

## Appendix A

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

Product Name: bicycle light

Trade Mark: MAGICSHINE

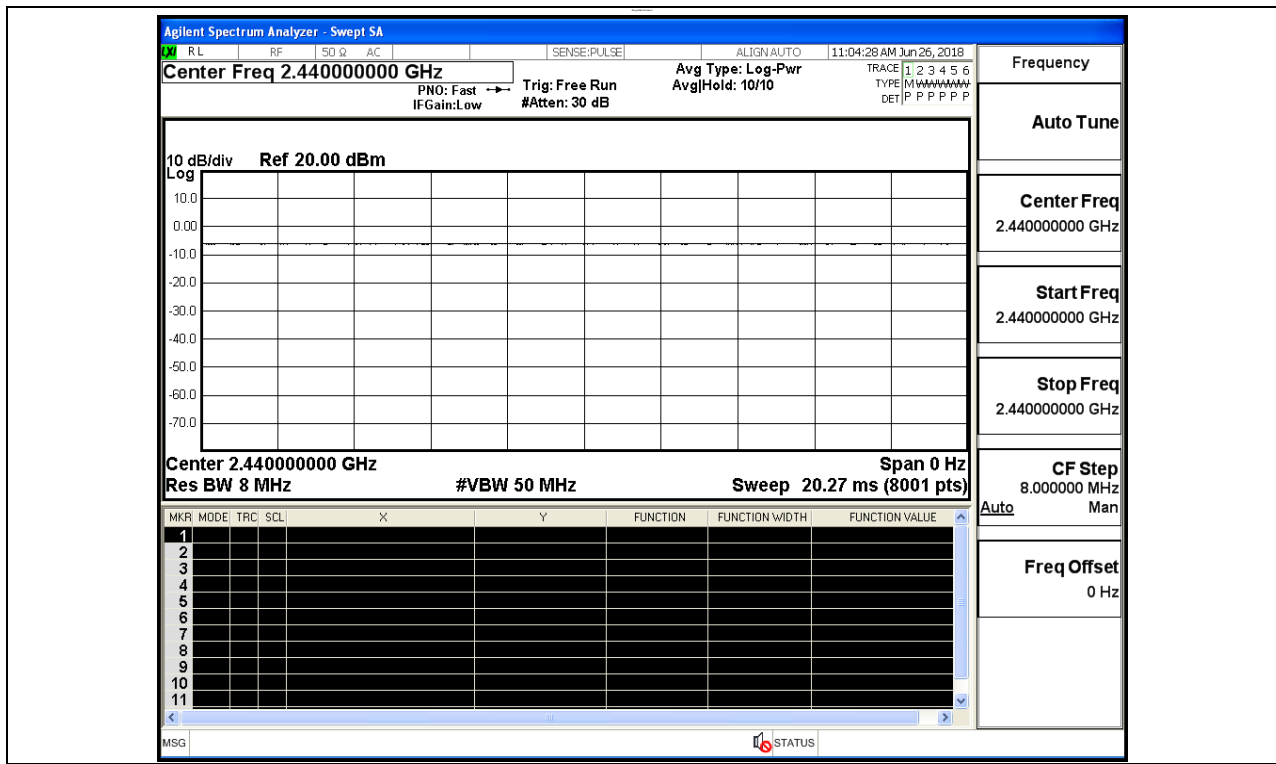
Test Model: MJ-906BC

#### Environmental Conditions

|                    |             |
|--------------------|-------------|
| Temperature:       | 23.4 ° C    |
| Relative Humidity: | 53.6%       |
| ATM Pressure:      | 100.0 kPa   |
| Test Engineer:     | Wilson.Hong |
| Supervised by:     | Jayden.Zhuo |

