

Appendix B

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

Product Name: IFROGZ Airtime ANC

Trade Mark: IFROGZ

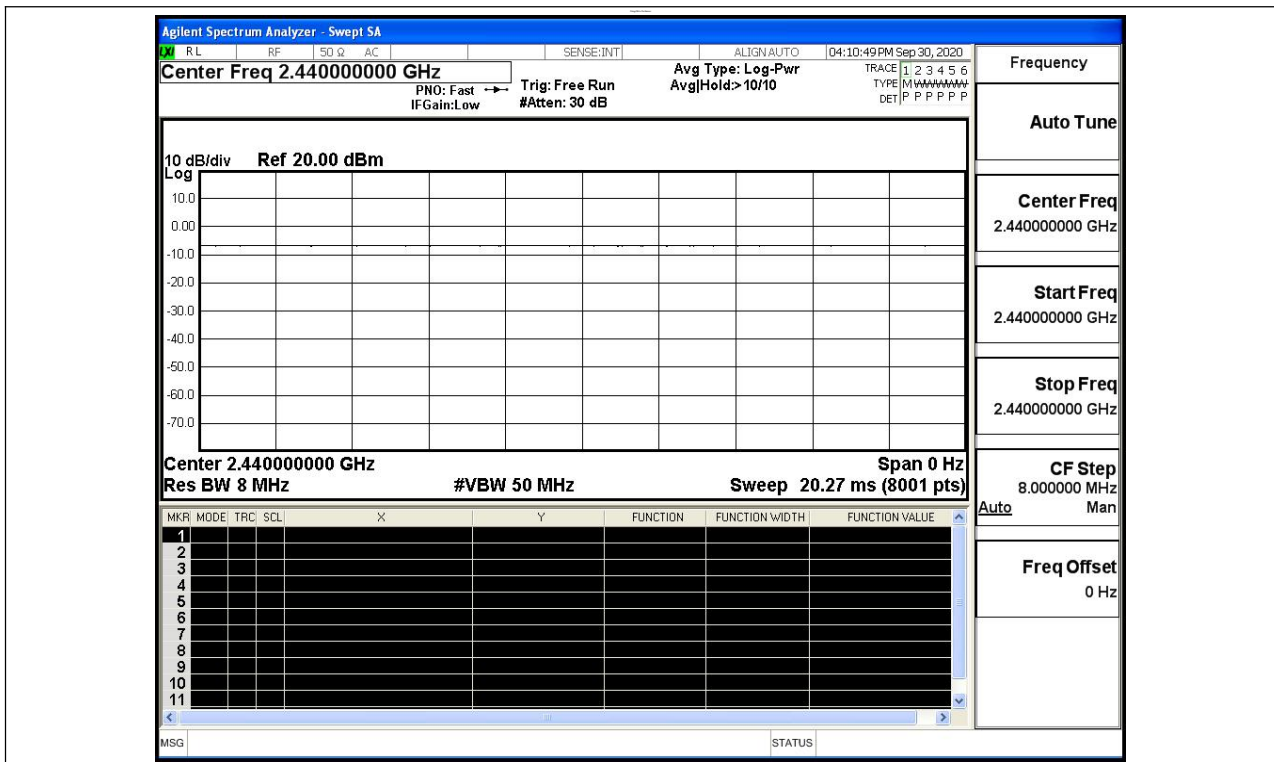
Test Model: IFIEANCTWS52

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 22.3° C |
| Relative Humidity: | 54.4% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Ken He |
| Supervised by: | Li Huan |

