



SC4812T Lite @ 800 MHz CDMA BTS

TEST REPORT EXHIBIT

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Global Telecom Solutions Sector

APPLICANT: MOTOROLA

FCC ID: IHET5DJ1

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

 4-3-03

Signature

Date

Brian Daniel
 Lead EMI Engineer



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


Signature Date

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

 4-3-03

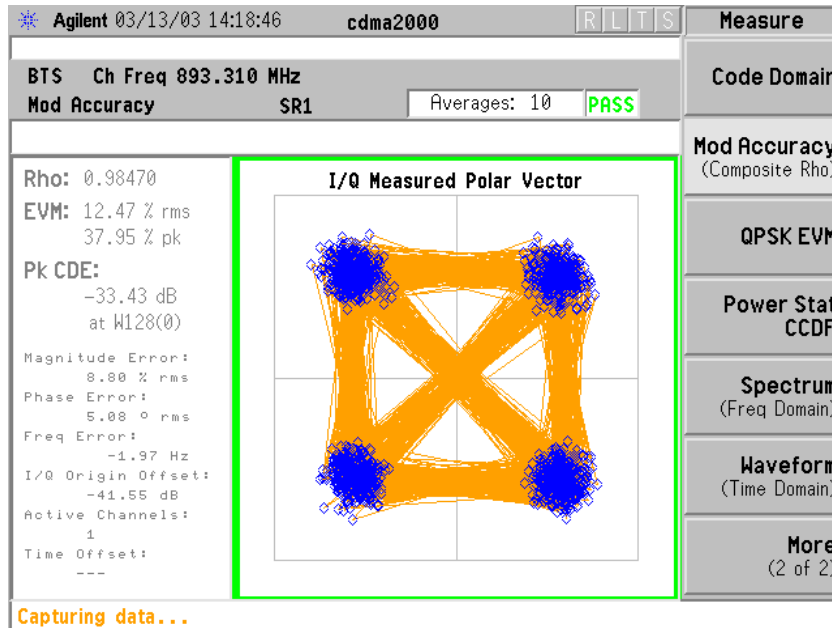
Signature

Date

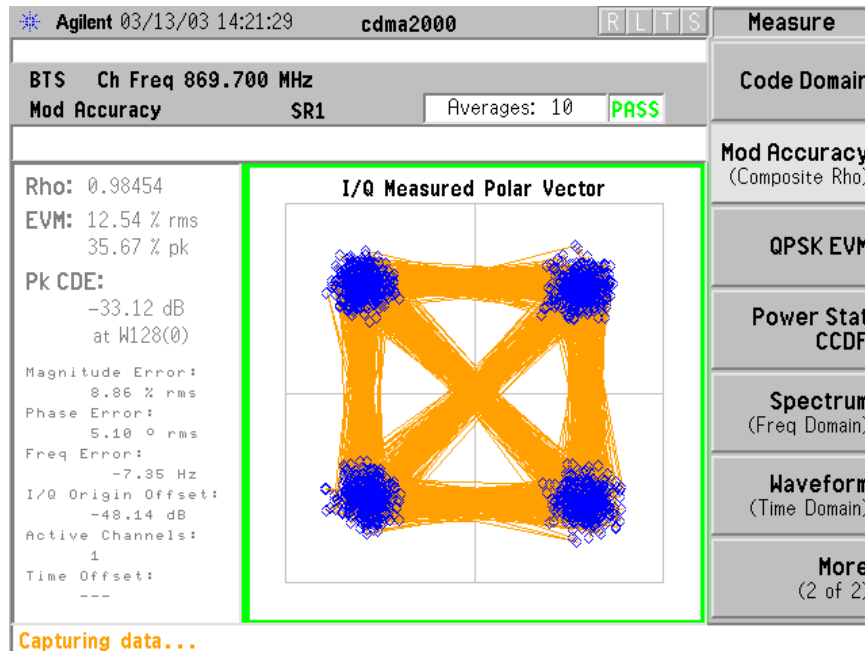
Brian Daniel
Lead EMI Engineer



208V AC – Modulation Characteristics - 400mW



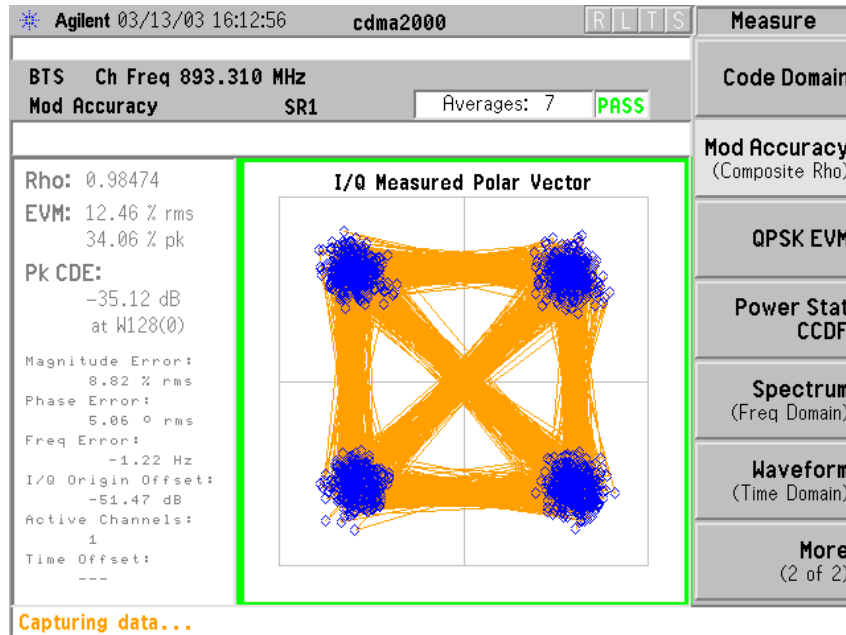
Channel 777 – 893.31 MHz



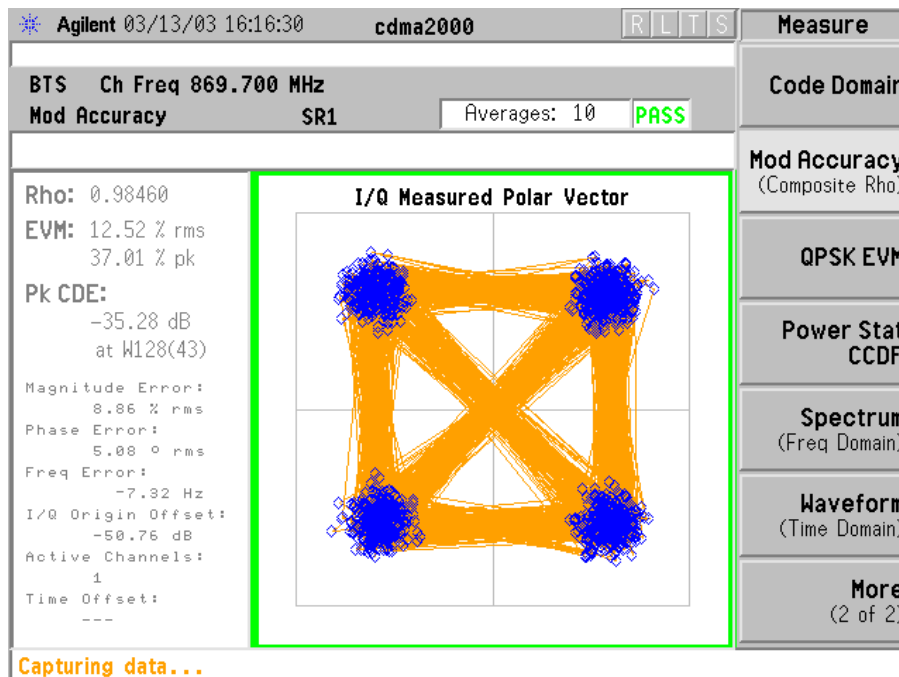
Channel 1013 – 869.7 MHz



208V AC – Modulation Characteristics – 90W

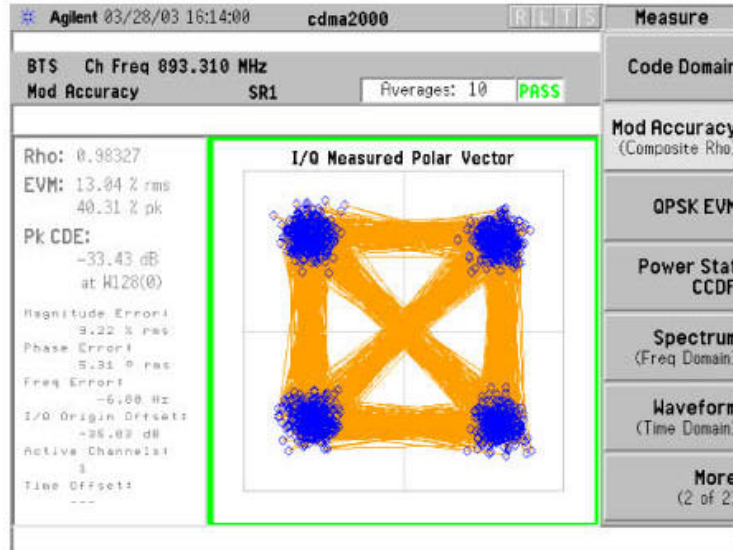


Channel 777 – 893.31 MHz

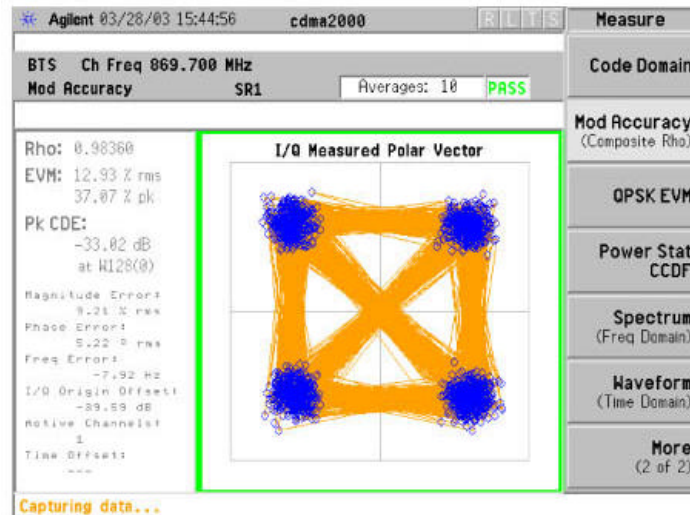


Channel 1013 – 869.7 MHz

