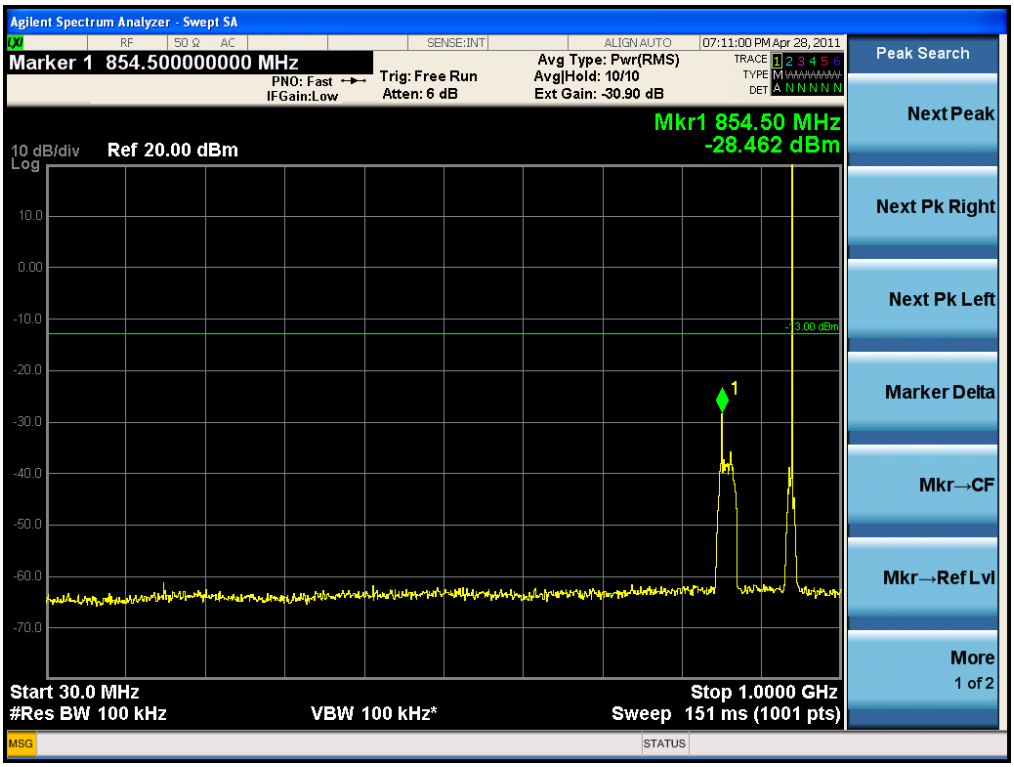
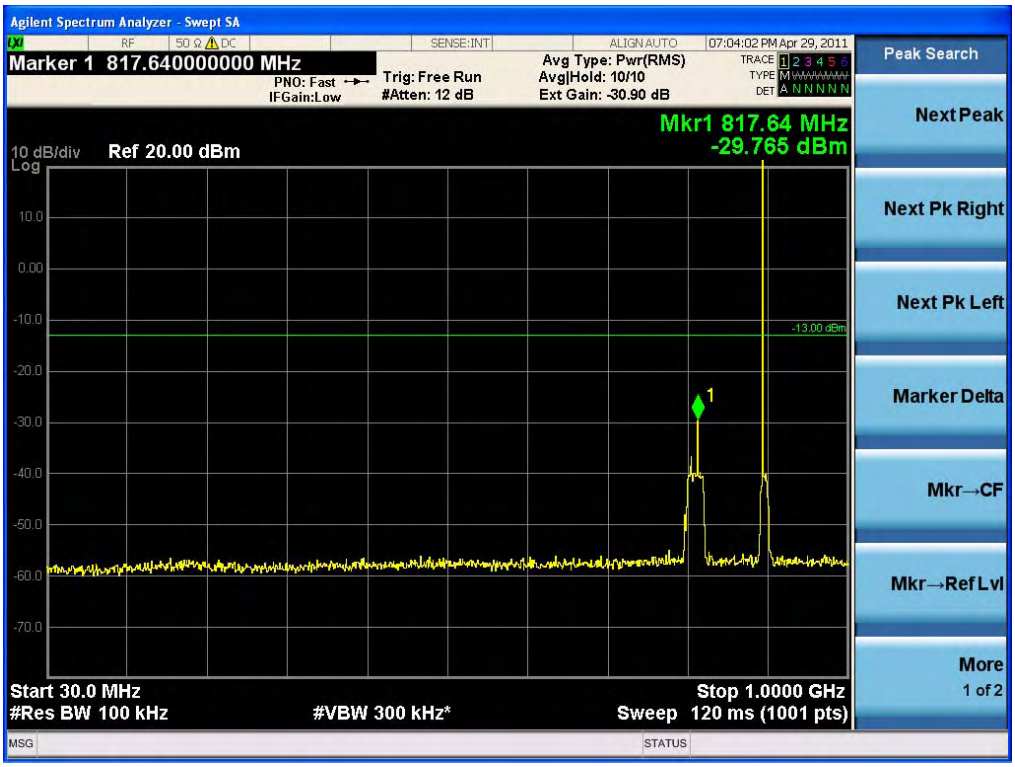


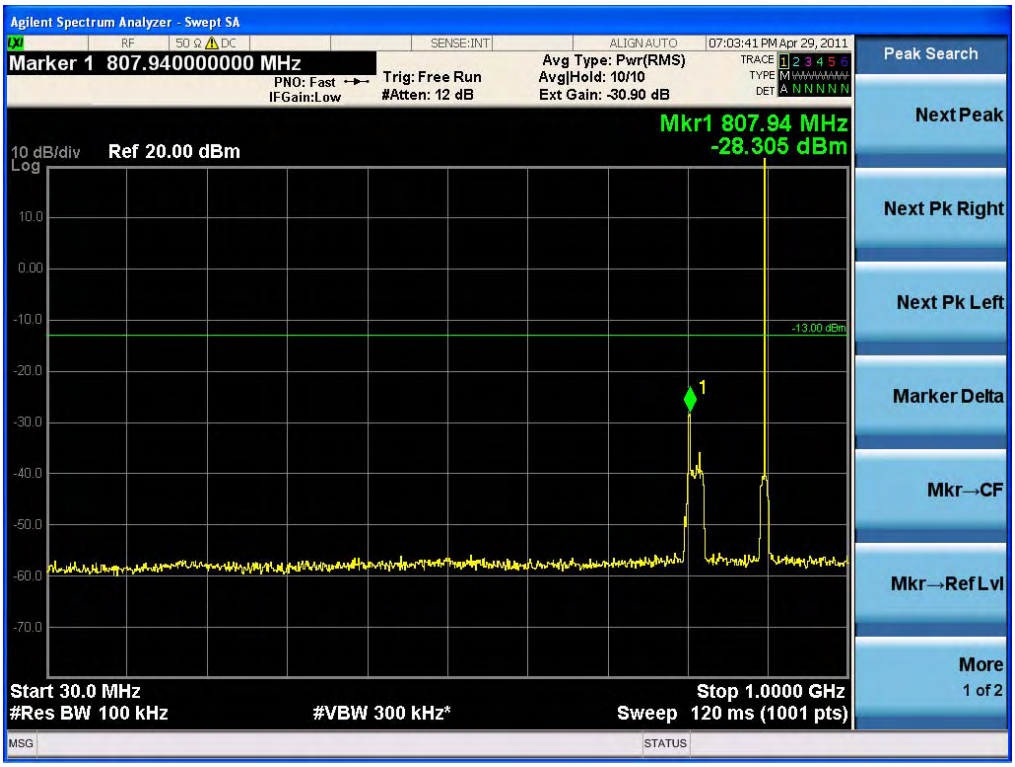
Conducted Spurious Emissions Downlink High CH (30 MHz – 1 GHz)

Conducted Spurious Emissions Downlink High CH (1 GHz – 26.5 GHz)



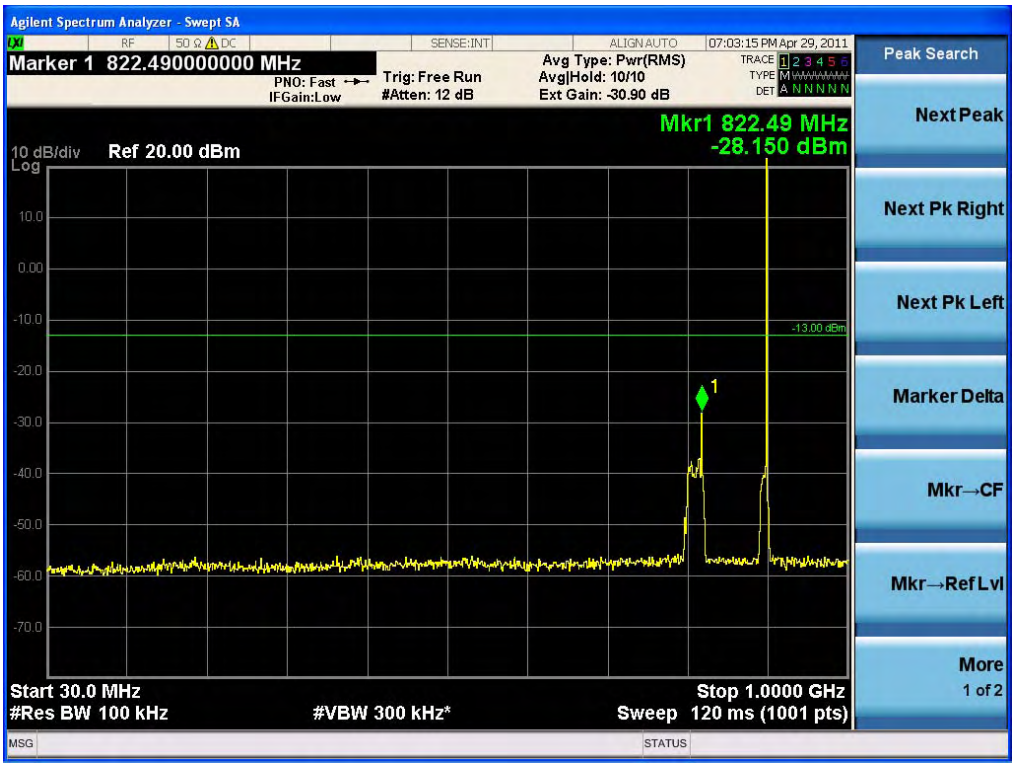
Conducted Spurious Emissions Uplink Low CH (30 MHz – 1 GHz)

Conducted Spurious Emissions Uplink Low CH (1 GHz – 26.5 GHz)



Conducted Spurious Emissions Uplink Mid CH (30 MHz – 1 GHz)

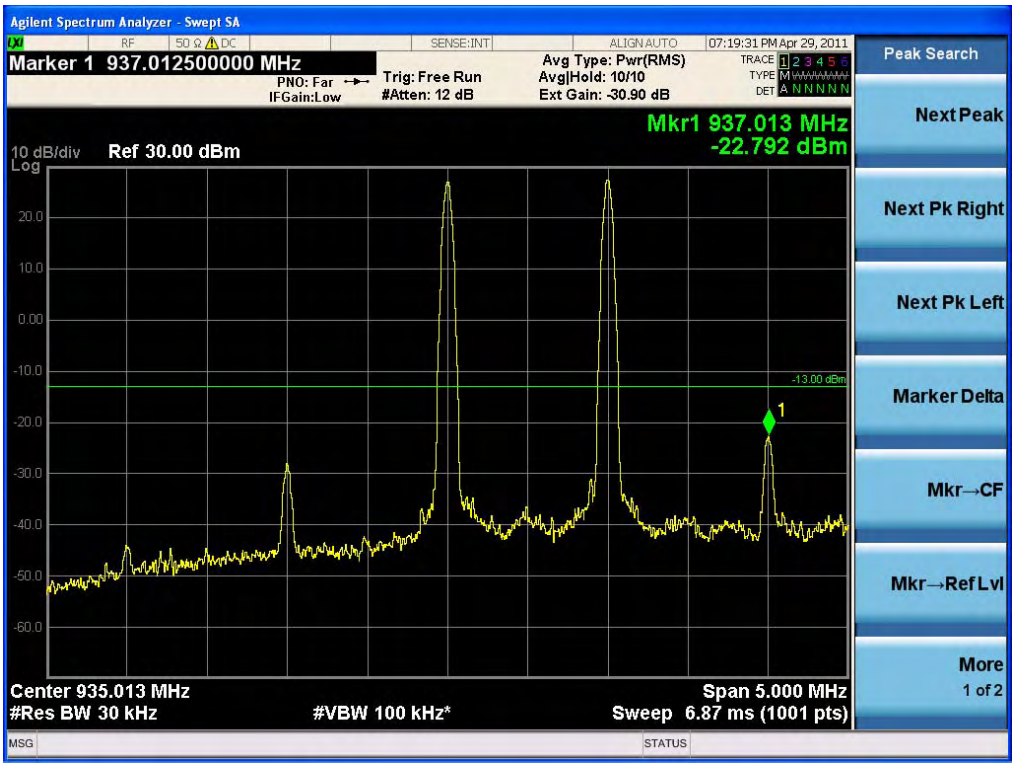
Conducted Spurious Emissions Uplink Mid CH (1 GHz – 26.5 GHz)