B.1 Duty Cycle

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

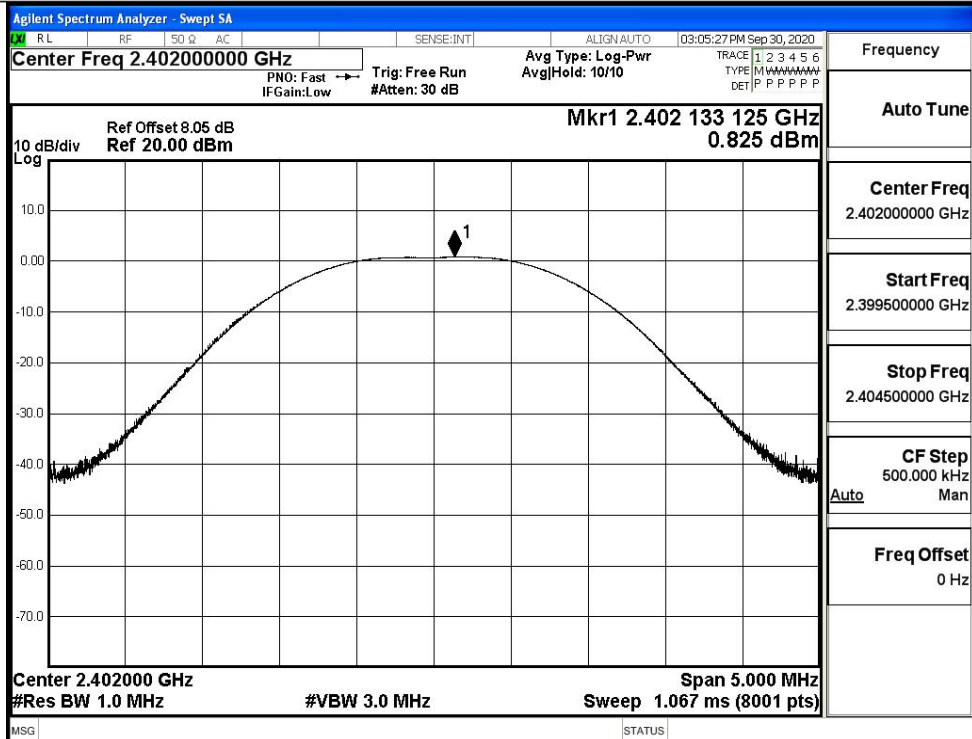


B.2 Maximum Conducted Peak Output Power

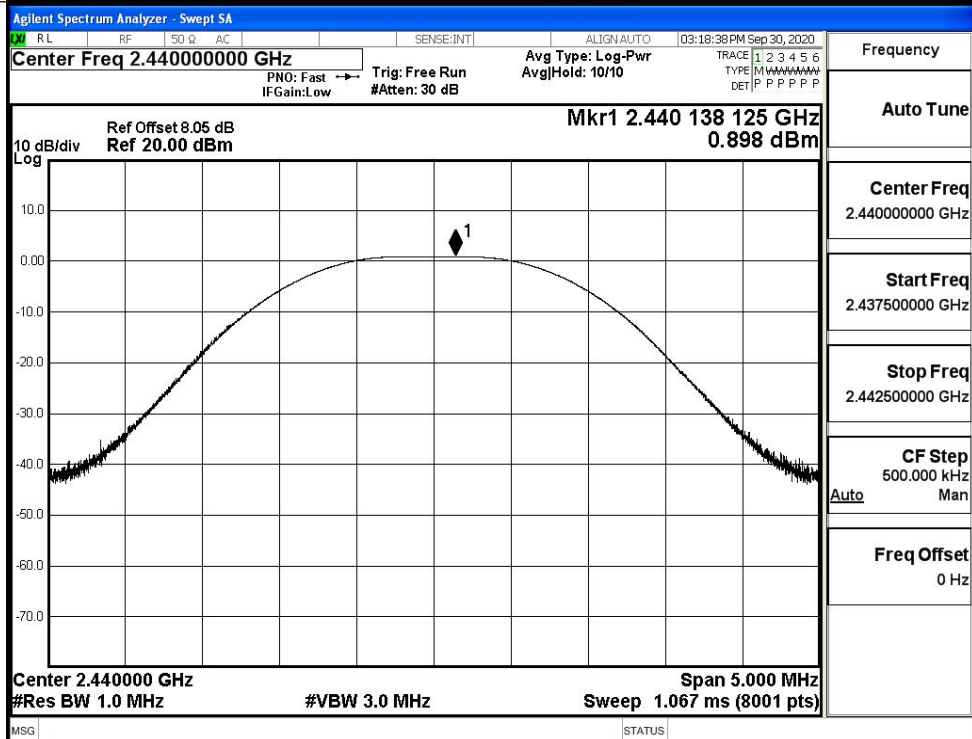
| Mode | Channel | Conduct Peak Power[dBm] | Limit [dBm] | Verdict |
|-------|---------|-------------------------|-------------|---------|
| BT LE | LCH | 0.825 | 30 | PASS |
| BT LE | MCH | 0.898 | 30 | PASS |
| BT LE | HCH | -0.187 | 30 | PASS |