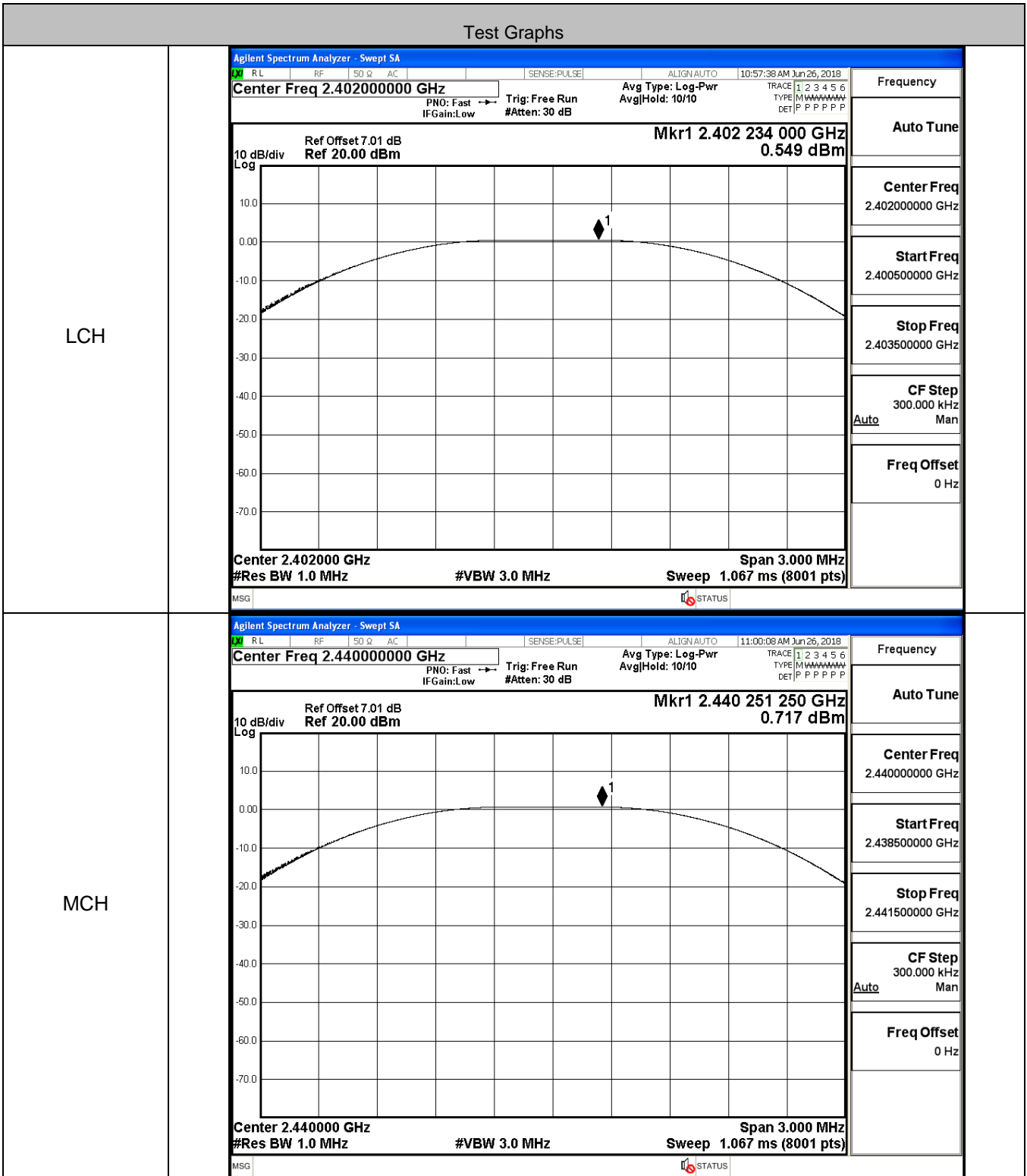
#### A.1 Duty Cycle

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

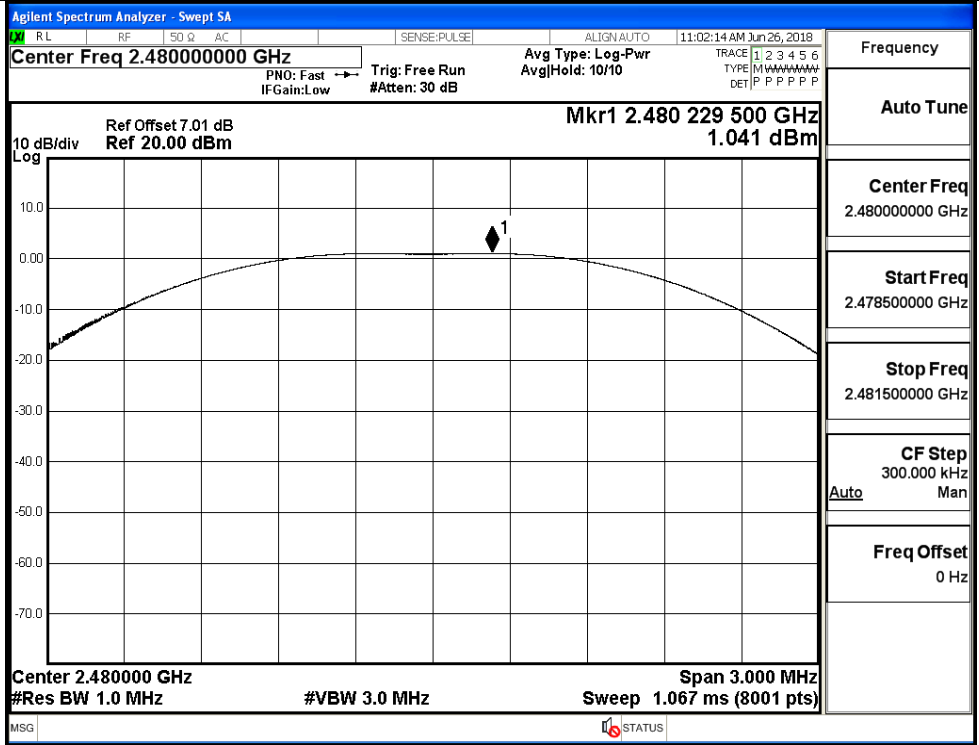


### A.2 Maximum Conducted Peak Output Power

| Mode  | Channel | Conduct Peak Power[dBm] | Limit [dBm] | Verdict |
|-------|---------|-------------------------|-------------|---------|
| BT LE | LCH     | 0.549                   | 30          | PASS    |
| BT LE | MCH     | 0.717                   | 30          | PASS    |
| BT LE | HCH     | 1.041                   | 30          | PASS    |



