ELECTROMAGNETIC COMPATIBILITY

EMC TEST REPORT

FOR

COMMERCIANT, L.P.

PORTABLE CREDIT CARD TRANSACTION TERMINAL

WITH

DUAL-BAND CELLULAR/PCS CDMA-2000 MODEM

MODEL: M-106X

FCC ID: QWL-M-106X

Test Report Serial Number

013006QWL-T716-E24C

Test Report Issue No.

E716C-030206-R0

Test Lab

Celltech Compliance Testing & Engineering Lab
(Celltech Labs Inc.)
1955 Moss Court
Kelowna, BC
Canada
V1Y 9L3

DECLARATION OF COMPLIANCE

Test Lab

CELLTECH LABS INC.
Testing and Engineering Services
1955 Moss Court
Kelowna, B.C.
Canada V1Y 9L3

Phone: 250-448-7047
Fax: 250-448-7048
e-mail: info@celltechlabs.com
web site: www.celltechlabs.com

Applicant

COMMERCIANT, L.P.
2901 Wilcrest, Suite 250
Houston, Texas 77042
United States

Lab Registration No.(s):	FCC:	714830			IC:	3874					
Rule Part(s):	FCC:	§2	§22H	§24E	IC:	RSS-133 Issue 3		RSS-132 Issue 2			
Device Classification:	FCC:	PCS Licensed Transmitter (PCB)									
	IC:	2 GHz Personal Communication Services (RSS-133 Issue 3) 800 MHz Cellular Telephones Employing New Technologies (RSS-132 Issue 2)									
Device Identification:	FCC ID:	QWL-M-106X									
DUT Description:											
Model:	M-106X										
Device Description:	Portable Wireless Credit Card Transaction Terminal										
Internal Transmitter(s):	Wavecom Q2438F Dual-Band CDMA-2000 Modem										
Transmit Freq. Range(s):	Cellular CDMA	824.70 - 848.31 MHz			PCS CDMA			1851.25 - 1908.75 MHz			
Maximum RF Conducted Output Power Levels Measured:	Cellular CDMA	Ch. 1013	24.96 dBm	0.313 W	Ch. 384	24.98 dBm	0.315 W	Ch. 777	25.00 dBm	0.316 W	
	PCS CDMA	Ch. 25	24.08 dBm	0.256 W	Ch. 600	24.33 dBm	0.271 W	Ch. 1175	24.38 dBm	0.274 W	
Max. ERP Measured:	22.36 dBm	0.172 W	848.31 MHz		Channel 777			Cellular CDMA Band			
Max. EIRP Measured:	21.96 dBm	0.157 W	1880.00 MHz		Channel 600			PCS CDMA Band			
Emission Designator:	1M25F9W										
Antenna Type(s):	Internal PCB antenna										
Power Source(s):	Stationary: AC Power Adapter (Model: HK-A114-U07) Input: 100-120 VAC 50/60 Hz 0.45 A, Output: 7 VDC 2 A										
	3.7 V Internal Lithium-ion Battery, 1800 mAh (Model: Ultralife UBBPO1)										

This wireless portable device has demonstrated compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC 47 CFR Rule Parts 2, 22H, 24E; Industry Canada RSS-132 Issue 2, RSS-133 Issue 3; and ANSI TIA/EIA-603-C-2004.

I attest to the accuracy of the data. All measurements reported herein were performed by me or were under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested By:

Spencer Watson

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

Reviewed By:

Duane M. Friesen
EMC Manager
Celltech Labs Inc.

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FIGURES

PHOTOGRAPHS

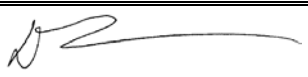
TEST SUMMARY

Appendix	Test Description	Procedure Reference	Limit Reference	Test Start Date	Test End Date	Result
Referenced Standard: FCC CFR Title 47 Part 2, 22H						
A	Conducted RF Output Power	§2.1046	§2.1046	02Feb06	02Feb06	Pass
B	Occupied Bandwidth	§2.1049	§2.202	07Feb06	07Feb06	Pass
C	Conducted TX Spurious Emissions	§22.917(b)	§22.917(a)	07Feb06	07Feb06	Pass
D	Effective Radiated Power	ANSI/TIA/EIA-603-C	§22.913	14Feb06	20Feb06	Pass
E	Radiated TX Spurious Emissions	ANSI/TIA/EIA-603-C	§22.917 (e)	14Feb06	22Feb06	Pass
Referenced Standard: FCC CFR Title 47 Part 2, 24E						
F	Conducted RF Output Power	§2.1046	§2.1046	02Feb06	02Feb06	Pass
G	Occupied Bandwidth	§2.1049	§2.202	07Feb06	07Feb06	Pass
H	Conducted TX Spurious Emissions	§24.238(b)	§24.238(a)	07Feb06	07Feb06	Pass
I	Effective Isotropic Radiated Power	ANSI/TIA/EIA-603-C	§24.232(b)	14Feb06	20Feb06	Pass
J	Radiated TX Spurious Emissions	ANSI/TIA/EIA-603-C	§24.238 (a)	14Feb06	20Feb06	Pass
Referenced Standard: IC RSS-132 Issue 2						
A	Conducted RF Output Power	RSS-Gen §4.6	SRSP-503 §5.1	02Feb06	02Feb06	Pass
B	Occupied Bandwidth	FCC CFR 47 §2.1049	RSS-132 §4.2	07Feb06	07Feb06	Pass
C	Conducted TX Spurious Emissions	RSS-Gen §4.7	RSS-132 §4.5	07Feb06	07Feb06	Pass
D	Effective Radiated Power	ANSI/TIA/EIA-603-C	SRSP-503 §5.1	14Feb06	20Feb06	Pass
E	Radiated TX Spurious Emissions	RSS-Gen §4.7	RSS-132 §4.5	14Feb06	22Feb06	Pass
K	Conducted RX Spurious Emissions	RSS-Gen §4.8	RSS-Gen §6 (b)	27Feb06	27Feb06	Pass
Referenced Standard: IC RSS-133 Issue 3						
F	Conducted RF Output Power	ANSI/TIA/EIA-603-C	SRSP-510 §5.1.2	02Feb06	02Feb06	Pass
G	Occupied Bandwidth	FCC CFR 47 §2.1049	RSS-133 §6.2	07Feb06	07Feb06	Pass
H	Conducted TX Spurious Emissions	RSS-Gen §4.7	RSS-133 §6.5	07Feb06	07Feb06	Pass
I	Effective Isotropic Radiated Power	ANSI/TIA/EIA-603-C	RSS-133 §6.4	14Feb06	20Feb06	Pass
J	Radiated TX Spurious Emissions	RSS-Gen §4.7	RSS-133 §6.5	14Feb06	20Feb06	Pass
L	Conducted RX Spurious Emissions	RSS-133 §4.5	RSS-133 §6.7 (b)	27Feb06	27Feb06	Pass

REVISION LOG

Issue No.	Description	Implemented By	Implementation Date
E716C-030206-R0	Initial Release	Jonathan Hughes	March 02, 2006

SIGNATORIES

Prepared By:		March 01, 2006
Name/Title	Duane M. Friesen, C.E.T. / EMC Manager	Date
Approved By:		March 02, 2006
Name/Title	Jonathan Hughes / General Manager	Date

1.0 SCOPE

This report outlines the measurements made and results collected during electromagnetic emissions testing of the Commerciant M-106X Wireless Credit Card Transaction Terminal FCC ID: QWL-M-106X incorporating the Wavecom Q2438F Dual-Band CDMA-2000 Modem and internal antenna. The measurement results were applied against the applicable EMC requirements and limits outlined in the technical rules and regulations set forth in the Federal Communications Commission's Code of Federal Regulations Title 47 Parts 2, 22 Subpart H, and 24 Subpart E; and Industry Canada Radio Standards Specifications RSS-132 Issue 2, and RSS-133 Issue 3.

2.0 REFERENCES

2.1 Normative References

ANSI/ISO 17025:1999	General Requirements for competence of testing and calibration laboratories
IEEE/ANSI C63.4:2003	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
IEEE/ANSI Std C95.1:1999	American National Standard Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields
ANSI/TIA/EIA-603-C:2004	Land Mobile FM or PM Communication Equipment Measurement and Performance Standards
CFR Title 47 Part 2:2005	Code of Federal Regulations Title 47: Telecommunication Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations Part 22: Public Mobile Services Part 24: Personal Communication Services
IC Spectrum Management & Telecommunications Policy	Radio Standards Specification RSS-102 Issue 2 - Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields RSS-132 Issue 2 - 800 MHz Cellular Telephones Employing New Technologies RSS-133 Issue 3 - 2 GHz Personal Communication Services SRSP-503 Issue 6 - Technical Requirements for Cellular Radiotelephone Systems Operating in the Bands 824 - 849 MHz and 869 - 894 MHz SRSP-510 Issue 3 - Technical Requirements for Personal Communications Services in the Bands 1850-1910 MHz and 1930-1990 MHz

3.0 TERMS AND DEFINITIONS

AV	Average
CDMA	Code Division Multiple Access
CFR	Code of Federal Regulations
dB	decibel
dBm	dB referenced to 1 mW
dBuV	dB referenced to 1 uV
DUT	Device under Test
DSSS	Direct Sequence Spread Spectrum
dBc	dB down from carrier
EBW	Emission Bandwidth
EIRP	Effective Isotropic Radiated Power
EDGE	Enhanced Data Rate for GSM Evolution
EMC	Electromagnetic Compatibility
ERP	Effective Radiated Power
EV-DO	Evolution - Data Only
FCC	Federal Communication Commission
FHSS	Frequency Hopping Spread Spectrum
FPC	Flexible Printed Circuit
GSM	Global Systems for Mobile Communication
GPRS	General Packet Radio Service
HP	Hewlett Packard
HPF	High Pass Filter
Hpol	Horizontal Polarization
Hz	Hertz
IC	Industry Canada
kHz	kilohertz
LNA	Low Noise Amplifier
m	meter
MHz	Megahertz
Mbps	megabits per second
na	not applicable
n/a	not available
PK	Peak
PPSD	Peak Power Spectral Density
QP	Quasi-Peak
RBW	Resolution Bandwidth
R&S	Rohde & Schwarz
RSS	Radio Standard Specification
RX	Receiver
SA	Spectrum Analyzer
TX	Transmitter
VBW	Video Bandwidth
Vpol	Vertical Polarization
WLAN	Wireless Local Area Network

4.0 FACILITIES AND ACCREDITATIONS

The facilities used in collecting the test results outlined in this report are located at 1955 Moss Court, Kelowna, British Columbia, Canada, V1Y 9L3. The radiated and conducted emissions sites conform to the requirements set forth in ANSI C63.4 and are filed and listed with the FCC under Registration Number 714830 and Industry Canada under File Number IC 3874.

5.0 GENERAL INFORMATION

5.1 Applicant Information

Company Name:	**Commerciant, L.P.**
Address:	2901 Wilcrest, Suite 250
	Houston, Texas
	USA 77042

5.2 DUT Description

Device:	Portable Credit Card Transaction Terminal	
Model:	M-106X	
Test Sample Serial No.:	Prototype	
Internal Transmitter:	Wavecom Q2438F Dual-Band CDMA-2000 Modem	
Transmitter Serial No.:	F60B83E4 513 019 08 PP	
Identifier(s):	FCC ID:	QWL-M-106X
Rule Part(s):	FCC:	§22.913; §22.917; §24.232; §24.238
	IC:	RSS-132 Issue 2; RSS-133 Issue 3
Classification(s):	FCC:	- PCS Licensed Transmitter (PCB)
	IC:	- 800 MHz Cellular Telephones employing New Technologies (RSS-132)
		- 2 GHz Personal Communication Services (RSS-133)
Power Source Tested:	Stationary: AC Power Adapter (Model: HK-A114-U07) Input: 100-120 VAC 50/60 Hz 0.45 A, Output: 7 VDC 2 A	
Internal Battery Type:	3.7 V Internal Lithium-ion, 1800 mAh (Model: Ultralife UBBPO1)	

5.3 Co-Located Equipment

Description	none

5.4 Cable Descriptions

ROUTING		Length	Model	Terminations		Shield Type	Shield Termination		Suppression
From	To	m		End 1	End 2		End 1	End 2	
none									

5.5 Support Equipment

The following equipment was used in support of the DUT.

Co-located Support Equipment List		
Manufacturer	**Model**	**Description**
none		

5.6 Mode(s) of Operation Tested

5.6.1 Wireless Credit Card Transaction Terminal with Dual-Band CDMA-2000 Modem

A CDMA Communications Test Set was used to set the M-106X to the appropriate channel and maximum power level for the specific measurement. Measurements were made with the transmitter set to the low, mid and high channel in each band or on a worst-case channel for the measurement, as determined by prescan evaluations.

5.6.1.1 Cellular CDMA

Transmit Frequency Range:	824.70 - 848.31 MHz Ch. 1013 (824.70 MHz) (low), Ch. 384 (836.52 MHz) (mid) & Ch. 777 (848.31 MHz) (high) measured unless otherwise noted
Software Power Gain Settings:	Set by CDMA communications test set for "all ups"
Emission Designator(s):	1M25F9W

5.6.1.2 PCS CDMA

Transmit Frequency Range:	1851.25 - 1908.75 MHz Ch. 25 (1851.25 MHz) (low), Ch 600 (1880.00 MHz) (mid) & Ch. 1175 (1908.75 MHz) (high) measured unless otherwise noted
Software Power Gain Settings:	Set by CDMA communications test set for "all ups"
Emission Designator(s):	1M25F9W

5.6.2 DUT Exercising Software Description

The DUT was configured and exercised during the testing using the CDMA communications test set in the "all ups" power control mode. For the conducted measurements, the communications test set signal was fed to the antenna port via a directional coupler. For the radiated measurements the communications test set was connected to a transmit antenna placed near the DUT.

6.0 PASS/FAIL CRITERIA

Unless otherwise noted in the Appendices, the pass/fail criterion is the limit set forth in the reference standards. A DUT is considered to have passed the requirements if the data collected during the described measurement procedure is within the specified limits as defined. The pass/fail statements made in this report only apply to the unit tested.

APPENDICES

Appendix A - Cellular Band Conducted TX RF Output Power Measurement

A.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §2.1046
Procedure Reference	FCC CFR 47 §2.1046

A.2. LIMITS

FCC CFR 47 §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 procedures to give the values of current and voltage on the circuit elements specified in §2.1033(c) (8).

*ERP limits are specified in Appendix D.

A.3. ENVIRONMENTAL CONDITIONS

Temperature	25 ± 5 ºC
Humidity	35 ± 5 %RH
Barometric Pressure	uncontrolled

A.4. EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00110	Gigatronics	8652A	Power Meter	08Apr05	08Apr06
00109	Gigatronics	80701A	Power Sensor	16Apr05	16Apr06
00114	AR	DC7154	Directional coupler	na	na*
Customer Supplied	Commerciant	na	Cable & SMA adapter	na	na*
00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06

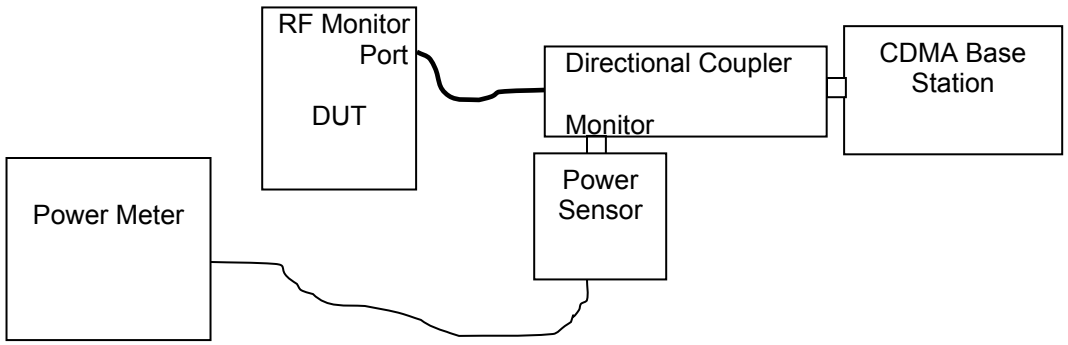
* Attenuation offset in power meter setup

A.5. MEASUREMENT EQUIPMENT SETUP

Measurement Equipment Connections	The equipment was connected as shown in the setup drawing in A.6.
Measurement Equipment Settings	Mode - MAP Offset - set to include loss through cable and directional coupler.
Measurement Procedure	The channel was set on the base station and the resulting power measurement recorded and reported herein.

