

## 8.4 Out of band emissions at the band edge / conducted spurious emissions

### Test requirements and limit, §15.247(d)

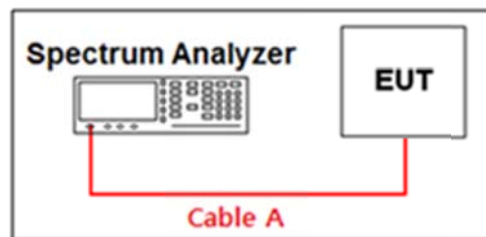
§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

If the **peak output power procedure** is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated **by at least 20 dB** relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in band average PSD level.

In either case, attenuation to levels below the general emission limits specified in §15.209(a) is not required.

### ■ TEST CONFIGURATION



### ■ TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer.

#### - Measurement Procedure 1 – Reference Level

1. Set instrument center frequency to DTS channel center frequency.
2. Set the span to  $\geq 1.5$  times the DTS bandwidth.
3. Set the RBW = 100 kHz.
4. Set the VBW  $\geq 3 \times$  RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum PSD level

#### - Measurement Procedure 2 - Unwanted Emissions

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = **100 kHz for below 1 GHz, 1 MHz for above 1 GHz( Actual 1 MHz , See below note)**
3. Set the VBW  $\geq 3 \times$  RBW (**Actual 3 MHz, See below note**)
4. Detector = **peak**.
5. Ensure that the number of measurement points  $\geq$  span/RBW
6. Sweep time = **auto couple**.
7. Trace mode = **max hold**.
8. **Allow the trace to stabilize** (this may take some time, depending on the extent of the span).
9. Use the peak marker function to determine the maximum amplitude level.

**Note:** The conducted spurious emission was tested with below settings.

**Frequency range: 9 kHz ~ 30 MHz**

**RBW= 100 kHz, VBW= 300 kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT: 40001**

**Frequency range: 30 MHz ~ 10 GHz, 10 GHz~25 GHz**

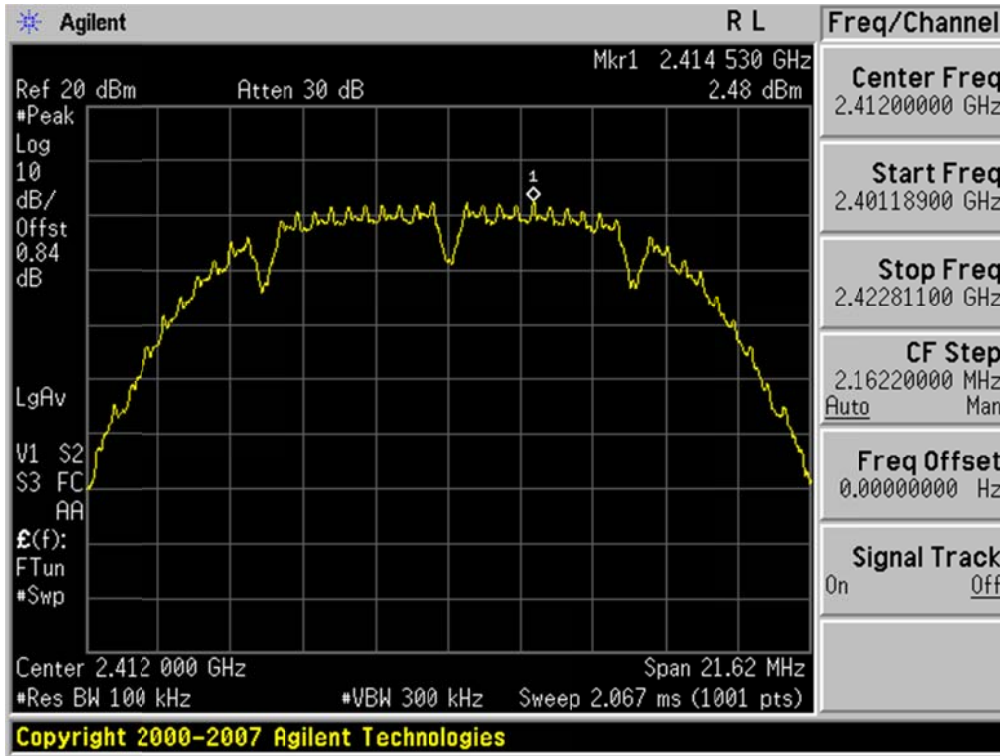
**RBW= 1MHz, VBW= 3 MHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT: 40001**

If the emission level with above setting was close to the limit (ie, less than 3 dB margin) then zoom scan is required using RBW = 100 kHz, VBW = 300 kHz, SAPN = 100 MHz and BINS = 2001 to get accurate emission level within 100 kHz BW.

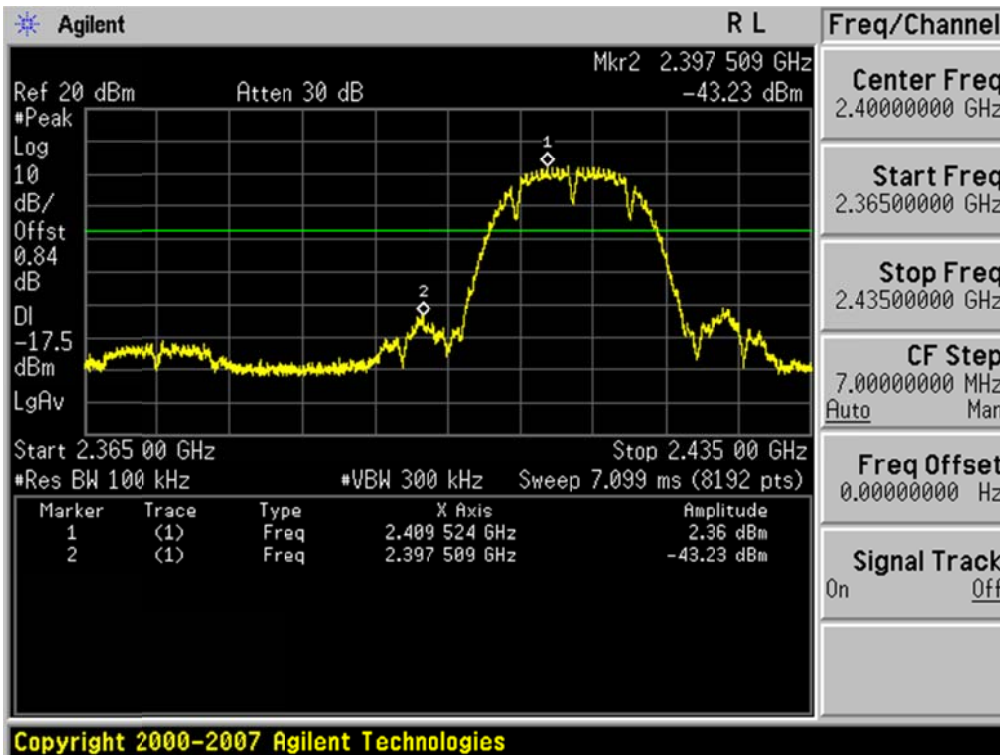
RESULT PLOTS

TM 1 & ANT 1 & Lowest

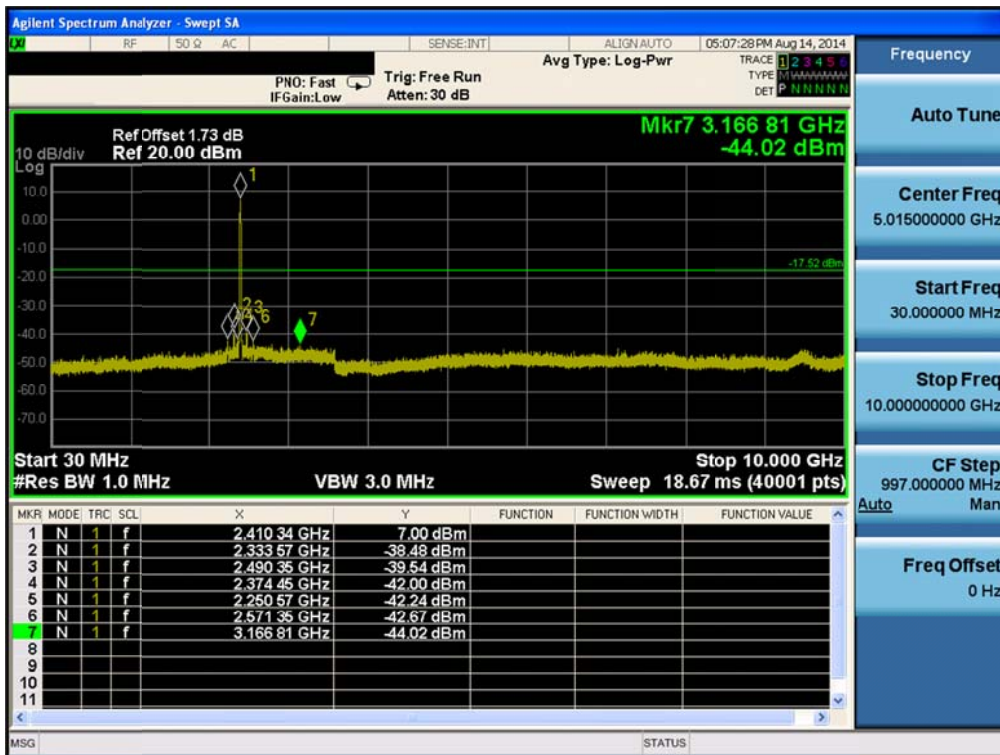
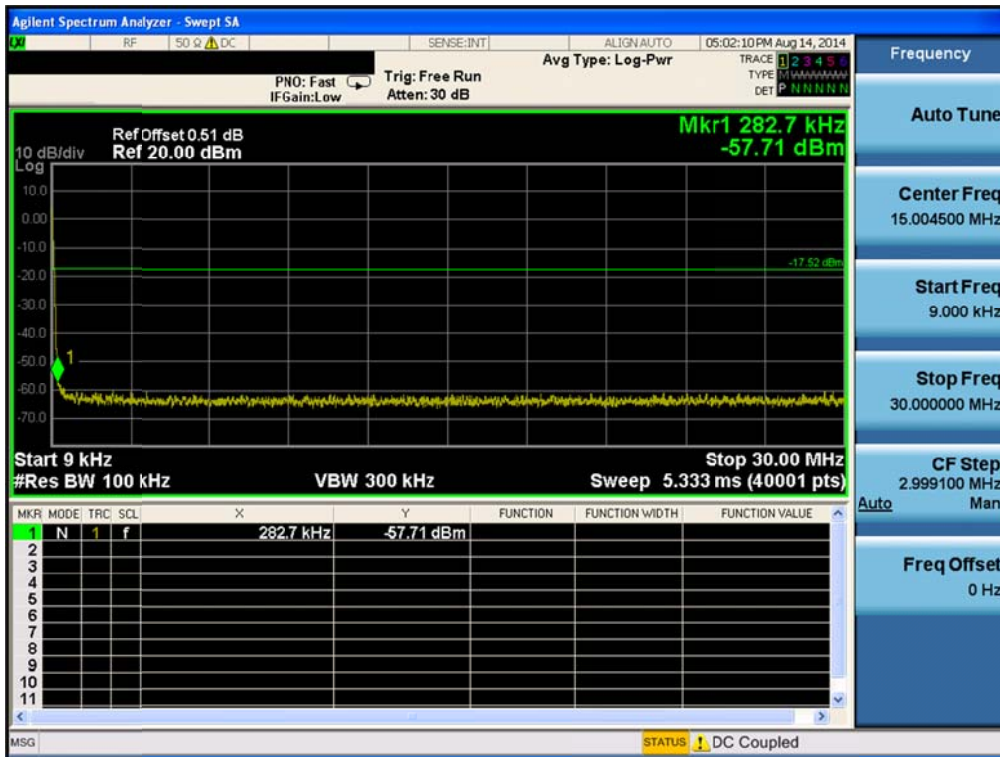
Reference