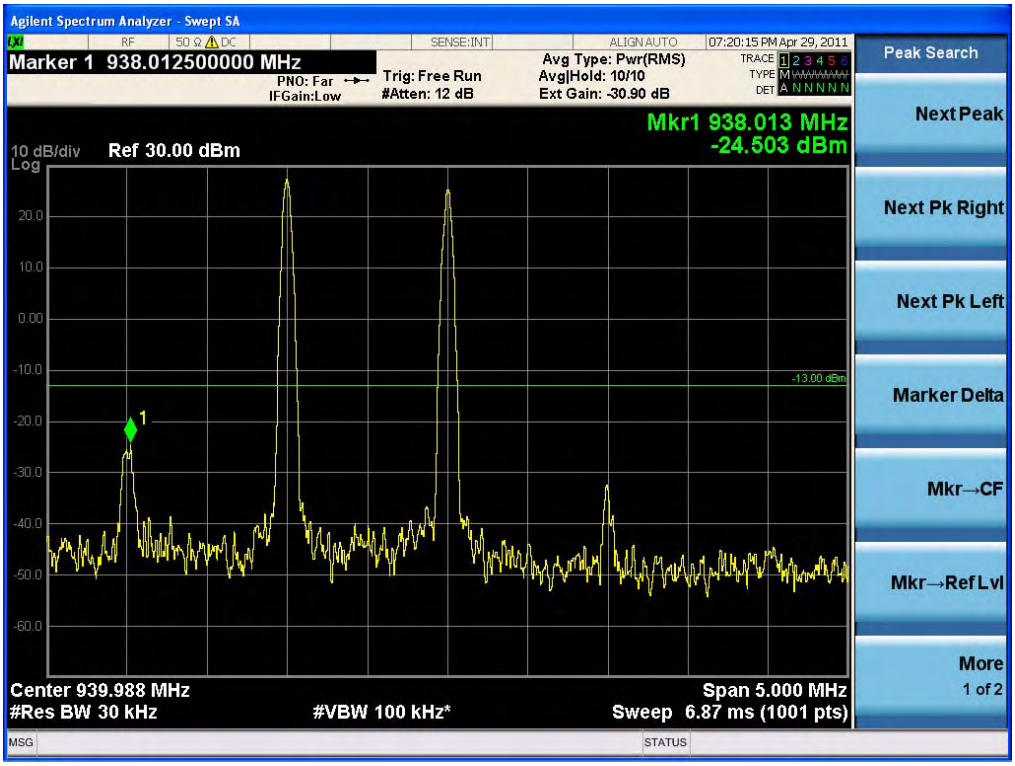
Conducted Spurious Emissions Uplink High CH (30 MHz – 1 GHz)

Conducted Spurious Emissions Uplink High CH (1 GHz – 26.5 GHz)

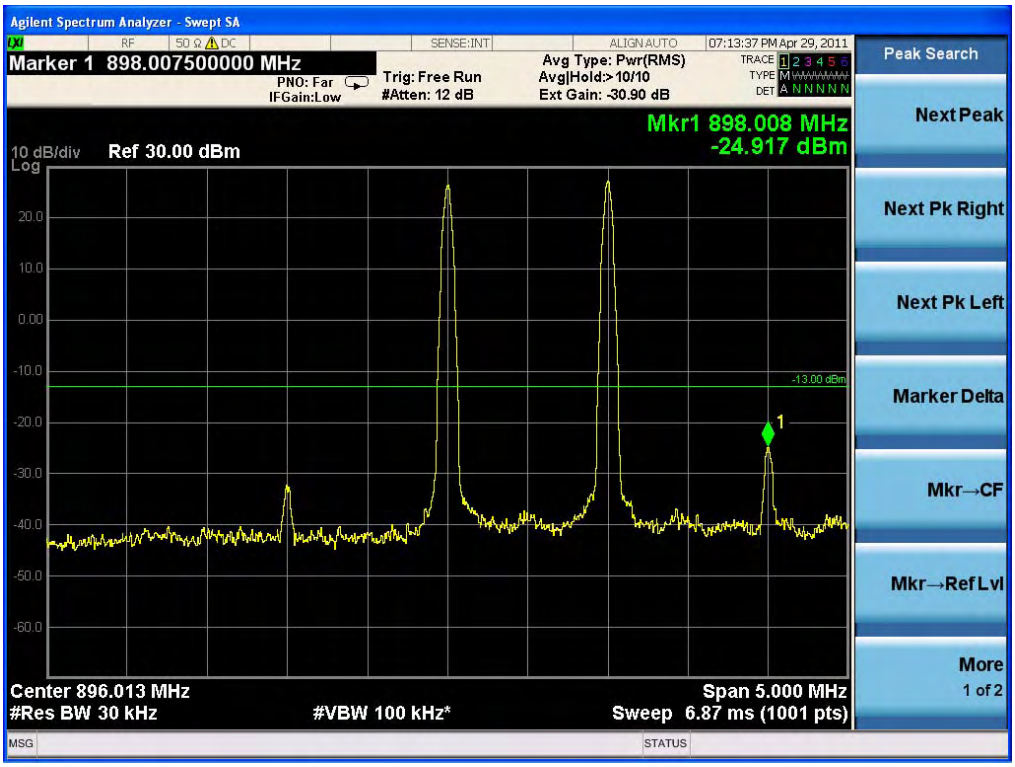
Plots of Two Tone Intermodulation, iDEN 900



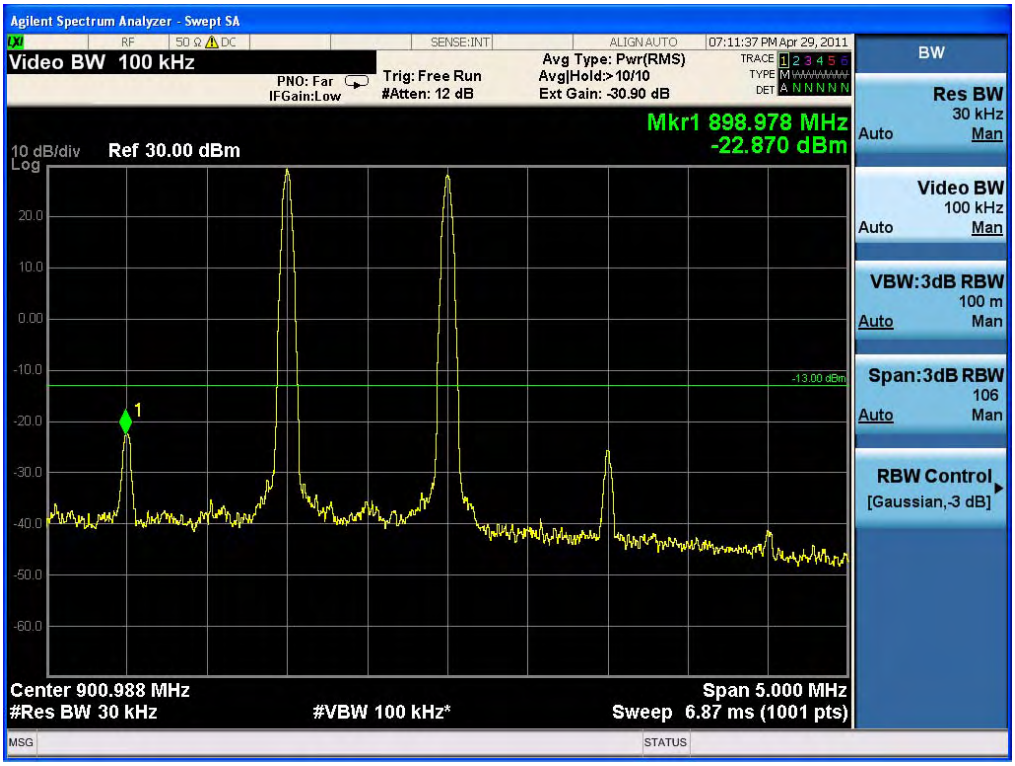
Two Tone Downlink Low End Intermodulation



