FCC PART 24 TYPE APPROVAL
EMI MEASUREMENT AND TEST REPORT

For

Chi Mei Communication Systems, Inc.

11F, No. 39, Chung Hua Road Sec. 1
Taipei 100, Taiwan, R.O.C.

FCC ID: QDJ-0302AMD01

March 18, 2003

This Report Concerns:	**Equipment Type:**
☒ Original Report	PCS Wireless Phone

Test Engineer:	Benjamin Jing
Report No.:	R0302191
Test Date:	March 16, 2003
Reviewed By:	Hans Mellberg
Prepared By:	Bay Area Compliance Laboratory Corporation 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164

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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *Chi Mei Communication Systems, Inc.'s* product, model: *AMADEUS or the* "EUT" as referred to in this report is a PCS Wireless Phone. The EUT measures approximately 3.8"L x 1.6"W x 0.65"H.

** The test data was only good for test sample. It may have deviation for other product samples.*

1.2 Objective

This type approval report is prepared on behalf of *Chi Mei Communication Systems, Inc.* in accordance with Part 2, Subpart J, Part 15, Subparts A and B, and Part 24 Subpart E, of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC Part 2, Part 15 and Part 24.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-1992 and TIA/EIA 603A, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed by Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method – 47 CFR Part – Digital Devices, CISPER 22: 1997: Electromagnetic Interference – Limits and Methods of Measurement of Information Technology Equipment test methods.

1.6 Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Due Data
HP	Spectrum Analyzer	8566B	2610A02165	12/6/03
HP	Spectrum Analyzer	8593B	2919A00242	12/20/03
HP	Amplifier	8349B	2644A02662	12/20/03
HP	Quasi-Peak Adapter	85650A	917059	12/6/03
HP	Amplifier	8447E	1937A01046	12/6/03
A.H. System	Horn Antenna	SAS0200/571	261	12/27/03
Com-Power	Log Periodic Antenna	AL-100	16005	11/2/03
Com-Power	Biconical Antenna	AB-100	14012	11/2/03
Solar Electronics	LISN	8012-50-R-24-BNC	968447	12/28/03
Com-Power	LISN	LI-200	12208	12/20/03
Com-Power	LISN	LI-200	12005	12/20/03
BACL	Data Entry Software	DES1	0001	12/20/03
Rohde & Schwarz	Signal Generator	SMIQ03B	1125.5555.03	7/10/2003
Rohde & Schwarz	I/Q Modulation Generator	AMIQ	1110.2003.02	8/10/2003
HP	Power Meter	E 4418A	N/A	4/29/03

Statement of Traceability: Bay Area Compliance Laboratory Corp. declares that all equipment has been performed calibration using suitable standard traceable to National Institute of Standard and Technology (NIST).

1.7 Remote Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Anritsu	Base Station Simulator	MT8802A	N/A	DoC

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

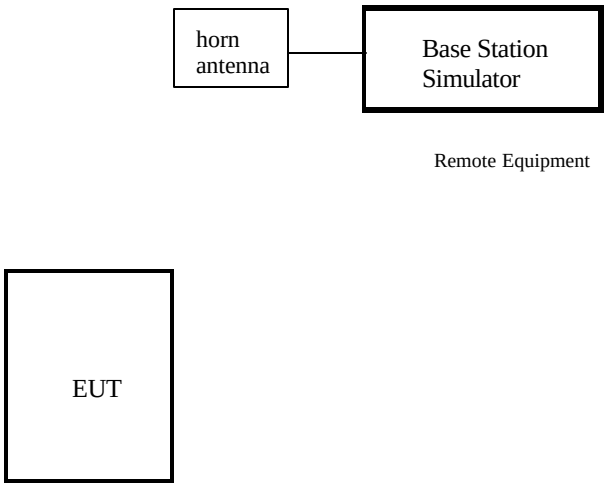
The EUT was configured for testing in a typical fashion (as normally used in a typical application).

The final qualification test was performed with the EUT operating at normal mode.

2.2 Schematics/Block Diagram

Please refer to Exhibit D.

2.3 Test Setup Block Diagram



2.4 Equipment Modifications

No modifications were necessary for the EUT to comply with the applicable standard and limit.

3 - SUMMARY OF TEST RESULTS

FCC RULE	DESCRIPTION OF TEST	Measured	Result
§ 2.1049 § 24.238	Emission Bandwidth	Section 5	Compliant
2.1051 § 24.238(a)	Spurious emissions at antenna terminals	Section 6	Compliant
2.1053 § 24.238 (a)	Field strength of spurious radiation	Section 7	Compliant
§ 2.1055 (a) § 2.1055 (d) § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Section 9	Compliant
§ 2.1093 § 24.52	RF Exposure Requirement	SAR report	Compliant

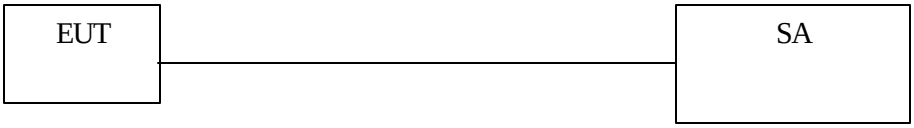
4 - CONDUCTED OUTPUT POWER MEASUREMENT

4.1 Standard Applicable

According to § 2.1046 (a) for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in §2.1033(c)(8).

4.2 Measurement Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Add a correction factor to the display.



Note: The antenna is integrated with the EUT. The conducted output power may not be measured exactly.