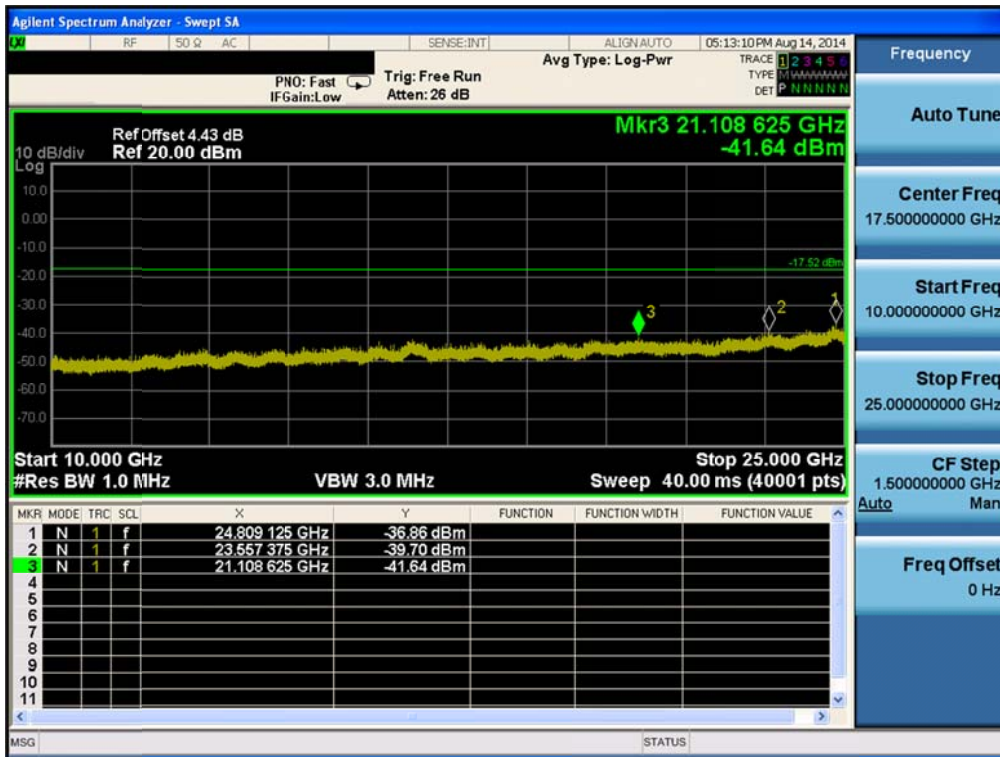
Low Band-edge



### Conducted Spurious Emissions

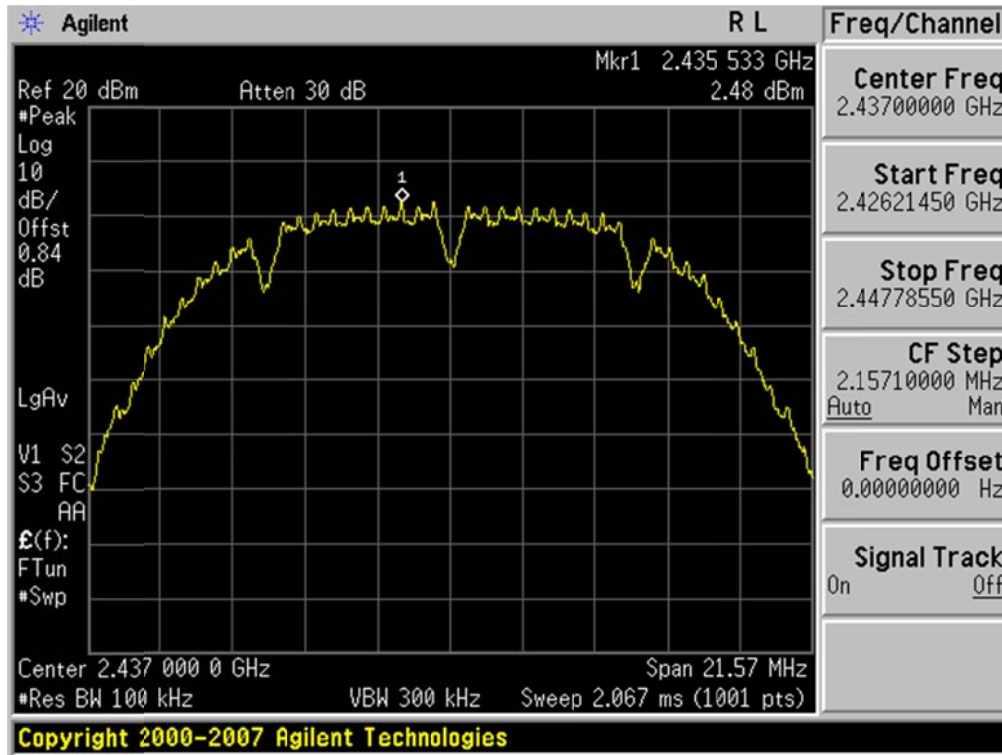


### Conducted Spurious Emissions

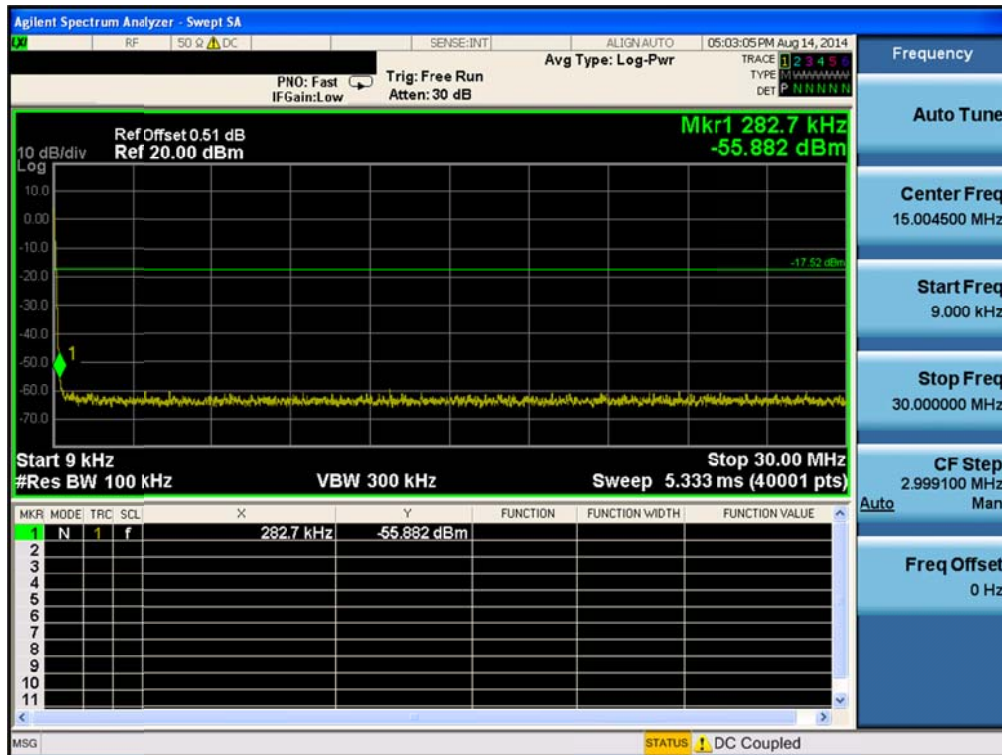


**TM 1 & ANT 1 & Middle**

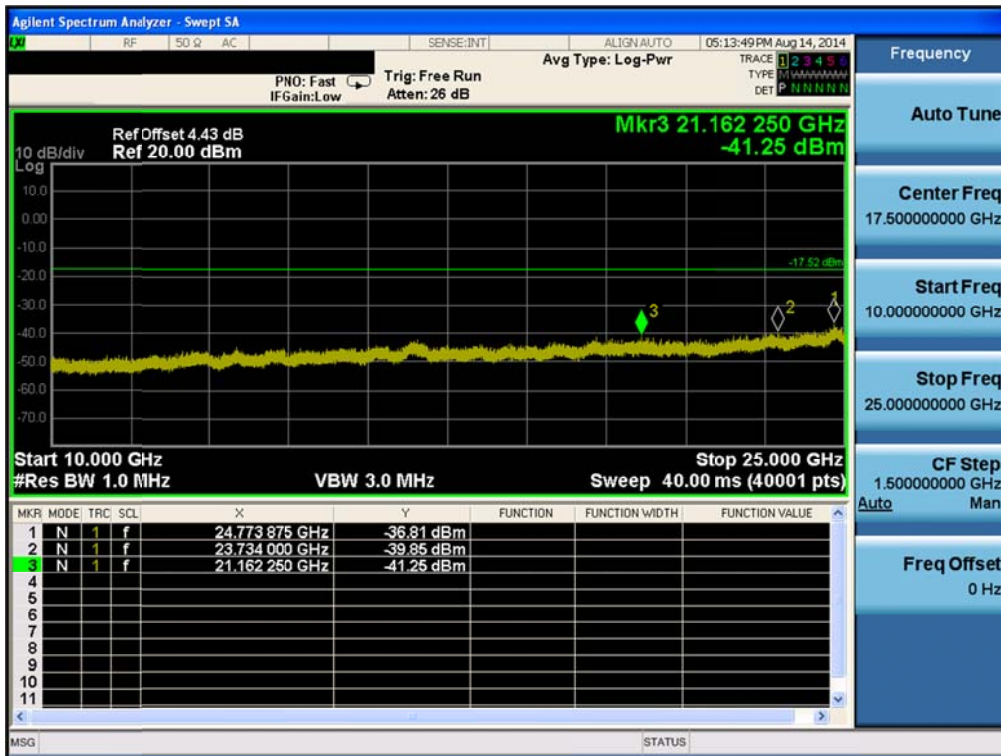
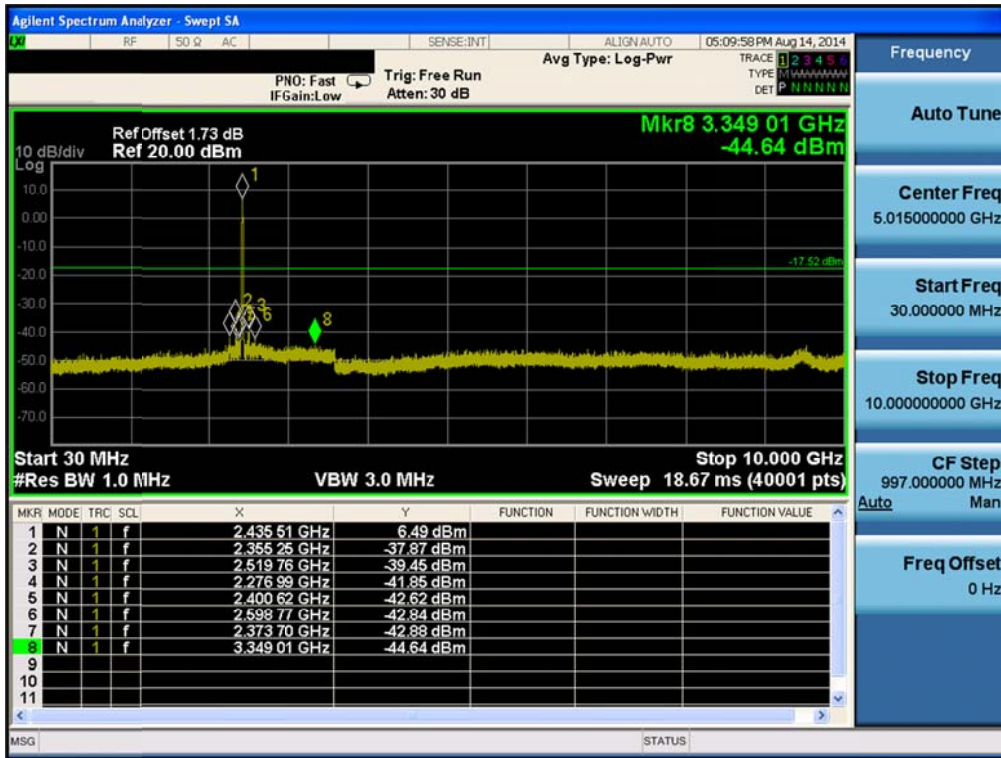
**Reference**