Test Graphs

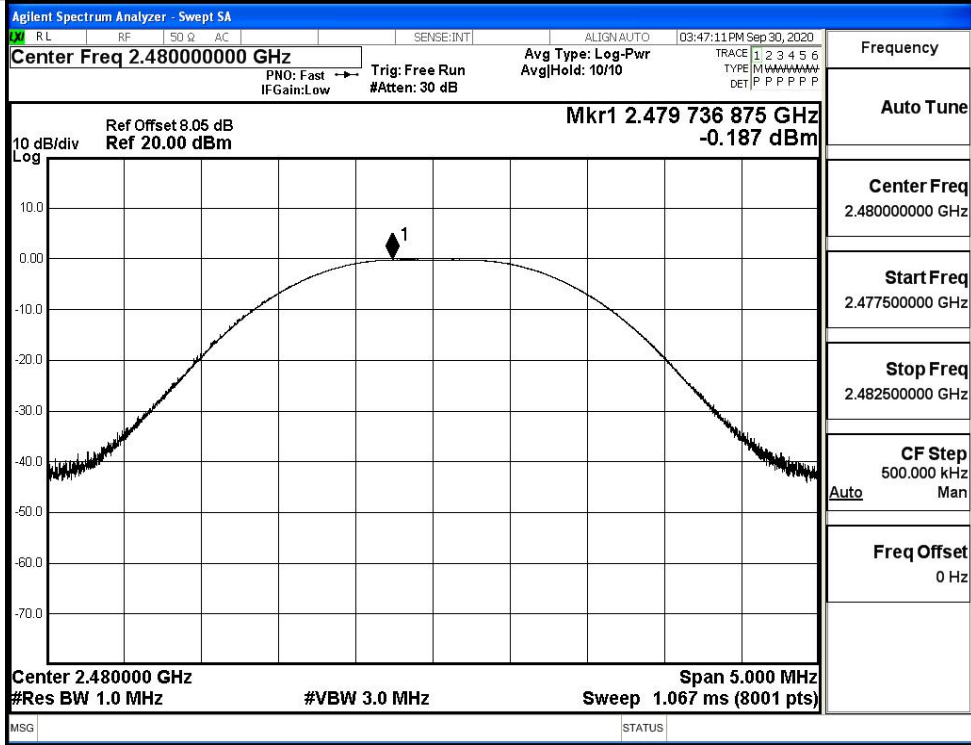
LCH



MCH



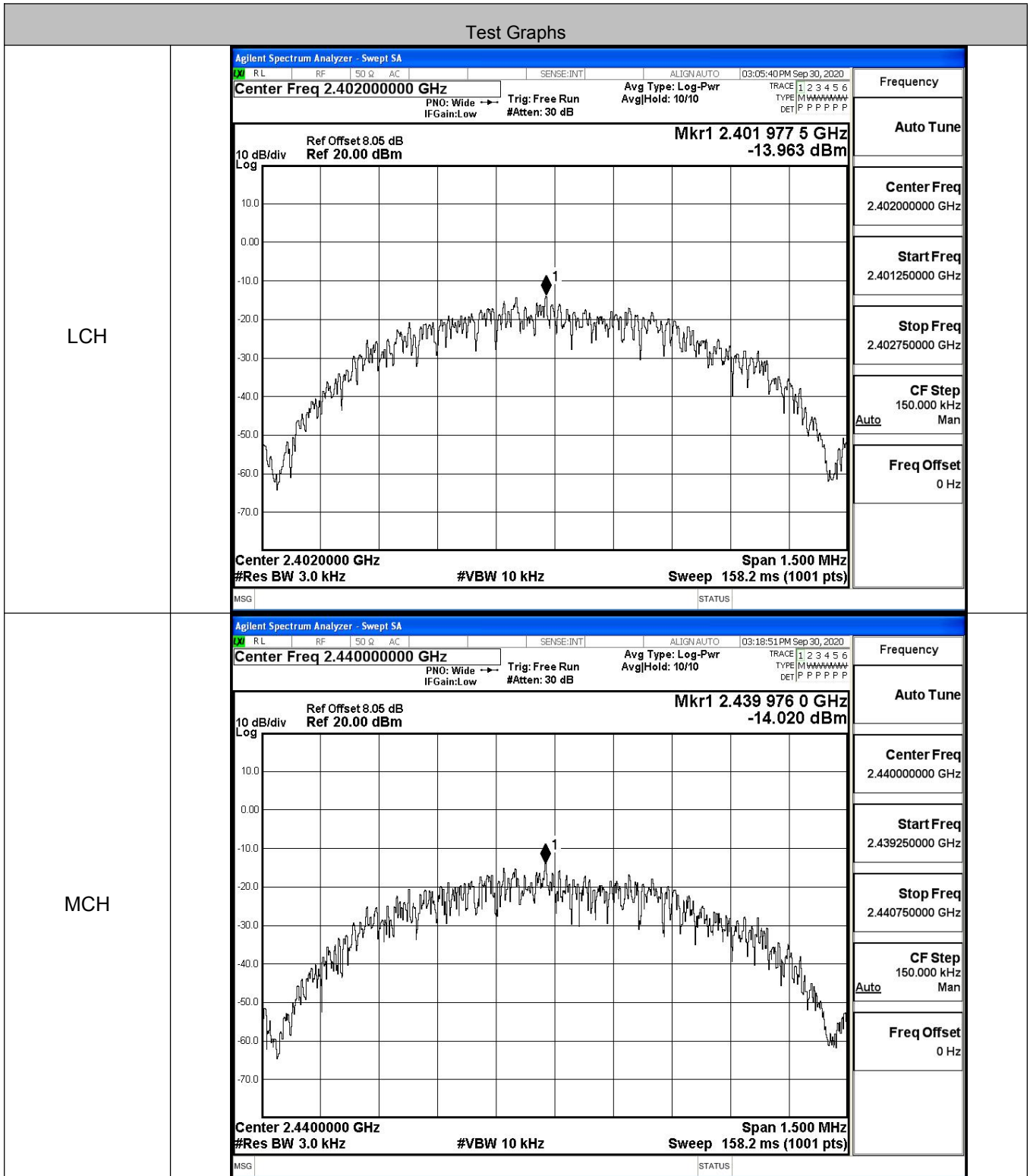
HCH



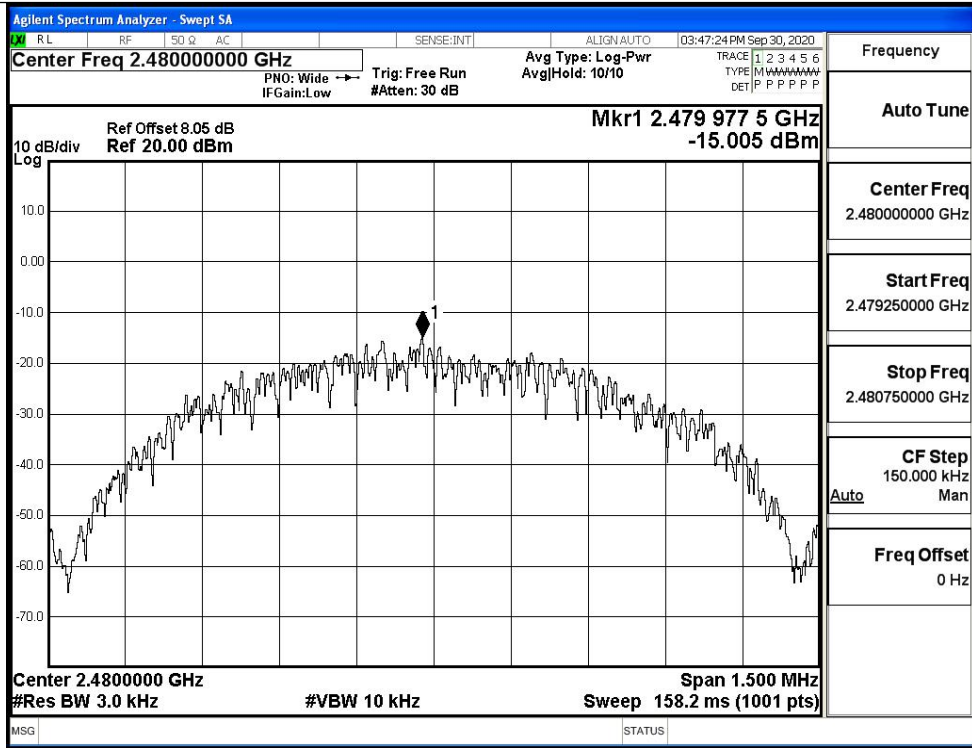
B.3 Maximum Power Spectral Density

| Mode | Channel | PSD [dBm/3KHz] | Limit [dBm/3KHz] | Verdict |
|-------|---------|----------------|------------------|---------|
| BT LE | LCH | -13.963 | 8 | PASS |
| BT LE | MCH | -14.020 | 8 | PASS |
| BT LE | HCH | -15.005 | 8 | PASS |