A.6. SETUP DRAWING

Figure A.6-1 - Setup Drawing



A.7. DUT OPERATING DESCRIPTION

Power measurements were made for each of the three Cellular test channels (Channel 1013, 384 & 777), with the M-106X set appropriately as described in Section 5.6.

A.8. TEST RESULTS

Mode	Channel	Frequency	Conducted Power	
		MHz	dBm	Watts
Cellular CDMA	1013	824.70	+24.96	0.313
	384	836.52	+24.98	0.315
	777	848.31	+25.00	0.316

A.9. PASS/FAIL

There is no pass/fail criterion for this measurement. The ERP values, applied to appropriate regulatory requirements are outlined in Appendix D.

A.10. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

2Feb06
Date

Appendix B - Cellular Band Occupied Bandwidth Measurement

B.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §2.202
Procedure Reference	FCC CFR 47 §2.1049

B.2. LIMITS

FCC CFR 47 §2.202	*Applicable Emission designator: 1M25F9W therefore: Theoretical Necessary BW=1.25 MHz*

B.3. ENVIRONMENTAL CONDITIONS

Temperature	25 ± 5 ºC
Humidity	35 ± 5 %RH
Barometric Pressure	uncontrolled

B.4. EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00015	Agilent	E4408B	Spectrum Analyzer	02Feb06	02Feb07
00102	Pasternack	PE7015-3010	30dB attenuator	na	na*
00079	Pasternack	PE2208-6	Directional coupler	na	na*
Customer Supplied	Commerciant	na	Cable & SMA adapter	na	na*
00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06

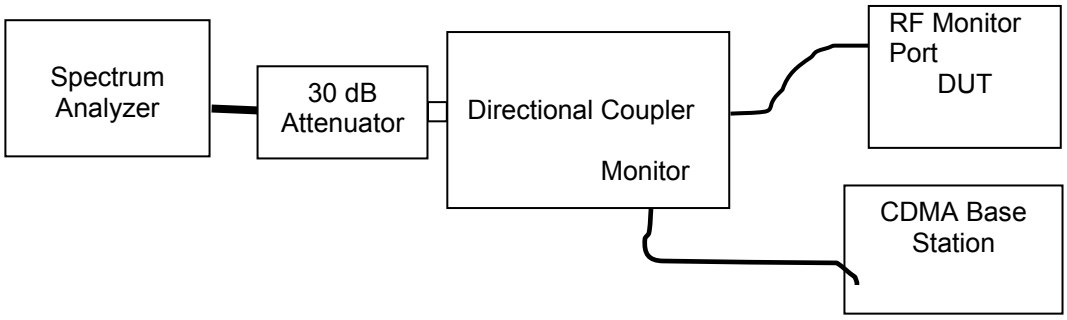
* Verified with power meter prior to use

B.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	The measurement equipment was connected as shown in B.6.			
MEASUREMENT EQUIPMENT SETTINGS	The spectrum analyzer was set to the following settings:			
	RBW	VBW	Detector	
	kHz	kHz		
	30	30	Sample	

B.6. SETUP DRAWING

Figure B.6-1 - Setup Drawing

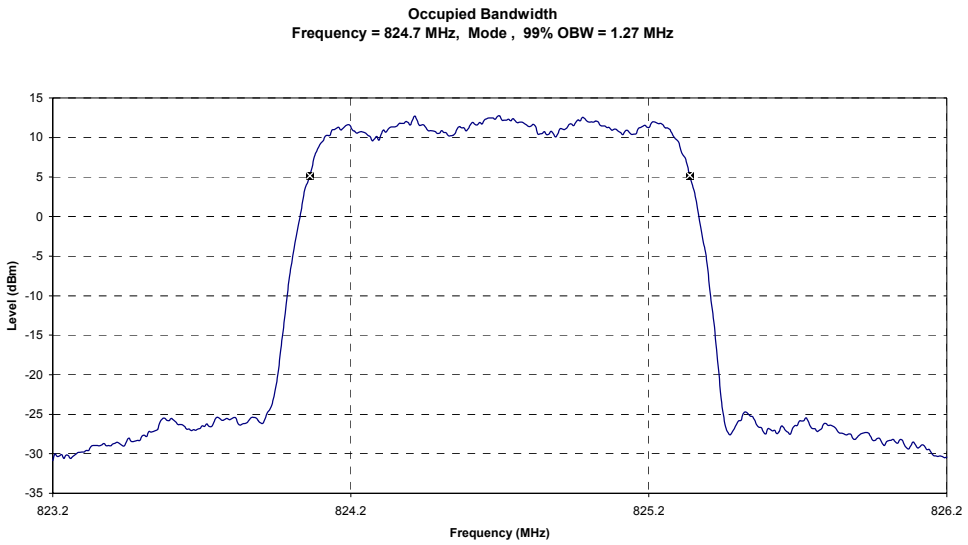


B.7. DUT OPERATING DESCRIPTION

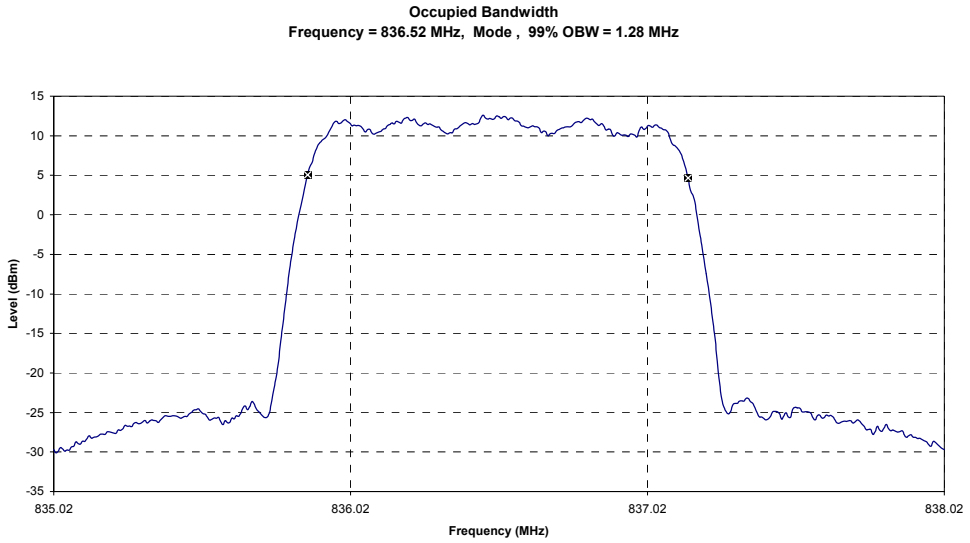
Measurements were made with the DUT transmitting at maximum power in the cellular band, in a configuration as described in Section 5 of this report.

B.8. TEST RESULTS

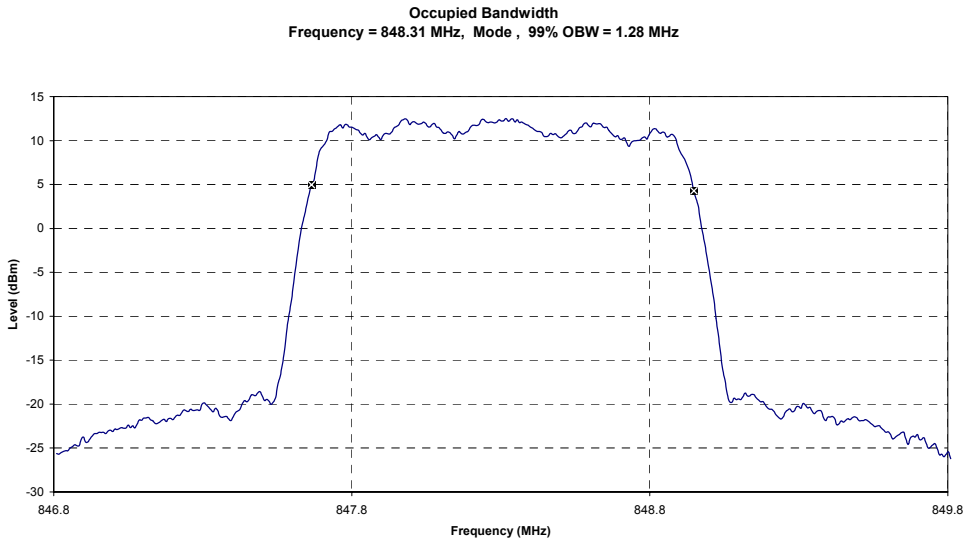
Channel 1013 (824.70 MHz)



Channel 384 (836.52 MHz)



Channel 777 (848.31 MHz)



Summary

Channel	Frequency	OBW
	MHz	MHz
1013	824.70	1.27
384	836.52	1.28
777	848.31	1.28

B.9. PASS/FAIL

In reference to the theoretical necessary bandwidth of 1.25 MHz associated with the published Emission Designator 1M25F9W, the maximum occupied bandwidth measured exceeds this by 2.4%

B.10. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

07Feb06
Date

Appendix C - Cellular Band Conducted TX Spurious Emissions Measurement

C.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §22.917(a)
Procedure Reference	FCC CFR 47 §22.917(b)

C.2. LIMITS

FCC CFR 47 §22.917	*(a) Out of Band Emissions. The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by: at least 43 + 10 log P dB*

C.3. ENVIRONMENTAL CONDITIONS

Temperature	25 ± 5 ºC
Humidity	35 ± 5 %RH
Barometric Pressure	uncontrolled

C.4. EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00015	Agilent	E4408B	Spectrum Analyzer	02Feb06	02Feb07
00102	Pasternack	PE7015-3010	30dB attenuator	na	na*
00079	Pasternack	PE2208-6	Directional coupler	na	na*
Customer Supplied	Commerciant	na	Cable & SMA adapter	na	na*
00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06

* Verified with power meter prior to use

C.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS

The measurement equipment was connected as shown in C.6.

MEASUREMENT EQUIPMENT SETTINGS

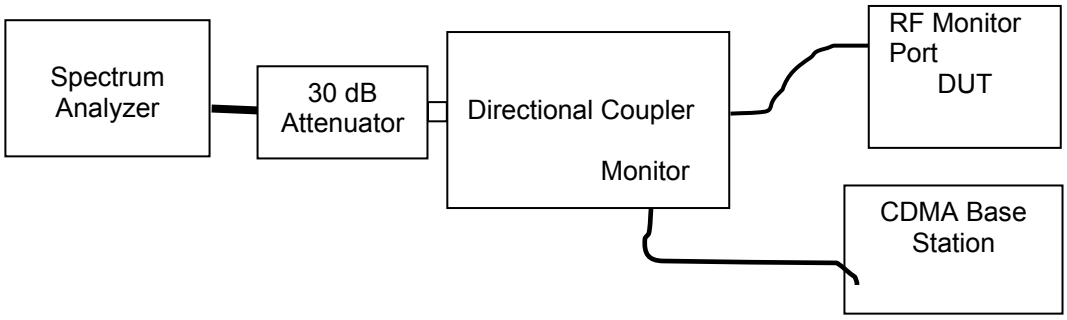
The spectrum analyzer was set to the following settings:

Frequency Range	Measurement		Specified BW*	Detector
	RBW	VBW		
MHz	kHz	kHz	kHz	
At Block edges	10	10	1% EBW	Sample
Within 1 MHz of the Block edges	10	10	1% EBW	Sample
Between 1MHz and 40 MHz from Block edges	10	10	100	Sample
Beyond 40MHz from Block edges	100	100	100	Peak

*Measured data corrected for specified BW using 10*log (measurement RBW / specified BW)

C.6. SETUP DRAWING

Figure C.6-1 - Setup Drawing



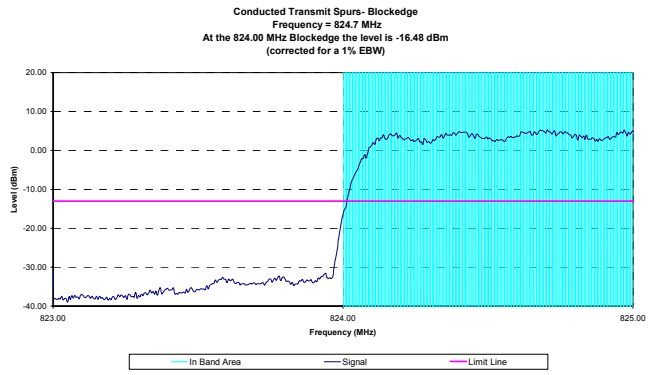
C.7. DUT OPERATING DESCRIPTION

Measurements were made with the DUT transmitting at maximum power in the cellular band, in a configuration as described in Section 5 of this report. The Block Edge measurements were made with the DUT transmitting on the channel closest to the edge under investigation (CH1013 & CH777). The remaining spurious measurements were made on each of the three channels, Low (CH1013), Mid (CH384) and High (CH777).

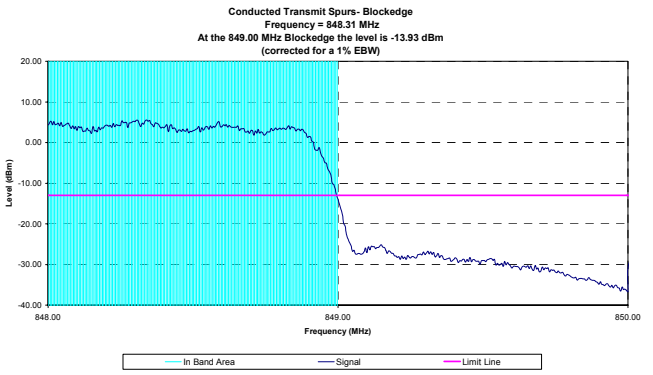
C.8. TEST RESULTS

C.8.1. Spurious Emissions within 1MHz of Block Edge

Lower Block Edge - 824 MHz (Channel 1013)

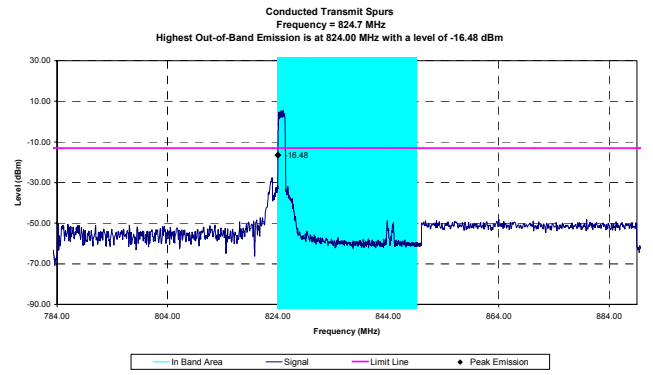


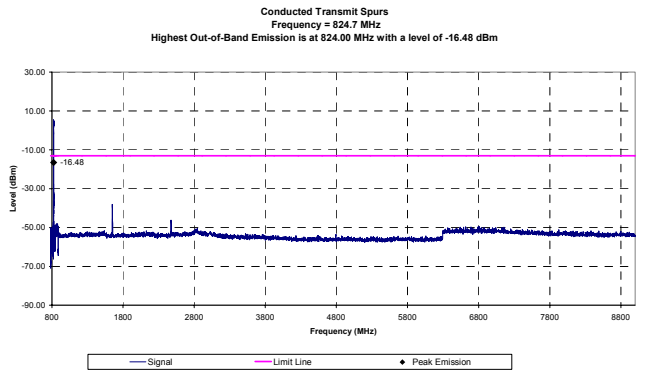
Upper Block Edge - 849 MHz (Channel 777)



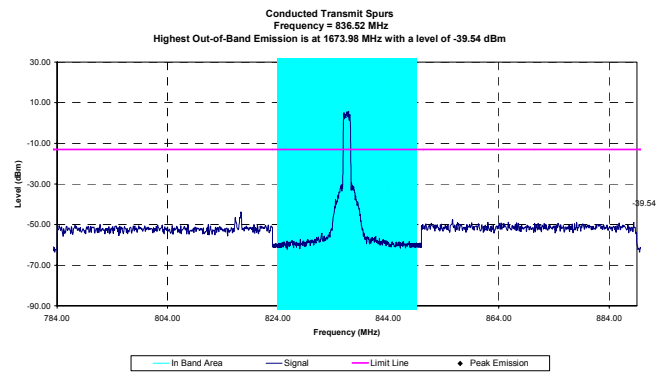
C.8.2. Conducted Transmit Spurious Emissions

