



## CERTIFICATION TEST REPORT

Applicant:	Fusion Wireless, Inc. (aka U-Blox) 12626 High Bluff Drive, Suite 200 Solana Beach, CA 92130
Equipment Under Test (EUT):	CDMA 1xRTT Module
Model:	FW75
FCC ID:	XU9-FW75
IC ID:	8694A-FW75
In Accordance With:	FCC Part 22, Subpart H RSS-132, Issue 2 September 2005  FCC Part 24 Subpart E RSS 133 Issue 5 February 2009
Report Number:	2012 01195598 FCC
Project Number:	10219205
Nex Number:	195598
Date:	February 14, 2012
Total Number of Pages:	42

## Section1: Summary of Test Results

### General

All measurements are traceable to national standards

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC rules parts CFR47 Part 2 and 24 subpart E for the United States and RSS132 Issue 2, RSS133 Issue 5, and RSS-Gen Issue 2 for Canada. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC and IC.

The assessment summary is as follows:

Apparatus Assessed:	CDMA 1xRTT Module
Model:	FW75
Serial:	EFF980, EFF748,
Specifications:	FCC Part 22, Subpart H Industry Canada RSS-132, Issue 2, September 2005 FCC Part 2, Part 24 Subpart E RSS 133 Issue 5, February 2009
Date Received in Laboratory:	January 25, 2012
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None

### 1.1 Report Release History

REVISION	DATE	COMMENTS
-	FEBURARY 14, 2012	Prepared By: Alex Chang
-	FEBURARY 14, 2012	Initial Release: Alan Laudani

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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TESTED BY: Alex Chang Date: FEBURARY 14, 2012  
Alex Chang, RF/EMC Engineer

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## Section 2: Equipment Under Test

### 2.1 Product Identification

The Equipment Under Test was identified as follows:

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT – CDMA 1xRTT Module	U-Blox Model: FW75 Serial #: EFF980, EFF748, <b>Error!</b> <b>Reference source not found.</b>	3.9 VDC, Powered from external power source
Support – DC Power Source	Xantrex Model: XT-30-2 Serial #: E00104978	1.5m, unshielded, 18 AWG, 3-wire, IEC connector
Support – Laptop	Dell Model: PP18L Serial #: 20838871837	Powered from external power supply
Support – External power supply	Dell Model: NADP-90KB A Serial #: CN-0C2894-48661-434-0PGE Rev. A01	1m, unshielded, 18 AWG, 3-wire, IEC connector

CONNECTION	I/O CABLE
EUT to laptop	1m, unshielded, USB cable
EUT of antenna	50ohm, 20W, terminated

## 2.2 Technical Specifications of the EUT

Manufacturer:	U-Blox
Transmit Frequency:	Cellular Band: 824.70 to 848.31 MHz PCS Band: 1851.25 to 1908.75 MHz
Rated Power:	Cellular Band: 0.871 W PCS Band: 0.498 W
Modulation:	CDMA
Emission Designator:	Cellular Band: 1M36F9W PCS Band: 1M36F9W
Antenna:	Taoglas FXP14
Antenna Connector:	External, TNC with TNC to SMA cable
Power Source:	3.2 to 4.4 VDC from host.

## Section 3: Test Conditions

### 3.1 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	18-31 °C
Humidity range	:	18-70 %
Pressure range	:	101.2 kPa
Power supply range	:	N/A

### 3.2 Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
317	Preamplifier	HP	8449A	2749A00167	May 16, 2011	May 16, 2012
752	Antenna, DRWG	EMCO	3115	4943	Dec. 02, 2010	Dec. 02, 2012
835	Spectrum Analyzer	Rohde & Schwarz	RHDFSEK	829058/005	Jul. 22, 2011	Jul. 22, 2012
911	Spectrum Analyzer	Agilent	E4440A	US41421266	Oct. 27, 2011	Oct. 27, 2012
NA	20 dB Attenuator	Weinschel	33-20-34	BX4210	Verified	Verified
E1026	EMI Test Receiver 9kHz to 7GHz	Rohde & Schwarz	ESCI 7	100800	Jun. 01, 2011	Jun. 01, 2012
810	Multimeter	Fluke	111	77820242	Mar. 25, 2011	Mar. 25, 2012
N151 C	Regulated DC Power Supply	Xantrex	XT 30-2	E00104978	Verified	Verified
901	Preamplifier	Sonoma	310 N	130607	Oct. 27, 2011	Oct. 27, 2012
116	Antenna, Bicon	EMCO	3110	1267	Dec. 02, 2010	Dec. 02, 2012
110	Antenna, LPA	Electrometrics	LPA-25	1217	Apr. 01, 2011	Apr. 01, 2013
941	Power Meter	Agilent	E4418B	MY40510887	Aug. 22, 2011	Aug. 22, 2012
N149	Environmental Chamber	Cincinnati Sub-Zero	ZPHS-32-2-2-H/AC	ZP0552665	Apr. 29, 2011	Apr. 29, 2012

Registrations of the 10m Semi-anechoic chamber are on file with the Federal Communications Commission and with Industry Canada under Site Number 2040B-3.

## Section 4: Observations

- 4.1 Modifications Performed During Assessment  
None
- 4.2 Record Of Technical Judgments  
No technical judgments were made during the assessment.
- 4.3 EUT Parameters Affecting Compliance  
The user of the apparatus could not alter parameters that would affect compliance.
- 4.4 Test Deleted  
No Tests were deleted from this assessment.
- 4.5 Additional Observations  
There were no additional observations made during this assessment.



## Section 5: Results Summary

### 2.1 Test Result summary table

FCC Part 2 Subpart J: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations. Equipment Authorization Procedures.

FCC CFR 47 Part 24 Subpart E – Personal Communications Services – Broadband PCS

RSS-GEN Issue 2 (June 2007) – General requirements and information for the Certification of Radiocommunication Equipment

RSS-133 Issue 5 (February 2009) – 2 GHz Personal Communications Services

The column headed “Required” indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No: not applicable / not relevant

Y Yes: Mandatory i.e. the apparatus shall conform to these test.