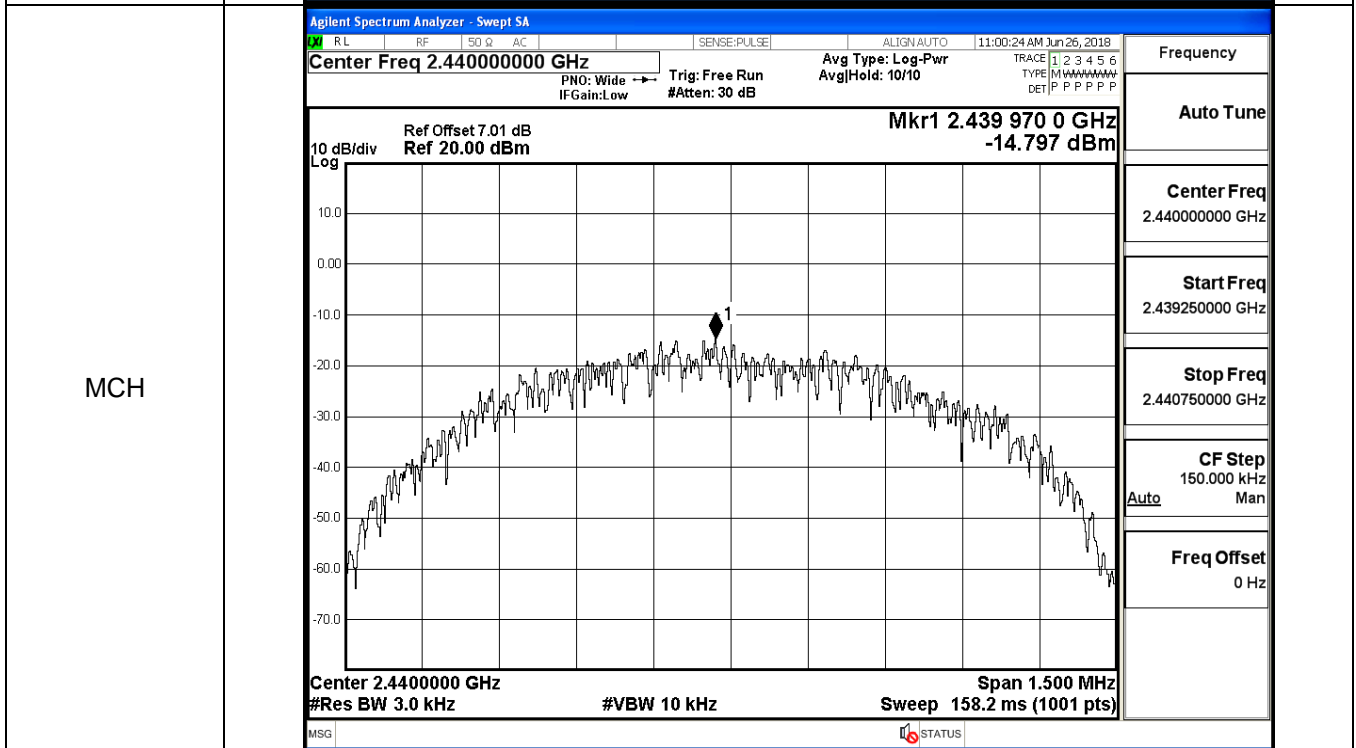
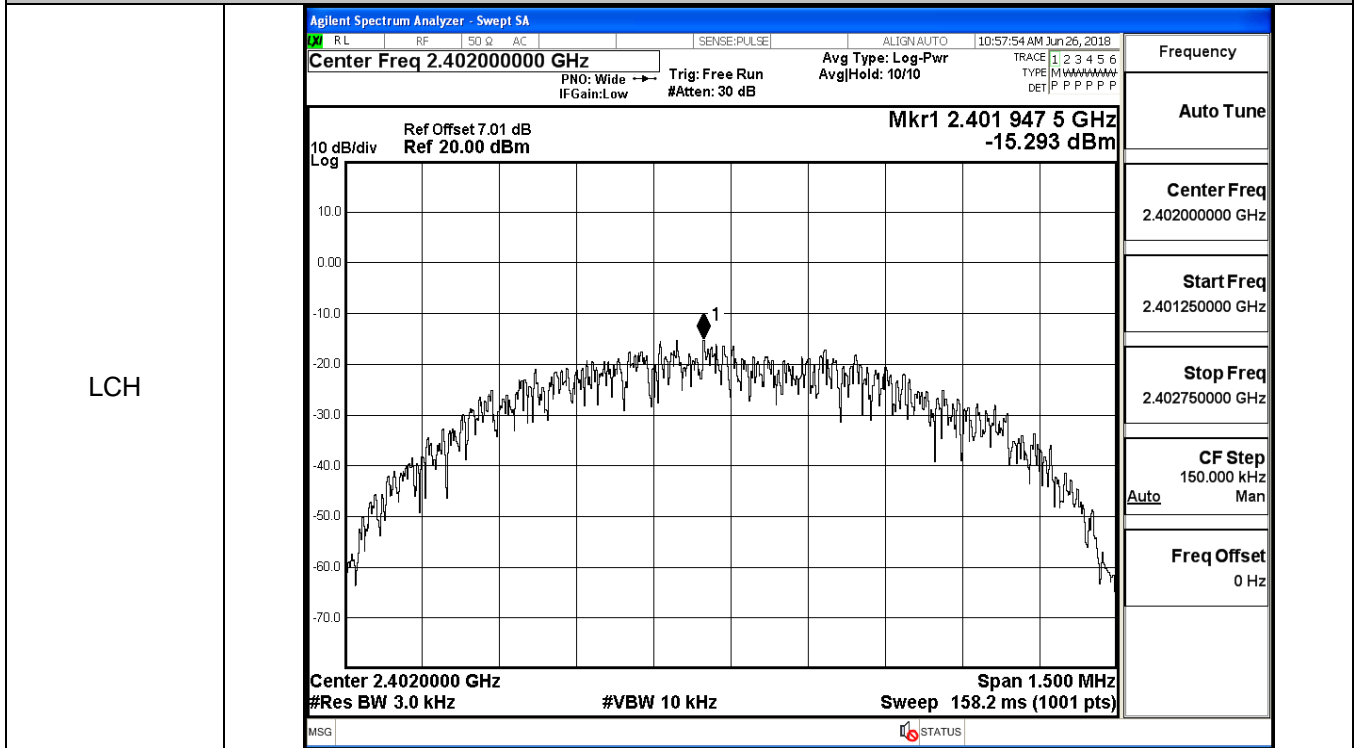
HCH



### A.3 Maximum Power Spectral Density

| Mode  | Channel | PSD [dBm/3KHz] | Limit [dBm/3KHz] | Verdict |
|-------|---------|----------------|------------------|---------|
| BT LE | LCH     | -15.293        | 8                | PASS    |
| BT LE | MCH     | -14.797        | 8                | PASS    |
| BT LE | HCH     | -14.446        | 8                | PASS    |

