



APPLICANT: MOTOROLA

Global Telecom Solutions Sector

FCC ID: IHET5DJ1

SC4812T Lite @ 800 MHz CDMA BTS

TEST REPORT EXHIBIT

Index

<u>Section</u>	<u>Description</u>
A	Summary of RF Measurements
B	Modulation Characteristics
C	Spurious & Harmonic Emissions Radiated
D	Spurious & Harmonic Emissions Conducted
E	Occupied Bandwidth
F	Frequency Stability



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Section A

Summary of RF Measurements

Summary of Radiated RF Measurements

**Worst Case Radiated RF Spur Levels for SC4812T LITE @ 800MHz
CDMA BTS**

Channel / Voltage	Spurious Frequency (MHz)	Antenna Polarity	Measured Radiated Field Strength (dBuV/m)	Measured Radiated Field Strength (dBm) (Note 1)	Cable Loss (dB)	Antenna Gain (dB)	Equivalent Transmit Power (dBm)	(Pass/Fail)
1013 / 208V AC	1739.42	V	50.7	-44.528	5.2	8.0	-44.6	Pass

Note:

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:
 $(\text{dBuV/M}) + 20 - 104.77 = \text{dBm}$



Signature

Date

Brian Daniel
Lead EMI Engineer



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Summary of Conducted RF Measurements

SC4812T LITE @ 800MHz CDMA BTS

FCC Part 22

CHANNEL	VOLTAGE	FREQUENCY (GHz)	SPUR LEVEL MEASURED (dBmV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT (dBm)	PASS / FAIL
777	-48V DC	9.82641	88.65	-18.35	-13	Pass



4-3-03

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Brian Daniel
Lead EMI Engineer

Section B

Summary of Modulation Characteristics

SC4812T LITE @ 800MHz CDMA BTS

CHANNEL / VOLTAGE	TUNE FREQUENCY (MHz)	RHO Measured	RHO Specifications	PASS / FAIL
777 / -48V DC	893.31	0.98309	> 0.912	Pass
1013 / -48V DC	869.7	0.98328	> 0.912	Pass

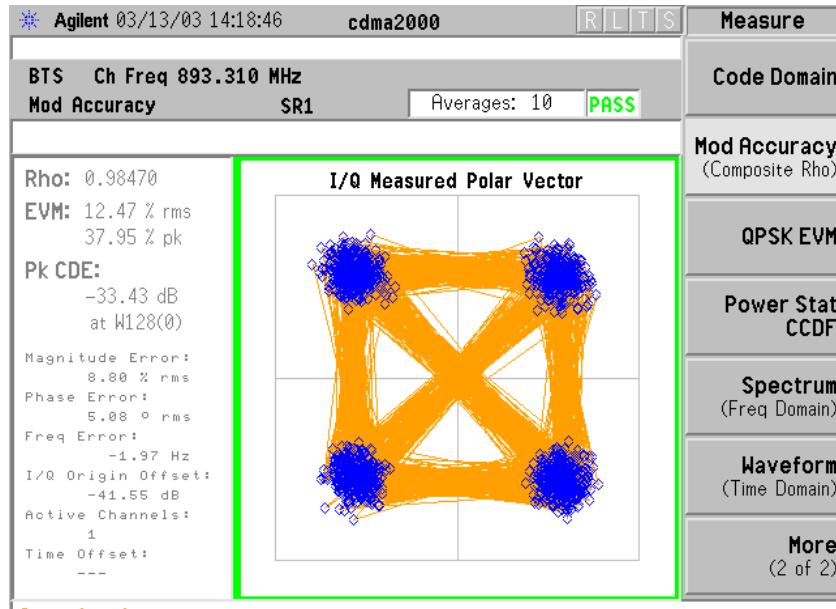
The BTS was configured for maximum power out of 49.54 dBm and minimum power out of 26.0 dBm respectively. The output power was set respectively to 90 Watts or 400 mWatts using a power meter



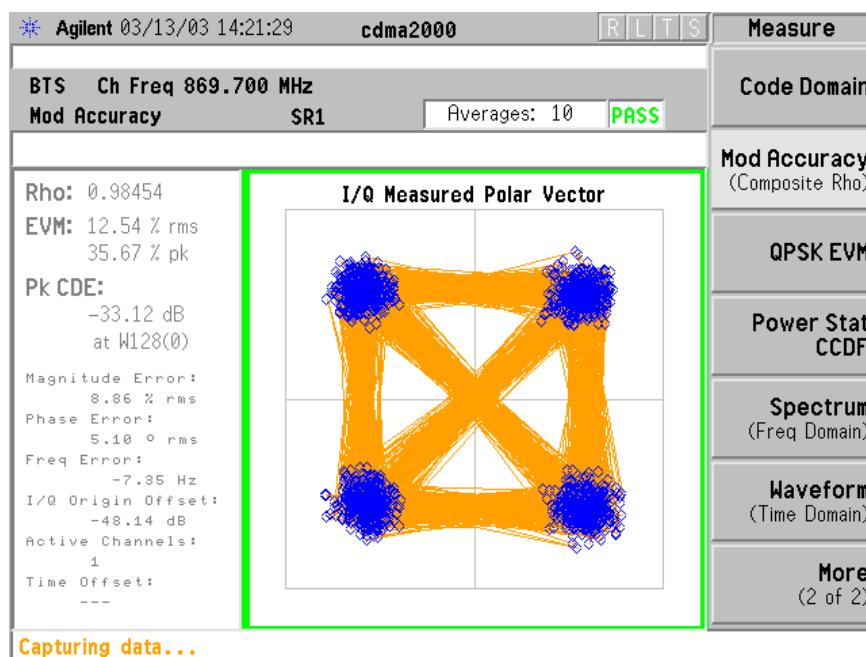
Signature

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Brian Daniel
Lead EMI Engineer

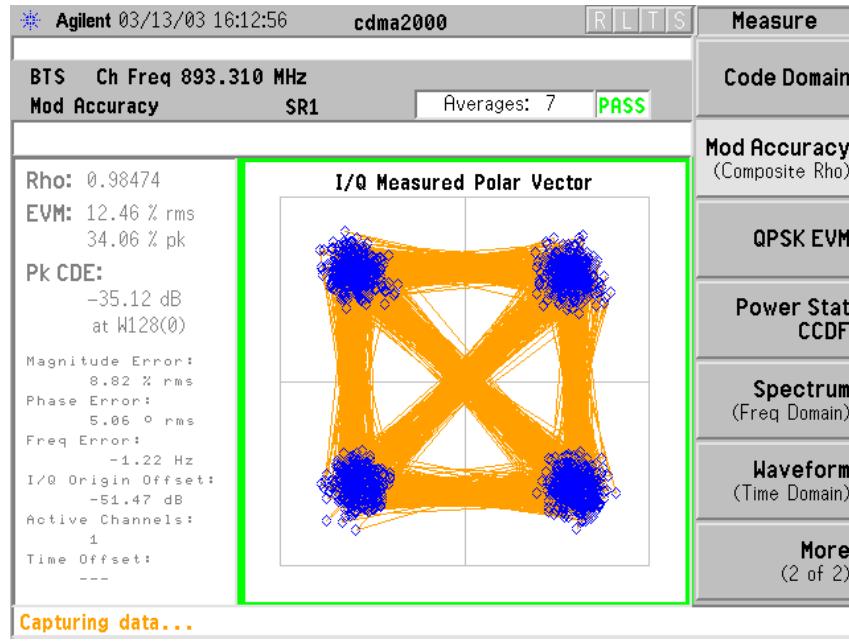
208V AC – Modulation Characteristics - 400mW

Channel 777 – 893.31 MHz

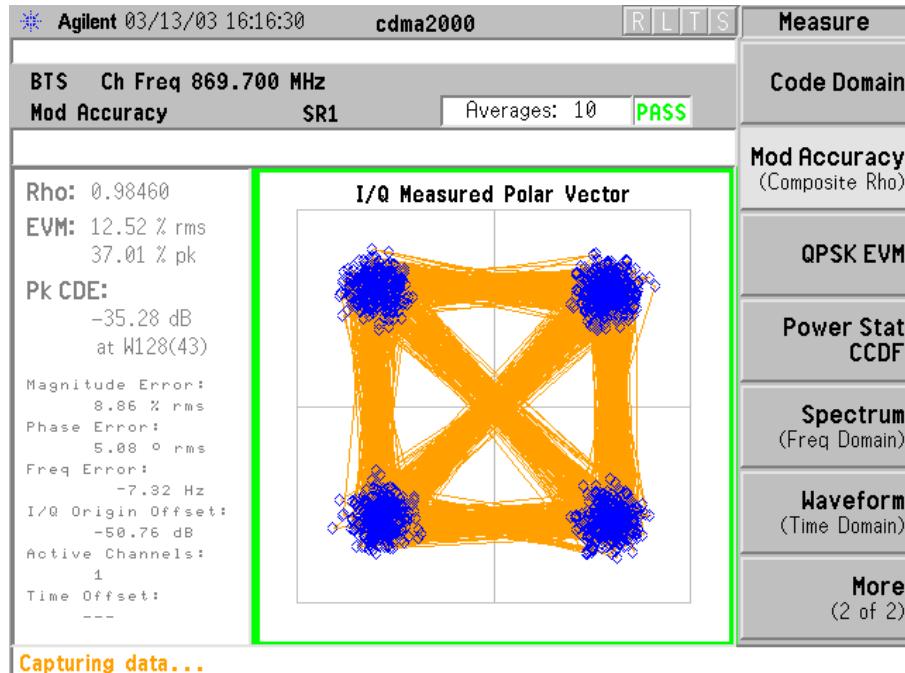


Channel 1013 – 869.7 MHz

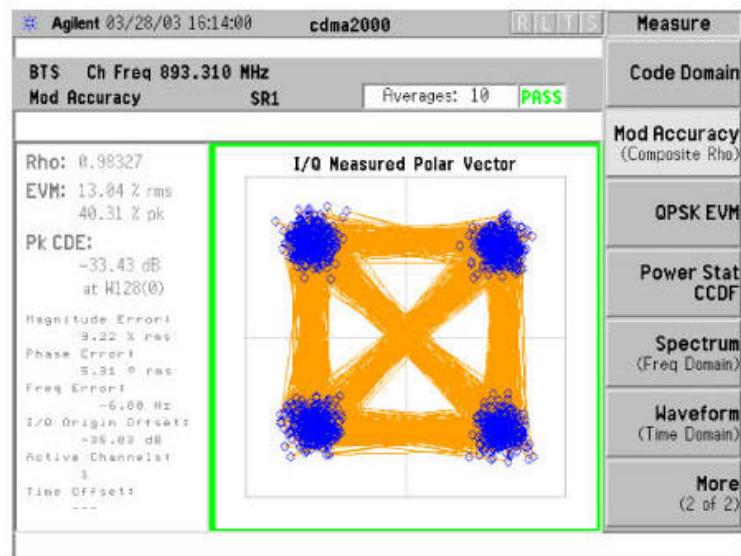
208V AC – Modulation Characteristics – 90W



