

## Appendix B

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

Product Name: iConnect Round

Trade Mark: iConnect By Timex

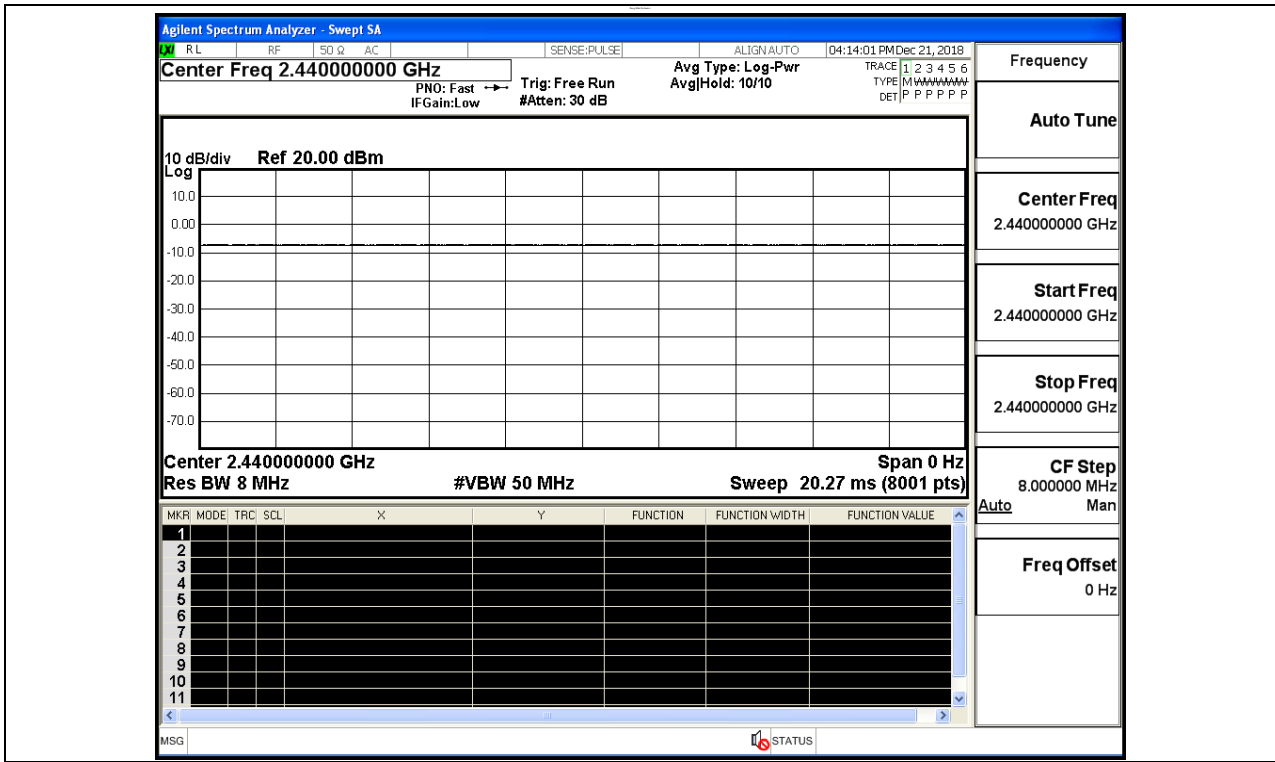
Test Model: M03Z

#### Environmental Conditions

|                    |             |
|--------------------|-------------|
| Temperature:       | 24.3 ° C    |
| Relative Humidity: | 53.1%       |
| ATM Pressure:      | 100.0 kPa   |
| Test Engineer:     | Mina.Xu     |
| Supervised by:     | Jayden.Zhuo |

#### B.1 Duty Cycle

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

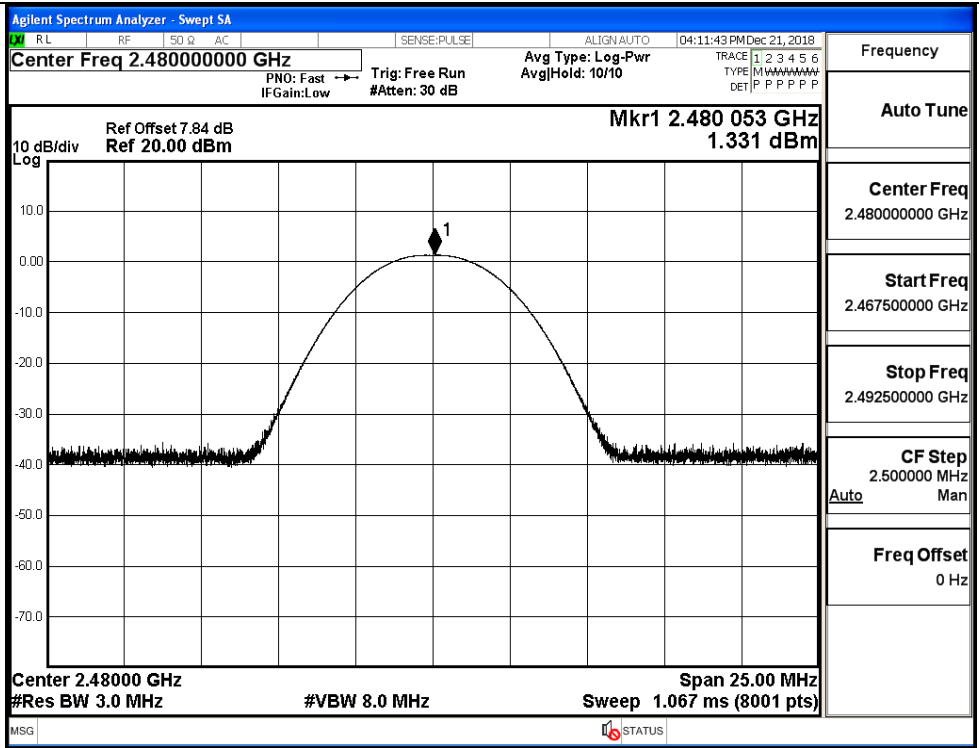


**B.2 Maximum Conducted Peak Output Power**

| Mode  | Channel | Conduct Peak Power[dBm] | Limit [dBm] | Verdict |
|-------|---------|-------------------------|-------------|---------|
| BT LE | LCH     | -0.139                  | 30          | PASS    |
| BT LE | MCH     | 0.574                   | 30          | PASS    |
| BT LE | HCH     | 1.331                   | 30          | PASS    |

| Test Graphs |  |
|-------------|--|
| LCH         | <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.40200000 GHz</p> <p>Mkr1 2.402 138 GHz<br/>-0.139 dBm</p> <p>Ref Offset 7.84 dB<br/>Ref 20.00 dBm</p> <p>10 dB/div<br/>Log</p> <p>Center 2.40200 GHz<br/>#Res BW 3.0 MHz<br/>#VBW 8.0 MHz<br/>Sweep 1.067 ms (8001 pts)</p> |
| MCH         | <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.44000000 GHz</p> <p>Mkr1 2.439 747 GHz<br/>0.574 dBm</p> <p>Ref Offset 7.84 dB<br/>Ref 20.00 dBm</p> <p>10 dB/div<br/>Log</p> <p>Center 2.44000 GHz<br/>#Res BW 3.0 MHz<br/>#VBW 8.0 MHz<br/>Sweep 1.067 ms (8001 pts)</p>  |