#### Test Graphs

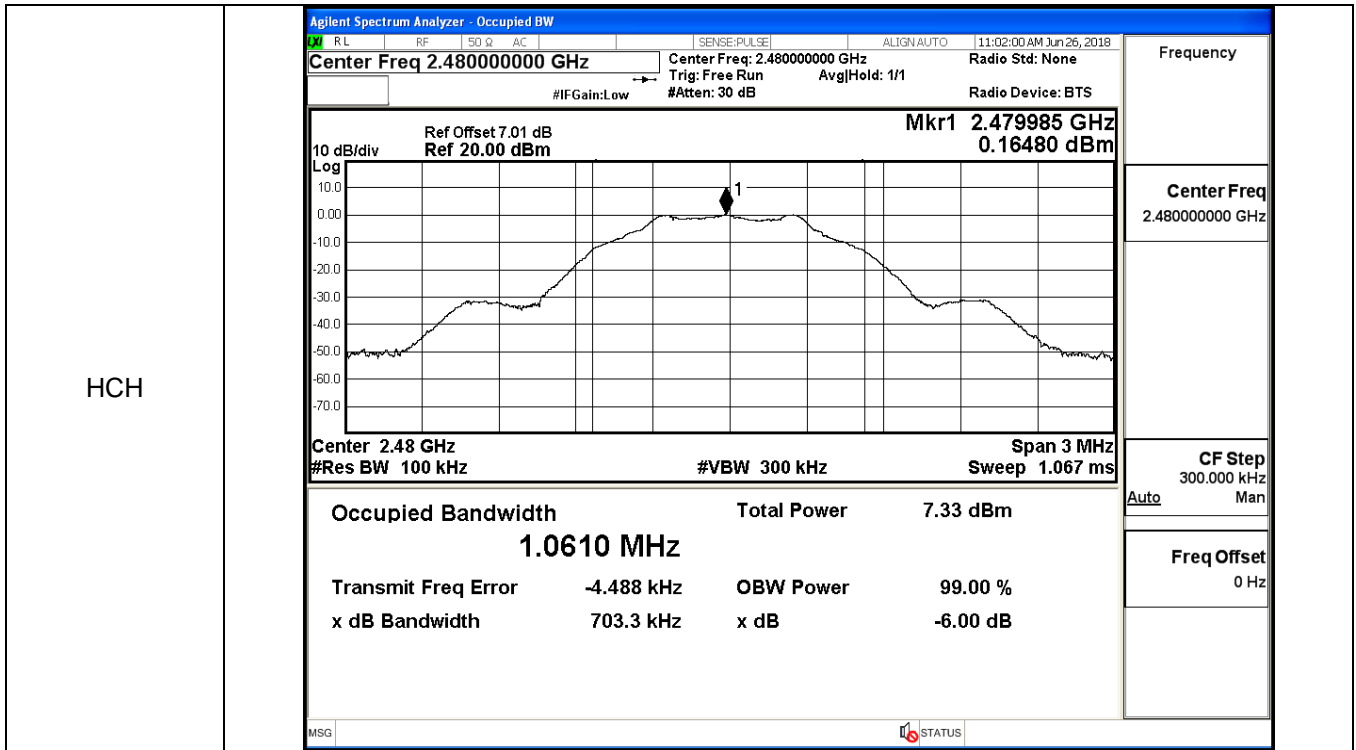




**A.4 6dB Bandwidth**

| Mode  | Channel | 6dB Bandwidth [MHz] | Limit [MHz] | Verdict |
|-------|---------|---------------------|-------------|---------|
| BT LE | LCH     | 0.7033              | ≥0.5        | PASS    |
| BT LE | MCH     | 0.7007              | ≥0.5        | PASS    |
| BT LE | HCH     | 0.7033              | ≥0.5        | PASS    |

