RF MEASUREMENT REPORT (FCC/IC)

ELECTROMAGNETIC COMPATIBILITY (EMC)

APPLICANT	GENERAL DYNAMICS ITRONIX CORPORATION		
DEVICE UNDER TEST (DUT)	TABLET PC		
INTERNAL TRANSMITTER(S)	802.11a/b/g/n WLAN		
	BLUETOOTH Ver.2.0+EDR		
	RFID (13.56 MHz)		
DEVICE MODEL(S)	GD3000		
DEVICE IDENTIFIER(S)	FCC ID: KBC-GD3000		
APPLICATION TYPE	CLASS II PERMISSIVE CHANGE - Add Co-located WWAN & Antenna		
	(Sierra Wireless Gobi2000 FCC ID: N7NGOBI2 w/ PIFA/PCB Antenna)		
STANDARD(S) & PROCEDURE(S)	FCC 47 CFR	Part 2	
		Part 22 Subpart H	
		Part 24 Subpart E	
	ANSI	TIA/EIA-603-C-2004	
DATE OF SAMPLE RECEIPT	May 18, 2010		
DATE(S) OF EVALUATION(S)	May 31 - June 22, 2010		
TEST REPORT SERIAL NO.	051810KBC-T1019-E24M		
TEST REPORT REVISION NO.	Revision 1.0	Initial Release	July 02, 2010
TEST REPORT SIGNATORIES	Sean Johnston	Lab Manager	Celltech Labs Inc.
TEST LAB AND LOCATION	Celltech Compliance Testing and Engineering Laboratory		
	21-364 Lougheed Road, Kelowna, B.C. V1X 7R8 Canada		
TEST LAB CONTACT INFO.	Tel.: 250-765-7650	Fax: 250-765-7645	
	info@celltechlabs.com	www.celltechlabs.com	
TEST LAB ACCREDITATION(S)	ISO/IEC 17025:2005 (A2LA Test Lab Certificate No. 2470.01)		

DECLARATION OF COMPLIANCE - ELECTROMAGNETIC COMPATIBILITY (FCC)

Test Lab Information	**Name**	**CELLTECH LABS INC.**		
	Address	21-364 Lougheed Road, Kelowna B.C. V1X 7R8 Canada		
Test Site Registration No.(s)	**FCC**	714830		
	IC	3874A-1		
Applicant Information	**Name**	**GENERAL DYNAMICS ITRONIX CORPORATION**		
	Address	509 North Sullivan - C441, Spokane Valley, WA 99037 USA		
Standard(s) & Procedure(s)	**FCC**	47 CFR Part 2	47 CFR Part 22 Subpart H	47 CFR Part 24 Subpart E
	ANSI	TIA/EIA-603-C-2004		
Application Type	**FCC**	Class II Permissive Change		
Description of Change(s)	Add co-location with WWAN Module* and PIFA/PCB diversity antenna (MAIN Tx/Rx, AUX Rx)			
	* Sierra Wireless Inc. Gobi2000 GPRS/EDGE/WCDMA/HSPA/EV-DO Mini-PCI Express Card (Modular FCC ID: N7NGOBI2)			
Device Identifier(s)	**FCC ID:**	KBC-GD3000		
Device Model(s)	GD3000			
Device Under Test (DUT)	Tablet PC			
Test Sample Serial No.(s)	GD3000	SY0120000313 (Identical Prototype)		
WWAN Transmit Frequency Range(s)	Cell Band	824.2-848.8 MHz (GPRS/EDGE)	826.4-846.6 MHz (WCDMA/HSPA)	824.70-848.31 MHz (CDMA/EV-DO)
	PCS Band	1850.2-1909.8 MHz (GPRS/EDGE)	1852.4-1907.5 MHz (WCDMA/HSPA)	1851.25-1908.75 MHz (CDMA/EV-DO)
Antenna Type(s) Tested	Internal WWAN (located in handle above LCD display)	MAIN Diversity	Type: PIFA/PCB	Part No.: TWT10GPPI01+G
Power Source(s) Tested	Dual Lithium-Ion Rechargeable Battery (11.1V, 2.4Ah)			

This wireless 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 and ANSI TIA/EIA-603-C-2004.

I attest to the accuracy of data. All measurements were performed by me or were made 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.

The results and statements contained in this report pertain only to the device(s) evaluated.

This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc.