N/T Not Tested, mandatory but not assessed. (See section 4.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

FCC Part 2/Part xx	RSS Paragraph RSS-GEN/RSS-133	Test/Requirement Description	Required	Result
2.1046/24.232	RSS-133 6.4 4.8/6.4	RF Power Output	Y	COMPLIES
22.913	RSS-129 7.1/9.1	RF Power Output	Y	COMPLIES
2.1049/24.238	4.6.1/6.5	Occupied Bandwidth	Y	COMPLIES
22.917(D)		Occupied Bandwidth	Y	COMPLIES
2.1051/24.238	RSS-133 6.5.1 4.9/6.5	Spurious Emissions at antenna Terminals	Y	COMPLIES
22.917(B)	RSS-129 6.3/8.1	Spurious Emissions at antenna Terminals	Y	COMPLIES
2.1053/24.238	4.9/6.5	Field Strength of Spurious Emissions	Y	COMPLIES
22.917(B)		Field Strength of Spurious Emissions	Y	COMPLIES
2.1055/24.235	RSS-133 6.3 4.7/6.3	Frequency Stability	Y	COMPLIES
22.355	RSS-129 7.2/9.2	Frequency Stability	Y	COMPLIES
	RSS-129 10.0 RSS-133 6.7 4.10/6.6	Receiver Spurious	Y	COMPLIES

## Appendix A: Test Results

### A1. RF Power Output

Para. No. : FCC 2.1046 & RSS-GEN 4.8

#### § 22.913

The effective radiated power (ERP) of transmitters in the Cellular Radiotelephone Service must not exceed the limits in this section.

(a) Maximum ERP. In general, the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. However, for those systems operating in areas more than 72 km (45 miles) from international borders that:

(2) Extend coverage on a secondary basis into cellular unserved areas, as those areas are defined in §22.949, the ERP of base transmitters and cellular repeaters of such systems must not exceed 1000 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

#### § 24.232 *Power and antenna height limits.*

Para. No.: 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.

(c) Mobile/portable stations are limited to 2 watts EIRP power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

(d) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

#### RSS-132

##### 4.4 Transmitter Output Power

The transmitter output power shall not exceed the limits given in SRSP-503.

NOTE: From SRSP-503 issue 7, Feb 2008:

5.1.3 The maximum EIRP shall be 11.5 watts for mobile stations.

#### RSS-133

##### 6.4 Transmitter Output Power

The average equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510.

NOTE: From SRSP-510 issue 5, Feb 2009:

##### 5.1.2 Mobile Stations

Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p. The equipment shall employ means to limit the power to the minimum necessary for successful communication.

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

## Conditions:

Model:	FW75	Temperature:	22°C
Date:	Jan. 26, 2012	Humidity:	30%
Modification State:	None	Tester:	Alex Chang
		Laboratory:	Nemko

## Observations:

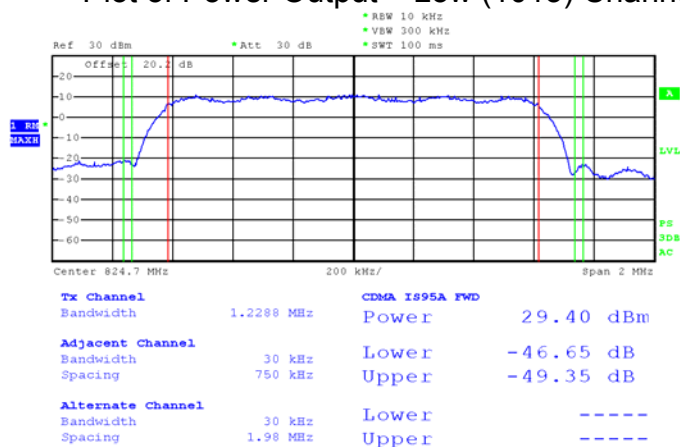
- Input voltage varied from 3.4 to 4.3 VDC
- Cellular macro of standard used in spectrum analyzer for conducted power measurement. 20.2 dB offset measured prior to test.
- PCS macro of standard used in spectrum analyzer for conducted power measurement. 20.2 dB offset measured prior to test.
- Peak, max hold used for Peak output power with RBW > EBW.

## Test Results: Complies

Carrier Frequency (MHz)	Channel	Voltage Nom +/- 15% VDC	Output Power (dBm)	Output Power (W)
824.70	1013	3.4	29.19	
		3.9	29.40	0.871
		4.3	29.22	
836.52	384	3.4	28.67	
		3.9	28.77	0.753
		4.3	28.55	
848.31	777	3.4	28.59	
		3.9	28.91	0.778
		4.3	28.75	

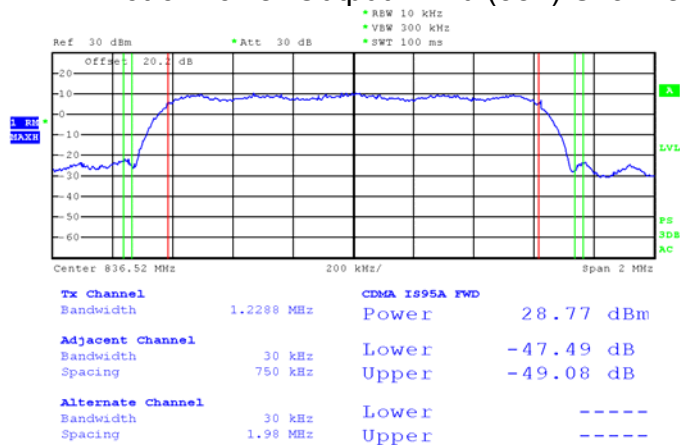
Carrier Frequency (MHz)	Channel	Voltage Nom +/- 15% VDC	Output Power (dBm)	Output Power (W)	Peak Output Power (dBm)	Peak to Average Ratio (dB)
1851.25	25	3.4	26.85			
		3.9	26.97	0.498	27.10	1.03
		4.3	26.84			
1880.00	600	3.4	26.88			
		3.9	26.90	0.490	26.92	1.00
		4.3	26.87			
1908.75	1175	3.4	26.23			
		3.9	26.41	0.438	26.83	1.12
		4.3	26.22			

### Plot of Power Output – Low (1013) Channel



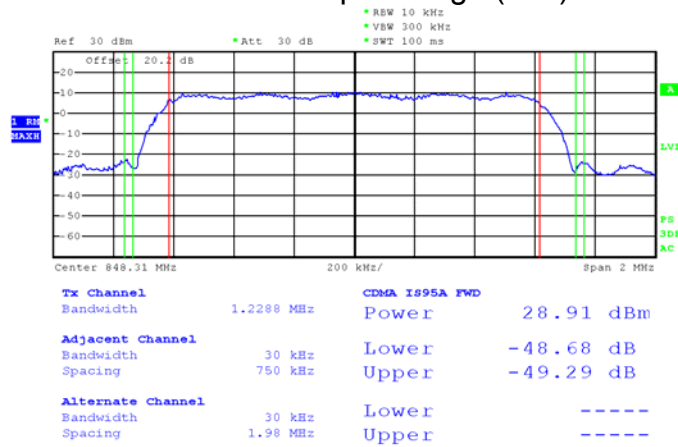
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### Plot of Power Output – Mid (384) Channel



