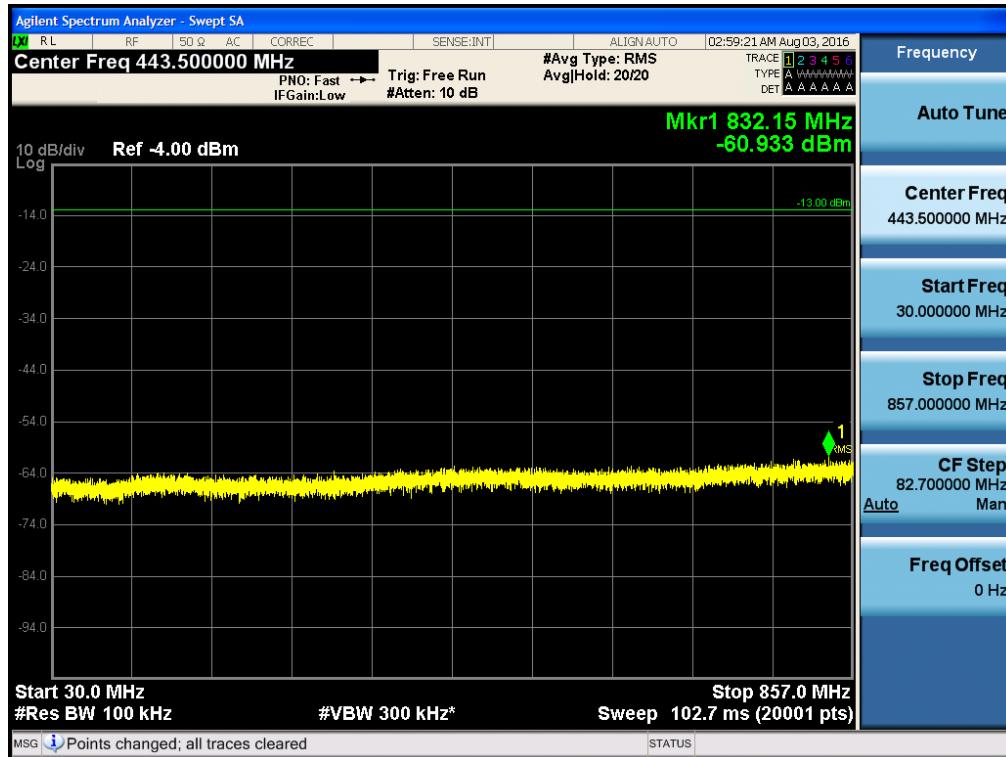


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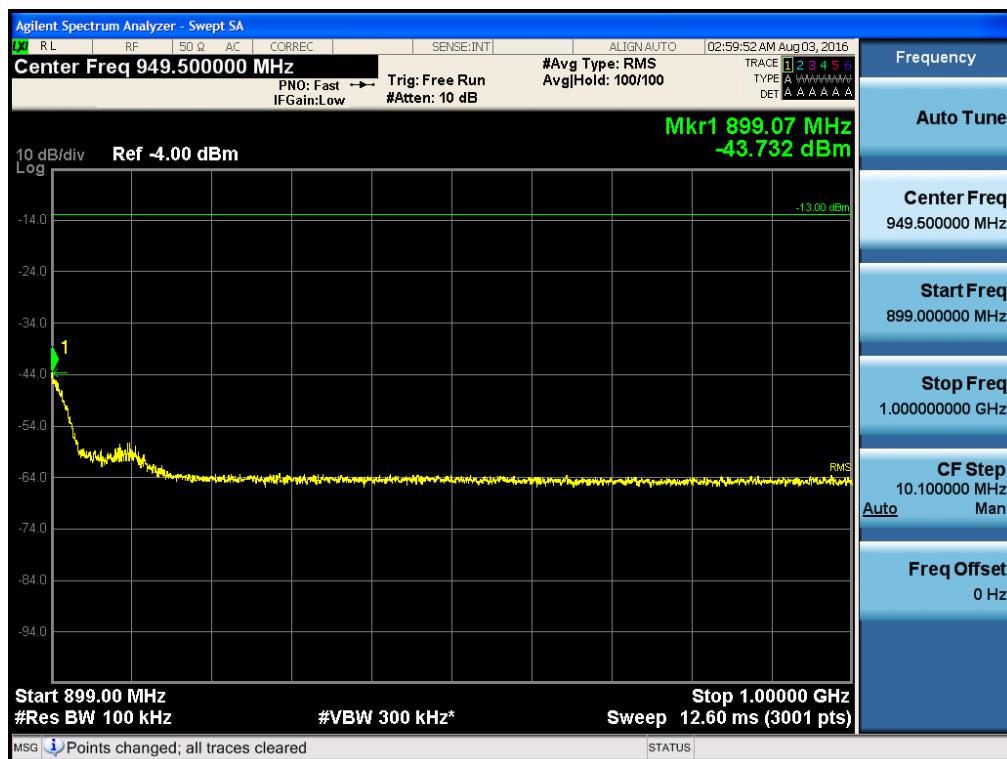
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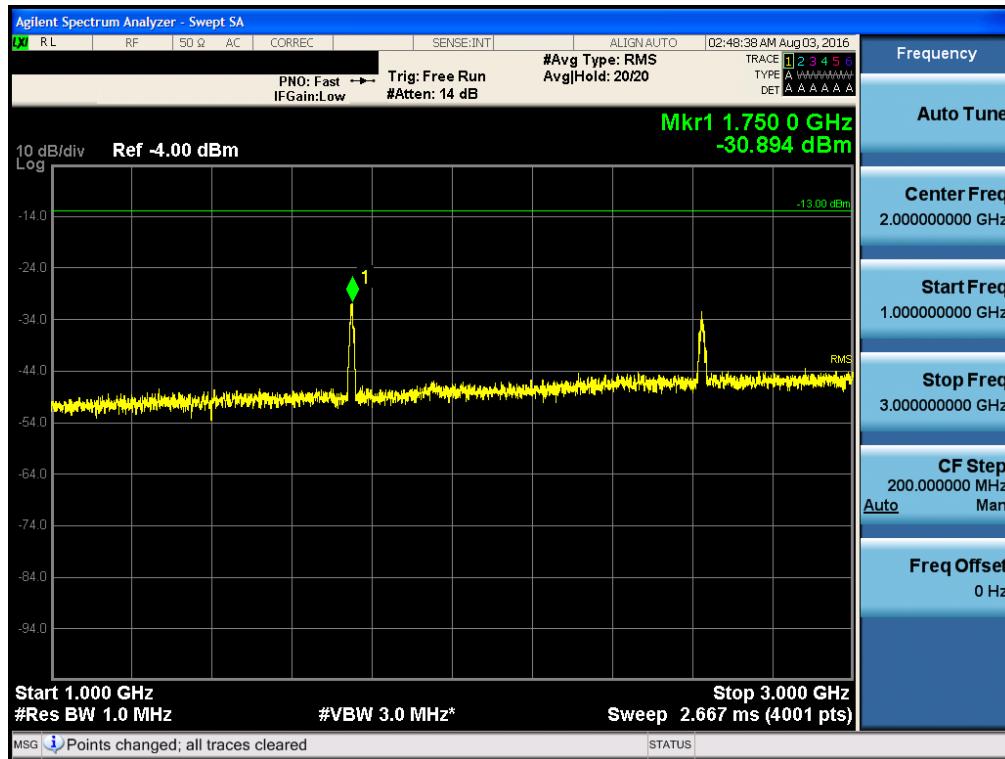
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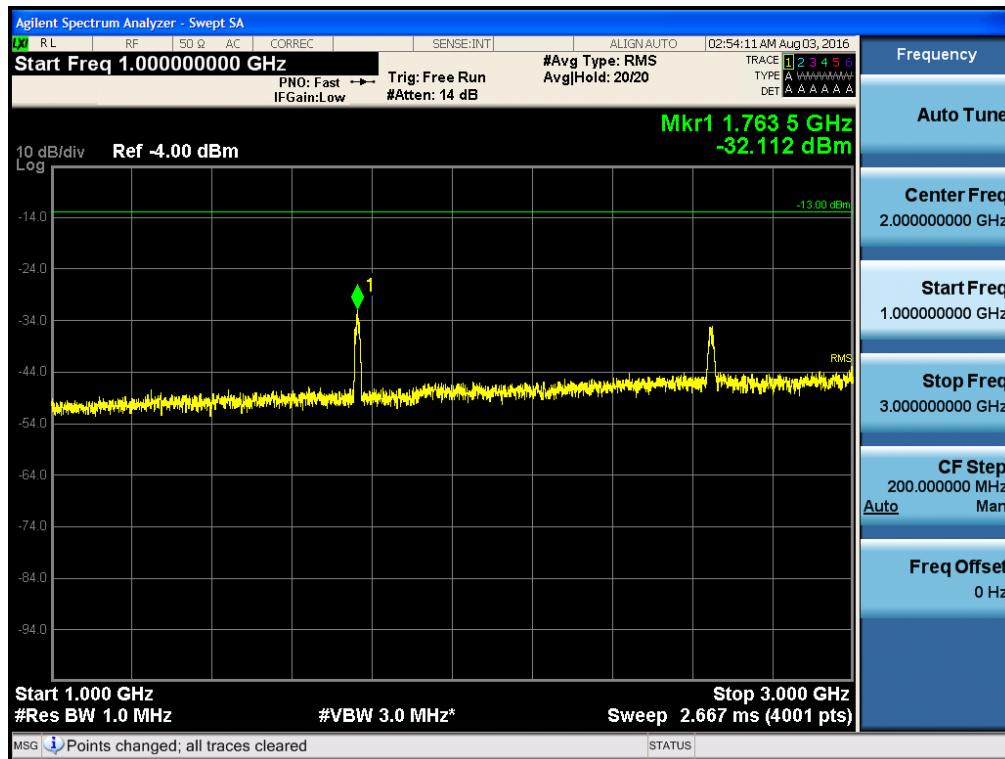
Conducted Spurious Emissions (1 GHz – 12.75 GHz)
[Downlink Low]-1



[Downlink Low]-2



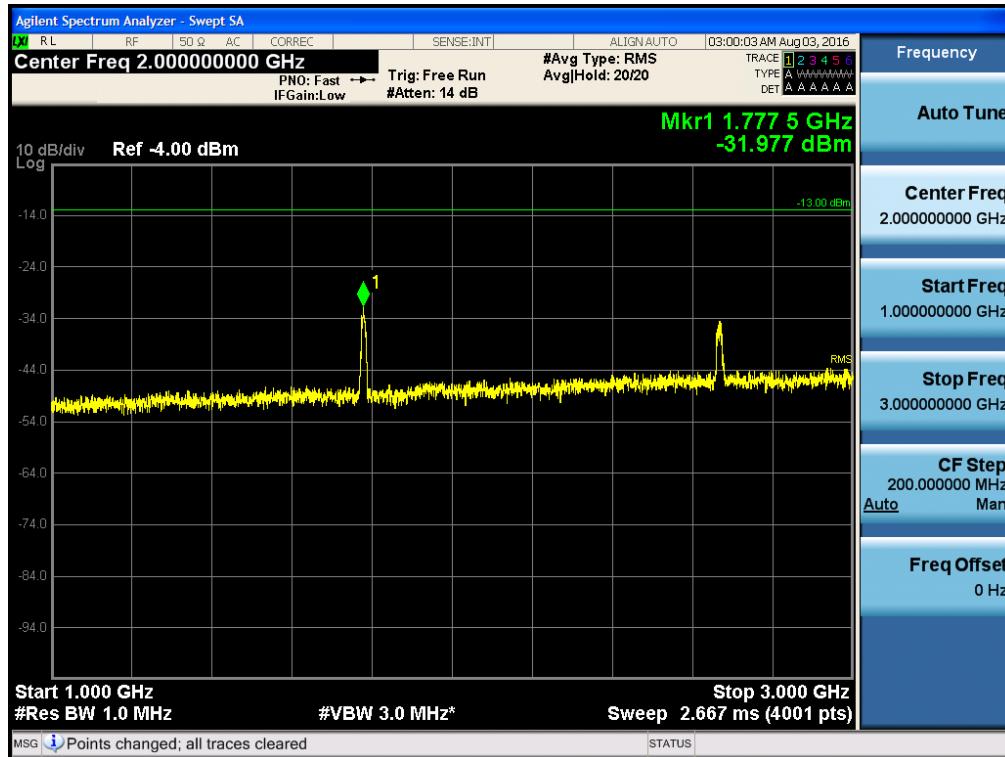
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[Downlink Middle]-2



[Downlink High]-1

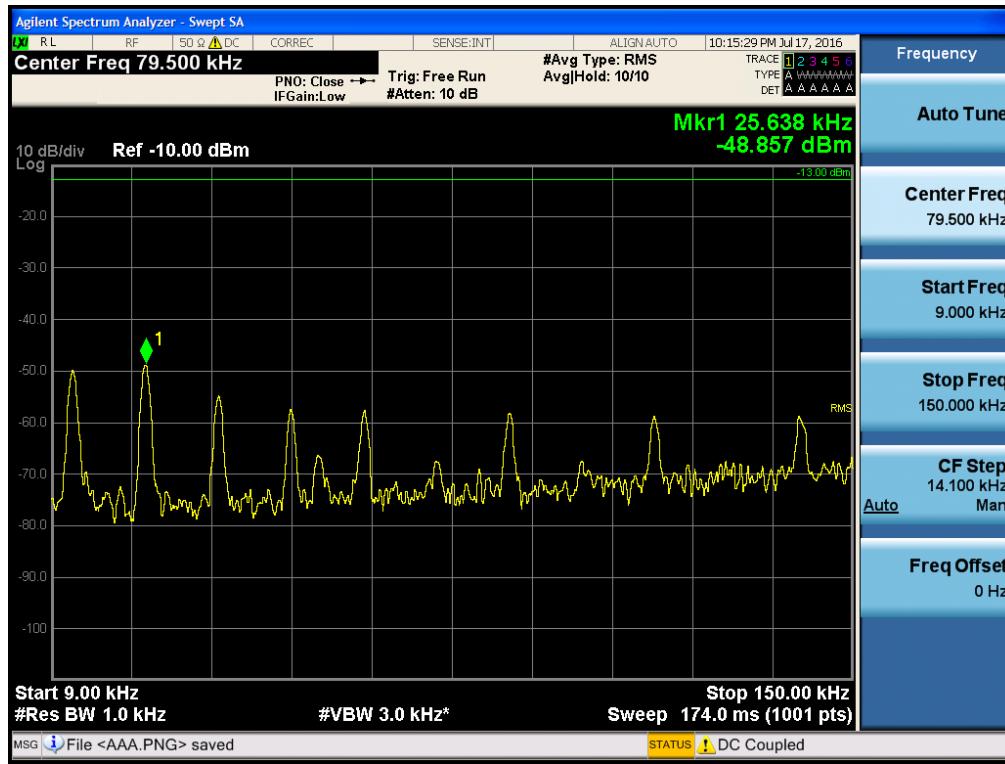


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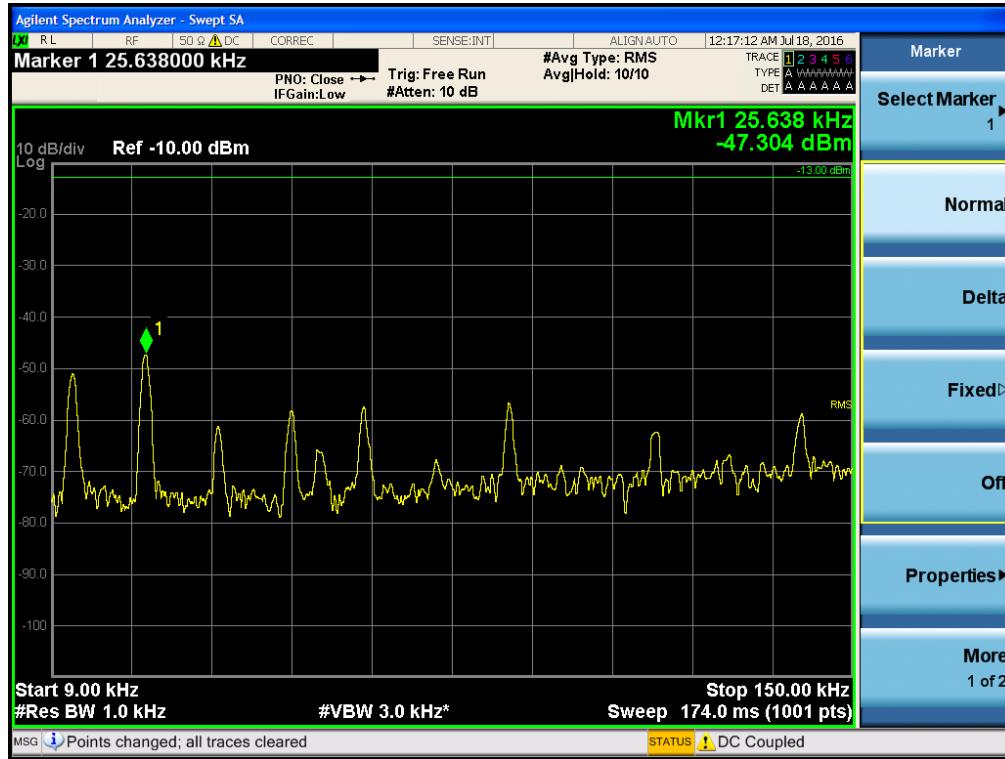


Single channel Enhancer Plots of Spurious Emission for 850CEL BAND CDMA Conducted Spurious Emissions (9 kHz – 150 kHz)

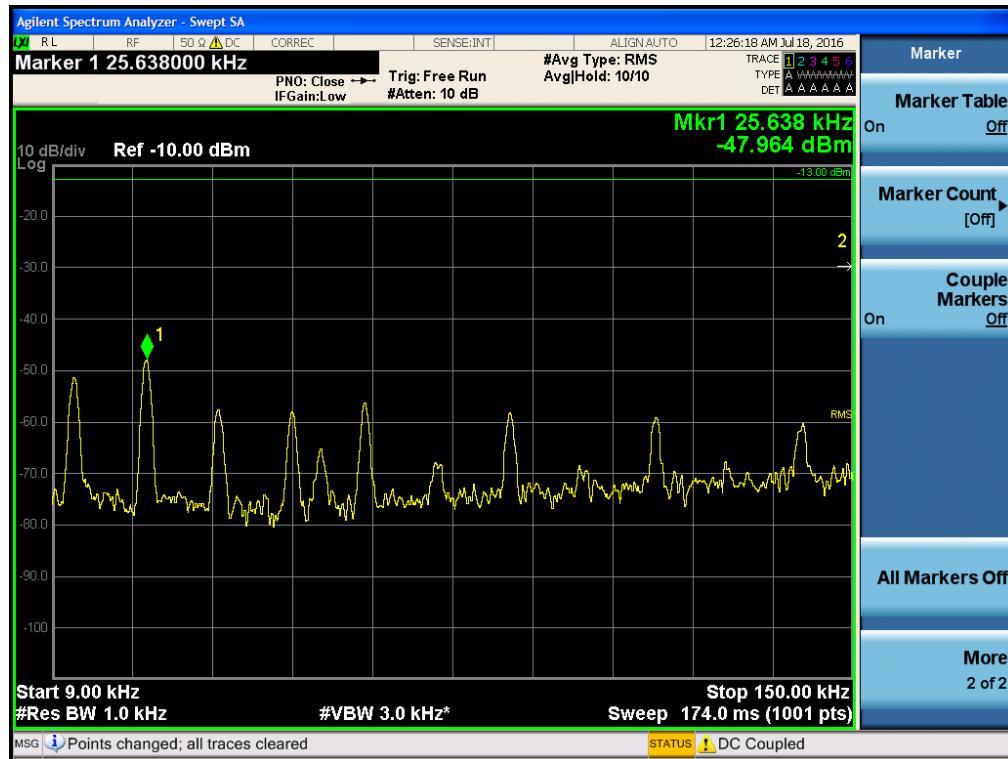
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[Downlink Middle]

