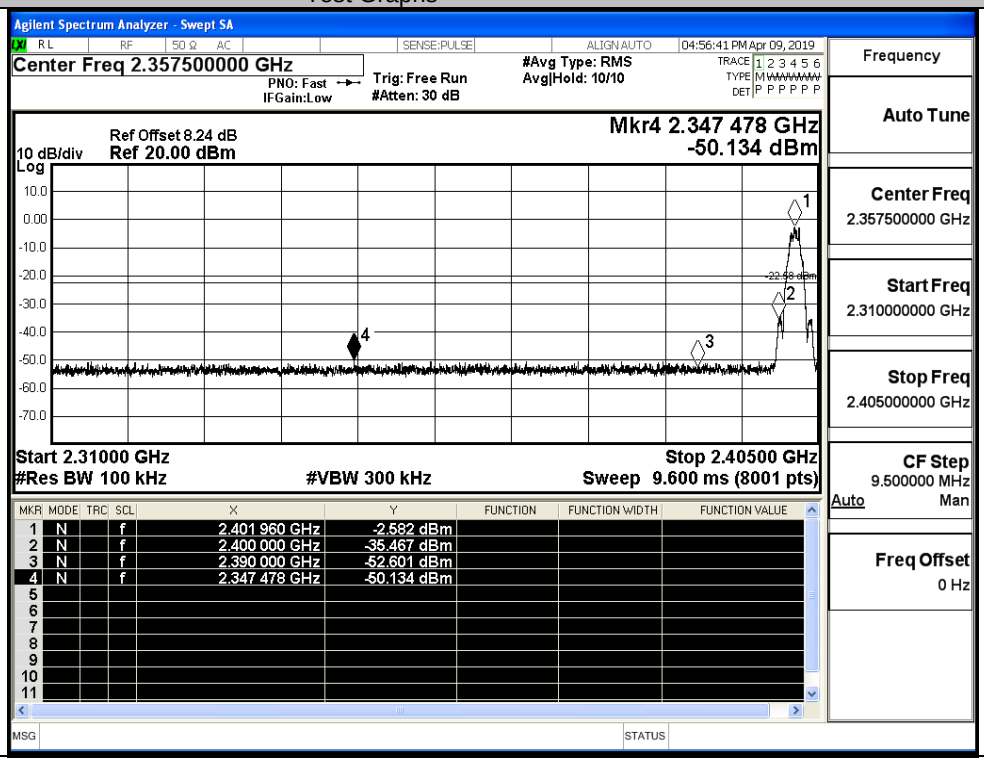
## B.6 Band-edge for RF Conducted Emissions

| Mode | Channel | Carrier Power[dBm] | Max.Spurious Level [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|
| BT LE | LCH | -1.285 | -49.677 | -21.29 | PASS |
| BT LE | HCH | -4.011 | -49.870 | -24.01 | PASS |
| BT 2LE | LCH | -2.582 | -50.134 | -22.58 | PASS |
| BT 2LE | HCH | -4.204 | -49.926 | -24.2 | PASS |

