



# ***SC4812ET 1X /EVDO @ 800 MHz CDMA BTS***

## **TEST REPORT EXHIBIT**

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**FCC ID: IHET5EG1**

# **Section A**

## **Summary of RF Measurements**

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## Summary of Radiated RF Measurements

*Worst Case Radiated RF Spur Level for SC4812ET EVDO @ 800MHz CDMA BTS*

Radiated RF Measurements					Spec	Result
Channel	Spurious Frequency (MHz)	Antenna Polarity	Measured Radiated Field Strength (dBuV/m)	Measured Radiated Field Strength (dBm) (Note 1)	FCC Part 22/24 MAX LIMIT (dBm)	(Pass/Fail)
1020	1744.44	H	52.14	-43.09	-13	Pass

## Notes:

1. Converting dBuV/M to dBm at 3 meters:  
 $(\text{dBuV/M}) + 9.542 - 104.77 = \text{dBm}$   
Converting dBuV/M to dBm at 10 meters:
2.  $(\text{dBuV/M}) + 20 - 104.77 = \text{dBm}$

11.19.04

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Date

*Francisco Avalos*

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FCC ID: IHET5EG1

## Summary of Radiated RF Measurements

### Worst Case Radiated RF Spur Level for SC4812ET @ 800 MHz

Radiated Data			Substituted Power				Spec	Result
TX Channel	Spurious Frequency (MHz)	Antenna Polarity	Measured Radiated Field Strength (dBuV/M)	Measured Radiated Field Strength (dBm) (Note 1)	TX Antenna Terminal Voltage (dBm) (Note 2)	EDRP (dBm) (Note 3)	FCC Part 24 MAX LIMIT (dBm)	Pass/Fail
777	1786.341	H	46.07	-49.158	-57.72	-52.67	-13	Pass

**Notes:**

1. Converting dBuV/M to dBm at 3 meters  
(dBuV/M) +9.542-104.77dB=dBm  
Converting dBuV/M to dBm at 10 meters  
(dBuV/M) +20 -104.77dB=dBm
2. The same horn antenna and measurement system was used for EUT scan and during substitution method. After maximizing the receive antenna and adjusting signal generator power level to measure the same emission level with the spectrum analyzer as with the EUT. Signal generator output level was recorded for each of the spurious frequencies. Test cable was then disconnected from the transmit horn and was connected to the input of the S/A measuring the voltage at the terminals of the antenna.
3. This value was obtained by converting the Equivalent Isotropic Radiated Power (EIRP) to ideal half-wave dipole reference power - (Equivalent Di-Pole Radiated Power - EDRP) per (TIA-603, 2.2.12.2(i)(m))

Radiated Engineer  
Terry Schwenk

8/13/01

Date



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**Summary of Conducted RF Measurements**  
***SC4812ET EVDO @ 800MHz CDMA BTS***  
**FCC Part 22**

CHANNEL	FREQUENCY (GHz)	SPUR LEVEL MEASURED (dBμV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT (dBm)	PASS / FAIL
770	7.725	71.08	-35.92	-13	Pass

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## Summary of Conducted RF Measurements

**SC4812ET@ 800MHz**

**FCC Part 22**

CHANNEL	FREQUENCY (MHz)	SPUR LEVEL MEASURED (dBμV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT dBm
777	6952.559	83.83	-23.17	-13

Radiated Engineer  
Terry Schwenk

8/13/01

Date



# **Section B**

## **Summary of Modulation Characteristics**

### ***SC4812ET EVDO @ 800MHz CDMA BTS***

CHANNEL	TUNE FREQUENCY (MHz)	RHO Measured	RHO Specifications	PASS / FAIL
1020	869.91	0.99729	> 0.970	Pass
770	893.10	0.99780	> 0.970	Pass

The BTS was configured for maximum power out of 46.00 dBm and minimum power out of 36.5 dBm respectively for EVDO configuration. The output power was set respectively to 40.0 Watts or 4.5 Watts using an HP437B power meter

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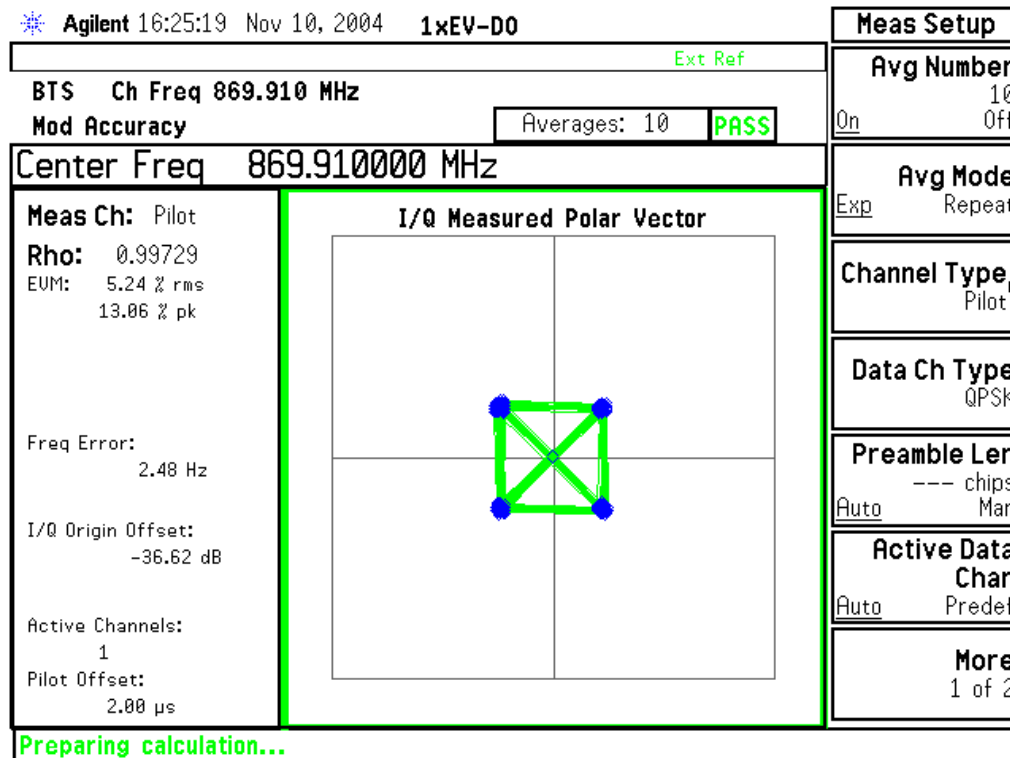
Date