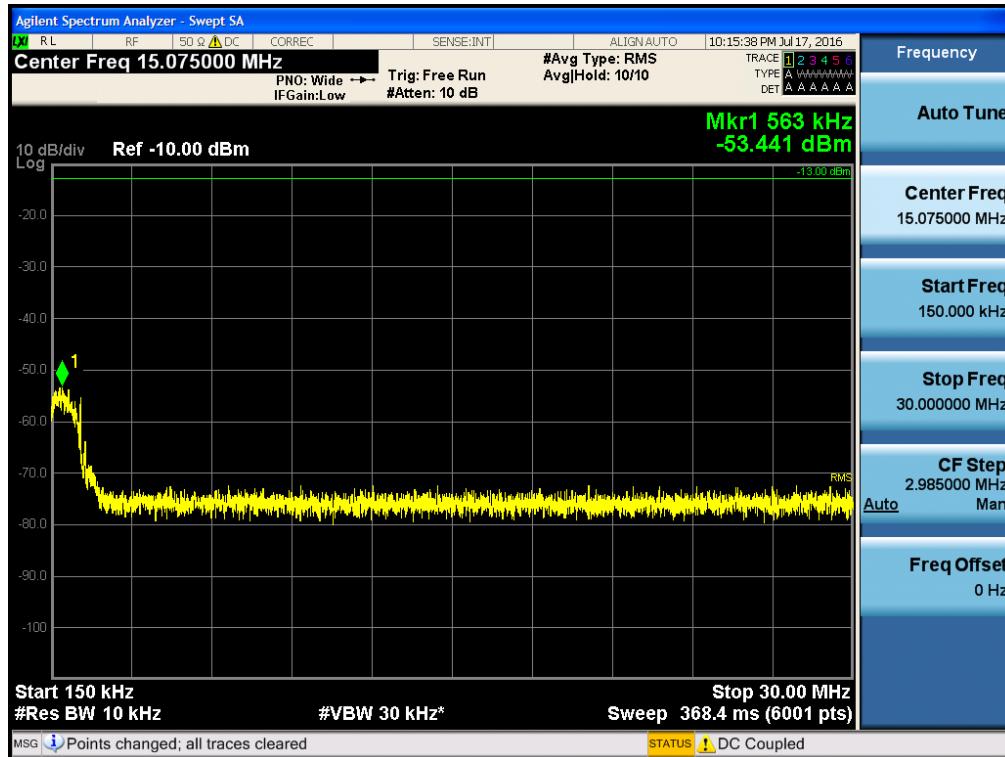


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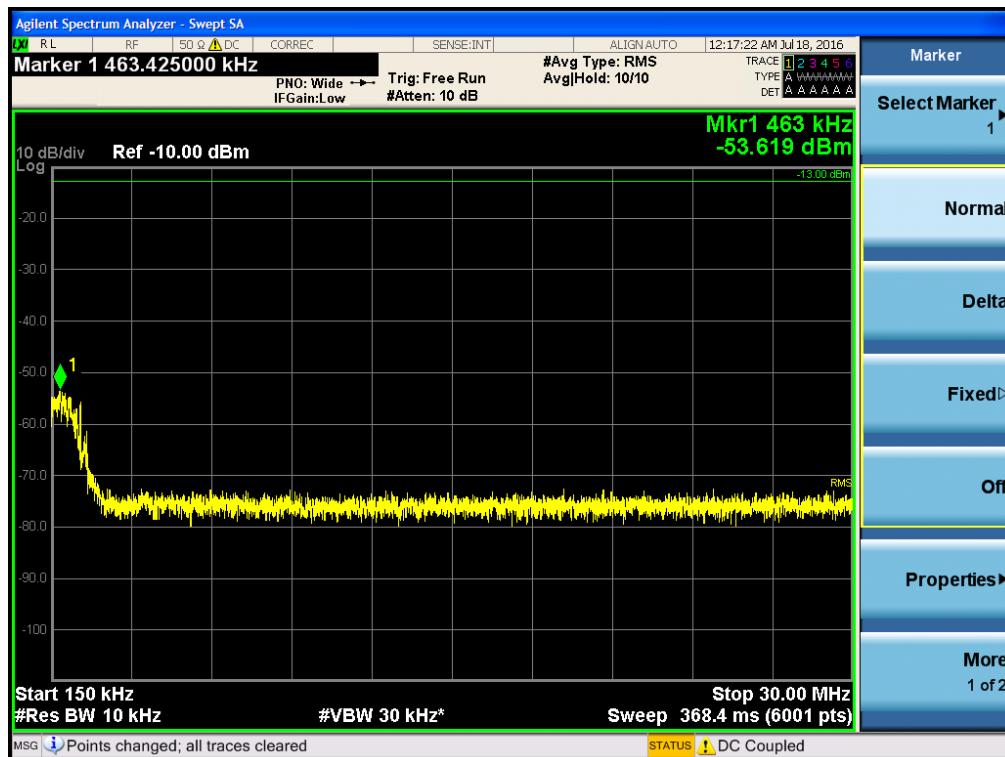


Conducted Spurious Emissions (150 kHz – 30 MHz)

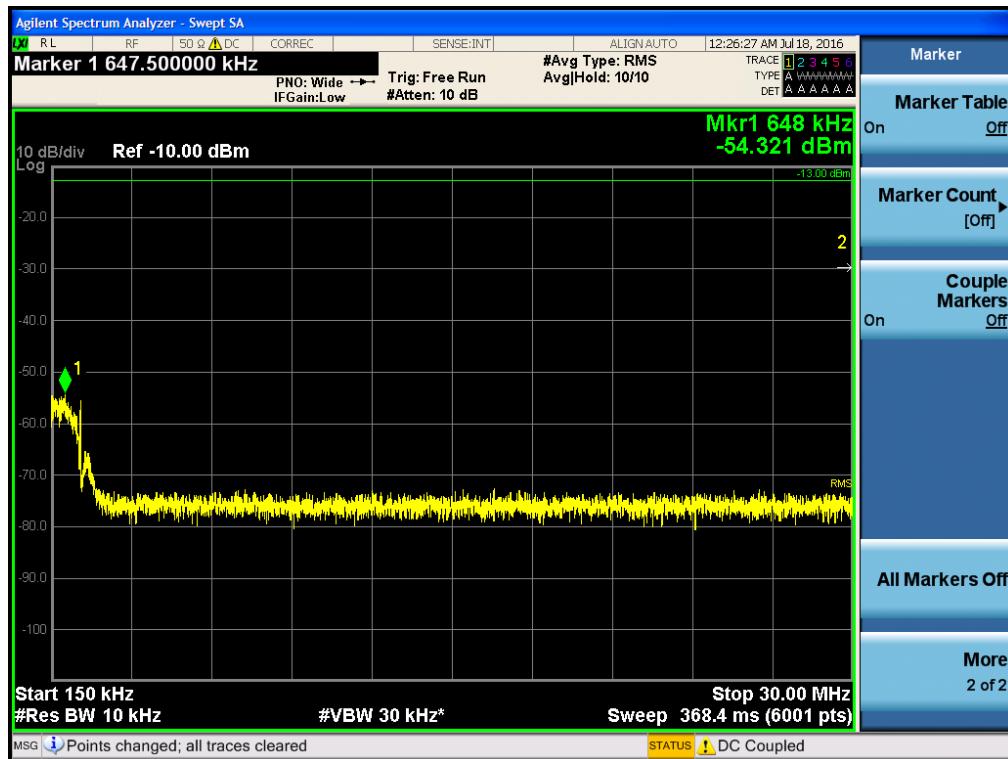
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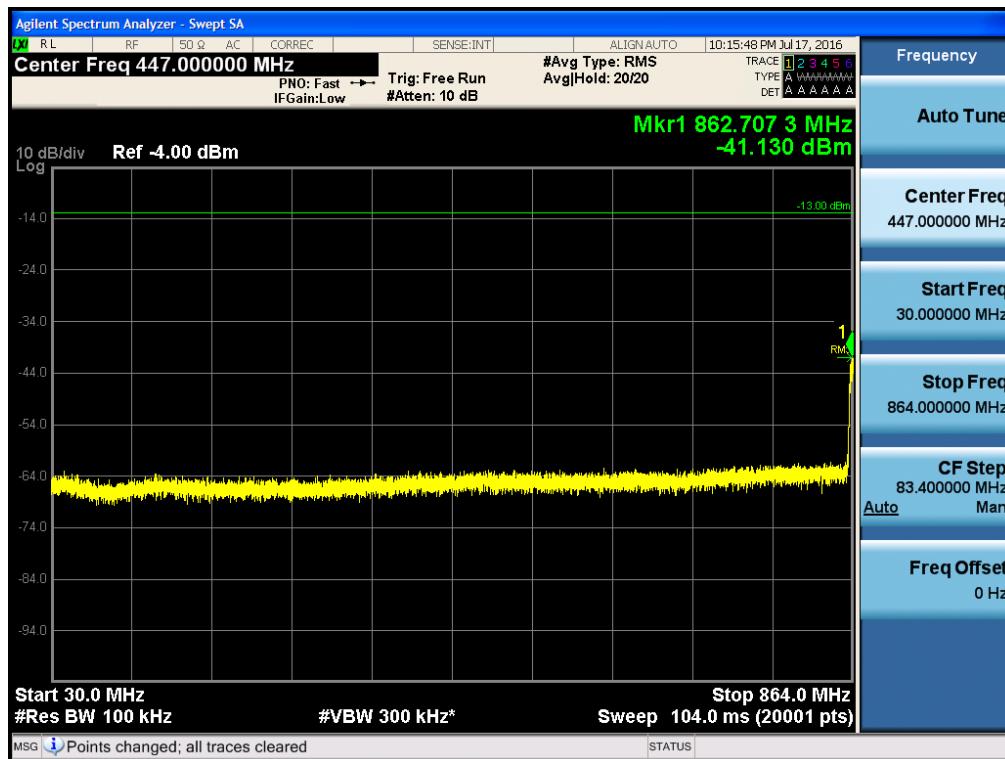


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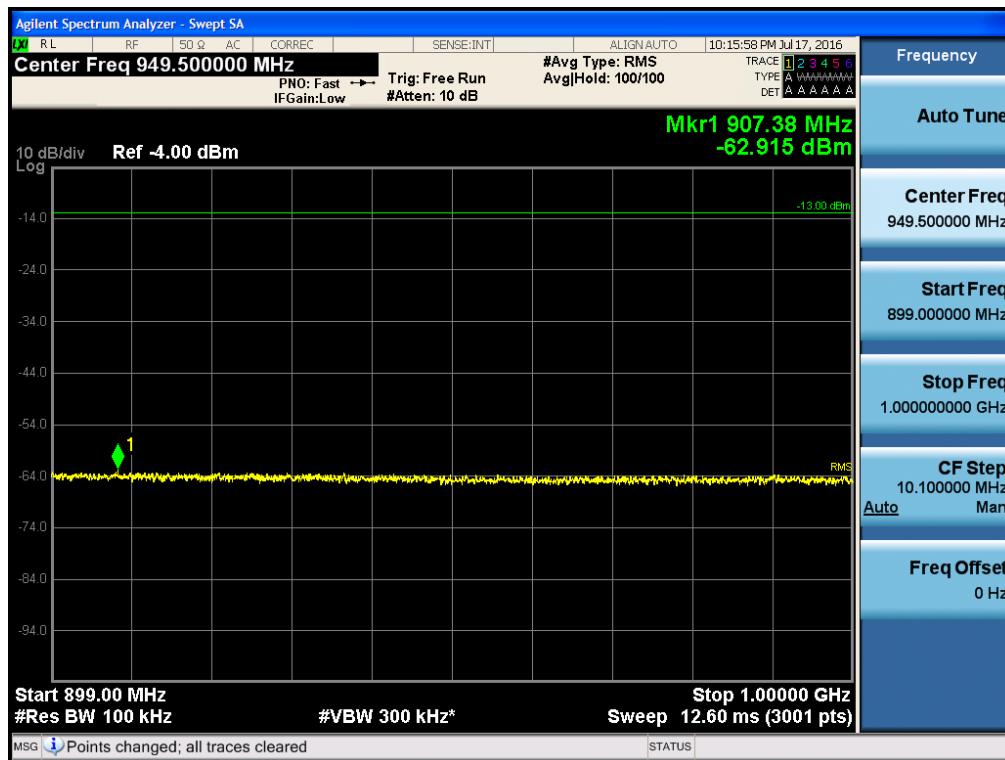


Conducted Spurious Emissions (30 MHz – 1 GHz)

[Downlink Low] -1



[Downlink Low] -2



[Downlink Middle] -1



[Downlink Middle] -2



[Downlink High] -1



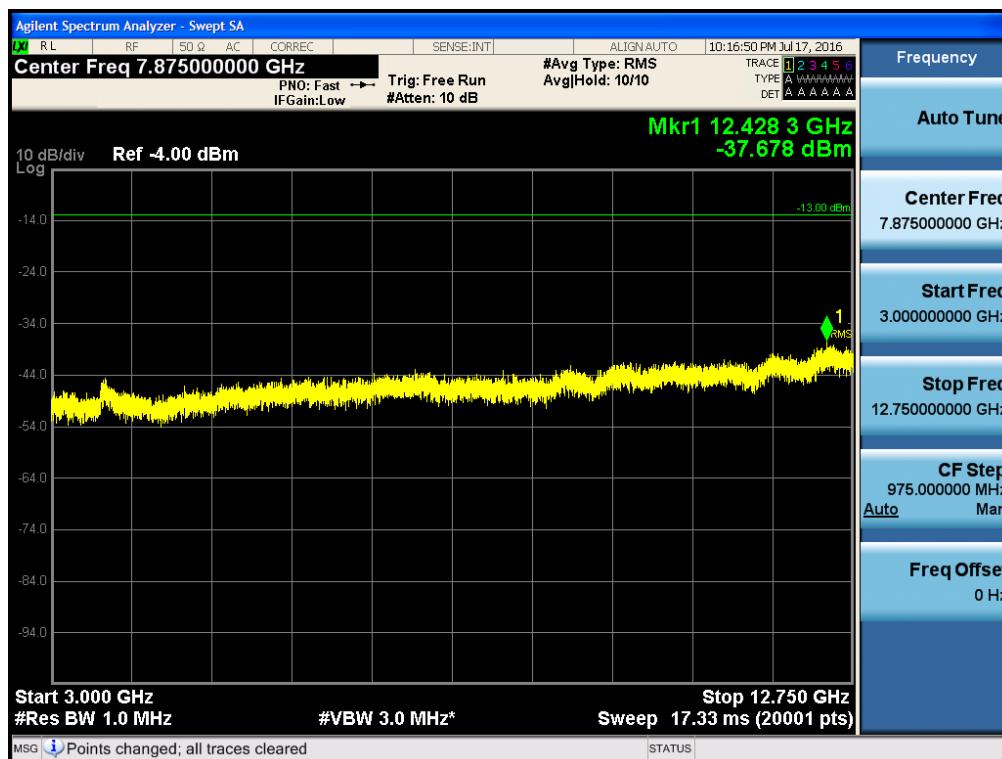
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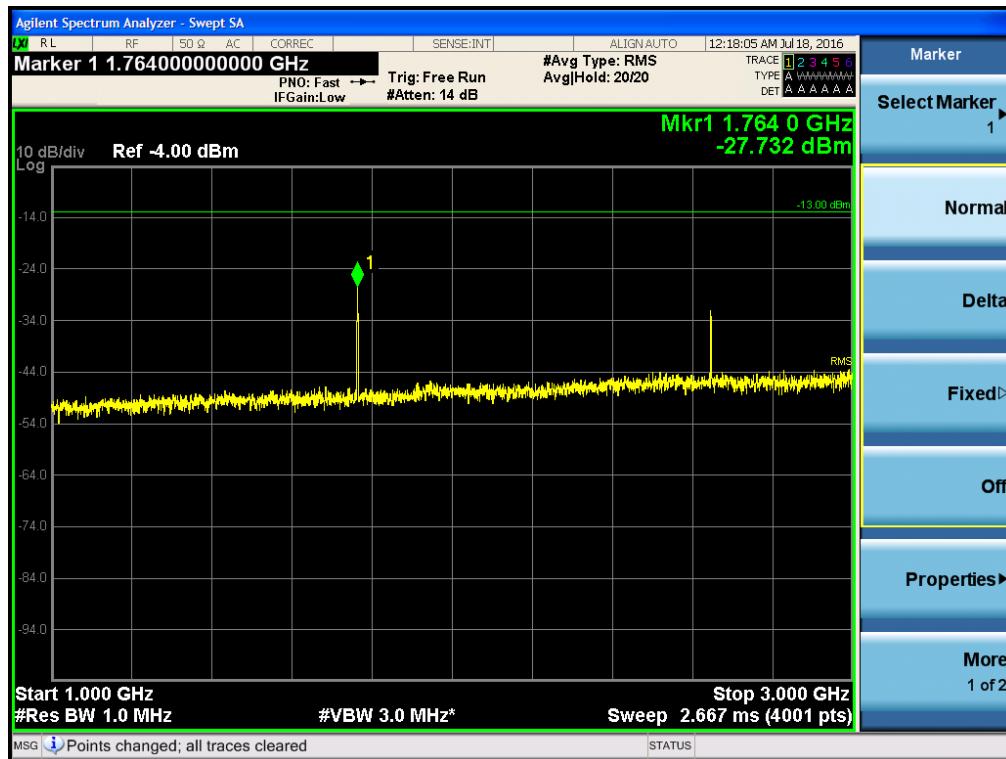
Conducted Spurious Emissions (1 GHz – 12.75 GHz)
[Downlink Low]-1



[Downlink Low]-2



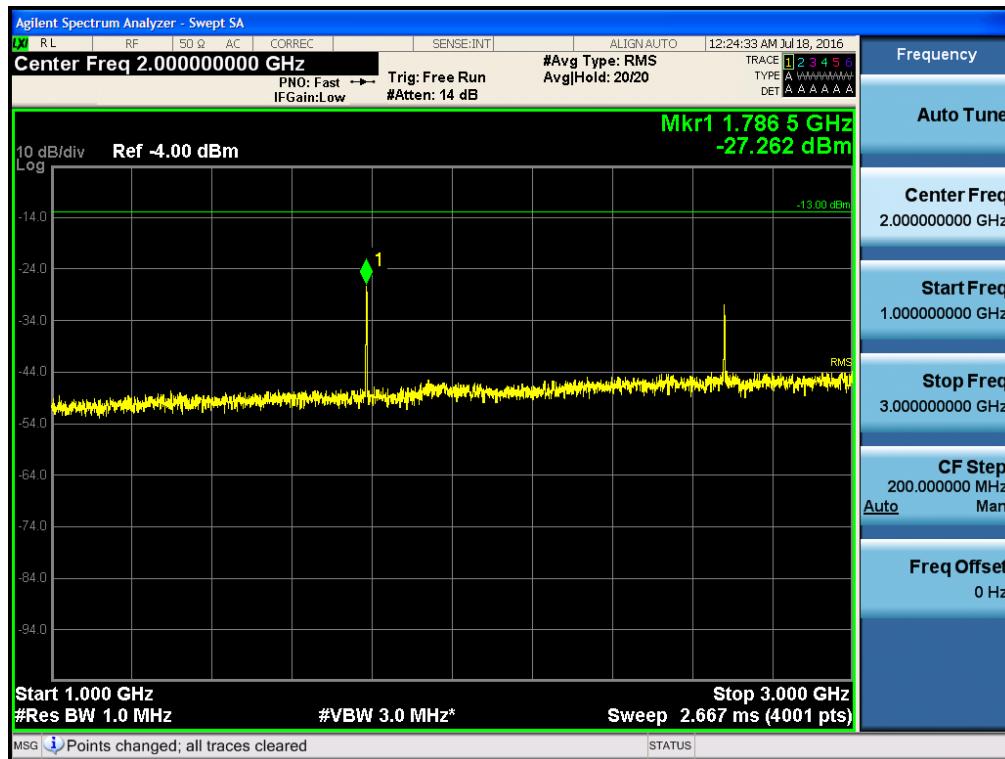
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[Downlink Middle]-2



[Downlink High]-1



[Downlink High]-2

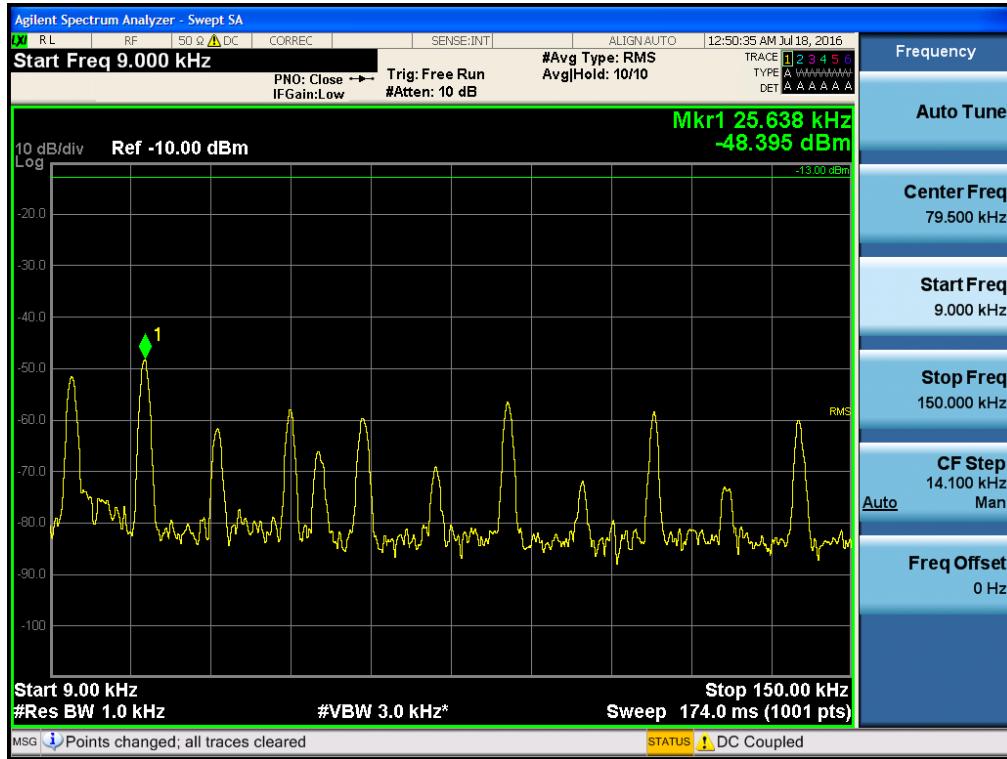


Single channel Enhancer Plots of Spurious Emission for 850CEL BAND WCDMA Conducted Spurious Emissions (9 kHz – 150 kHz)