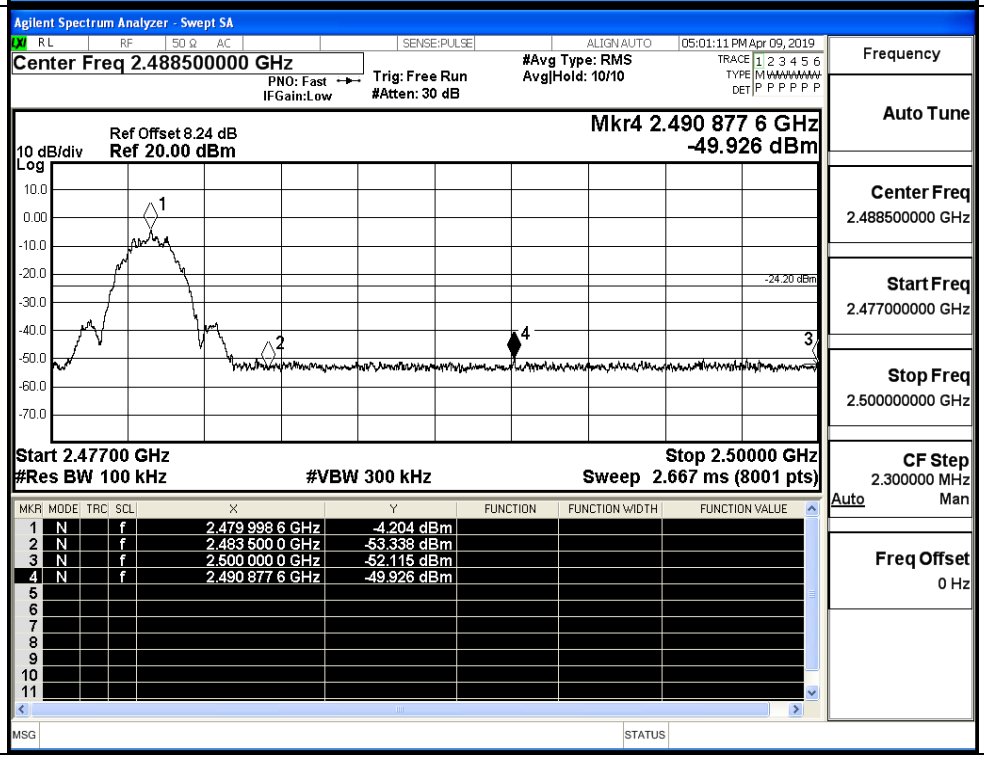
| Test Graphs | | |
|---|---|---|
| BT LE - LCH | |  |
| BT LE - HCH | |  |