27V DC – Modulation Characteristics - 400mW

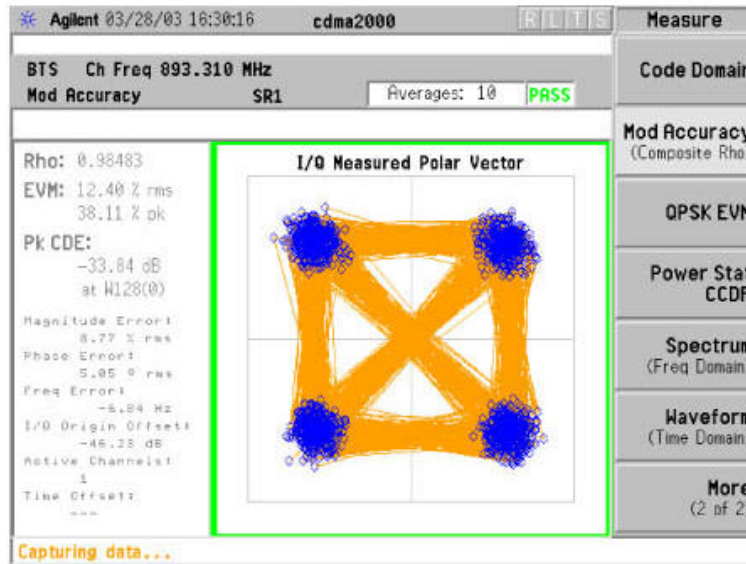


Channel 777 – 893.31 MHz

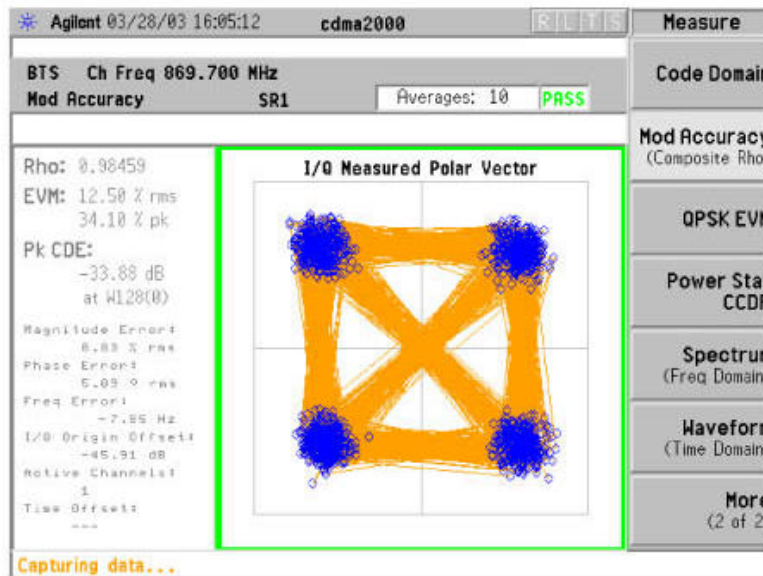


Channel 1013 – 869.7 MHz

27V DC – Modulation Characteristics – 90W

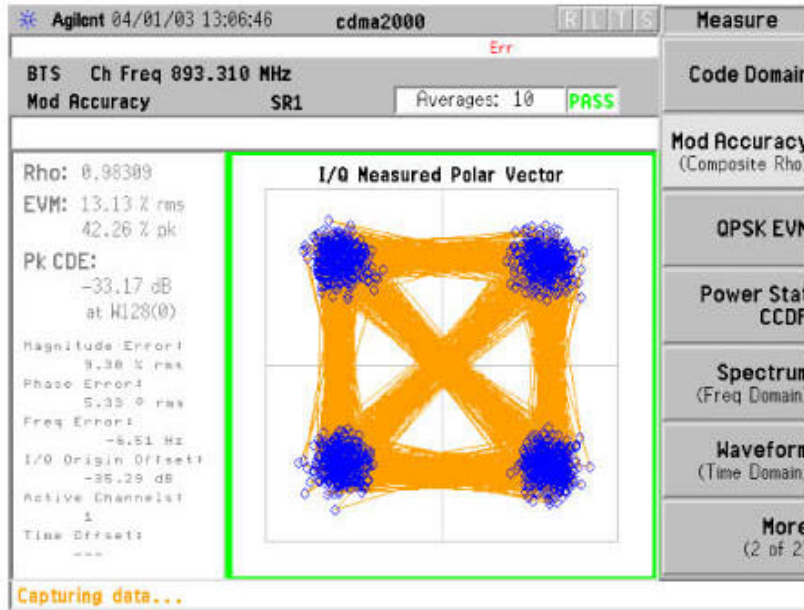


Channel 777 – 893.31 MHz

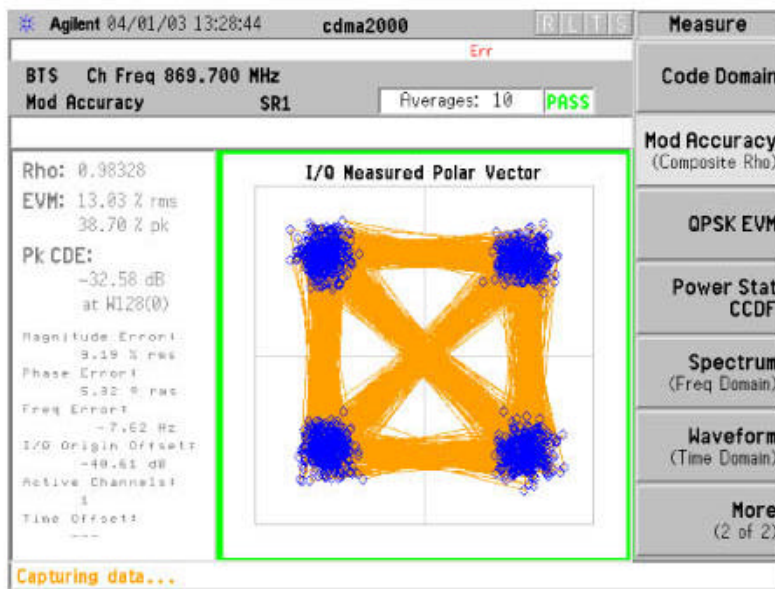


Channel 1013 – 869.7 MHz

-48V DC – Modulation Characteristics - 400mW

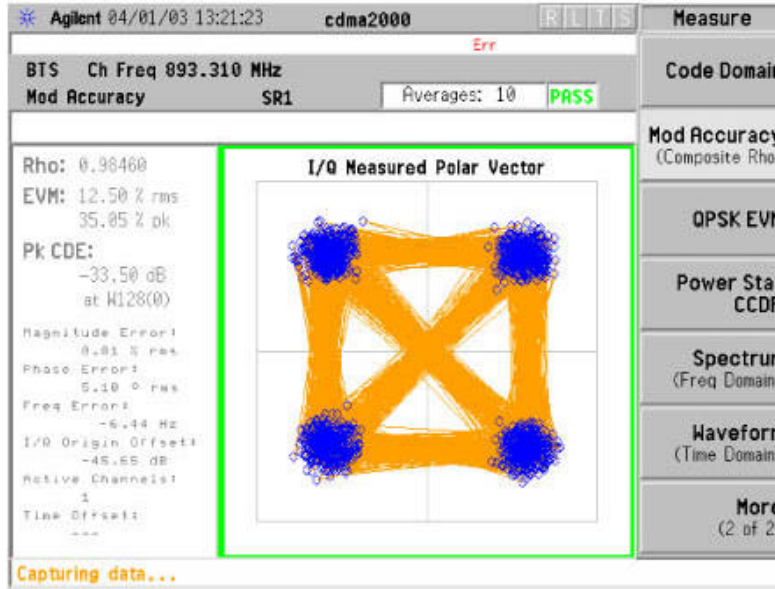


Channel 777 – 893.31 MHz

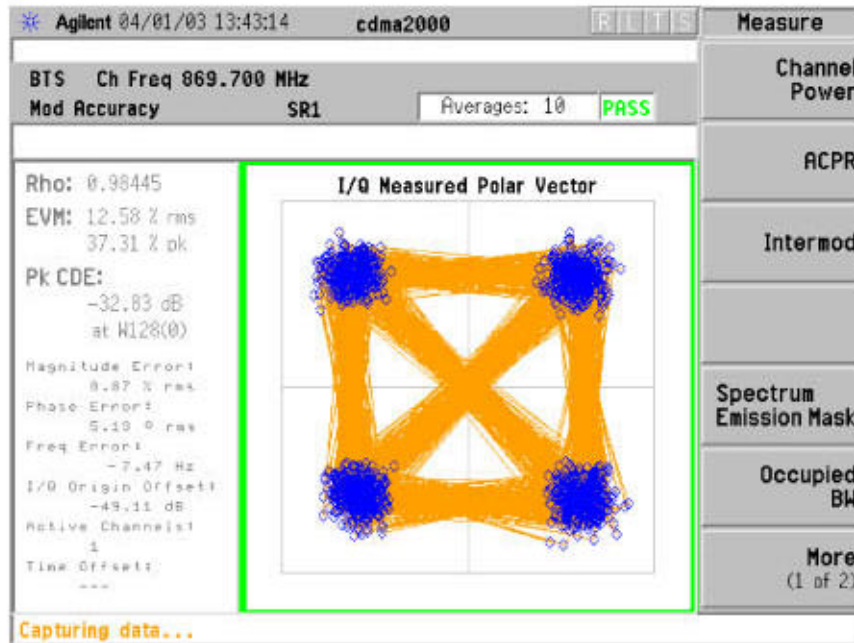


Channel 1013 – 869.7 MHz

-48V DC – Modulation Characteristics – 90W



Channel 777 – 893.31 MHz



Channel 1013 – 869.7 MHz



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APPLICANT: MOTOROLA

FCC ID: IHET5DJ1

Section C

Spurious and Harmonic Emissions Radiated



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:

$$(dBuV/M) + 9.542 - 104.77 = dBm$$

Converting dBuV/M to dBm at 10 meters:

$$(dBuV/M) + 20 - 104.77 = dBm$$

 4-3-03

Signature

Date

Brian Daniel
Lead EMI Engineer



Global Telecom Solutions Sector

APPLICANT: MOTOROLA

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Section C

Spurious and Harmonic Emissions Conducted



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

 4-3-03

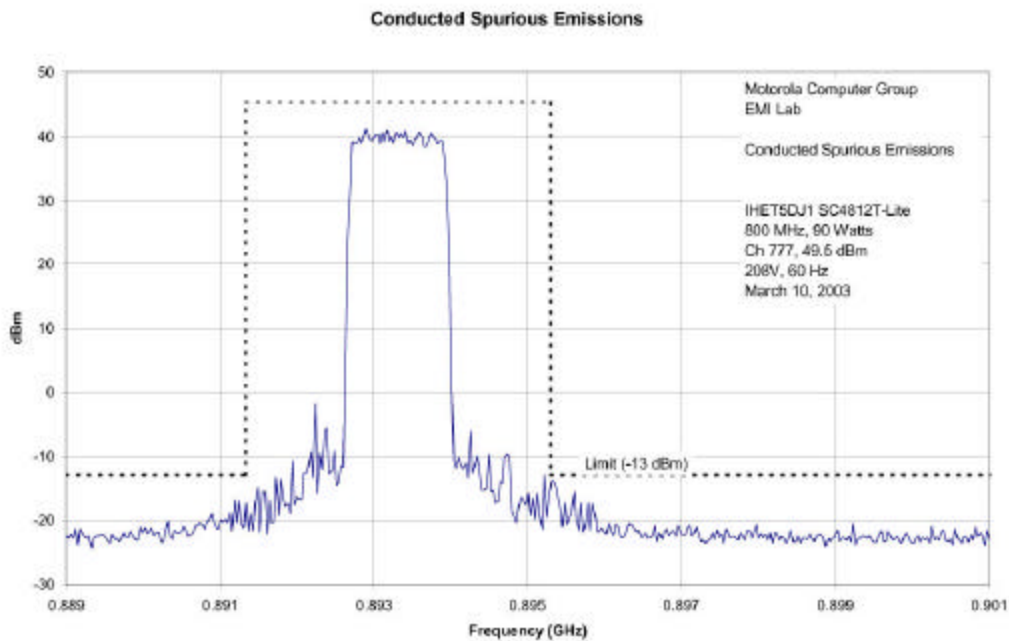
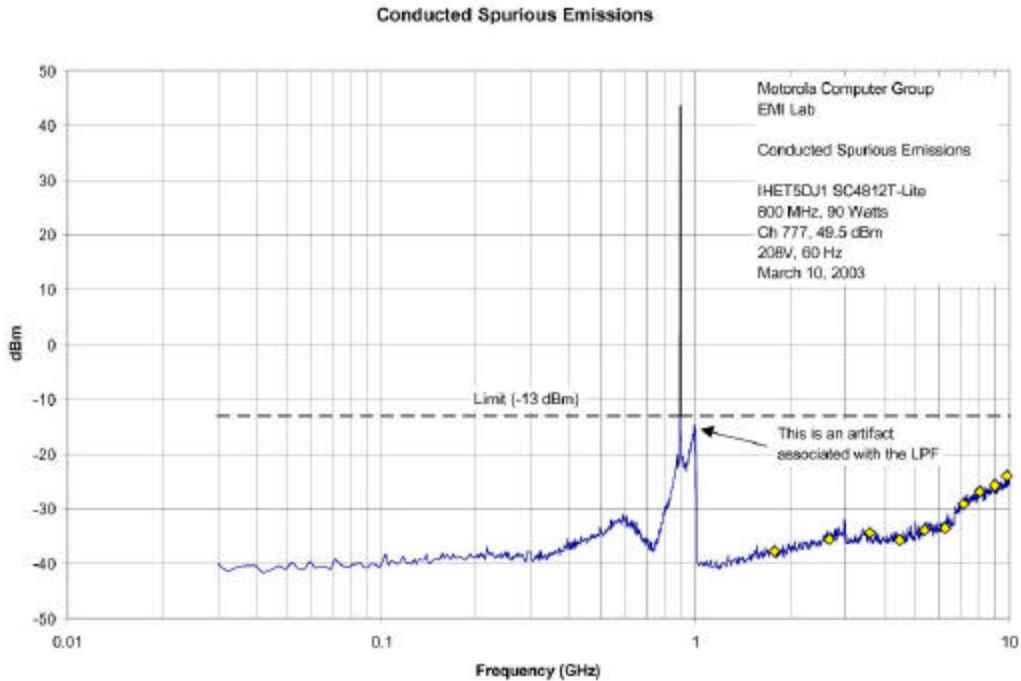
Signature

Date

Brian Daniel
Lead EMI Engineer



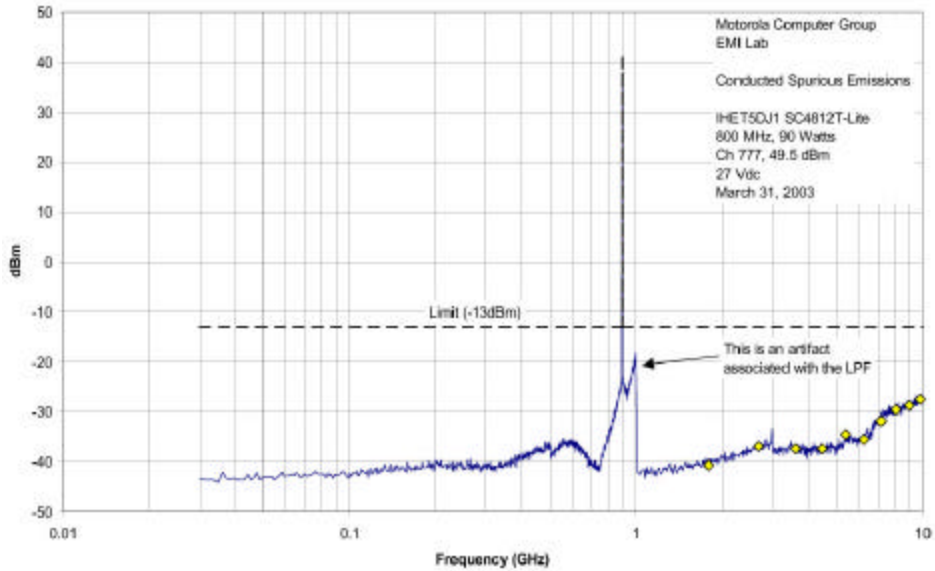
Spurious and Harmonic Emissions Conducted CDMA Channel 777 – Maximum Power – 208V AC



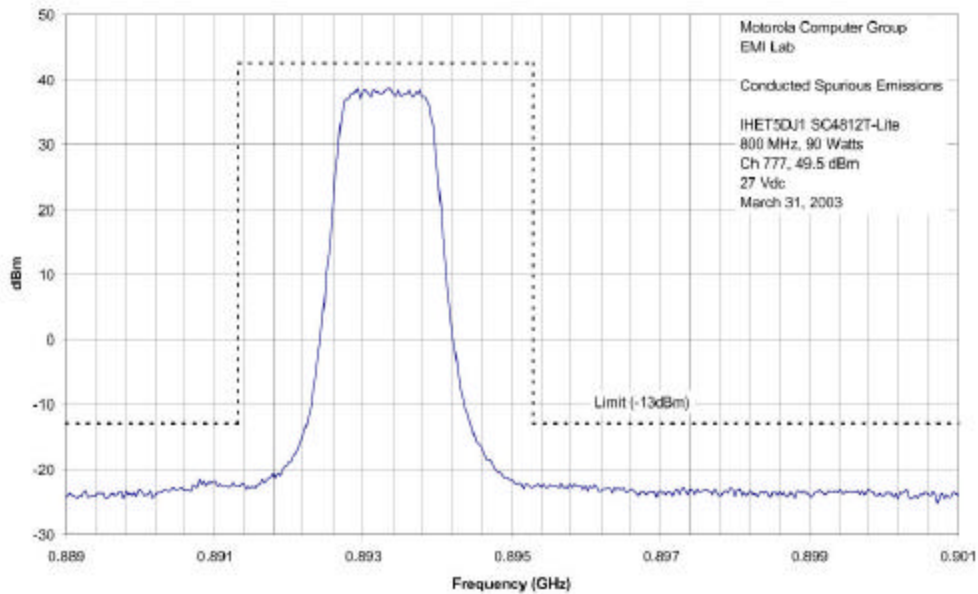


Spurious and Harmonic Emissions Conducted CDMA Channel 777 – Maximum Power – 27V DC

27VDC Conducted Spurious Emissions



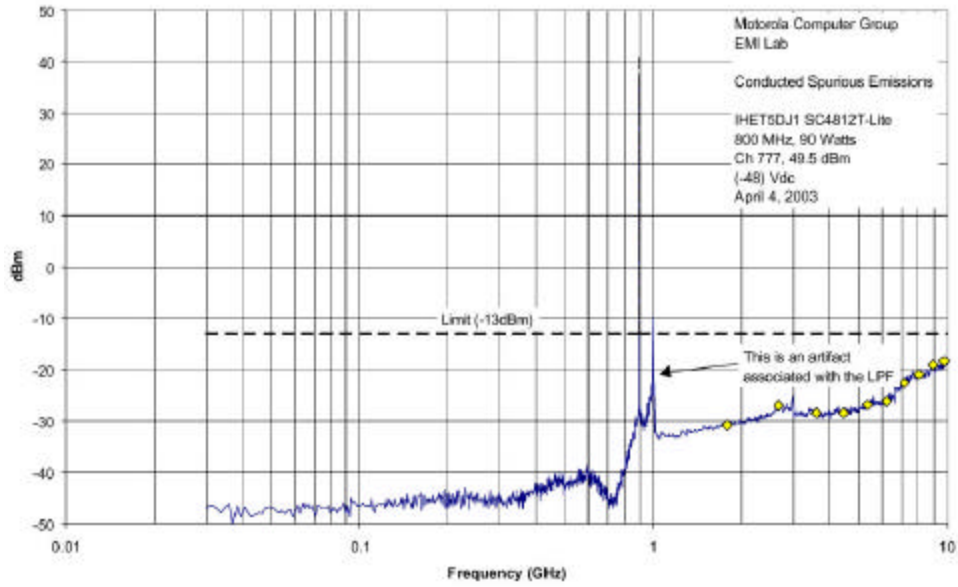
27 VDC Conducted Spurious Emissions



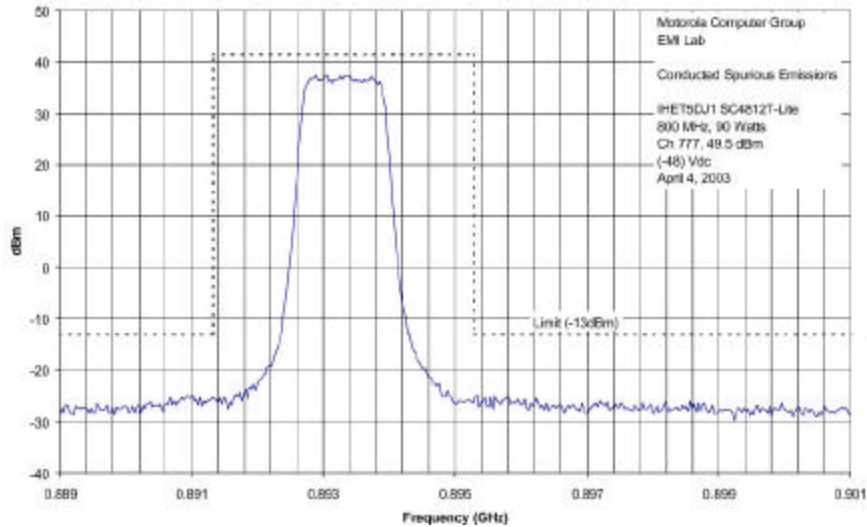


Spurious and Harmonic Emissions Conducted CDMA Channel 777 – Maximum Power – -48V DC

