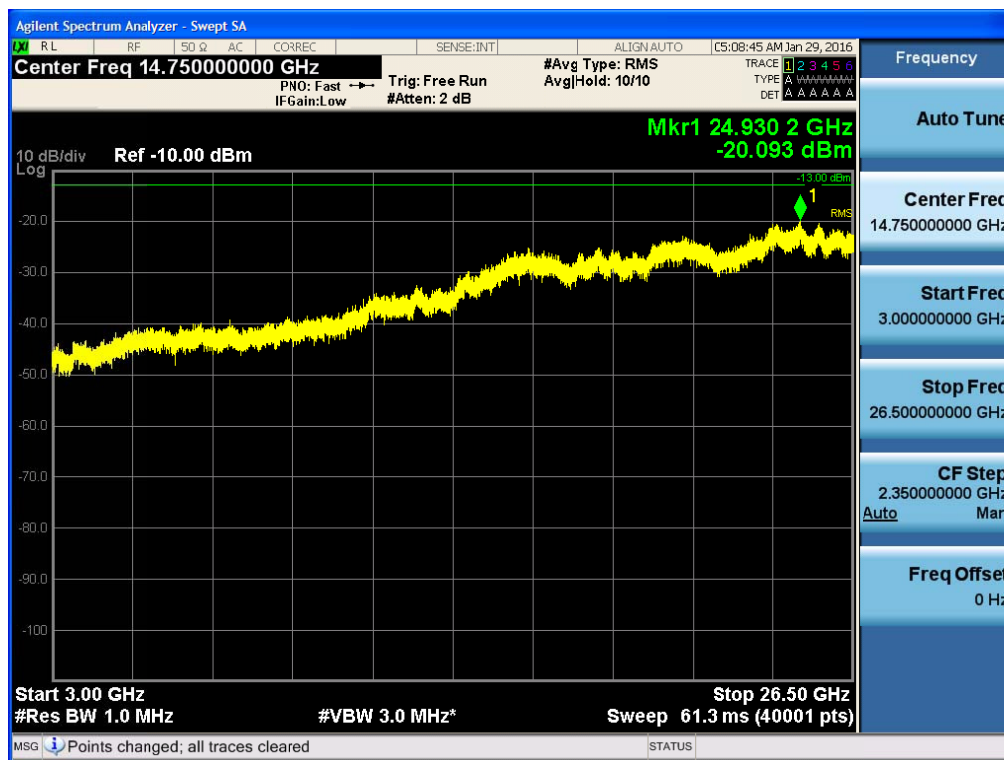
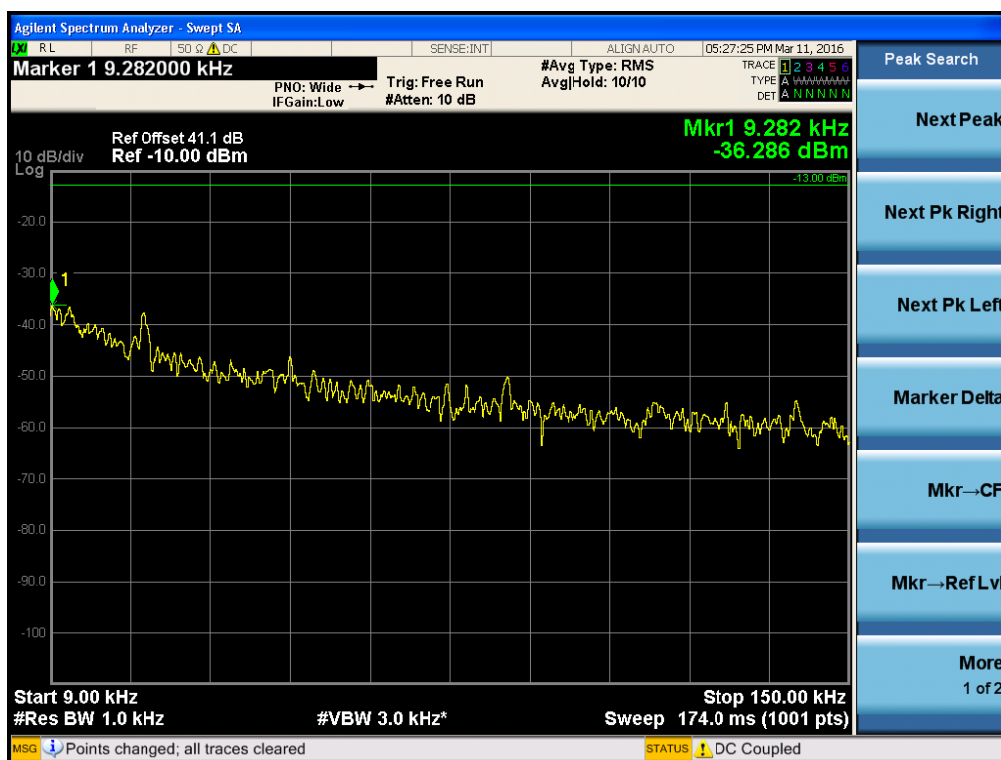


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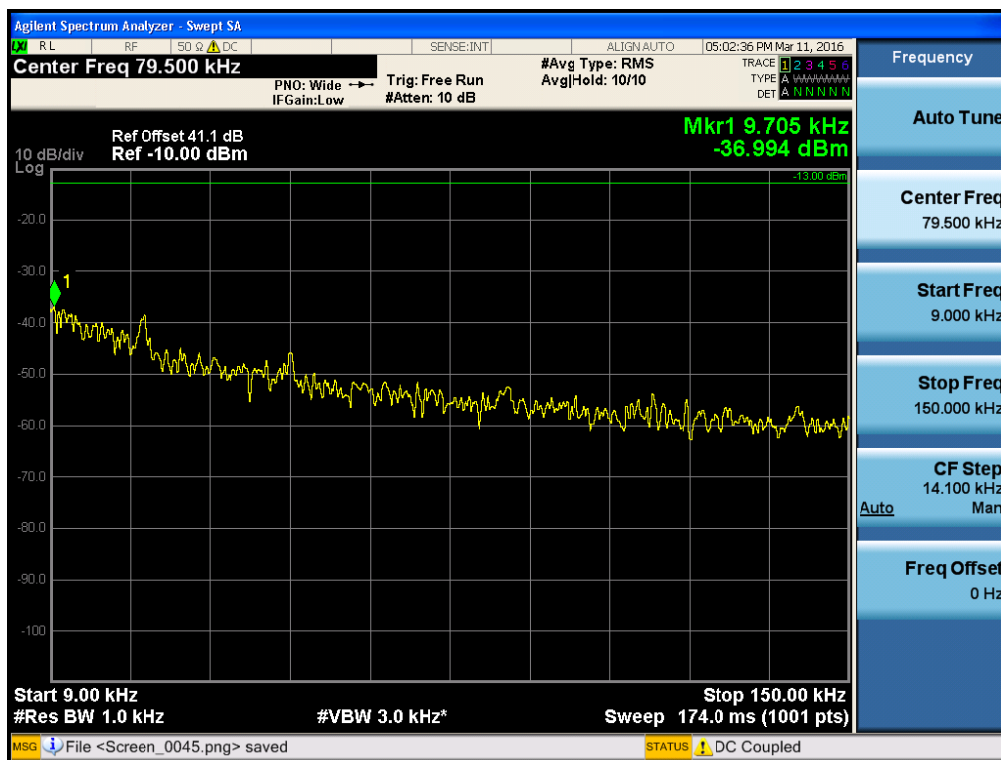


Multi channel Enhancer Plots of Spurious Emission for IC_1900 PCS BAND Conducted Spurious Emissions (9 kHz – 150 kHz)

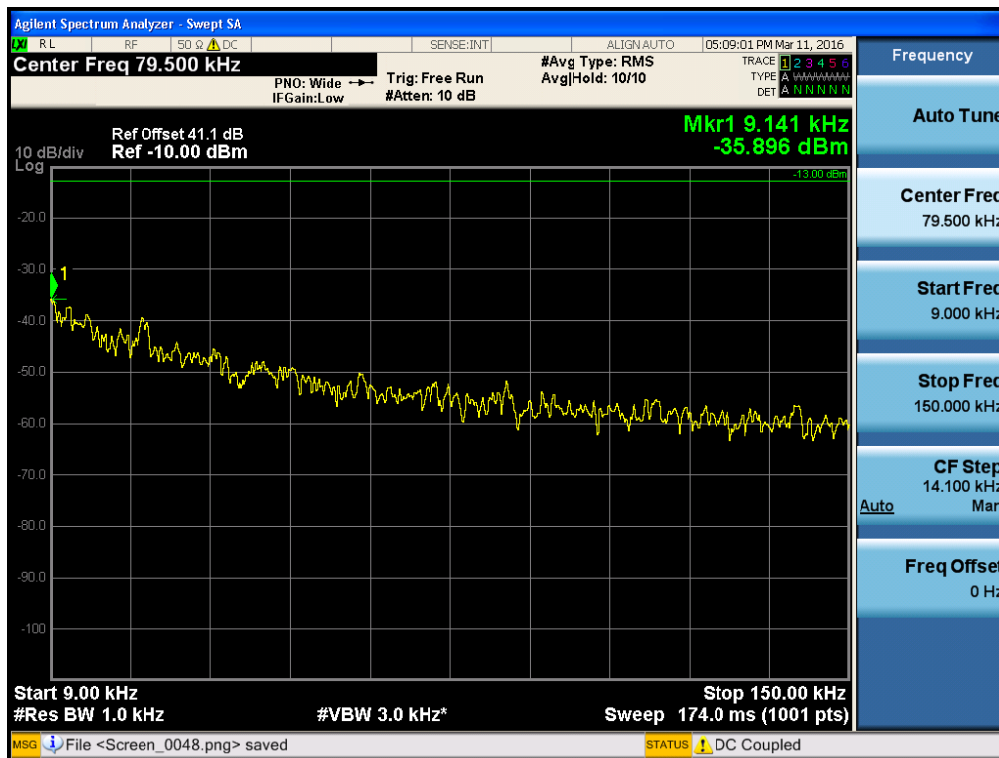
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[Downlink Middle]

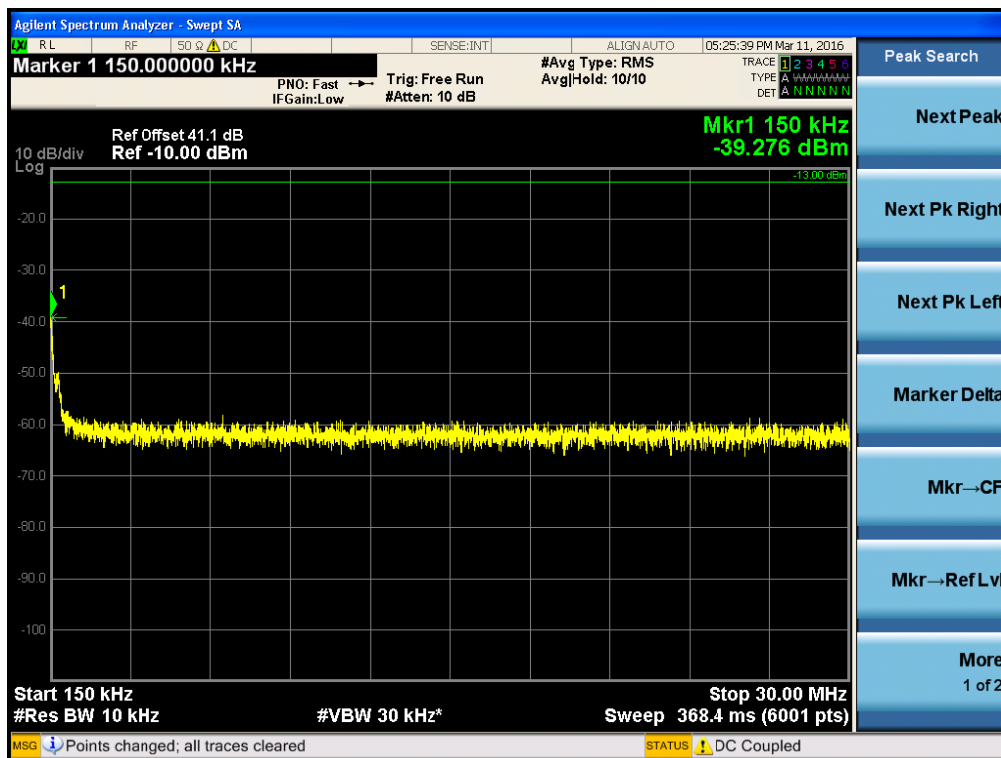


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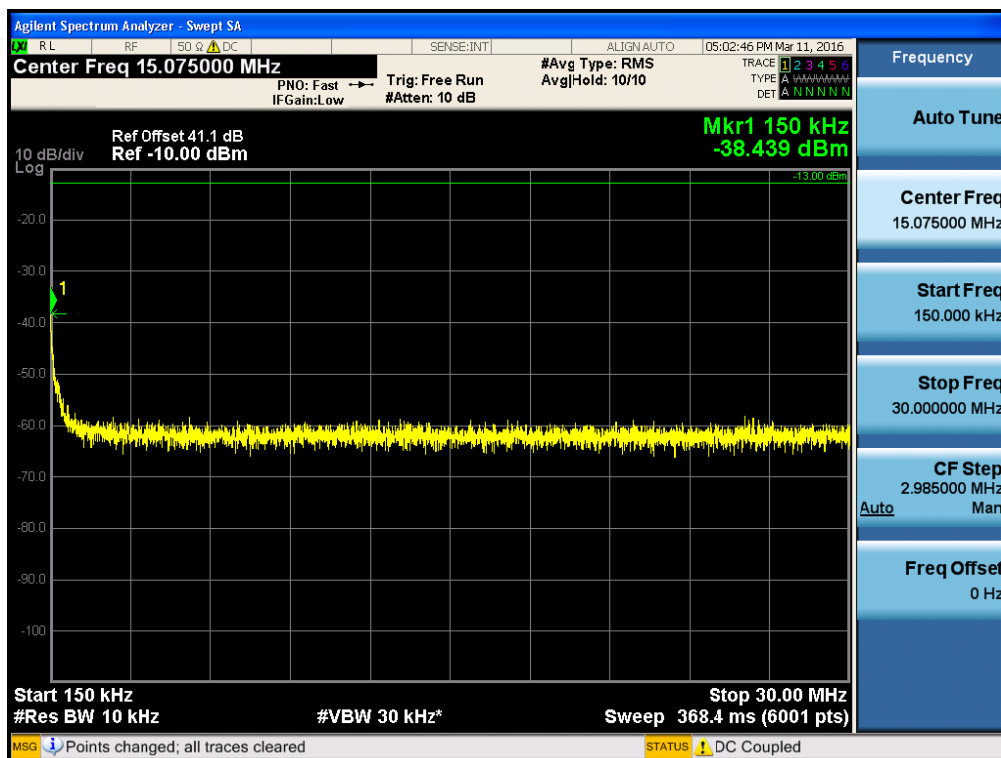


Conducted Spurious Emissions (150 kHz – 30 MHz)

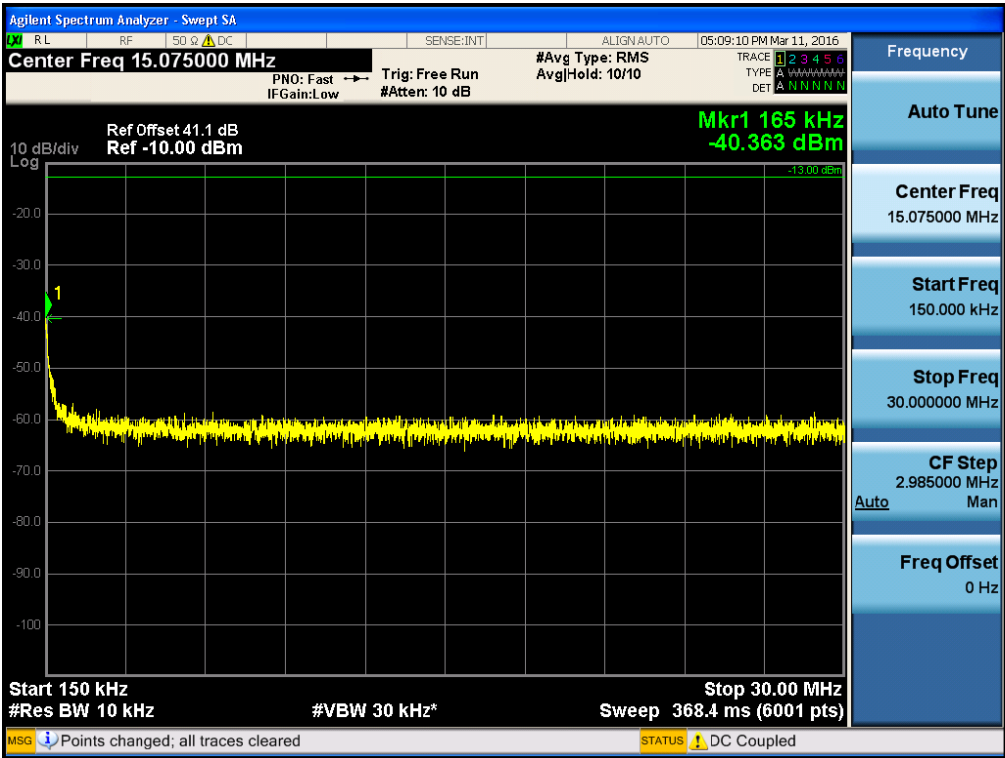
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[Downlink Middle]

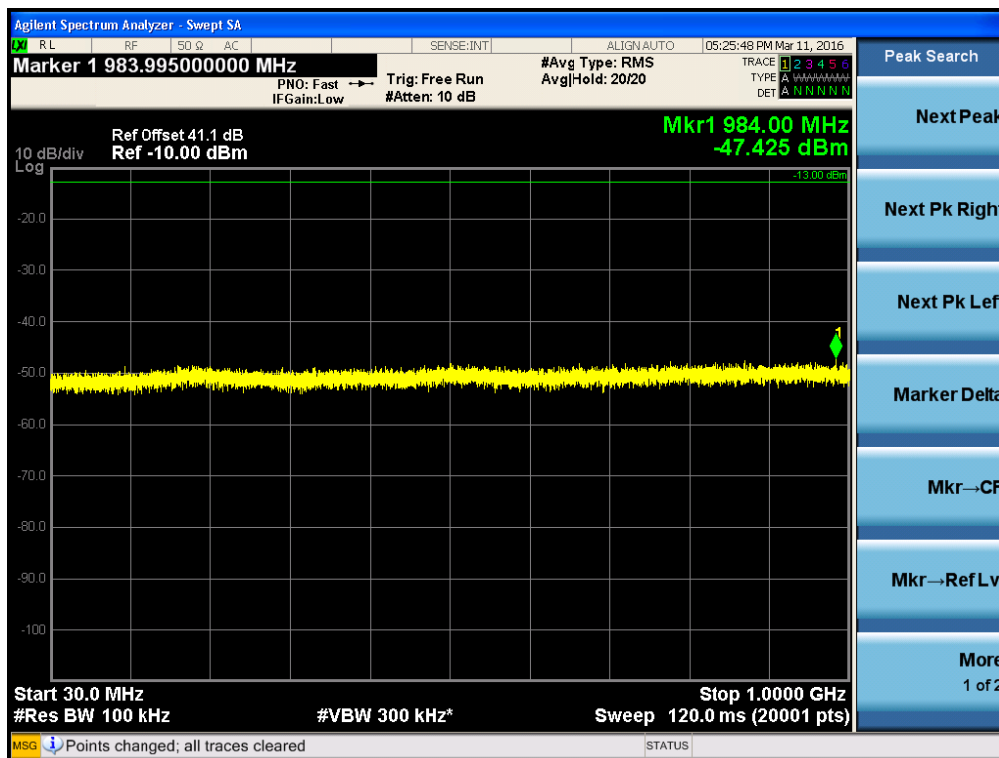


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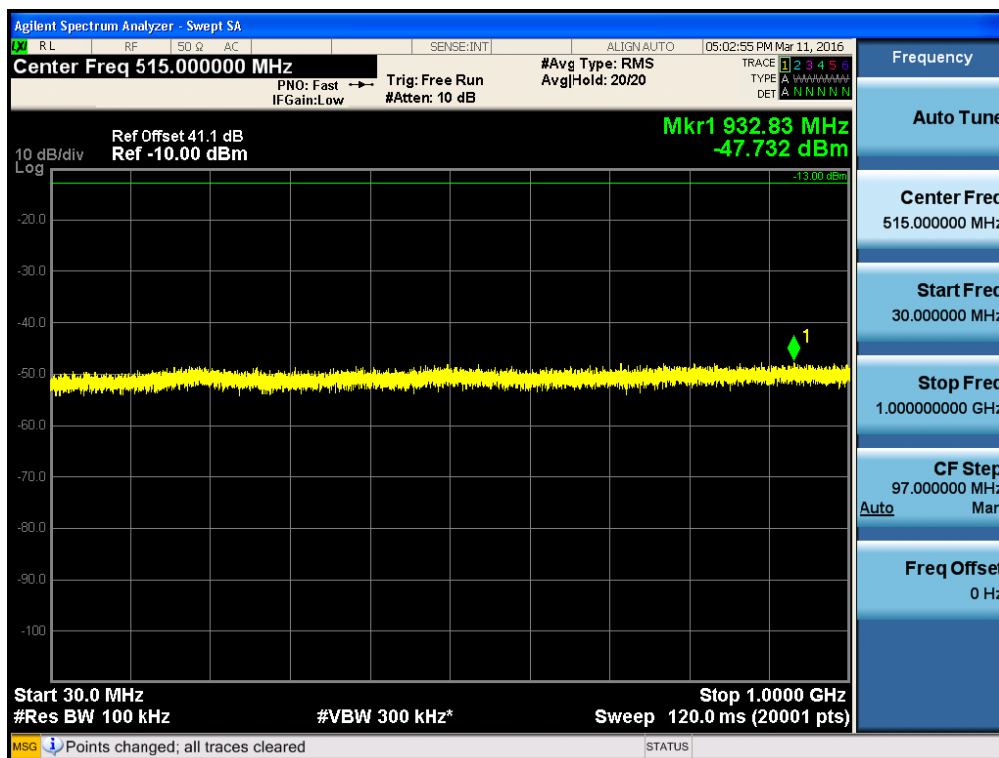


Conducted Spurious Emissions (30 MHz – 1 GHz)

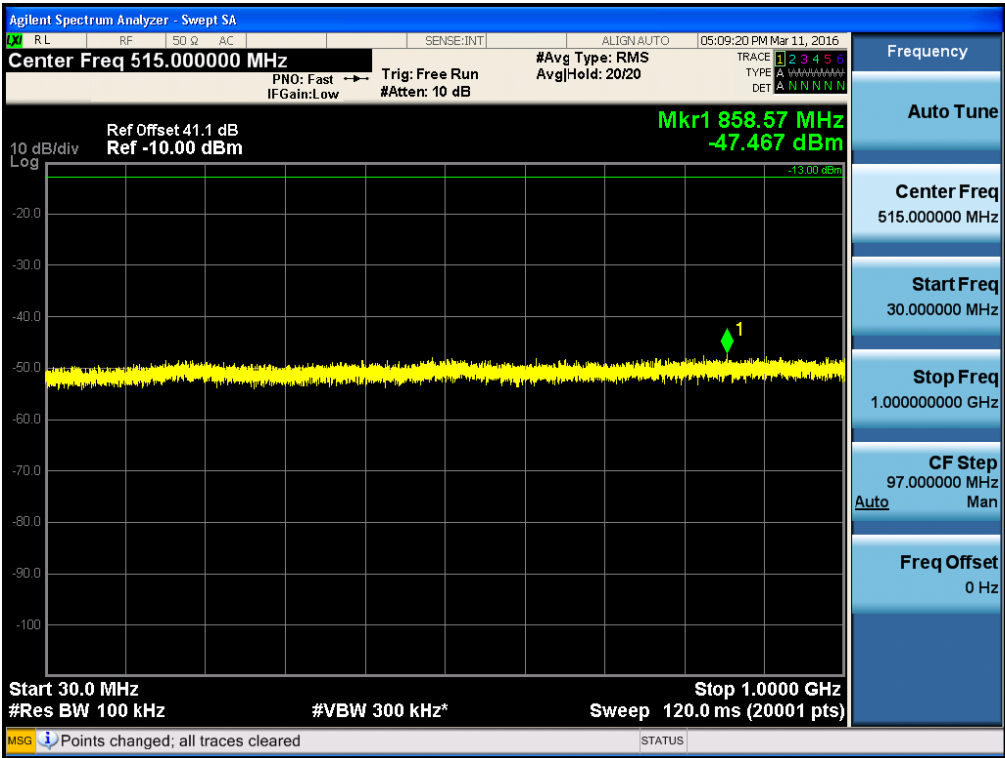
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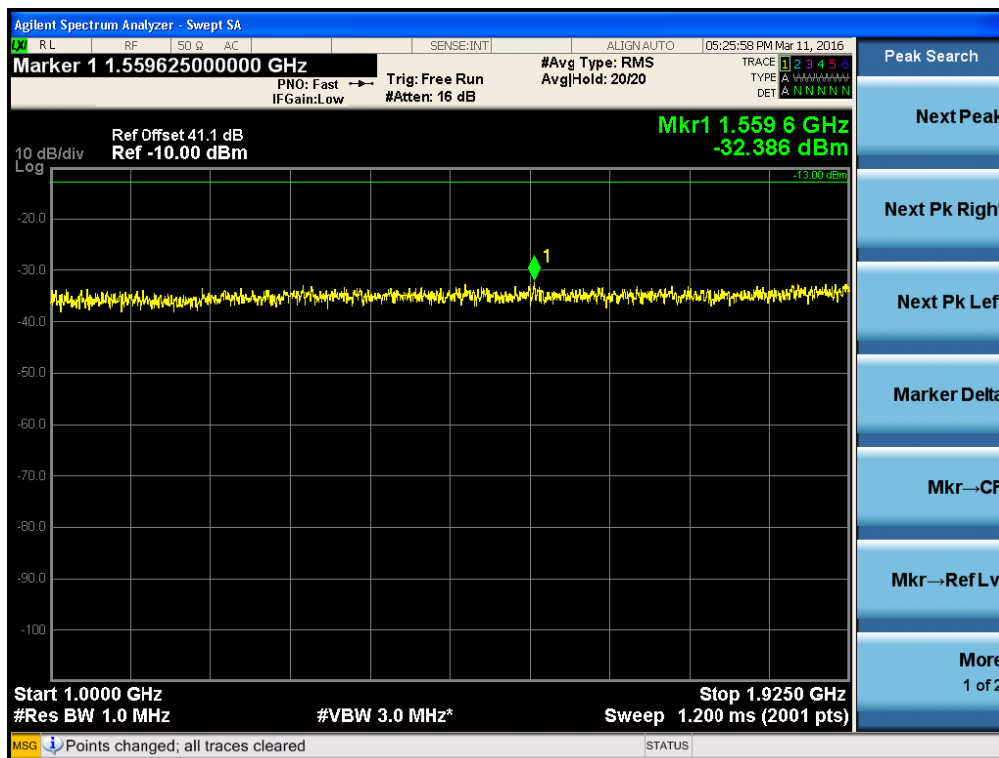


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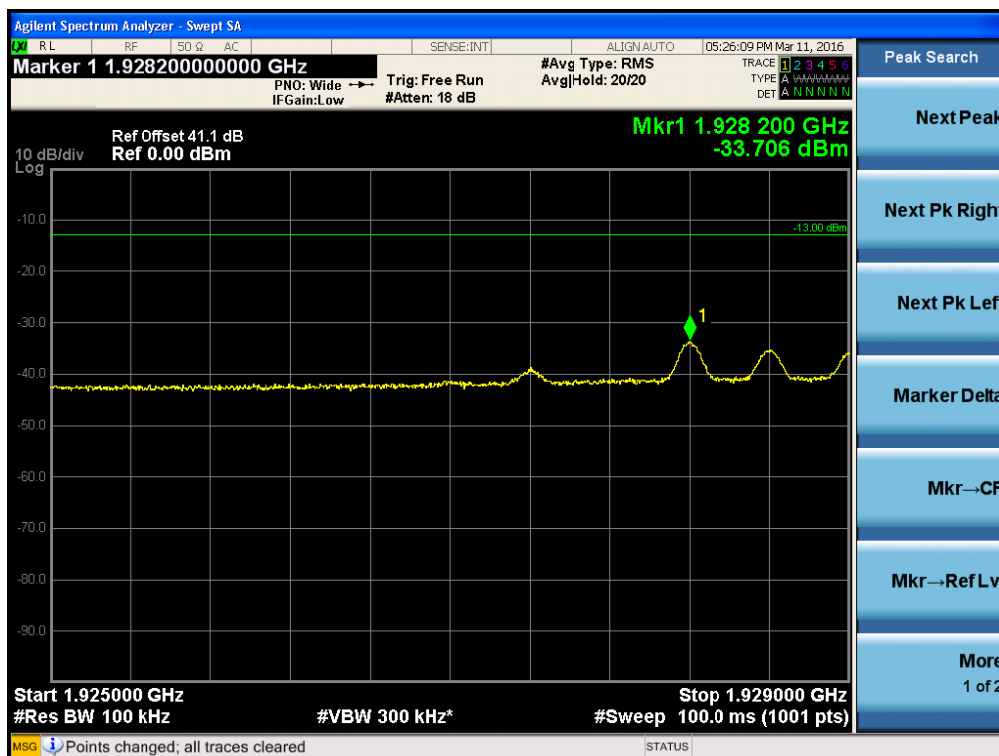