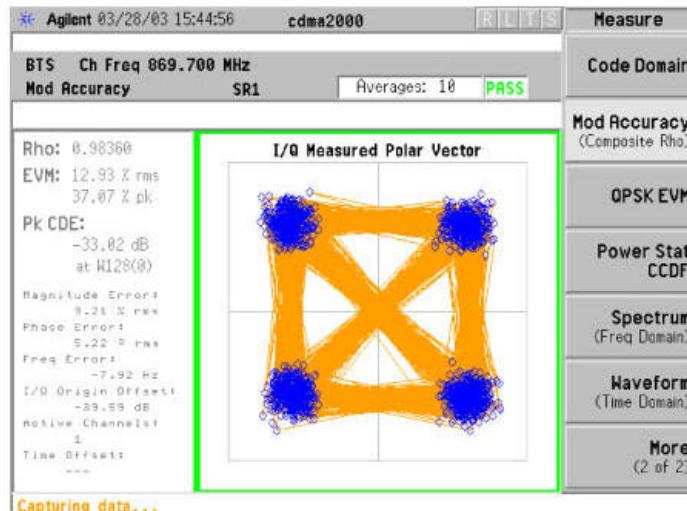
Channel 777 – 893.31 MHz



Channel 1013 – 869.7 MHz

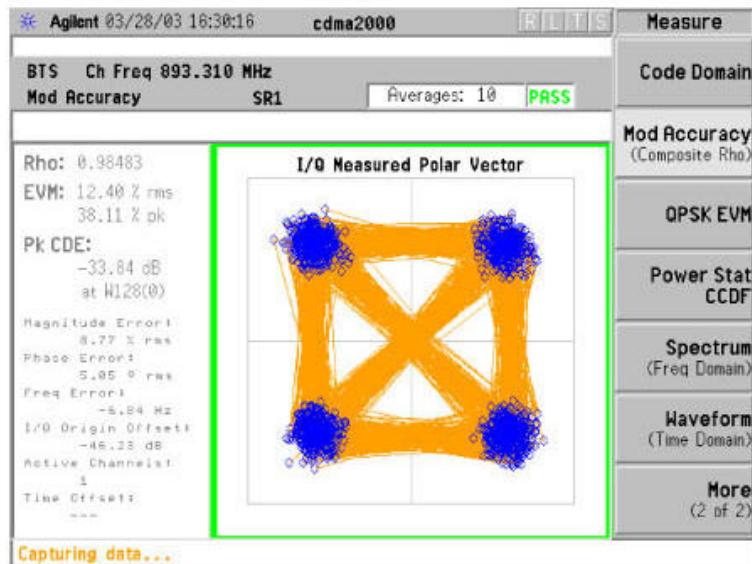
27V DC – Modulation Characteristics - 400mW

Channel 777 – 893.31 MHz

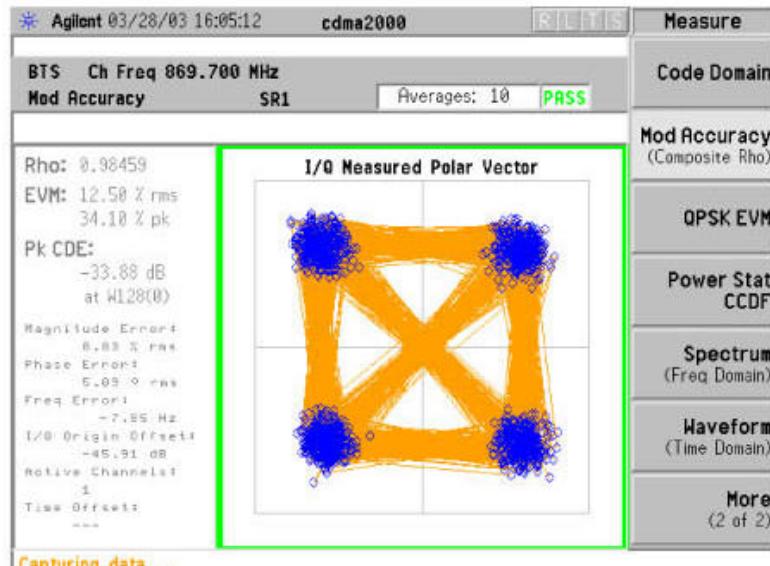


Channel 1013 – 869.7 MHz

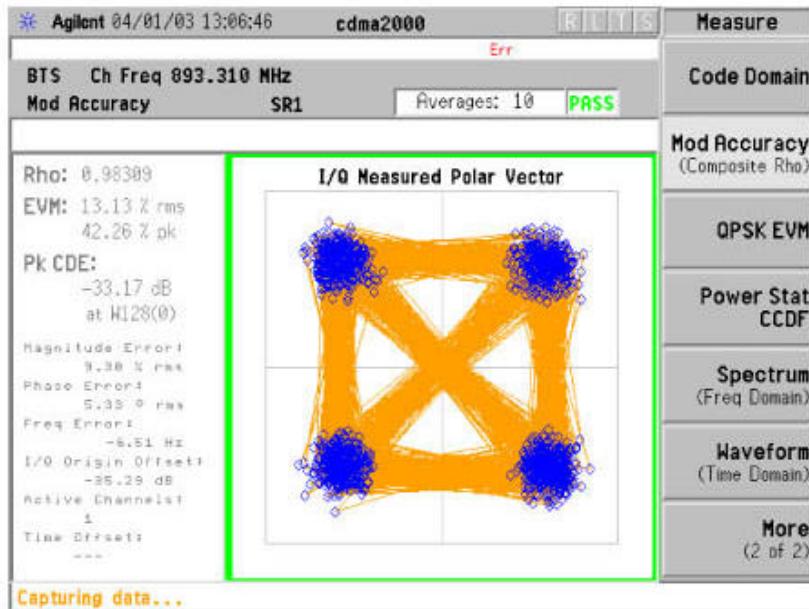
27V DC – Modulation Characteristics – 90W



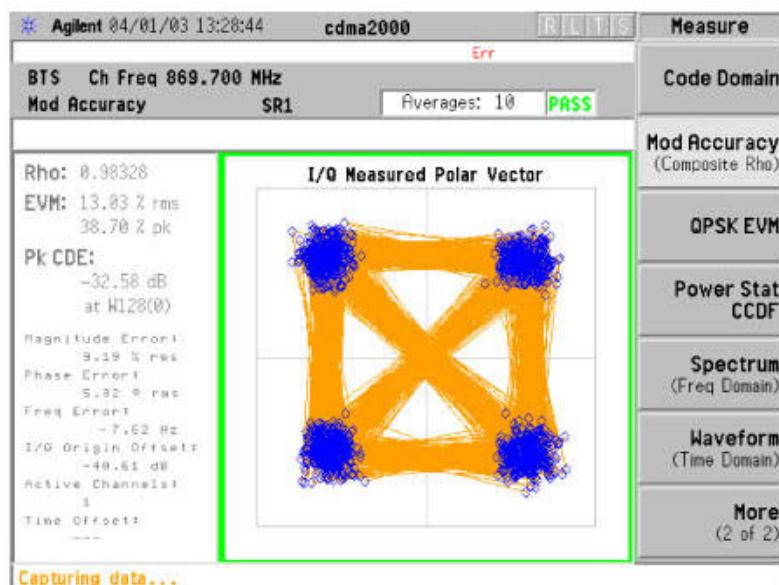
Channel 777 – 893.31 MHz



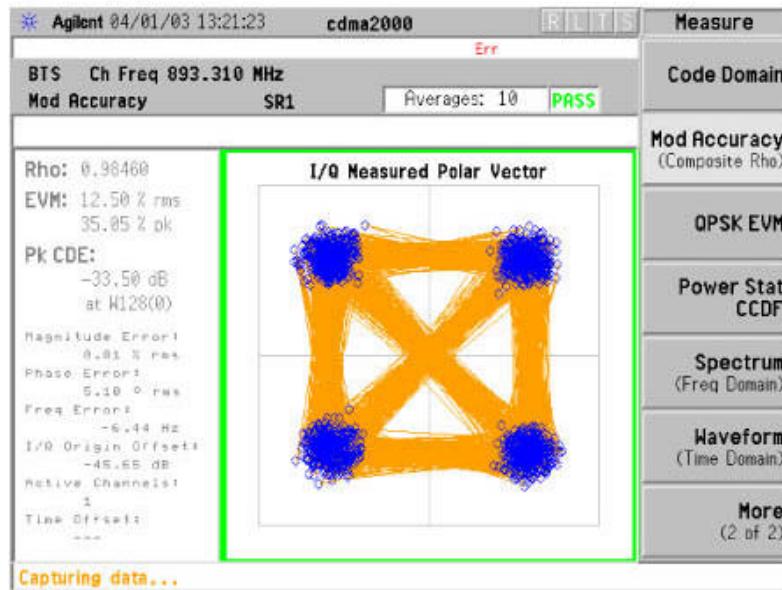
Channel 1013 – 869.7 MHz

-48V DC – Modulation Characteristics - 400mW

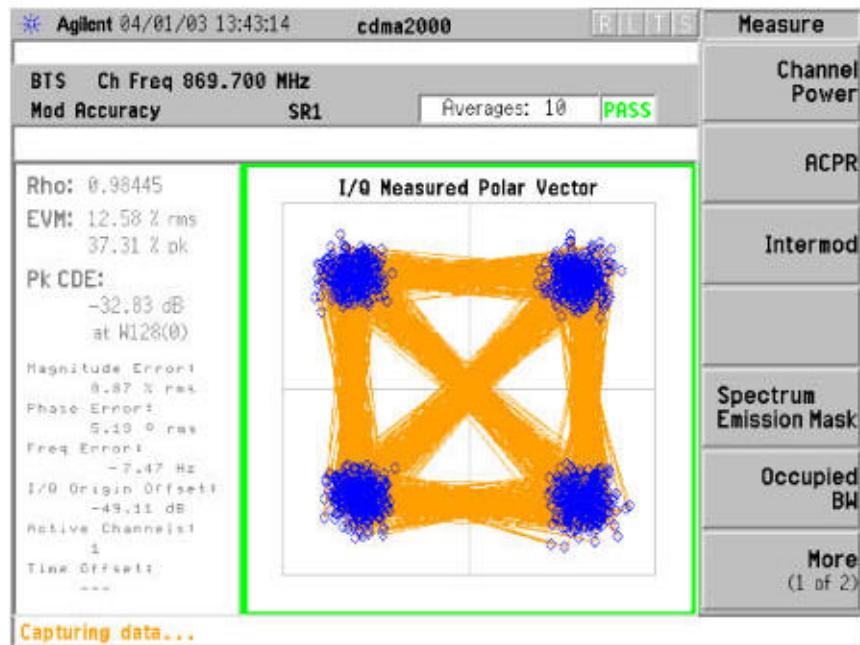
Channel 777 – 893.31 MHz



Channel 1013 – 869.7 MHz

-48V DC – Modulation Characteristics – 90W

Channel 777 – 893.31 MHz



Channel 1013 – 869.7 MHz



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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 SC4812T LITE @ 800MHz CDMA BTS

Channel / Voltage	Spurious Frequency (MHz)	Antenna Polarity	Measured Radiated Field Strength (dBuV/m)	Measured Radiated Field Strength (dBm) (Note 1)	Cable Loss (dB)	Antenna Gain (dB)	Equivalent Transmit Power (dBm)	(Pass/Fail)
1013 / 208V AC	1739.42	V	50.7	-44.528	5.2	8.0	-44.6	Pass
1013 / 208V AC	2609.13	V	40.3	-54.928	6.7	8.7	-62.6	Pass
1013 / 27V DC	3478.84 – 27V	V	41.1	-54.128	7.6	8.9	-59.7	Pass
777 / 208V AC	1786.62	V	39.9	-55.328	5.2	8.0	-59.9	Pass
777 / 27V DC	2679.93	V	35.2	-60.028	6.4	8.6	-69.8	Pass