**Conducted Spurious Emissions**

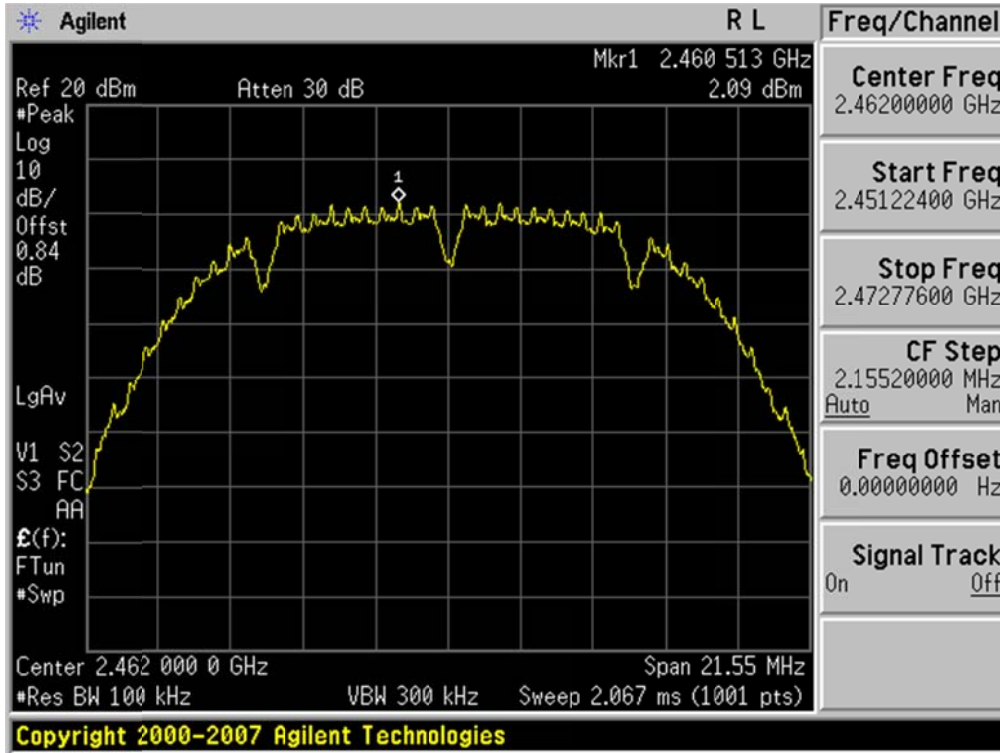


### Conducted Spurious Emissions

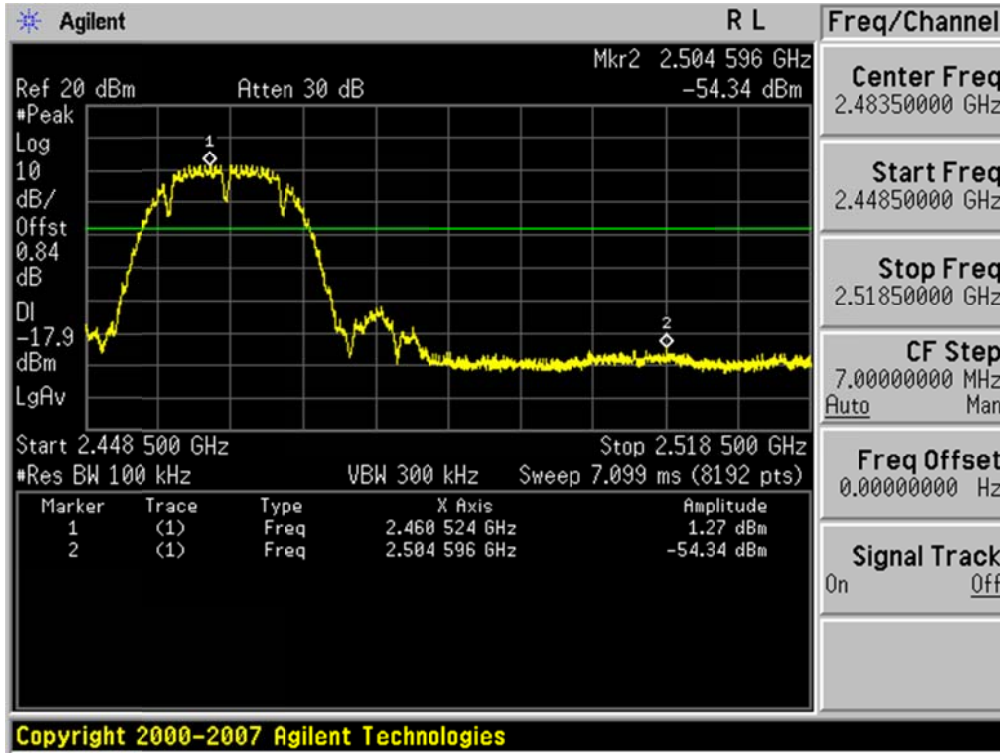


**TM 1 & ANT 1 & Highest**

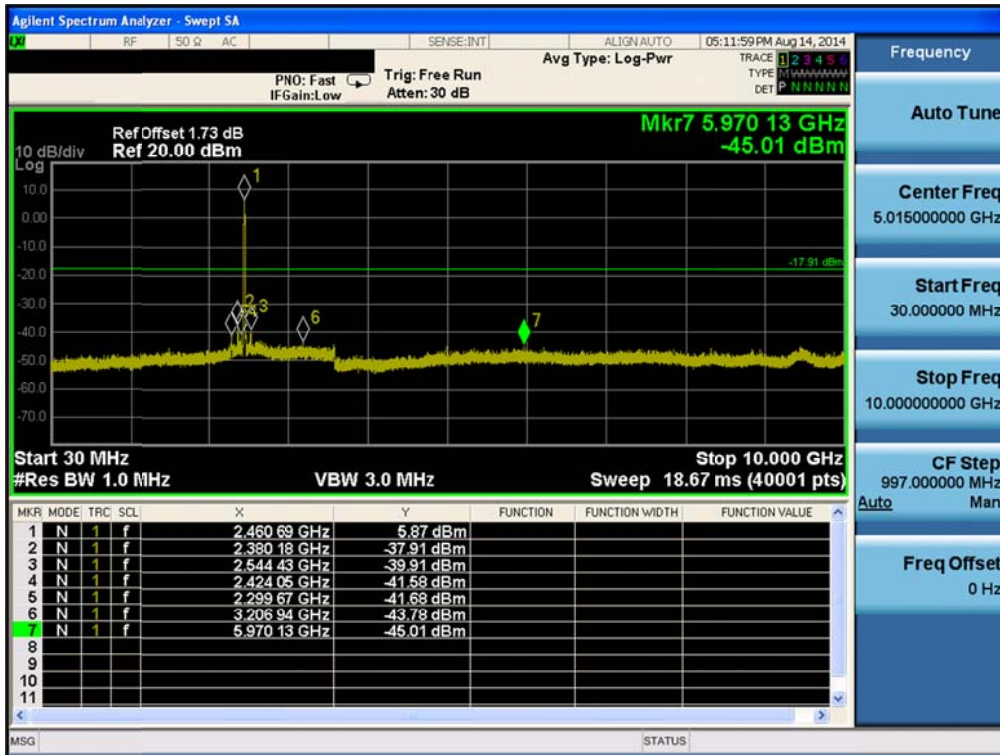
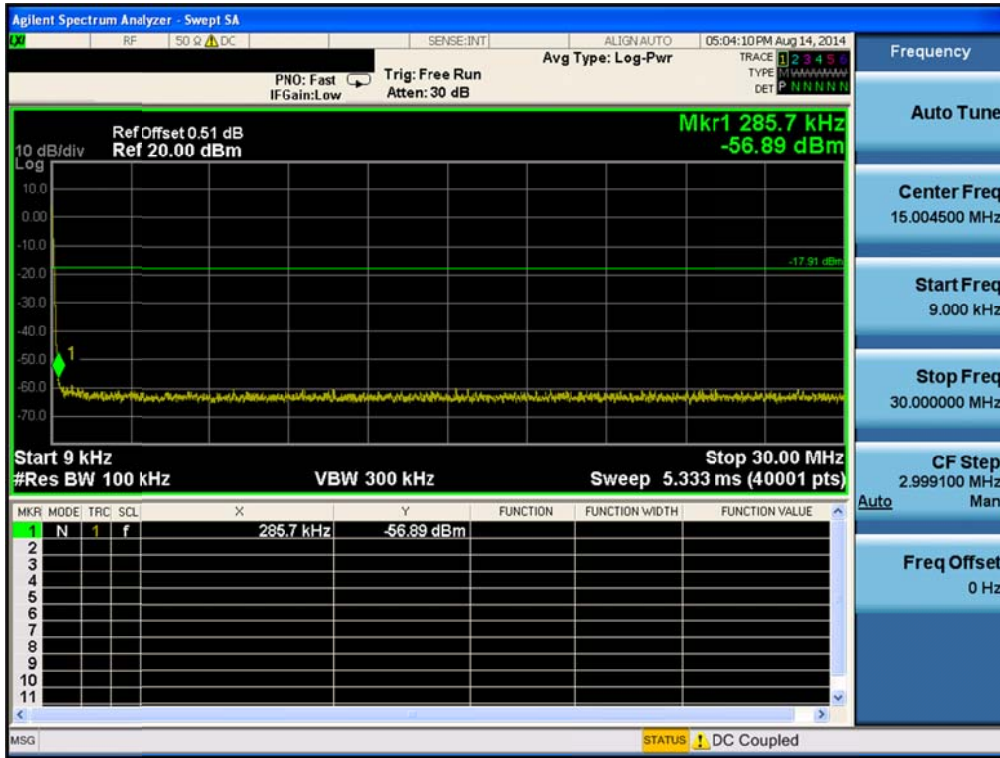
**Reference**



**High Band-edge**

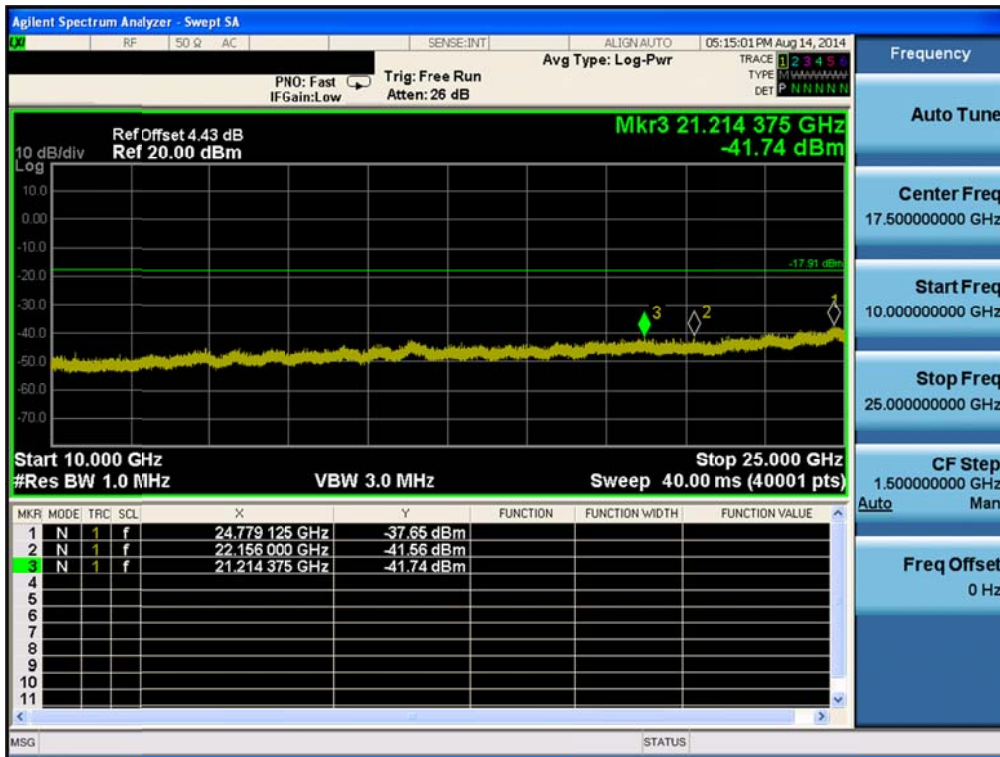


### Conducted Spurious Emissions



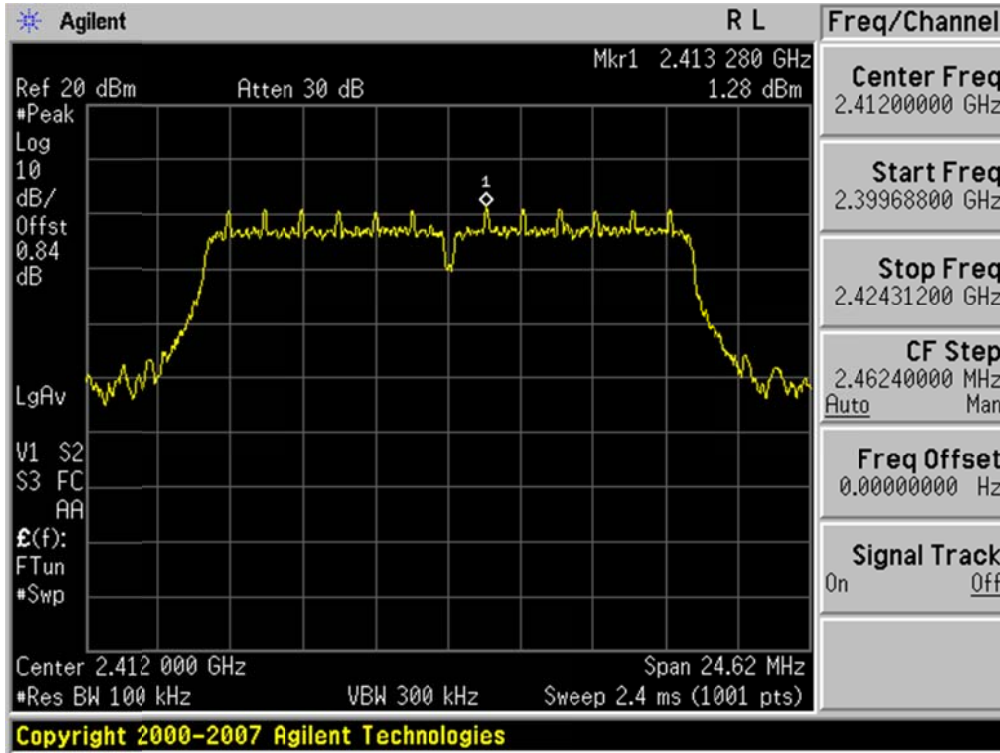


### Conducted Spurious Emissions

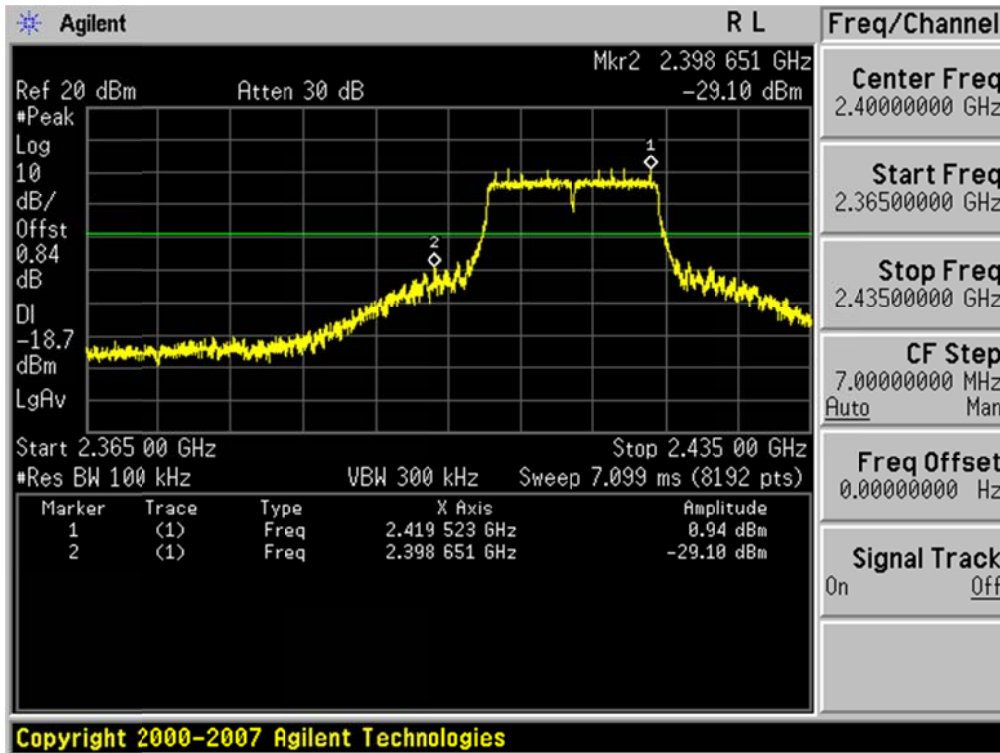


**TM 2 & ANT 1 & Lowest**

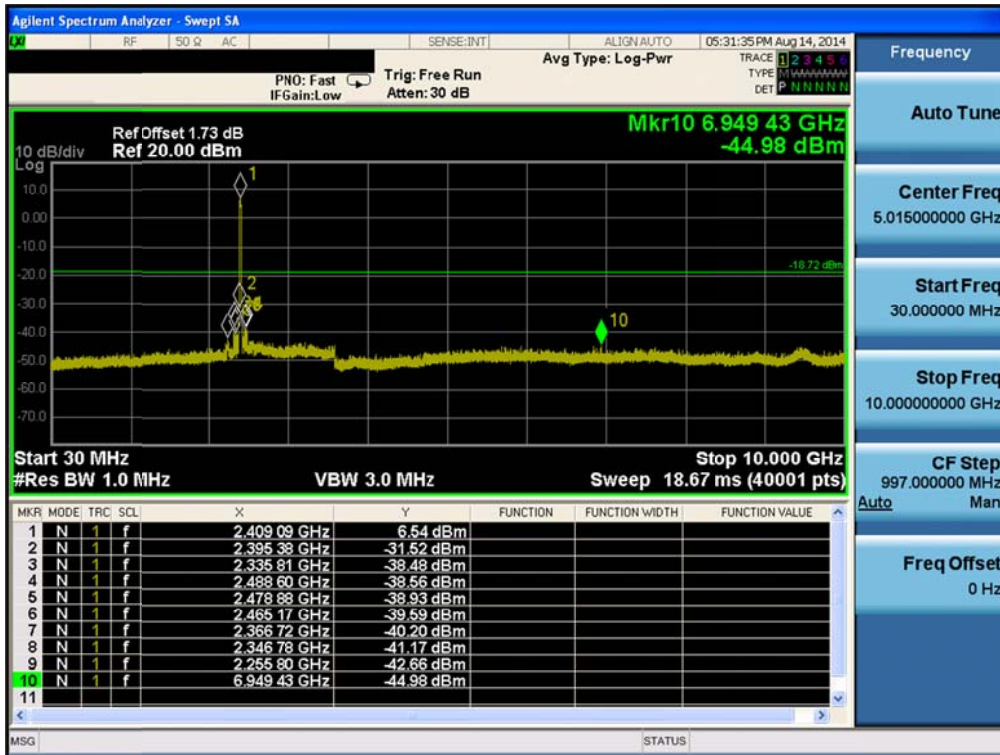
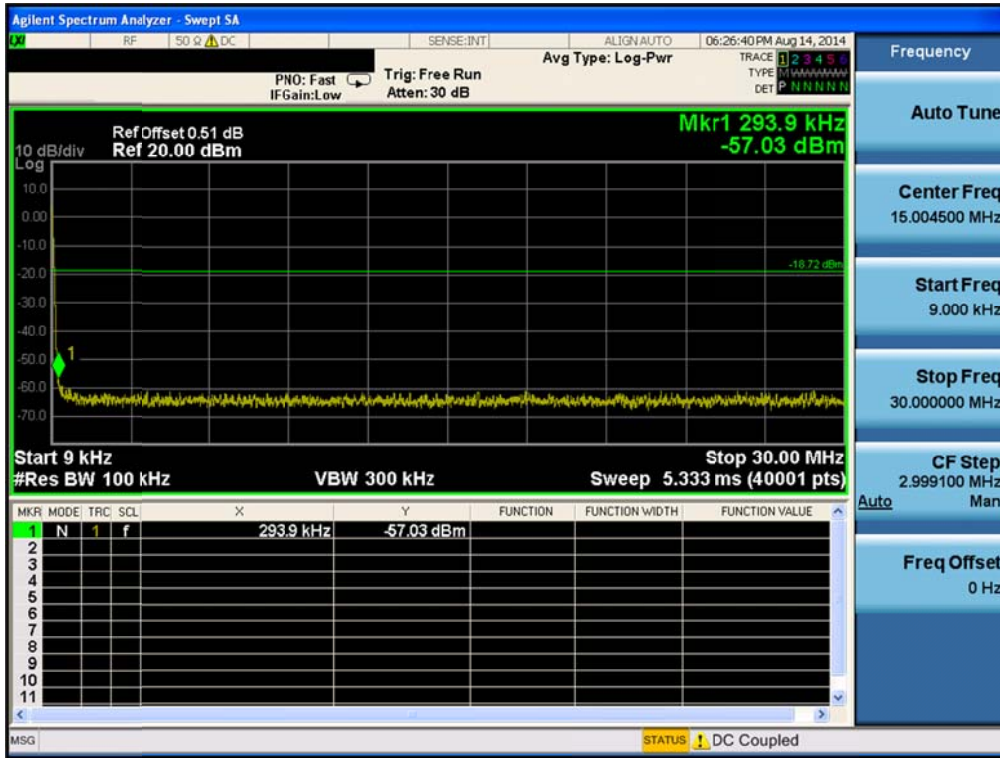
**Reference**