Test Report Approved By		**Sean Johnston**	**Lab Manager**	**Celltech Labs Inc.**

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FIGURES

PHOTOGRAPHS

TEST SUMMARY

Referenced Standard(s):		FCC CFR Title 47 Parts 2, 22 & 24				
Appendix	Test Description	Procedure Reference	Limit Reference	Test Start Date	Test End Date	Result
A	Effective Radiated Power	ANSI/TIA/EIA-603-C	§22.913	31-May-10	03-Jun-10	Pass
	Effective Isotropic Radiated Power	ANSI/TIA/EIA-603-C	§24.232(c)	31-May-10	03-Jun-10	Pass
B	Radiated TX Spurious Emissions	ANSI/TIA/EIA-603-C	§22.917 (a) §24.238 (a)	11-Jun-10	22-Jun-10	Pass

REVISION LOG

Revision	Description	Implemented By	Implementation Date
1.0	Initial Release	Jonathan Hughes	July 02, 2010

SIGNATORIES

Prepared By		July 02, 2010
Name/Title	Sean Johnston / Lab Manager	Date

1.0 SCOPE

This report outlines the measurements made and results collected during electromagnetic emissions testing of the General Dynamics Itronix Corporation Model: GD3000 Tablet PC FCC ID: KBC-GD3000 with the addition of a co-located WWAN Module (Sierra Wireless Gobi2000) and PIFA/PCB Diversity Antenna (MAIN Tx/Rx, AUX Rx). The measurement results were applied against the applicable EMC requirements and limits outlined in the technical rules and regulations set forth in the Federal Communication's Commission Code of Federal Regulations Title 47 Parts 2, 22 Subpart H and 24 Subpart E.

2.0 REFERENCES

2.1 Normative References

ANSI/ISO 17025:2005	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 C95.1:2005	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 2:2009	Code of Federal Regulations Title 47: Telecommunication Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR Title 47 Part 22:2009	Code of Federal Regulations Title 47: Telecommunication Part 22: Public Mobile Services
CFR Title 47 Part 24:2009	Code of Federal Regulations Title 47: Telecommunication Part 24: Personal Communication Services

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
dBc	dB down from carrier
EBW	Emission Bandwidth
EDGE	Enhanced Data Rates for GSM Evolution
EIRP	Effective Isotropic Radiated Power
EMC	Electromagnetic Compatibility
ERP	Effective Radiated Power
EV-DO	Evolution - Data Optimized
FCC	Federal Communications Commission
FHSS	Frequency Hopping Spread Spectrum
GSM	Global Systems for Mobile Communication
GMRS	General Mobile Radio Service
GPRS	General Packet Radio Service
HP	Hewlett Packard
HPF	High Pass Filter
Hpol	Horizontal Polarization
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
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
SA	Spectrum Analyzer
UMTS	Universal Mobile Telecommunications System
VBW	Video Bandwidth
Vpol	Vertical Polarization
WCDMA	Wide CDMA

4.0 FACILITIES AND ACCREDITATIONS

The facilities used in collecting the test results outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site conforms to the requirements set forth in ANSI C63.4 and is filed and listed with the FCC under Registration Number 714830 and Industry Canada under File Number IC 3874A-1.

5.0 GENERAL INFORMATION

5.1 Applicant Information

Company Name	**GENERAL DYNAMICS ITRONIX CORPORATION**
Address	509 North Sullivan - C44
	Spokane Valley, WA 99037
	United States

5.2 DUT Description

Device Type	Tablet PC	**Model**	GD3000	**Serial No.**	SY0120000313
Transmitter Type	Sierra Wireless WWAN	**Model**	Gobi2000	**FCC ID:**	N7NGOBI2
Device Identifier(s)	**FCC ID:**	KBC-GD3000			
Battery Type(s) Tested	Dual Lithium-Ion Rechargeable Battery (11.1V, 2.4Ah)				
Antenna Type Tested	Internal WWAN (located in Tablet handle)	MAIN Diversity	Part No.: TWT10GPPI01+G		

5.3 Rule Part(s) & Classification(s)

Rule Part(s) Applied	**FCC**	47 CFR §2; §22(H), §24(E)

5.4 Mode(s) of Operation Tested

5.4.1 Dual-Band CDMA/EV-DO

Measurements were made with the DUT set to the low, mid and high channel in each band and in 3 orthogonal DUT positions.