*Francisco Avalos*



## SC4812ET EVDO – Modulation Characteristics

High Power – 46.00 dBm – 8PSK



Channel 1020– 869.91 MHz

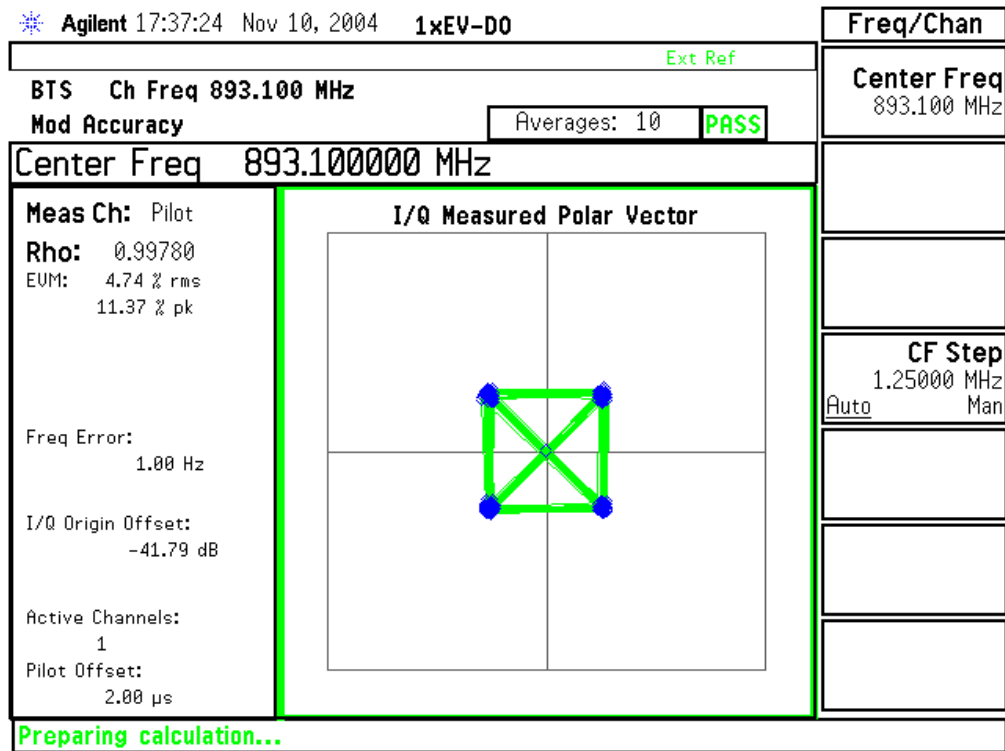




FCC ID: IHET5EG1

## **SC4812ET EVDO – Modulation Characteristics**

High Power – 46.00 dBm – 16QAM

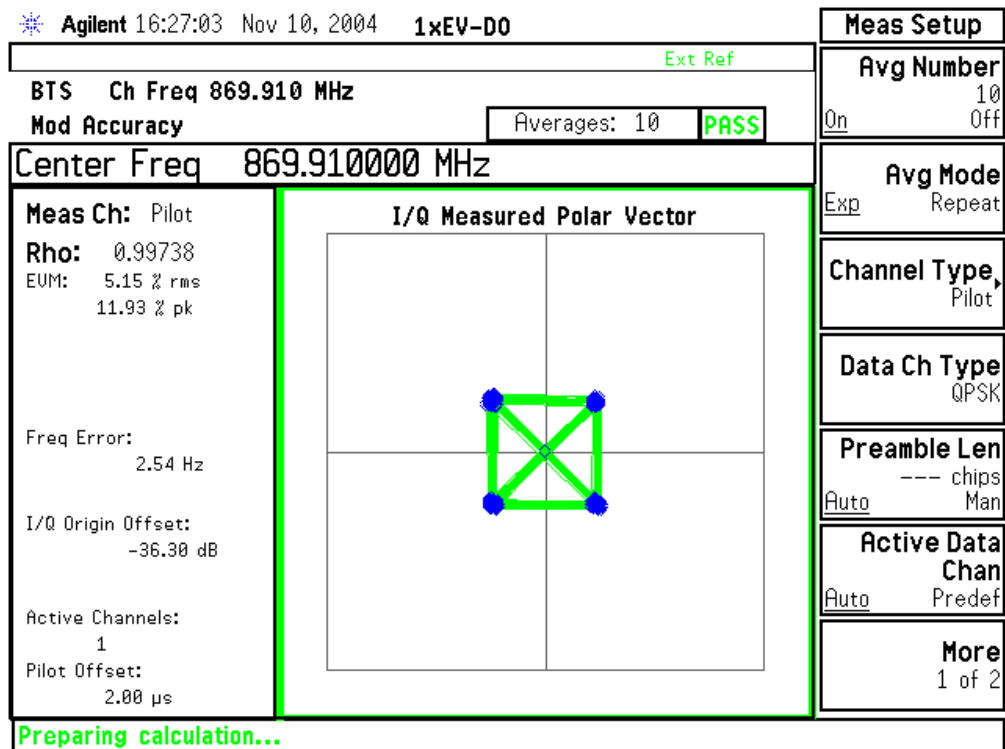


Channel 770 – 893.1 MHz



## SC4812ET EVDO – Modulation Characteristics

Low Power – 36.5 dBm – 8PSK

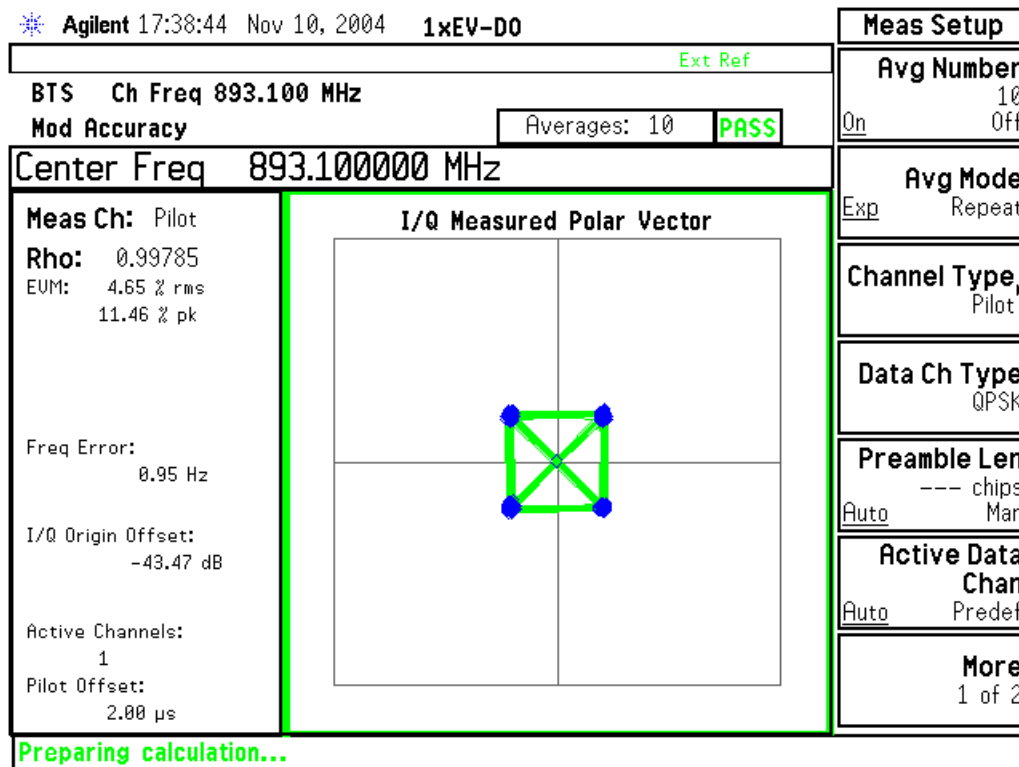


Channel 1020– 869.91 MHz



## SC4812ET EVDO – Modulation Characteristics

Low Power – 36.5 dBm – 16QAM



Channel 770 – 893.1 MHz

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## Summary of Modulation Characteristics

**SC4812ET @800MHz worst cases**

CHANNEL	TUNE FREQUENCY (MHz)	RHO measured	RHO specifications	Pass/Fail
1013	869.70	0.982	>0.912	Pass
777	893.31	0.9825	>0.912	Pass

The BTS was configured for maximum power out of 46.0 dBm and minimum power out of 23.0 dBm respectively. The output power was set respectively to 40.0 Watts or 200 mWatts using an HP437B power meter.