Test Graphs



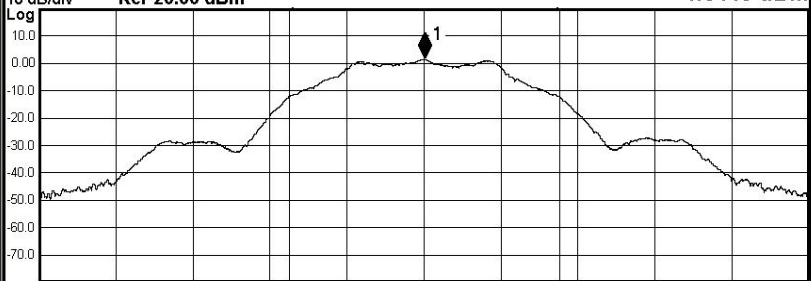
HCH

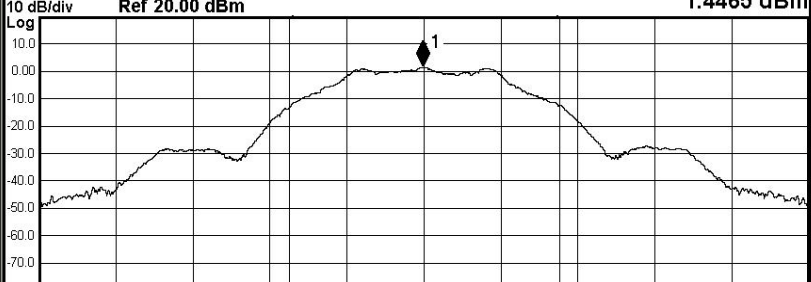


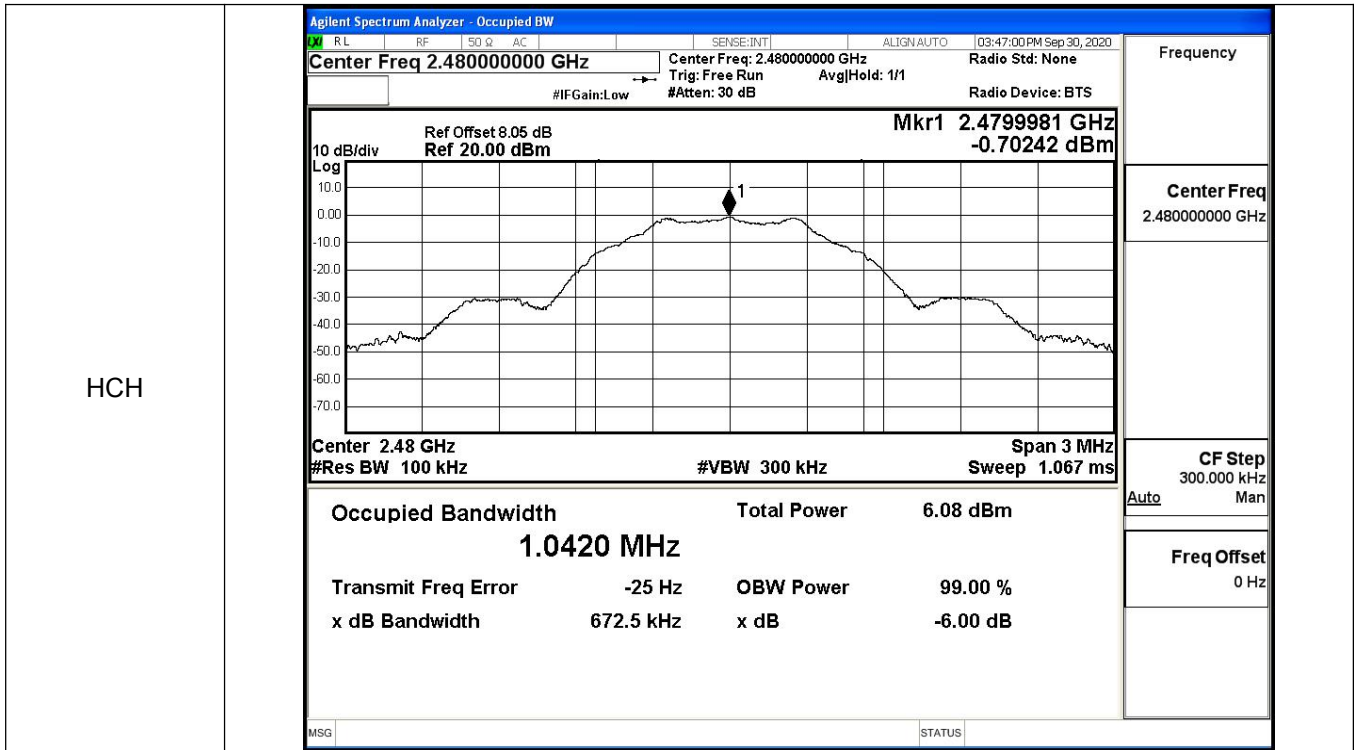
B.4 6dB Bandwidth

| Mode | Channel | 6dB Bandwidth [MHz] | Limit [MHz] | Verdict |
|-------|---------|---------------------|-------------|---------|
| BT LE | LCH | 0.6643 | ≥0.5 | PASS |
| BT LE | MCH | 0.6664 | ≥0.5 | PASS |
| BT LE | HCH | 0.6725 | ≥0.5 | PASS |

Test Graphs

| | | | | | | | | | | | | | | |
|----------------|---|--------------------|-------------|----------|-------------------|--|--|---------------------|-----------|---------|----------------|------|----------|---|
| LCH | <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:INT ALIGN:AUTO 03:04:58 PM Sep 30, 2020</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;"> <p style="font-size: x-small; margin: 0;">10 dB/div Ref Offset 8.05 dB Mkr1 2.4020026 GHz</p> <p style="font-size: x-small; margin: 0;">Log Ref 20.00 dBm 1.3448 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>Occupied Bandwidth</td> <td>Total Power</td> <td>8.11 dBm</td> </tr> <tr> <td style="text-align: center;">1.0486 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>x dB</td> <td>-6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> | Occupied Bandwidth | Total Power | 8.11 dBm | 1.0486 MHz | | | Transmit Freq Error | OBW Power | 99.00 % | x dB Bandwidth | x dB | -6.00 dB | <p>Frequency</p> <hr/> <p>Center Freq 2.402000000 GHz</p> <hr/> <p>CF Step 300.000 kHz Auto Man</p> <hr/> <p>Freq Offset 0 Hz</p> |
| | Occupied Bandwidth | Total Power | 8.11 dBm | | | | | | | | | | | |
| | 1.0486 MHz | | | | | | | | | | | | | |
| | Transmit Freq Error | OBW Power | 99.00 % | | | | | | | | | | | |
| x dB Bandwidth | x dB | -6.00 dB | | | | | | | | | | | | |