Test Graphs

BT 2LE - LCH



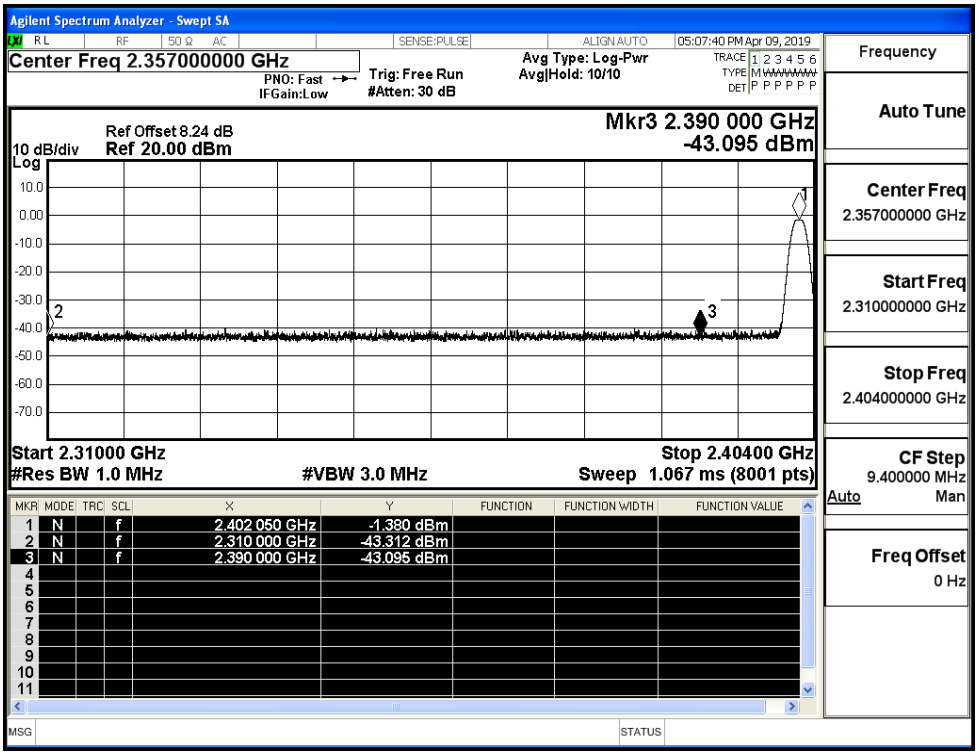

BT 2LE - HCH



## B.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 | -43.31 | 2.0 | 0 | 51.95 | PEAK | 74 | PASS |
| | | Ant1 | 2310.0 | -53.41 | 2.0 | 0 | 41.85 | AV | 54 | PASS |
| | | Ant1 | 2390.0 | -43.10 | 2.0 | 0 | 52.16 | PEAK | 74 | PASS |
| | | Ant1 | 2390.0 | -53.19 | 2.0 | 0 | 42.07 | AV | 54 | PASS |
| | 2480 | Ant1 | 2483.5 | -42.81 | 2.0 | 0 | 52.45 | PEAK | 74 | PASS |
| | | Ant1 | 2483.5 | -52.82 | 2.0 | 0 | 42.44 | AV | 54 | PASS |
| | | Ant1 | 2500.0 | -43.09 | 2.0 | 0 | 52.17 | PEAK | 74 | PASS |
| | | Ant1 | 2500.0 | -52.73 | 2.0 | 0 | 42.53 | AV | 54 | PASS |
| BT 2LE | 2402 | Ant1 | 2310.0 | -43.16 | 2.0 | 0 | 52.10 | PEAK | 74 | PASS |
| | | Ant1 | 2310.0 | -53.77 | 2.0 | 0 | 41.49 | AV | 54 | PASS |
| | | Ant1 | 2390.0 | -43.03 | 2.0 | 0 | 52.23 | PEAK | 74 | PASS |
| | | Ant1 | 2390.0 | -53.53 | 2.0 | 0 | 41.73 | AV | 54 | PASS |
| | 2480 | Ant1 | 2483.5 | -42.80 | 2.0 | 0 | 52.46 | PEAK | 74 | PASS |
| | | Ant1 | 2483.5 | -52.67 | 2.0 | 0 | 42.59 | AV | 54 | PASS |
| | | Ant1 | 2500.0 | -44.62 | 2.0 | 0 | 50.64 | PEAK | 74 | PASS |
| | | Ant1 | 2500.0 | -52.85 | 2.0 | 0 | 42.40 | AV | 54 | PASS |

Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK

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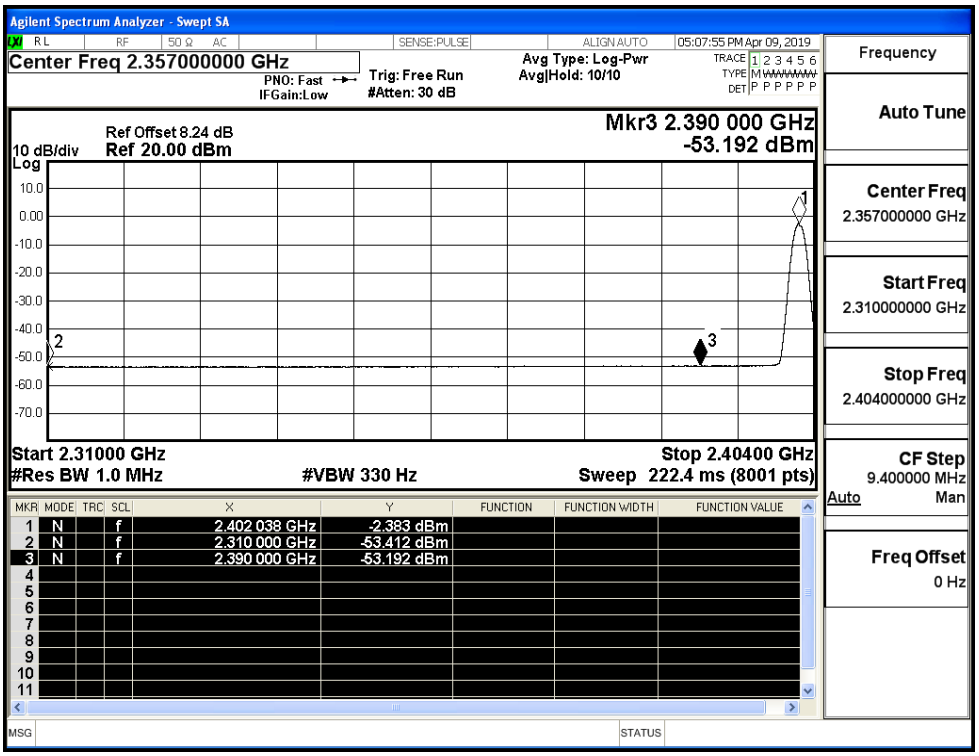