Two Tone Downlink Hi End Intermodulation

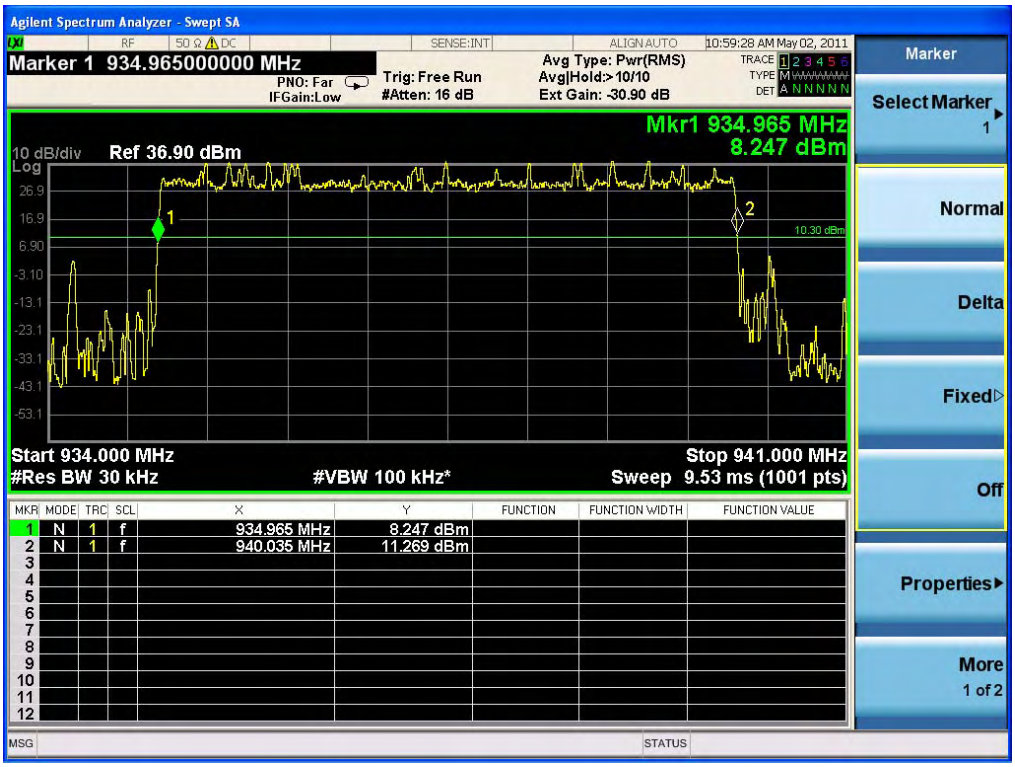


Two Tone Uplink Low End Intermodulation

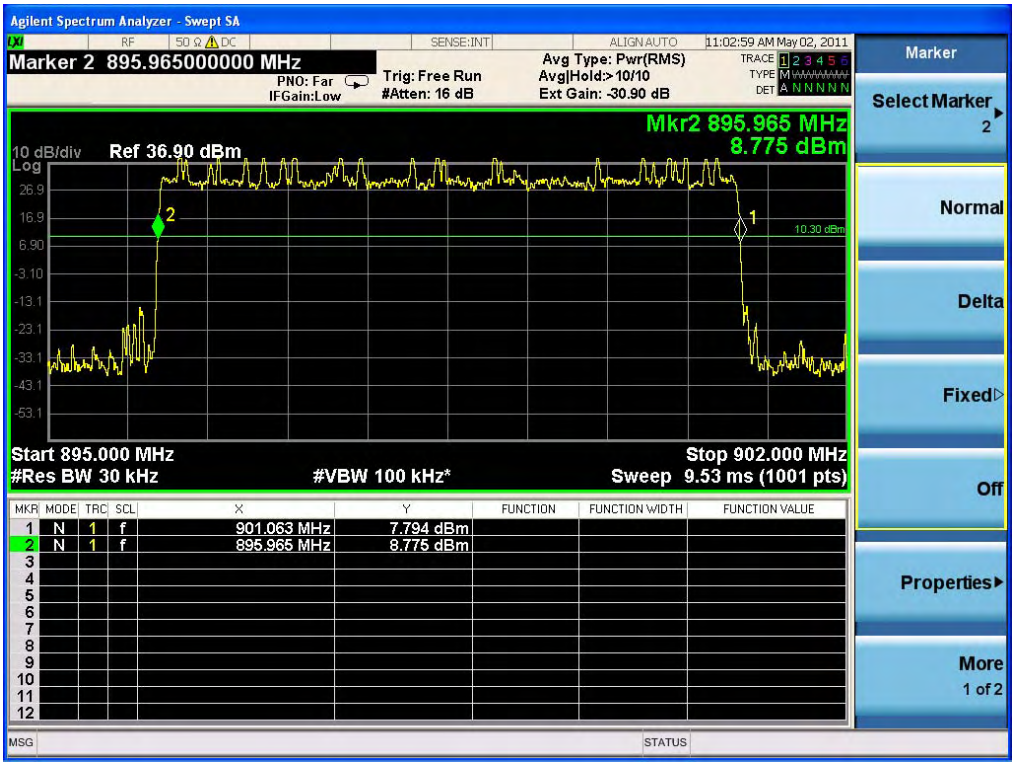


Two Tone Uplink Hi End Intermodulation

Plots of Band Reject iDEN900

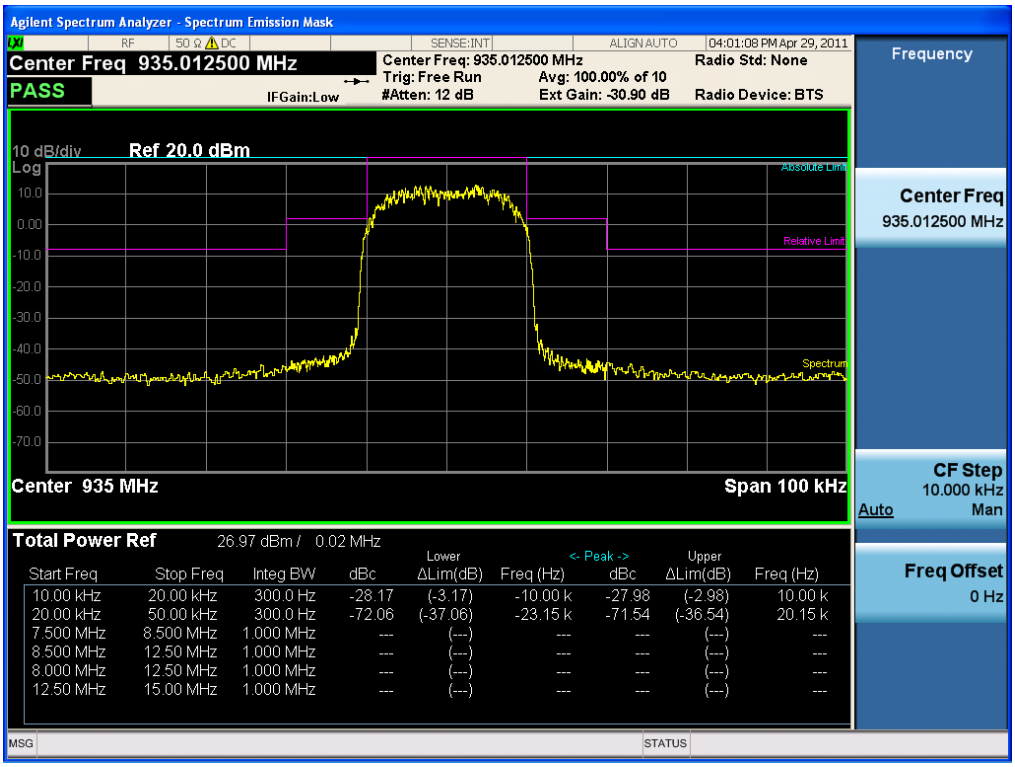


(iDEN900 Downlink Mid CH)

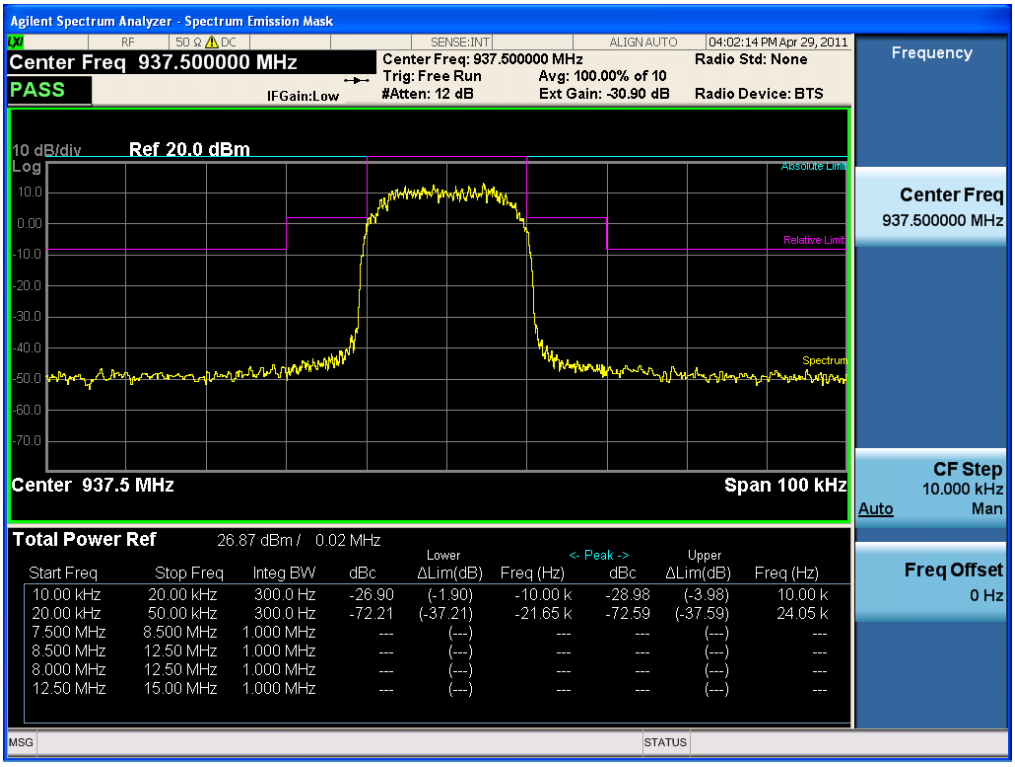


(iDEN900 Uplink Mid CH)

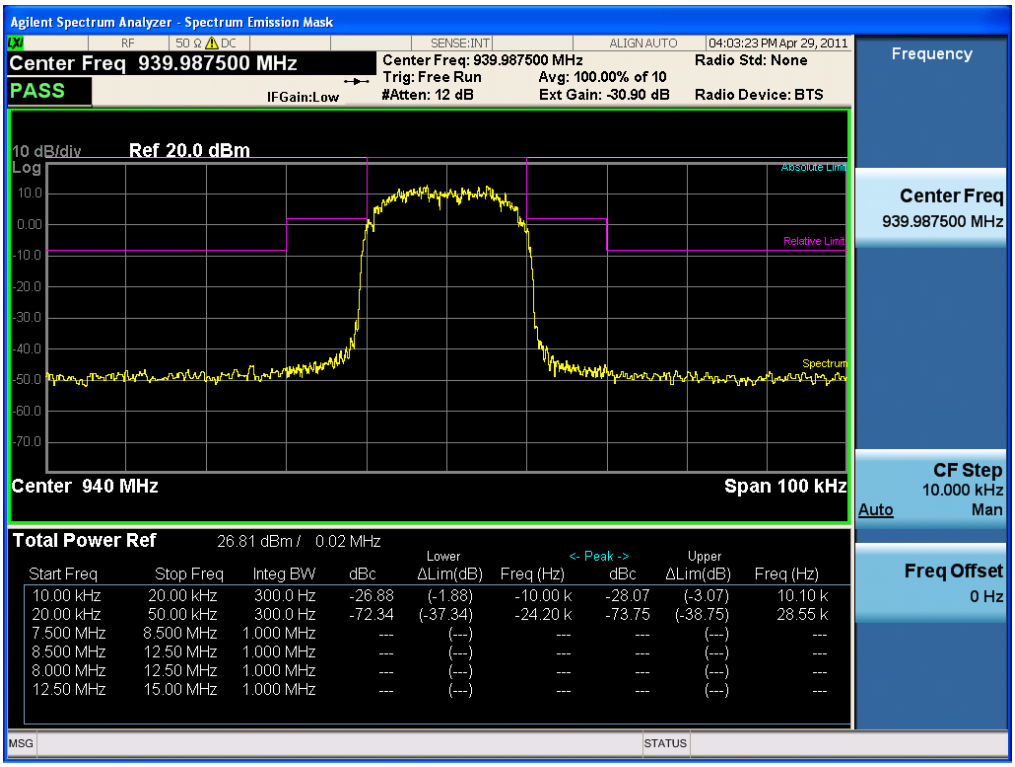
Plots of Emission Mask iDEN900



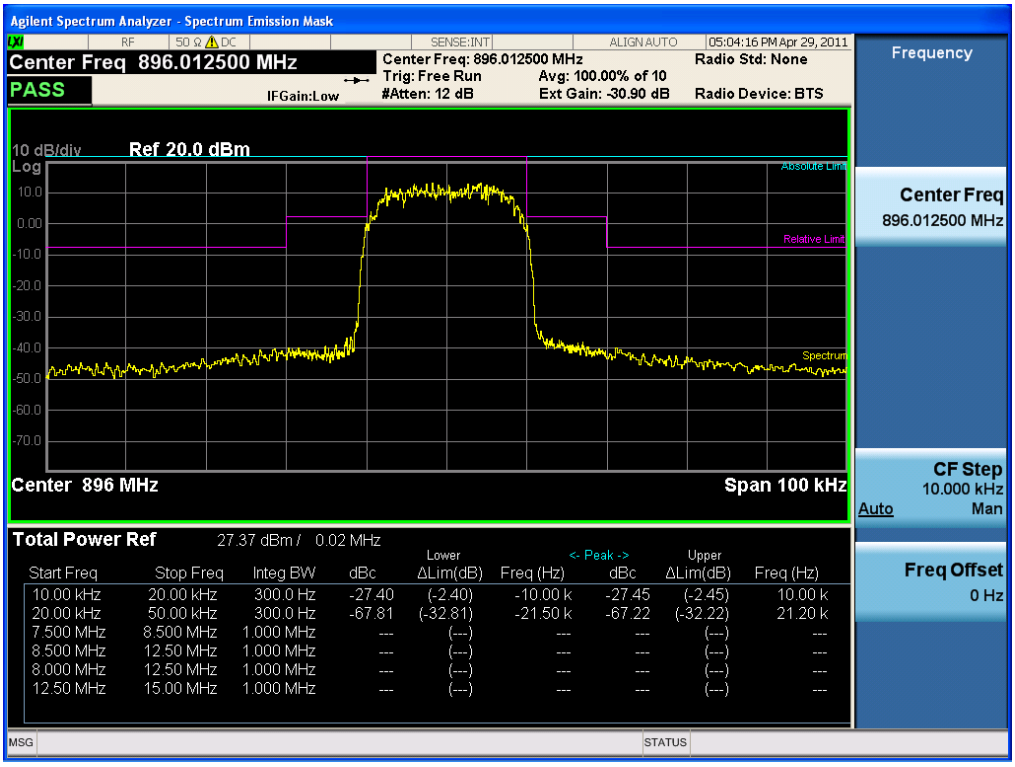
(iDEN900 Downlink Low CH)