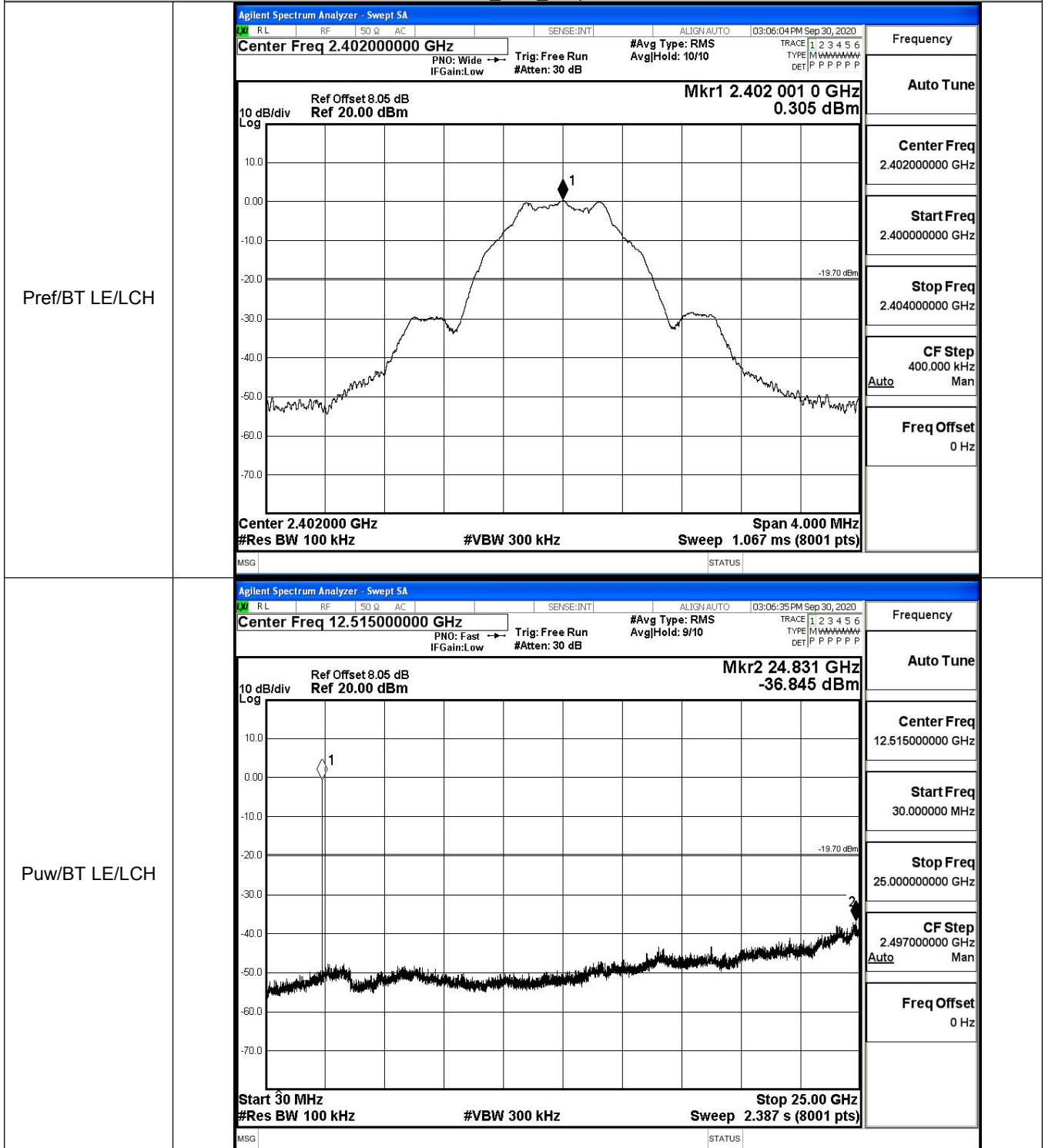
| | | | | | | | | | | | | | | |
|----------------|--|--------------------|-------------|----------|-------------------|--|--|---------------------|-----------|---------|----------------|------|----------|---|
| MCH | <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Occupied BW</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 03:17:34 PM Sep 30, 2020</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;"> <p style="font-size: x-small; margin: 0;">10 dB/div Ref Offset 8.05 dB Mkr1 2.4399959 GHz</p> <p style="font-size: x-small; margin: 0;">Log Ref 20.00 dBm 1.4465 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>Occupied Bandwidth</td> <td>Total Power</td> <td>8.24 dBm</td> </tr> <tr> <td style="text-align: center;">1.0430 MHz</td> <td></td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>x dB</td> <td>-6.00 dB</td> </tr> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> | Occupied Bandwidth | Total Power | 8.24 dBm | 1.0430 MHz | | | Transmit Freq Error | OBW Power | 99.00 % | x dB Bandwidth | x dB | -6.00 dB | <p>Frequency</p> <hr/> <p>Center Freq 2.440000000 GHz</p> <hr/> <p>CF Step 300.000 kHz Auto Man</p> <hr/> <p>Freq Offset 0 Hz</p> |
| | Occupied Bandwidth | Total Power | 8.24 dBm | | | | | | | | | | | |
| | 1.0430 MHz | | | | | | | | | | | | | |
| | Transmit Freq Error | OBW Power | 99.00 % | | | | | | | | | | | |
| x dB Bandwidth | x dB | -6.00 dB | | | | | | | | | | | | |