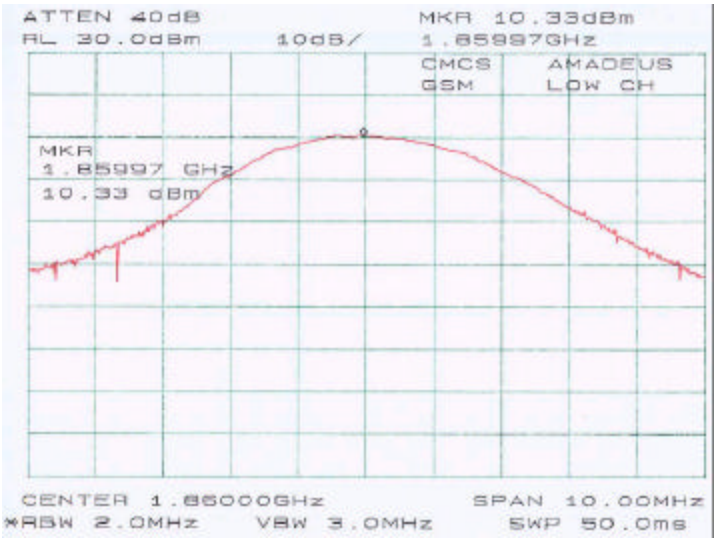
4.3 Measurement Result

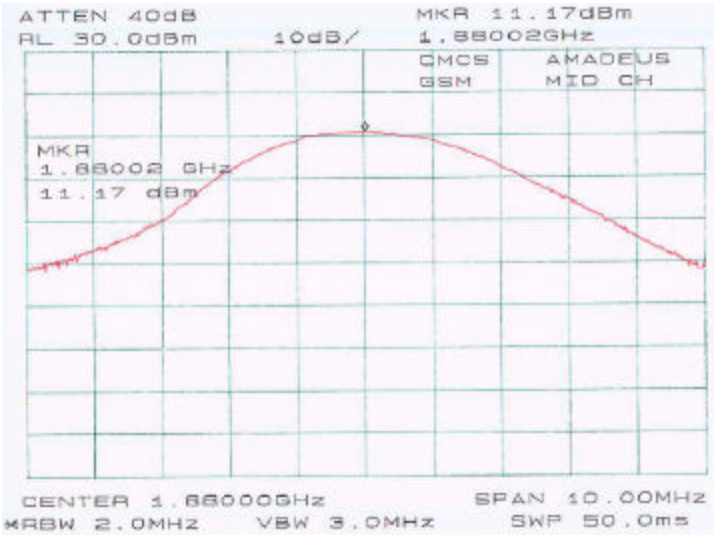
Please refer to the attached pictures for more information.

Frequency	Output Power in dBm
1860	10.33
1880	11.17
1990	14.33

4.4 Test Equipment

Manufacturer	Model No.	Serial No.	Calibration Due Date
HP	8568B	2610A02165	12/6/03
HP	8593B	2919A0242	12/20/03


ATTEN 40dB
RL 30.0dBm
10dB/
MKR 10.33dBm
1.85997GHz
CMCS
GSM
AMADEUS
LOW CH
MKR
1.85997 GHz
10.33 dBm
CENTER 1.86000GHz
SPAN 10.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR 11.17dBm
1.88002GHz
CMCS
GSM
AMADEUS
MID CH
MKR
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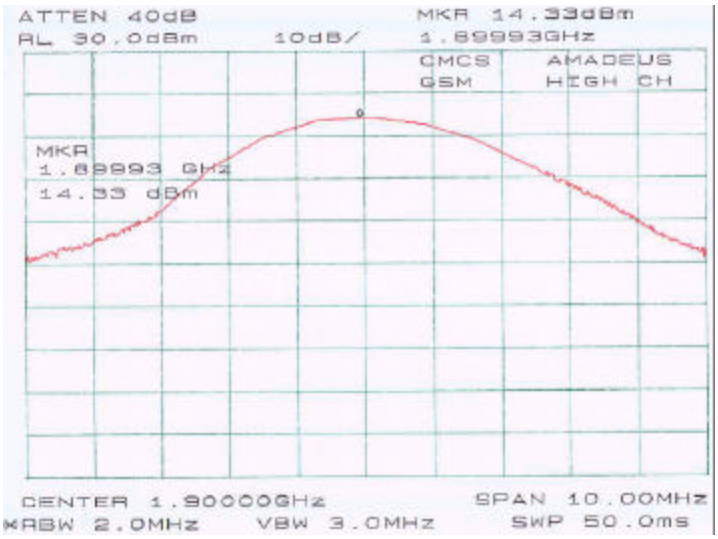
11.17 dBm
CENTER 1.88000GHz
SPAN 10.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR 14.33dBm
1.89993GHz
CMCS
GSM
AMADEUS
HIGH CH
MKR
1.89993 GHz
14.33 dBm
CENTER 1.90000GHz
SPAN 10.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms

5 - RF POWER OUTPUT

5.1 Applicable Standard

According to FCC §2.1046 and §24.232 (1), mobile/portable stations are limited to 2 watts EIRP.

5.2 Test Procedure

1. On a test site, the EUT shall be placed at 1.5m height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the quasi-peak detector is used for the measurement.
4. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6. The transmitter shall then the rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a horn (substitution antenna).
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

17. The measure of the effective radiated power is the large of the two levels recorded, at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

5.3 Test Results

Frequency	Output Power in dBm
1860	24.6
1880	25.3
1990	23.0

6 - EMISSION BANDWIDTH

6.1 Applicable Standards

According to FCC §2.1049 and §24.238 (b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

6.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 3 KHz and the spectrum was recorded.