5.4.1.1 Cellular CDMA/EV-DO

Transmitter Frequency Range	824.70 - 848.31 MHz		
Transmitter Test Channels	Ch. 1013 (824.70 MHz) - Low	Ch. 384 (836.52 MHz) - Mid	Ch. 777 (848.31 MHz) - High
Software Power Gain Settings	Set by communications test set for “all ups” RC3 (SO55)		

5.4.1.2 Cellular WCDMA/HSDPA/HSUPA

Transmitter Frequency Range	826.40 - 846.6 MHz		
Transmitter Test Channels	Ch. 4132 (826.40 MHz) - Low	Ch. 4182 (836.4 MHz) - Mid	Ch. 4233 (846.6 MHz) - High
Software Power Gain Settings	Set by CDMA communications test set for “all ups” Set Test mode 1 loop back with a 12.2kbps Reference measurement channel (RMC) Bc = 8, Bd =15 (3GPP default) Set and send continuously up power control commands, TPC = ALL 1’s		

5.4.1.3 Cellular GSM/GPRS/EDGE

Transmitter Frequency Range	824.2 - 848.8 MHz		
Transmitter Test Channels	Ch. 128 (824.2 MHz) - Low	Ch. 190 (836.6 MHz) - Mid	Ch. 251 (848.8 MHz) - High
Software Power Gain Settings	Set by communications test set for power class 5, GPRS		

5.4.1.4 PCS CDMA/EV-DO

Transmitter Frequency Range	1851.25 - 1908.75 MHz		
Transmitter Test Channels	Ch. 25 (1851.25 MHz) - Low	Ch. 600 (1880.00 MHz) - Mid	Ch. 1175 (1908.75 MHz) - High
Software Power Gain Settings	Set by communications test set for “all ups” RC3 (SO55)		

5.4.1.5 PCS WCDMA/HSDPA/HSUPA

Transmitter Frequency Range	1852.4 - 1907.6 MHz		
Transmitter Test Channels	Ch. 9262 (1852.4 MHz) - Low	Ch. 9400 (1880.0 MHz) - Mid	Ch. 9538 (1907.6 MHz) - High
Software Power Gain Settings	Set by CDMA communications test set for "all ups" Set Test mode 1 loop back with a 12.2kbps Reference measurement channel (RMC) Bc = 8, Bd =15 (3GPP default) Set and send continuously up power control commands, TPC = ALL 1's		

5.4.1.6 PCS GSM/GPRS/EDGE

Transmitter Frequency Range	1850.2 - 1909.8 MHz		
Transmitter Test Channels	Ch. 512 (1850.2 MHz) - Low	Ch. 661 (1880.0 MHz) - Mid	Ch. 810 (1909.8 MHz) - High
Software Power Gain Settings	Set by communications test set for power class 5, GPRS		

5.5 Configuration Description

5.5.1 Configuration Justification

The DUT was tested in a configuration described by the client as being typical of normal use.

6.0 PASS/FAIL CRITERIA

Unless otherwise noted in the Appendices, the pass/fail criteria is the limit set forth in the reference standards. The DUT is considered to have passed the requirements if the data collected during the described measurement procedure is no greater than the specified limits as defined. The pass/fail statements made in this report only apply to the unit tested.

Appendix A - Effective Radiated Power / Effective Isotropic Radiated Power Measurement

A.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §22.913 (a)(2), FCC CFR 47 §24.232 (c)
Procedure Reference	ANSI/TIA/EIA-603-C

A.2 LIMITS

A.2.1 FCC CFR 47

FCC CFR 47 §22.913 (a)(2)	*(a)(2) Maximum ERP. ……. The ERP of mobile transmitters and auxiliary transmitters must not exceed 7 Watts.*
FCC CFR 47 §24.232 (c)	*(c) 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.3 ENVIRONMENTAL CONDITIONS