B.5 RF Conducted Spurious Emissions

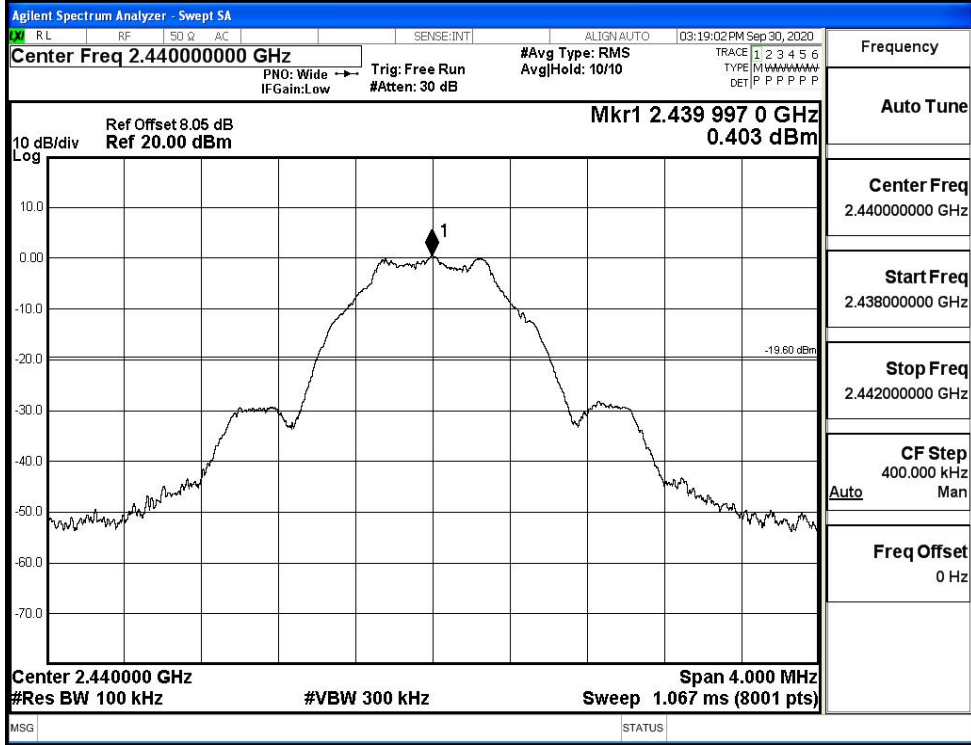
| Mode | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|-------|---------|------------|------------------|-------------|---------|
| BT LE | LCH | 0.305 | -36.845 | -19.695 | PASS |
| BT LE | MCH | 0.403 | -37.418 | -19.597 | PASS |
| BT LE | HCH | -0.612 | -37.382 | -20.612 | PASS |

