Engineering and Testing for EMC and Safety Compliance

CLASS II PERMISSIVE CHANGE REPORT

Ericsson Inc.

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MODEL: CM-42 Dual Band/Dual Mode
800/1900 MHz AMPS/CDMA2000 Module

FCC ID: AXATR-423-A2

July 12, 2004

STANDARDS REFERENCED FOR THIS REPORT	
PART 2: 2003	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS
PART 15: 2003	RADIO FREQUENCY DEVICES - §15.109: RADIATED EMISSIONS LIMITS
PART 22: 2002	Public Mobile Services: Subpart H – Cellular Radiotelephone Services
PART 24: 2002	Personal Communications Services: Subpart E – Broadband PCS
ANSI C63.4-2001	AMERICAN NATIONAL STANDARD FOR METHODS OF MEASUREMENT OF RADIO NOISE EMISSIONS FROM LOW -VOLTAGE ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE OF 9 KHZ – 40 GHZ
RSS-129; Issue 6; 1999	800 MHz Dual Mode CDMA Cellular Telephones

Frequency Range (MHz)	Maximum Measured Output Power (W) Conducted	Measured Frequency Tolerance (ppm)	Emission Designator
824-849 AMPS Mode	2.773	2.5	40K0F1D, 40K0F8W
824-849 CDMA Cellular Mode	0.296	2.5	1M23F9W
1850-1910 CDMA PCS Mode	0.286	2.5	1M23F9W

REPORT PREPARED BY TEST ENGINEER: DAN BIGGS

Document Number: 2004060/ QRTL04-105

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1 GENERAL INFORMATION

The following report of a Class II Permissive Change is prepared on behalf of **Ericsson, Inc**. in accordance with the Federal Communications Commission and Industry Canada Rules and Regulations. The Equipment Under Test (EUT) was the **CM-42; FCC ID: AXATR-423-A2**. The test results reported in this document relate only to the item that was tested.

FCC Rules Part 22.901: The rules in this subpart govern the licensing and operation of cellular radiotelephone systems.

FCC Rules Part 24 (E): The rules in this subpart govern Personal Communications Services – Broadband PCS.

IC RSS-129: This Radio Standards Specification (RSS) and the TIA/EIA-627 Compatibility Standard referred to in section 3.10 set out the minimum requirements for the certification (type-approval) of transmitters and receivers for the dual-mode (analog and digital CDMA) cellular telephone system in the 824-849 MHz and 869-894 MHz paired bands.

All measurements contained in this application were conducted in accordance with the FCC Rules and Regulations CFR47, Industry Canada RSS-129 and ANSI/TIA/EIA603-2002 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

1.1 TEST FACILITY

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report dated March 3, 1994, submitted to and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2001).

1.2 RELATED SUBMITTAL(S)/GRANT(S)

This is a Class 2 Permissive Change application for the original certification for FCC ID AXATR-432-A2 per FCC 2.1043(b)(2). Upon an engineering review of the changes, the tests presented in this report were performed to show that the EUT still met the applicable rules. A detailed description of the changes is provided as an exhibit to this application.

1.3 JUSTIFICATION

To complete the test configuration required by the FCC, the receiver and conducted power were tested and a separate DoC report has been prepared.

The transmitter was tested at a high, mid, and low channel in the following frequency range (824 – 849 MHz and 1930 – 1990 MHz). The following frequencies were tested: 824.04, 836.49, 848.97, 1851.25, 1878.75, and 1908.75 MHz. Each transmitter frequency was measured independently in 3 orthogonal planes at 360º rotation.

1.4 EXERCISING THE EUT

The CM-42 was tested using client-based software to set all the parameters required for testing, such as power level, modulation type, frequency, and receive modes. There were no deviations from the test standard(s) and/or method(s).

2 TESTED SYSTEM DETAILS

The test sample was received on May 19, 2004. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

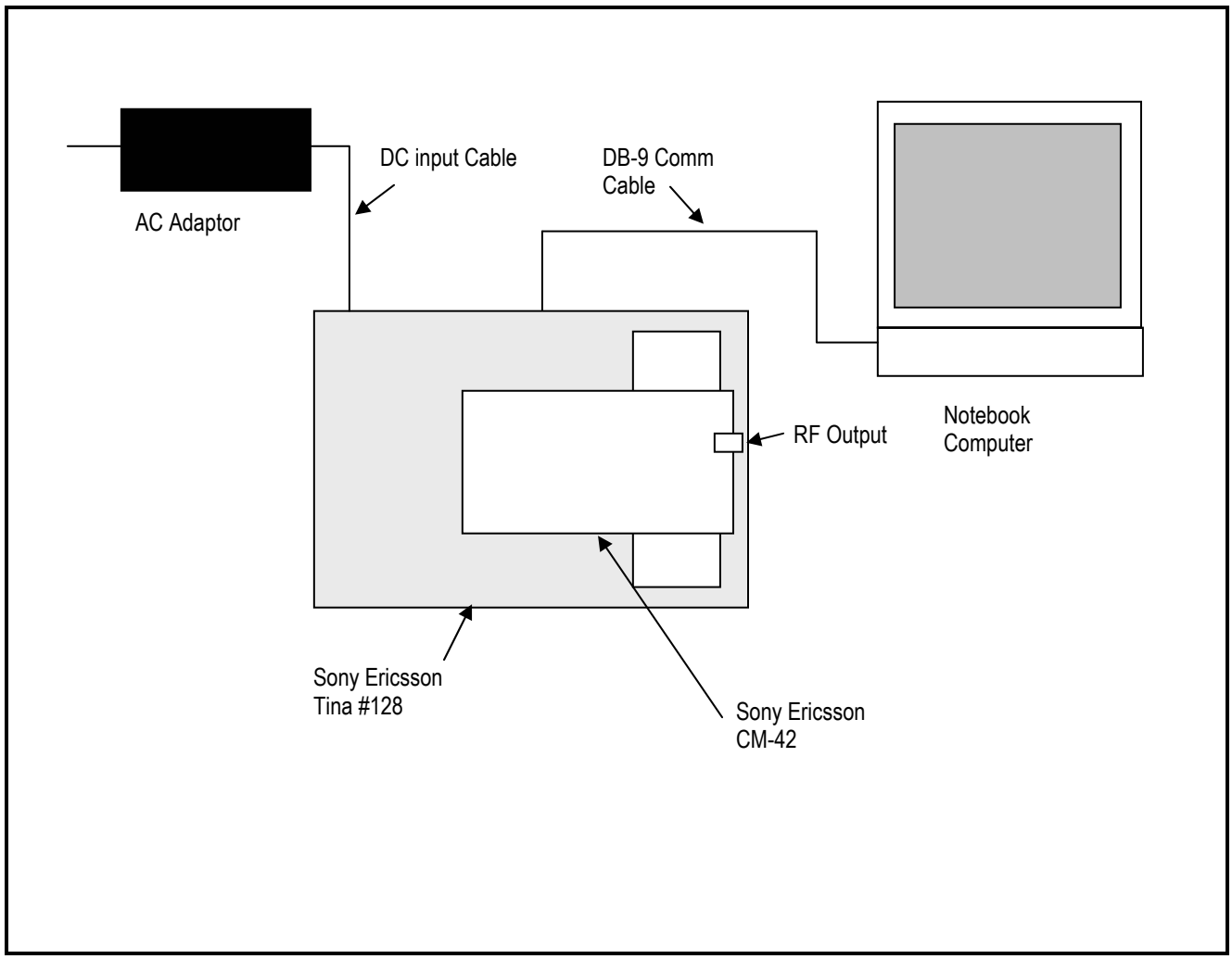
TABLE 2-1: EQUIPMENT UNDER TEST (EUT)

Part	Manufacturer	Model	Serial Number/PN	FCC ID	Cable Type/Size	RTL Bar Code
Transceiver	Ericsson, Inc.	CM-42	TE6146-02008112	AXATR-423-A2	5cm Unshielded I/O	15923
Transceiver	Ericsson, Inc.	CM-42	TE6146-02008111	AXATR-423-A2	5cm Unshielded I/O	15924

TABLE 2-2: SUPPORT EQUIPMENT

Part	Manufacturer	Model	Serial Number/PN	FCC ID	Cable Type/ Size	RTL Bar Code
Test Board	Ericsson, Inc.	Tina #124	10KGKK	N/A	6' dB9 M/F Serial	15925
Test Board	Ericsson, Inc.	Tina #128	10KGEC	N/A	6' dB9 M/F Serial	15926
Portable Handsfree	Ericsson, Inc.	KRY1011028	NGR000000986	N/A	1.22m unshielded I/O	15927
Portable Hands Free	Ericsson, Inc.	KRY1011028	NGR000000488	N/A	1.22m unshielded I/O	15928
AC Adapter	Cincon Electronics Co., Ltd.	TR45A12	45120-0016374	N/A	1.2m unshielded DC; 1.8m unshielded AC	15931
AC Adapter	Cincon Electronics Co., Ltd.	TR45A12	45120-0016390	N/A	1.2m unshielded DC; 1.8m unshielded AC	15932

FIGURE 2-1: CONFIGURATION OF TESTED SYSTEM



3 NECESSARY BANDWIDTH AND EMISSION BANDWIDTH - § 2.202

Type of Emission: F8W, F1D

Necessary Bandwidth and Emission Bandwidth:
40K0F1D
40K0F8W

Calculation for 40K0F8W

1/ Voice + SAT
Modulation: Voice is 2.5 kHz and SAT is 6 kHz, thus the maximum modulation is M = 6 kHz
Deviation: Voice is 12 kHz and SAT is 2 kHz, thus the maximum deviation is D= 12+2= 14 kHz
Bn = 2xM+2xDK with K =1
Bn= 40 kHz

2/ Signaling Tone (ST) + SAT
Modulation: ST is 10 kHz and SAT is 6 kHz, thus the maximum modulation is M = 10 kHz
Deviation: ST is 8 kHz and SAT is 2 kHz, thus the maximum deviation is D= 8+2= 10 kHz
Bn = 2xM+2xDK with K =1
Bn= 40 kHz

Calculation for 40K0F1D (Wide Band Data)

1/ Voice + SAT
Modulation: Wideband Data is 10 kHz and SAT is 6 kHz, thus the maximum modulation is M = 10 kHz
Deviation: Wideband Data is 8 kHz and SAT is 2 kHz, thus the maximum deviation is D= 8+2 = 10 kHz
Bn = 2xM+2xDK with K =1
Bn= 40 kHz

4 DC VOLTAGES AND CURRENTS - PART §2.1033(C)(8); VOLTAGES AND CURRENTS THROUGH THE FINAL AMPLIFYING STAGE

The dc voltages applied to and dc currents into the several elements of the final radio frequency amplifying device for normal operation over the power range.