Note:

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:

$$(\text{dBuV/M}) + 20 - 104.77 = \text{dBm}$$



4-3-03

Signature

Date

Brian Daniel
Lead EMI Engineer



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Section C

Spurious and Harmonic Emissions Conducted



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Conducted RF Measurements

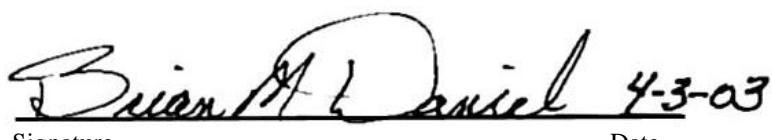
SC4812T LITE @ 800MHz CDMA BTS

FCC Part 22

CHANNEL	VOLTAGE	FREQUENCY (GHz)	SPUR LEVEL MEASURED (dBmV)	SPUR LEVEL MEASURED (dBm)	FCC MAX LIMIT (dBm)	PASS / FAIL
777	-48V DC	9.82641	88.65	-18.35	-13	Pass
1013	208V AC	9.56681	80.99	-26.01	-13	Pass

FCC Maximum Limit Per 47 CFR:

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



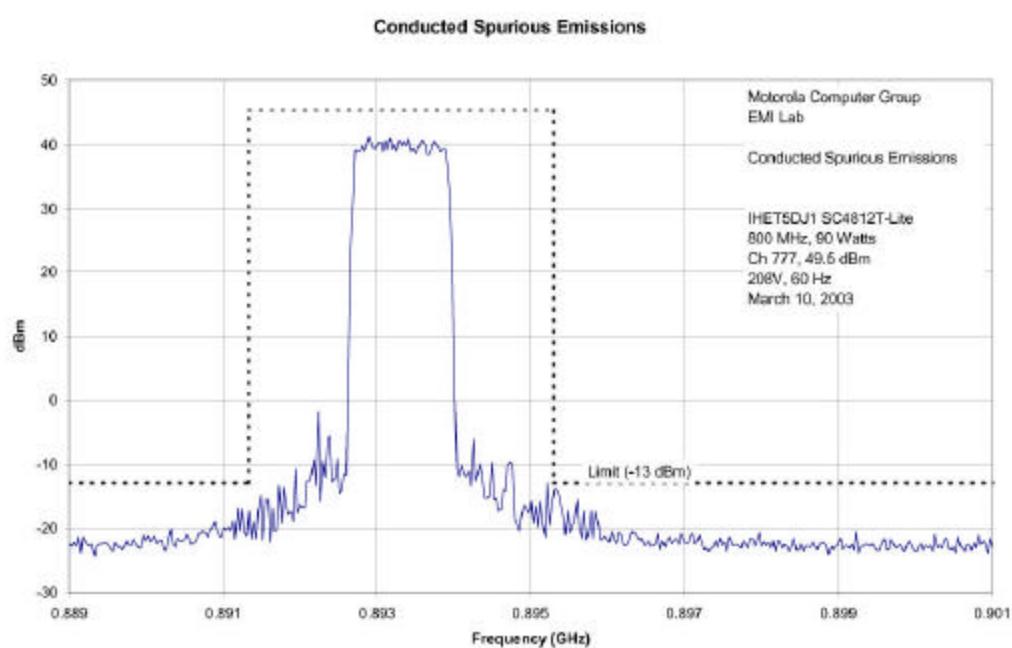
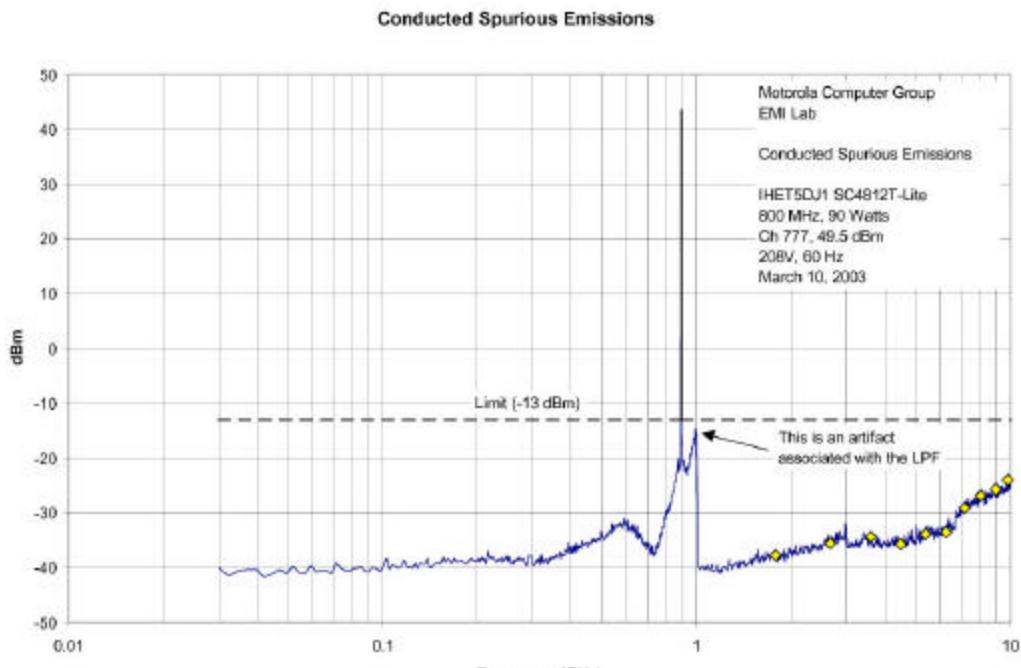
Brian M. Daniel 4-3-03

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Date

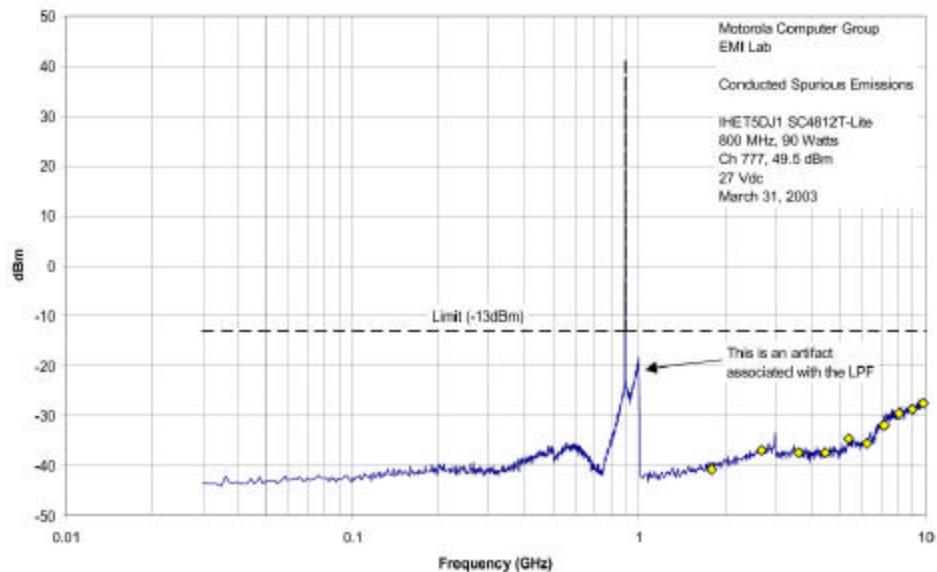
Brian Daniel
Lead EMI Engineer

Spurious and Harmonic Emissions Conducted
CDMA Channel 777 – Maximum Power – 208V AC

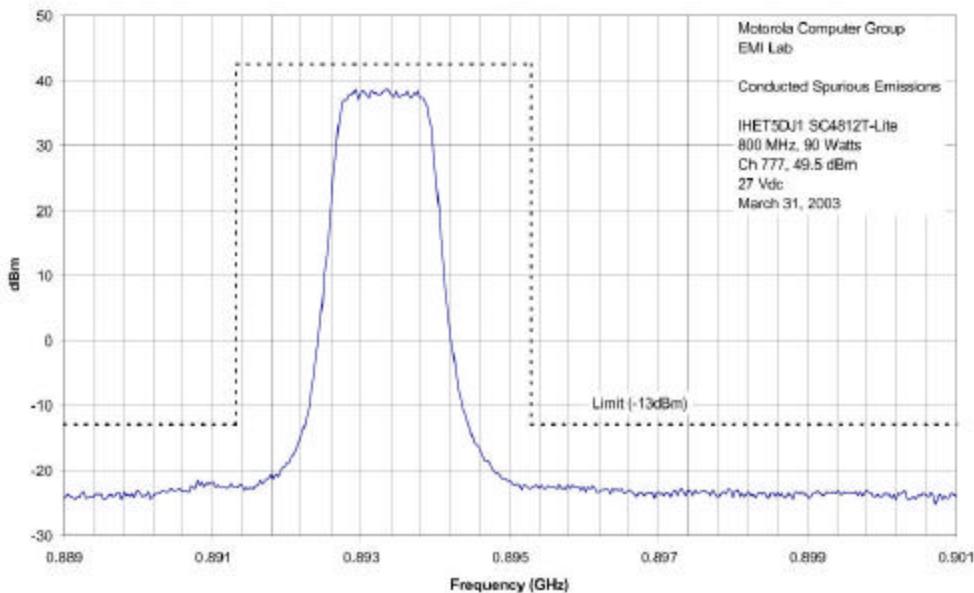


Spurious and Harmonic Emissions Conducted
CDMA Channel 777 – Maximum Power – 27V DC

27VDC Conducted Spurious Emissions

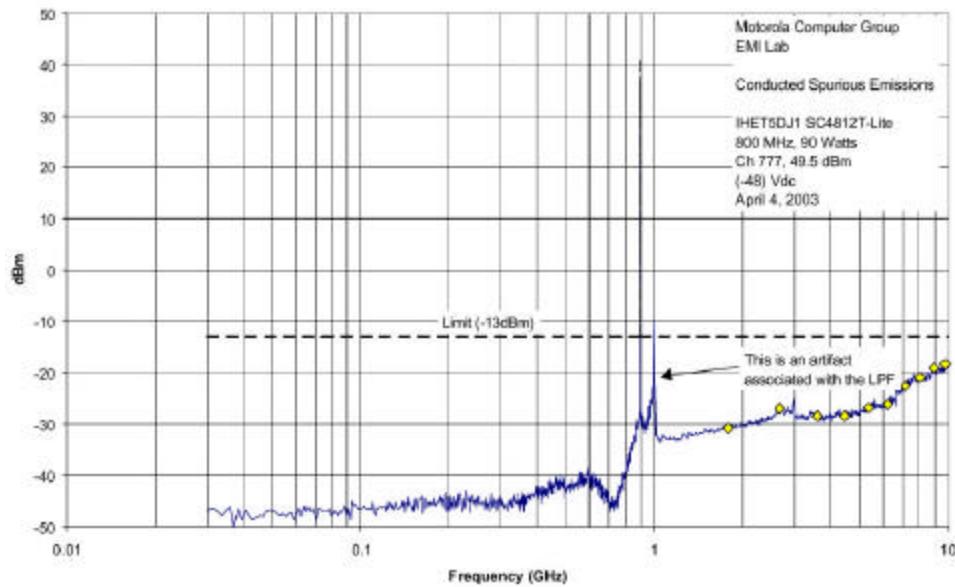


27 VDC Conducted Spurious Emissions

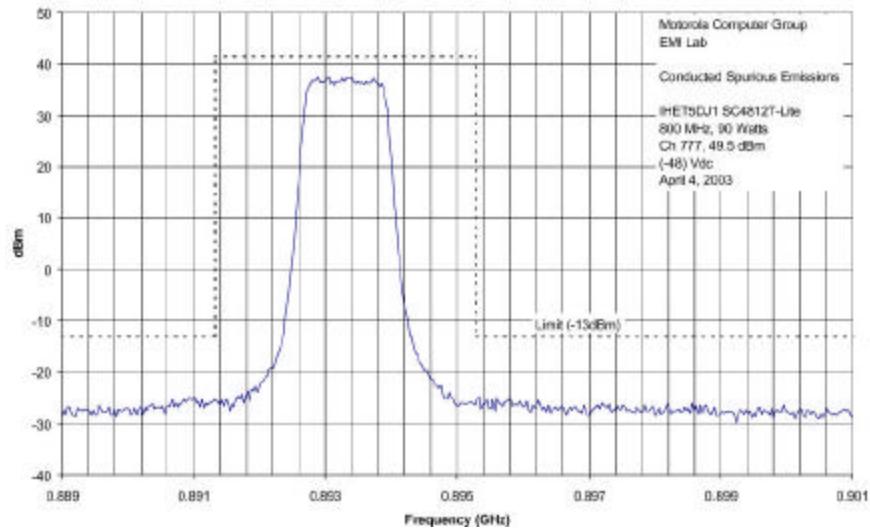


Spurious and Harmonic Emissions Conducted
CDMA Channel 777 – Maximum Power – -48V DC