6.3 Test Equipment

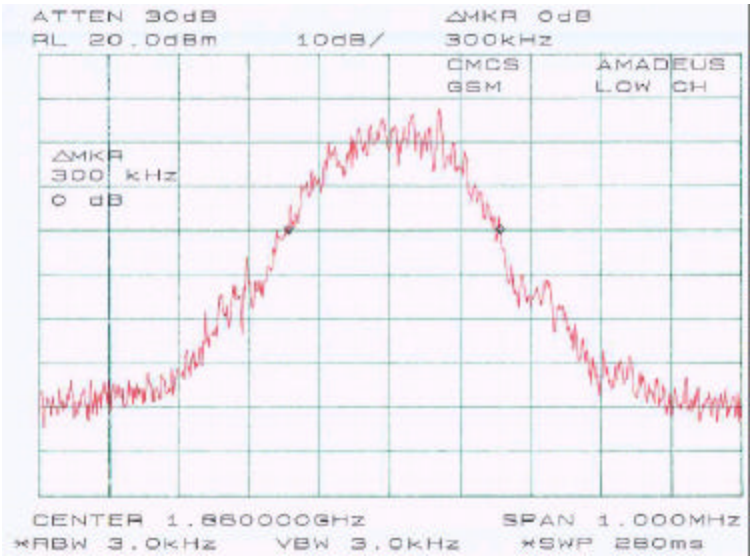
Agilent 8565EC Spectrum Analyzer
Hewlett Packard HP 7470A Plotter
Hewlett Packard 8449 Amplifier
A.H. Systems, Inc SAS-200/571 Horn Antenna

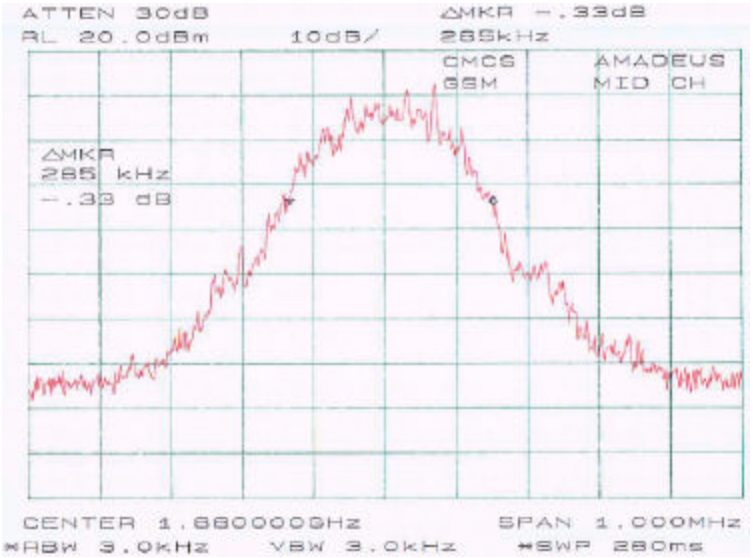
6.4 Plots of Occupied Bandwidth

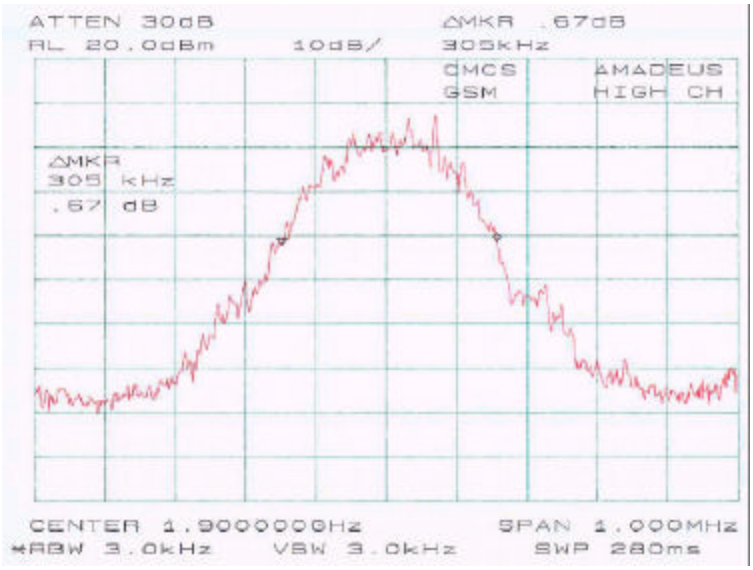
Please refer to plots hereinafter.

Test Data Summary

Channel	Emission Bandwidth in kHz
Low	300
Mid	285
High	305


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR 0dB
300kHz
CMCS
GSM
AMADEUS
LOW CH
ΔMKR
300 kHz
0 dB
CENTER 1.8600000GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 280ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -.33dB
285kHz
CMCS
GSM
AMADEUS
MID CH
ΔMKR
285 kHz
-.33 dB
CENTER 1.8800000GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 280ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR .67dB
305kHz
CMCS
GSM
AMADEUS
HIGH CH
ΔMKR
305 kHz
.67 dB
CENTER 1.9000000GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
SWP 280ms

7 - OUT OF BAND EMISSIONS AT ANTENNA TERMINALS

7.1 Applicable Standards

According to FCC §2.1049 and §24.238, on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB.

7.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1 MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