Temperature	25 +/- 5 ºC
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

A.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00072	EMCO	2075	Mini-mast	n/a
00073	EMCO	2080	Turn Table	n/a
00071	EMCO	2090	Multi-Device Controller	n/a
00015	HP	E4408B	Spectrum Analyzer	03May12
00050	Chase	CBL-6111A	Bilog Antenna	03May13
00034	ETS	3115	Double Ridged Guide Horn	29Apr13
00035	ETS	3115	Double Ridged Guide Horn	29Apr13
00051	HP	8566B	Spectrum Analyzer RF Section	03May12
00049	HP	85650A	Quasi-peak Adapter	06May12
00047	HP	85685A	RF Preselector	05May12
00006	R & S	SMR 20	Signal Generator (10MHz-40GHz)	30Apr12
00114	Amplifier Research	DC7154	Directional Coupler (0.8-4.2 GHz)	n/a
00078	Pasternack	PE2214-20	Directional Coupler (1-18 GHz)	n/a
00106	Amplifier Research	5S1G4	Power Amplifier (5W, 800MHz-4.2GHz)	n/a
00041	Amplifier Research	10W1000C	Power Amplifier (0.5 - 1 GHz)	n/a
00007	Gigatronics	8652A	Power Meter	04May12
00014	Gigatronics	80701A	Power Sensor	04May12
80012	Agilent	8960A	Radio Communications Test Set	24Sep11

A.5 MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS

For the field strength measurements, the measurement equipment was connected as shown in B.6. A number of antennas were used to cover the applicable frequency range tested. The ranges in which each antenna was used are as follows. For the final substitutions, the DUT was replaced with the appropriate antenna and fed from a CW signal source sufficient to replicate the received field strength of the emission being investigated.

Frequency Range	RX Antenna	TX Antenna
30 MHz – 0.8GHz	Bilog	Dipole
0.8 GHz - 18 GHz	ETS 3115 Horn	ETS 3115 Horn

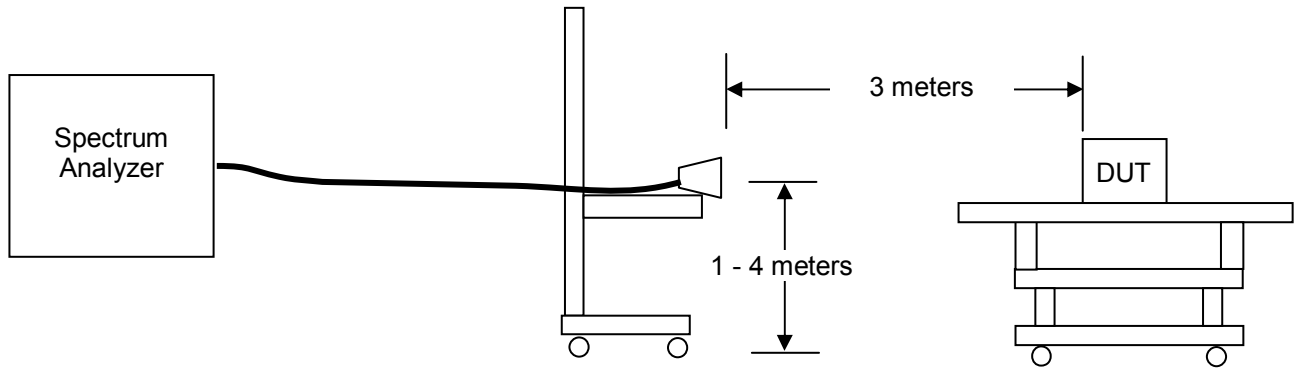
MEASUREMENT EQUIPMENT SETTINGS

For measuring the radiated field strength of the fundamental, the spectrum analyzer was set to the following settings:

Mode	RBW	VBW	Detector
	MHz	MHz	
Cellular	1	3	Peak
PCS	1	3	Peak

A.6 SETUP DRAWING

Figure A.6-1 - Setup Drawing



A.7 DUT OPERATING DESCRIPTION

Measurements were made for the low, mid and high channels for both the cellular and PCS bands at maximum power level as described in Appendix A.

A.8 SETUP PHOTOGRAPHS

Photograph A.8-1 – DUT Position A

Photograph A.8-2 – DUT Position B

Photograph A.8-3 – DUT Position C

A.9 TEST RESULTS

A.9.1 Carrier Levels

A.9.1.1 Cellular Band Carrier Levels – CDMA 1xRTT

Frequency (MHz)	Measured Level (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi) – 2.15db	Polarization (V/H)	ERP		Limit (dBm)	Margin (dB)	Pass/Fail
					Watts	dBm			
824.70	93.21	24.21	1.55	V	0.38	25.76	38	12.24	Pass
824.70	89.81	13.31	1.45	H	0.03	14.76	38	23.24	Pass
836.52	92.68	22.48	1.95	V	0.28	24.43	38	13.57	Pass
836.52	88.11	11.51	1.65	H	0.02	13.16	38	24.84	Pass
848.31	92.54	20.94	2.35	V	0.21	23.29	38	14.71	Pass
848.31	87.48	10.88	2.15	H	0.02	13.03	38	24.97	Pass