Radiated Engineer  
Terry Schwenk

8/13/01

Date



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# **MODULATION CHARACTERISTICS**

## **Maximum Power**

## CDMA ANALYZER

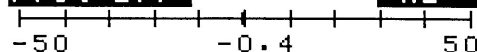
Rho

0.9825

Time Offset us

-0.01

Freq Err Hz

-50 -0.4 50

Carrier Feedthru dB

-34.9

Tune Freq  
893.310000  
MHzInput Atten  
Auto/Hold  
0 dBInput Port  
RF In/AntFind PN  
Auto/ManualPN Offset  
134Even Sec In  
Enable/NotMeas Intvl  
1.25  
msGain  
Auto/Hold  
18 dBAnl Dir  
Fwd/Rev  
Anl Special  
NormalAnalyzer  
Arm Meas  
Single/Cont  
DisarmQual Event  
80 ms  
Trig Event  
80 ms

SC4812ET 800MHz 3G-1X 46dBm

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E6380A Cell Site Test Set: 07/23/01 03:41:00 PM SC4812ET @ 800 MHz

CDMA BTS FRAME

CDMA ANALYZER

Rho

0.9829

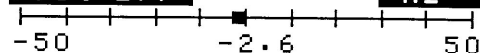
Time Offset

0.13

us

Freq Err

Hz



Carrier Feedthru

dB

-39.7

Tune Freq

869.700000

MHz

Input Atten

Auto/Hold

0 dB

Input Port

RF In/Ant

Find PN

Auto/Manual

PN Offset

122

Even Sec In

Enable/Not

Meas Intvl

1.25

ms

Gain

Auto/Hold

18 dB

Anl Dir

Fwd/Rev

Anl Special

Normal

Analyzer

Arm Meas

Single/Cont

Disarm

Qual Event

80 ms

Tris Event

80 ms

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# **MODULATION CHARACTERISTICS**

## **Minimum Power**



## CDMA ANALYZER

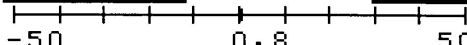
Rho

0.9825

Time Offset us

-0.01

Freq Err Hz

-50 0.8 50

Carrier Feedthru dB

-34.7

Tune Freq  
893.310000  
MHzInput Atten  
Auto/Hold  
0 dBInput Port  
RF In/AntFind PN  
Auto/ManualPN Offset  
134Even Sec In  
Enable/NotMeas Intvl  
1.25  
msGain  
Auto/Hold  
36 dBAnl Dir  
Fwd/Rev  
Anl Special  
NormalAnalyzer  
Arm Meas  
Single/Cont  
DisarmQual Event  
80 ms  
Trie Event  
80 ms

## CDMA ANALYZER

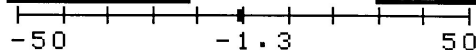
Rho

0.9820

Time Offset us

0.13

Freq Err Hz



Carrier Feedthru dB

-51.8

Tune Freq  
869.700000  
MHzInput Atten  
Auto/Hold  
0 dBInput Port  
RF In/AntFind PN  
Auto/ManualPN Offset  
122Even Sec In  
Enable/NotMeas Intvl  
1.25  
msGain  
Auto/Hold  
36 dBAnl Dir  
Fwd/Rev  
Anl Special  
NormalAnalyzer  
Arm Meas  
Single/Cont  
DisarmQual Event  
80 ms  
Tris Event  
80 ms



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# **Section C**

## **Spurious and Harmonic Emissions Radiated**

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# Radiated RF Measurements

*Worst Case Radiated RF Spur Levels for SC4812ET EVDO @ 800MHz CDMA BTS*

<i>Radiated RF Measurements</i>					<i>Spec</i>	<i>Result</i>
<i>Channel</i>	<i>Spurious Frequency (MHz)</i>	<i>Antenna Polarity</i>	<i>Measured Radiated Field Strength (dBuV/m)</i>	<i>Measured Radiated Field Strength (dBm) (Note 1)</i>	<i>FCC Part 22/24 MAX LIMIT (dBm)</i>	<i>(Pass/Fail)</i>
1020	1744.44	H	52.14	-43.09	-13	Pass
770	5611.11	V	50.45	-44.78	-13	Pass

Notes:

1. Converting dBuV/M to dBm at 3 meters:  
 $(\text{dBuV/M}) + 9.542 - 104.77 = \text{dBm}$   
 Converting dBuV/M to dBm at 10 meters:  
 $(\text{dBuV/M}) + 20 - 104.77 = \text{dBm}$

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APPLICANT: MOTOROLA

FCC ID: IHET5EG1

## Conducted RF Measurements

SC4812ET EVDO @ 800 MHz CDMA BTS  
FCC Part 22

CHANNEL	FREQUENCY (GHz)	SPUR LEVEL MEASURED (dBμV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT (dBm)	PASS / FAIL
770	7.725	71.08	-35.92	-13	Pass
1020	7.680	70.85	-36.15	-13	Pass

**FCC Maximum Limit Per 47 CFR:**

- “ = Transmitted Power  $(10 \log_{10}(P_{\text{watt}})) - (43 + 10 \log_{10}(P_{\text{watt}}))$  dBW
- “ =  $10 \log_{10}(P_{\text{watt}}) - (43 + 10 \log_{10}(P_{\text{watt}}))$  dBW
- “ = -43 dBW
- “ = -13 dBm

