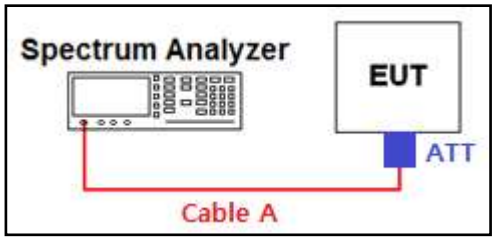
8.3 Maximum power spectral density

Test requirements and limit, §15.247(e) & RSS-210 [A8.2]

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Minimum Standard –specifies a conducted power spectral density (PSD) limit of 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE:

The Measurement Procedure **Method PKPSD of KDB558074 v03r1** is used.

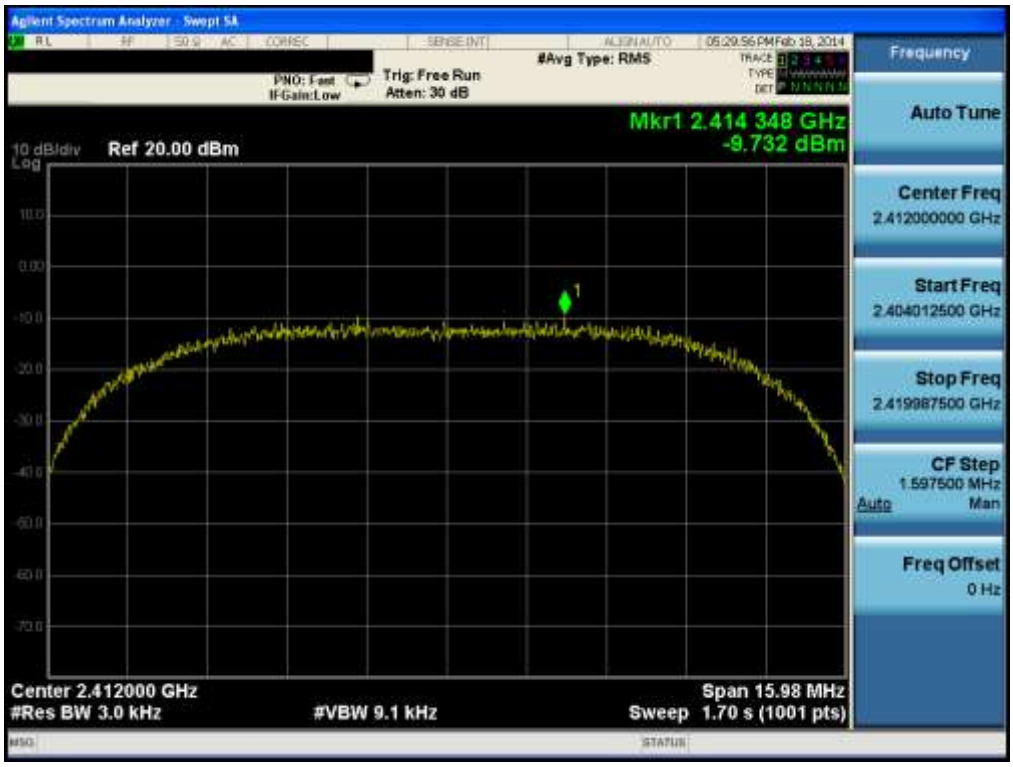
1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to **1.5 times** the DTS bandwidth.
3. Set the RBW to: **3 kHz** ≤ RBW ≤ **100 kHz**
4. Set the VBW **≥ 3 x RBW**
5. Detector = **peak**
6. Sweep time = **auto couple**
7. Trace mode = **max hold.**
8. Allow trace to fully stabilize.
9. Use the **peak marker function** to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

▣ **TEST RESULTS: Comply**

Test Mode	Frequency	RBW	PKPSD [dBm]		
			ANT 1	ANT 2	SUM (ANT 1 + ANT 2)
TM 1	Lowest	3 kHz	-9.732	-10.067	N/A
	Middle	3 kHz	-9.911	-9.453	N/A
	Highest	3 kHz	-9.601	-9.814	N/A
TM 2	Lowest	3 kHz	-15.872	-16.236	N/A
	Middle	3 kHz	-15.925	-16.436	N/A
	Highest	3 kHz	-16.135	-16.088	N/A
TM 3	Lowest	3 kHz	-15.658	-16.257	-12.937
	Middle	3 kHz	-15.583	-16.025	-12.789
	Highest	3 kHz	-15.659	-14.976	-12.294
TM 4	Lowest	3 kHz	-19.204	-17.723	-15.391
	Middle	3 kHz	-18.923	-17.490	-15.138
	Highest	3 kHz	-19.279	-18.392	-15.803
TM 5	Lowest	3 kHz	-15.301	-15.500	N/A
	Middle	3 kHz	-14.946	-14.832	N/A
	Highest	3 kHz	-14.696	-14.305	N/A
TM 6	Lowest	3 kHz	-15.929	-15.151	-12.513
	Middle	3 kHz	-15.581	-14.374	-11.926
	Highest	3 kHz	-14.661	-14.272	-11.452
TM 7	Lowest	3 kHz	-18.122	-18.552	-15.322
	Highest	3 kHz	-18.251	-18.349	-15.290
TM 10	Middle	3 kHz	-23.376	-22.356	-19.826