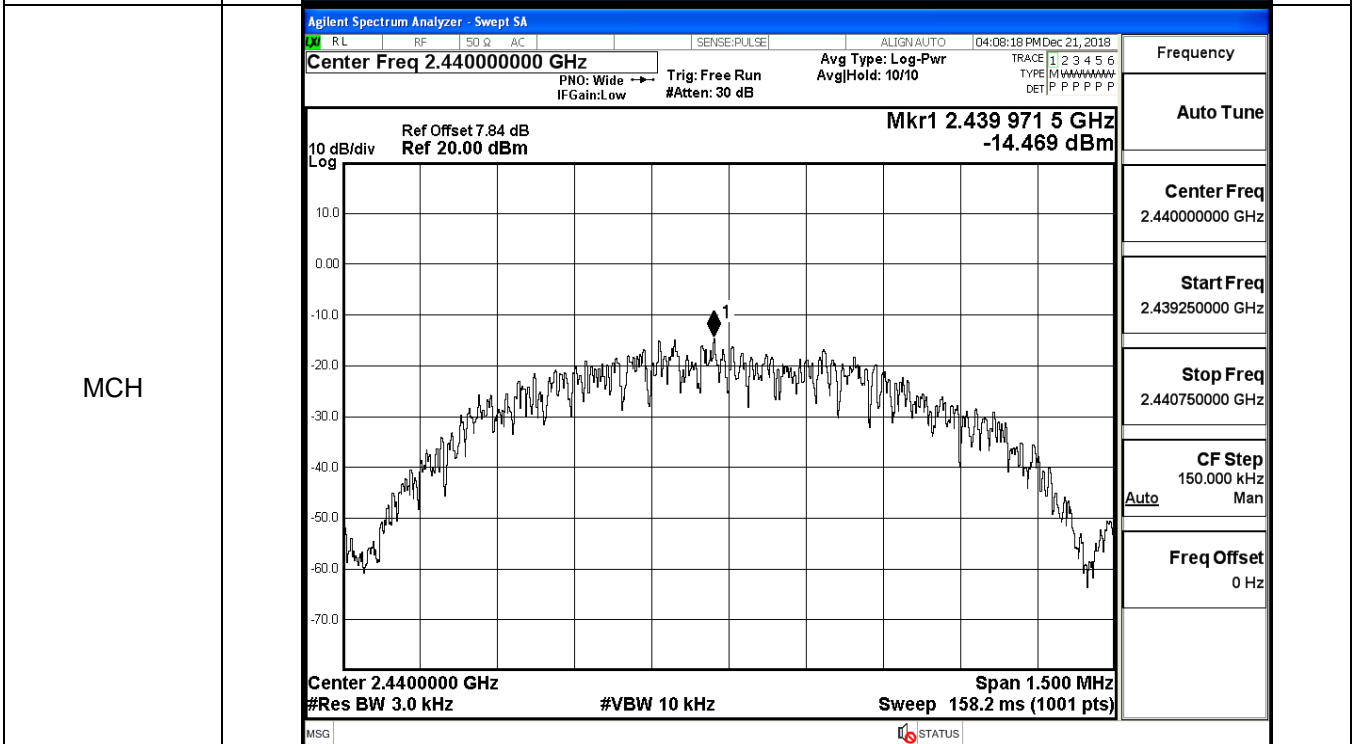
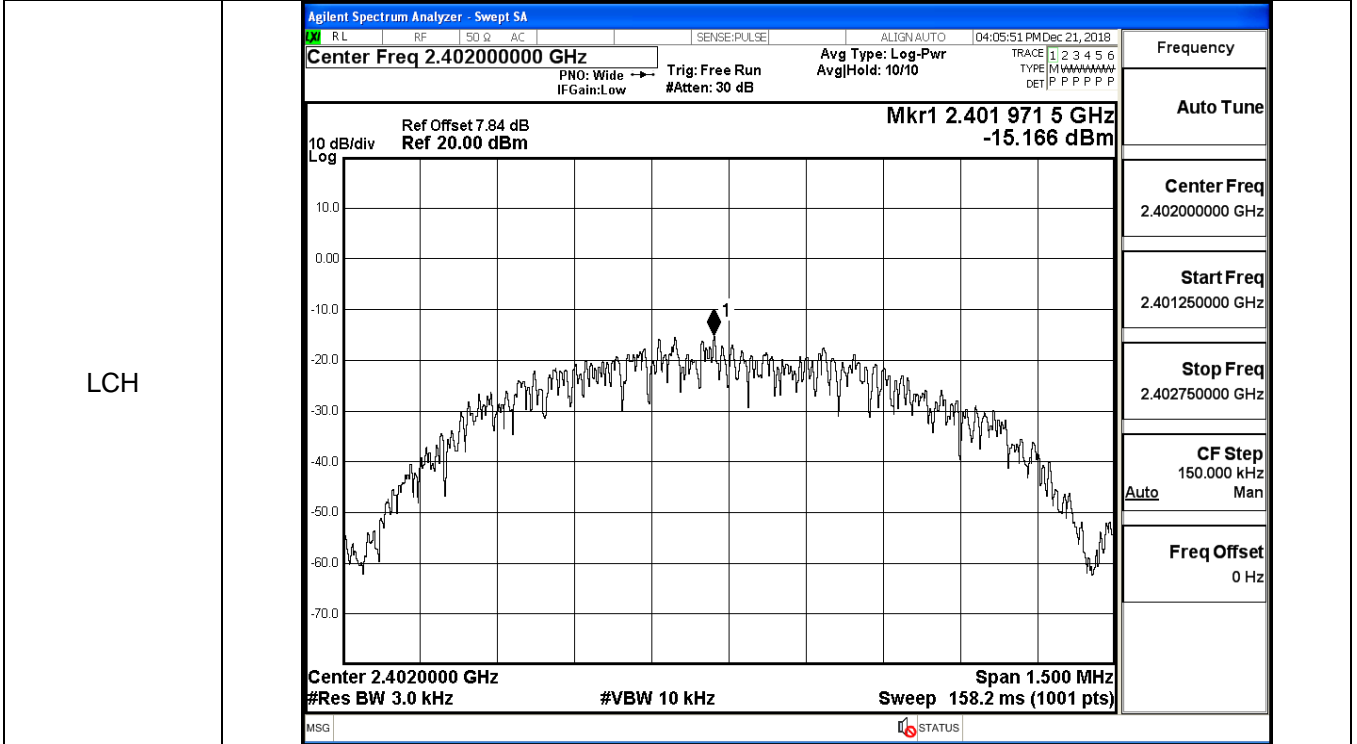
HCH