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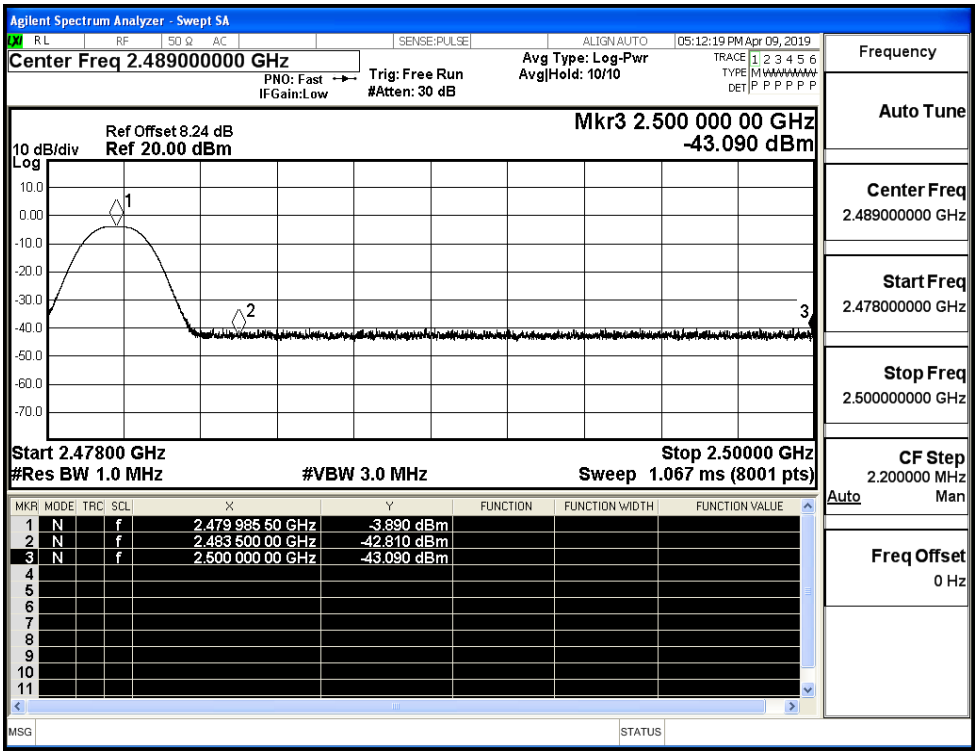


