SC4812T 1X / 1X-EVDO @ 1.9 GHz CDMA BTS

TEST REPORT EXHIBIT

Index

Section A

Summary of RF Measurements

Summary of Radiated RF Measurements

Worst Case Radiated RF Spur Level for SC4812T 1X-EVDO @ 1.9GHz 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)***
1175	3978.979	H	56.76	-38.47	-13	Pass

Worst Case Radiated RF Spur Level for SC4812T 1X @ 1.9GHz 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)***
1175	3977.5000	H	75.71	-19.52	-13	Pass

Notes:

1. Converting dBuV/M to dBm at 3 meters:
   (dBuV/M) + 9.542 – 104.77 = dBm
   Converting dBuV/M to dBm at 10 meters:
2. (dBuV/M) + 20 – 104.77 = dBm

Francisco J Avalos 04.12.04

Signature Date

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Summary of Conducted RF Measurements

SC4812T 1X-EVDO @ 1.9GHz CDMA BTS

FCC Part 24

CHANNEL	FREQUENCY (MHz)	SPUR LEVEL MEASURED (dBµV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT (dBm)	PASS / FAIL
1175	13781.556	87.76	-19.24	-13	Pass

SC4812T 1X @ 1.9GHz CDMA BTS

CHANNEL	FREQUENCY (MHz)	SPUR LEVEL MEASURED (dBµV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT (dBm)	PASS / FAIL
25	13772.108	89.26	-17.74	-13	Pass

Francisco J Avalos 04.12.04

Signature Date

Francisco Avalos

Section B

Summary of Modulation Characteristics

SC4812T 1X-EVDO @ 1.9 GHz CDMA BTS

CHANNEL	TUNE FREQUENCY (MHz)	RHO Measured	RHO Specifications	PASS / FAIL
25	1931.25	0.99834	> 0.970	Pass
1175	1988.75	0.99833	> 0.970	Pass

SC4812T 1X @ 1.9 GHz CDMA BTS

CHANNEL	TUNE FREQUENCY (MHz)	RHO Measured	RHO Specifications	PASS / FAIL
25	1931.25	0.9962	> 0.912	Pass
1175	1988.75	0.9957	> 0.912	Pass

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

04.12.04

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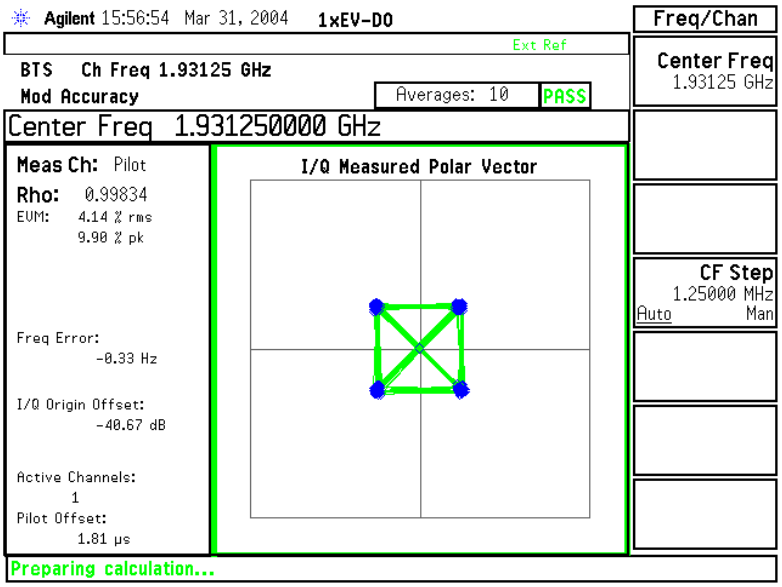
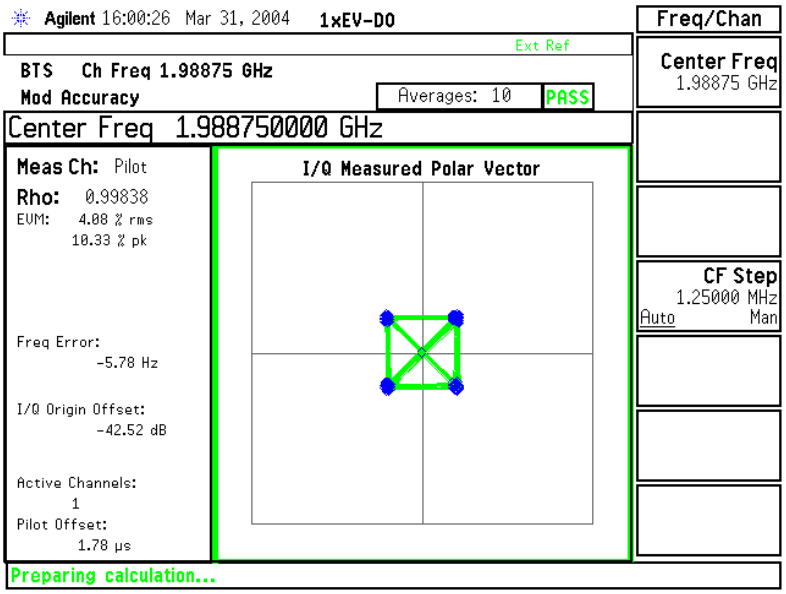
SC4812T 1X-EVDO – Modulation Characteristics

