



	Test Report Serial No.:	081012TS5-T1188-E24C	Issue Date:	Aug. 24, 2012	 Test Lab Certificate No. 2470.01
	Measurement Date(s):	August 14-17, 2012	Rev. No.:	Revision 1.0	
	Testing Standard(s):	FCC 47 CFR §2, §22H, §24E	IC RSS-132 & RSS-133		
	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

DECLARATION OF COMPLIANCE		RF MEASUREMENT REPORT			FCC & IC		
Test Lab Information	Name	CELLTECH LABS INC.					
	Address	21-364 Lougheed Road, Kelowna B.C. V1X 7R8 Canada					
Test Lab Registration No.(s)	ISO 17025	A2LA Test Lab Certificate No. 2470.01					
	IC	3874A-1					
Applicant Information	Name	SENDUM WIRELESS CORPORATION					
	Address	4500 Beedie Street, Burnaby, B.C. V5J 5L2 Canada					
Standard(s) & Procedure(s)	FCC	47 CFR Part 2	47 CFR Part 22 Subpart H	47 CFR Part 24 Subpart E			
	IC	RSS-132 Issue 2	RSS-133 Issue 5	RSS-Gen Issue 3			
	ANSI	TIA/EIA-603-C-2004					
Device Classification(s)	FCC	PCS Licensed Transmitter (PCB)			47 CFR §24(E)		
	IC	2 GHz Personal Communication Services 800 MHz Cellular Telephones Employing New Technologies			RSS-133 Issue 5 RSS-132 Issue 2		
Device Identifier(s)	FCC ID:	TS5-6055M-GT300		IC:	6234A-GT300		
Device Under Test (DUT)	Global Asset Tracking Device						
Device Model(s)	GT300						
Test Sample Receipt Date	August 10, 2012		Date(s) of Measurements		August 14-17, 2012		
Test Sample Revision No.(s)	Hardware	R1.0		Firmware	R1.43.14		
Test Sample Serial No.(s)	0311205280060905674018 (Identical Prototype)						
Mode(s) of Operation	Dual-Band CDMA 1xRTT						
Emission Designator(s)	1M28F9W						
Transmit Freq. Range(s)	850 Band	824.70 - 848.31 MHz		1900 Band	1851.25 - 1908.75 MHz		
Max. RF Output Power Tested	850	CDMA 1xRTT	824.70 MHz	1013	22.85	0.19	ERP
			836.52 MHz	384	22.25	0.17	ERP
			848.31 MHz	777	20.45	0.11	ERP
	1900	CDMA 1xRTT	1851.25 MHz	25	25.8	0.38	EIRP
			1880.00 MHz	600	25.1	0.32	EIRP
			1908.75 MHz	1175	25.1	0.32	EIRP
Antenna Type(s) Tested	Internal Monopole (-4 dBi)						
Power Source(s) Tested	Li-Poly Rechargeable Smart Battery		3.7 V	2020 mAh	Model: GT300		
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; Industry Canada RSS-132 Issue 2, RSS 133 Issue 5, RSS-Gen Issue 3 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.							
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Test Report Approved By			Sean Johnston	Lab Manager	Celltech Labs Inc.		

Applicant:	Sendum Wireless Corp.	FCC ID:	TS5-6055M-GT300	IC:	6234A-GT300	Sendum
DUT Model:	GT300	DUT Type:	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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TEST SUMMARY						
FCC CFR Title 47 Parts 2, 22 & 24						
Appendix	Test Description	Procedure Reference	Limit Reference	Test Start Date	Test End Date	Result
A	Occupied Bandwidth	§2.1049	§2.1049, §22.905, §24.238	14-Aug	14-Aug	Pass
B	Peak-to-Average Ratio	§24.232(d)	§24.232(d)	14-Aug	14-Aug	Pass
C	Out of Band TX Conducted spurious emissions	§2.1055	§22.917 (a) §24.238 (a)	14-Aug	14-Aug	Pass
D	Effective Radiated Power	ANSI/TIA/EIA-603-C	§22.913	15-Aug	16-Aug	Pass
	Effective Isotropic Radiated Power	ANSI/TIA/EIA-603-C	§24.232(c)			Pass
E	Radiated TX Spurious Emissions	ANSI/TIA/EIA-603-C	§22.917 (a)	15-Aug	16-Aug	Pass
			§24.238 (a)			Pass
F	Frequency Stability	ANSI/TIA/EIA-603-C	§2.1055, §22.335 §2.1055, §24.235	17-Aug	17-Aug	Pass
IC RSS-132 Issue 2 & RSS-133 Issue 5						
A	Occupied Bandwidth	RSS-Gen 4.6.1	N/A	14-Aug	14-Aug	Pass
B	Peak-to-Average Ratio	RSS-Gen, RSS-133	RSS-133 6.4	14-Aug	14-Aug	Pass
C	Out of Band TX Conducted Spurious Emissions	RSS-Gen 4.9	RSS-132 RSS-133	14-Aug	14-Aug	Pass
D	Effective Radiated Power	ANSI/TIA/EIA-603-C	SRSP-503 5.1.3	15-Aug	16-Aug	Pass
	Effective Isotropic Radiated Power	ANSI/TIA/EIA-603-C	SRSP-510 5.1.2			Pass
E	Radiated TX Spurious Emissions	RSS-Gen 4.9	RSS-132 4.5	15-Aug	16-Aug	Pass
			RSS-133 6.5			Pass
F	Frequency Stability	RSS-Gen 4.7	RSS-132 4.3	17-Aug	17-Aug	Pass
			RSS-133 6.3			



Applicant:	Sendum Wireless Corp.	FCC ID:	TS5-6055M-GT300	IC:	6234A-GT300	Sendum
DUT Model:	GT300	DUT Type:	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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### REVISION LOG

Revision	Description	Prepared By	QA Review By	Report Issue Date
1.0	1st Release	Sean Johnston	Jon Hughes	August 24, 2012

Applicant:	Sendum Wireless Corp.	FCC ID:	TS5-6055M-GT300	IC:	6234A-GT300	Sendum
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## 1.0 SCOPE



This report outlines the measurements made and the results collected for the Sendum Wireless Corp. Model: GT300 Dual-Band CDMA Asset Tracking Device. The measurement results were applied against the applicable 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; and Industry Canada Radio Standards Specification RSS-132 Issue 2, RSS-133 Issue 5 and RSS-Gen Issue 3.

## 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	Code of Federal Regulations Title 47: Telecommunication Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR Title 47 Part 22	Code of Federal Regulations Title 47: Telecommunication Part 22: Public Mobile Services
CFR Title 47 Part 24	Code of Federal Regulations Title 47: Telecommunication Part 24: Personal Communication Services
IC Spectrum Management & Telecommunications Policy	Radio Standards Specification RSS-132 Issue 2 - 800 MHz Cellular Telephones Employing New Technologies RSS-133 Issue 5 - 2 GHz Personal Communication Services RSS-Gen Issue 3 - General Requirements and Information for the Certification of Radiocommunication Equipment SRSP-503 Issue 7 - Technical Requirements for Cellular Radiotelephone Systems Operating in the Bands 824 - 849 MHz and 869 - 894 MHz SRSP-510 Issue 5 - Technical Requirements for Personal Communications Services in the Bands 1850 - 1910 MHz and 1930 - 1990 MHz



Applicant:	Sendum Wireless Corp.	FCC ID:	TS5-6055M-GT300	IC:	6234A-GT300	Sendum
DUT Model:	GT300	DUT Type:	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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### 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

Applicant:	Sendum Wireless Corp.	FCC ID:	TS5-6055M-GT300	IC:	6234A-GT300	Sendum
DUT Model:	GT300	DUT Type:	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

#### 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 as an accredited test site and with Industry Canada under File Number IC 3874A-1.