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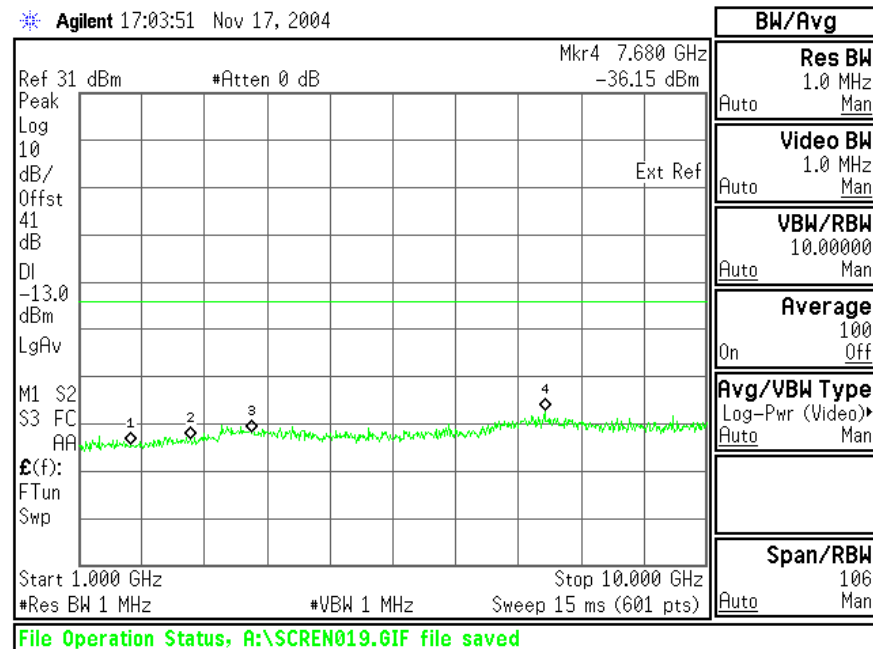
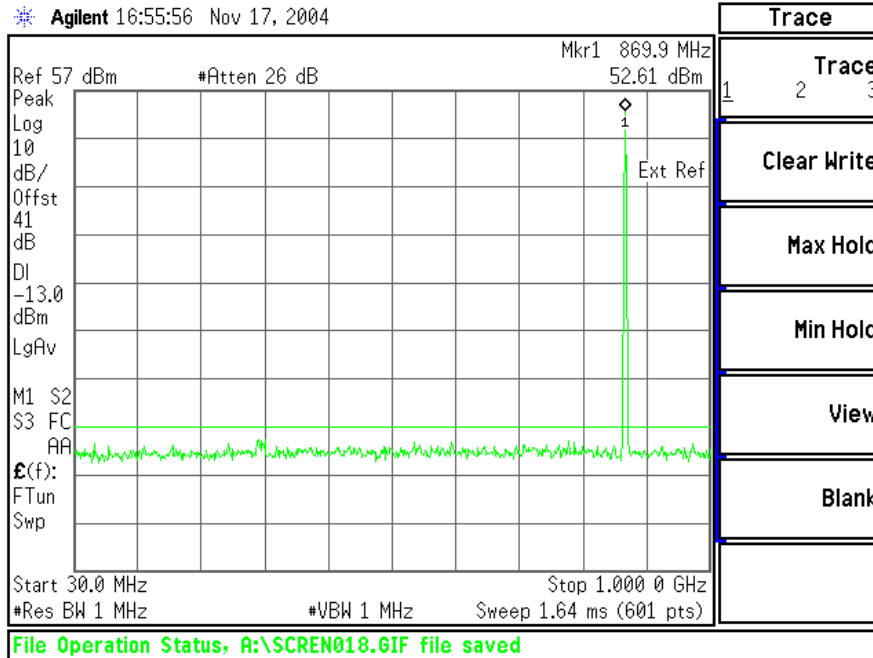
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**Spurious and Harmonic Emissions Conducted**  
**CDMA EVDO Channel 1020 – 46.00 dBm – 8PSK**