High Power – 46.00 dBm – 8PSK



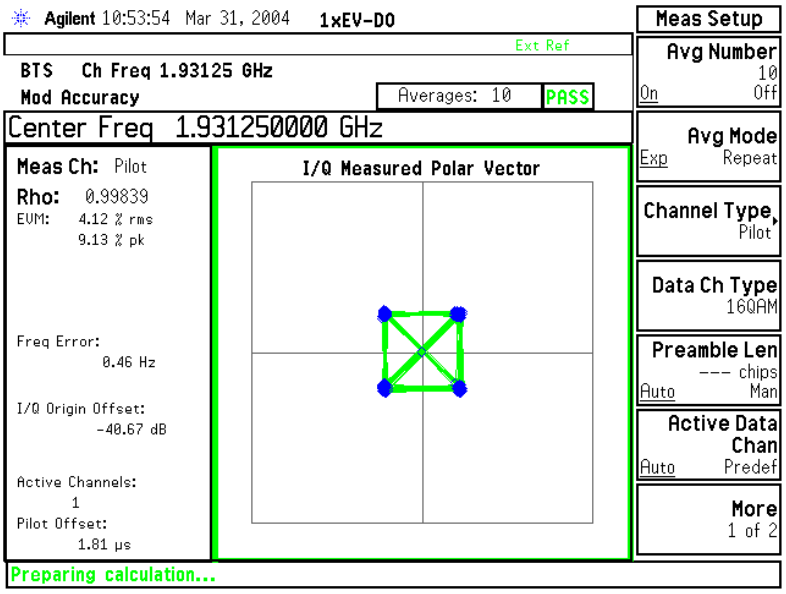
Channel 25 – 1931.25 MHz



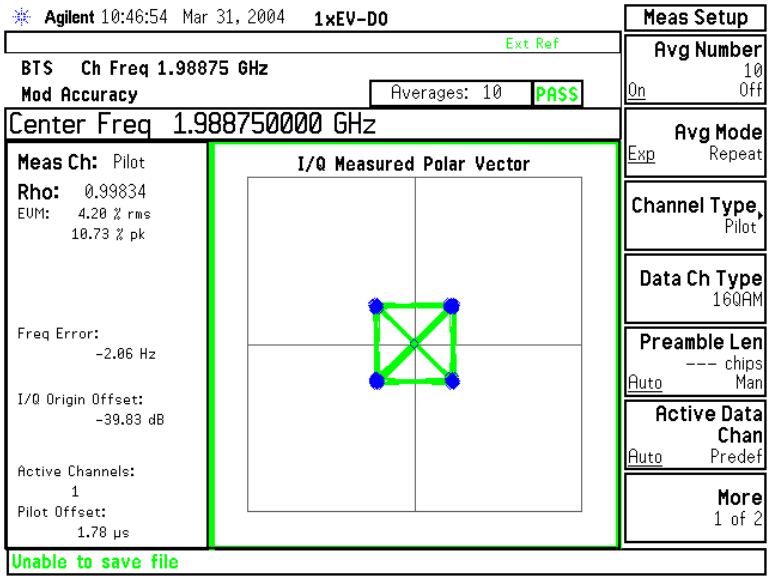
Channel 1175 – 1988.75 MHz

SC4812T 1X-EVDO – Modulation Characteristics

High Power – 46.00 dBm – 16QAM



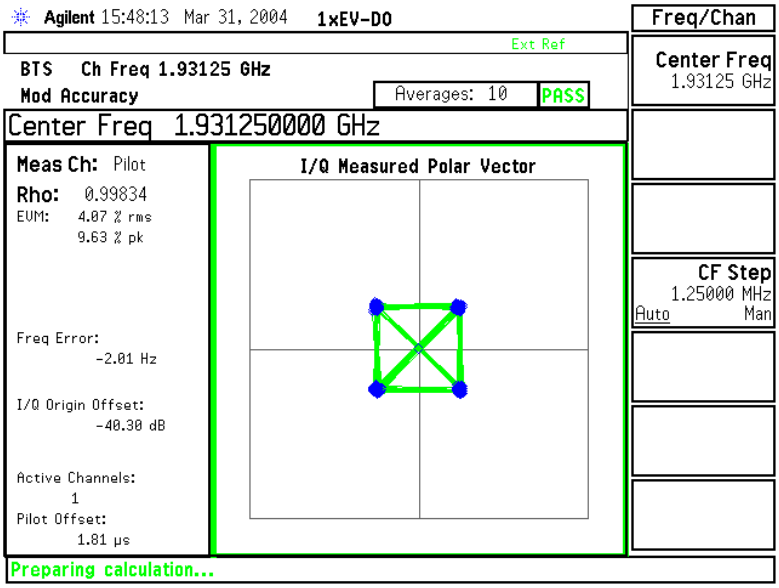
Channel 25 – 1931.25 MHz



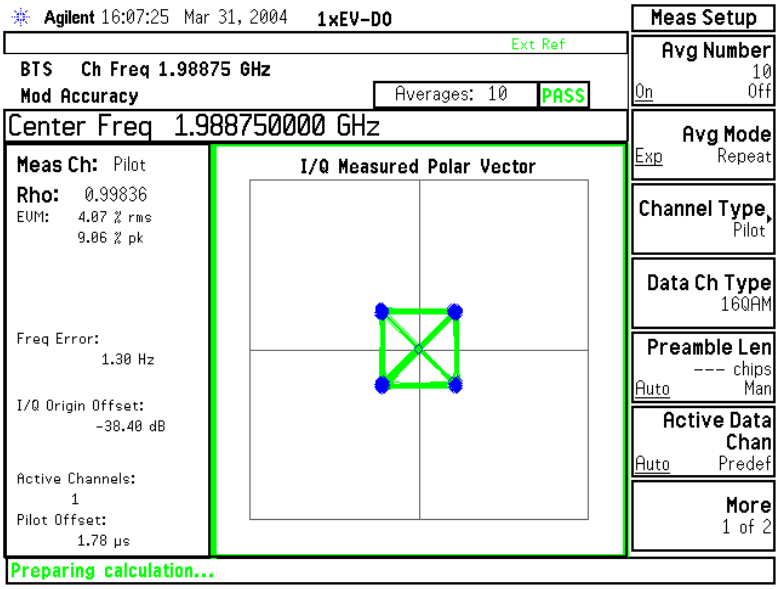
Channel 1175 – 1988.75 MHz

SC4812T 1X-EVDO – Modulation Characteristics

Low Power – 36.5 dBm – 8PSK



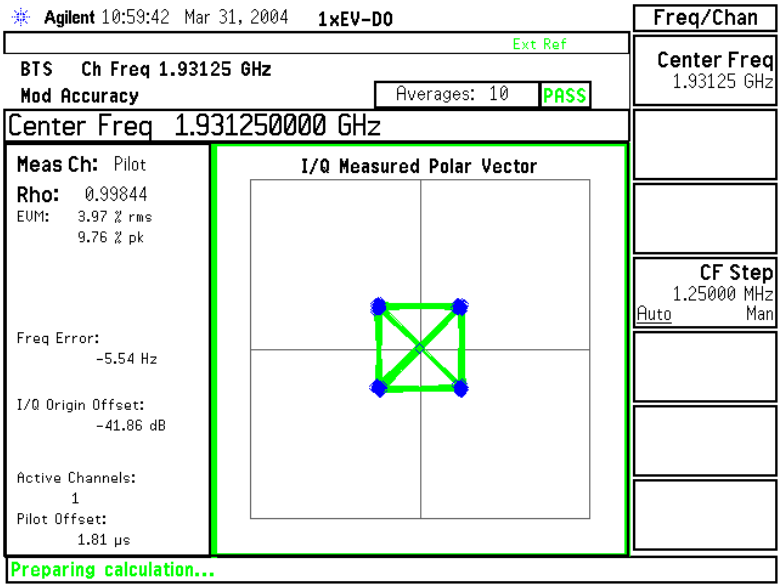
Channel 25 – 1931.25 MHz



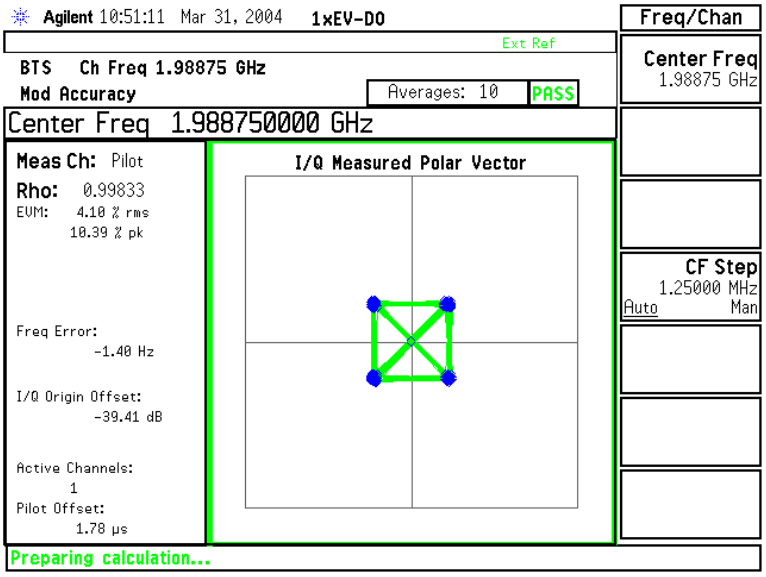
Channel 1175 – 1988.75 MHz

SC4812T 1X-EVDO – Modulation Characteristics

Low Power – 36.5 dBm – 16QAM



Channel 25 – 1931.25 MHz



Channel 1175 – 1988.75 MHz

SC4812T 1X – Modulation Characteristics

High Power – 46.00 dBm

Channel 25 – 1931.25 MHz

Channel 1175 – 1988.75 MHz

SC4812T 1X – Modulation Characteristics

Low Power – 26.0 dBm

Channel 25 – 1931.25 MHz

Channel 1175 – 1988.75 MHz

Section C

Spurious and Harmonic Emissions Radiated

Radiated RF Measurements

Worst Case Radiated RF Spur Levels for SC4812T 1X-EVDO @ 1.9 GHz 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)***
25	3864.8650	H	51.27	-43.96	-13	Pass
1175	3978.979	H	56.76	-38.47	-13	Pass

Worst Case Radiated RF Spur Levels for SC4812T 1X @ 1.9 GHz 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)***
25	3862.5053	H	75.05	-20.17	-13	Pass
1175	3977.5000	H	75.71	-19.52	-13	Pass

Notes:

1. Converting dBuV/M to dBm at 3 meters:
   (dBuV/M) + 9.542 – 104.77 = dBm
   Converting dBuV/M to dBm at 10 meters:
   (dBuV/M) + 20 – 104.77 = dBm

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04.12.04

Signature Date

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Section C

Spurious and Harmonic Emissions Conducted

Conducted RF Measurements

SC4812T 1X-EVDO @ 1.9 GHz CDMA BTS
FCC Part 24

CHANNEL	FREQUENCY (MHz)	SPUR LEVEL MEASURED (dBµV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT (dBm)	PASS / FAIL
25	13903.980	87.34	-19.66	-13	Pass
1175	13781.556	87.76	-19.24	-13	Pass

SC4812T 1X @ 1.9 GHz CDMA BTS
FCC Part 24

CHANNEL	FREQUENCY (MHz)	SPUR LEVEL MEASURED (dBµV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT (dBm)	PASS / FAIL
25	13772.108	89.26	-17.74	-13	Pass

FCC Maximum Limit Per 47 CFR:

" = Transmitted Power (10 $\text{Log}_{10}(P_{watt})$) – (43 + 10 $\text{Log}_{10}(P_{watt})$) dBW
" = 10 $\text{Log}_{10}(P_{watt})$ - (43 + 10 $\text{Log}_{10}(P_{watt})$) dBW
" = -43 dBW
" = -13 dBm

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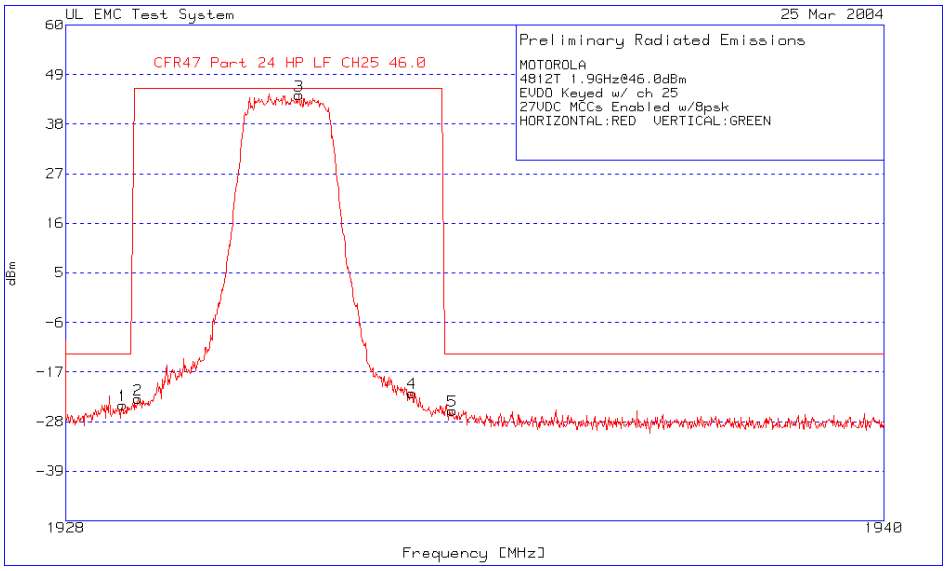
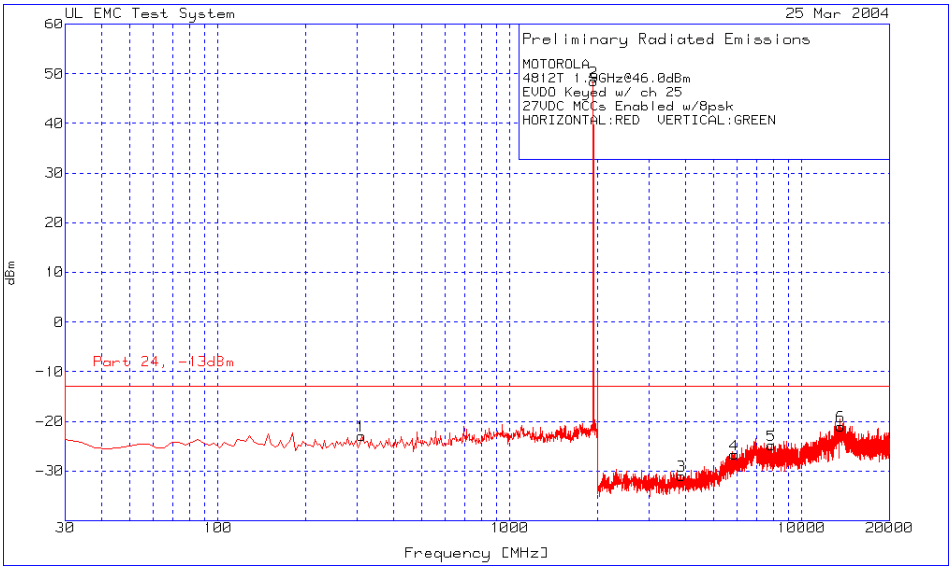
Spurious and Harmonic Emissions Conducted