BT LE_LCH_Graphs

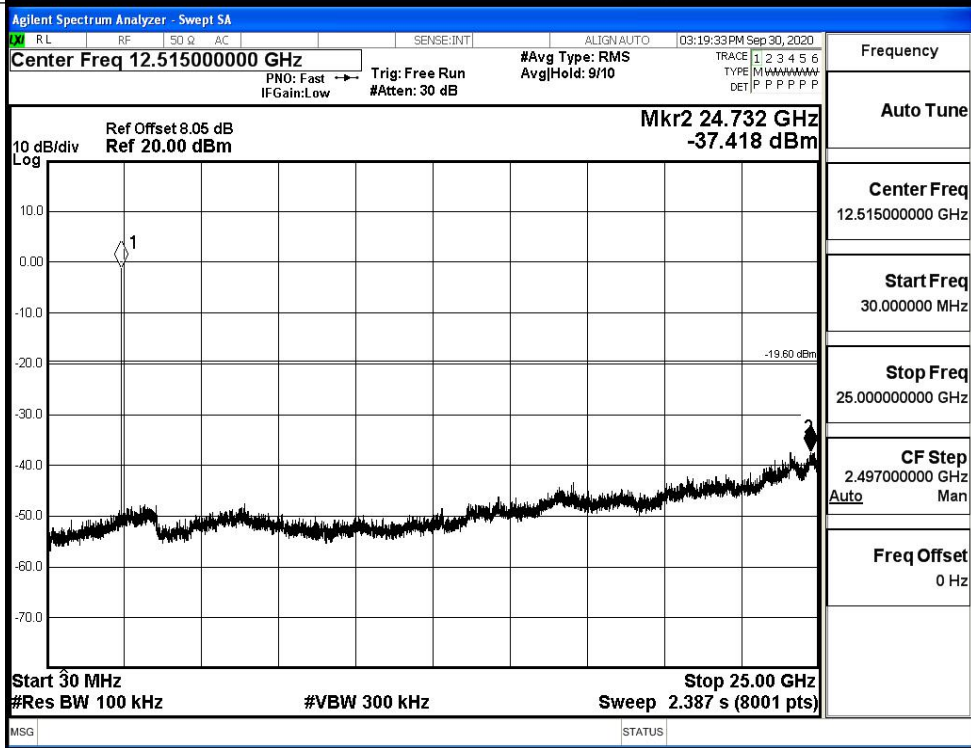


BT LE MCH Graphs

Pref/BT LE/MCH

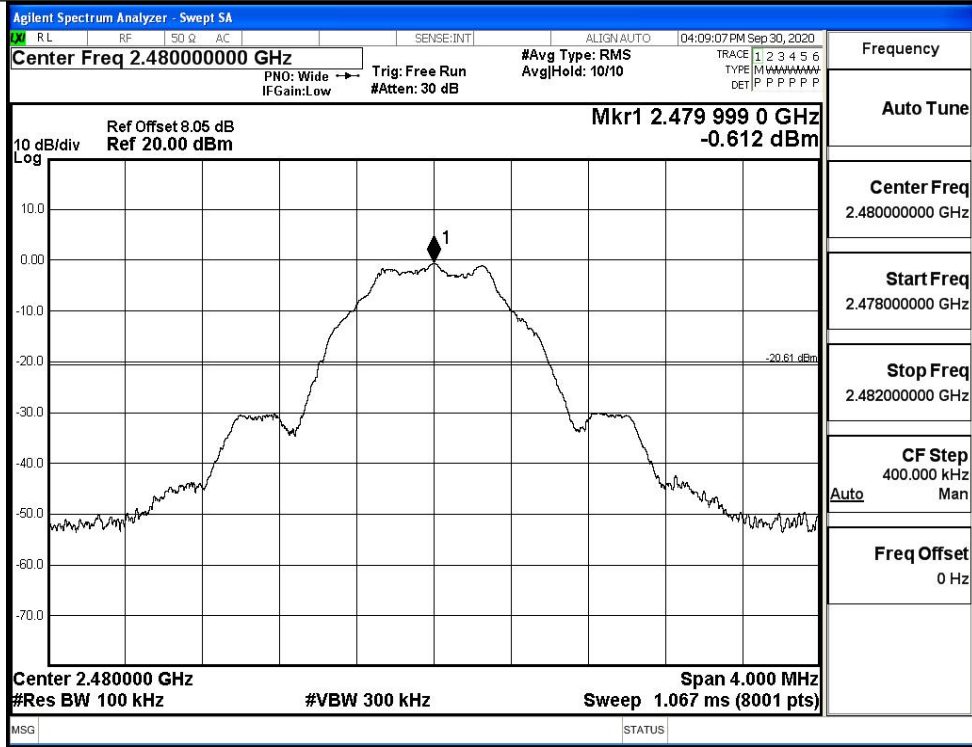


Puw/BT LE/MCH

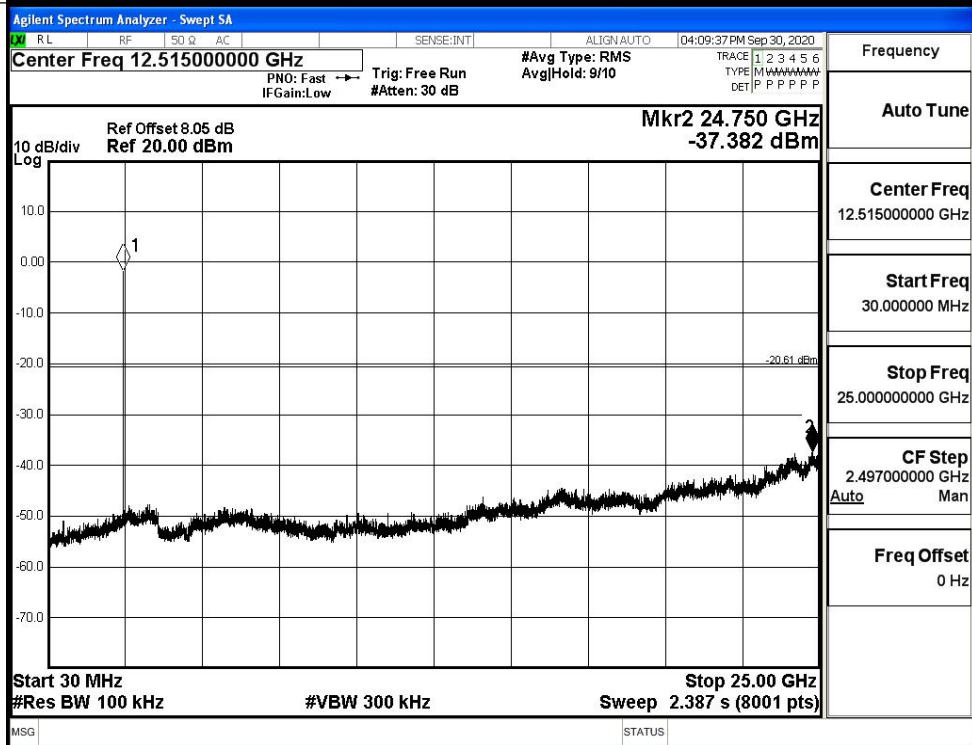


BT LE HCH Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



B.6 Band-edge for RF Conducted Emissions

| Mode | Channel | Carrier Power[dBm] | Max.Spurious Level [dBm] | Limit [dBm] | Verdict |
|-------|---------|--------------------|--------------------------|-------------|---------|
| BT LE | LCH | 0.326 | -48.665 | -19.67 | PASS |
| BT LE | HCH | -0.540 | -49.638 | -20.54 | PASS |

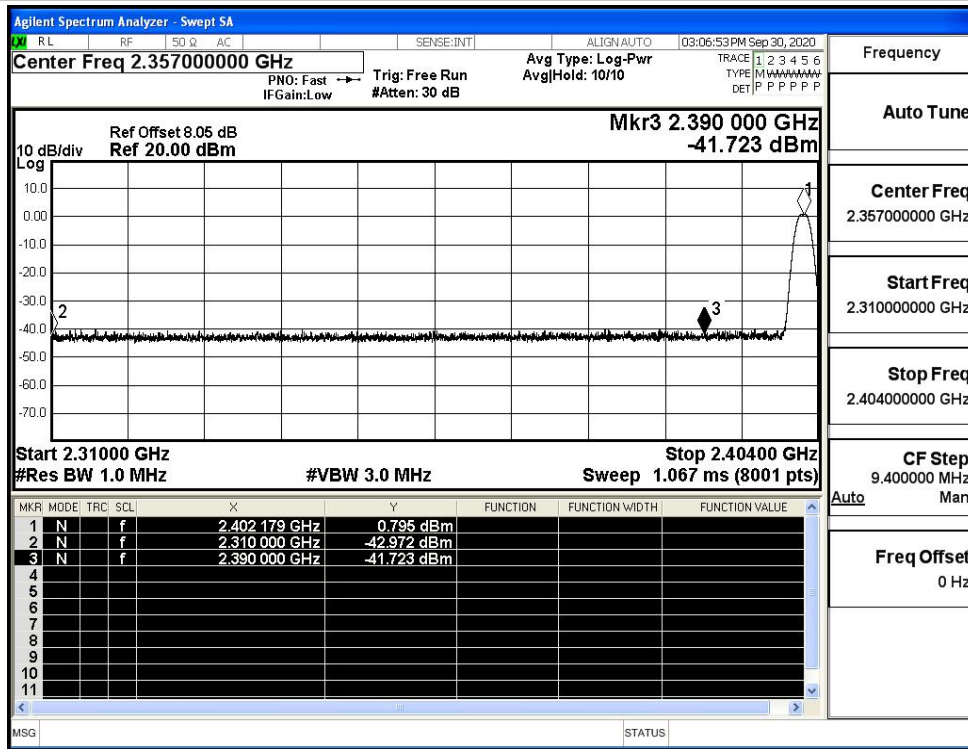
Test Graphs

| | | |
|-----|--|--|
| LCH | | <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.35700000 GHz</p> <p>Start Freq 2.31000000 GHz</p> <p>Stop Freq 2.40400000 GHz</p> <p>CF Step 9.400000 MHz</p> <p>Freq Offset 0 Hz</p> |
| HCH | | <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.48900000 GHz</p> <p>Start Freq 2.47800000 GHz</p> <p>Stop Freq 2.50000000 GHz</p> <p>CF Step 2.200000 MHz</p> <p>Freq Offset 0 Hz</p> |