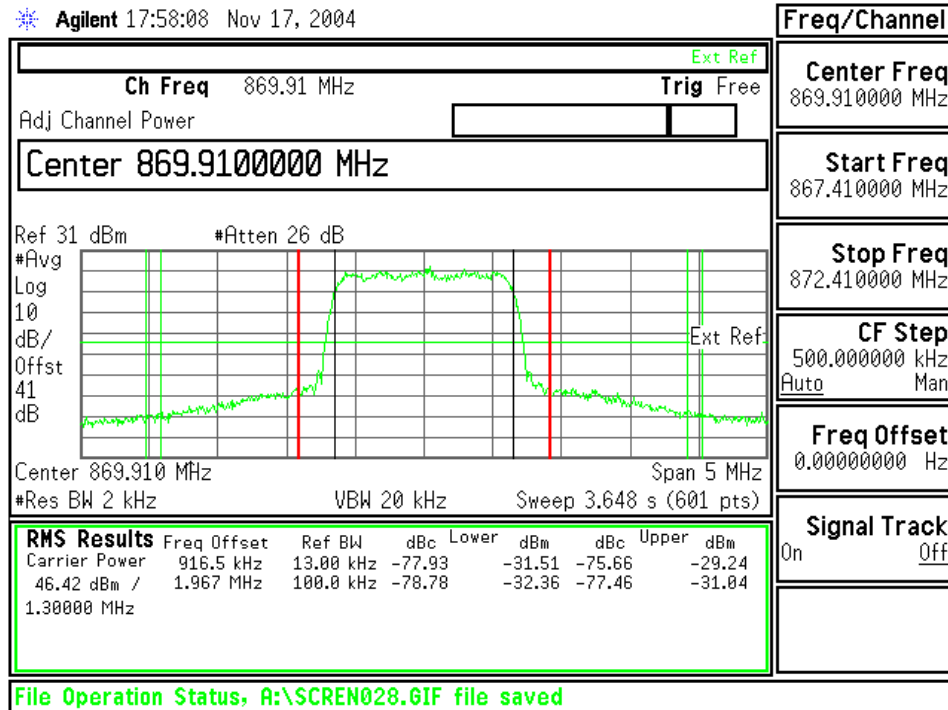


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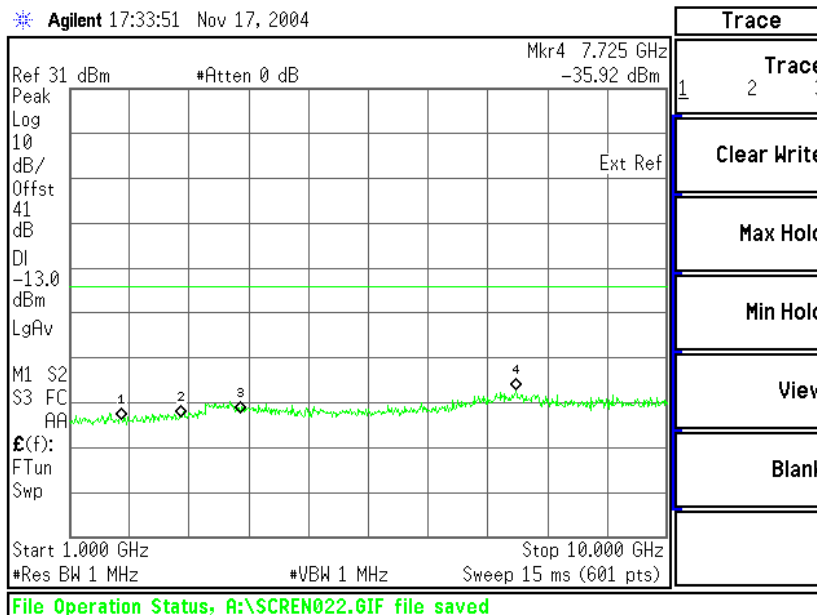
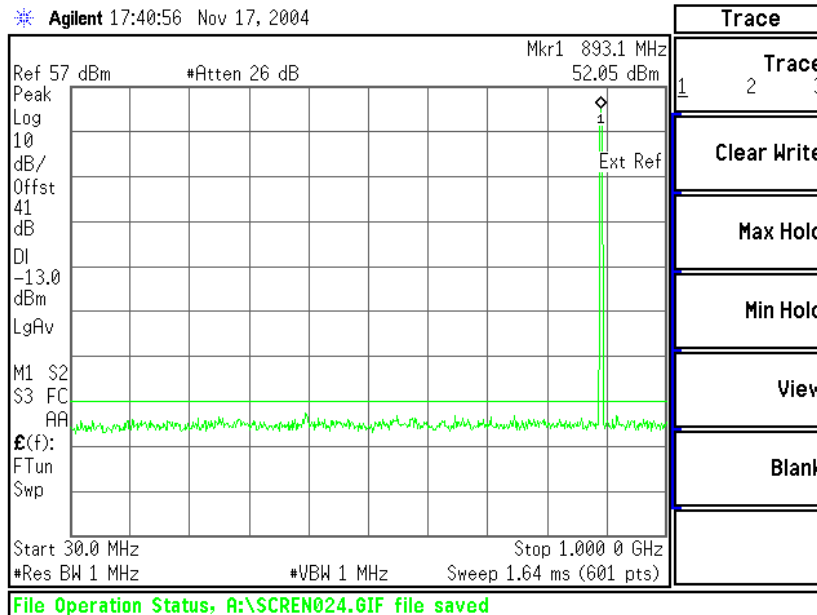
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## Spurious and Harmonic Emissions Conducted