Conducted Spurious Emissions (1 GHz –26.5 GHz)

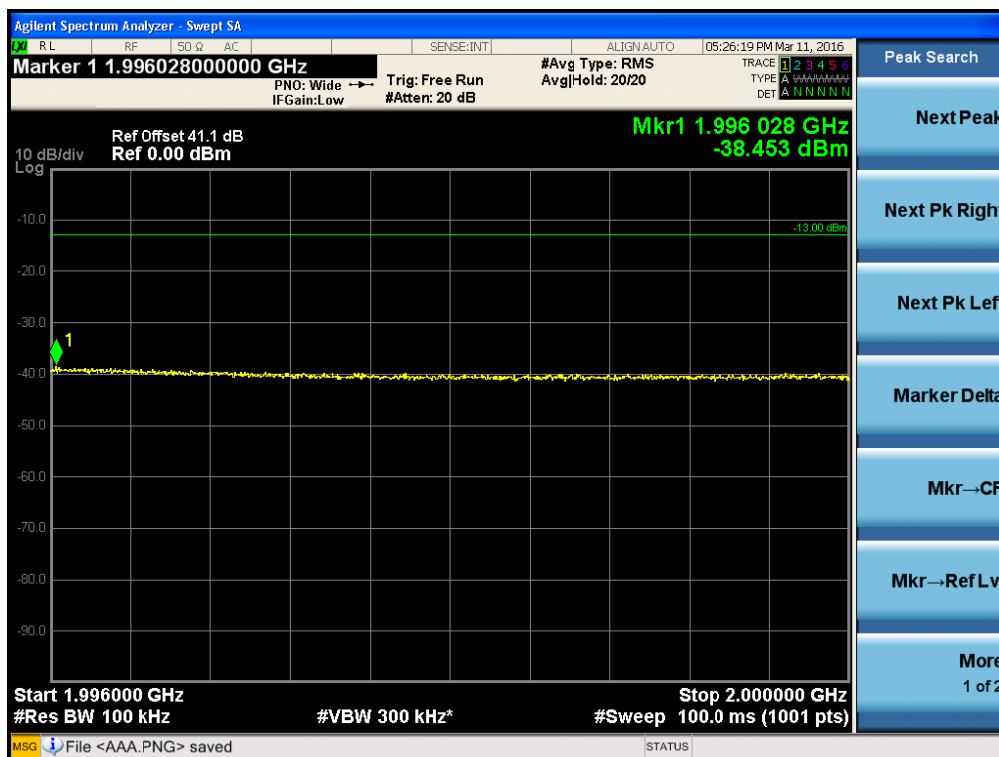
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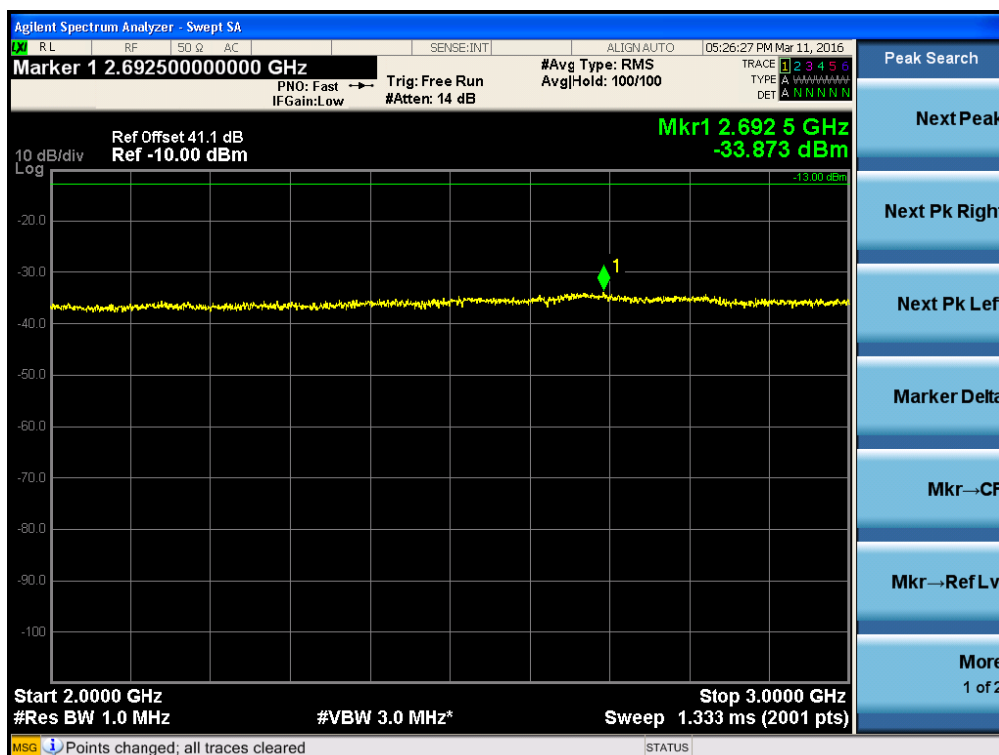
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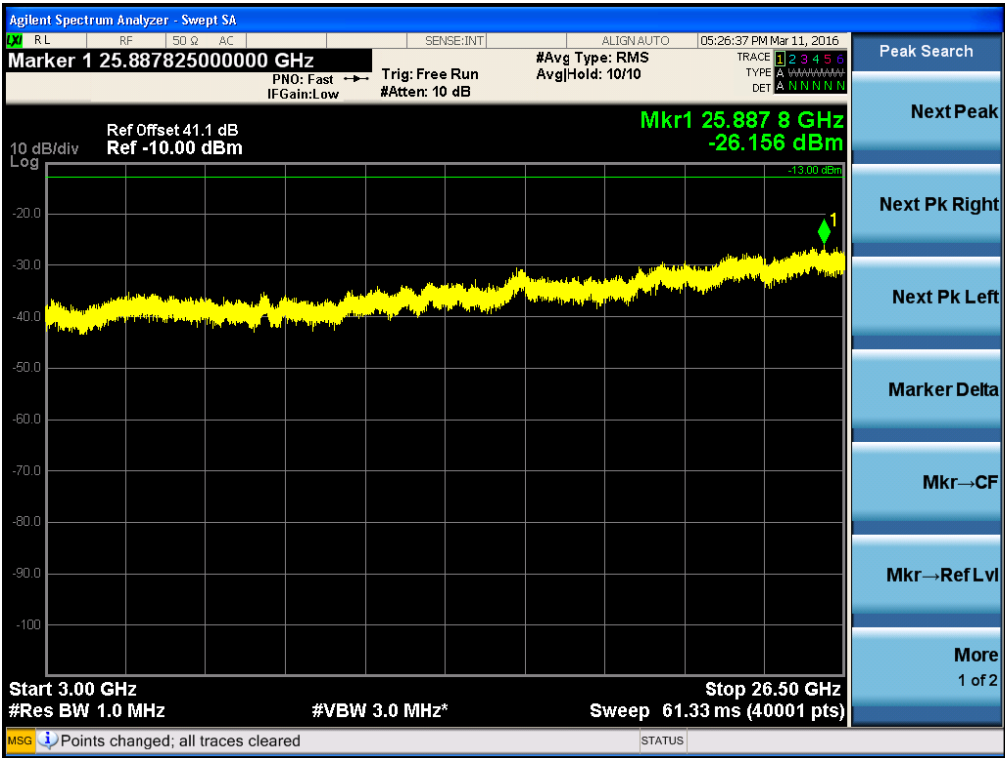
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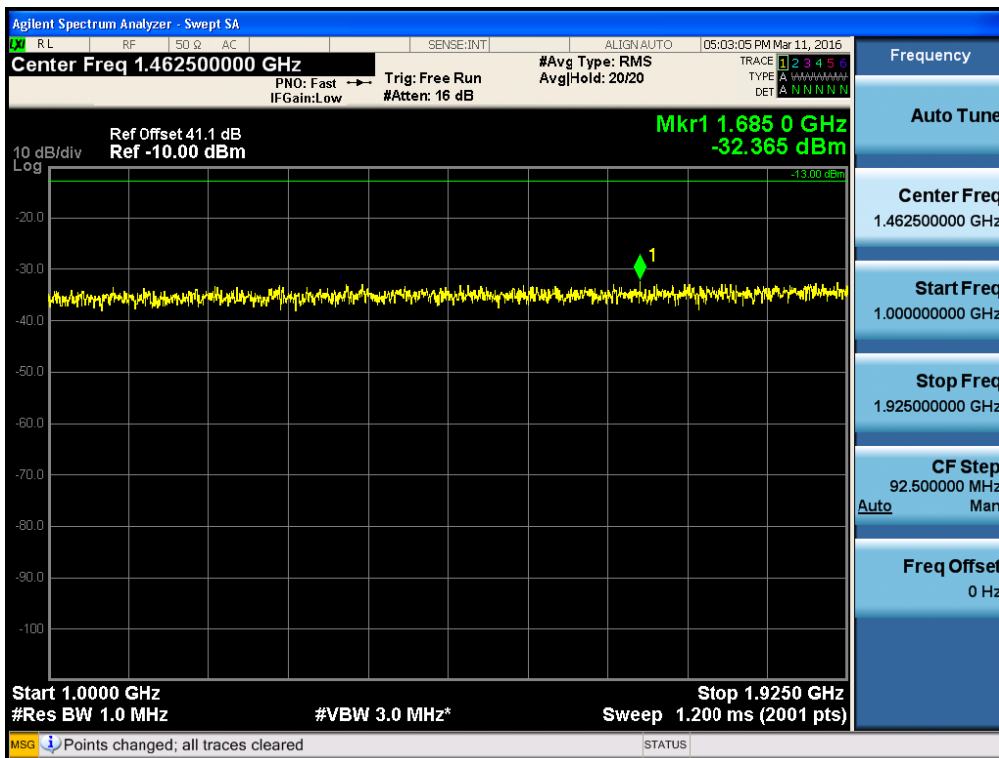
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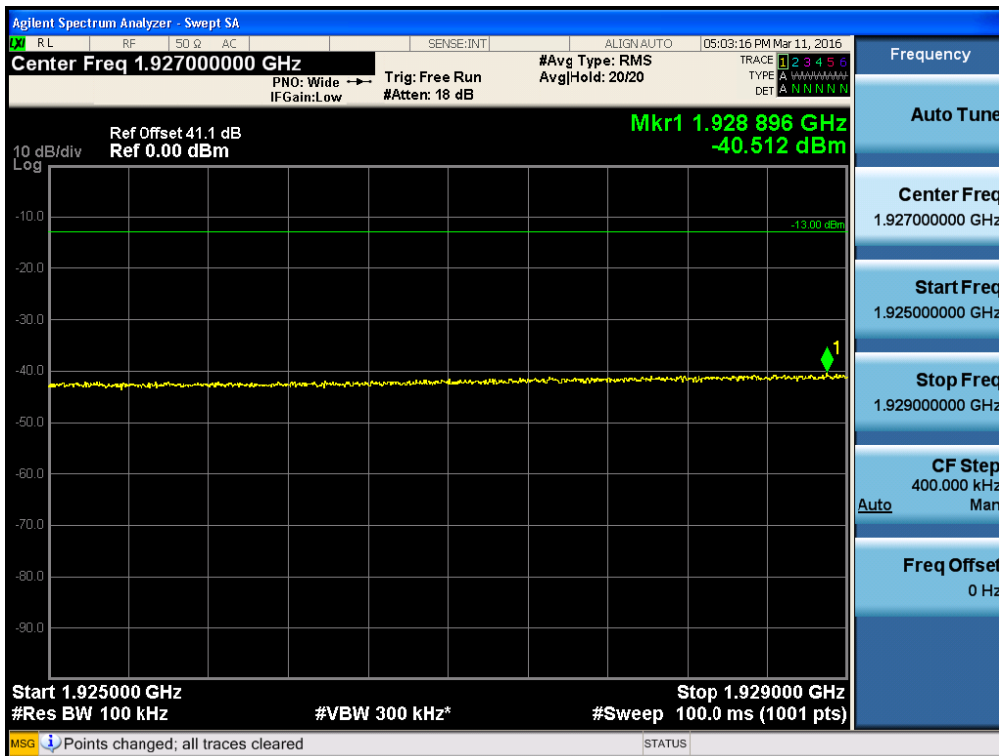
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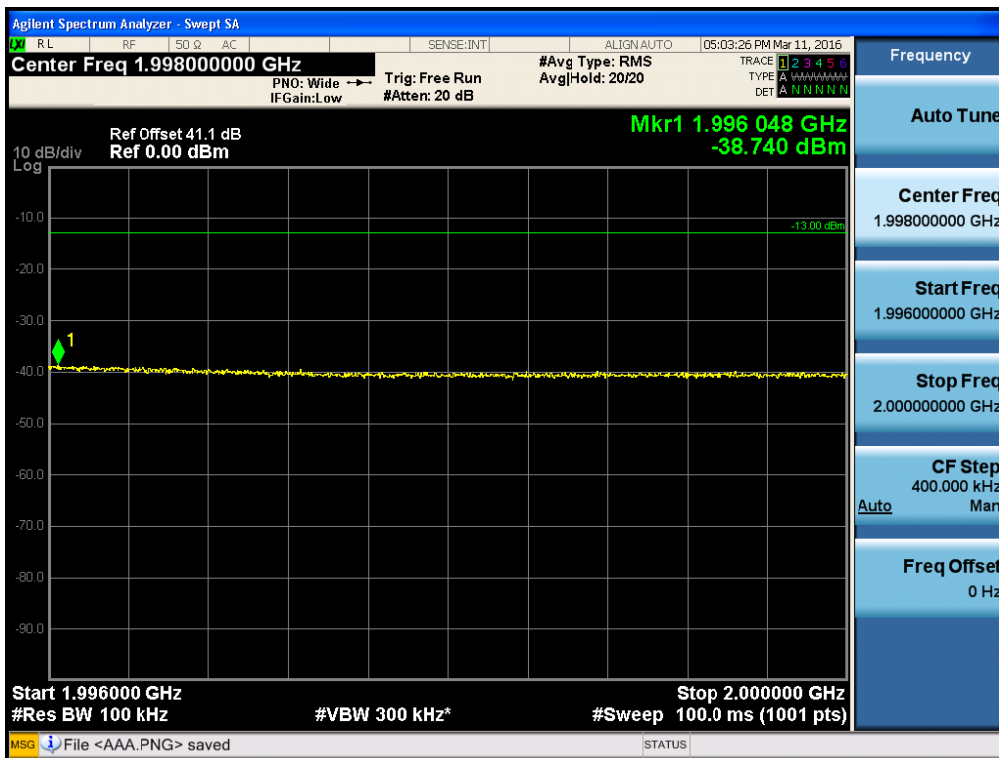
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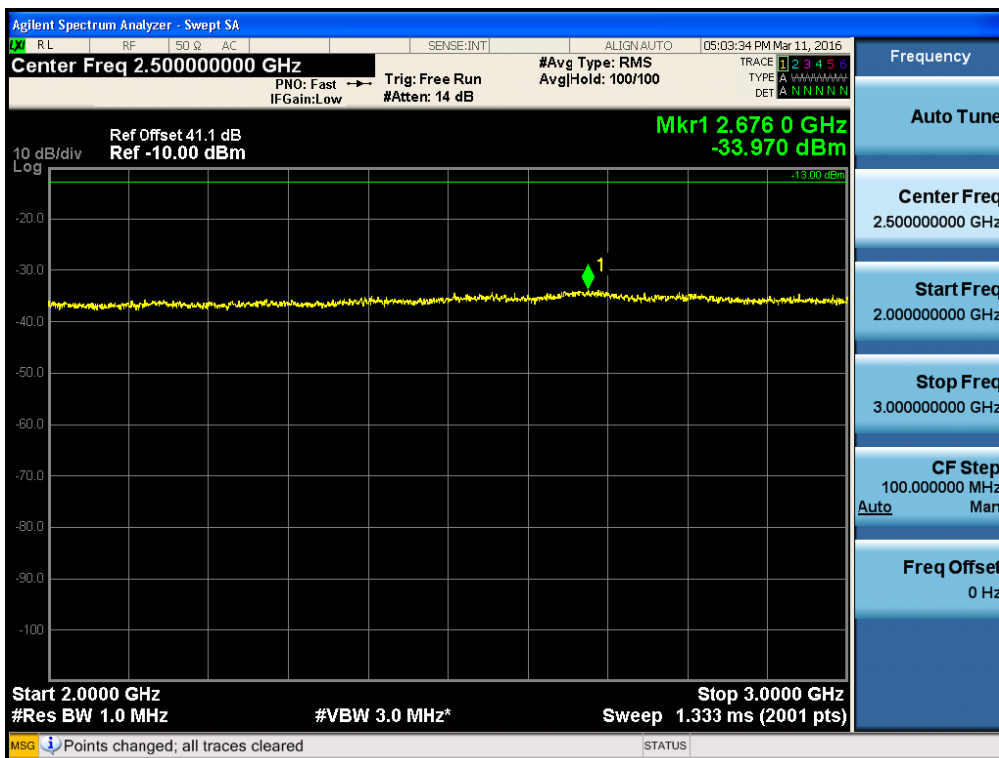
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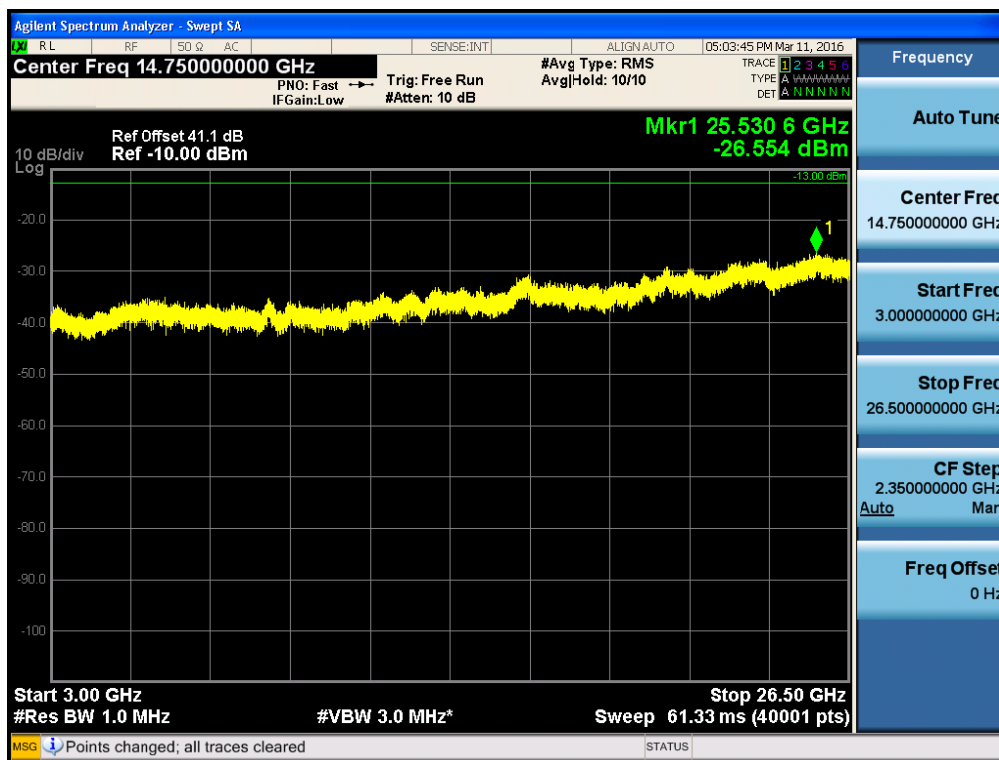
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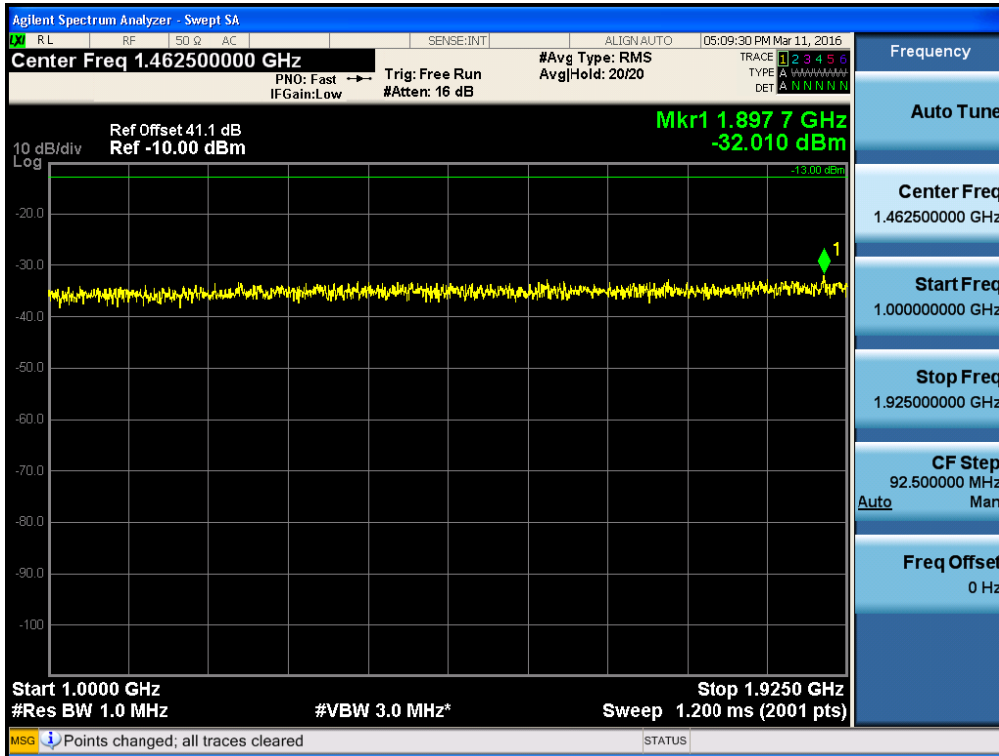
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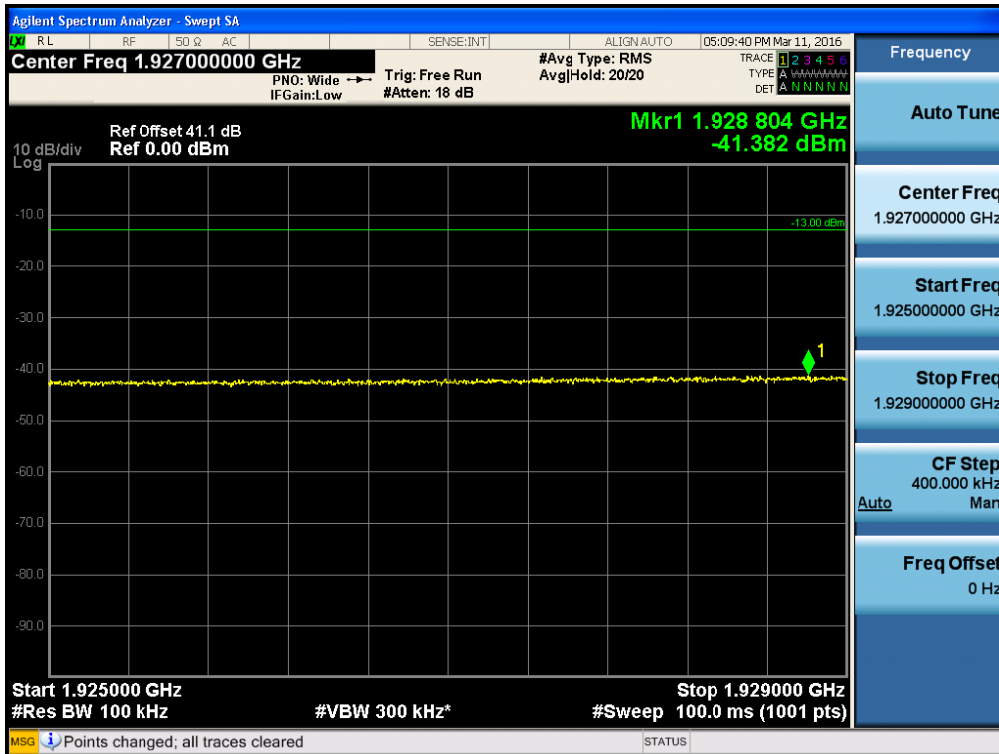
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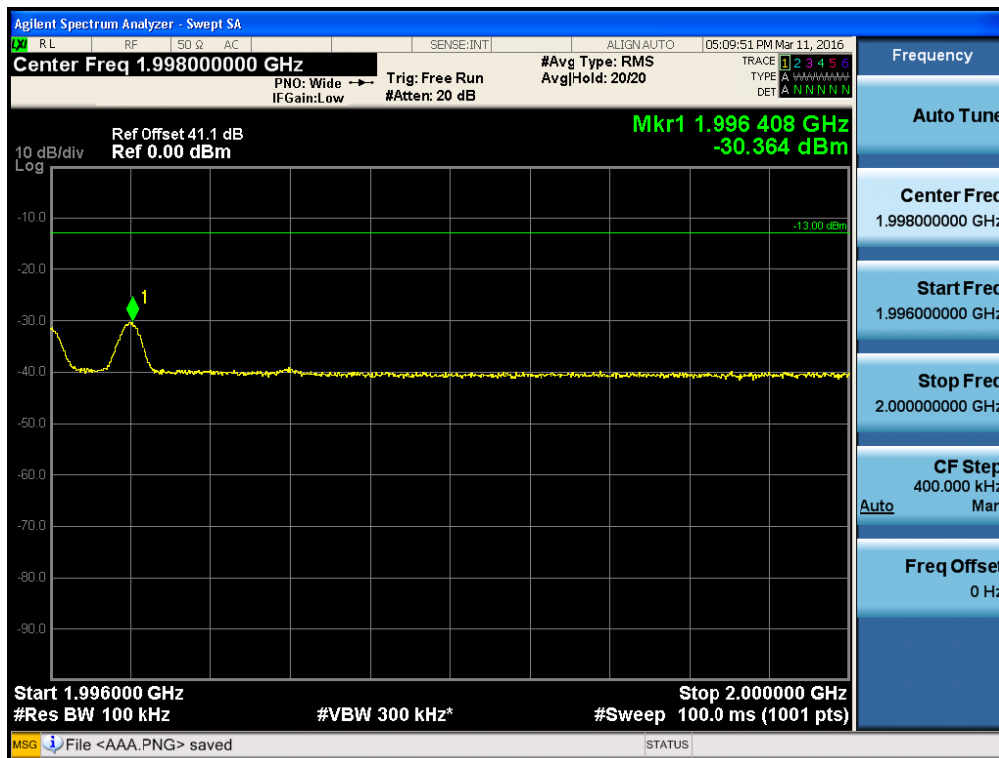
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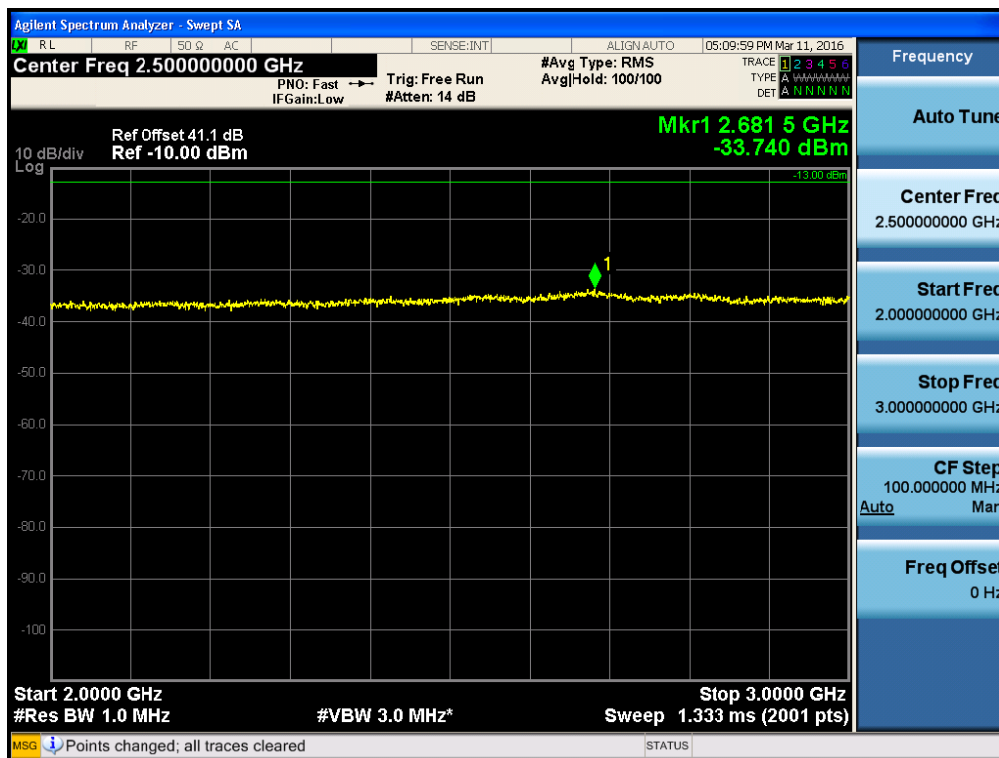
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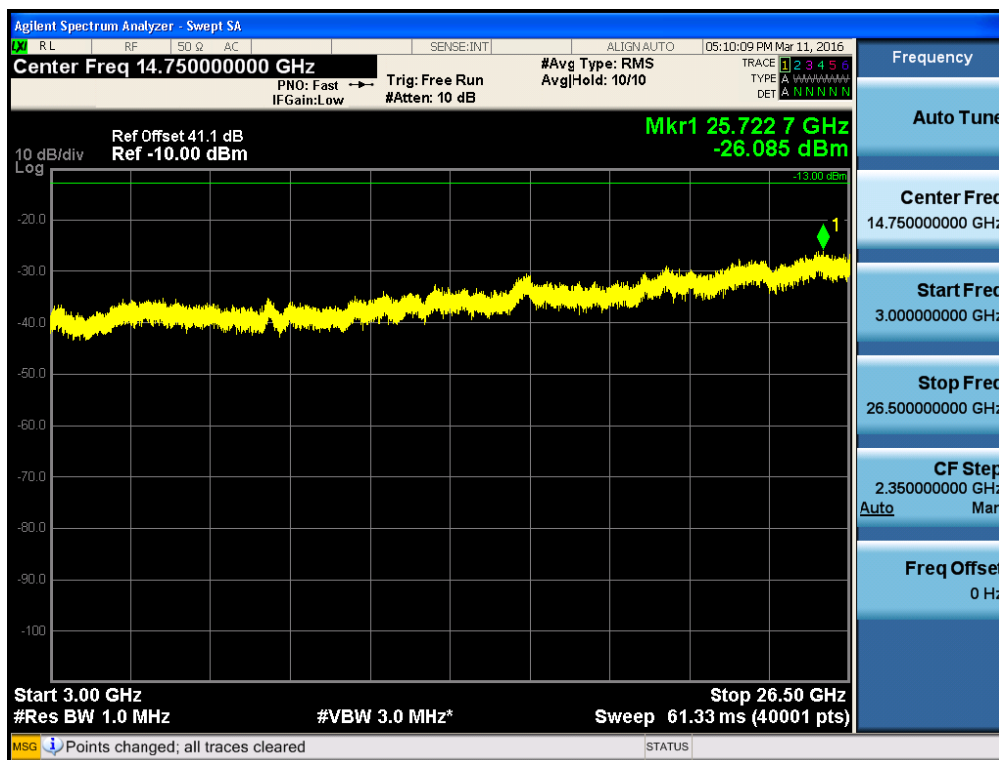
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[Downlink High]-4