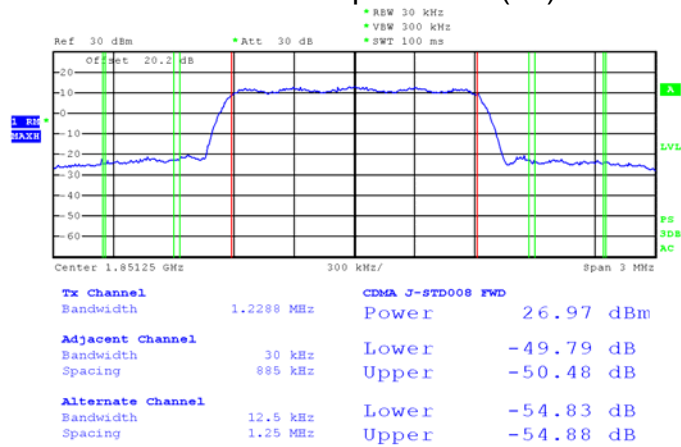
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## Plot of Power Output – High (777) Channel

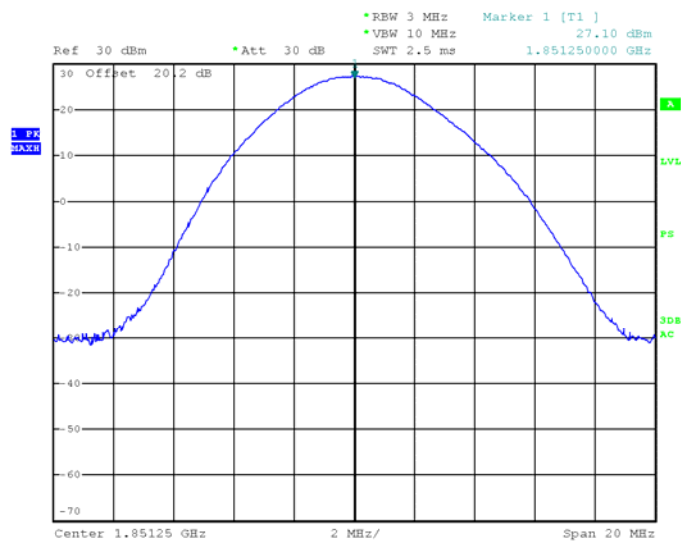


Date: 26.JAN.2012 21:19:03

### Plot of Power Output – Low (25) Channel

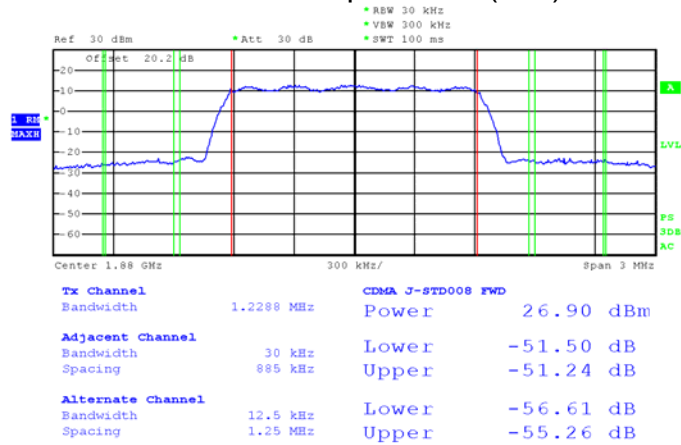


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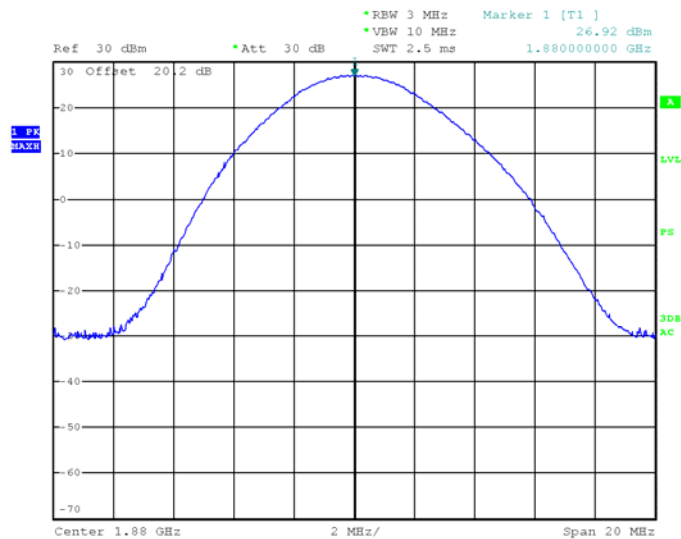


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### Plot of Power Output – Mid (600) Channel

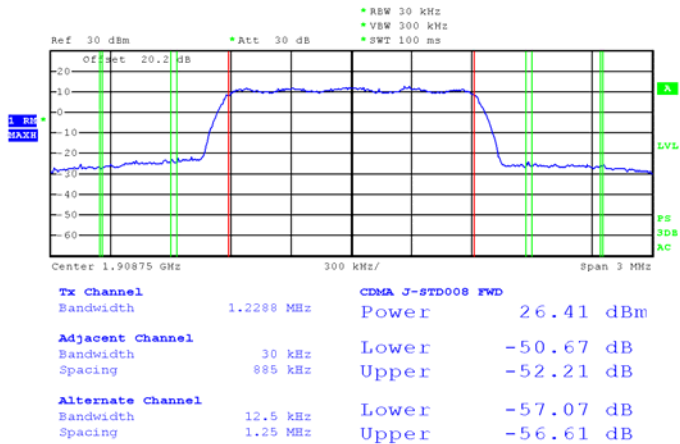


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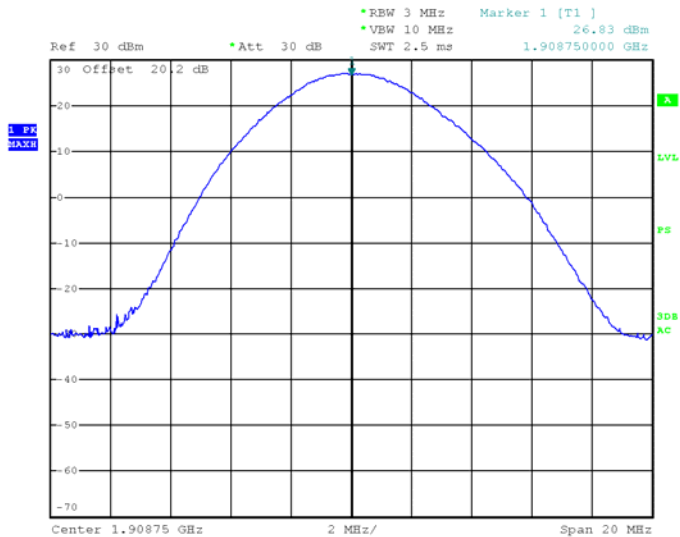


Date: 26.JAN.2012 20:14:09

## Plot of Power Output – High (1175) Channel



Date: 26.JAN.2012 22:21:45



Date: 26.JAN.2012 20:15:48



## A2. Occupied Bandwidth

Para. No.: 2.1049 and RSS-GEN 4.6

Part 22.917

### 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(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.

### RSS-GEN

#### 4.6.1 Occupied Bandwidth

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

The span between the two recorded frequencies is the occupied bandwidth.