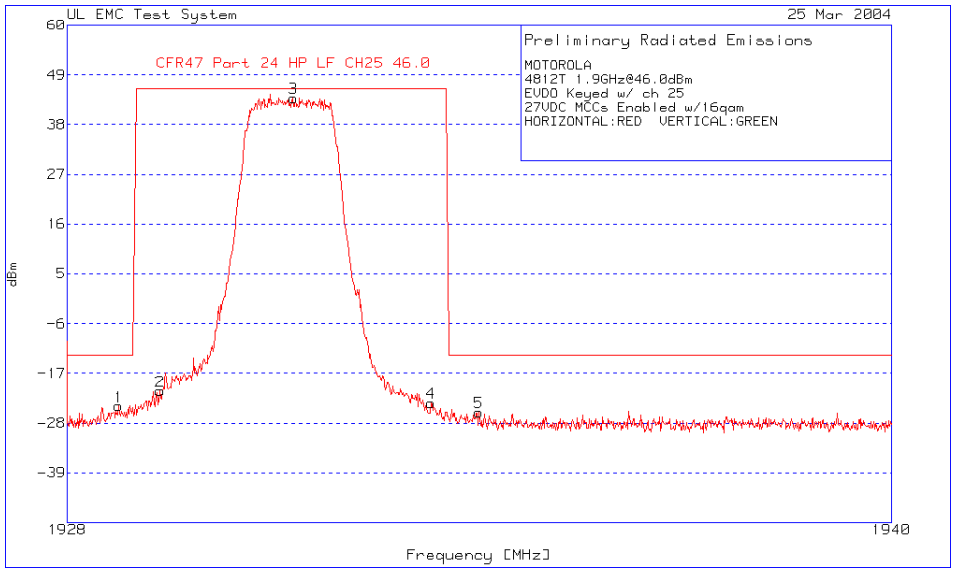
CDMA Channel 25 – 46.00 dBm – 8PSK

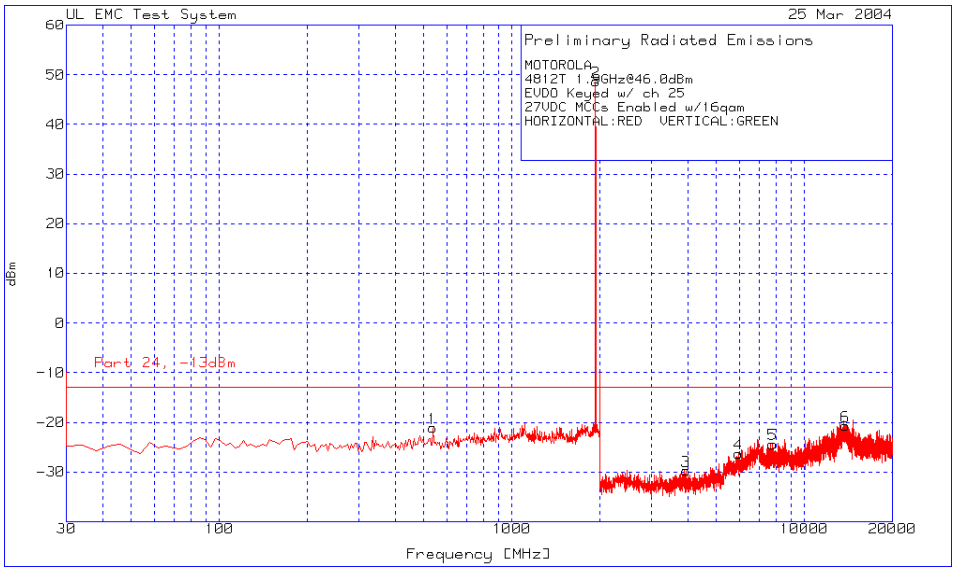




Spurious and Harmonic Emissions Conducted

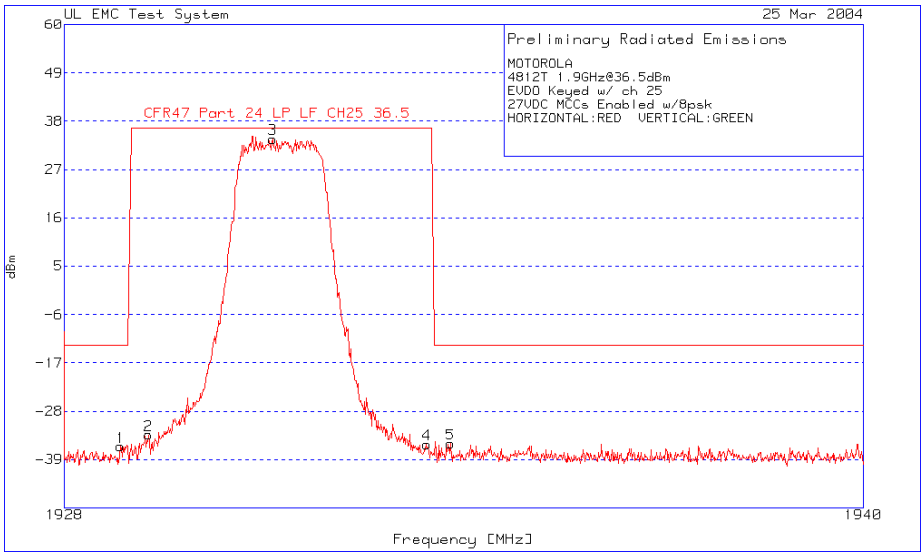
CDMA Channel 25 – 46.00 dBm – 16QAM

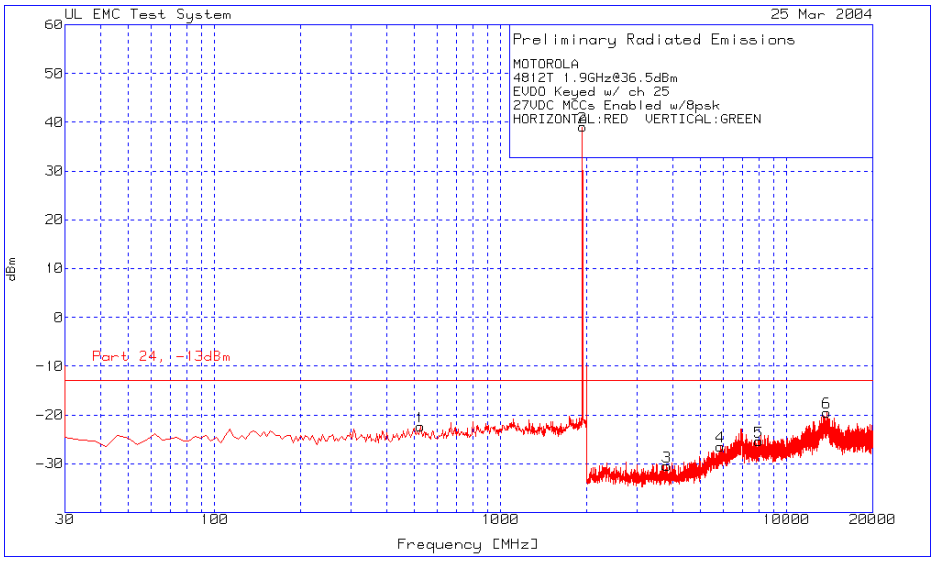




Spurious and Harmonic Emissions Conducted

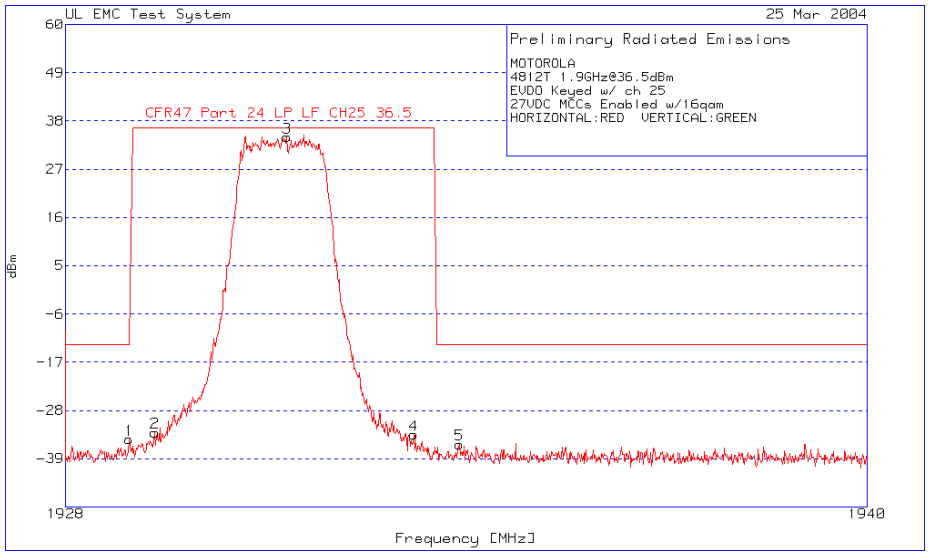
CDMA Channel 25 – 36.5 dBm – 8PSK

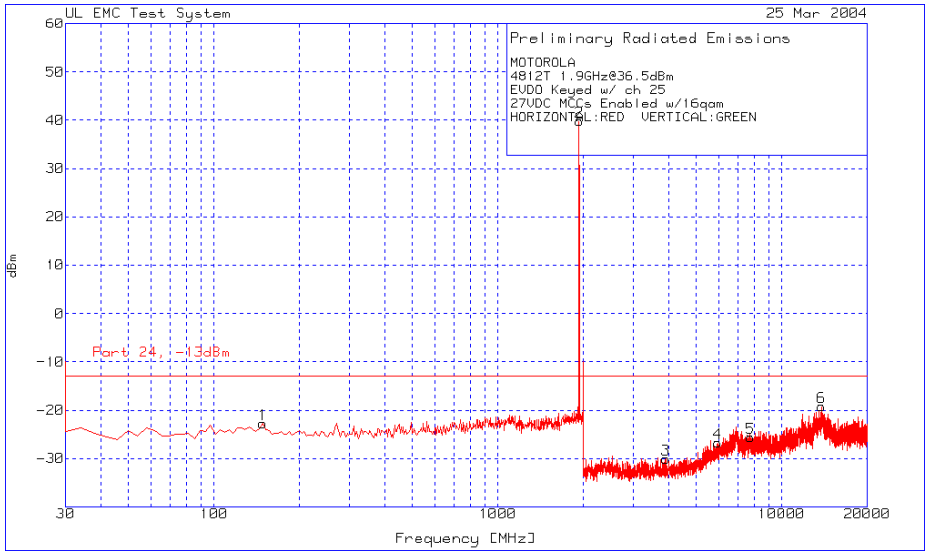




Spurious and Harmonic Emissions Conducted

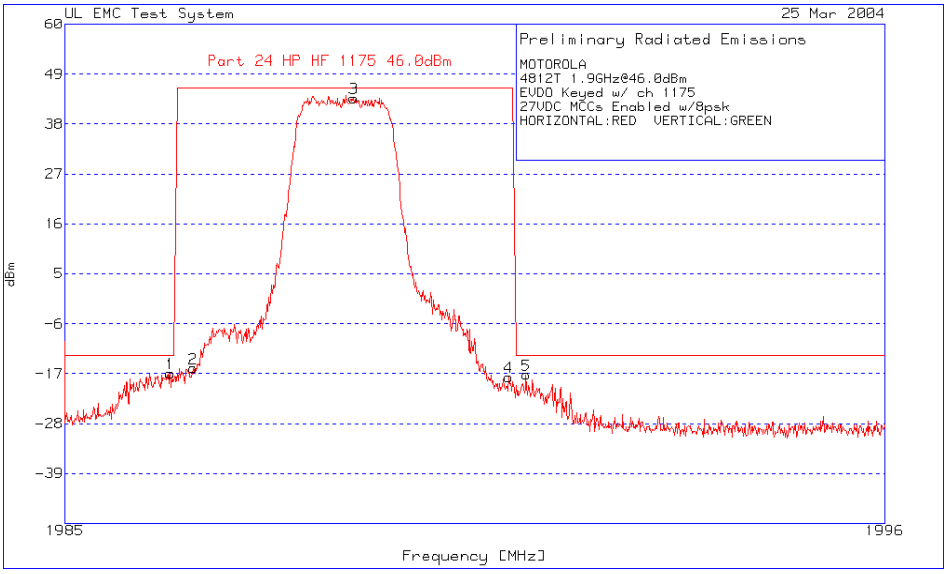
CDMA Channel 25 – 36.5 dBm – 16QAM

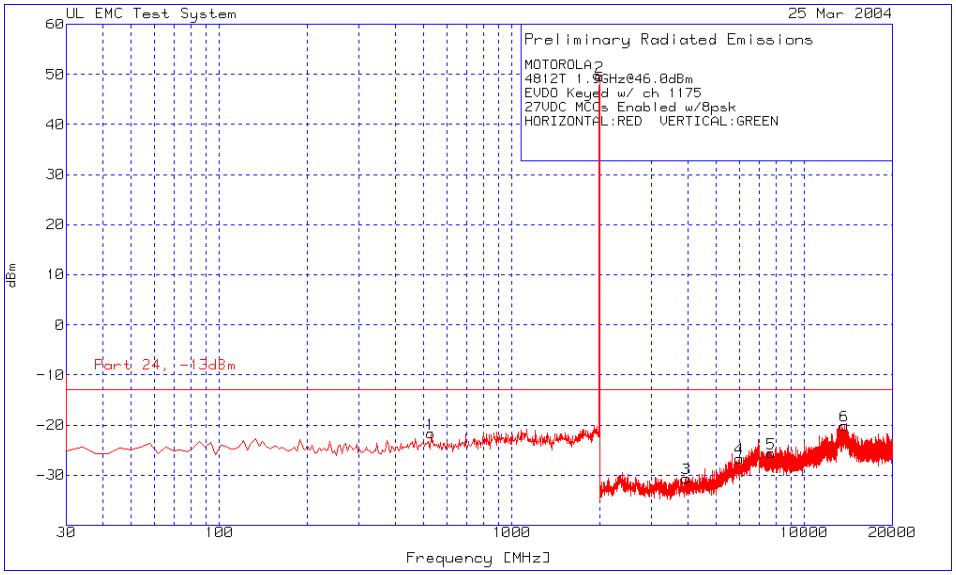




Spurious and Harmonic Emissions Conducted

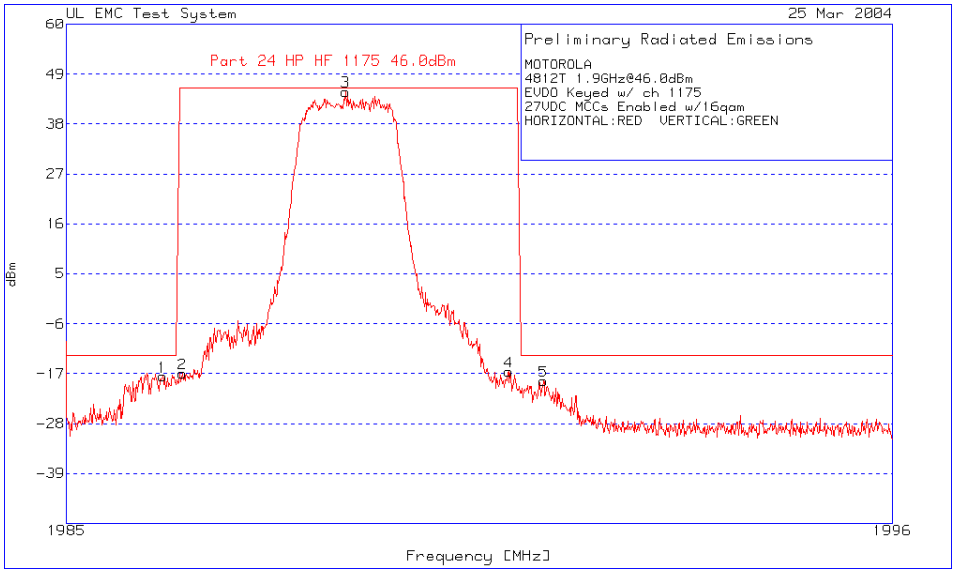
CDMA Channel 1175 – 46.00 dBm – 8PSK

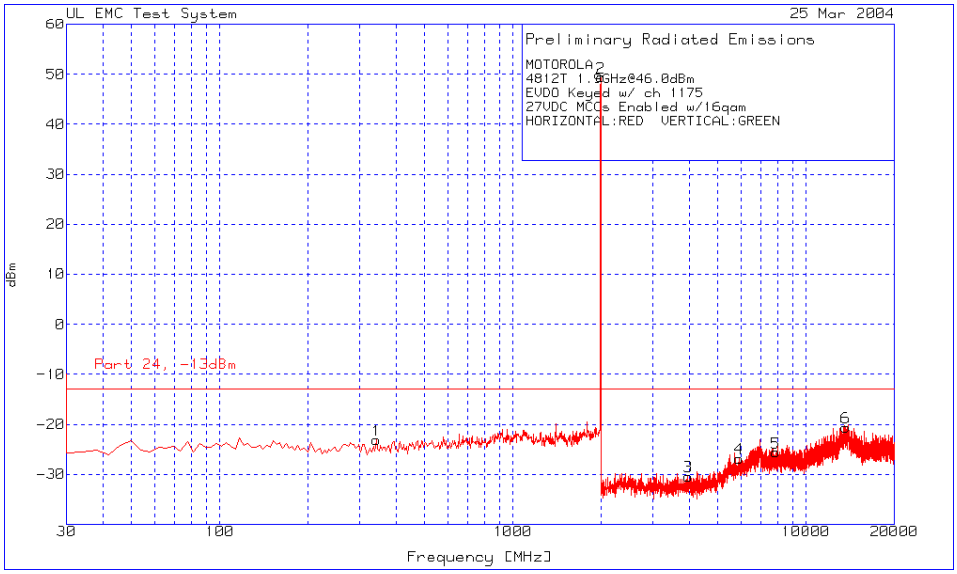




Spurious and Harmonic Emissions Conducted

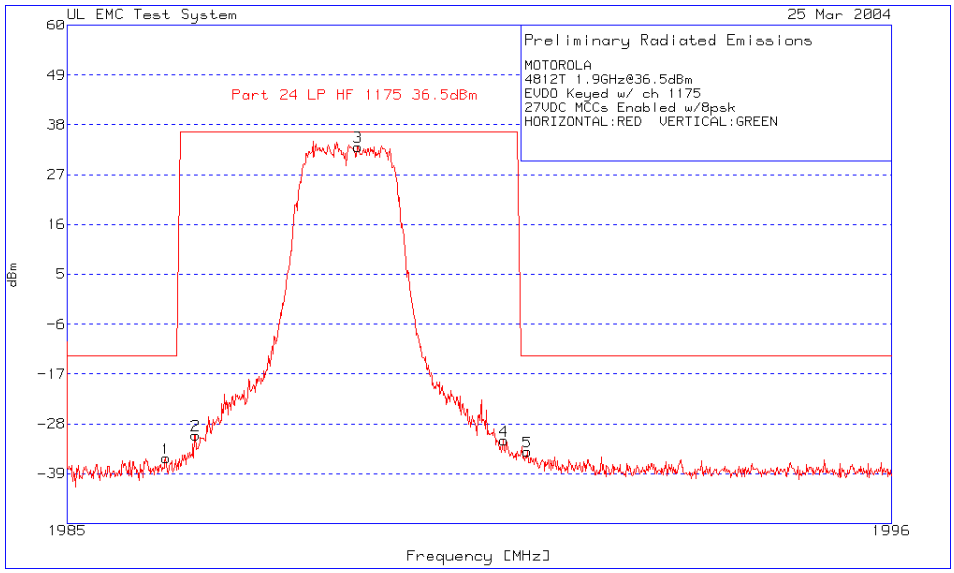