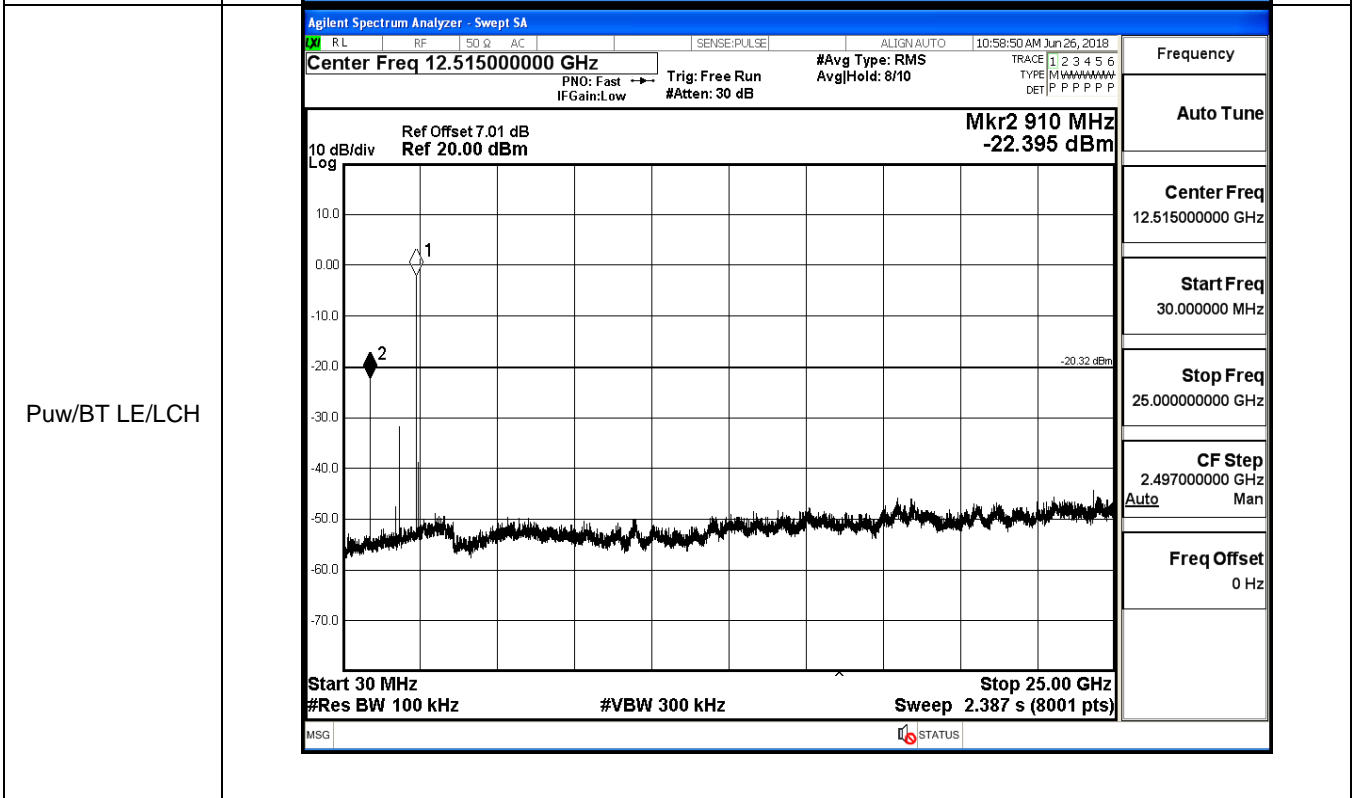
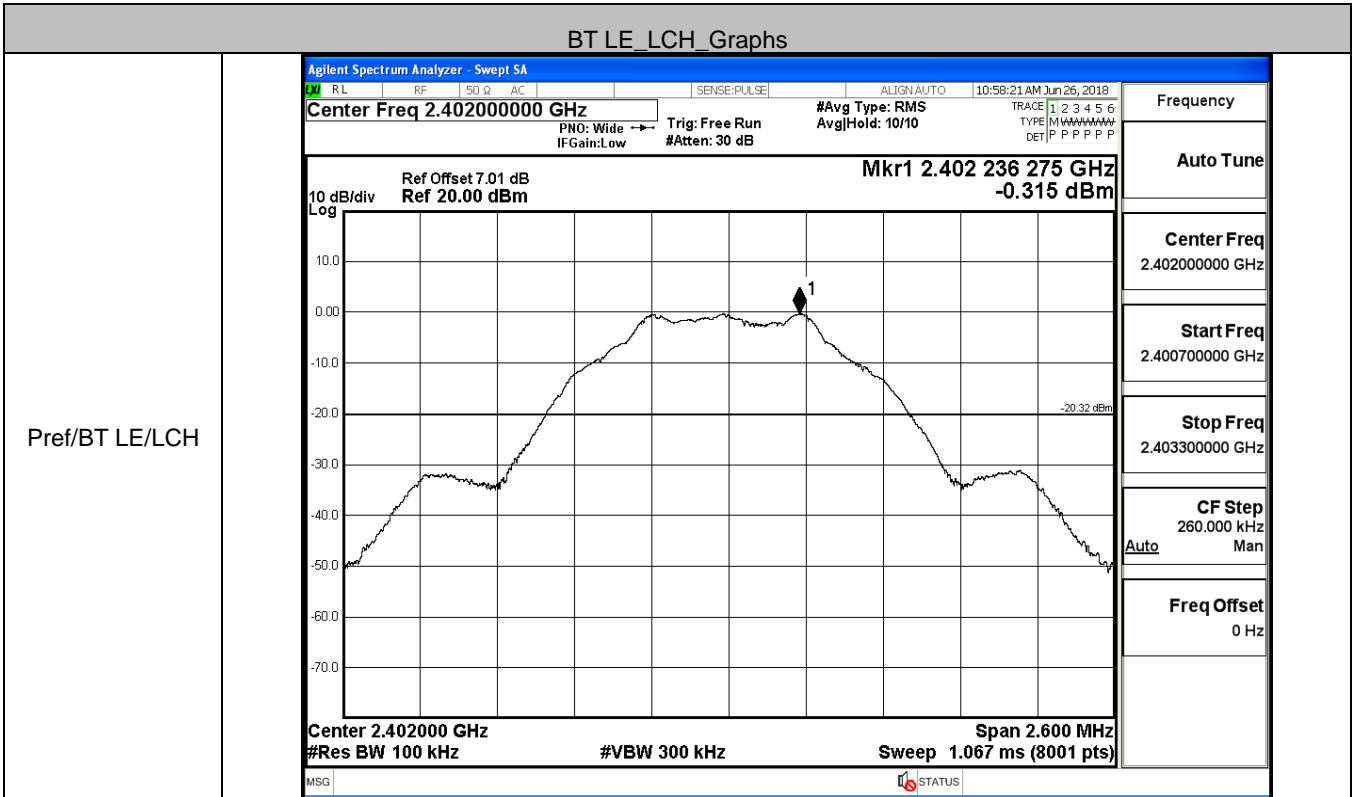
| Test Graphs |   |
|-------------|---|
| LCH         | <div data-bbox="416 562 1390 1294"> <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.402000000 GHz    Center Freq: 2.402000000 GHz    Radio Std: None</p> <p>Trig: Free Run    AvgHold: 1/1    Radio Device: BTS</p> <p>#IFGain:Low    #Atten: 30 dB</p> <p>Ref Offset 7.01 dB    Mkr1 2.402378 GHz</p> <p>Ref 20.00 dBm    -0.32013 dBm</p> <p>Center 2.402 GHz    Span 3 MHz</p> <p>#Res BW 100 kHz    #VBW 300 kHz    Sweep 1.067 ms</p> <p>Occupied Bandwidth    Total Power    6.85 dBm</p> <p><b>1.0613 MHz</b></p> <p>Transmit Freq Error    -4.577 kHz    OBW Power    99.00 %</p> <p>x dB Bandwidth    703.3 kHz    x dB    -6.00 dB</p> <p>MSG    STATUS</p> </div>  |
| MCH         | <div data-bbox="416 1305 1390 2042"> <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.440000000 GHz    Center Freq: 2.440000000 GHz    Radio Std: None</p> <p>Trig: Free Run    AvgHold: 1/1    Radio Device: BTS</p> <p>#IFGain:Low    #Atten: 30 dB</p> <p>Ref Offset 7.01 dB    Mkr1 2.4402393 GHz</p> <p>Ref 20.00 dBm    -0.15814 dBm</p> <p>Center 2.44 GHz    Span 3 MHz</p> <p>#Res BW 100 kHz    #VBW 300 kHz    Sweep 1.067 ms</p> <p>Occupied Bandwidth    Total Power    7.00 dBm</p> <p><b>1.0614 MHz</b></p> <p>Transmit Freq Error    -4.314 kHz    OBW Power    99.00 %</p> <p>x dB Bandwidth    700.7 kHz    x dB    -6.00 dB</p> <p>MSG    STATUS</p> </div> |



### A.5 RF Conducted Spurious Emissions

| Mode  | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|-------|---------|------------|------------------|-------------|---------|
| BT LE | LCH     | -0.315     | -22.395          | -20.315     | PASS    |
| BT LE | MCH     | -0.158     | -31.065          | -20.158     | PASS    |
| BT LE | HCH     | 0.171      | -29.452          | -19.829     | PASS    |