#### 5.0 GENERAL INFORMATION

##### 5.1 Applicant Information

<b>Company Name</b>	Sendum Wireless Corporation
<b>Address</b>	4500 Beedie Street
	Burnaby, B.C. V5J 5L2
	Canada



##### 5.2 DUT Description

<b>Device Description</b>	Global Asset Tracking Device
<b>Device Model</b>	GT300
<b>Device Serial No.</b>	0311205280060905674018 (Identical Prototype)
<b>Hardware Revision No.</b>	R1.0
<b>Firmware Revision No.</b>	R1.43.14
<b>Internal Transmitter</b>	Dual-Band CDMA 1xRTT
<b>Modulation Type(s)</b>	QPSK
<b>Power Source</b>	Li-Poly Battery Model: GT300 (3.7V, 2020mAh)
<b>Antenna Type &amp; Gain</b>	Internal Monopole (-4 dBi)

##### 5.3 Rule Part(s) & Classification(s)

<b>Rule Part(s) Applied</b>	<b>FCC</b>	47 CFR §2; §22(H), §24(E)
	<b>IC</b>	RSS-132 Issue 2, RSS-133 Issue 5, RSS-Gen Issue 3
<b>Device Classification(s)</b>	<b>FCC</b>	PCS Licensed Transmitter (PCB)
	<b>IC</b>	800 MHz Cellular Telephones employing New Technologies (RSS-132)
		2 GHz Personal Communication Services (RSS-133)

<b>Applicant:</b>	Sendum Wireless Corp.	<b>FCC ID:</b>	TS5-6055M-GT300	<b>IC:</b>	6234A-GT300	Sendum
<b>DUT Model:</b>	GT300	<b>DUT Type:</b>	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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## 5.4 Mode(s) of Operation Tested

### 5.4.1 Dual-Band CDMA 1xRTT

Measurements were made with the DUT 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.

#### 5.4.1.1 Cellular CDMA 1xRTT

<b>Transmitter Frequency Range</b>	824.70 - 848.31 MHz		
<b>Transmitter Test Channels</b>	Ch. 1013 (824.70 MHz) - Low	Ch. 384 (836.52 MHz) - Mid	Ch. 777 (848.31 MHz) - High
<b>Software Power Gain Settings</b>	Set by CDMA communications test set for "all ups"		
<b>Modulation Type(s)</b>	QPSK		

#### 5.4.1.2 PCS CDMA 1xRTT

<b>Transmitter Frequency Range</b>	1851.25 - 1908.75 MHz		
<b>Transmitter Test Channels</b>	Ch. 25 (1851.25 MHz) - Low	Ch. 600 (1880.00 MHz) - Mid	Ch. 1175 (1908.75 MHz) - High
<b>Software Power Gain Settings</b>	Set by CDMA communications test set for "all ups"		
<b>Modulation Type(s)</b>	QPSK		

## 5.5 Configuration Description

Transmission in RC3 S055 mode was utilized as worst-case power mode for both cellular and PCS bands.

### 5.5.1 Configuration Justification

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



### 5.5.2 Transmitter Configuration(s)

## 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.

<b>Applicant:</b>	Sendum Wireless Corp.	<b>FCC ID:</b>	TS5-6055M-GT300	<b>IC:</b>	6234A-GT300	Sendum
<b>DUT Model:</b>	GT300	<b>DUT Type:</b>	Asset Tracking Device (Dual-Band CDMA 1xRTT)	<b>850 / 1900 Bands</b>		
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## Appendix A - Occupied Bandwidth

A.1 REFERENCES	
<b>Normative Reference Standard</b>	FCC CFR 47 §2.1049, §22.905, §24.238, RSS-132, RSS 133, RSS-Gen
<b>Procedure Reference</b>	FCC CFR 47 §2.1049, RSS-Gen

A.2 LIMITS	
A.2.1 N/a	

A.3 ENVIRONMENTAL CONDITIONS	
<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

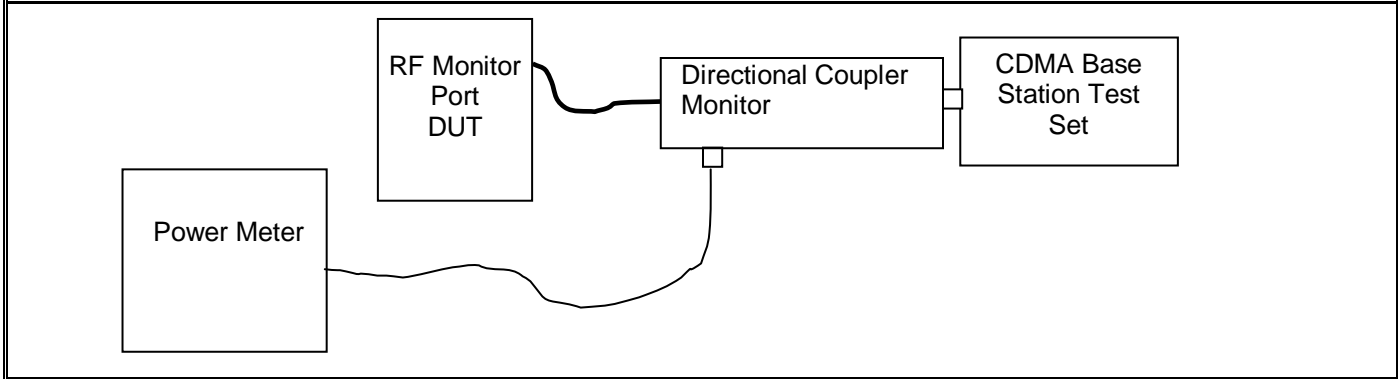
A.4 EQUIPMENT LIST				
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00015	HP	E4408B	Spectrum Analyzer	03May14
00208	Anritsu	MT8820A	Radio Communications Test Set	03May14
00007	Gigatronics	8652A	Power Meter	04May14
00014	Gigatronics	80701A	Power Sensor	04May14
00078	Pasternack	PE2214-20	Directional Coupler 1-18 GHz	N/a*

\*Verified with power meter prior to use

A.5 MEASUREMENT EQUIPMENT SETUP	
<b>Equipment Connections</b>	The equipment was connected as shown in the setup drawing in A.6.
<b>Equipment Settings</b>	Offset - set to include loss through cable and directional coupler.
<b>Measurement Procedure</b>	The channel was set on the base station and the power set for "all ups".

## A.6 SETUP DRAWING

Figure A.6-1 - Setup Drawing





## A.7 DUT OPERATING DESCRIPTION

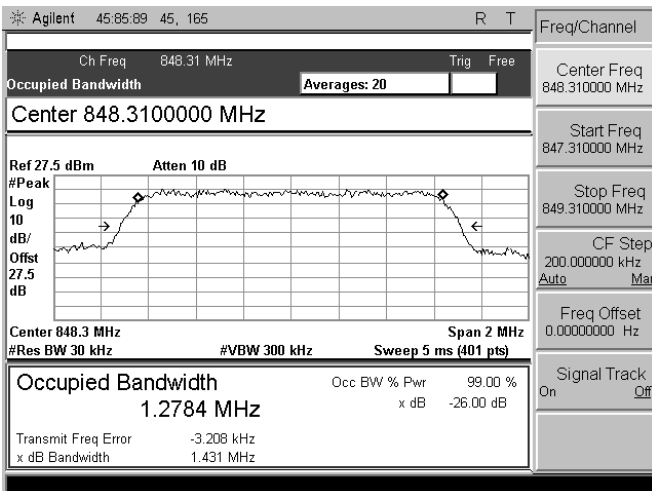
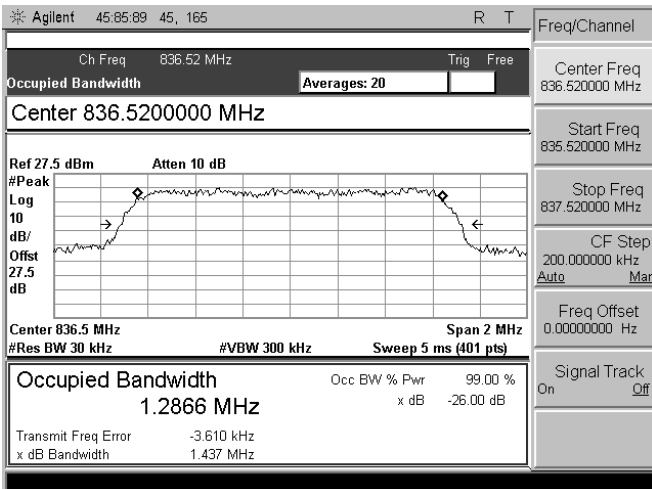
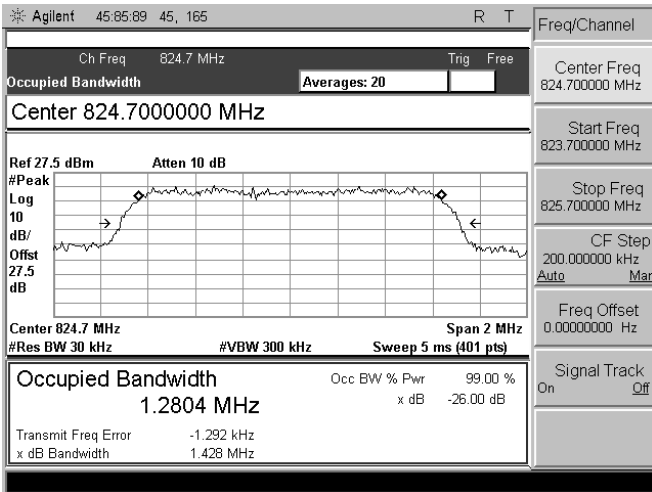
Measurements were made in the cellular and PCS bands with the DUT set appropriately in CDMA 1xRTT. The occupied bandwidth was measured in low, mid and high channel in each band.