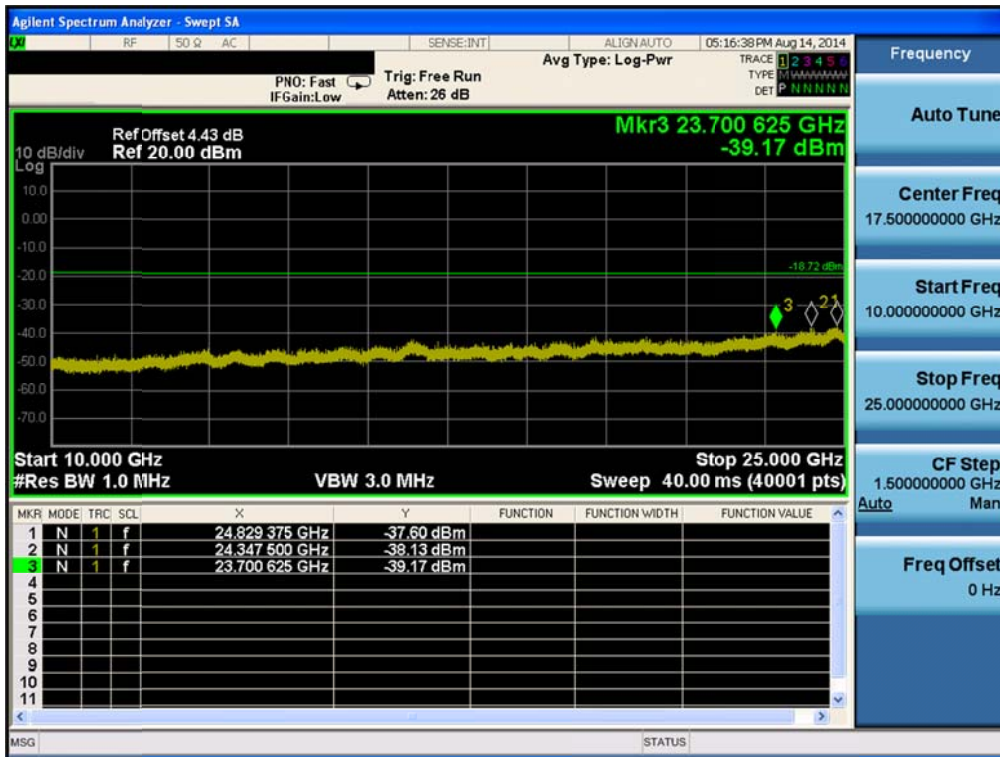
**Low Band-edge**



### Conducted Spurious Emissions

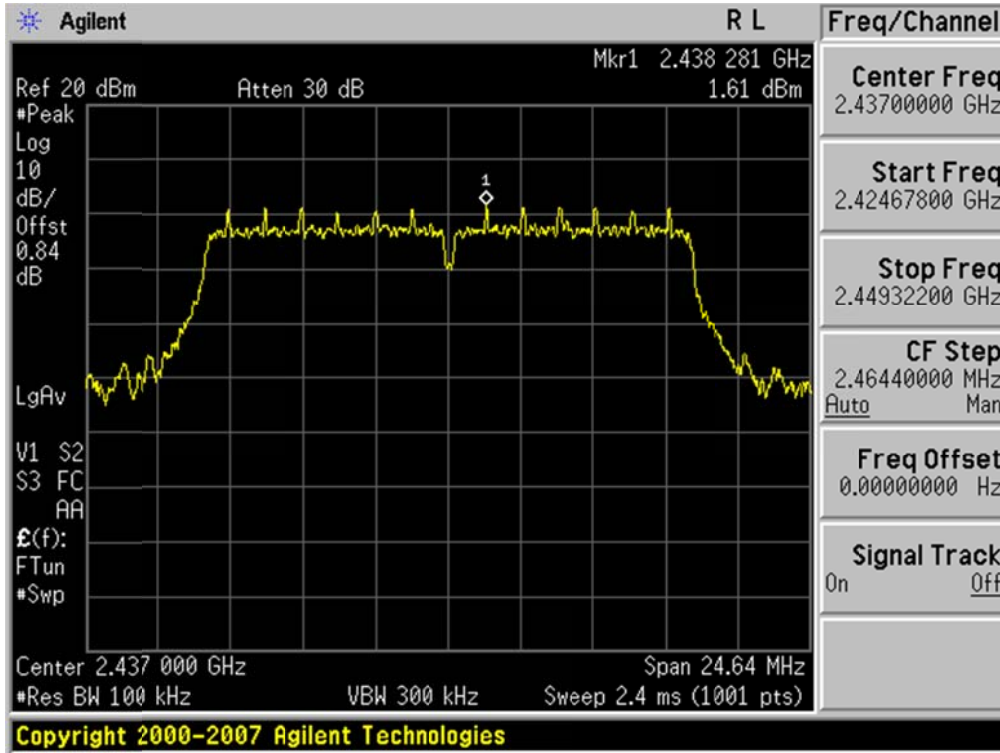


### Conducted Spurious Emissions

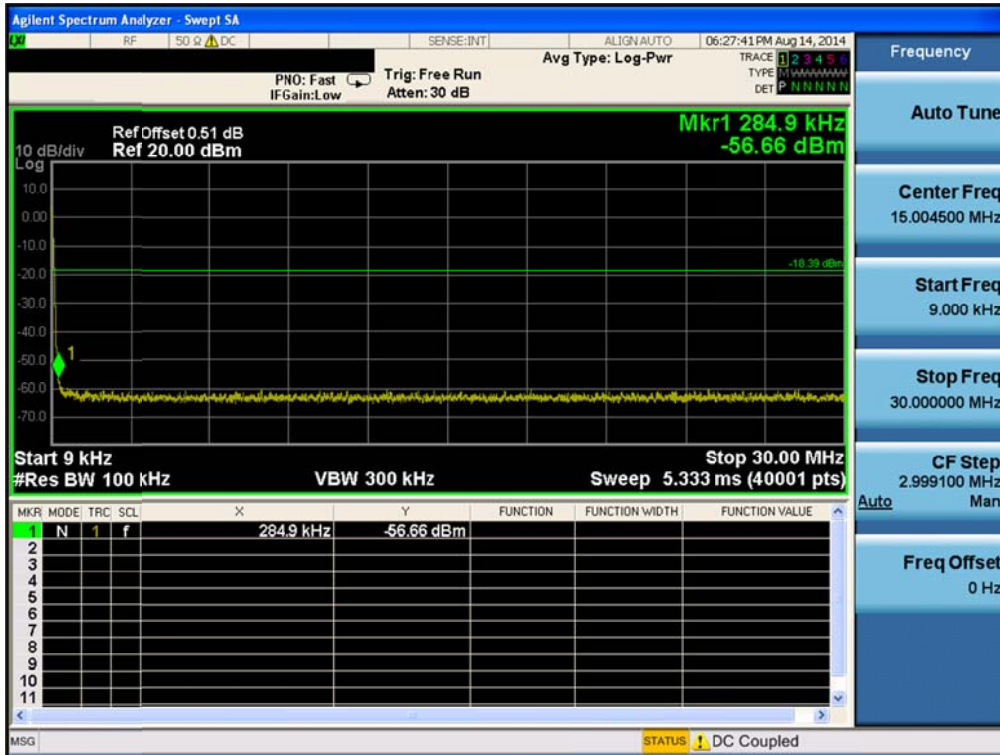


TM 2 & ANT 1 & Middle

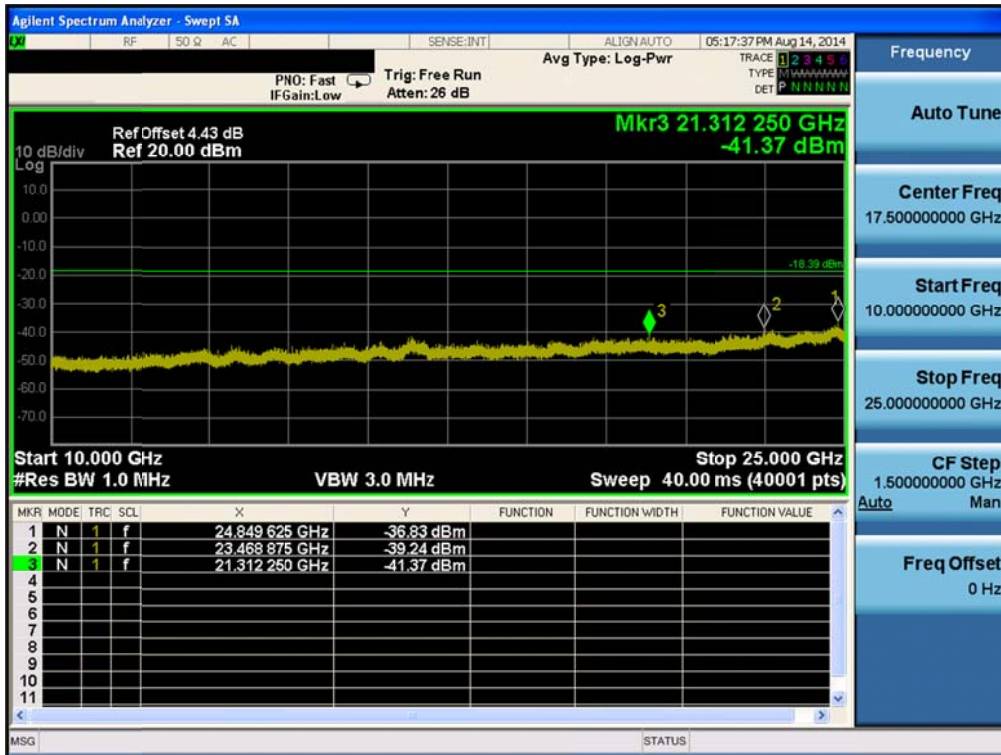
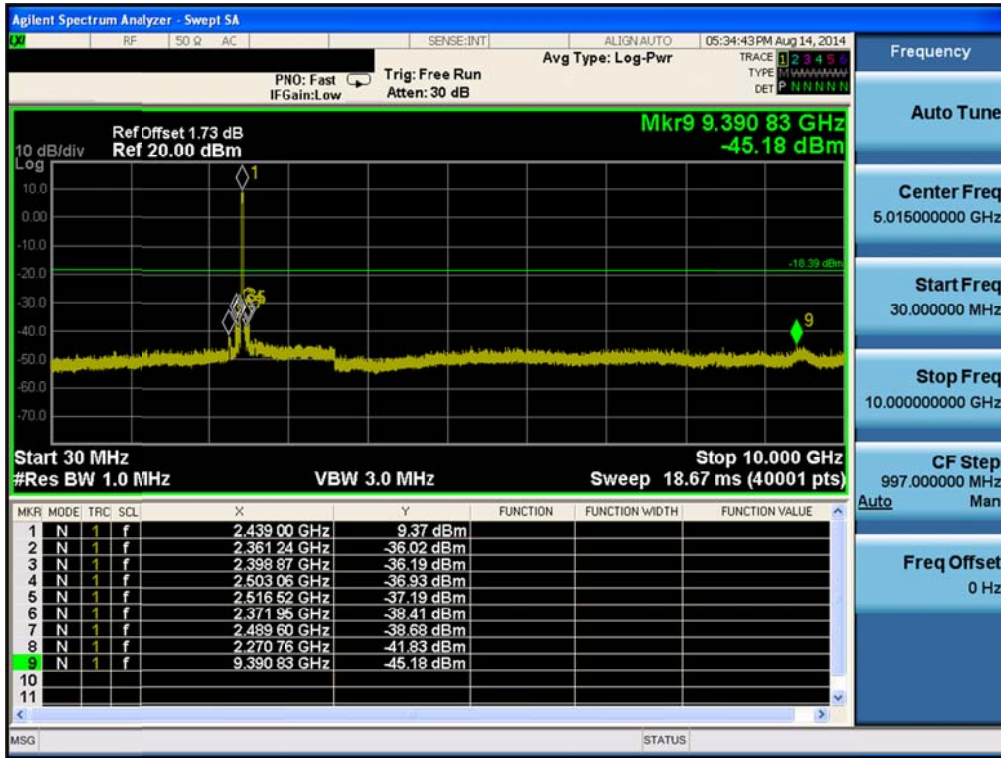
Reference