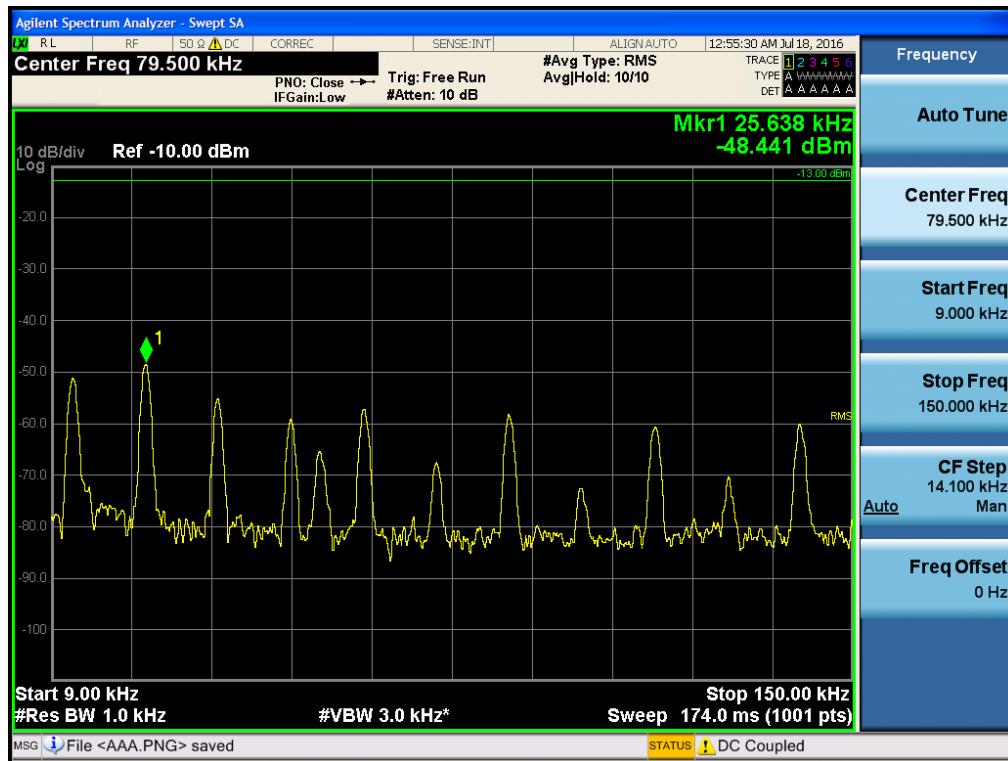
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[Downlink Middle]

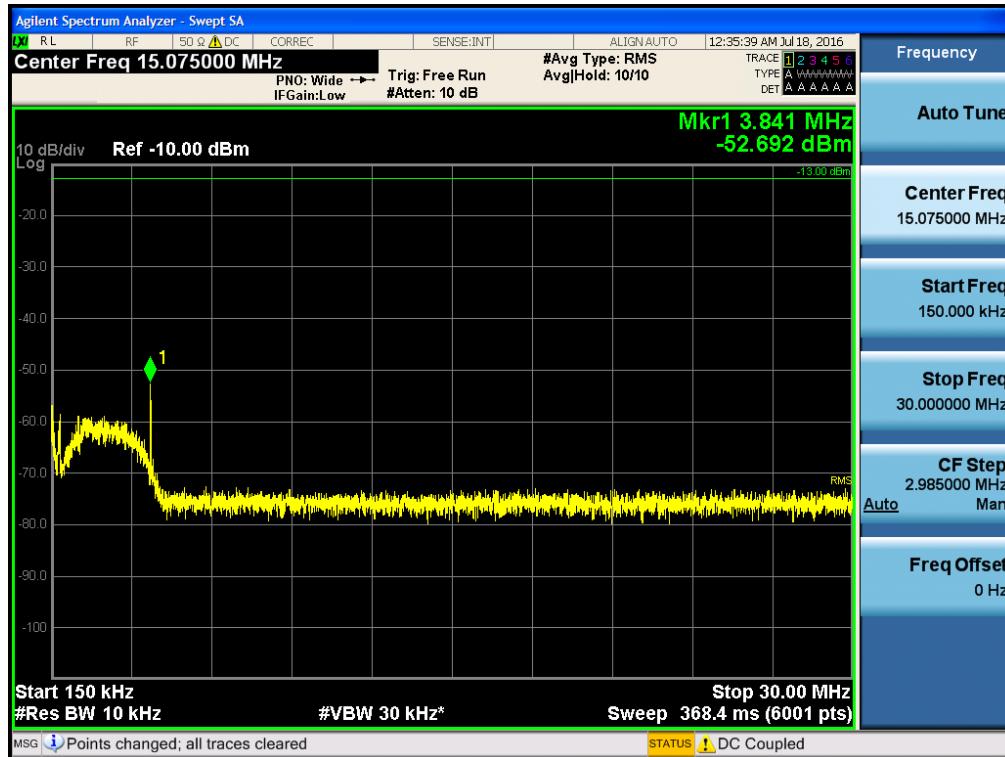


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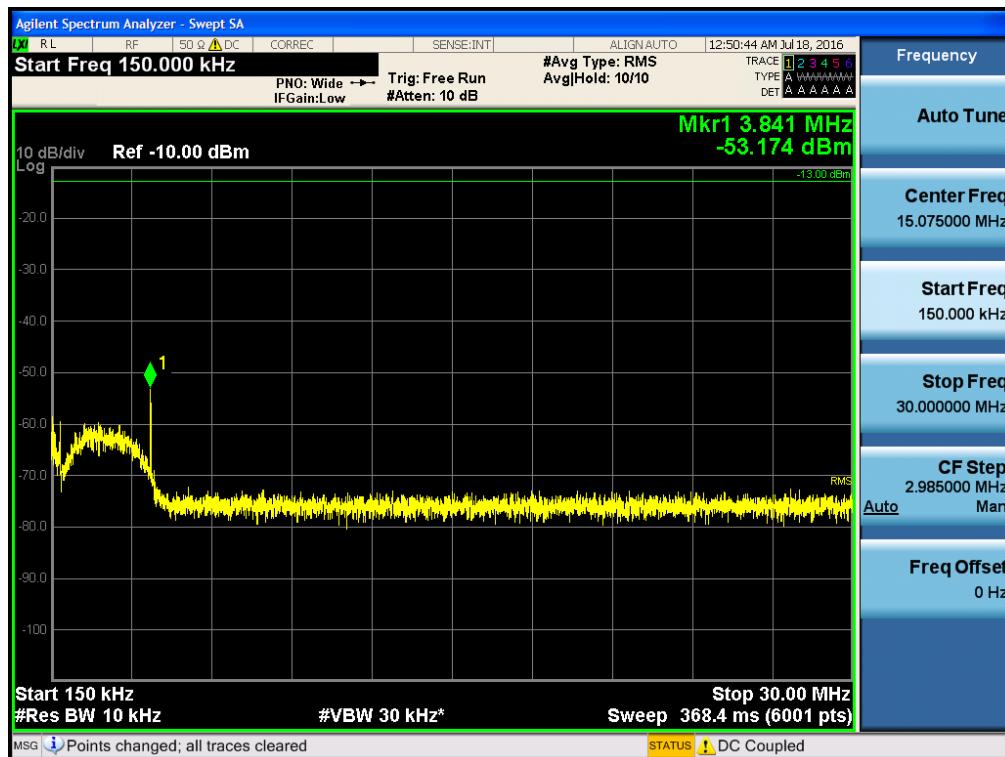


Conducted Spurious Emissions (150 kHz – 30 MHz)

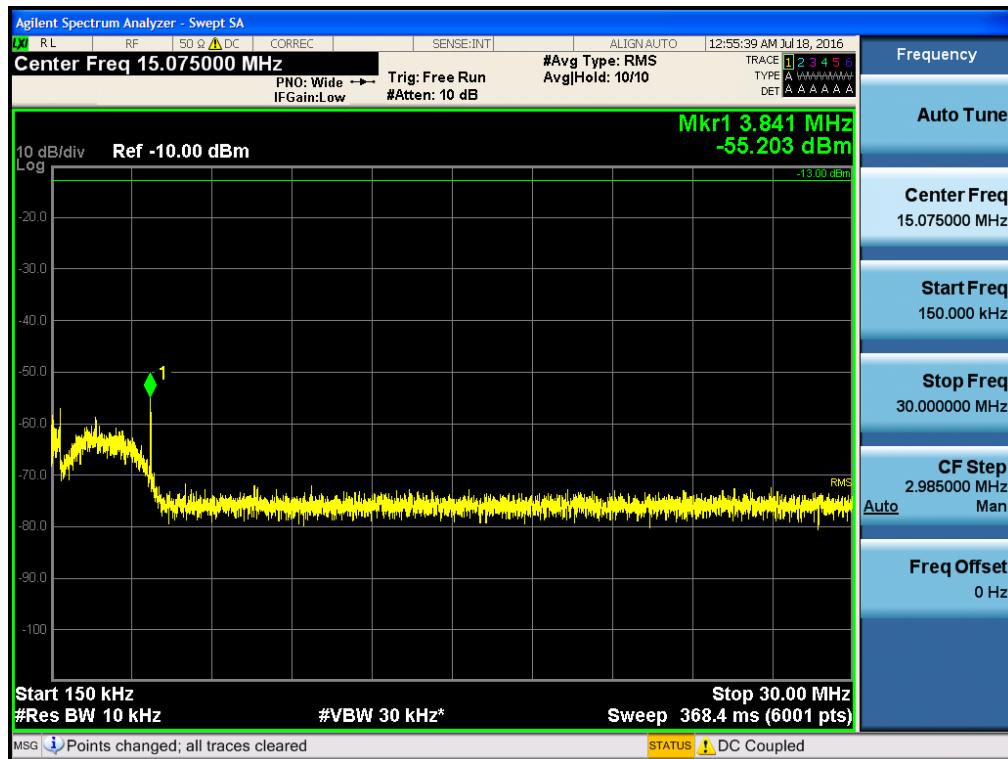
[Downlink Low]



[Downlink Middle]



[Downlink High]



Conducted Spurious Emissions (30 MHz – 1 GHz)

[Downlink Low] -1



[Downlink Low] -2



[Downlink Middle] -1



[Downlink Middle] -2



[Downlink High] -1



[Downlink High] -2



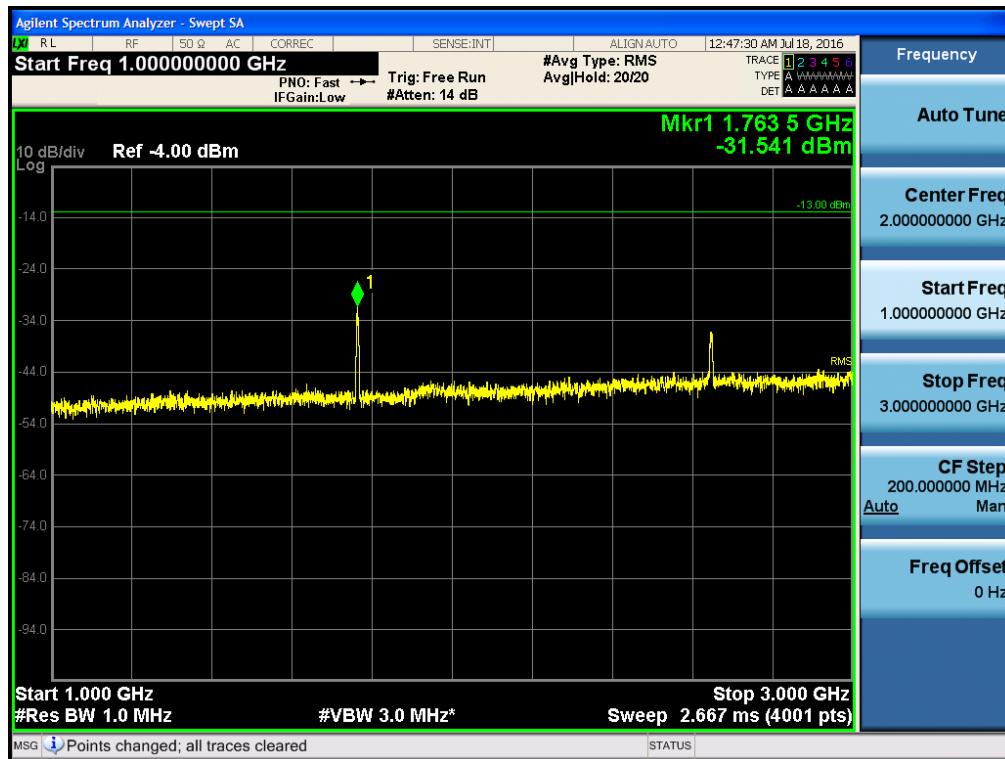
Conducted Spurious Emissions (1 GHz – 12.75 GHz)
[Downlink Low]-1



[Downlink Low]-2



[Downlink Middle]-1



[Downlink Middle]-2



[Downlink High]-1

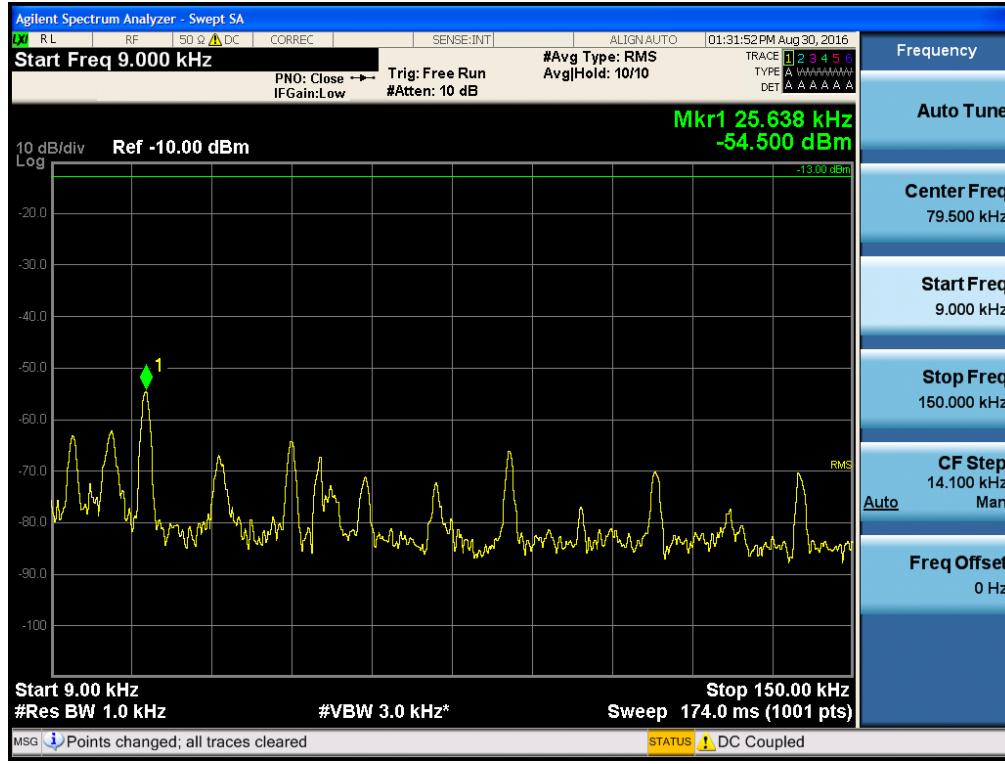


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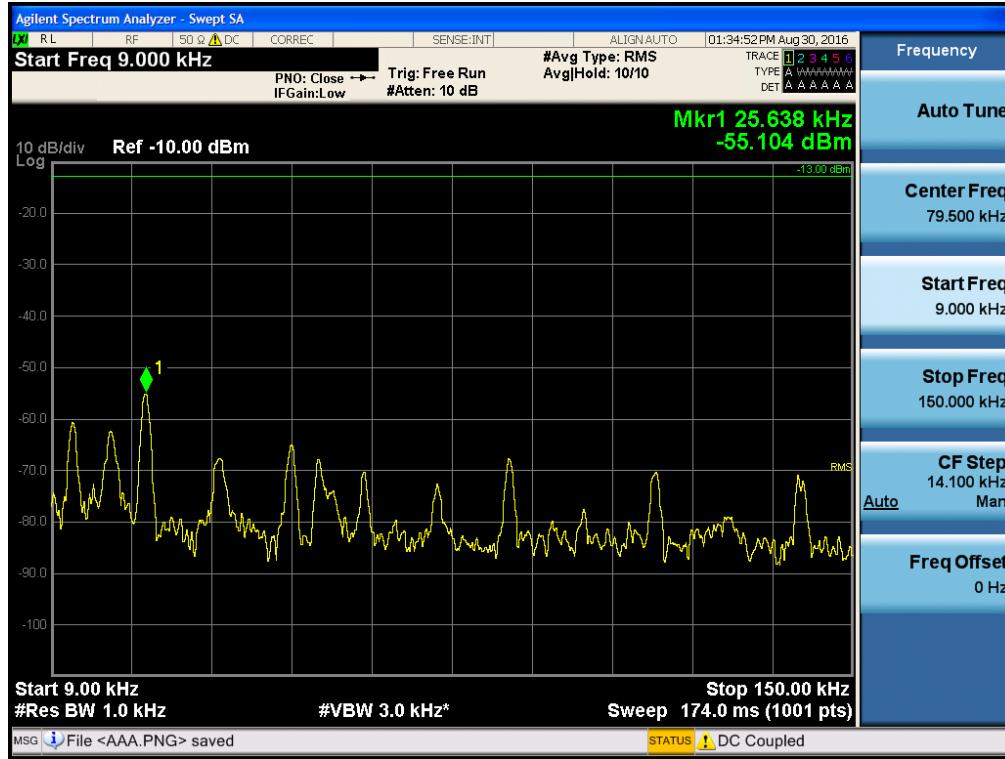


Multi channel Enhancer Plots of Spurious Emission for IC_800IDEN BAND Conducted Spurious Emissions (9 kHz – 150 kHz)

[Downlink Low]



[Downlink Middle]

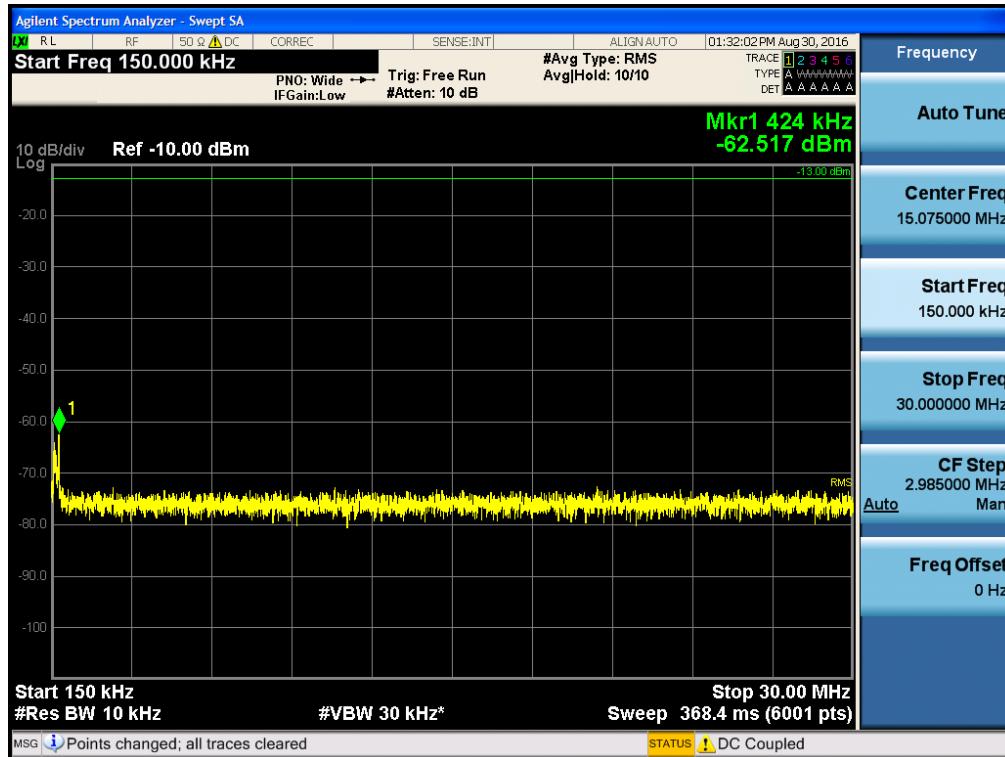


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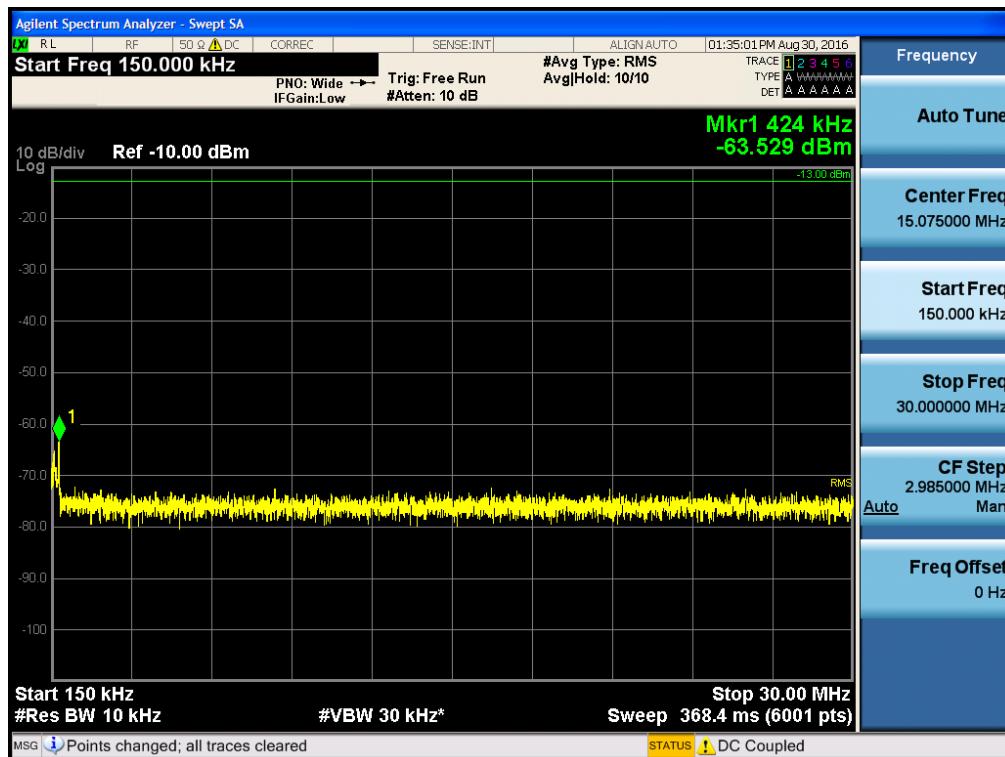