(-48) VDC Conducted Spurious Emissions

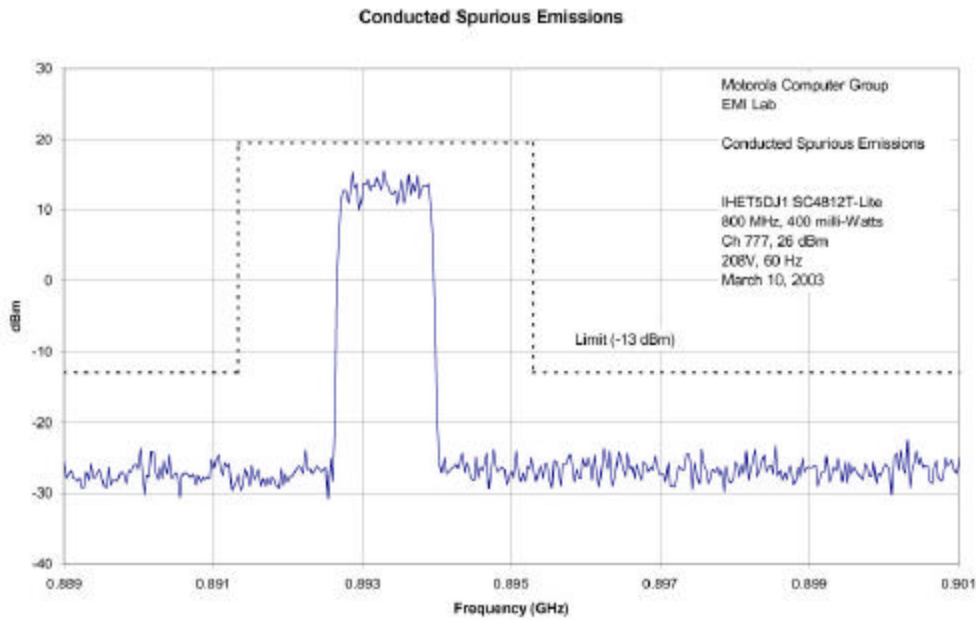
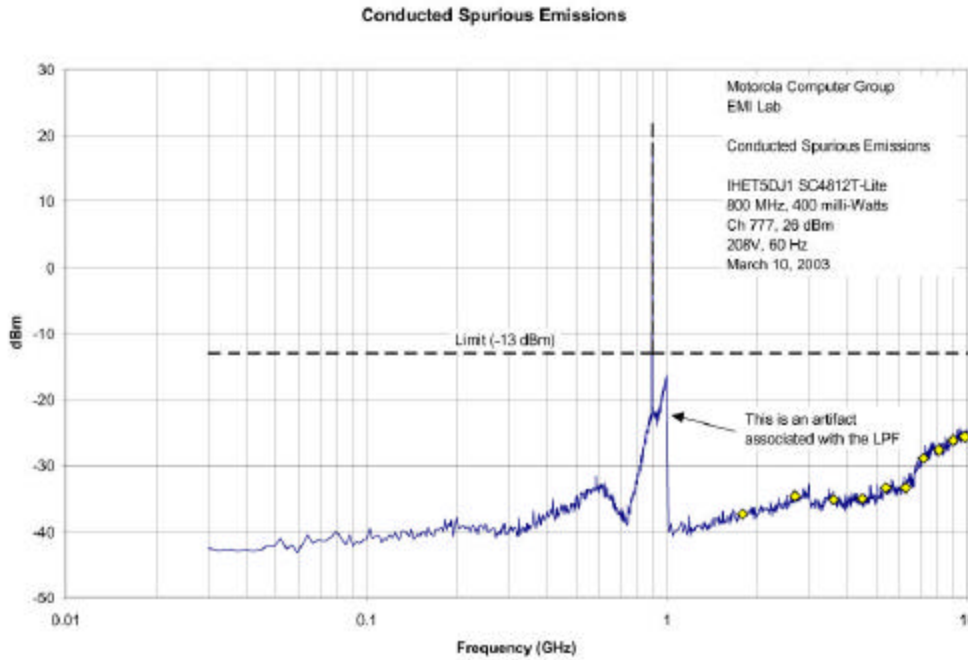


(-48) VDC Conducted Spurious Emissions



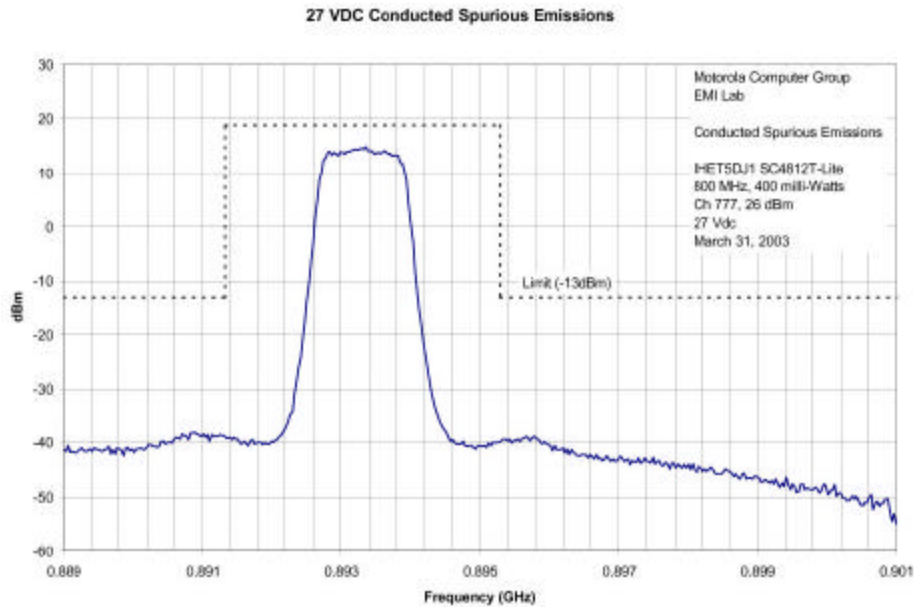
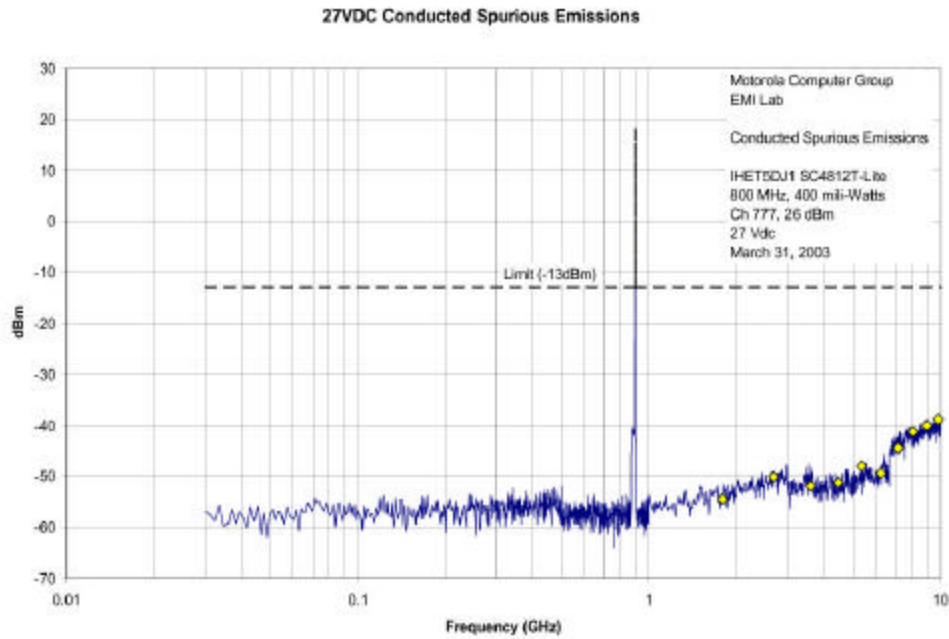


Spurious and Harmonic Emissions Conducted CDMA Channel 777 – Minimum Power – 208V AC





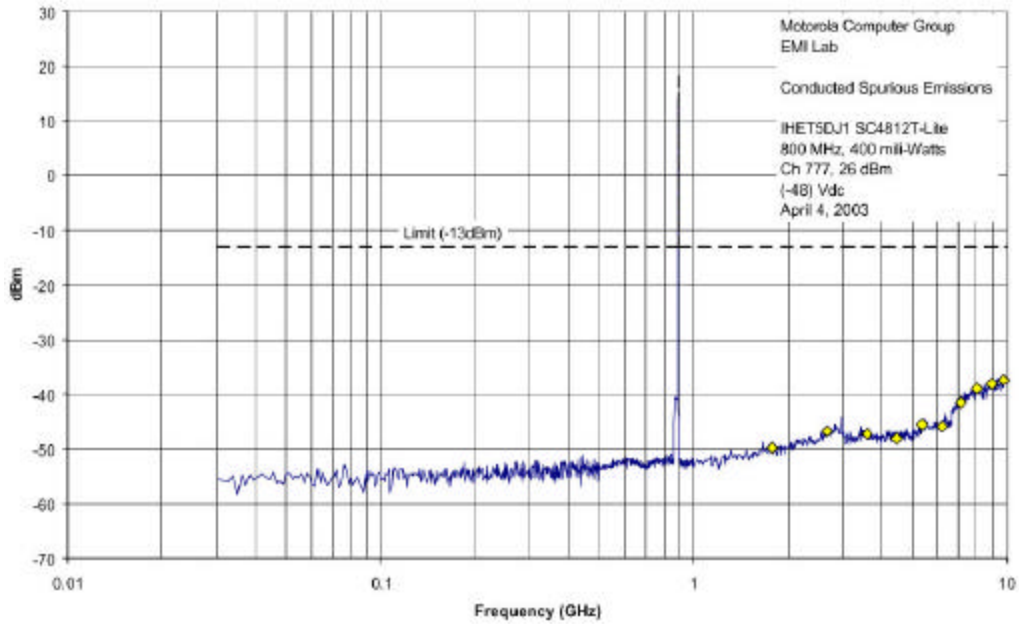
Spurious and Harmonic Emissions Conducted CDMA Channel 777 – Minimum Power – 27V DC



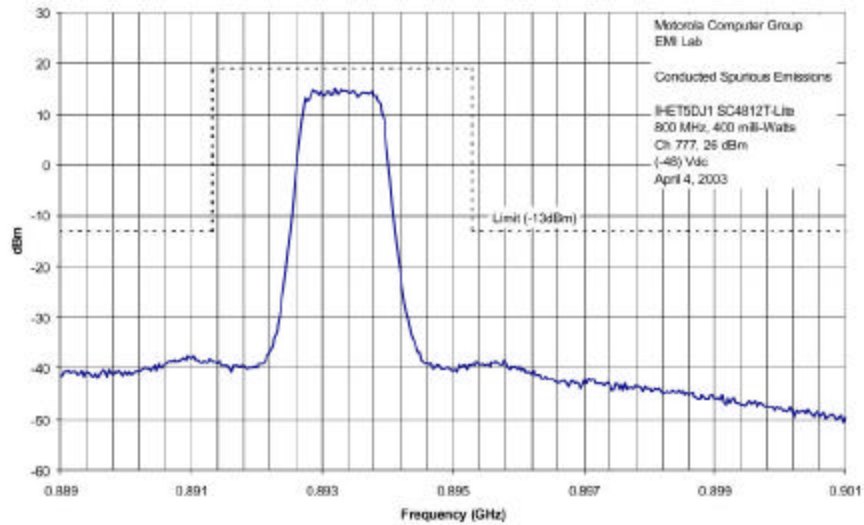


Spurious and Harmonic Emissions Conducted CDMA Channel 777 – Minimum Power – -48V DC