## A.8 TEST RESULTS



Table 1: Occupied Bandwidth

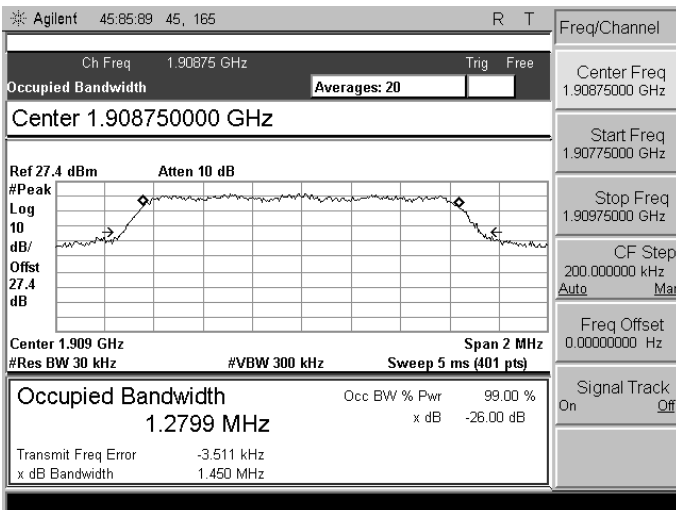
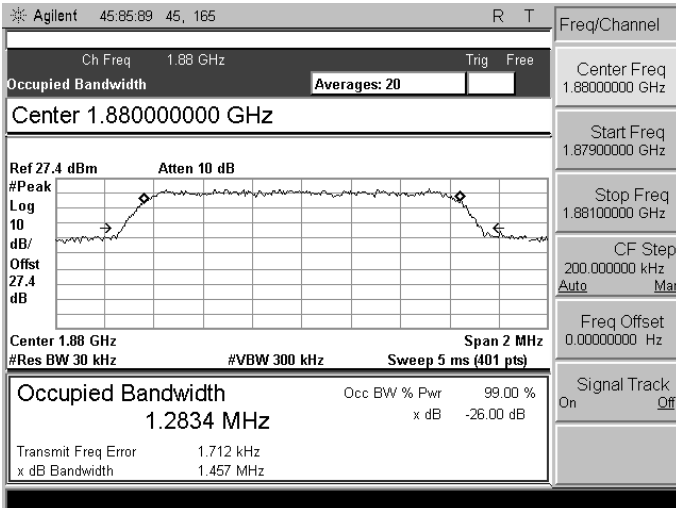
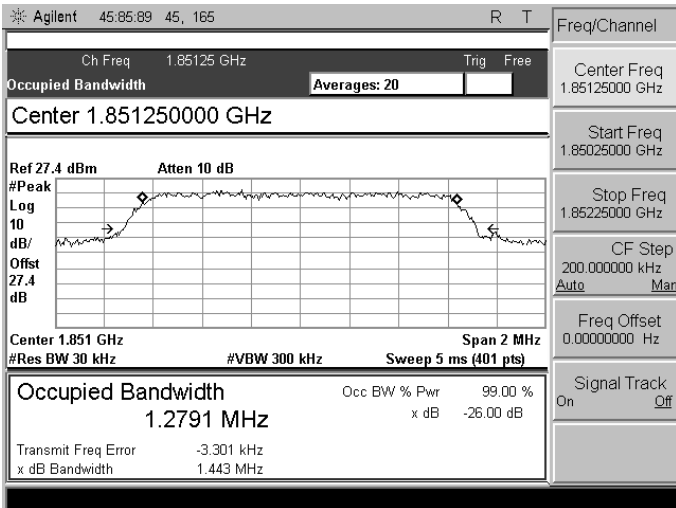
Mode	Band	Freq. (MHz)	Channel	99% Occupied Bandwidth (MHz)
RC3 S055	850	824.7	1013	1.2804
		836.52	384	1.2866
		848.31	777	1.2784
	1900	1851.25	25	1.2791
		1880	600	1.2834
		1908.75	1175	1.2799

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DUT Model:	GT300	DUT Type:	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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**A.9 PASS/FAIL**

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

**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.





Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Aug. 14, 2012

Date

Applicant:	Sendum Wireless Corp.	FCC ID:	TS5-6055M-GT300	IC:	6234A-GT300	Sendum
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	Measurement Date(s):	August 14-17, 2012	Rev. No.:	Revision 1.0	
	Testing Standard(s):	FCC 47 CFR §2, §22H, §24E	IC RSS-132 & RSS-133		
	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

## Appendix B - Peak to Average Ratio

### B.1 REFERENCES

<b>Normative Reference Standard</b>	FCC CFR 47 §24.232
<b>Procedure Reference</b>	FCC CFR 47 §24.232; IC RSS-133

### B.2 LIMITS

B.2.1	FCC CFR 47: < 13 dB
B.2.2	IC RSS 133: The peak to average ratio shall not exceed 13 dB

### B.3 ENVIRONMENTAL CONDITIONS

<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

### B.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00015	HP	E4408B	Spectrum Analyzer	03May14
00208	Anritsu	MT8820A	Radio Communications Test Set	03May14
00007	Gigatronics	8652A	Power Meter	04May14
00014	Gigatronics	80701A	Power Sensor	04May14
00078	Pasternack	PE2214-20	Directional Coupler 1-18 GHz	N/a*

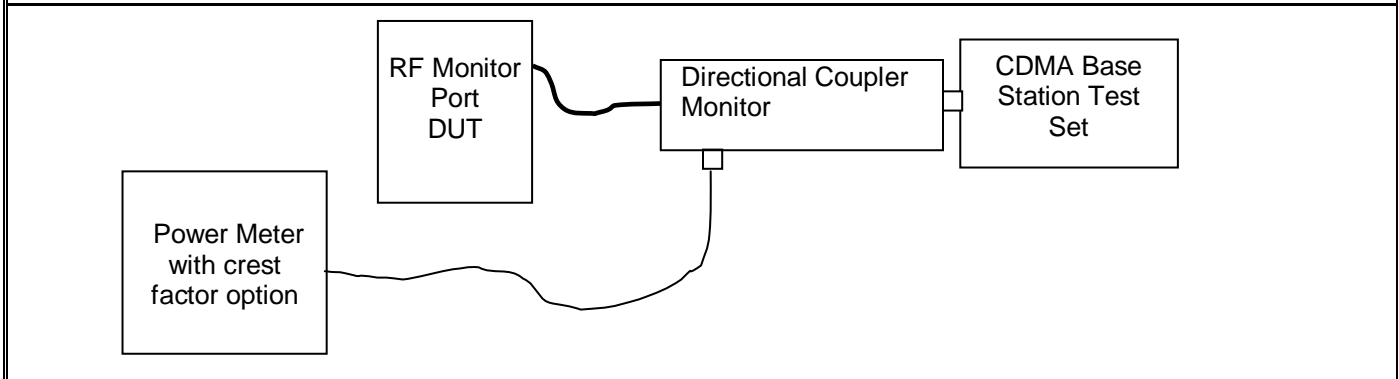
\*Verified with power meter prior to use

### B.5 MEASUREMENT EQUIPMENT SETUP

<b>Equipment Connections</b>	The equipment was connected as shown in the setup drawing in B.6.
<b>Equipment Settings</b>	Offset - set to include loss through cable and directional coupler.
<b>Measurement Procedure</b>	The channel was set on the base station and the power set for "all ups".