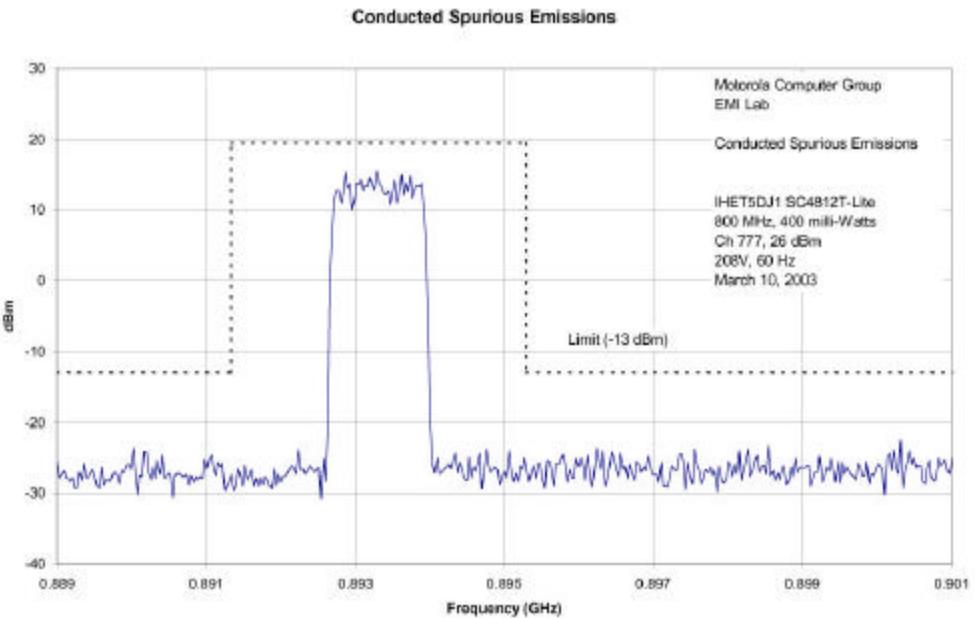
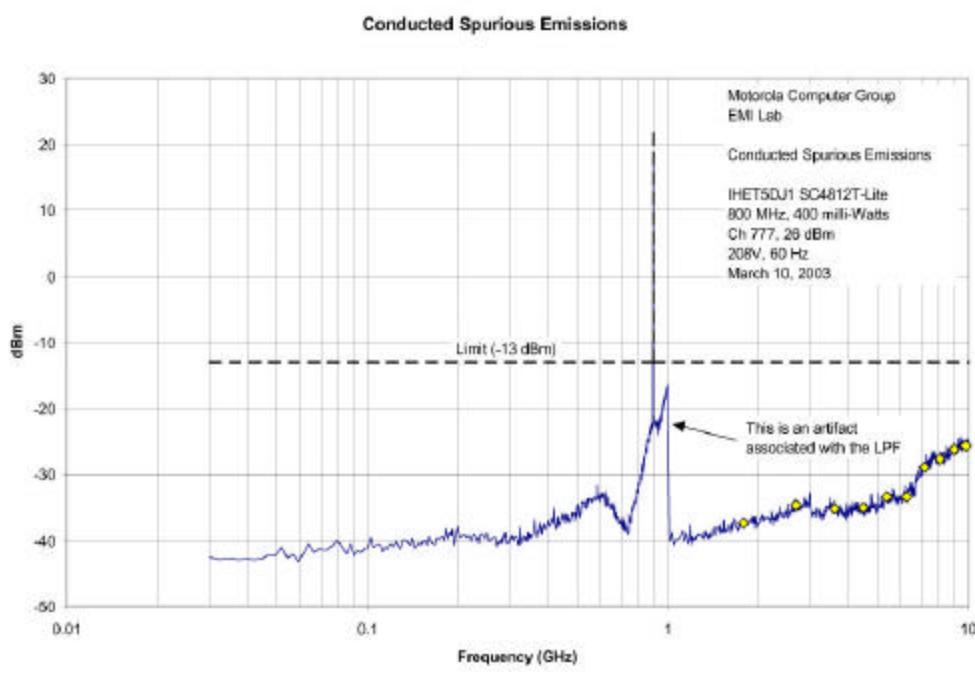
(-48) VDC Conducted Spurious Emissions



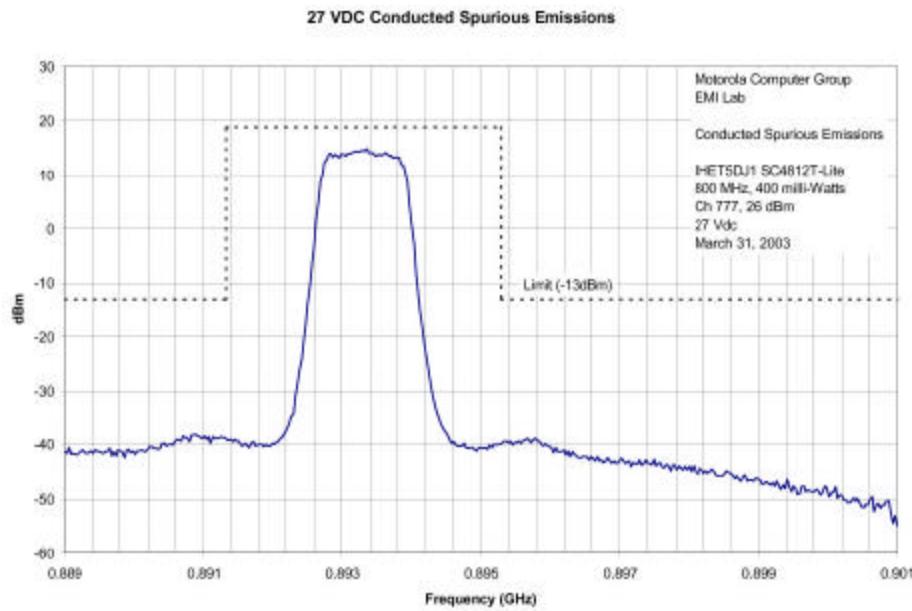
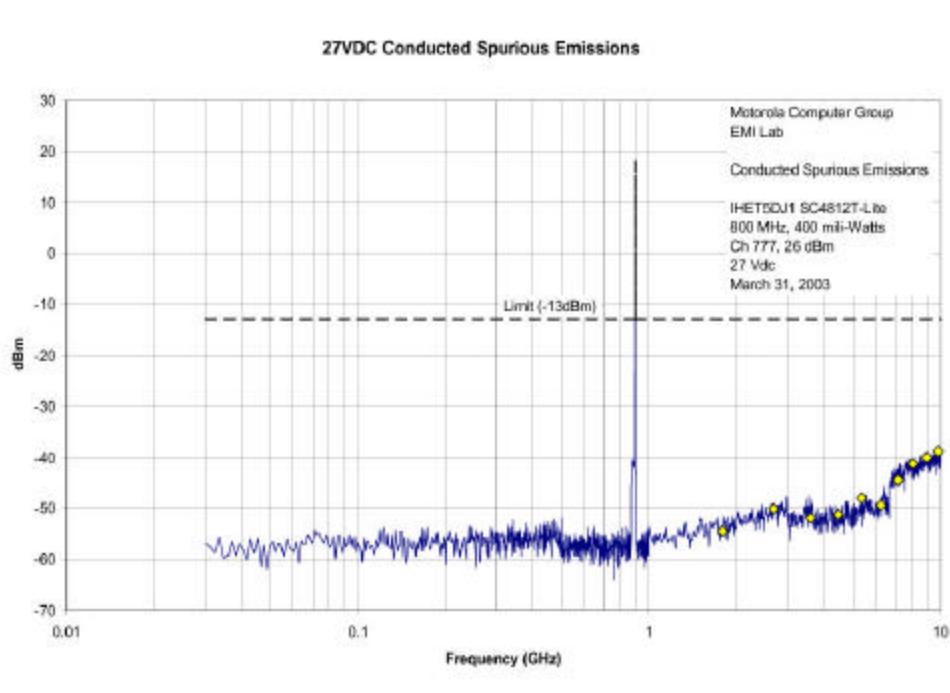
(-48) VDC Conducted Spurious Emissions



Spurious and Harmonic Emissions Conducted
CDMA Channel 777 – Minimum Power – 208V AC

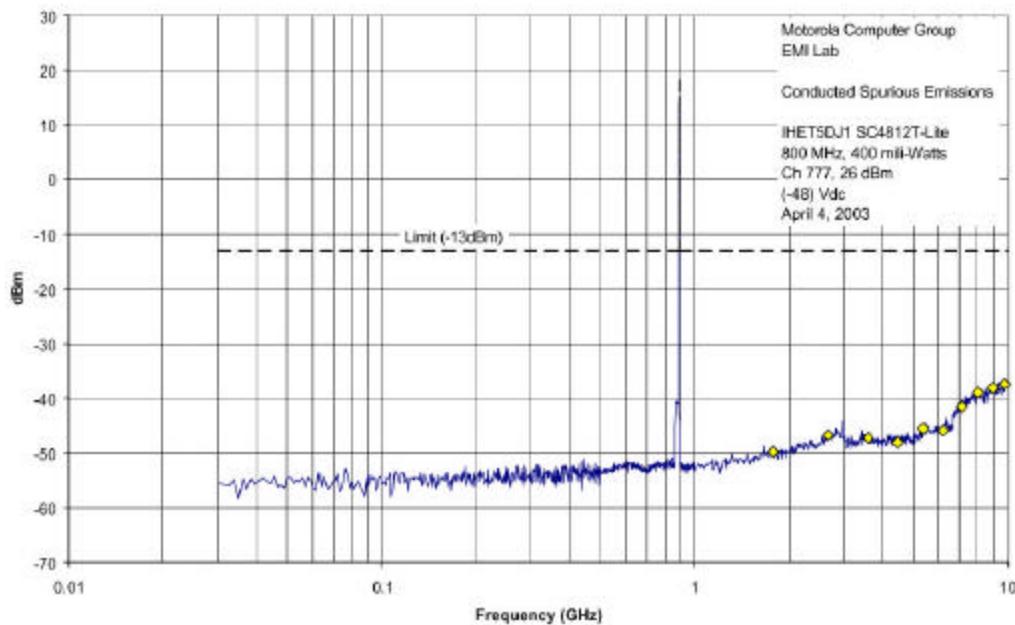


Spurious and Harmonic Emissions Conducted
CDMA Channel 777 – Minimum Power – 27V DC