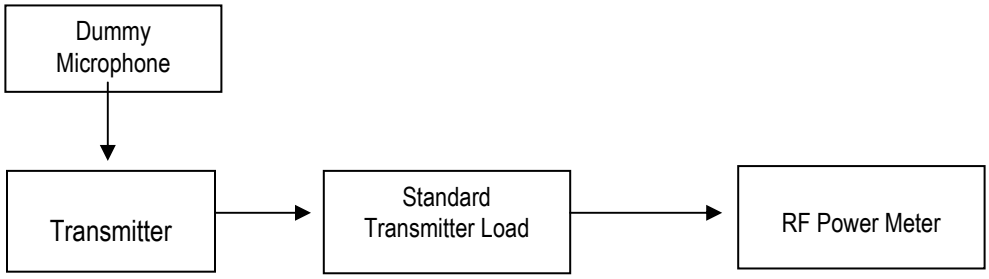
LABEL	LEVEL (VOLTS)	TOLERANCE	MAX. CURRENT
VCC_5V	5	+/-10%	
VCC_12V	13.8	+/-20%	
VDIG	2.9	+/-2%	150 mA
VCODEC	2.6	+/-2%	100 mA
VCORE	2.6	+/-2%	100 mA
VPA	4	+/-3%	1000 mA
VBT	3.1	+/-2%	150 mA
VBATTIN	5		
VTX	2.9		164 mA
VRX	2.9		80 mA
VSYNTH	2.9		150 mA
VGPS	3.3		
VRTC			
VRXRF	2.9	+/-2%	
12V_PA	13.8	+/-20%	1A
12V_SW	13.8	+/-20%	1A
VCC_10V	10	+/-20%	5 mA
VGRF	3.3		
VRXRF_PCS	2.9		
VTCXO	2.8	+/-2%	150 mA
VGCORE	3.3		

Note: Highlighted data describes the E and I in the final amplifier or PA section

5 FCC RULES AND REGULATIONS PART 2 §2.1046 (A): RF POWER OUTPUT: CONDUCTED

5.1 TEST PROCEDURE

ANSI/TIA/EIA-603-2002, section 2.2.1
The EUT was connected to a coaxial attenuator having a 50Ω load impedance.



5.2 POWER OUTPUT TEST DATA

The following channels (in MHz) were tested:

AMPS mode: 991 (824.04 MHz); 383 (836.49 MHz); 799 (848.97 MHz)
800 MHz CDMA: 1013 (824.7 MHz); 384 (837 MHz); 777 (848.31 MHz)
1900 MHz PCS CDMA: 25 (1851.25 MHz); 600 (1878.75 MHz); 1175 (1908.75 MHz)

TABLE 5-1: RF POWER OUTPUT (HIGH POWER): CARRIER OUTPUT POWER (UNMODULATED)

(800 MHZ AMPS Mode)

Channel Number	Frequency Tuned (MHz)	Conducted Power (Low Power) (dBm)	RF Power (Low Power) (Watts)*	EUT Conducted Power (High Power) (dBm)	RF Power (High Power) (Watts)*
991	824.04	24.0	0.249	34.5	2.8
383	836.49	23.9	0.244	34.5	2.8
799	848.97	23.2	0.210	33.9	2.4

* Measurement accuracy: +/- .04 dB (logarithmic mode)

(800 MHz CDMA mode)

Channel Number	Frequency Tuned (MHz)	EUT Conducted Power (dBm)	RF Power Measured (Watts)*
1013	824.70	23.9	0.248
384	836.52	23.9	0.245
777	848.31	24.0	0.253

* Measurement accuracy: +/- .04 dB (logarithmic mode)

(1900 MHz PCS CDMA mode)

Channel Number	Frequency Tuned (MHz)	EUT Conducted Power (dBm)	RF Power Measured (Watts)*
025	1851.25	24.2	0.263
600	1878.75	24.3	0.269
1175	1908.75	24.2	0.263

* Measurement accuracy: +/- .02 dB (logarithmic mode)

TABLE 5-2: RF POWER OUTPUT (RATED POWER)

Rated Power (High Power) (W)	Rated Power (Low Power)(W)
3	3

TABLE 5-3: TEST EQUIPMENT USED FOR TESTING RF POWER OUTPUT - CONDUCTED

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901184/901186	Agilent	E4416A/E9323A	Power Meter/Sensor	GB41050573/US420.52510380	07/30/04

TEST PERSONNEL:

DANIEL BIGGS		JUNE 7, 2004
TEST TECHNICIAN/ENGINEER	SIGNATURE	DATE OF TEST

6 FCC RULES AND REGULATIONS PART 2 §2.1049 (C) (1): OCCUPIED BANDWIDTH

OCCUPIED BANDWIDTH - COMPLIANCE WITH THE EMISSION MASKS

6.1 TEST PROCEDURE

ANSI/TIA/EIA-603-2002, section 2.2.11 and TIA/EIA-102.CAAA-2002 section 2.2.5

Device with audio modulation: Transmitter was modulated with a 2,500 Hz sine wave at an input level of 16 dB greater than that required to produce 50% of rated system deviation at 1,000 Hz.

Device with digital modulation: Modulated to its maximum extent using a pseudo random data sequence – 9600-bps

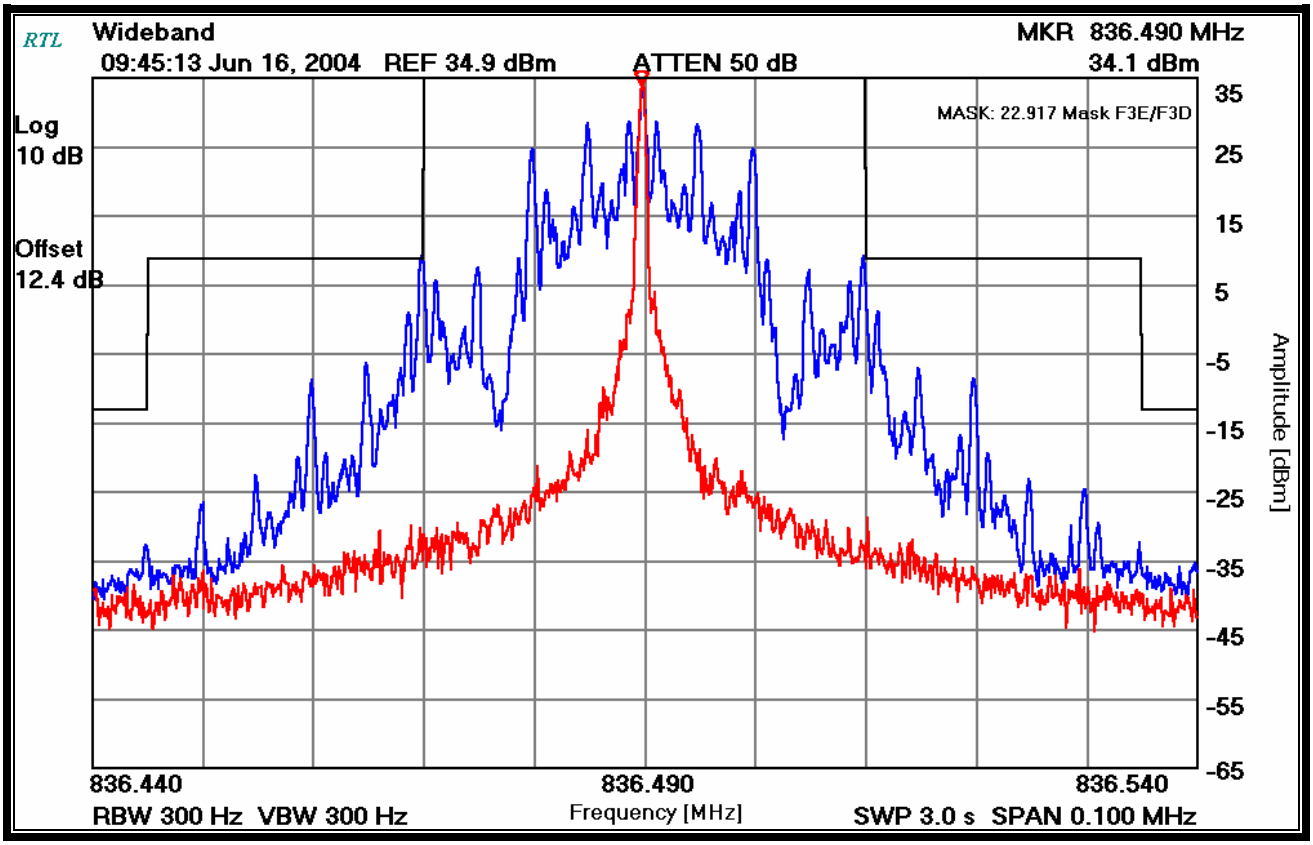
6.2 EMISSION LIMITS

100% of the in-band modulation was below the specified mask per §22.917 (C). Specified Limits:

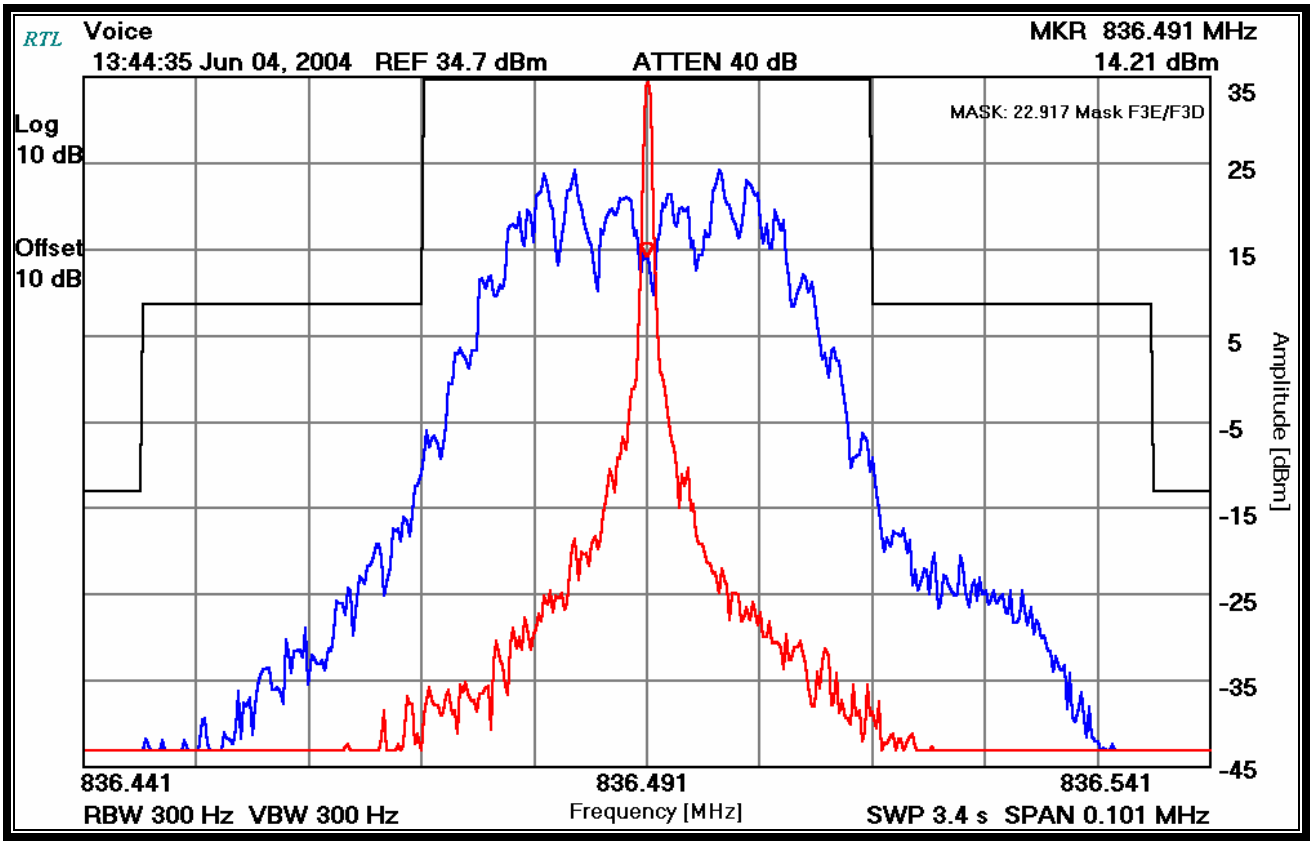
A. On any frequency removed from the assigned carrier frequency by more than 20 kHz, up to and including 45 kHz, the sideband was at least 26dB below the carrier.
B. On any frequency removed from the assigned carrier frequency by more than 45 kHz, up to and including 90 kHz, the sideband was at least 45 dB below the carrier.
C. On any frequency removed from the assigned carrier frequency by more than 90 kHz, up to the first multiple of the carrier frequency, the sideband was at least 60dB below the carrier of 43 + log10 (mean power output in Watts) dB, whichever was the smaller attenuation.