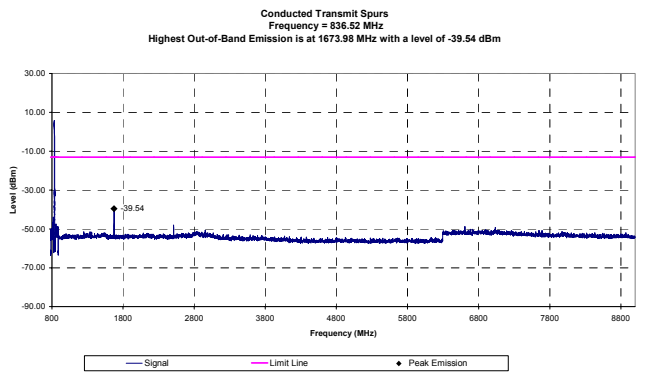
Channel 1013



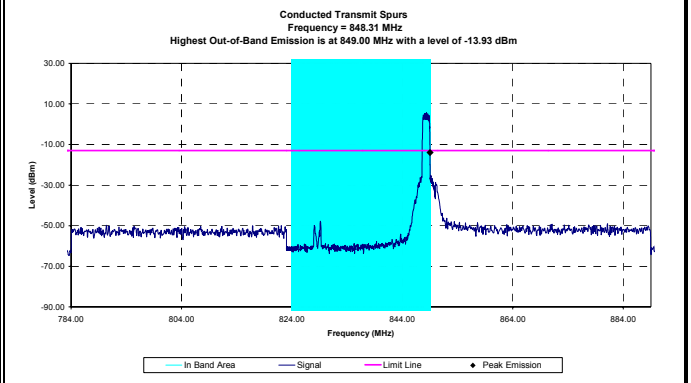


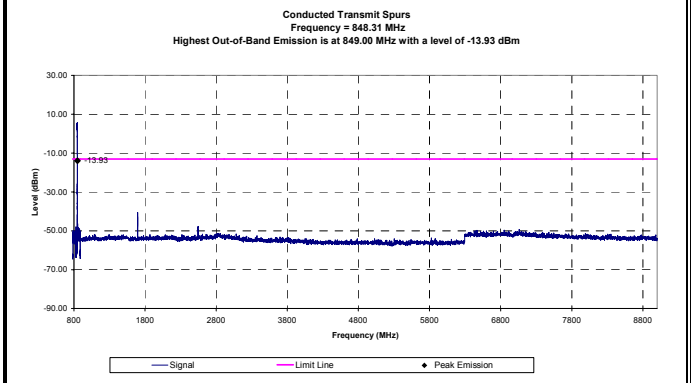
Channel 384





Channel 777





Channel	Peak Spurious Emission				Limit	Margin	Pass / Fail
	Frequency	Measured Level	BW Correction	Corrected Level			
	MHz	dBm	dB	dBm	dBm	dB	
1013	824.00	-18.04	1.55	-16.48	-13.00	3.48	Pass
384	1673.98	-39.54	0.00	-39.54	-13.00	26.54	Pass
777	849.00	-15.54	1.61	-13.93	-13.00	0.93	Pass

Formulae:
BW Correction (dB) = 10 * log (BW_1/BW_2) where: BW_1 is the measurement RBW and BW_2 is the Limit BW*

*Losses other than for BW are factored into the measured value with an offset in the analyzer.
*Limit BW = 1% of the EBW for in-band +/- 1 MHz, 100 kHz for other

C.9. PASS/FAIL

In reference to the results outlined in C.8, the DUT passes the requirements as stated in the reference standards.

FCC CFR 4 §22.917 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The results set forth in this section meet the requirement with a margin of at least 0.93 dB
(-13.93 dBm @ 849.00 MHz vs a limit of -13 dBm with Channel 777 transmitting)

C.10. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

07Feb06
Date

Appendix D - Cellular Band Effective Radiated Power Measurement

D.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §22.913 (a)
Procedure Reference	ANSI/TIA/EIA-603-C

D.2. LIMITS

FCC CFR 47 §22.913 (a)	*(a) Maximum ERP. ……. The ERP of mobile transmitters and auxiliary transmitters must not exceed 7 Watts.*

D.3. ENVIRONMENTAL CONDITIONS

Temperature	uncontrolled
Humidity	uncontrolled
Barometric Pressure	uncontrolled

D.4. EQUIPMENT LIST

RECEIVING EQUIPMENT

ID	ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
1	00072	EMCO	2075	Mini-mast	na	na
2	00073	EMCO	2080	Turn Table	na	na
3	00071	EMCO	2090	Multi-Device Controller	na	na
4	00050	Chase	CBL-6111A	Bilog Antenna	08Feb05	08Aug06
5	00051	HP	8566B	Spectrum Analyzer	12Apr05	12Apr06
6	00047	HP	85685A	Preselector	13Apr05	13Apr06
7	00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06
8	00120	Celltech	n/a	Microwave Cable (RX)	25Mar05	25Mar06
9	00121	Andrew	FSJ4-50B	Microwave Cable (RX)	25Mar05	25Mar06
10	00130	Andrew	FSJ1-50A	Microwave Cable (RX)	25Mar05	25Mar06

ADDITIONAL SUBSTITUTION EQUIPMENT

ID	ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
11	00059	ETS	3121C	Roberts Dipole	04Dec03	04Jun06
12	00131	Andrew	FSJ1-50A	Microwave Cable (TX)	na	na
13	00127	Andrew	FSJ4-50B	Microwave Cable (TX)	na	na
14	00133	Andrew	FSJ1-50A	Microwave Cable (TX)	na	na
15	00006	R &S	SMR40	Signal Generator	12Apr05	12Apr06
16	00110	Gigatronics	8652A	Power Meter	16Apr05	16Apr06
17	00012	Gigatronics	80701A	Power Sensor	12Sep05	12Sep06
18	00014	Gigatronics	80701A	Power Sensor	7Sep05	07Sep06
19	00102	Pasternack	PE7015-3110	30 dB attenuator	na*	na*
20	00078	Pasternack	PE2214-20	Directional Coupler	na*	na*

*Attenuation offset in power meter setup

D.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	The measurement equipment was connected as shown in D.6.

MEASUREMENT EQUIPMENT SETTINGS — The spectrum analyzer was set to the following settings:

Frequency Range	RBW	VBW	Detector
MHz	kHz	kHz	
30 - 1000	100	100	Peak

D.6. SETUP DRAWING

Figure D.6-1 - Field Strength Setup Drawing

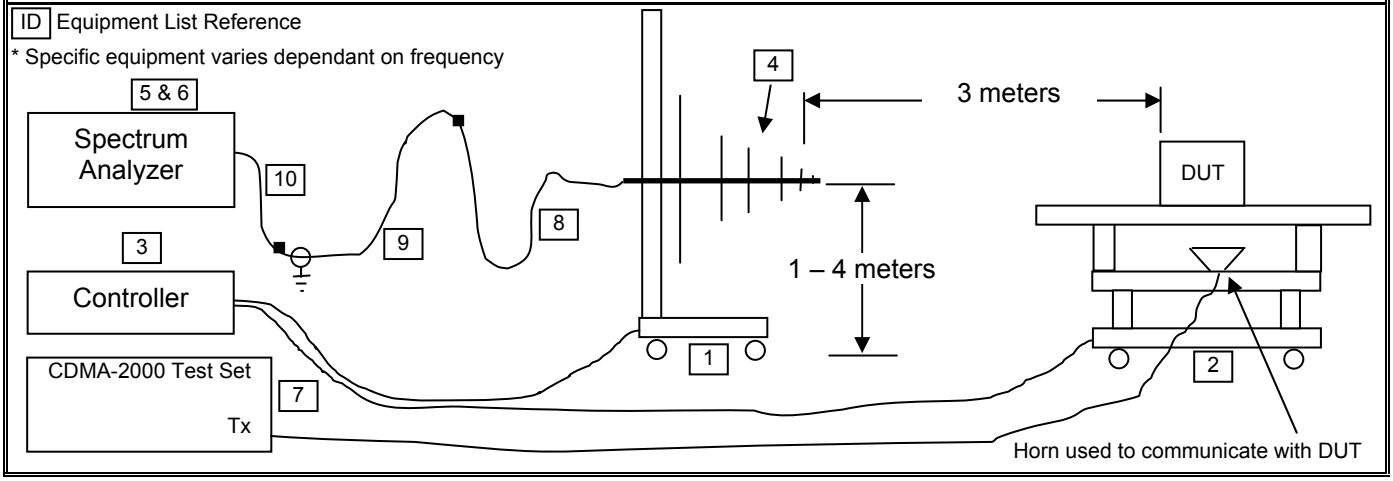
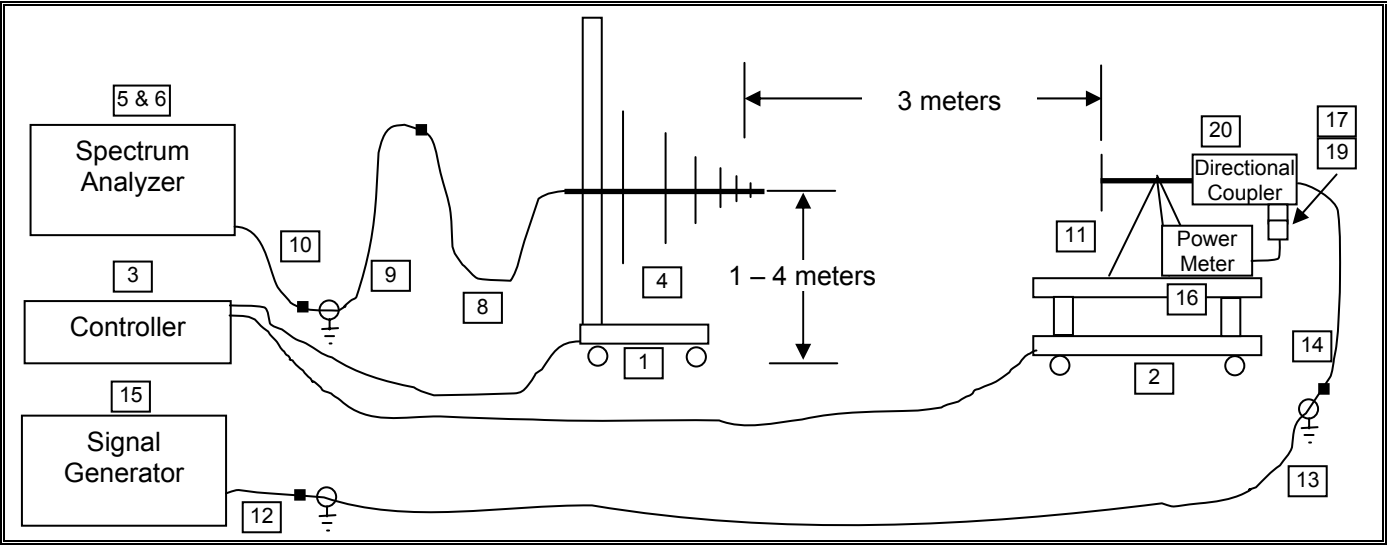


Figure D.6-2 - Signal Substitution Setup Drawing



D.7. SETUP PHOTOGRAPHS

Photograph D.7-1 - 3m ERP Field Strength Setup

Photograph D.7-2 - 3m ERP Substitution Setup

D.8. DUT OPERATING DESCRIPTION

Measurements were made for the low, mid and high CDMA channels transmitting in the cellular band at maximum power levels, and the DUT configured as described in Section 5 of this report.

D.9. ERP TEST RESULTS

Project Number: 716
Company: Commerciant
Product: M-106X

Standard: FCC22.913
Test Start Date: 14-Feb-06
Test End Date: 20-Feb-06

Face Up Carrier Power Levels

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Carrier Level		ERP Limit		Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBd	dBm	Watts	dBm	Watts	dB	
H	3	B_3121C	1013	824.70	120.59	94.30	20.08	-0.84	19.24	0.084	38.45	7.00	19.21	PASS
V	3	B_3121C	1013	824.70	114.59	88.30	17.64	-0.84	16.80	0.048	38.45	7.00	21.65	PASS
H	3	B_3121C	384	836.52	122.59	95.90	22.13	-0.70	21.43	0.139	38.45	7.00	17.02	PASS
V	3	B_3121C	384	836.52	117.79	91.10	21.44	-0.70	20.74	0.119	38.45	7.00	17.71	PASS
H	3	B_3121C	777	848.31	122.96	95.70	22.92	-0.56	22.36	0.172	38.45	7.00	16.09	PASS
V	3	B_3121C	777	848.31	116.56	89.30	20.76	-0.56	20.20	0.105	38.45	7.00	18.25	PASS

Note:
Dipole Antenna used for substitution
Detector: Peak
Formulae:
ERP Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
Margin (dB) = Limit (dBm) – Level (dBm)

D.10. PASS/FAIL

In reference to the results outlined in D.9, the DUT passes the requirements as stated in the reference standards as follows:

FCC 22.913 (a) Maximum ERP. ……. The ERP of mobile transmitters and auxiliary transmitters must not exceed 7 Watts.

A maximum ERP of +22.36 dBm (0.172 Watts) was measured when Channel 777 was transmitting.

D.11. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

20Feb06
Date

Appendix E - Cellular Band Radiated TX Spurious Emissions Measurement

E.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §22.917(e)
Procedure Reference	ANSI/TIA/EIA-603-C

E.2. LIMITS

FCC CFR 47 §22.917	*(e) Out of Band Emissions. The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by: at least 43 + 10 log P dB*

E.3. ENVIRONMENTAL CONDITIONS

Temperature	uncontrolled
Humidity	uncontrolled
Barometric Pressure	uncontrolled

E.4. EQUIPMENT LIST

RECEIVING EQUIPMENT

ID	ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
1	00072	EMCO	2075	Mini-mast	na	na
2	00073	EMCO	2080	Turn Table	na	na
3	00071	EMCO	2090	Multi-Device Controller	na	na
4	00050	Chase	CBL-6111A	Bilog Antenna	08Feb05	08Aug06
5	00034	ETS	3115	Double Ridged Guide Antenna (Rx)	11Aug05	11Aug06
6	00015	Agilent	E4408B	Spectrum Analyzer	02Feb06	02Feb07
7	00051	HP	8566B	Spectrum Analyzer	12Apr05	12Apr06
8	00047	HP	85685A	Preselector	13Apr05	13Apr06
9	00120	Celltech	n/a	Microwave Cable (RX)	25Mar05	25Mar06
10	00121	Andrew	FSJ4-50B	Microwave Cable (RX)	25Mar05	25Mar06
11	00130	Andrew	FSJ1-50A	Microwave Cable (RX)	25Mar05	25Mar06
12	00115	Miteq	JS4-00102600-35-5A	Low Noise Amplifier	08Jun05	08Jun06
13	00093	Microtronics	HPM50111	High Pass Filter	08Jun05	08Jun06
14	00119	INMAT	18AH-10	10dB attenuator	08Jun05	08Jun06
15	00009	Willtek	4303	Communications Test set	09Jun04	09Jun06

ADDITIONAL SUBSTITUTION EQUIPMENT						
ID	ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
16	00059	ETS	3121C	Roberts Dipole	04Dec03	04Jun06
17	00035	ETS	3115	Double Ridged Guide Antenna (Tx)	24Mar04	24Mar06
18	00131	Andrew	FSJ1-50A	Microwave Cable (TX)	na	na
19	00127	Andrew	FSJ4-50B	Microwave Cable (TX)	na	na
20	00133	Andrew	FSJ1-50A	Microwave Cable (TX)	na	na
21	00006	R & S	SMR-20	Signal Generator	12Apr05	12Apr06
22	00007	Gigatronics	8652A	Power Meter	03Feb06	03Feb07
23	00011	Gigatronics	80701A	Power Sensor	03Feb06	03Feb07
24	00013	Gigatronics	80701A	Power Sensor	03Feb06	03Feb07
25	00102	Pasternack	PE7015-3110	30 dB attenuator	na*	na*
26	00078	Pasternack	PE2214-20	Directional Coupler	na*	na*
27	00142	HP	8491A	20 dB attenuator	na*	na*

* Attenuation offset in power meter setup

E.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS

The measurement equipment was connected as shown in E.6. A number of measurement equipment configurations were used to cover the applicable frequency ranges. The configurations for each range are as follows:

Frequency Range	LNA Asset #	Filter/Attenuator Asset #	Rx Antenna Asset #	Tx Antenna Asset #
30 MHz – 1 GHz	none	none	00050	00059
1 GHz – 2 GHz	none	none	00034	00035
2 GHz – 3 GHz	00115	00119	00034	00035
3 GHz – 10 GHz	00115	00093	00034	00035

MEASUREMENT EQUIPMENT SETTINGS

The spectrum analyzer was set to the following settings:

Frequency Range	RBW	VBW	Detector
MHz	kHz	kHz	
800 MHz – 10 GHz	100*	100*	Peak*

*Field strength measurements were made with a worst-case RBW and VBW of 1 MHz for frequency bands above 1 GHz and a peak detector was used when adequate margins were attained.