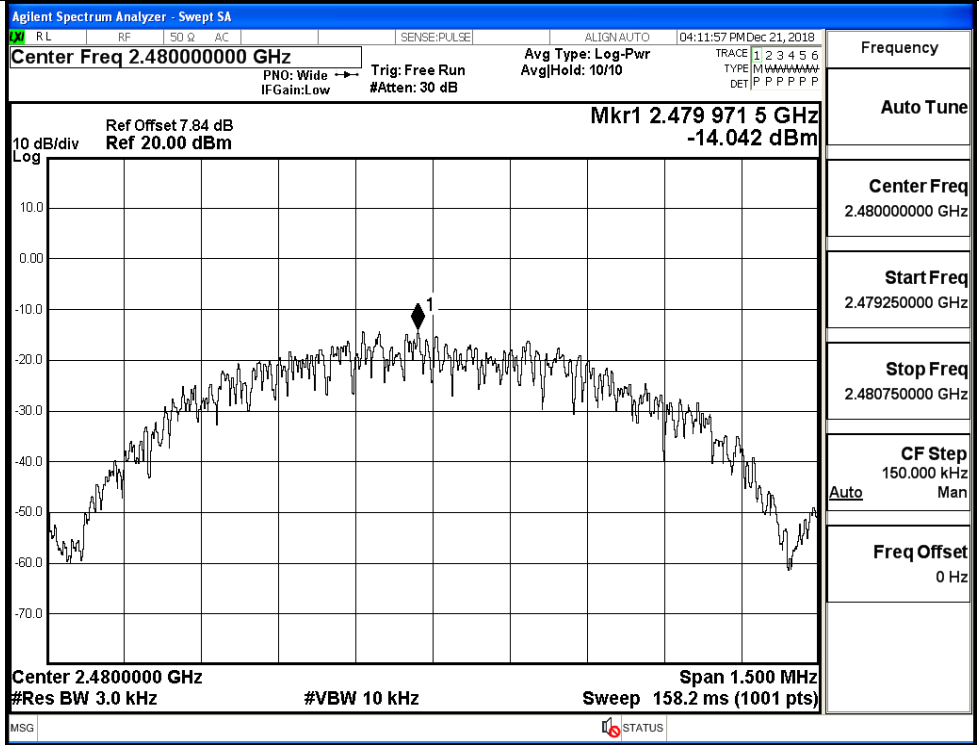
**B.3 Maximum Power Spectral Density**

| Mode  | Channel | PSD [dBm/3KHz] | Limit [dBm/3KHz] | Verdict |
|-------|---------|----------------|------------------|---------|
| BT LE | LCH     | -15.166        | 8                | PASS    |
| BT LE | MCH     | -14.469        | 8                | PASS    |
| BT LE | HCH     | -14.042        | 8                | PASS    |

**Test Graphs**

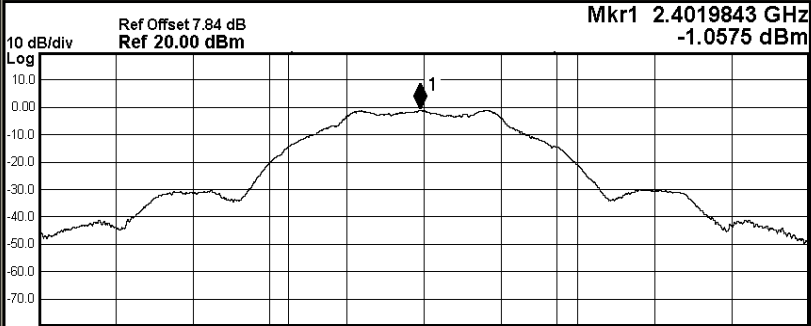
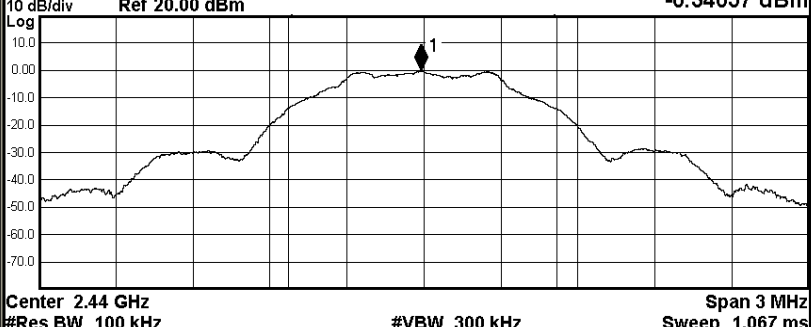