## B.6 SETUP DRAWING

Figure B.6-1 - Setup Drawing





## B.7 DUT OPERATING DESCRIPTION

Measurements were made in the PCS band with the DUT set appropriately in CDMA 1xRTT. The peak to average ratio was measured in low, mid and high channel.

## B.8 TEST RESULTS

Table 2: Peak to average ratio

Channel	Frequency (MHz)	Measured Peak (dB)	Measured Average (dBm)	Peak to average Ratio (dB)
25	1851.25	28.5	24.3	4.2
600	1880.0	28.9	25.1	3.8
1175	1908.75	28.1	24.2	3.9

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	Testing Standard(s):	FCC 47 CFR §2, §22H, §24E	IC RSS-132 & RSS-133		
	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

**B.9 PASS/FAIL**

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

**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.





Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Aug. 14, 2012

Date

Applicant:	Sendum Wireless Corp.	FCC ID:	TS5-6055M-GT300	IC:	6234A-GT300	Sendum
DUT Model:	GT300	DUT Type:	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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	Measurement Date(s):	August 14-17, 2012	Rev. No.:	Revision 1.0	
	Testing Standard(s):	FCC 47 CFR §2, §22H, §24E	IC RSS-132 & RSS-133		
	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

**Appendix C**

**- Out of Band Emissions at the Antenna Terminals**

**C.1 REFERENCES**

<b>Normative Reference Standard</b>	FCC CFR 47 §2.1051, §22.917, §24.238, RSS-132, RSS-133
<b>Procedure Reference</b>	FCC CFR 47 §2.1051, RSS-Gen

**C.2 LIMITS**

FCC §22.917  
FCC CFR 47: (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) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( *i.e.* 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.



§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) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

IC RSS-132 & RSS-133

In the first 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least  $43 + 10 \log_{10}(P)$ , dB.

After the first 1.0 MHz (for equipment that complies with (a)(i) of this subsection) or 1.5 MHz (for equipment that complies with (a)(ii) of this subsection), the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in watts) by at least  $43 + 10 \log_{10}(P)$ , dB. (**Note:** If the test result using 1% of the emission bandwidth is used, power integration over 1.0 MHz is required; alternatively, the spectrum analyzer resolution and video bandwidths can be increased to 1.0 MHz for this measurement).

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	Testing Standard(s):	FCC 47 CFR §2, §22H, §24E	IC RSS-132 & RSS-133		
	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		
					Test Lab Certificate No. 2470.01

### C.3 ENVIRONMENTAL CONDITIONS

<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

### C.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00015	HP	E4408B	Spectrum Analyzer	03May14
00208	Anritsu	MT8820A	Radio Communications Test Set	03May14
00007	Gigatronics	8652A	Power Meter	04May14
00014	Gigatronics	80701A	Power Sensor	04May14
00078	Pasternack	PE2214-20	Directional Coupler 1-18 GHz	N/a*

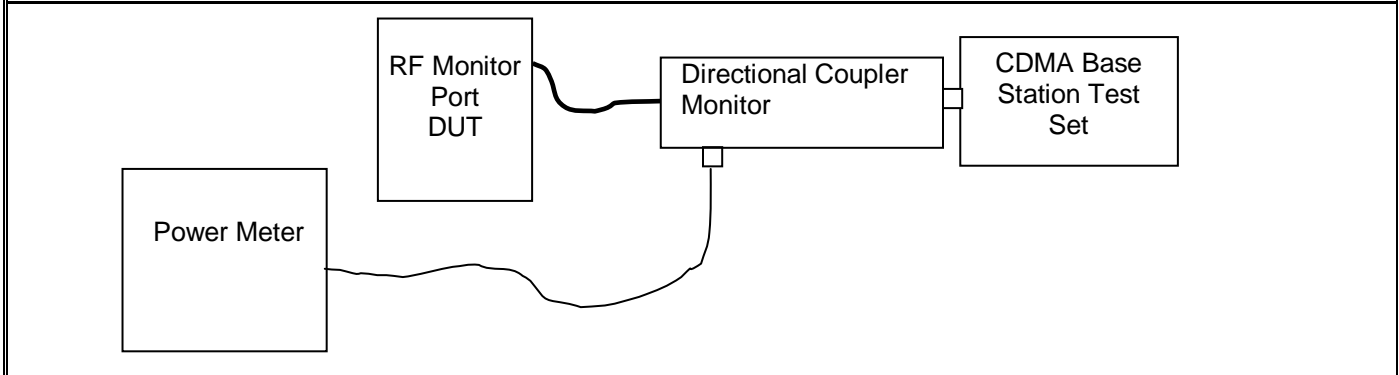
\*Verified with power meter prior to use

### C.5 MEASUREMENT EQUIPMENT SETUP

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

### C.6 SETUP DRAWING

Figure C.6-1 - Setup Drawing



### C.7 DUT OPERATING DESCRIPTION

1. The measurements were made in the cellular and PCS bands with the DUT in the appropriate test mode as described in Section 5.4.

<b>Applicant:</b>	Sendum Wireless Corp.	<b>FCC ID:</b>	TS5-6055M-GT300	<b>IC:</b>	6234A-GT300	Sendum
<b>DUT Model:</b>	GT300	<b>DUT Type:</b>	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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## C.8 TEST RESULTS

Table 3: Block Edge limit correction table

Limit line correction  $10\log(RB1/RB2)$

Frequency (MHz)	Channel	99% Occupied Bandwidth (MHz)	26dB Bandwidth (Emission bandwidth)	1% of emission bandwidth	Correction factor on limit	Limit
824.7	1013	1.2804	1.428	14.28	-1.55	-14.55
836.52	384	1.2866	1.437	14.37	-1.57	-14.57
848.31	777	1.2784	1.431	14.31	-1.56	-14.56
1851.25	25	1.2791	1.443	14.43	-1.59	-14.59
1880.0	600	1.2834	1.457	14.57	-1.63	-14.63
1908.75	1175	1.2799	1.45	14.50	-1.61	-14.61