E.6. SETUP DRAWING

Figure E.6-1 - Field Strength Setup Drawing

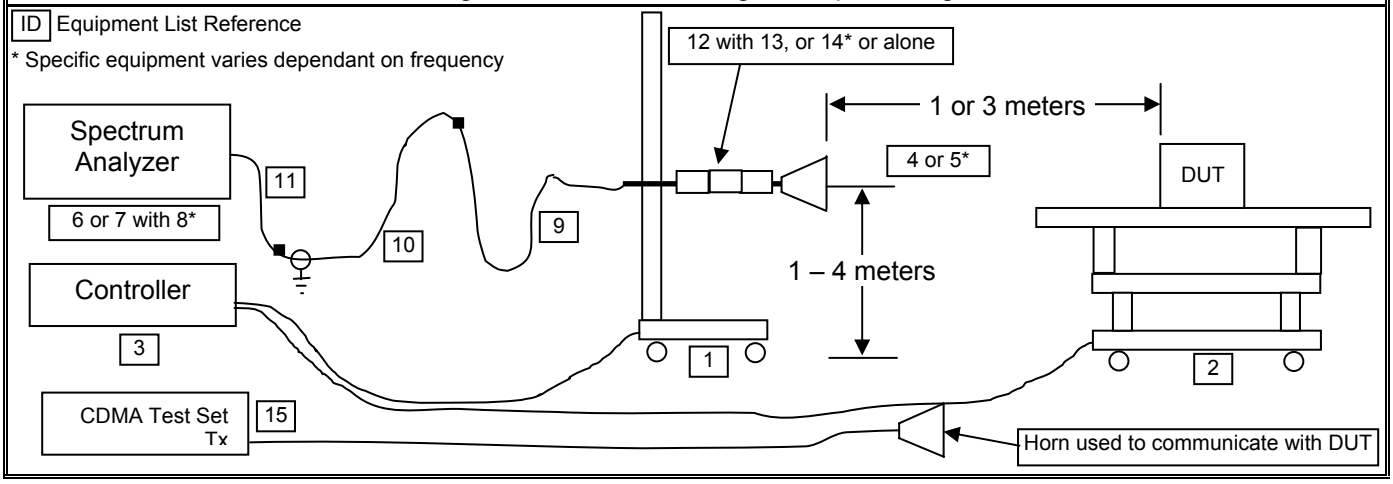
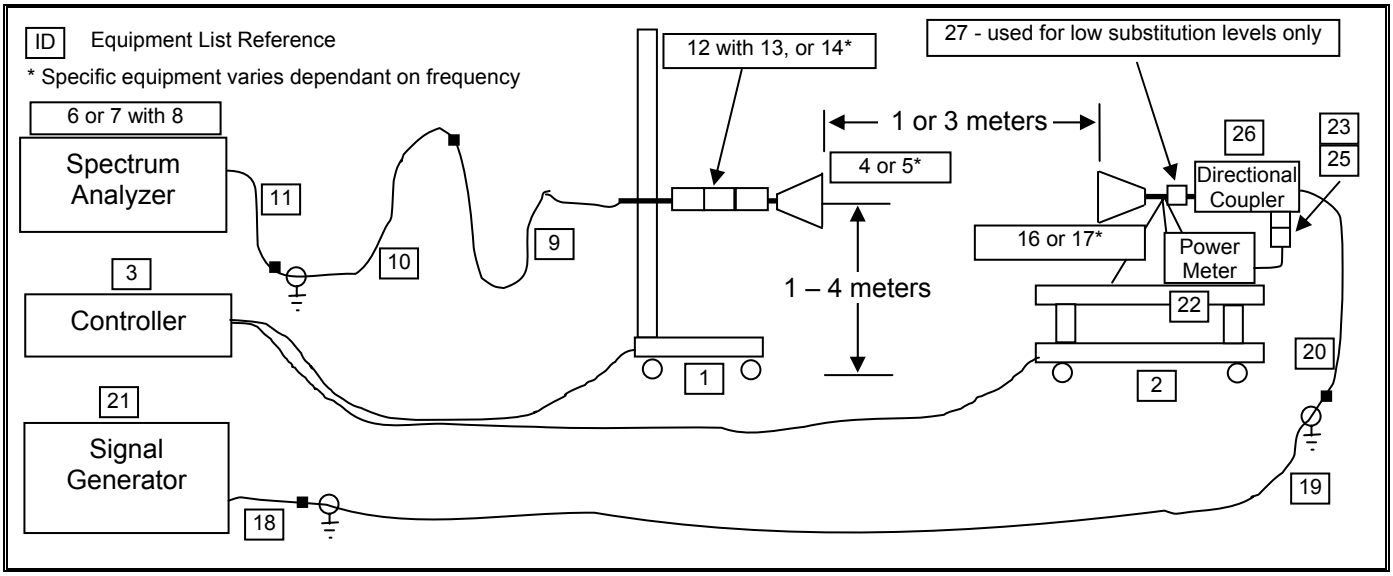


Figure E.6-2 - Signal Substitution Setup Drawing



E.7. SETUP PHOTOGRAPHS

Photograph E.7-1 - 3m Bilog Setup

Photograph E.7-2 - 3m Horn Setup

Photograph E.7-3 - 1m Horn/LNA Setup

E.8. DUT OPERATING DESCRIPTION

Measurements were made for the low, mid and high CDMA channels transmitting in the cellular band at maximum power levels as described in Section 5 of this report. The conducted transmit spurious emissions supplementary measurements are described in Appendix C.

E.9. TEST RESULTS

Channel 1013

Project Number: 716
Company: Commerciant
Product: M-106X

Standard: FCC22.917
Test Start Date: 14-Feb-06
Test End Date: 22-Feb-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Noise floor	Power Applied to Antenna	Antenna Gain	ERP Emission Level	Detector	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV		dBm	dBi	dBm		dBm or dBuV/m*	dB	
H	3	none	1013	836.96	48.91		*				PK*	84.4*	35.5*	PASS*
H	3	none	1013	**1649.70**	57.52						PK*	84.4*	26.8*	PASS*
H	3	none	1013	1890.56	48.13		*				PK*	84.4*	36.2*	PASS*
H	3	none	1013	1896.28	48.96		*				PK*	84.4*	35.4*	PASS*
H	3	none	1013	2120.40	46.45		*				PK*	84.4*	37.9*	PASS*
H	3	none	1013	**2474.58**	50.21						PK*	84.4*	34.2*	PASS*
H	3	none	1013	**3299.20**	46.71						PK*	84.4*	37.7*	PASS*
H	3	none	1013	**4122.42**	42.24		*				PK*	84.4*	42.1*	PASS*
H	3	none	1013	**4939.48**	43.86		*				PK*	84.4*	40.5*	PASS*
H	3	none	1013	**5768.06**	50.25						PK*	84.4*	34.1*	PASS*
H	3	none	1013	**6605.08**	52.81		*				PK*	84.4*	31.6*	PASS*
H	3	none	1013	**7412.70**	54.27		*				PK*	84.4*	30.1*	PASS*
H	3	none	1013	**8248.44**	56.47		*				PK*	84.4*	27.9*	PASS*
V	3	none	1013	**1650.08**	53.82						PK*	84.4*	30.5*	PASS*
V	3	none	1013	1887.14	49.21		*				PK*	84.4*	35.2*	PASS*
V	3	none	1013	1896.28	48.96		*				PK*	84.4*	35.4*	PASS*
V	3	none	1013	**2474.28**	54.38						PK*	84.4*	30.0*	PASS*
V	3	none	1013	2481.64	47.80						PK*	84.4*	36.6*	PASS*
V	3	none	1013	**3297.70**	49.70						PK*	84.4*	34.7*	PASS*
V	3	none	1013	**4114.23**	42.35		*				PK*	84.4*	42.0*	PASS*
V	3	none	1013	**4940.40**	44.37		*				PK*	84.4*	40.0*	PASS*
V	3	none	1013	**5760.04**	52.01						PK*	84.4*	32.4*	PASS*
V	3	none	1013	**6600.29**	53.26		*				PK*	84.4*	31.1*	PASS*
V	3	none	1013	**7420.41**	54.09		*				PK*	84.4*	30.3*	PASS*
V	3	none	1013	**8236.21**	55.54		*				PK*	84.4*	28.8*	PASS*

PK* - measurement made with a peak detector and applied to an average limit.
Pass* - Margin and Pass/Fail based on measured field strengths applied against a theoretical field strength limit.
BOLD denotes a harmonic frequency region

Note:
The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with peak field strengths within 20 dB of the theoretical limit. All other emissions attributed to the DUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

Formulae:
ERP Emission Level (dBm) = Power applied to antenna (dBm) + Antenna Gain (dBd)
Margin (dB) = Limit (dBm) – ERP Emission Level (dBm) or Theoretical Limit (dBuV/m) - Corrected Field Strength (dBuV/m)
Theoretical Limit (V/m) = SQRT(30 * P / r2) where P is the total transmitted power (W), r is measurement distance (m)

Channel 384

Project Number: 716
Company: Commerciant
Product: M-106X

Standard: FCC22.917
Test Start Date: 14-Feb-06
Test End Date: 22-Feb-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Noise floor	Power Applied to Antenna	Antenna Gain	ERP Emission Level	Detector	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV		dBm	dBi	dBm		dBm or dBuV/m*	dB	
H	3	none	384	934.77	39.16						PK*	84.4*	45.2*	PASS*
H	3	none	384	**1672.36**	57.64						PK*	84.4*	26.7*	PASS*
H	3	none	384	2477.72	49.79						PK*	84.4*	34.6*	PASS*
H	3	none	384	**2509.44**	51.30						PK*	84.4*	33.1*	PASS*
H	3	none	384	**3345.34**	47.66						PK*	84.4*	36.7*	PASS*
H	3	none	384	**4172.66**	42.04		*				PK*	84.4*	42.3*	PASS*
H	3	none	384	**5016.90**	44.28		*				PK*	84.4*	40.1*	PASS*
H	3	none	384	**5864.98**	52.07		*				PK*	84.4*	32.3*	PASS*
H	3	none	384	**6696.74**	52.91		*				PK*	84.4*	31.5*	PASS*
H	3	none	384	**7529.98**	55.36		*				PK*	84.4*	29.0*	PASS*
H	3	none	384	**8367.82**	56.55		*				PK*	84.4*	27.8*	PASS*
V	3	none	384	1416.32	47.19		*				PK*	84.4*	37.2*	PASS*
V	3	none	384	1504.60	47.66		*				PK*	84.4*	36.7*	PASS*
V	3	none	384	**1672.38**	59.34						PK*	84.4*	25.0*	PASS*
V	3	none	384	1881.82	49.18		*				PK*	84.4*	35.2*	PASS*
V	3	none	384	1922.20	48.31		*				PK*	84.4*	36.1*	PASS*
V	3	none	384	**2510.42**	52.11						PK*	84.4*	32.3*	PASS*
V	3	none	384	**3346.42**	48.66						PK*	84.4*	35.7*	PASS*
V	3	none	384	**4175.46**	42.46		*				PK*	84.4*	41.9*	PASS*
V	3	none	384	**5023.26**	44.22		*				PK*	84.4*	40.2*	PASS*
V	3	none	384	**5853.74**	51.68		*				PK*	84.4*	32.7*	PASS*
V	3	none	384	**6687.88**	53.10		*				PK*	84.4*	31.3*	PASS*
V	3	none	384	**7532.26**	54.86		*				PK*	84.4*	29.5*	PASS*
V	3	none	384	**8365.32**	56.73		*				PK*	84.4*	27.6*	PASS*

PK* - measurement made with a peak detector and applied to an average limit.
Pass* - Margin and Pass/Fail based on measured field strengths applied against a theoretical field strength limit.
BOLD denotes a harmonic frequency region

Note:
The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with peak field strengths within 20 dB of the theoretical limit. All other emissions attributed to the DUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

Formulae:
ERP Emission Level (dBm) = Power applied to antenna (dBm) + Antenna Gain (dBd)
Margin (dB) = Limit (dBm) – ERP Emission Level (dBm) or Theoretical Limit (dBuV/m) - Corrected Field Strength (dBuV/m)
Theoretical Limit (V/m) = SQRT(30 * P / r2) where P is the total transmitted power (W), r is measurement distance (m)

Channel 777

Project Number: 716
Company: Commerciant
Product: M-106X

Standard: FCC22.917
Test Start Date: 14-Feb-06
Test End Date: 22-Feb-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Noise floor	Power Applied to Antenna	Antenna Gain	ERP Emission Level	Detector	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV		dBm	dBi	dBm		dBm or dBuV/m*	dB	
H	3	none	777	**1696.90**	53.22						AV	84.4*	31.2*	PASS*
H	3	none	777	1886.78	49.01						PK*	84.4*	35.4*	PASS*
H	3	none	777	**2544.93**	50.50						PK*	84.4*	33.9*	PASS*
H	3	none	777	**3393.46**	43.32						PK*	84.4*	41.1*	PASS*
H	3	none	777	**4239.67**	42.39		*				PK*	84.4*	42.0*	PASS*
H	3	none	777	**5088.72**	44.77		*				PK*	84.4*	39.6*	PASS*
H	3	none	777	**5938.73**	51.69		*				PK*	84.4*	32.7*	PASS*
H	3	none	777	**6783.00**	52.82		*				PK*	84.4*	31.5*	PASS*
H	3	none	777	**7630.87**	55.67		*				PK*	84.4*	28.7*	PASS*
H	3	none	777	**8490.32**	56.42		*				PK*	84.4*	28.0*	PASS*
V	3	none	777	1080.32	48.39		*				PK*	84.4*	36.0*	PASS*
V	3	none	777	**1696.52**	55.11						PK*	84.4*	29.3*	PASS*
V	3	none	777	**2545.29**	51.70						PK*	84.4*	32.7*	PASS*
V	3	none	777	**3392.96**	45.12						PK*	84.4*	39.3*	PASS*
V	3	none	777	**4238.81**	42.59		*				PK*	84.4*	41.8*	PASS*
V	3	none	777	**5082.50**	44.51		*				PK*	84.4*	39.9*	PASS*
V	3	none	777	**5938.15**	51.99		*				PK*	84.4*	32.4*	PASS*
V	3	none	777	**6791.42**	53.22		*				PK*	84.4*	31.1*	PASS*
V	3	none	777	**7626.83**	55.07		*				PK*	84.4*	29.3*	PASS*
V	3	none	777	**8486.84**	56.52		*				PK*	84.4*	27.8*	PASS*

PK* - measurement made with a peak detector and applied to an average limit.
Pass* - Margin and Pass/Fail based on measured field strengths applied against a theoretical field strength limit.
BOLD denotes a harmonic frequency region

Note:
The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with peak field strengths within 20 dB of the theoretical limit. All other emissions attributed to the DUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

Formulae:
ERP Emission Level (dBm) = Power applied to antenna (dBm) + Antenna Gain (dBd)
Margin (dB) = Limit (dBm) – ERP Emission Level (dBm) or Theoretical Limit (dBuV/m) - Corrected Field Strength (dBuV/m)
Theoretical Limit (V/m) = SQRT(30 * P / r2) where P is the total transmitted power (W), r is measurement distance (m)

E.10. PASS/FAIL

In reference to the results outlined in E.9, the DUT passes the requirements as stated in the reference standards.

(e) Out of Band Emissions. The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by: at least 43 + 10 log P dB

The results set forth in this section meet the requirement with a peak to average field strength margin of at least 25.0 dB

E.11. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

22Feb06
Date

Appendix F - PCS Band Conducted TX RF Output Power Measurement

F.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §2.1046
Procedure Reference	FCC CFR 47 §2.1046

F.2. LIMITS

FCC CFR 47 §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 procedures to give the values of current and voltage on the circuit elements specified in §2.1033(c) (8).

*EIRP limits are specified in Appendix I.