Conducted Spurious Emissions (150 kHz – 30 MHz)

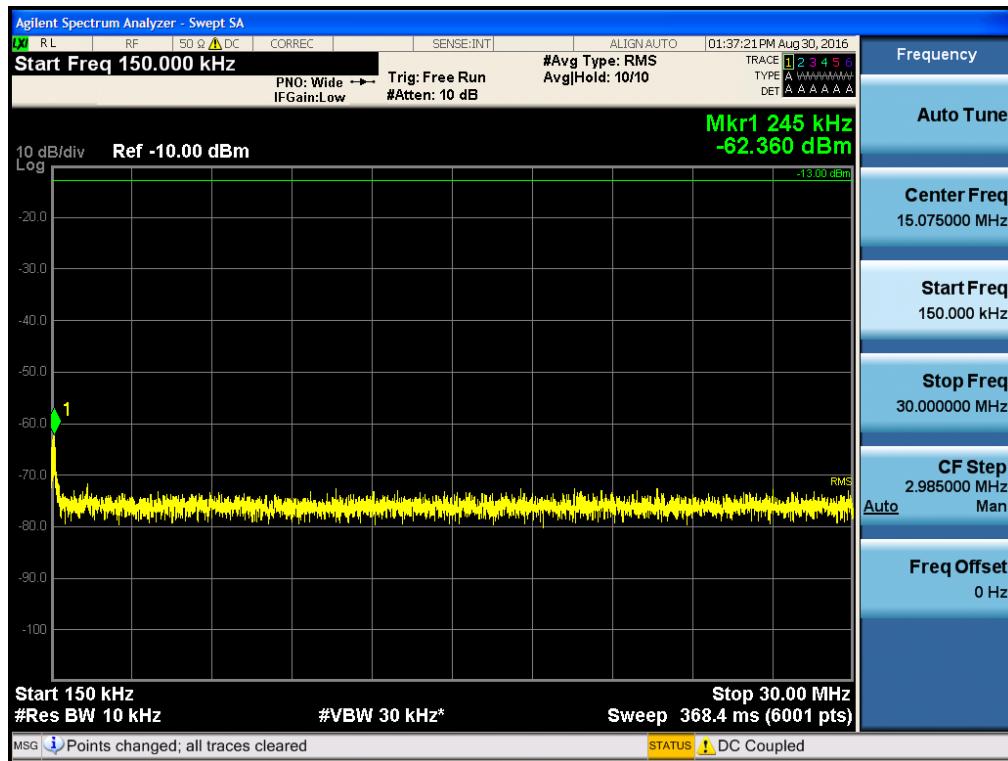
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[Downlink Middle]

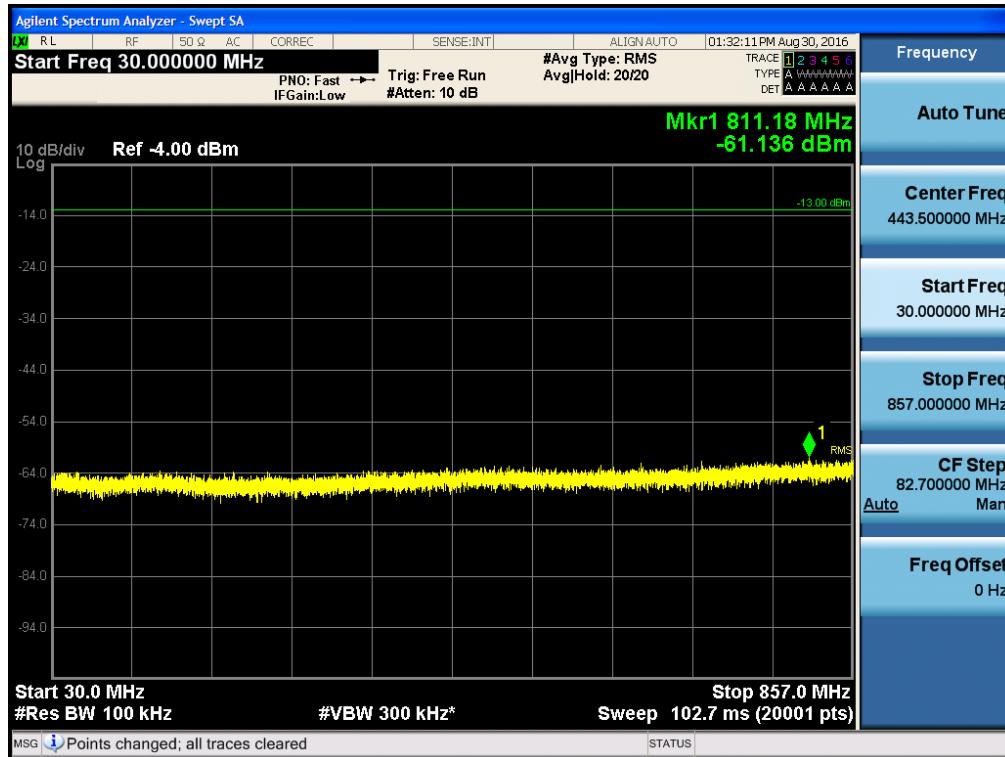


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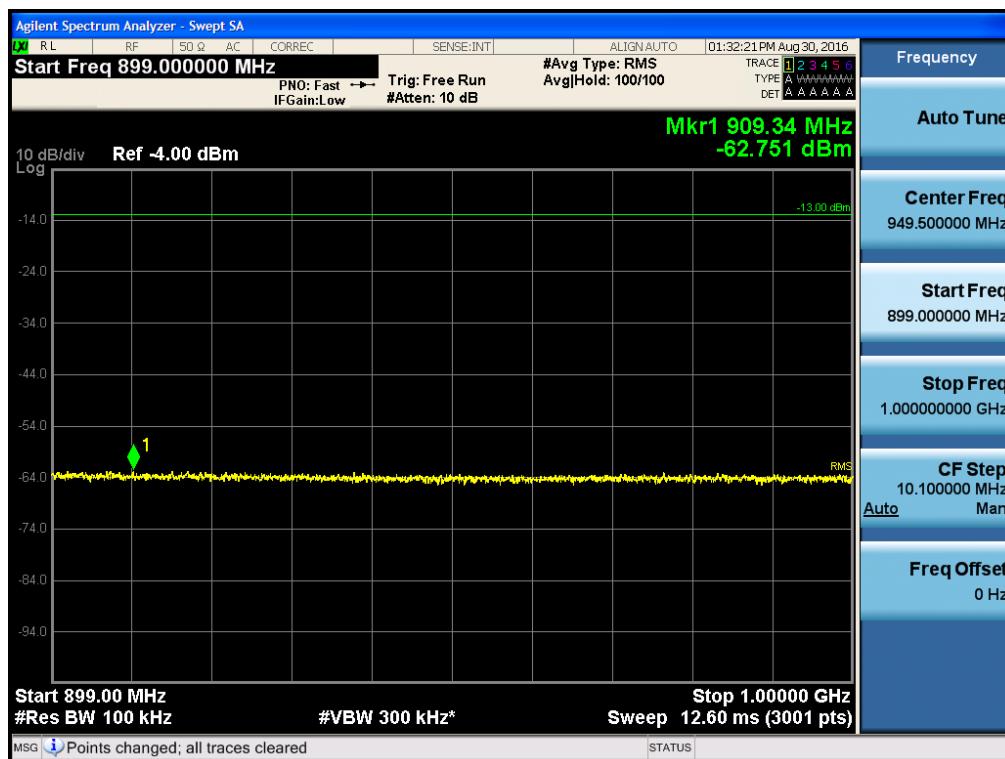


Conducted Spurious Emissions (30 MHz – 1 GHz)

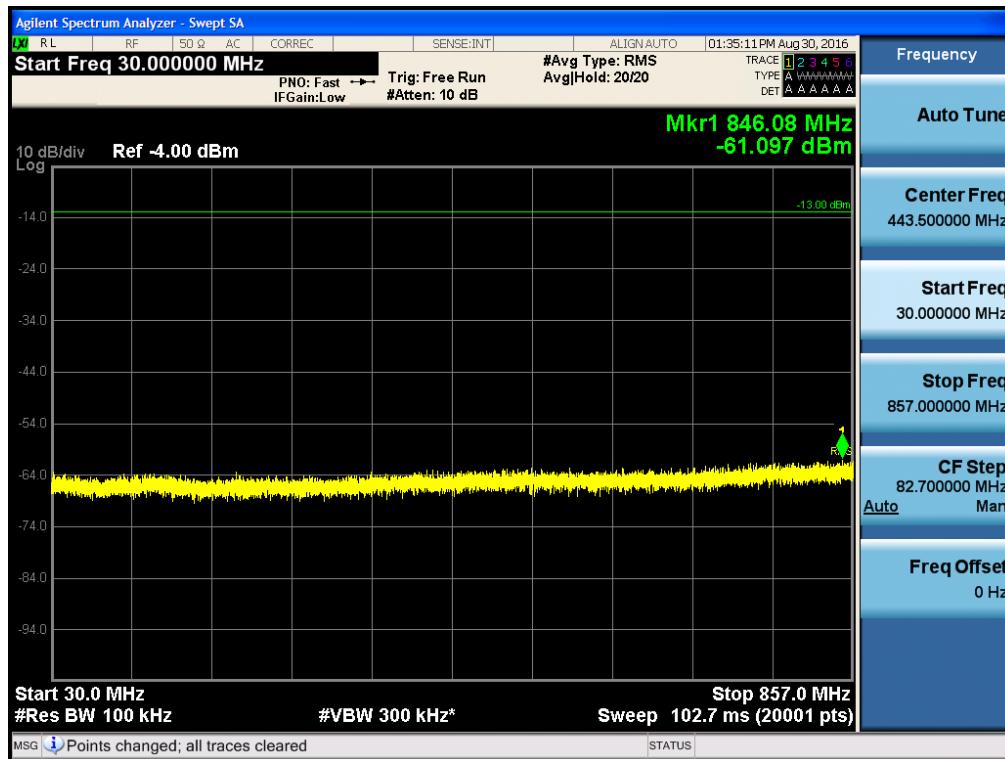
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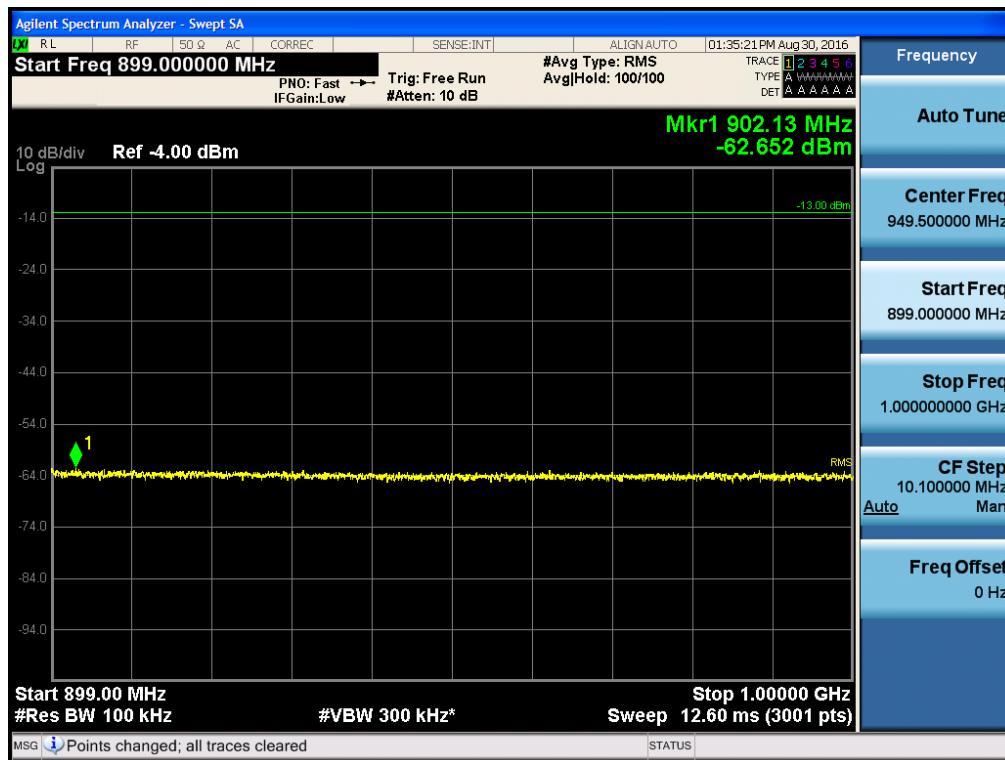
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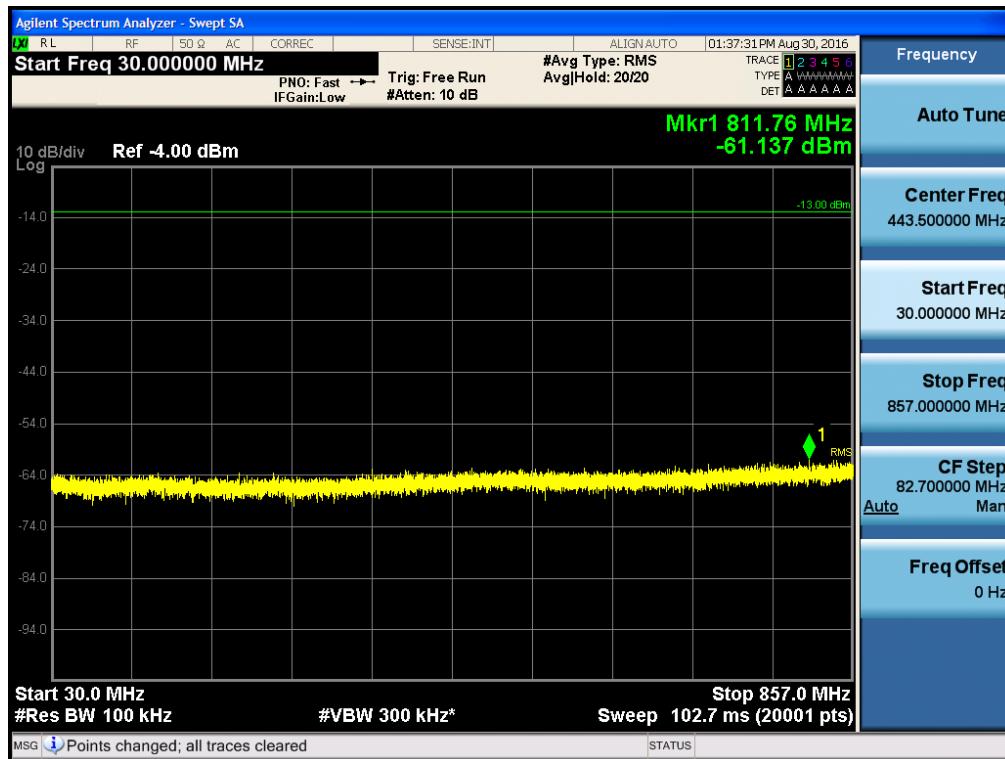
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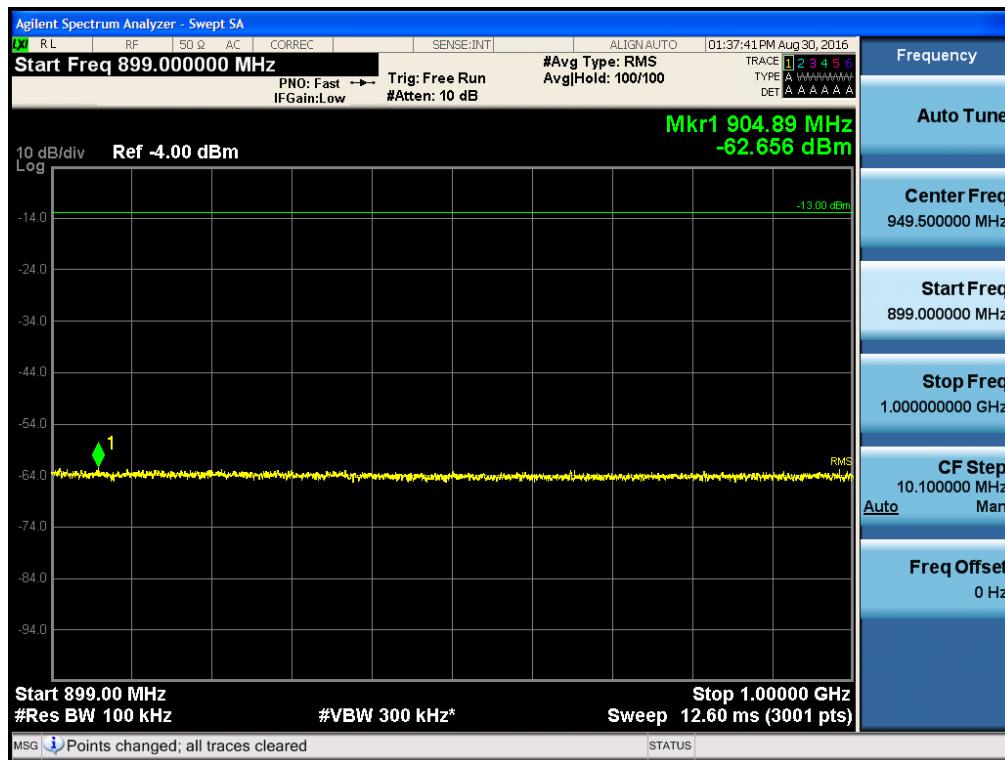
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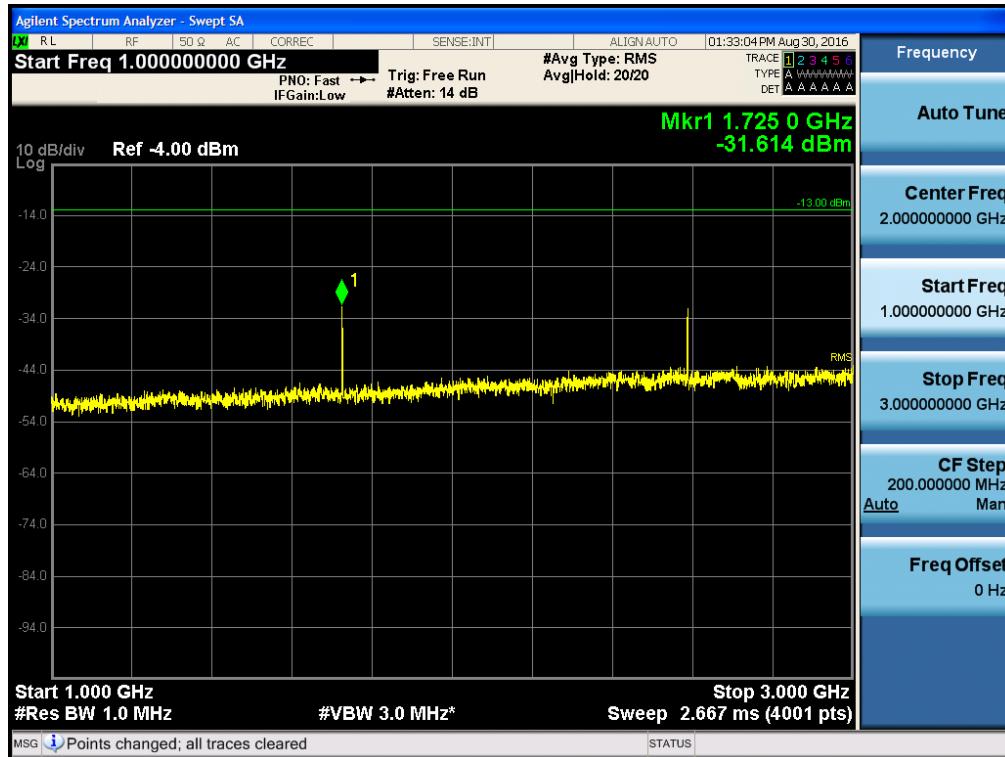