Conducted Spurious Emissions

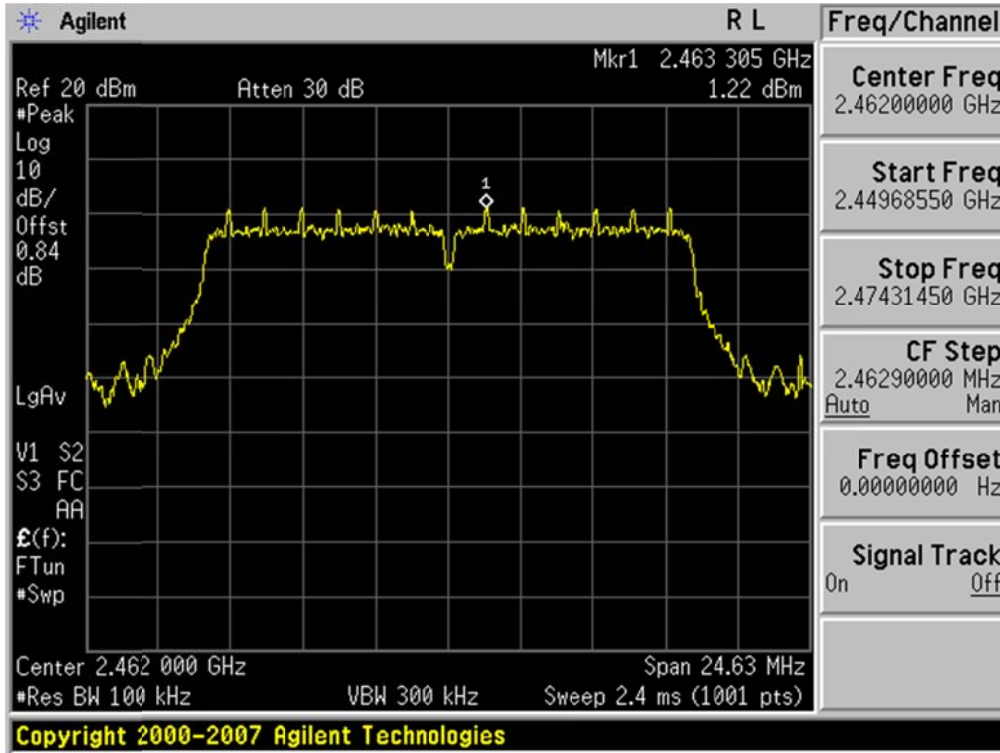


### Conducted Spurious Emissions

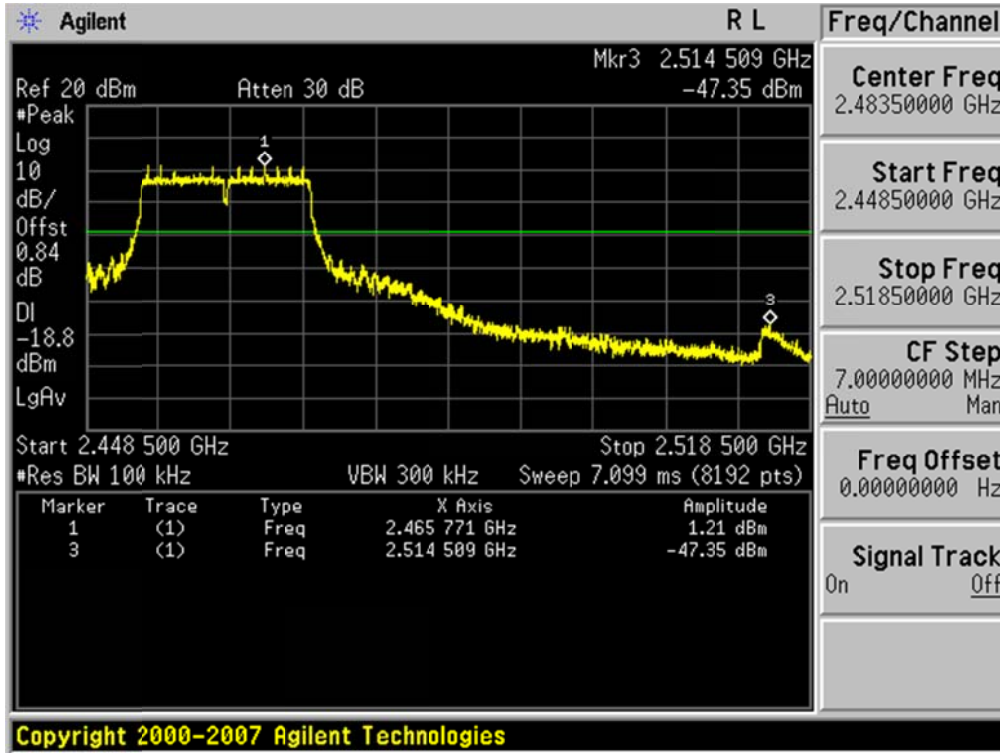


**TM 2 & ANT 1 & Highest**

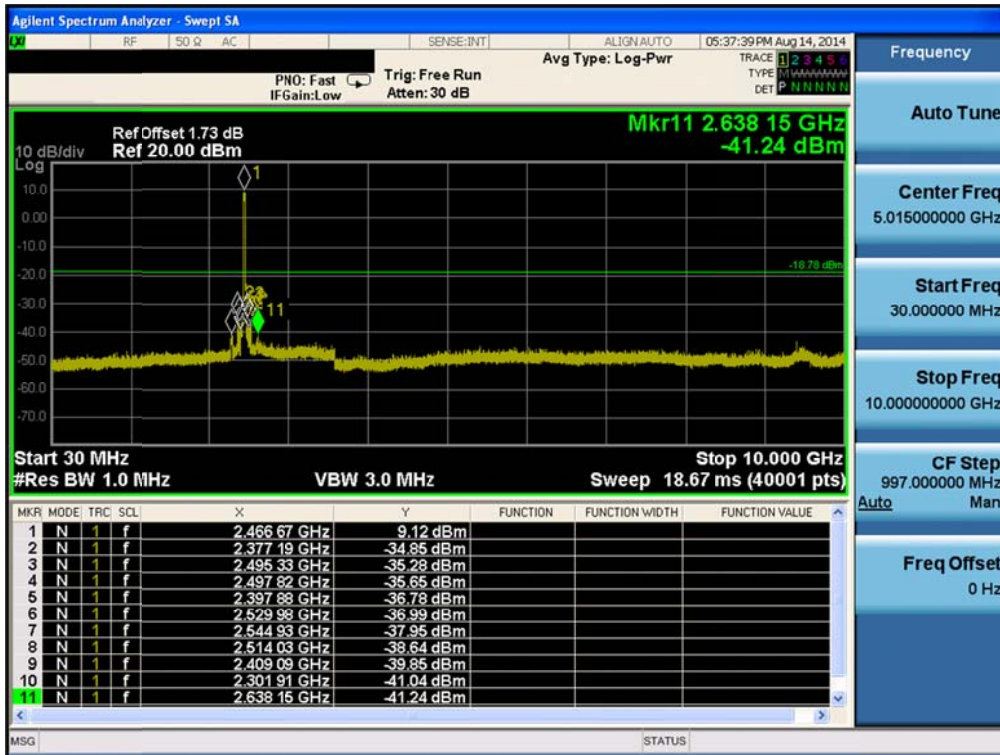
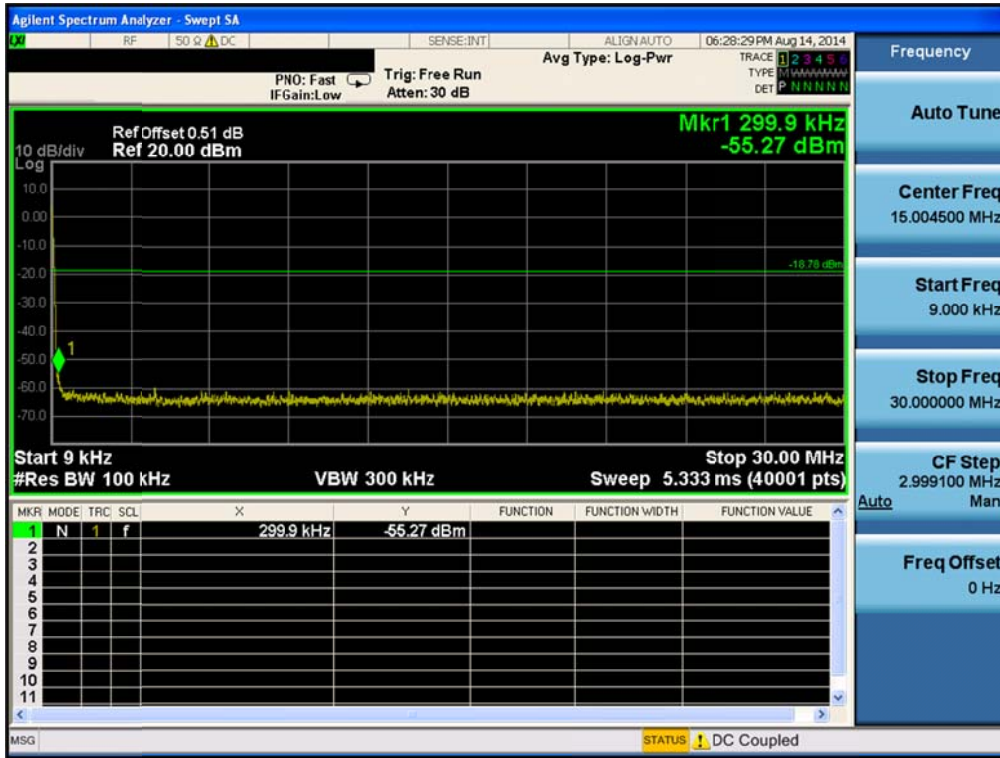
**Reference**