Table 4: Block Edge

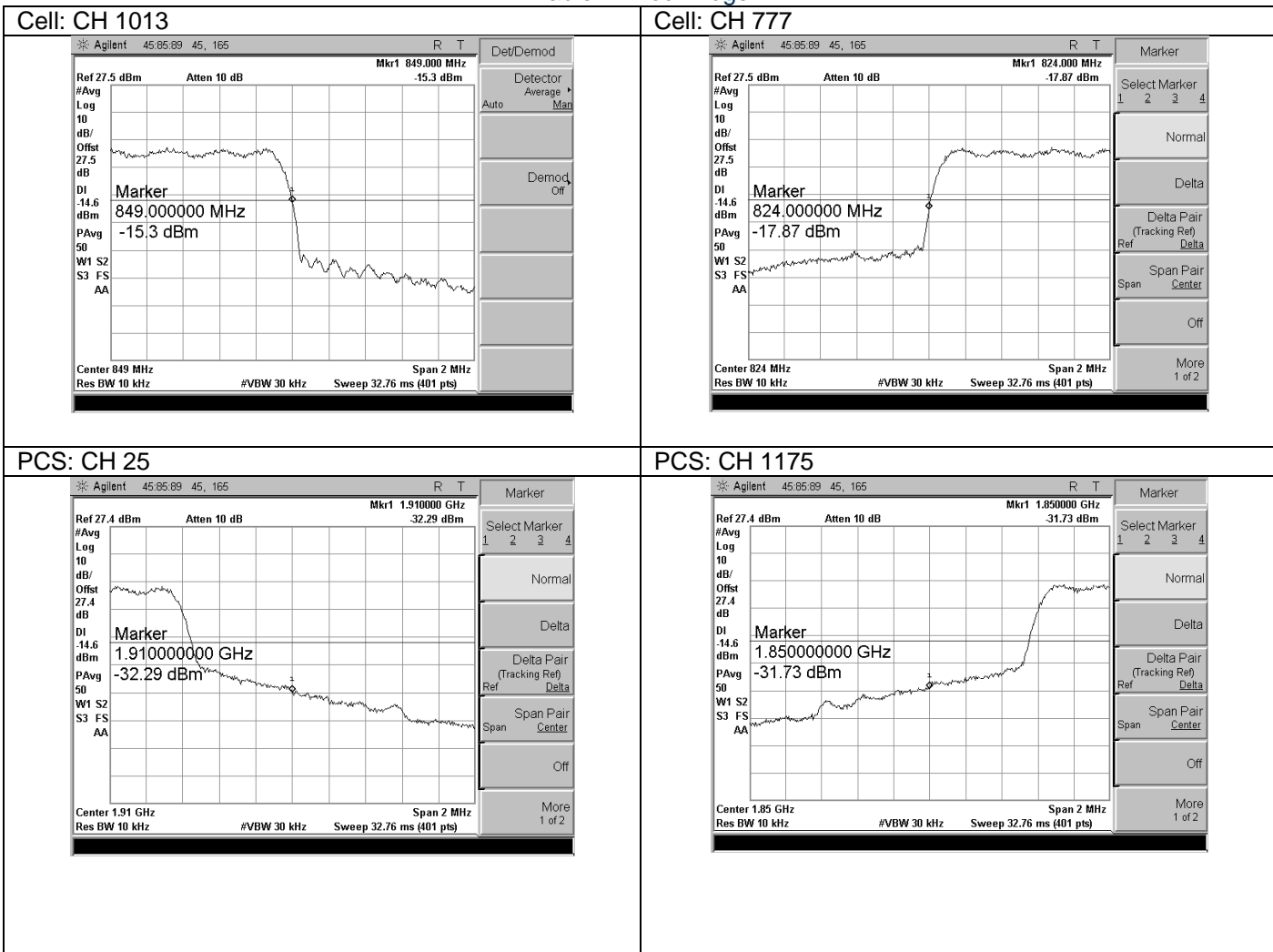
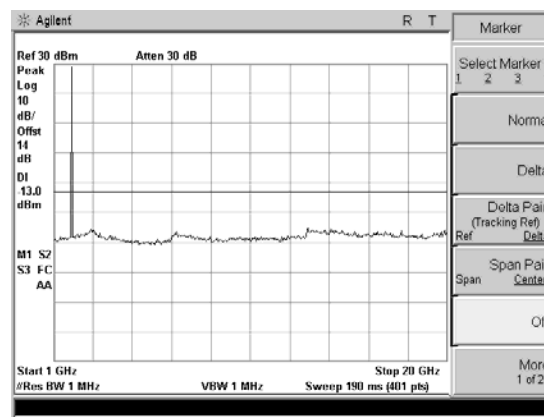
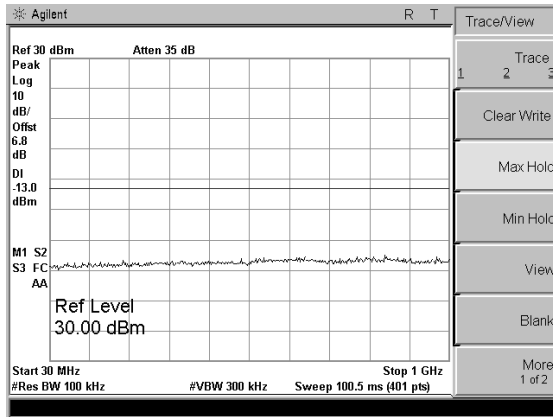
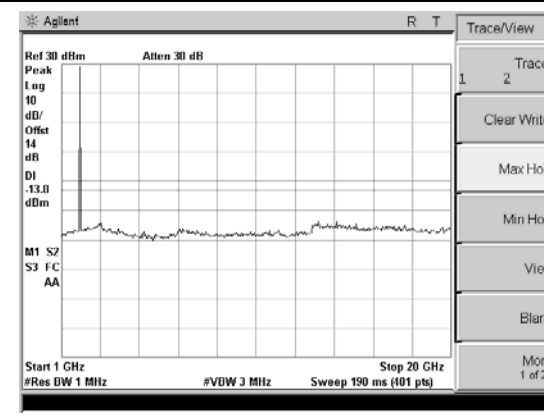
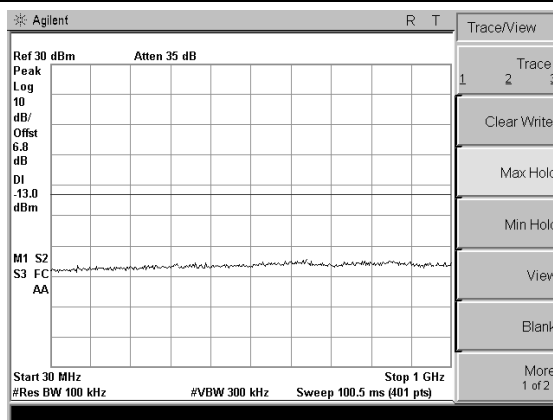


Table 5: PCS Band TX spurious Emissions

PCS CH 25



PCS CH 600



PCS CH 1175

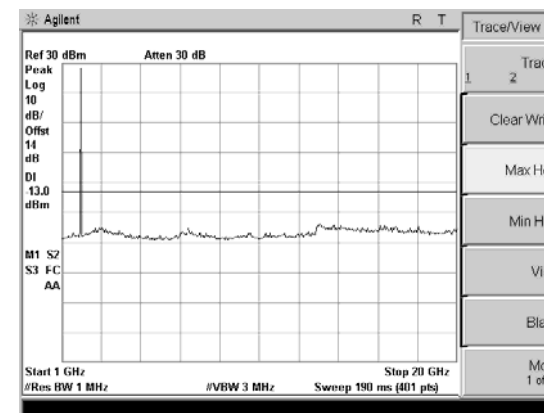
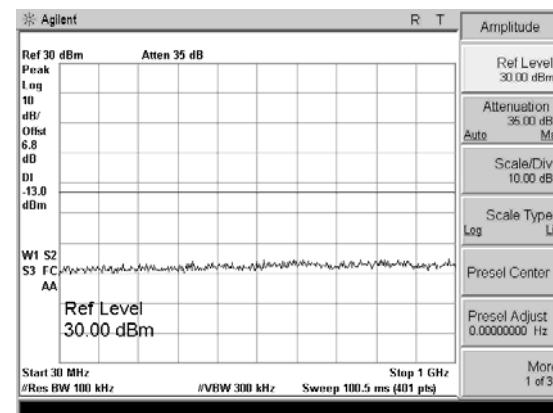
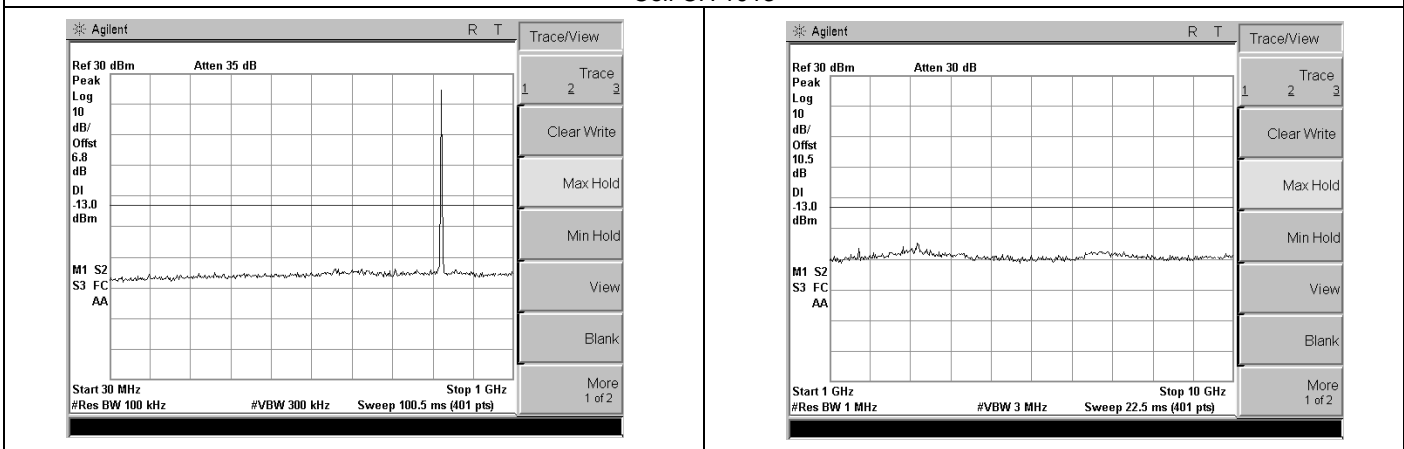
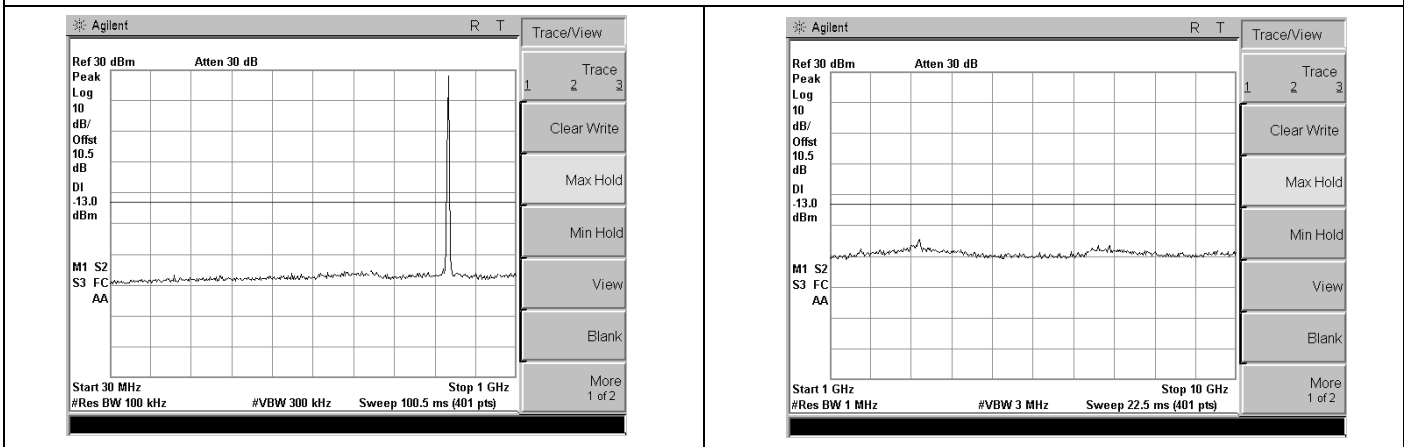