(-48) VDC Conducted Spurious Emissions

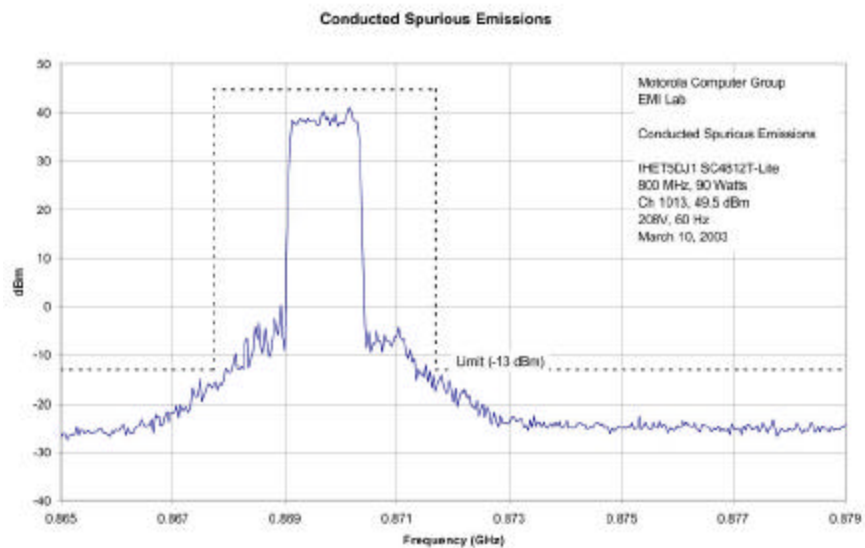
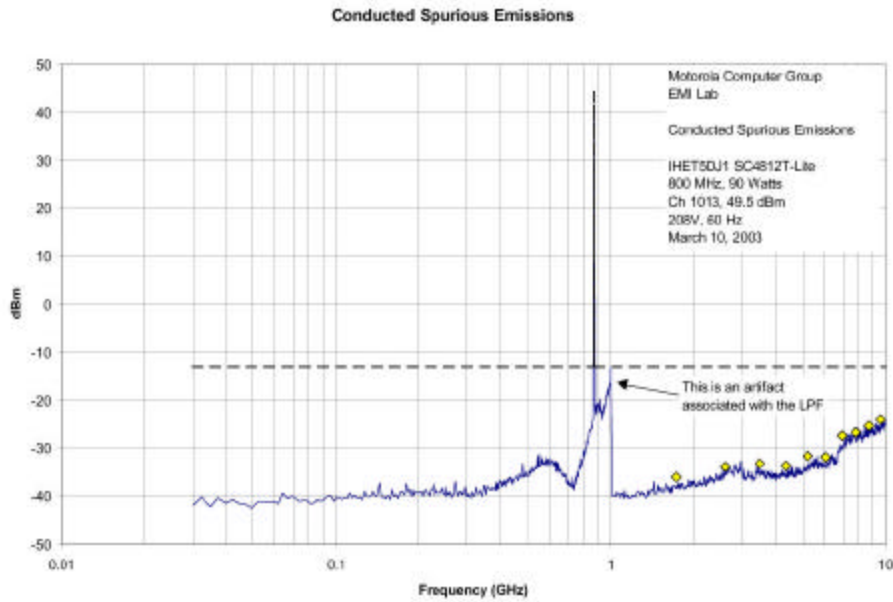


(-48) VDC Conducted Spurious Emissions



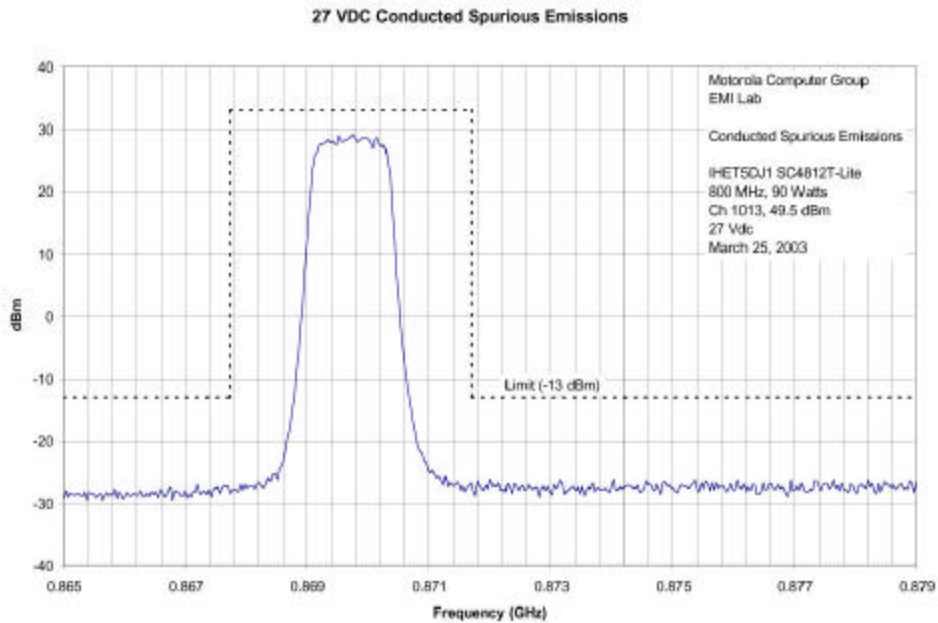
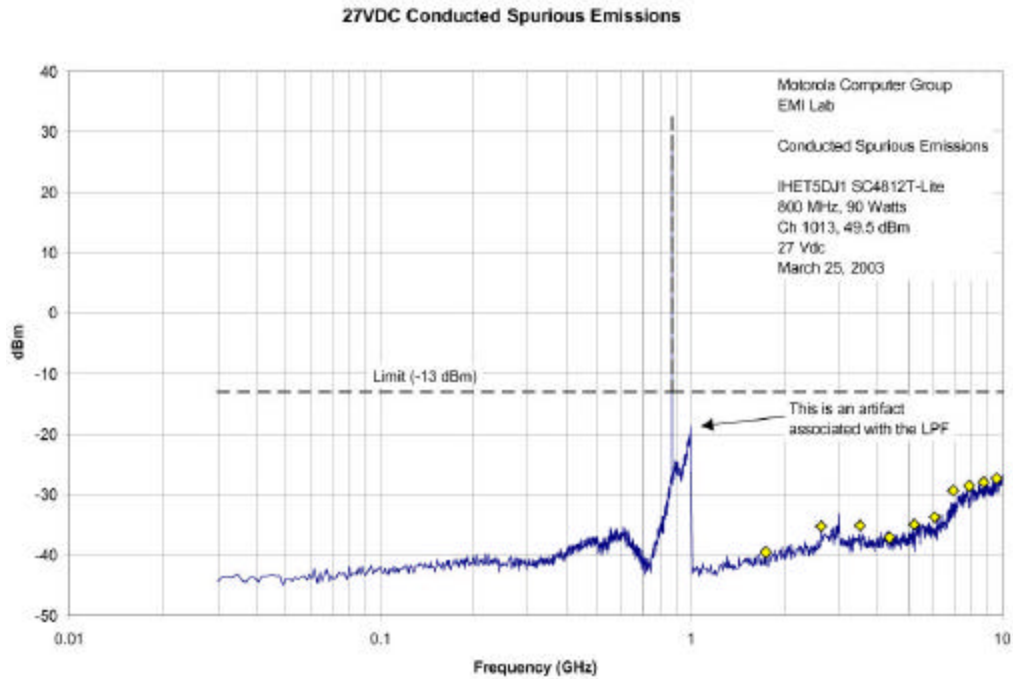


Spurious and Harmonic Emissions Conducted CDMA Channel 1013 – Maximum Power – 208V AC



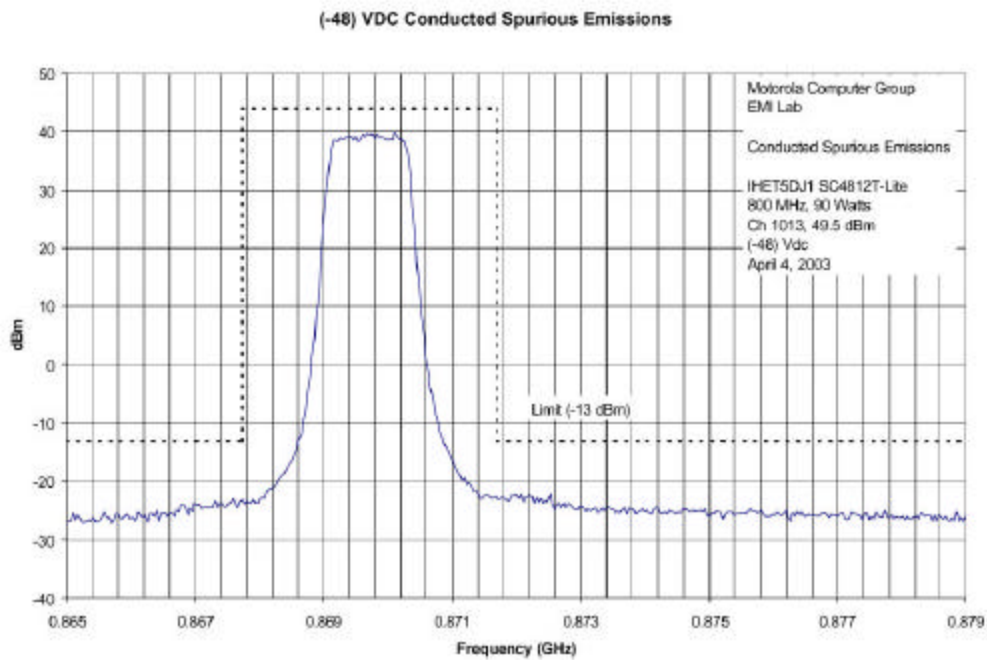
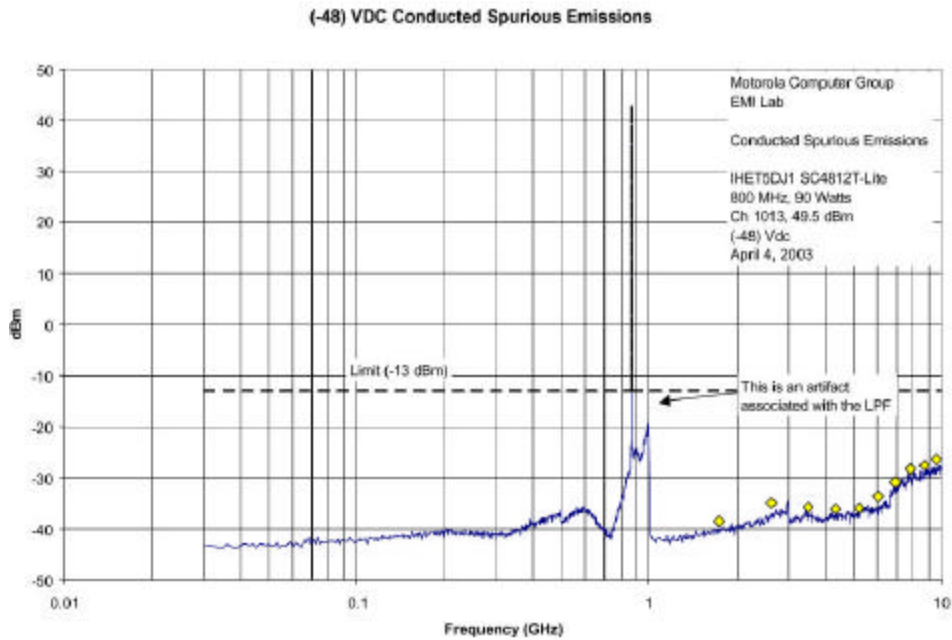


Spurious and Harmonic Emissions Conducted CDMA Channel 1013 – Maximum Power – 27V DC