**High Band-edge**

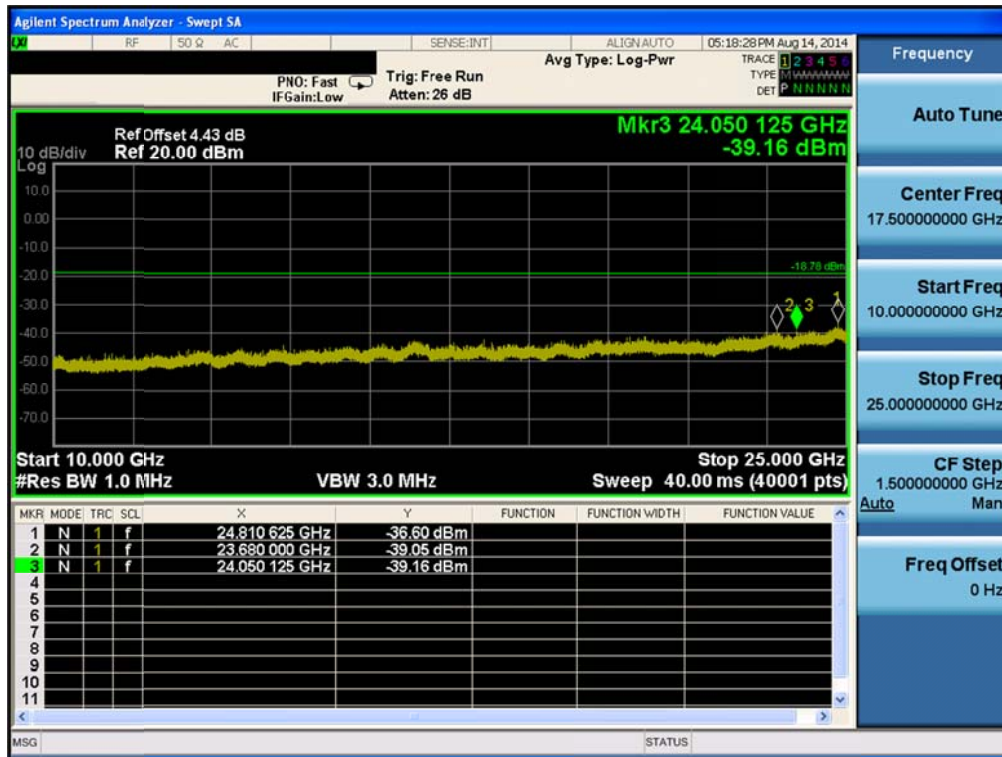


### Conducted Spurious Emissions



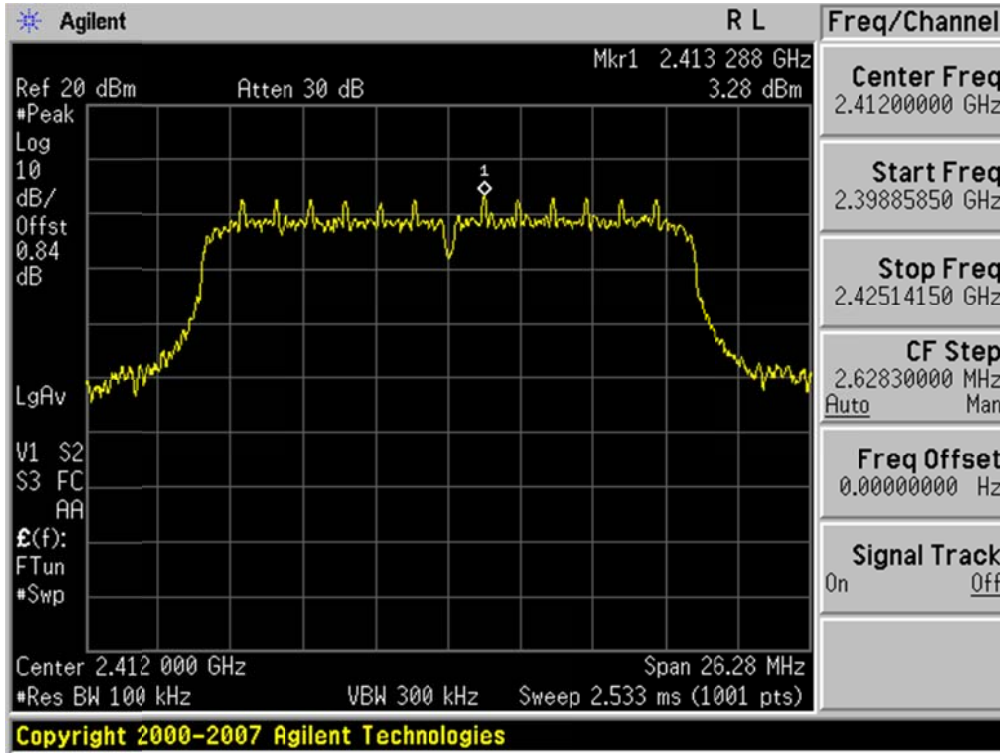


### Conducted Spurious Emissions

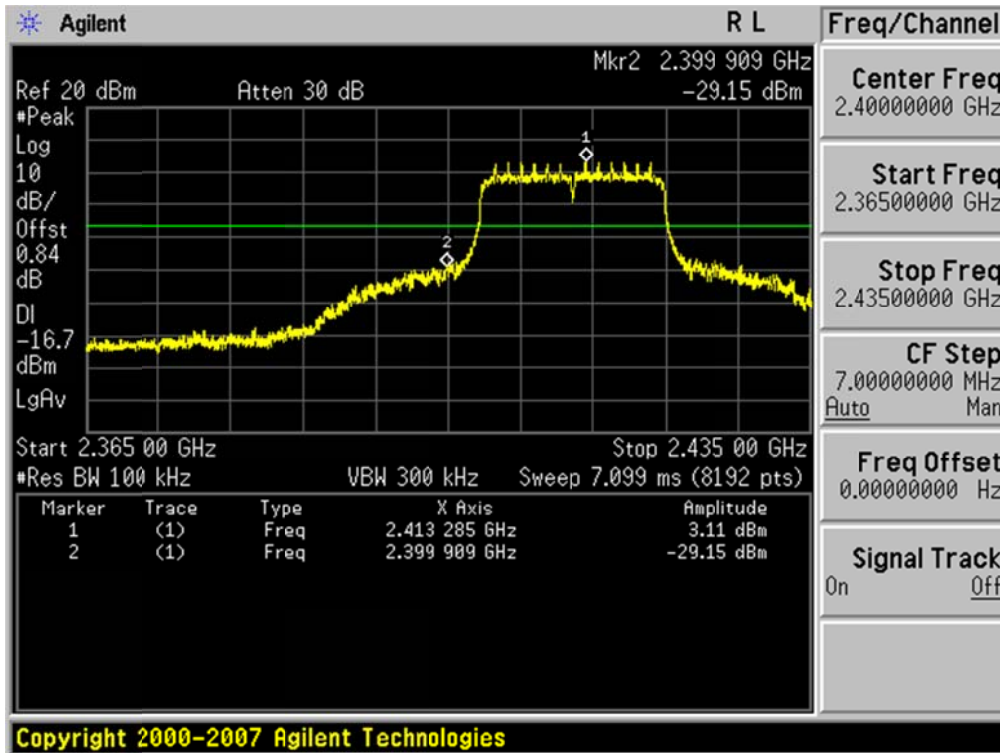


**TM 3 & ANT 1 & Lowest**

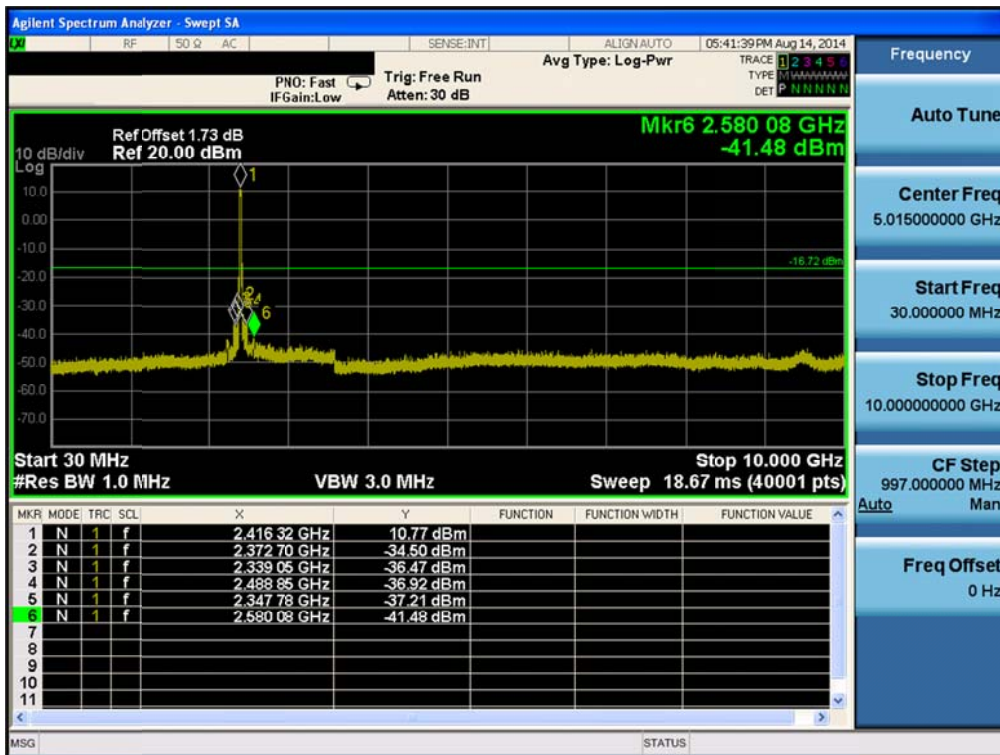
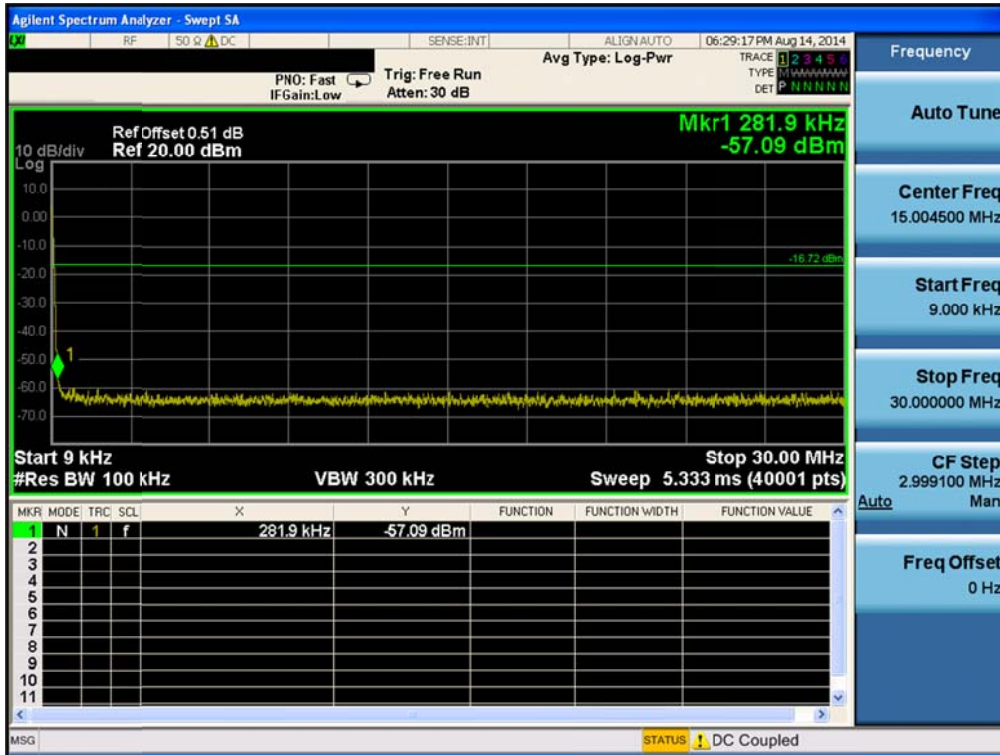
**Reference**