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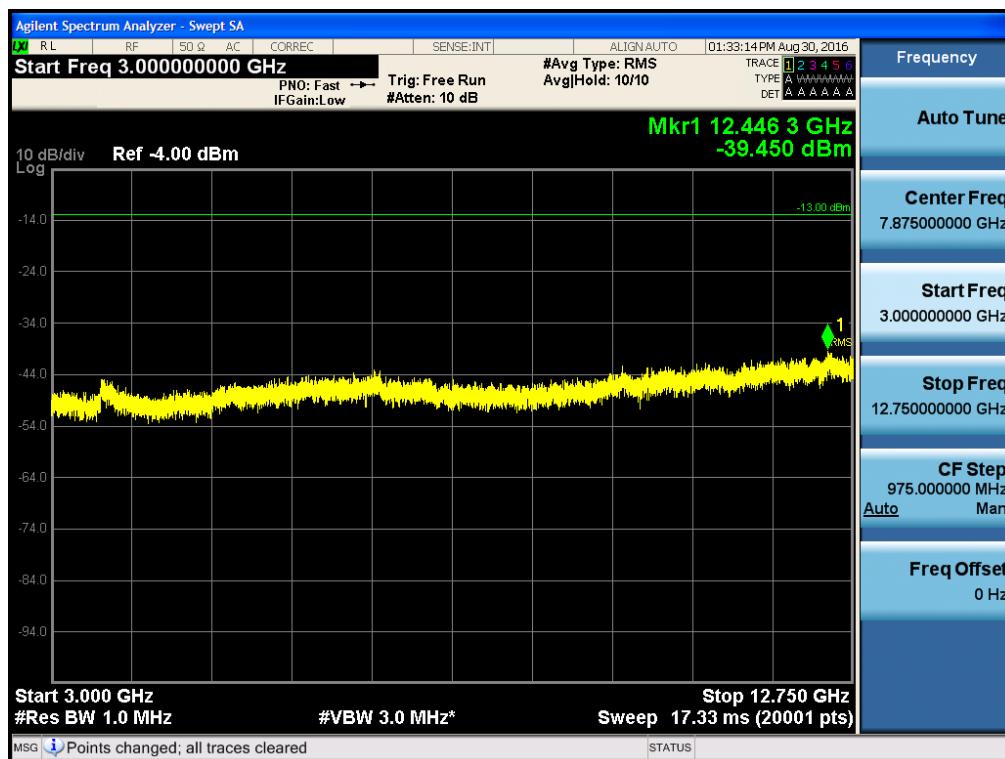


Conducted Spurious Emissions (1 GHz –12.75 GHz)

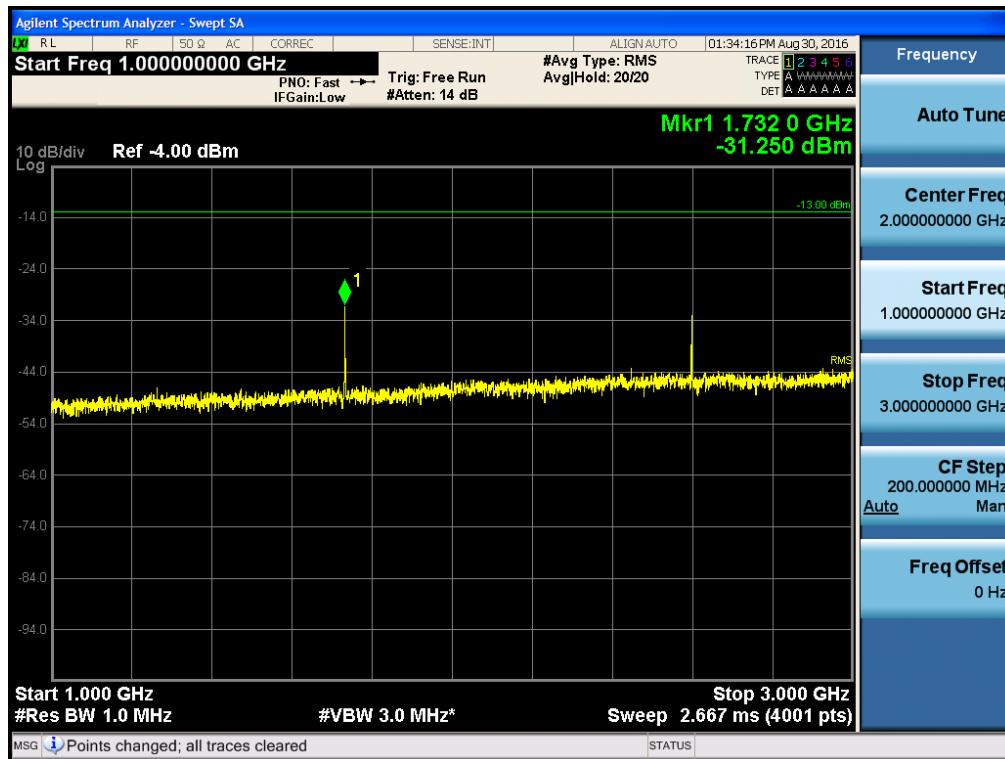
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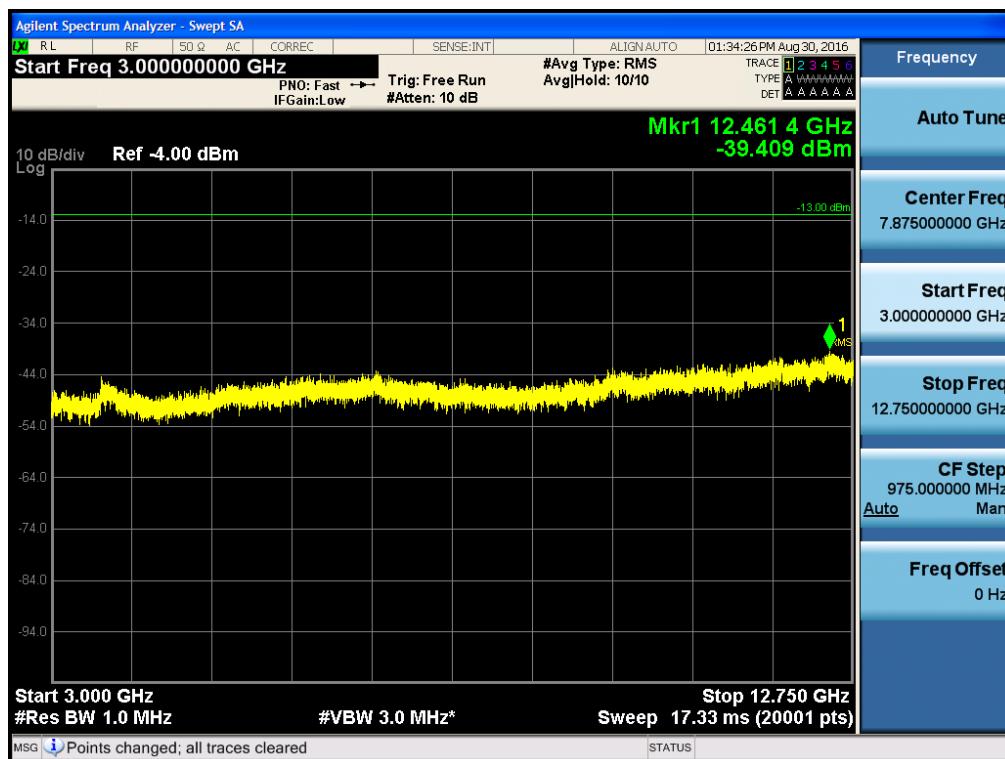
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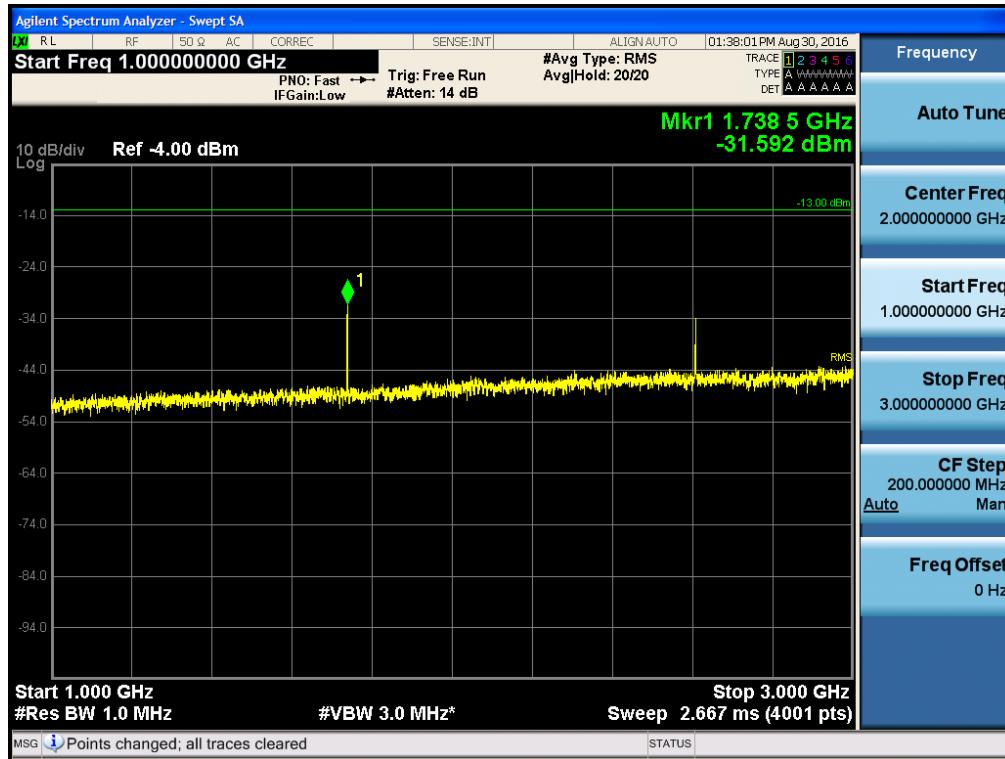
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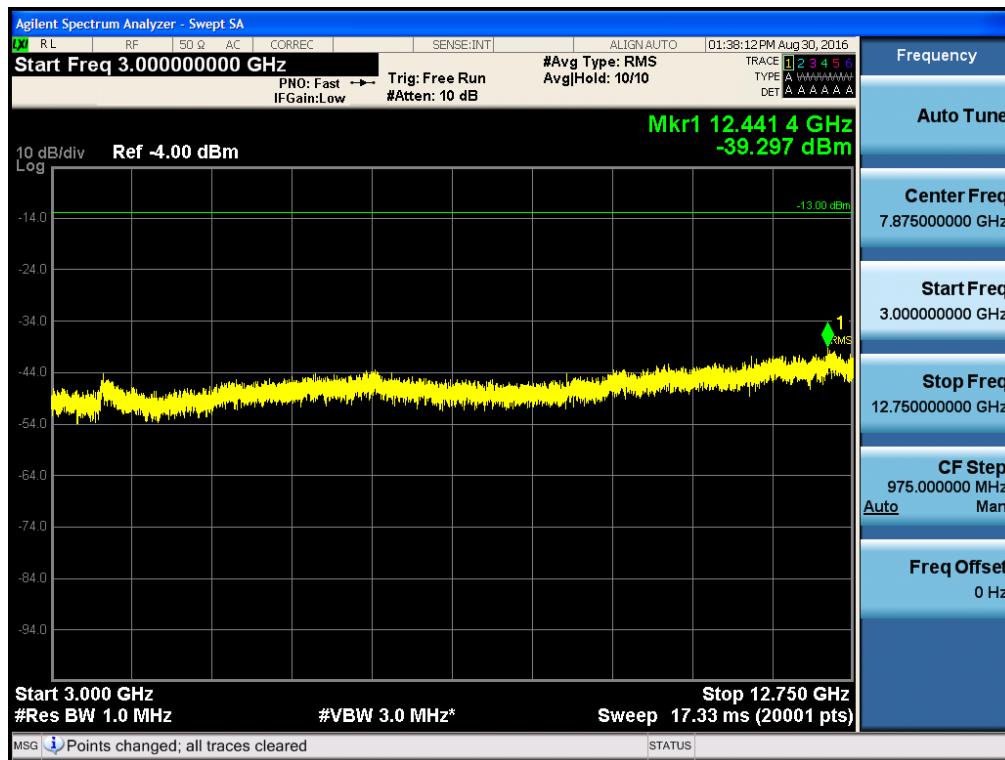
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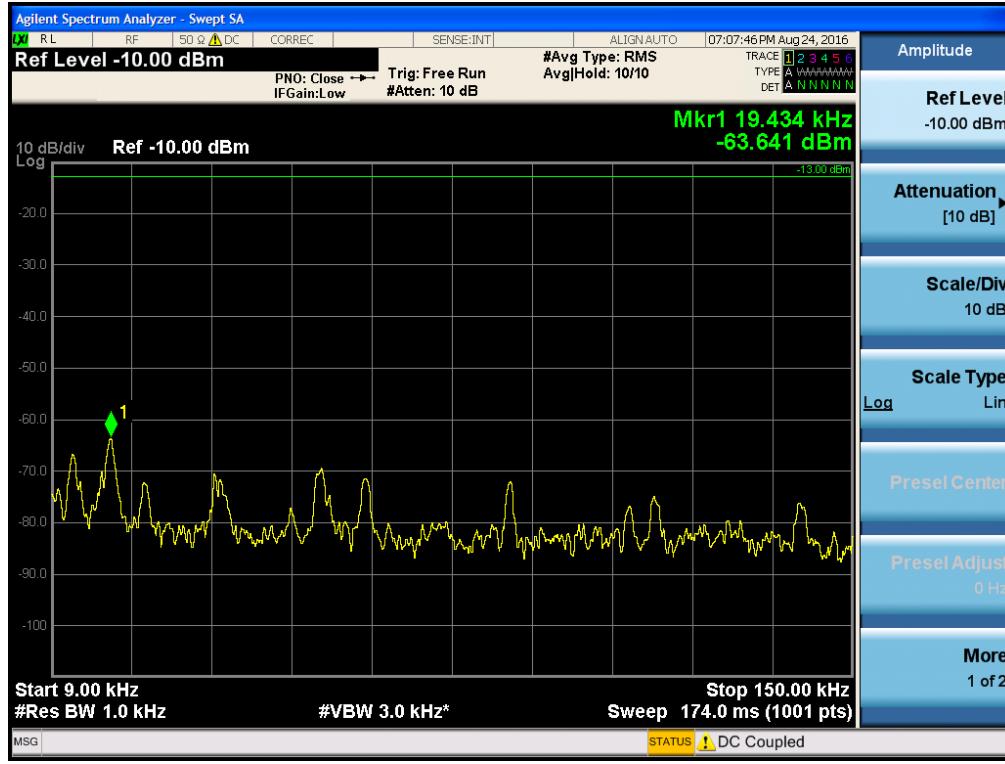


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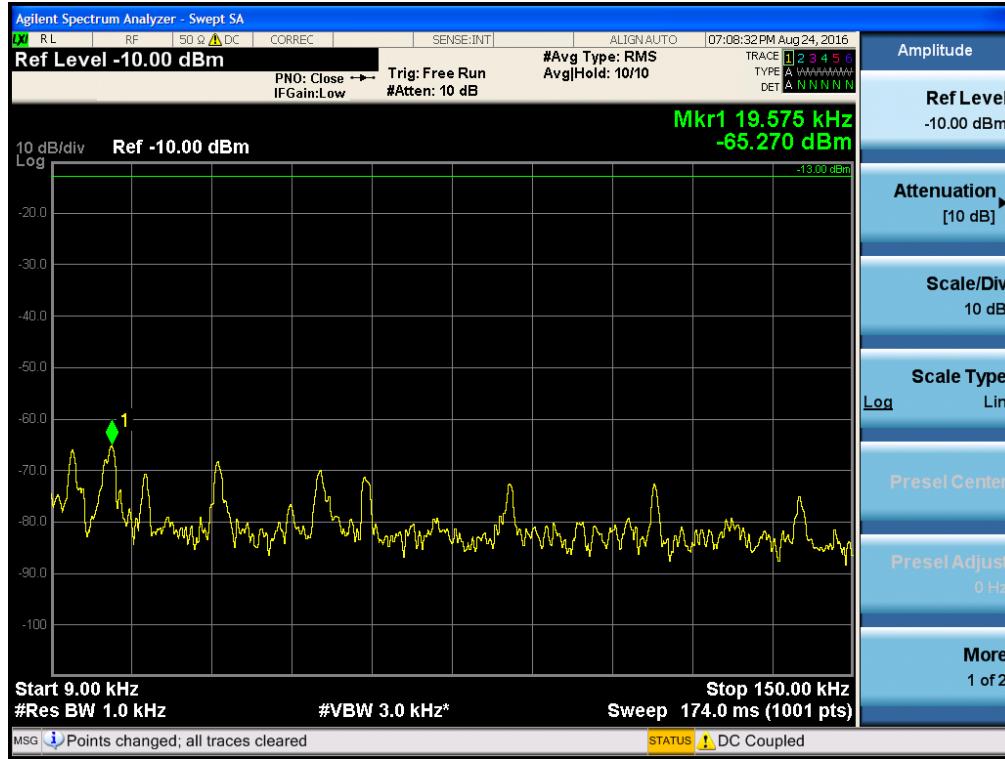


Multi channel Enhancer Plots of Spurious Emission for IC_850CEL BAND Conducted Spurious Emissions (9 kHz – 150 kHz)

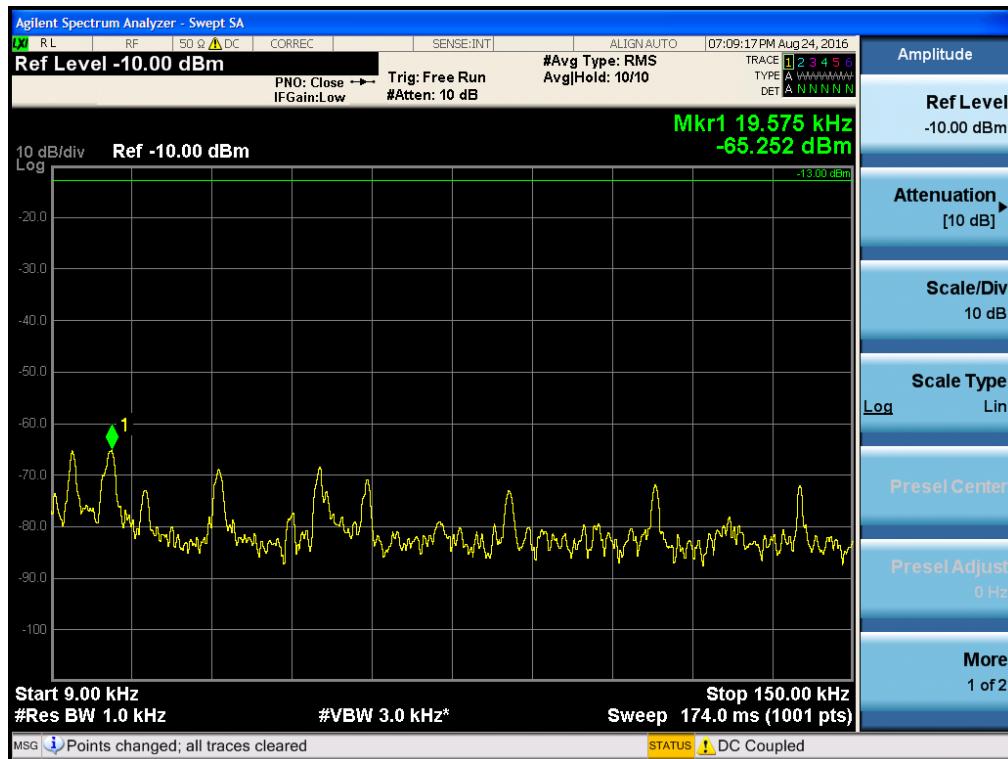
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[Downlink Middle]