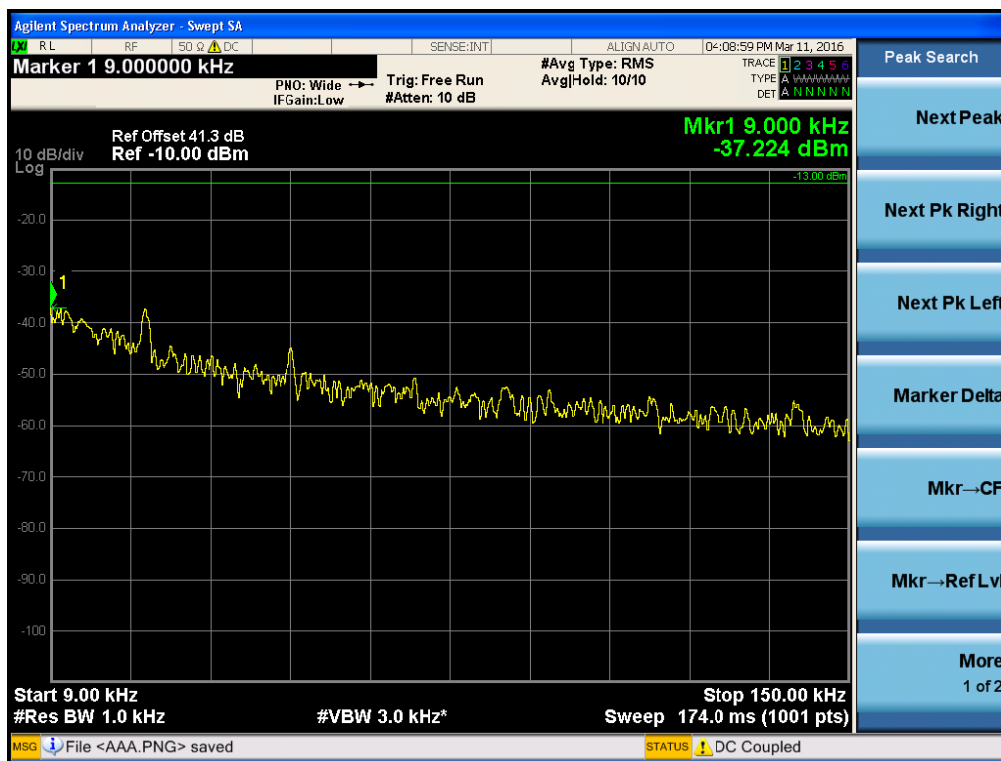


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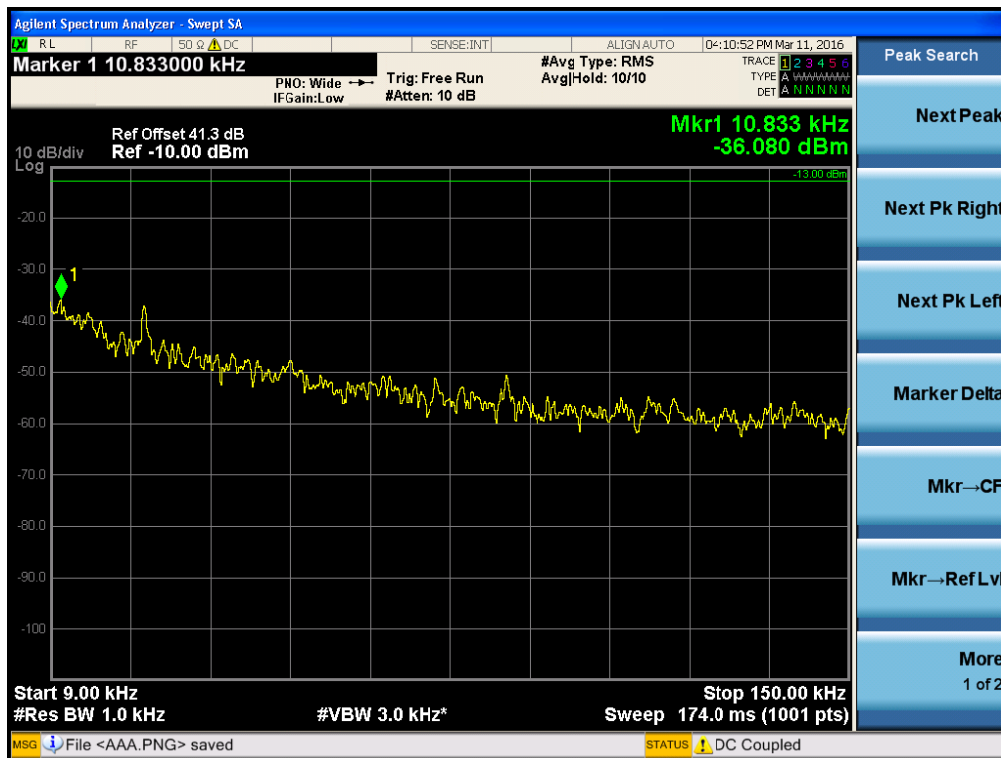


Multi channel Enhancer Plots of Spurious Emission for IC_AWSBAND Conducted Spurious Emissions (9 kHz – 150 kHz)

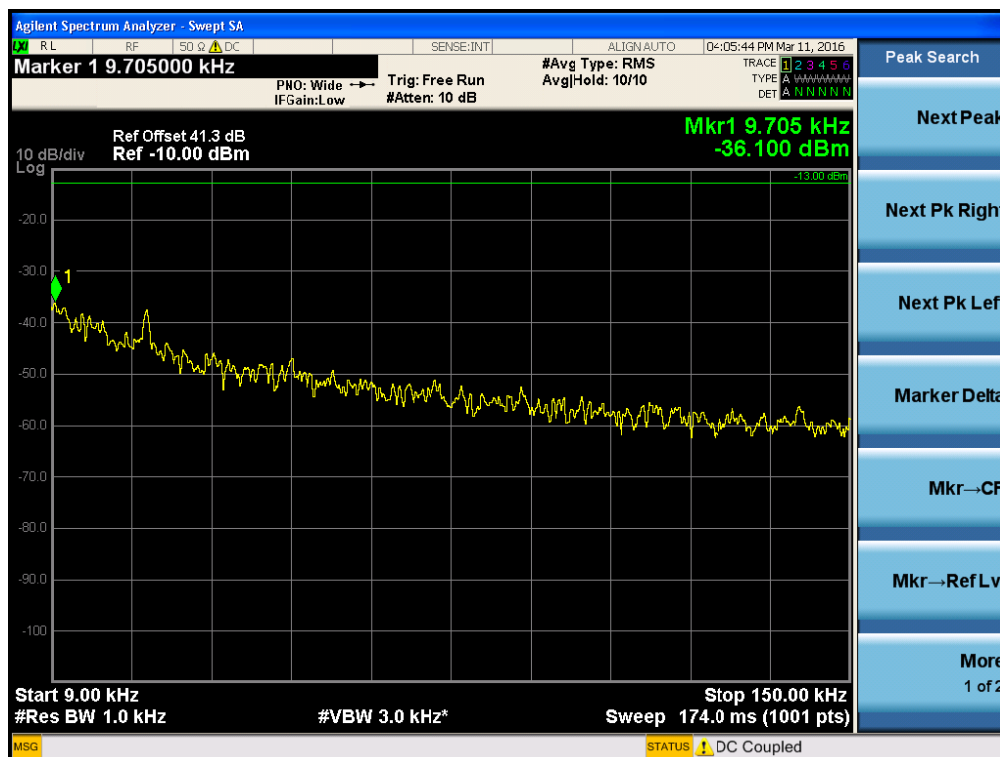
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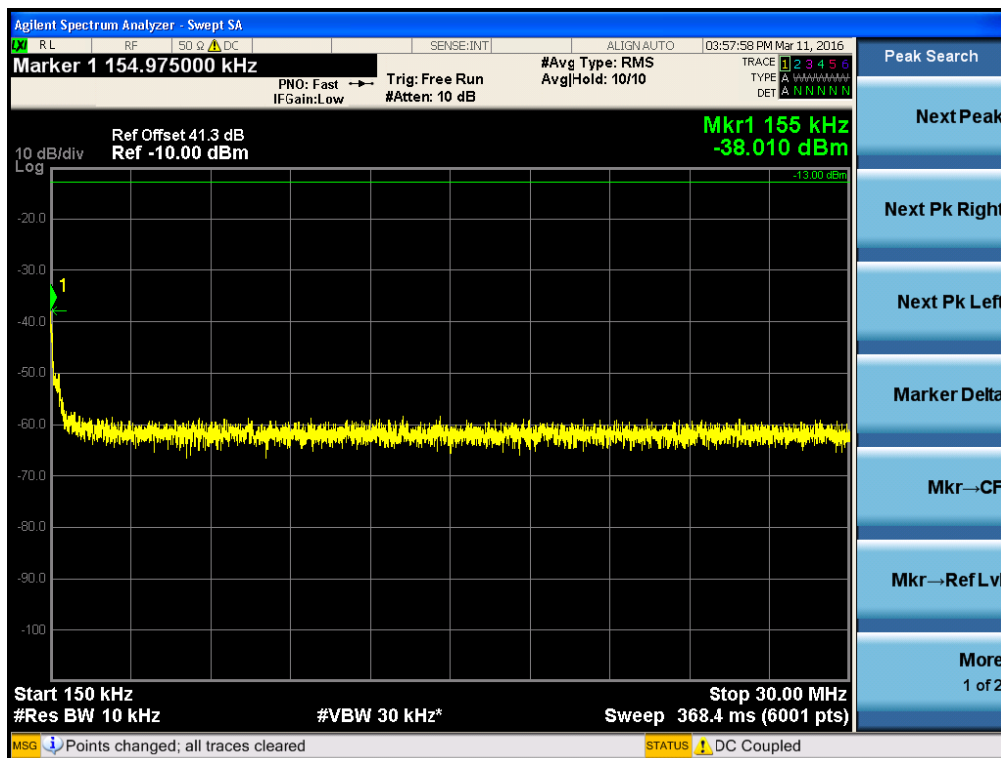


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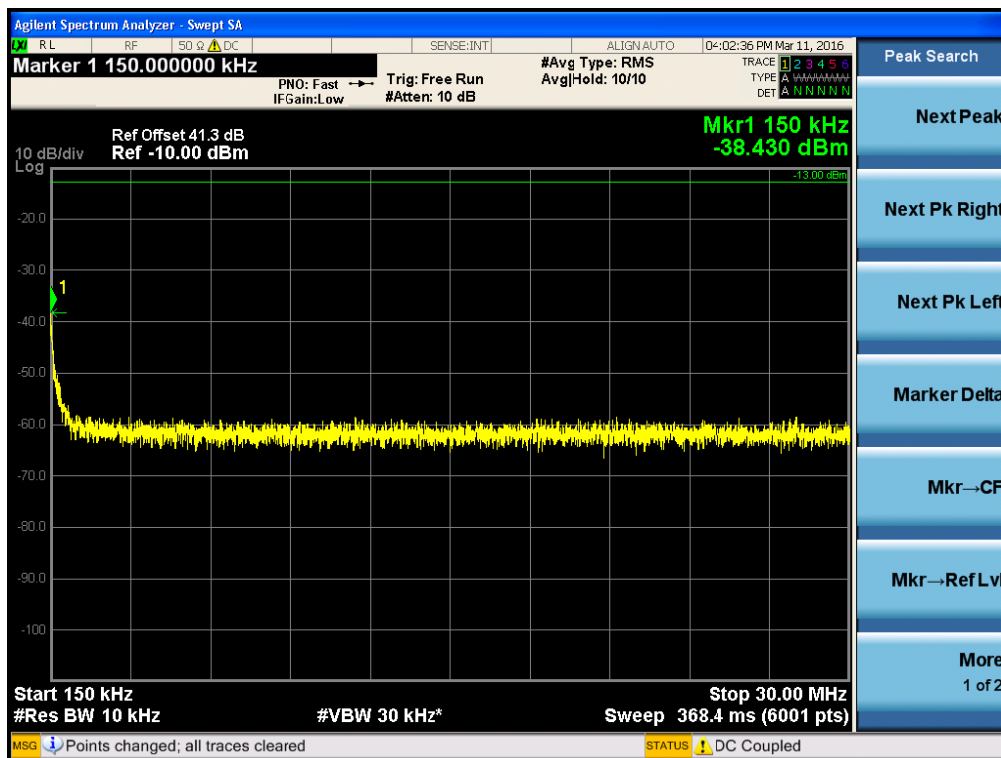


Conducted Spurious Emissions (150 kHz – 30 MHz)

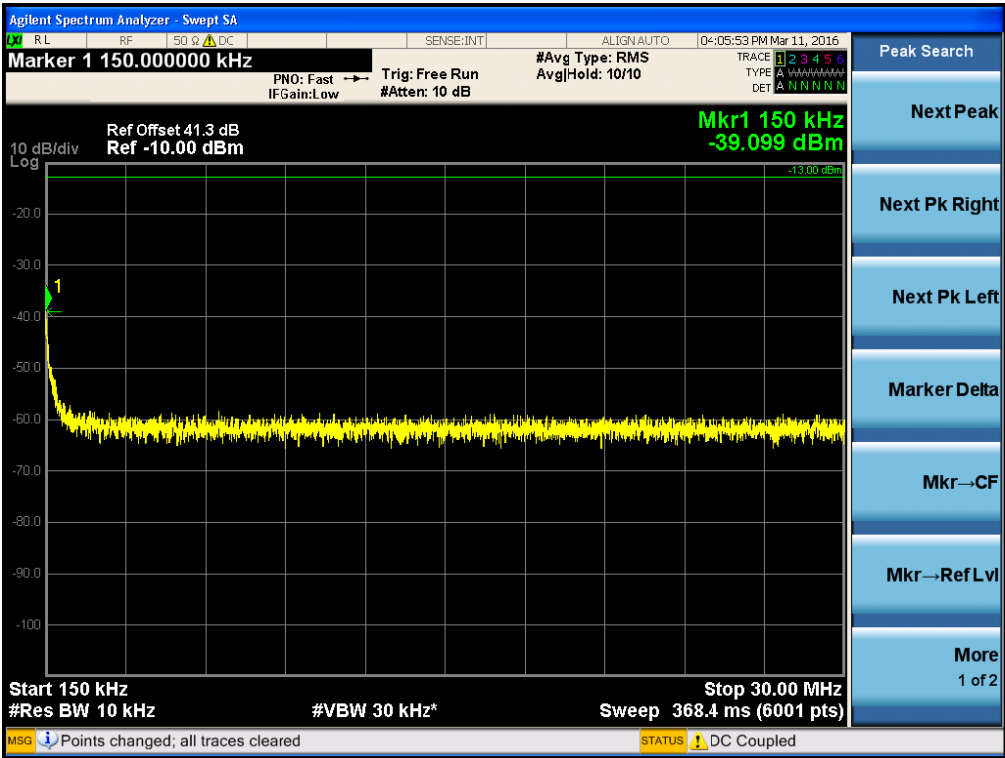
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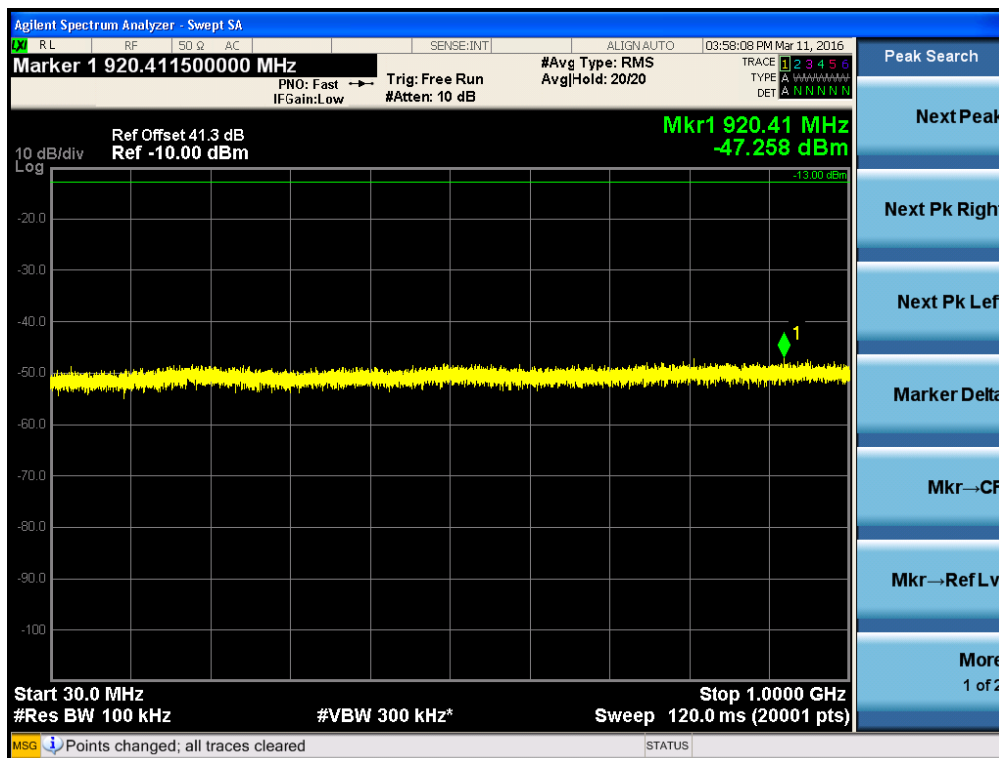


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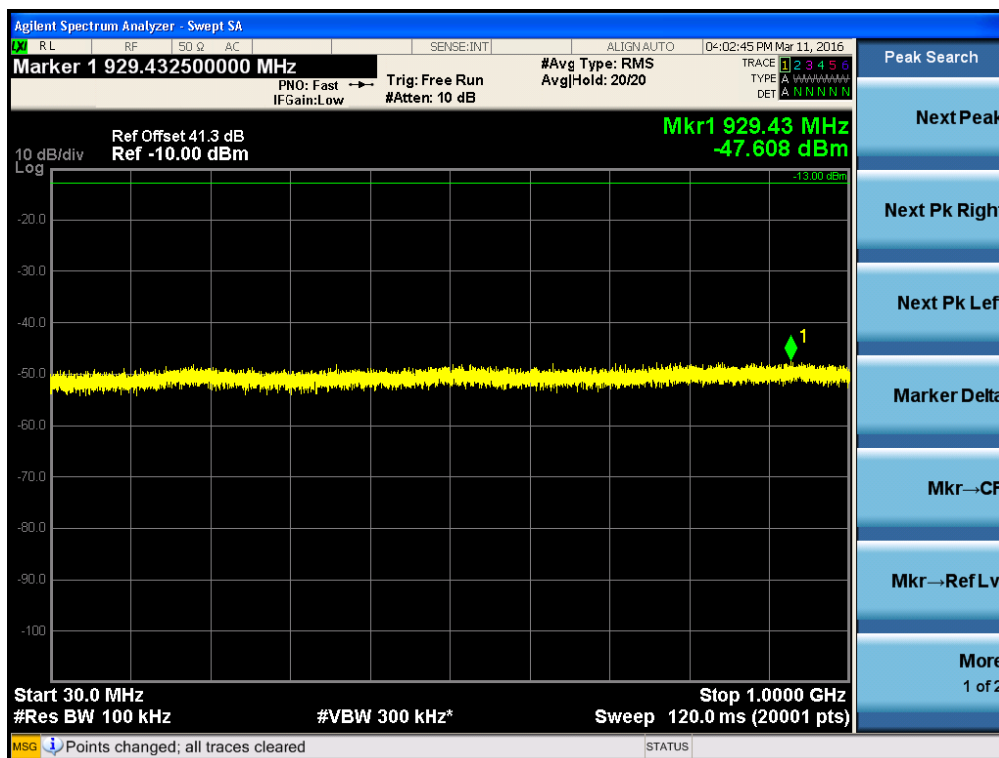


Conducted Spurious Emissions (30 MHz – 1 GHz)

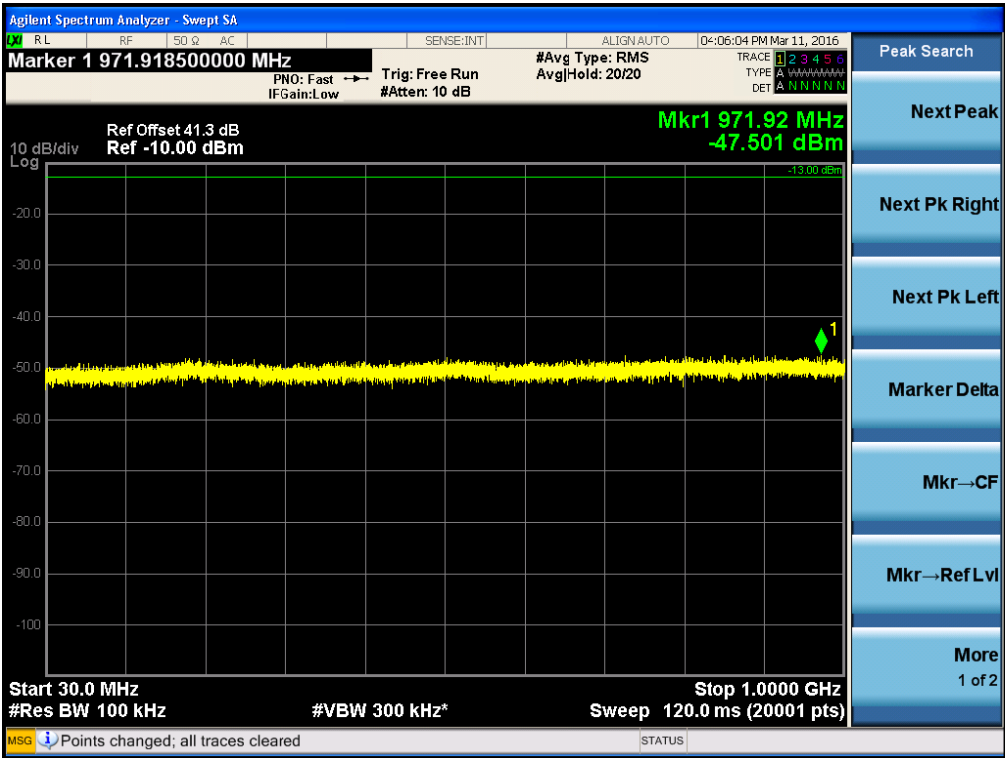
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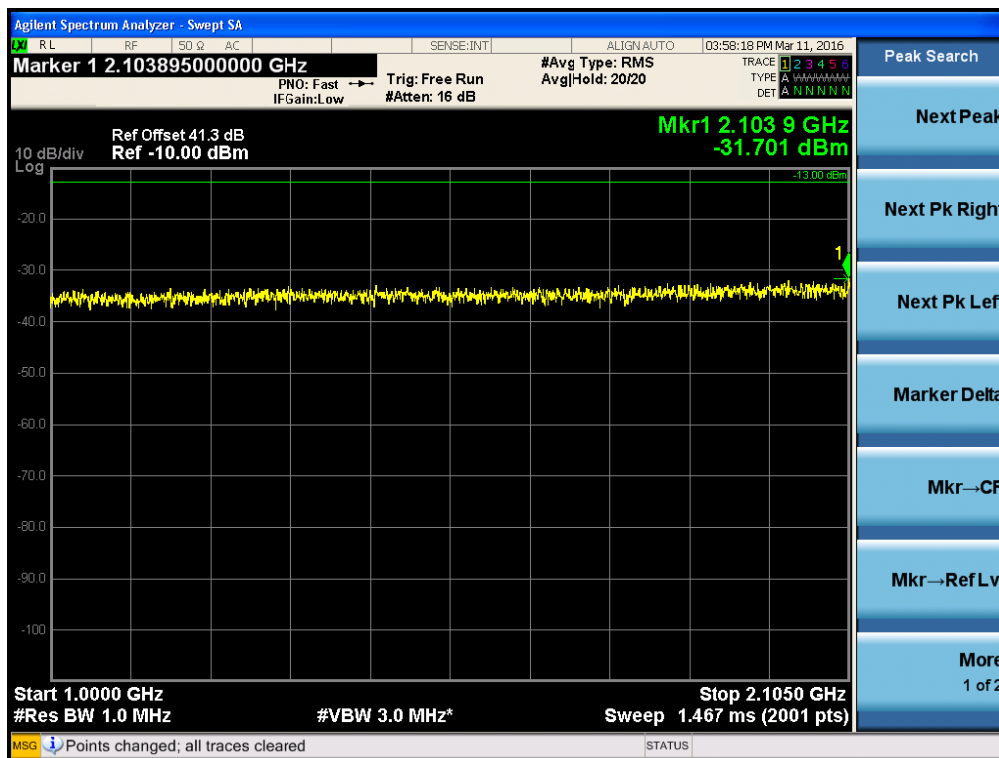


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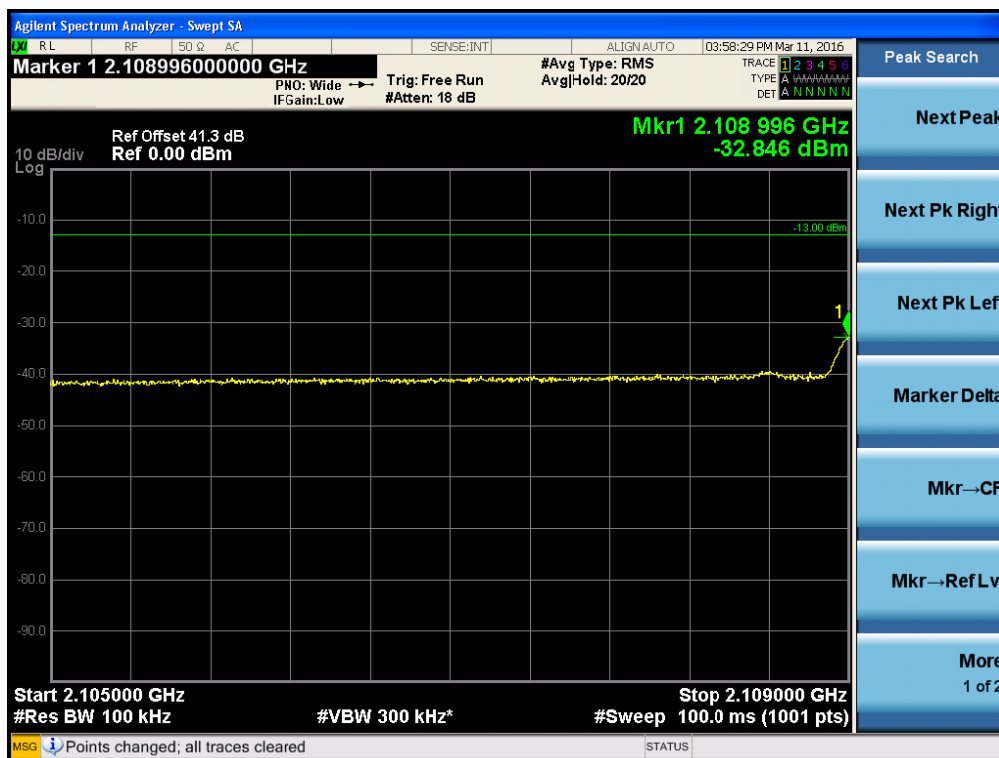


Conducted Spurious Emissions (1 GHz –26.5 GHz)