### Conditions:

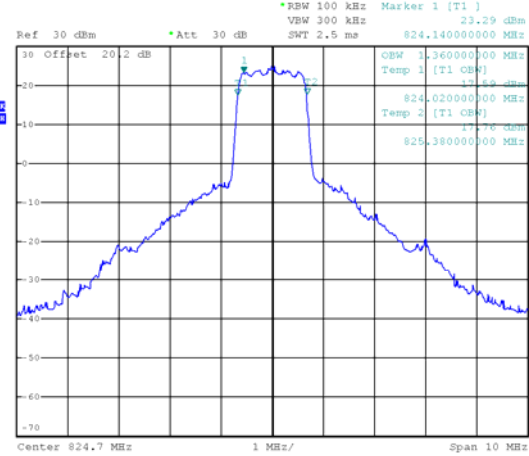
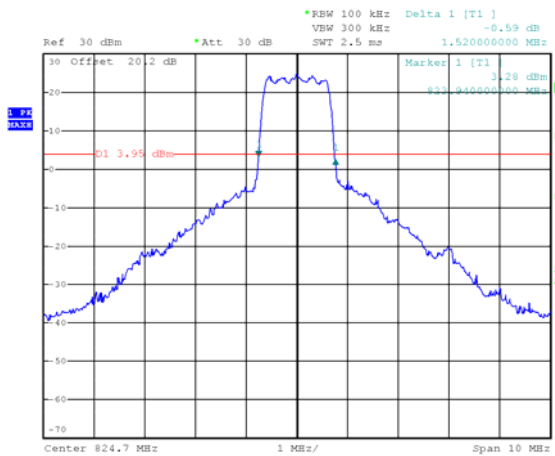
Model:	FW75	Temperature:	22°C
Date:	Jan. 26, 2012	Humidity:	30%
Modification State:	Modulated	Tester:	Alex Chang
		Laboratory:	Nemko

Observations: None

Test Results: Complies

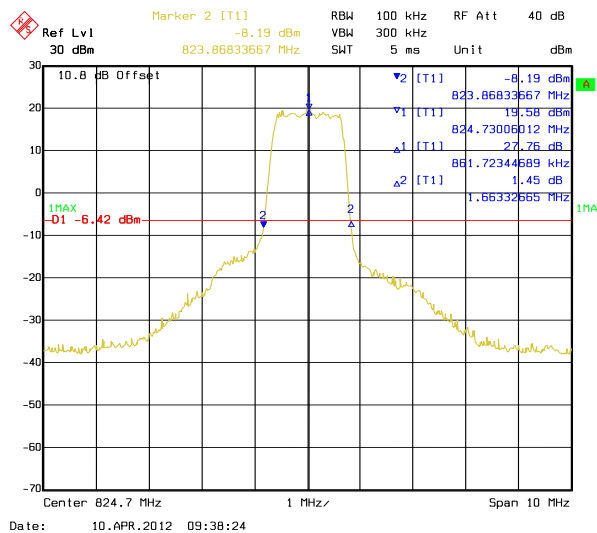
Test Data: See attached plots.

Frequency	20 dB Bandwidth	26 dB Bandwidth	99% Bandwidth
824.70 MHz	1.52 MHz	1.66 MHz	1.36 MHz
836.52 MHz	1.52 MHz	1.64 MHz	1.36 MHz
848.31 MHz	1.50 MHz	1.66 MHz	1.36 MHz
1851.25 MHz	1.50 MHz	1.66 MHz	1.36 MHz
1880.00 MHz	1.49 MHz	1.64 MHz	1.36 MHz
1908.75 MHz	1.50 MHz	1.66 MHz	1.36 MHz



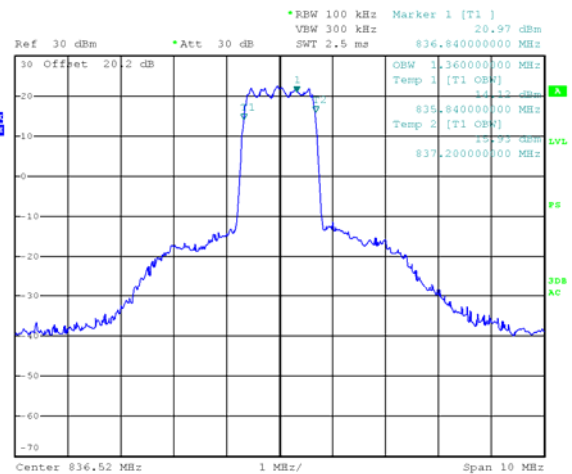
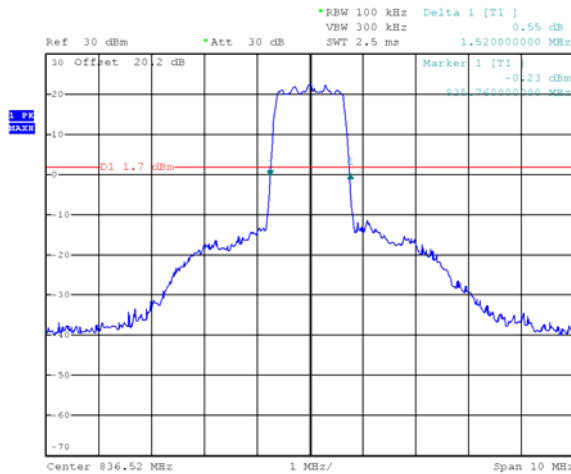
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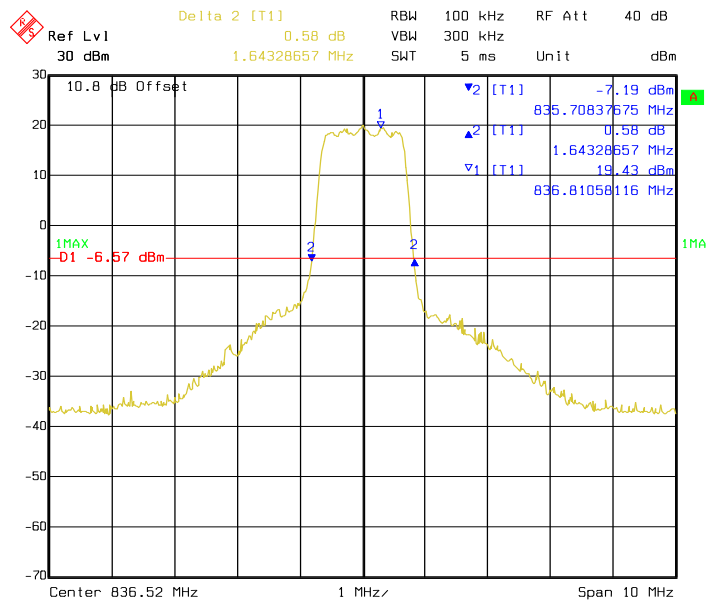
Date: 10.APR.2012 09:38:24