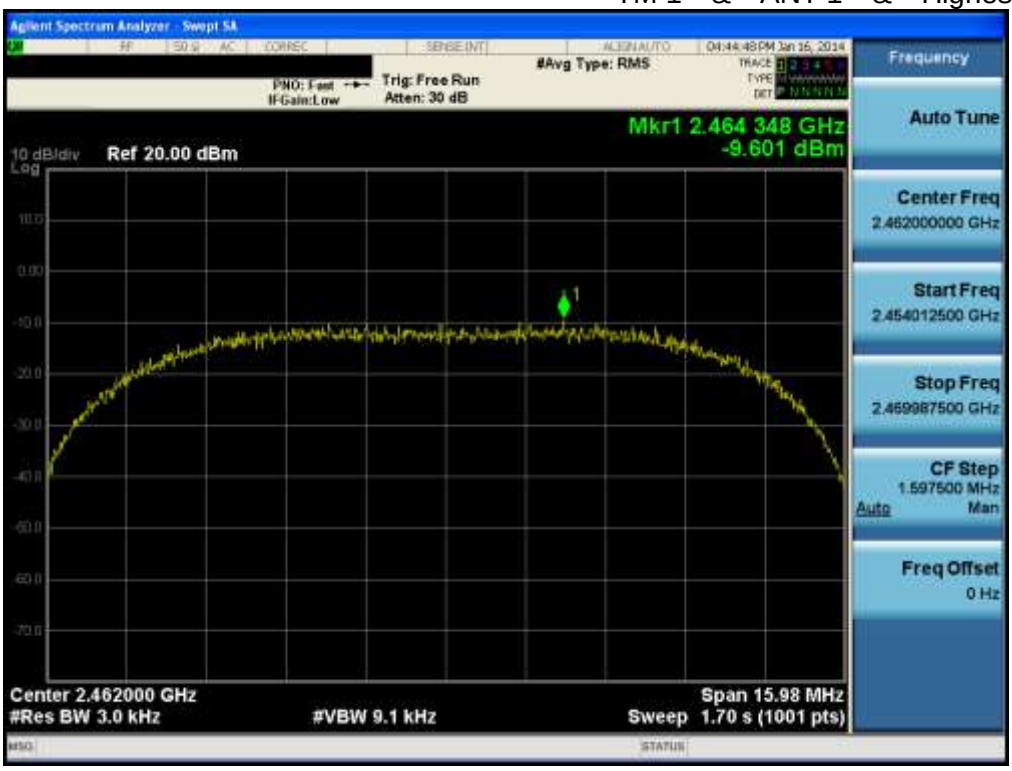
▣RESULT PLOTS

Maximum PPSD TM 1 & ANT 1 & Lowest

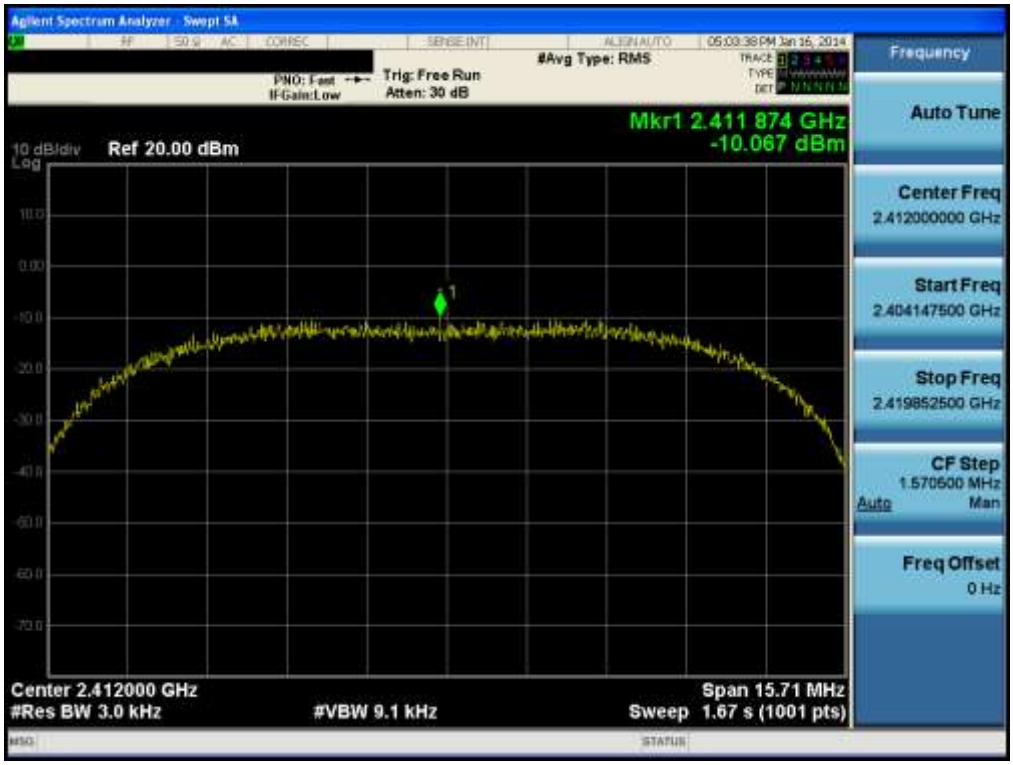


Maximum PPSD TM 1 & ANT 1 & Middle

Maximum PPSD TM 1 & ANT 1 & Highest



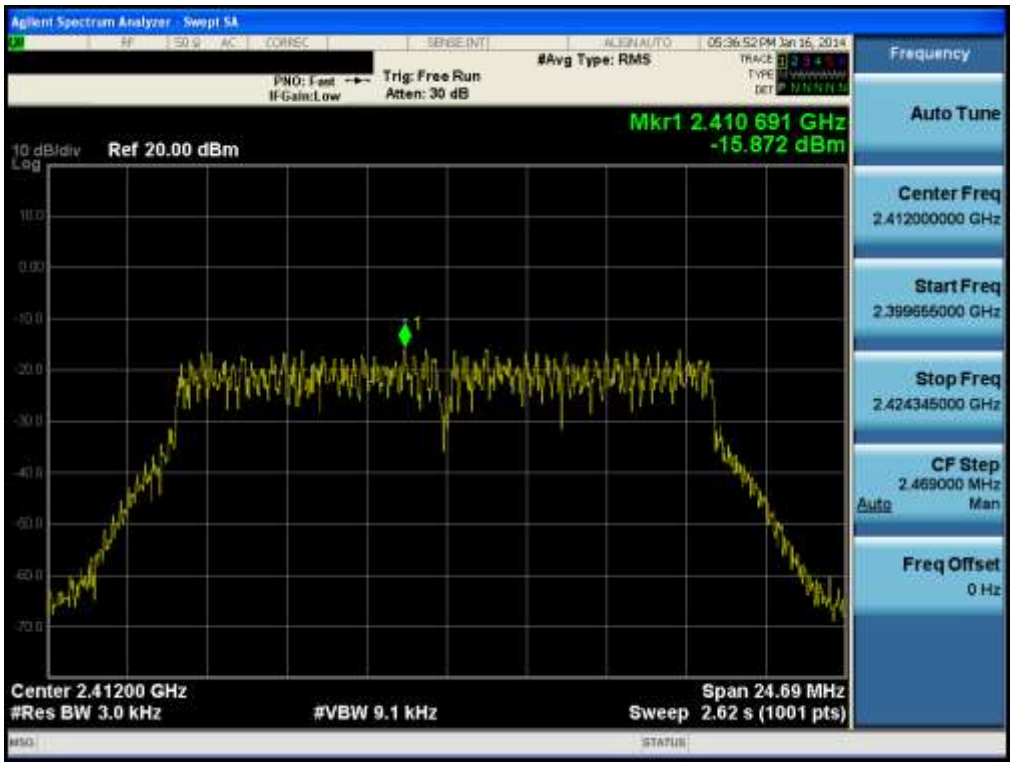
Maximum PPSD TM 1 & ANT 2 & Lowest



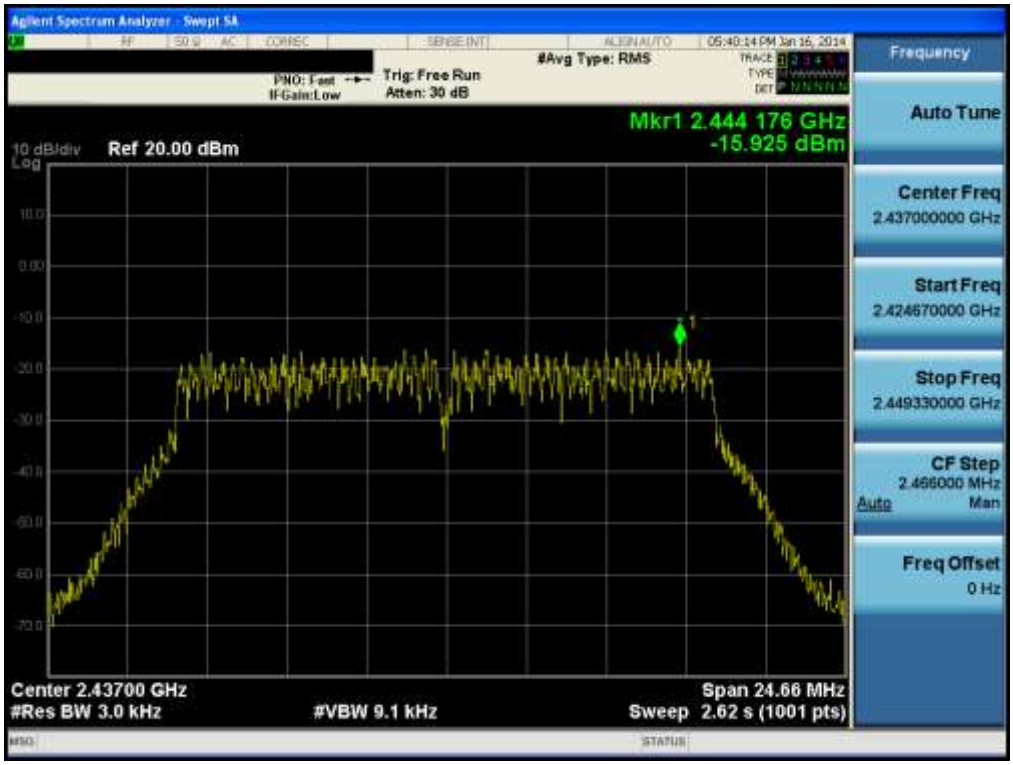
Maximum PPSD TM 1 & ANT 2 & Middle

Maximum PPSD TM 1 & ANT 2 & Highest

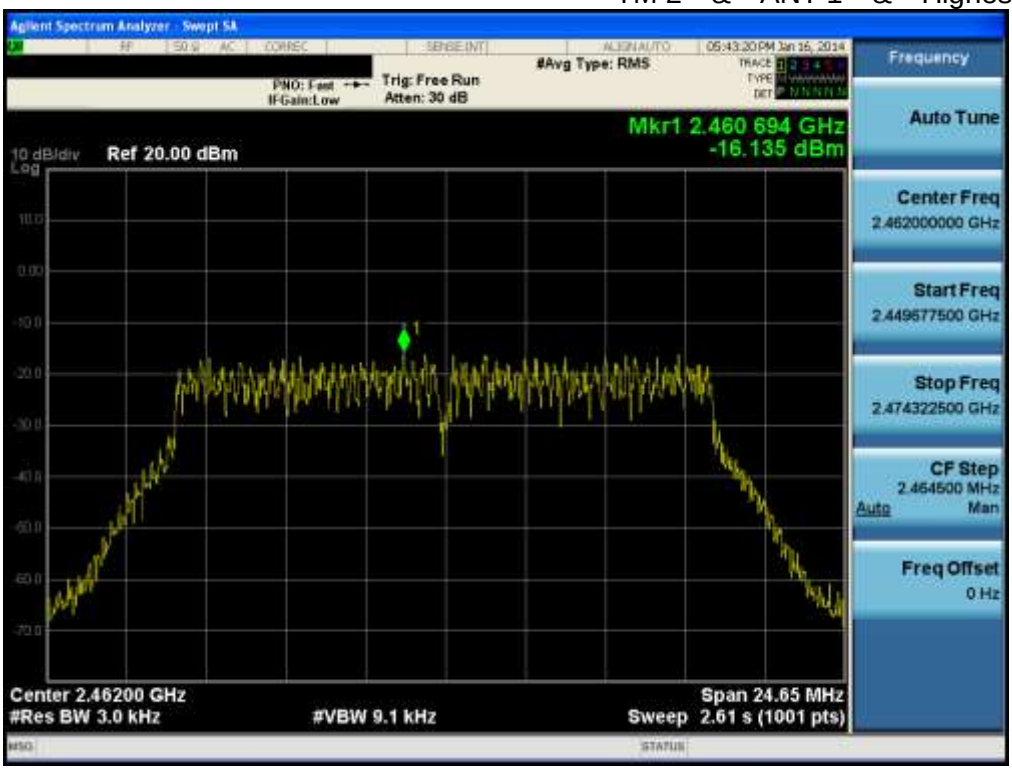
Maximum PPSD TM 2 & ANT 1 & Lowest



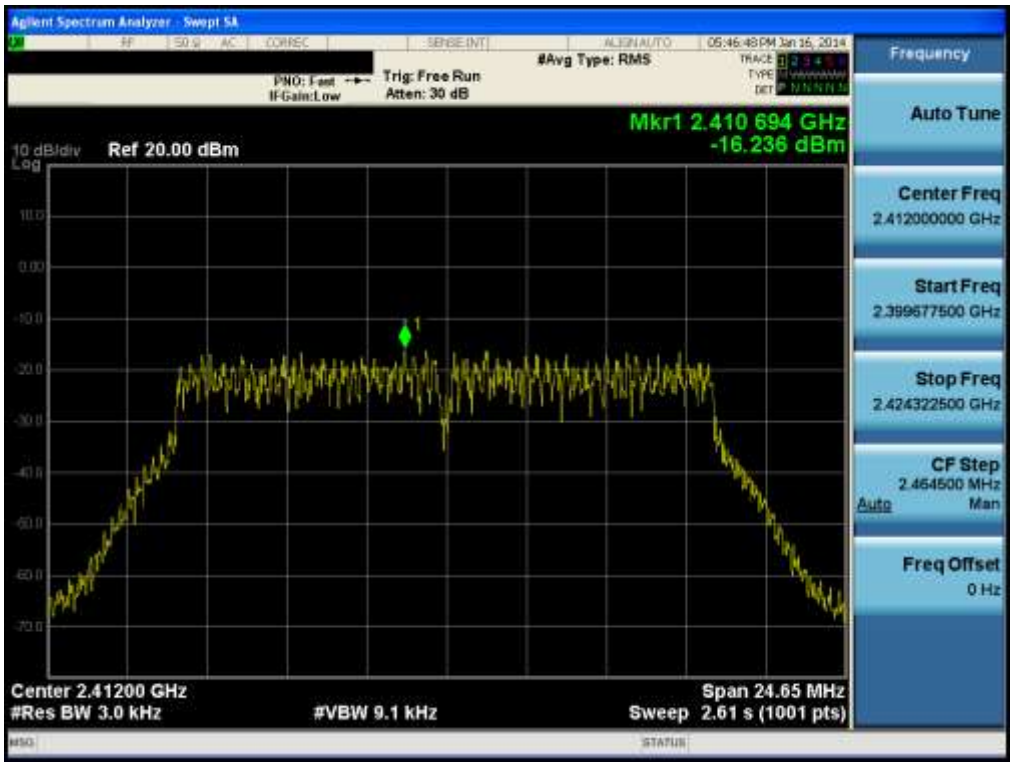
Maximum PPSD TM 2 & ANT 1 & Middle



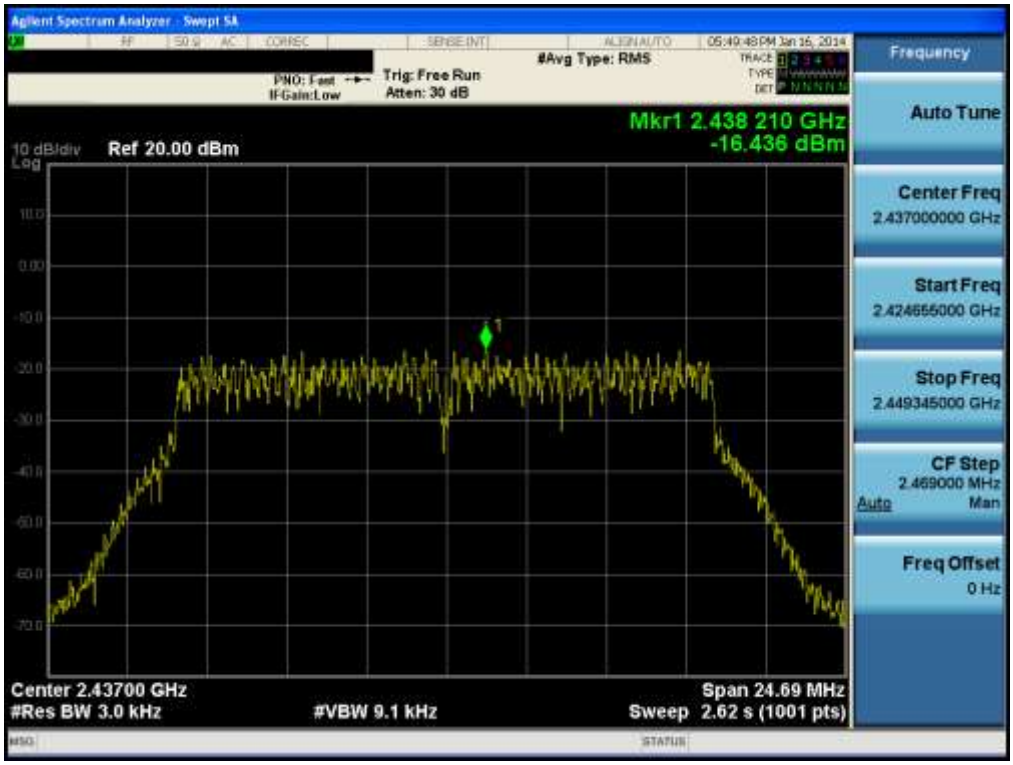
Maximum PPSD TM 2 & ANT 1 & Highest



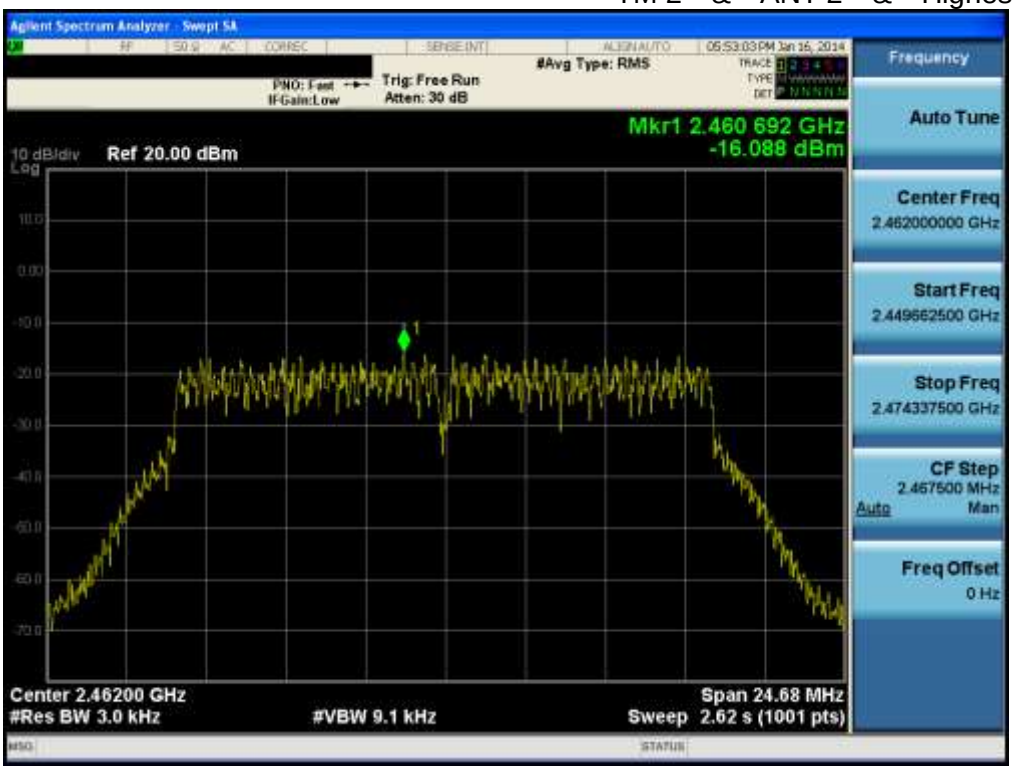
Maximum PPSD TM 2 & ANT 2 & Lowest



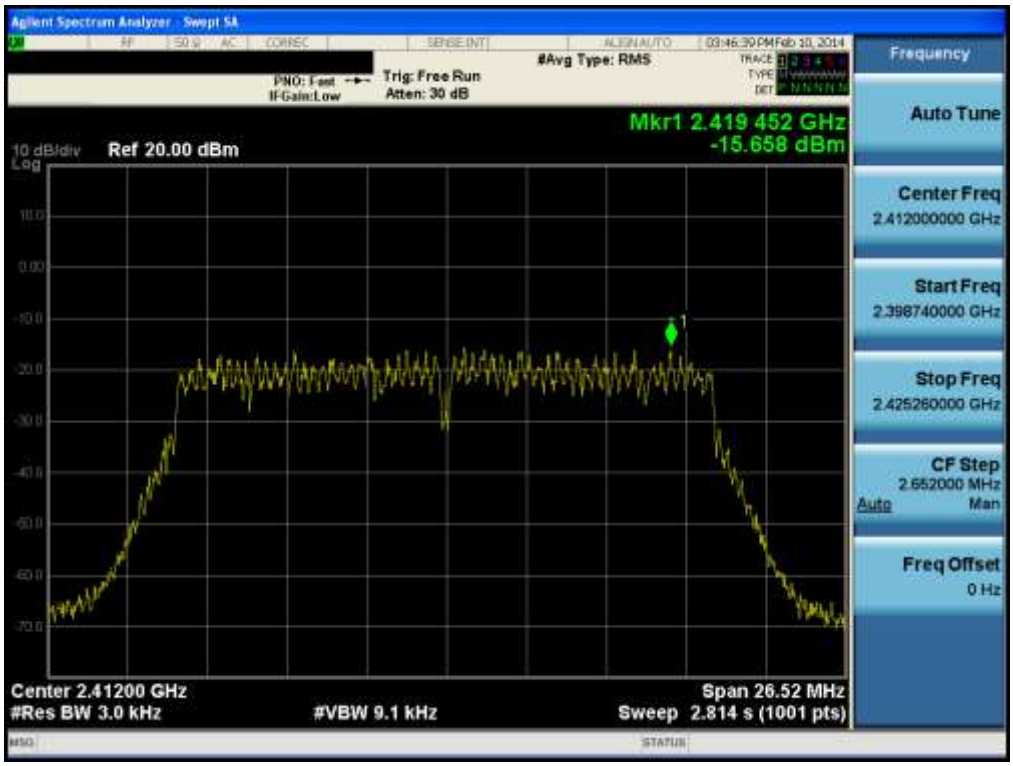
Maximum PPSD TM 2 & ANT 2 & Middle



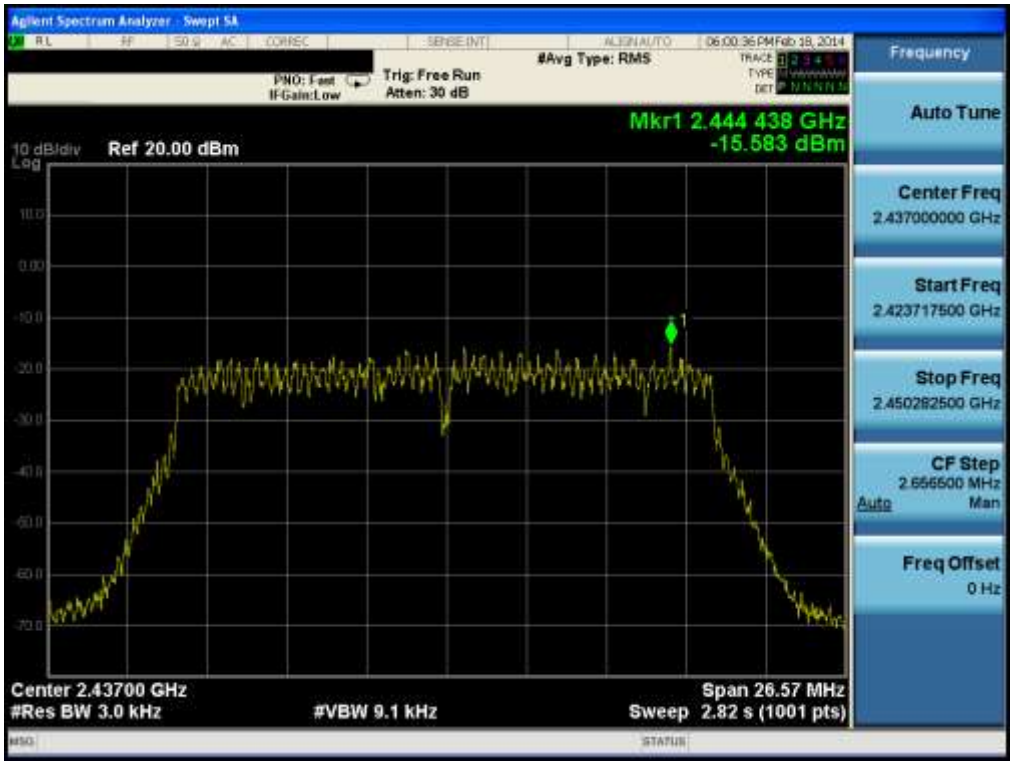
Maximum PPSD TM 2 & ANT 2 & Highest



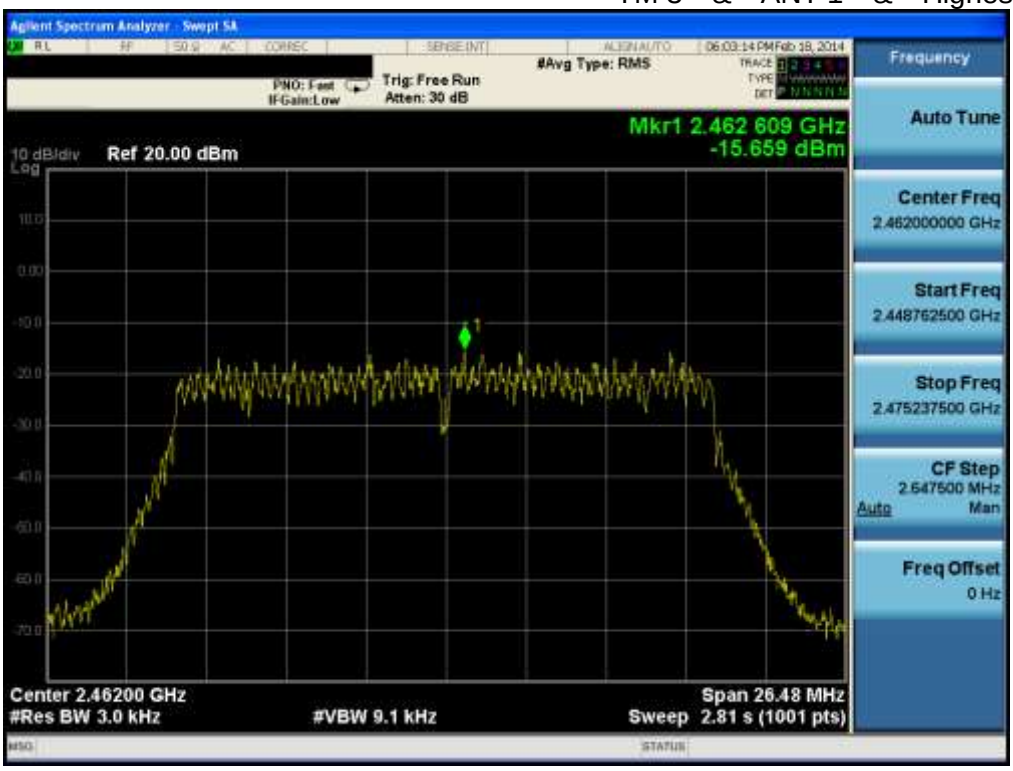
Maximum PPSD TM 3 & ANT 1 & Lowest



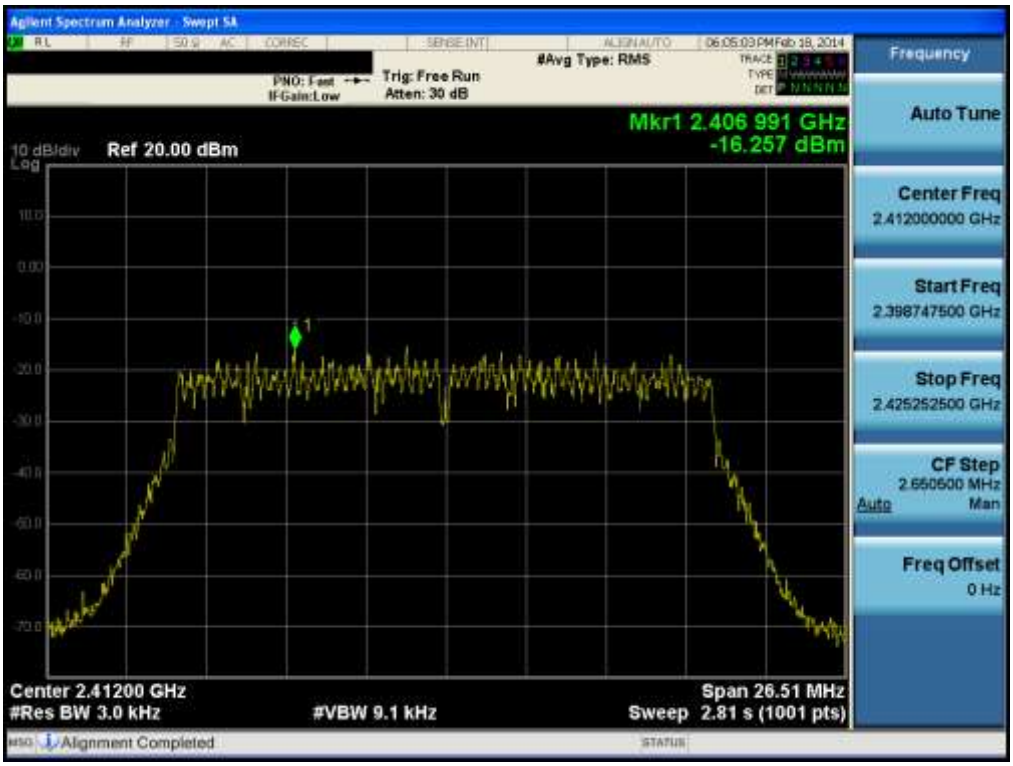