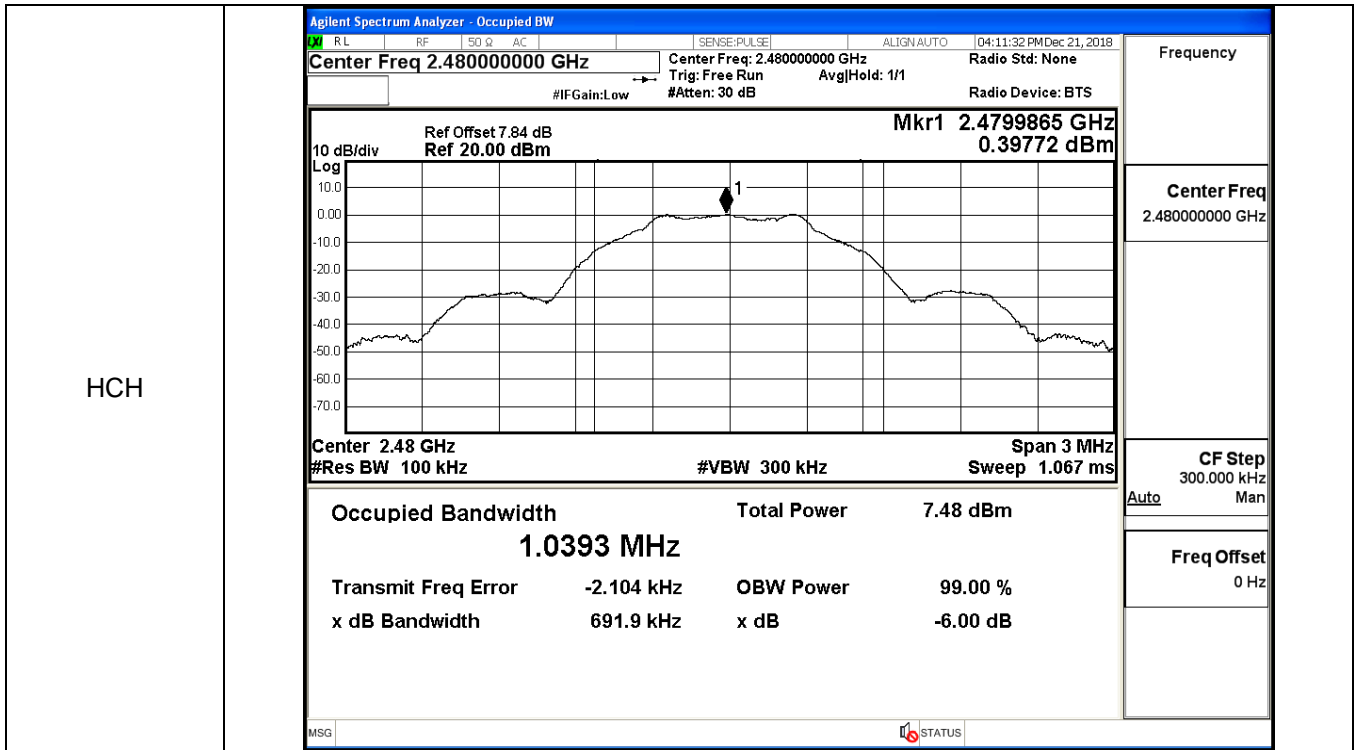
HCH



**B.4 6dB Bandwidth**

| Mode  | Channel | 6dB Bandwidth [MHz] | Limit [MHz] | Verdict |
|-------|---------|---------------------|-------------|---------|
| BT LE | LCH     | 0.6976              | ≥0.5        | PASS    |
| BT LE | MCH     | 0.6956              | ≥0.5        | PASS    |
| BT LE | HCH     | 0.6919              | ≥0.5        | PASS    |

| Test Graphs         |   |                    |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
|---------------------|---|--------------------|-------------|----------|-------------------|--|--|---------------------|------------|-----------|----------------|-----------|------|--|--|---------|--|--|----------|
| LCH                 | <div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN: AUTO 04:05:26 PM Dec 21, 2018</p> <p style="font-size: small; margin: 0;">Center Freq: 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None</p> <p style="font-size: x-small; margin: 0;">Trig: Free Run AvgHold: 1/1</p> <p style="font-size: x-small; margin: 0;">#IFGain: Low #Atten: 30 dB Radio Device: BTS</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="font-size: x-small; margin: 0;">10 dB/div Ref Offset 7.84 dB Mkr1 2.4019843 GHz</p> <p style="font-size: x-small; margin: 0;">Log Ref 20.00 dBm -1.0575 dBm</p>  </div> <p style="font-size: x-small; margin: 0;">Center 2.402 GHz Span 3 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: x-small; border-collapse: collapse;"> <tr> <td style="width: 33%;">Occupied Bandwidth</td> <td style="width: 33%;">Total Power</td> <td style="width: 33%;">6.05 dBm</td> </tr> <tr> <td style="text-align: center;"><b>1.0433 MHz</b></td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-3.429 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>697.6 kHz</td> <td>x dB</td> </tr> <tr> <td></td> <td></td> <td>99.00 %</td> </tr> <tr> <td></td> <td></td> <td>-6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>   | Occupied Bandwidth | Total Power | 6.05 dBm | <b>1.0433 MHz</b> |  |  | Transmit Freq Error | -3.429 kHz | OBW Power | x dB Bandwidth | 697.6 kHz | x dB |  |  | 99.00 % |  |  | -6.00 dB |
| Occupied Bandwidth  | Total Power   | 6.05 dBm           |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
| <b>1.0433 MHz</b>   |   |                    |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
| Transmit Freq Error | -3.429 kHz  | OBW Power          |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
| x dB Bandwidth      | 697.6 kHz   | x dB               |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
|                     |   | 99.00 %            |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
|                     |   | -6.00 dB           |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
| MCH                 | <div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:PULSE ALIGN: AUTO 04:07:53 PM Dec 21, 2018</p> <p style="font-size: small; margin: 0;">Center Freq: 2.440000000 GHz Center Freq: 2.440000000 GHz Radio Std: None</p> <p style="font-size: x-small; margin: 0;">Trig: Free Run AvgHold: 1/1</p> <p style="font-size: x-small; margin: 0;">#IFGain: Low #Atten: 30 dB Radio Device: BTS</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <p style="font-size: x-small; margin: 0;">10 dB/div Ref Offset 7.84 dB Mkr1 2.4399888 GHz</p> <p style="font-size: x-small; margin: 0;">Log Ref 20.00 dBm -0.34057 dBm</p>  </div> <p style="font-size: x-small; margin: 0;">Center 2.44 GHz Span 3 MHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <table style="width: 100%; font-size: x-small; border-collapse: collapse;"> <tr> <td style="width: 33%;">Occupied Bandwidth</td> <td style="width: 33%;">Total Power</td> <td style="width: 33%;">6.72 dBm</td> </tr> <tr> <td style="text-align: center;"><b>1.0393 MHz</b></td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>-3.028 kHz</td> <td>OBW Power</td> </tr> <tr> <td>x dB Bandwidth</td> <td>695.6 kHz</td> <td>x dB</td> </tr> <tr> <td></td> <td></td> <td>99.00 %</td> </tr> <tr> <td></td> <td></td> <td>-6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div> | Occupied Bandwidth | Total Power | 6.72 dBm | <b>1.0393 MHz</b> |  |  | Transmit Freq Error | -3.028 kHz | OBW Power | x dB Bandwidth | 695.6 kHz | x dB |  |  | 99.00 % |  |  | -6.00 dB |
| Occupied Bandwidth  | Total Power   | 6.72 dBm           |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
| <b>1.0393 MHz</b>   |   |                    |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
| Transmit Freq Error | -3.028 kHz  | OBW Power          |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
| x dB Bandwidth      | 695.6 kHz   | x dB               |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
|                     |   | 99.00 %            |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |
|                     |   | -6.00 dB           |             |          |                   |  |  |                     |            |           |                |           |      |  |  |         |  |  |          |



**B.5 Occupied Bandwidth**

| Mode  | Channel | Occupied Bandwidth [MHz] | Limit [MHz] | Verdict |
|-------|---------|--------------------------|-------------|---------|
| BT LE | LCH     | 1.0308                   | No Limit    | PASS    |
| BT LE | MCH     | 1.0300                   | No Limit    | PASS    |
| BT LE | HCH     | 1.0297                   | No Limit    | PASS    |

Test Graphs

|     |   |   |
|-----|---|---|
| LCH | <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.40200000 GHz</p> <p>Center Freq: 2.402000000 GHz</p> <p>Ref Offset 7.84 dB</p> <p>Ref 20.00 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Center 2.402 GHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 4 MHz</p> <p>Sweep 4.267 ms</p> <p>Occupied Bandwidth 1.0308 MHz</p> <p>Total Power 6.09 dBm</p> <p>Transmit Freq Error 2.785 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 655.9 kHz</p> <p>x dB -6.00 dB</p> | <p>Frequency</p> <p>Center Freq 2.40200000 GHz</p> <p>CF Step 400.000 kHz</p> <p>Freq Offset 0 Hz</p> |
|     | <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.44000000 GHz</p> <p>Center Freq: 2.440000000 GHz</p> <p>Ref Offset 7.84 dB</p> <p>Ref 20.00 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Center 2.44 GHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 4 MHz</p> <p>Sweep 4.267 ms</p> <p>Occupied Bandwidth 1.0300 MHz</p> <p>Total Power 6.71 dBm</p> <p>Transmit Freq Error 2.515 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 655.6 kHz</p> <p>x dB -6.00 dB</p>  | <p>Frequency</p> <p>Center Freq 2.44000000 GHz</p> <p>CF Step 400.000 kHz</p> <p>Freq Offset 0 Hz</p> |