Cellular Band Frequency Low Channel (1013) – 824.70 MHz



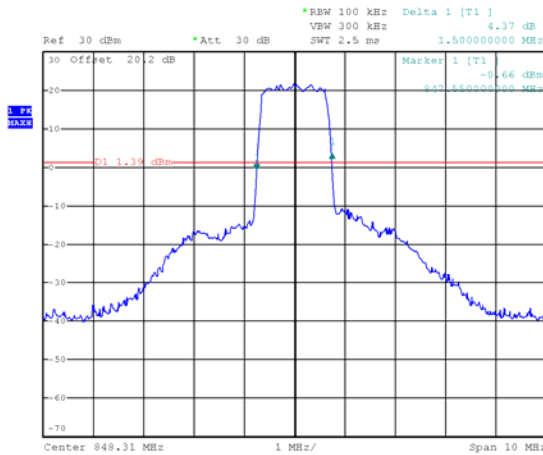
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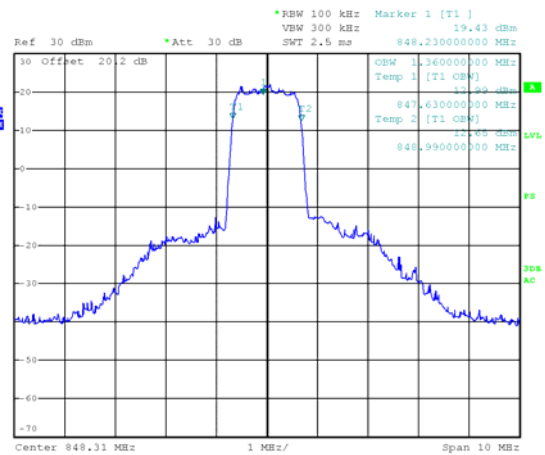


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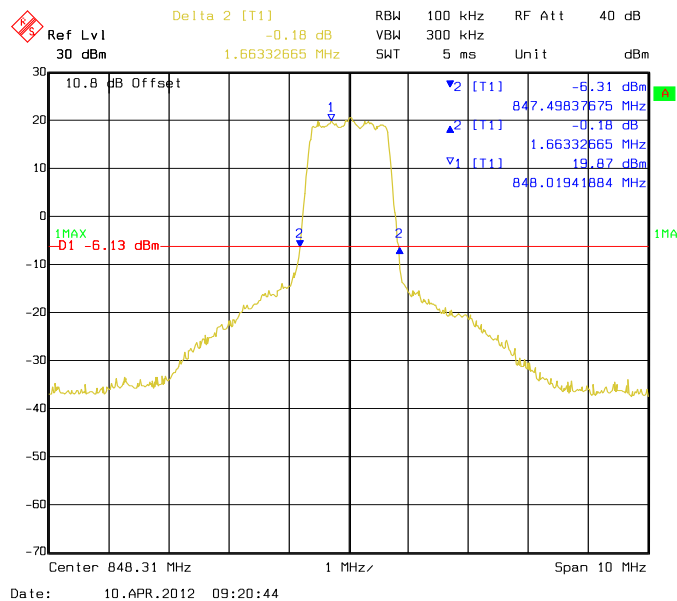
Cellular Band Frequency Mid Channel (384) – 836.52 MHz



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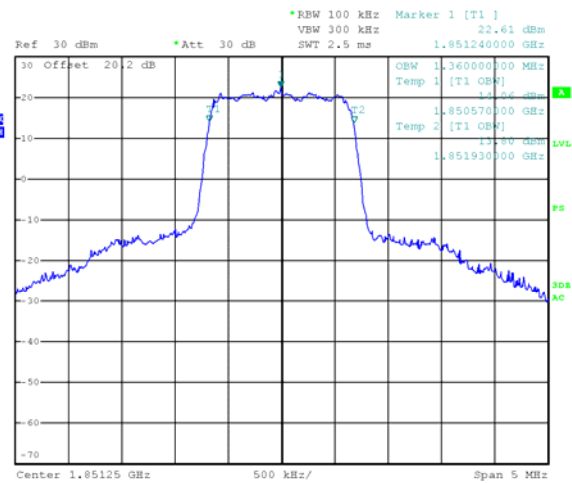
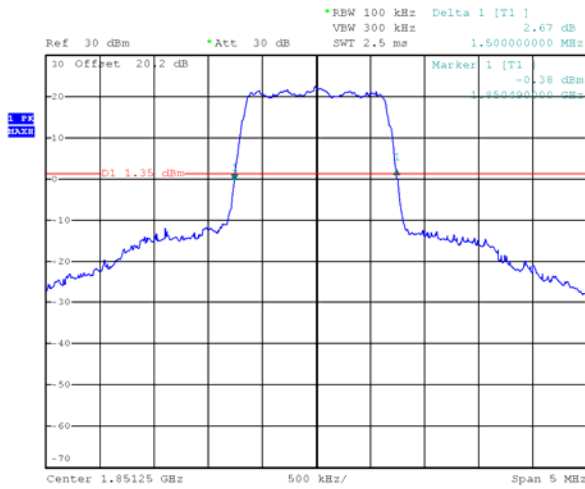


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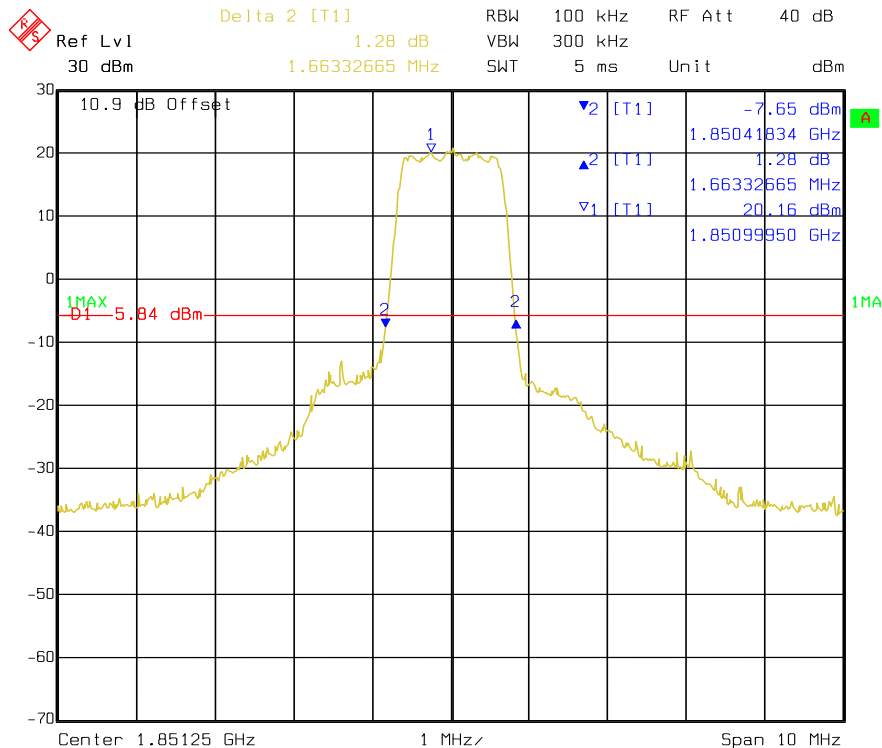
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Cellular Band Frequency High Channel (777) – 848.31 MHz