F.3. ENVIRONMENTAL CONDITIONS

Temperature	25 ± 5 ºC
Humidity	35 ± 5 %RH
Barometric Pressure	uncontrolled

F.4. EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00110	Gigatronics	8652A	Power Meter	08Apr05	08Apr06
00109	Gigatronics	80701A	Power Sensor	16Apr05	16Apr06
00114	AR	DC7154	Directional coupler	na	na*
Customer Supplied	Commerciant	na	Cable & SMA adapter	na	na*
00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06

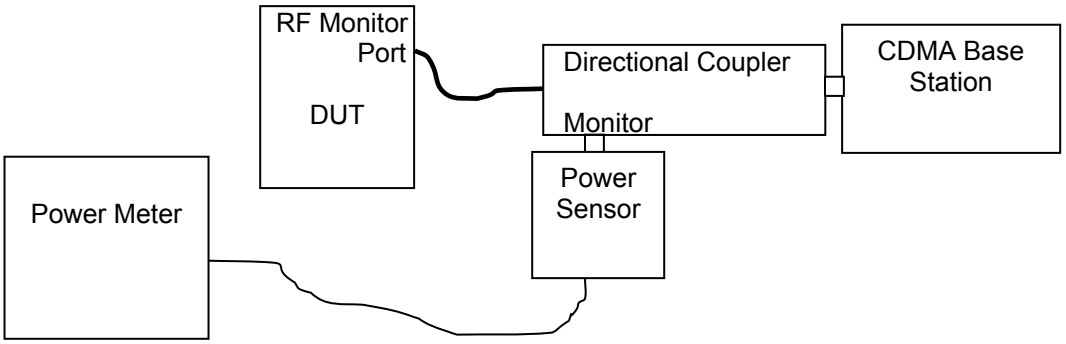
* Attenuation offset in power meter setup

F.5. MEASUREMENT EQUIPMENT SETUP

Measurement Equipment Connections	The equipment was connected as shown in the setup drawing in F.6.
Measurement Equipment Settings	Mode - MAP Offset - set to include loss through cable and directional coupler.
Measurement Procedure	The channel was set on the base station and the resulting power measurement recorded and reported herein.

F.6. SETUP DRAWING

Figure F.6-1 - Setup Drawing



F.7. DUT OPERATING DESCRIPTION

Power measurements were made for each of the three PCS test channels (Channel 25, 600 & 1175), with the M-106X set appropriately as described in Section 5.6.

F.8. TEST RESULTS

Mode	Channel	Frequency	Conducted Power	
		MHz	dBm	watts
PCS CDMA	25	1851.25	+24.08	0.256
	600	1880.00	+24.33	0.271
	1175	1908.75	+24.38	0.274

F.9. PASS/FAIL

There is no pass/fail criterion for this measurement. The EIRP values, applied to appropriate regulatory requirements are outlined in Appendix I.

F.10. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

02Feb06
Date

Appendix G - PCS Band Occupied Bandwidth Measurement

G.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §2.1049
Procedure Reference	FCC CFR 47 §2.1049

G.2. LIMITS

FCC CFR 47 §2.202	*Applicable Emission designator: 1M25F9W therefore: Theoretical Necessary BW=1.25 MHz*

G.3. ENVIRONMENTAL CONDITIONS

Temperature	25 ± 5 ºC
Humidity	35 ± 5 %RH
Barometric Pressure	uncontrolled

G.4. EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00015	Agilent	E4408B	Spectrum Analyzer	02Feb06	02Feb07
00102	Pasternack	PE7015-3010	30dB attenuator	na	na*
00079	Pasternack	PE2208-6	Directional coupler	na	na*
Customer Supplied	Commerciant	na	Cable & SMA adapter	na	na*
00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06

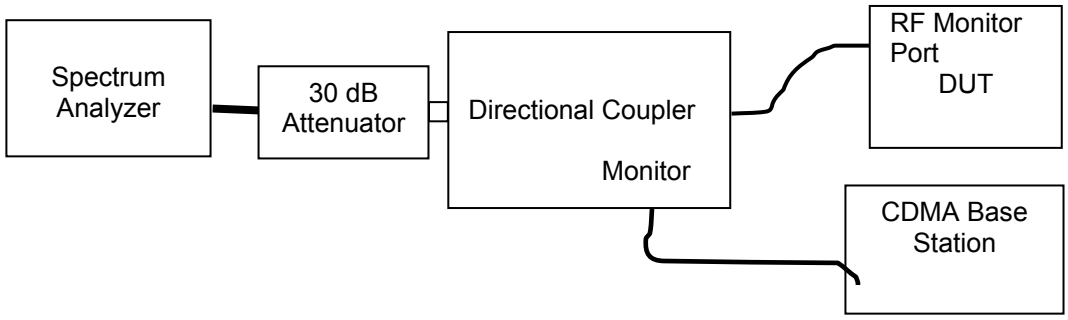
* Verified with power meter prior to use

G.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	The measurement equipment was connected as shown in G.6.			
MEASUREMENT EQUIPMENT SETTINGS	The spectrum analyzer was set to the following settings:			
	RBW	VBW	Detector	
	kHz	kHz		
	30	30	Sample	

G.6. SETUP DRAWING

Figure G.6-1 - Setup Drawing

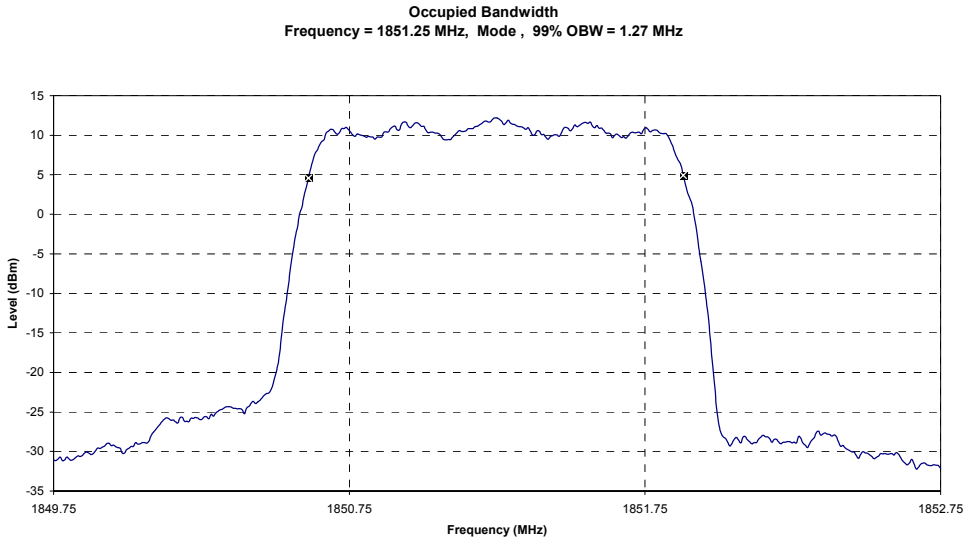


G.7. DUT OPERATING DESCRIPTION

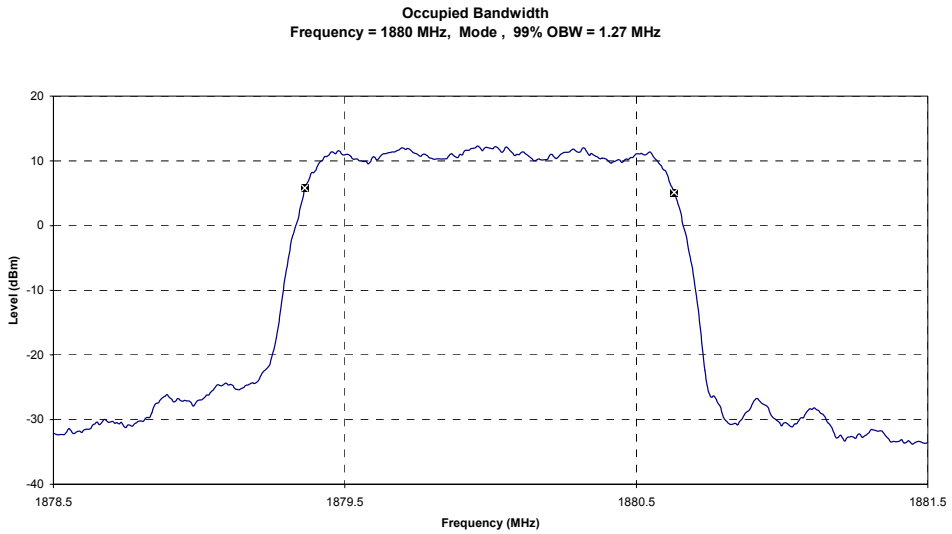
Measurements were made with the DUT transmitting at maximum power in the PCS band, in a configuration as described in Section 5 of this report.

G.8. TEST RESULTS

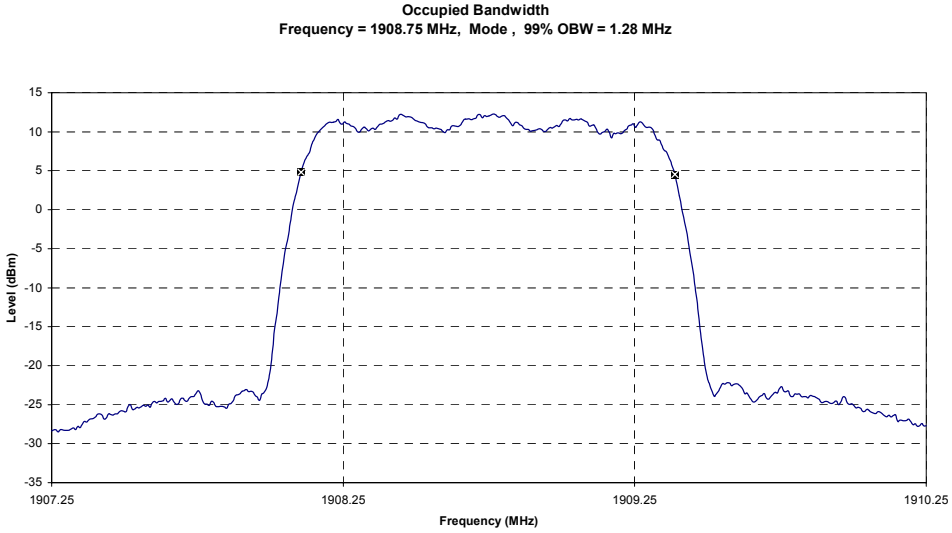
Channel 25 (1851.25 MHz)



Channel 600 (1880 MHz)



Channel 1175 (1908.75 MHz)



Summary

Channel	Frequency	OBW
	MHz	MHz
25	1851.25	1.27
600	1880.00	1.27
1175	1908.75	1.28

G.9. PASS/FAIL

In reference to the theoretical bandwidth of 1.25 MHz associated with the published Emission Designator 1M25F9W, the maximum occupied bandwidth measured exceeds this by 2.4%

G.10. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

07Feb06
Date

Appendix H - PCS Band Conducted TX Spurious Emissions Measurement

H.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §24.238(a)
Procedure Reference	FCC CFR 47 §24.238(b)

H.2. LIMITS

FCC CFR 47 §24.238	(a) *Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.*

H.3. ENVIRONMENTAL CONDITIONS

Temperature	25 ± 5 ºC
Humidity	35 ± 5 %RH
Barometric Pressure	uncontrolled

H.4. EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00015	Agilent	E4408B	Spectrum Analyzer	02Feb06	02Feb07
00102	Pasternack	PE7014-30	30dB attenuator	na	na*
00079	Pasternack	PE2208-6	Directional coupler	na	na*
Customer Supplied	Commerciant	na	Cable & SMA adapter	na	na*
00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06

* Verified with power meter prior to use

H.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS

The measurement equipment was connected as shown in H.6.

MEASUREMENT EQUIPMENT SETTINGS

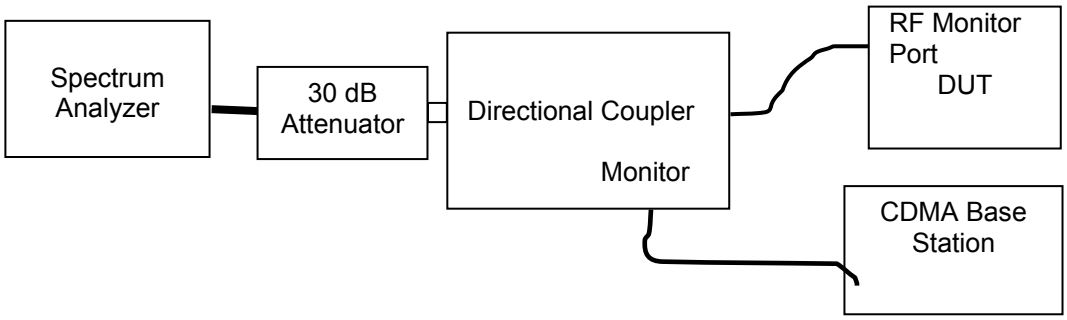
The spectrum analyzer was set to the following settings:

Frequency Range	Measurement		Specified BW*	Detector
	RBW	VBW		
MHz	kHz	kHz	kHz	
At Block edges	10	10	1% EBW	Sample
Within 1 MHz of the Block edges	10	10	1% EBW	Sample
1MHz and 40 MHz from Block edges	10	10	1000	Sample
Beyond 40MHz from Block edges	1000	1000	1000	Peak

Measured data corrected for specified BW using 10 * log (measurement RBW / specified BW)

H.6. SETUP DRAWING

Figure H.6-1 - Setup Drawing



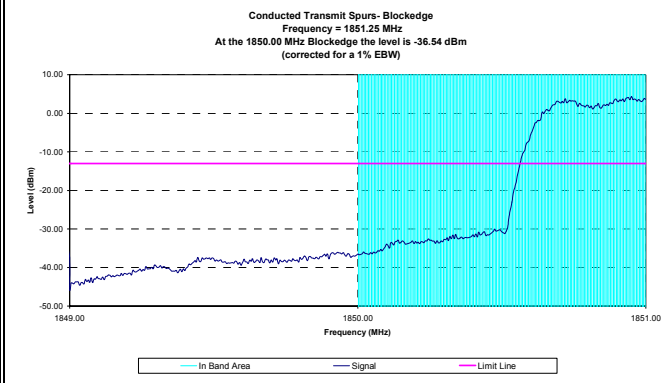
H.7. DUT OPERATING DESCRIPTION

Measurements were made with the DUT transmitting at maximum power in the PCS band, in a configuration as described in Section 5 of this report. The Block edge measurements were made with the DUT transmitting on the channel closest to the edge under investigation (CH25 & CH1175). The remaining spurious measurements were made on each of the three channels, Low (CH25), Mid (CH600) and High (CH1175).