6.3 TEST DATA

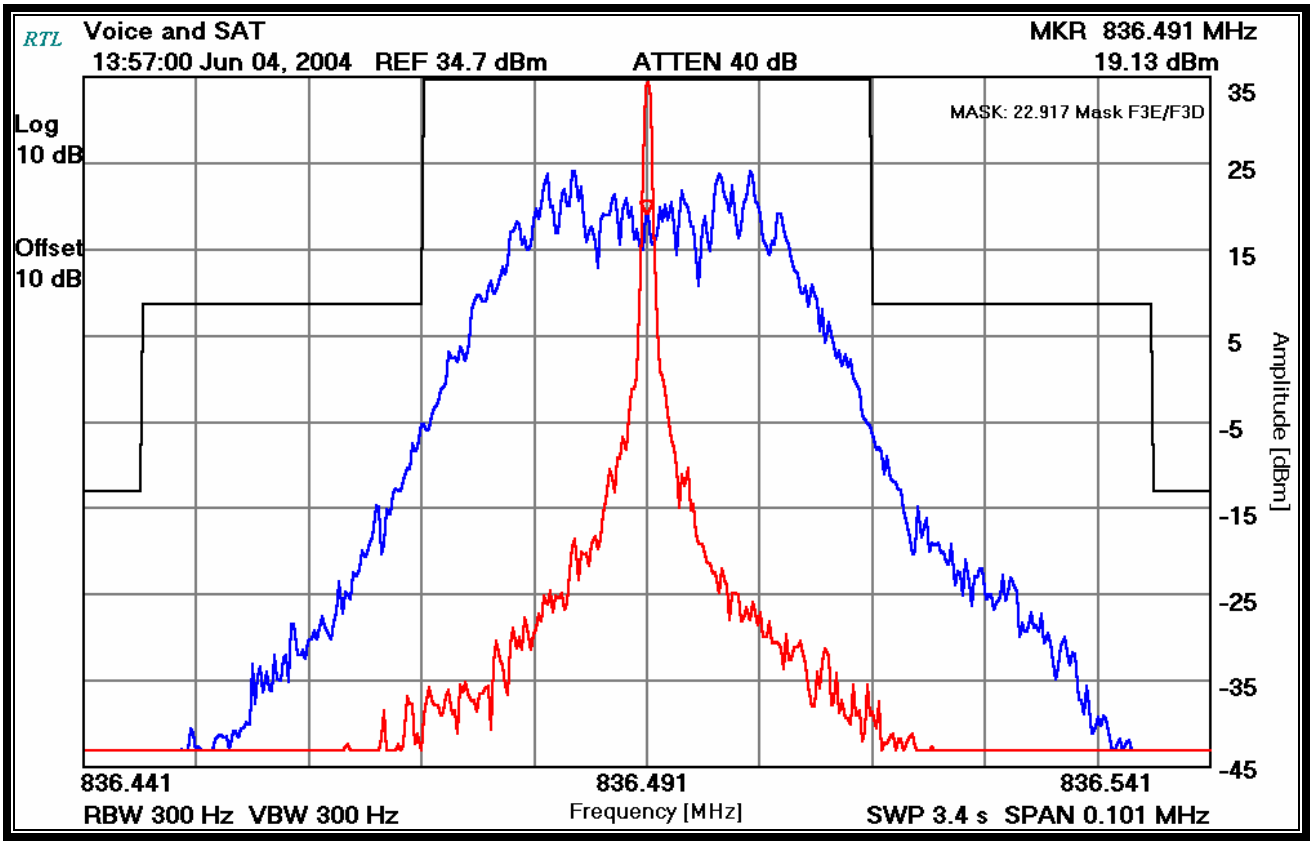
PLOT 6-1: 40 KHZ CHANNEL BANDWIDTH – WIDEBAND DATA 836.49 MHZ



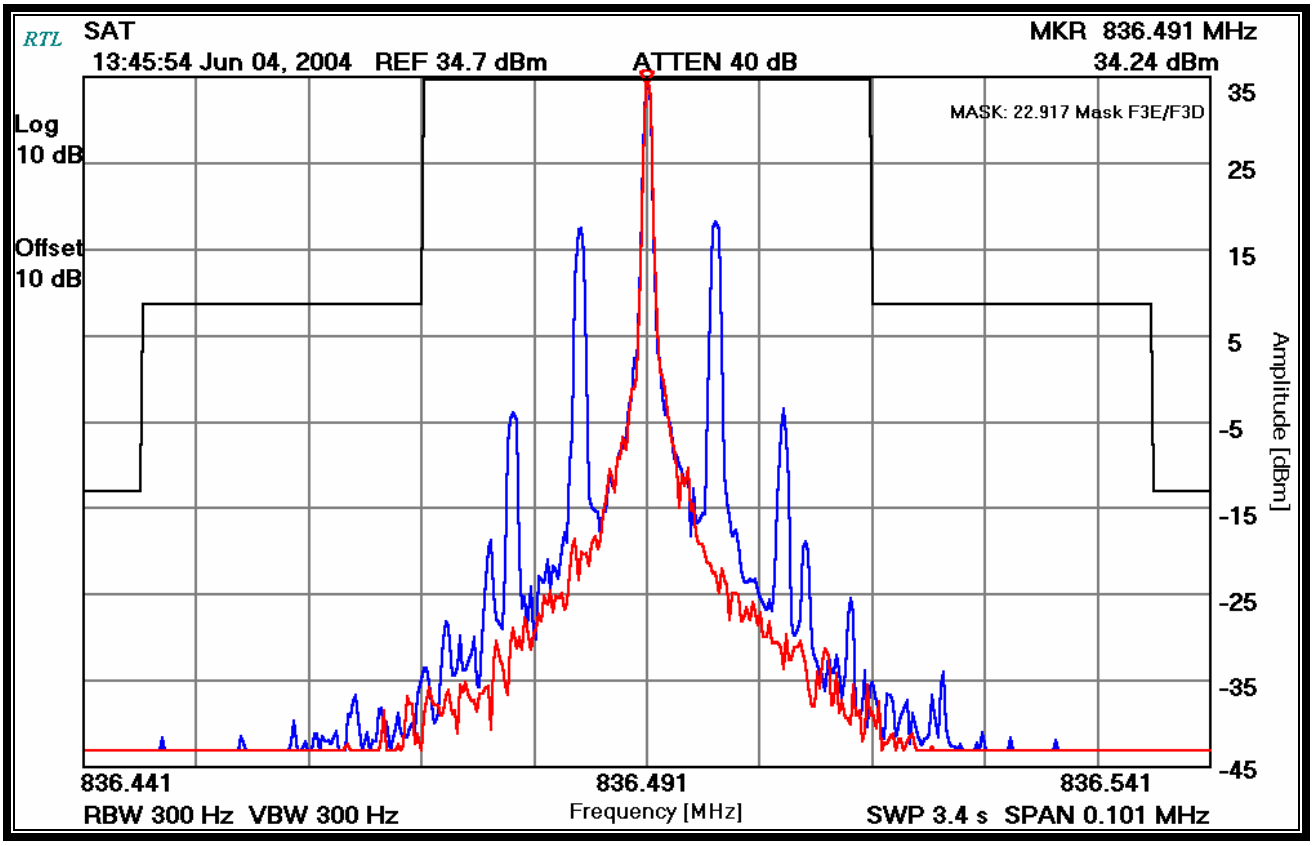
PLOT 6-2: OCCUPIED BANDWIDTH: AMPS VOICE (MASK 22.917)



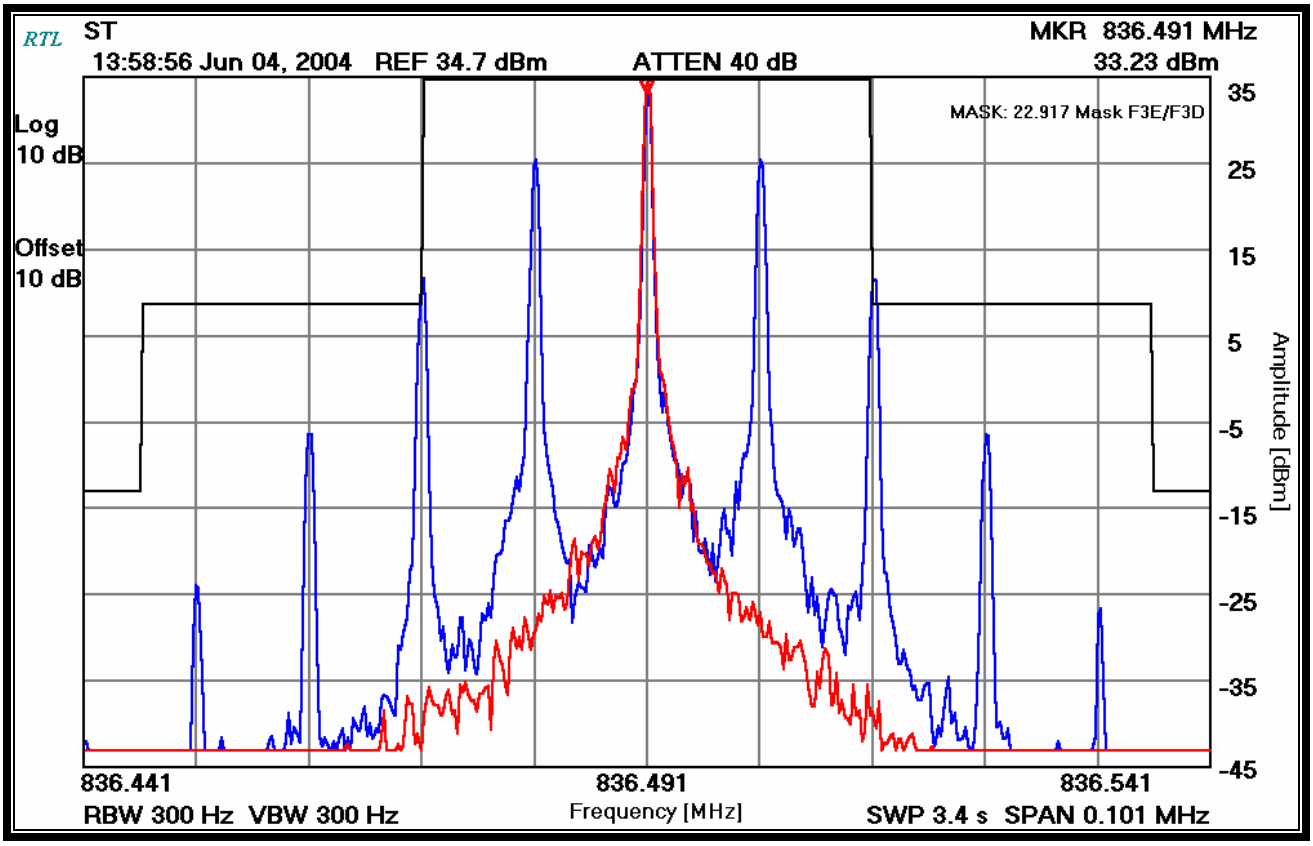
PLOT 6-3: OCCUPIED BANDWIDTH: AMPS VOICE/SAT - (MASK 22.917)



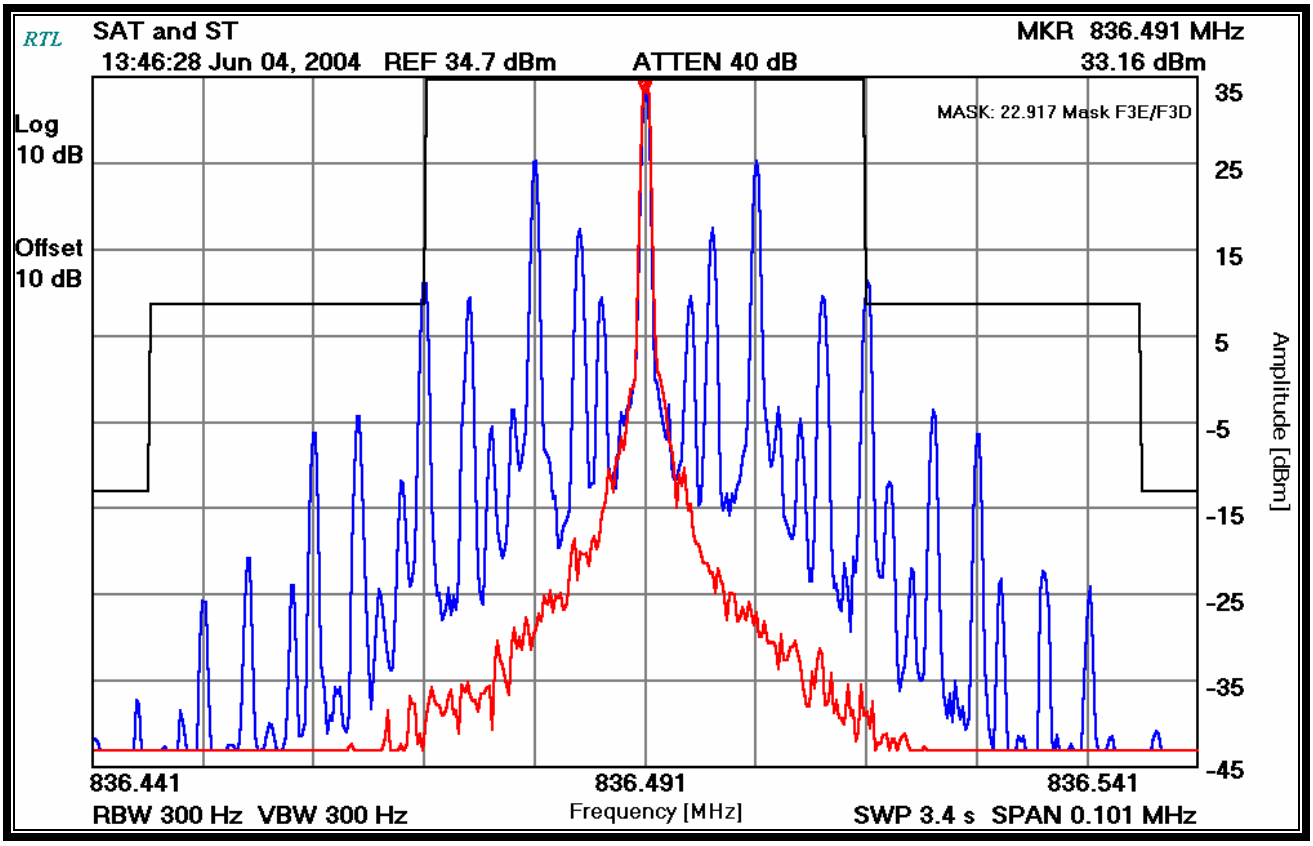
PLOT 6-4: OCCUPIED BANDWIDTH: AMPS SAT - (MASK 22.917)