Maximum PPSD TM 3 & ANT 1 & Middle



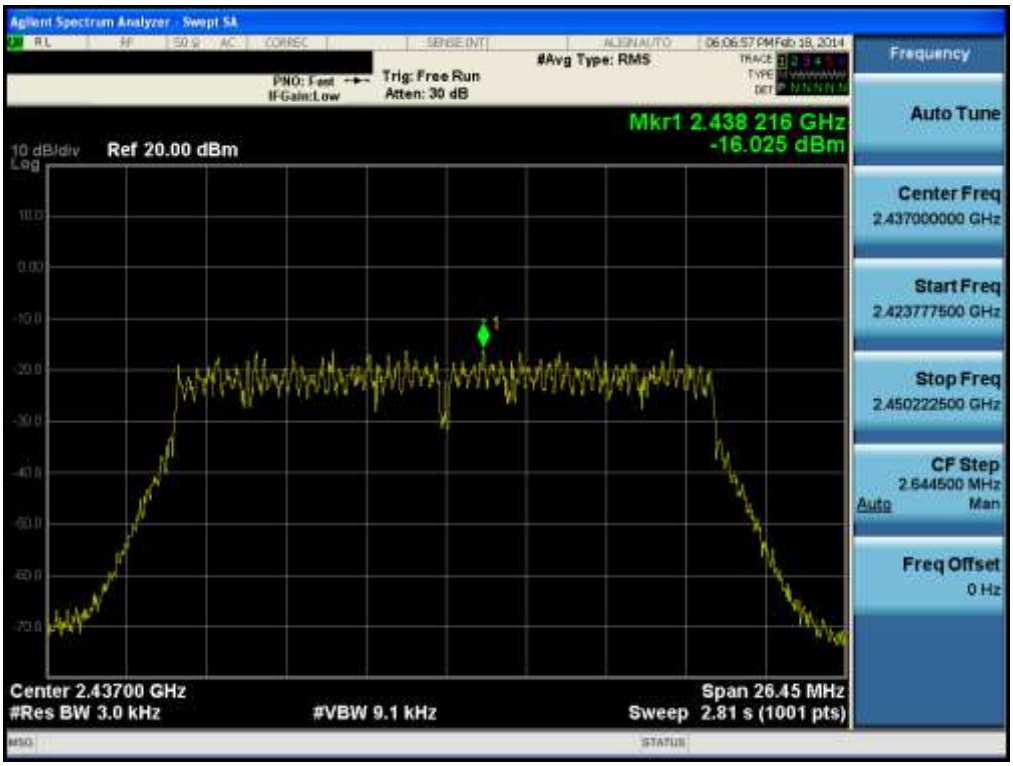
Maximum PPSD TM 3 & ANT 1 & Highest



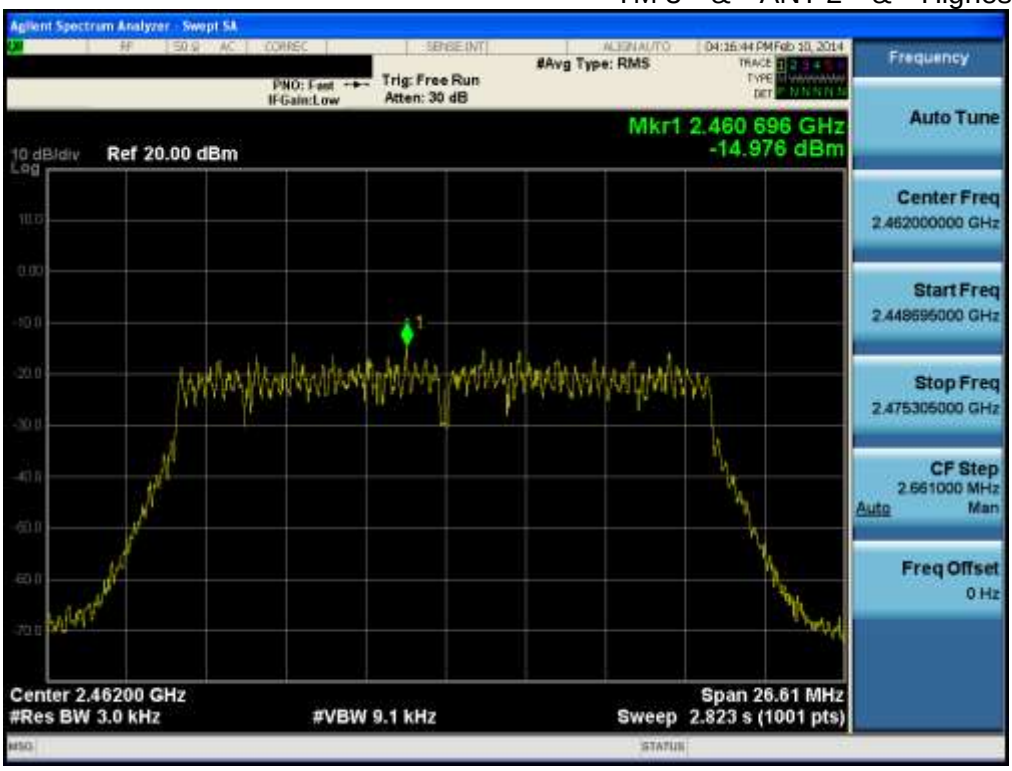
Maximum PPSD TM 3 & ANT 2 & Lowest



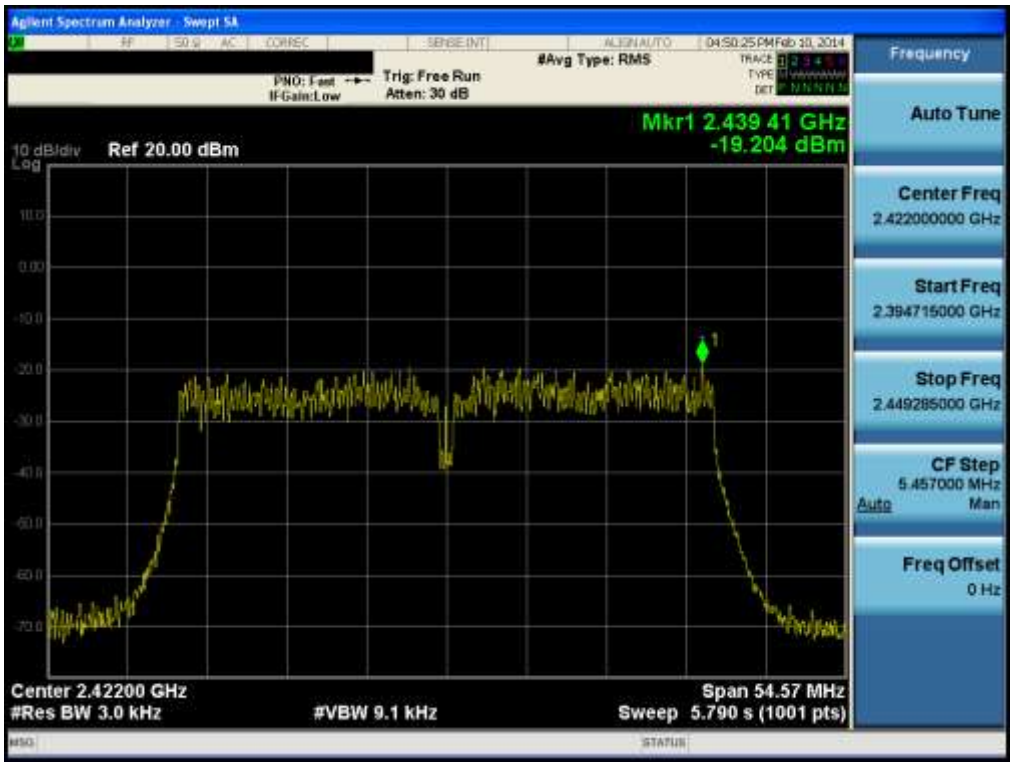
Maximum PPSD TM 3 & ANT 2 & Middle



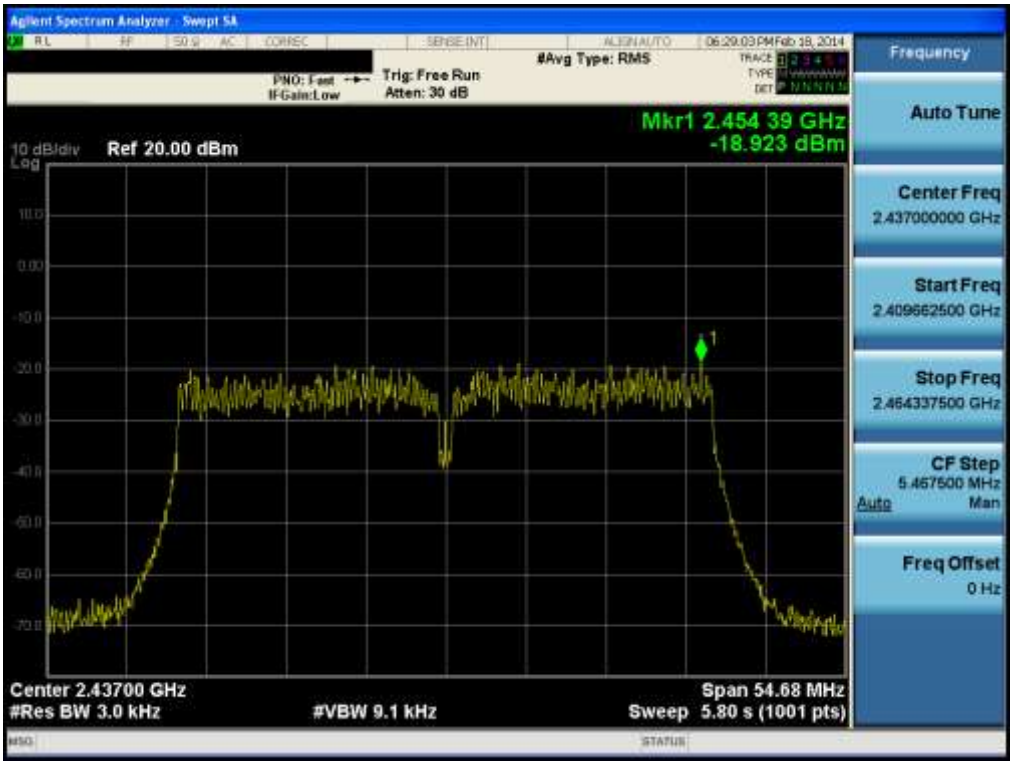
Maximum PPSD TM 3 & ANT 2 & Highest



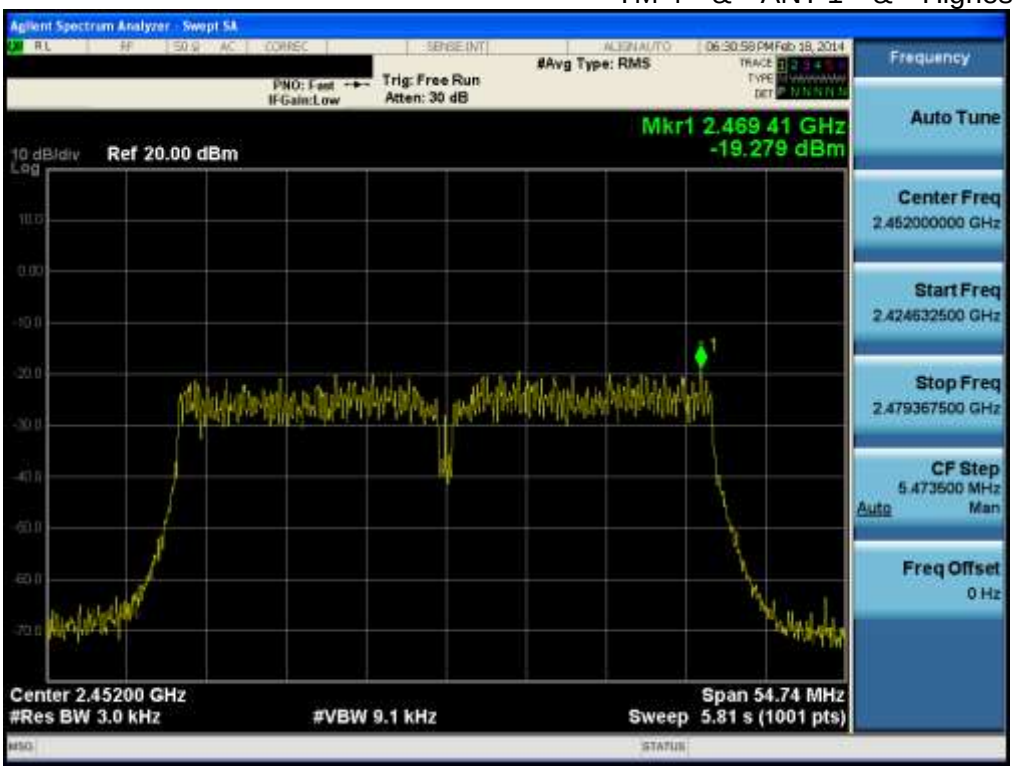
Maximum PPSD TM 4 & ANT 1 & Lowest



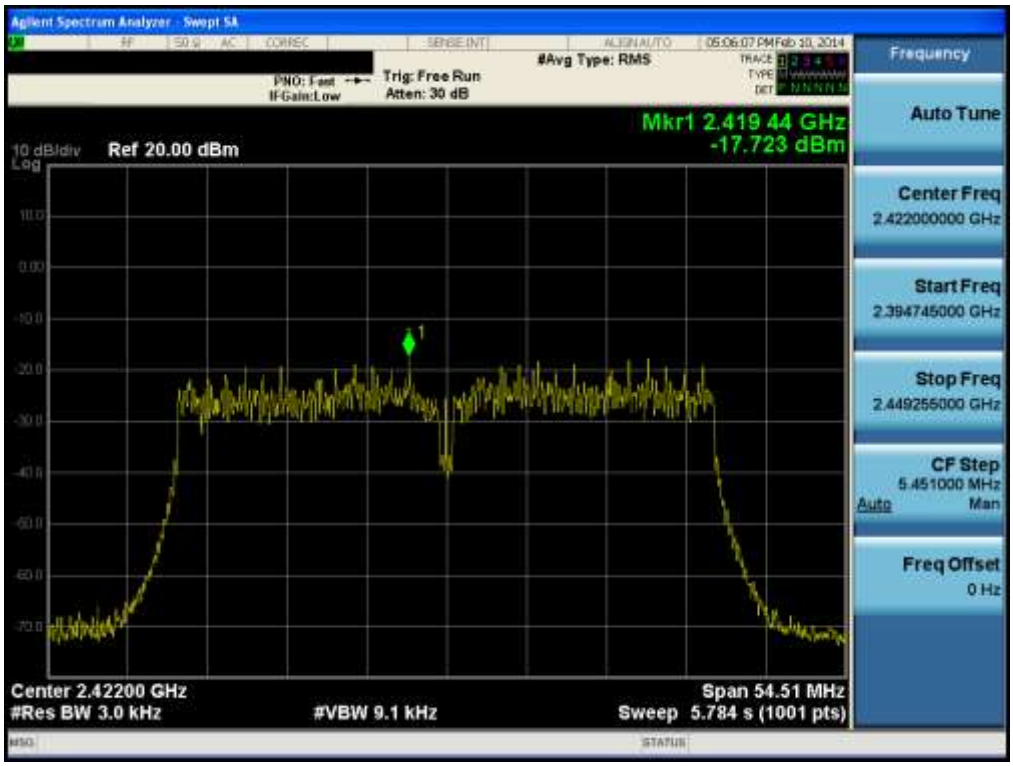
Maximum PPSD TM 4 & ANT 1 & Middle



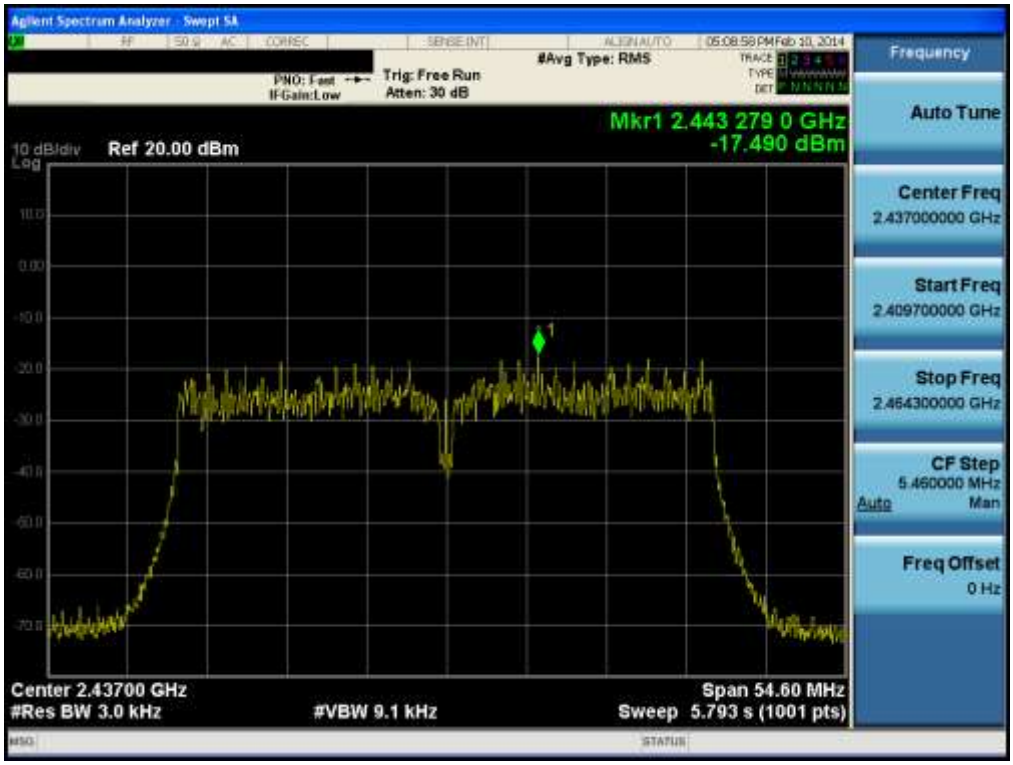
Maximum PPSD TM 4 & ANT 1 & Highest



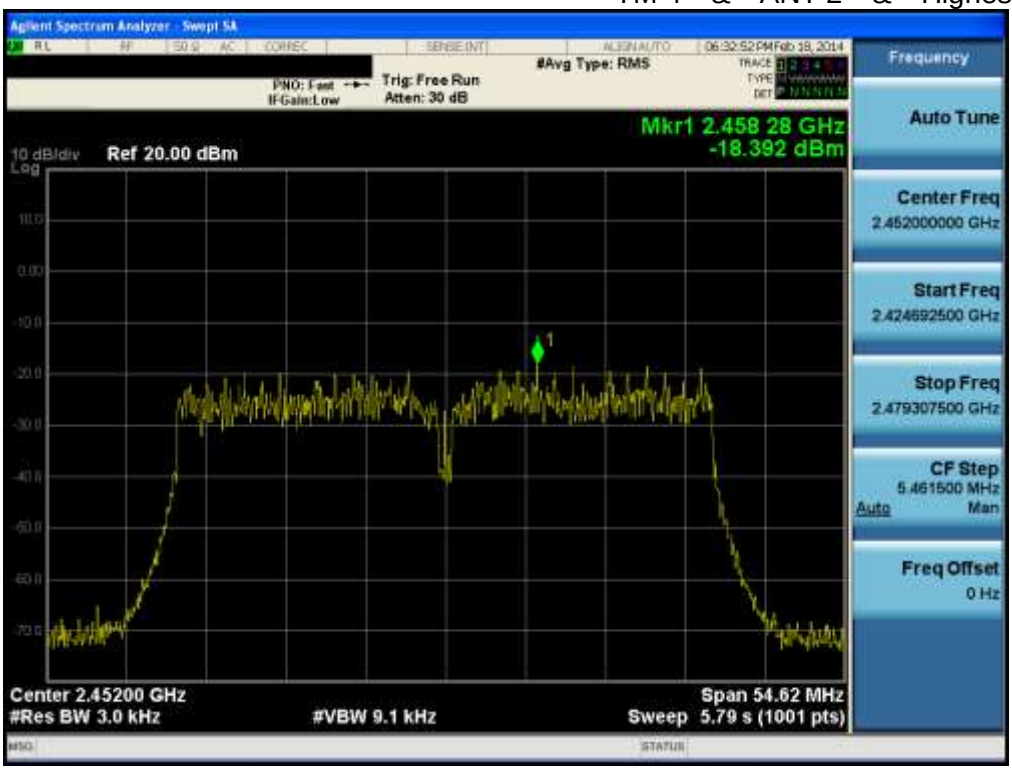
Maximum PPSD TM 4 & ANT 2 & Lowest



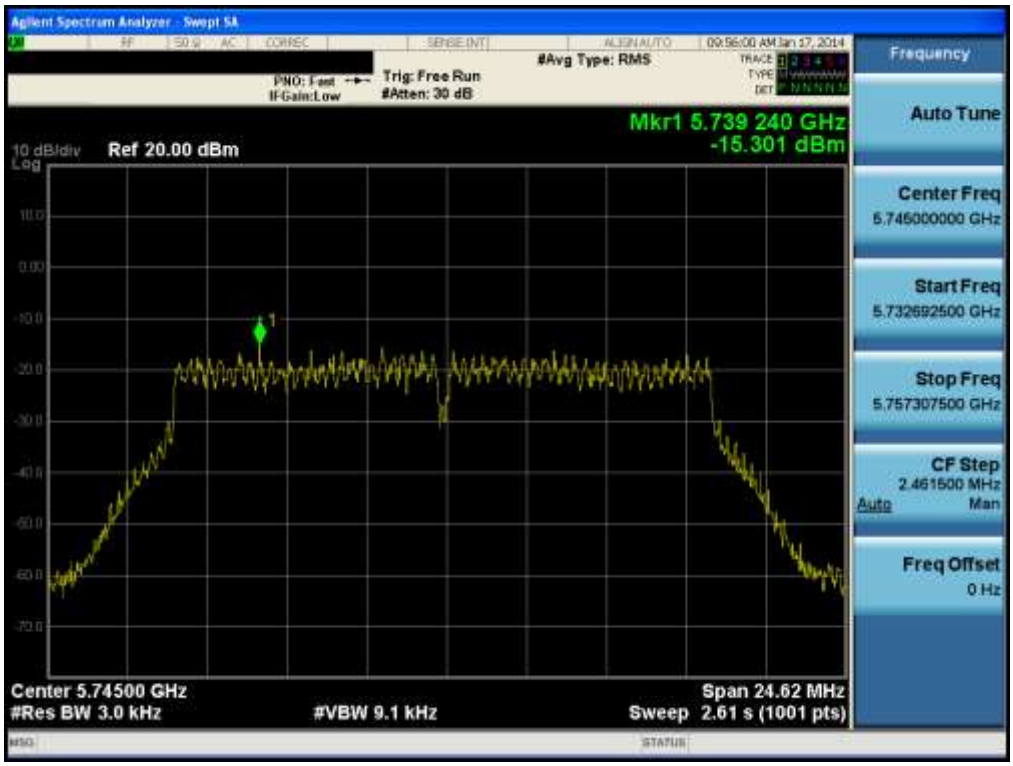
Maximum PPSD TM 4 & ANT 2 & Middle



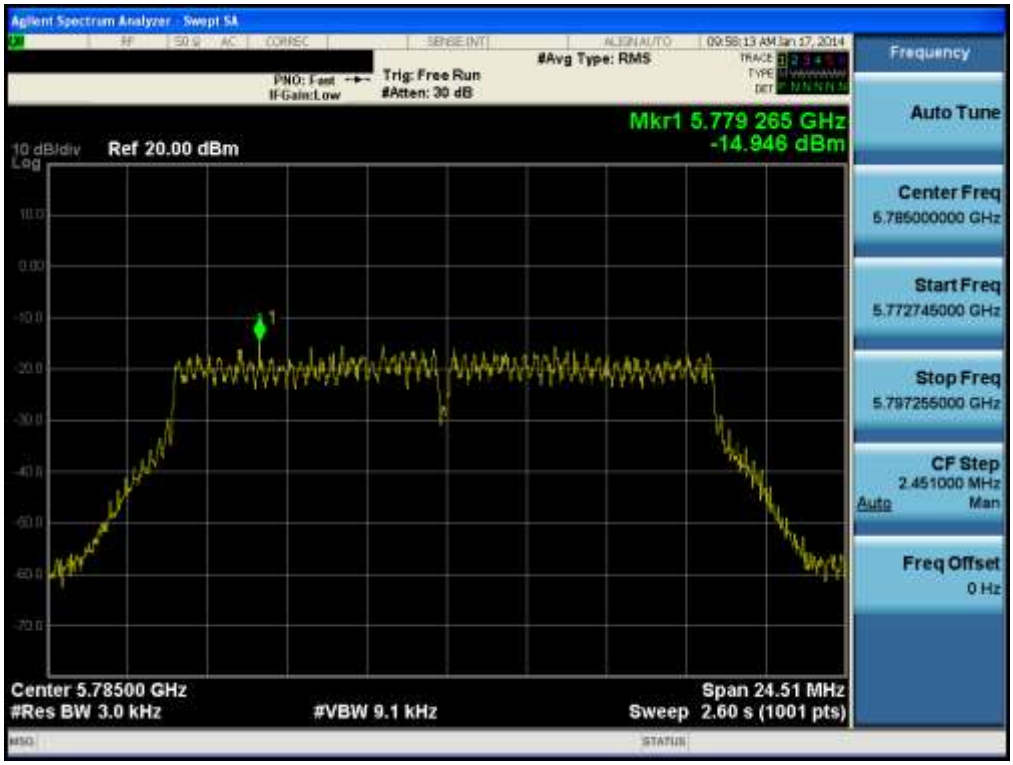
Maximum PPSD TM 4 & ANT 2 & Highest



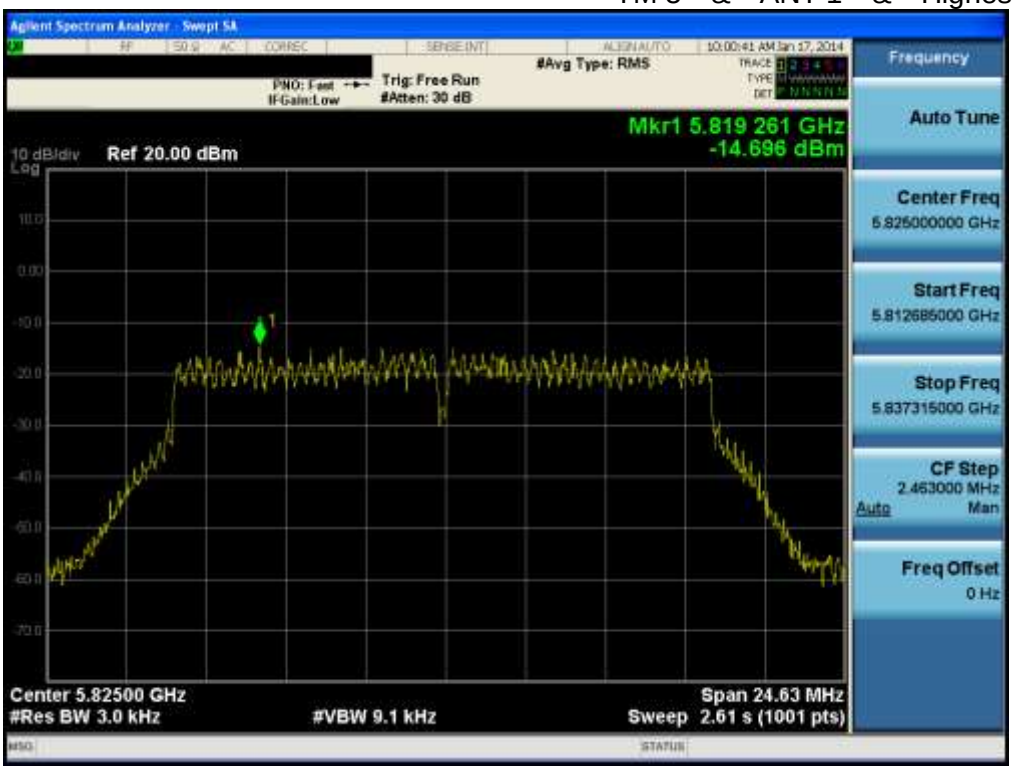
Maximum PPSD TM 5 & ANT 1 & Lowest



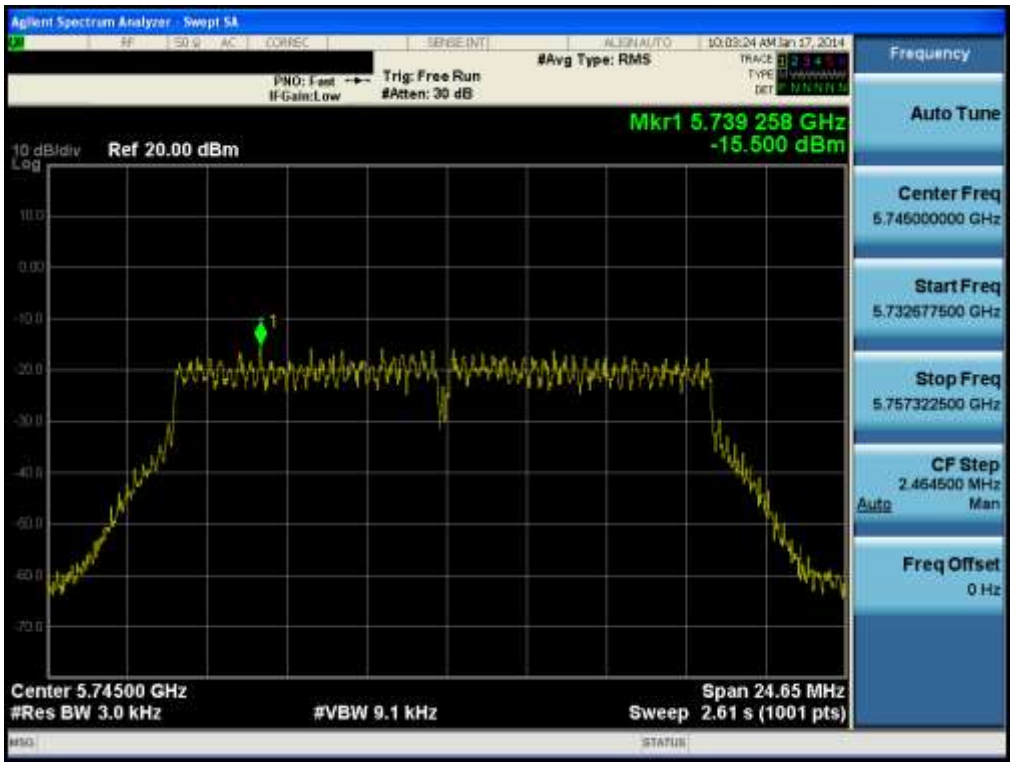
Maximum PPSD TM 5 & ANT 1 & Middle