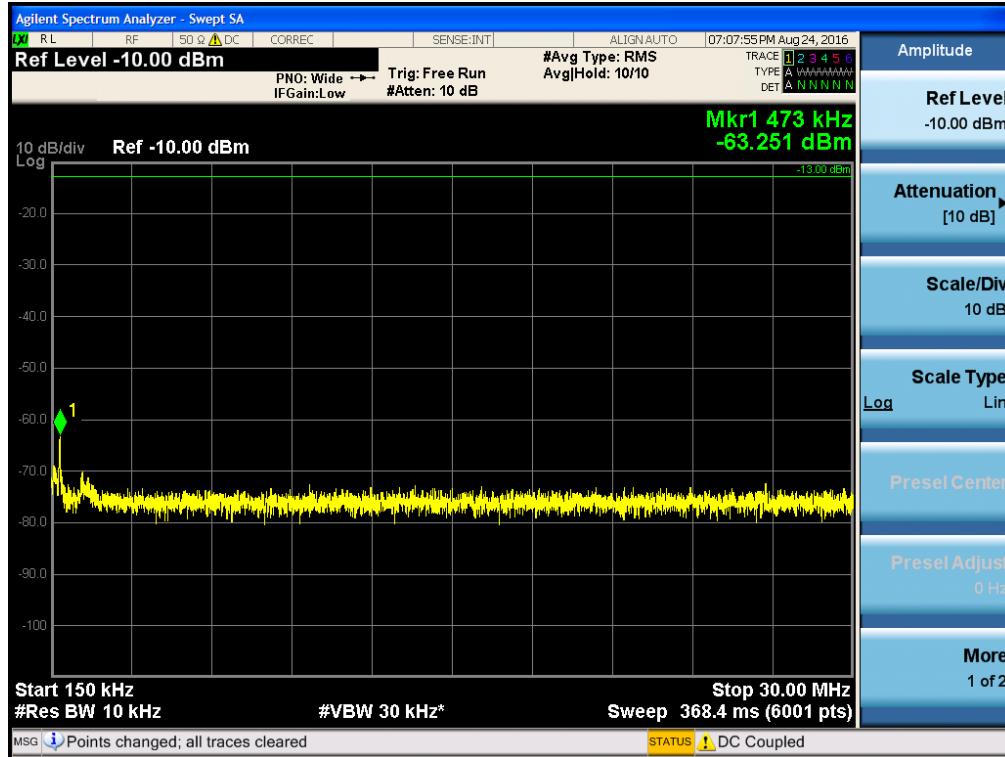


[Downlink High]

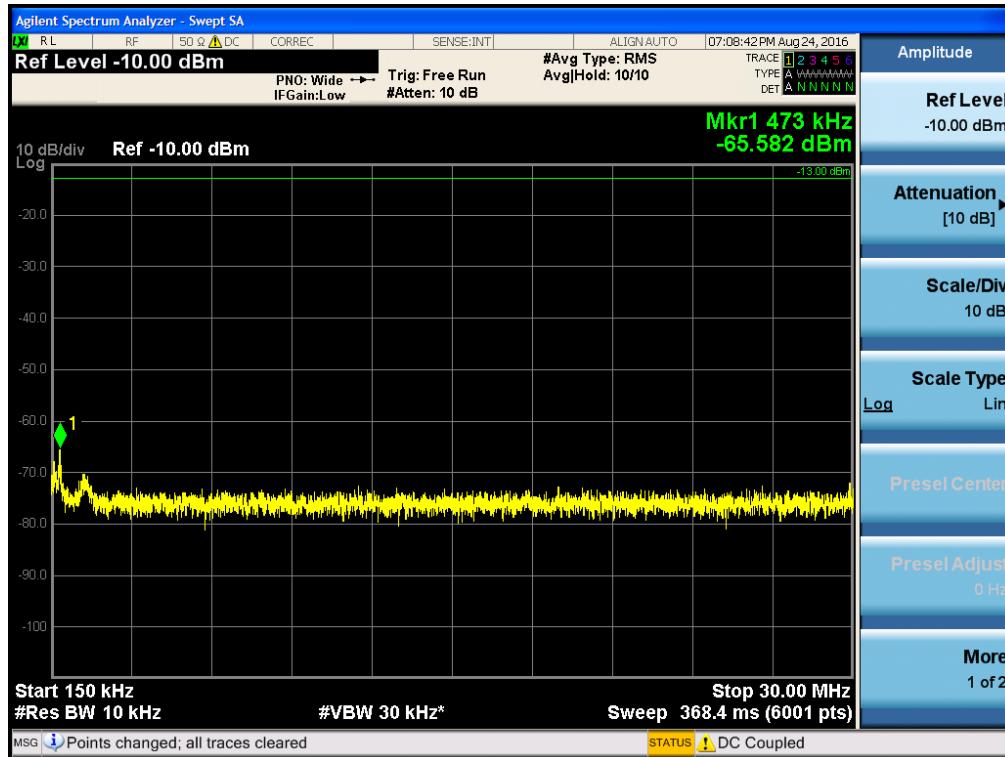


Conducted Spurious Emissions (150 kHz – 30 MHz)

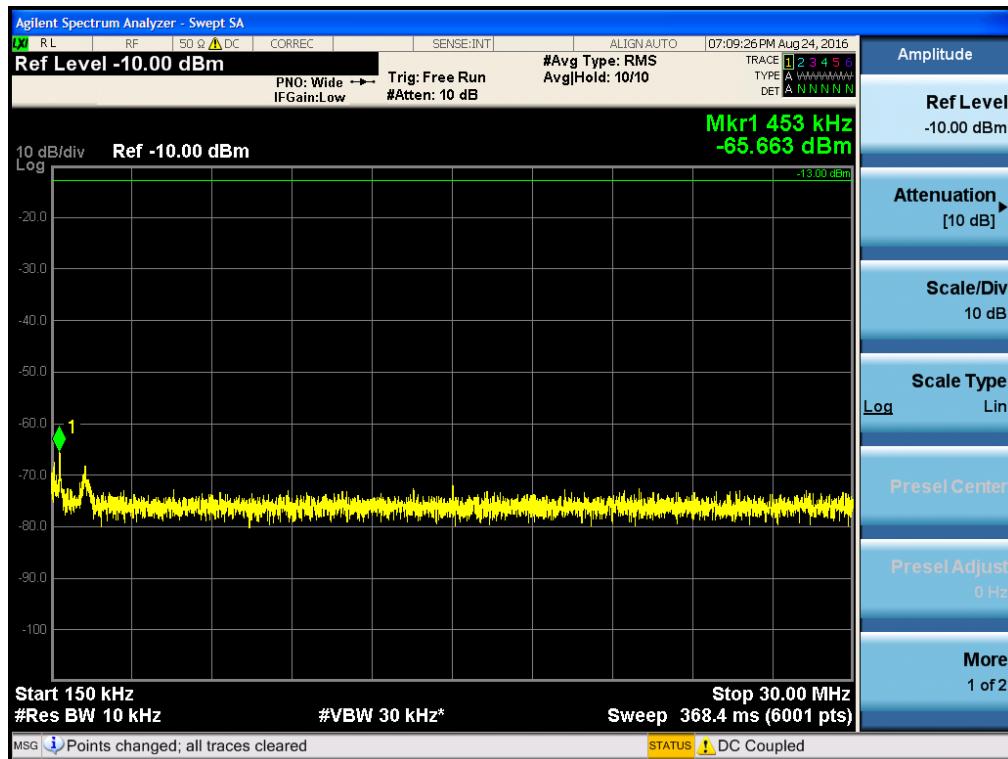
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[Downlink Middle]

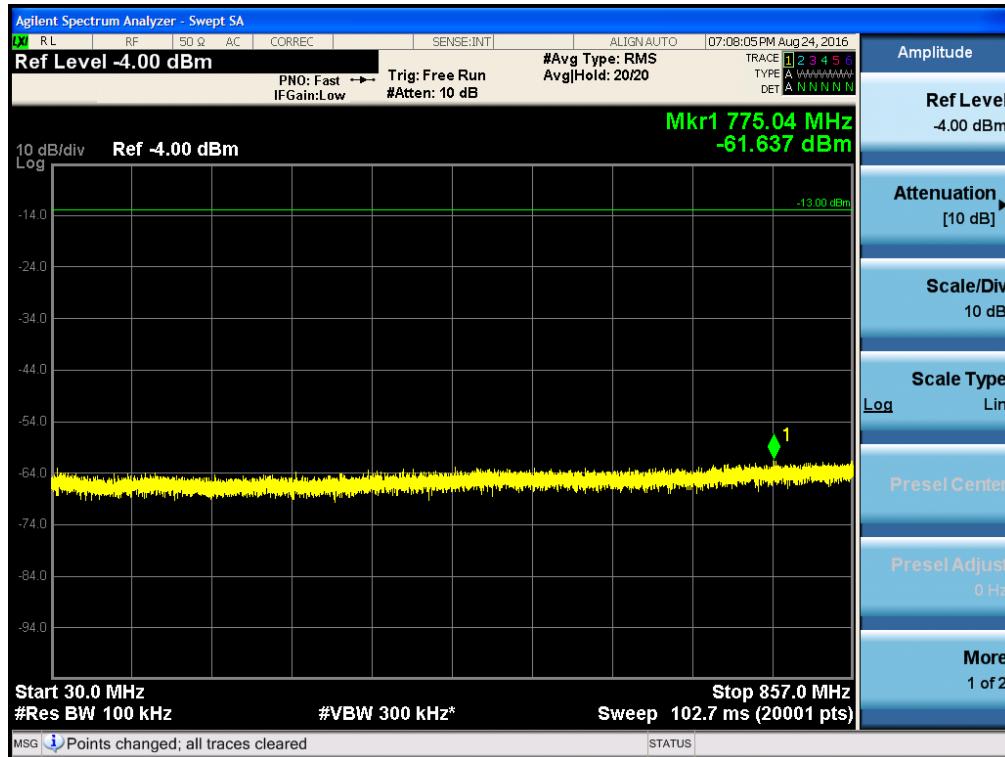


[Downlink High]

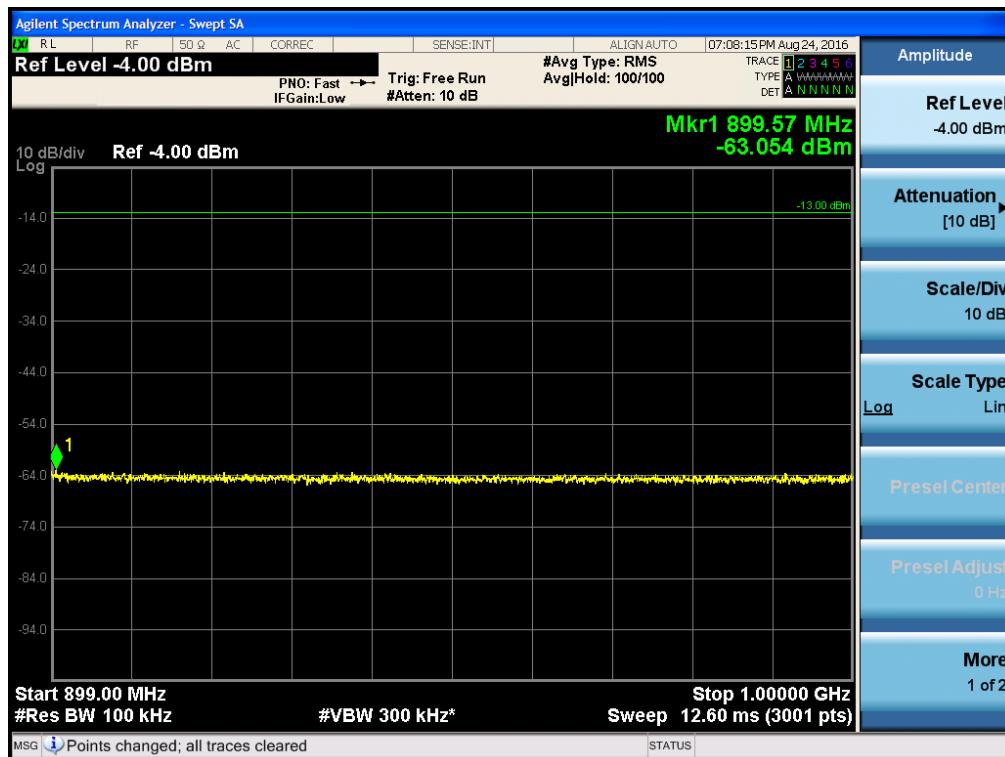


Conducted Spurious Emissions (30 MHz – 1 GHz)

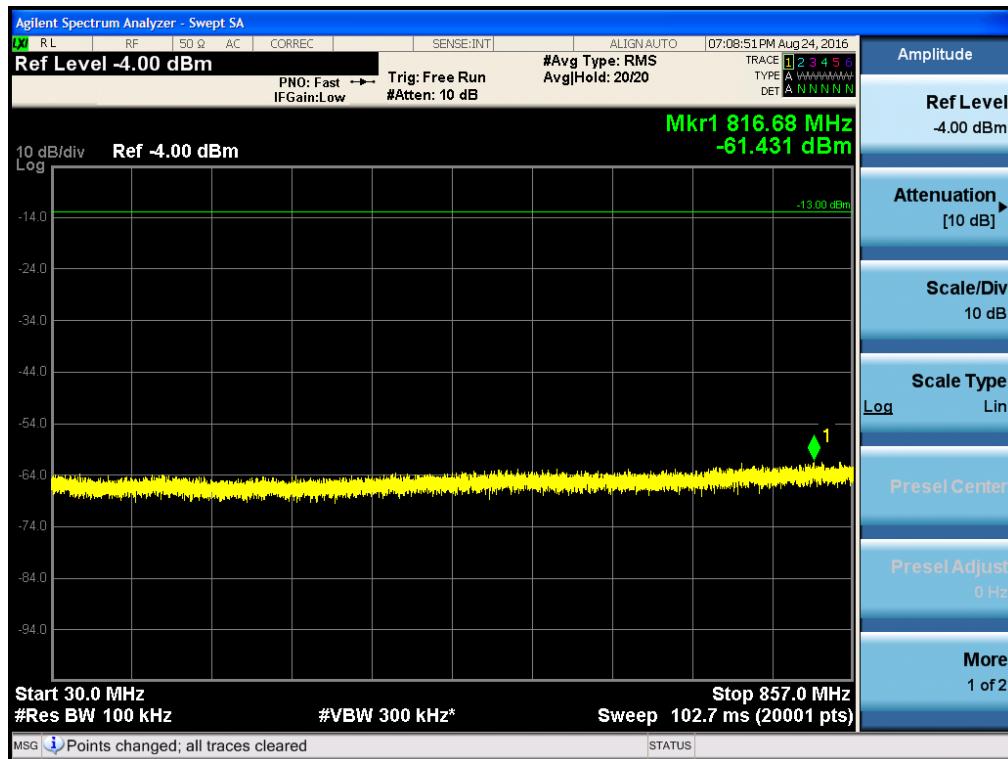
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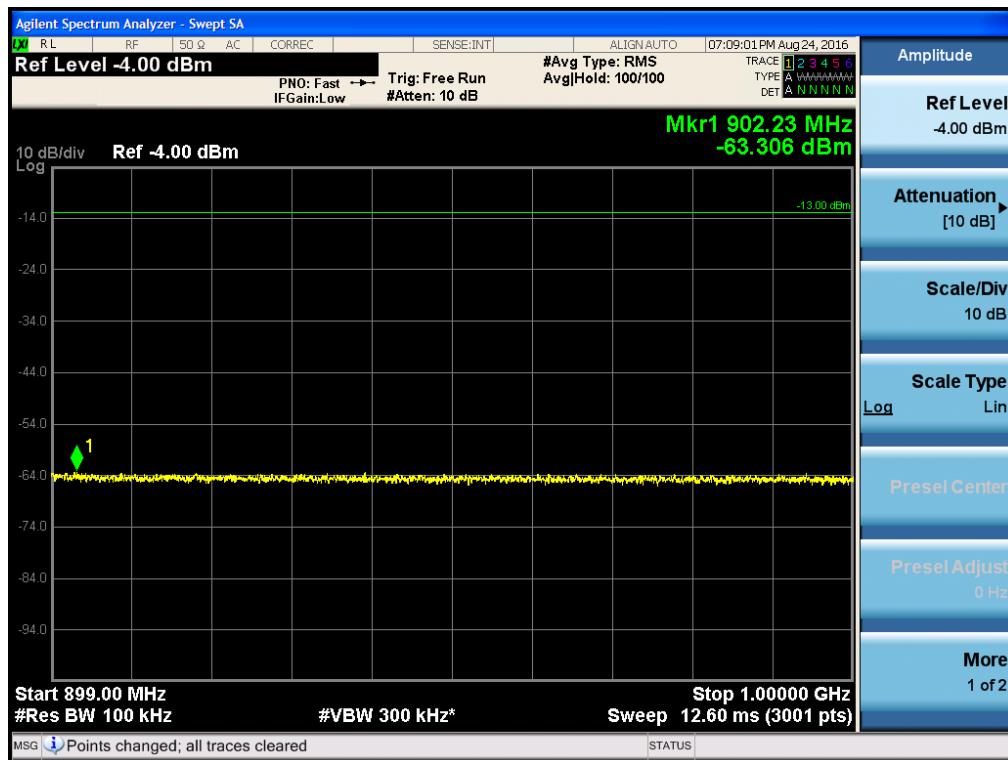
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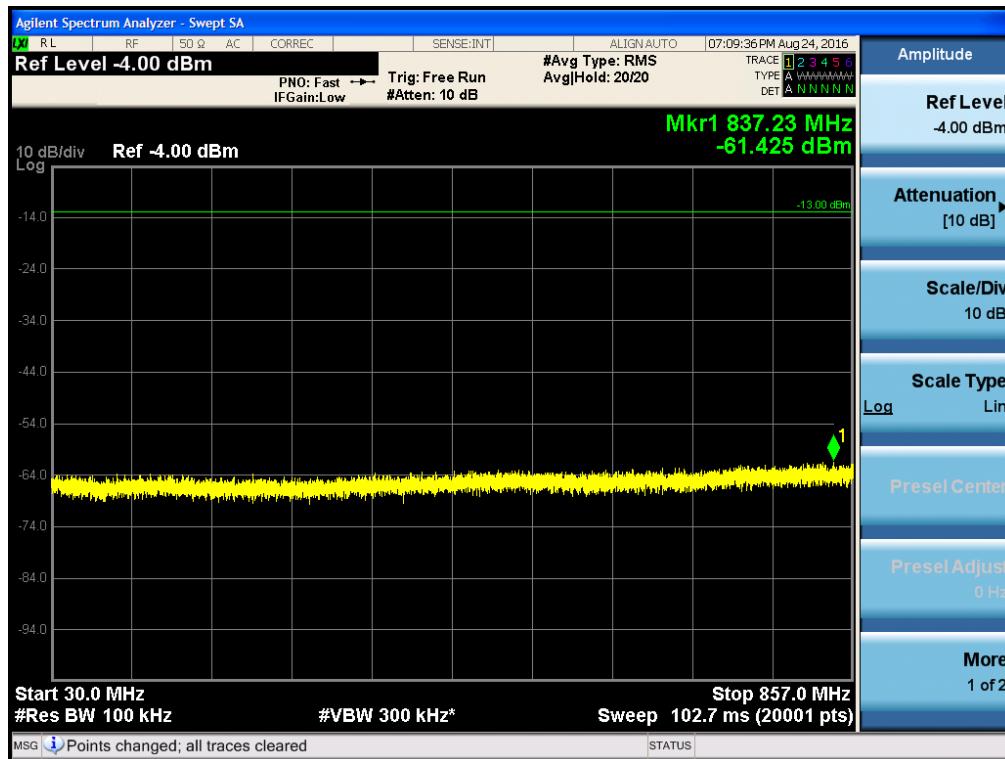
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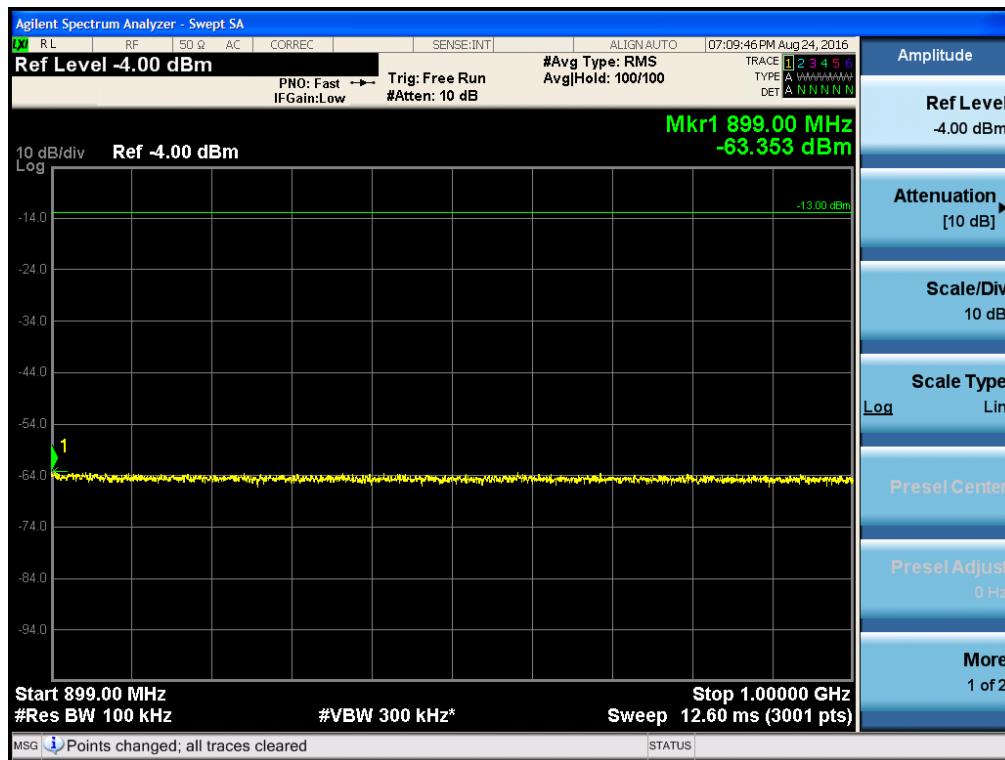
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[Downlink High] -1