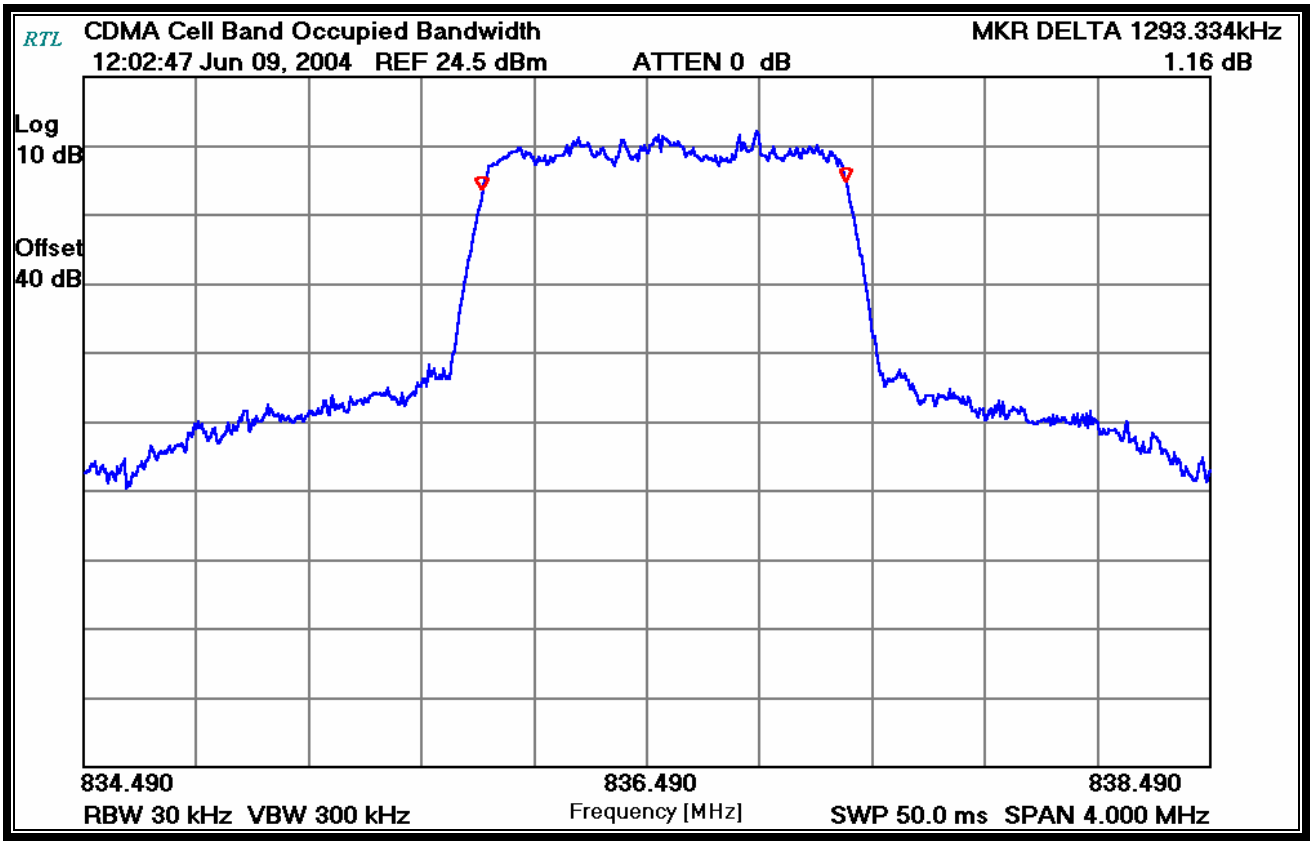
PLOT 6-5: OCCUPIED BANDWIDTH: AMPS ST - (MASK 22.917)



PLOT 6-6: OCCUPIED BANDWIDTH: AMPS SAT/ST - (MASK 22.917)



PLOT 6-7: 99% OCCUPIED BANDWIDTH – CDMA CELL BAND



PLOT 6-8: 99% OCCUPIED BANDWIDTH – CDMA PCS BAND

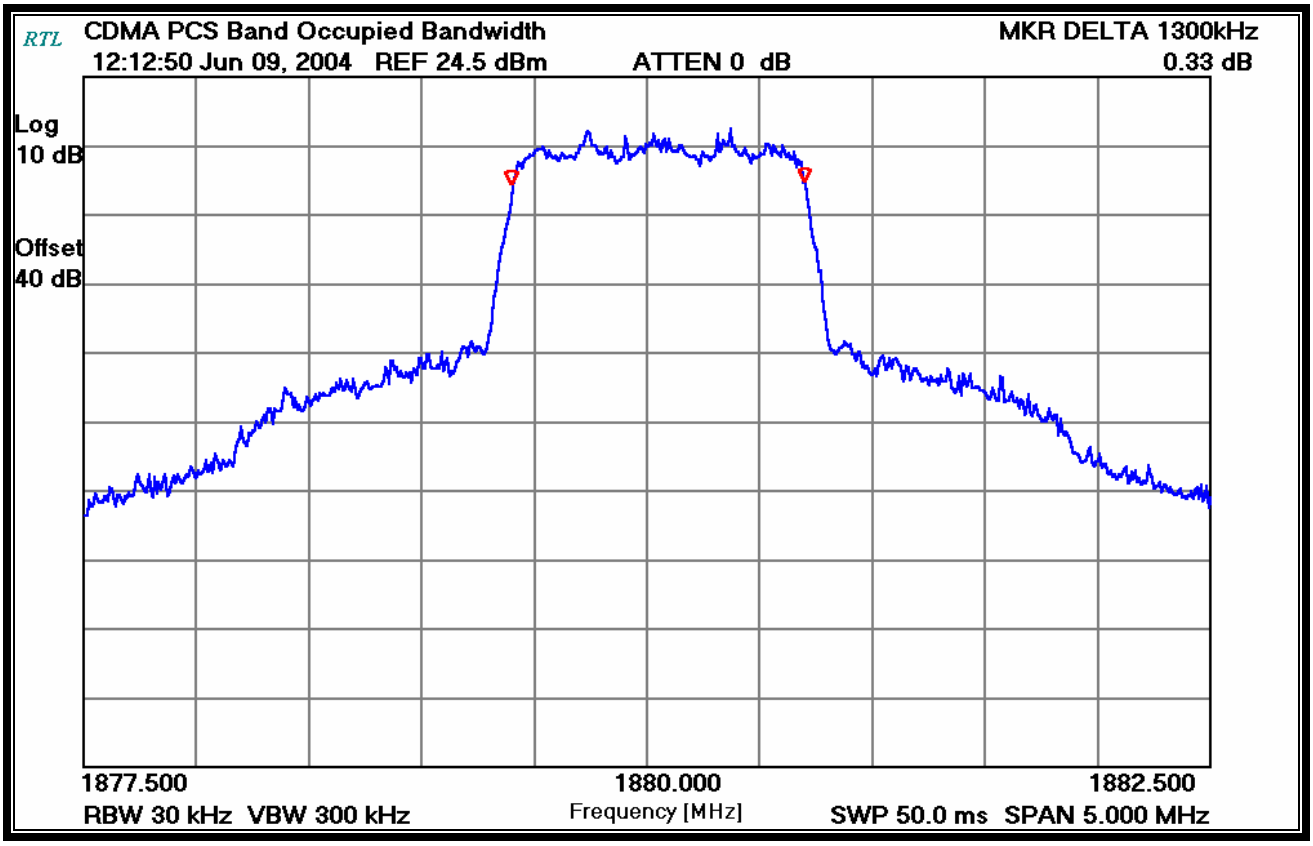


TABLE 6-1: TEST EQUIPMENT USED FOR TESTING OCCUPIED BANDWIDTH

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz - 40 GHz)	3943A01719	07/15/04
901118	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2406A00178	06/18/04

TEST PERSONNEL:

DANIEL BIGGS	Daniel Biggs	JUNE 4, 9, & 16 2004
TEST TECHNICIAN/ENGINEER	SIGNATURE	DATES OF TEST

7 FCC RULES AND REGULATIONS PART 2 §2.1051: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

7.1 TEST PROCEDURE

ANSI/TIA/EIA-603-2002, Section 2.2.13

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer.

Part 22: The following spectrum analyzer bandwidth settings should be used for measurement of spurious emissions. When operating in the radiotelephony mode or the supervisory audio tone mode: (1) Any emission not more than 45 kHz removed from the carrier frequency, 300 Hz. (2) Any emission more than 45 kHz removed from the carrier frequency, 30 kHz. When operating in the wideband data mode or the signaling tone mode: (1) Any emission not more than 60 kHz removed from the carrier frequency, 300 Hz. (2) Any emission more than 60 kHz removed from the carrier frequency, 30 kHz.

7.1.1 EMISSION LIMITS - §24.133

The power of any emission shall be attenuated below the transmitter power, as measured in accordance with FCC §24.132.

7.2 EMISSION LIMITATIONS FOR CELLULAR - §22.917

(d) *F1D emission mask.* For F1D emissions, the mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) as follows:

(1) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz: at least 26 dB;

(2) On any frequency removed from the carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency: at least 60 dB or 43 + 10 log P dB, whichever is the lesser attenuation.