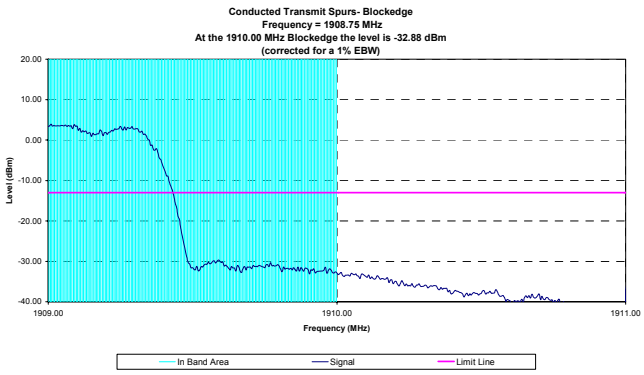
H.8. TEST RESULTS

H.8.1. Spurious Emissions within 1MHz of Block Edge

Lower Block Edge - 1850 MHz

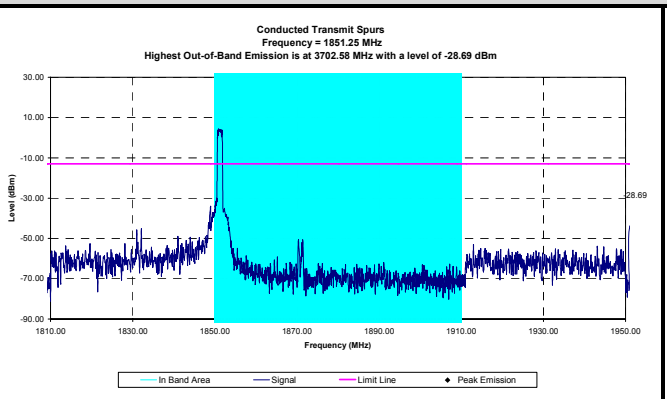


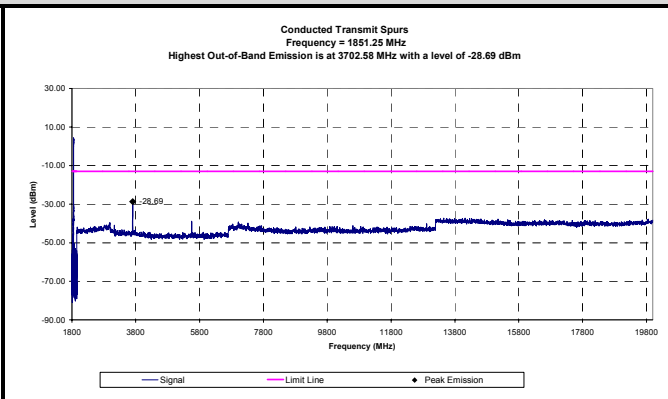
Upper Block Edge - 1910 MHz



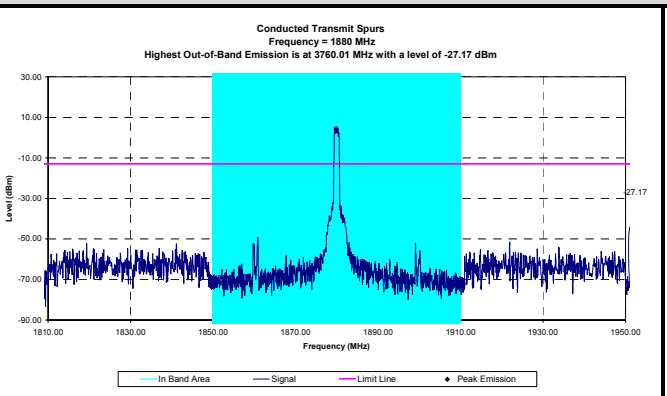
H.8.2. Spurious Emissions removed by more than 1MHz from Block Edge

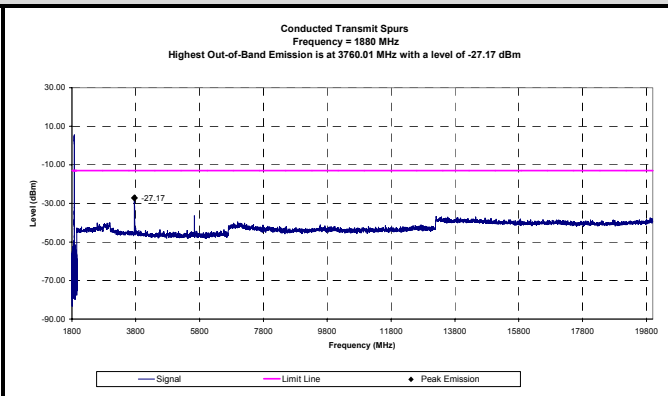
Channel 25



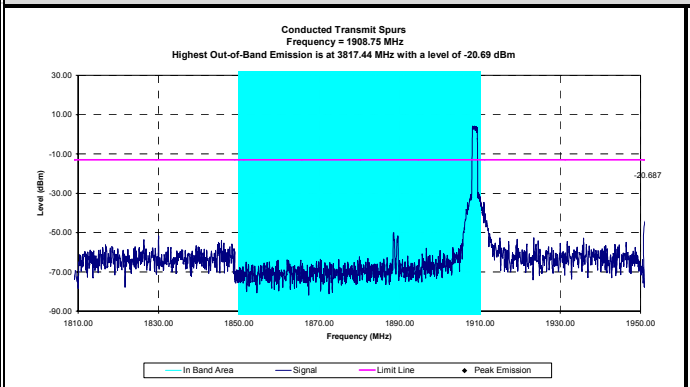


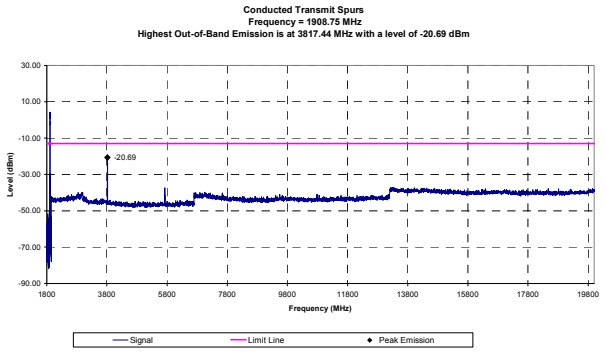
Channel 600





Channel 1175





Channel	Peak Spurious Emission				Limit	Margin	Pass / Fail
	Frequency	Measured Level	BW Correction	Corrected Level			
	MHz	dBm	dB	dBm	dBm	dB	
25	3702.58	-28.69	0.00	-28.69	-13.00	15.69	Pass
600	3760.01	-27.17	0.00	-27.17	-13.00	14.17	Pass
1175	3817.44	-20.69	0.00	-20.69	-13.00	7.69	Pass

Formulae:
BW Correction (dB) = 10 * log (BW_1/BW_2) where: BW_1 is the measurement RBW and BW_2 is the Limit BW*

* Losses other than for BW are factored into the measured value with an offset in the analyzer.
*Limit BW = 1% of the EBW for in-band +/- 1 MHz, 1000 kHz for other.

H.9. PASS/FAIL

In reference to the results outlined in H.8, the DUT passes the requirements as stated in the reference standards.

FCC CFR 4 §24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The results set forth in this section meet the requirement with a margin of at least 7.69 dB
(-20.69 dBm @ 3817.44 vs a limit of -13 dBm with Channel 1175 transmitting)

H.10. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

07Feb06
Date

Appendix I - PCS Band Effective Isotropic Radiated Power Measurement

I.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §24.232(b)
Procedure Reference	ANSI/TIA/EIA-603-C

I.2. LIMITS

FCC CFR 47 §24.232 (b)	*(b) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications*.

I.3. ENVIRONMENTAL CONDITIONS

Temperature	uncontrolled
Humidity	uncontrolled
Barometric Pressure	uncontrolled

I.4. EQUIPMENT LIST

RECEIVING EQUIPMENT

ID	ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
1	00072	EMCO	2075	Mini-mast	na	na
2	00073	EMCO	2080	Turn Table	na	na
3	00071	EMCO	2090	Multi-Device Controller	na	na
4	00034	ETS	3115	Double Ridged Guide Antenna (Rx)	11Aug05	11Aug06
5	00051	HP	8566B	Spectrum Analyzer	12Apr05	12Apr06
6	00047	HP	85685A	Preselector	13Apr05	13Apr06
7	00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06
8	00120	Celltech	n/a	Microwave Cable (RX)	25Mar05	25Mar06
9	00121	Andrew	FSJ4-50B	Microwave Cable (RX)	25Mar05	25Mar06
10	00130	Andrew	FSJ1-50A	Microwave Cable (RX)	25Mar05	25Mar06

ADDITIONAL SUBSTITUTION EQUIPMENT

ID	ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
11	00035	ETS	3115	Horn Antenna (Tx)	24Mar04	24Mar06
12	00131	Andrew	FSJ1-50A	Microwave Cable (TX)	na	na
13	00127	Andrew	FSJ4-50B	Microwave Cable (TX)	na	na
14	00133	Andrew	FSJ1-50A	Microwave Cable (TX)	na	na
15	00006	R &S	SMR40	Signal Generator	12Apr05	12Apr06
16	00007	Gigatronics	8652A	Power Meter	03Feb06	03Feb07
17	00011	Gigatronics	80701A	Power Sensor	03Feb06	03Feb07
18	00013	Gigatronics	80701A	Power Sensor	03Feb06	03Feb07
19	00102	Pasternack	PE7015-3110	30 dB attenuator	na*	na*
20	00078	Pasternack	PE2214-20	Directional Coupler	na*	na*

*Attenuation offset in power meter setup

I.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	The measurement equipment was connected as shown in I.6.

MEASUREMENT EQUIPMENT SETTINGS — The spectrum analyzer was set to the following settings:

Frequency Range	RBW	VBW	Detector
MHz	MHz	MHz	
1000 - 2000	1	1	Peak

I.6. SETUP DRAWING

Figure I.6-1 - Field Strength Setup Drawing

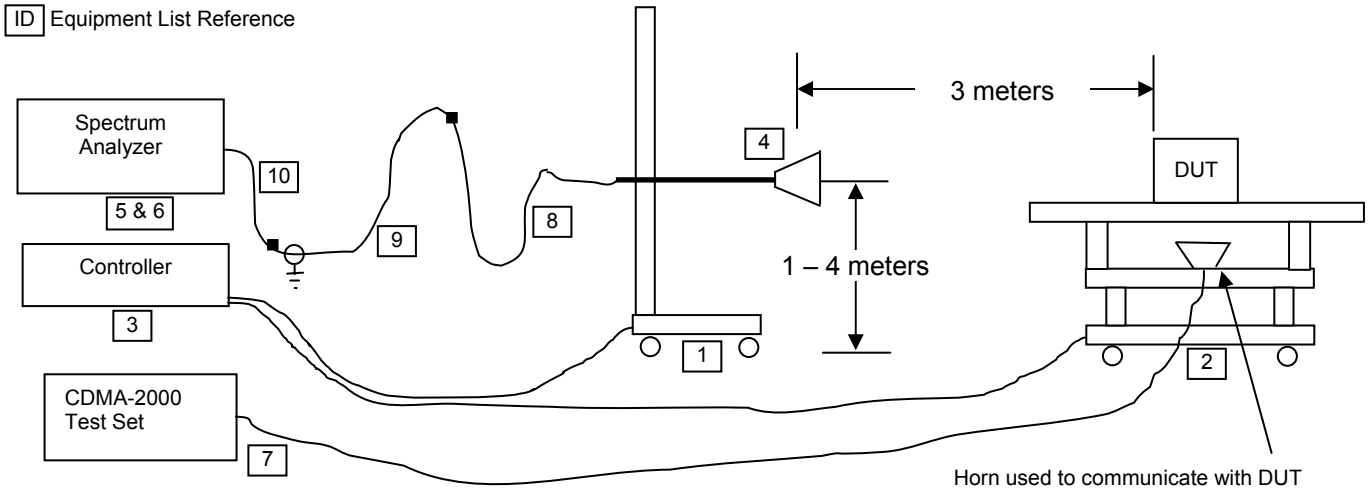
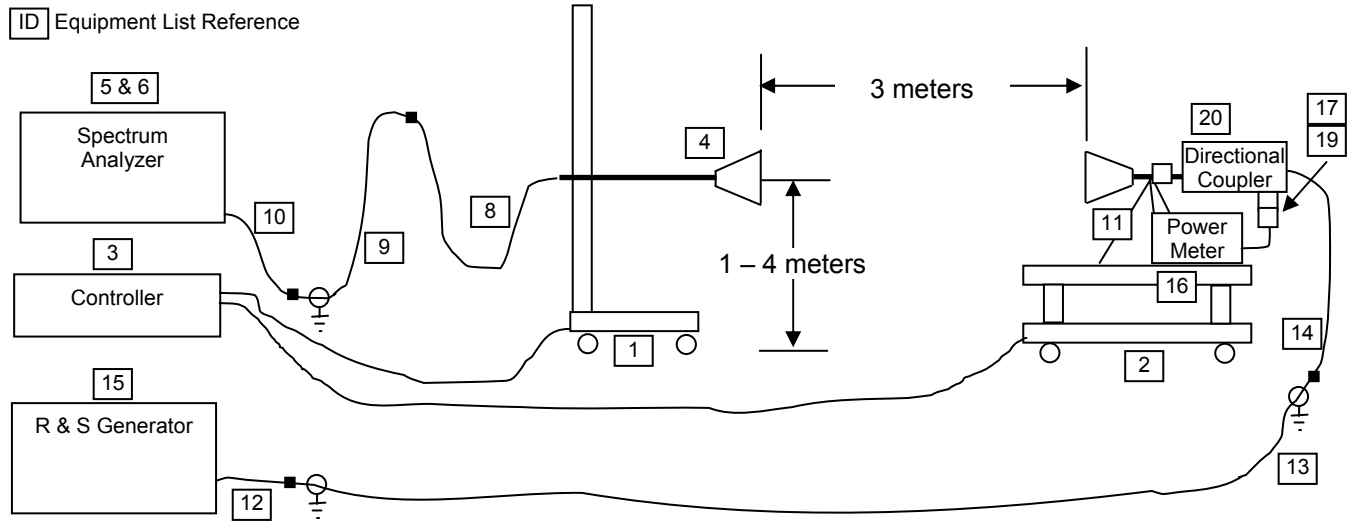


Figure I.6-2 - Substitution Setup Drawing



I.7. SETUP PHOTOGRAPHS

Photograph I.7-1 - 3m EIRP Field Strength Setup	Photograph I.7-2 - 3m EIRP Substitution Setup
	

I.8. DUT OPERATING DESCRIPTION

Measurements were made for the low, mid and high CDMA channels transmitting in the PCS band at maximum power levels, and the DUT configured as described in Section 5 of this report.

I.9. EIRP TEST RESULTS

Project Number: #716
Company: Commerciant
Product: M-106X

Standard: FCC24.232b
Test Start Date: 14-Feb-06
Test End Date: 20-Feb-06

Short Edge Up Carrier Power Levels

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)		Power Applied to Antenna	Antenna Gain	EIRP Carrier Level			EIRP Limit		Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV		dBm	dBi	dBm		Watts	dBm	Watts	dB	
H	3	Horn SN6276	25	1851.25	119.91	87.10		14.67	6.67	21.34		0.136	33.01	2.00	11.67	PASS
V	3	Horn SN6276	25	1851.25	118.61	85.80		13.38	6.67	20.05		0.101	33.01	2.00	12.96	PASS
H	3	Horn SN6276	600	1880.00	120.17	87.20		15.28	6.68	21.96		0.157	33.01	2.00	11.05	PASS
V	3	Horn SN6276	600	1880.00	115.17	82.20		11.07	6.68	17.75		0.060	33.01	2.00	15.26	PASS
H	3	Horn SN6276	1175	1908.75	117.63	84.50		13.38	6.68	20.06		0.101	33.01	2.00	12.95	PASS
V	3	Horn SN6276	1175	1908.75	114.93	81.80		11.79	6.68	18.47		0.070	33.01	2.00	14.54	PASS

Note:
Double Ridged Guide Antenna used for substitution
Detector: Peak
Formulae:
EIRP Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBi)
Margin (dB) = Limit (dBm) – Level (dBm)

I.10. PASS/FAIL

In reference to the results outlined in I.9, the DUT passes the requirements as stated in the reference standards as follows:

FCC 24.232 (b) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications…..

A maximum EIRP of +21.96 dBm (0.157 Watts) was measured when Channel 600 was transmitting.