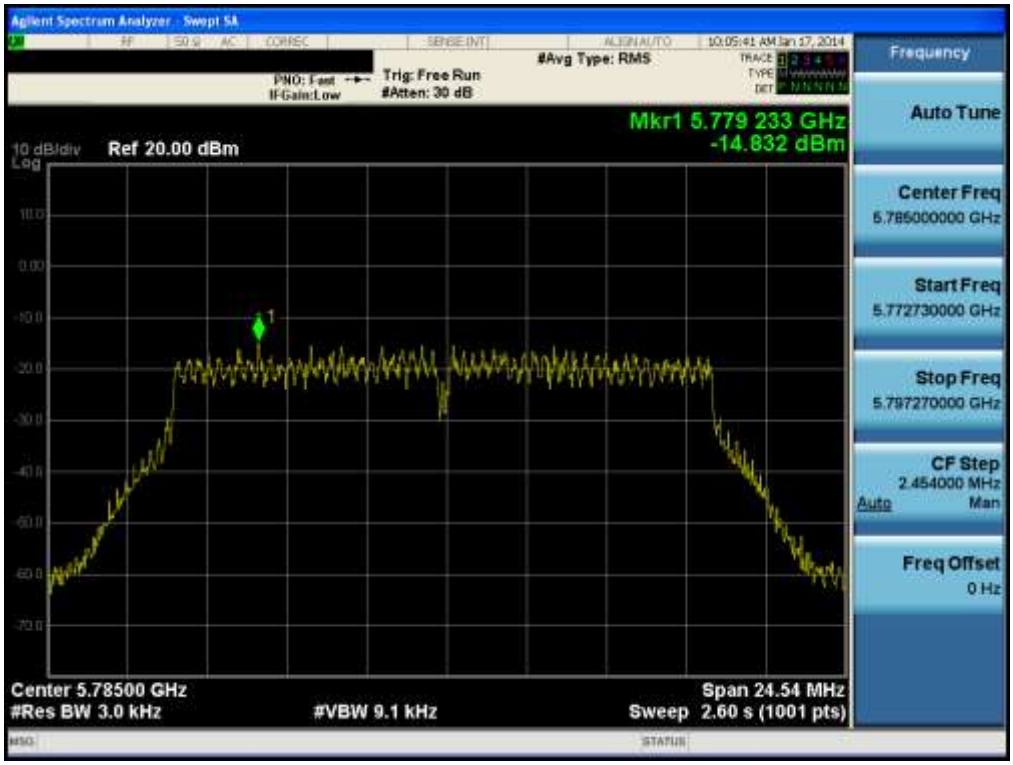
Maximum PPSD TM 5 & ANT 1 & Highest



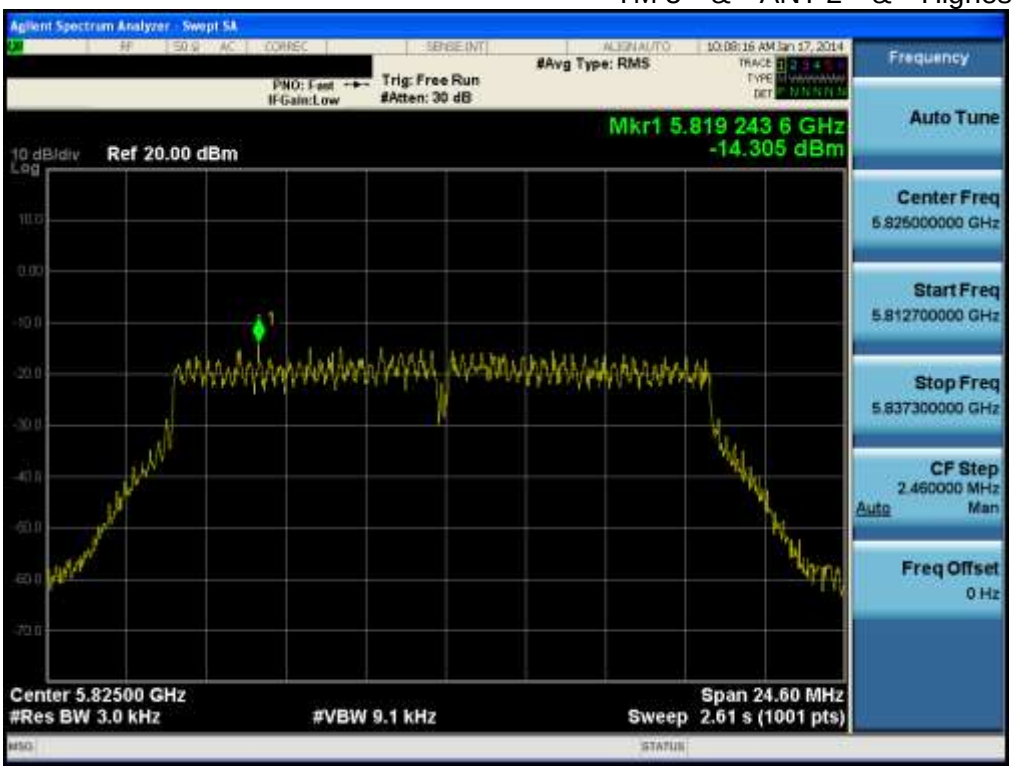
Maximum PPSD TM 5 & ANT 2 & Lowest



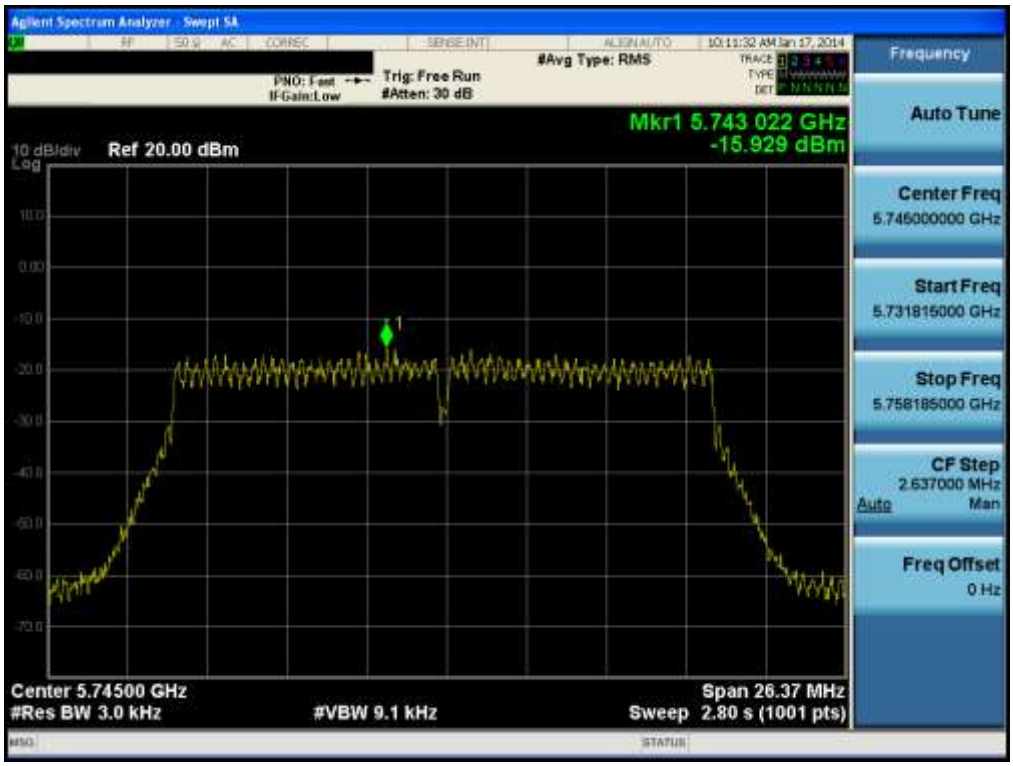
Maximum PPSD TM 5 & ANT 2 & Middle



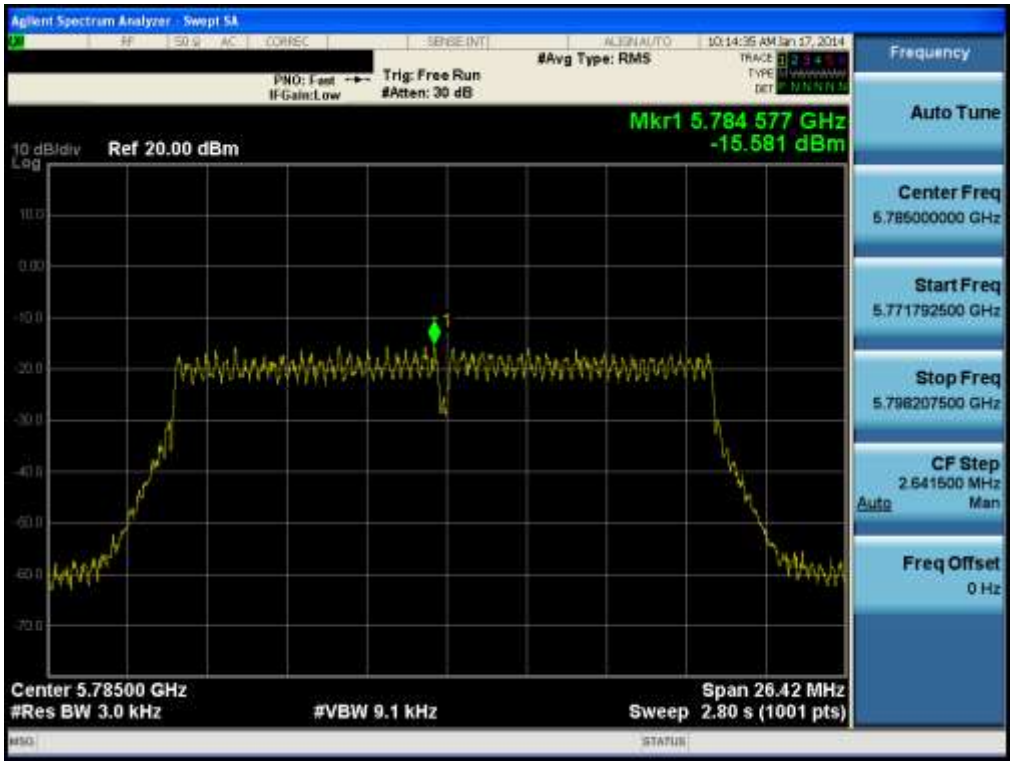
Maximum PPSD TM 5 & ANT 2 & Highest



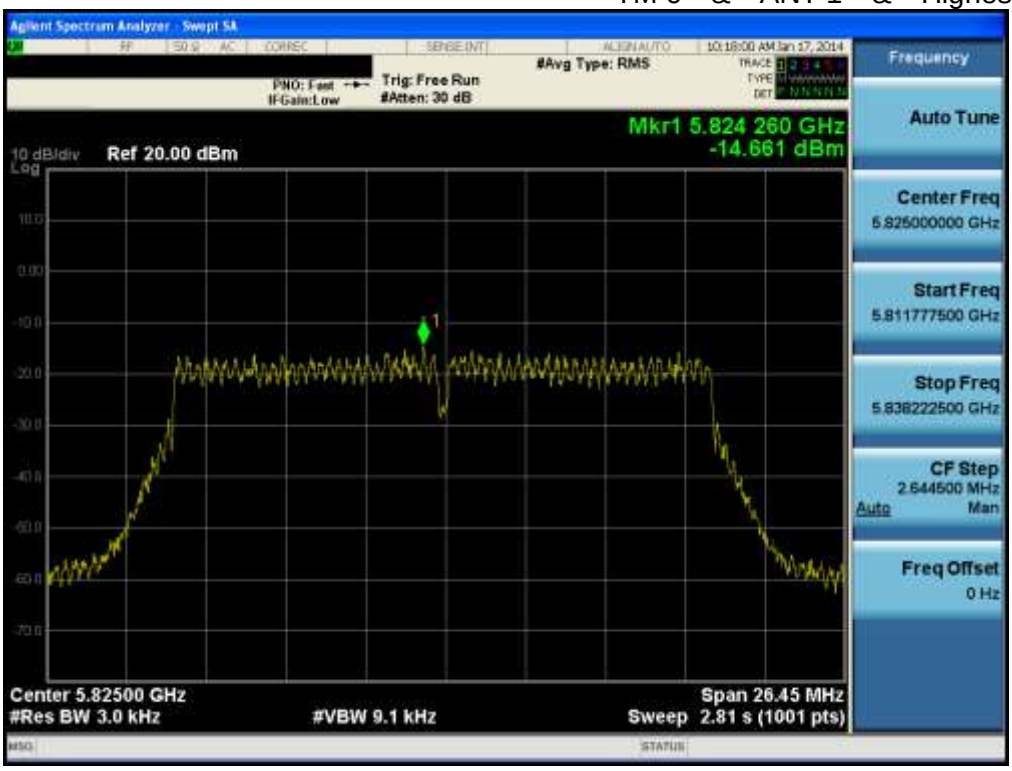
Maximum PPSD TM 6 & ANT 1 & Lowest



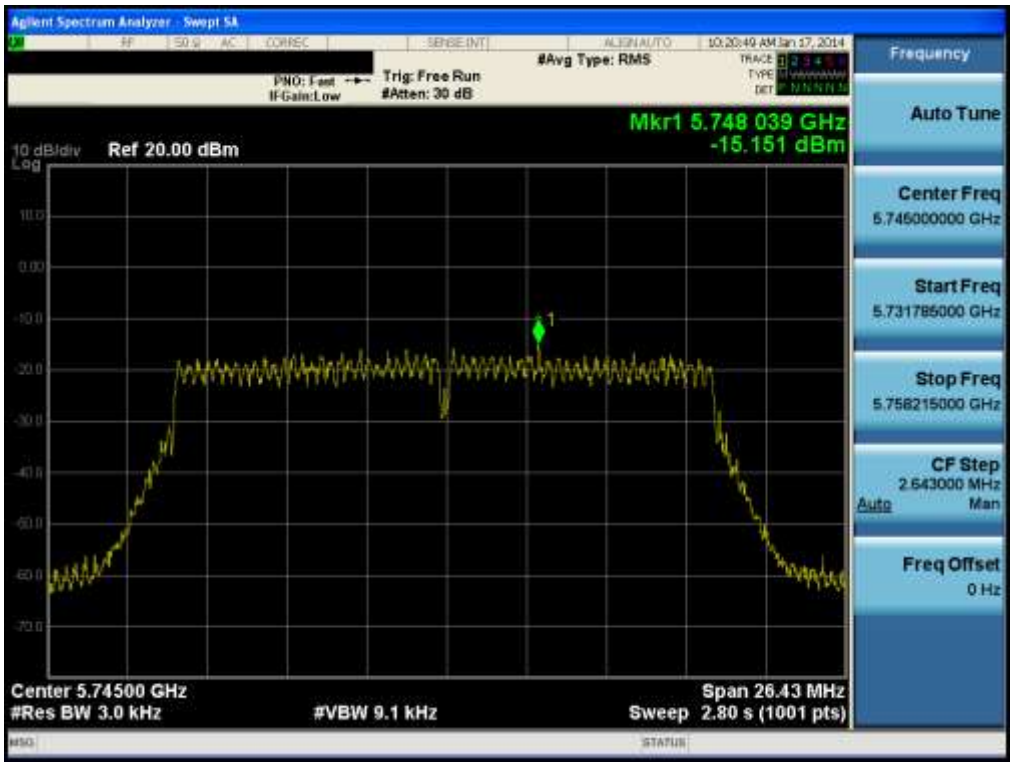
Maximum PPSD TM 6 & ANT 1 & Middle



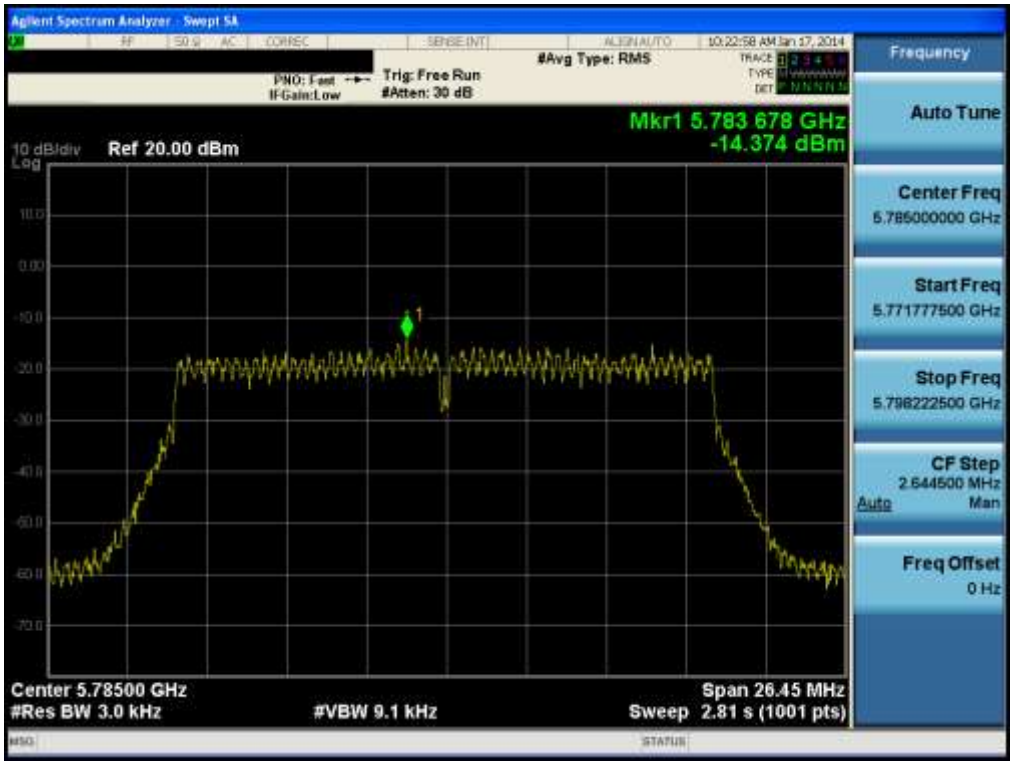
Maximum PPSD TM 6 & ANT 1 & Highest



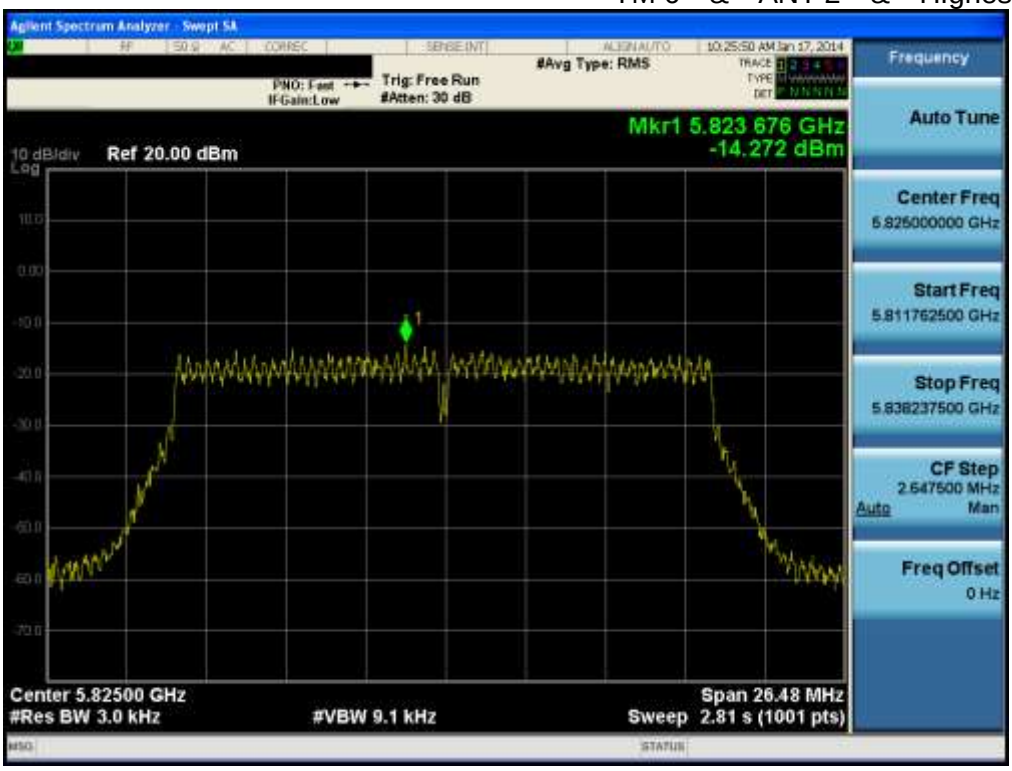
Maximum PPSD TM 6 & ANT 2 & Lowest



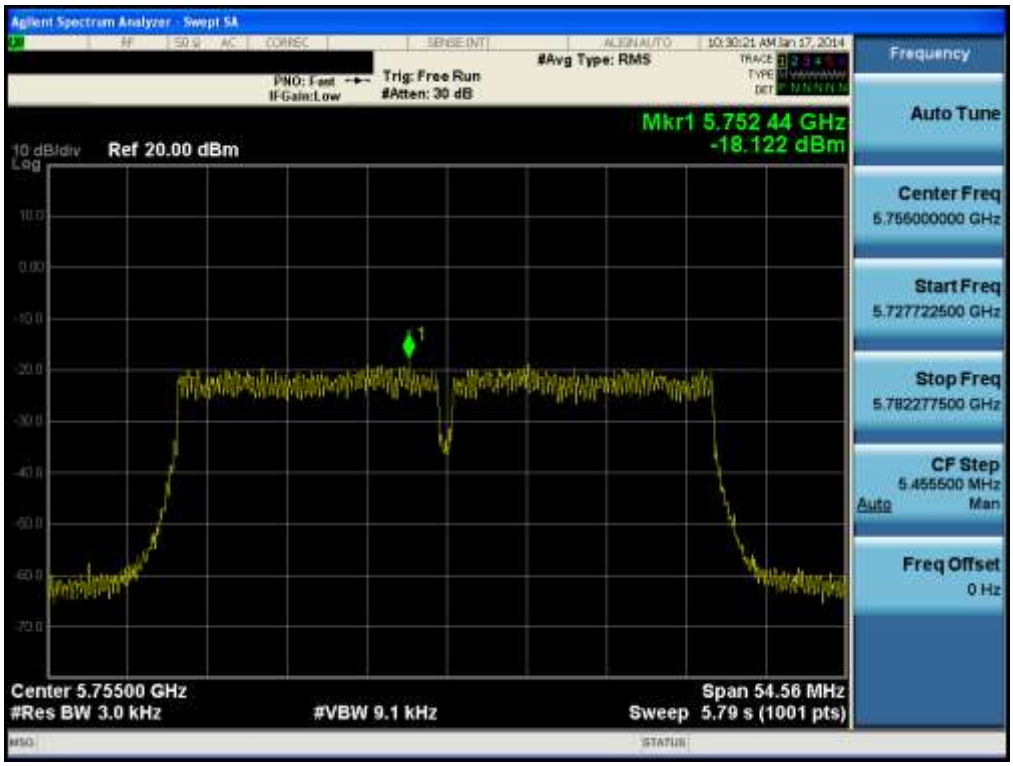
Maximum PPSD TM 6 & ANT 2 & Middle



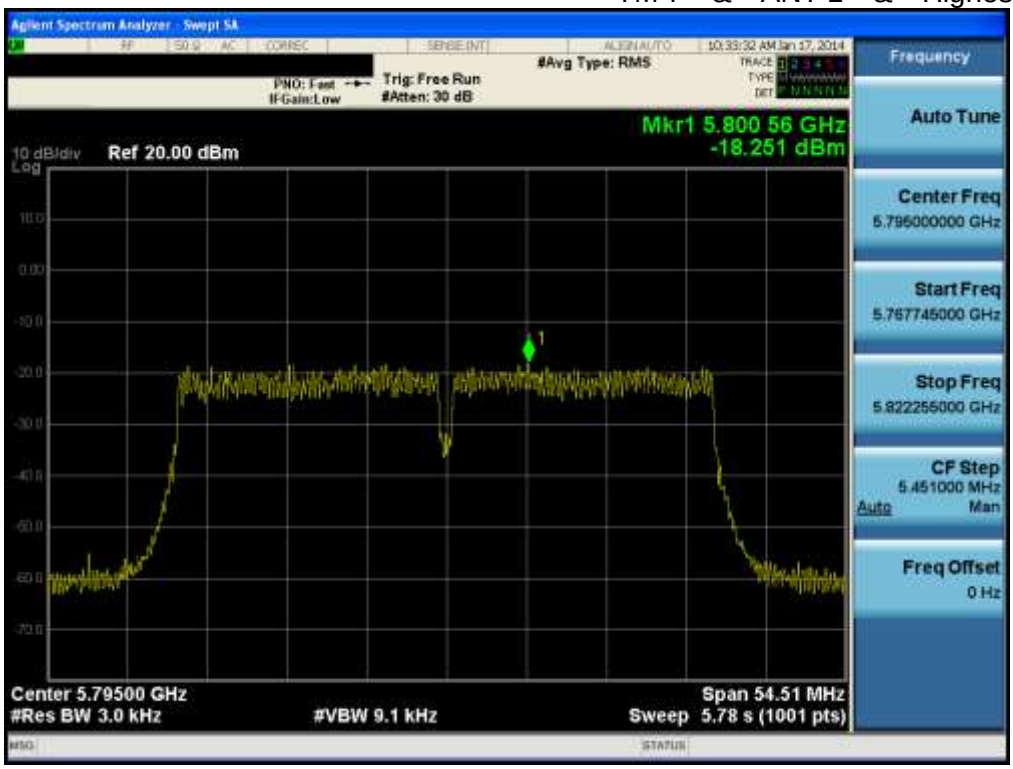
Maximum PPSD TM 6 & ANT 2 & HIghest



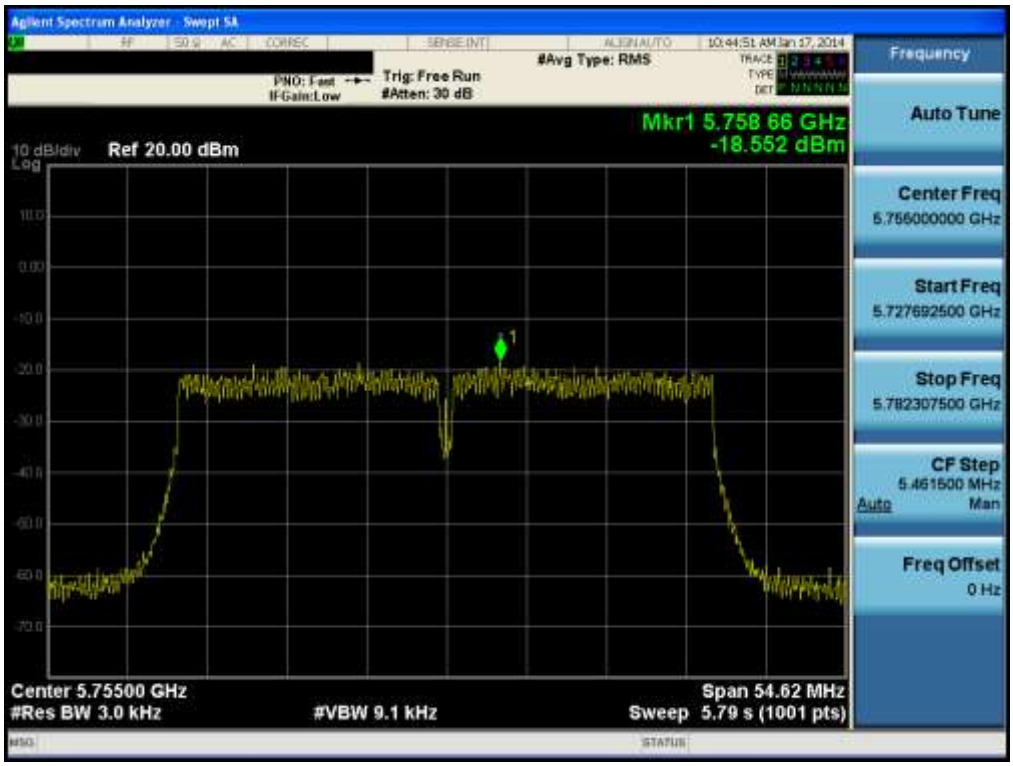
Maximum PPSD TM 7 & ANT 1 & Lowest



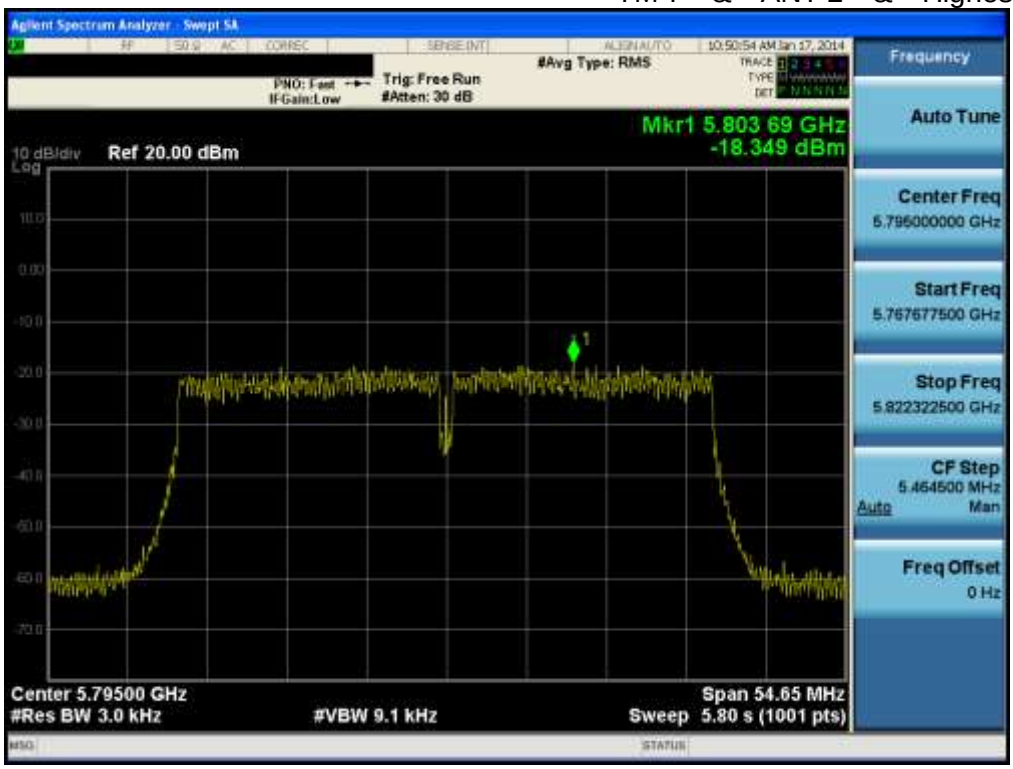
Maximum PPSD TM 7 & ANT 1 & Highest



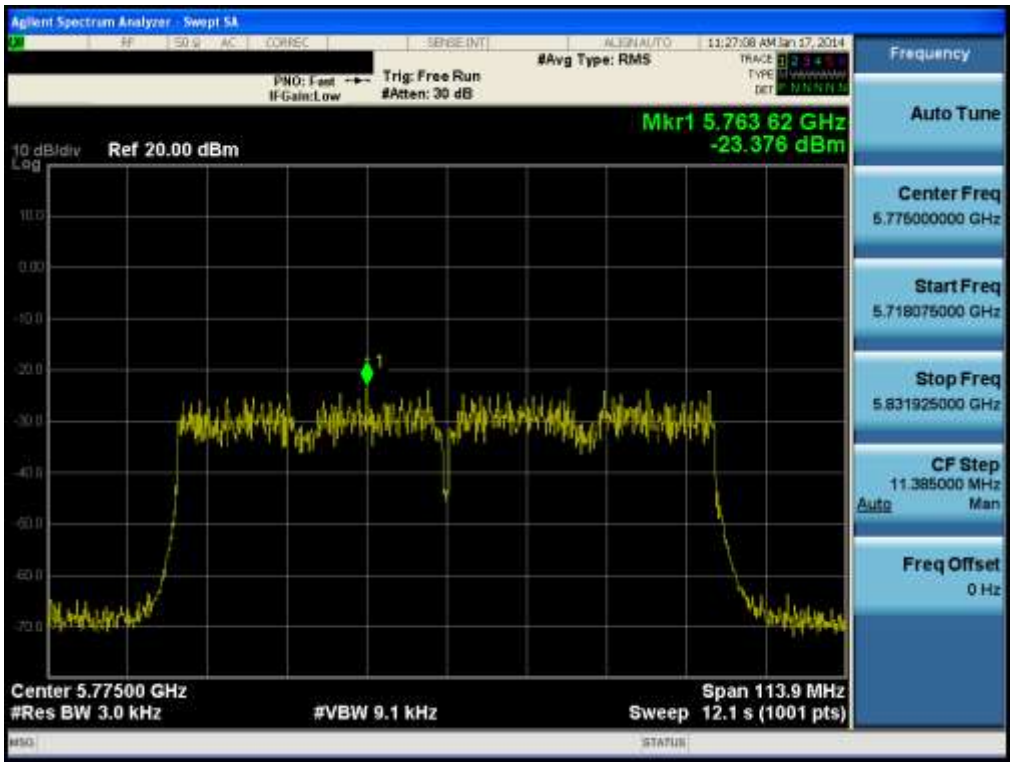
Maximum PPSD TM 7 & ANT 2 & Lowest