7.3 Test Equipment

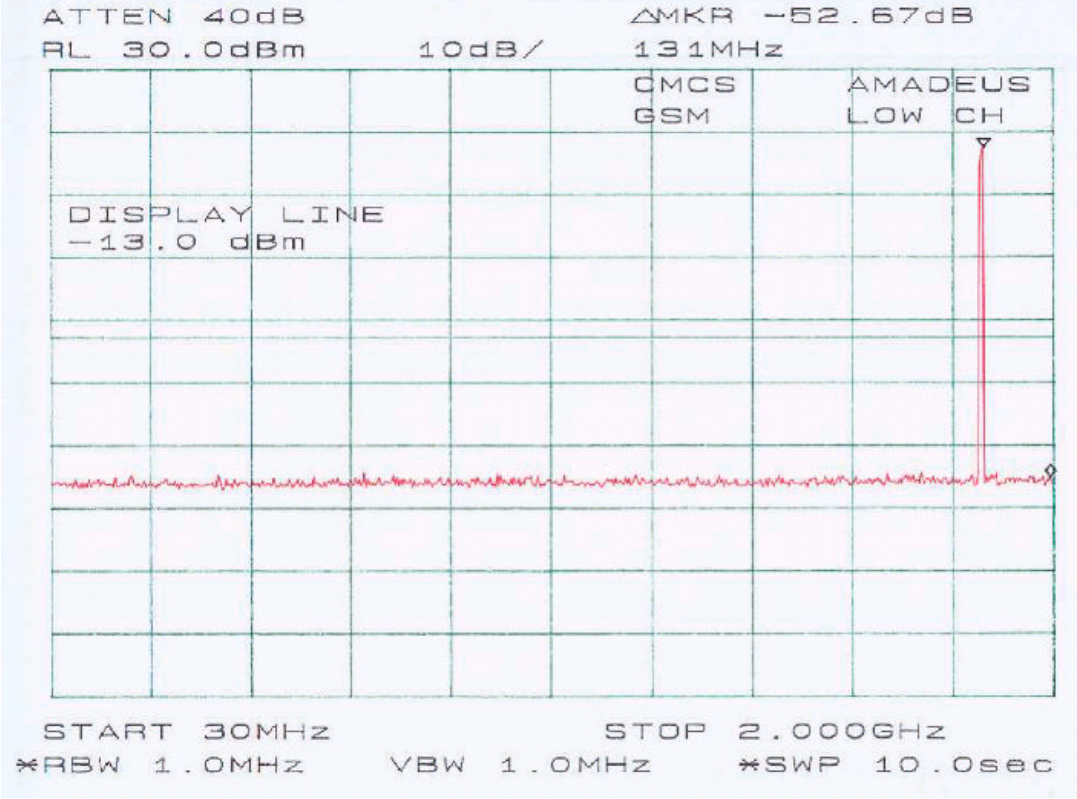
Agilent 8565EC Spectrum Analyzer
HP 7470A Plotter
Hewlett Packard HP8566B Spectrum Analyzer
Hewlett Packard HP 7470A Plotter
Hewlett Packard 8449 Amplifier
A.H. Systems, Inc SAS-200/571 Horn Antenna

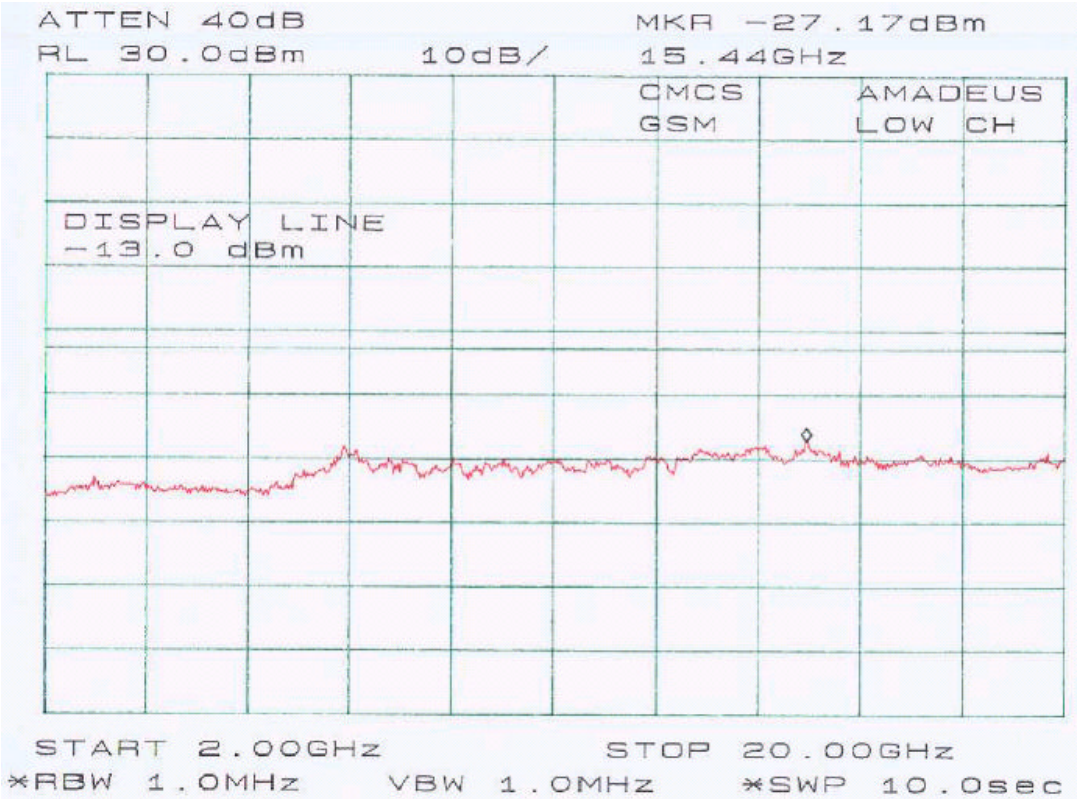
7.4 Test Results

Channel	Measured
Low	< -13dBm
Mid	< -13dBm
High	< -13dBm

6.5 Plots of Out-of-Band Emissions at Antenna Terminal

Please refer to plots hereinafter.