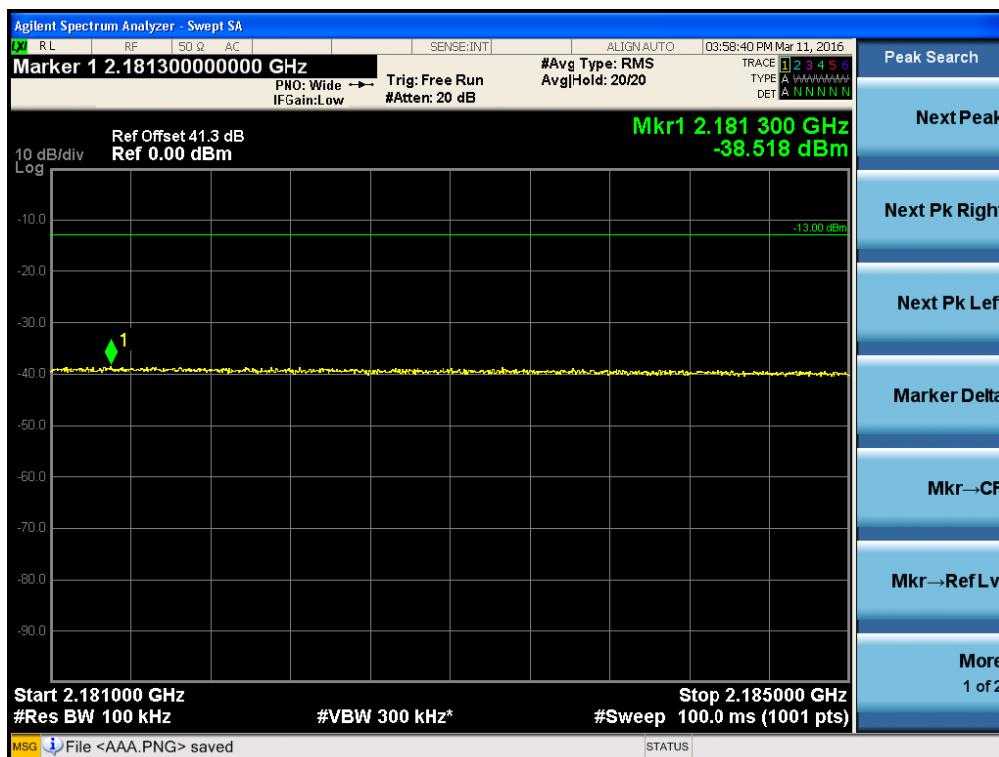
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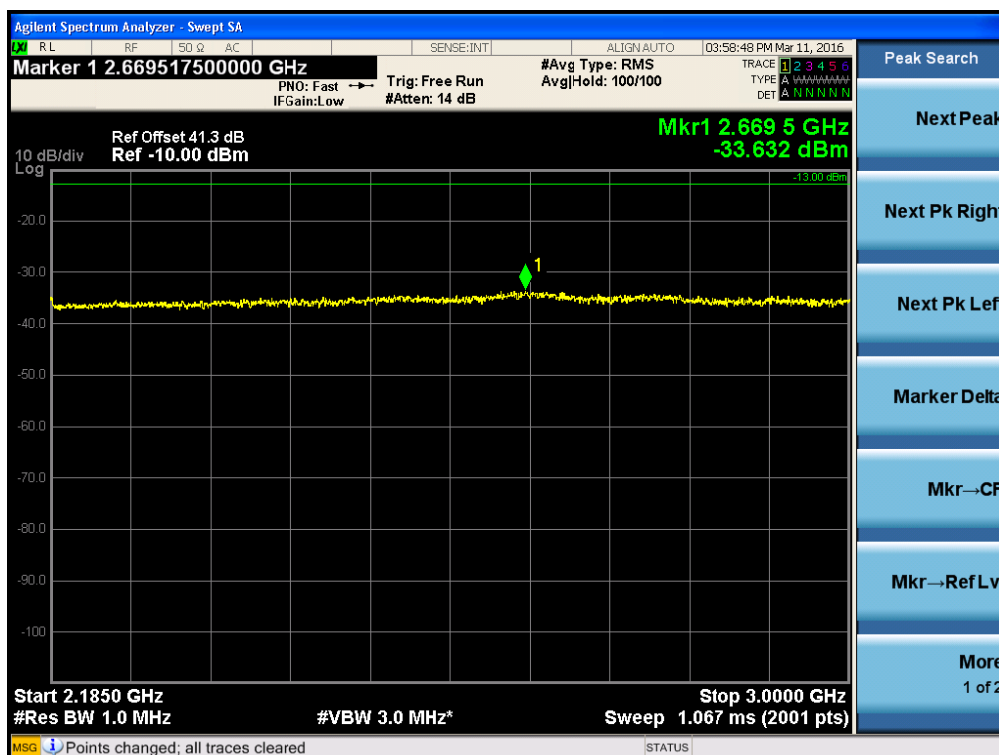
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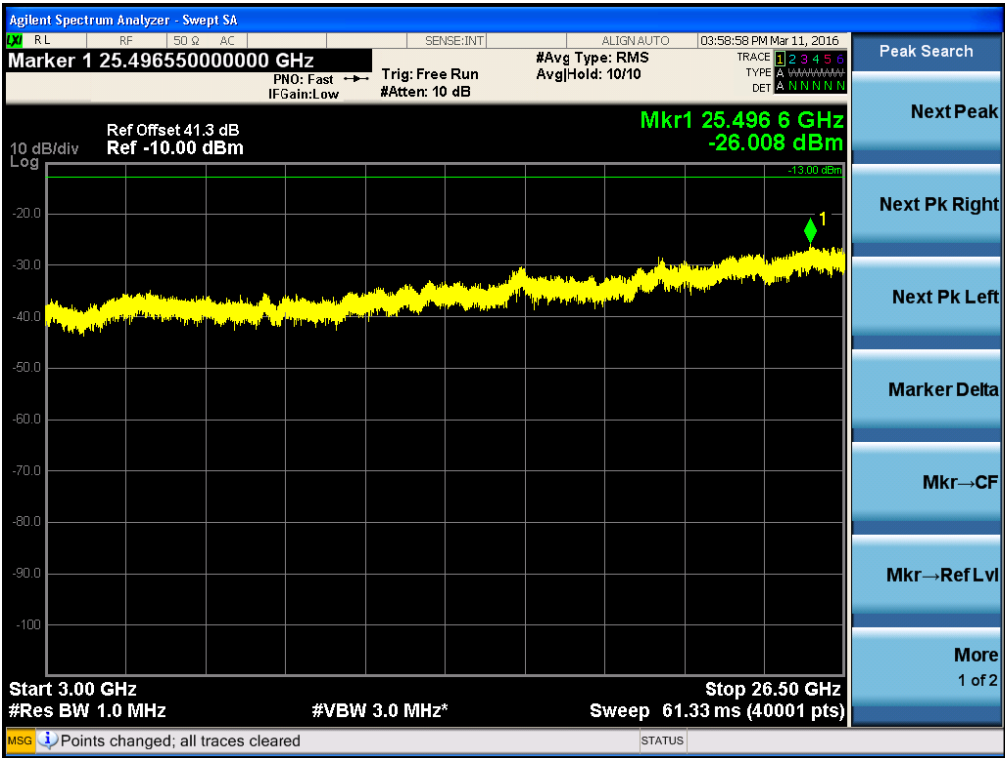
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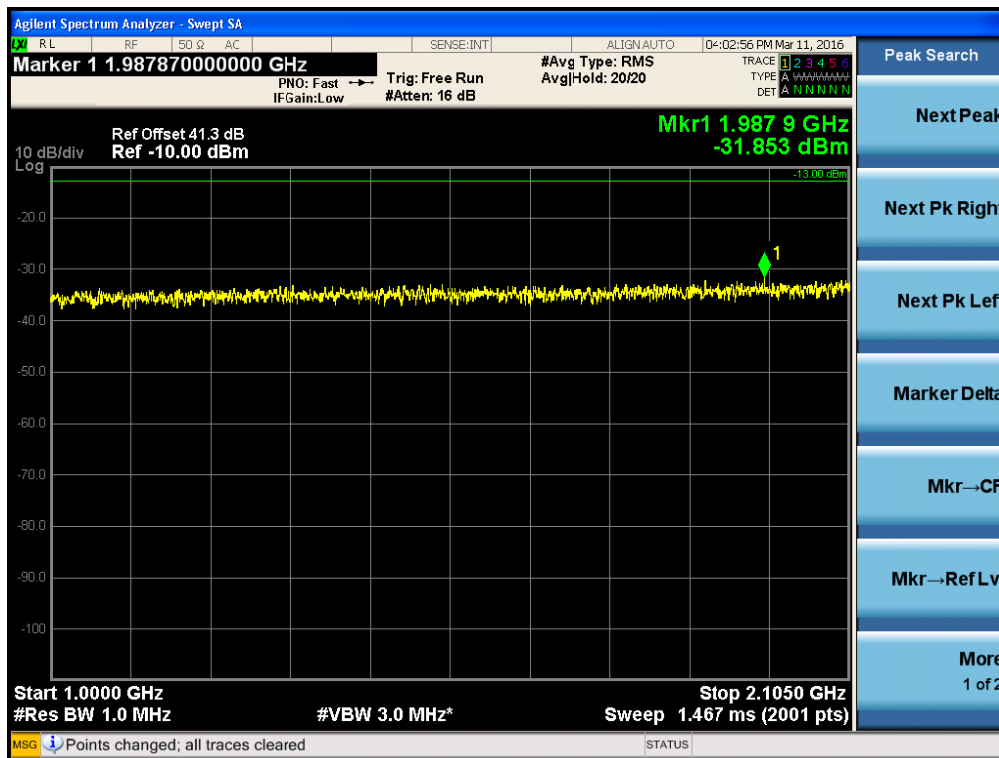
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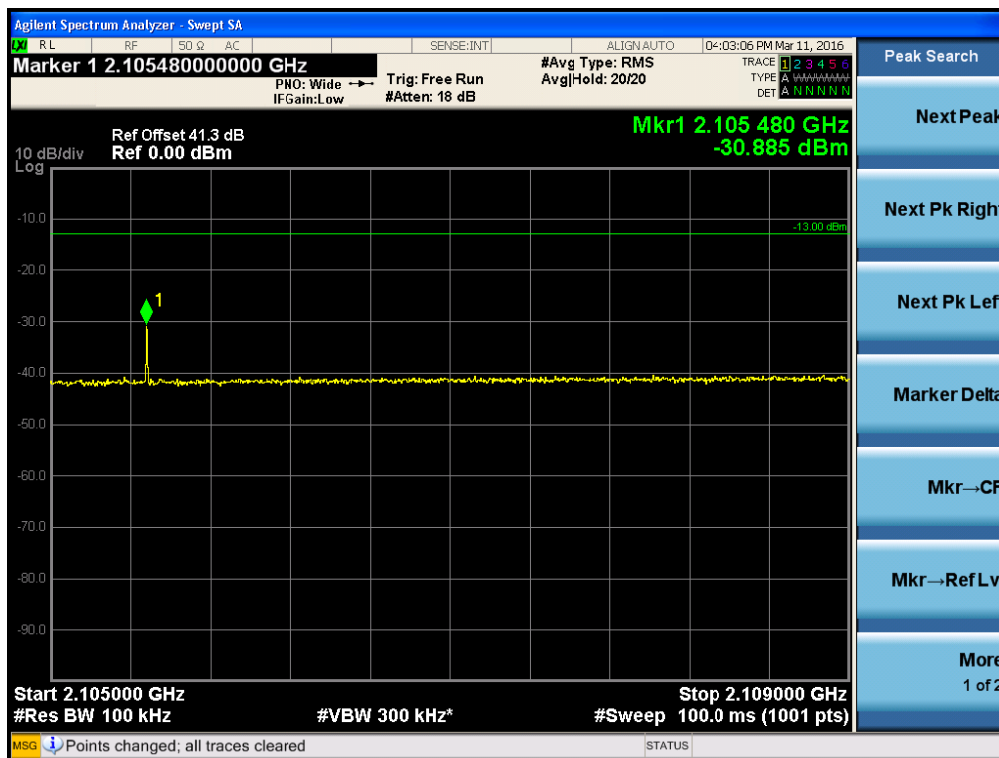
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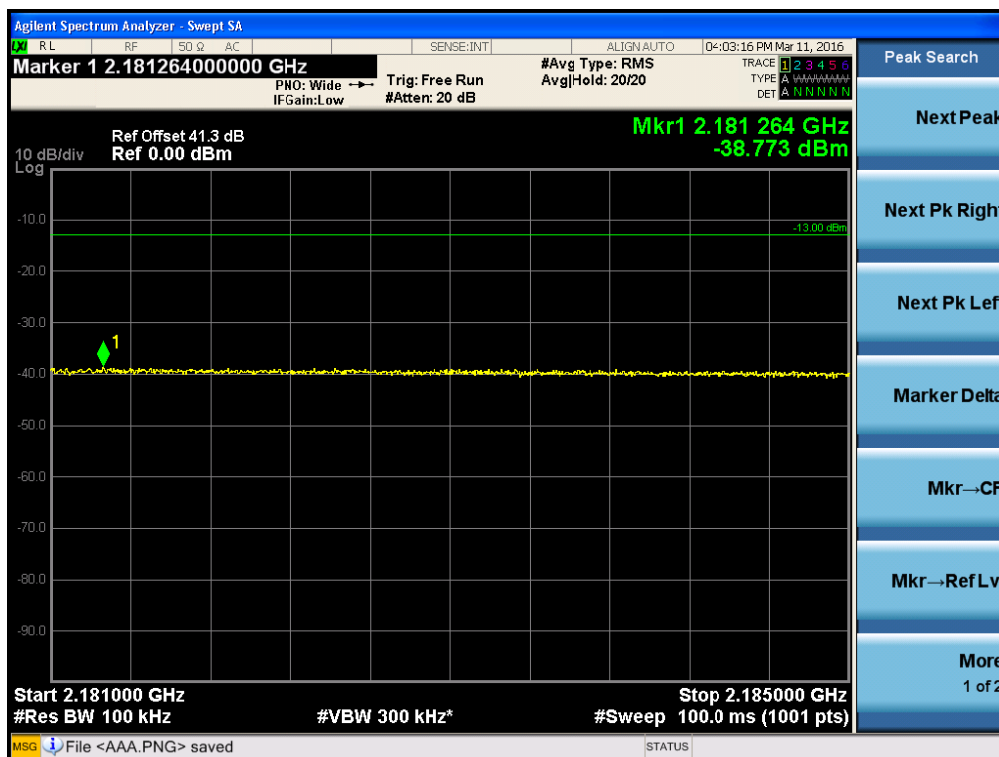
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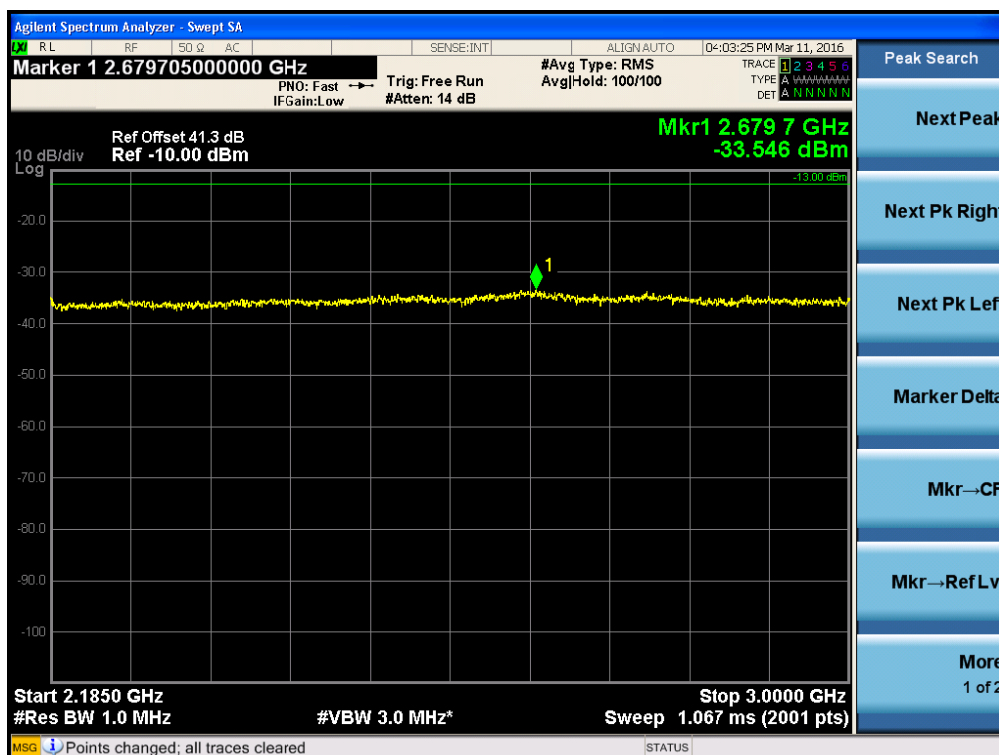
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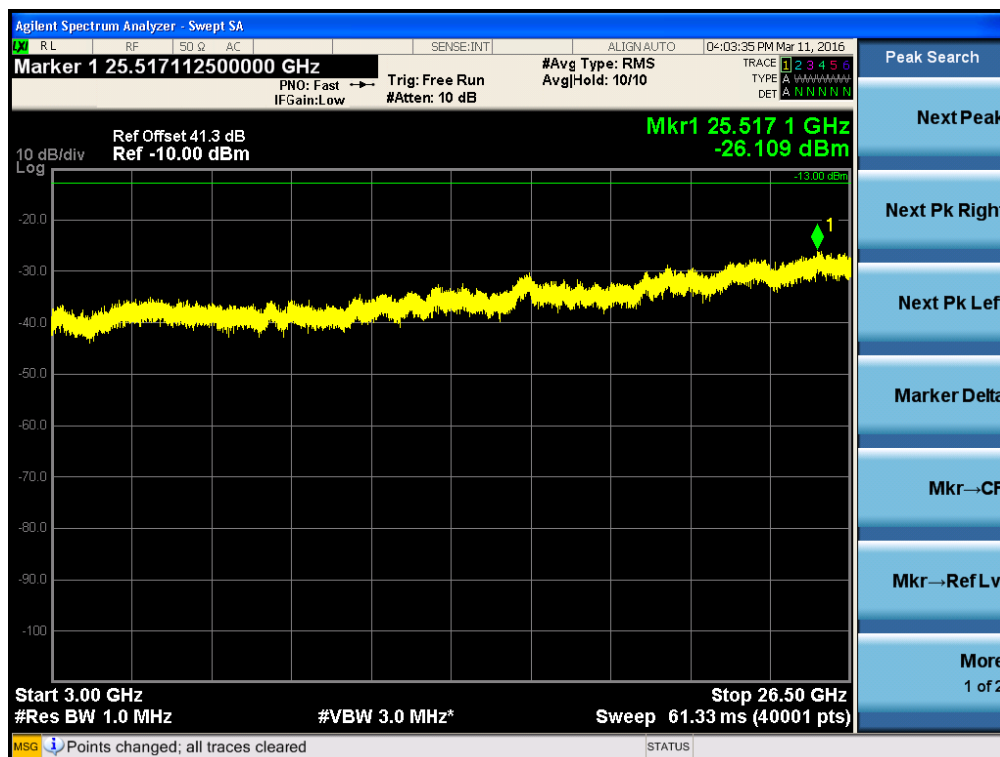
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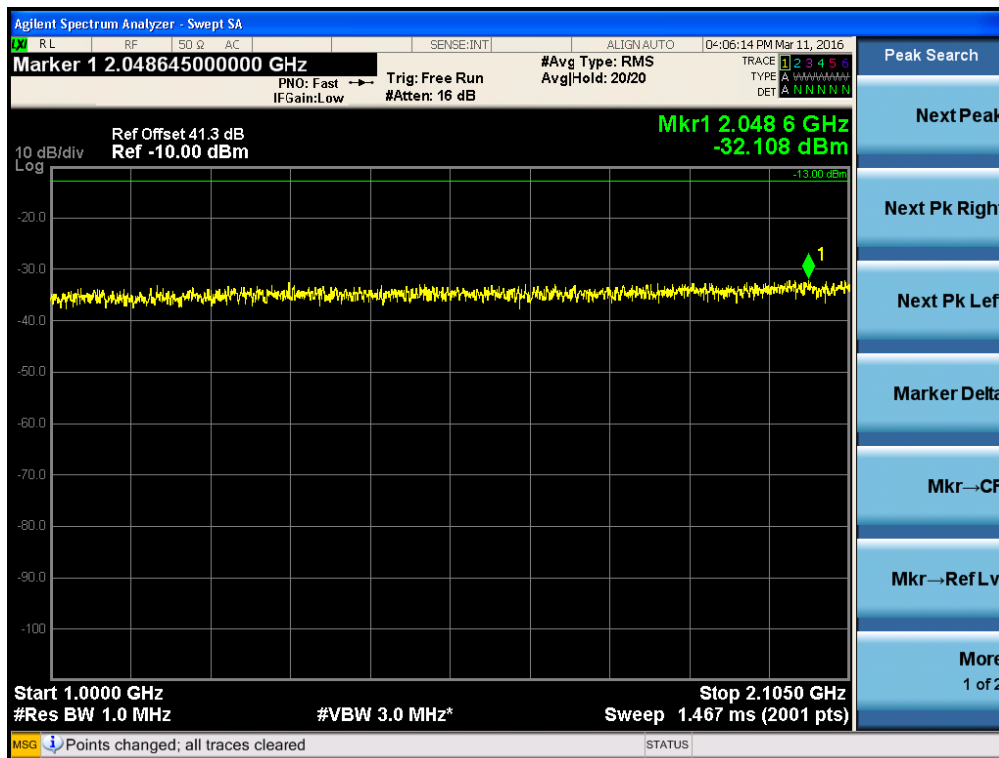
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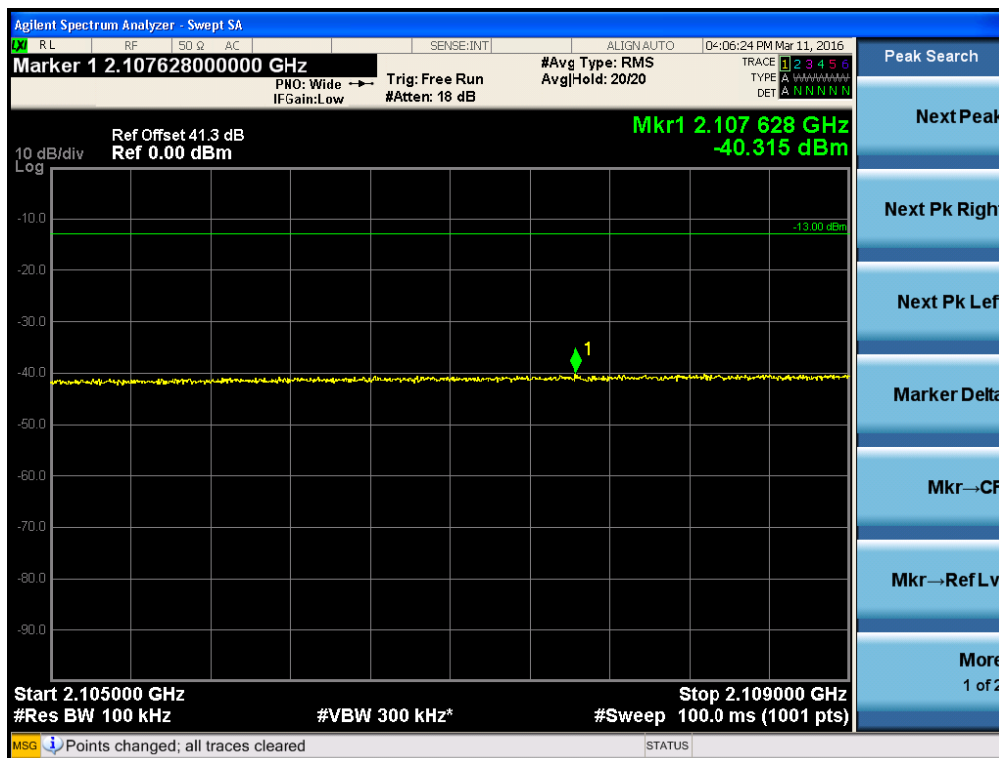
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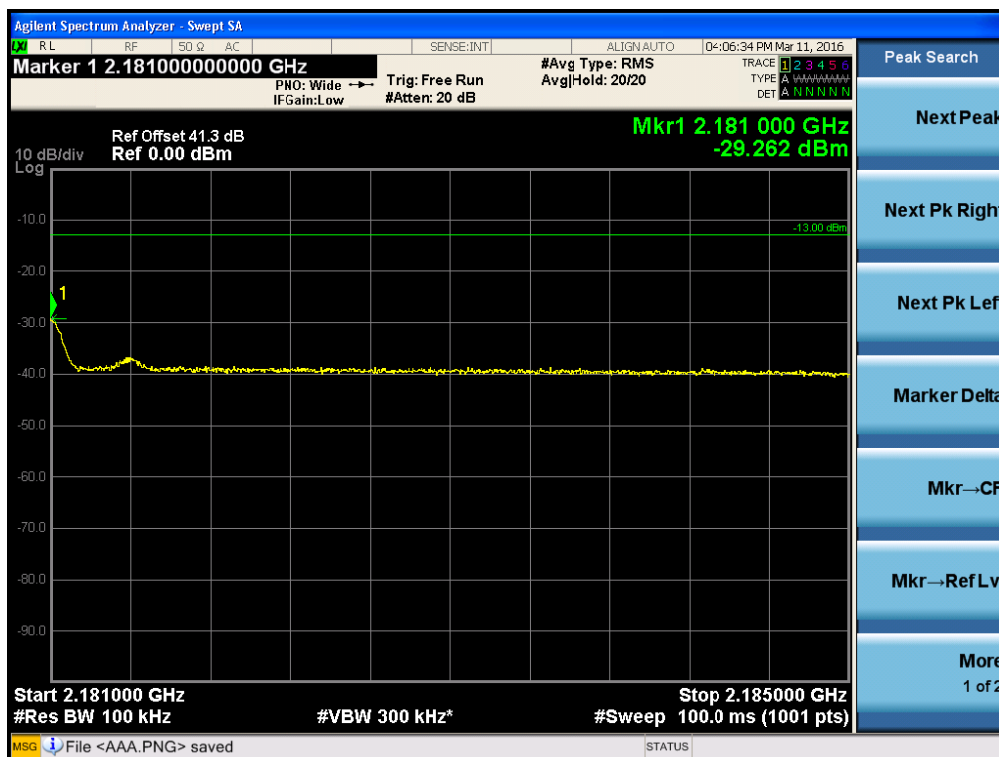
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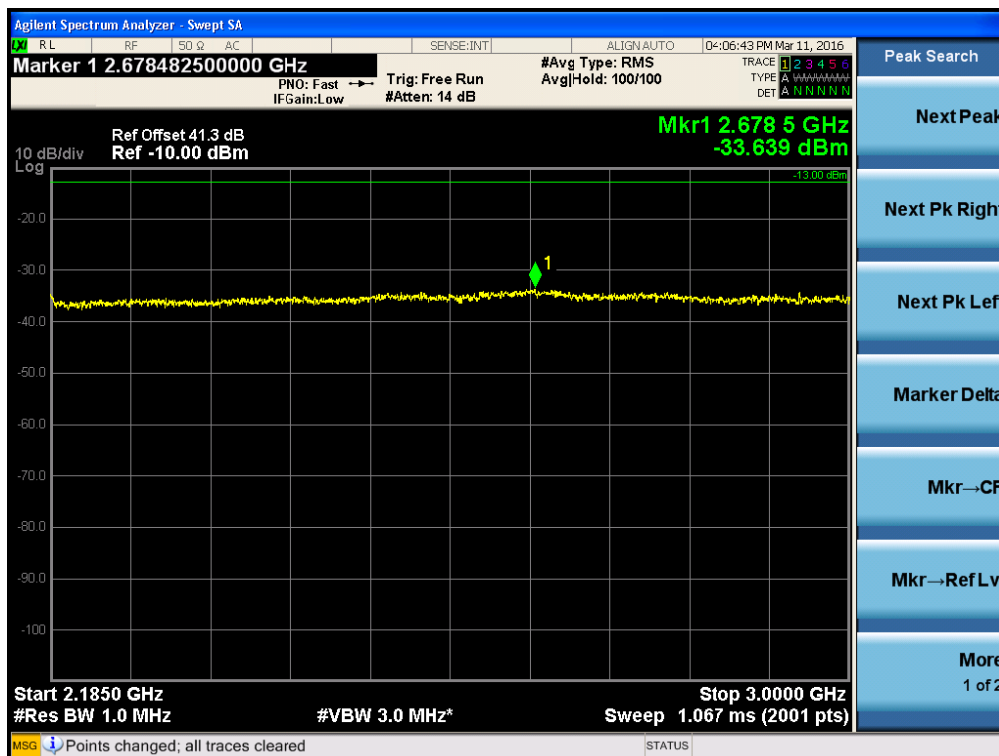
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[Downlink High]-3