7.3 TEST DATA

Frequency range of measurement per Part 2.1057: 9 kHz to 10 x Fc

Limits: (43+10xLOG P(W))

The worse case (unwanted emissions) channels are shown in following tables. The magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

TABLE 7-1: CONDUCTED SPURIOUS EMISSIONS CHANNEL 991 – 824.04 MHZ – HIGH POWER

40 kHz channel spacing; Conducted power = 2.8 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1648.080	86.4	47.5	-38.9
2472.120	89.1	47.5	-41.6
3296.160	96.9	47.5	-49.4
4120.200	78.3	47.5	-30.8
4944.240	103.6	47.5	-56.1
5768.280	106.9	47.5	-59.4
6592.320	110.4	47.5	-62.9
7416.360	91.2	47.5	-43.7
8240.400	106.3	47.5	-58.8

TABLE 7-2: CONDUCTED SPURIOUS EMISSIONS CHANNEL 991 – 824.04 MHZ – LOW POWER

40 kHz channel spacing; Conducted power = 0.249 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1648.080	91.0	37.0	-54.0
2472.120	88.2	37.0	-51.2
3296.160	104.9	37.0	-67.9
4120.200	86.3	37.0	-49.4
4944.240	105.3	37.0	-68.3
5768.280	110.3	37.0	-73.3
6592.320	109.7	37.0	-72.7
7416.360	101.9	37.0	-64.9
8240.400	107.8	37.0	-70.8

TABLE 7-3: CONDUCTED SPURIOUS EMISSIONS CHANNEL 383 – 836.49 MHZ – HIGH POWER

40 kHz channel spacing; Conducted power = 2.8 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1672.980	85.0	47.5	-37.5
2509.470	87.0	47.5	-39.6
3345.960	101.9	47.5	-54.4
4182.450	87.8	47.5	-40.3
5018.940	93.3	47.5	-45.8
5855.430	108.7	47.5	-61.2
6691.920	108.8	47.5	-61.3
7528.410	105.8	47.5	-58.3
8364.900	96.4	47.5	-48.9

TABLE 7-4: CONDUCTED SPURIOUS EMISSIONS CHANNEL 383 – 836.49 MHZ – LOW POWER

40 kHz channel spacing; Conducted power = 0.244 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1672.980	76.5	36.9	-39.6
2509.470	84.8	36.9	-48.0
3345.960	91.2	36.9	-54.3
4182.450	81.3	36.9	-44.4
5018.940	82.0	36.9	-45.1
5855.430	100.2	36.9	-63.3
6691.920	97.6	36.9	-60.7
7528.410	96.0	36.9	-59.1
8364.900	94.1	36.9	-57.2

TABLE 7-5: CONDUCTED SPURIOUS EMISSIONS CHANNEL 799 – 848.97 MHZ – HIGH POWER

40 kHz channel spacing; Conducted power = 2.4 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1697.940	90.5	46.9	-43.7
2546.910	78.6	46.9	-31.7
3395.880	84.7	46.9	-37.9
4244.850	60.5	46.9	-13.6
5093.820	103.4	46.9	-56.5
5942.790	108.6	46.9	-61.7
6791.760	107.7	46.9	-60.8
7640.730	104.9	46.9	-58.0
8489.700	92.8	46.9	-45.9

TABLE 7-6: CONDUCTED SPURIOUS EMISSIONS CHANNEL 799 – 848.97 MHZ – LOW POWER

40 kHz channel spacing; Conducted power = 0.210 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1697.940	84.7	36.2	-48.5
2546.910	75.2	36.2	-39.0
3395.880	87.0	36.2	-50.8
4244.850	57.2	36.2	-20.9
5093.820	97.0	36.2	-60.8
5942.790	97.2	36.2	-61.0
6791.760	95.9	36.2	-59.6
7640.730	95.3	36.2	-59.0
8489.700	87.5	36.2	-51.2

TABLE 7-7: CONDUCTED SPURIOUS EMISSIONS CHANNEL 1013– 824.7 MHZ – CDMA CELL BAND

40 kHz channel spacing; Conducted power = 0.245 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1649.400	92.7	36.9	-45.8
2474.100	89.5	36.9	-42.7
3298.800	97.0	36.9	-50.1
4123.500	106.9	36.9	-60.1
4948.200	102.9	36.9	-56.0
5772.900	105.9	36.9	-59.0
6597.600	102.1	36.9	-55.2
7422.300	105.8	36.9	-58.9
8247.000	100.4	36.9	-53.5

TABLE 7-8: CONDUCTED SPURIOUS EMISSIONS CHANNEL 384– 836.5224.7 MHZ – CDMA CELL BAND

40 kHz channel spacing; Conducted power = 0.245 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1673.040	96.6	36.9	-59.7
2509.560	105.9	36.9	-69.0
3346.080	88.0	36.9	-51.1
4182.600	108.8	36.9	-71.9
5019.120	110.3	36.9	-73.4
5855.640	106.1	36.9	-69.2
6692.160	109.9	36.9	-73.0
7528.680	108.0	36.9	-71.1
8365.200	109.5	36.9	-72.6

TABLE 7-9: CONDUCTED SPURIOUS EMISSIONS CHANNEL 777 – 848.31 MHZ –CDMA CELL BAND

40 kHz channel spacing; Conducted power = 0.253 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1696.620	99.6	37.0	-62.5
2544.930	99.7	37.0	-62.7
3393.240	87.3	37.0	-50.2
4241.550	107.8	37.0	-70.7
5089.860	109.1	37.0	-72.1
5938.170	105.8	37.0	-68.8
6786.480	110.0	37.0	-73.0
7634.790	109.4	37.0	-72.3
8483.100	108.8	37.0	-71.7

TABLE 7-10: CONDUCTED SPURIOUS EMISSIONS CHANNEL 025 – 1851.25 MHZ – CDMA PCS BAND

40 kHz channel spacing; Conducted power = 0.263 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
3702.500	83.0	37.2	-45.8
5553.750	94.7	37.2	-57.5
7405.000	102.5	37.2	-65.3
9256.250	107.4	37.2	-70.2
11107.500	107.4	37.2	-70.2
12958.750	107.8	37.2	-70.6
14810.000	105.7	37.2	-68.5
16661.250	106.0	37.2	-68.8
18512.500	105.5	37.2	-68.3

TABLE 7-11: CONDUCTED SPURIOUS EMISSIONS CHANNEL 600 – 1880.00 MHZ – CDMA PCS BAND

40 kHz channel spacing; Conducted power = 0.269 W

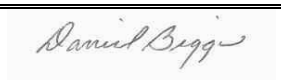
Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
3760.000	77.3	37.3	-40.0
5640.000	112.5	37.3	-75.2
7520.000	97.0	37.3	-59.7
9400.000	111.6	37.3	-74.3
11280.000	110.3	37.3	-73.0
13160.000	110.6	37.3	-73.3
15040.000	107.8	37.3	-70.5
16920.000	107.6	37.3	-70.3
18800.000	109.5	37.3	-72.2

TABLE 7-12: CONDUCTED SPURIOUS EMISSIONS CHANNEL 1175 – 1908.75 MHZ – CDMA PCS BAND

40 kHz channel spacing; Conducted power = 0.263 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
3817.500	74.7	37.2	-37.5
5726.250	94.2	37.2	-57.0
7635.000	107.2	37.2	-70.0
9543.750	112.4	37.2	-75.2
11452.500	112.2	37.2	-75.0
13361.250	109.9	37.2	-72.7
15270.000	109.2	37.2	-72.0
17178.750	108.8	37.2	-71.6
19087.500	111.2	37.2	-74.0

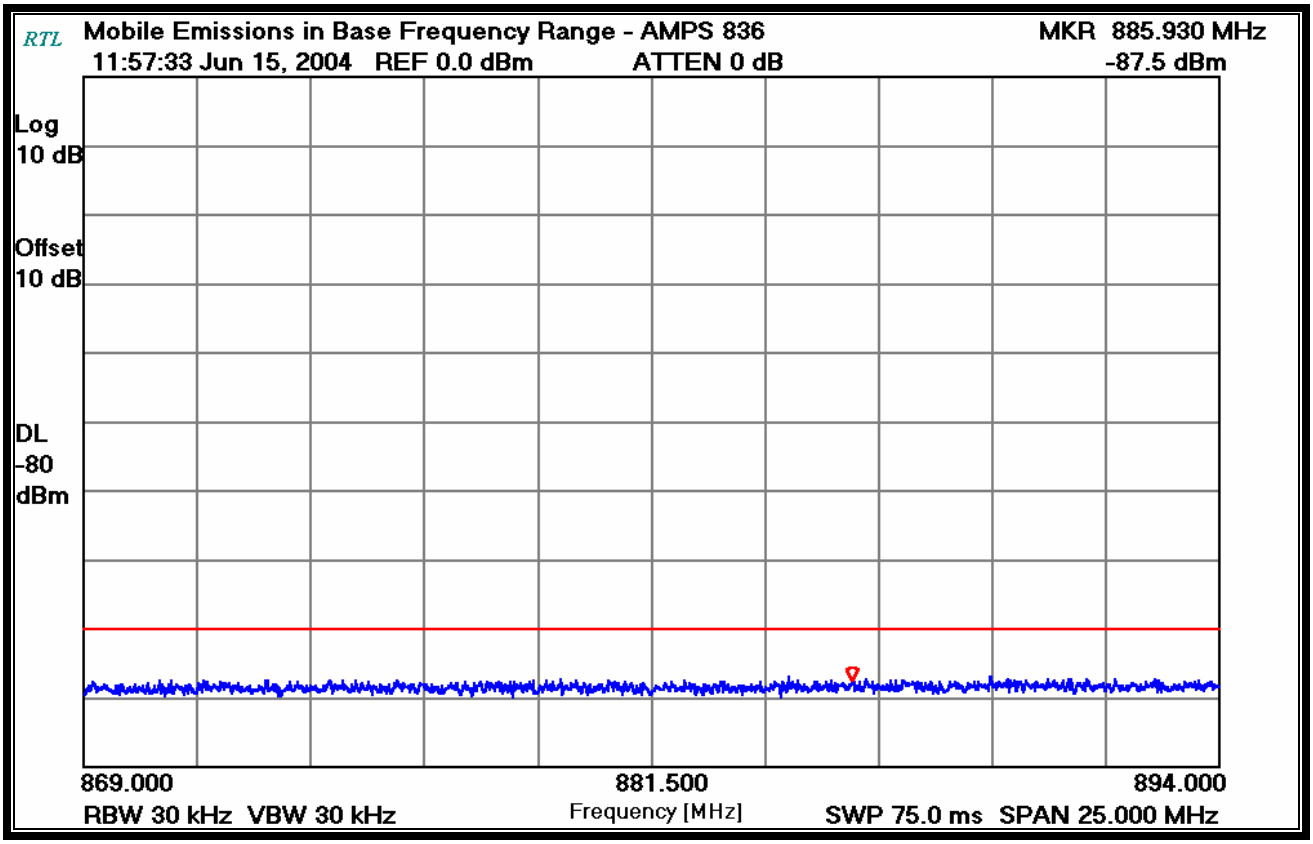
TEST PERSONNEL:

DANIEL BIGGS		JUNE 11, 2004
TEST TECHNICIAN/ENGINEER	SIGNATURE	DATE OF TEST

7.4 FCC PART 22.917 (F) MOBILE EMISSIONS IN BASE FREQUENCY RANGE

Mobile emissions in base frequency range: The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed 80 dBm at the transmit antenna connector.