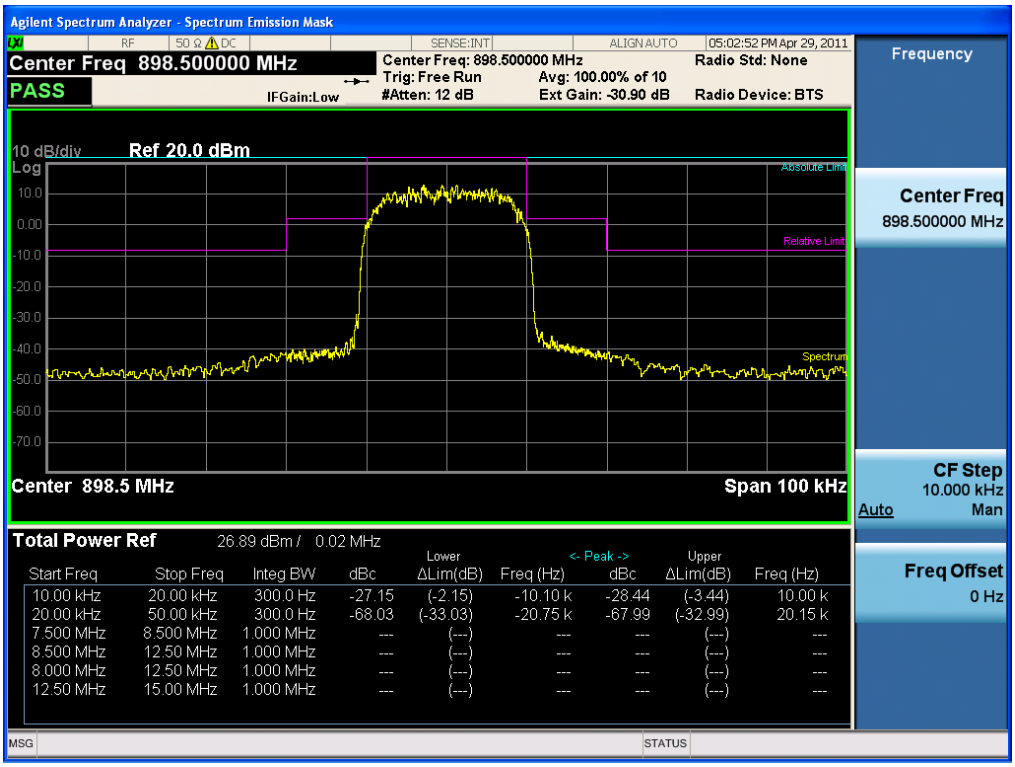
(iDEN900 Downlink Mid CH)



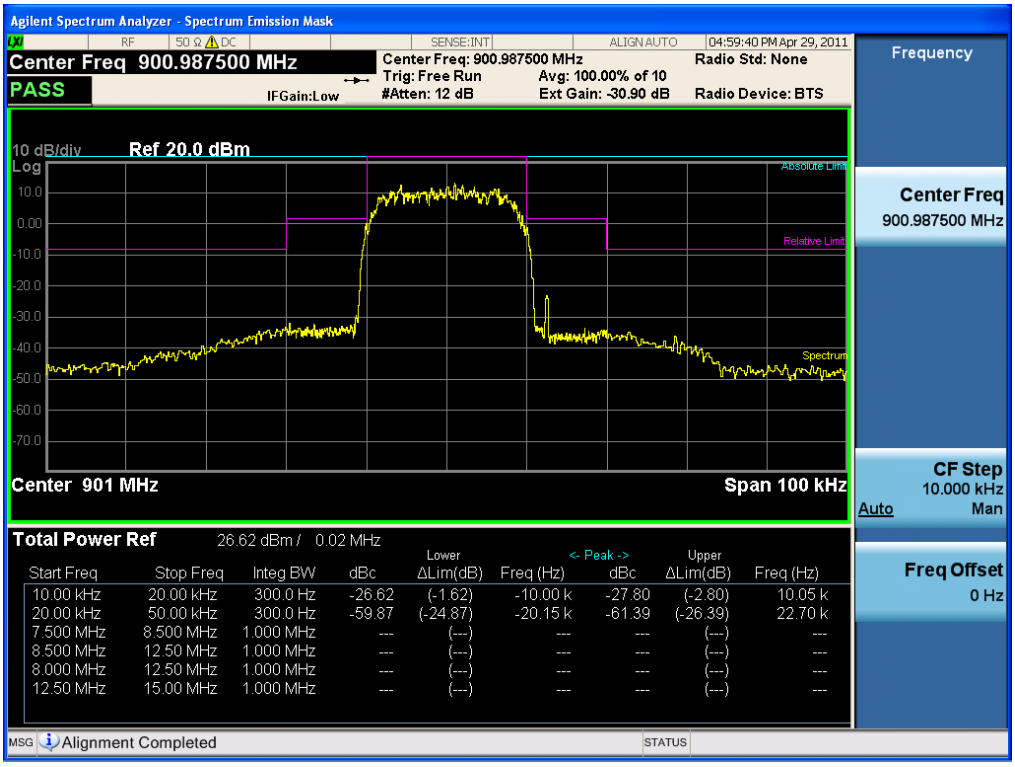
(iDEN900 Downlink High CH)



(iDEN900 Uplink Low CH)

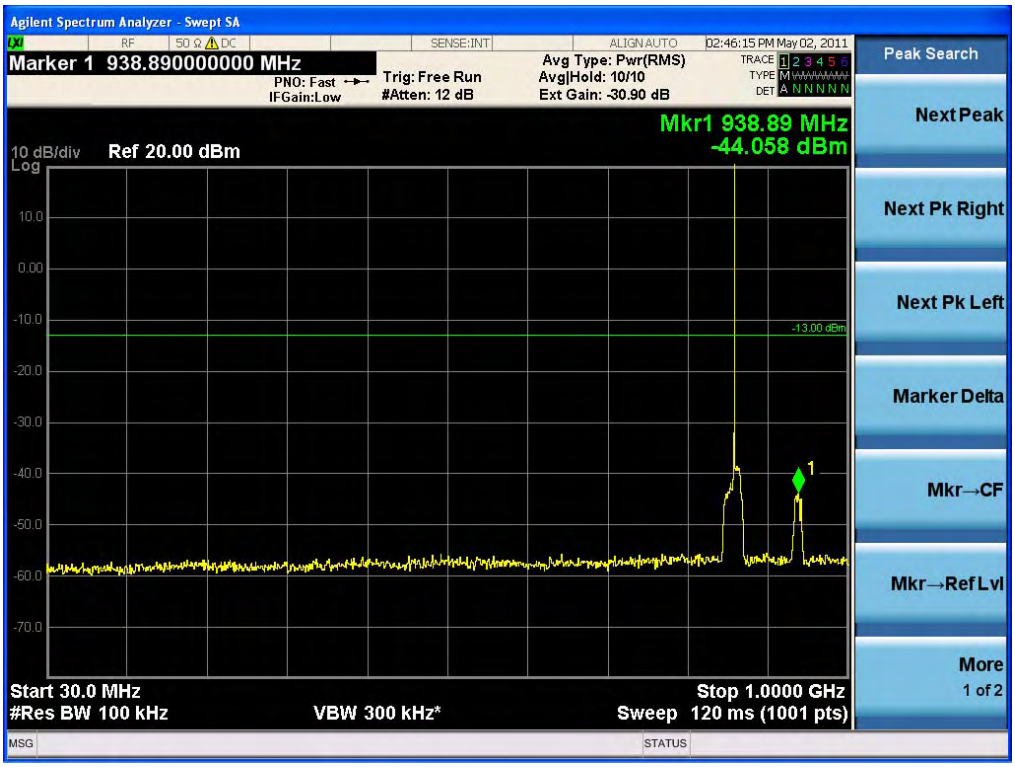


(iDEN900 Uplink Mid CH)



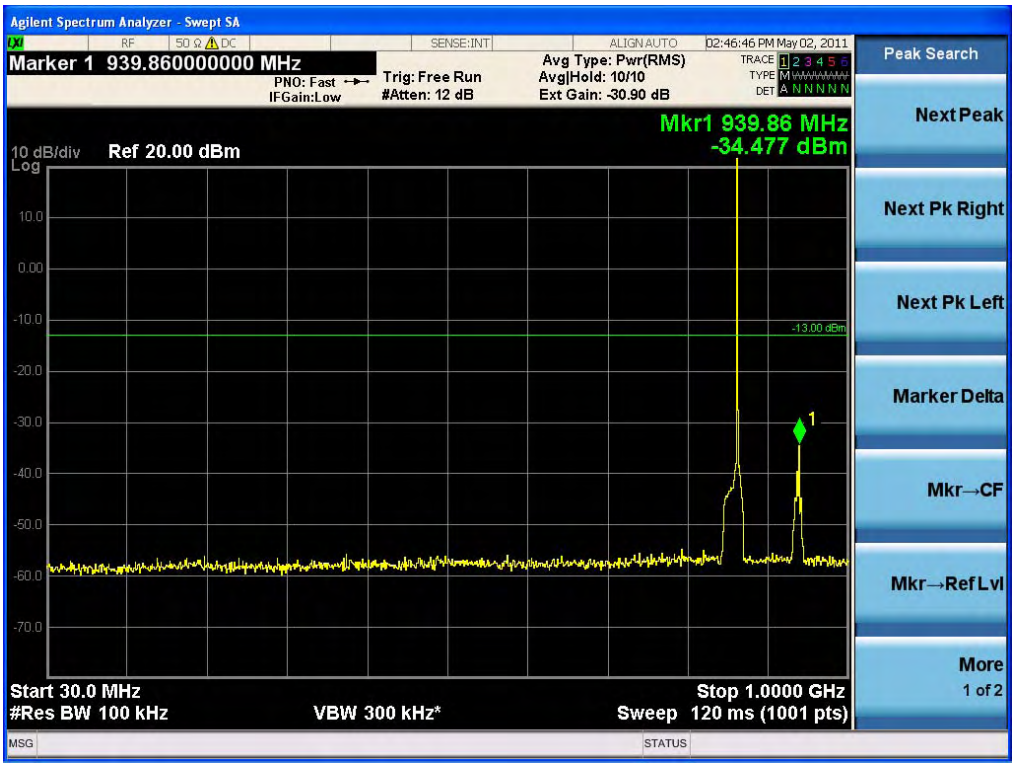
(iDEN900 Uplink High CH)

Plots of Spurious Emission, iDEN800-7 MHz



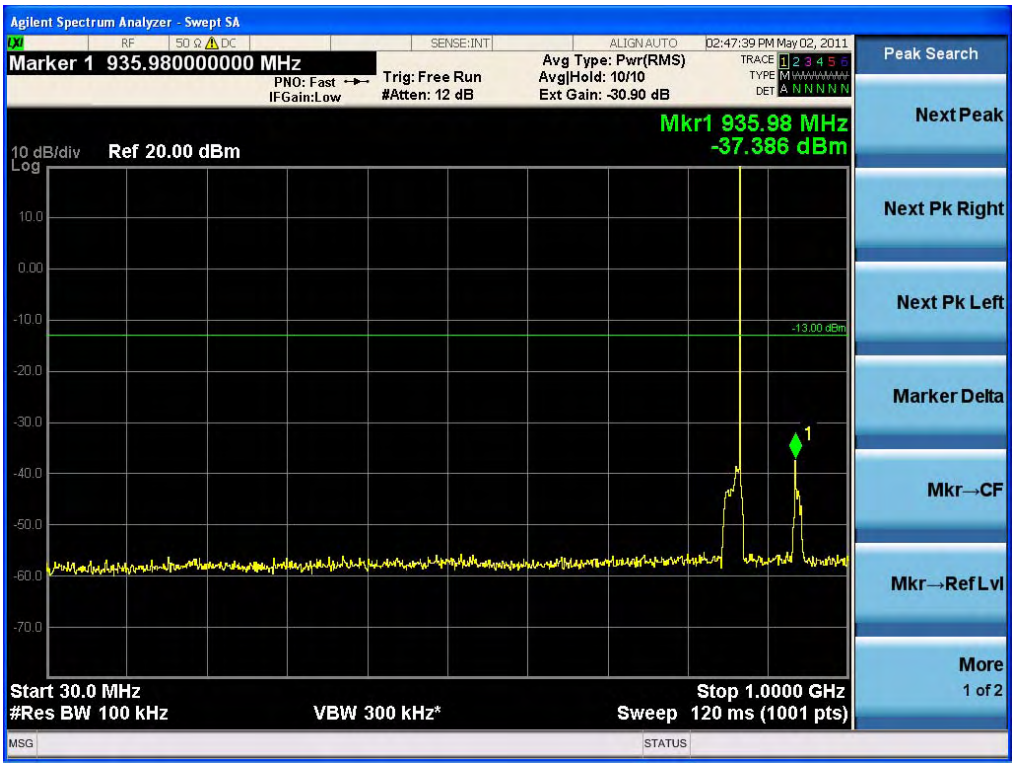
Conducted Spurious Emissions Downlink Low CH (30 MHz – 1 GHz)