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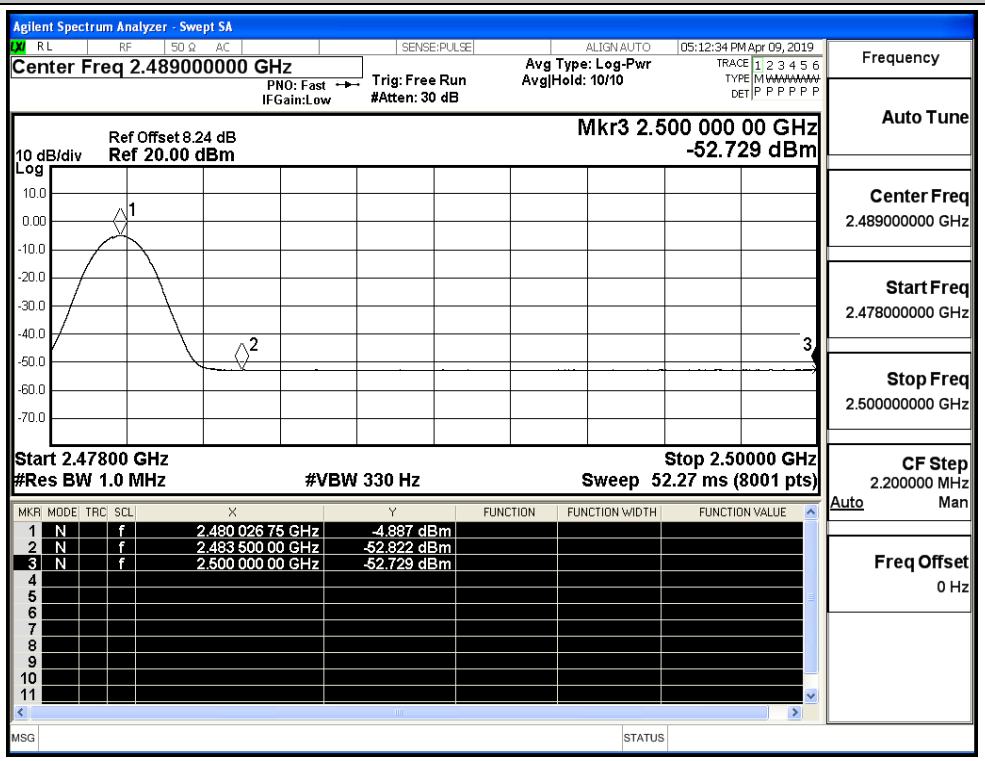
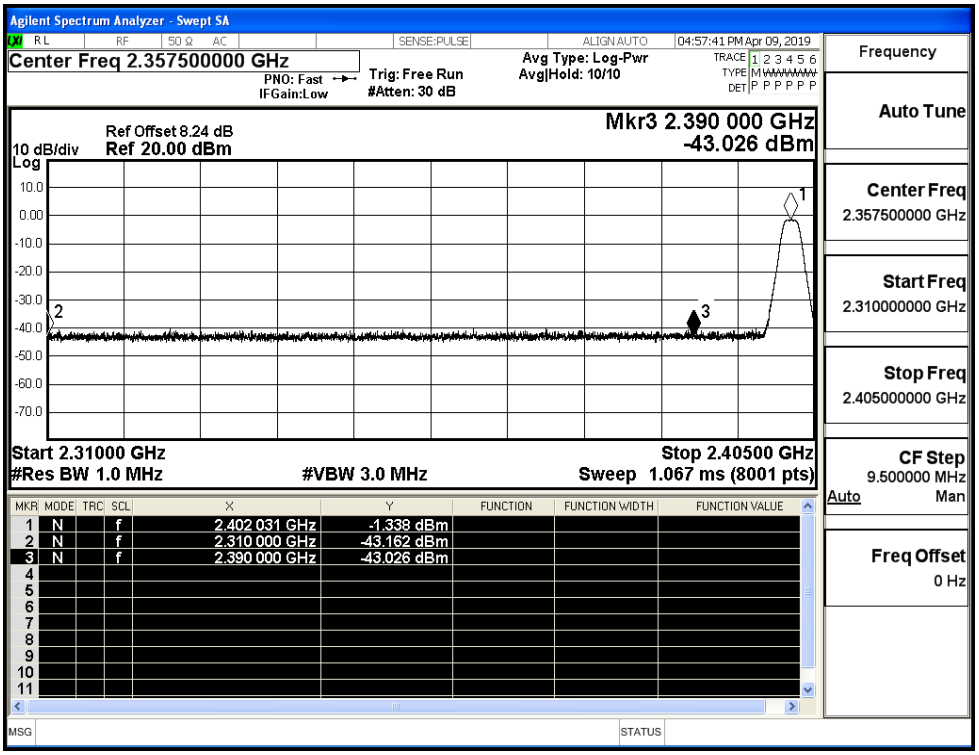