CDMA Channel 1175 – 46.00 dBm – 16QAM

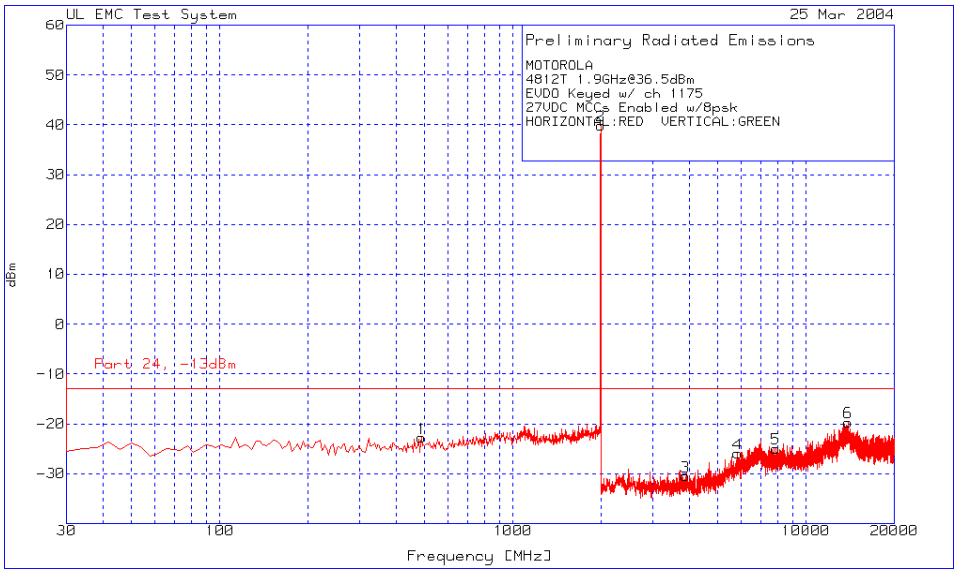




Spurious and Harmonic Emissions Conducted

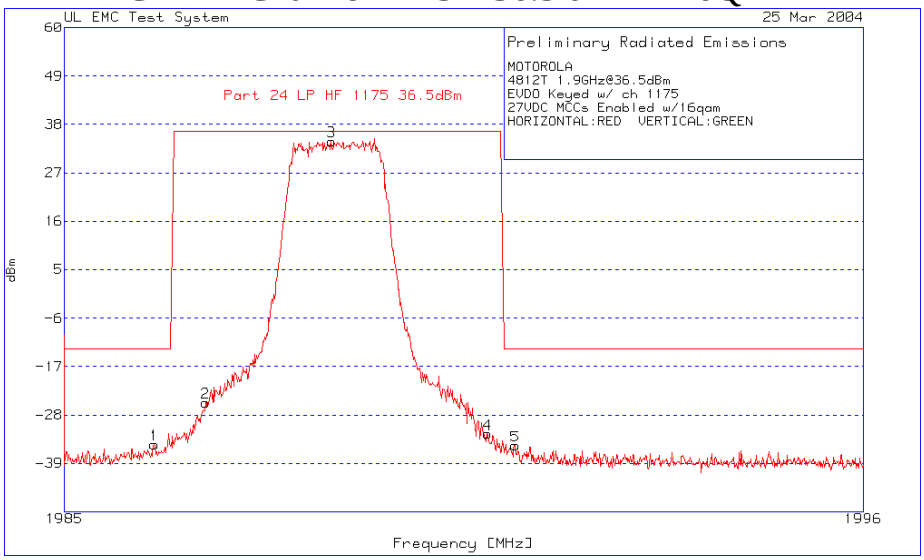
CDMA Channel 1175 – 36.5 dBm – 8PSK

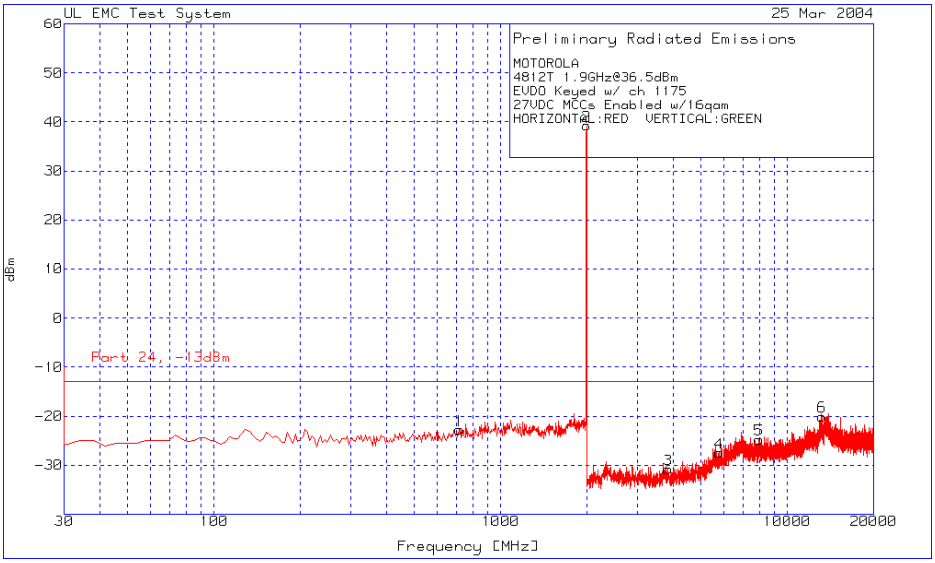




Spurious and Harmonic Emissions Conducted

CDMA Channel 1175 – 36.5 dBm – 16QAM





SECTION E
OCCUPIED BANDWIDTH

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

The following formula is used to obtain the correct power reference point from which the OBW of the CDMA signal is obtained. See example calculation below:

Power (measured in 30 kHz bandwidth) + 10 log (1.30 MHz / 30 kHz)

Example: 29.63 dBm + 16.37 dB = 46.00 dBm

The occupied bandwidth is measured in a 30 kHz resolution bandwidth. The summary is listed below.

SC4812T 1X-EVDO @ 1.9GHz SUMMARY OF OCCUPIED BANDWIDTH

CHANNEL	Power Level (dBm)	FREQUENCY (MHz)	MEASURED (MHz)	FCC LIMIT (MHz)	Pass / Fail
25	46.00	1931.25	1.2763	1.30	Pass
1175	36.5	1988.75	1.2758	1.30	Pass

04.12.04

Signature Date

Francisco Avalos

NOTE: Per FCC acceptance precedent, plots are measured in a 30kHz resolution bandwidth. The following formula is used to obtain the correct power reference point from which the OBW of the CDMA signal is obtained. See example calculation below:

Power (measured in 30 kHz bandwidth) + 10 log (1.30 MHz / 30 kHz)

Example: 29.63 dBm + 16.37 dB = 46.00 dBm

The BTS was configured for maximum power out of 46.0 dBm and minimum power out of 36.5 dBm respectively. The max and min output power was set to 40.0 Watts or 4.5 Watts respectively using an HP437B power meter. Markers are measured at +/- 1.25 MHz with respect to the method stated above.

The summary is listed below.