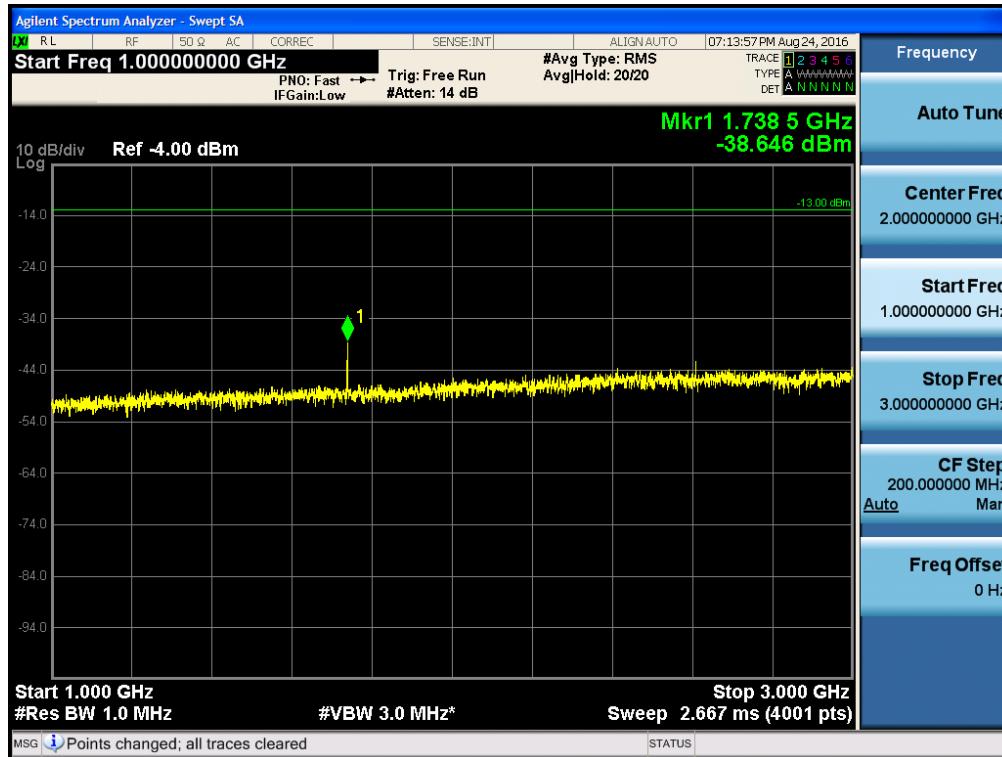


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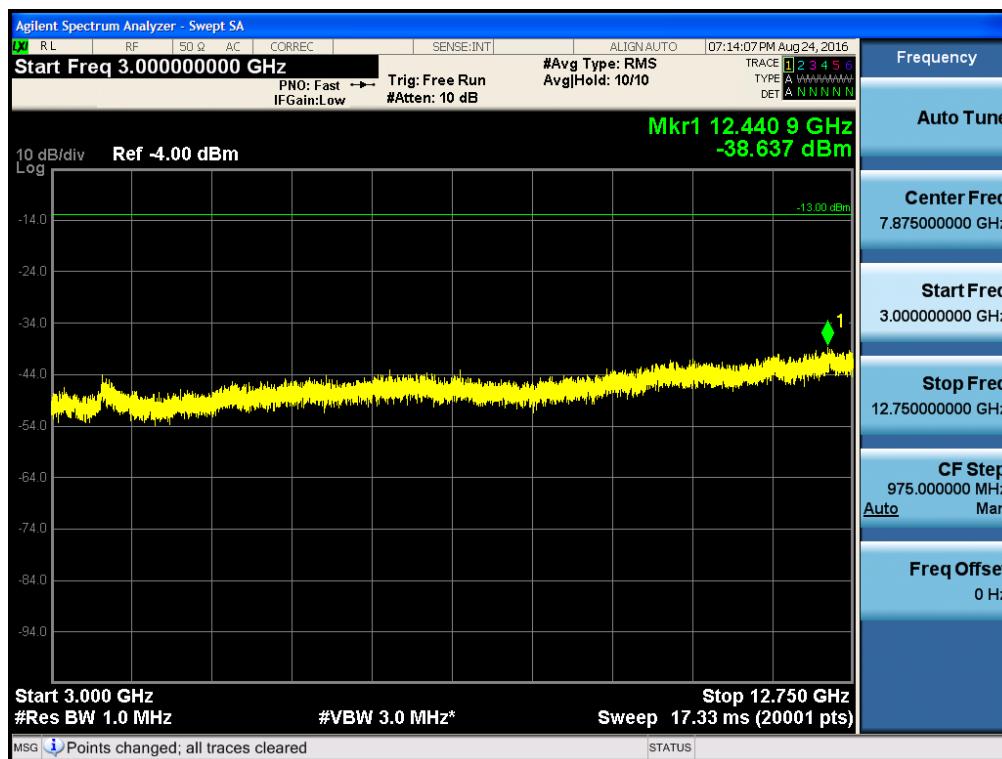


Conducted Spurious Emissions (1 GHz –12.75 GHz)

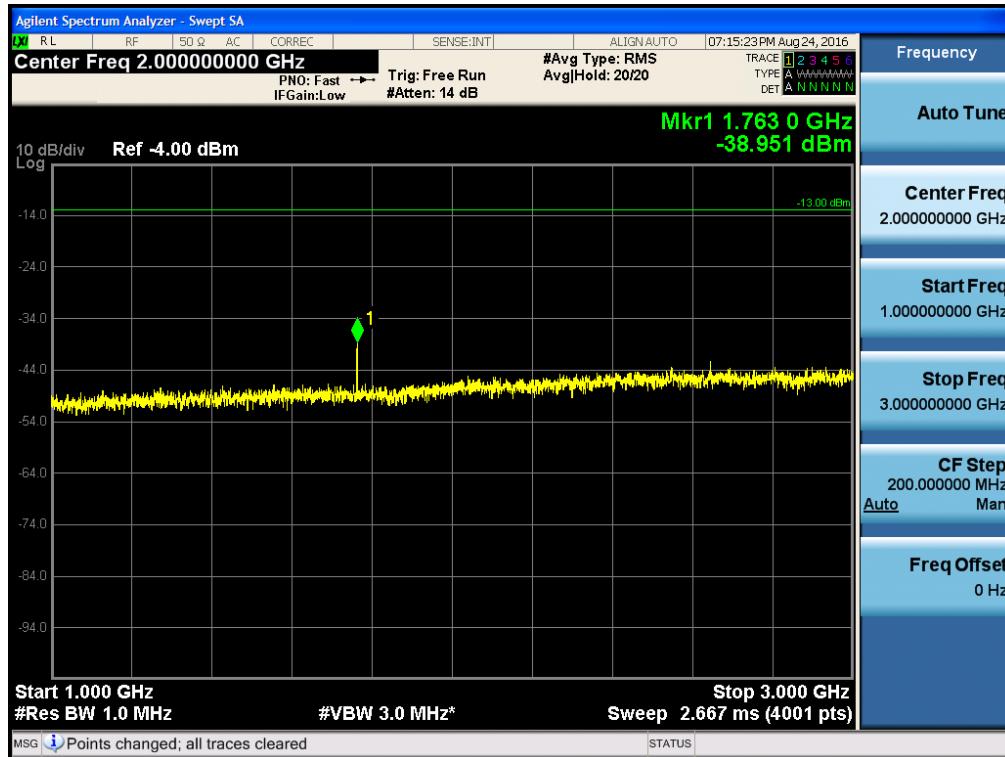
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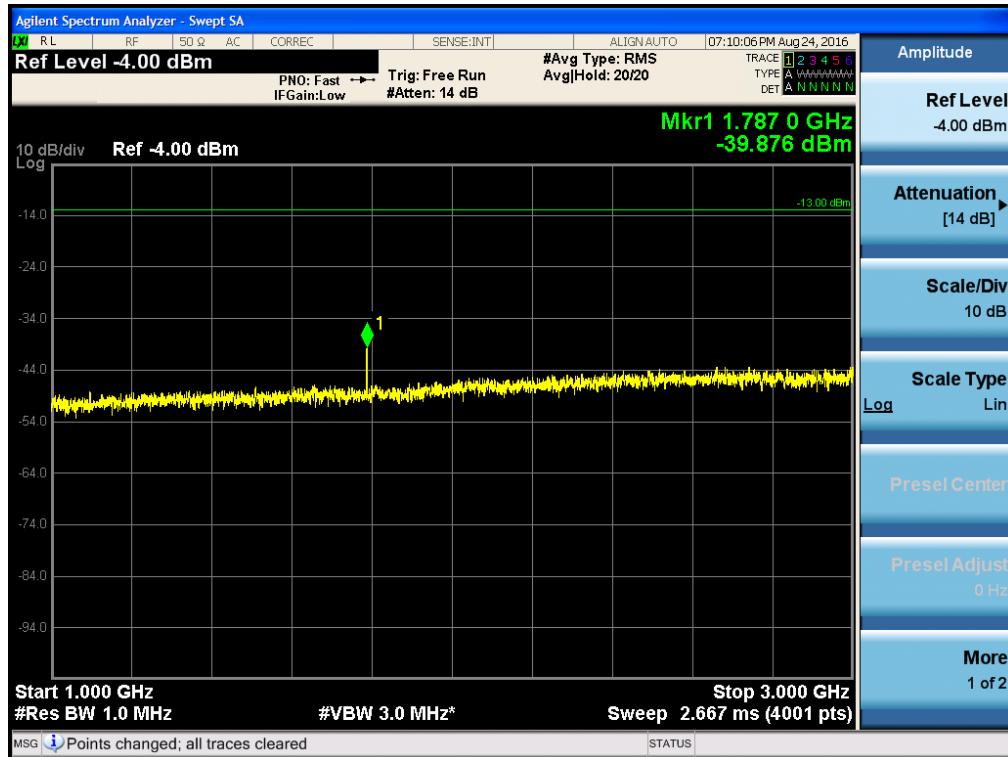
[Downlink Middle]-1



[Downlink Middle]-2



[Downlink High]-1



[Downlink High]-2



Intermodulation Spurious Emissions for FCC_ 800IDEN BAND LTE 5 MHz
[Downlink Low]

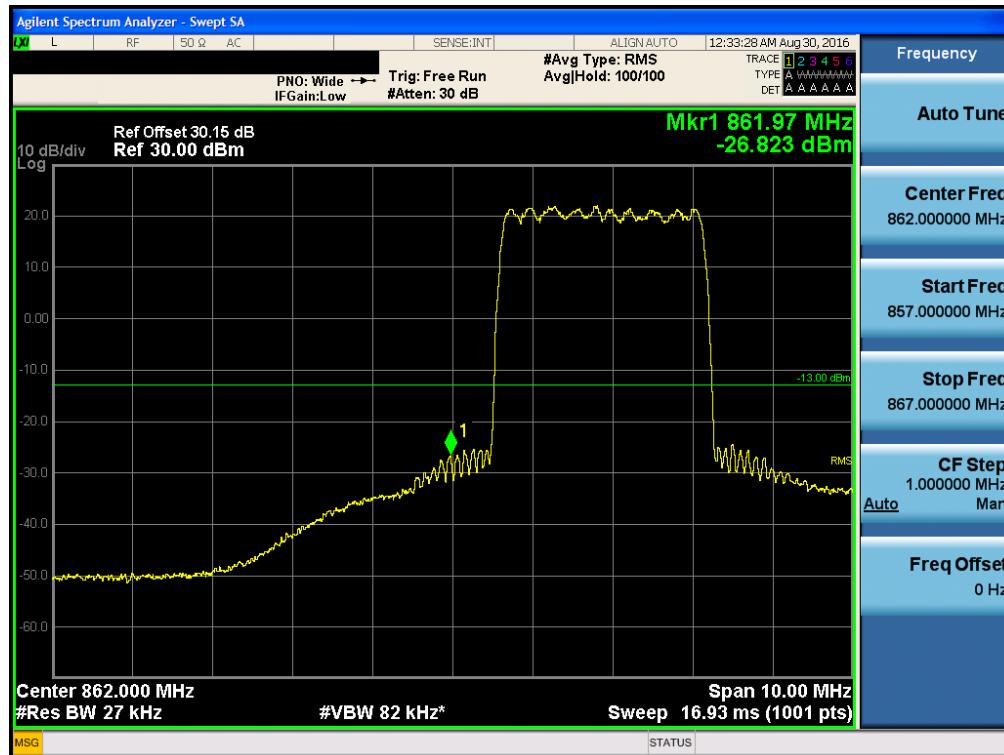


[Uplink Low]

*SMR800 Band (LTE 5 MHz_BW) amplifies only one selected channel.(Low channel)

Intermodulation Spurious Emissions for FCC_800IDEN BAND CDMA

[Downlink Low]



[Downlink High]



Intermodulation Spurious Emissions for FCC_ 850CEL BAND LTE 5 MHz
[Downlink Low]



[Downlink High]



Intermodulation Spurious Emissions for FCC_ 850CEL BAND LTE 10 MHz [Downlink Low]

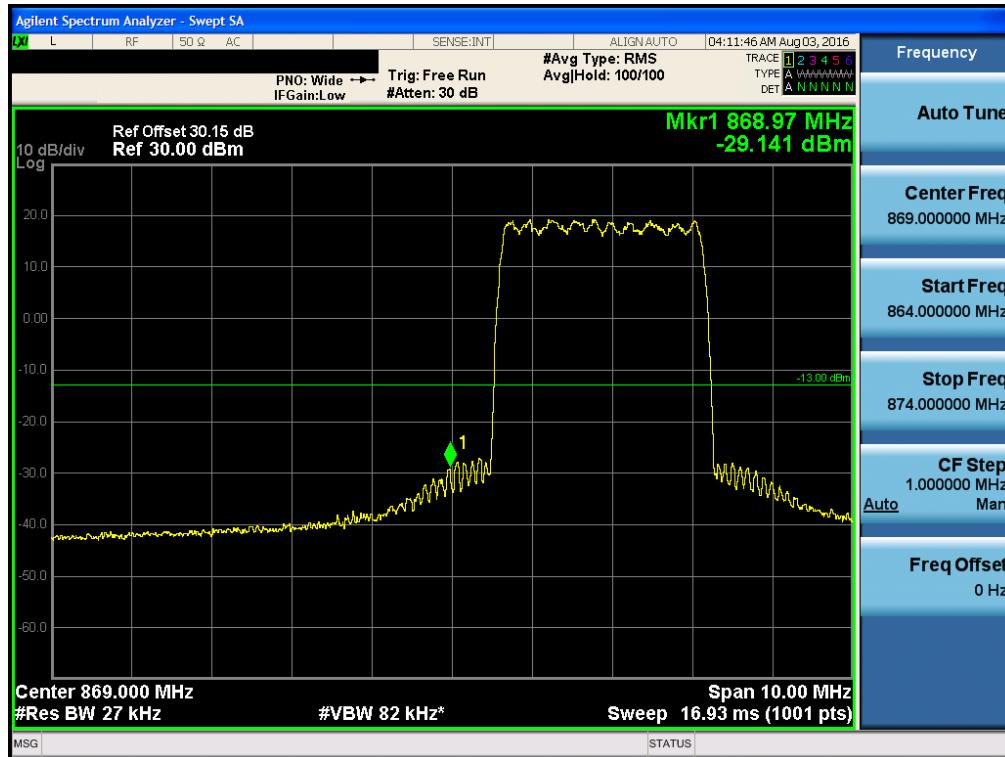


[Downlink High]



Intermodulation Spurious Emissions for FCC_850CEL BAND CDMA

[Downlink Low]



[Downlink High]



Intermodulation Spurious Emissions for FCC_850CEL BAND WCDMA [Downlink Low]



[Downlink High]

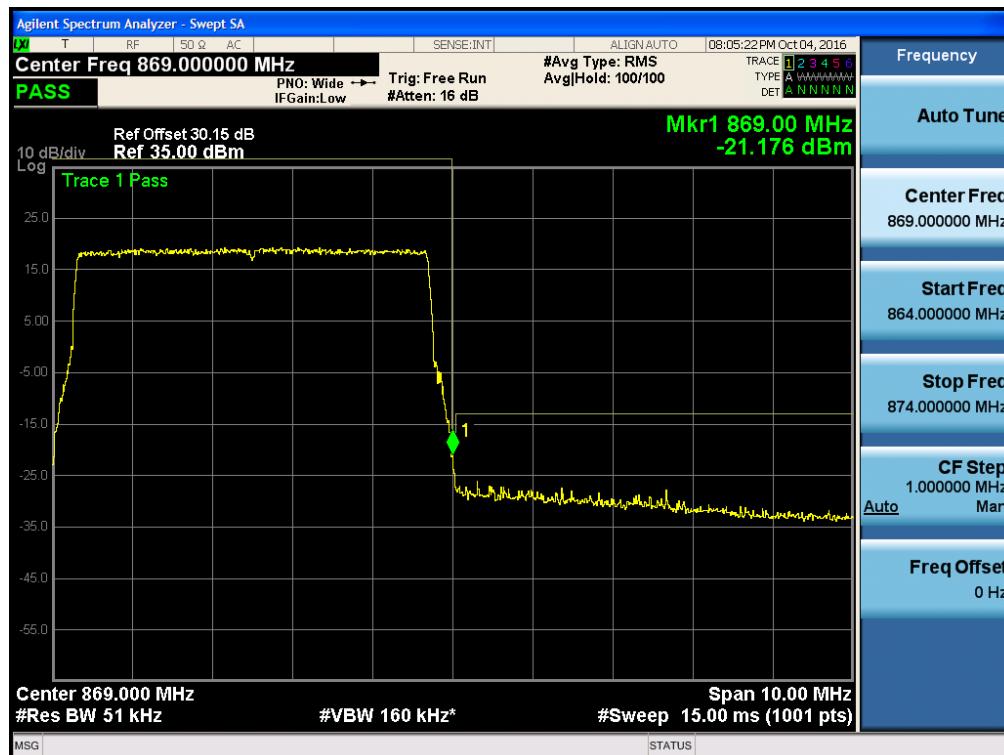


Single channel Enhancer Band Edge_800IDEN BAND LTE 5 MHz

[Downlink Low]



[Downlink High]



Single channel Enhancer Band Edge_800IDEN BAND CDMA
[Downlink Low]



[Downlink High]



Single channel Enhancer Band Edge_850CEL BAND LTE 5 MHz

[Downlink Low]



[Downlink High]



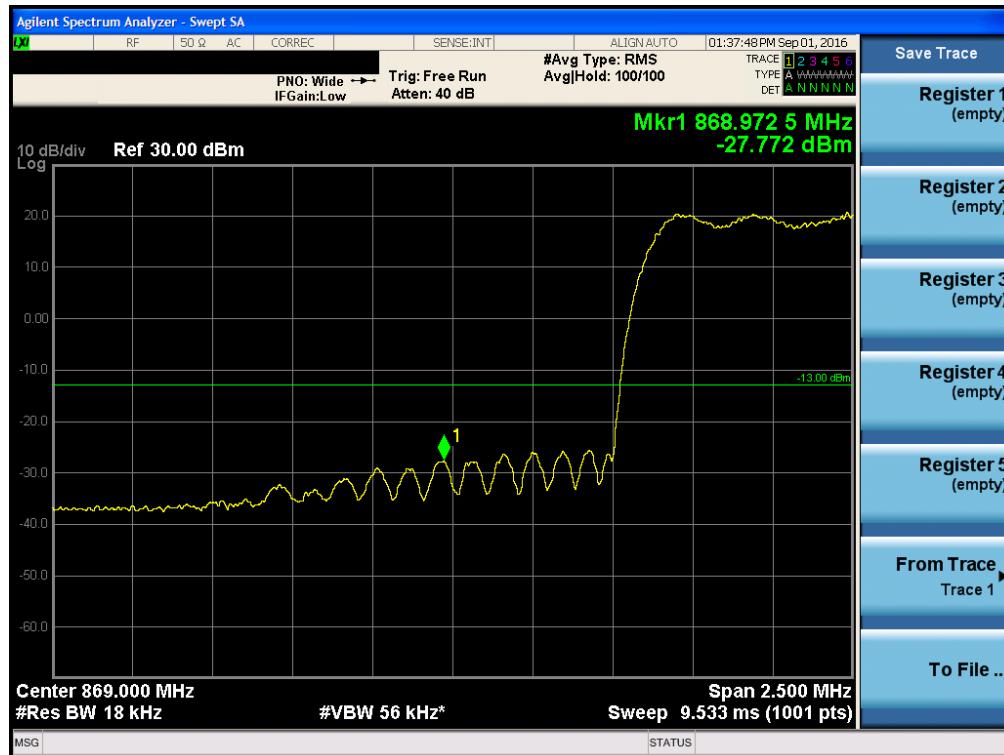
Single channel Enhancer Band Edge_850CEL BAND LTE 10 MHz
[Downlink Low]