Table 6: Cell Band TX Spurious Emissions

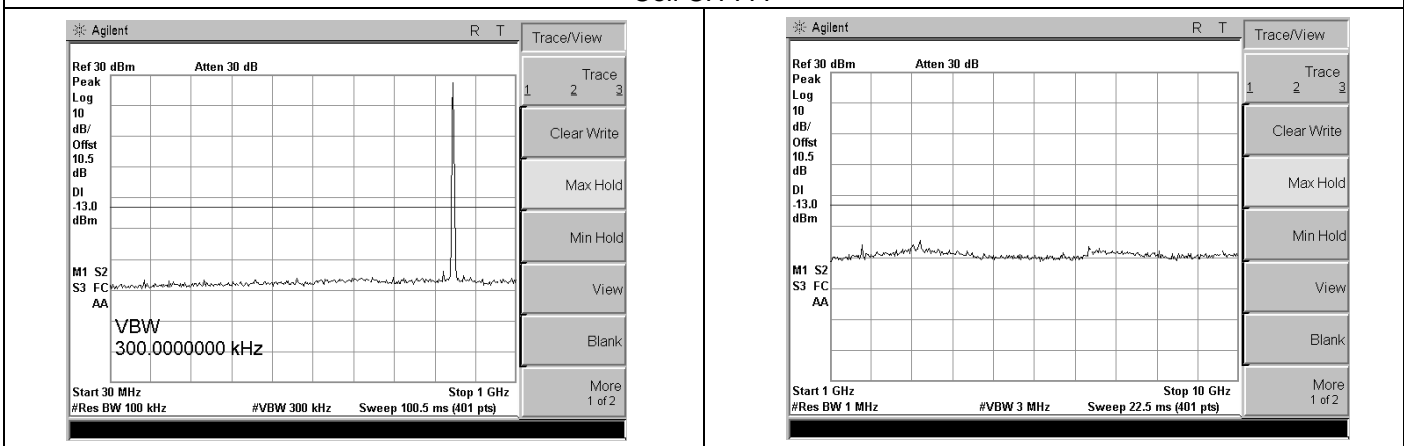
Cell CH 1013





Cell CH 384



Cell CH 777



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	Measurement Date(s):	August 14-17, 2012	Rev. No.:	Revision 1.0	
	Testing Standard(s):	FCC 47 CFR §2, §22H, §24E	IC RSS-132 & RSS-133		
	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

**C.9 PASS/FAIL**

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

**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.





Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Aug. 14, 2012

Date

<b>Applicant:</b>	Sendum Wireless Corp.	<b>FCC ID:</b>	TS5-6055M-GT300	<b>IC:</b>	6234A-GT300	Sendum
<b>DUT Model:</b>	GT300	<b>DUT Type:</b>	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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	Test Report Serial No.:	081012TS5-T1188-E24C	Issue Date:	Aug. 24, 2012	 Test Lab Certificate No. 2470.01
	Measurement Date(s):	August 14-17, 2012	Rev. No.:	Revision 1.0	
	Testing Standard(s):	FCC 47 CFR §2, §22H, §24E	IC RSS-132 & RSS-133		
	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

**Appendix D**

**- Effective Radiated Power / Effective Isotropic Radiated Power Measurement**

**D.1 REFERENCES**

<b>Normative Reference Standards</b>	FCC CFR 47 §22.913 (a)(2), FCC CFR 47 §24.232 (c)
	IC RSS-132 Section 4.4; RSS-133 Section 6.4; SRSP-503
<b>Procedure Reference</b>	ANSI/TIA/EIA-603-C

**D.2 LIMITS**

**D.2.1 FCC CFR 47**

FCC CFR 47 §22.913 (a)(2)	(a)(2) <i>Maximum ERP. .... The ERP of mobile transmitters and auxiliary transmitters must not exceed 7 Watts.</i>
FCC CFR 47 §24.232 (c)	(c) <i>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>

**D.3 ENVIRONMENTAL CONDITIONS**

<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

**D.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	03May14
00050	Chase	CBL-6111A	Bilog Antenna	03May15
00034	ETS	3115	Double Ridged Guide Horn	29Apr15
00035	ETS	3115	Double Ridged Guide Horn	29Apr15
00051	HP	8566B	Spectrum Analyzer RF Section	03May14
00049	HP	85650A	Quasi-peak Adapter	06May14
00047	HP	85685A	RF Preselector	05May14
00006	R & S	SMR 20	Signal Generator (10MHz-40GHz)	30Apr14
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	04May14
00014	Gigatronics	80701A	Power Sensor	04May14
00208	Anritsu	MT8820A	Radio Communications Test Set	03May14

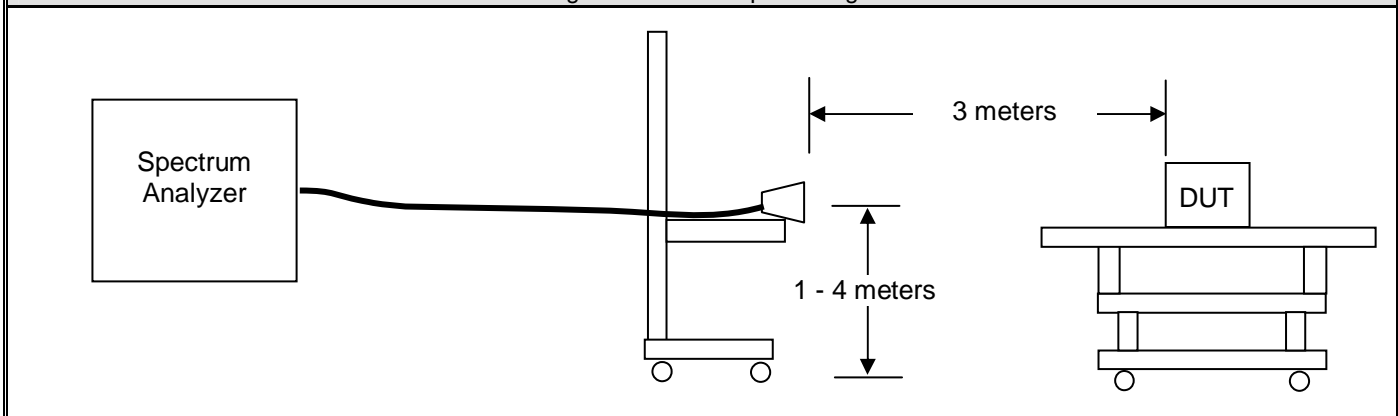
<b>Applicant:</b>	Sendum Wireless Corp.	<b>FCC ID:</b>	TS5-6055M-GT300	<b>IC:</b>	6234A-GT300	Sendum
<b>DUT Model:</b>	GT300	<b>DUT Type:</b>	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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### D.5 MEASUREMENT EQUIPMENT SETUP