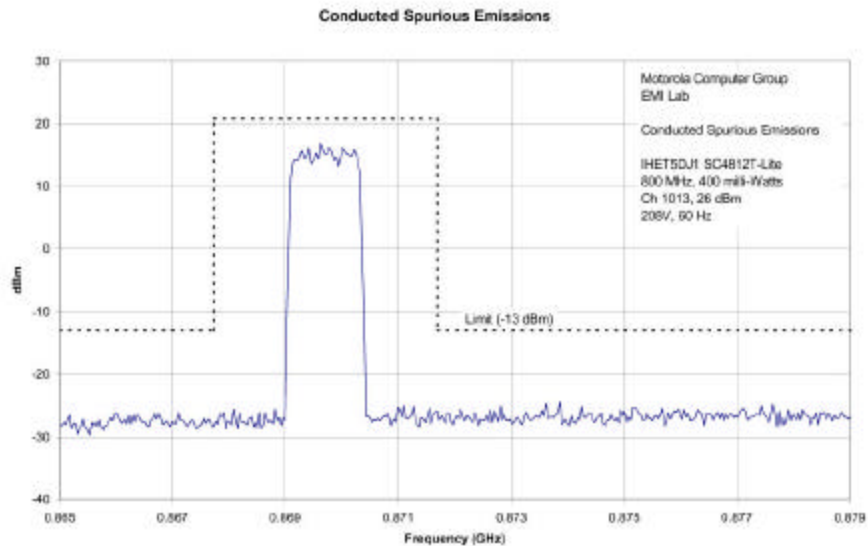
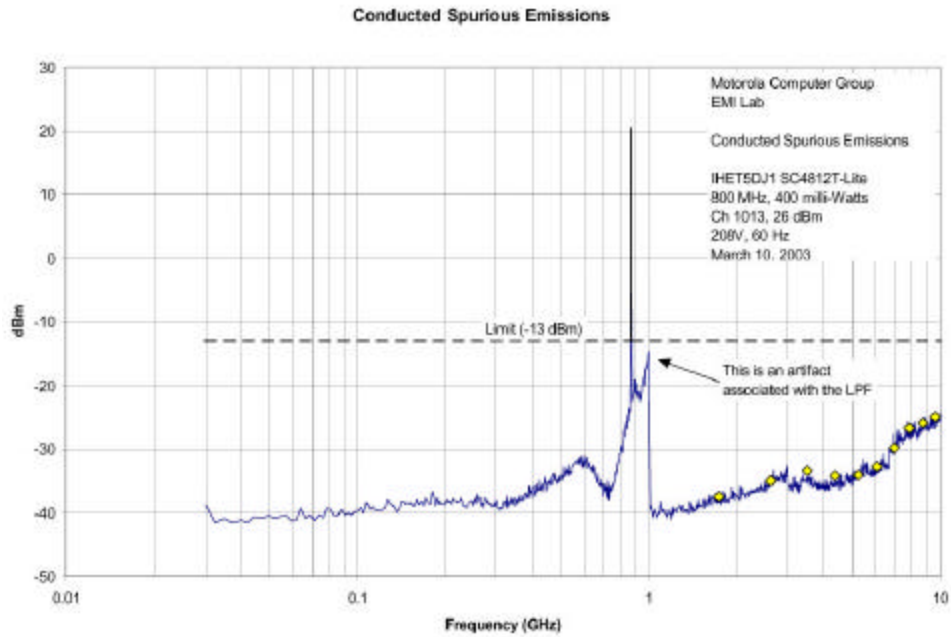


Spurious and Harmonic Emissions Conducted CDMA Channel 1013 – Maximum Power – -48V DC



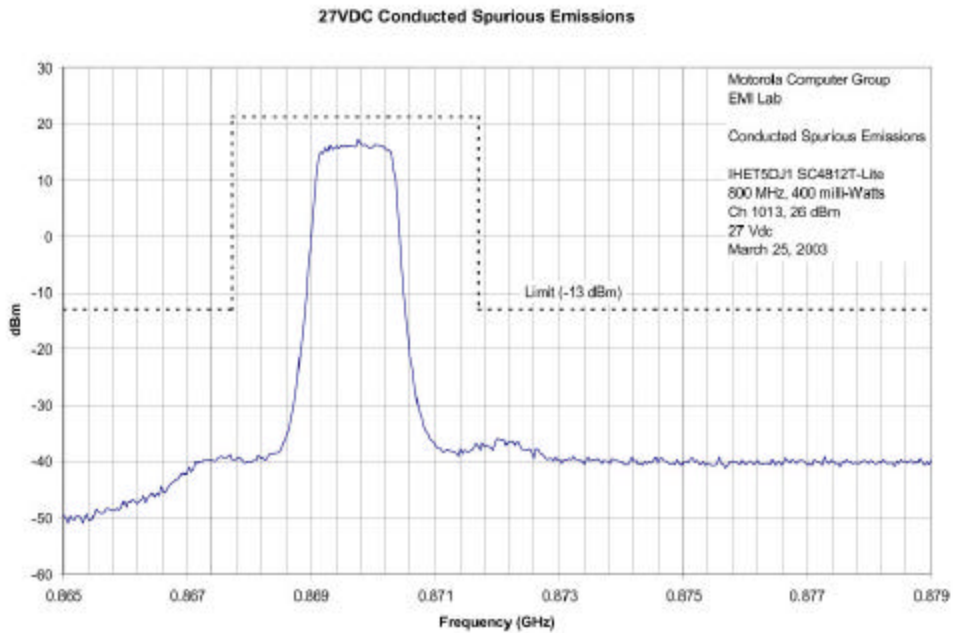
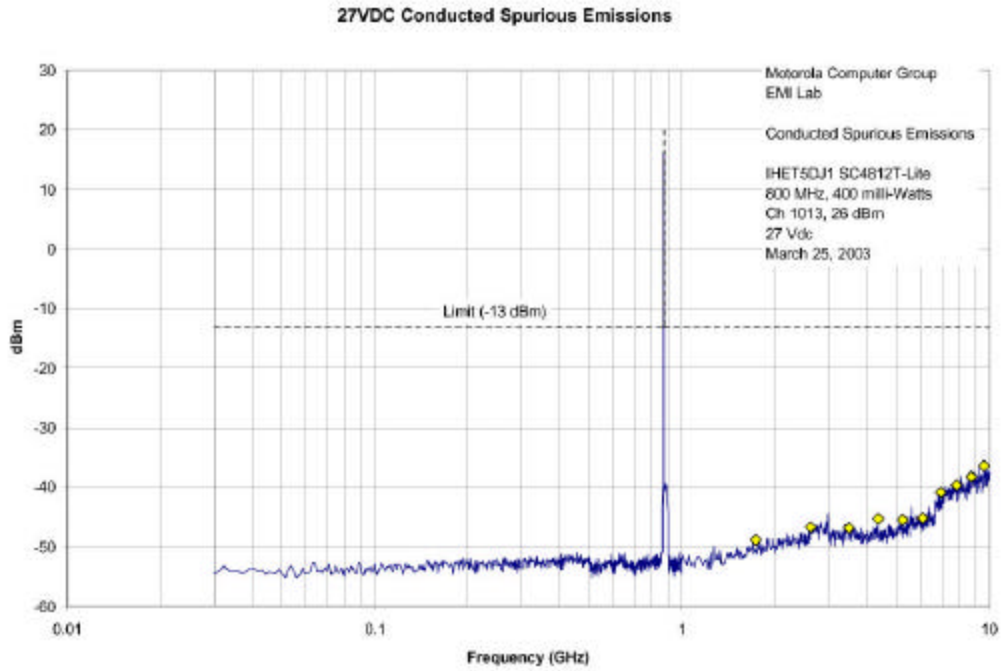


Spurious and Harmonic Emissions Conducted CDMA Channel 1013 – Minimum Power – 208V AC



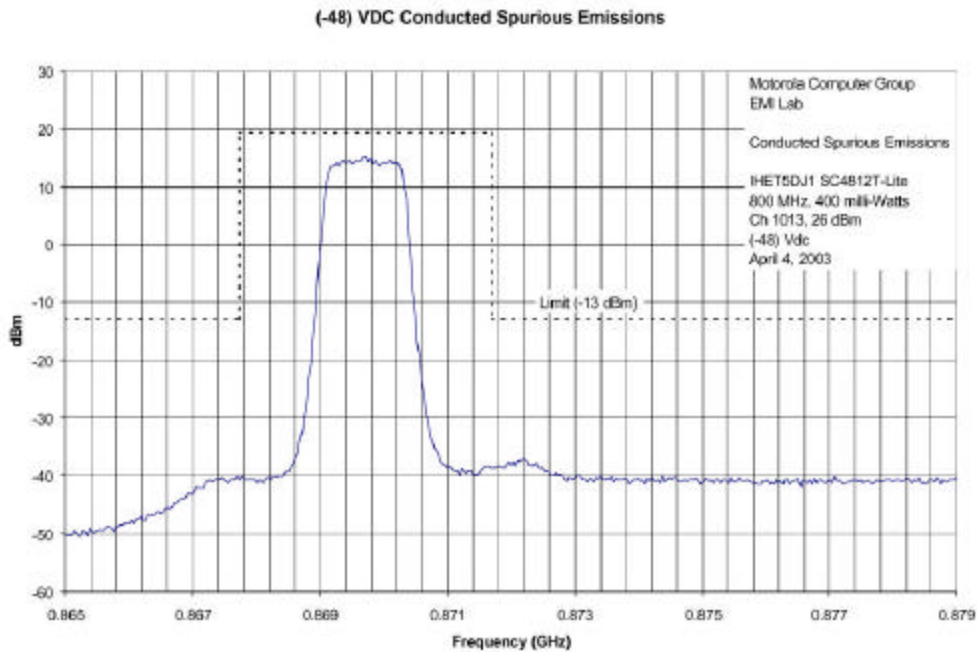
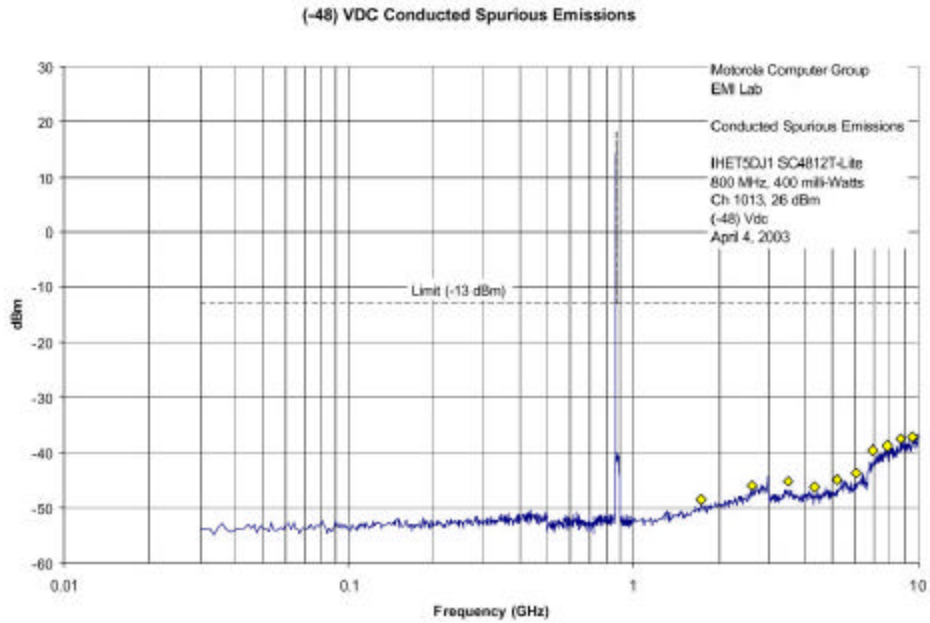


Spurious and Harmonic Emissions Conducted CDMA Channel 1013 – Minimum Power – 27V DC





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:

$$\text{Power (measured in 30 kHz bandwidth)} + 10 \log (1.2288 \text{ MHz} / 30 \text{ kHz})$$