A.9.1.2 Cellular Band Carrier Levels – WCDMA

Frequency (MHz)	Measured Level (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)-2.15	Polarization (V/H)	ERP		Limit (dBm)	Margin (dB)	Pass/Fail
					Watts	dBm			
826.40	91.21	22.21	1.55	V	0.24	23.76	38	14.24	Pass
826.40	89.81	13.31	1.45	H	0.03	14.76	38	23.24	Pass
836.40	90.05	19.85	1.95	V	0.15	21.8	38	16.2	Pass
836.40	87.23	10.63	1.65	H	0.02	12.28	38	25.72	Pass
846.60	90.64	19.40	2.35	V	0.15	21.75	38	16.25	Pass
846.60	86.40	9.80	2.15	H	0.02	11.95	38	26.05	Pass

A.9.1.3 Cellular Band Carrier Levels – GPRS

Frequency (MHz)	Measured Level (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)-2.15	Polarization (V/H)	ERP		Limit (dBm)	Margin (dB)	Pass/Fail
					Watts	dBm			
824.20	95.82	26.8	1.55	V	0.68	28.35	38	9.65	Pass
824.20	93.14	18.6	1.45	H	0.10	20.05	38	17.95	Pass
836.60	95.41	25.2	1.95	V	0.52	27.15	38	10.85	Pass
836.60	92.09	15.5	1.65	H	0.05	17.15	38	20.85	Pass
848.80	96.05	24.4	2.35	V	0.47	26.75	38	11.25	Pass
848.80	90.23	13.6	2.15	H	0.04	15.75	38	22.25	Pass

Notes:
All 3 orthogonal DUT positions investigated. Worst case DUT Position C summarized in table.
Formulae:
ERP Level = Substitute Level + Antenna Gain
Margin (dB) = Limit – Level

A.10 TEST RESULTS CONT…

A.10.1 Carrier Levels

A.10.1.1 PCS Band Carrier Levels – CDMA 1xRTT

Frequency (MHz)	Measured Level (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	Polarization (V/H)	EIRP		Limit (dBm)	Margin (dB)	Pass/Fail
					Watts	dBm			
1851.25	91.95	15.45	8.80	V	0.27	24.25	33	8.75	Pass
1851.25	86.83	11.43	8.60	H	0.10	20.03	33	12.97	Pass
1880.00	92.58	16.08	8.85	V	0.31	24.93	33	8.07	Pass
1880.00	86.82	11.52	8.55	H	0.10	20.07	33	12.93	Pass
1908.75	91.26	15.36	8.90	V	0.27	24.26	33	8.74	Pass
1908.75	85.24	10.74	8.50	H	0.08	19.24	33	13.76	Pass

A.10.1.2 PCS Band Carrier Levels – WCDMA

Frequency (MHz)	Measured Level (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	Polarization (V/H)	EIRP		Limit (dBm)	Margin (dB)	Pass/Fail
					Watts	dBm			
1852.40	91.22	16.12	8.80	V	0.31	24.92	33	8.08	Pass
1852.40	84.40	9.00	8.60	H	0.06	17.60	33	15.40	Pass
1880.00	91.42	15.92	8.85	V	0.30	24.77	33	8.23	Pass
1880.00	85.80	10.50	8.55	H	0.08	19.05	33	13.95	Pass
1907.60	91.03	16.13	8.90	V	0.32	25.03	33	7.97	Pass
1907.60	85.70	11.25	8.50	H	0.09	19.75	33	13.25	Pass

A.10.1.3 PCS Band Carrier Levels – GPRS

Frequency (MHz)	Measured Level (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	Polarization (V/H)	EIRP		Limit (dBm)	Margin (dB)	Pass/Fail
					Watts	dBm			
1850.20	95.38	20.3	8.80	V	0.81	29.10	33	3.90	Pass
1850.20	91.46	16.1	8.60	H	0.30	24.70	33	8.30	Pass
1880.00	95.21	19.7	8.85	V	0.72	28.55	33	4.45	Pass
1880.00	91.02	15.8	8.55	H	0.27	24.35	33	8.65	Pass
1909.80	94.25	19.3	8.90	V	0.66	28.20	33	4.80	Pass
1909.80	89.11	14.6	8.50	H	0.20	23.10	33	9.90	Pass

Notes:
All 3 orthogonal DUT positions investigated. Worst case DUT Position C summarized in table.
Formulae:
ERP Level = Substitute Level + Antenna Gain
Margin (dB) = Limit – Level

A.11 PASS/FAIL

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

A.12 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.