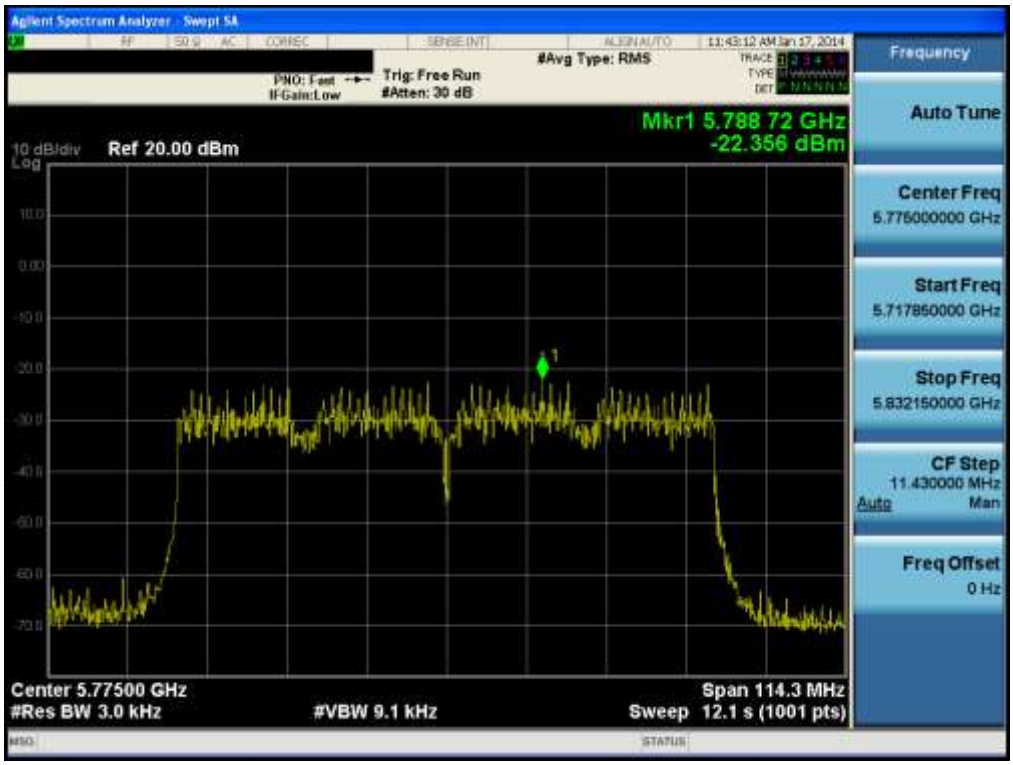
Maximum PPSD TM 7 & ANT 2 & Highest



Maximum PPSD TM 10 & ANT 1 & Middle



Maximum PPSD TM 10 & ANT 2 & Middle



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

Test requirements and limit, §15.247(d)

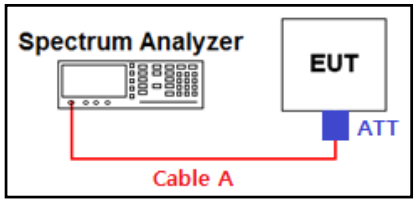
§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

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 ≥ 1.5 times the DTS bandwidth.
3. Set the RBW = 100 kHz.
4. Set the VBW ≥ 3 x 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 1GHz , 1MHz for above 1GHz(Actual 1 MHz , See below note)**
3. Set the VBW ≥ **3 x RBW(Actual 3 MHz, See below note)**
4. Detector = **peak**.
5. Ensure that the number of measurement points ≥ 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= 100kHz, VBW= 300kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT: 40001

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

RBW= 1MHz, VBW= 3MHz, 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.