I.11. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

20Feb06
Date

Appendix J - PCS Band Radiated TX Spurious Emissions Measurement

J.1. REFERENCES

Normative Reference Standard	FCC CFR 47 §24.238(a)
Procedure Reference	ANSI/TIA/EIA-603-C

J.2. LIMITS

FCC CFR 47 §24.238	(a) *Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.*

J.3. ENVIRONMENTAL CONDITIONS

Temperature	uncontrolled
Humidity	uncontrolled
Barometric Pressure	uncontrolled

J.4. EQUIPMENT LIST

RECEIVING EQUIPMENT

ID	ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
1	00072	EMCO	2075	Mini-mast	na	na
2	00073	EMCO	2080	Turn Table	na	na
3	00071	EMCO	2090	Multi-Device Controller	na	na
4	00035	ETS	3115	Double Ridged Guide Antenna (Rx)	24Mar04	24Mar06
5	00161/00166	Waveline	899/801-KF	Standard Gain Horn Antenna (Rx)	n/a	n/a
6	00015	HP	E4408B	Spectrum Analyzer	02Feb06	02Feb07
7	00051	HP	8566B	Spectrum Analyzer	12Apr05	12Apr06
8	00047	HP	85685A	Preselector	13Apr05	13Apr06
9	00120	Celltech	n/a	Microwave Cable (RX)	25Mar05	25Mar06
10	00121	Andrew	FSJ4-50B	Microwave Cable (RX)	25Mar05	25Mar06
11	00130	Andrew	FSJ1-50A	Microwave Cable (RX)	25Mar05	25Mar06
12	00115	Miteq	JS4-00102600-35-5A	Low Noise Amplifier	08Jun05	08Jun06
13	00093	Microtronics	HPM50111	High Pass Filter	08Jun05	08Jun06
14	00119	INMAT	18AH-10	10dB attenuator	08Jun05	08Jun06
15	00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06

ADDITIONAL SUBSTITUTION EQUIPMENT						
ID	ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
16	00034	ETS	3115	Horn Antenna (Tx)	24Mar04	24Mar06
17	00162/00165	Waveline	899/801-KF	Standard Gain Horn Antenna (Tx)	na	na
18	00131	Andrew	FSJ1-50A	Microwave Cable (TX)	na	na
19	00127	Andrew	FSJ4-50B	Microwave Cable (TX)	na	na
20	00133	Andrew	FSJ1-50A	Microwave Cable (TX)	na	na
21	00006	R & S	SMR-20	Signal Generator	12Apr05	12Apr06
22	00007	Gigatronics	8652A	Power Meter	03Feb06	03Feb07
23	00011	Gigatronics	80701A	Power Sensor	03Feb06	03Feb07
24	00013	Gigatronics	80701A	Power Sensor	03Feb06	03Feb07
25	00102	Pasternack	PE7015-3110	30 dB attenuator	na*	na*
26	00096	Agilent	HP87302D	Directional Coupler	na*	na*
27	n/a	Agilent	8493C	6 dB attenuator	na*	na*

* Attenuation offset in power meter setup

J.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS

The measurement equipment was connected as shown in J.6. A number of measurement equipment configurations were used to cover the applicable frequency ranges. The configurations for each range are as follows:

Frequency Range	LNA Asset #	Filter/Attenuator Asset #	Rx Antenna Asset #	Tx Antenna Asset #
1 GHz – 2 GHz	none	none	00034	00035
2 GHz – 3 GHz	00115	00119	00034	00035
3 GHz – 18 GHz	00115	00093	00034	00035
18 GHz – 25 GHz	00115	none	000161/00166	000162/00165

MEASUREMENT EQUIPMENT SETTINGS

The spectrum analyzer was set to the following settings:

Frequency Range	RBW	VBW	Detector
MHz	kHz	kHz	
1 GHz – 25 GHz	1000	1000	Peak

J.6. SETUP DRAWING

Figure J.6-1 - Field Strength Setup Drawing

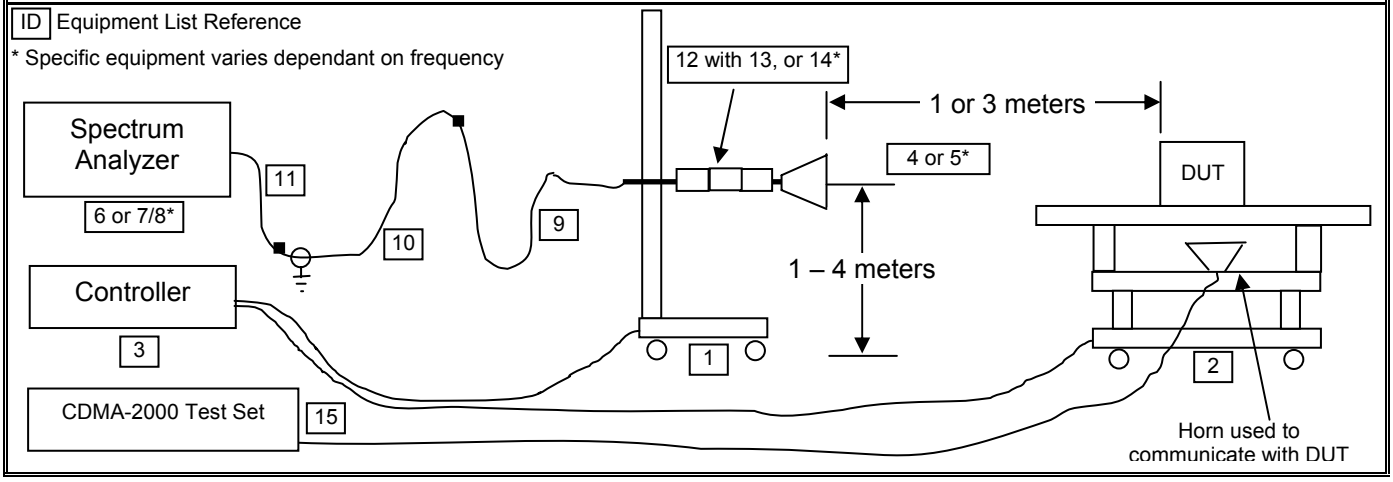
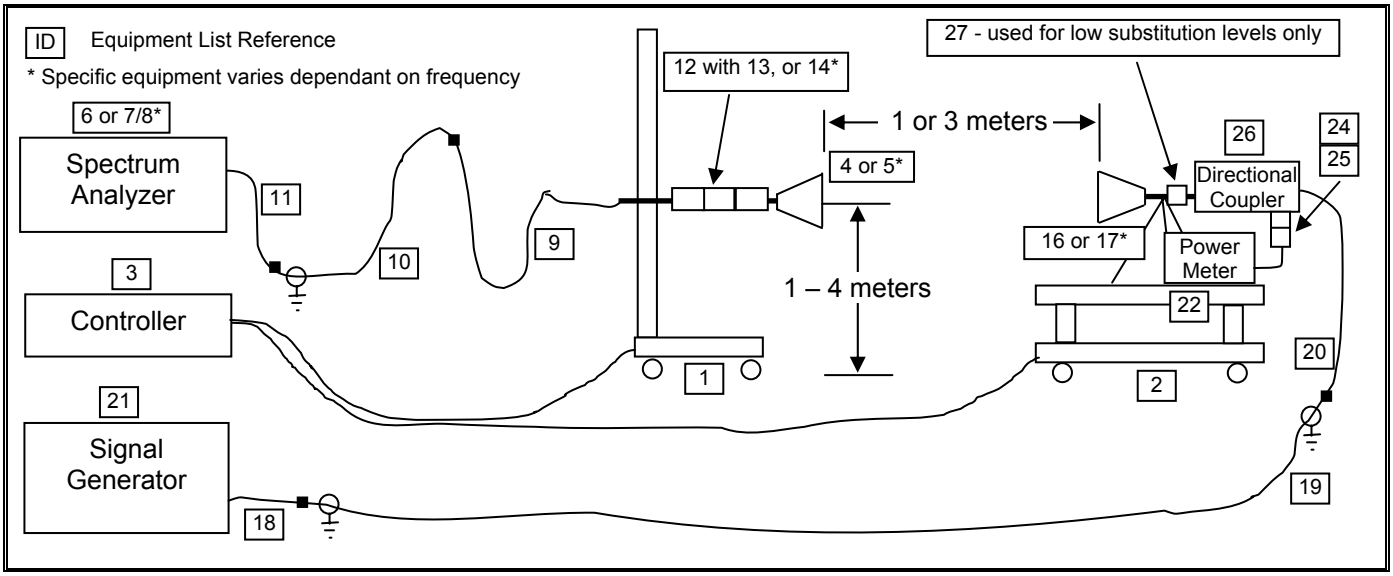


Figure J.6-2 - Signal Substitution Setup Drawing



J.7. SETUP PHOTOGRAPHS

Photograph J.7-1 - 3m Horn Setup

Photograph J.7-2 - 3m Horn/LNA Setup

Photograph J.7-3 - 1m Horn/LNA Setup

Photograph J.7-4 - 18-26 GHz 1m Horn/LNA Setup

J.8. DUT OPERATING DESCRIPTION

Measurements were made for the low, mid and high CDMA channels transmitting in the PCS band at maximum power levels as described in Section 5 of this report. The conducted transmit spurious emissions supplementary measurements are described in Appendix H.

J.9. TEST RESULTS

Channel 25

Project Number: #716 **Standard:** FCC24.238
Company: Commerciant **Test Start Date:** 14-Feb-06
Product: M-106X **Test End Date:** 20-Feb-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Noisefloor	Power Applied to Antenna	Antenna Gain	EIRP Emission Level	Detector	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV		dBm	dBi	dBm		dBm or dBuV/m*	dB	
H	3	none	25	1931.29	60.46						PK*	82.2*	21.8*	PASS*
H	3	none	25	2019.77	51.85						AV	82.2*	30.4*	PASS*
H	3	none	25	2438.90	61.85						PK*	82.2*	20.4*	PASS*
H	3	none	25	**3702.50**	61.80						AV	82.2*	20.4*	PASS*
H	3	Horn SN6276	25	**5553.58**	64.86	50.70		-37.15	8.56	-28.59	AV	-13.00	15.59	PASS
H	1	none	25	**7406.20**	77.46						PK*	91.8*	14.3*	PASS*
H	1	none	25	**9257.46**	71.29						PK*	91.8*	20.5*	PASS*
H	1	none	25	**11108.24**	60.90		*				PK*	91.8*	30.9*	PASS*
H	1	none	25	**12959.08**	59.81		*				PK*	91.8*	32.0*	PASS*
H	1	none	25	**14810.05**	51.65						AV	91.8*	40.1*	PASS*
H	1	none	25	**16661.78**	55.99		*				PK*	91.8*	35.8*	PASS*
H	1	none	25	**17981.88**	63.69						PK*	91.8*	28.1*	PASS*
H	1	none	25	**18514.50**	56.40		*				PK*	91.8*	35.4*	PASS*
V	3	none	25	1073.24	49.15		*				PK*	82.2*	33.1*	PASS*
V	3	none	25	1931.39	61.96						PK*	82.2*	20.3*	PASS*
V	3	none	25	2428.09	49.13						AV	82.2*	33.1*	PASS*
V	3	none	25	2462.45	48.65						AV	82.2*	33.6*	PASS*
V	3	none	25	2705.95	59.82		*				PK*	82.2*	22.4*	PASS*
V	3	none	25	2770.65	62.44						PK*	82.2*	19.8*	PASS*
V	3	none	25	2782.75	61.22						PK*	82.2*	21.0*	PASS*
V	3	none	25	2834.00	59.69		*				PK*	82.2*	22.5*	PASS*
V	3	none	25	**3702.51**	59.30						AV	82.2*	22.9*	PASS*
V	3	Horn SN6276	25	**5553.49**	61.46	47.30		-39.03	8.56	-30.47	AV	-13.00	17.47	PASS
V	1	none	25	**7404.87**	60.04						AV	91.8*	31.7*	PASS*
V	1	none	25	**9256.21**	55.57						AV	91.8*	36.2*	PASS*
V	1	none	25	**11105.27**	60.49		*				PK*	91.8*	31.3*	PASS*
V	1	none	25	**12960.70**	59.55		*				PK*	91.8*	32.2*	PASS*
V	1	none	25	**14810.16**	55.79		*				AV	91.8*	36.0*	PASS*
V	1	none	25	**16659.50**	56.28						PK*	91.8*	35.5*	PASS*
V	1	none	25	**17958.08**	64.74		*				PK*	91.8*	27.0*	PASS*
V	1	none	25	**18509.00**	55.77		*				PK*	91.8*	36.0*	PASS*

PK* - measurement made with a peak detector and applied to an average limit.
Pass* - Margin and Pass/Fail based on measured field strengths applied against a theoretical field strength limit.
BOLD signifies a harmonic region

Note:
The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with peak field strengths within 20 dB of the theoretical limit. All other emissions attributed to the DUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

Formulae:
EIRP Emission Level (dBm) = Power applied to antenna (dBm) + Antenna Gain (dBi)
Margin (dB) = Limit (dBm) – EIRP Emission Level (dBm) or Theoretical Limit (dBuV/m) - Corrected Field Strength (dBuV/m)
Theoretical Limit (V/m) = SQRT(30 * P / r2) where P is the total transmitted power (W), r is measurement distance (m)

Channel 600

Project Number: #716
Company: Commerciant
Product: M-106X

Standard: FCC24.238
Test Start Date: 14-Feb-06
Test End Date: 20-Feb-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Noisefloor	Power Applied to Antenna	Antenna Gain	EIRP Emission Level	Detector	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV		dBm	dBi	dBm		dBm or dBuV/m*	dB	
H	3	none	600	1960.10	62.54						PK*	82.2*	19.7*	PASS*
H	3	none	600	2420.40	47.32						AV	82.2*	34.9*	PASS*
H	3	none	600	2440.16	57.16						PK*	82.2*	25.1*	PASS*
H	3	none	600	2451.74	44.41						AV	82.2*	37.8*	PASS*
H	3	none	600	**3759.76**	58.69						AV	82.2*	23.5*	PASS*
H	3	none	600	**5639.83**	60.55						AV	82.2*	21.7*	PASS*
H	1	none	600	**7519.90**	61.67						AV	91.8*	30.1*	PASS*
H	1	none	600	**9400.97**	66.45						PK*	91.8*	25.3*	PASS*
H	1	none	600	**11280.52**	60.00		*				PK*	91.8*	31.8*	PASS*
H	1	none	600	**13155.99**	60.97		*				AV	91.8*	30.8*	PASS*
H	1	none	600	**15039.86**	55.23						AV	91.8*	36.5*	PASS*
H	1	none	600	**16923.85**	57.69		*				PK*	91.8*	34.1*	PASS*
H	1	none	600	**18800.23**	55.57		*				PK*	91.8*	36.2*	PASS*
V	3	none	600	1093.13	48.72		*				PK*	82.2*	33.5*	PASS*
V	3	none	600	1262.24	51.89		*				PK*	82.2*	30.3*	PASS*
V	3	none	600	2830.52	60.08		*				PK*	82.2*	22.2*	PASS*
V	3	none	600	2452.92	62.11						PK*	82.2*	20.1*	PASS*
V	3	none	600	2476.62	59.38		*				PK*	82.2*	22.8*	PASS*
V	3	none	600	2802.88	58.56		*				PK*	82.2*	23.7*	PASS*
V	3	none	600	**3759.82**	57.39						AV	82.2*	24.8*	PASS*
V	3	none	600	4355.39	42.34		*				PK*	82.2*	39.9*	PASS*
V	3	none	600	**5639.89**	57.65						AV	82.2*	24.6*	PASS*
V	1	none	600	**7520.01**	61.40						AV	91.8*	30.4*	PASS*
V	1	none	600	9400.14	64.62						AV	91.8*	27.1*	PASS*
V	1	none	600	**11280.22**	60.89		*				PK*	91.8*	30.9*	PASS*
V	1	none	600	**13155.00**	60.97		*				AV	91.8*	30.8*	PASS*
V	1	none	600	**15040.18**	57.09						AV	91.8*	34.7*	PASS*
V	1	none	600	**16920.95**	57.61		*				PK*	91.8*	34.2*	PASS*
V	1	none	600	**18804.35**	54.89		*				PK*	91.8*	36.9*	PASS*

PK* - measurement made with a peak detector and applied to an average limit.
Pass* - Margin and Pass/Fail based on measured field strengths applied against a theoretical field strength limit.
BOLD signifies a harmonic region

Note:
The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with peak field strengths within 20 dB of the theoretical limit. All other emissions attributed to the DUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

Formulae:
EIRP Emission Level (dBm) = Power applied to antenna (dBm) + Antenna Gain (dBi)
Margin (dB) = Limit (dBm) – EIRP Emission Level (dBm) or Theoretical Limit (dBuV/m) - Corrected Field Strength (dBuV/m)
Theoretical Limit (V/m) = SQRT(30 * P / r2) where P is the total transmitted power (W), r is measurement distance (m)