SC4812T 1X @ 1.9GHz SUMMARY OF OCCUPIED BANDWIDTH

CHANNEL/POWER	FREQUENCY (MHz)	MEASURED (dBm)	FCC EMISSION LIMIT	Pass / Fail
25/MAX	1931.25	-26.57	-9.2dBm	Pass
1175/MAX	1931.25	-29.88	-9.2dBm	Pass
25/MIN	1931.25	-51.38	-9.2dBm	Pass
1175/MIN	1988.75	-50.44	-9.2dBm	Pass

08.22.01

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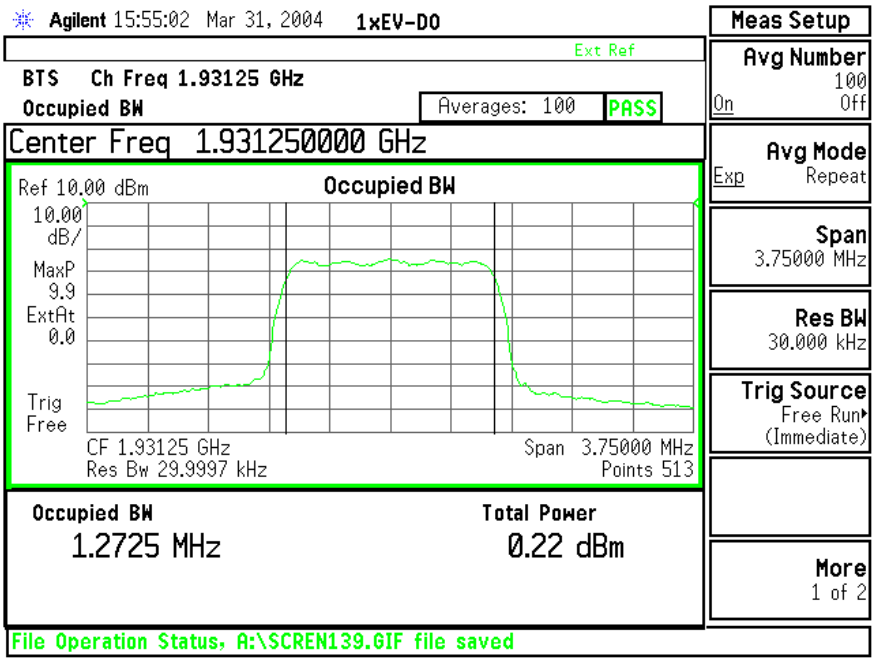
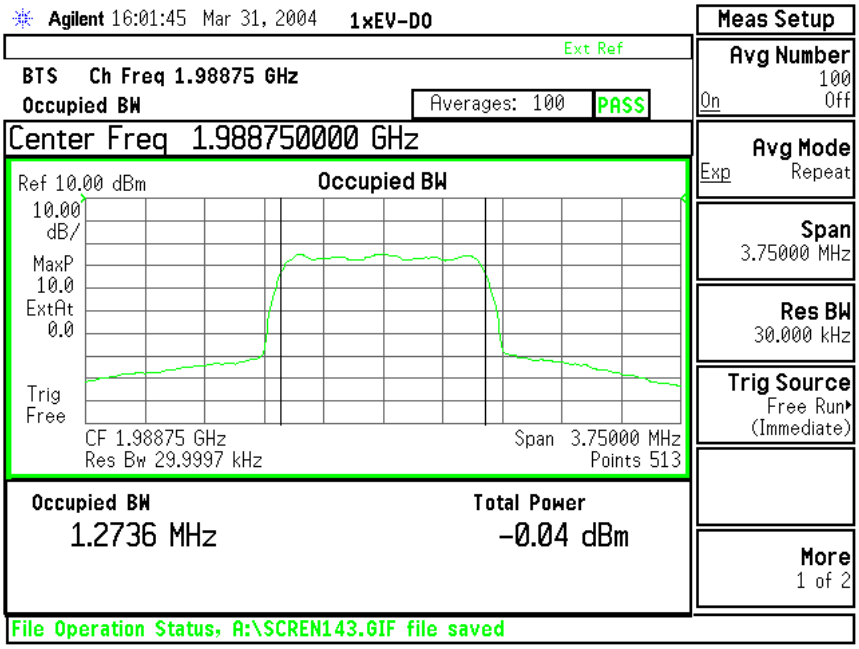
SC4812T 1X-EVDO – Occupied Bandwidth – 46.00 dBm – 8PSK