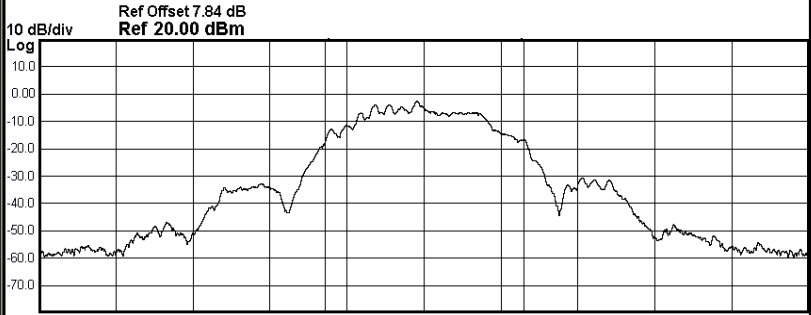


HCH

Agilent Spectrum Analyzer - Occupied BW

|                                    |    |      |                              |             |                   |                          |
|------------------------------------|----|------|------------------------------|-------------|-------------------|--------------------------|
| RL                                 | RF | 50 Ω | AC                           | SENSE:PULSE | ALIGN:AUTO        | 04:04:45 PM Dec 21, 2018 |
| <b>Center Freq 2.480000000 GHz</b> |    |      | Center Freq: 2.480000000 GHz |             | Radio Std: None   |                          |
|                                    |    |      | Trig: Free Run               |             | AvgHold: 10/10    |                          |
|                                    |    |      | #IFGain:Low                  |             | #Atten: 30 dB     |                          |
|                                    |    |      |                              |             | Radio Device: BTS |                          |

10 dB/div  
Log



Ref Offset 7.84 dB  
Ref 20.00 dBm

Center 2.48 GHz      #Res BW 30 kHz      #VBW 100 kHz      Span 4 MHz  
Sweep 4.267 ms

|                           |           |                    |          |
|---------------------------|-----------|--------------------|----------|
| <b>Occupied Bandwidth</b> |           | <b>Total Power</b> |          |
| <b>1.0297 MHz</b>         |           | <b>7.48 dBm</b>    |          |
| Transmit Freq Error       | 2.849 kHz | OBW Power          | 99.00 %  |
| x dB Bandwidth            | 656.0 kHz | x dB               | -6.00 dB |

Frequency

Center Freq  
2.480000000 GHz

CF Step  
400.000 kHz  
Auto Man

Freq Offset  
0 Hz

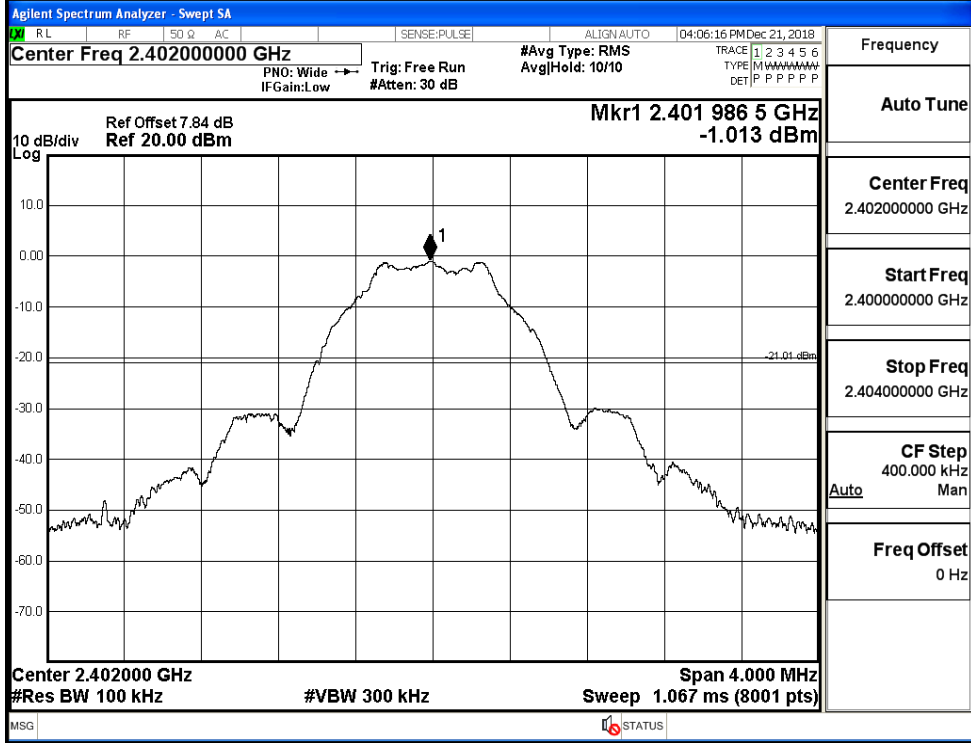
MSG
STATUS

**B.6 RF Conducted Spurious Emissions**

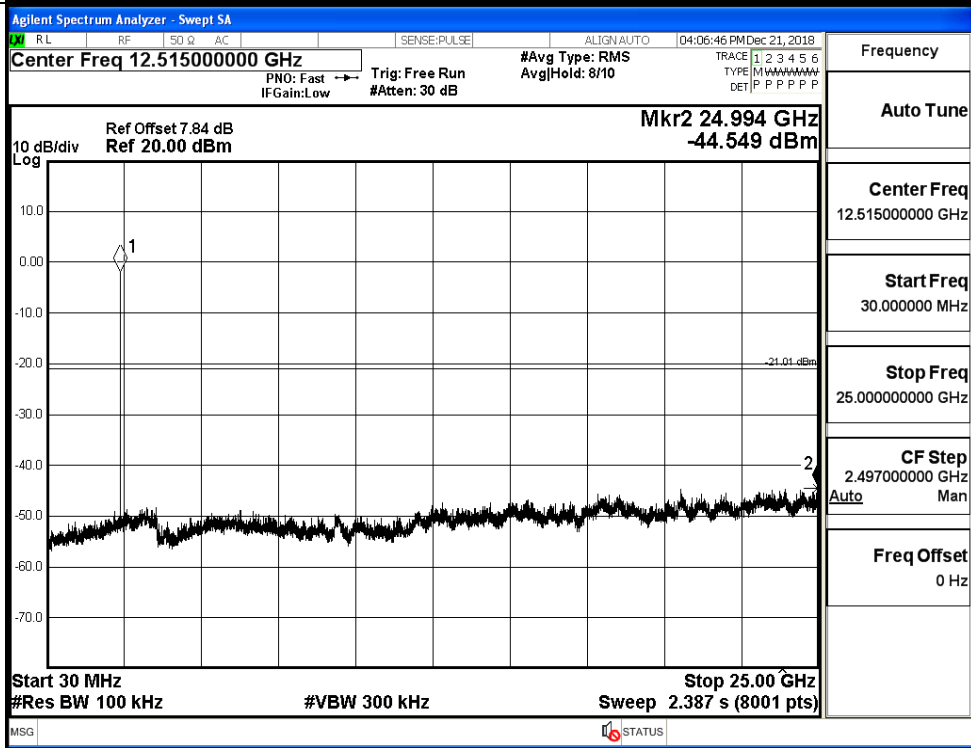
| Mode  | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|-------|---------|------------|------------------|-------------|---------|
| BT LE | LCH     | -1.013     | -44.549          | -21.013     | PASS    |
| BT LE | MCH     | -0.297     | -44.054          | -20.297     | PASS    |
| BT LE | HCH     | 0.299      | -43.575          | -19.701     | PASS    |