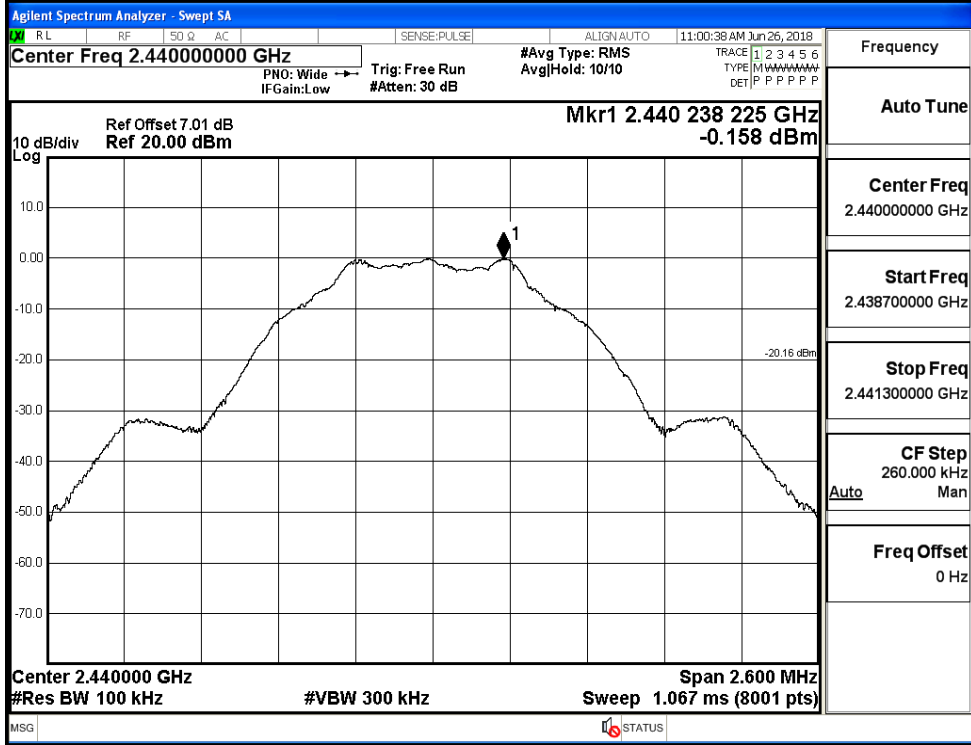
BT LE\_LCH\_Graphs



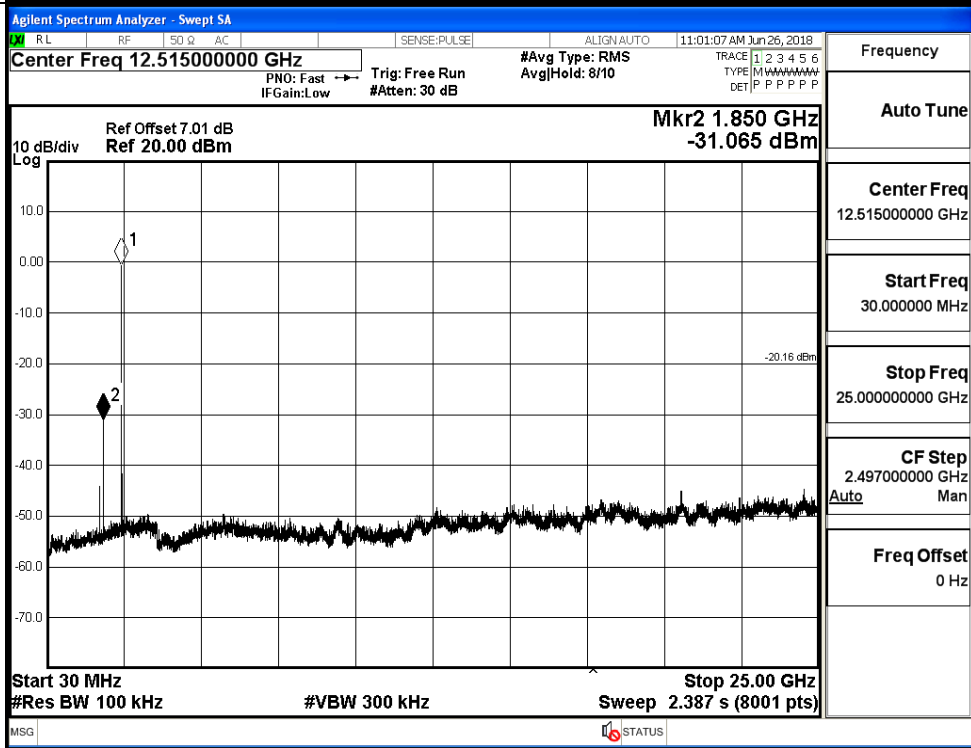


BT LE\_MCH\_Graphs

Pref/BT LE/MCH

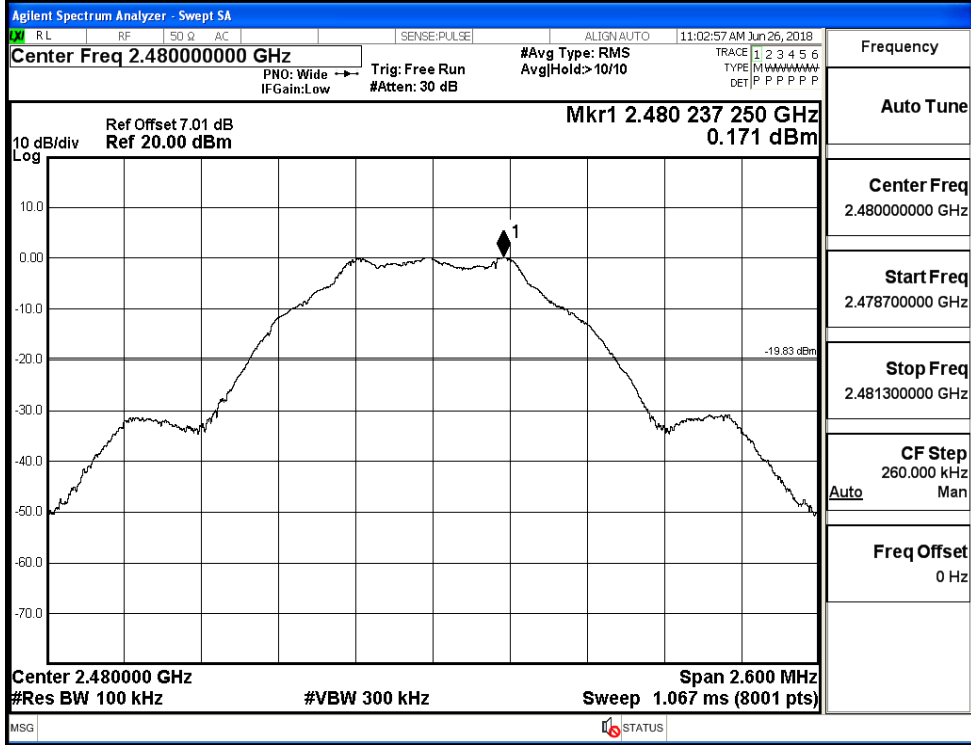


Puw/BT LE/MCH

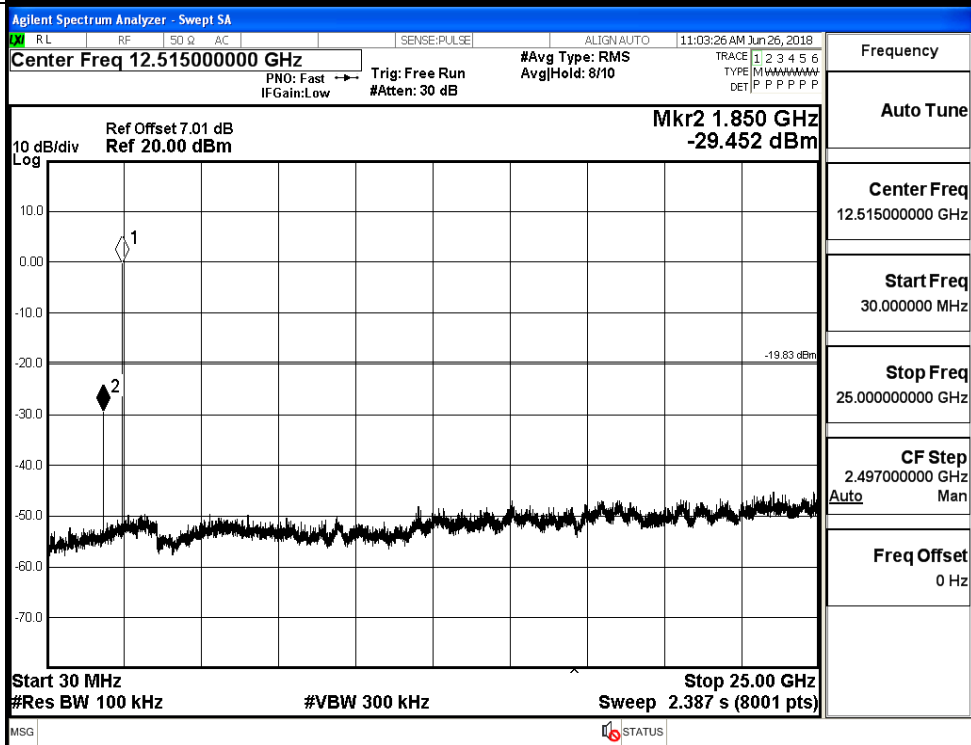


BT LE\_HCH\_Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



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

| Mode  | Channel | Carrier Power[dBm] | Max.Spurious Level [dBm] | Limit [dBm] | Verdict |
|-------|---------|--------------------|--------------------------|-------------|---------|
| BT LE | LCH     | -0.081             | -51.489                  | -20.08      | PASS    |
| BT LE | HCH     | 0.365              | -51.190                  | -19.64      | PASS    |