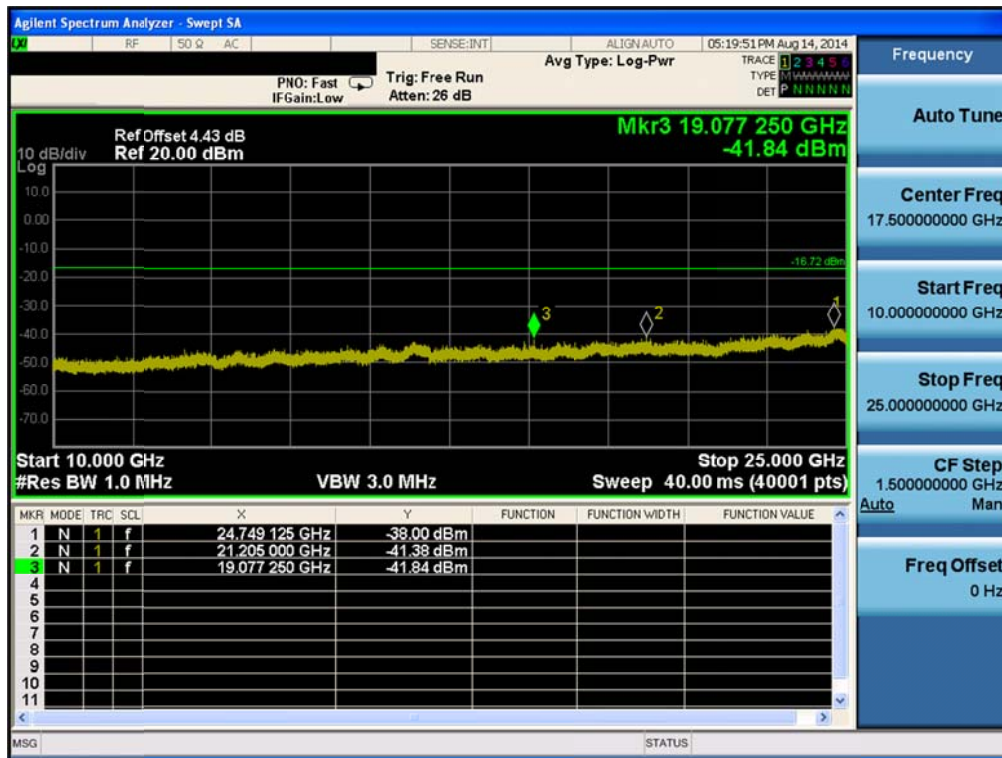
**Low Band-edge**



### Conducted Spurious Emissions



### Conducted Spurious Emissions



Frequency

Auto Tune

Center Freq  
17.500000000 GHz

Start Freq  
10.000000000 GHz

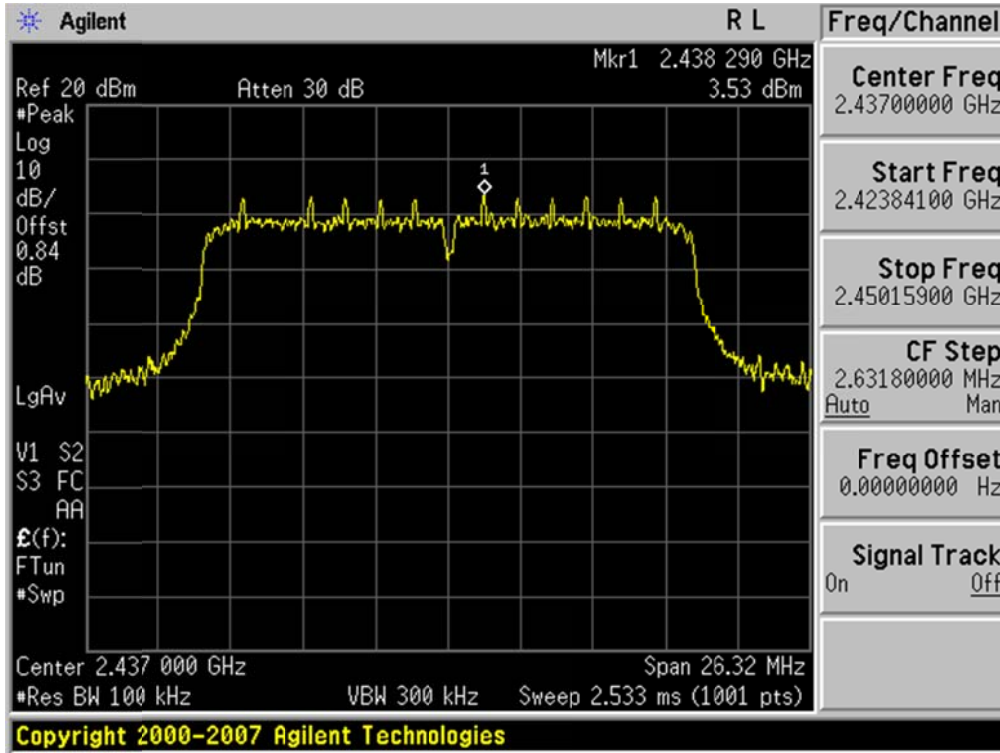
Stop Freq  
25.000000000 GHz

CF Step  
1.500000000 GHz  
Auto Man

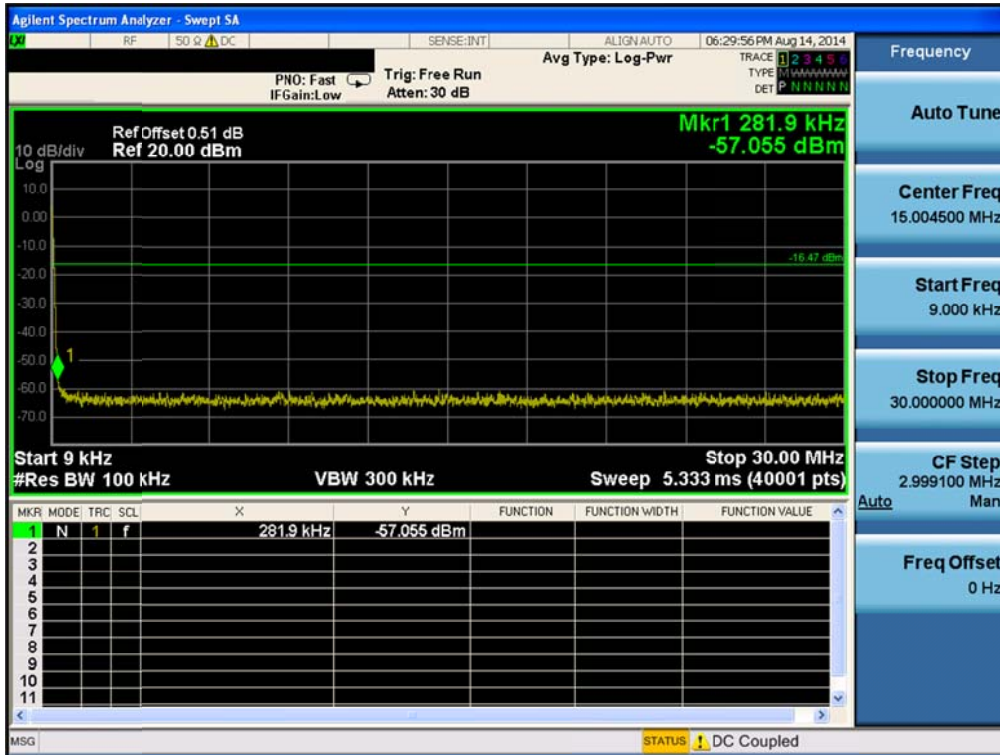
Freq Offset  
0 Hz

TM 3 & ANT 1 & Middle

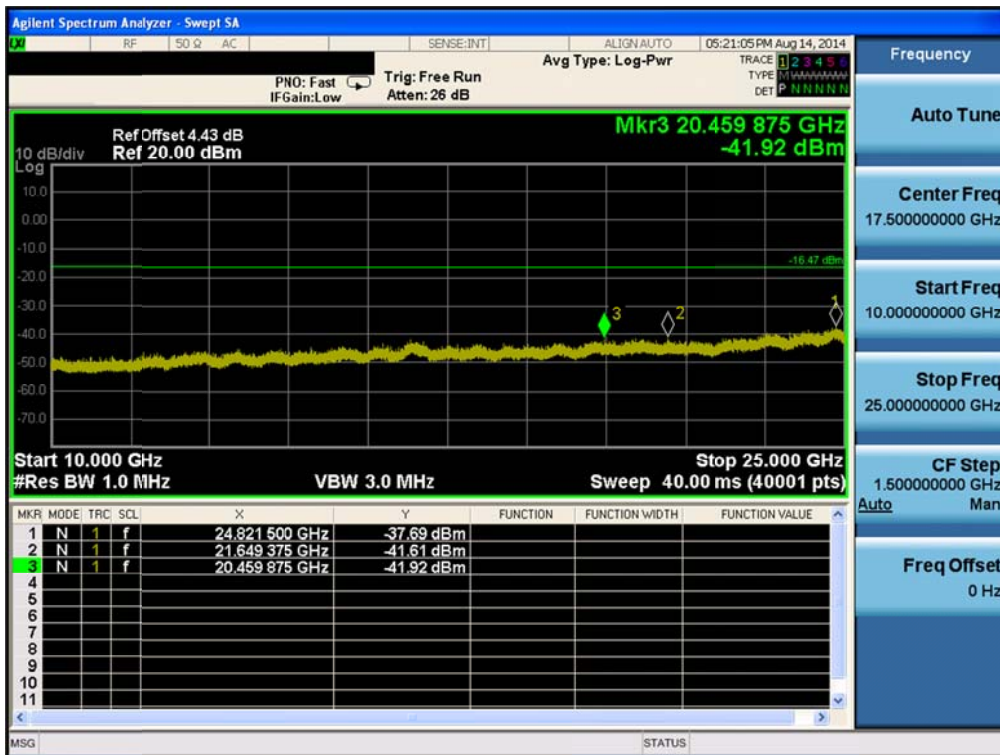
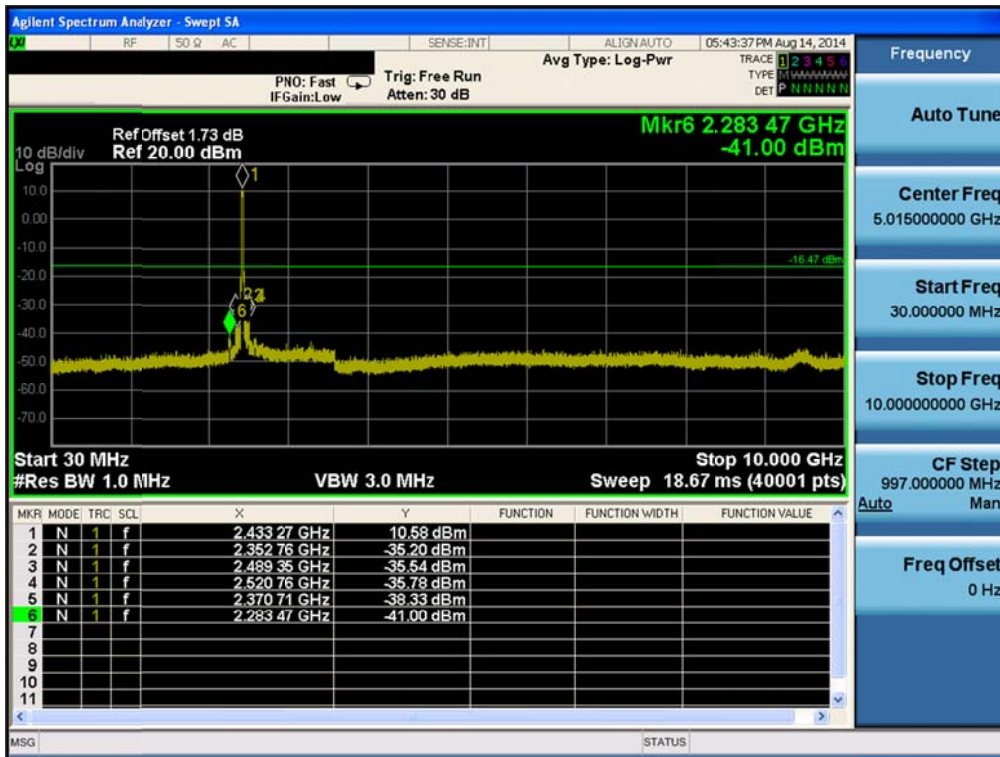
Reference



Conducted Spurious Emissions

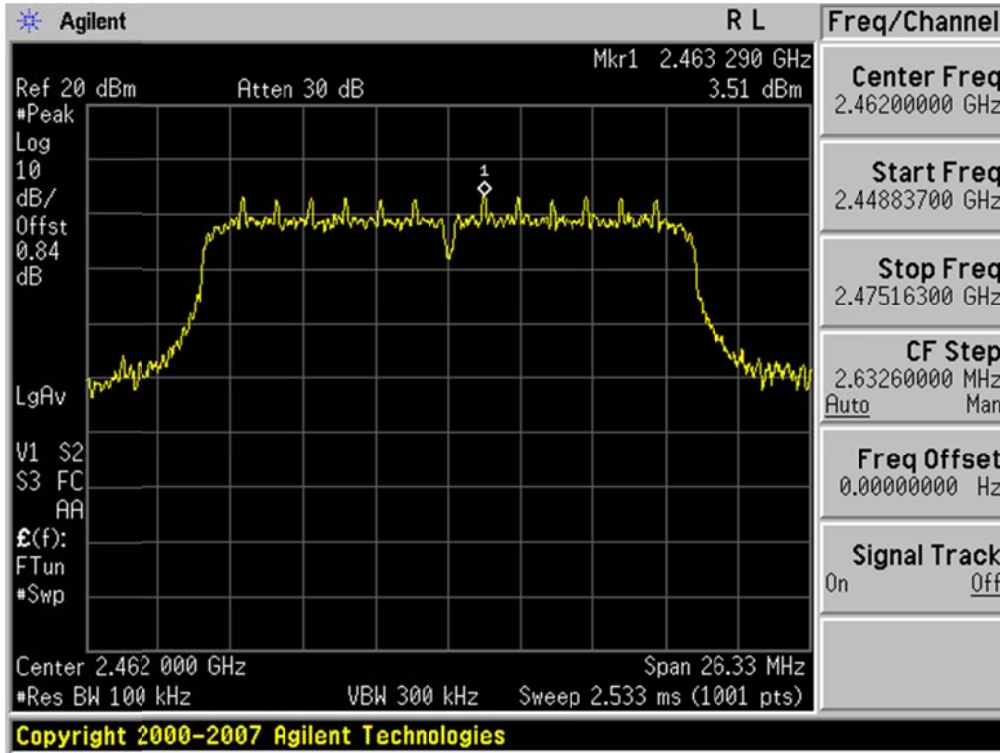


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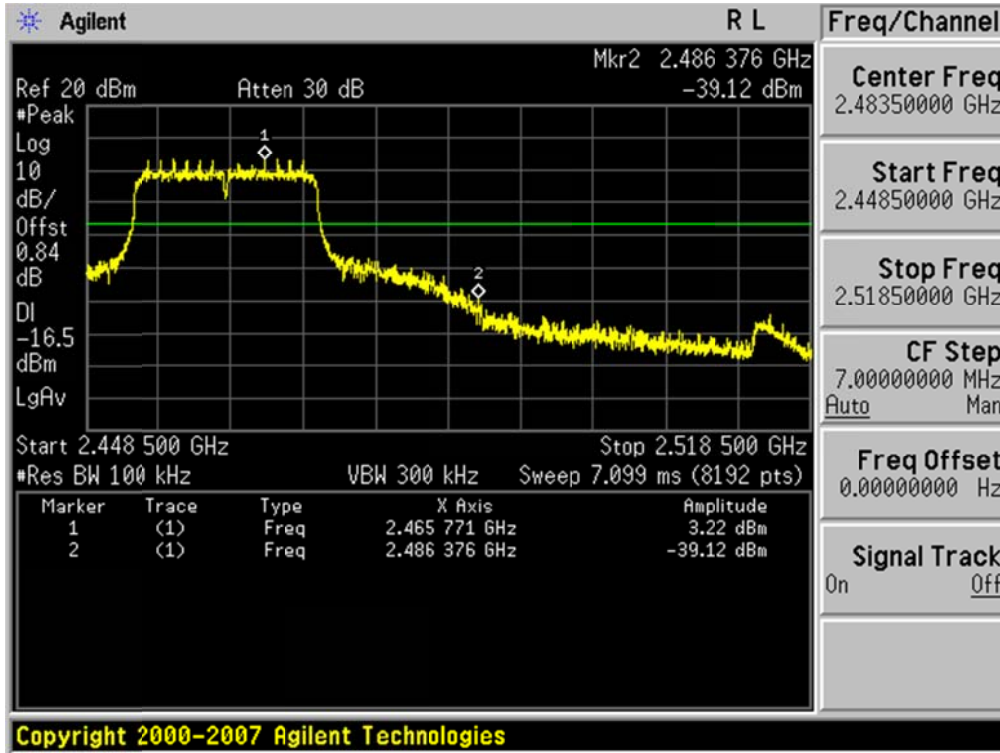


**TM 3 & ANT 1 & Highest**

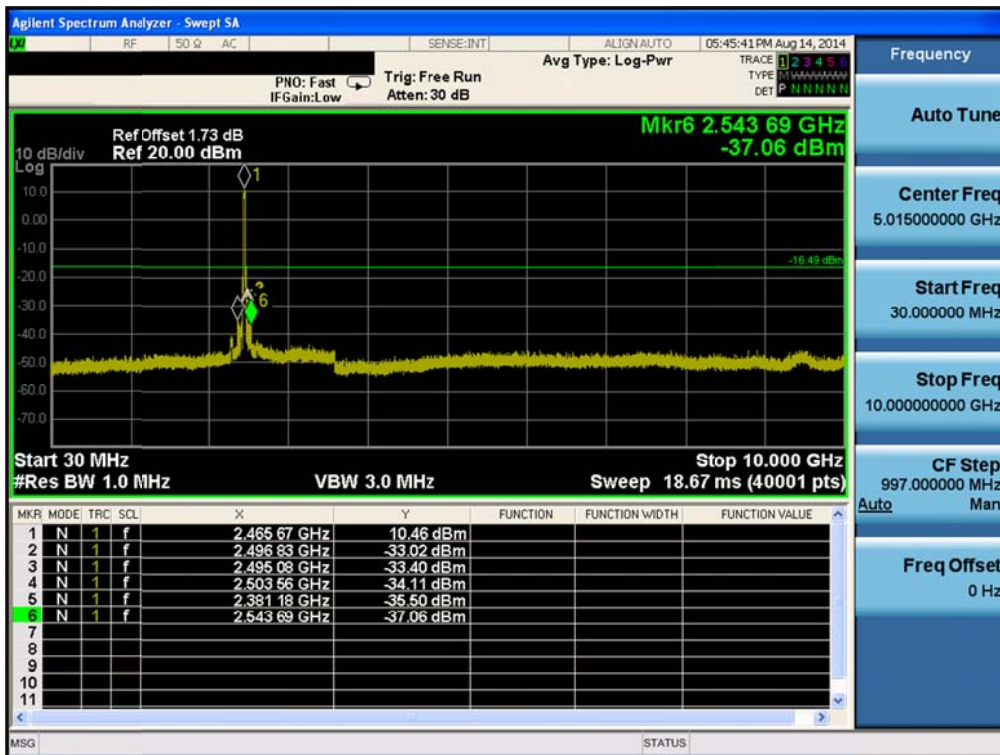
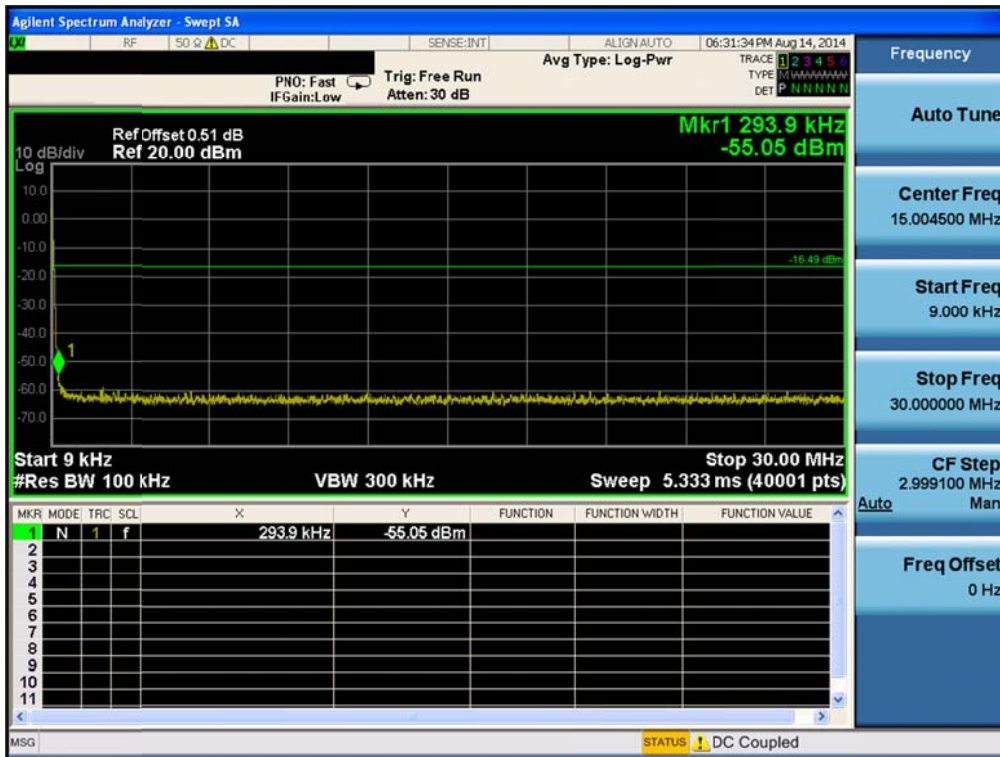
**Reference**