Conducted Spurious Emissions Downlink Low CH (1 GHz – 26.5 GHz)



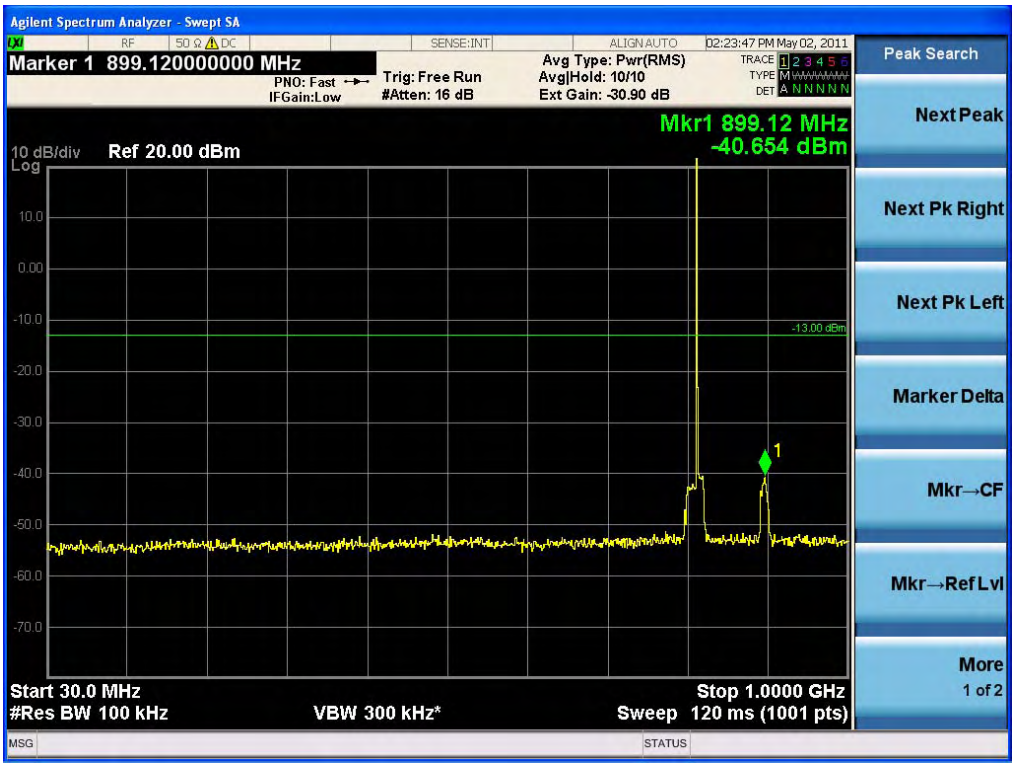
Conducted Spurious Emissions Downlink Mid CH (30 MHz – 1 GHz)

Conducted Spurious Emissions Downlink Mid CH (1 GHz – 26.5 GHz)



Conducted Spurious Emissions Downlink High CH (30 MHz – 1 GHz)

Conducted Spurious Emissions Downlink High CH (1 GHz – 26.5 GHz)

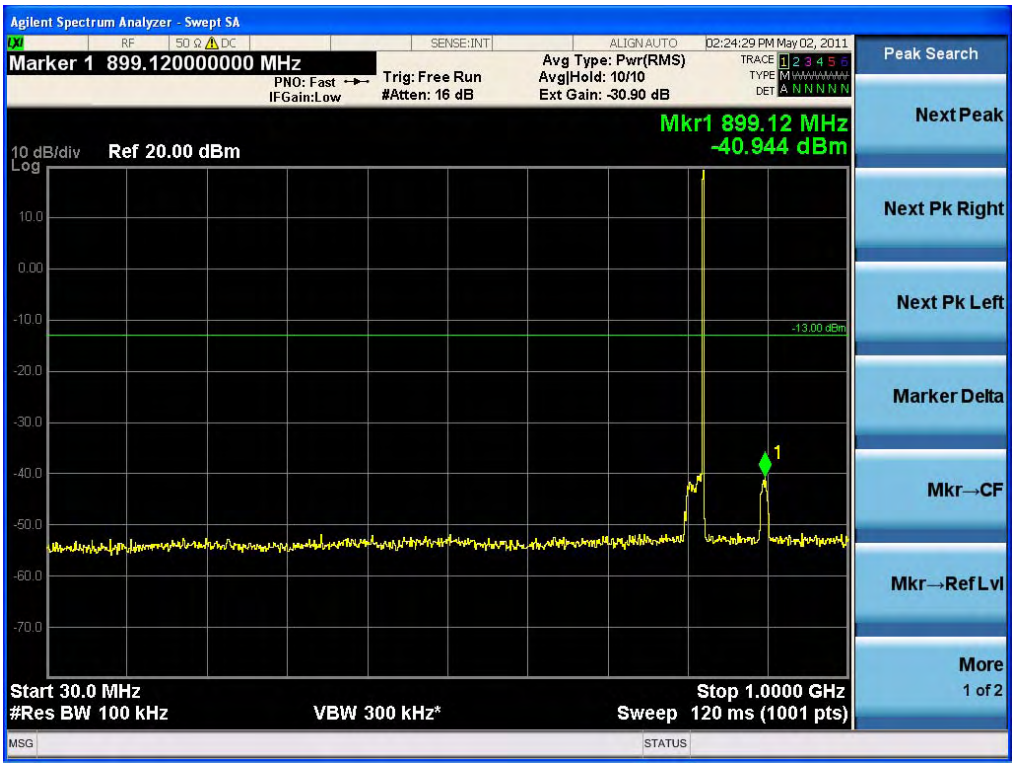


Conducted Spurious Emissions Uplink Low CH (30 MHz – 1 GHz)

Conducted Spurious Emissions Uplink Low CH (1 GHz – 26.5 GHz)

Conducted Spurious Emissions Uplink Mid CH (30 MHz – 1 GHz)

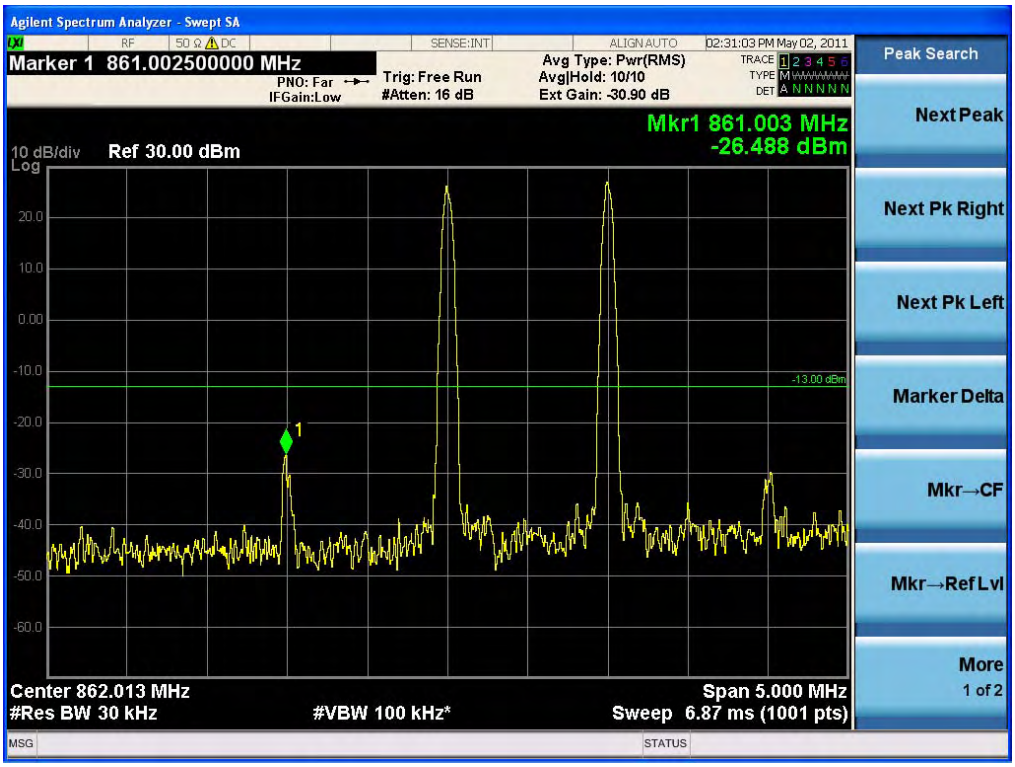
Conducted Spurious Emissions Uplink Mid CH (1 GHz – 26.5 GHz)



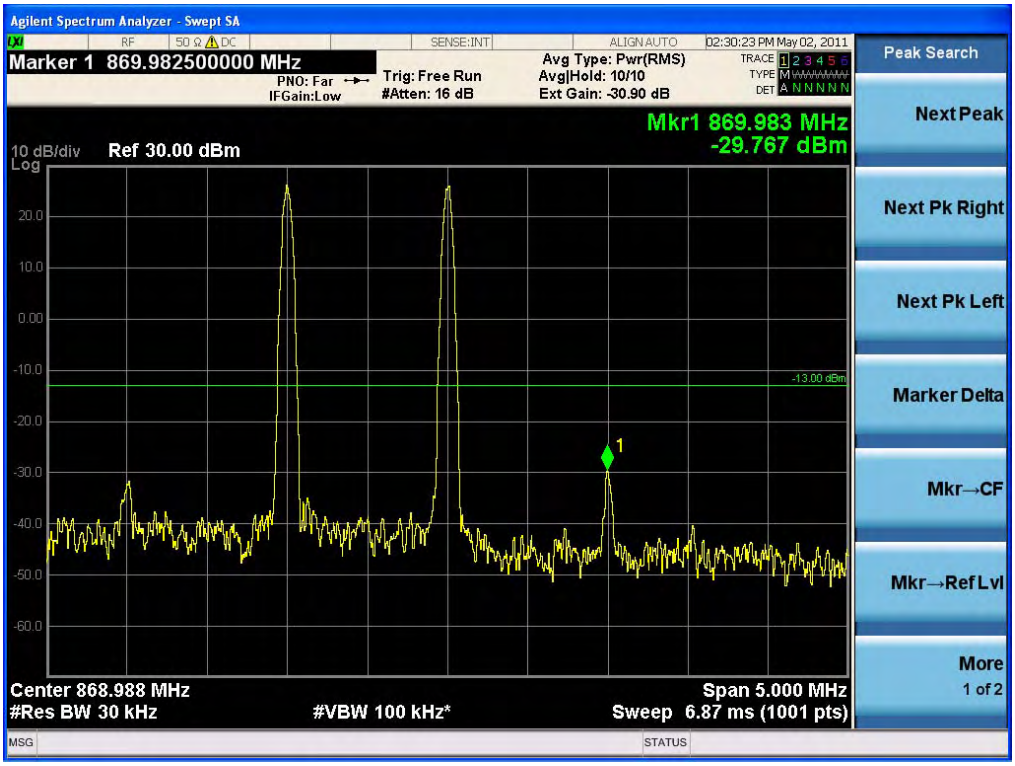
Conducted Spurious Emissions Uplink High CH (30 MHz – 1 GHz)

Conducted Spurious Emissions Uplink High CH (1 GHz – 26.5 GHz)