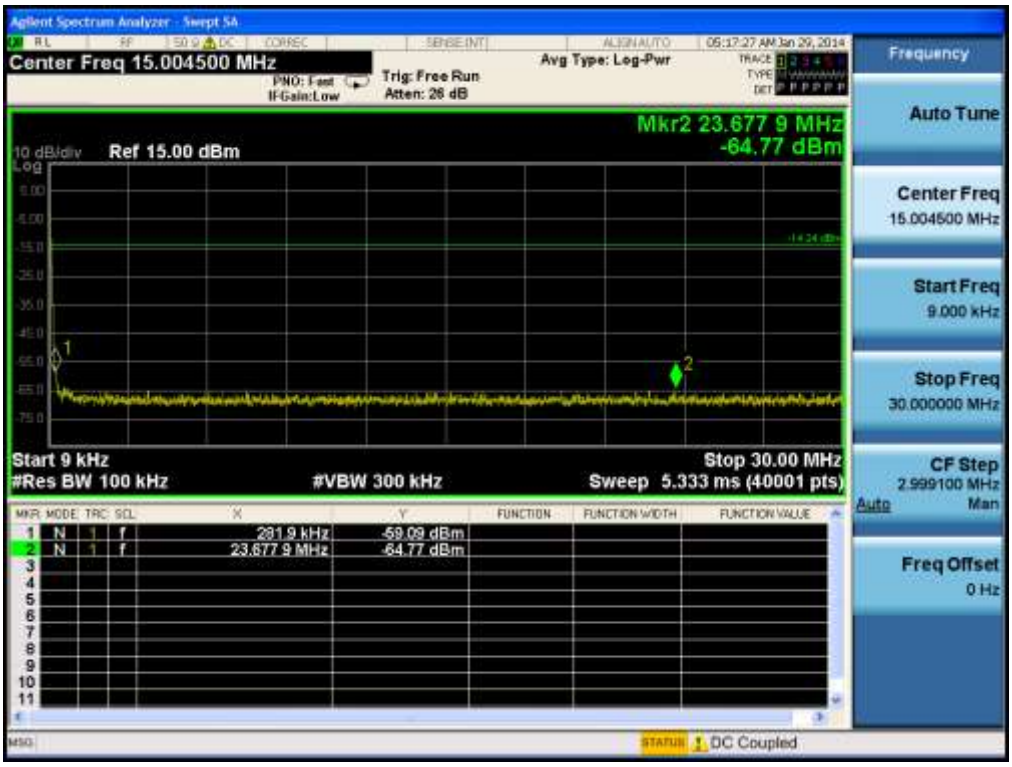
▣ RESULT PLOTS

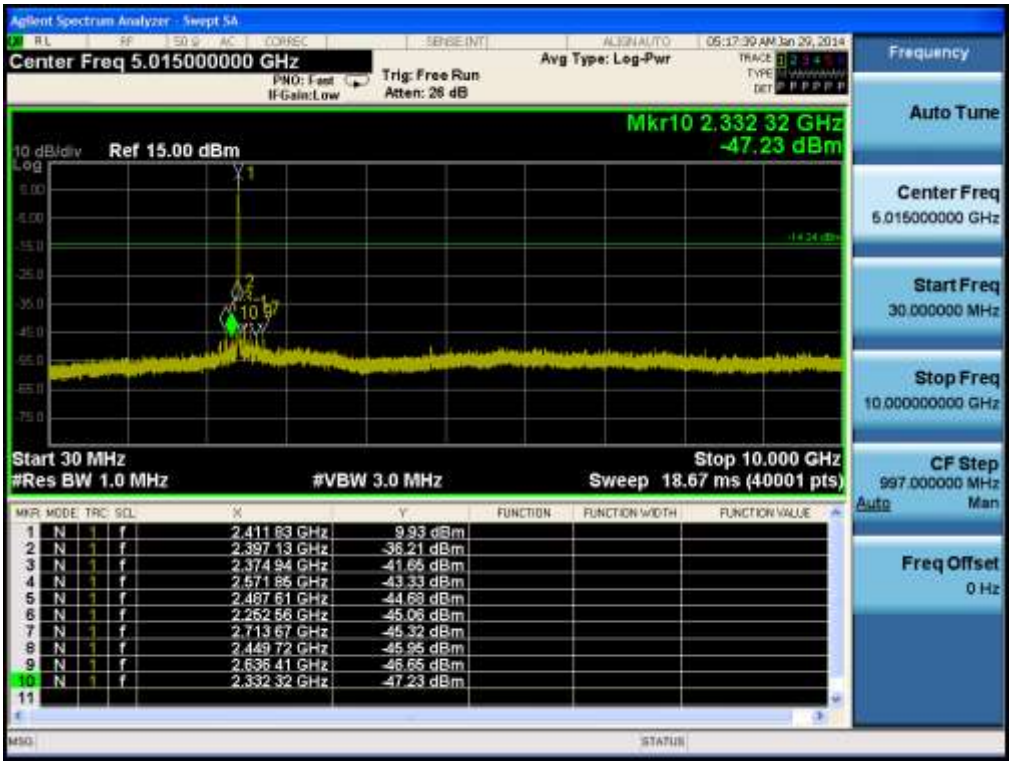
TM 1 & ANT 1 & Lowest

Reference

Low Band-edge

Conducted Spurious Emissions



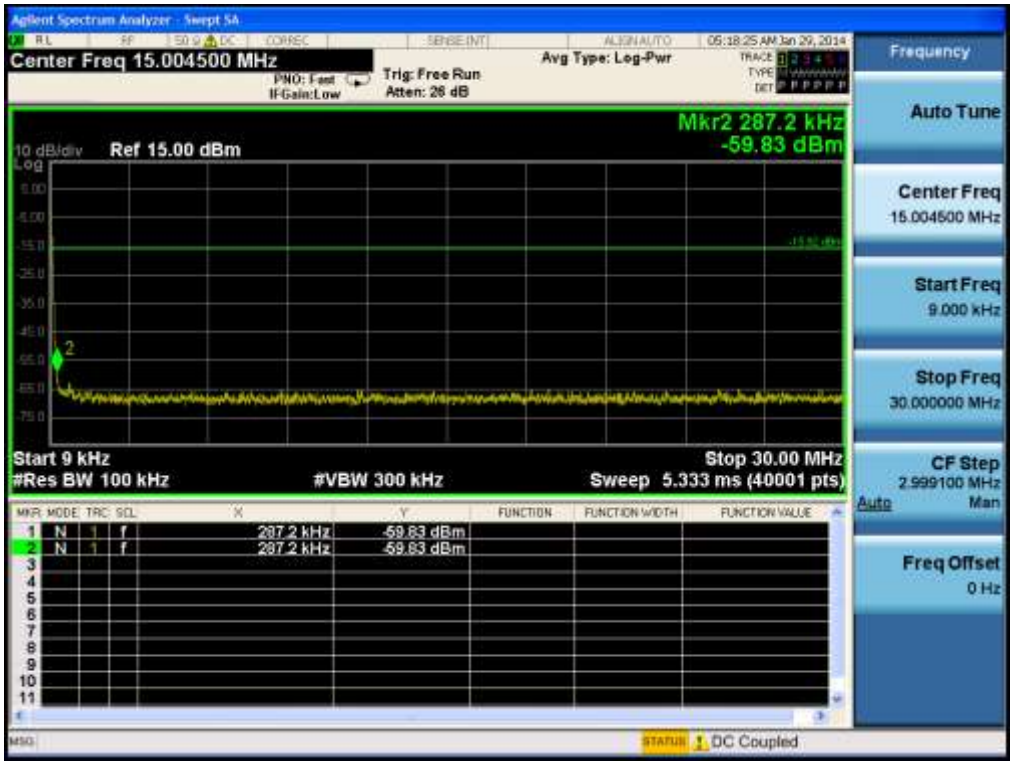


Conducted Spurious Emissions

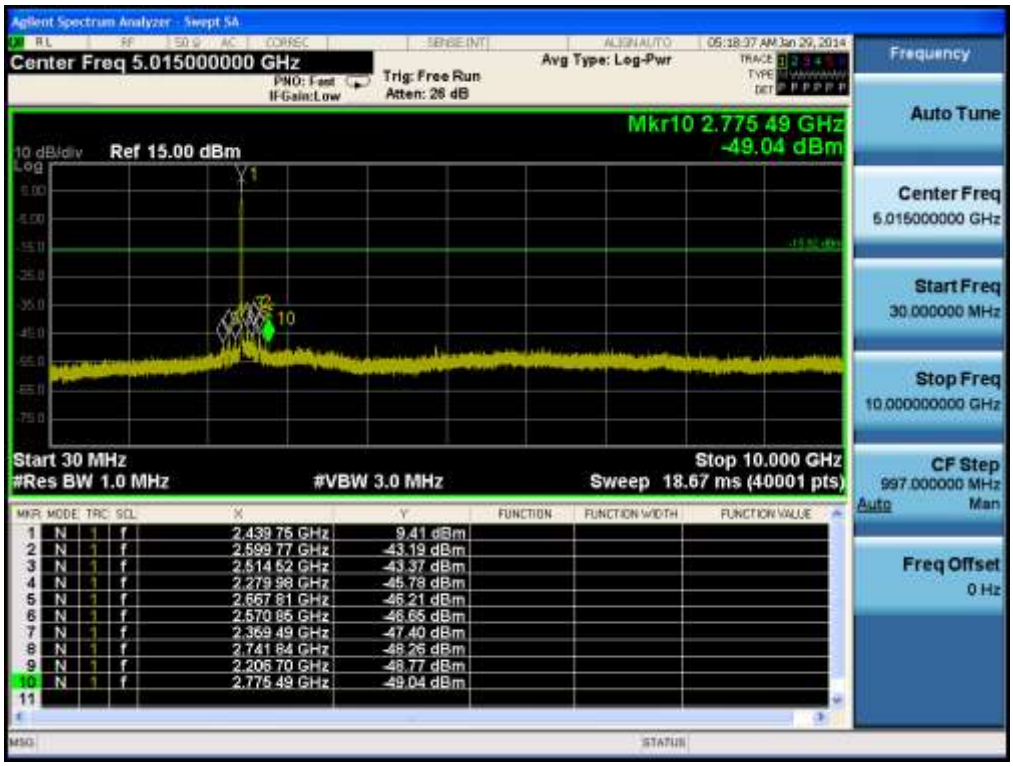
TM 1 & ANT 1 & Middle

Reference

Conducted Spurious Emissions



Conducted Spurious Emissions

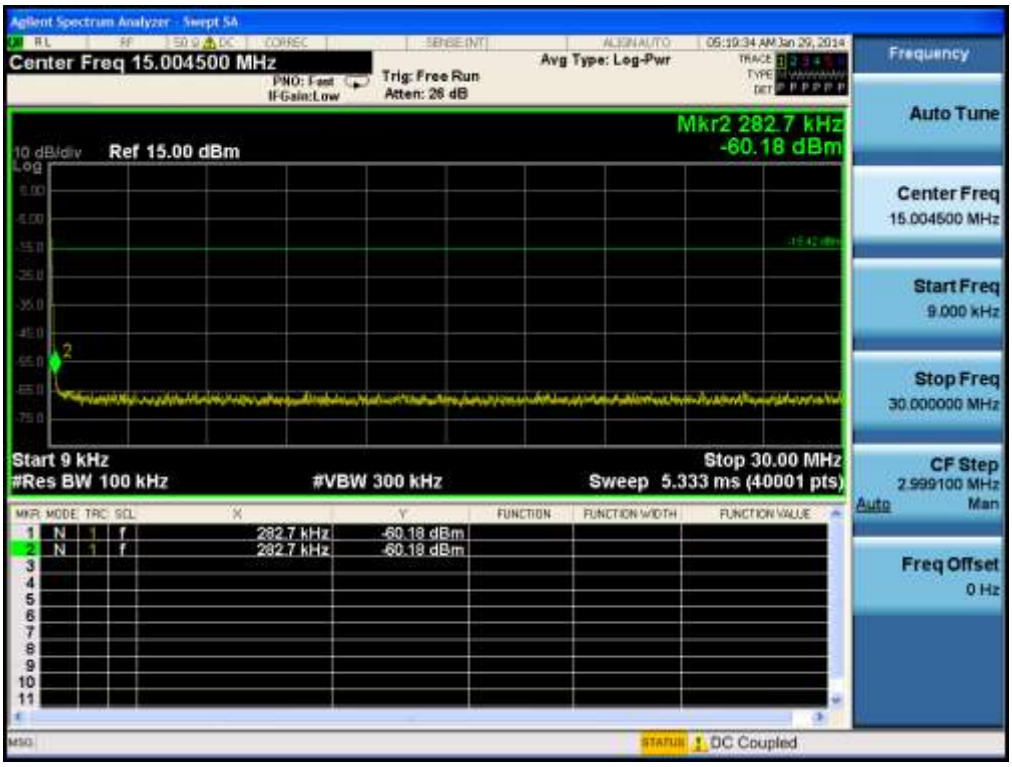


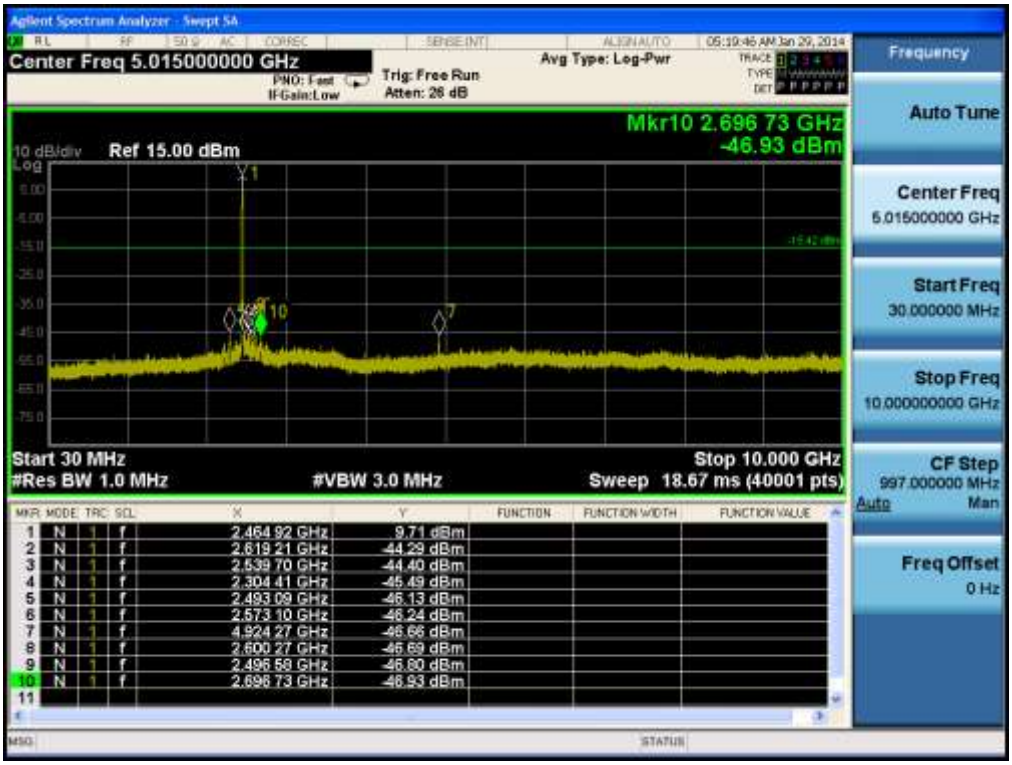
TM 1 & ANT 1 & Highest

Reference

High Band-edge

Conducted Spurious Emissions





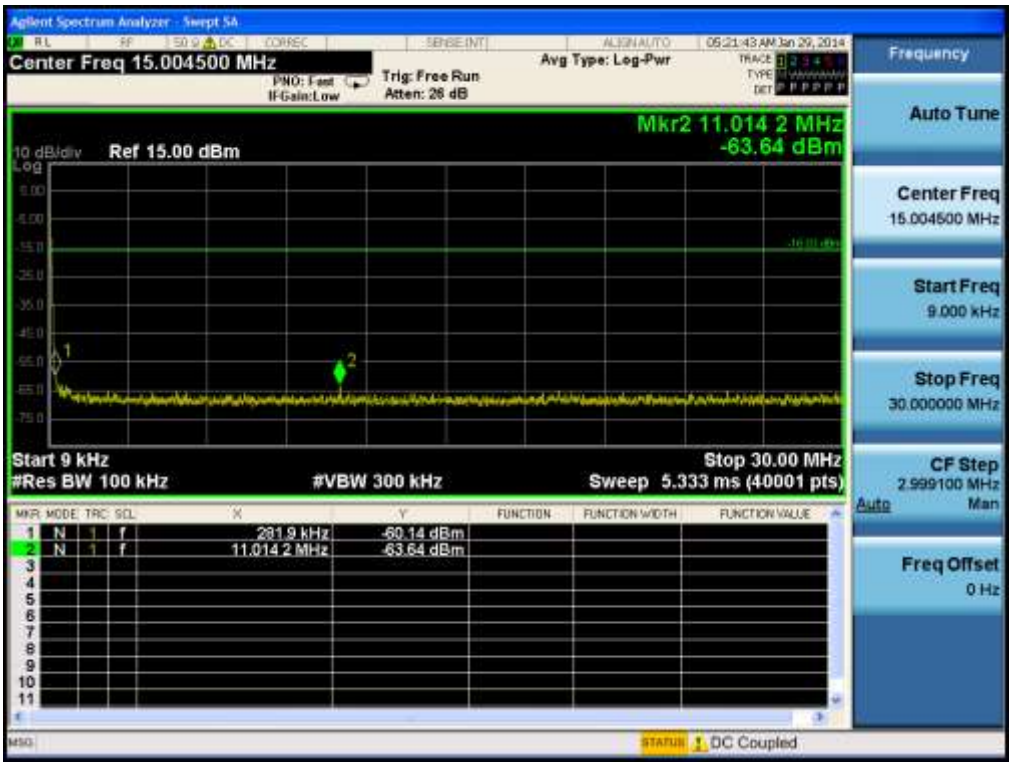
Conducted Spurious Emissions

TM 1 & ANT 2 & Lowest

Reference

Low Band-edge

Conducted Spurious Emissions