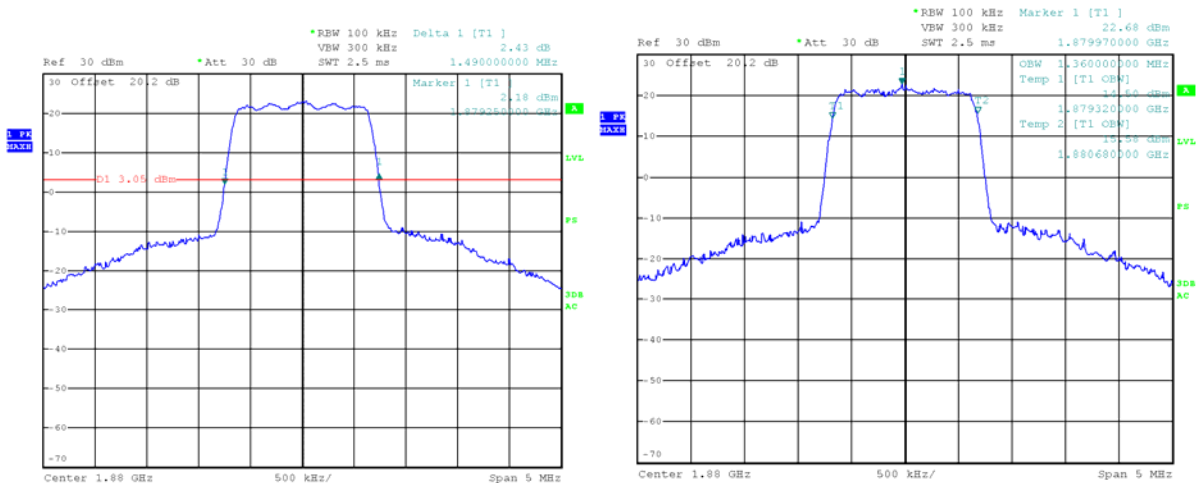
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Date: 26.JAN.2012 19:03:22



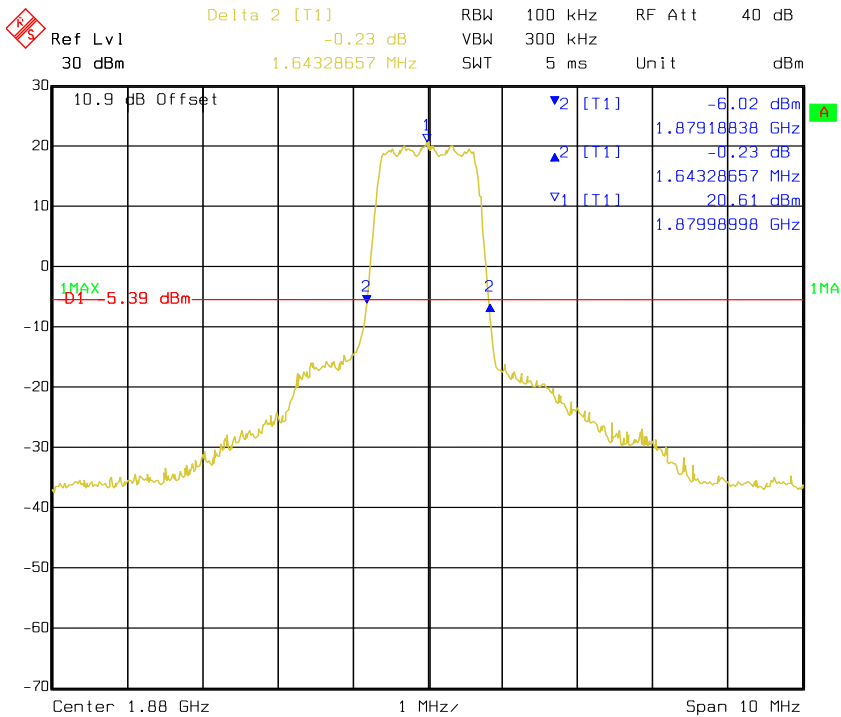
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PCS Band Frequency Low Channel (25) – 1851.25 MHz