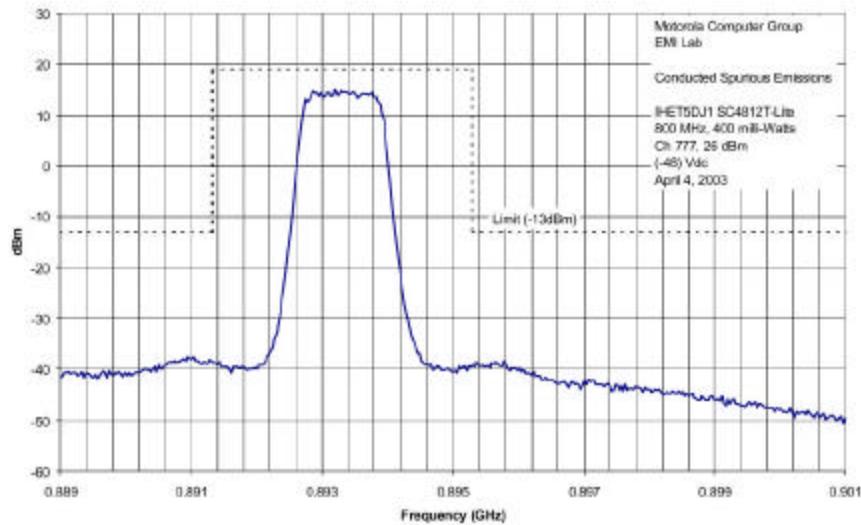


Spurious and Harmonic Emissions Conducted
CDMA Channel 777 – Minimum Power – -48V DC

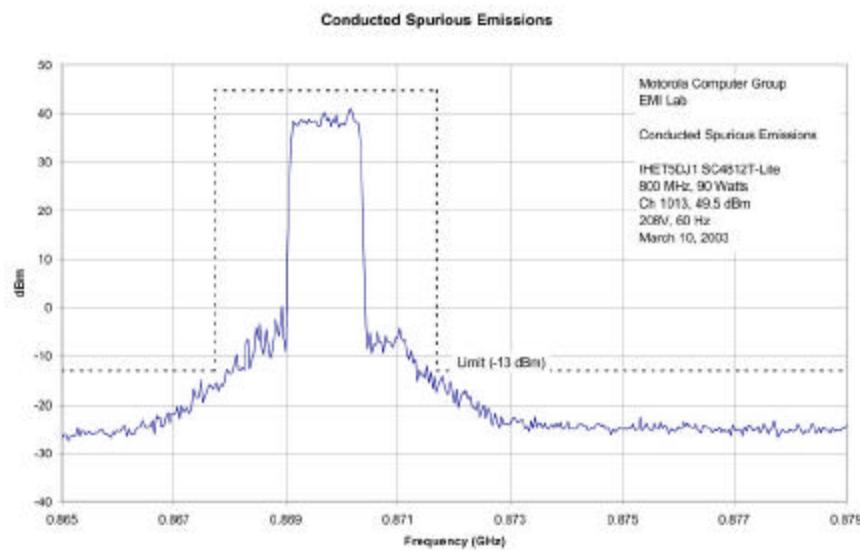
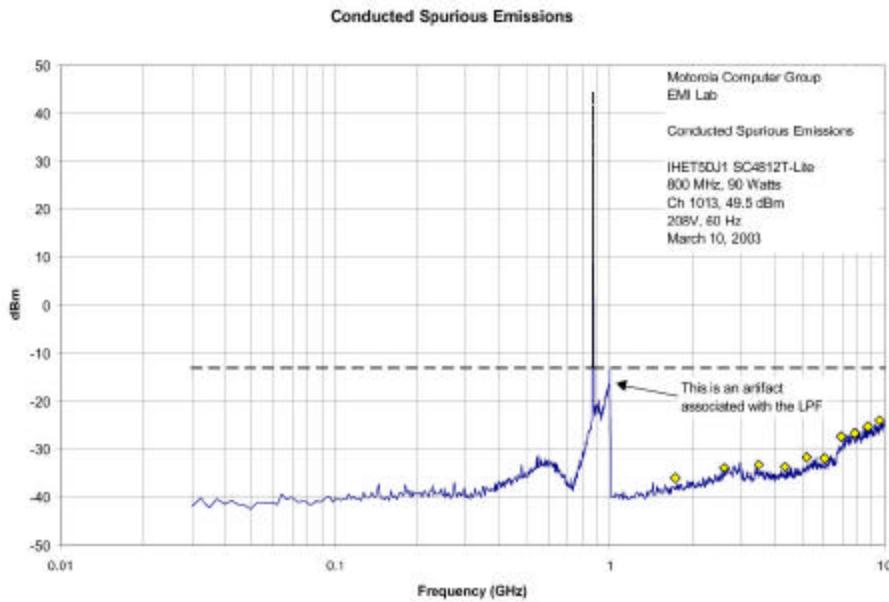
(-48) VDC Conducted Spurious Emissions



(-48) VDC Conducted Spurious Emissions



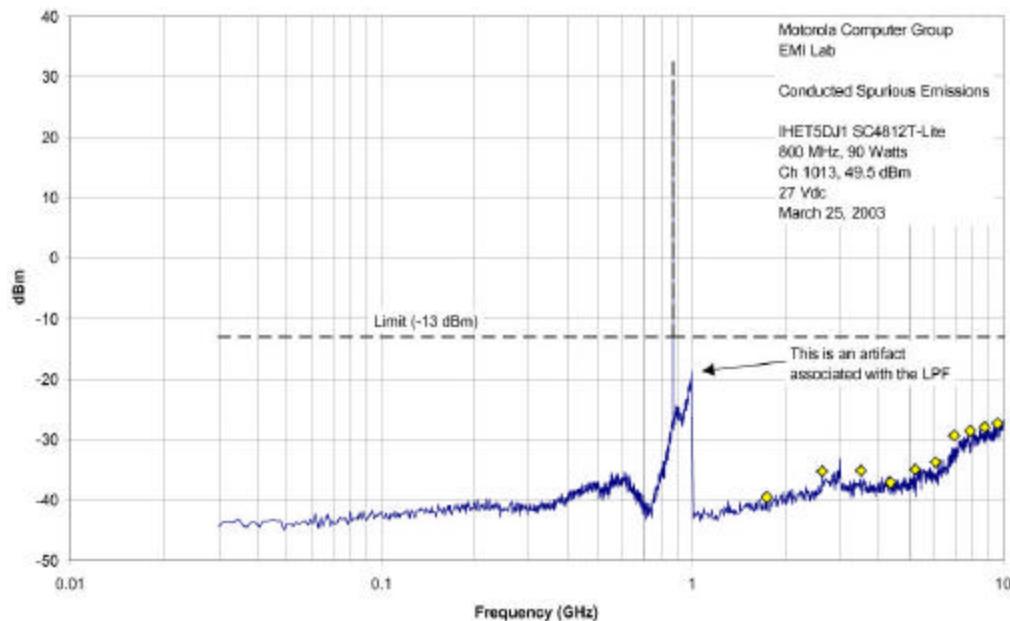
Spurious and Harmonic Emissions Conducted
CDMA Channel 1013 – Maximum Power – 208V AC



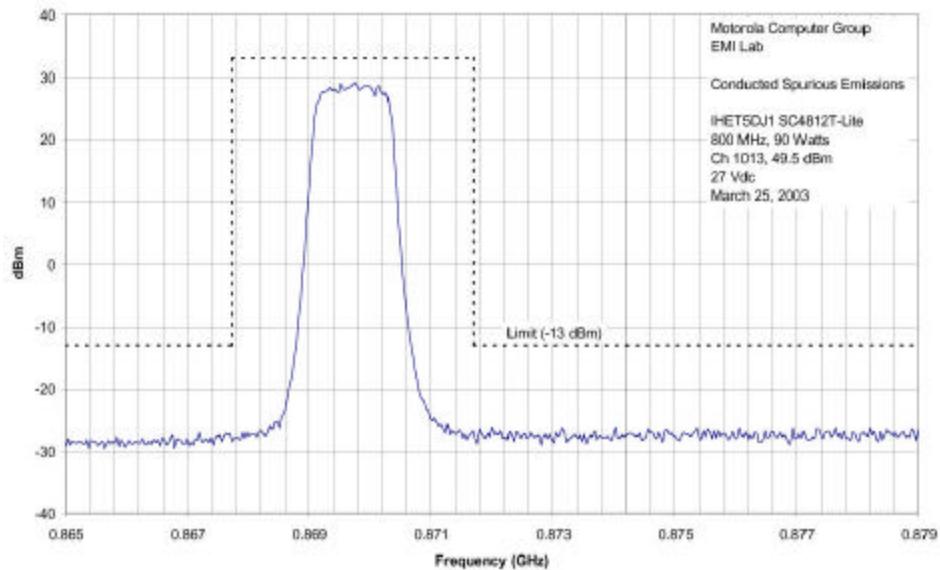
Spurious and Harmonic Emissions Conducted