**High Band-edge**

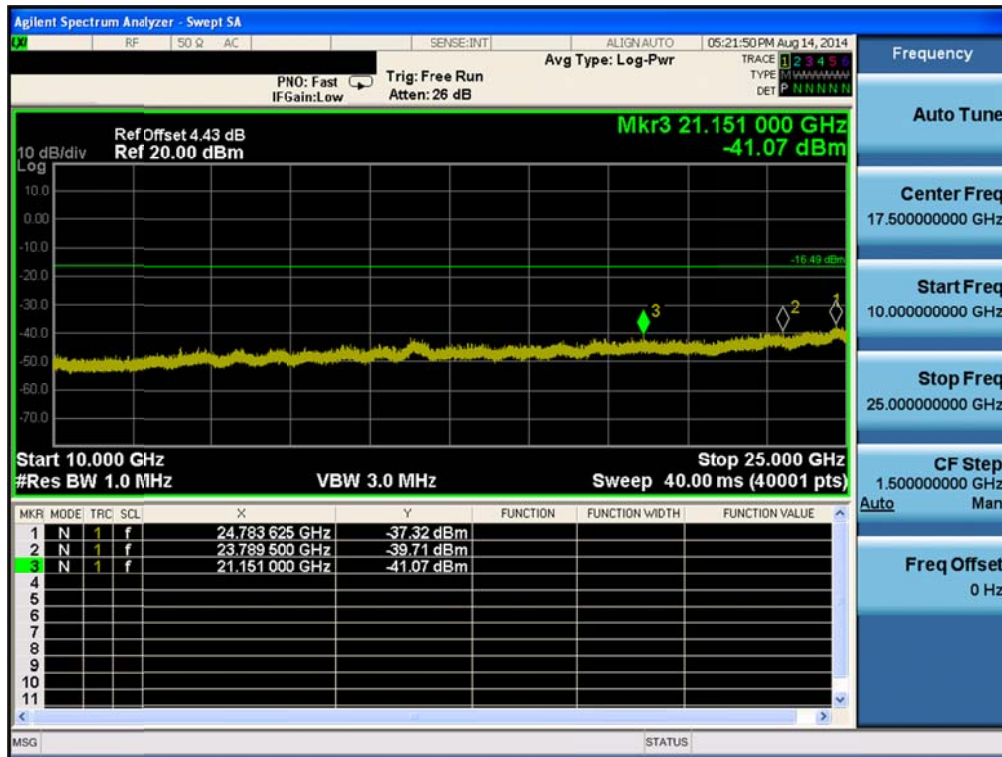


### Conducted Spurious Emissions



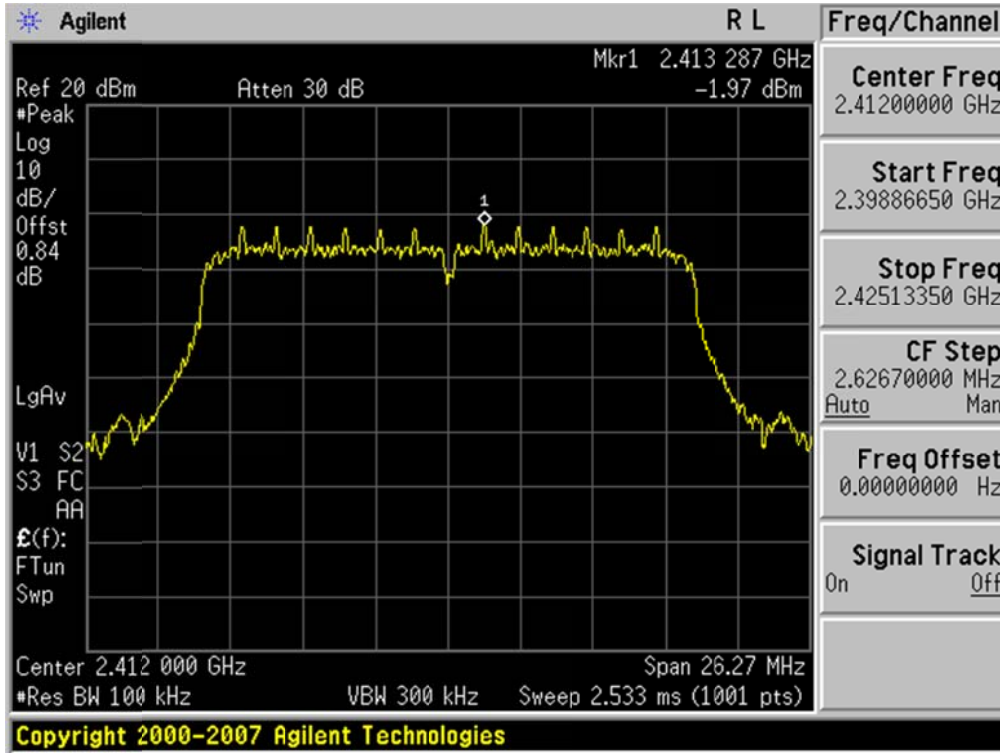


### Conducted Spurious Emissions

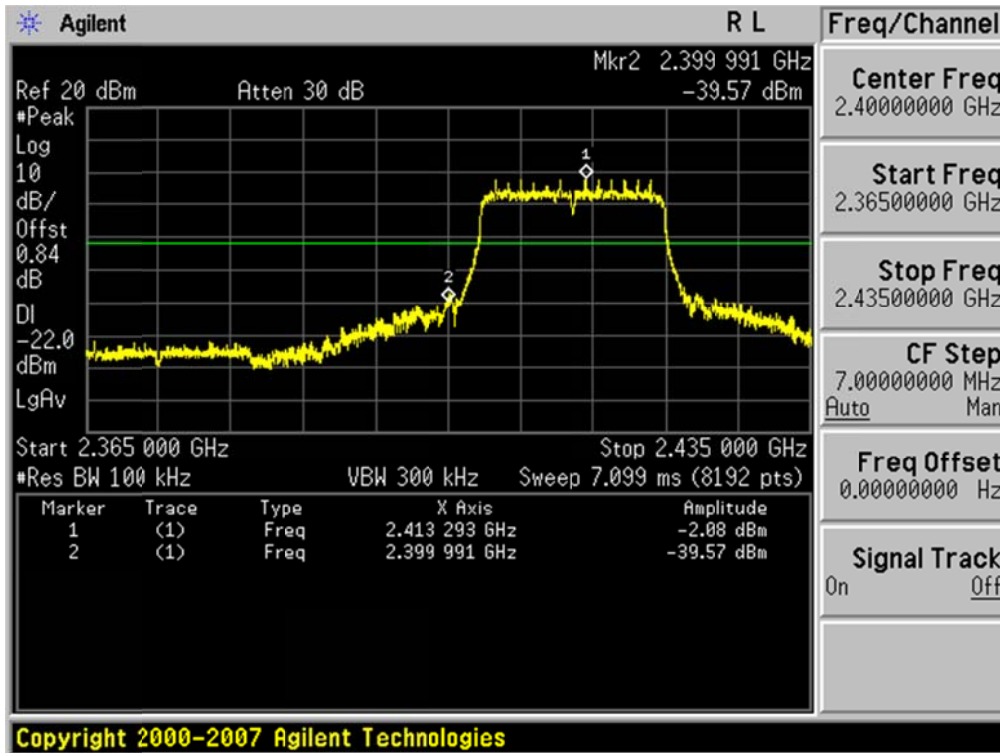


**TM 3 & ANT 2 & Lowest**

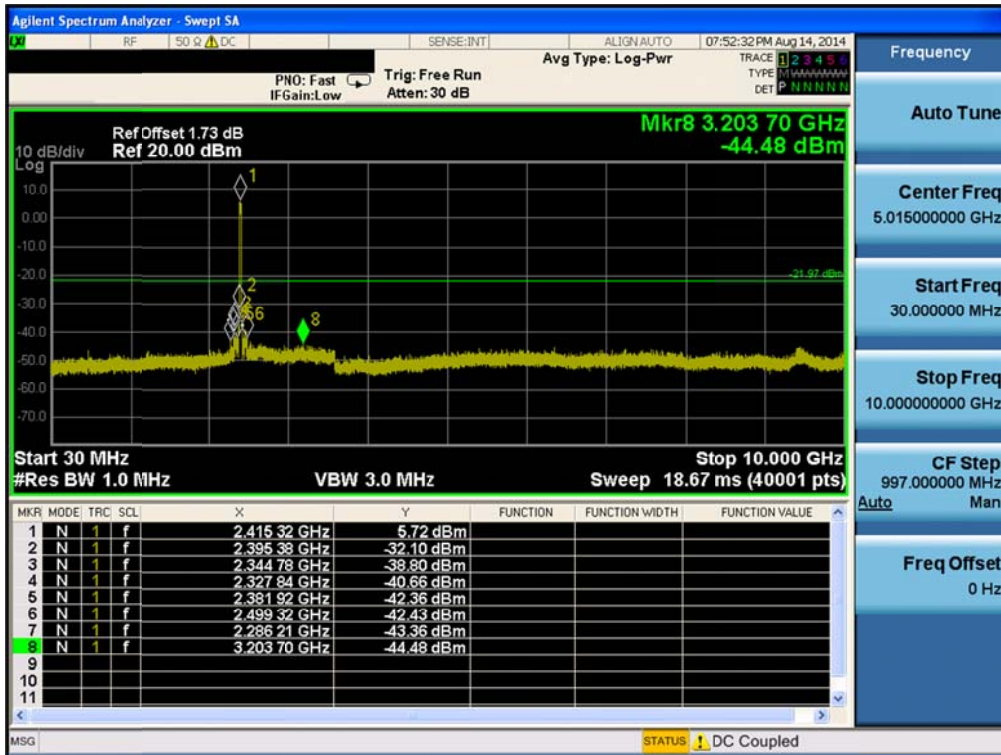
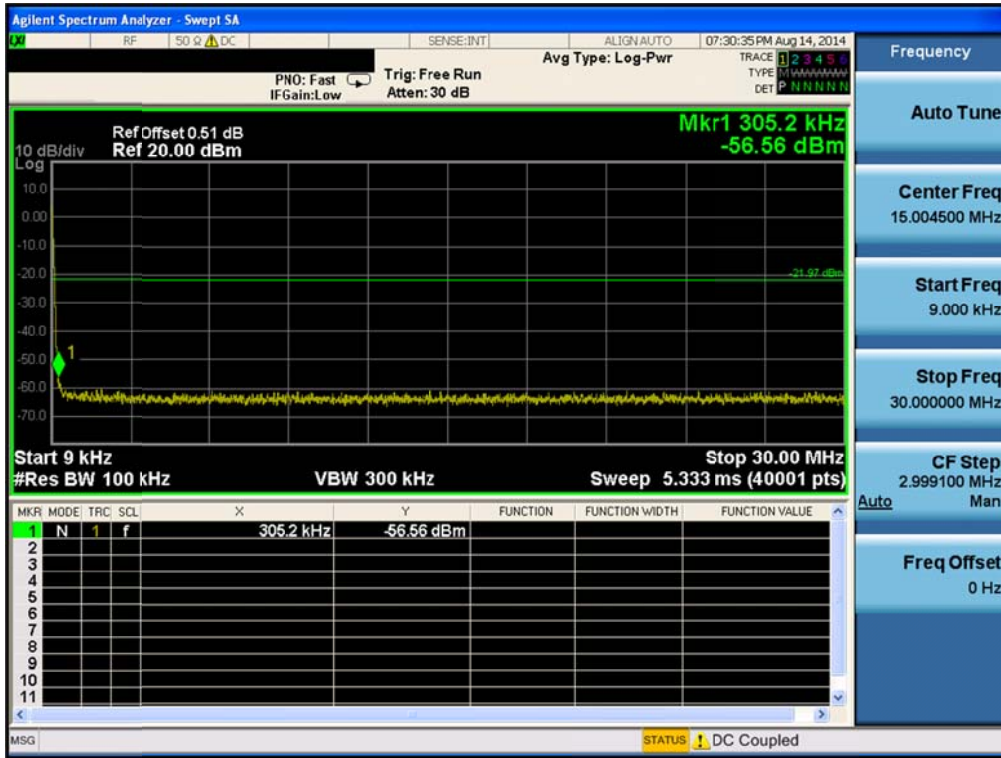
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**Low Band-edge**



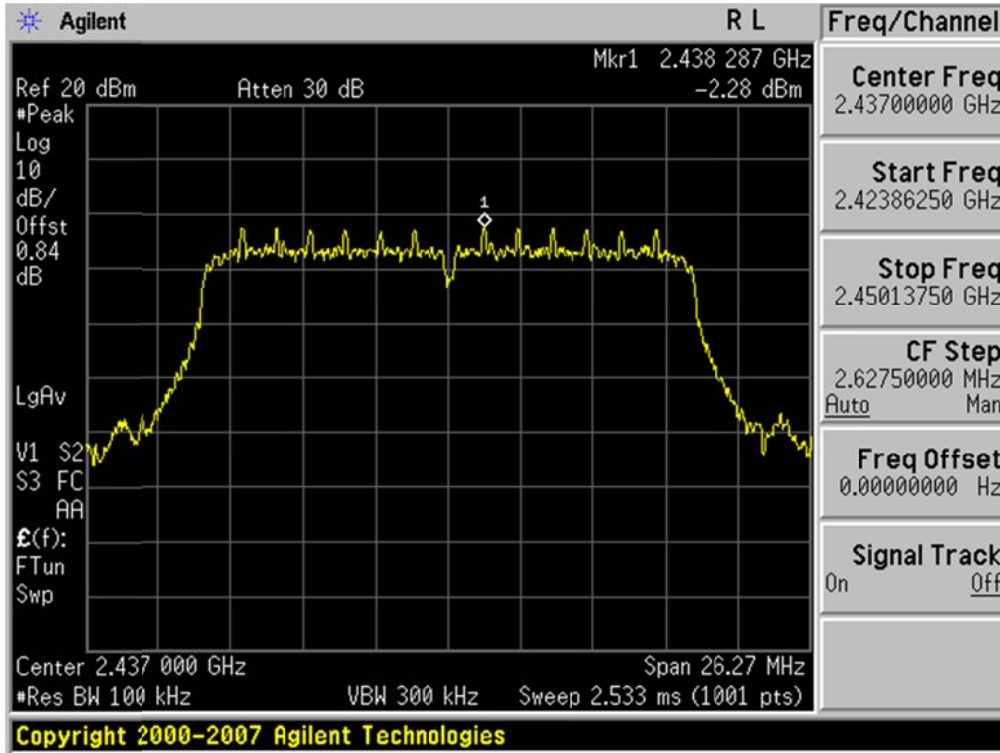
### Conducted Spurious Emissions



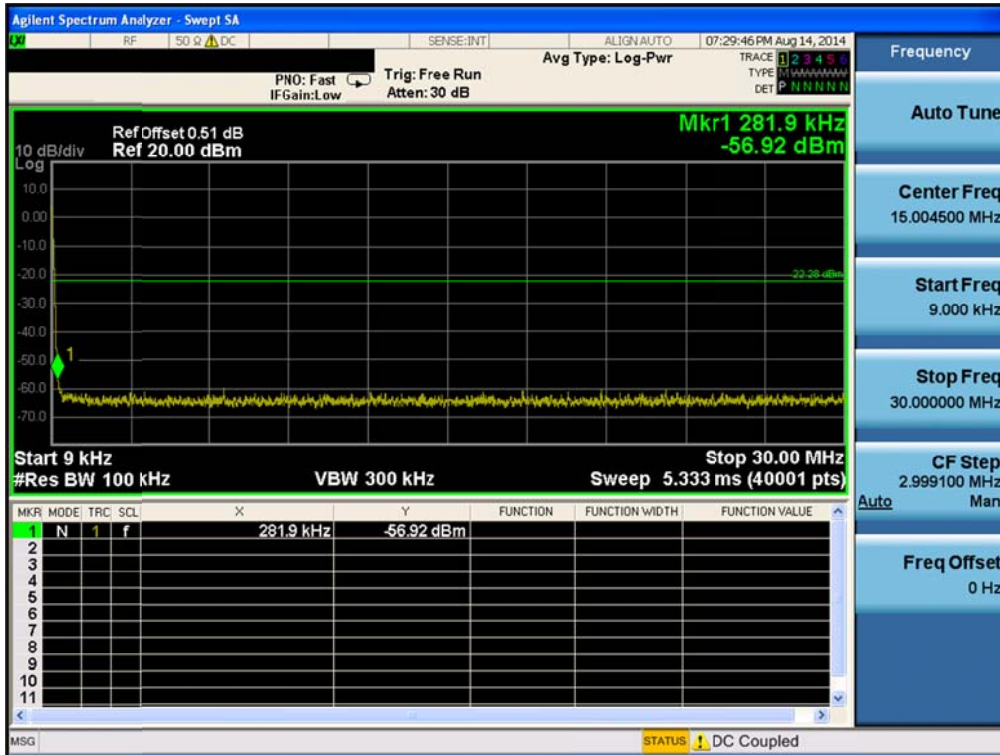


TM 3 & ANT 2 & Middle

Reference



Conducted Spurious Emissions



### Conducted Spurious Emissions