BT LE\_LCH\_Graphs

Pref/BT LE/LCH

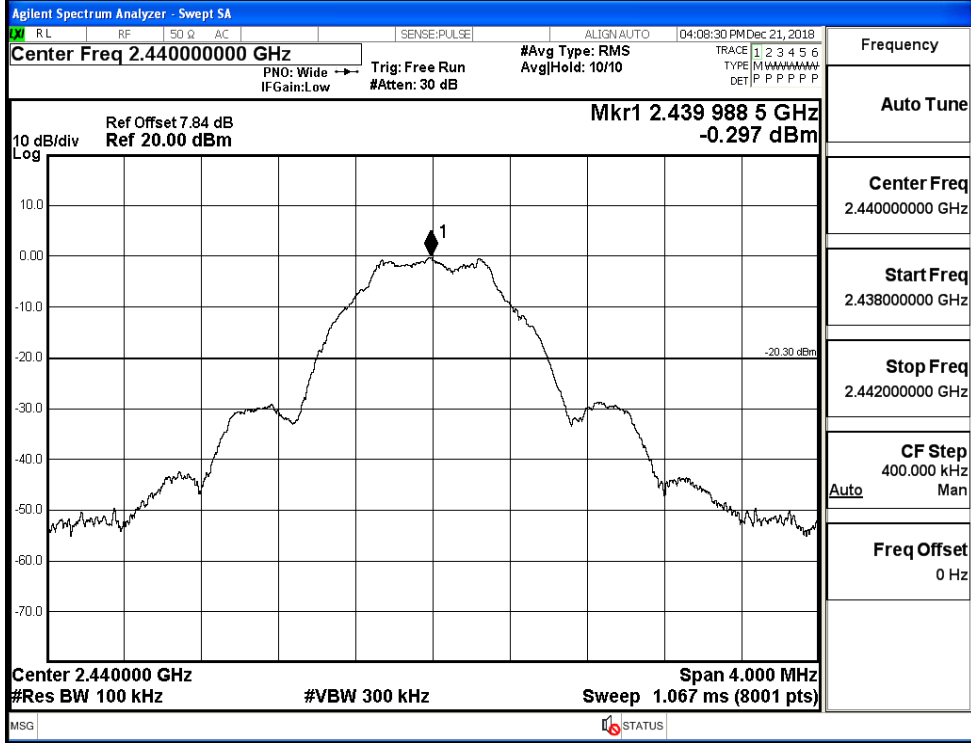


Puw/BT LE/LCH

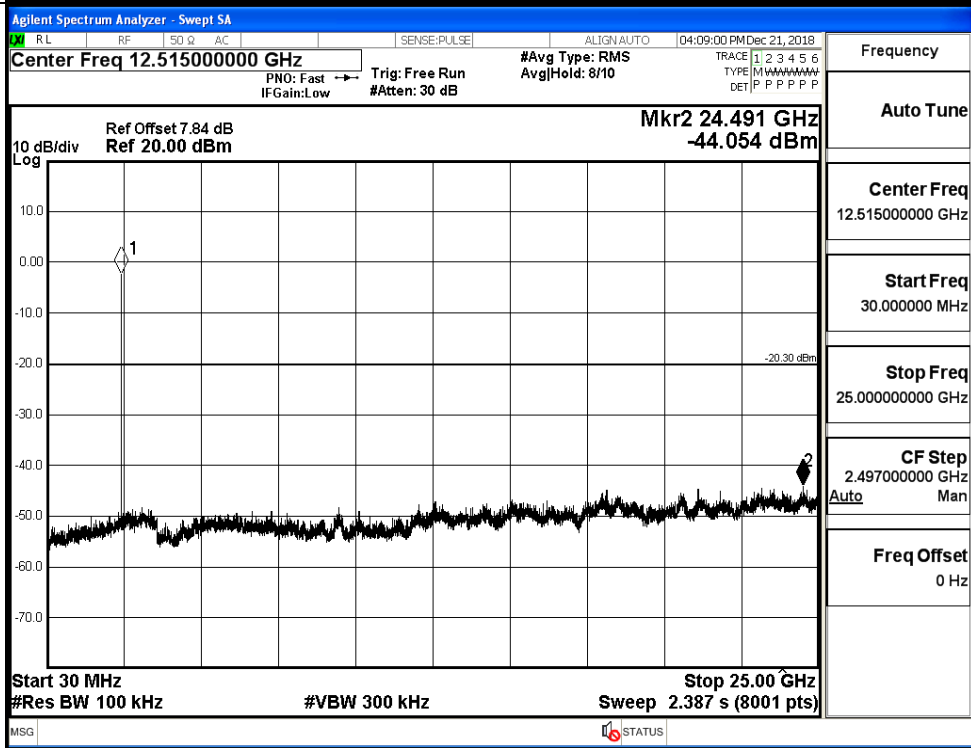


BT LE\_MCH\_Graphs

Pref/BT LE/MCH

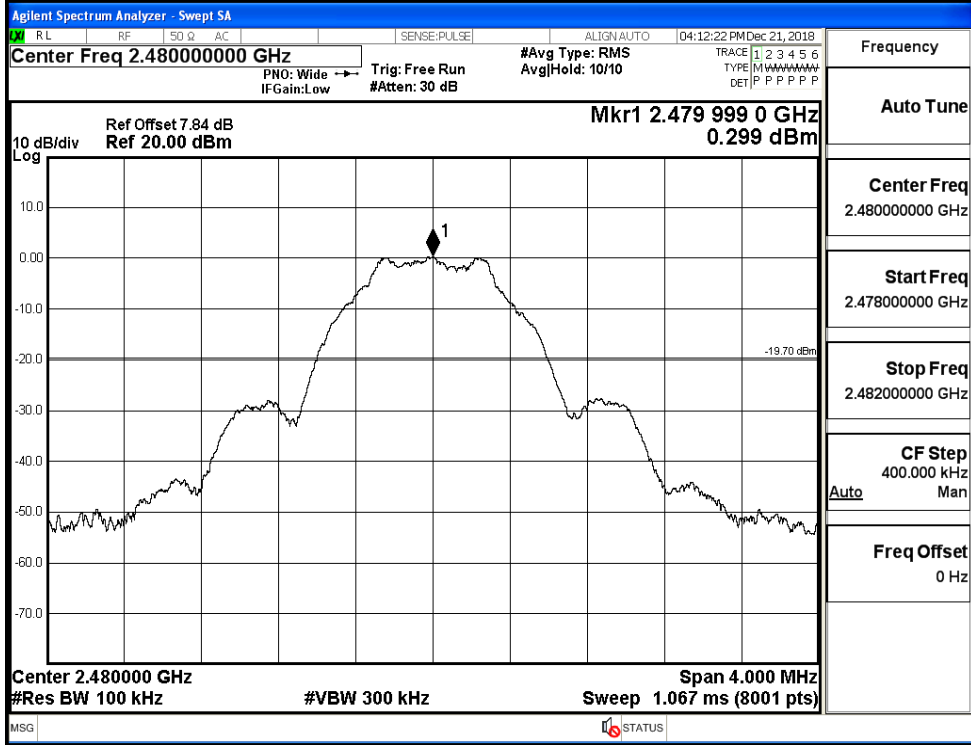


Puw/BT LE/MCH

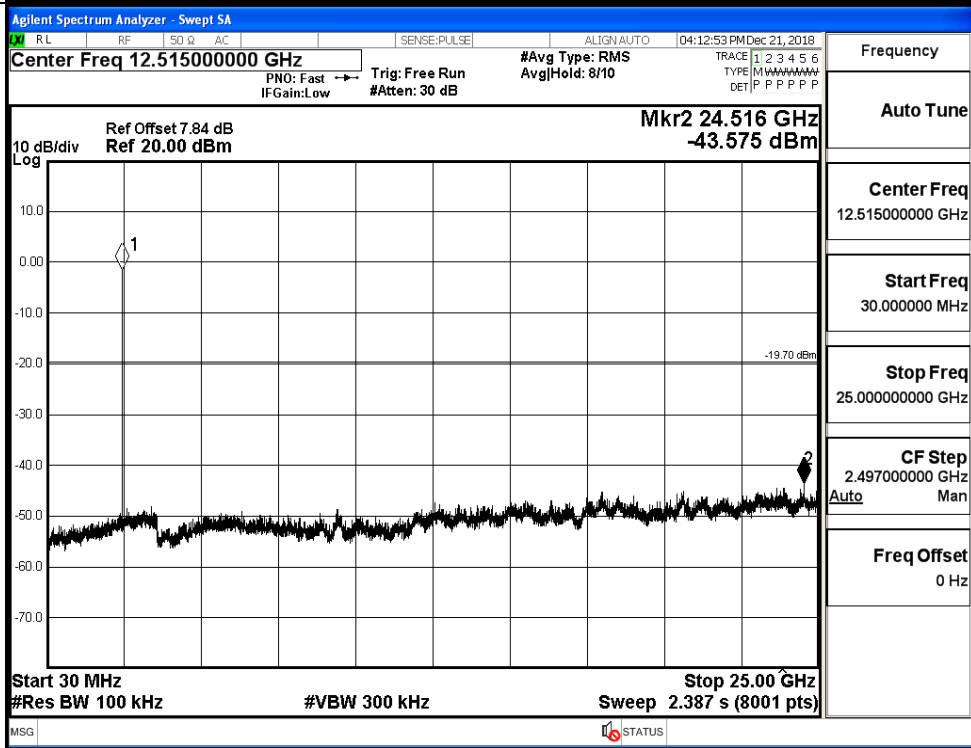


BT LE\_HCH\_Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



**B.7 Band-edge for RF Conducted Emissions**

| Mode  | Channel | Carrier Power[dBm] | Max.Spurious Level [dBm] | Limit [dBm] | Verdict |
|-------|---------|--------------------|--------------------------|-------------|---------|
| BT LE | LCH     | -0.957             | -50.777                  | -20.96      | PASS    |
| BT LE | HCH     | 0.640              | -50.175                  | -19.36      | PASS    |

**Test Graphs**

LCH

Agilent Spectrum Analyzer - Swept SA  
 Center Freq 2.35700000 GHz  
 Mkr4 2.380 488 GHz -50.777 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    | f   |     | 2.402 226 GHz | -0.957 dBm  |          |                |                |
| 2   | N    | f   |     | 2.400 000 GHz | -53.936 dBm |          |                |                |
| 3   | N    | f   |     | 2.390 000 GHz | -53.037 dBm |          |                |                |
| 4   | N    | f   |     | 2.380 488 GHz | -50.777 dBm |          |                |                |

Frequency

Auto Tune

Center Freq  
2.35700000 GHz

Start Freq  
2.310000000 GHz

Stop Freq  
2.404000000 GHz

CF Step  
9.400000 MHz

Freq Offset  
0 Hz

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HCH

Agilent Spectrum Analyzer - Swept SA  
 Center Freq 2.48900000 GHz  
 Mkr4 2.491 816 00 GHz -50.175 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    | f   |     | 2.479 988 25 GHz | 0.640 dBm   |          |                |                |
| 2   | N    | f   |     | 2.483 500 00 GHz | -52.908 dBm |          |                |                |
| 3   | N    | f   |     | 2.500 000 00 GHz | -53.768 dBm |          |                |                |
| 4   | N    | f   |     | 2.491 816 00 GHz | -50.175 dBm |          |                |                |