ATTEN 40dB
RL 30.0dBm
10dB/
ΔMKR -52.67dB
131MHz
CMCS
GSM
AMADEUS
LOW CH
DISPLAY LINE
-13.0 dBm
START 30MHz
STOP 2.000GHz
*RBW 1.0MHz
VBW 1.0MHz
*SWP 10.0sec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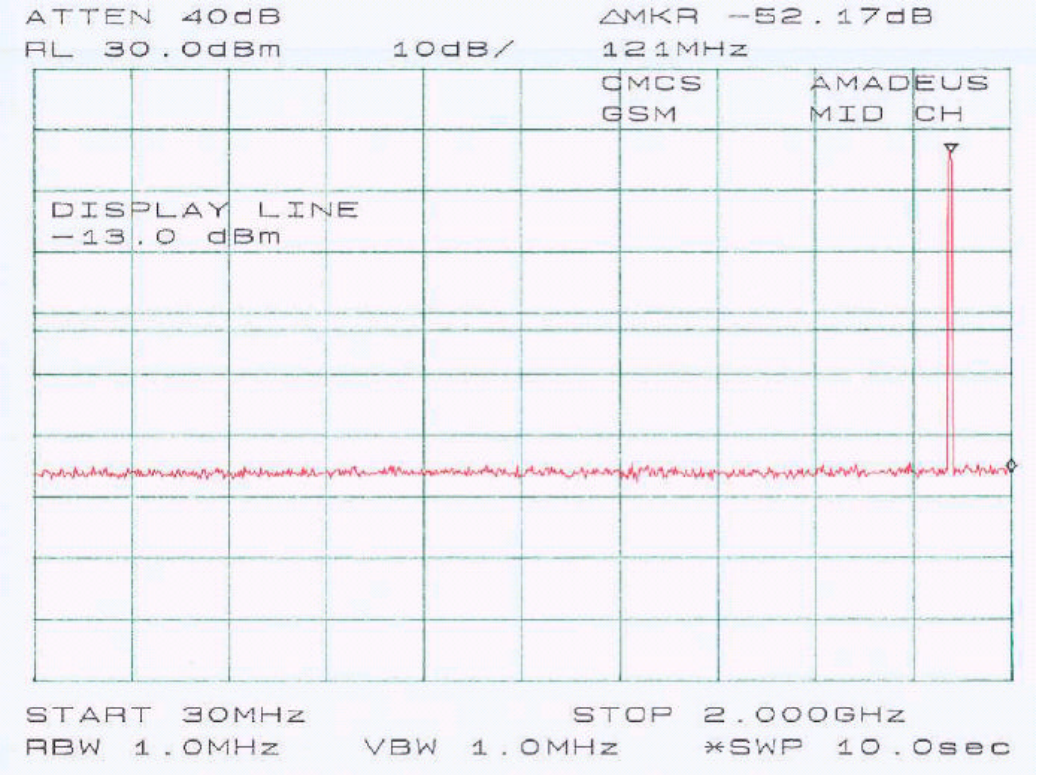