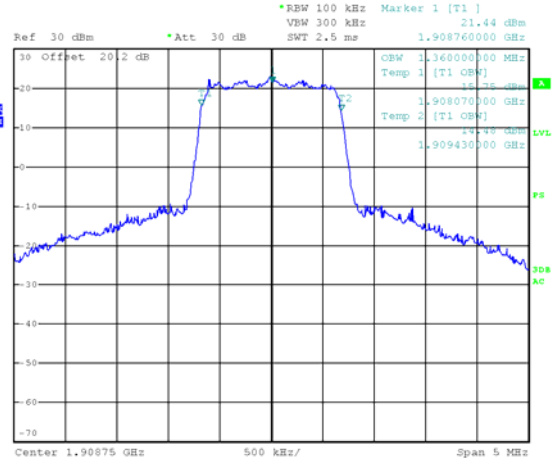
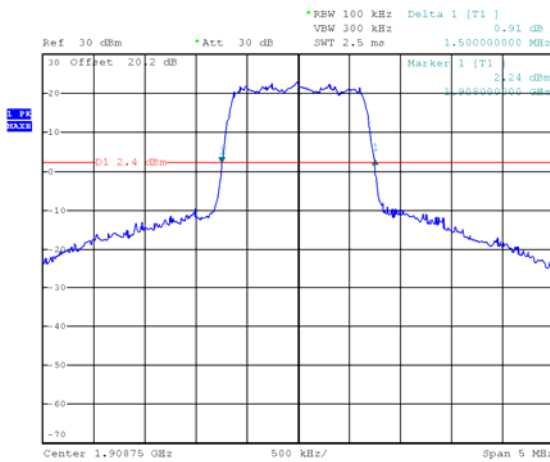
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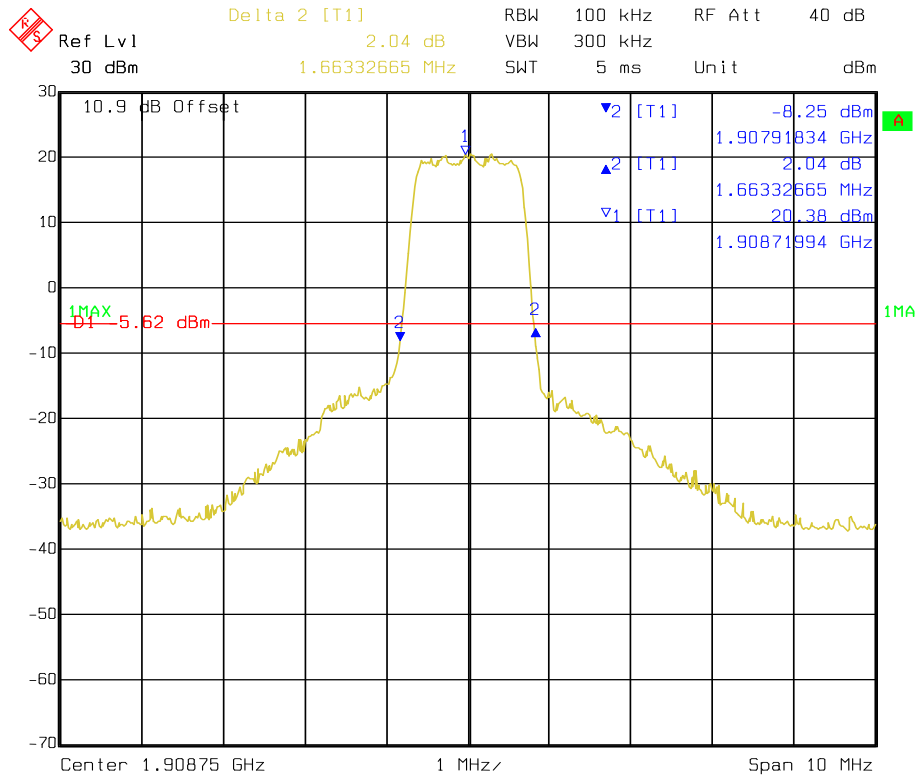
Date: 10.APR.2012 09:59:20

PCS Band Frequency Mid Channel (600) – 1880.00 MHz



Date: 26.JAN.2012 19:17:42

Date: 26.JAN.2012 19:18:38



Date: 10.APR.2012 10:04:53

PCS Band Frequency High Channel (1175) – 1908.75 MHz

### A3. Spurious Emissions At Antenna Terminals

Para. No.: FCC 2.1051 & RSS-GEN 4.9

*Part 22.917*

#### **24.238 Emission limitations for Broadband PCS equipment.**

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(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.

#### **RSS 133 6.5 Transmitter Unwanted Emissions**

##### **6.5.1 Out-of-Block Emissions (Mobile and Base Stations)**

(a) Mobile stations shall comply with subsection (i) below. Base stations shall comply with either subsection (i) or subsection (ii).

(i) 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.

#### Conditions:

Model:	FW75	Temperature:	22°C
Date:	Jan. 27, 2012	Humidity:	30%
Modification State:	Modulated	Tester:	Alex Chang
		Laboratory:	Nemko

#### Observations:

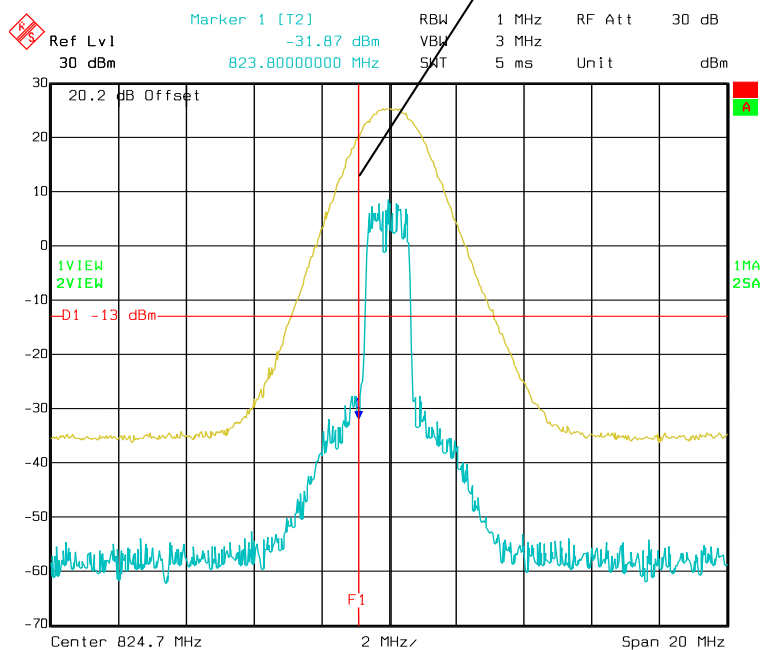
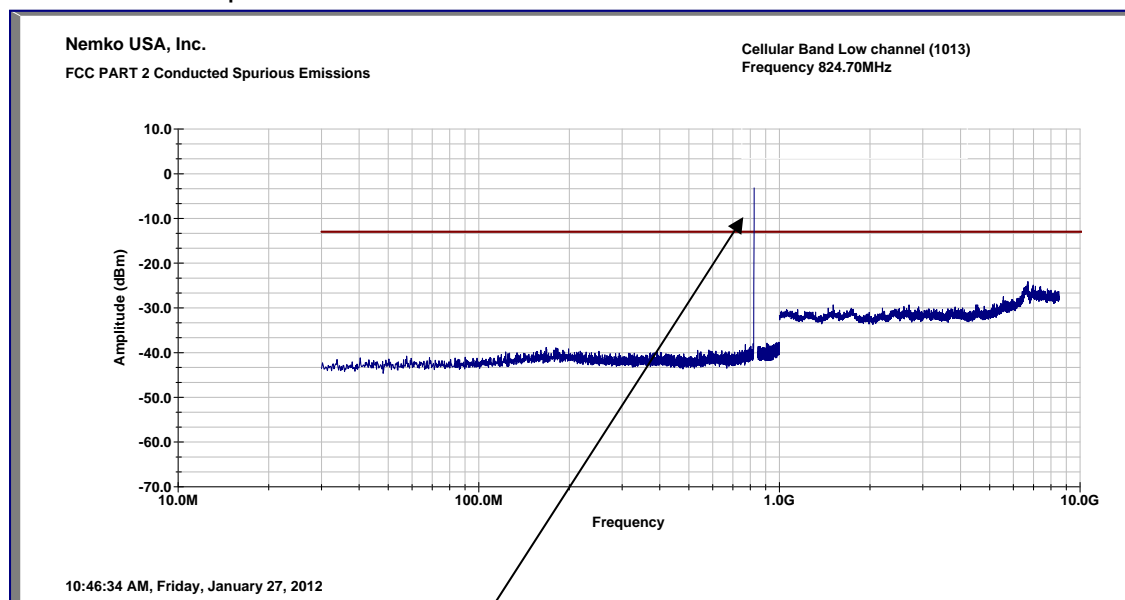
1. RBW = 1 MHz, VBW = 3 MHz, Peak hold.
2. See plots comparing RBW at 100 kHz to sweeps RBW at 1 MHz.