PLOT 7-1: MOBILE EMISSIONS IN BASE FREQUENCY RANGE – AMPS 836



PLOT 7-2: MOBILE EMISSIONS IN BASE FREQUENCY RANGE – CDMA 836,52 MHZ

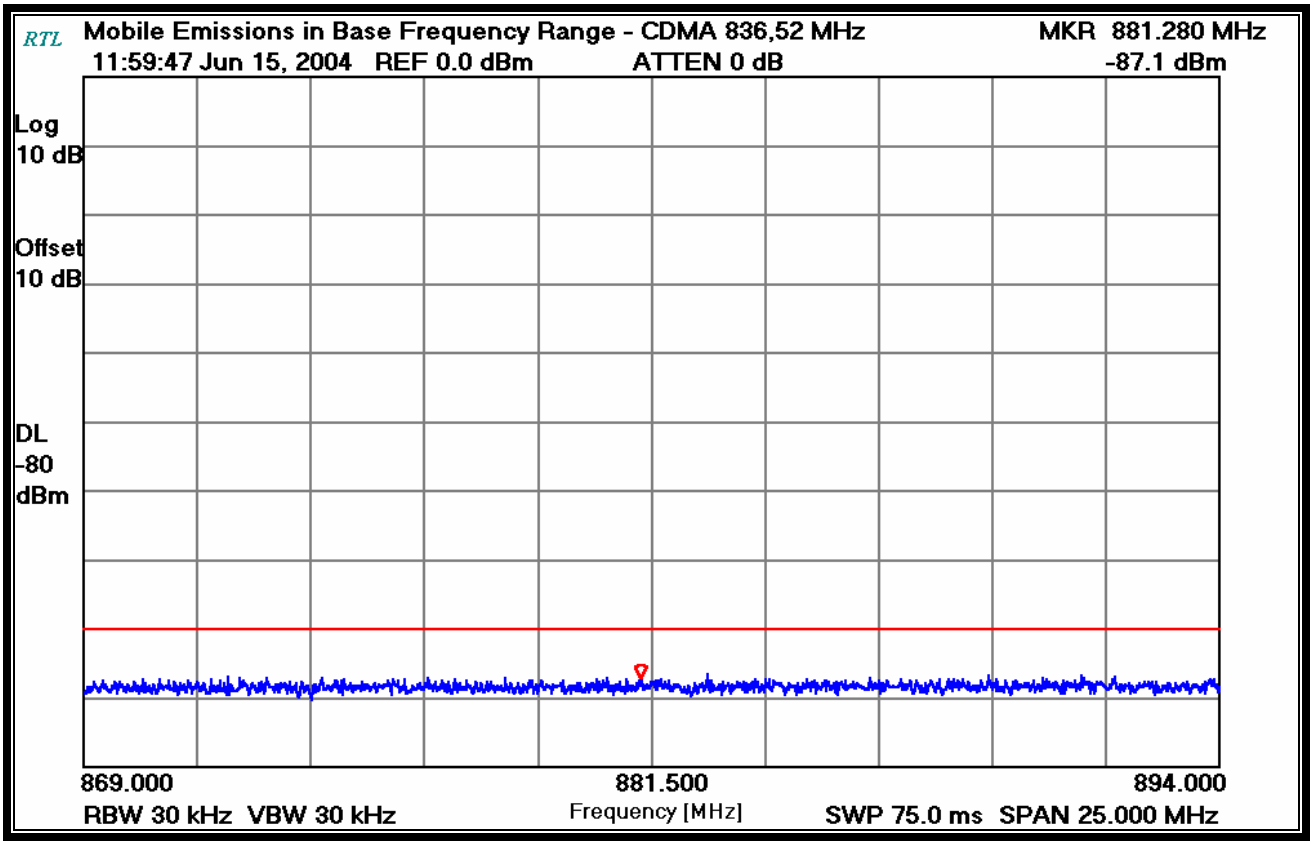


TABLE 7-13: SPURIOUS EMISSIONS AT ANTENNA TERMINAL TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz - 40 GHz)	3943A01719	7/15/04
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585	8/6/04
901128	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	5/13/05

TEST PERSONNEL:

DANIEL BIGGS	Daniel Biggs	JUNE 15, 2004
TEST TECHNICIAN/ENGINEER	SIGNATURE	DATE OF TEST

8 FCC RULES AND REGULATIONS PART 2 §2.1053 (A): FIELD STRENGTH OF SPURIOUS RADIATION

8.1 TEST PROCEDURE

ANSI C63.4

Modulated with CDMA client provided software which controlled power, channel, and modulation.

The spurious emissions levels were measured from a 3 meter distance, 360 degrees, while the receive antenna was raised and lowered from 1 to 4 meters in both vertical and horizontal polarities. The EUT was replaced by a transmitting antenna connected to a signal generator. This signal generator level was lowered or raised until the receive level matched that of the original measured level of the EUT. The signal generator level was then corrected by subtracting the cable loss from the substitution antenna to the signal generator, and the gain of the antenna was further corrected to a half wave dipole for ERP measurement or to an isotropic radiator for EIRP measurements. Substitution SWR was verified using a high frequency power divider and power meter at the antenna connector.

8.2 TEST DATA

The worst-case emissions test data are shown. The magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

8.3 FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA - §2.1053

TABLE 8-1: FIELD STRENGTH DATA §2.1053 (CELLULAR AMPS)

Radiated Spurious Emissions
836.49 MHz; Channel 383
Limit = 43 + 10 Log P = 47.5 dBc
Conducted Power = 34.5 dBm = 2.8 W

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss* (dB)	Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
1672.98	32.0	-45.8	5.2	5.0	80.9	-33.0
2509.47	51.3	-41.1	7.4	7.0	76.4	-28.5
3345.96	40.3	-49.8	7.8	7.6	84.9	-37.0
4182.45	41.3	-44.7	8.1	7.5	80.2	-32.3
5018.94	37.8	-48.8	8.0	7.7	84.0	-36.1
5855.43	17.7	-66.6	9.1	8.5	102.1	-54.2
6691.92	27.7	-48.9	9.6	8.6	84.8	-36.9
7528.41	19.8	-57.8	9.8	8.9	93.6	-45.7
8364.90	17.3	-63.4	10.0	8.1	100.2	-52.3

*This insertion loss corresponds to the cable connecting the RF Signal Generator to the transmit antenna.

TABLE 8-2: FIELD STRENGTH DATA §2.1053 (CELLULAR CDMA)

Radiated Spurious Emissions
837.00 MHz; Channel 400
Limit = 43 + 10 Log P = 36.9 dBc
Conducted Power = 23.9 dBm = 0.245 W

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss* (dB)	Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
1674.000	59.0	-58.8	5.3	5.0	83.1	-46.2
2511.000	34.3	-58.1	7.4	7.0	82.5	-45.6
3348.000	29.3	-56.7	7.8	7.6	80.9	-44.0
4185.000	27.5	-58.5	8.1	7.5	83.1	-46.2
5022.000	28.0	-58.6	8.0	7.7	82.9	-46.0
5859.000	26.7	-49.9	9.1	8.5	74.5	-37.6
6696.000	26.7	-49.9	9.6	8.6	74.9	-38.0
7533.000	27.5	-50.1	9.8	8.8	75.1	-38.2
8370.000	26.8	-53.9	10.2	8.1	80.0	-43.1

*This insertion loss corresponds to the cable connecting the RF Signal Generator to the transmit antenna.

TABLE 8-3: FIELD STRENGTH DATA §2.1053 (PCS CDMA)

Radiated Spurious Emissions
1880 MHz; Channel 600
Limit = 43 + 10 Log P = 37.3 dBc
Conducted Power = 24.3 dBm = 0.269 W

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss* (dB)	Antenna Gain (dBi)	Corrected Signal Generator Level (dBc)	Margin (dB)
3760.000	27.8	-60.4	7.9	9.5	83.1	-45.8
5640.000	25.7	-59.9	8.1	10.4	81.9	-44.6
7520.000	28.5	-48.6	9.8	11.0	71.7	-34.4
9400.000	27.8	-50.8	10.5	11.1	74.5	-37.2
11280.000	26.8	-50.0	11.4	11.8	73.9	-36.6
13160.000	24.5	-46.2	11.7	12.0	70.2	-32.9
15040.000	27.3	-41.8	13.1	12.4	66.8	-29.5
16920.000	27.8	-40.7	14.1	13.6	65.5	-28.2

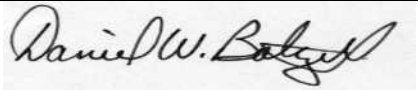
*This insertion loss corresponds to the cable connecting the RF Signal Generator to the transmit antenna.