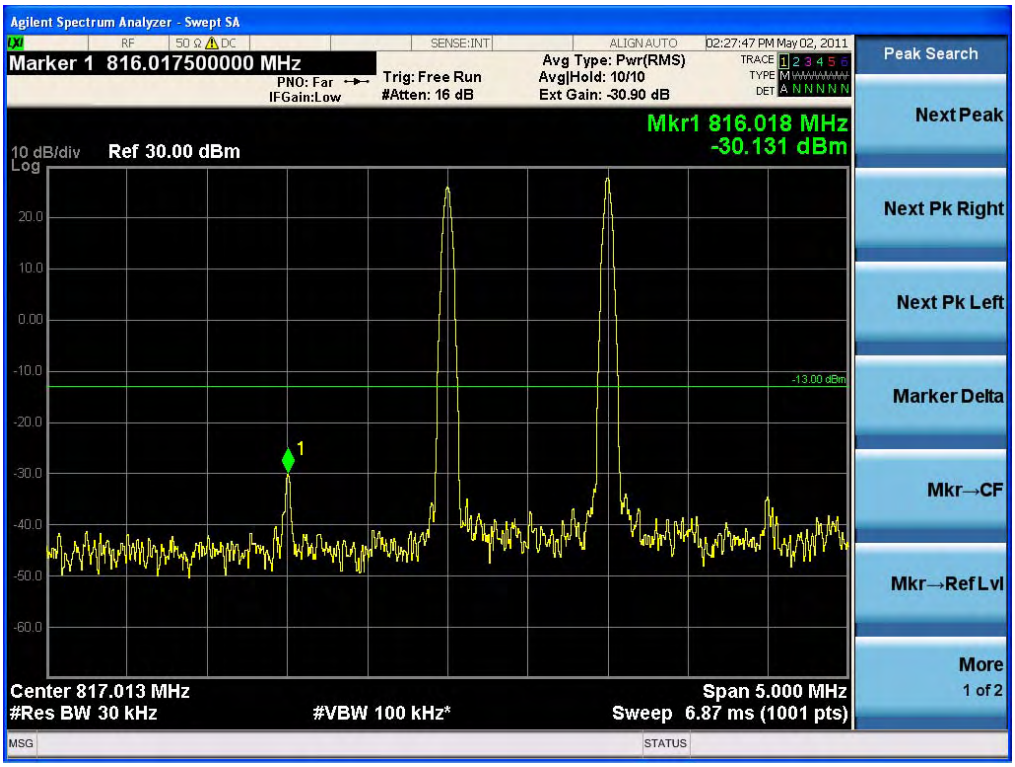
Plots of Two Tone Intermodulation, iDEN 800-7 MHz



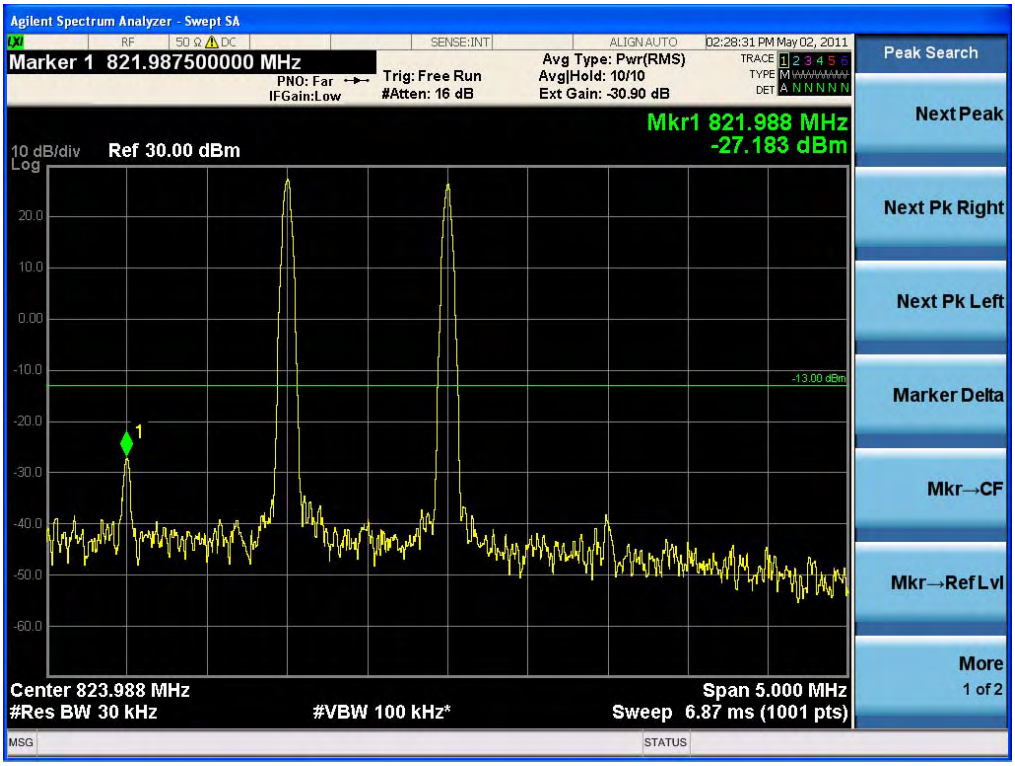
Two Tone Downlink Low End Intermodulation