### CDMA EVDO Channel 770 – 46.00 dBm – 16QAM







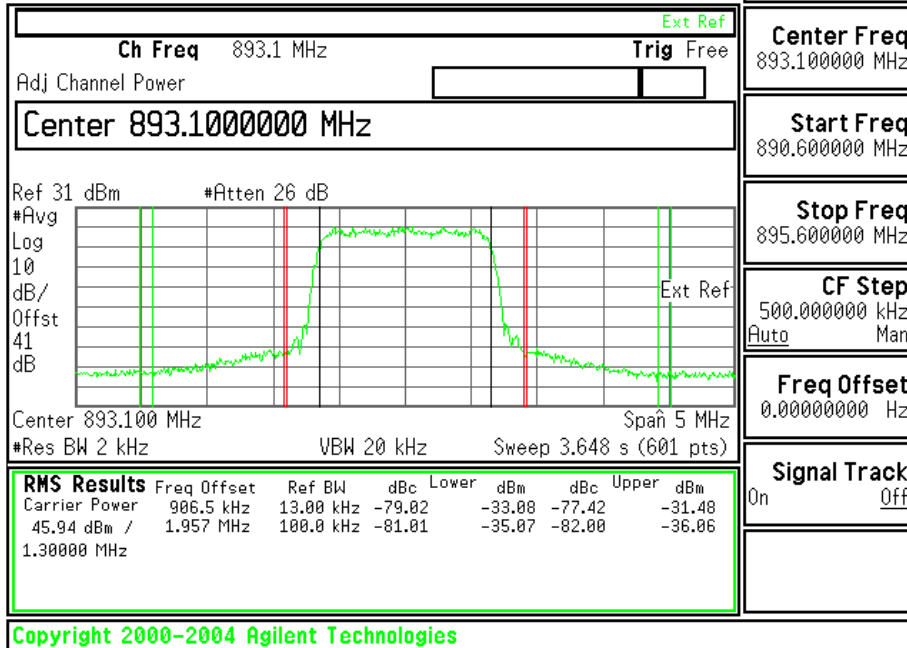
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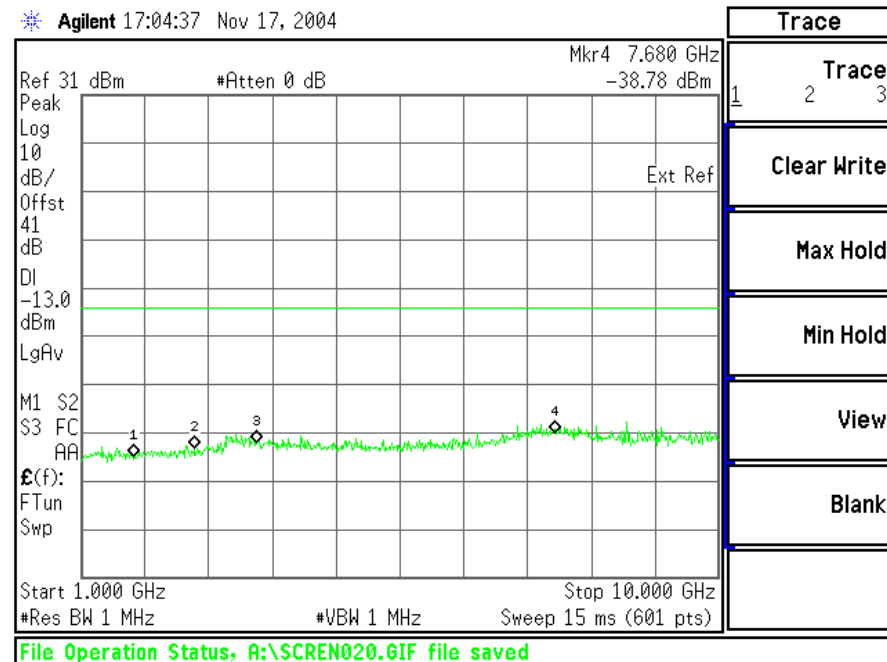
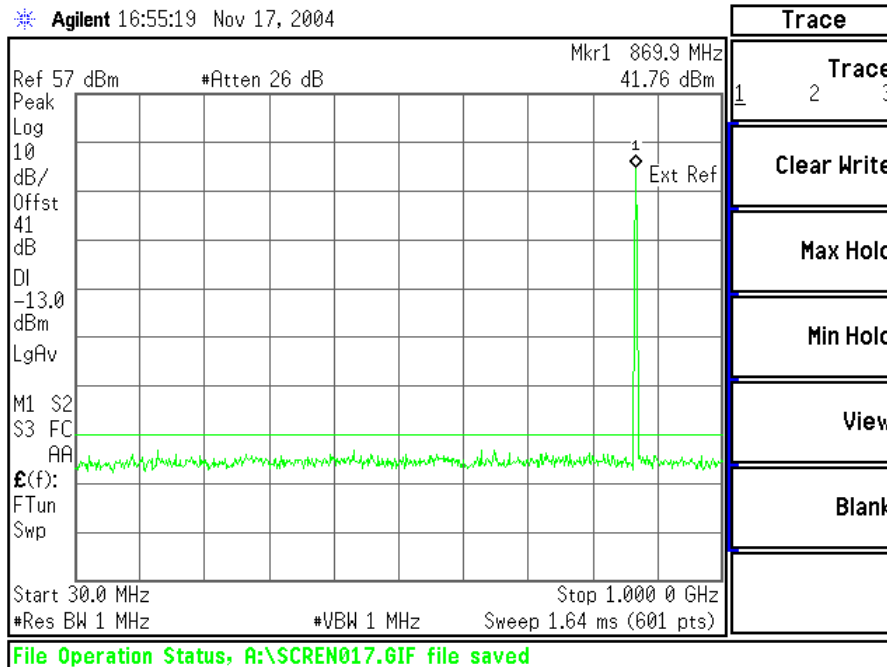
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Agilent 10:48:26 Nov 22, 2004