Restrict-band band-edge measurements_BT 2LE_2402_Ant1_PEAK

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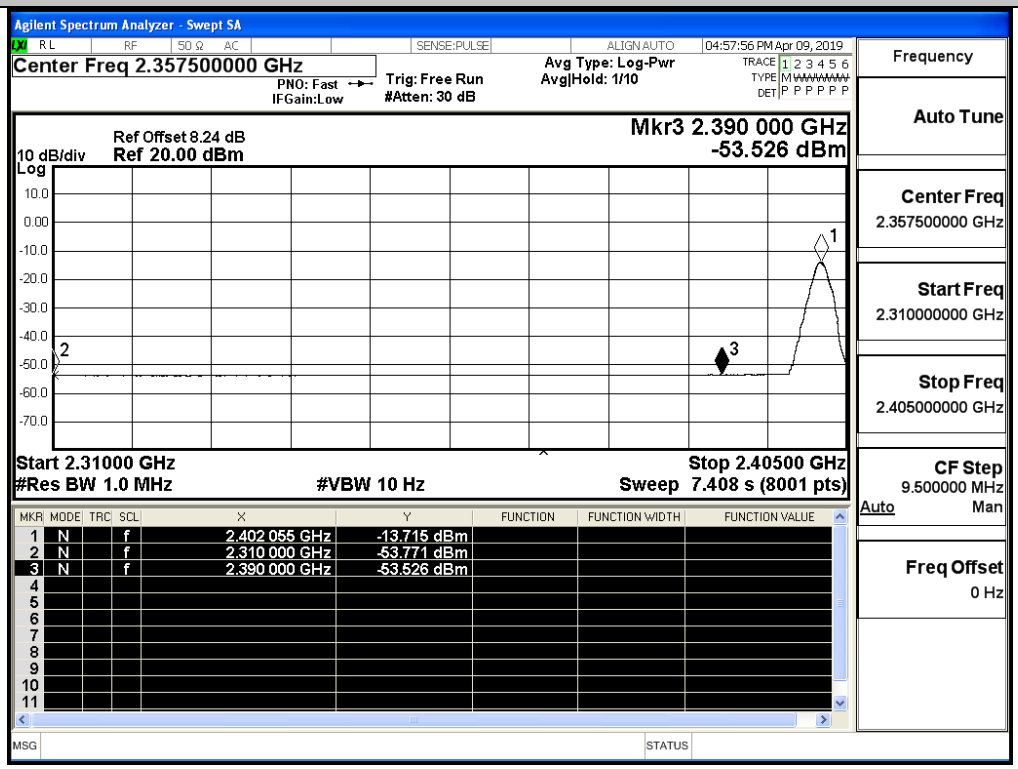

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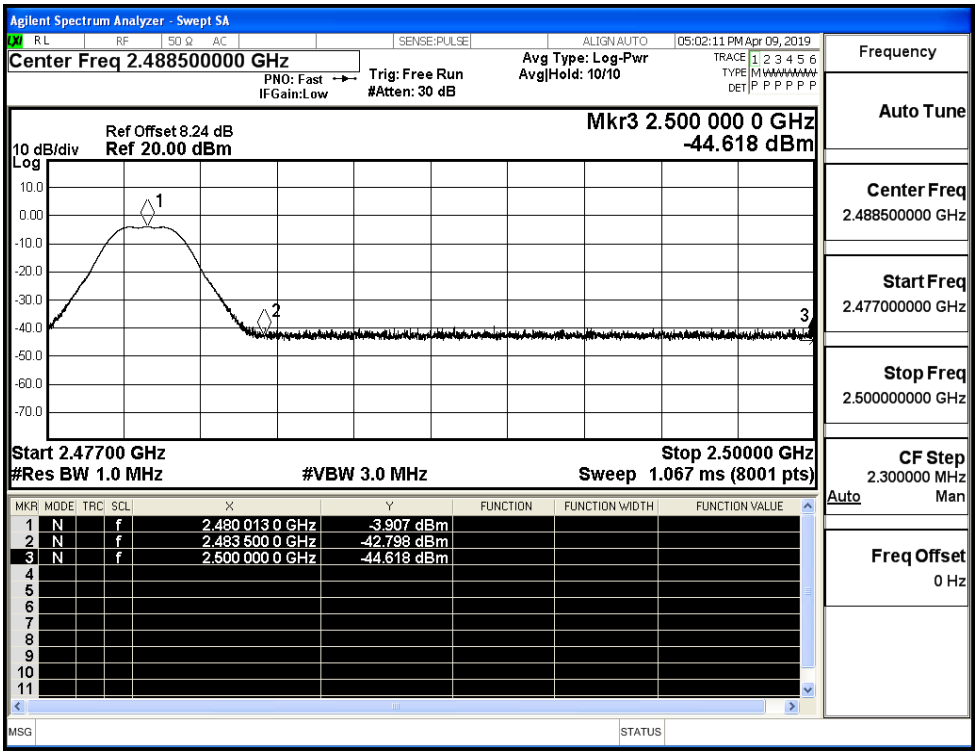


Restrict-band band-edge measurements_BT 2LE_2480_Ant1_AV