Two Tone Downlink Hi End Intermodulation

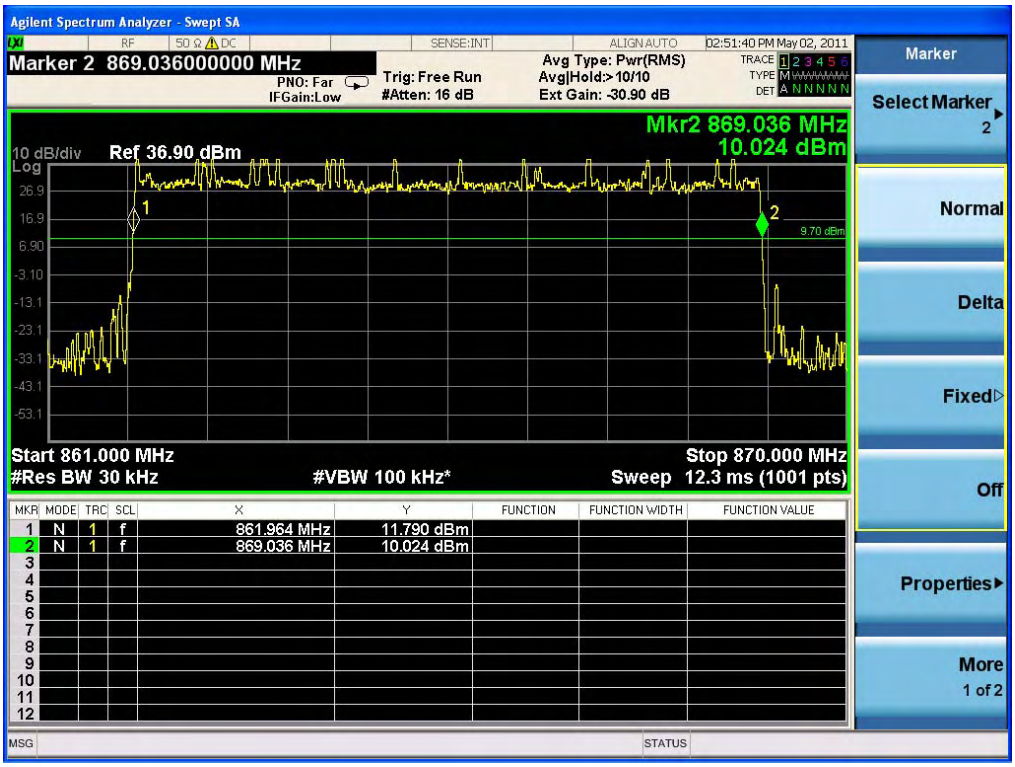


Two Tone Uplink Low End Intermodulation

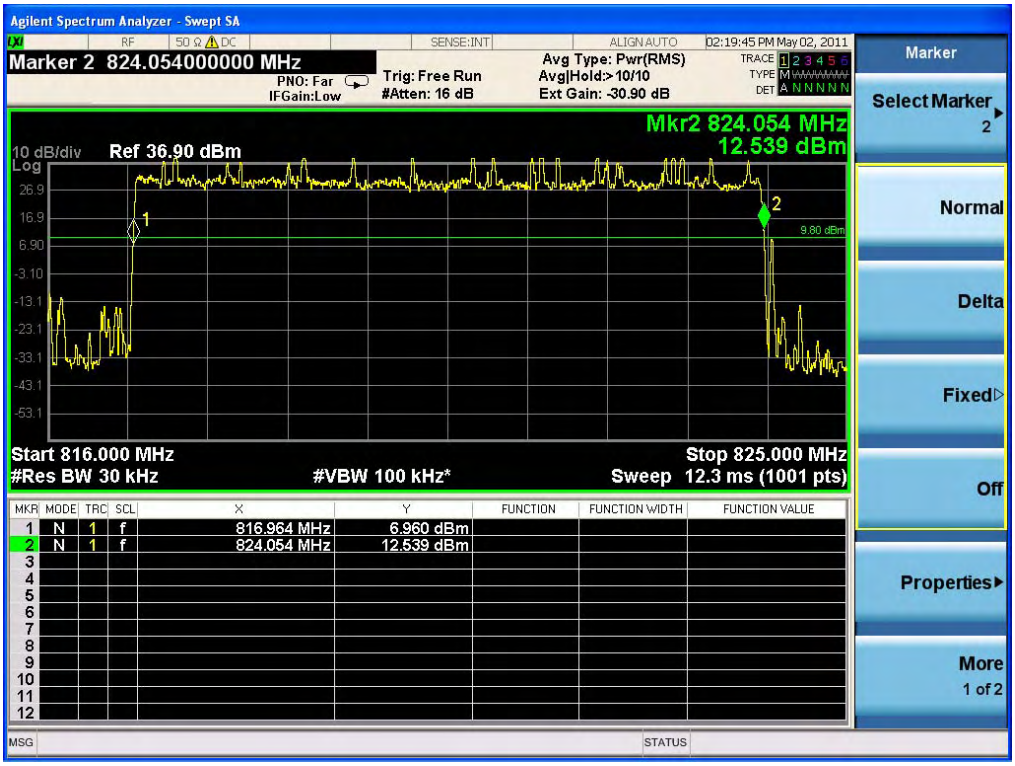


Two Tone Uplink Hi End Intermodulation

Plots of Band Reject iDEN 800-7 MHz

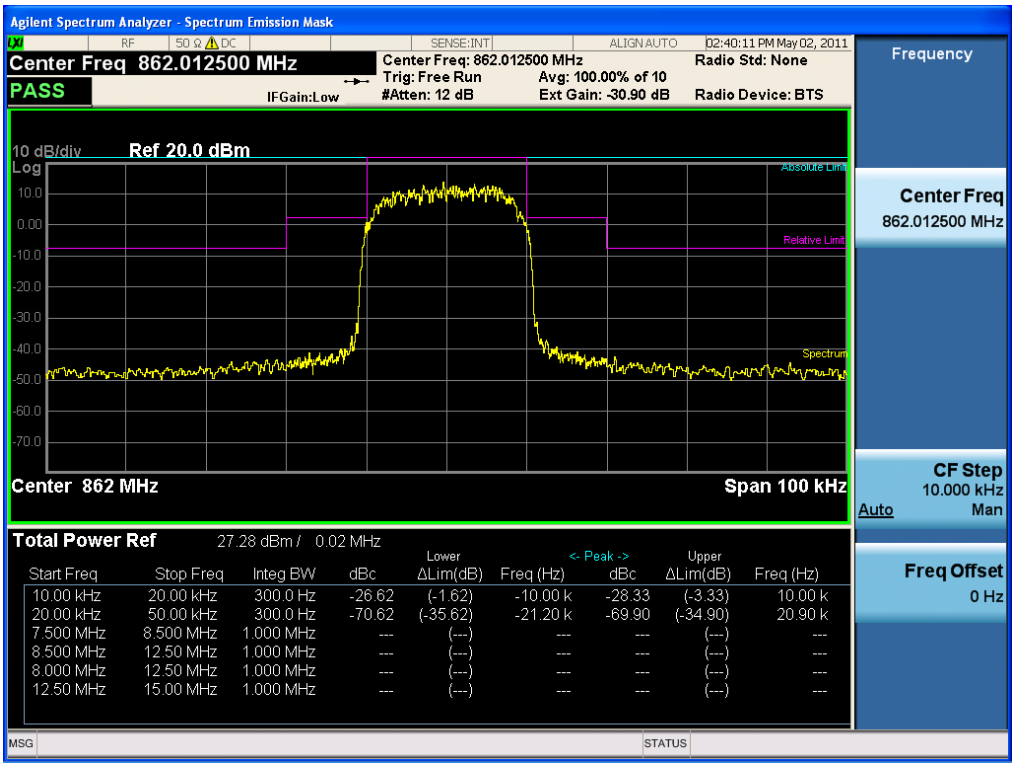


(iDEN800 Downlink Mid CH) - 7 MHz

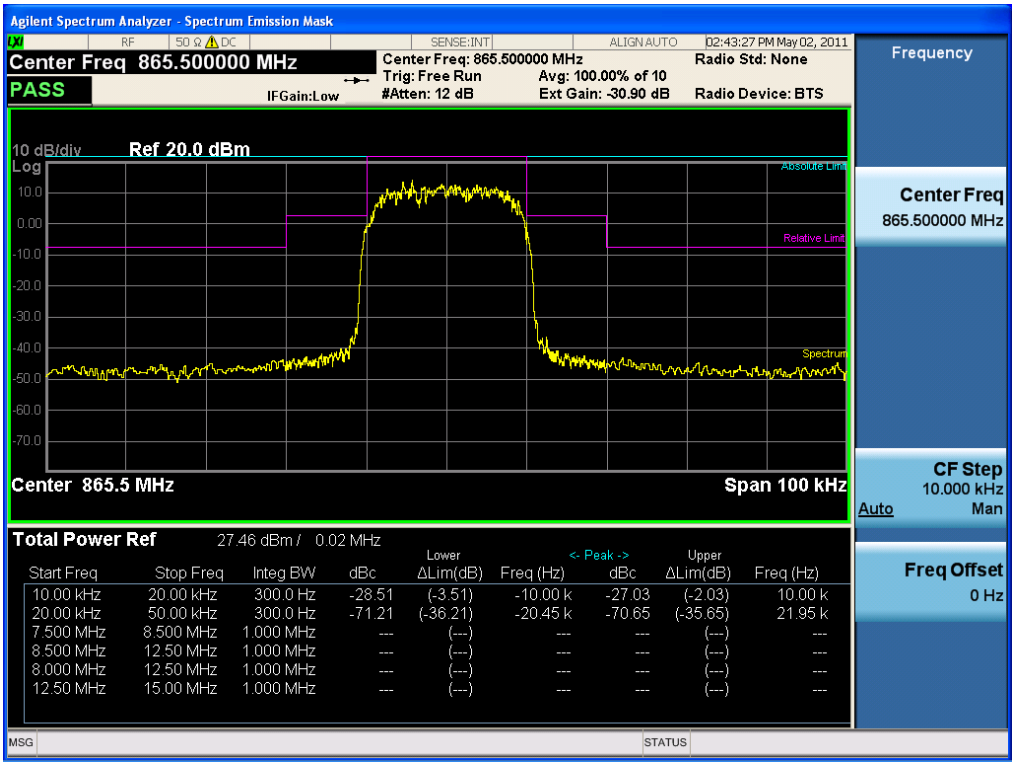


(iDEN800 Uplink Mid CH) - 7 MHz

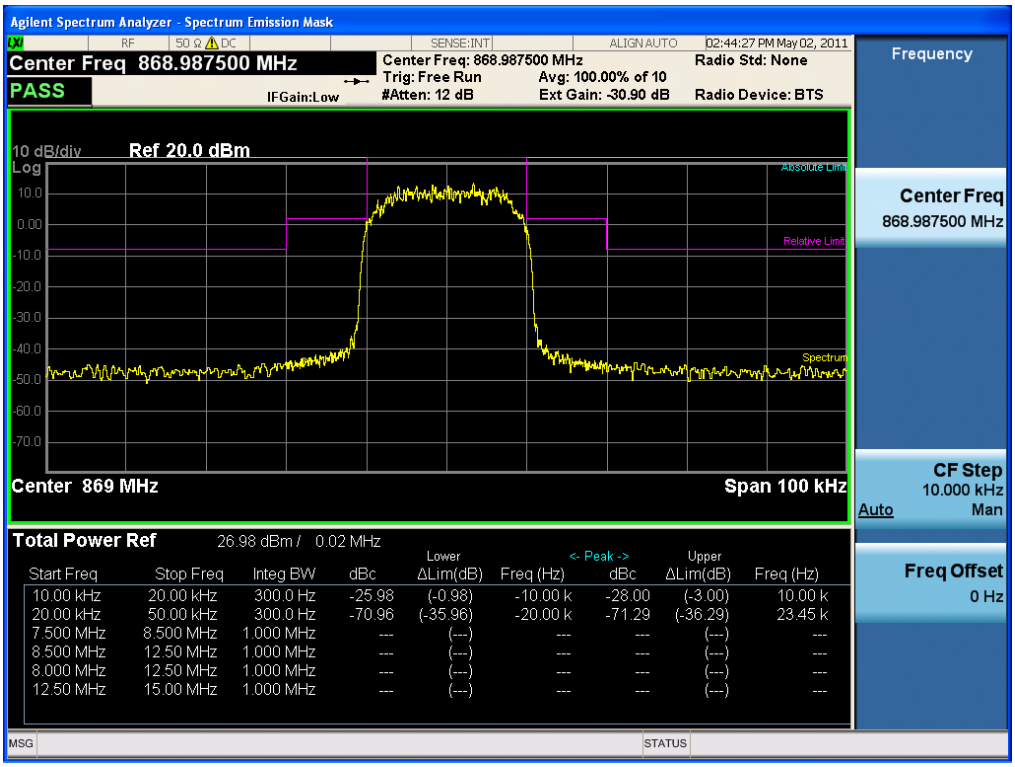
Plots of Emission Mask iDEN 800-7 MHz



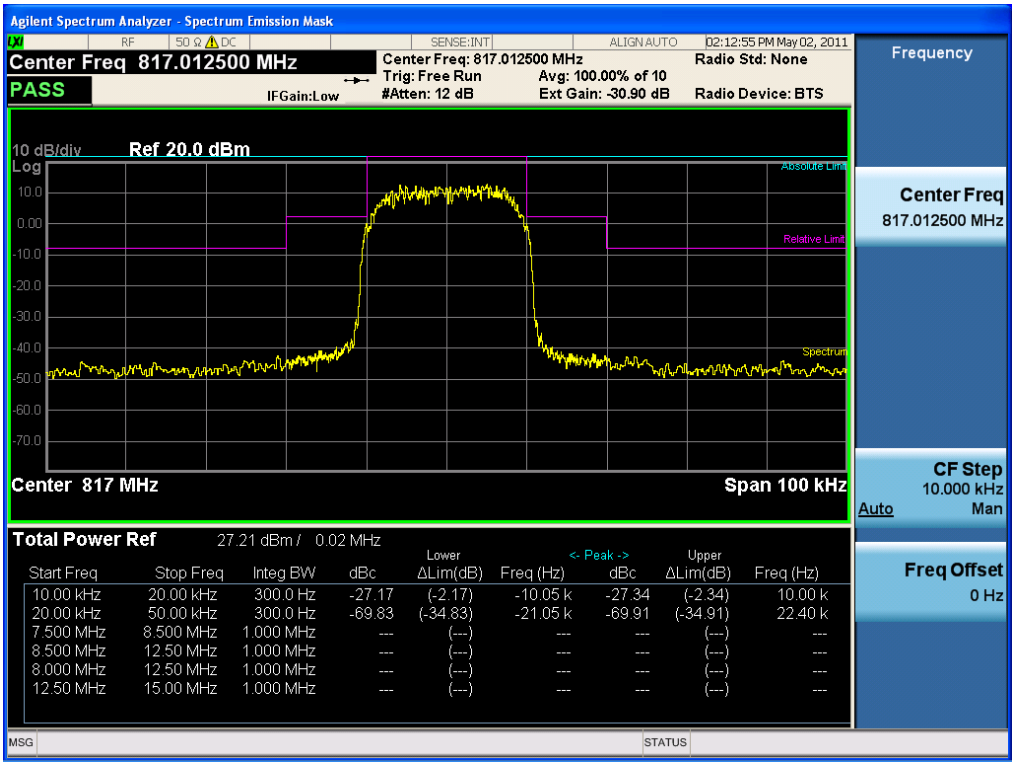
(iDEN900 Downlink Low CH) - 7 MHz



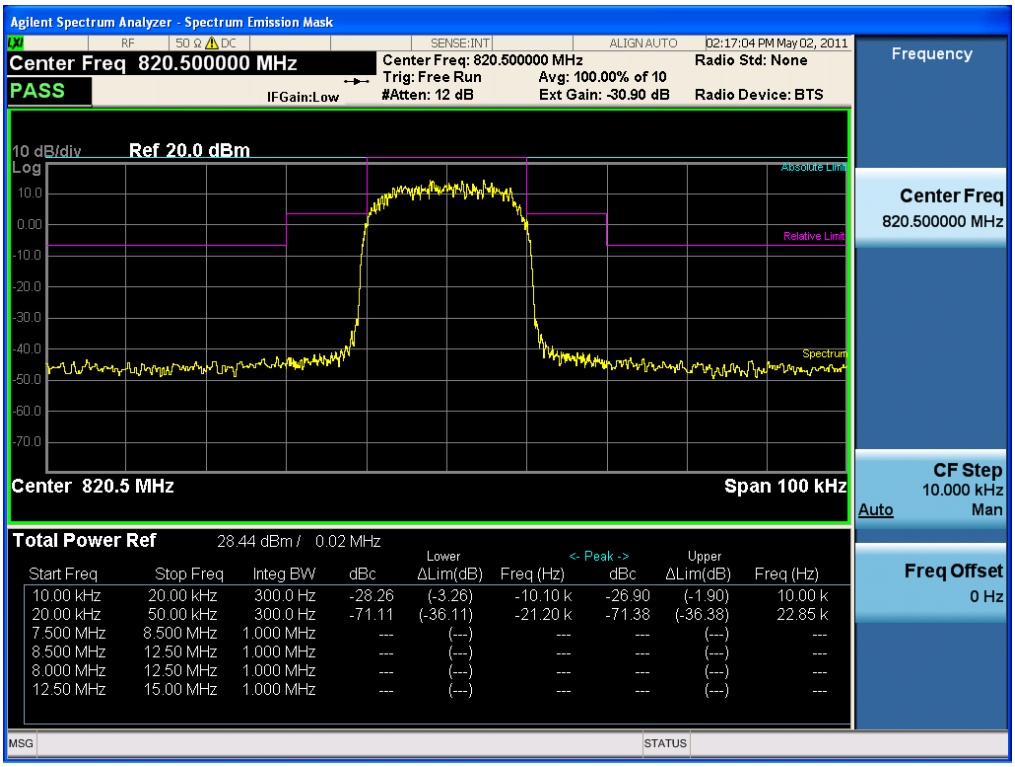
(iDEN900 Downlink Mid CH) - 7 MHz



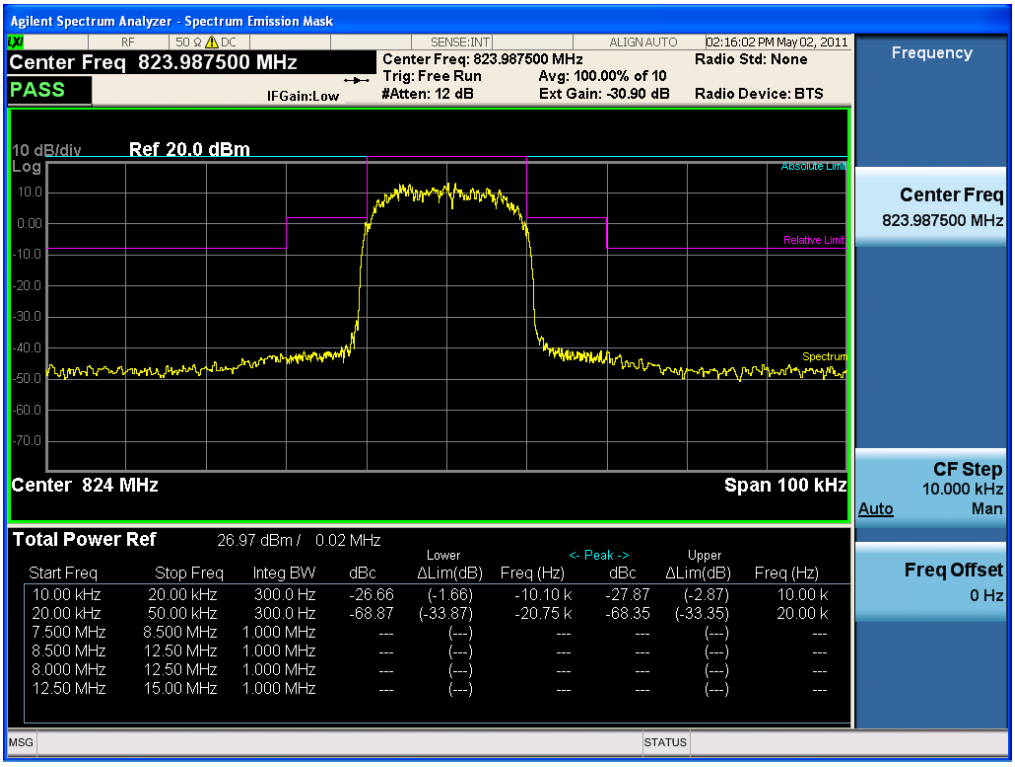
(iDEN900 Downlink High CH) - 7 MHz



(iDEN900 Uplink Low CH) - 7 MHz



(iDEN900 Uplink Mid CH) - 7 MHz



(iDEN900 Uplink High CH) - 7 MHz

8. FIELD STRENGTH OF SPURIOUS RADIATION

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.