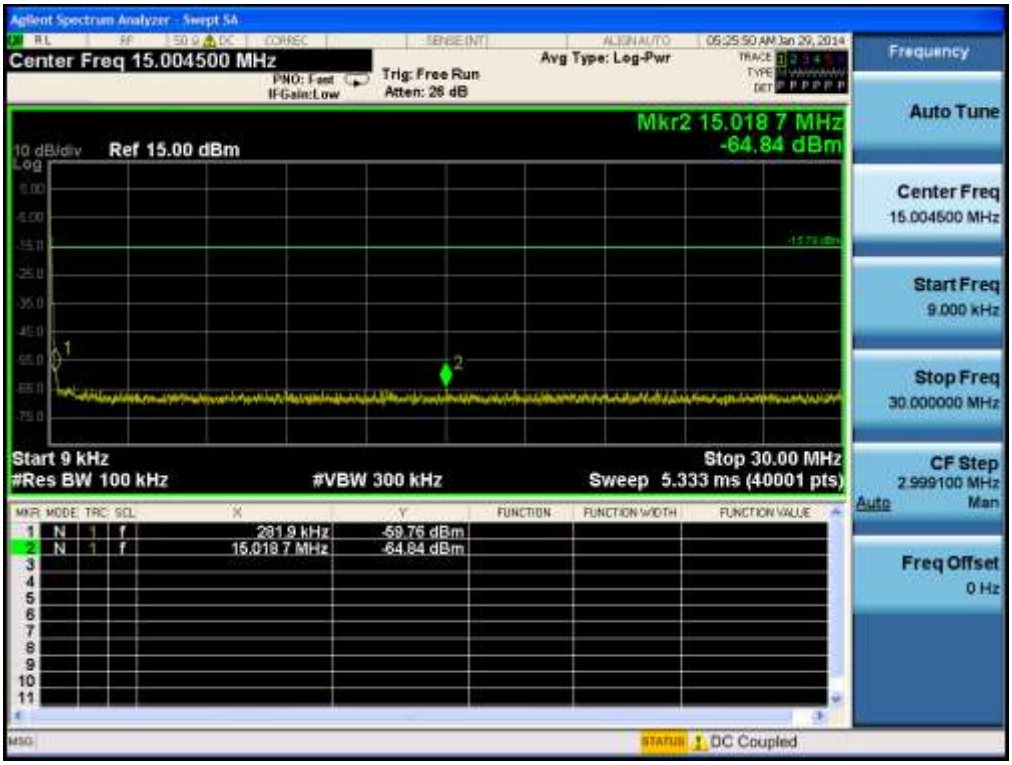


Conducted Spurious Emissions

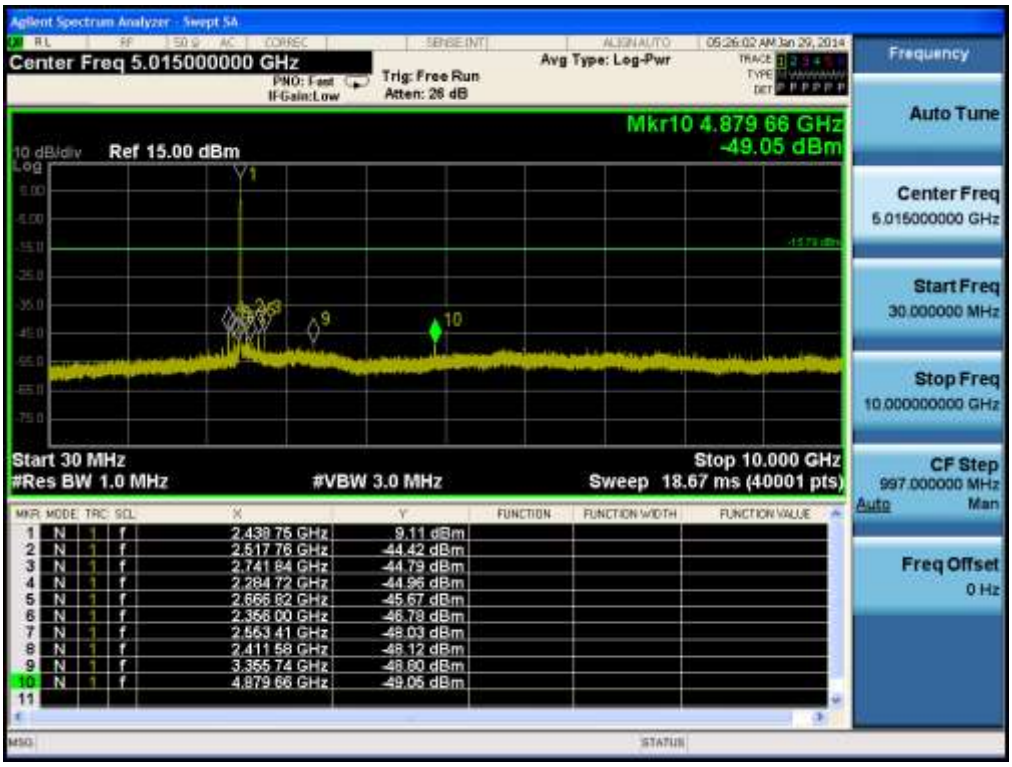
TM 1 & ANT 2 & Middle

Reference

Conducted Spurious Emissions



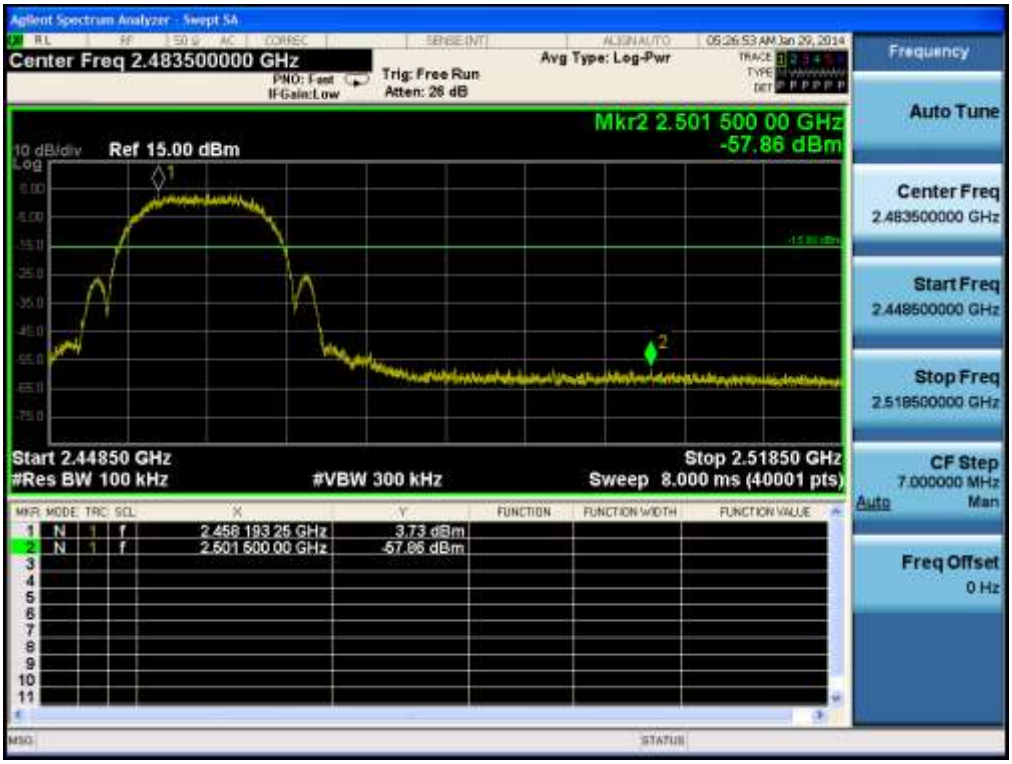
Conducted Spurious Emissions



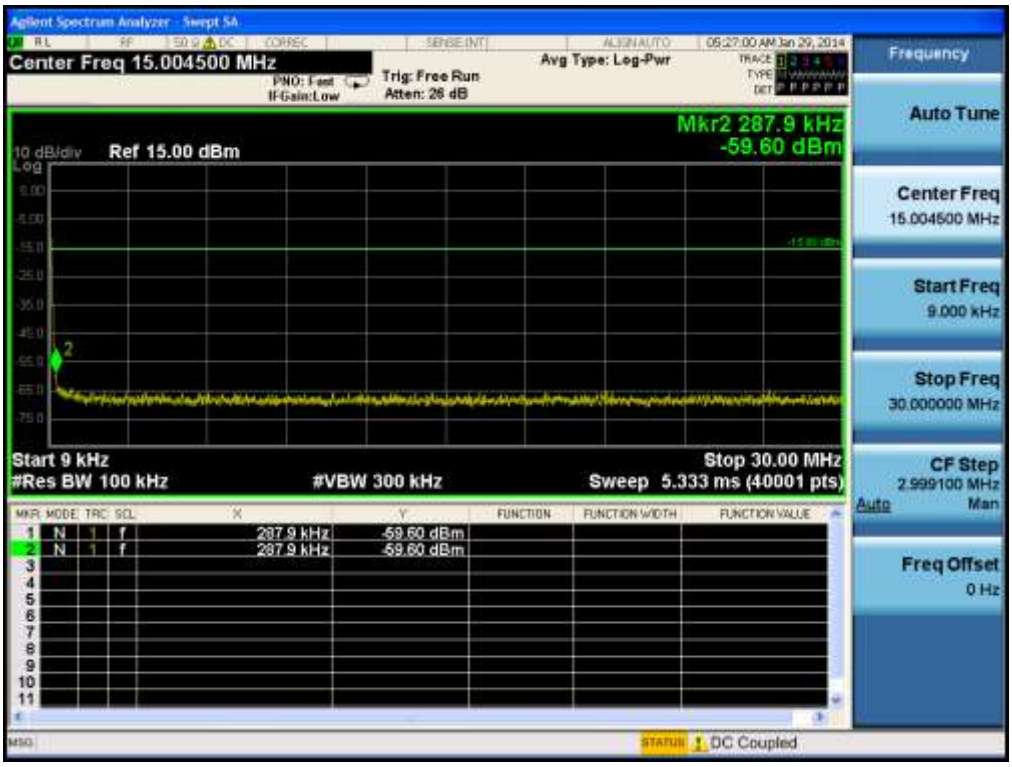
TM 1 & ANT 2 & Highest

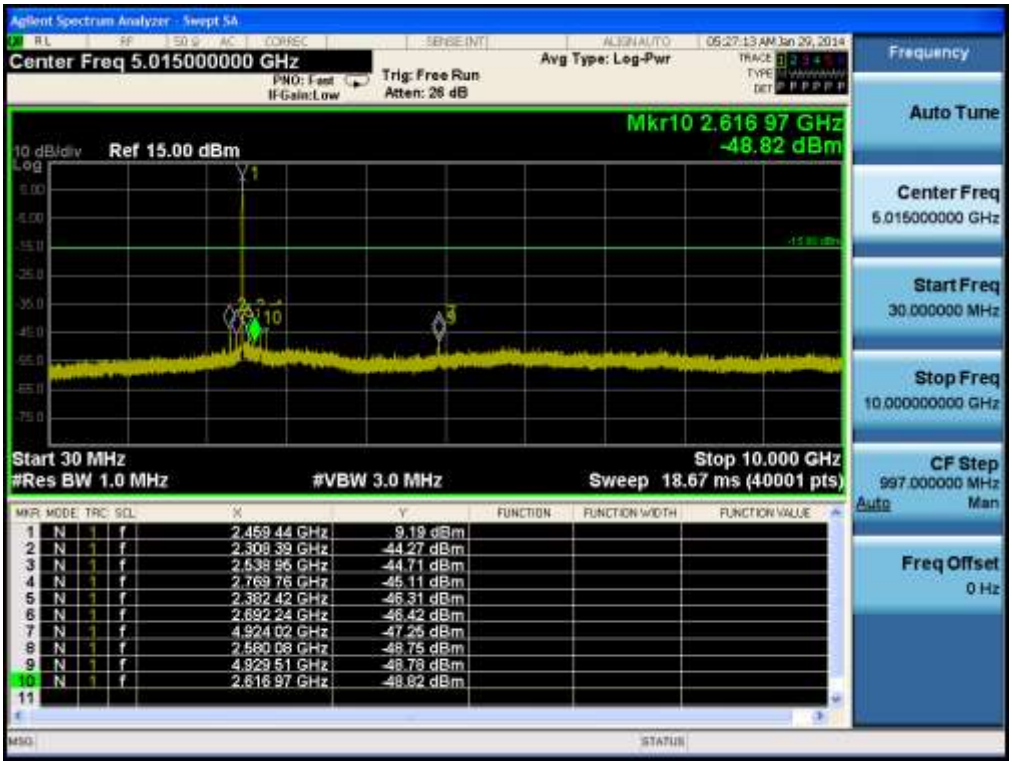
Reference

High Band-edge



Conducted Spurious Emissions



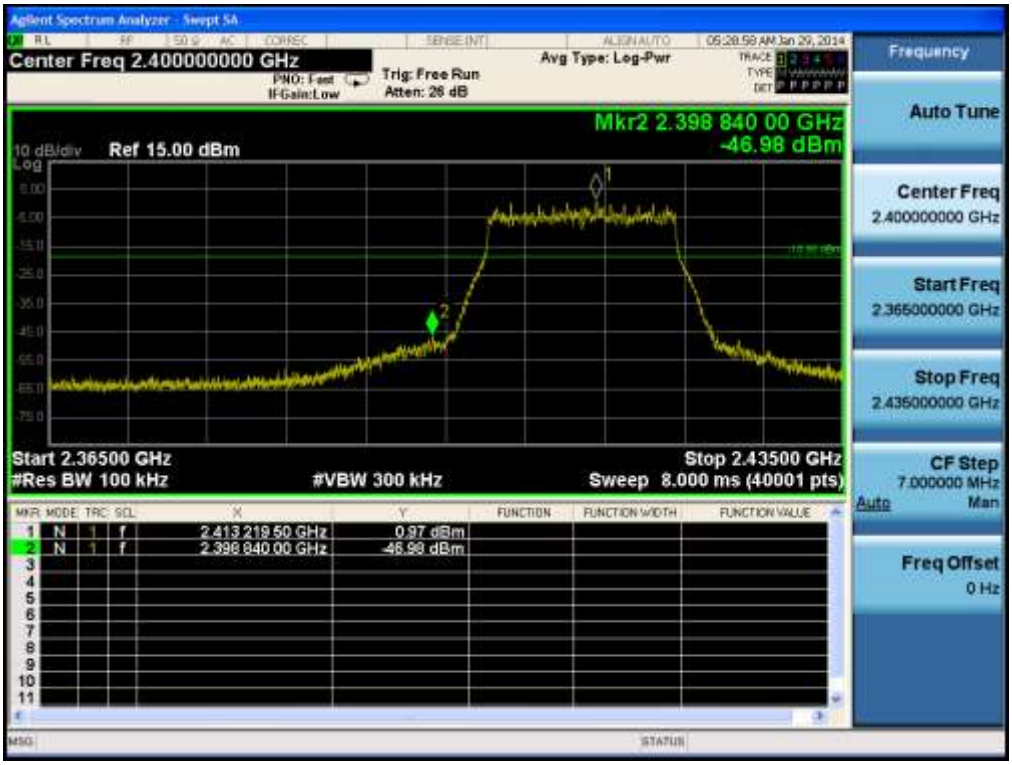


Conducted Spurious Emissions

TM 2 & ANT 1 & Lowest

Reference

Low Band-edge



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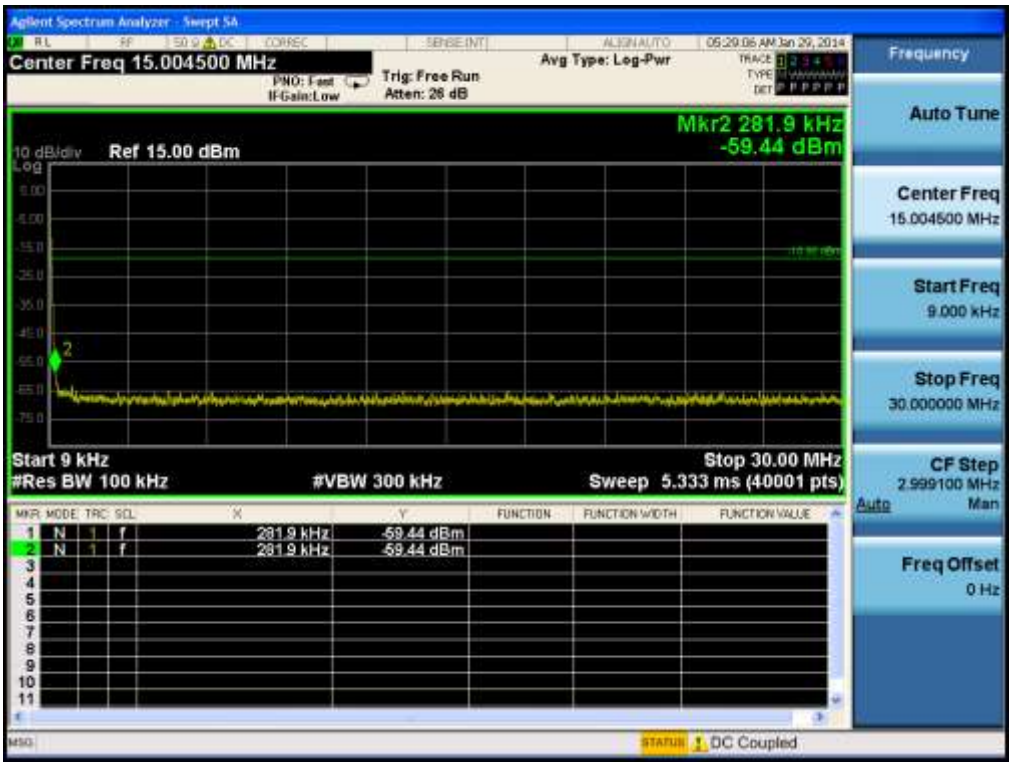
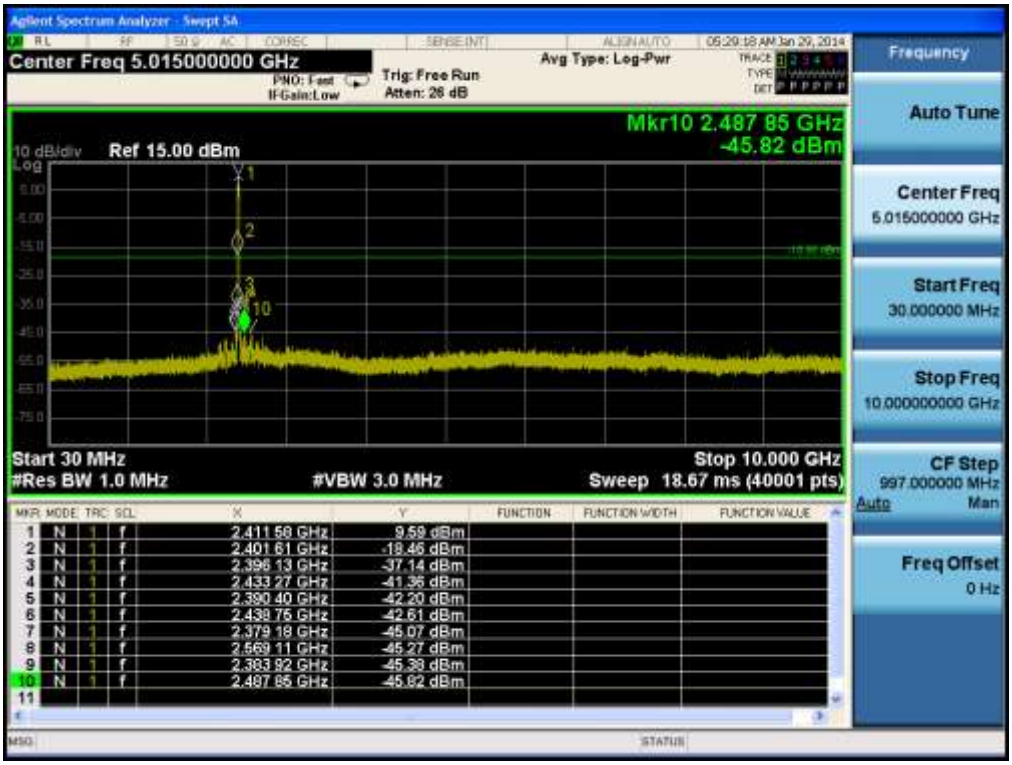