[Downlink High]-4

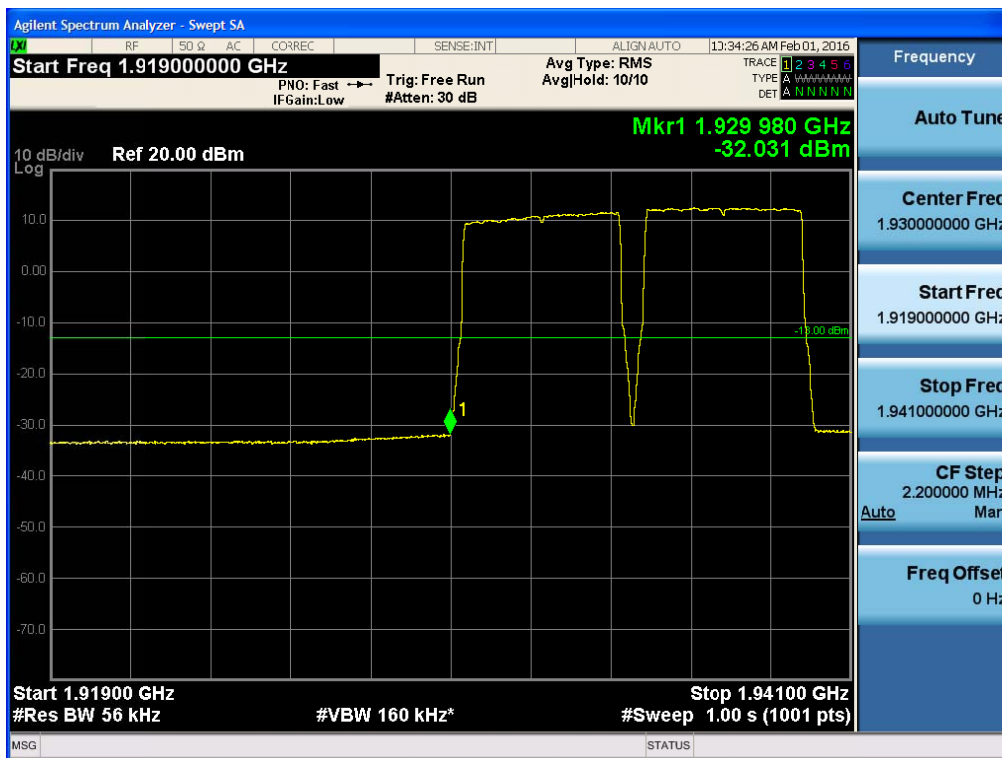


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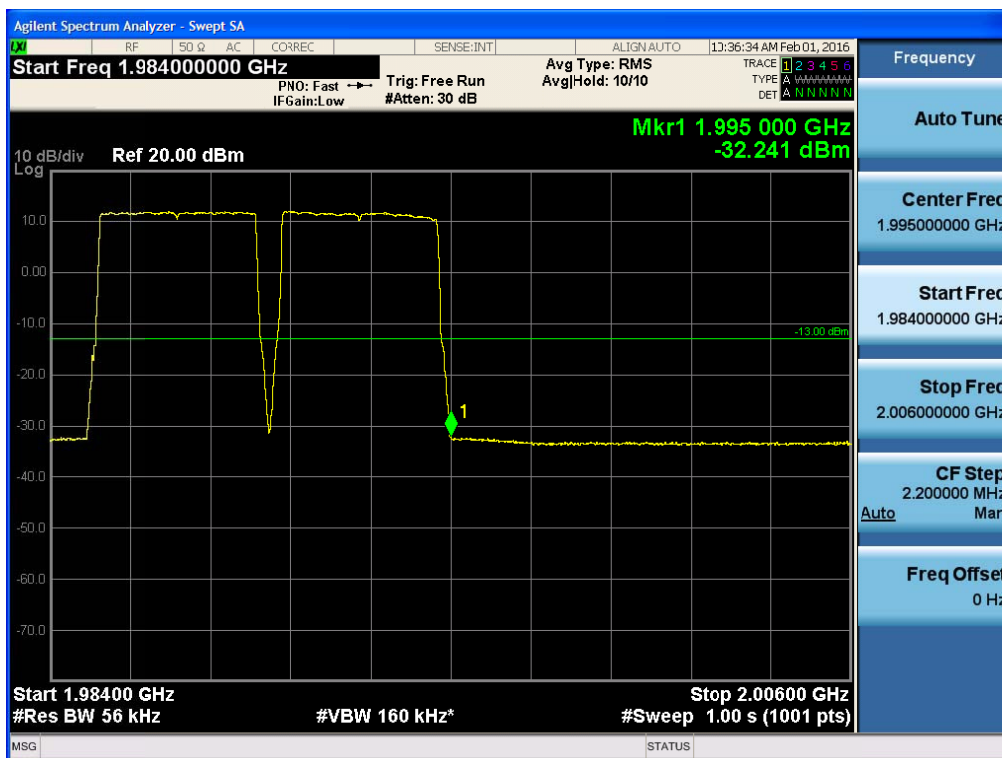


Intermodulation Spurious Emissions for FCC_1900 PCSBAND LTE 5MHz

[Downlink Low]

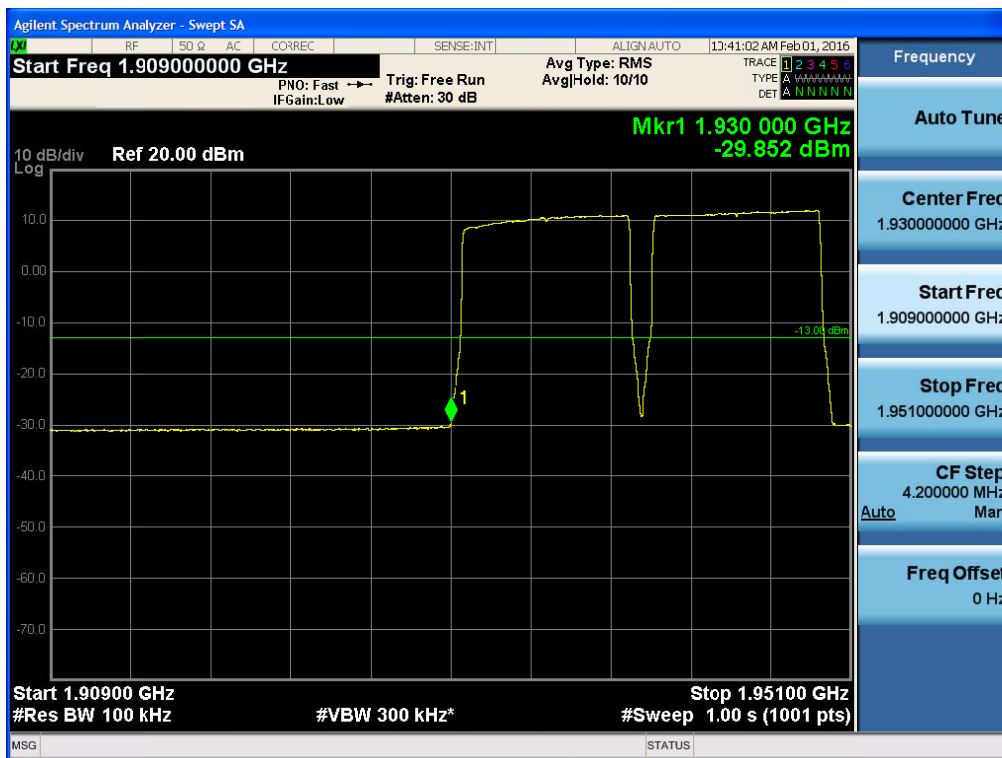


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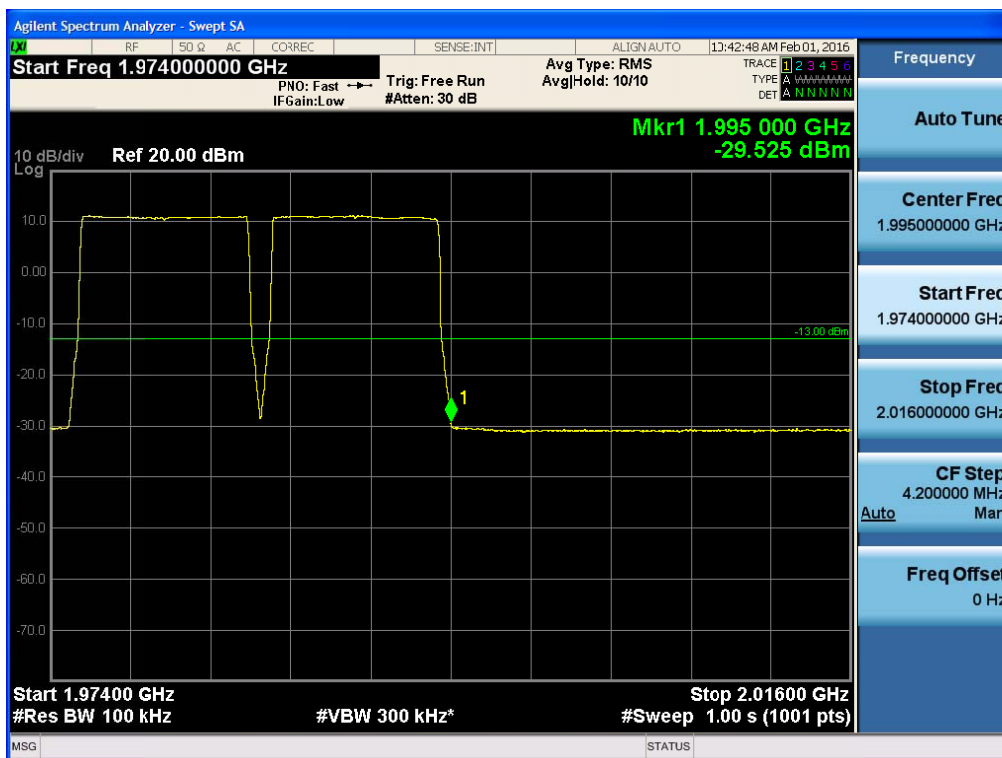


Intermodulation Spurious Emissions for FCC_1900 PCSBAND LTE 10MHz

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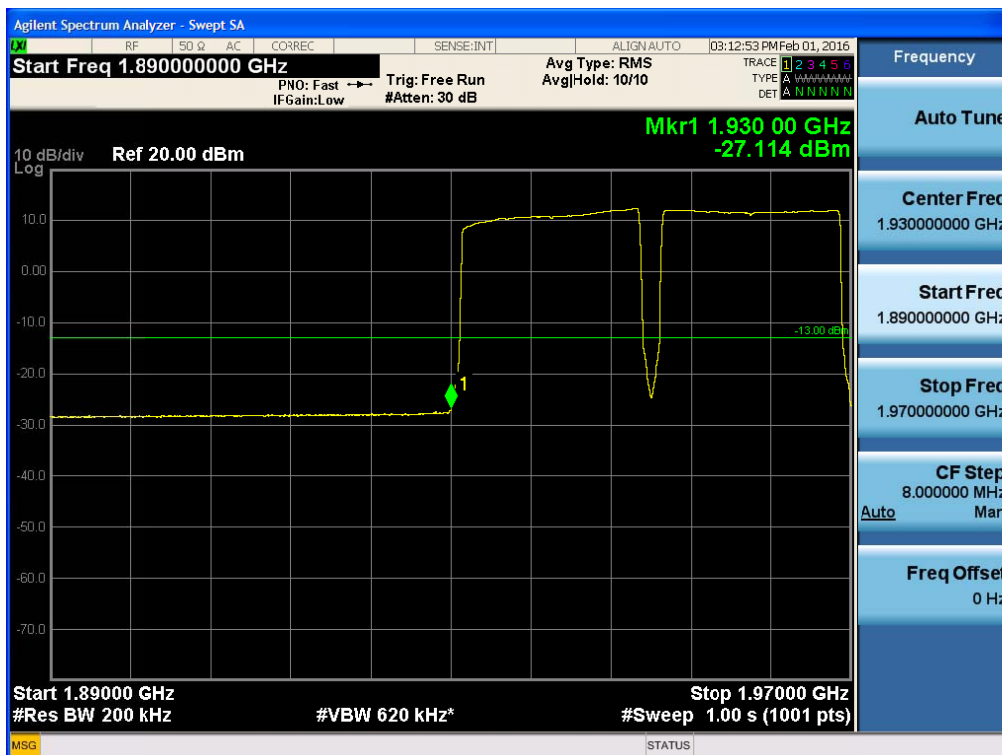


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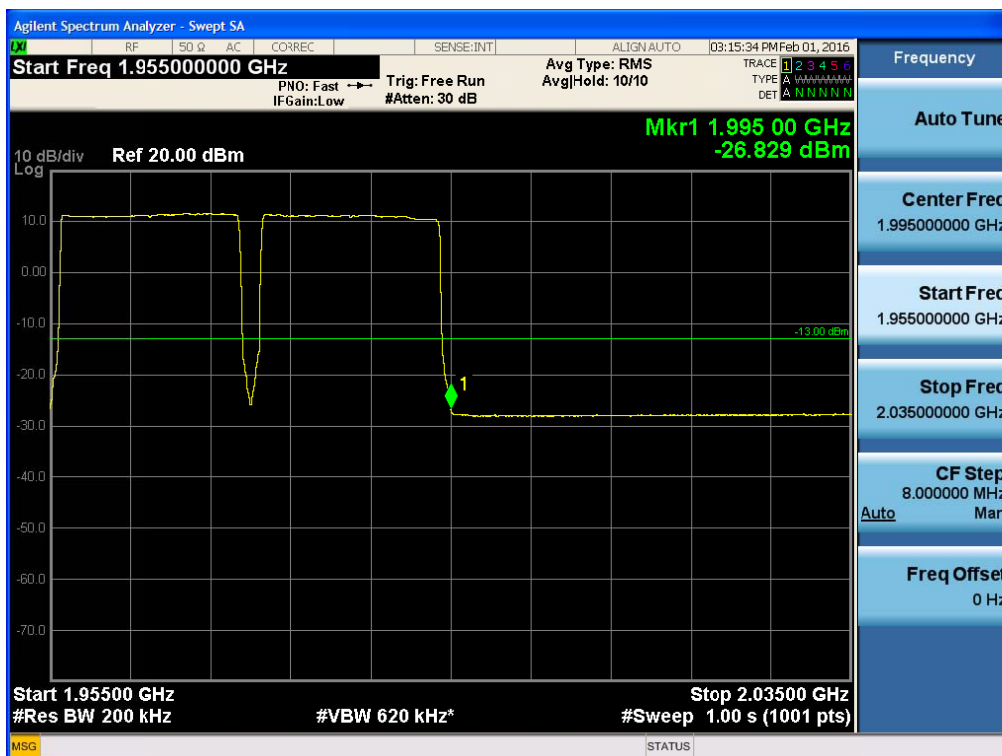


Intermodulation Spurious Emissions for FCC_1900 PCSBAND LTE 20MHz

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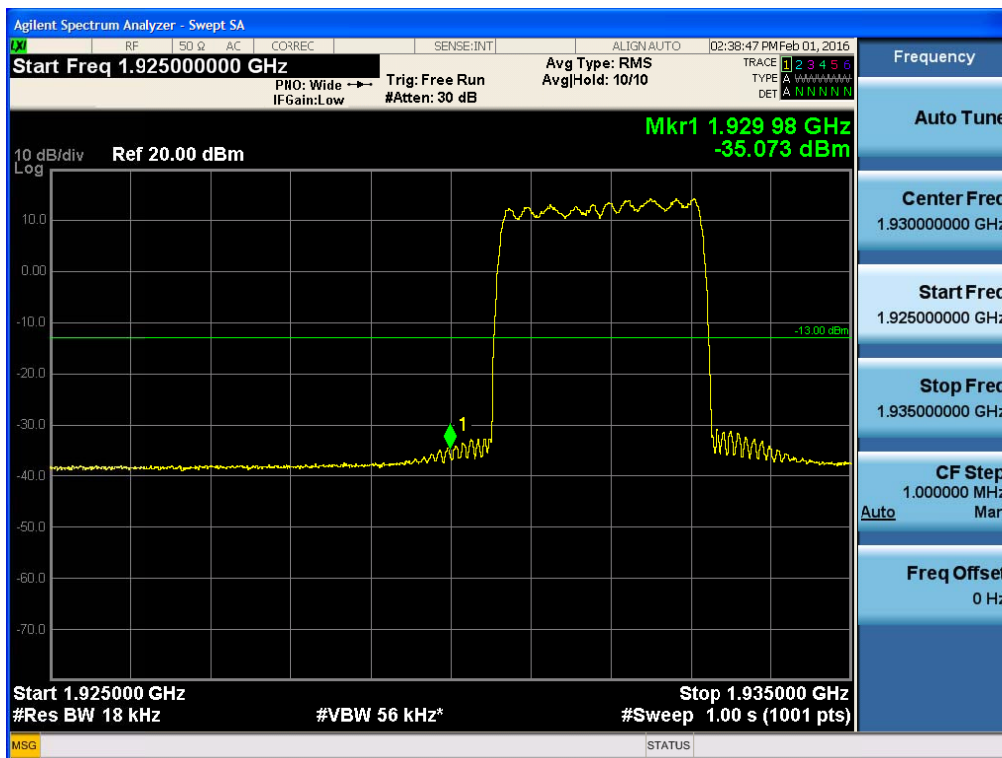


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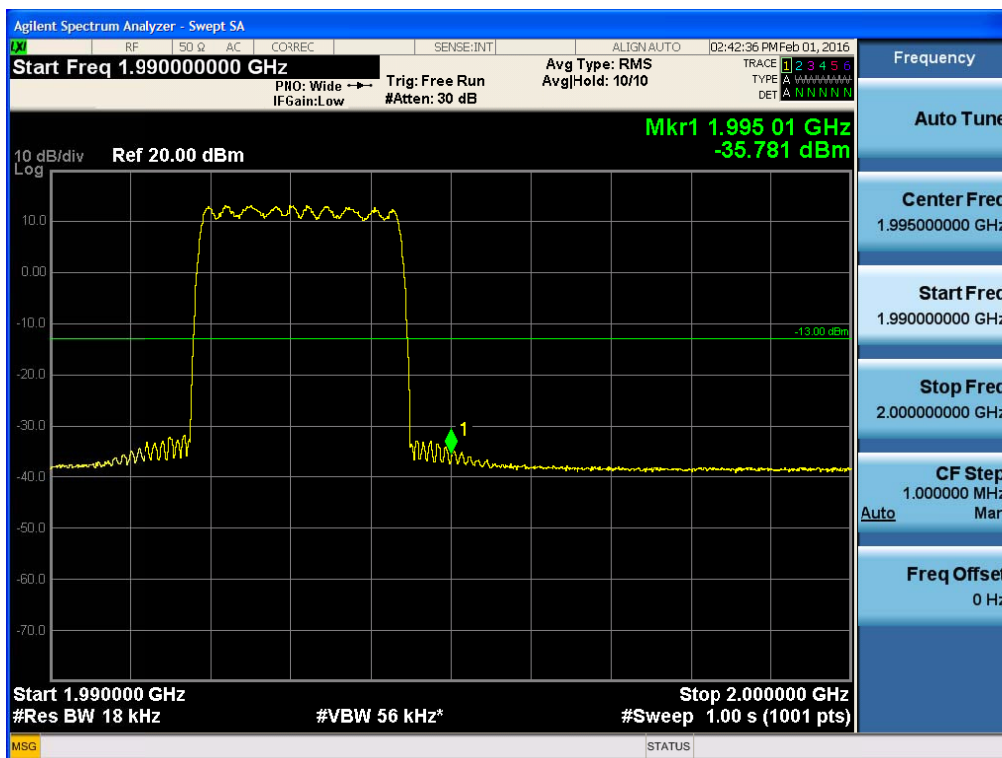


Intermodulation Spurious Emissions for FCC_1900 PCSBAND CDMA

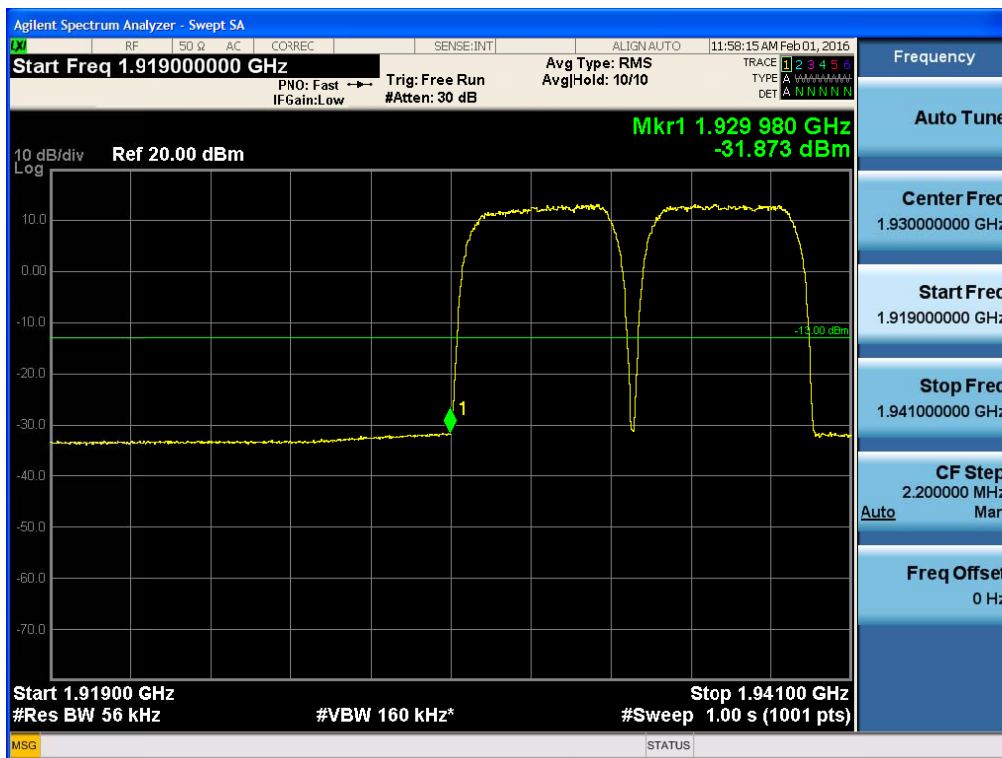
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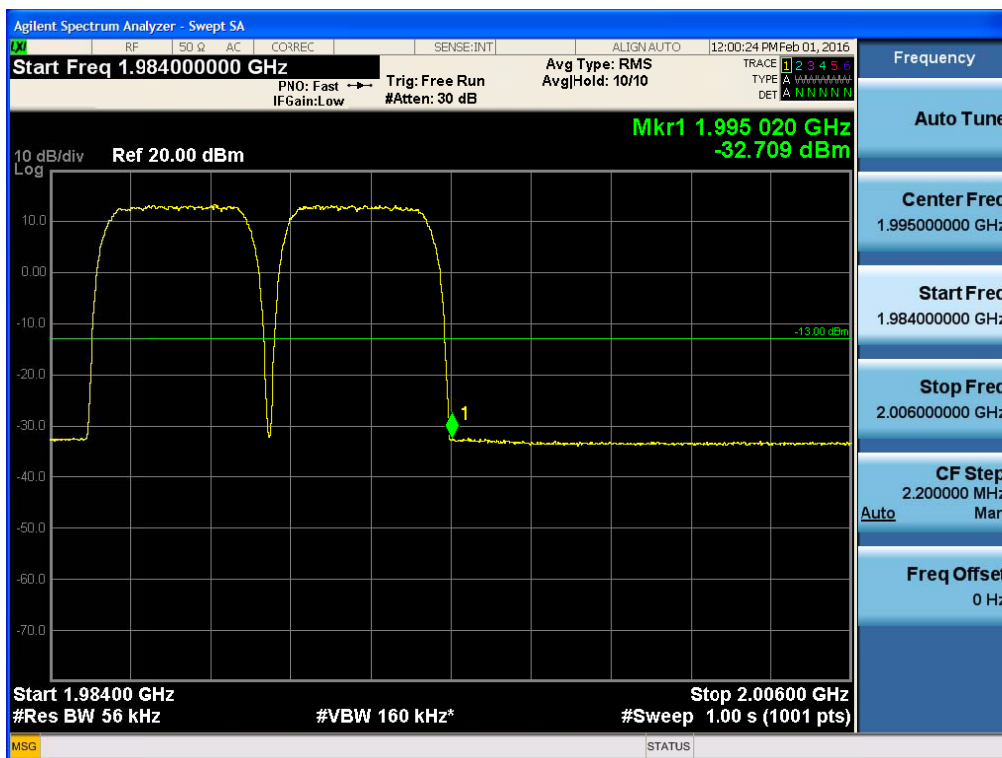
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Intermodulation Spurious Emissions for FCC_1900 PCSBAND WCDMA [Downlink Low]

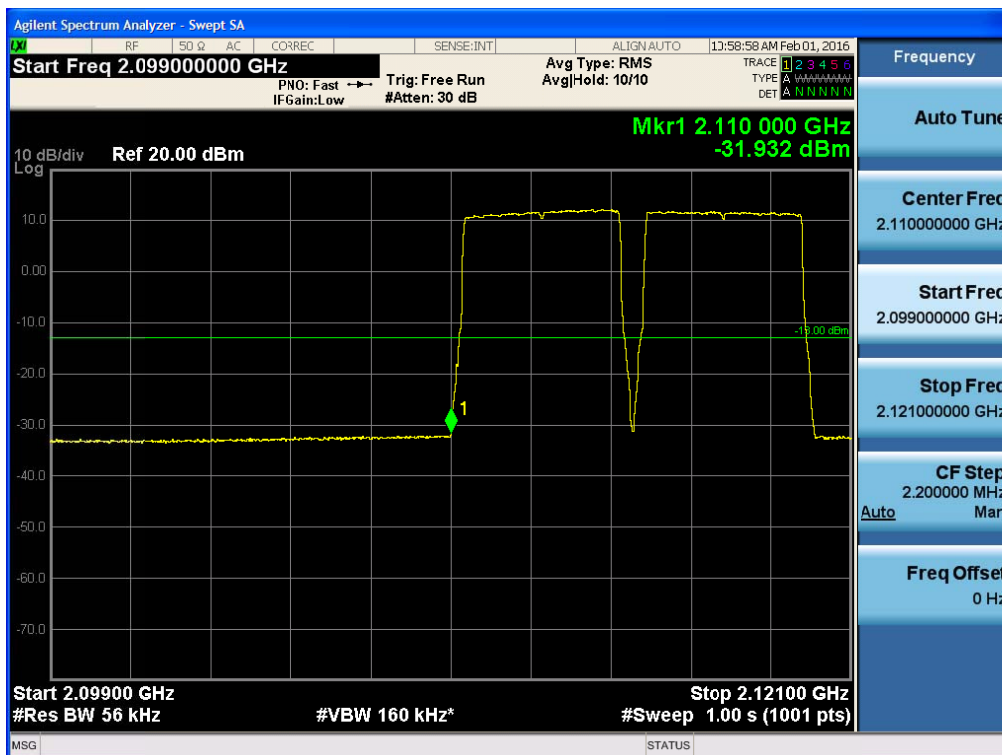


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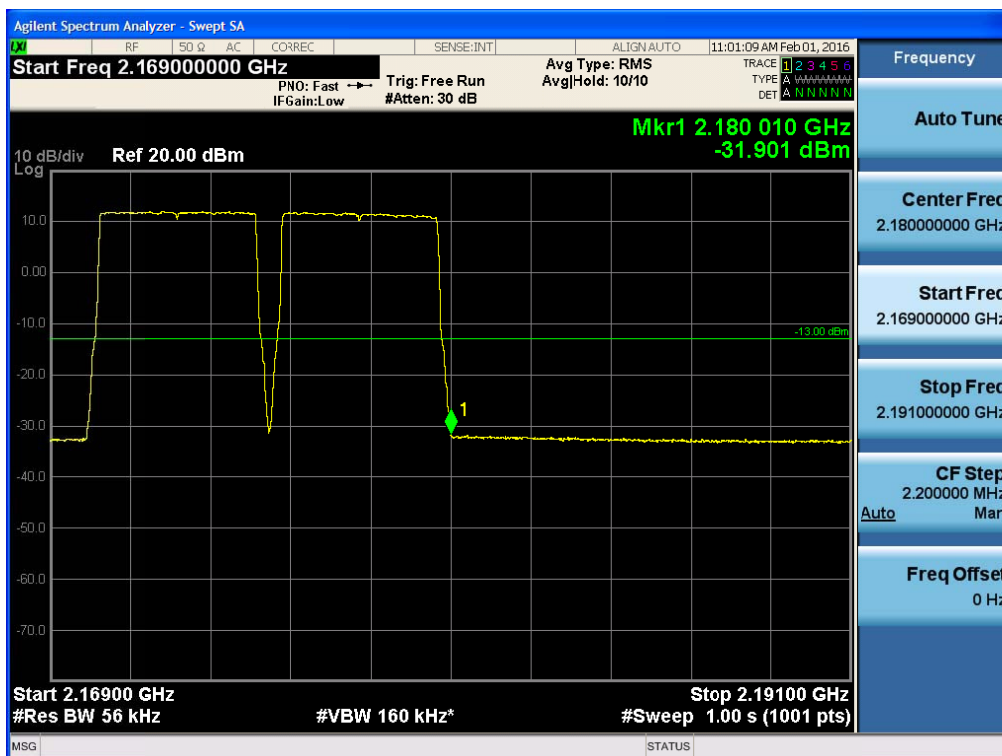


Intermodulation Spurious Emissions for FCC_AWSBAND LTE 5MHz

[Downlink Low]