Example: $23.88 \text{ dBm} + 16.12 \text{ dB} = 40.0 \text{ dBm}$

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

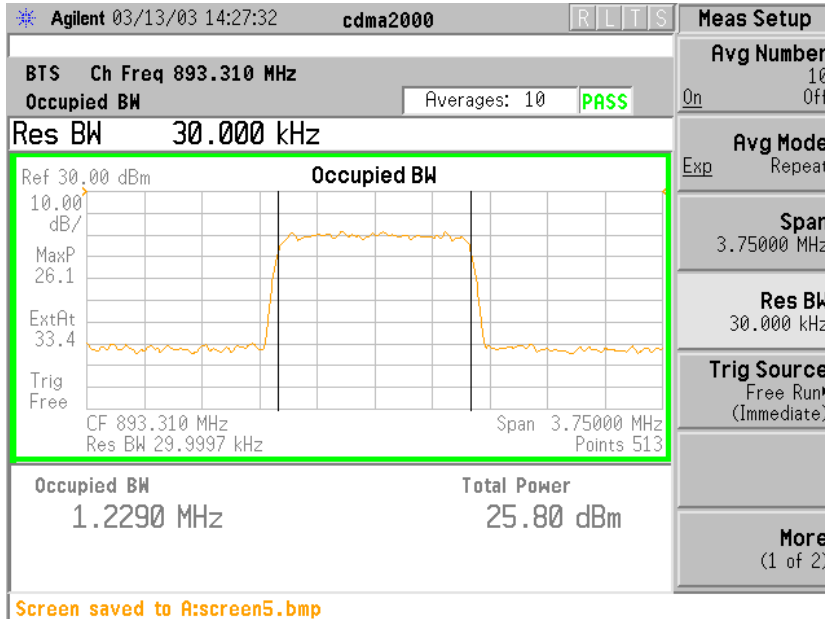
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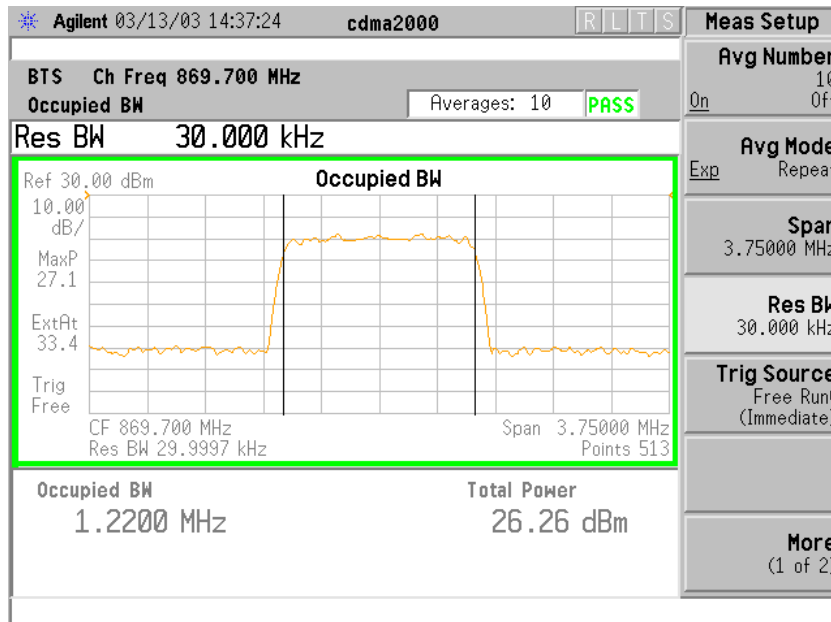
Brian Daniel
Lead EMI Engineer