CDMA Channel 1013 – Maximum Power – 27V DC

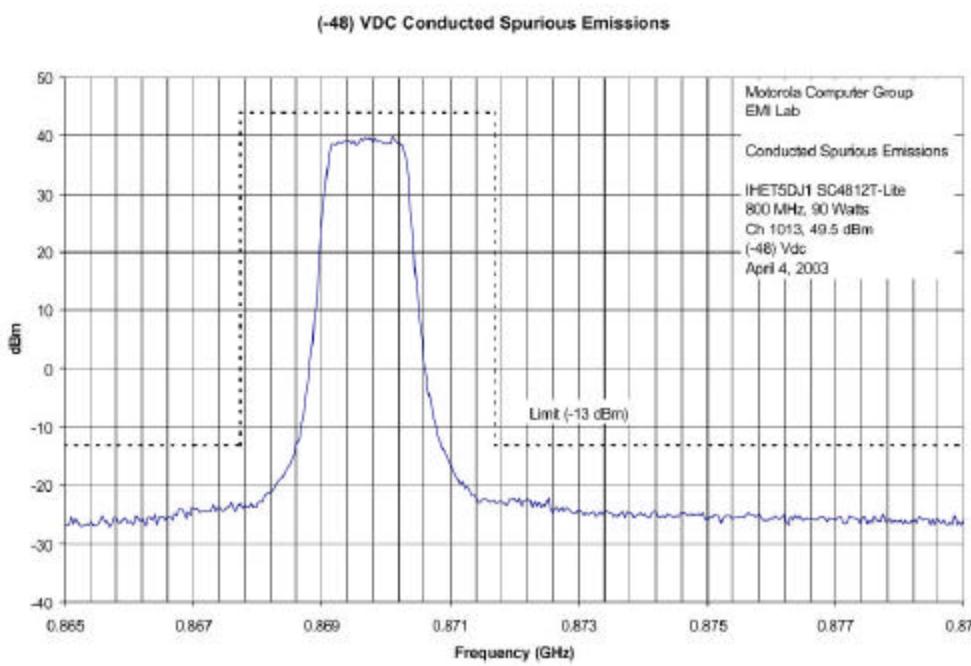
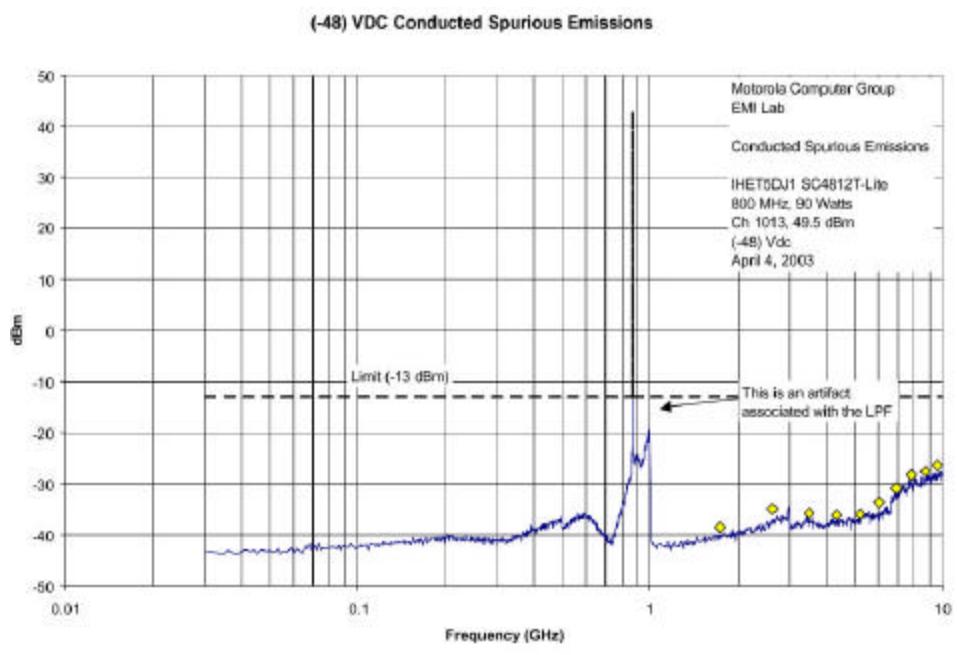
27VDC Conducted Spurious Emissions



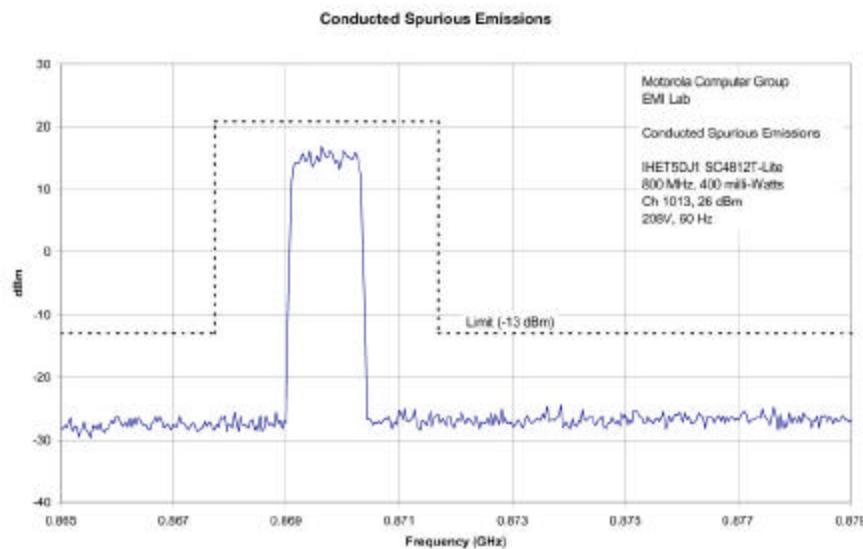
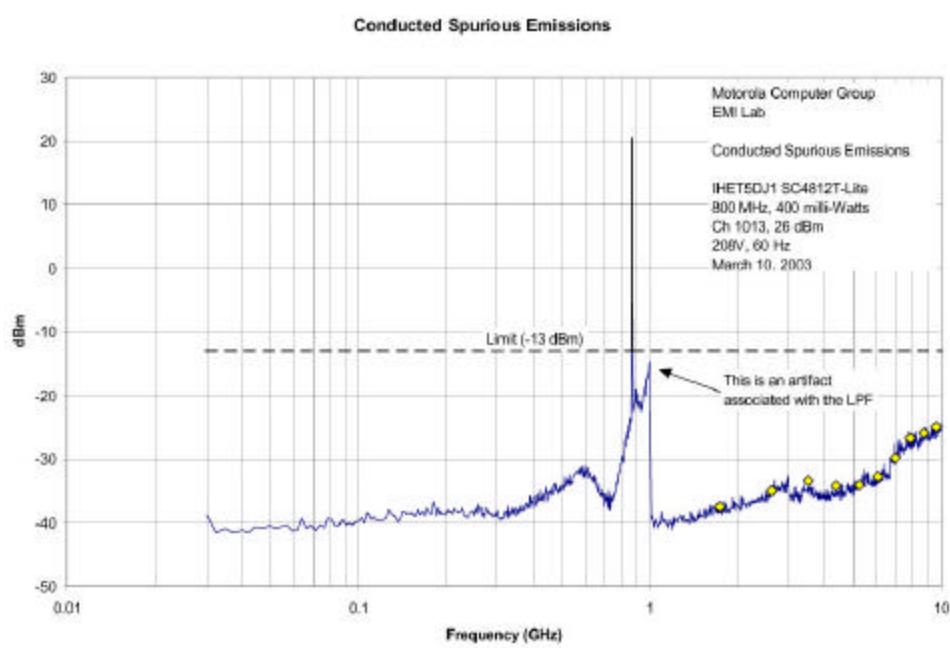
27 VDC Conducted Spurious Emissions



Spurious and Harmonic Emissions Conducted
CDMA Channel 1013 – Maximum Power – -48V DC

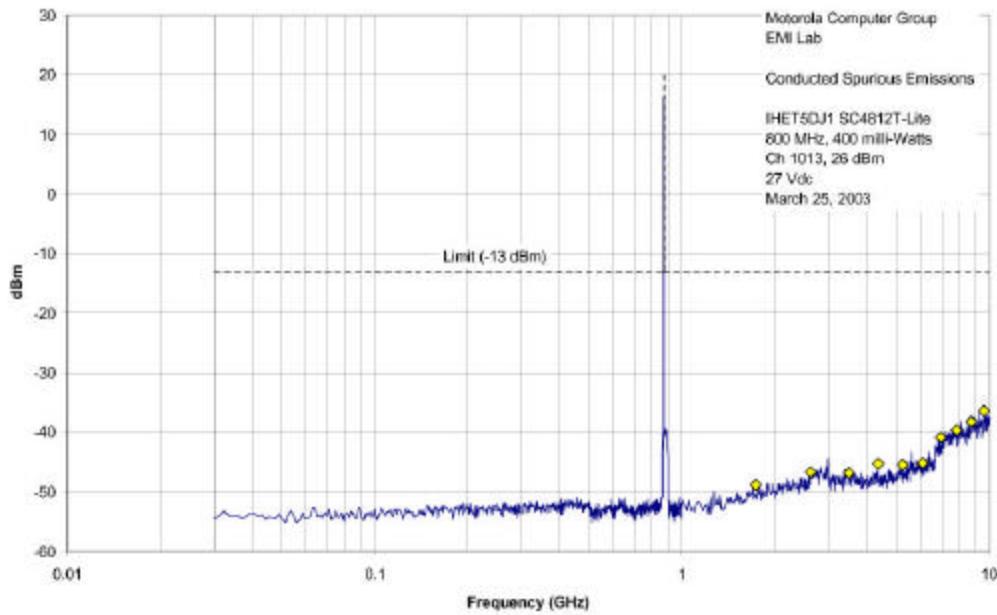


Spurious and Harmonic Emissions Conducted
CDMA Channel 1013 – Minimum Power – 208V AC

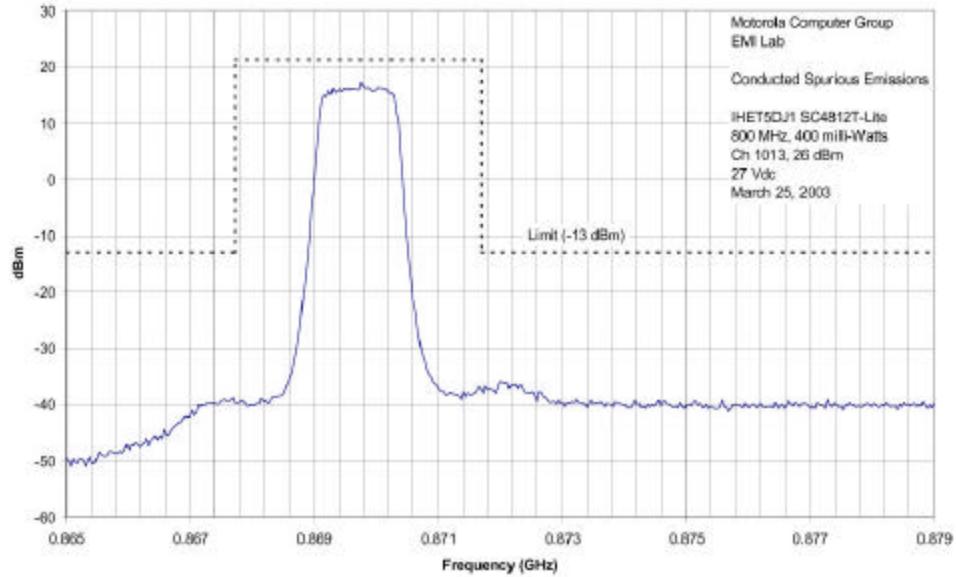


Spurious and Harmonic Emissions Conducted
CDMA Channel 1013 – Minimum Power – 27V DC