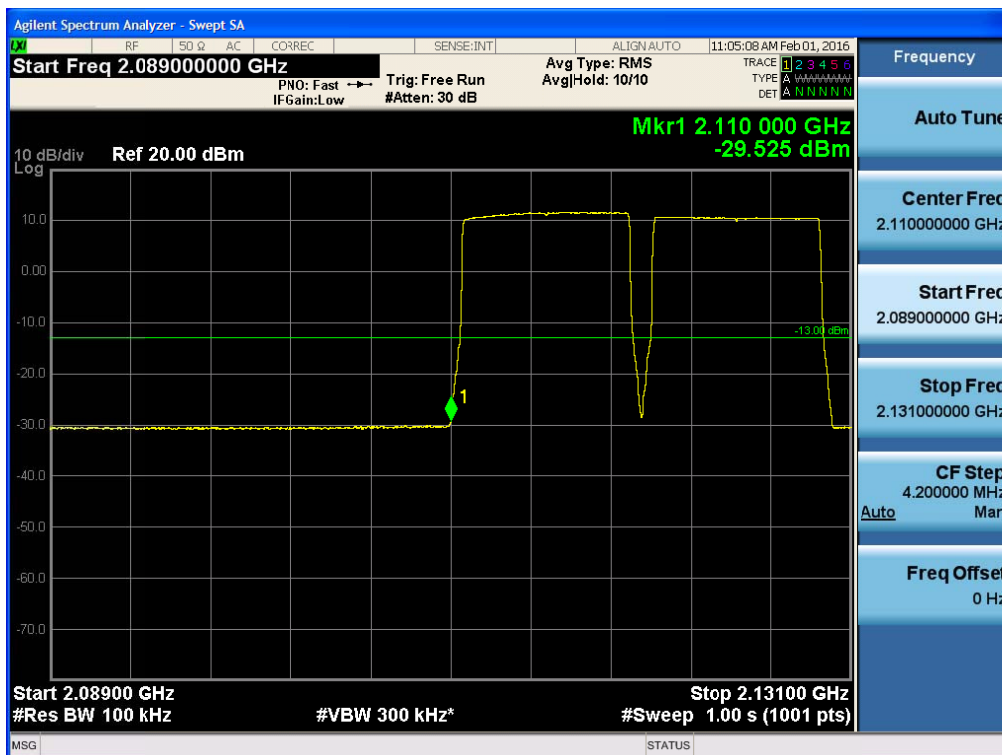


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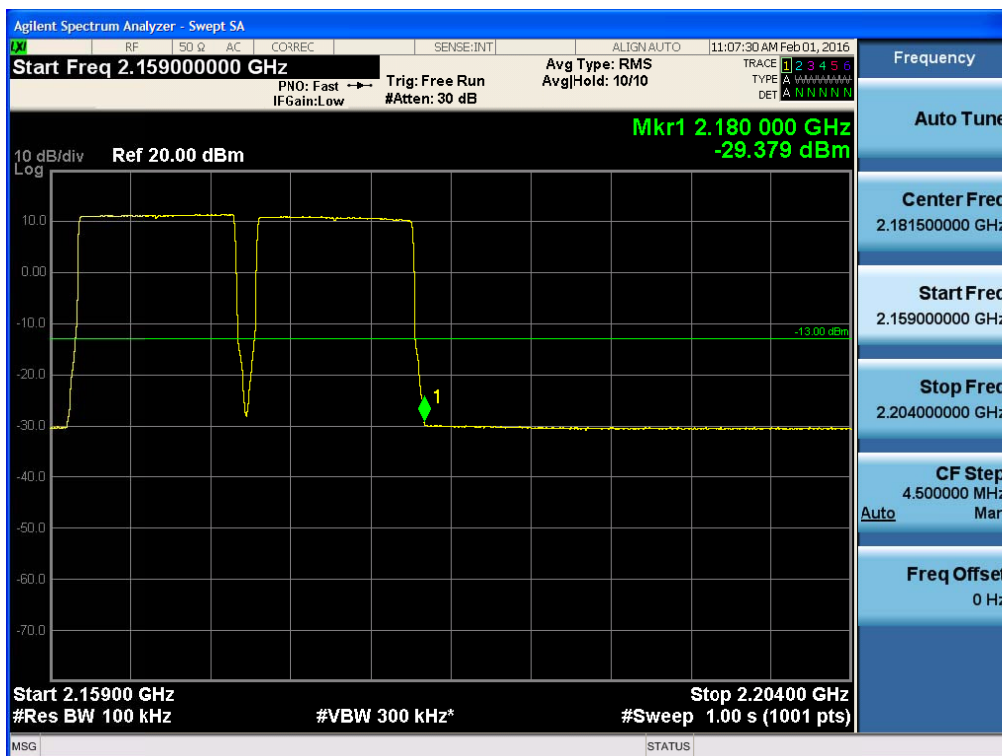


Intermodulation Spurious Emissions for FCC_AWSBAND LTE 10MHz

[Downlink Low]

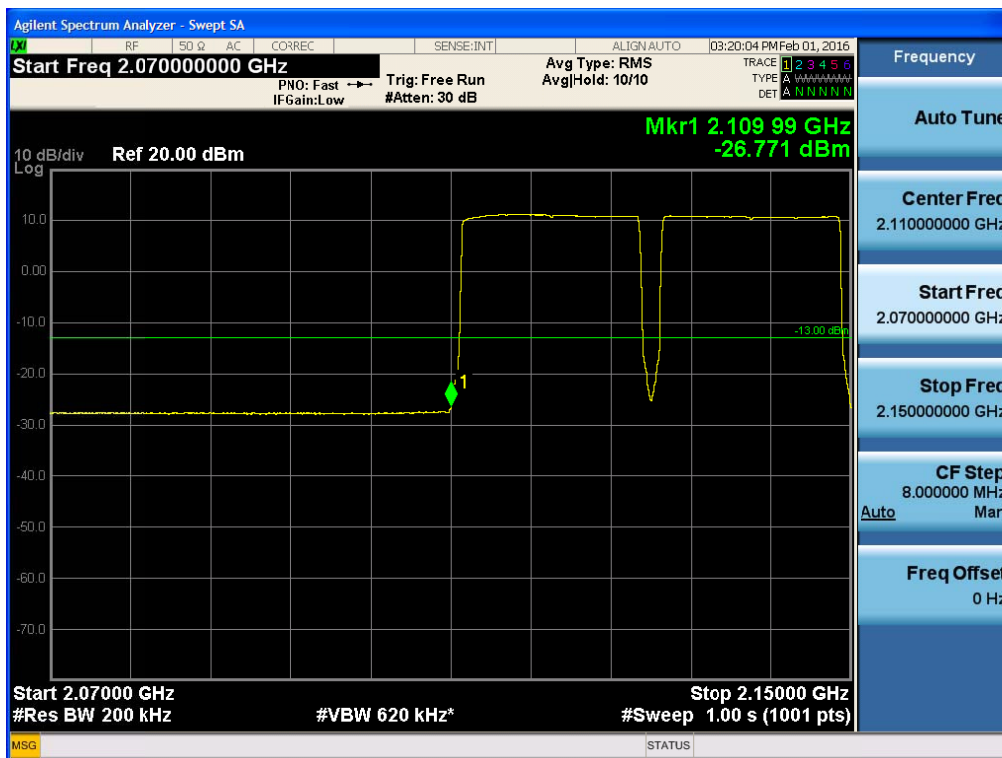


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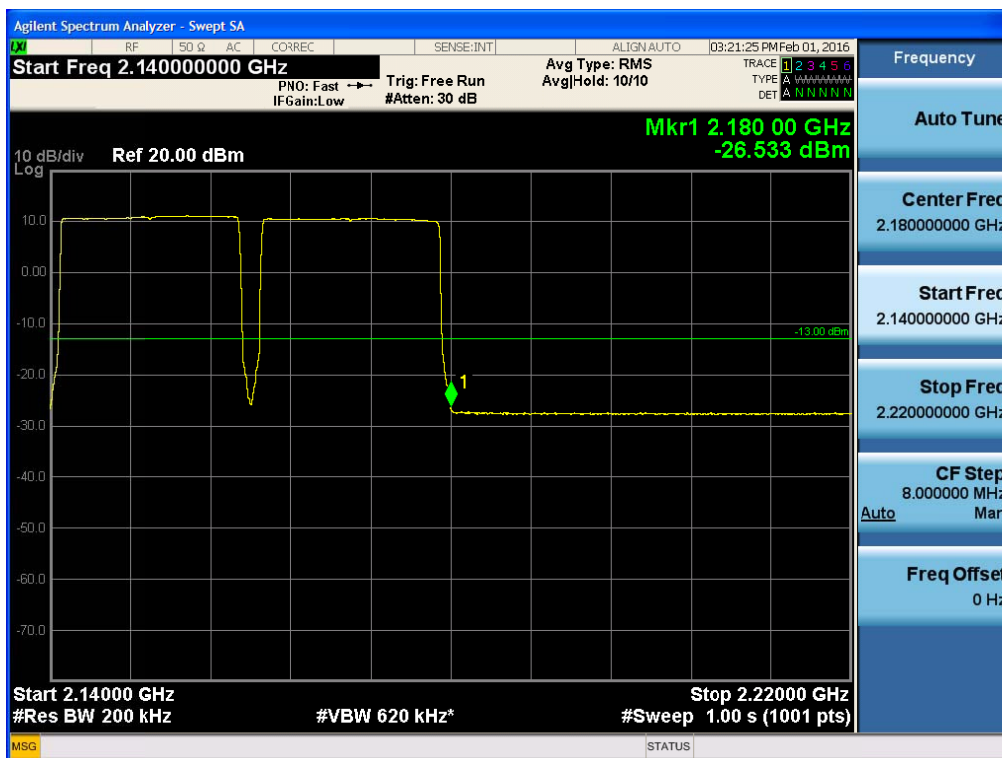


Intermodulation Spurious Emissions for FCC_AWSBAND LTE 20MHz

[Downlink Low]

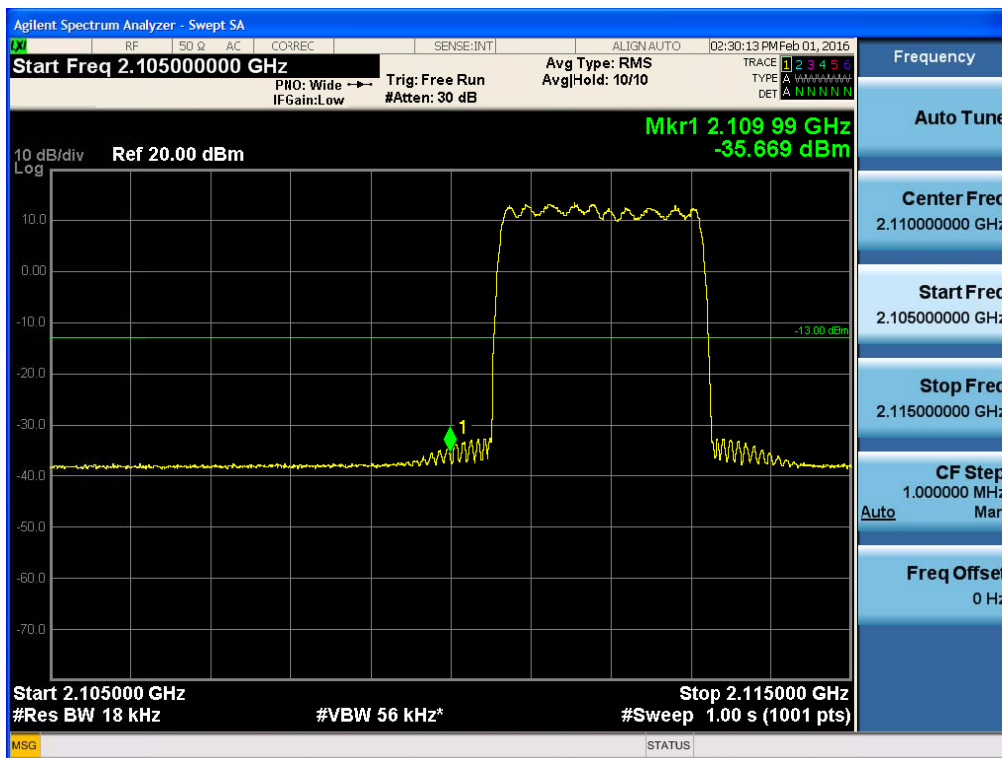


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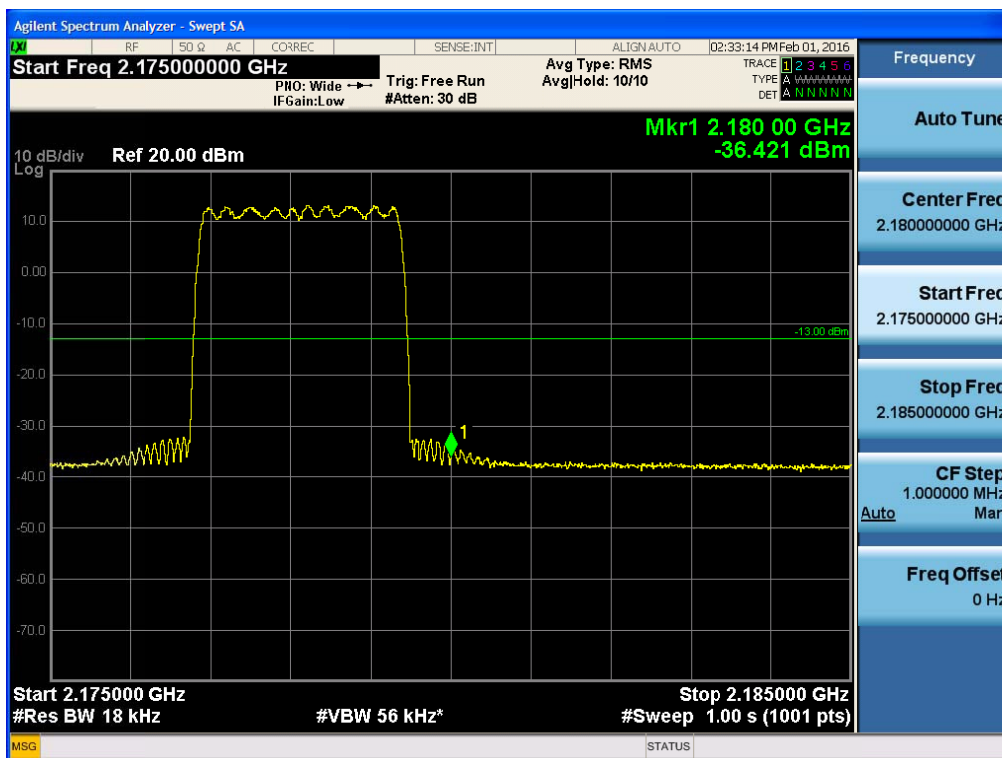


Intermodulation Spurious Emissions for FCC_AWS CDMA

[Downlink Low]

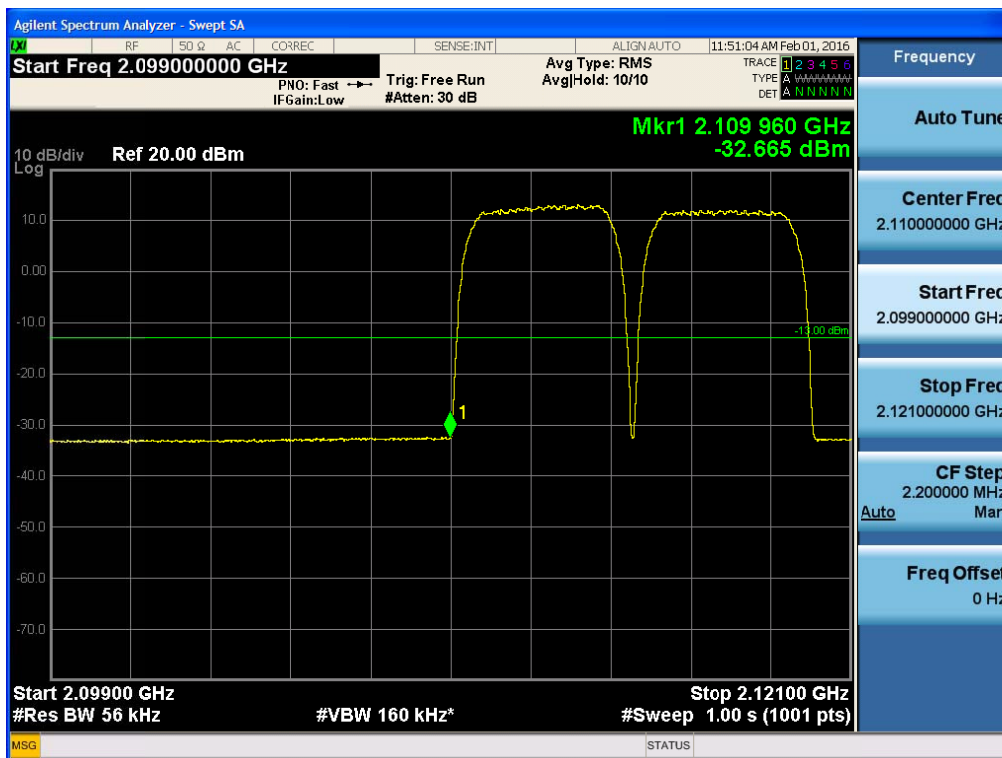


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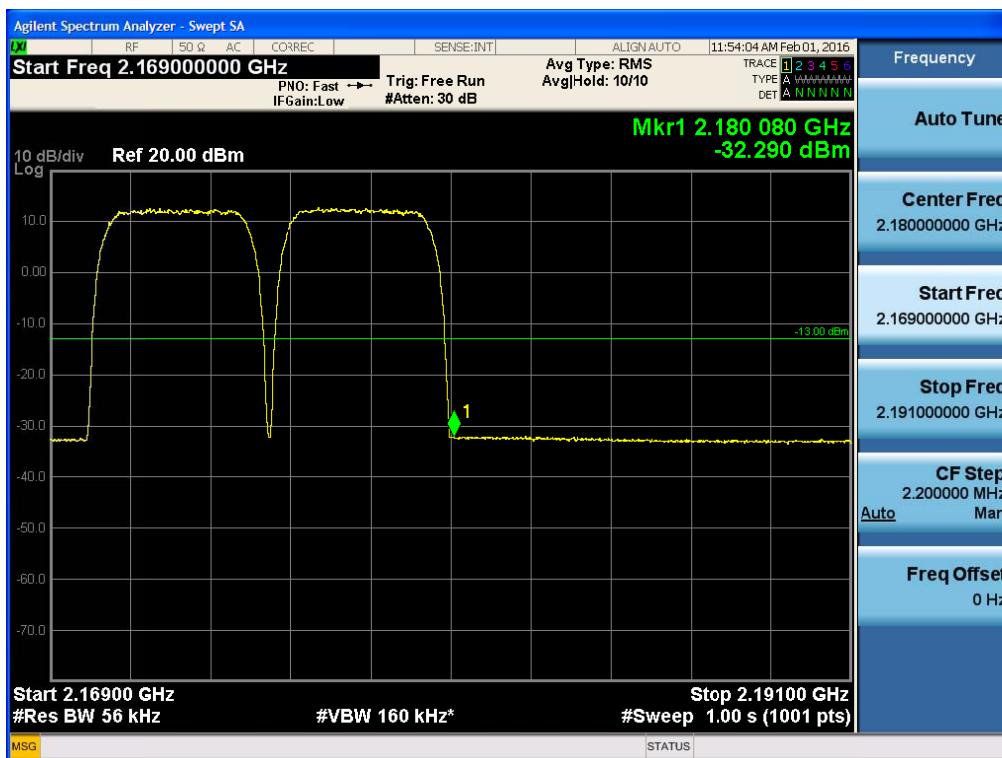


Intermodulation Spurious Emissions for FCC_AWSBAND WCDMA

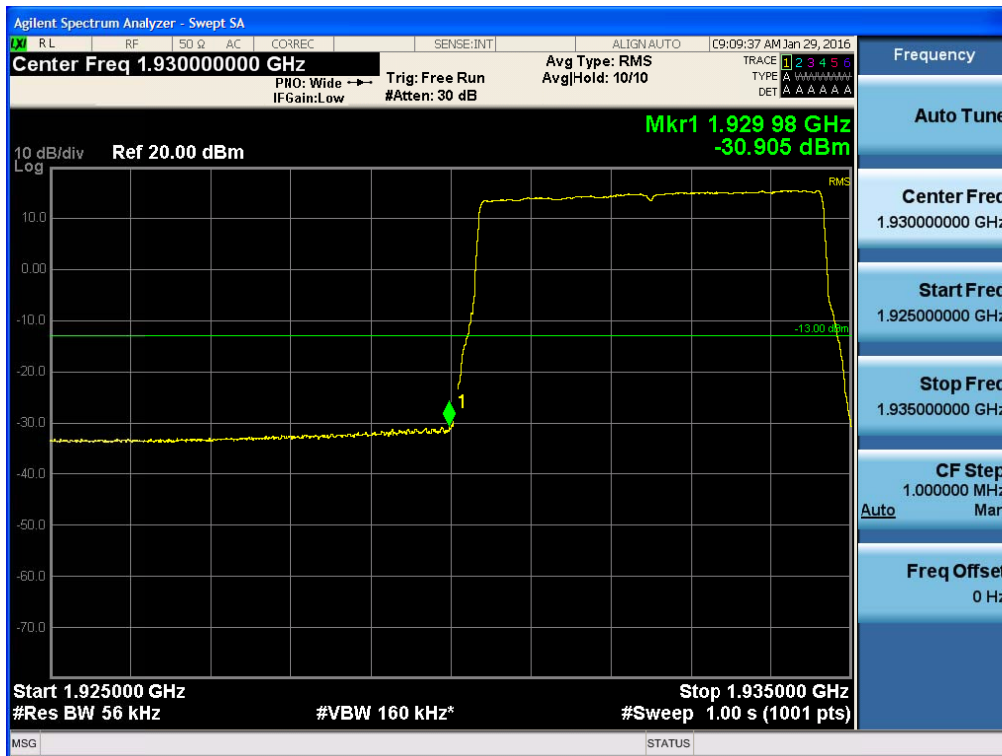
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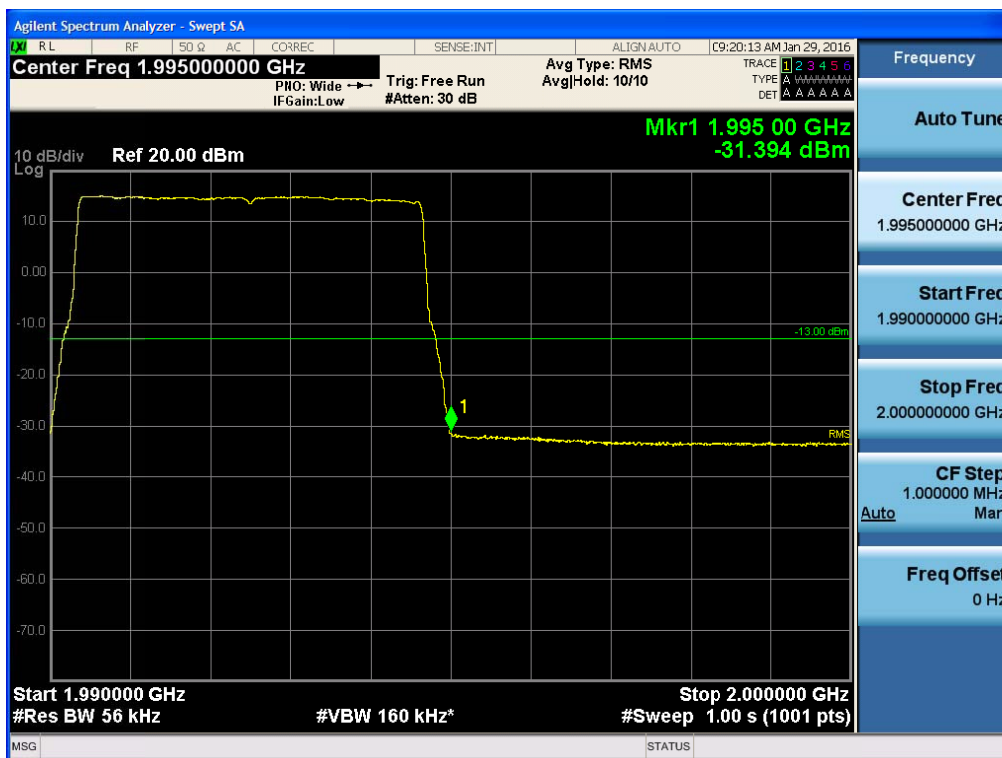
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Single channel Enhancer Band Edge_1900 PCS BAND LTE 5MHz [Downlink Low]

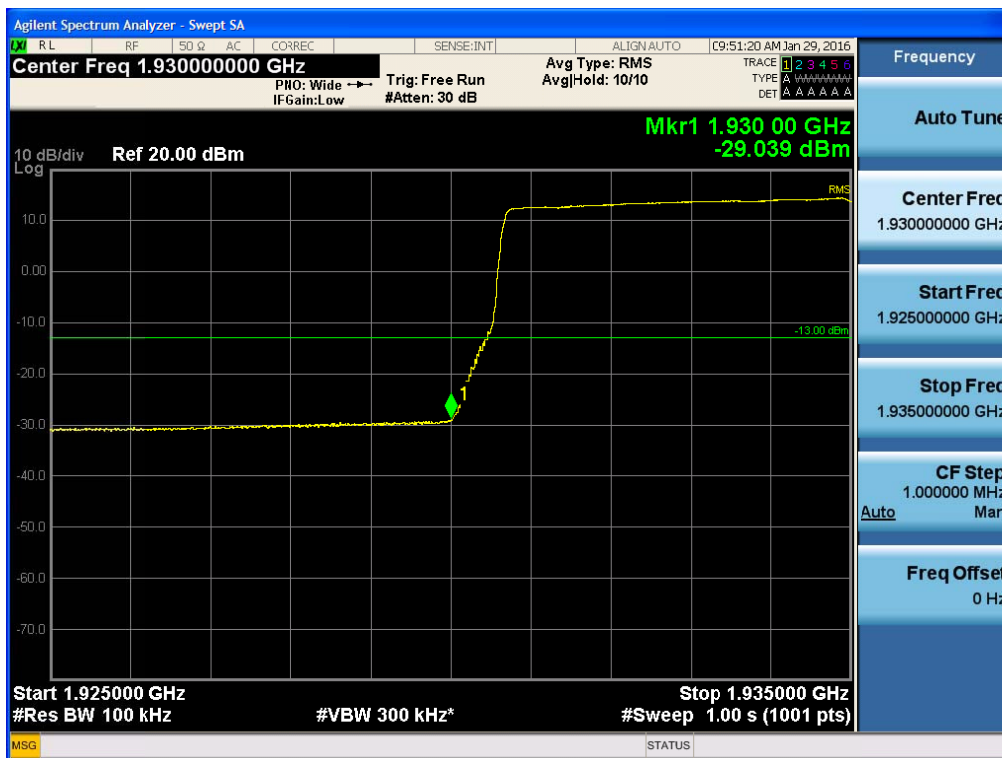


[Downlink High]

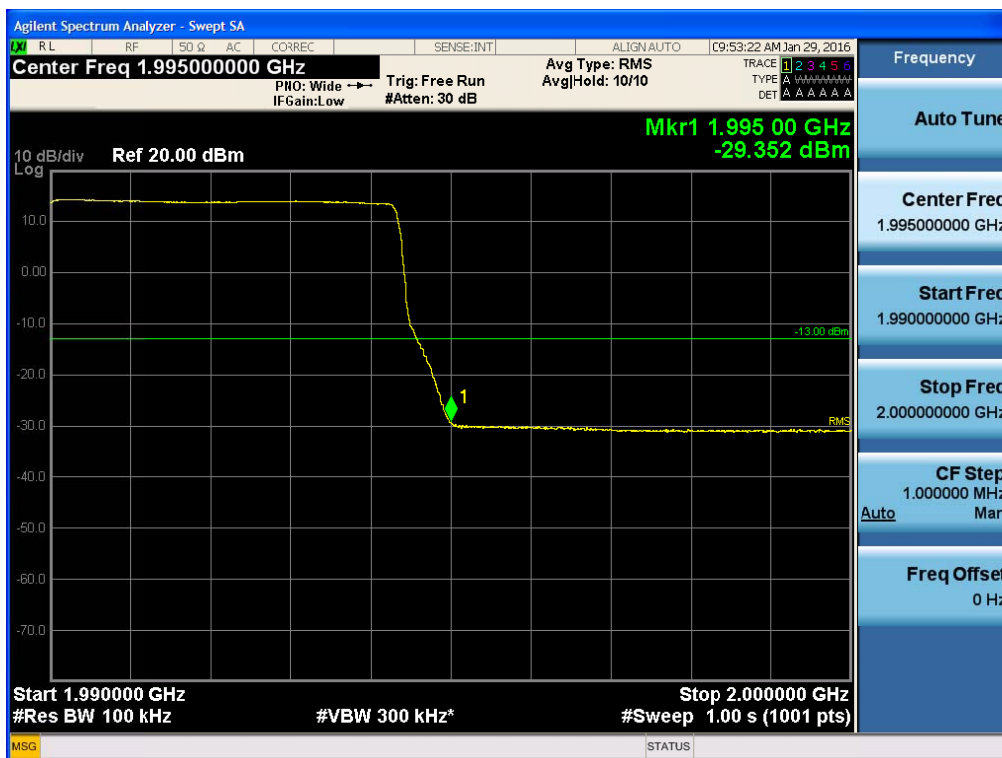


Single channel Enhancer Band Edge_1900 PCS BAND LTE 10MHz

[Downlink Low]