208V AC – Occupied Bandwidth – 400mW



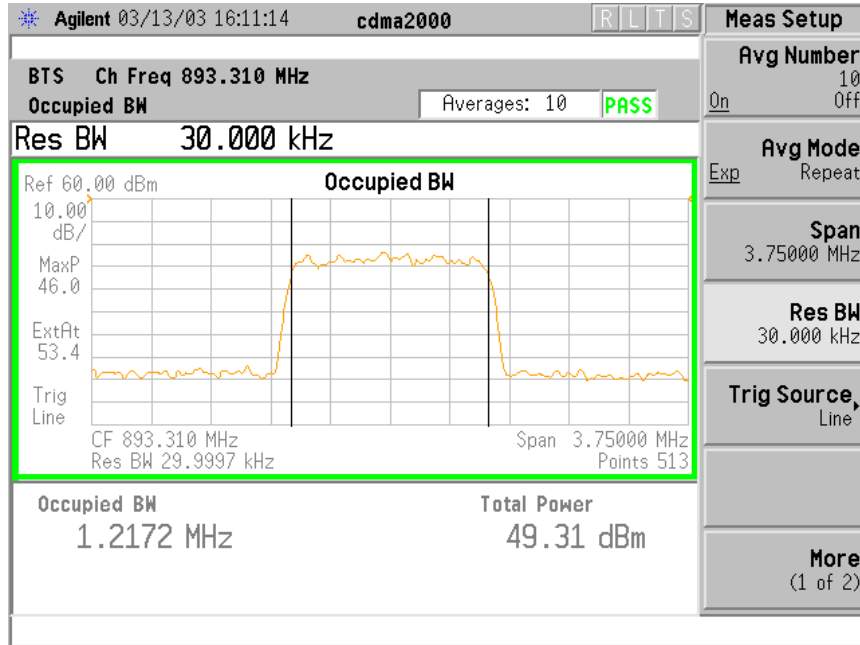
Channel 777 – 893.31 MHz



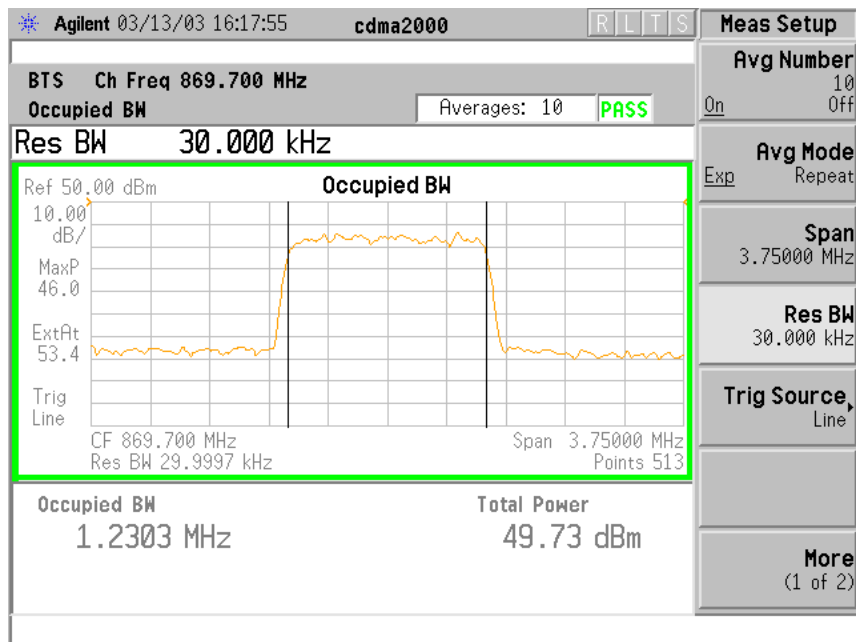
Channel 1013 – 869.7 MHz



208V AC – Occupied Bandwidth – 90W



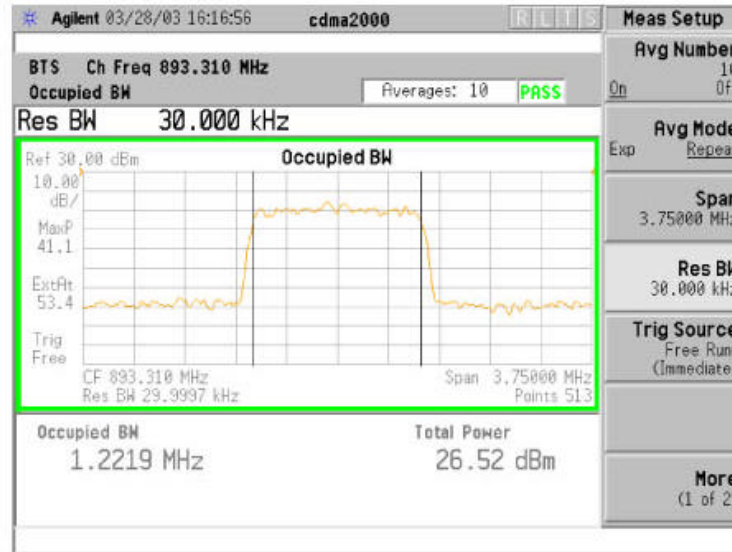
Channel 777 – 893.31 MHz



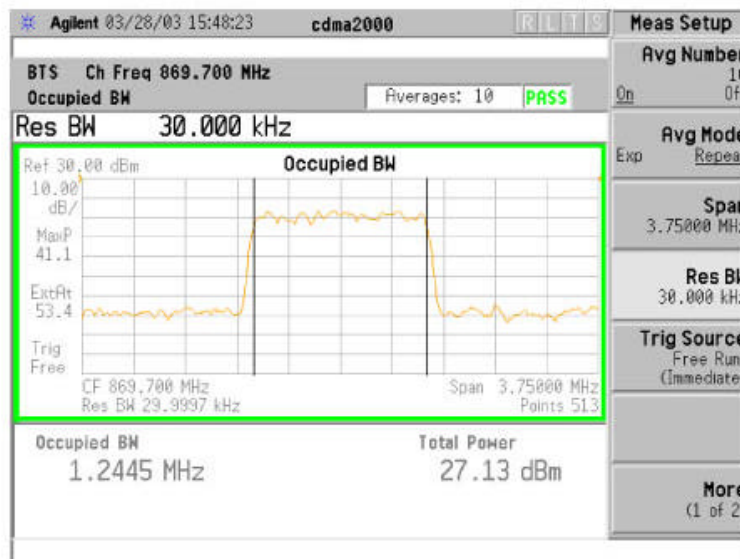
Channel 1013 – 869.7 MHz



27 V DC – Occupied Bandwidth – 400mW



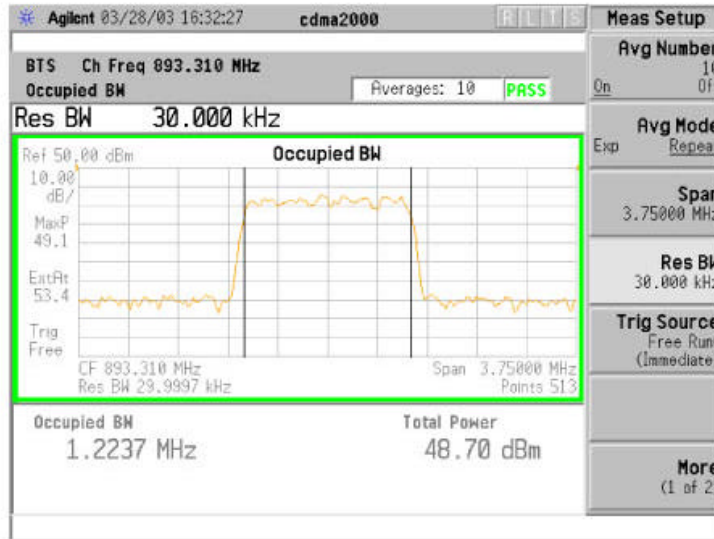
Channel 777 – 893.31 MHz



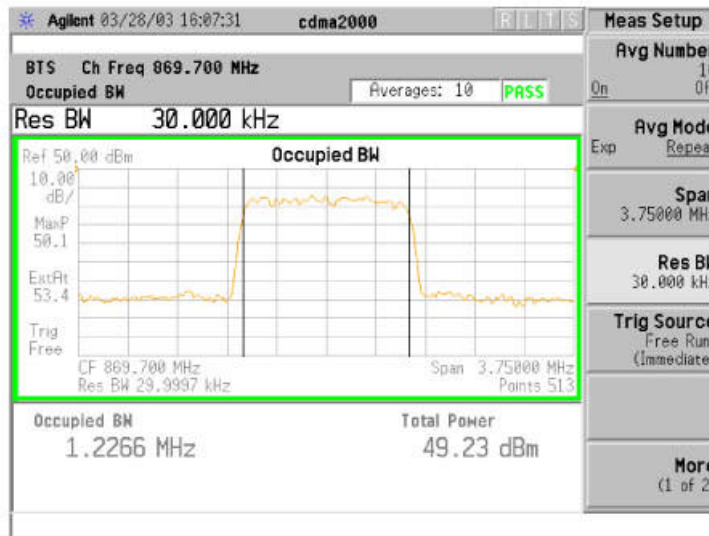
Channel 1013 – 869.7 MHz



27V DC – Occupied Bandwidth – 90W



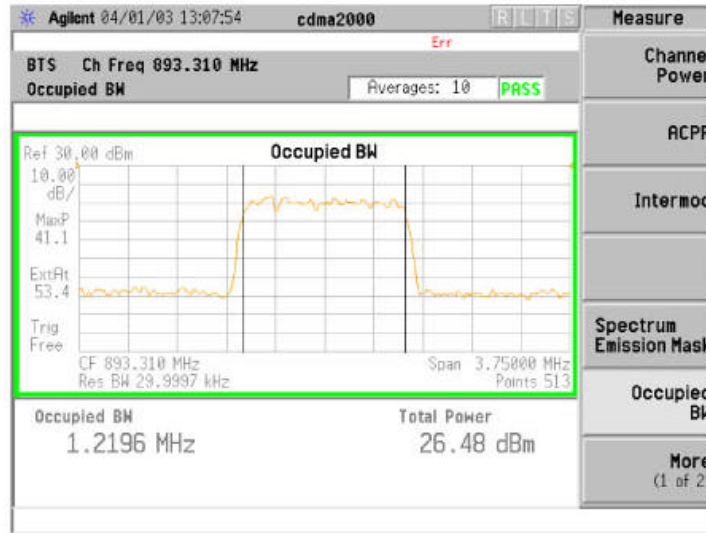
Channel 777 – 893.31 MHz



Channel 1013 – 869.7 MHz



-48V DC – Occupied Bandwidth – 400mW



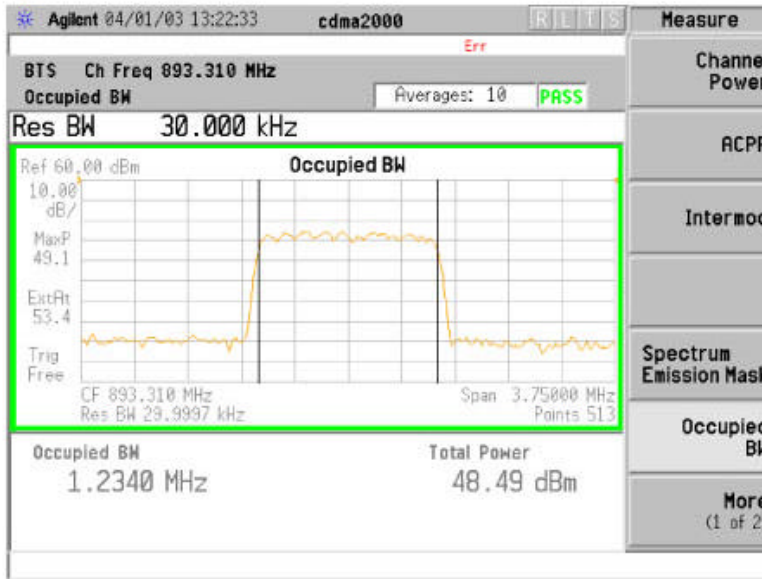
Channel 777 – 893.31 MHz



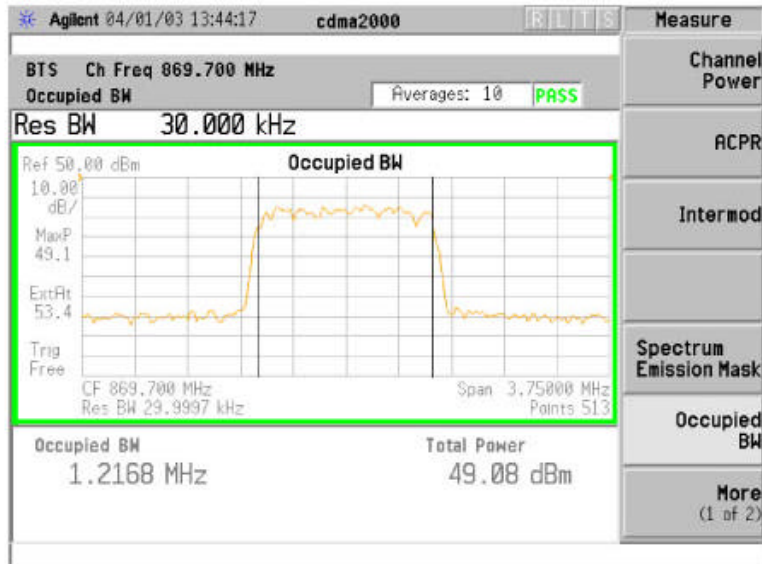
Channel 1013 – 869.7 MHz



-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

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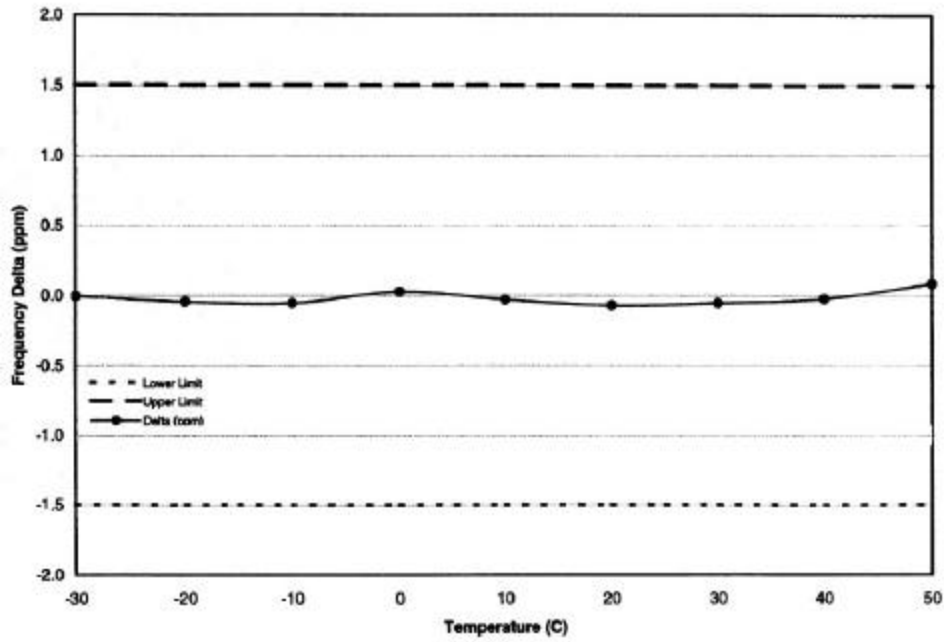
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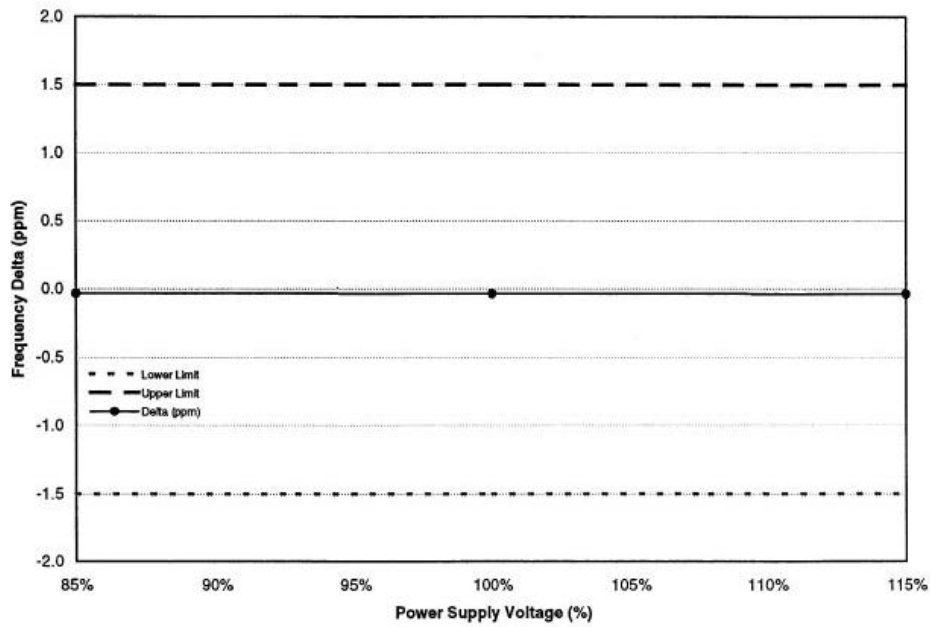
Terry Schwenk



Frequency Stability Over Temperature - CSM1

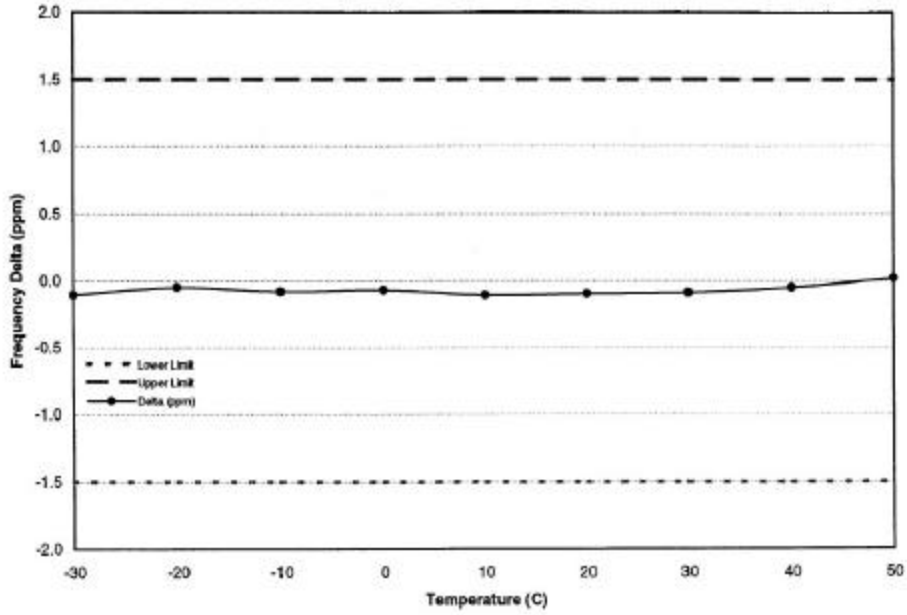


Frequency Stability with Varying Supply Voltage - CSM1





Frequency Stability Over Temperature - CSM2



Frequency Stability with Varying Supply Voltage - CSM2