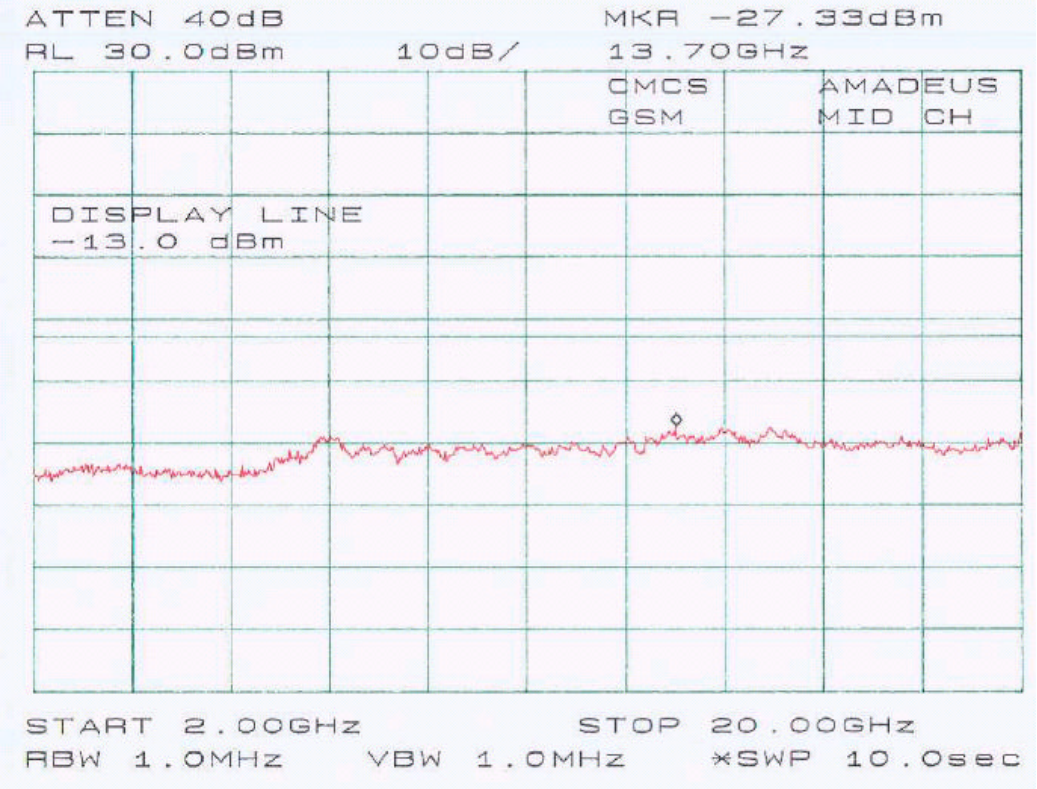
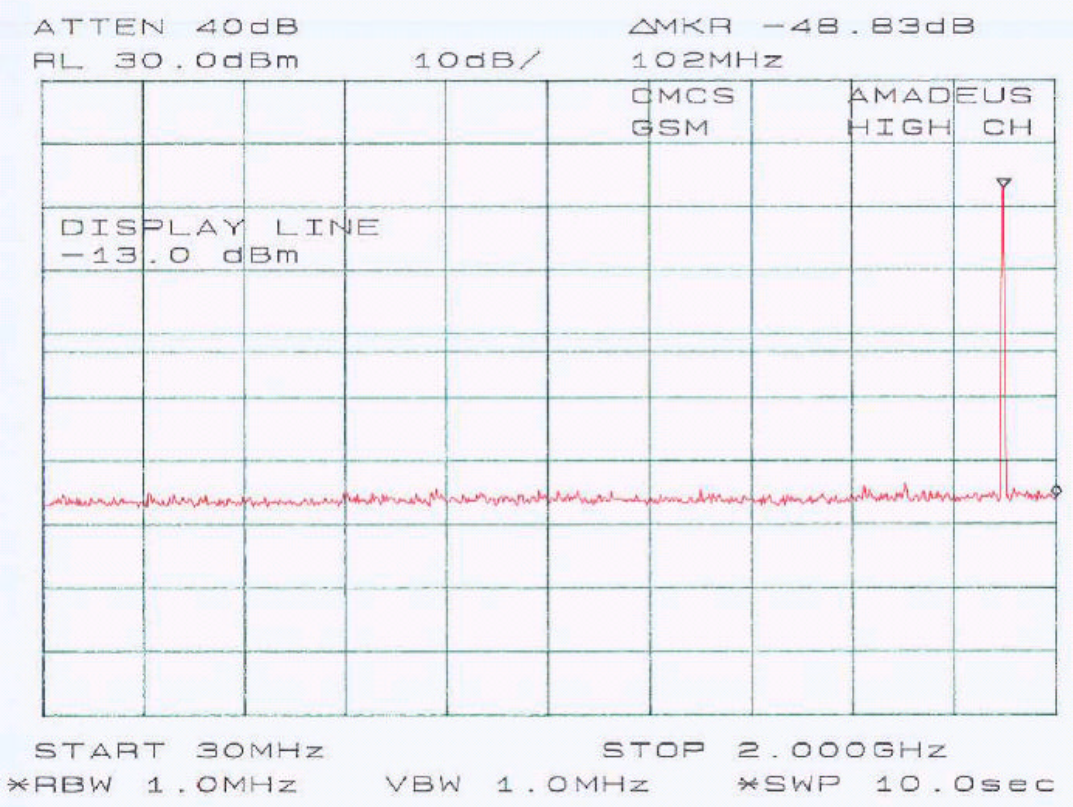
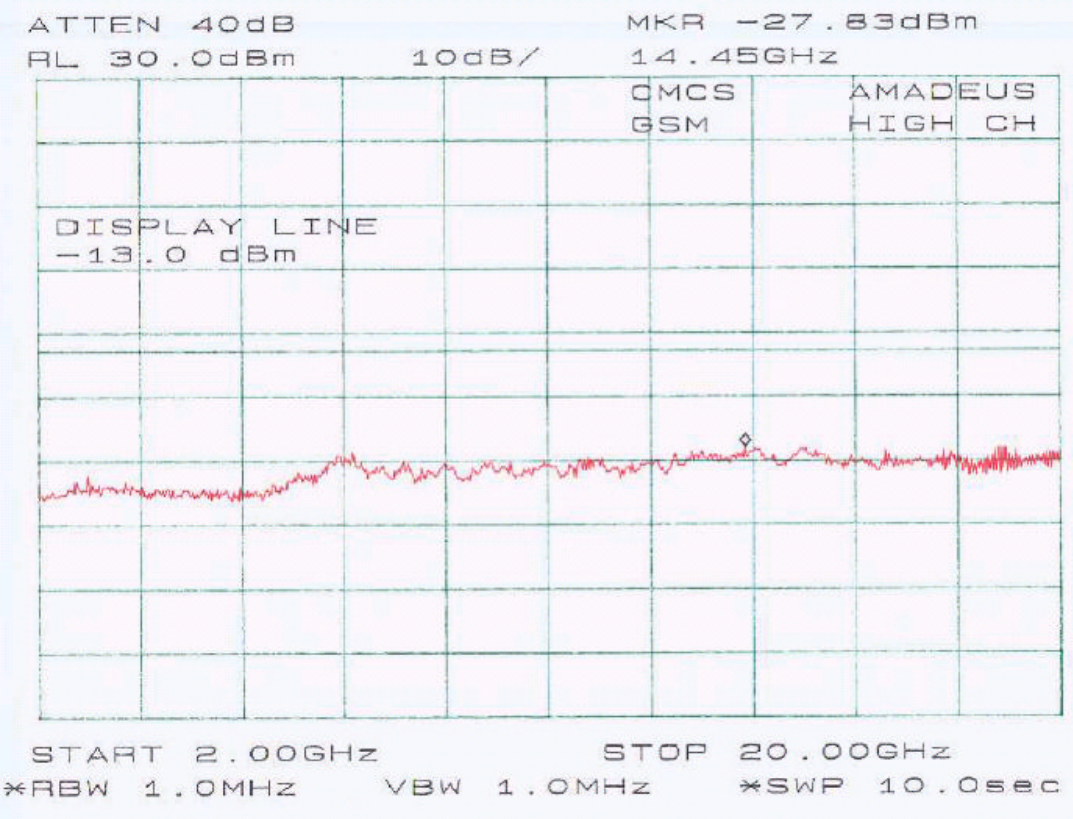
RL 30.0dBm
10dB/
MKR -27.17dBm
15.44GHz
CMCS
GSM
AMADEUS
LOW CH
DISPLAY LINE
-13.0 dBm
START 2.00GHz
STOP 20.00GHz
*RBW 1.0MHz
VBW 1.0MHz
*SWP 10.0sec