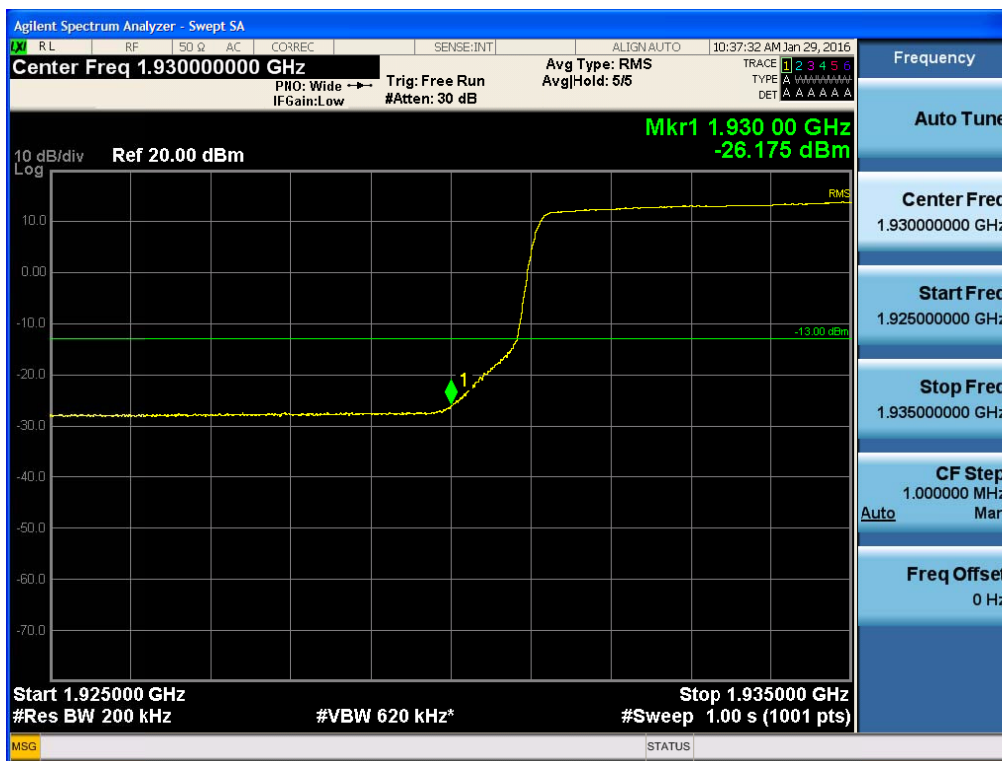


[Downlink High]

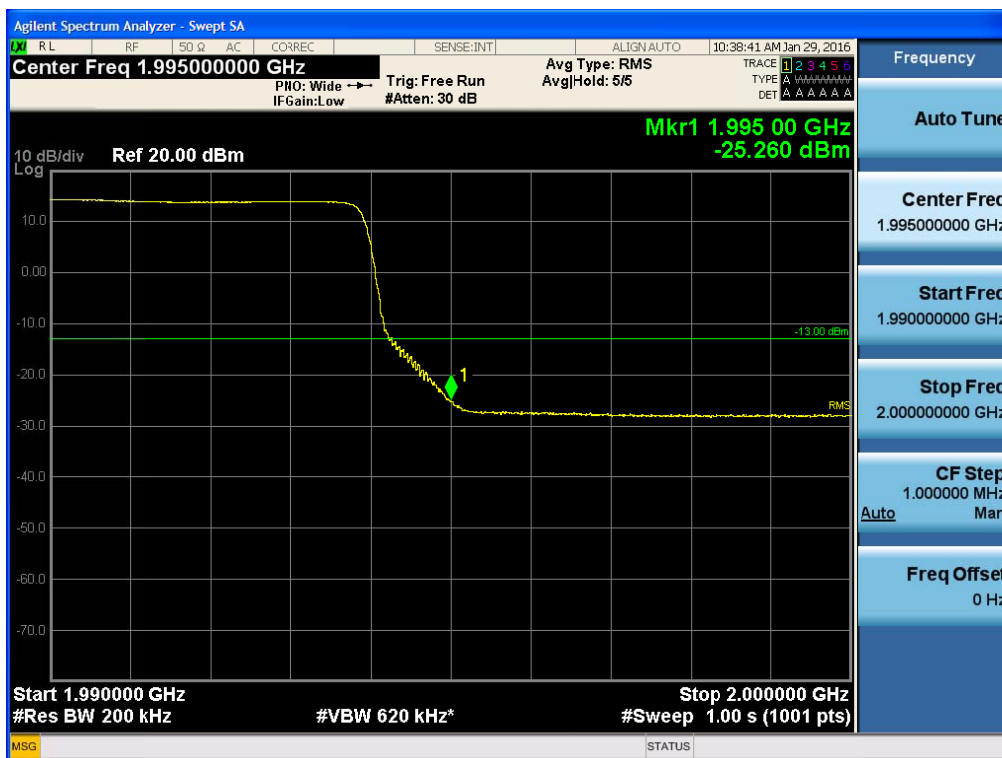


Single channel Enhancer Band Edge_1900 PCS BAND LTE 20 MHz

[Downlink Low]

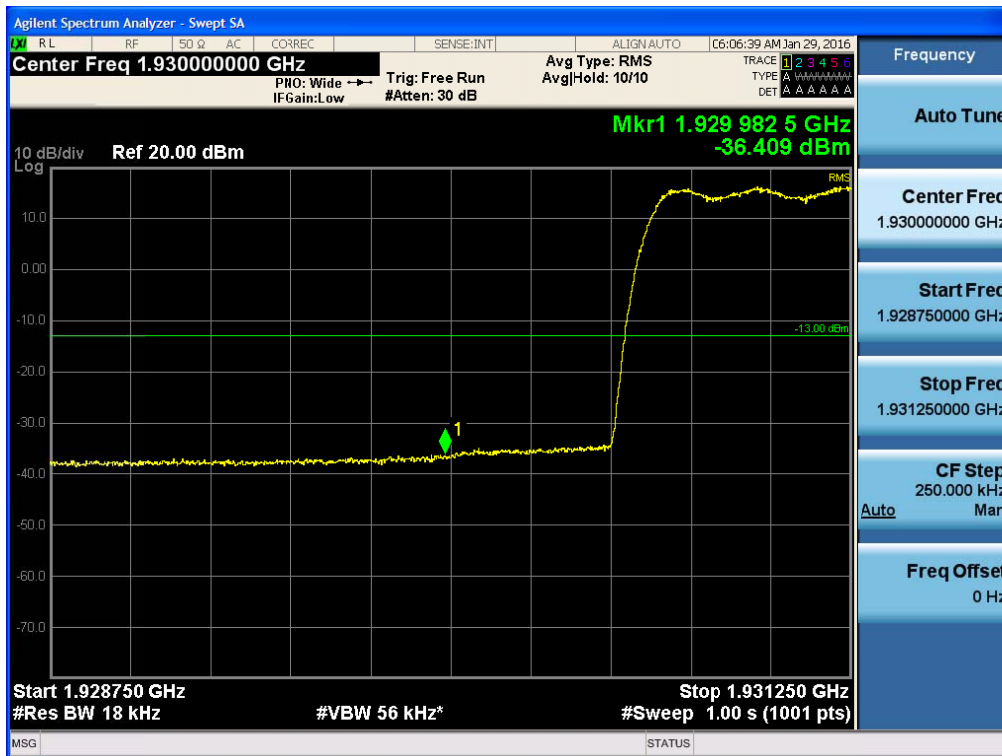


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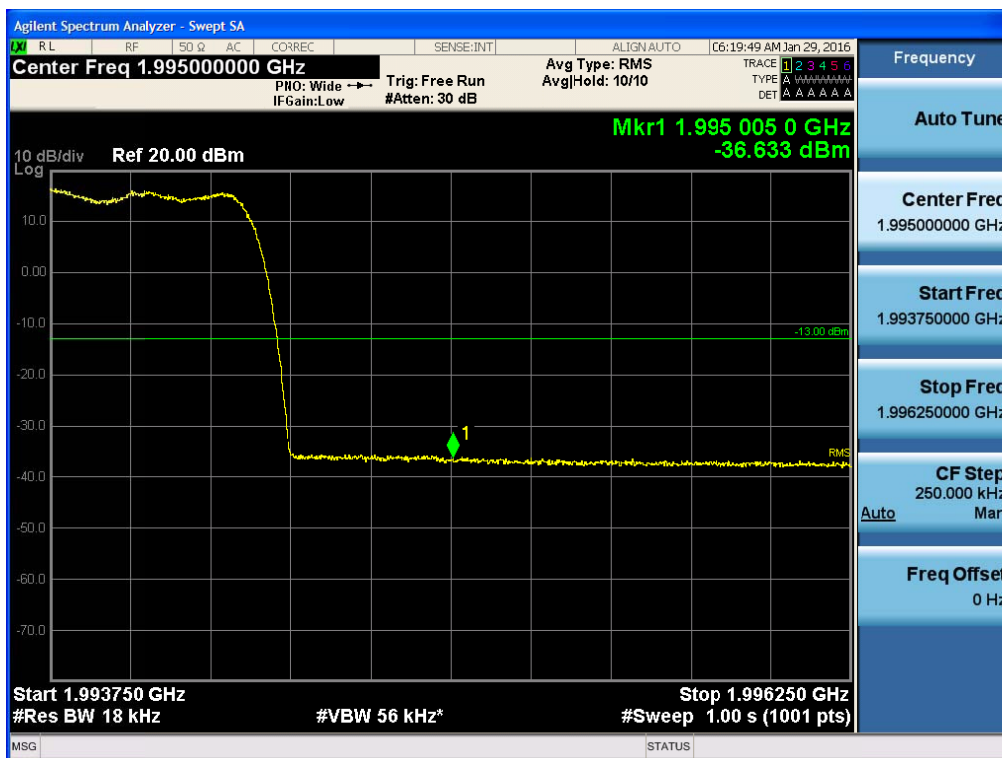


Single channel Enhancer Band Edge_1900 PCS BAND CDMA

[Downlink Low]

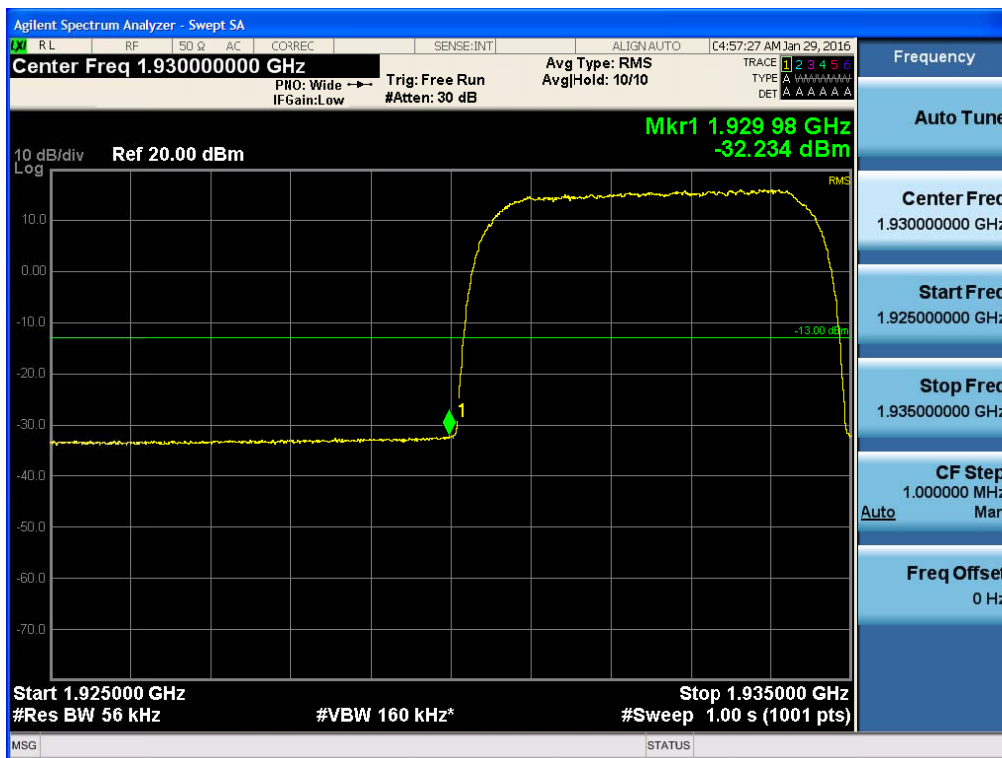


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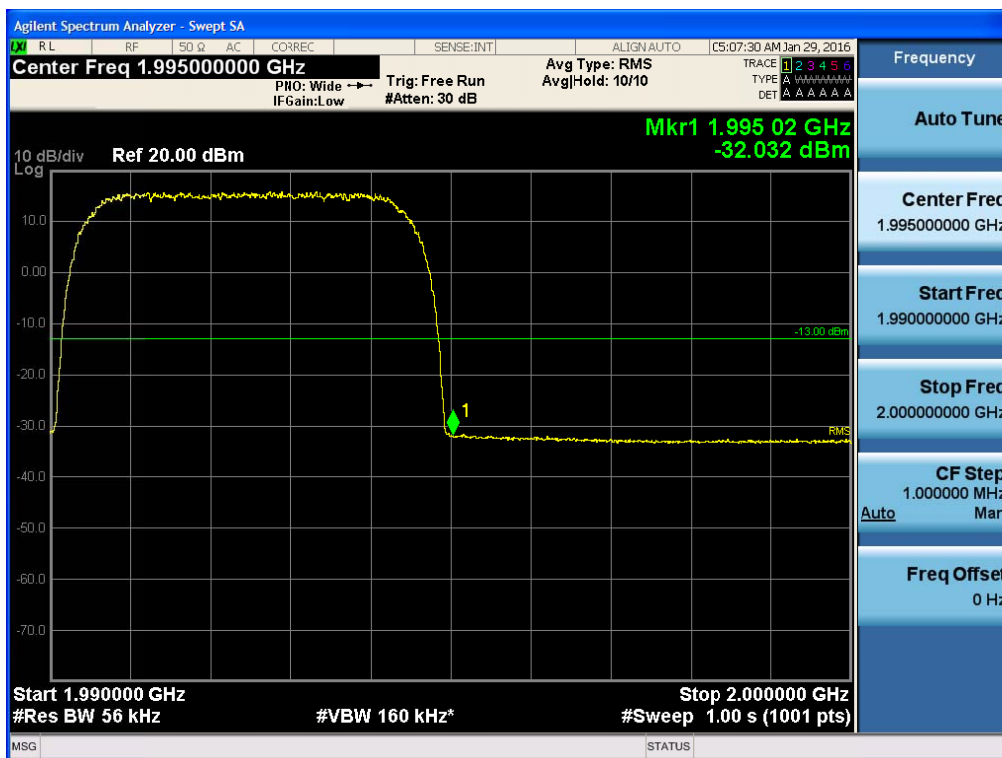


Single channel Enhancer Band Edge_1900 PCS BAND WCDMA

[Downlink Low]

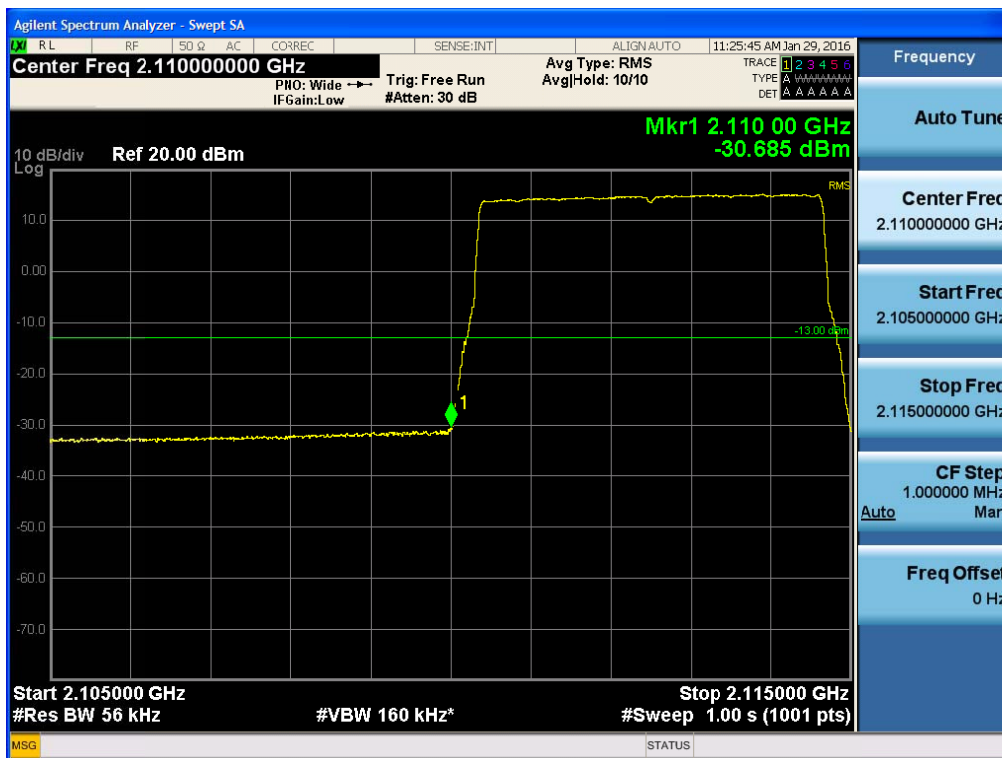


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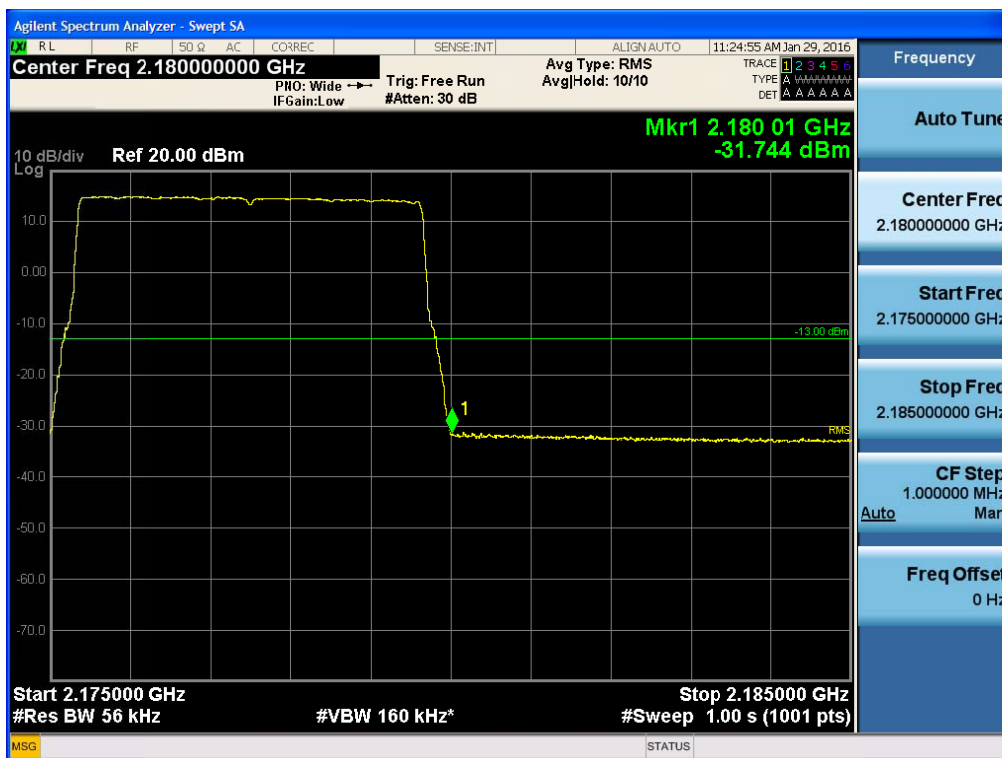


Single channel Enhancer Band Edge_AWS13 BAND LTE 5MHz

[Downlink Low]

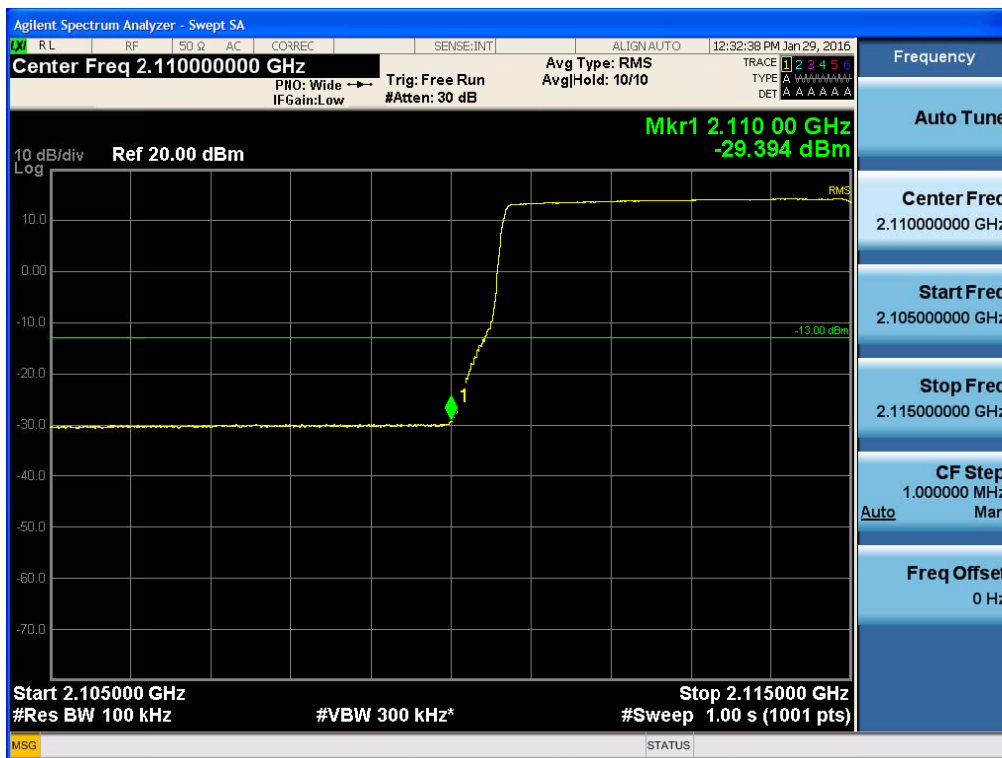


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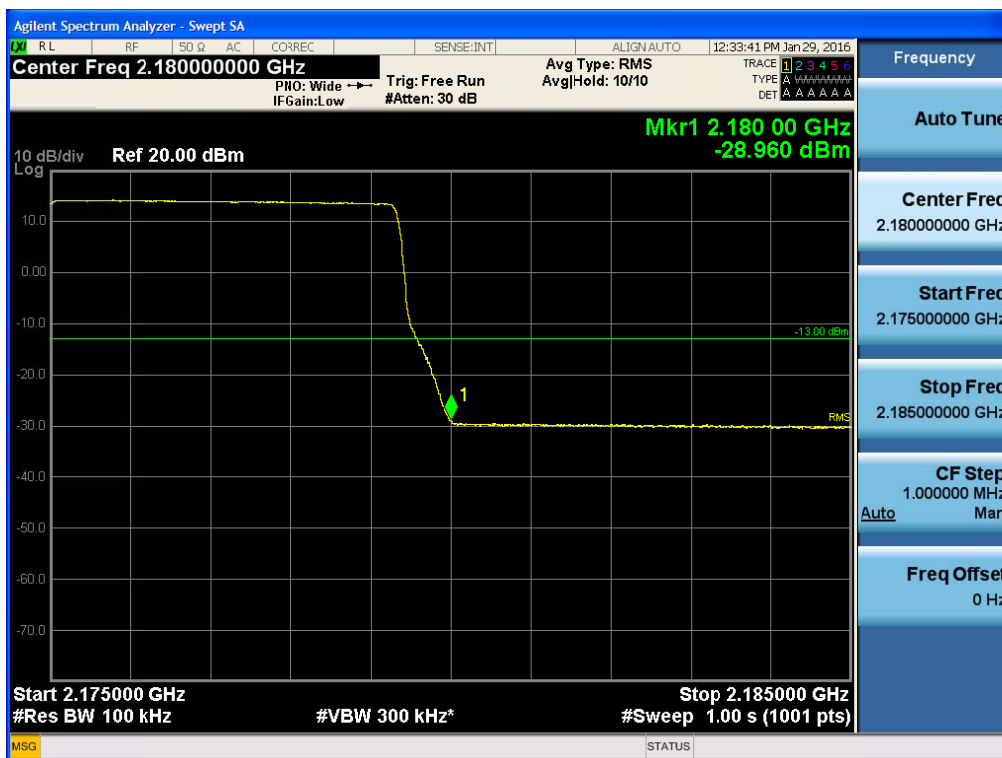


Single channel Enhancer Band Edge_AWS13 BAND LTE 10MHz

[Downlink Low]

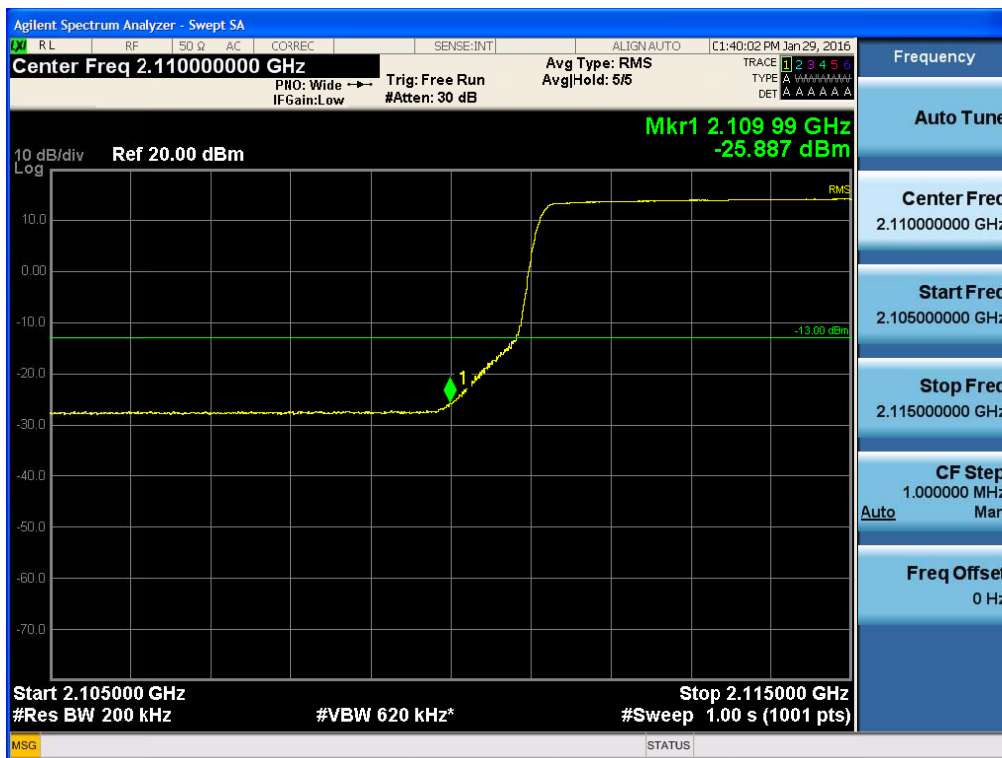


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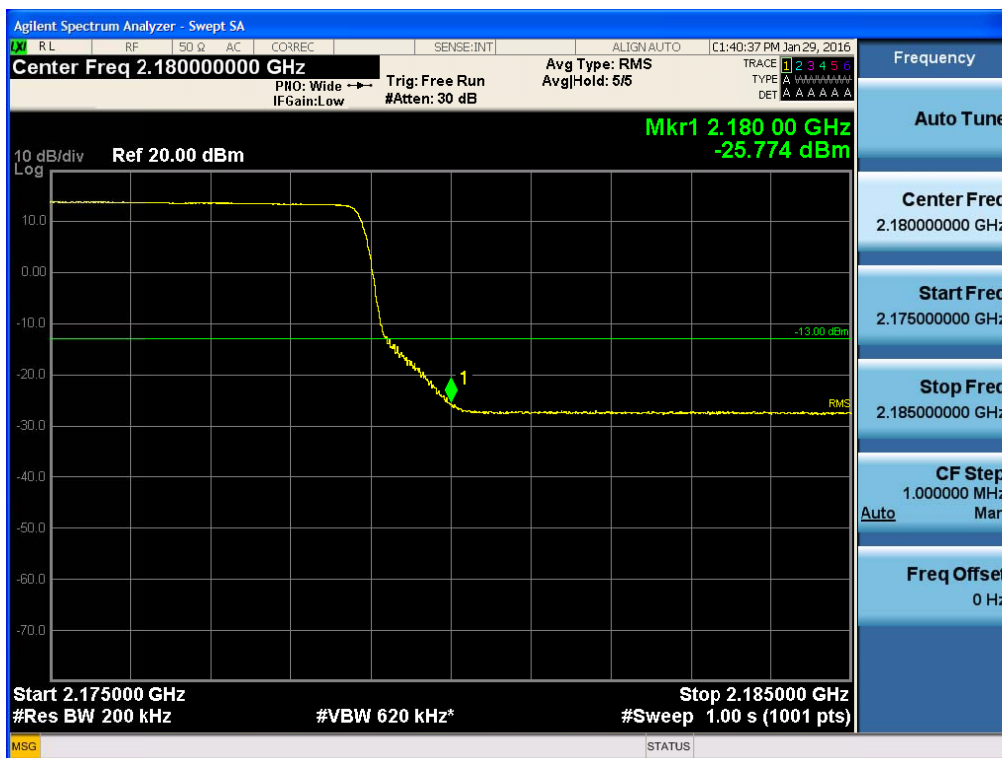


Single channel Enhancer Band Edge_AWS BAND LTE 20 MHz

[Downlink Low]