Channel 1175

Project Number: #716
Company: Commerciant
Product: M-106X

Standard: FCC24.238
Test Start Date: 14-Feb-06
Test End Date: 20-Feb-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Noisefloor	Power Applied to Antenna	Antenna Gain	EIRP Emission Level	Detector	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV		dBm	dBi	dBm		dBm or dBuV/m*	dB	
H	3	none	1175	1075.59	51.06		*				PK*	82.2*	31.2*	PASS*
H	3	none	1175	1089.32	53.11		*				PK*	82.2*	29.1*	PASS*
H	3	none	1175	1108.23	51.48		*				PK*	82.2*	30.7*	PASS*
H	3	none	1175	1166.90	51.13		*				PK*	82.2*	31.1*	PASS*
H	3	none	1175	1988.90	61.73						PK*	82.2*	20.5*	PASS*
H	3	none	1175	2420.80	53.72						AV	82.2*	28.5*	PASS*
H	3	none	1175	2436.20	44.35						AV	82.2*	37.9*	PASS*
H	3	none	1175	2460.61	46.15						AV	82.2*	36.1*	PASS*
H	3	none	1175	**3817.36**	57.81						AV	82.2*	24.4*	PASS*
H	3	none	1175	**4652.40**	43.13						PK*	82.2*	39.1*	PASS*
H	3	Horn SN6276	1175	**5725.89**	64.90	50.90		-37.35	8.77	-28.58	AV	-13.00	15.58	PASS
H	1	none	1175	**7635.92**	74.56						PK*	91.8*	17.2*	PASS*
H	1	none	1175	**7634.92**	64.44						AV	91.8*	27.3*	PASS*
H	1	none	1175	**9542.49**	71.29						PK*	91.8*	20.5*	PASS*
H	1	none	1175	**11454.25**	61.31		*				PK*	91.8*	30.5*	PASS*
H	1	none	1175	**13360.36**	58.58		*				AV	91.8*	33.2*	PASS*
H	1	none	1175	**15270.03**	54.74						AV	91.8*	37.0*	PASS*
H	1	none	1175	**17179.55**	58.43		*				PK*	91.8*	33.3*	PASS*
H	1	none	1175	**19085.68**	55.74						PK*	91.8*	36.0*	PASS*
V	3	none	1175	1989.13	62.43						PK*	82.2*	19.8*	PASS*
V	3	none	1175	2428.99	49.75						AV	82.2*	32.5*	PASS*
V	3	none	1175	2461.99	47.05						AV	82.2*	35.2*	PASS*
V	3	none	1175	3630.50	39.95		*				PK*	82.2*	42.3*	PASS*
V	3	none	1175	**3817.34**	57.11						AV	82.2*	25.1*	PASS*
V	3	none	1175	4264.92	43.86		*				PK*	82.2*	38.4*	PASS*
V	3	none	1175	4348.60	45.36		*				PK*	82.2*	36.9*	PASS*
V	3	Horn SN6276	1175	**5726.05**	62.60	48.60		-39.90	8.77	-31.13	AV	-13.00	18.13	PASS
V	1	none	1175	**7634.15**	69.18						PK*	91.8*	22.6*	PASS*
V	1	none	1175	**9543.72**	60.81						AV	91.8*	31.0*	PASS*
V	1	none	1175	**11456.97**	61.57						PK*	91.8*	30.2*	PASS*
V	1	none	1175	**13360.87**	58.69		*				AV	91.8*	33.1*	PASS*
V	1	none	1175	**15270.10**	58.19						AV	91.8*	33.6*	PASS*
V	1	none	1175	**17182.13**	59.15		*				PK*	91.8*	32.6*	PASS*
V	1	none	1175	**19087.25**	55.36		*				PK*	91.8*	36.4*	PASS*

PK* - measurement made with a peak detector and applied to an average limit.
Pass* - Margin and Pass/Fail based on measured field strengths applied against a theoretical field strength limit.
BOLD signifies a harmonic region

Note:
The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with peak field strengths within 20 dB of the theoretical limit. All other emissions attributed to the DUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

Formulae:
EIRP Emission Level (dBm) = Power applied to antenna (dBm) + Antenna Gain (dBi)
Margin (dB) = Limit (dBm) – EIRP Emission Level (dBm) or Theoretical Limit (dBuV/m) - Corrected Field Strength (dBuV/m)
Theoretical Limit (V/m) = SQRT(30 * P / r2) where P is the total transmitted power (W), r is measurement distance (m)

J.10. PASS/FAIL

In reference to the results outlined in J.9, the DUT passes the requirements as stated in the reference standards.

FCC CFR 4 §24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The results set forth in this section meet the requirement with a margin of at least 14.3 dB.

J.11. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

20Feb06
Date

Appendix K - Cellular Band Conducted RX Spurious Emissions Measurement

K.1. REFERENCES

Normative Reference Standard	IC RSS-132 §4.6, RSS-Gen §6 (b)
Procedure Reference	IC RSS-Gen §4.8

K.2. LIMITS

IC RSS-132 §4.6	*Receiver spurious emissions shall comply with the limits specified in RSS-Gen*
RSS-Gen §6 (b)	*(b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per 4 kHz spurious frequency in the band 30 – 1000 MHz or 5 nanowattts above 1 GHz.*

K.3. ENVIRONMENTAL CONDITIONS

Temperature	25 ± 5 ºC
Humidity	35 ± 5 %RH
Barometric Pressure	uncontrolled

K.4. EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00015	Agilent	E4408B	Spectrum Analyzer	02Feb06	02Feb07
00188	Narda	M3933/16-06	2 x 2dB attenuator	na	na*
00078	Pasternack	PE2214-20	Directional coupler	na	na*
Customer Supplied	Commerciant	na	Cable & SMA adapter	na	na*
00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06

*Verified prior to use

K.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	The measurement equipment was connected as shown in K.6.
MEASUREMENT EQUIPMENT SETTINGS	Spectrum analyzer settings:

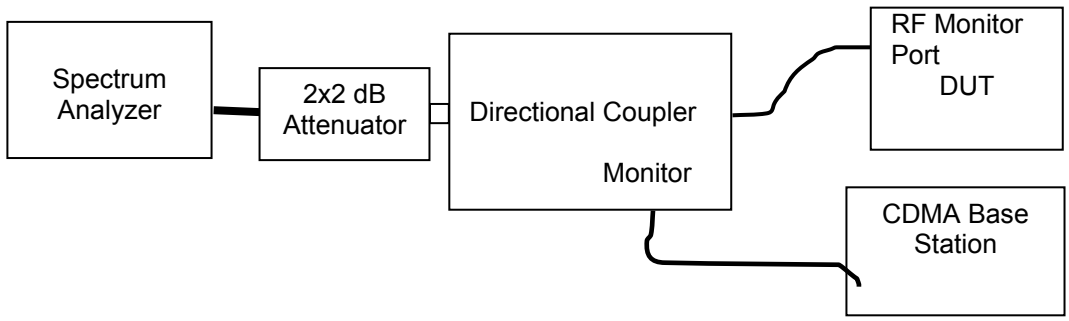
Frequency Range	RBW	VBW	Bands	Detector
MHz	kHz	kHz		
30 MHz - 3 * F_c	10*	1000	18	Peak

POST MEASURMENT PROCESSING	The data collected was imported into an EXCEL template where it was corrected for measurement bandwidth, measurement path losses and then plotted.

Note: Due to measurement limitations, 10 kHz RBW & VBW were used and resulting values corrected to 4 kHz. A bandwidth correction factor of 10 * log (4 kHz / 10 kHz), (-3.98 dB) was added to the measured results.

K.6. SETUP DRAWING

Figure K.6-1 - Setup Drawing



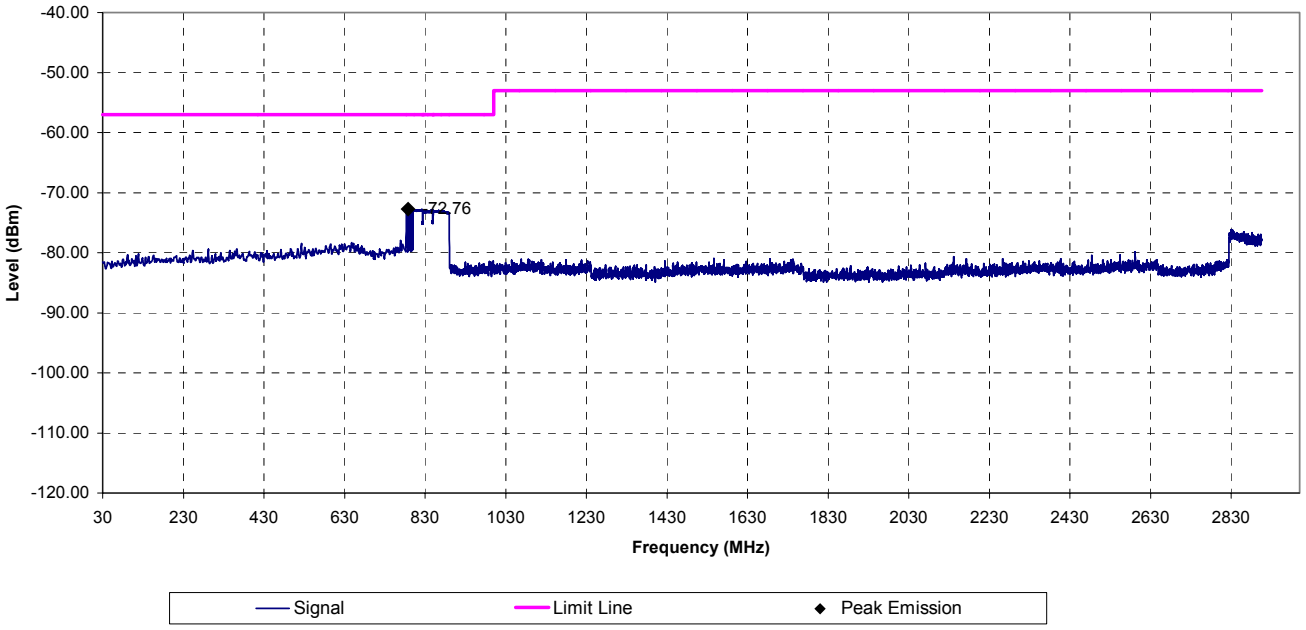
K.7. DUT OPERATING DESCRIPTION

Measurements were made with the DUT in receive mode for the cellular band mid channel (CH384)

K.8. TEST RESULTS

K.8.1. Receiver Spurious Emissions

Conducted Receiver Spurs
Frequency = 836.52 MHz
Spurious Emission with the lowest margin is at 787.39 MHz
with a margin of 15.77 dB and a level of -72.76dBm



Calculations:

Limit (dBm) = 10 * log (Limit (mW)
Margin (dB) = Limit (dBm – Peak Emission (dBm)
BW Correction (dB) = 10 * log (4 kHz / 10 kHz) where: 4 kHz is the limit BW and 10 kHz is the measurement RBW

K.9. PASS/FAIL

In reference to the results outlined in K.9, the DUT passes the requirements as stated in the reference standards.

IC RSS-Gen §6 (b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per 4kHz spurious frequency in the band 30 – 1000 MHz or 5 nanowattts above 1 GHz.

The results set forth in this section meet the requirement with a margin of at least 15.77 dB
(-72.76 dBm [0.05 nW] vs a 2 nW limit)

K.10. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
Senior Compliance Technologist
Celltech Labs Inc.

27Feb06
Date

Appendix L - PCS Band Conducted RX Spurious Emissions Measurement

L.1. REFERENCES

Normative Reference Standard	IC RSS-133 §6.7 (b)
Procedure Reference	IC RSS-133 §4.5

L.2. LIMITS

IC RSS-133 §6.7	*(b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per 4 kHz spurious frequency in the band 30 – 1000 MHz or 5 nanowattts above 1 GHz.*

L.3. ENVIRONMENTAL CONDITIONS

Temperature	25 ± 5 ºC
Humidity	35 ± 5 %RH
Barometric Pressure	uncontrolled

L.4. EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00015	Agilent	E4408B	Spectrum Analyzer	02Feb06	02Feb07
00188	Narda	M3933/16-06	2 x 2dB attenuator	na	na*
00078	Pasternack	PE2214-20	Directional coupler	na	na*
Customer Supplied	Commerciant	na	Cable & SMA adapter	na	na*
00009	Willtek	4303	Communications Test Set	09Jun04	09Jun06

*Verified prior to use

L.5. MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	The measurement equipment was connected as shown in L.6.
MEASUREMENT EQUIPMENT SETTINGS	Spectrum analyzer settings:

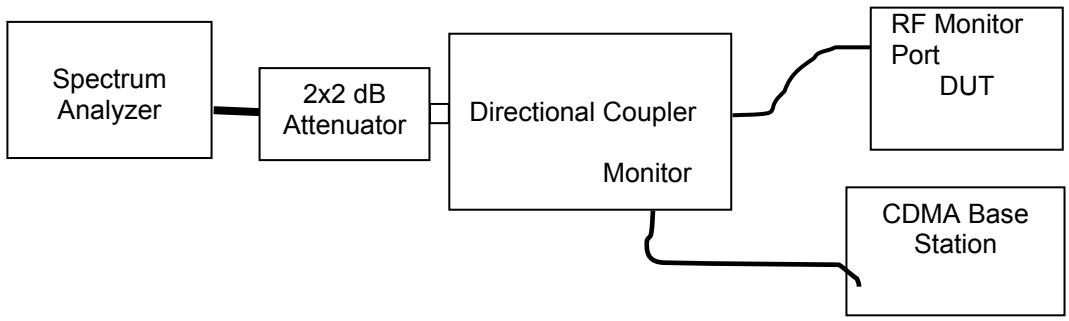
Frequency Range	RBW	VBW	Bands	Detector
MHz	kHz	kHz		
30 MHz - 3 * F_c	10*	1000	18	Peak

POST MEASURMENT PROCESSING	The data collected was imported into an EXCEL template where it was corrected for measurement bandwidth, measurement path losses and then plotted.

Note: Due to measurement limitations, 10 kHz RBW & VBW were used and resulting values corrected to 4 kHz. A bandwidth correction factor of 10 * log (4 kHz / 10 kHz), (-3.98 dB) was added to the measured results.

L.6. SETUP DRAWING

Figure L.6-1 - Setup Drawing



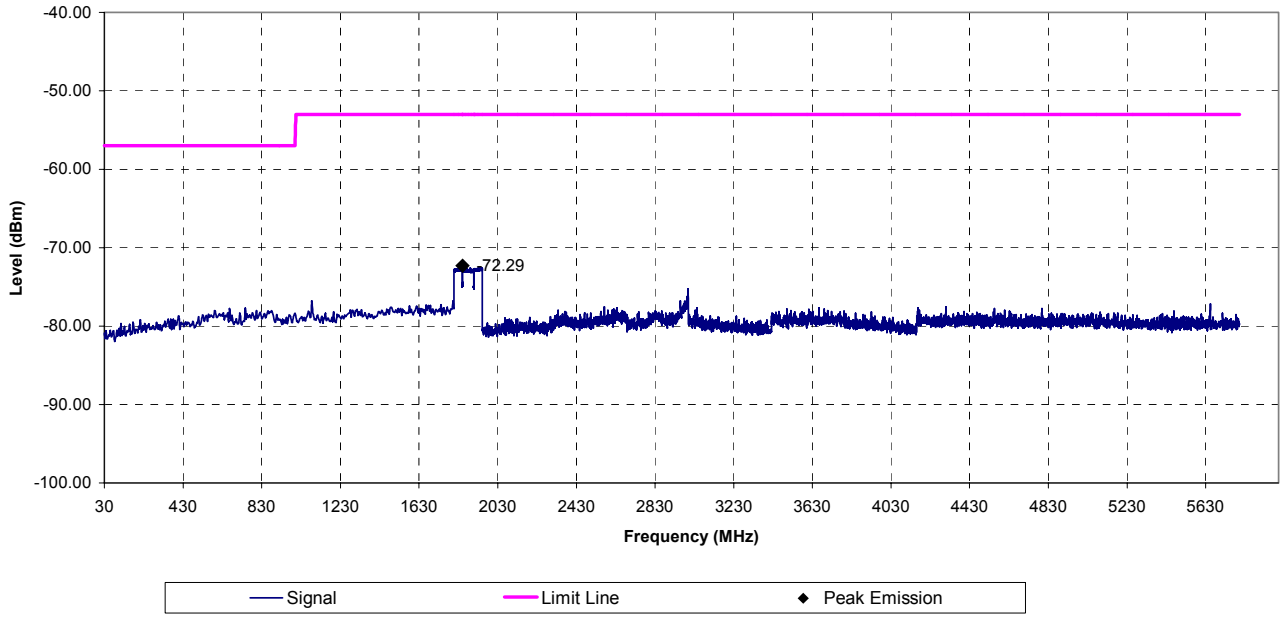
L.7. DUT OPERATING DESCRIPTION

Measurements were made with the DUT in the receive mode for the PCS band mid channel (CH600)

L.8. TEST RESULTS

L.8.1. Receiver Spurious Emissions

Conducted Receiver Spurs
Frequency = 1876.25 MHz
Spurious Emission with the lowest margin is at 1852.23 MHz
with a margin of 19.28 dB and a level of -72.29dBm



Calculations:

Limit (dBm) = 10 * log (Limit (mW)
Margin (dB) = Limit (dBm – Peak Emission (dBm)
BW Correction (dB) = 10 * log (4 kHz / 10 kHz) where: 4 kHz is the limit BW and 10 kHz is the measurement RBW

L.9. PASS/FAIL

In reference to the results outlined in L.9, the DUT passes the requirements as stated in the reference standards.

IC RSS-133 §6.7 (b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per 4kHz spurious frequency in the band 30 - 1000 MHz or 5 nanowattts above 1 GHz.

The results set forth in this section meet the requirement with a margin of at least 19.28 dB
(-72.29 dBm [.06 nW] vs a 5 nW limit)

L.10. SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
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27Feb06
Date

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