**Spurious and Harmonic Emissions Conducted**  
**CDMA EVDO Channel 1020 – 36.5 dBm – 8PSK**



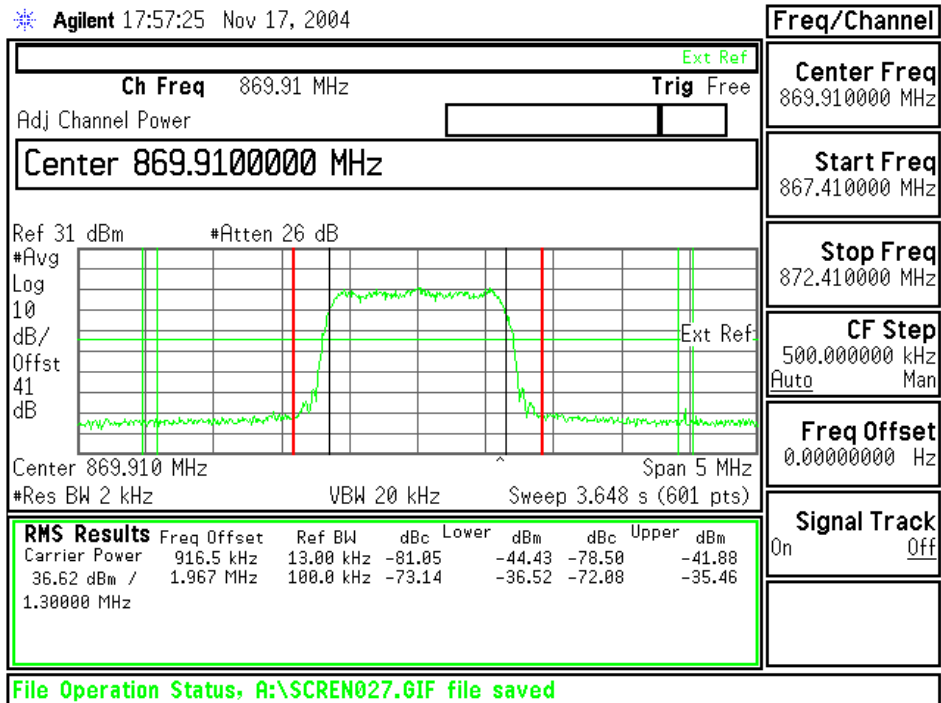


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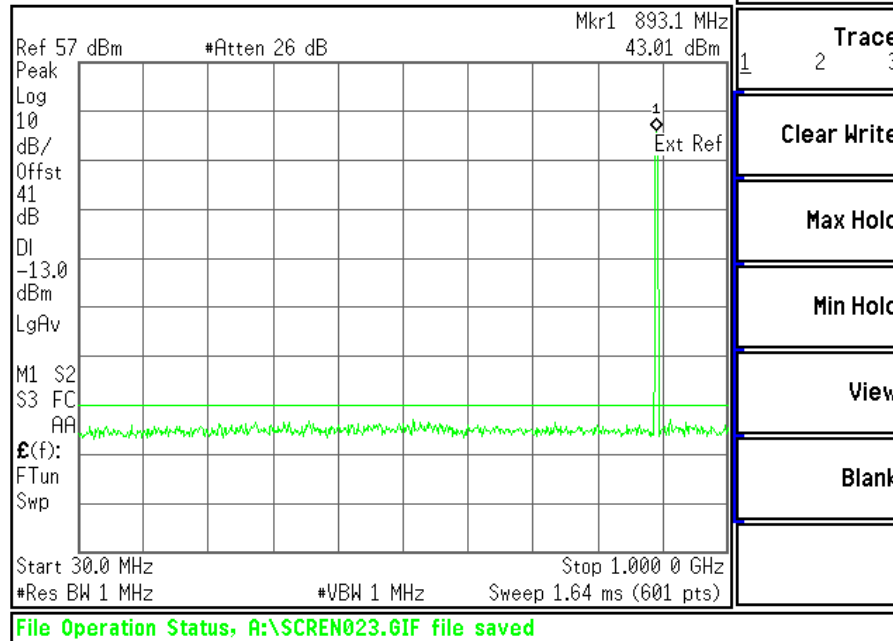
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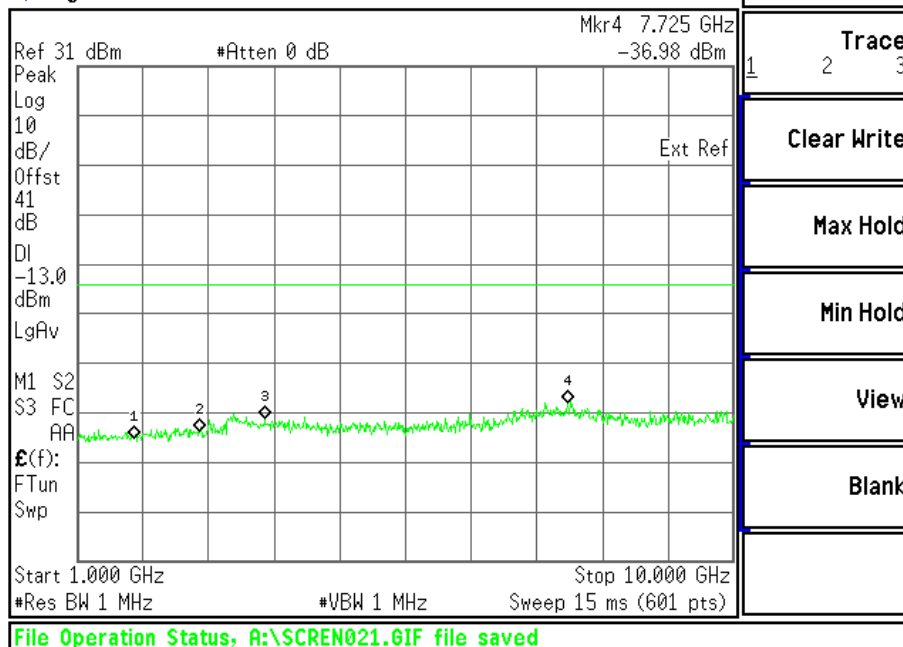


**Spurious and Harmonic Emissions Conducted**  
**CDMA EVDO Channel 770 – 36.5 dBm – 16QAM**

Agilent 17:39:40 Nov 17, 2004



Agilent 17:31:51 Nov 17, 2004





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FCC ID: IHET5EG