<b>MEASUREMENT EQUIPMENT CONNECTIONS</b>	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 - 1GHz	Bilog	Dipole	
	700 MHz - 18 GHz	ETS 3115 Horn	ETS 3115 Horn	
<b>MEASUREMENT EQUIPMENT SETTINGS</b>	For measuring the radiated field strength of the fundamental CDMA signal, the spectrum analyzer was set to the following settings:			
	Mode	RBW	VBW	Detector
		MHz	MHz	
	Cellular	1	3	Peak
PCS	1	3	Peak	

### D.6 SETUP DRAWING

Figure D.6-1 - Setup Drawing



### D.7 DUT OPERATING DESCRIPTION

1. The measurements were made in the cellular and PCS bands with the DUT in the appropriate test mode as described in Section 5.4.



### D.8 SETUP PHOTOGRAPHS



## D.9 TEST RESULTS

### D.9.1 Carrier Levels

#### D.9.1.1 Cellular Band Carrier Levels

Frequency (MHz)	Measured Level	Substitute Level	Cable Loss (dB)	Antenna Gain (dBi)	Pol. (V/H)	ERP		Limit (dBm)	Margin (dB)	Pass/Fail
	(uncorr.) (dBuV)					(dBm)	Watts			
824.70	93.7	24.3	2.8	3.5	V	0.19	22.85	38.45	15.60	Pass
836.52	92.4	23.5	2.8	3.7	V	0.17	22.25	38.45	16.20	Pass
848.31	89.5	21.5	2.9	4	V	0.11	20.45	38.45	18.00	Pass

#### D.9.1.2 PCS Band Carrier Levels

Frequency (MHz)	Measured Level	Substitute Level	Cable Loss (dB)	Antenna Gain (dBi)	Pol. (V/H)	EIRP		Limit (dBm)	Margin (dB)	Pass/Fail
	(uncorr.) (dBuV)					(dBm)	Watts			
1851.25	89.2	21.0	3.7	8.5	V	0.38	25.8	33	7.2	Pass
1880.00	88.1	20.3	3.7	8.5	V	0.32	25.1	33	7.9	Pass
1908.75	88.1	20.4	3.8	8.5	V	0.32	25.1	33	7.9	Pass

## D.10 PASS/FAIL

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

## 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.



Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Aug. 15, 2012

Date

	Test Report Serial No.:	081012TS5-T1188-E24C	Issue Date:	Aug. 24, 2012	 Test Lab Certificate No. 2470.01
	Measurement Date(s):	August 14-17, 2012	Rev. No.:	Revision 1.0	
	Testing Standard(s):	FCC 47 CFR §2, §22H, §24E	IC RSS-132 & RSS-133		
	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

## Appendix E - Radiated Spurious Emissions Measurement

### E.1 REFERENCES

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

### E.2 LIMITS

#### E.2.1 FCC CFR 47


FCC CFR 47 §22.917 & §24.238	(a) <i>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.</i>
------------------------------	---

### E.3 ENVIRONMENTAL CONDITIONS

<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

### E.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	03May14
00050	Chase	CBL-6111A	Bilog Antenna	03May15
00034	ETS	3115	Double Ridged Guide Horn	29Apr15
00035	ETS	3115	Double Ridged Guide Horn	29Apr15
00051	HP	8566B	Spectrum Analyzer RF Section	03May14
00049	HP	85650A	Quasi-peak Adapter	06May14
00047	HP	85685A	RF Preselector	05May14
00006	R & S	SMR 20	Signal Generator (10MHz-40GHz)	30Apr14
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	04May14
00014	Gigatronics	80701A	Power Sensor	04May14
00208	Anritsu	MT8820A	Radio Communications Test Set	03May14

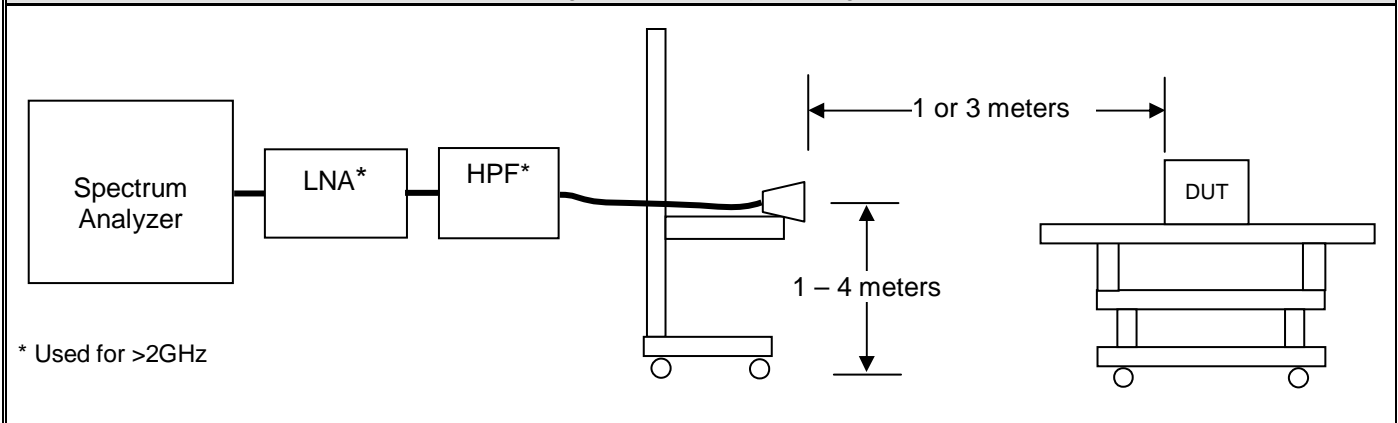
<b>Applicant:</b>	Sendum Wireless Corp.	<b>FCC ID:</b>	TS5-6055M-GT300	<b>IC:</b>	6234A-GT300	
<b>DUT Model:</b>	GT300	<b>DUT Type:</b>	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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### E.5 MEASUREMENT EQUIPMENT SETUP

<b>MEASUREMENT EQUIPMENT CONNECTIONS</b>	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	
	30 MHz – 700MHz	Bilog	Dipole	
	700 MHz - 18 GHz	ETS 3115 Horn	ETS 3115 Horn	
<b>MEASUREMENT EQUIPMENT SETTINGS</b>	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*

### E.6 SETUP DRAWING

Figure E.6-1 - Setup Drawing



### E.7 DUT OPERATING DESCRIPTION

1. The measurements were made in the cellular and PCS bands with the DUT in the appropriate test mode as described in Section 5.4.

## E.8 TEST RESULTS

### E.8.1 Spurious Emissions

#### E.8.1.1 850 Band Spurious Emissions

Low Channel: 824.70 MHz

Measured output power: 22.85 dBm = 0.19 W, Limit:  $43+10\log(W)=42.3\text{dBc}$

Or -13dBm

Frequency (GHz)	Measured Level	Measured Level	Substitute Level (dBm)	Antenna Gain (dBi)	Loss	EIRP (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail	Notes
	V (dBuV)	H (dBuV)								
CH 1013										
1.649	NF	34.3	-43.2	8.8	3.85	-38.25	-13	25.25	Pass	*

Mid Channel: 836.52 MHz

Measured output power: 22.25 dBm = 0.17 W, Limit:  $43+10\log(W)=42.2\text{dBc}$

Or -13dBm

Frequency (GHz)	Measured Level	Measured Level	Substitute Level (dBm)	Antenna Gain (dBi)	Loss	EIRP (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail	Notes
	V (dBuV)	H (dBuV)								
CH 384										
1.673	NF	32.4	-41.3	8.8	3.85	-36.35	-13	23.35	Pass	*

High Channel: 848.31 MHz

Measured output power: 20.45 dBm = 0.11 W, Limit:  $43+10\log(W)=42.0\text{dBc}$

Or -13dBm

Frequency (GHz)	Measured Level	Measured Level	Substitute Level (dBm)	Antenna Gain (dBi)	Loss	EIRP (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail	Notes
	V (dBuV)	H (dBuV)								
CH 777										
1.697	NF	NF	n/a	8.8	3.85	n/a	-13	n/a	Pass	*

\*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10<sup>th</sup> harmonic of the carrier. All other emissions were at the noise floor and substitutions were not made.