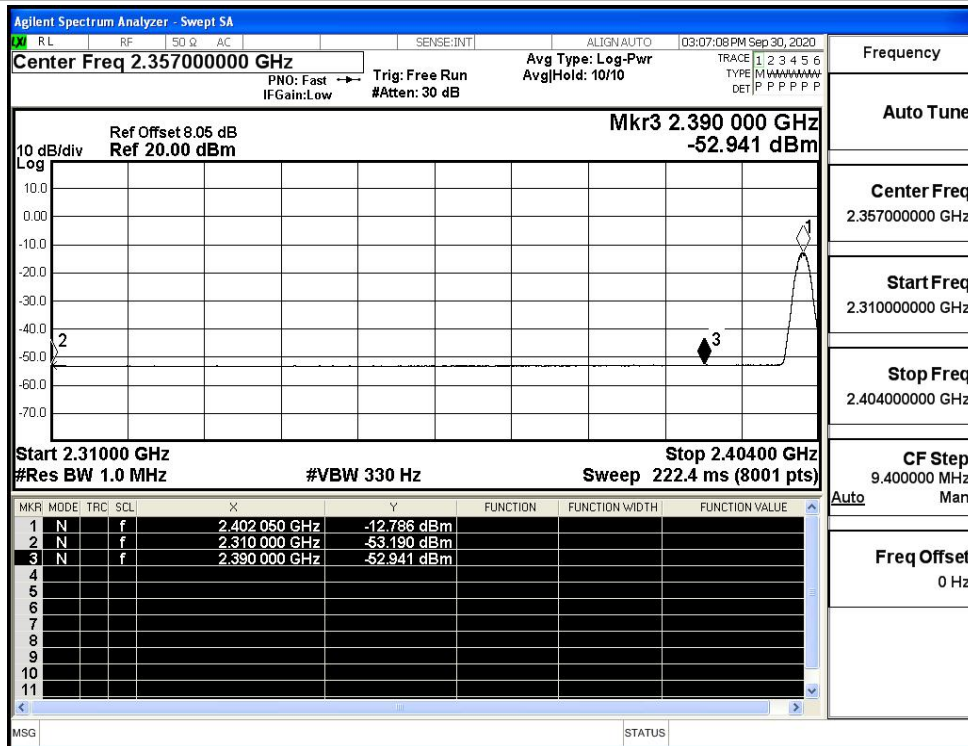
B.7 Restrict-band band-edge measurements

| 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 | -42.97 | 2.0 | 0 | 54.26 | PEAK | 74 | PASS |
| | | Ant1 | 2310.0 | -53.19 | 2.0 | 0 | 44.04 | AV | 54 | PASS |
| | | Ant1 | 2390.0 | -41.72 | 2.0 | 0 | 55.51 | PEAK | 74 | PASS |
| | | Ant1 | 2390.0 | -52.94 | 2.0 | 0 | 44.29 | AV | 54 | PASS |
| | 2480 | Ant1 | 2483.5 | -40.07 | 2.0 | 0 | 57.16 | PEAK | 74 | PASS |
| | | Ant1 | 2483.5 | -52.48 | 2.0 | 0 | 44.75 | AV | 54 | PASS |
| | | Ant1 | 2500.0 | -43.04 | 2.0 | 0 | 54.19 | PEAK | 74 | PASS |
| | | Ant1 | 2500.0 | -52.31 | 2.0 | 0 | 44.92 | AV | 54 | PASS |

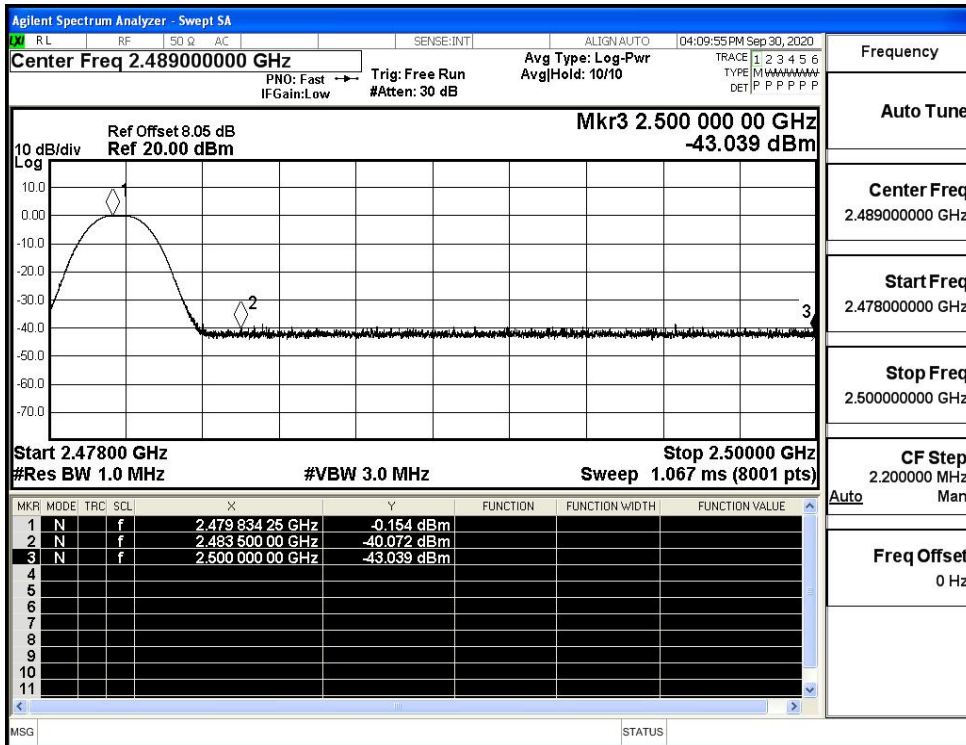
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



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