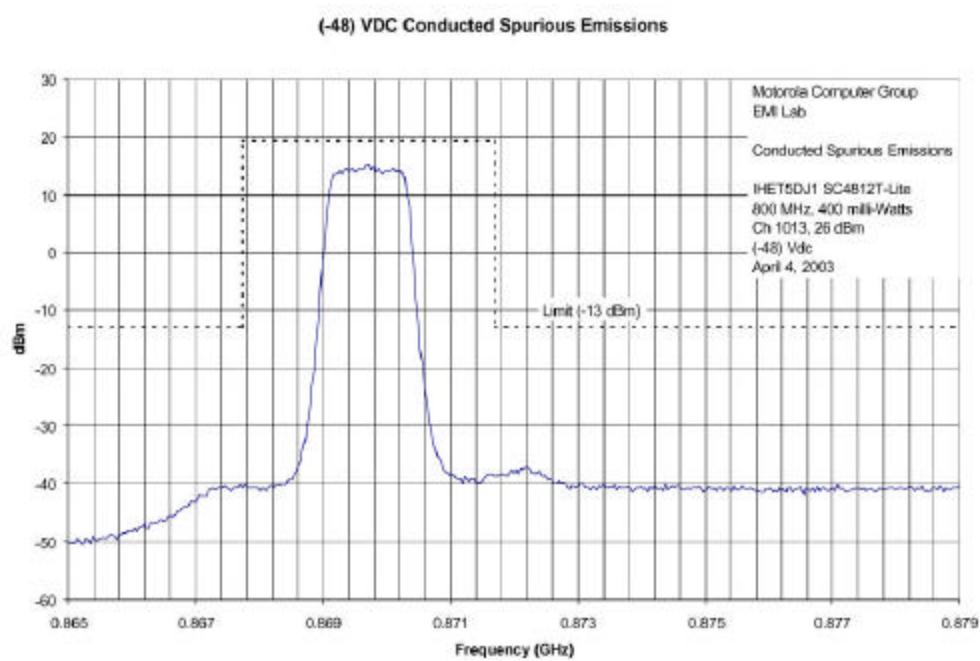
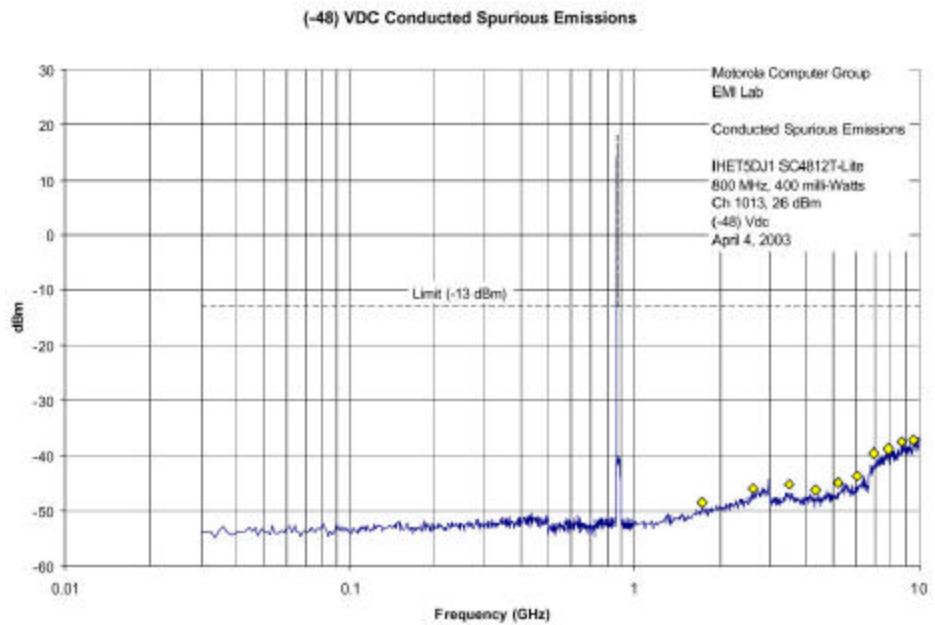
27VDC Conducted Spurious Emissions



27VDC Conducted Spurious Emissions



Spurious and Harmonic Emissions Conducted
CDMA Channel 1013 – Maximum Power – -48V DC



SECTION E

OCCUPIED BANDWIDTH

Note: The BTS was configured for maximum power out of 49.54 dBm and minimum power out of 26.0 dBm respectively. The output power was set respectively to 90 Watts or 400 mWatts using a 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 (1.2288 MHz / 30 kHz)

Example: 23.88 dBm + 16.12 dB = 40.0 dBm

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

CHANNEL / VOLTAGE	Power Level (dBm)	FREQUENCY (MHz)	MEASURED (MHz)	FCC LIMIT (MHz)	Pass / Fail
777 / -48V DC	49.54	893.31	1.2340	1.30	Pass
1013 / -48V DC	26.0	869.7	1.2994	1.30	Pass

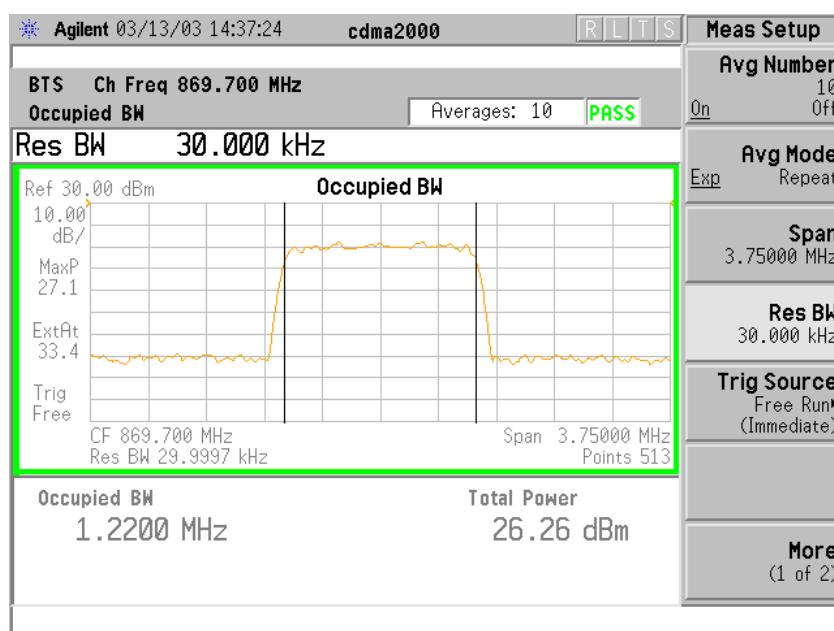
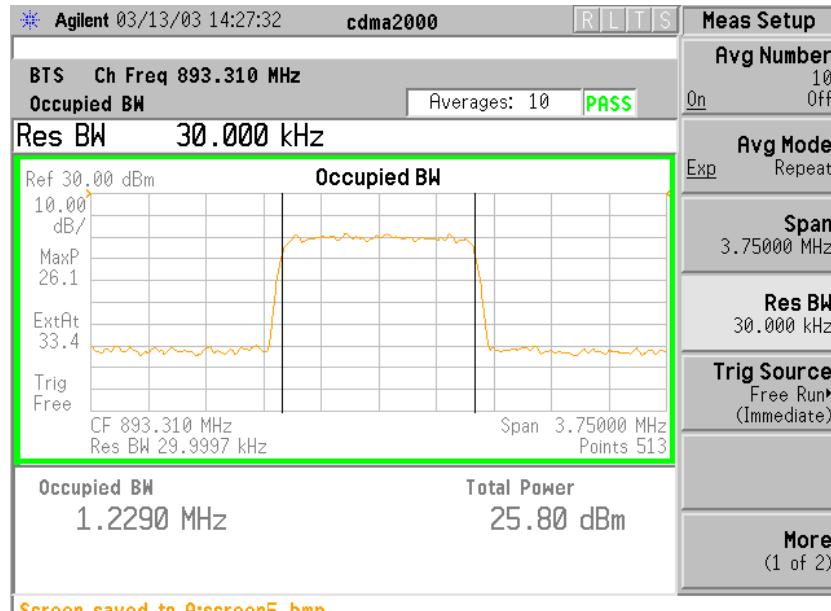


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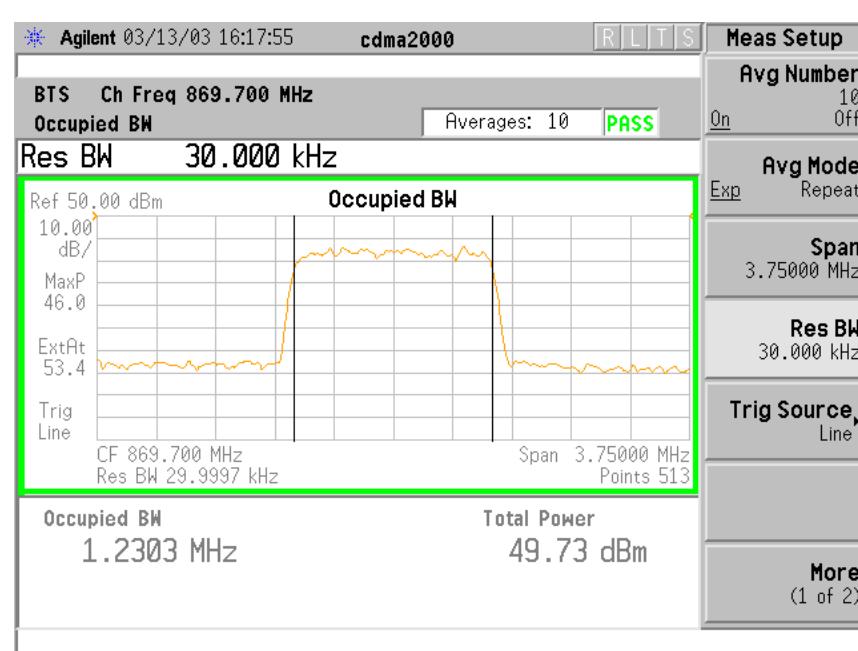
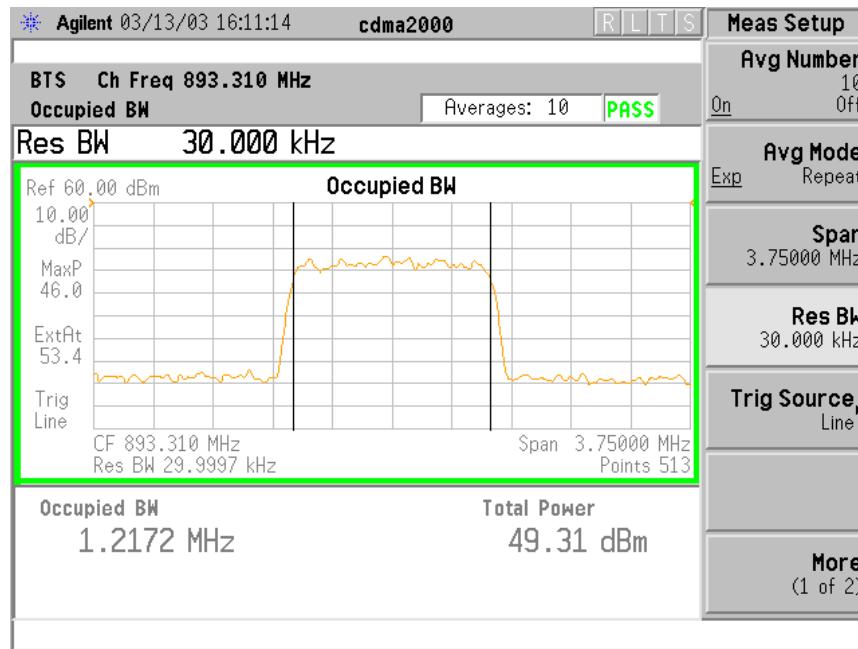
Date