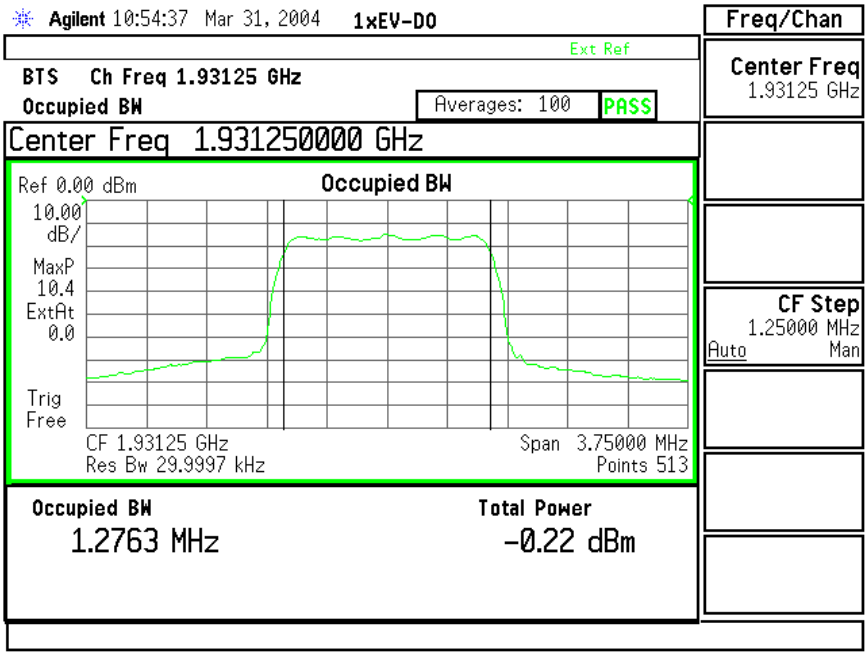


Channel 25 – 1931.25 MHz

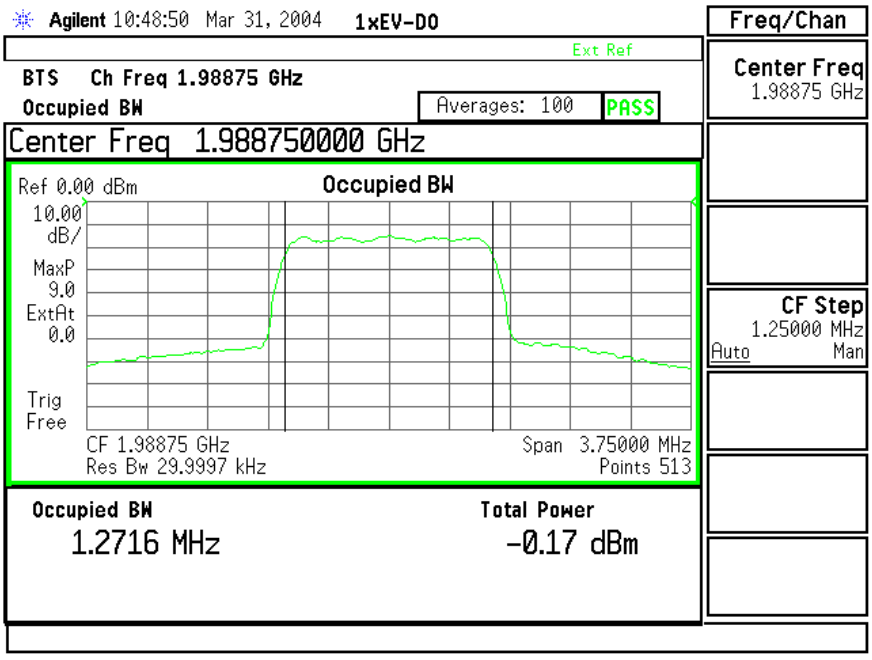


Channel 1175 – 1988.75 MHz

SC4812T 1X-EVDO – Occupied Bandwidth – 46.00 dBm – 16QAM

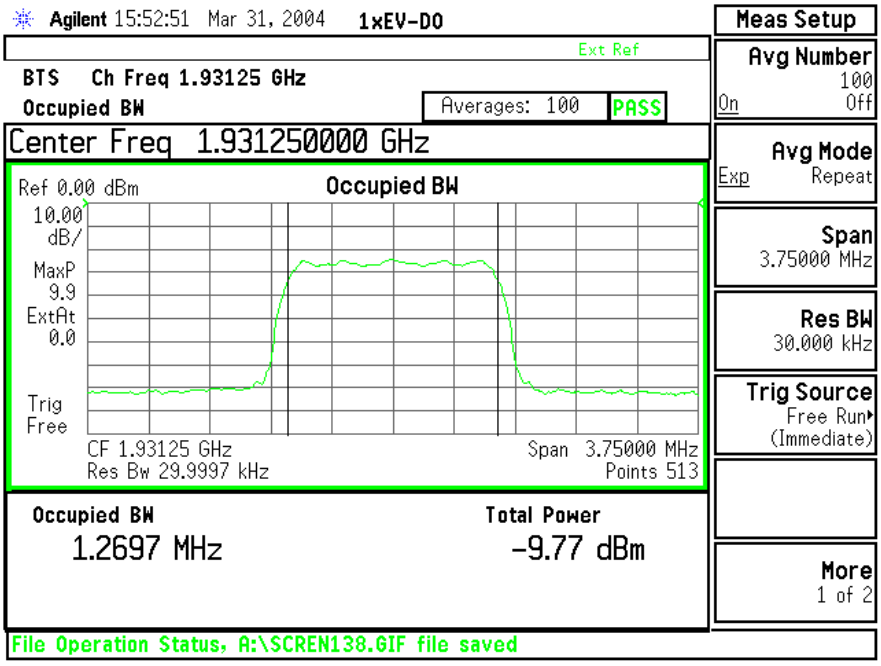


Channel 25 – 1931.25 MHz

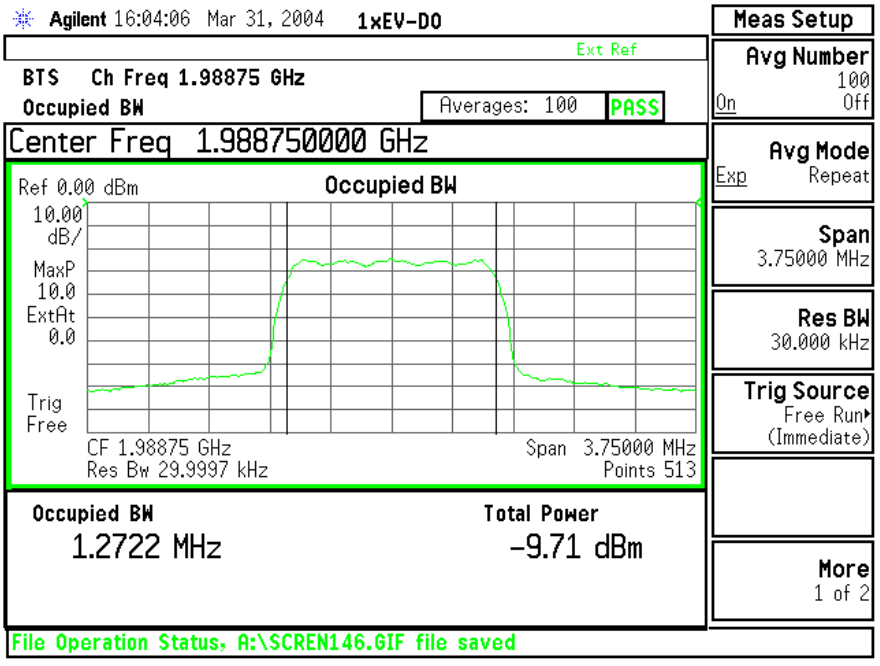


Channel 1175 – 1988.75 MHz

SC4812T 1X-EVDO – Occupied Bandwidth – 36.5 dBm – 8PSK

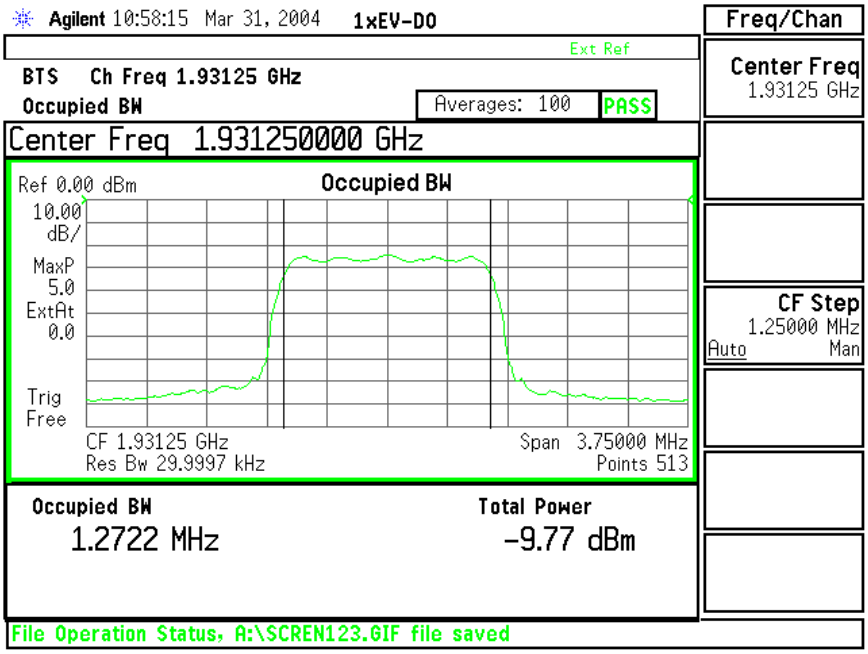


Channel 25 – 1931.25 MHz

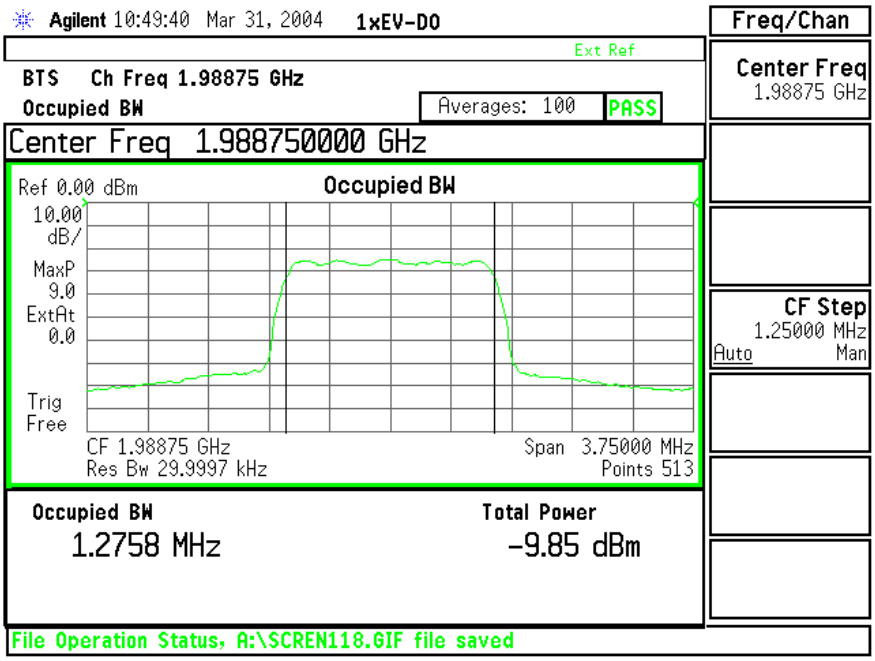


Channel 1175 – 1988.75 MHz

SC4812T 1X-EVDO – Occupied Bandwidth – 36.5 dBm – 16QAM

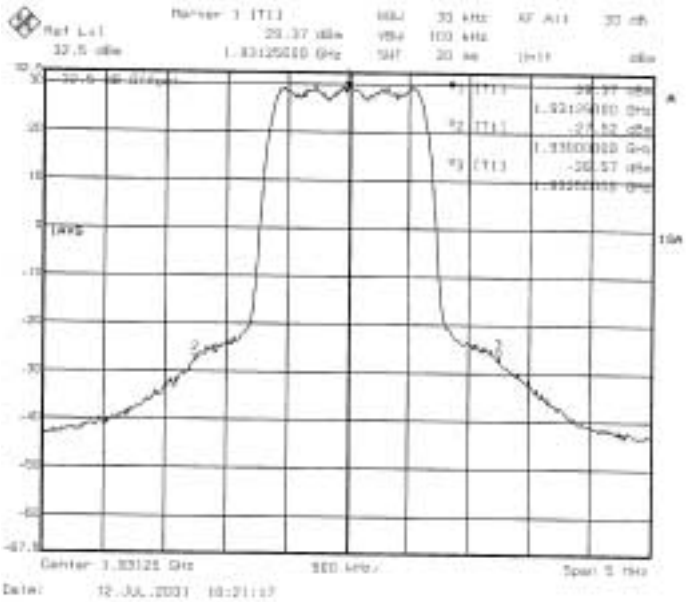


Channel 25 – 1931.25 MHz

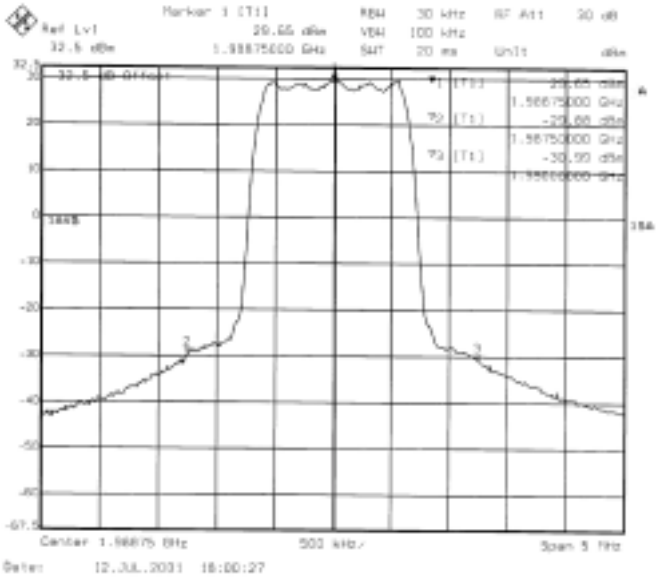


Channel 1175 – 1988.75 MHz

SC4812T 1X – Occupied Bandwidth – 46.00 dBm

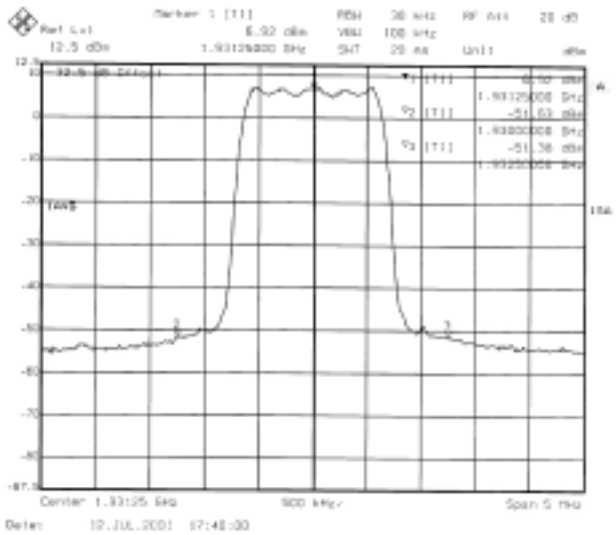


Channel 25 – 1931.25 MHz

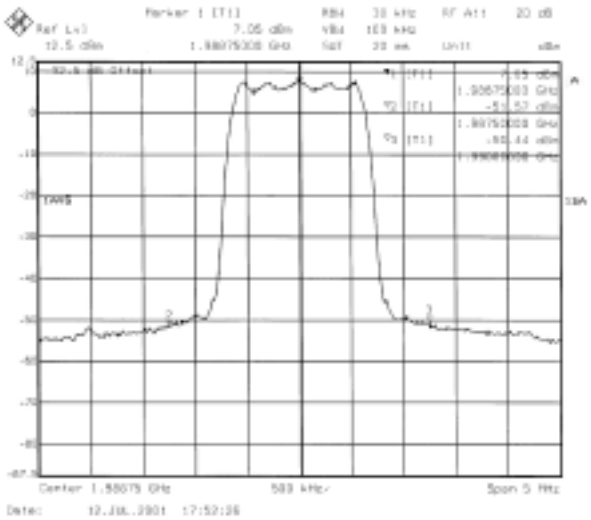


Channel 1175 – 1988.75 MHz

SC4812T 1X – Occupied Bandwidth – 26.0 dBm



Channel 25 – 1931.25 MHz



Channel 11.75 – 1988.75 MHz