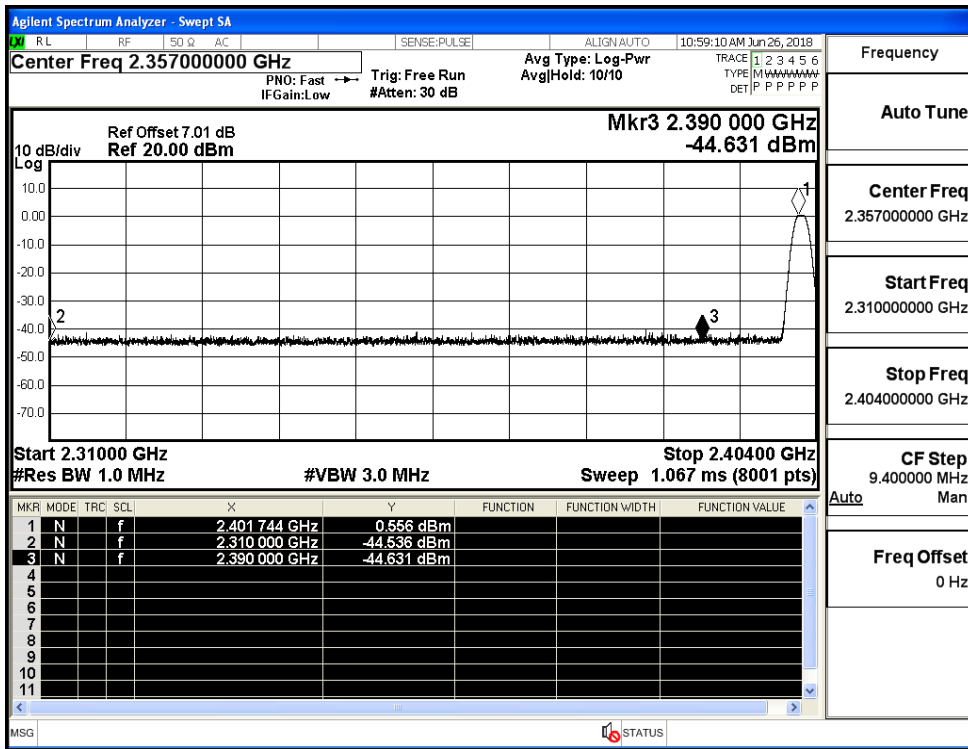
Test Graphs

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

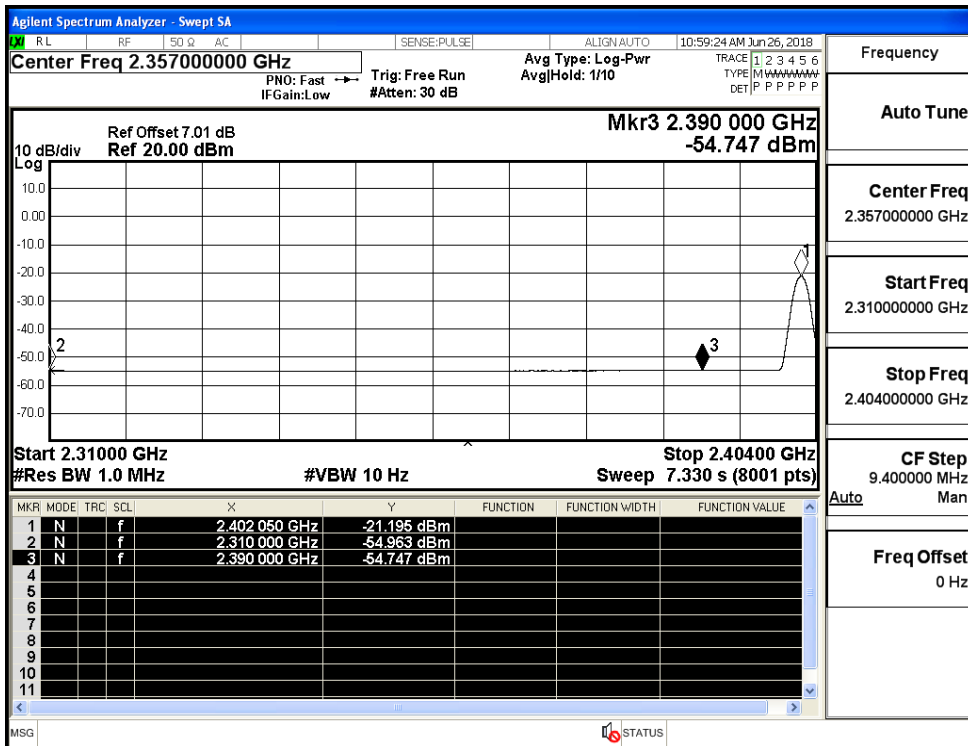
### A.7 Restrict-band band-edge measurements

| 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 | -44.54      | 2.0  | 0             | 52.72      | PEAK     | 74             | PASS  |
|           |              | Ant1 | 2310.0 | -54.96      | 2.0  | 0             | 42.29      | AV       | 54             | PASS  |
|           |              | Ant1 | 2390.0 | -44.63      | 2.0  | 0             | 52.63      | PEAK     | 74             | PASS  |
|           |              | Ant1 | 2390.0 | -54.75      | 2.0  | 0             | 42.51      | AV       | 54             | PASS  |
|           | 2480         | Ant1 | 2483.5 | -42.33      | 2.0  | 0             | 54.93      | PEAK     | 74             | PASS  |
|           |              | Ant1 | 2483.5 | -54.44      | 2.0  | 0             | 42.82      | AV       | 54             | PASS  |
|           |              | Ant1 | 2500.0 | -44.79      | 2.0  | 0             | 52.47      | PEAK     | 74             | PASS  |
|           |              | Ant1 | 2500.0 | -54.35      | 2.0  | 0             | 42.91      | AV       | 54             | PASS  |

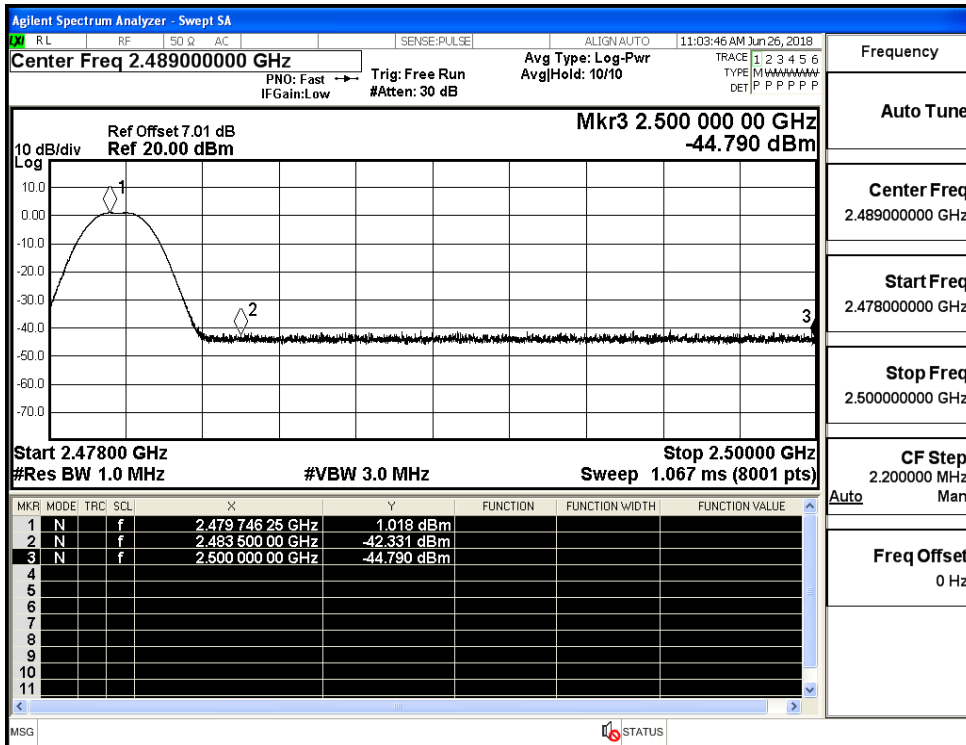
Restrict-band band-edge measurements\_BT LE\_2402\_Ant1\_PEAK



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