ATTEN 40dB
RL 30.0dBm
10dB/
△MKR -52.17dB
121MHz
CMCS
GSM
AMADEUS
MID CH
DISPLAY LINE
-13.0 dBm
START 30MHz
STOP 2.000GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 10.0sec


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -27.33dBm
13.70GHz
CMCS
GSM
AMADEUS
MID CH
DISPLAY LINE
-13.0 dBm
START 2.00GHz
STOP 20.00GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 10.0sec


ATTEN 40dB
RL 30.0dBm
10dB/
ΔMKR -48.83dB
102MHz
CMCS
GSM
AMADEUS
HIGH CH
DISPLAY LINE
-13.0 dBm
START 30MHz
STOP 2.000GHz
*RBW 1.0MHz
VBW 1.0MHz
*SWP 10.0sec


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -27.83dBm
14.45GHz
CMCS
GSM
AMADEUS
HIGH CH
DISPLAY LINE
-13.0 dBm
START 2.00GHz
STOP 20.00GHz
*RBW 1.0MHz
VBW 1.0MHz
*SWP 10.0sec

8 - FIELD STRENGTH OF SPURIOUS RADIATION

8.1 Test Procedure

Requirements: CFR 47, § 2.1053, § 22.917 and § 24.238 (a).

8.2 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

8.3 Test Equipment

CDI B100/200/300 Biconical Antennas
EMCO Bi-logcon Antenna
EMCO 3115 Horn Antenna
HP 8566B Spectrum Analyzer
Preamplifiers
HP8640 Generator
Non-radiating Load

8.4 Test Result

Low Channel: -23.4dBm at 3720MHz
Middle Channel: -25.6dBm at 3760MHz
High Channel: -25.9dBm at 3800MHz

Primary scan at 1860MHz (Low CH.)

Indicated		Table	Test Antenna		Substituted			Antenna	Cable	Absolute	Limit	Margin
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V	Gain Correction	Loss dB	Leval dBm	dBm	dB
1860	83.8	270	1.2	v	1860	12.5	v	6.6	0.5	18.6		
1860	86.8	90	1.5	h	1860	18.5	h	6.6	0.5	24.6		
3720	44.7	0	1.2	v	3720	-44.6	v	8.9	0.7	-36.4	-13	-23.4
3720	43.7	90	1.5	h	3720	-47.1	h	8.9	0.7	-38.9	-13	-25.9
5580	42.8	180	1.2	v	5580	-48.3	v	9.2	1.1	-40.2	-13	-27.2
5580	39.7	150	1	h	5580	-49.4	h	9.2	1.1	-41.3	-13	-28.3

Primary scan at 1880MHz (Mid CH.)

Indicated		Table	Test Antenna		Substituted			Antenna	Cable	Absolute	Limit	Margin
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V	Gain Correction	Loss dB	Leval dBm	dBm	dB
1880	82.5	0	1.2	v	1880	13.1	v	6.6	0.5	19.2		
1880	86.9	90	1.5	h	1880	19.2	h	6.6	0.5	25.3		
3760	44.3	30	1.2	v	3760	-47.1	v	8.9	0.7	-38.9	-13	-25.9
3760	45.2	110	1.5	h	3760	-46.8	h	8.9	0.7	-38.6	-13	-25.6
5640	39.7	120	1.5	v	5640	-48.9	v	9.2	1.1	-40.8	-13	-27.8
5640	38.8	90	1.2	h	5640	-49.6	h	9.2	1.1	-41.5	-13	-28.5

Primary scan at 1900MHz (High CH.)

Indicated		Table	Test Antenna		Substituted			Antenna	Cable	Absolute	Limit	Margin
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V	Gain Correction	Loss dB	Leval dBm	dBm	dB
1900	84.2	150	1.2	v	1900	13.5	v	6.6	0.5	19.6		
1900	85.2	0	1	h	1900	16.9	h	6.6	0.5	23		
3800	43.8	150	1.2	v	3800	-47.5	v	8.9	0.7	-39.3	-13	-26.3
3800	43.7	180	1.2	h	3800	-47.1	h	8.9	0.7	-38.9	-13	-25.9
5700	43.9	90	2	v	5700	-48.2	v	9.2	1.1	-40.1	-13	-27.1
5700	43	270	1.2	h	5700	-48.6	h	9.2	1.1	-40.5	-13	-27.5

Compliance Statement:

According to FCC Part 15, at 3-meter distance the emission from an intentional radiator shall not exceed the field strength level 40dBuV/m within 30-88MHz, 43.5dBuV/m within 88-216 MHz, 46dBuV/m within 226-960MHz, 54dBuV/m above 960MHz. The level of any unwanted emissions shall not exceed the level of the fundamental frequency.

The levels of unwanted emission of this device were below the above limits. This device was compliant with the FCC Part 15.

9 – BAND EDGE TEST

9.1 Applicable Standards

According to FCC §2.1049 and §24.238, when measuring the emission limits, carrier frequency shall be adjusted as close to the frequency block edges, both upper and lower.

9.2 Test Procedure

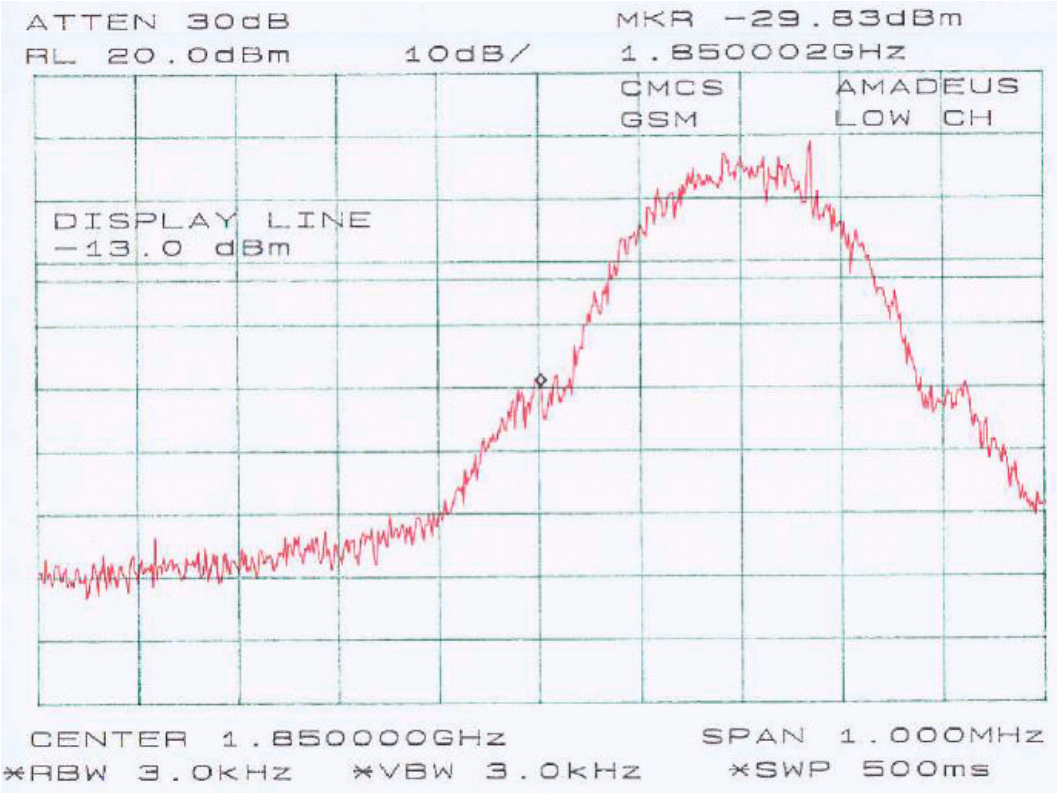
The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. Adjust the carrier frequency as close to the frequency block edges both upper and lower. Sufficient scans were taken to show any out of band-edge emission.