Sean Johnston
Lab Manager
Celltech Labs Inc.

June 03, 2010
Date

Appendix B - Radiated Spurious Emissions Measurement

B.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §22.917(a), FCC CFR 47 §24.238(a)
Procedure Reference	ANSI/TIA/EIA-603-C

B.2 LIMITS

B.2.1 FCC CFR 47

FCC CFR 47 §22.917 & §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.*

B.3 ENVIRONMENTAL CONDITIONS

Temperature	25 +/- 5 ºC
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

B.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00072	EMCO	2075	Mini-mast	n/a
00073	EMCO	2080	Turn Table	n/a
00071	EMCO	2090	Multi-Device Controller	n/a
00015	HP	E4408B	Spectrum Analyzer	03May12
00050	Chase	CBL-6111A	Bilog Antenna	03May13
00034	ETS	3115	Double Ridged Guide Horn	29Apr13
00035	ETS	3115	Double Ridged Guide Horn	29Apr13
00051	HP	8566B	Spectrum Analyzer RF Section	03May12
00049	HP	85650A	Quasi-peak Adapter	06May12
00047	HP	85685A	RF Preselector	05May12
00048	Gore	65474	Microwave Cable	n/a
00115	Miteq	J54-00102600-35-5A	LNA	n/a*
00006	R & S	SMR 20	Signal Generator (10MHz-40GHz)	30Apr12
00114	Amplifier Research	DC7154	Directional Coupler (0.8-4.2 GHz)	n/a
00078	Pasternack	PE2214-20	Directional Coupler (1-18 GHz)	n/a
00106	Amplifier Research	5S1G4	Power Amplifier (5W, 800MHz-4.2GHz)	n/a
00041	Amplifier Research	10W1000C	Power Amplifier (0.5 - 1 GHz)	n/a
00043	Microwave Circuits	H02G18G1	High Pass Filter	n/a*
00044	Microwave Circuits	H1G318G1	High Pass Filter	n/a*
00007	Gigatronics	8652A	Power Meter	04May12
00014	Gigatronics	80701A	Power Sensor	04May12
80012	Agilent	8960A	Radio Communications Test Set	24Sep11

* verified before use

B.5 MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS

For the field strength measurements, the measurement equipment was connected as shown in C.6. A number of antennas were used to cover the applicable frequency range tested. The ranges in which each antenna was used are shown below. For the final substitutions, the DUT was replaced with the appropriate antenna and fed from a CW signal source sufficient to replicate the received field strength of the emission being investigated.

Frequency Range	RX Antenna	TX Antenna
0.8 GHz - 18 GHz	ETS 3115 Horn	ETS 3115 Horn

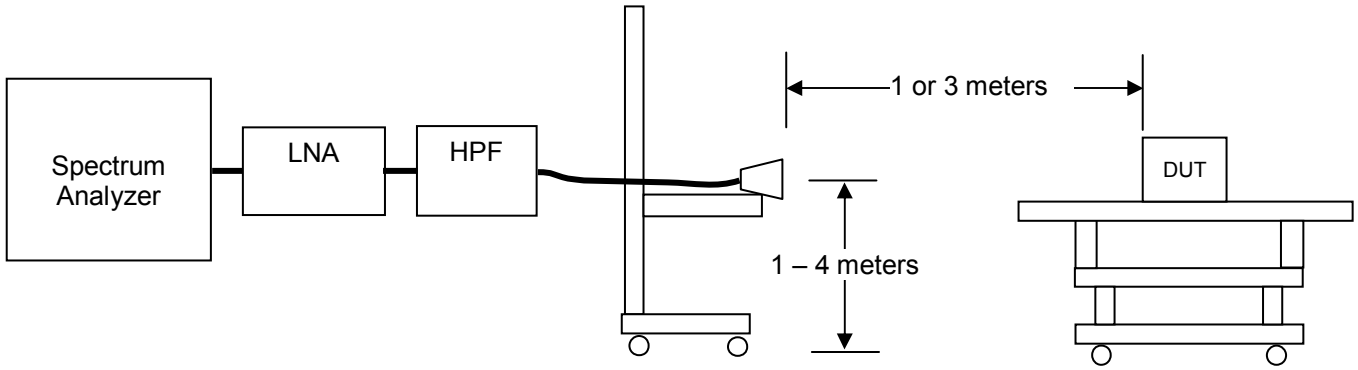
MEASUREMENT EQUIPMENT SETTINGS

For the spurious out-of-band emissions, the spectrum analyzer was set to the following settings:

Mode	RBW	VBW	Detector
	kHz	kHz	
Cellular < 1 GHz	100	300	Peak*
Cellular > 1 GHz	1000	3000	Peak*
PCS	1000	3000	Peak*

B.6 SETUP DRAWING

Figure B.6-1 - Setup Drawing



B.7 DUT OPERATING DESCRIPTION

Measurements were made for the low, mid and high channels transmitting in the cellular and PCS bands at maximum power level as described in Appendix A.

B.8 TEST RESULTS

B.8.1 Spurious Emissions

B.8.1.1 Cellular Band Spurious Emissions – CDMA 1xRTT

Low Channel: 824.70 MHz
Measured output power: 25.76 dBm = 0.38 W, Limit: 43+10Log(W)= 38.8dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Margin	Pass/Fail	Notes
CH 1013									
1.649	NF	NF	n/a					Pass	NF
2.474	NF	NF	n/a					Pass	NF
3.299	NF	NF	n/a					Pass	NF

Mid Channel: 836.52 MHz
Measured output power: 24.43 dBm = 0.28 W, Limit: 43+10Log(W)= 37.5dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Margin	Pass/Fail	Notes
CH 384									
1.673	NF	NF	n/a					Pass	NF
2.509	NF	NF	n/a					Pass	NF
3.346	NF	NF	n/a					Pass	NF

High Channel: 848.31 MHz
Measured output power: 23.29 dBm = 0.24 W, Limit: 43+10Log(W)= 36.8dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc		Pass/Fail	Notes
CH 777									
1.697	NF	NF	n/a					Pass	NF
2.545	NF	NF	n/a					Pass	NF
3.393	NF	NF	n/a					Pass	NF

- *Emission detected
- NF (Noise Floor)

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. All other emissions were at the noise floor and not reported.

B.9 TEST RESULTS

B.9.1 Spurious Emissions

B.9.1.1 Cellular Band Spurious Emissions – WCDMA

Low Channel: 826.4 MHz
Measured output power: 23.76 dBm = 0.24 W, Limit: 43+10Log(W)= 36.8dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 4132								
1.653	NF	NF	n/a				Pass	NF
2.479	NF	NF	n/a				Pass	NF
3.305	NF	NF	n/a				Pass	NF

Mid Channel: 836.4 MHz
Measured output power: 21.8 dBm = 0.15 W, Limit: 43+10Log(W)= 34.8dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 4182								
1.673	NF	NF	n/a				Pass	NF
2.509	NF	NF	n/a				Pass	NF
3.346	NF	NF	n/a				Pass	NF

High Channel: 846.6 MHz
Measured output power: 21.75 dBm = 0.15 W, Limit: 43+10Log(W)= 34.8dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 4233								
1.693	NF	NF	n/a				Pass	NF
2.540	NF	NF	n/a				Pass	NF
3.386	NF	NF	n/a				Pass	NF

- *Emission detected
- NF (Noise Floor)

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. All other emissions were at the noise floor and not reported.

B.10 TEST RESULTS

B.10.1 Spurious Emissions

B.10.1.1 Cellular Band Spurious Emissions – GPRS

Low Channel: 824.20 MHz
Measured output power: 28.35 dBm = 0.68 W, Limit: 43+10Log(W)= 41.3dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH. 128								
1.648	57.1	55.4	-57.9	9	-48.9	77.25	Pass	*
2.472	64.3	64.5	-45.9	9.9	-36	64.35	Pass	*
3.296	49.4	44.1	n/a	9.8	n/a	n/a	Pass	NF
4.121				10.6		n/a	Pass	NF

Mid Channel: 836.6 MHz
Measured output power: 27.15 dBm = 0.52 W, Limit: 43+10Log(W)= 40.2dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH. 190								
1.673	53.3	52.4	n/a	9	n/a	n/a	Pass	NF
2.509	62.3	64.7	-44	9.9	-34.1	61.25		*
3.346	49.4	44.5	n/a	9.8	n/a	n/a	Pass	NF
4.182				10.6	n/a	n/a	Pass	NF

High Channel: 848.8 MHz
Measured output power: 26.75 dBm = 0.47 W, Limit: 43+10Log(W)= 39.7dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH. 251								
1.697	51.8	51.5	n/a	9	n/a	n/a	Pass	NF
2.545	62.4	61.7	-45	9.9	-35.1	61.85	Pass	*
3.393	45.3	44.3	n/a	9.8	n/a	n/a	Pass	NF
4.242	NF	NF	n/a				Pass	NF

- *Emission detected
- NF (Noise Floor)

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. All other emissions were at the noise floor and not reported.