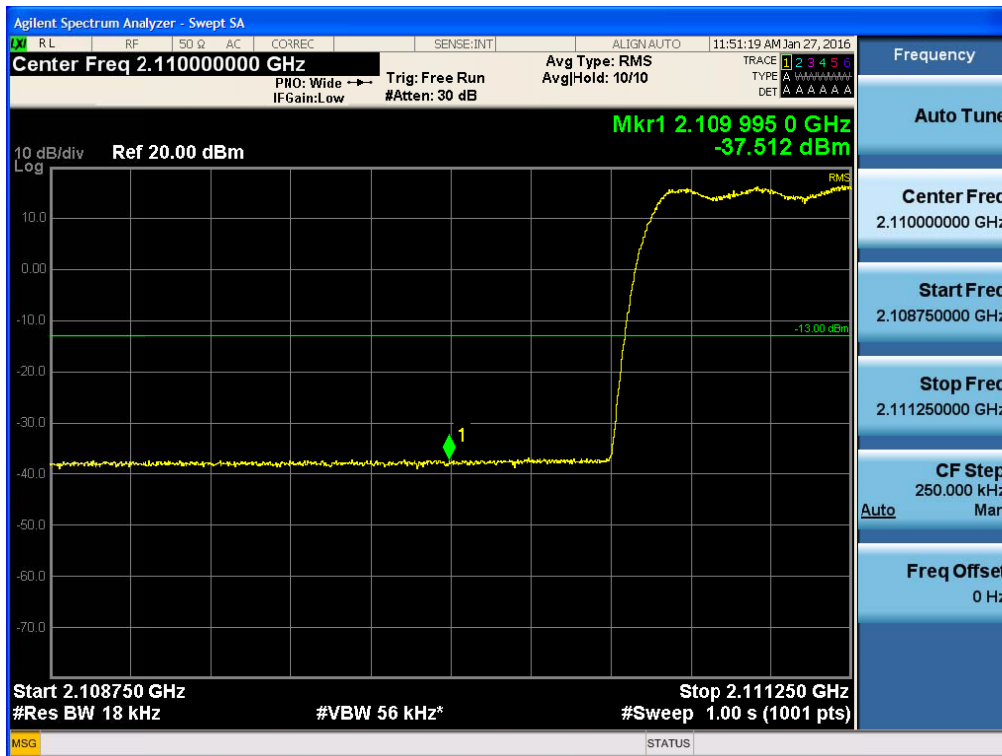


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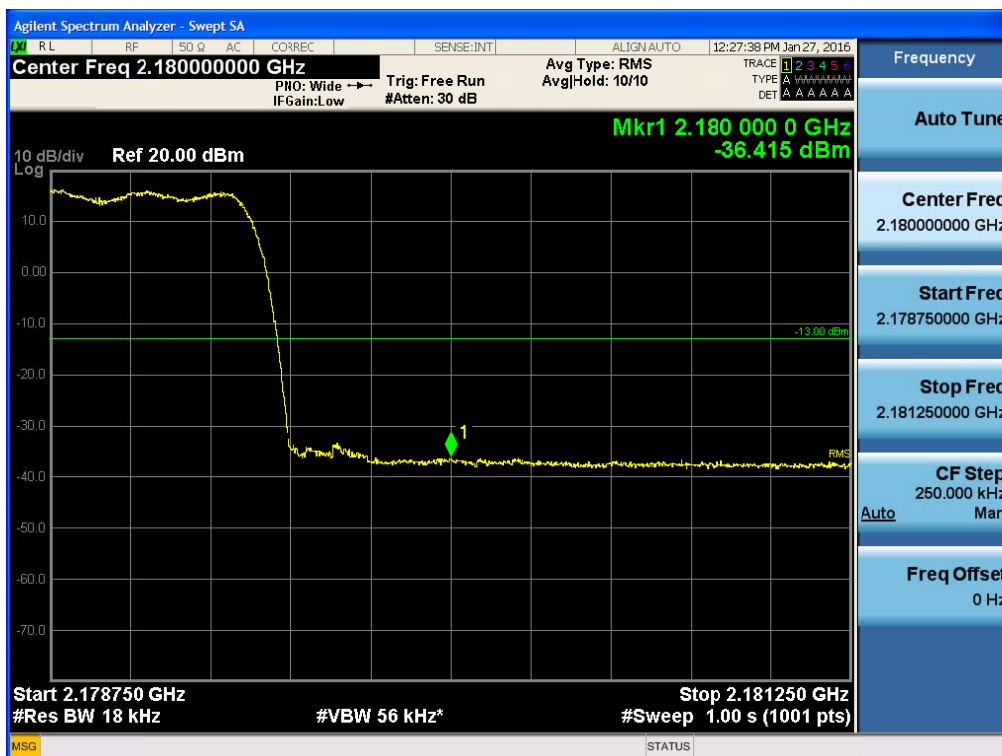


Single channel Enhancer Band Edge_AWS BAND CDMA

[Downlink Low]

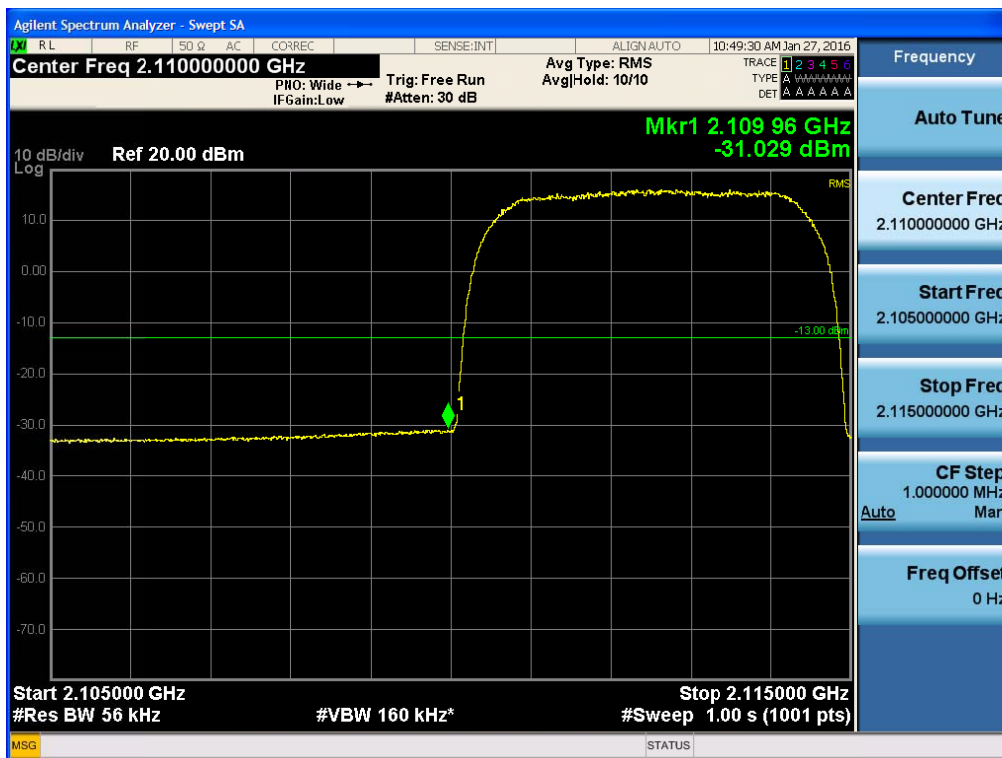


[Downlink High]

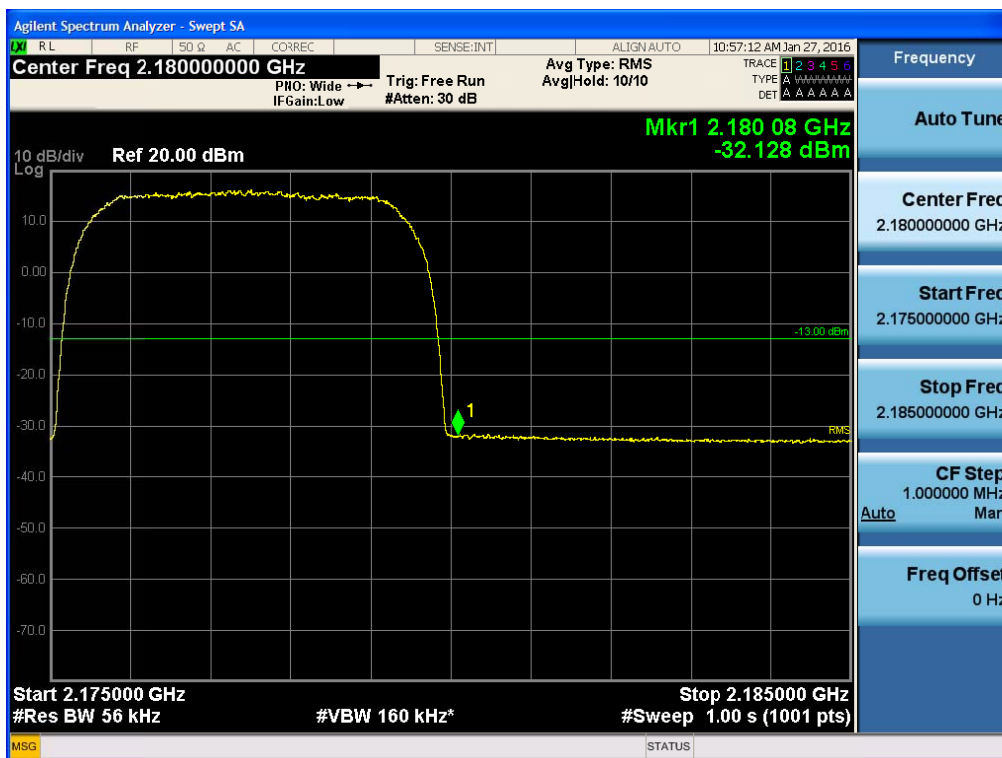


Single channel Enhancer Band Edge_AWS BAND WCDMA

[Downlink Low]

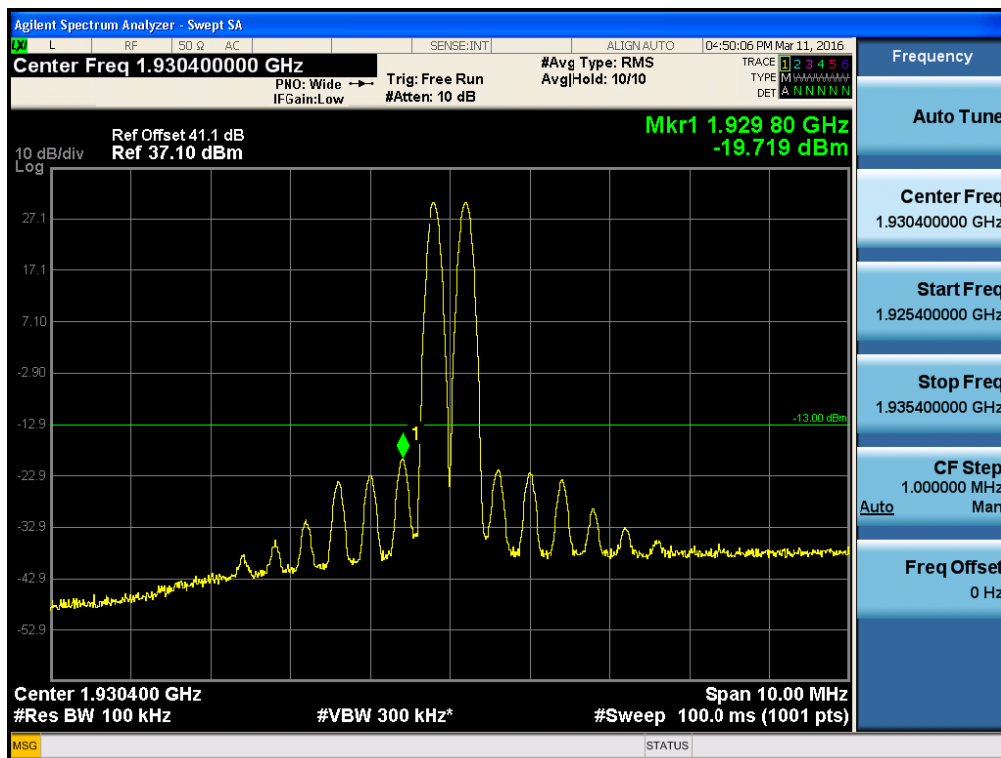


[Downlink High]

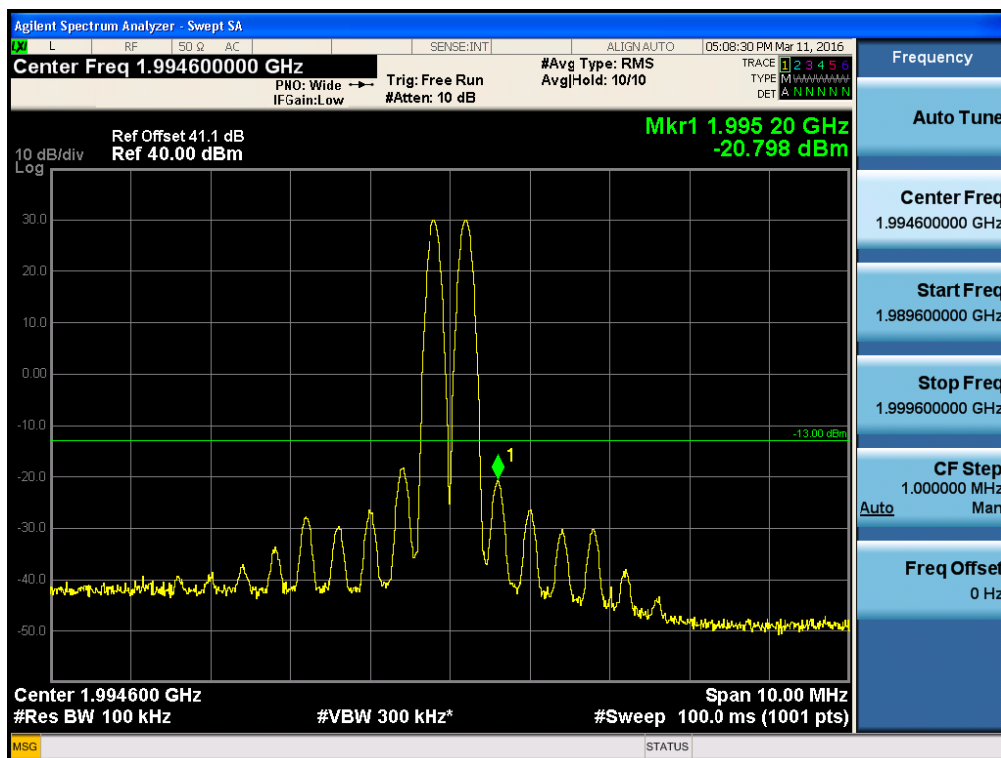


Multi channel Enhancer Band Edge for IC_PCS1900BAND

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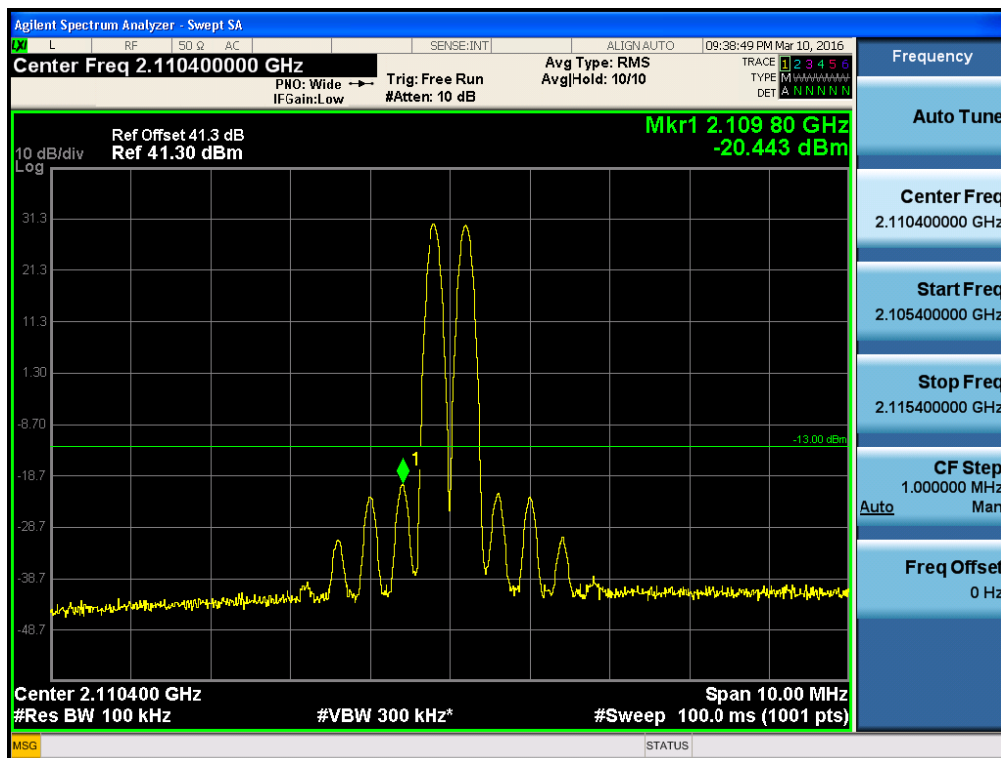


[Downlink High]

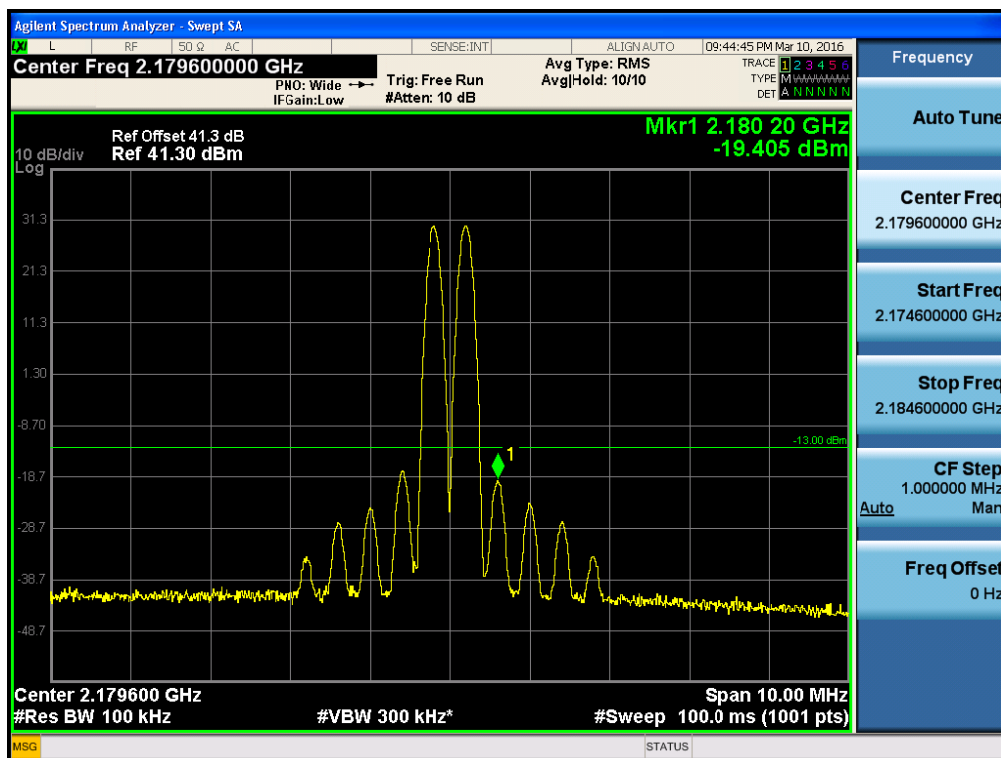


Multi channel Enhancer Band Edge for IC_AWS BAND

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[Downlink High]



10. RADIATED SPURIOUS EMISSIONS

Test Requirement(s): § 2.1053 Measurements required: Field strength of spurious radiation.

§ 2.1053 (a) Measurements shall be made to detect spurious emissions that may be Radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of § 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.

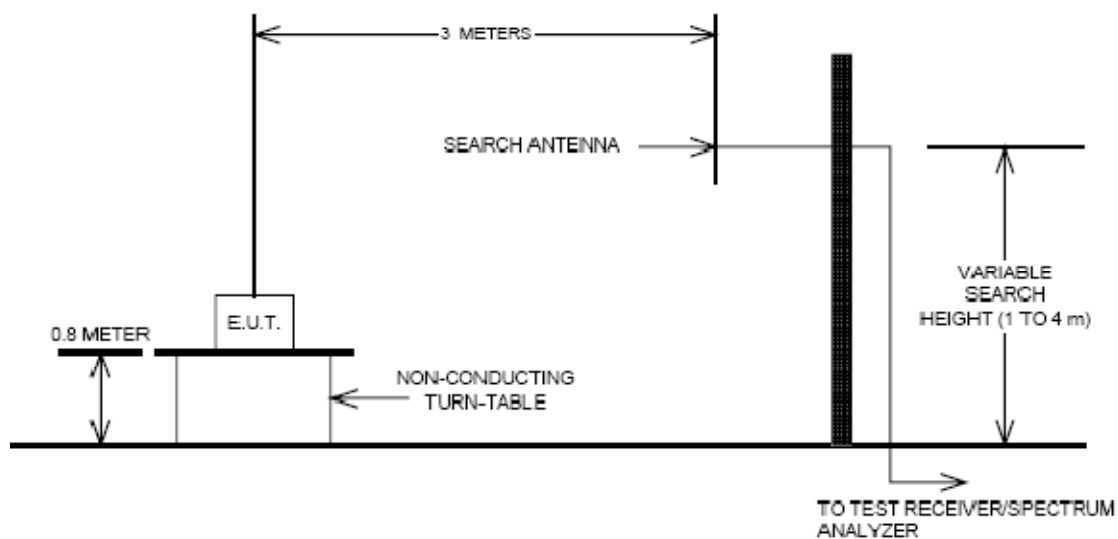
§ 2.1053 (b): The measurements specified in paragraph (a) of this section shall be made for the following equipment:

- (1) Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.
- (2) All equipment operating on frequencies higher than 25 MHz.
- (3) All equipment where the antenna is an integral part of, and attached directly to The transmitter.
- (4) Other types of equipment as required, when deemed necessary by the Commission.

Test Procedures: As required by 47 CFR 2.1053, *field strength of radiated spurious measurements* were made in accordance with the procedures of ANSI/TIA-603-C-2004 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards". Radiated emission measurements were performed inside a 3 meter semi-anechoic chamber. The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360 and the receiving antenna scanned from 1-3m in order to capture the maximum emission. A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was

duplicated. The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10th or 40GHz, whichever was the lesser, were investigated.

Radiated Spurious Emissions Test Setup



Test Result:

Note.

Input signal is the CW signal.

Harmonics were not found.

PCS 1900

[Downlink]

Voltage supplied to EUT	Tx Freq.(MHz)	Freq.(MHz)	<u>Substitute</u> <u>Level</u> [dBm]	Ant. Gain (dBi)	C.L	Pol.	EIRP (dBm)	Margin (dB)
120 Vac	1932.5	No Peak Found						
	1962.5							
	1992.5							

Voltage supplied to EUT	Tx Freq.(MHz)	Freq.(MHz)	<u>Substitute</u> <u>Level</u> [dBm]	Ant. Gain (dBi)	C.L	Pol.	EIRP (dBm)	Margin (dB)
-48 Vdc	1932.5	No Peak Found						
	1962.5							
	1992.5							

AWS

[Downlink]

Voltage supplied to EUT	Tx Freq.(MHz)	Freq.(MHz)	<u>Substitute</u> <u>Level</u> [dBm]	Ant. Gain (dBi)	C.L	Pol.	EIRP (dBm)	Margin (dB)
120 Vac	2112.5	4225	-32.04	12.62	4.77	V	-24.20	11.20
	2145.0	4290	-42.76	12.58	4.71	V	-34.89	21.89
	2177.5	4355	-42.72	12.54	4.65	H	-34.84	21.84

Voltage supplied to EUT	Tx Freq.(MHz)	Freq.(MHz)	<u>Substitute</u> <u>Level</u> [dBm]	Ant. Gain (dBi)	C.L	Pol.	EIRP (dBm)	Margin (dB)
-48 Vdc	2112.5	4225	-28.75	12.62	4.77	H	-20.91	7.91
	2145.0	4290	-43.08	12.58	4.71	H	-35.21	22.21
	2177.5	4355	-43.05	12.54	4.65	H	-35.17	22.17

11. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

FCC Rules

Test Requirement(s): §2.1055(a)(1), § 27.54

Test Procedures:

As required by 47 CFR 2.1055, *Frequency Stability measurements* were made at the RF output terminals using a Spectrum Analyzer.

The EUT was placed in the Environmental Chamber.

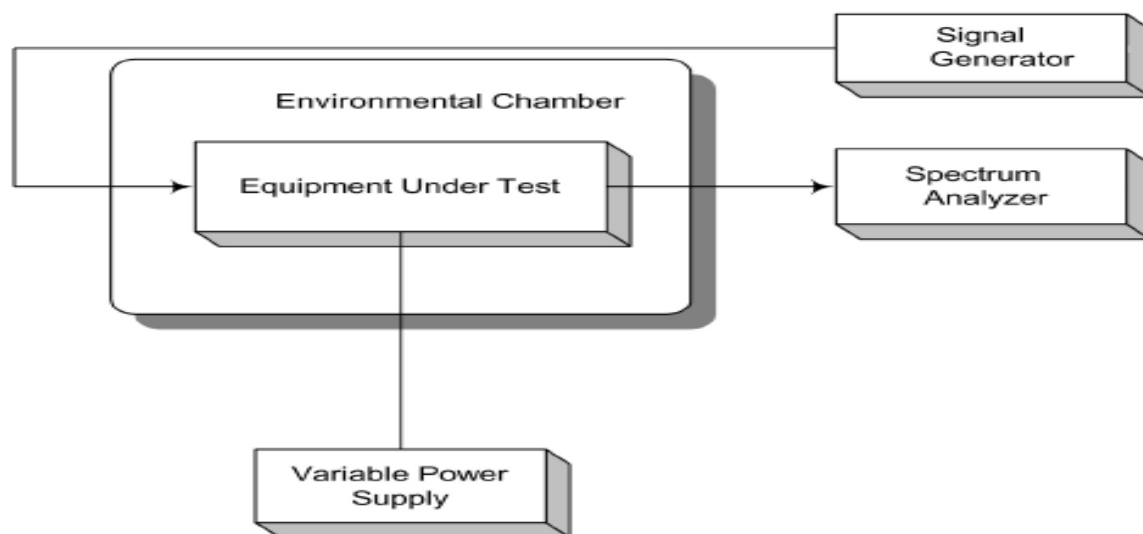
A CW signal was injected into the EUT at the appropriate RF level. The frequency counter option on the Spectrum Analyzer was used to measure frequency deviations.

The frequency drift was investigated for every 10 °C increment until the unit is stabilized then recorded the reading in tabular format with the temperature range of -30 to 50 °C.

Voltage supplied to EUT is 110 Vac reference temperature was done at 20°C.

The voltage was varied by ± 15 % of nominal

Test Setup:



IC Rules**Test Requirement(s): RSS-131 6.5**

A band translator is essentially a repeater station and should introduce as little frequency error as possible. The frequency stability should therefore meet the objectives of the overall land mobile or cellular service for which it serves. Better frequency stability than the minimum standard cited below will therefore be required in some cases.

The frequency stability shall be within 1.5 parts per million (0.00015%).

Test Procedures: RSS-131 4.5

In addition, the local oscillator frequency stability of the band translator shall be reported.

Frequency stability is a measure of the frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at +20 °C and rated supply voltage.

The following temperature and supply voltage ranges apply:

- (a) at 10 degree intervals of temperatures between -30 °C and +50 °C, and at the manufacturer's rated-supply voltage; and
- (b) at +20 °C temperature and 15% supply voltage variations.

Test Results:

The E.U.T was found in compliance for Frequency Stability and Voltage Test

Frequency Stability and Voltage Test Results [1900 PCSBAND]

Reference: 120 Vac at 20°C **Freq.** = 1962.50 MHz

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1962 500 000	0.0	0.0	0.0000
	-30	1962 500 000	-0.1	-0.1	-0.0001
	-20	1962 500 000	-0.1	-0.1	-0.0001
	-10	1962 500 000	-0.1	-0.1	-0.0001
	0	1962 500 000	0.0	0.0	0.0000
	+10	1962 500 000	0.0	0.0	0.0000
	+30	1962 500 000	0.0	0.0	0.0000
	+40	1962 500 000	-0.1	-0.1	-0.0001
	+50	1962 500 000	-0.1	-0.1	-0.0001
115%	+20	1962 500 000	0.0	0.0	0.0000
85%	+20	1962 500 000	0.0	0.0	0.0000

[AWS BAND]

Reference: 120 Vac at 20°C **Freq.** = 2145.00 MHz

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	2145 000 000	-0.1	0.0	0.0000
	-30	2145 000 000	-0.1	0.0	0.0000
	-20	2145 000 000	0.0	0.1	0.0000
	-10	2145 000 000	-0.1	0.0	0.0000
	0	2145 000 000	0.0	0.1	0.0000
	+10	2145 000 000	-0.1	0.0	0.0000
	+30	2145 000 000	-0.1	0.0	0.0000
	+40	2145 000 000	-0.1	0.0	0.0000
	+50	2145 000 000	0.0	0.1	0.0000
115%	+20	2145 000 000	0.0	0.1	0.0000
85%	+20	2145 000 000	-0.1	0.0	0.0000