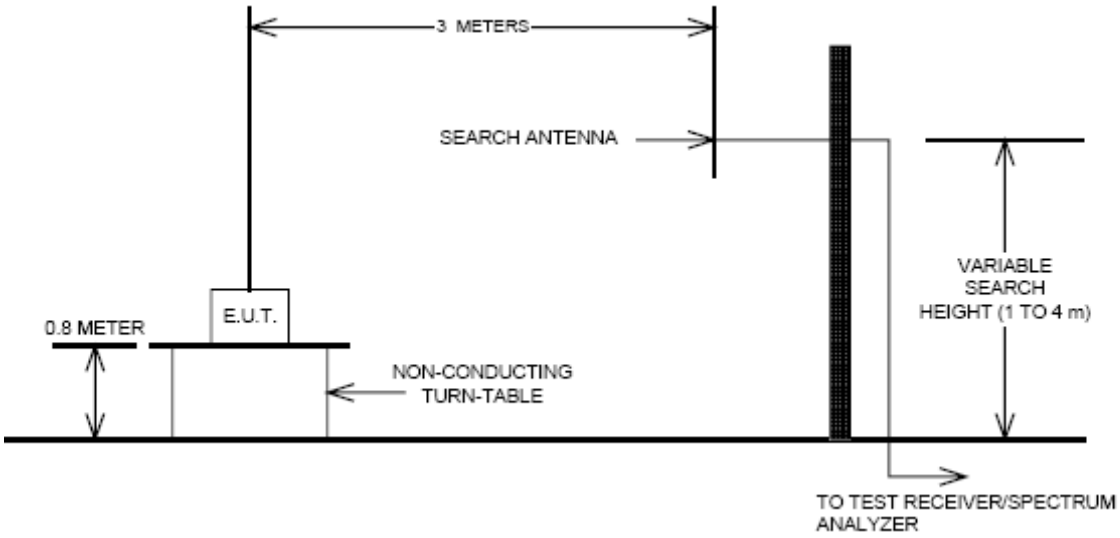
Test Procedures: As required by 47 CFR 2.1053, *field strength of radiated spurious measurements* were made in accordance with the procedures of TIA/EIA-603-A-2001 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards".

Radiated emission measurements were performed inside a 10 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 1-4m 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.

Test Results: There were no emissions detected above the noise floor which was at least 20 dB below the limit.

Radiated Spurious Emissions Test Setup



[iDEN 800]

Mode	Frequency	Freq.(MHz)	Substitute Level [dBm]	Ant. Gain (dBd)	C.L	Pol.	ERP (dBm)	Margin (dB)
DOWN-LINK	860.00	1720.00	-58.50	7.50	2.99	V	-53.99	-40.99
		2580.00	-57.60	8.27	3.51	V	-52.84	-39.84
UPLINK	815.00	1630.00	-58.90	7.07	2.95	V	-54.78	-41.78
		2445.00	-58.10	8.12	3.41	V	-53.39	-40.39

[iDEN 900]

Mode	Frequency	Freq.(MHz)	Substitute Level [dBm]	Ant. Gain (dBd)	C.L	Pol.	ERP (dBm)	Margin (dB)
DOWN-LINK	937.50	1875.00	-58.20	7.90	3.05	V	-53.35	-40.35
		2812.50	-57.90	8.65	3.67	V	-52.92	-39.92
UPLINK	898.50	1797.00	-58.30	7.87	3.02	V	-53.45	-40.45
		2695.50	-57.70	8.64	3.59	V	-52.83	-39.83

9. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

Test Requirement(s):

§2.1055(a)(1) §90.213

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.

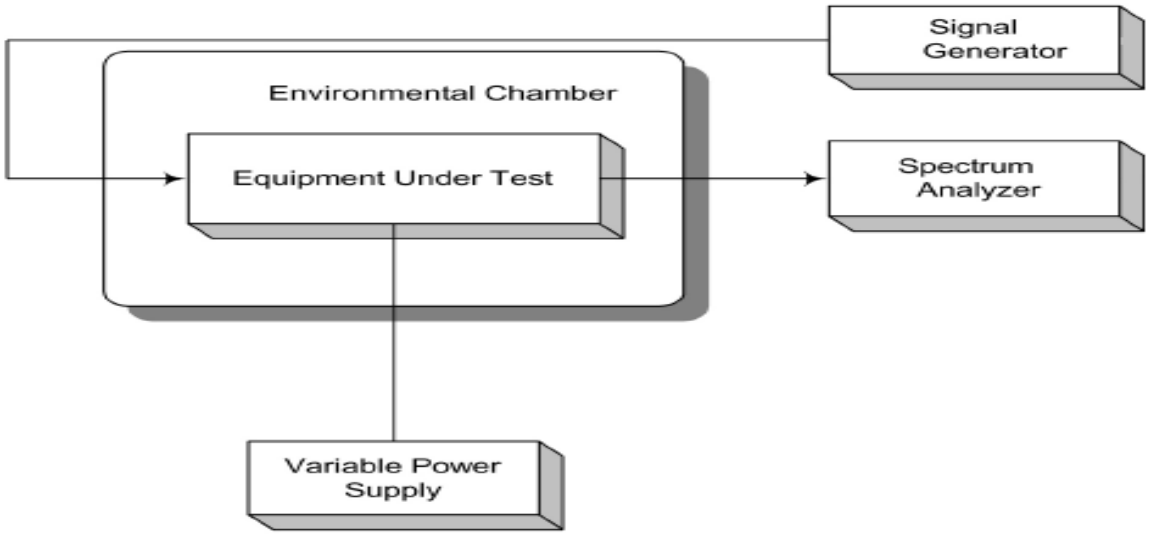
The frequency drift was investigated for every 10 ℃ increment until the unit is stabilized then recorded the reading in tabular format with the temperature range of -30 to 50 ℃.

Voltage supplied to EUT is 120 Vac reference temperature was done at 20℃. The voltage was varied by ± 15 % of nominal

Test Results:

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

Test Setup:



Frequency Stability and Voltage Test Results

Reference: 120 Vac at 20°C **Freq.** = 815.0000 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	815 000 001	1	0	0.0000
	-30	814 999 998	-2	-3	-0.0037
	-20	814 999 996	-4	-5	-0.0061
	-10	815 000 002	2	1	0.0012
	0	814 999 998	-2	-3	-0.0037
	+10	815 000 003	3	2	0.0025
	+30	814 999 999	-1	-2	-0.0025
	+40	814 999 996	-4	-5	-0.0061
	+50	815 000 003	3	2	0.0025
115%	+20	815 000 002	2	1	0.0012
85%	+20	814 999 999	-1	-2	-0.0025

Uplink Mid CH, iDEN 800

Reference: 120 Vac at 20°C **Freq.** = 860.0000 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	859 999 998	-2	0	0.0000
	-30	859 999 999	-1	1	0.0012
	-20	859 999 999	-1	1	0.0012
	-10	859 999 998	-2	0	0.0000
	0	860 000 003	3	5	0.0058
	+10	859 999 998	-2	0	0.0000
	+30	859 999 999	-1	1	0.0012
	+40	859 999 996	-4	-2	-0.0023
	+50	859 999 998	-2	0	0.0000
115%	+20	859 999 999	-1	1	0.0012
85%	+20	860 000 002	2	4	0.0047

Downlink Mid CH, iDEN 800

Reference: 120 Vac at 20°c **Freq.** = 898.500000 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	898 500 002	2	0	0.0000
	-30	898 500 001	1	-1	-0.0011
	-20	898 499 998	-2	-4	-0.0045
	-10	898 499 999	-1	-3	-0.0033
	0	898 499 998	-2	-4	-0.0045
	+10	898 499 999	-1	-3	-0.0033
	+30	898 499 997	-3	-5	-0.0056
	+40	898 500 000	0	-2	-0.0022
	+50	898 499 999	-1	-3	-0.0033
115%	+20	898 500 001	1	-1	-0.0011
85%	+20	898 500 001	1	-1	-0.0011

Uplink Mid CH, iDEN 900

Reference: 120 Vac at 20°C **Freq.** = 937.500000 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	937 500 001	1	0	0.0000
	-30	937 500 000	0	-1	-0.0011
	-20	937 499 998	-2	-3	-0.0032
	-10	937 499 999	-1	-2	-0.0021
	0	937 500 002	2	1	0.0011
	+10	937 500 001	1	0	0.0000
	+30	937 500 003	3	2	0.0021
	+40	937 499 999	-1	-2	-0.0021
	+50	937 500 002	2	1	0.0011
115%	+20	937 499 999	-1	-2	-0.0021
85%	+20	937 500 002	2	1	0.0011

Downlink Mid CH, iDEN 900

10. RF EXPOSURE STATEMENT

1. LIMITS

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
0.3 - 1.34.....	614	1.63	*(100)	30
1.34 - 30.....	824/f	2.19/f	*(180/ f^2)	30
30 - 300.....	27.5	0.073	0.2	30
300 - 1500.....	.....	.....	f/1500	30
1500 - 100.000.....	.....	.....	1.0	30

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

S = Power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

2-1. iDen Downlink (800 MHz)

Max Peak output Power at antenna input terminal	26.970	dBm
Max Peak output Power at antenna input terminal	497.737	mW
Prediction distance	50.000	cm
Prediction frequency	851.0125	MHz
Antenna Gain(typical)	12.000	dBi
Antenna Gain(numeric)	15.849	-
Power density at prediction frequency(S)	0.251	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.567	mW/cm^2

2-2. iDen Uplink (800 MHz)

Max Peak output Power at antenna input terminal	27.000	dBm
Max Peak output Power at antenna input terminal	501.187	mW
Prediction distance	50.000	cm
Prediction frequency	806.0125	MHz
Antenna Gain(typical)	12.000	dBi
Antenna Gain(numeric)	15.849	-
Power density at prediction frequency(S)	0.253	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.537	mW/cm^2

2-3. iDen Downlink (900 MHz)

Max Peak output Power at antenna input terminal	27.020	dBm
Max Peak output Power at antenna input terminal	503.501	mW
Prediction distance	50.000	cm
Prediction frequency	935.0125	MHz
Antenna Gain(typical)	12.000	dBi
Antenna Gain(numeric)	15.849	-
Power density at prediction frequency(S)	0.254	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.623	mW/cm^2

2-4. iDen Uplink (900 MHz)

Max Peak output Power at antenna input terminal	26.850	dBm
Max Peak output Power at antenna input terminal	484.172	mW
Prediction distance	50.000	cm
Prediction frequency	896.0125	MHz
Antenna Gain(typical)	12.000	dBi
Antenna Gain(numeric)	15.849	-
Power density at prediction frequency(S)	0.244	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.597	mW/cm^2

3. RESULTS

The power density level at 50 cm is 0.253 mW/cm²(iDen 800 MHz UpLink), 0.251 mW/cm²(iDen 800 MHz DownLink), 0.244 mW/cm²(iDen 900 MHz UpLink), 0.254 mW/cm²(iDen 900 MHz DownLink), which is below the uncontrolled exposure limit for iDEN band.

Simultaneous MPE at 25 Cm is (0.251/0.567) + (0.254/0.623) = 0.850 < 1 (DownLink),
(0.2536/0.537) + (0.244/0.597) = 0.883 < 1 (UpLink),

Warning: In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, it must also have a minimum distance of 50 cm from the body during normal operation.