NF = Noise Floor

### E.8.1.2 1900 Band Spurious Emissions

#### Low Channel: 1851.25 MHz

Measured output power: 25.8 dBm = 0.38 W, Limit:  $43+10\log(W)=42.6\text{dBc}$

Or -13dBm

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail	Notes
CH 25										
3.703	NF	NF	n/a	9.5	7.2	n/a	-13	n/a	Pass	

#### Mid Channel: 1880.00 MHz

Measured output power: 25.1 dBm = 0.32 W, Limit:  $43+10\log(W)= 42.5\text{dBc}$

Or -13dBm

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail	Notes
CH 600										
3.76	NF	NF	n/a	9.5	7.2	n/a	-13	n/a	Pass	

#### High Channel: 1908.75 MHz



Measured output power: 25.1 dBm = 0.32 W, Limit:  $43+10\log(W)= 42.5\text{dBc}$

Or -13dBm

Frequency (GHz)	Measured Level V (dBuV)	Measured Level H (dBuV)	Substitute Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail	Notes
CH 1175										
3.818	NF	NF	n/a	9.5	7.2	n/a	-13	n/a	Pass	

\*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10<sup>th</sup> harmonic of the carrier. All other emissions were at the noise floor and substitutions were not made.

NF = Noise Floor

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	Measurement Date(s):	August 14-17, 2012	Rev. No.:	Revision 1.0	
	Testing Standard(s):	FCC 47 CFR §2, §22H, §24E	IC RSS-132 & RSS-133		
	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

### E.9 PASS/FAIL

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

### E.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.





Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Aug. 16, 2012

Date

Applicant:	Sendum Wireless Corp.	FCC ID:	TS5-6055M-GT300	IC:	6234A-GT300	Sendum
DUT Model:	GT300	DUT Type:	Asset Tracking Device (Dual-Band CDMA 1xRTT)	850 / 1900 Bands		
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	Test Lab Registration(s):	FCC Accredited Site	IC Lab File #: IC 3874A-1		

## Appendix F – Frequency Stability

F.1 REFERENCES	
<b>Normative Reference Standards</b>	FCC CFR 47 §2.1055, §22.355, FCC CFR 47 §24.235
	IC RSS-132 Section 4.3; RSS-133 Section 6.3
<b>Procedure Reference</b>	ANSI/TIA/EIA-603-C

F.2 LIMITS		
F.2.1	FCC §22, 24	<i>The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within <math>\pm 0.00025\%</math> (<math>\pm 2.5</math> ppm) of the center frequency.</i>
	IC RSS-132	<i>The carrier frequency shall not depart from the reference frequency in excess of <math>\pm 2.5</math> ppm for mobile stations and <math>\pm 1.5</math> ppm for base stations.</i>
	IC RSS-133	<i>The carrier frequency shall not depart from the reference frequency, in excess of <math>\pm 2.5</math> ppm for mobile stations and <math>\pm 1.0</math> ppm for base stations.</i>

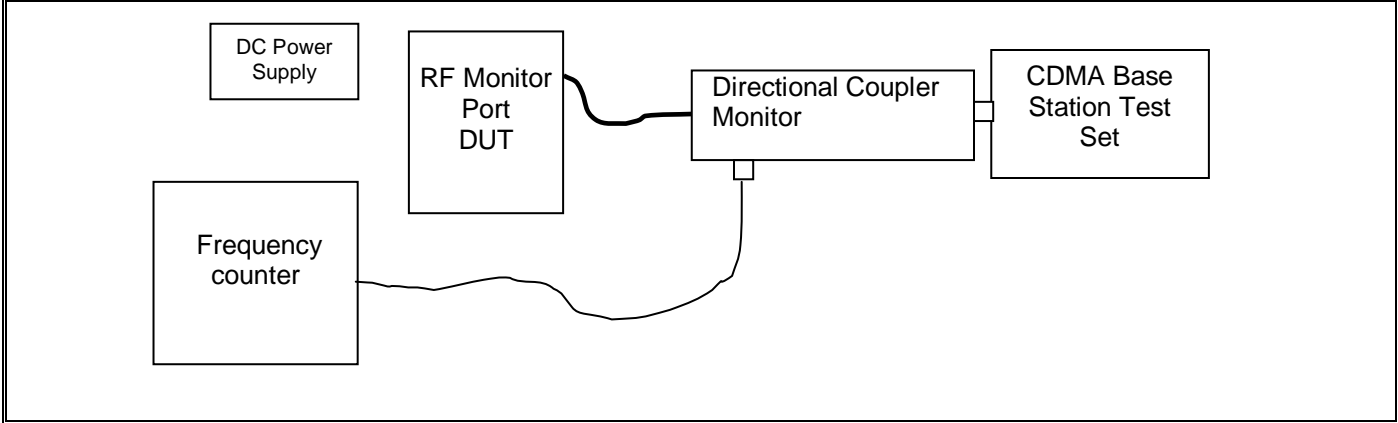
F.3 ENVIRONMENTAL CONDITIONS	
<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

F.4 EQUIPMENT LIST				
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00208	Anritsu	MT8820A	Radio Communications Test Set	03May14
na	ESPEC	ECT-2	Heater/Refrigerator	na
0003	HP	53181A	Frequency Counter	09-Apr-14
na	HP	E3611A	DC Power Supply	na
00207	VWR	na	Temperature Humidity Monitor	09-Apr-14



**F.5 SETUP DRAWING**

Figure F.5-1 - Setup Drawing



**F.6 DUT OPERATING DESCRIPTION**

1. The measurements were made in the cellular and PCS bands with the DUT in the appropriate test mode as described in Section 5.4.

## F.7 TEST RESULTS

### 850 Cell Band

#### CH 384

Temperature (degrees C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (%)	Frequency tolerance with reference to value @ 20 C (ppm)
-30	836.52000	836.5190466	-0.000114%	-0.041481421
-20	836.52000	836.5191438	-0.000102%	0.074714375
-10	836.52000	836.5190452	-0.000114%	-0.043155023
0	836.52000	836.5192664	-0.000088%	0.221274092
10	836.52000	836.5191997	-0.000096%	0.141538911
20	836.52000	836.5190813	-0.000110%	0
30	836.52000	836.5192841	-0.000086%	0.242433203
40	836.52000	836.5192841	-0.000086%	0.242433203
50	836.52000	836.5193174	-0.000082%	0.282241021



### 1900 PCS Band


#### CH 600



Temperature (degrees C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (%)	Frequency tolerance with reference to value @ 20 C (ppm)
-30	1880.00000	1879.9980520	-0.000104%	0.014893633
-20	1880.00000	1879.9980410	-0.000104%	0.009042563
-10	1880.00000	1879.9978030	-0.000117%	-0.117553315
0	1880.00000	1879.9982940	-0.000091%	0.143617172
10	1880.00000	1879.9982010	-0.000096%	0.094149035
20	1880.00000	1879.9980240	-0.000105%	0
30	1880.00000	1879.9984280	-0.000084%	0.214893843
40	1880.00000	1879.9984222	-0.000084%	0.211808733
50	1880.00000	1879.9984210	-0.000084%	0.211170435

## F.8 PASS/FAIL

In reference to the results outlined in F.7, the DUT passes the requirements as stated in the reference standards.

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<b>F.9 SIGN-OFF</b>
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.
 <hr/> Sean Johnston Lab Manager Celltech Labs Inc.  Aug. 17, 2012 <hr/> Date

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END OF DOCUMENT

<b>Applicant:</b>	<b>Sendum Wireless Corp.</b>	<b>FCC ID:</b>	<b>TS5-6055M-GT300</b>	<b>IC:</b>	<b>6234A-GT300</b>	<b>Sendum</b>
<b>DUT Model:</b>	<b>GT300</b>	<b>DUT Type:</b>	<b>Asset Tracking Device (Dual-Band CDMA 1xRTT)</b>	<b>850 / 1900 Bands</b>		
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