B.10.1.2 PCS Band Spurious Emissions CDMA 1xRTT

Low Channel: 1851.25 MHz
Measured output power: 24.25 dBm = 0.27 W, Limit: 43+10Log(W)= 37.31dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 25								
3.703	NF	NF	n/a				Pass	NF
5.553	NF	NF	n/a				Pass	NF
7.405	NF	NF	n/a				Pass	NF

Mid Channel: 1880.00 MHz
Measured output power: 24.93 dBm = 0.31 W, Limit: 43+10Log(W)= 37.9dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 600								
3.76	NF	NF	n/a				Pass	NF
5.64	NF	NF	n/a				Pass	NF
7.52	NF	NF	n/a				Pass	NF

High Channel: 1908.75 MHz
Measured output power: 19.72 dBm = 0.094 W, Limit: 43+10Log(W)= 37.31dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 1175								
3.818	NF	NF	n/a				Pass	NF
5.726	NF	NF	n/a				Pass	NF
7.635	NF	NF	n/a				Pass	NF

- *Emission detected
- NF (Noise Floor)

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. All other emissions were at the noise floor and not reported.

B.10.1.3 PCS Band Spurious Emissions – WCDMA

Low Channel: 1852.40 MHz
Measured output power: 24.92 dBm = 0.31 W, Limit: 43+10Log(W)= 37.91dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 9262								
3.705	55.1	48	-57	9.8	-47.2	72.12	Pass	NF
5.557	NF	NF	n/a				Pass	NF
7.409	NF	NF	n/a				Pass	NF

Mid Channel: 1880.00 MHz
Measured output power: 24.77 dBm = 0.30 W, Limit: 43+10Log(W)= 37.77dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 9400								
3.760	55.3	48	-57	9.8	-47.2	71.97	Pass	NF
5.640	NF	NF	n/a				Pass	NF
7.520	NF	NF	n/a				Pass	NF

High Channel: 1907.60 MHz
Measured output power: 25.03 dBm = 0.32 W, Limit: 43+10Log(W)= 38.1dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 9538								
3.815	52.8	49	-58	9.8	-48.2	73.23	Pass	NF
5.723	NF	NF	n/a				Pass	NF
7.630	NF	NF	n/a				Pass	NF

- *Emission detected
- NF (Noise Floor)

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. All other emissions were at the noise floor and not reported.

B.10.1.4 PCS Band Spurious Emissions – GPRS

Low Channel: 1852.20 MHz
Measured output power: 29.1 dBm = 0.81 W, Limit: 43+10Log(W)= 42.1dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 512								
3.700	NF	NF	n/a				Pass	NF
5.551	NF	NF	n/a				Pass	NF
7.401	NF	NF	n/a				Pass	NF

Mid Channel: 1880.00 MHz
Measured output power: 28.55 dBm = 0.72 W, Limit: 43+10Log(W)= 41.6dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 661								
3.760	NF	NF	n/a				Pass	NF
5.640	NF	NF	n/a				Pass	NF
7.520	NF	NF	n/a				Pass	NF

High Channel: 1909.80 MHz
Measured output power: 28.2 dBm = 0.66 W, Limit: 43+10Log(W)= 41.2dBc

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	EIRP (dBm)	dBc	Pass/Fail	Notes
CH 810								
3.819	NF	NF	n/a				Pass	NF
5.729	NF	NF	n/a				Pass	NF
7.639	NF	NF	n/a				Pass	NF

- *Emission detected
- NF (Noise Floor)

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. All other emissions were at the noise floor and not reported.

B.11 PASS/FAIL

In reference to the results shown in C.8, the DUT passes the requirements as stated in the reference standards as follows:
1. FCC 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.
2. FCC 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.

B.12 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.

Sean Johnston
Lab Manager
Celltech Labs Inc.

June 22, 2010
Date

END OF DOCUMENT