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Lead EMI Engineer

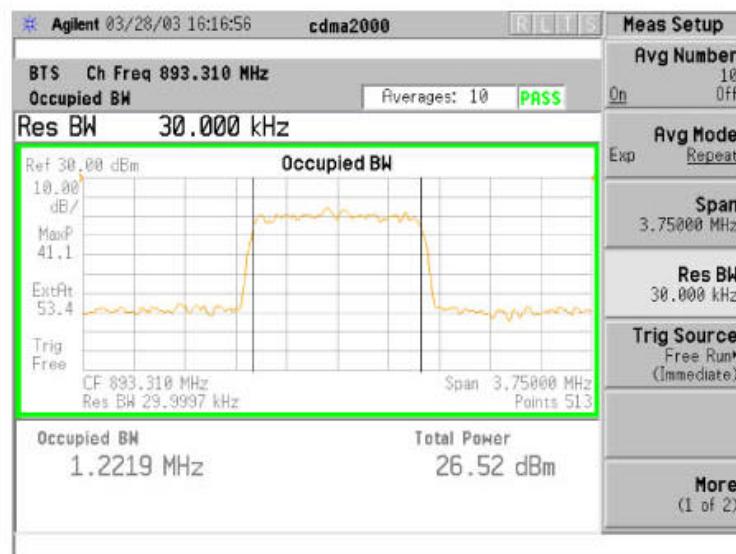
208V AC – Occupied Bandwidth – 400mW



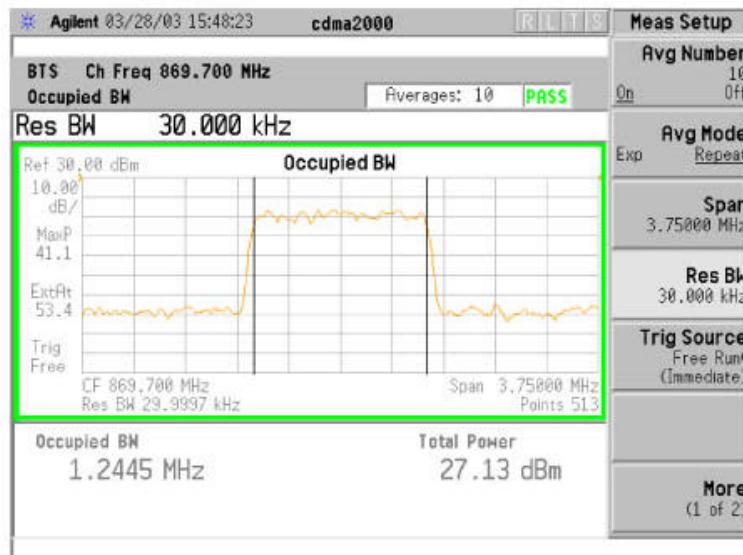
208V AC – Occupied Bandwidth – 90W



27 V DC – Occupied Bandwidth – 400mW

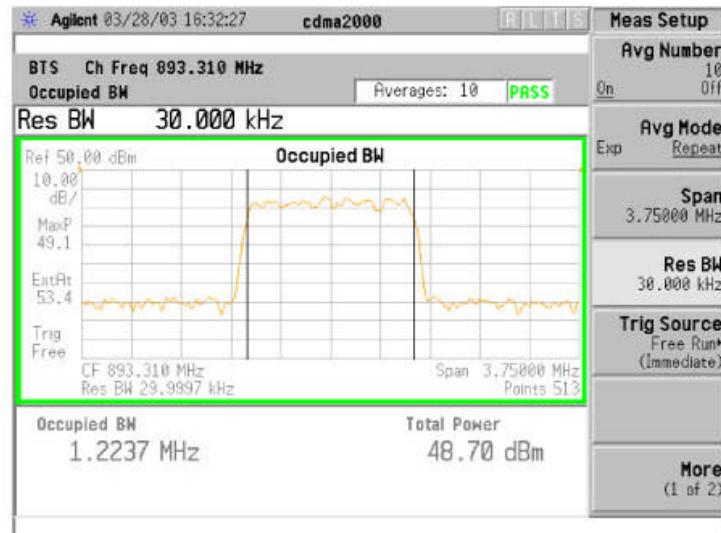


Channel 777 – 893.31 MHz

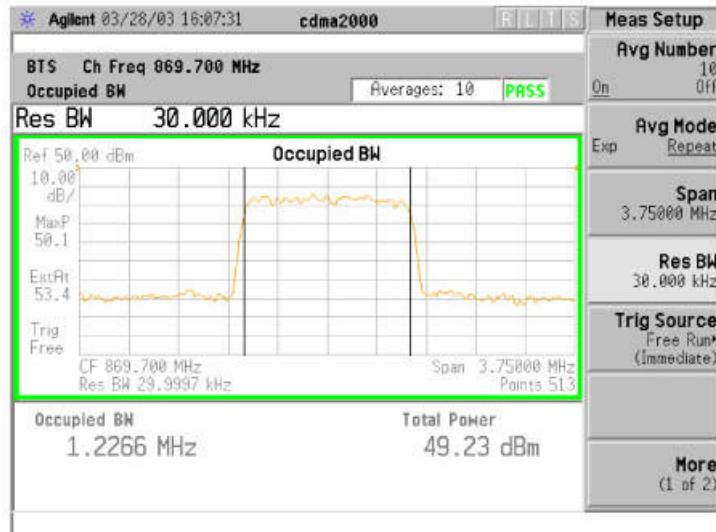


Channel 1013 – 869.7 MHz

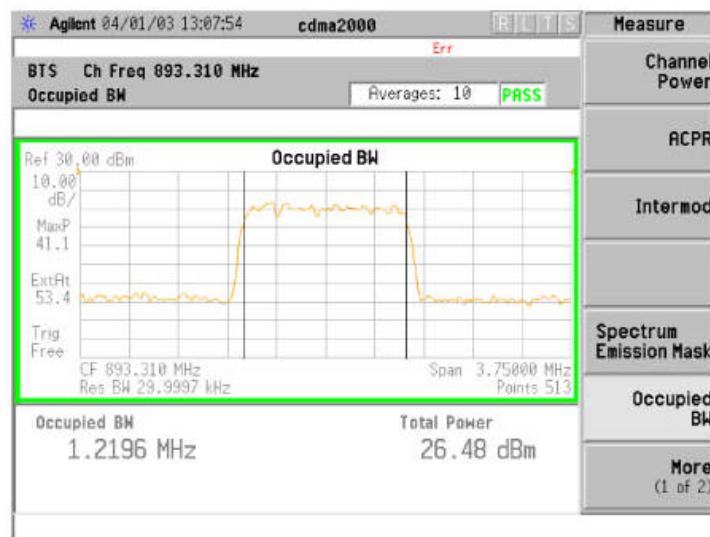
27V DC – Occupied Bandwidth – 90W



Channel 777 – 893.31 MHz



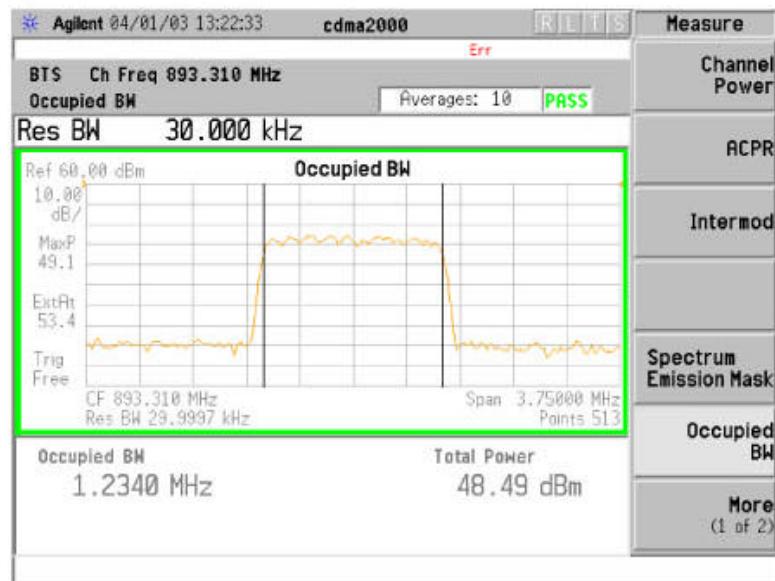
Channel 1013 – 869.7 MHz

-48V DC – Occupied Bandwidth – 400mW

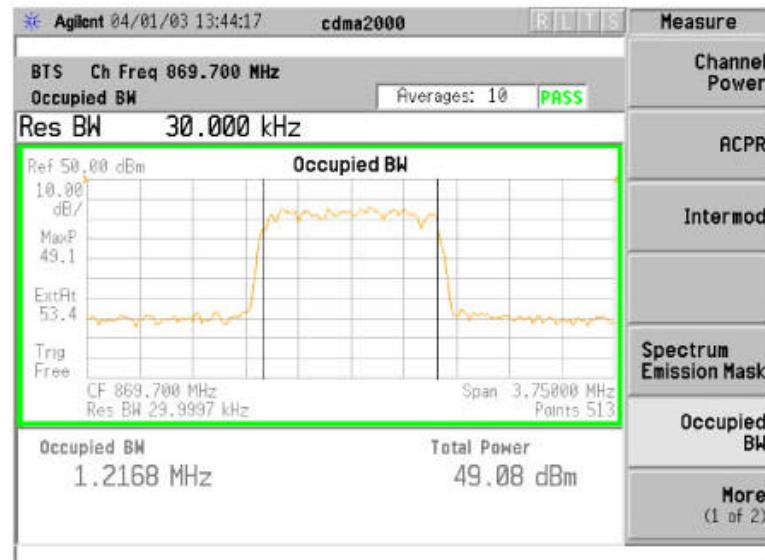
Channel 777 – 893.31 MHz



Channel 1013 – 869.7 MHz

-48V DC – Occupied Bandwidth – 90W

Channel 777 – 893.31 MHz



Channel 1013 – 869.7 MHz

SECTION F

FREQUENCY STABILITY

MODE	27V POWER	WORST CASE ? 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 ? PPM	FCC REQUIREMENT	Pass / Fail
CSM1	-30° to +50° C	<0.2	+/- 1.5 PPM MAX	Pass
CSM2	-30° to +50° C	<0.2	+/- 1.5 PPM MAX	Pass



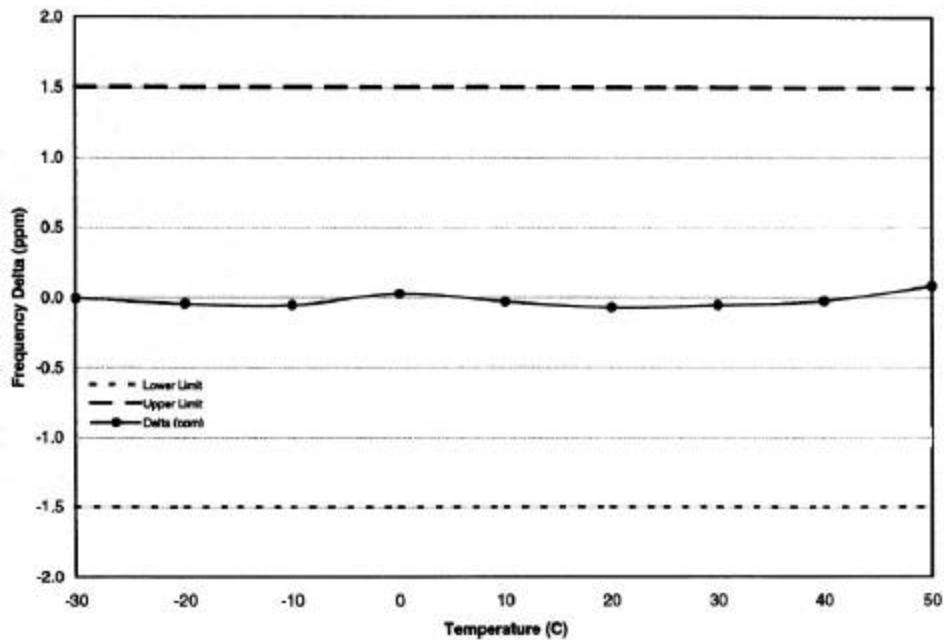
04.01.03

Signature

Date

Terry Schwenk

Frequency Stability Over Temperature - CSM1



Frequency Stability with Varying Supply Voltage - CSM1