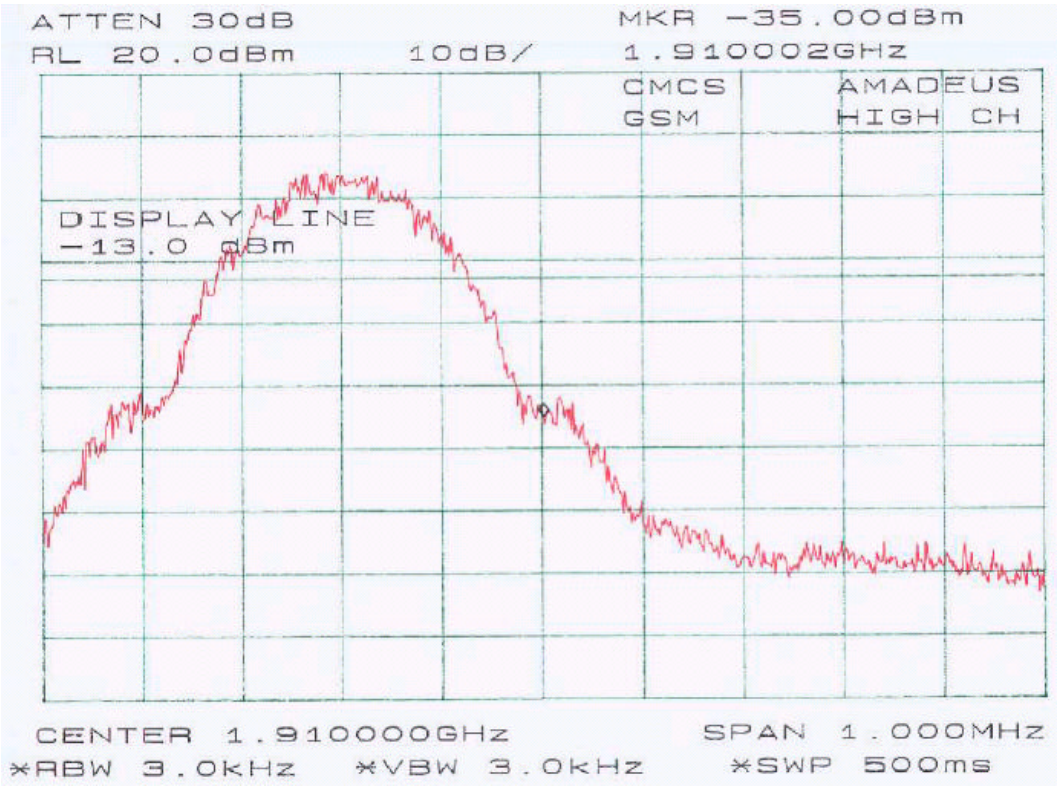
9.3 Test Equipment

Agilent 8565EC Spectrum Analyzer
HP 7470A Plotter
Hewlett Packard HP8566B Spectrum Analyzer
Hewlett Packard HP 7470A Plotter
Rohde & Schwarz SMIQ03B Signal Generator
Rohde & Schwarz AMIQ I/Q Modulation Generator
Hewlett Packard 8449 Amplifier
A.H. Systems, Inc SAS-200/571 Horn Antenna

9.4 Plots of Out-of-Band-Edge Emissions at Antenna Terminal

Please refer to plots hereinafter.


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -29.83dBm
1.850002GHz
CMCS
GSM
AMADEUS
LOW CH
DISPLAY LINE
-13.0 dBm
CENTER 1.850000GHz
SPAN 1.000MHz
*RBW 3.0kHz
*VBW 3.0kHz
*SWP 500ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -35.00dBm
1.910002GHz
CMCS
GSM
AMADEUS
HIGH CH
DISPLAY LINE
-13.0 dBm
CENTER 1.910000GHz
SPAN 1.000MHz
*RBW 3.0kHz
*VBW 3.0kHz
*SWP 500ms

10 - FREQUENCY STABILITY

Frequency Stability vs Temperature

Reference Frequency: 1880 MHz		
Temperature (° C)	Power Supplied (Vdc)	Frequency Measured with Time Elapsed
50	New Battery	1880.003
20	New Battery	1800.001
-30	New Battery	1799.998

Frequency Stability vs Battery Voltage

Reference Frequency: 1880 MHz		
Power Supplied (Vdc)	Time Elapsed (munite)	Frequency (MHz)
3.7	10	1880.001
3.1	10	1880.001

The manufacturer declares that the power end point is 3.1 Vdc.