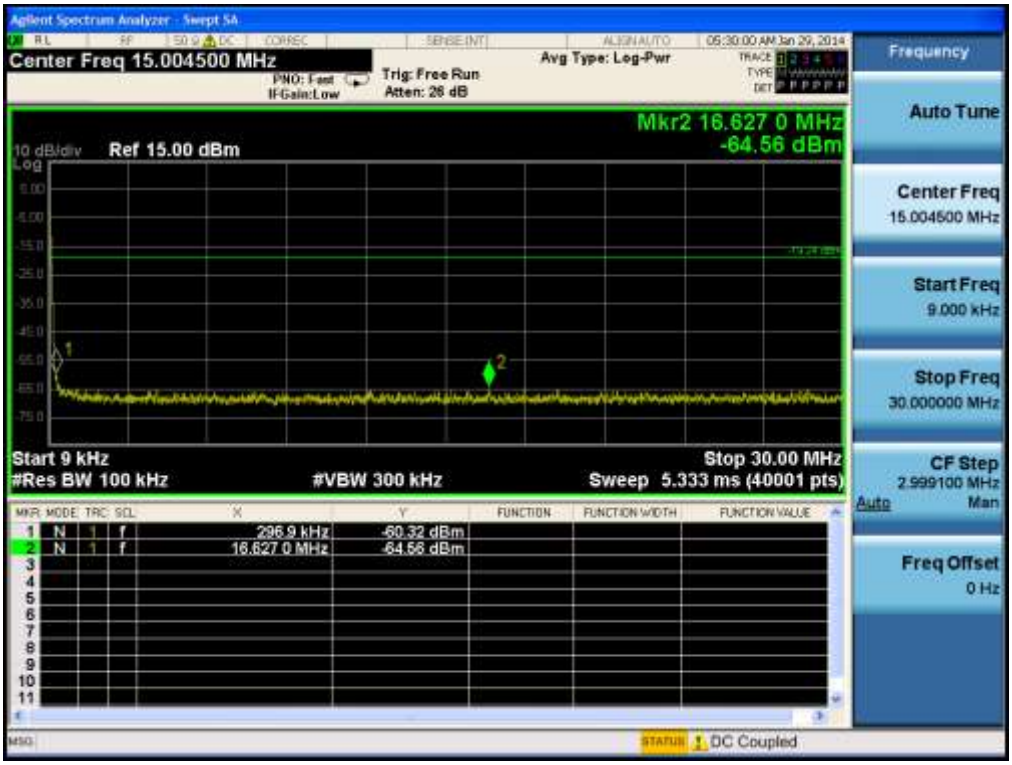


Conducted Spurious Emissions

TM 2 & ANT 1 & Middle

Reference

Conducted Spurious Emissions



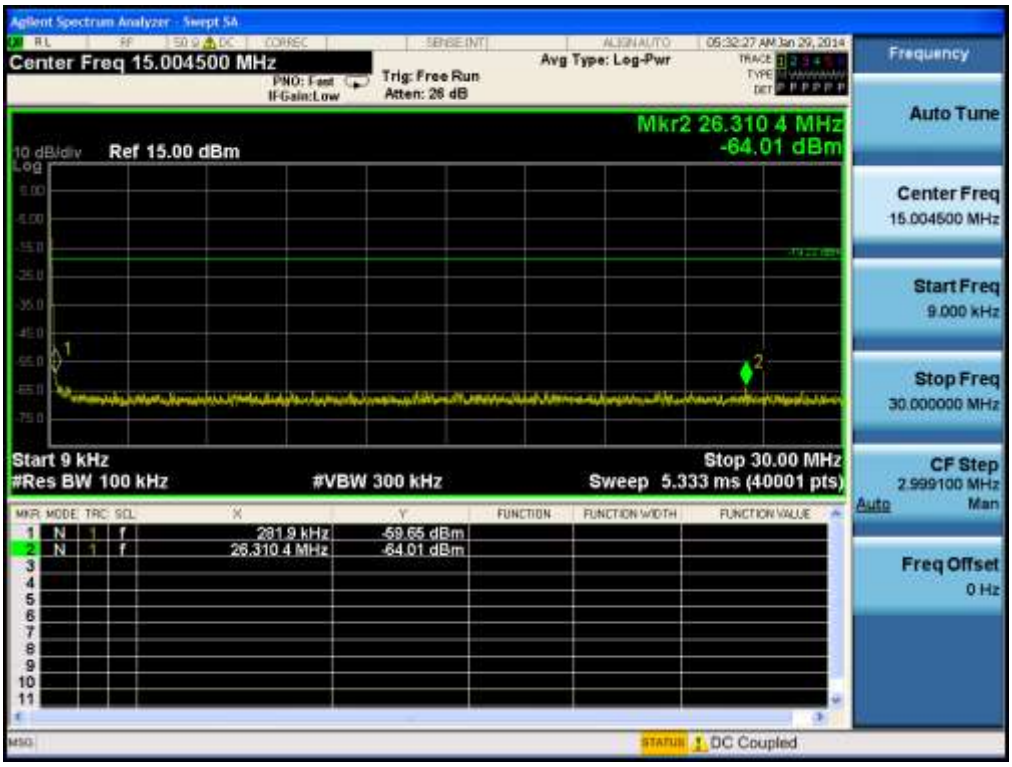
Conducted Spurious Emissions

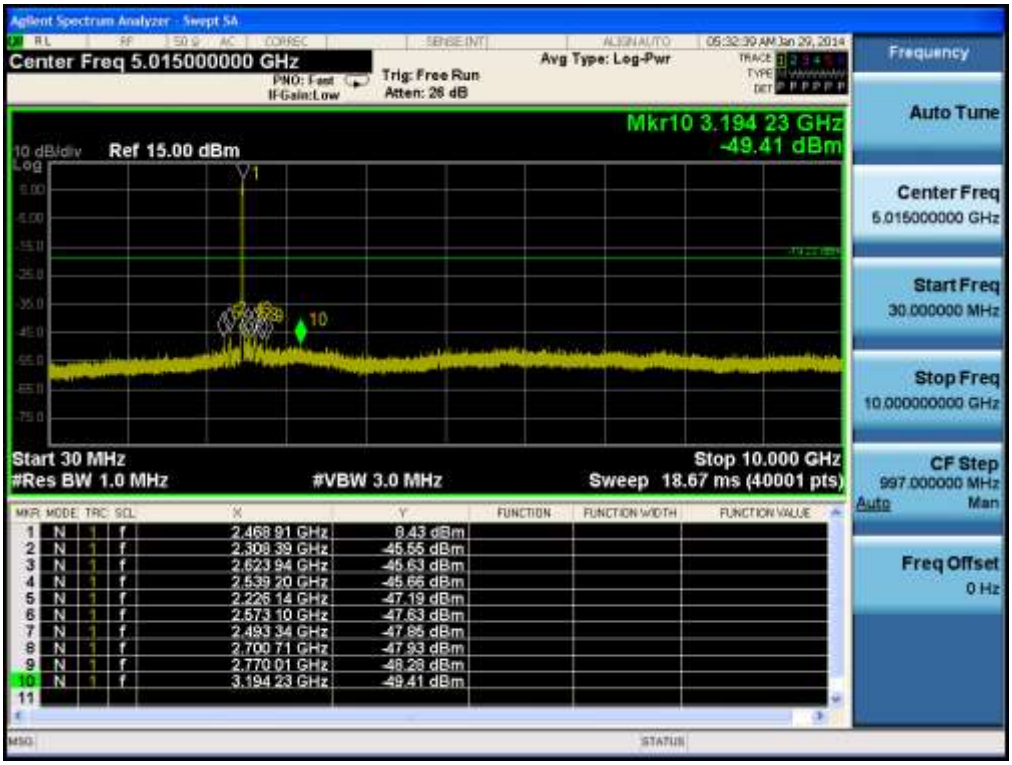
TM 2 & ANT 1 & Highest

Reference

High Band-edge

Conducted Spurious Emissions



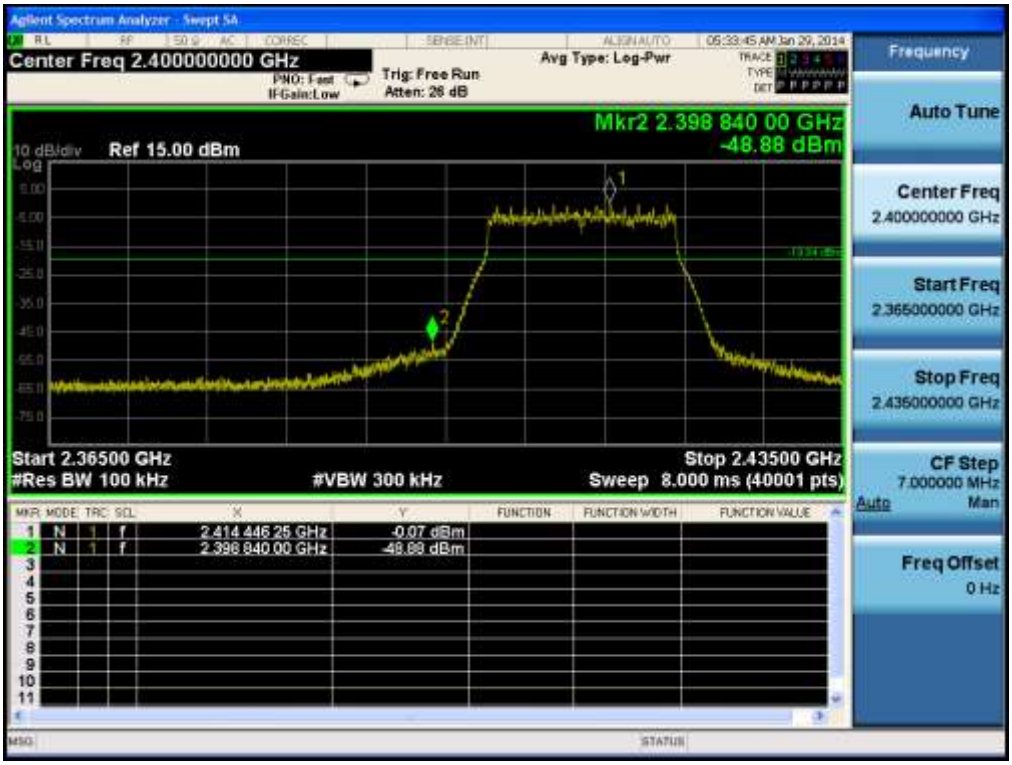


Conducted Spurious Emissions

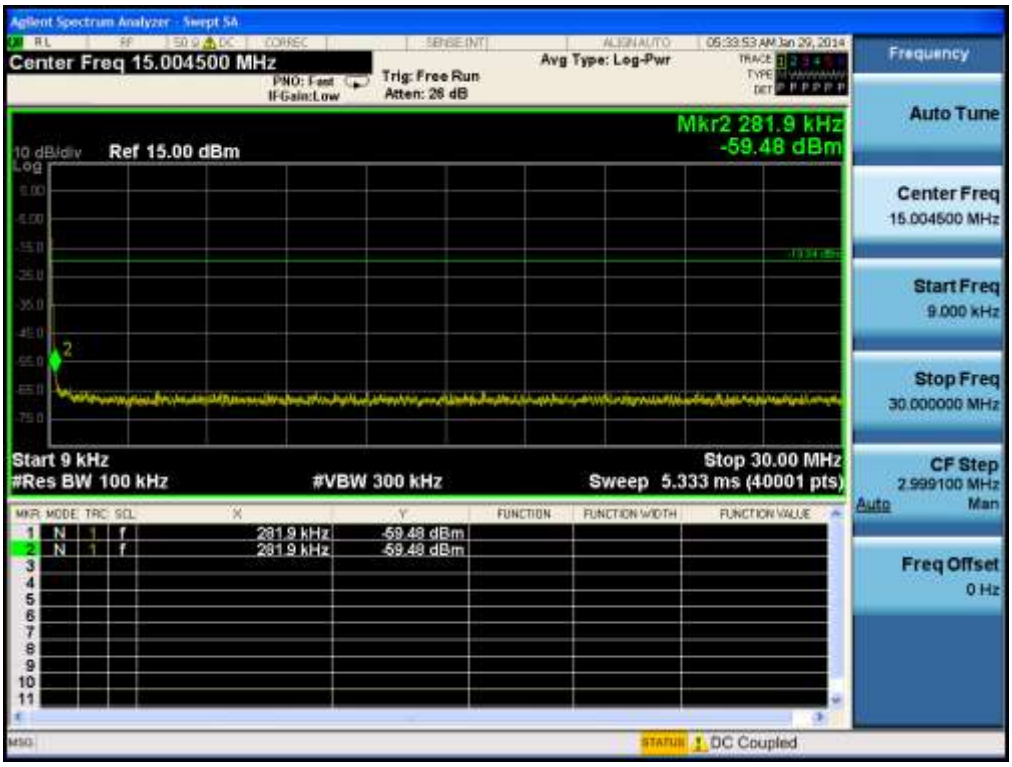
TM 2 & ANT 2 & Lowest

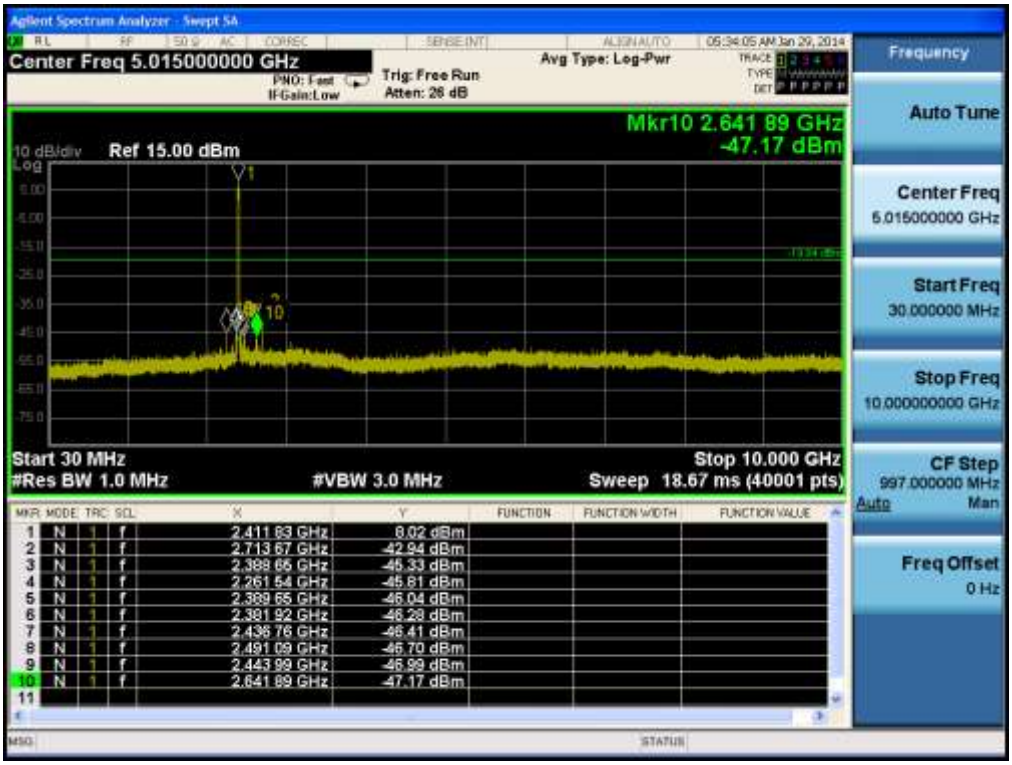
Reference

Low Band-edge



Conducted Spurious Emissions



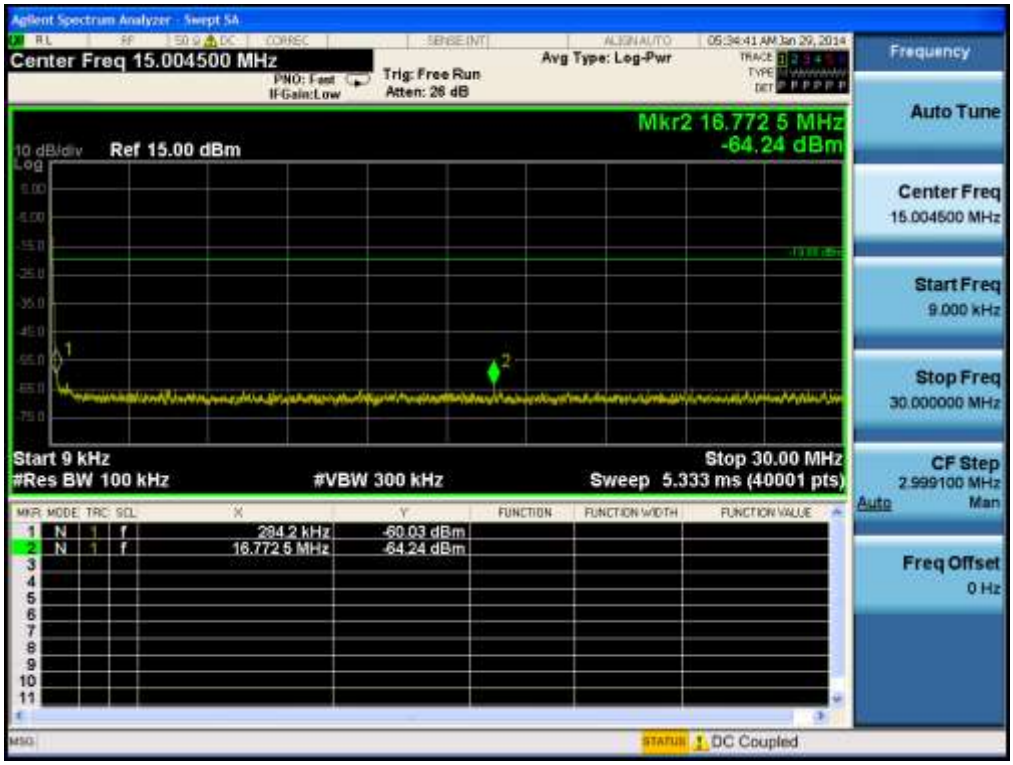


Conducted Spurious Emissions

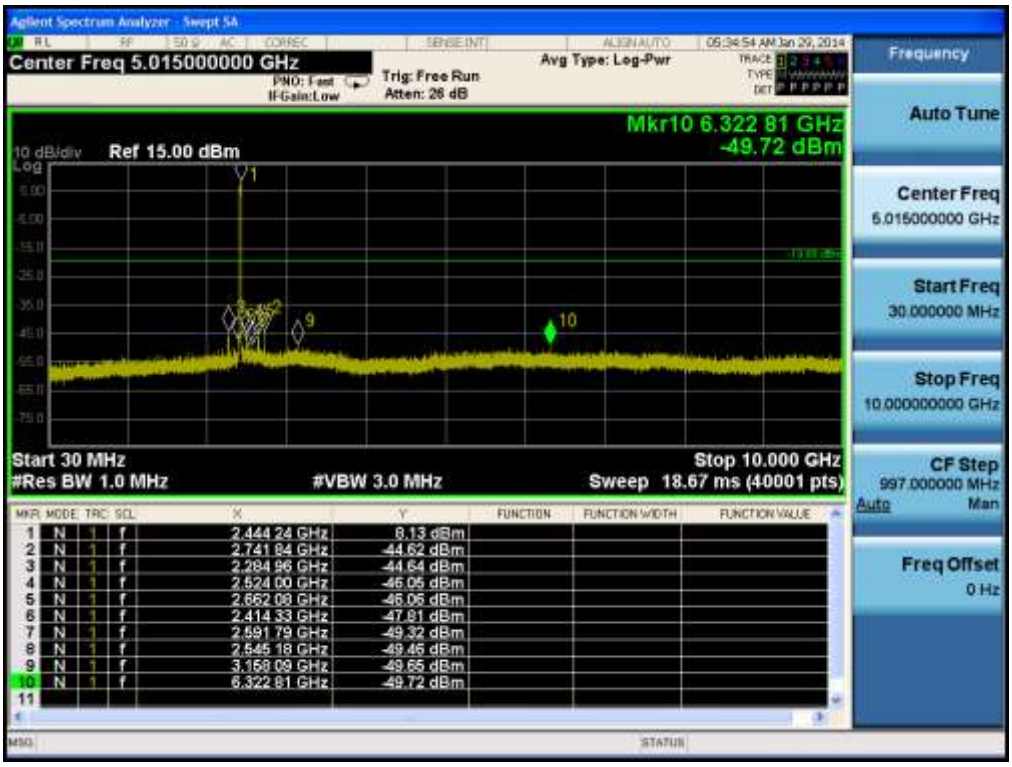
TM 2 & ANT 2 & Middle

Reference

Conducted Spurious Emissions

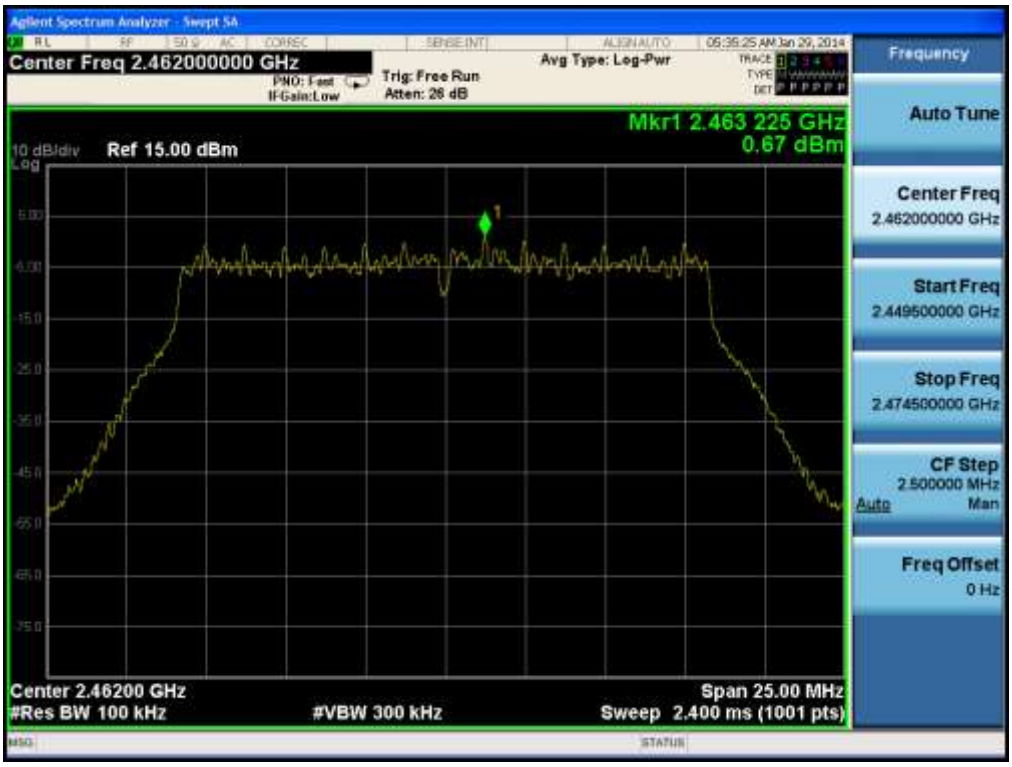


Conducted Spurious Emissions

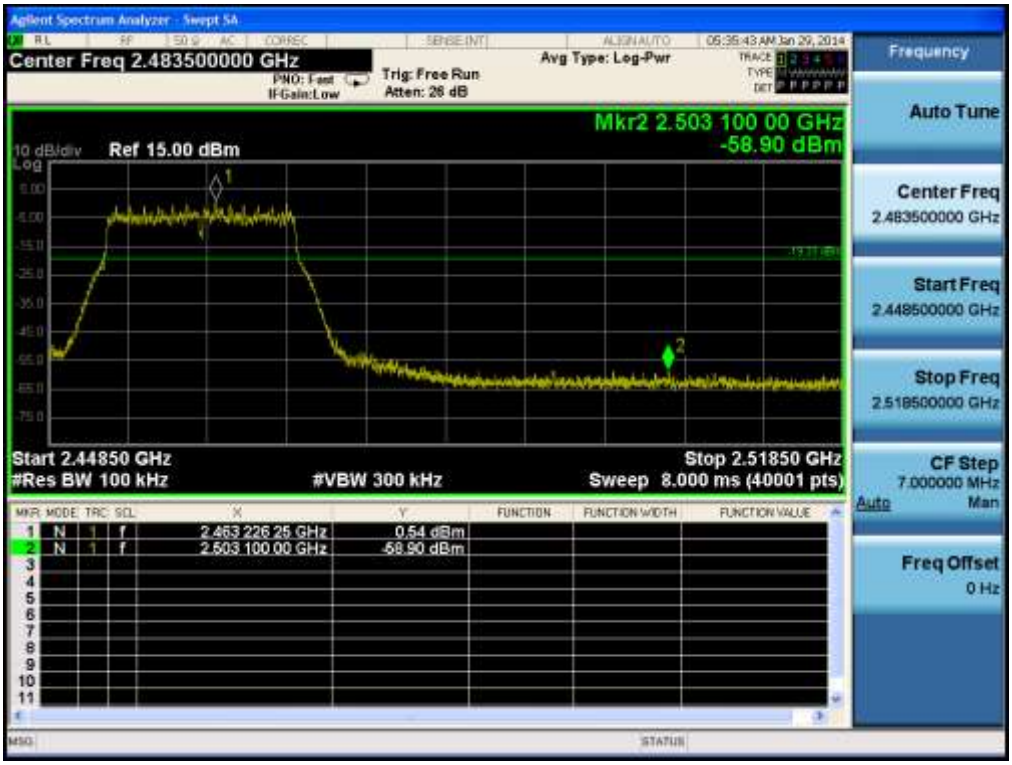


TM 2 & ANT 2 & Highest

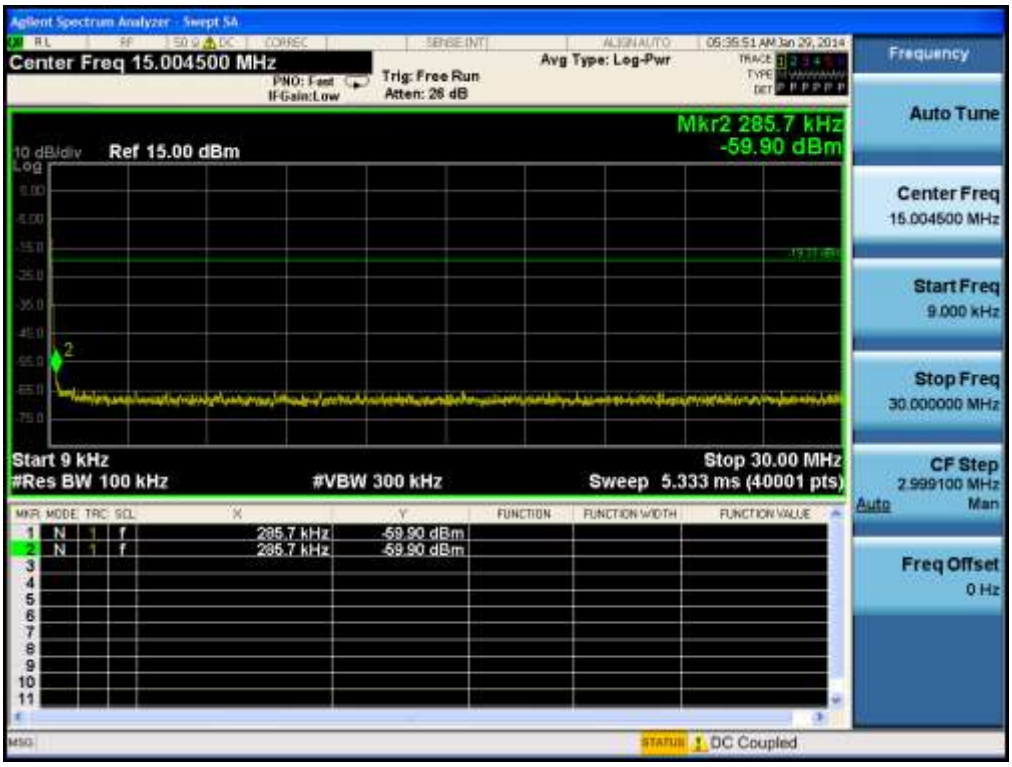
Reference

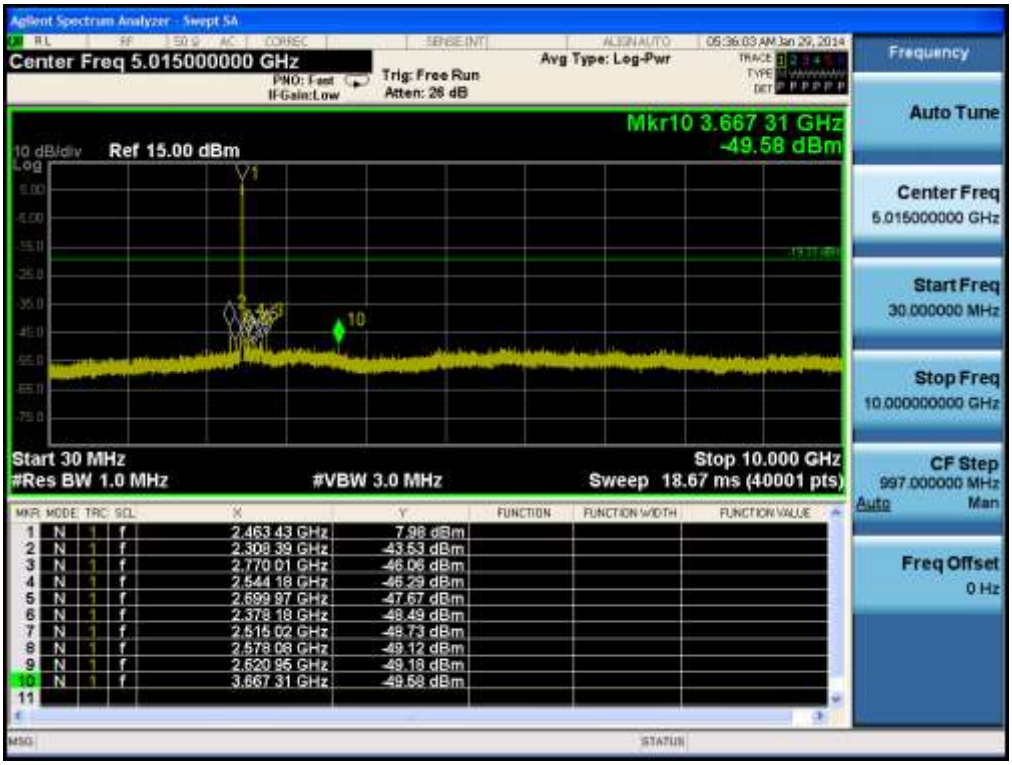


High Band-edge



Conducted Spurious Emissions





Conducted Spurious Emissions