Frequency

Auto Tune

Center Freq  
2.489000000 GHz

Start Freq  
2.478000000 GHz

Stop Freq  
2.500000000 GHz

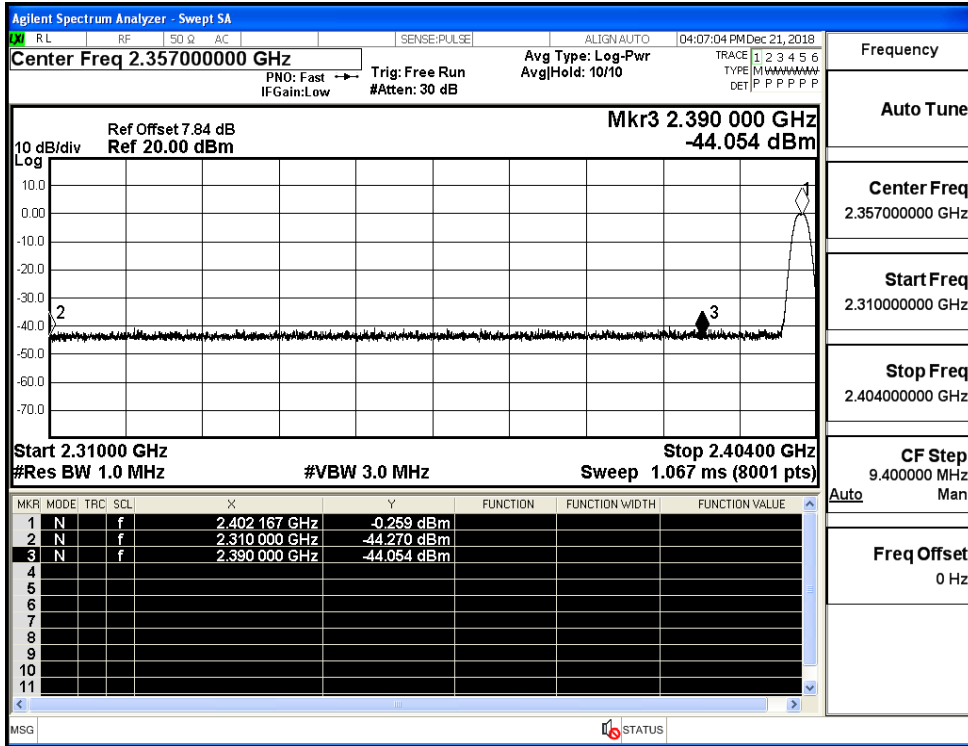
CF Step  
2.200000 MHz

Freq Offset  
0 Hz

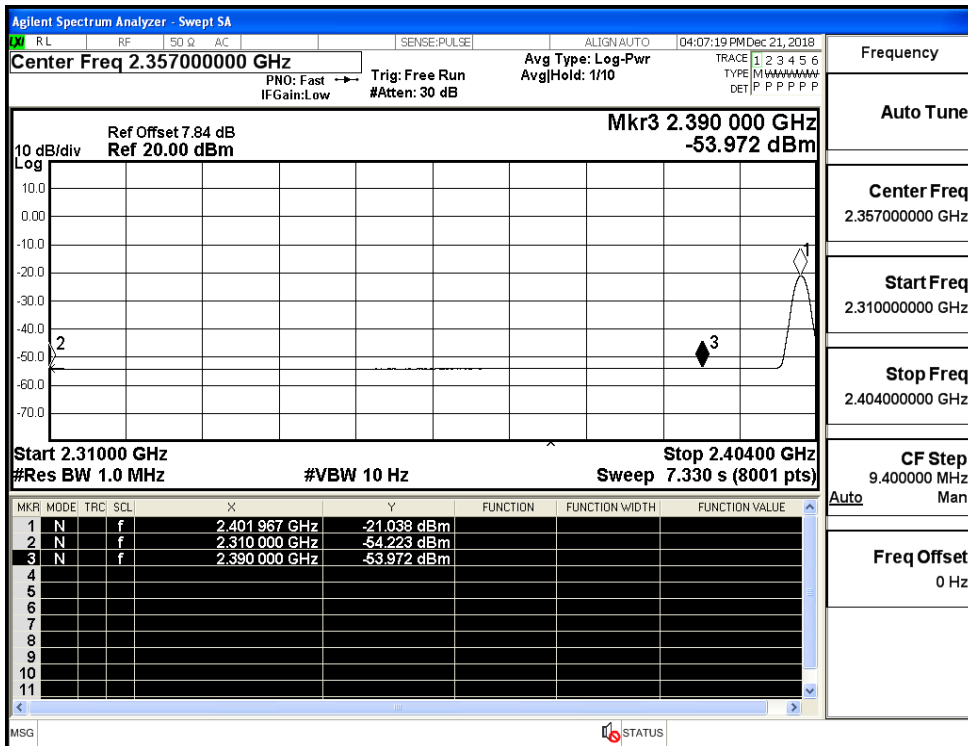
**B.8 Restrict-band band-edge measurements**

| 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 | -44.27      | 2.0  | 0             | 52.99      | PEAK     | 74             | PASS  |
|           |              | Ant1 | 2310.0 | -54.22      | 2.0  | 0             | 43.04      | AV       | 54             | PASS  |
|           |              | Ant1 | 2390.0 | -44.05      | 2.0  | 0             | 53.21      | PEAK     | 74             | PASS  |
|           |              | Ant1 | 2390.0 | -53.97      | 2.0  | 0             | 43.29      | AV       | 54             | PASS  |
|           | 2480         | Ant1 | 2483.5 | -44.24      | 2.0  | 0             | 53.02      | PEAK     | 74             | PASS  |
|           |              | Ant1 | 2483.5 | -53.71      | 2.0  | 0             | 43.55      | AV       | 54             | PASS  |
|           |              | Ant1 | 2500.0 | -42.38      | 2.0  | 0             | 54.88      | PEAK     | 74             | PASS  |
|           |              | Ant1 | 2500.0 | -53.57      | 2.0  | 0             | 43.69      | AV       | 54             | PASS  |

Restrict-band band-edge measurements\_BT LE\_2402\_Ant1\_PEAK

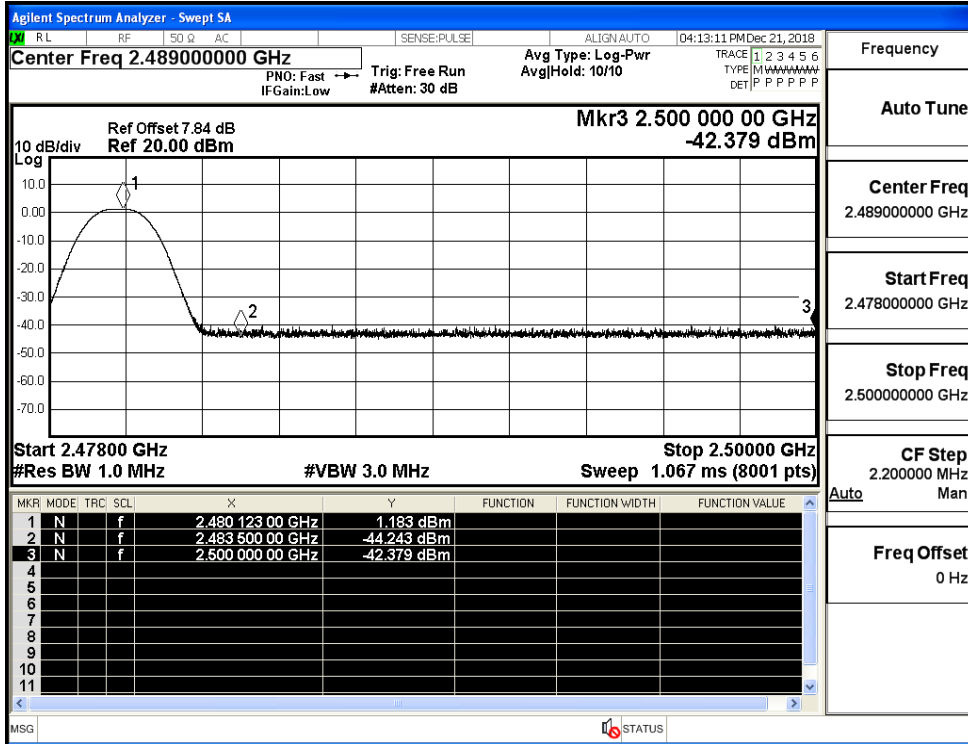


Restrict-band band-edge measurements\_BT LE\_2402\_Ant1\_AV





Restrict-band band-edge measurements\_BT LE\_2480\_Ant1\_PEAK



Restrict-band band-edge measurements\_BT LE\_2480\_Ant1\_AV