8.4 RADIATED SPURIOUS TEST EQUIPMENT

TABLE 8-4: RADIATED SPURIOUS TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
901053	Schaffner-Chase	CBL6112	Antenna (25 MHz – 2 GHz)	2648	07/03/04
900151	Rohde and Schwarz	HFH2-Z2	Antenna (Loop antenna, (9 kHz - 30 MHz)	827525/019	8/25/06
900932	Hewlett Packard	8449B OPT H02	Preamplifier (1 - 26.5 GHz)	3008A00505	5/5/05
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz - 40 GHz)	3943A01719	07/15/04
900928	Hewlett Packard	HP 83752A	Synthesized Sweeper (.01 – 20 GHz)	3610A00866	08/05/04
900811	Rhein Tech Labs	PR-1040	Amplifier	1003	2/13/05
900878	Rhein Tech Labs	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901231	IW Microwave Products	KPS-1503-2400-KPS	High frequency RF cables	240"	1/30/05
901232	IW Microwave Products	KPS-1503-2400-KPS	High frequency RF cables	240"	1/30/05
901235	IW Microwave Products	KPS-1503-360-KPS	High frequency RF cables	36"	1/30/05
901242	Rhein Tech Labs	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	5/20/07
900321	EMCO	3161-03	Horn Antennas (4 - 8,2 GHz)	9508-1020	5/20/07
900323	EMCO	3160-7	Horn Antennas (8,2 - 12,4 GHz)	9605-1054	5/20/07
900356	EMCO	3160-08	Horn Antenna (12.4 - 18 GHz)	9607-1044	5/20/07
900325	EMCO	3160-9	Horn Antennas (18 - 26.5 GHz)	9605-1051	5/20/07
901218	EMCO	3301B	Horn Antenna (18 - 26.5 GHz)	960281-003	7/30/04
900392	Hewlett Packard	1197OK	Harmonic Mixer (18 – 26.5 GHz)	3525A00159	7/30/04
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridged Guide Antenna (1 - 18 GHz)	2310	2/17/06
901184	Agilent	E4416A	Power Meter	GB41050573	07/30/04
901186	Agilent	E9323A	Sensor	US420.52510380	07/30/04
901344	Narda Microwave Corporation	3045B-10	Coaxial Directional Coupler	05137	7/1/2005
901341	Narda Microwave Corporation	3003-20-40	Coaxial Directional Coupler	2	7/1/2005
901342	Narda Microwave Corporation	3044-10	Coaxial Directional Coupler	901	7/1/2005

TEST PERSONNEL:

DANIEL BALTZELL		JUNE 11, 2004
TEST TECHNICIAN/ENGINEER	SIGNATURE	DATE OF TEST

9 FCC RULES AND REGULATION PART 2 §2.1055: FREQUENCY STABILITY

9.1 TEST PROCEDURE

ANSI/TIA/EIA-603-2002, section 2.2.2

The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.

The EUT was evaluated over the temperature range -30°C to +50°C.

The temperature was initially set to -30°C and a 2-hour period was observed for stabilization of the EUT. The frequency stability was measured within one minute after application of primary power to the transmitter. The temperature was raised at intervals of 10 degrees centigrade through the range. A ½ hour period was observed to stabilize the EUT at each measurement step and the frequency stability was measured within one minute after application of primary power to the transmitter. Additionally, the power supply voltage of the EUT was varied ±15% voltage variation from the nominal 12V supplied to the test board. (10.2 – 13.8 VDC).

The worst-case test data are shown in the tables below.

9.2 TEST DATA

9.2.1 FREQUENCY STABILITY/TEMPERATURE VARIATION

Limit is 2.5 ppm. Worst-case deviation was found to be 1.41 ppm at -30°C.

PLOT 9-1: TEMPERATURE FREQUENCY STABILITY

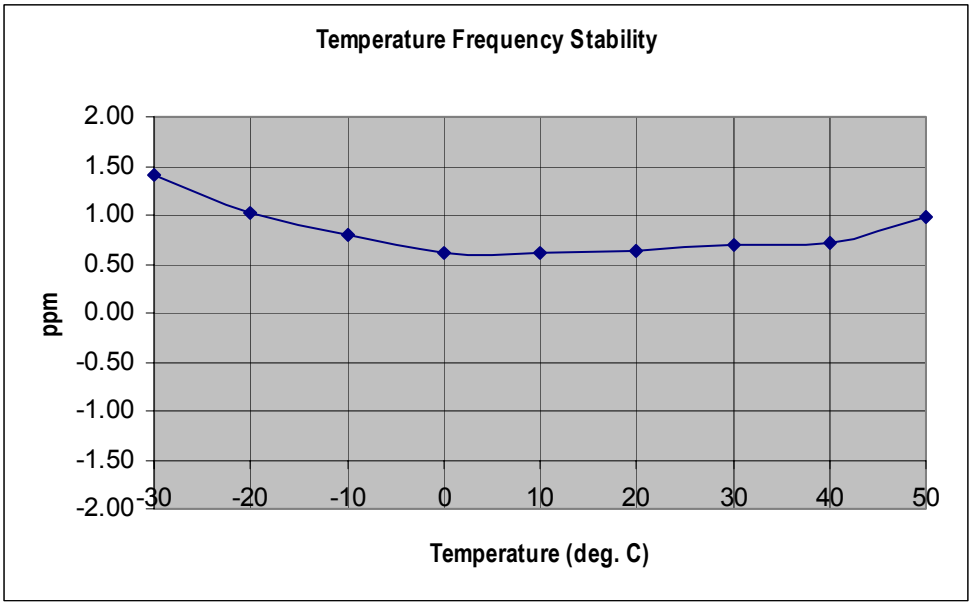


TABLE 9-1: TEMPERATURE FREQUENCY STABILITY CHANNEL 383, 836.49 MHZ

Temperature C	Measured Frequency (MHz)	ppm
-30	836.491180	1.41
-20	836.490848	1.01
-10	836.490660	0.79
0	836.490515	0.62
10	836.490518	0.62
20	836.490525	0.63
30	836.490578	0.69
40	836.490590	0.71
50	836.490823	0.98

TABLE 9-2: TEST EQUIPMENT USED FOR TESTING FREQUENCY STABILITY/TEMPERATURE

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
900946	Tenney Engineering, Inc.	TH65	Temperature Chamber with Humidity	11380	02/03/05
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz - 40 GHz)	3943A01719	07/15/04

TEST PERSONNEL:

DANIEL BIGGS		JUNE 10, 2004
TEST TECHNICIAN/ENGINEER	SIGNATURE	DATE OF TEST

9.2.2 FREQUENCY STABILITY/VOLTAGE VARIATION

Worst-case variation is .19 ppm.

PLOT 9-2: VOLTAGE FREQUENCY STABILITY

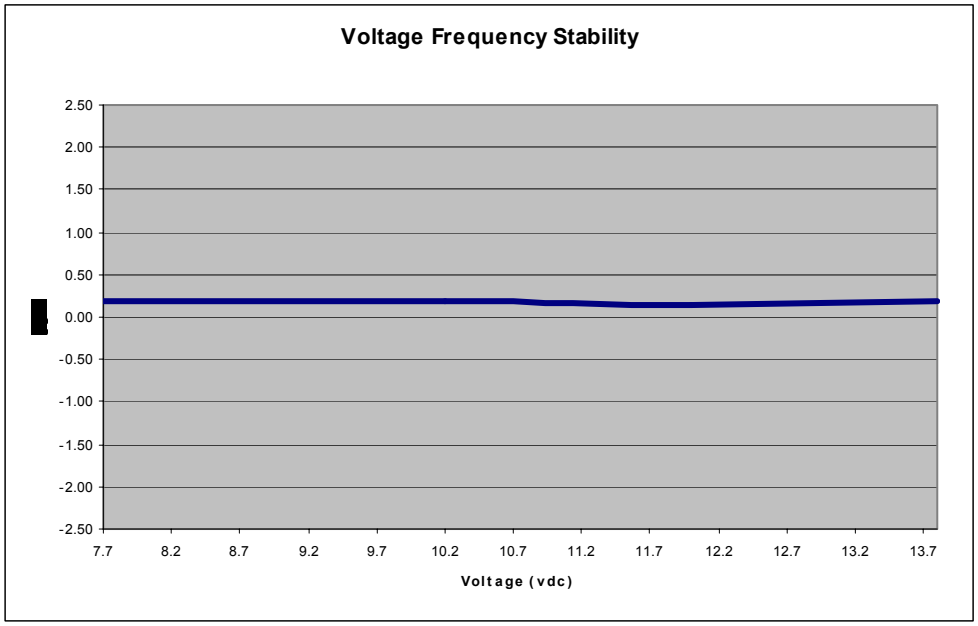


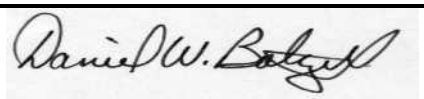
TABLE 9-3: FREQUENCY STABILITY/VOLTAGE VARIATION CHANNEL 383, 836.49 MHZ

Voltage (VDC)	Measured Frequency (MHz)	ppm
7.7 (Battery End-point)	836.490151	0.18
10.2	836.490152	0.18
12	836.490128	0.15
13.8	836.490162	0.19

TABLE 9-4: TEST EQUIPMENT USED FOR TESTING FREQUENCY STABILITY/VOLTAGE

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz - 40 GHz)	3943A01719	07/15/04
901247	Wavetek	DM25XT	Multimeter	40804098	3/3/05

TEST PERSONNEL:

DANIEL BALTZELL		JUNE 15, 2004
TEST TECHNICIAN/ENGINEER	SIGNATURE	DATE OF TEST

10 CONCLUSION

The data in this measurement report shows that the Ericsson, Inc. Model: CM-42, FCC ID: AXATR-423-A2 complies with all the requirements of Parts 2, 22.901(d) and 24E of the FCC Rules, and Industry Canada RSS-129.