[Downlink High]



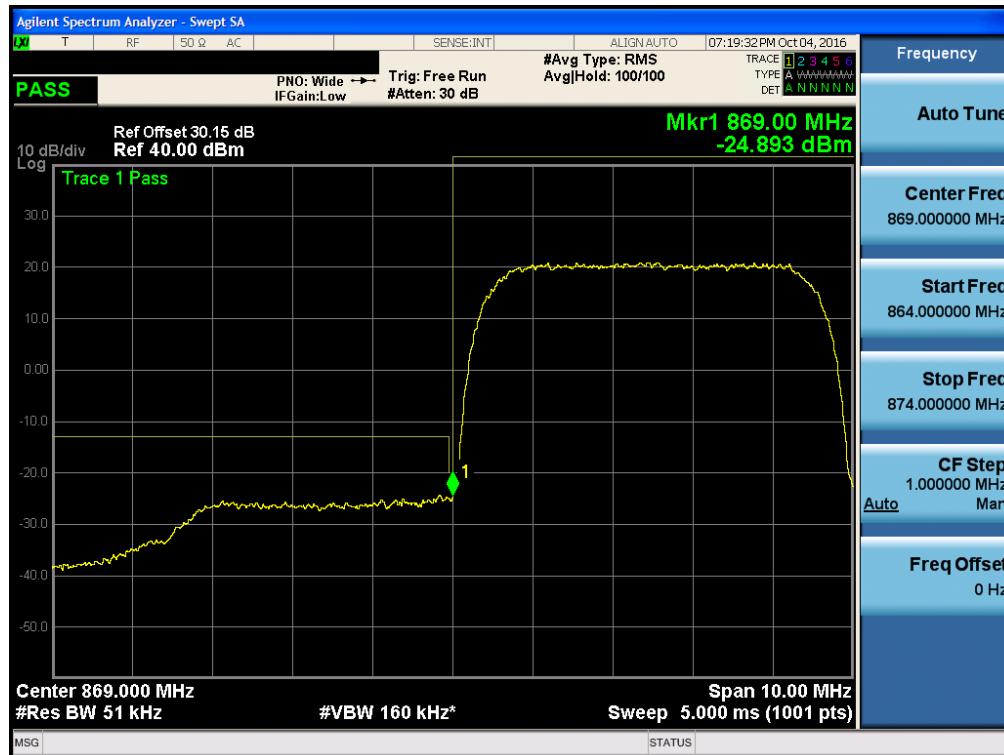
Single channel Enhancer Band Edge_850CEL BAND CDMA
[Downlink Low]



[Downlink High]



Single channel Enhancer Band Edge_850CEL BAND WCDMA
[Downlink Low]

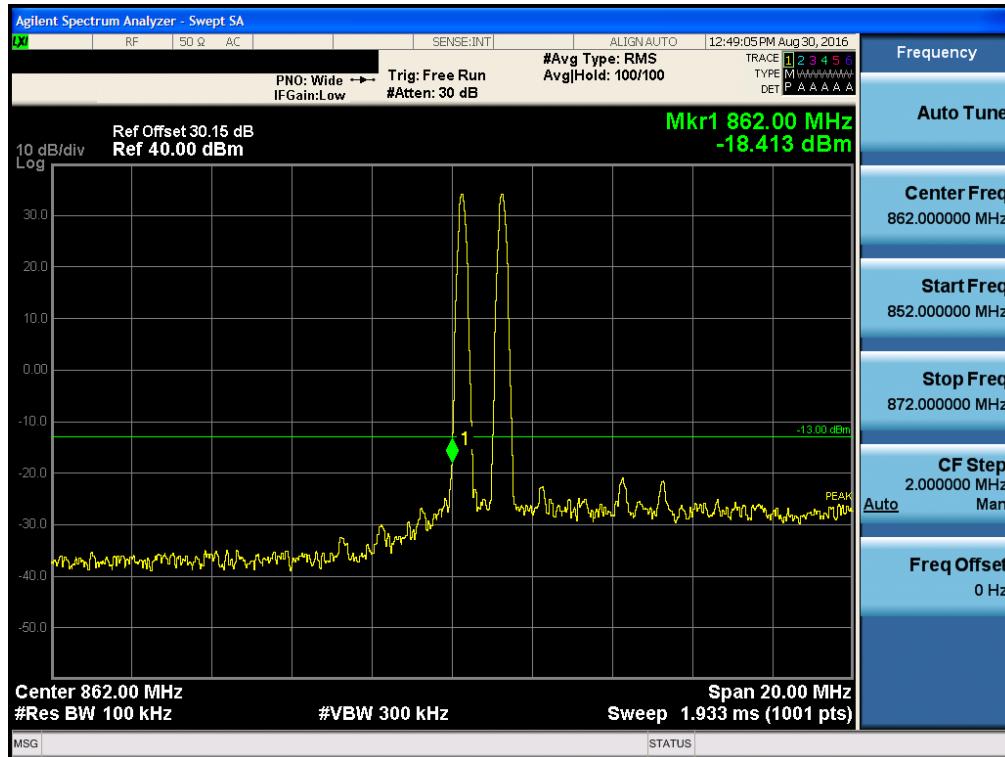


[Downlink High]

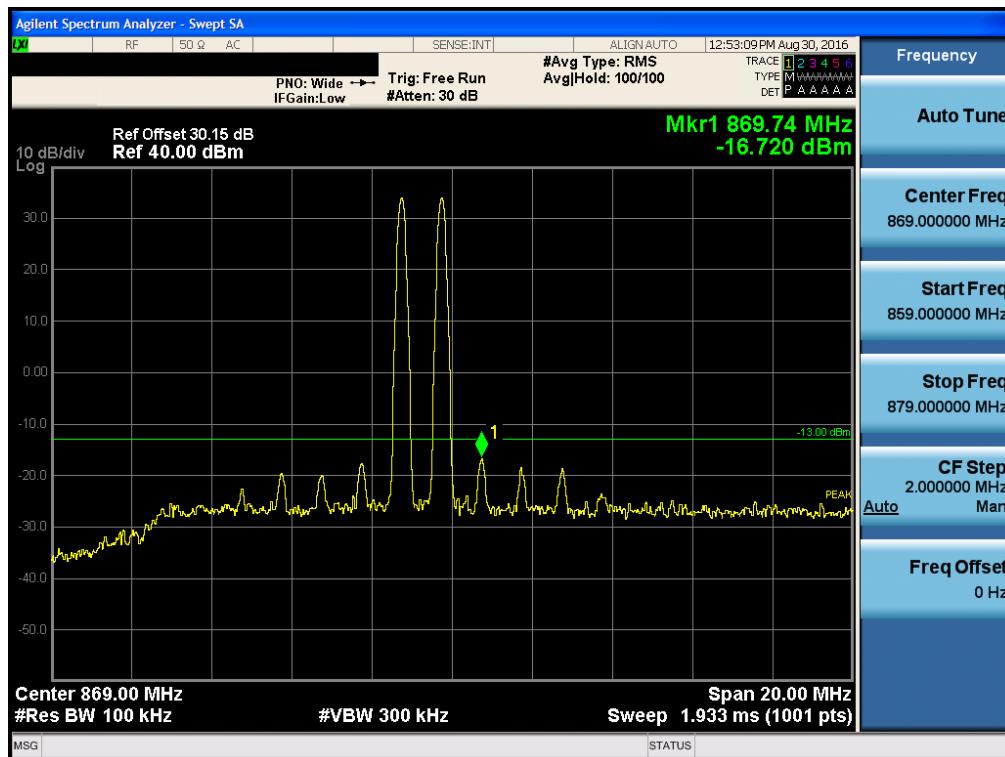


Multi channel Enhancer Band Edge for IC_ 800IDEN BAND

[Downlink Low]

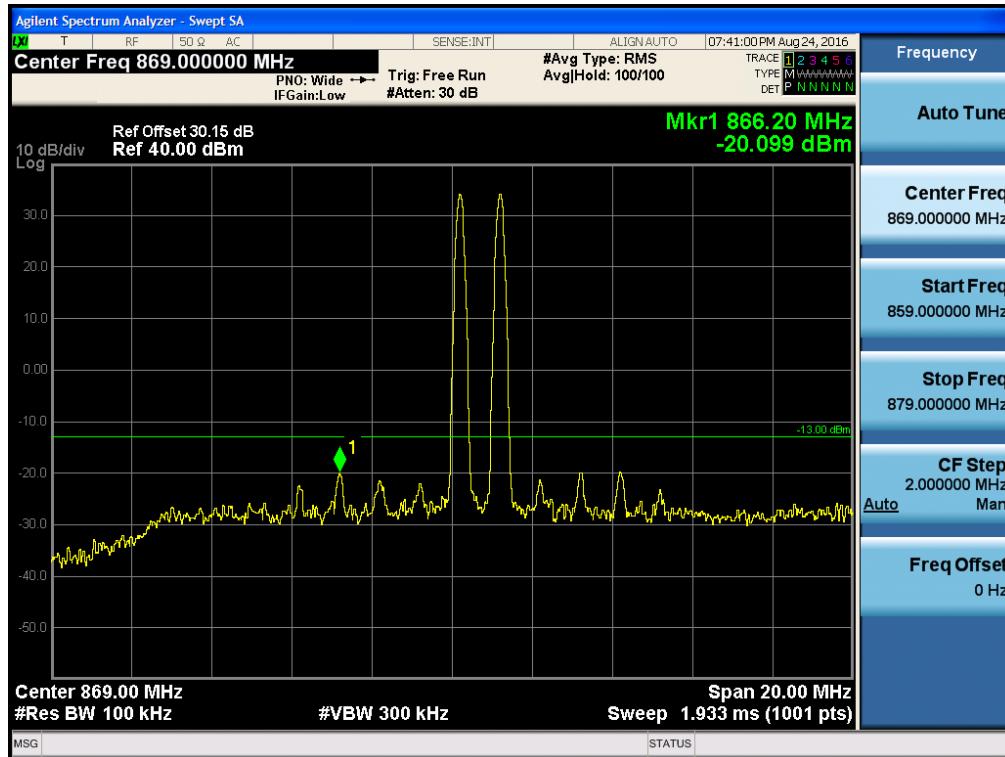


[Downlink High]

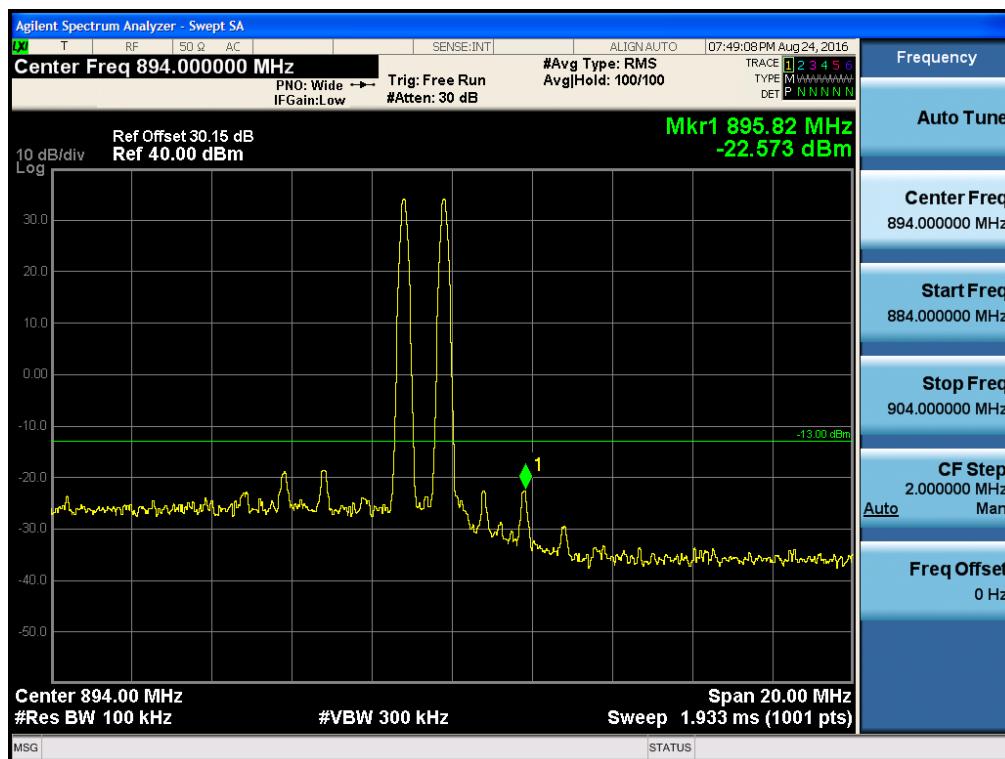


Multi channel Enhancer Band Edge for IC_ 850CEL BAND

[Downlink Low]



[Downlink High]



10. RADIATED SPURIOUS EMISSIONS

Test Requirement(s):

§ 2.1053 Measurements required: Field strength of spurious radiation.

(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 halfwave dipole antennas.

(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.

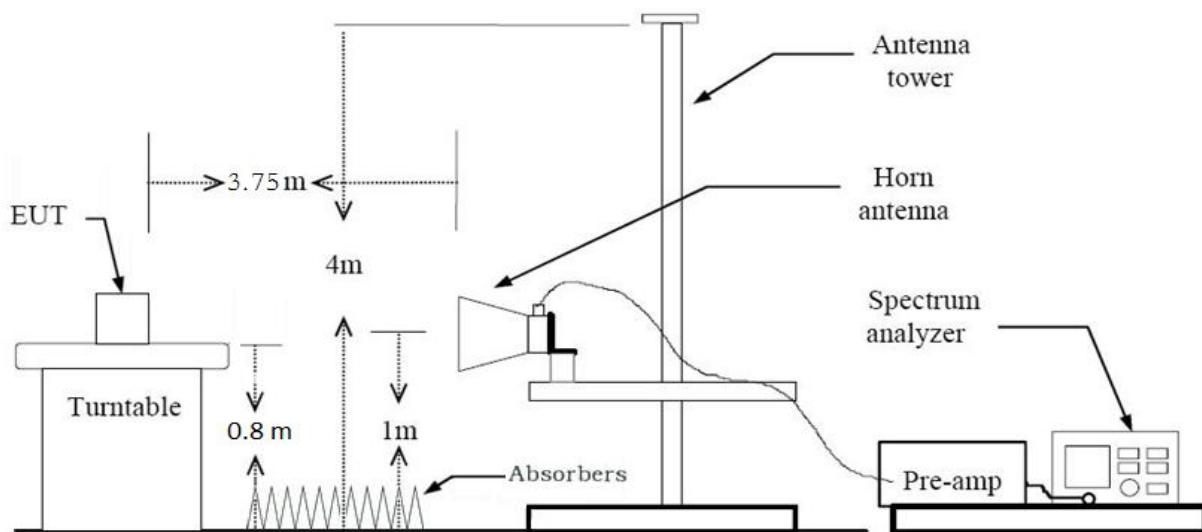
Test Procedures:

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



Note :

1. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
2. Distance extrapolation factor = $20 \log (\text{test distance} / \text{specific distance})$ (dB)

Test Result:

Note.

Input signal is the CW signal.

Harmonics were not found.

800IDEN, 850CEL Band

Voltage supplied to EUT	Ch.	Freq.(MHz)	Measured Level [dBuV/m]	Measured Power [dBm]	Ant. Factor [dB/m]	C.L. [dB]	A.G. [dB]	D.F. [dB]	Pol.	Result [dBm]	dBuV/m @3m
120 Vac	Low	1,738.00	62.22	-32.980	25.052	2.20	46.26	1.96	V	-50.028	45.172
	Mid	2,607.00	75.19	-20.010	27.824	3.04	45.92	1.96	V	-33.106	62.094
	High	-	-	-	-	-	-	-	-	-	-

Voltage supplied to EUT	Ch.	Freq.(MHz)	Measured Level [dBuV/m]	Measured Power [dBm]	Ant. Factor [dB/m]	C.L. [dB]	A.G. [dB]	D.F. [dB]	Pol.	Result [dBm]	dBuV/m @3m
-48 Vdc	Low	1,738.00	60.35	-34.850	25.052	2.20	46.26	1.96	V	-51.898	43.302
	Mid	2,607.00	74.33	-20.870	27.824	3.04	45.92	1.96	V	-33.966	61.234
	High	-	-	-	-	-	-	-	-	-	-

* C.L.: Cable Loss / A.G.: Ant. Gain / D.F.: Distance Factor (3.75 m)

11. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

FCC Rules

Test Requirement(s):

§2.1055 Measurements required: Frequency stability.

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

- (1) From -30° to + 50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

§ 22.355 Frequency tolerance.

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1—Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

§90.213 Frequency stability.

(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.

Minimum Frequency Stability

[Parts per million (ppm)]

Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
Below 25	^{1 2 3} 100	100	200
25-50	20	20	50
72-76	5		50
150-174	^{5 11} 5	⁶ 5	^{4 6} 50
216-220	1.0		1.0
220-222 ¹²	0.1	1.5	1.5
421-512	^{7 11 14} 2.5	⁸ 5	⁸ 5
806-809	¹⁴ 1.0	1.5	1.5
809-824	¹⁴ 1.5	2.5	2.5
851-854	1.0	1.5	1.5
854-869	1.5	2.5	2.5
896-901	¹⁴ 0.1	1.5	1.5
902-928	2.5	2.5	2.5
902-928 ¹³	2.5	2.5	2.5
929-930	1.5		
935-940	0.1	1.5	1.5
1427-1435	⁹ 300	300	300
Above 2450 ¹⁰			

¹⁴Control stations may operate with the frequency tolerance specified for associated mobile frequencies.

(b) For the purpose of determining the frequency stability limits, the power of a transmitter is considered to be the maximum rated output power as specified by the manufacturer.

Test Procedures:

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

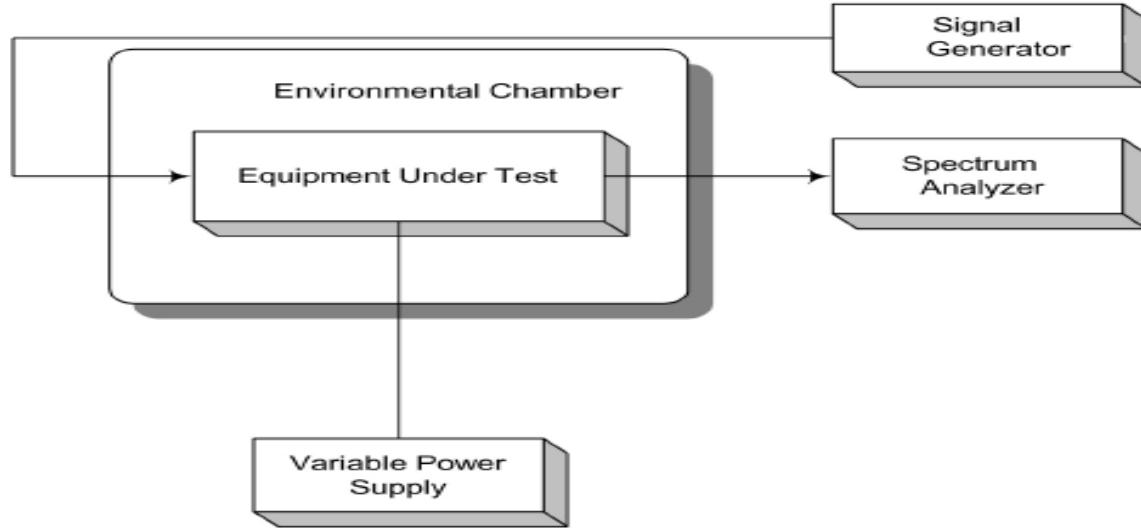
The EUT was placed in the Environmental Chamber.

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 Frequency Stability of Band Translators

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 Frequency Stability of Band Translators**

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

[800IDEN BAND]

Reference: 120 Vac at 20°C **Freq.** = 865.5 MHz

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	ppm
100%	+20(Ref)	865 500 000	0.034	0.00000
	-30	865 500 000	-0.012	-0.00002
	-20	865 500 000	0.092	0.00002
	-10	865 500 000	-0.007	-0.00002
	0	865 500 000	0.047	0.00001
	+10	865 500 000	0.064	0.00001
	+30	865 500 000	-0.087	-0.00005
	+40	865 500 000	0.103	0.00003
	+50	865 500 000	0.079	0.00002
	115%	865 500 000	0.021	-0.00001
85%	+20	865 500 000	0.010	-0.00001

[850CEL BAND]

Reference: 120 Vac at 20°C **Freq.** = 881.5 MHz

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	ppm
100%	+20(Ref)	881 500 000	-0.002	0.00000
	-30	881 500 000	-0.007	0.00000
	-20	881 500 000	0.023	0.00001
	-10	881 500 000	0.029	0.00001
	0	881 500 000	0.073	0.00003
	+10	881 500 000	-0.061	-0.00002
	+30	881 500 000	-0.108	-0.00004
	+40	881 500 000	-0.082	-0.00003
	+50	881 500 000	-0.068	-0.00003
	115%	881 500 000	-0.001	0.00000
85%	+20	881 500 000	0.012	0.00001