SECTION F

FREQUENCY STABILITY

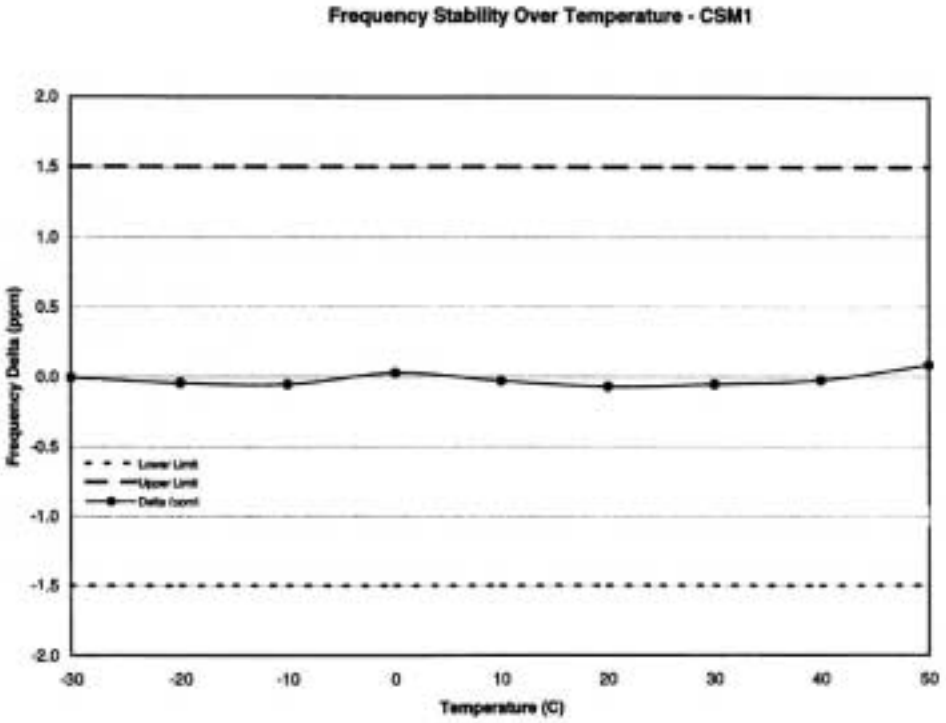
MODE	27V POWER	WORST CASE Δ PPM	FCC REQUIREMENT	Pass / Fail
CSM1	85-115%	<0.02	+/- 1.5 PPM MAX	Pass
CSM2	85-115%	<0.02	+/- 1.5 PPM MAX	Pass

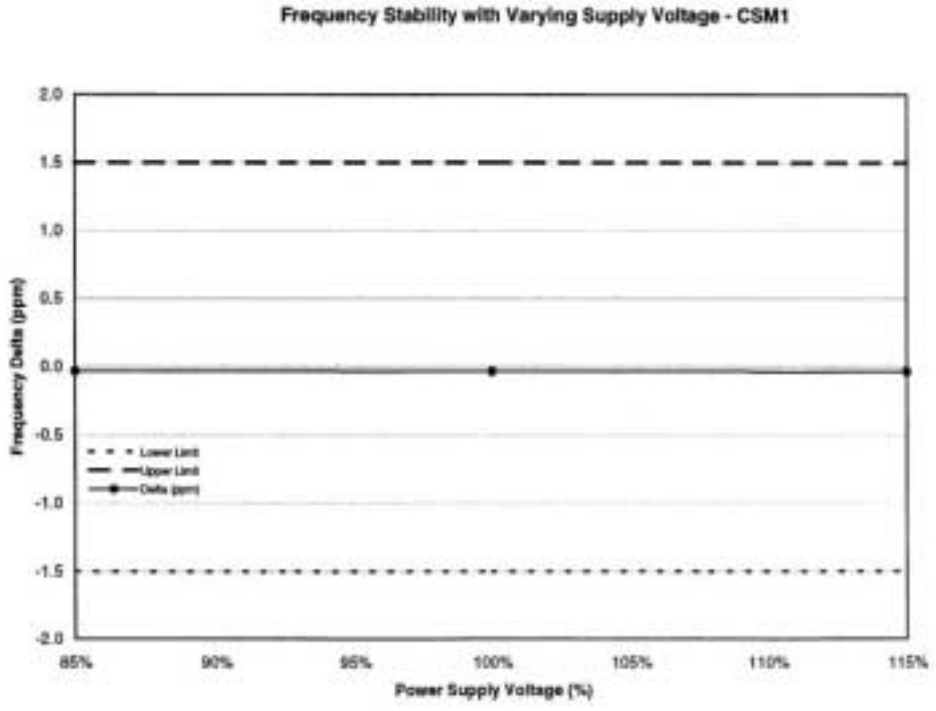
MODE	TEMPERATURE	WORST CASE Δ PPM	FCC REQUIREMENT	Pass / Fail
CSM1	-30º to +50º C	<0.2	+/- 1.5 PPM MAX	Pass
CSM2	-30º to +50º C	<0.2	+/- 1.5 PPM MAX	Pass

04.12.04

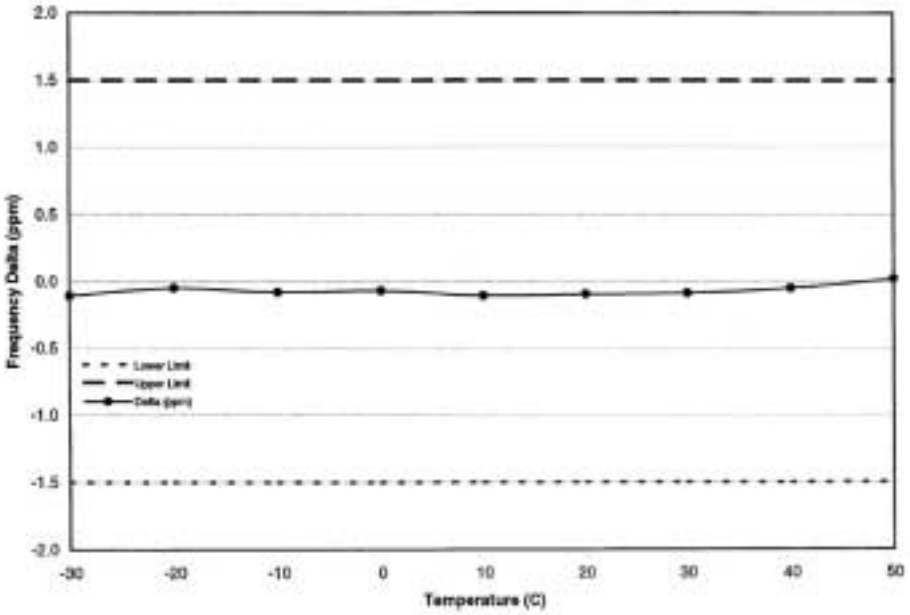
Signature Date

Terry Schwenk


Frequency Stability Over Temperature - CSM1
Frequency Delta (ppm)
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-30
-20
-10
0
10
20
30
40
50
Temperature (C)
Lower Limit
Upper Limit
Delta (ppm)


Frequency Stability with Varying Supply Voltage - CSM1
Frequency Delta (ppm)
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
85%
90%
95%
100%
105%
110%
115%
Power Supply Voltage (%)
Lower Limit
Upper Limit
Delta (ppm)

Frequency Stability Over Temperature - CSM2



Frequency Stability with Varying Supply Voltage - CSM2