Test Results: Complies

Test Data: See attached graphs.



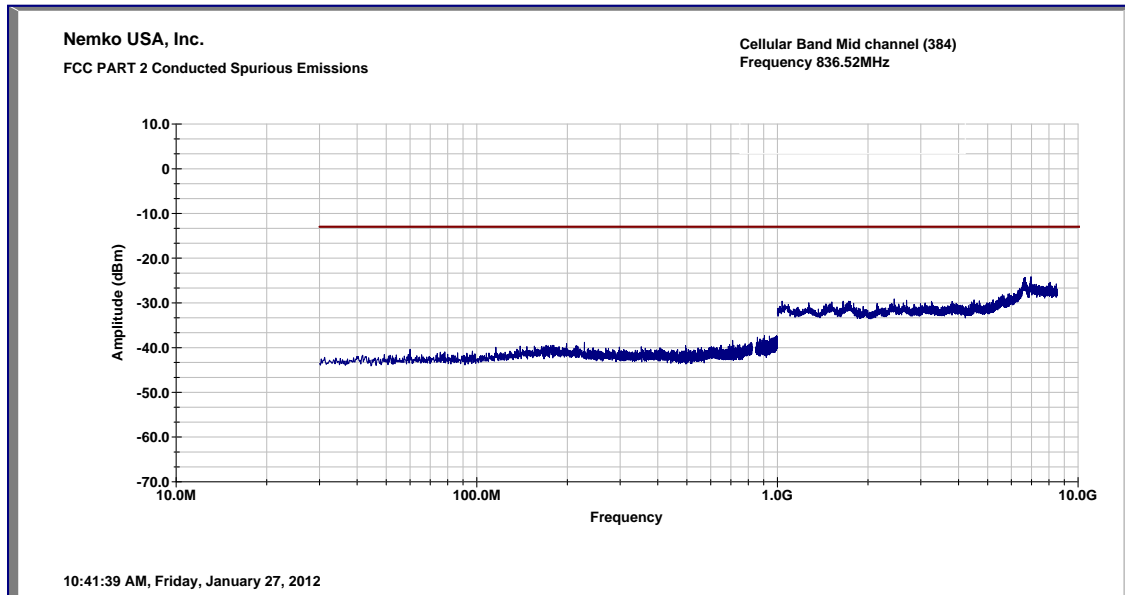
## Channel 1013 Spurious Emissions – Cellular Band Low Channel



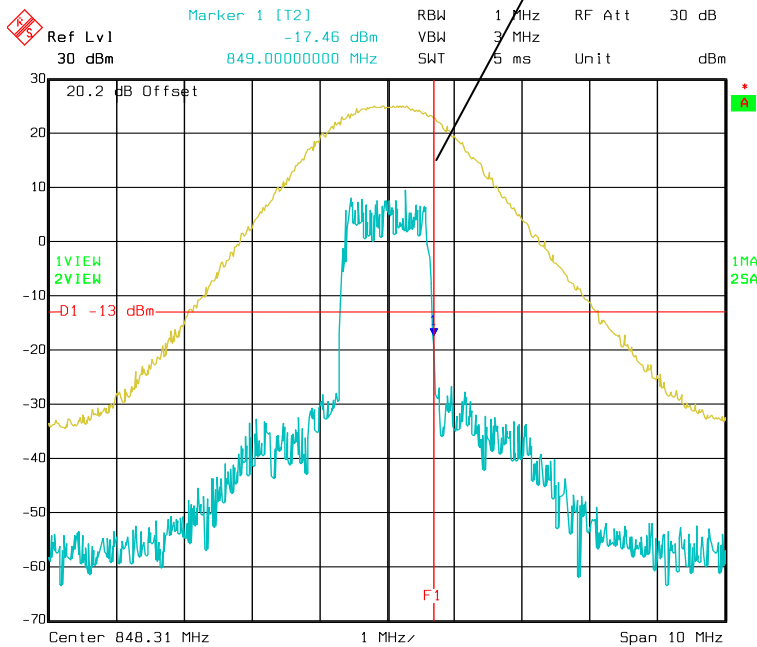
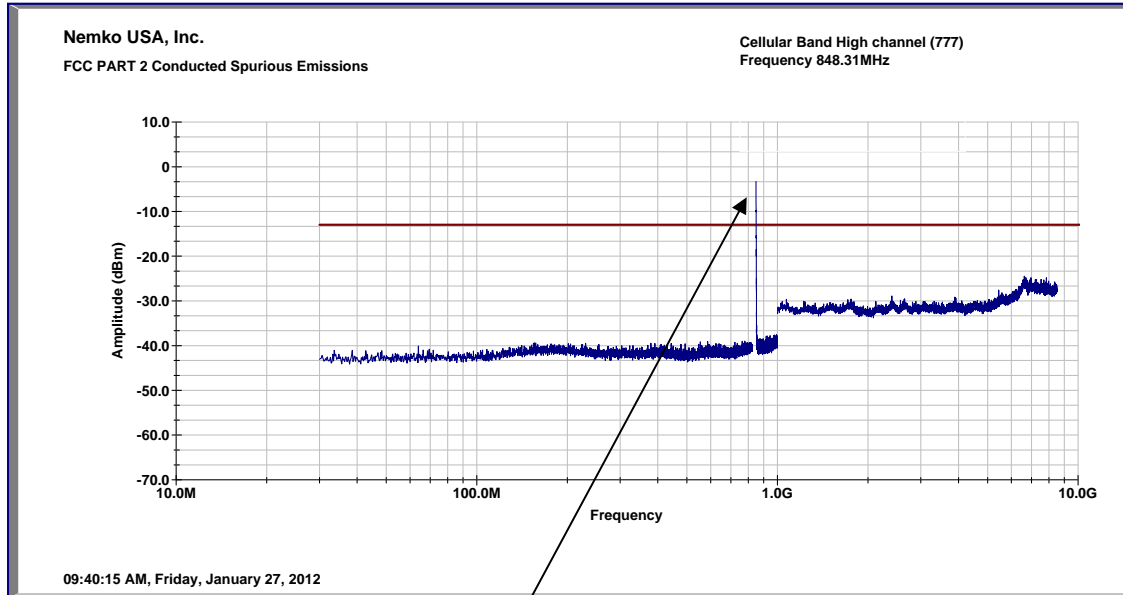
Date: 27.JAN.2012 13:53:19

Emission complies when RBW is applied.

## Channel Band 384 Spurious Emissions – Cellular Band Mid Channel

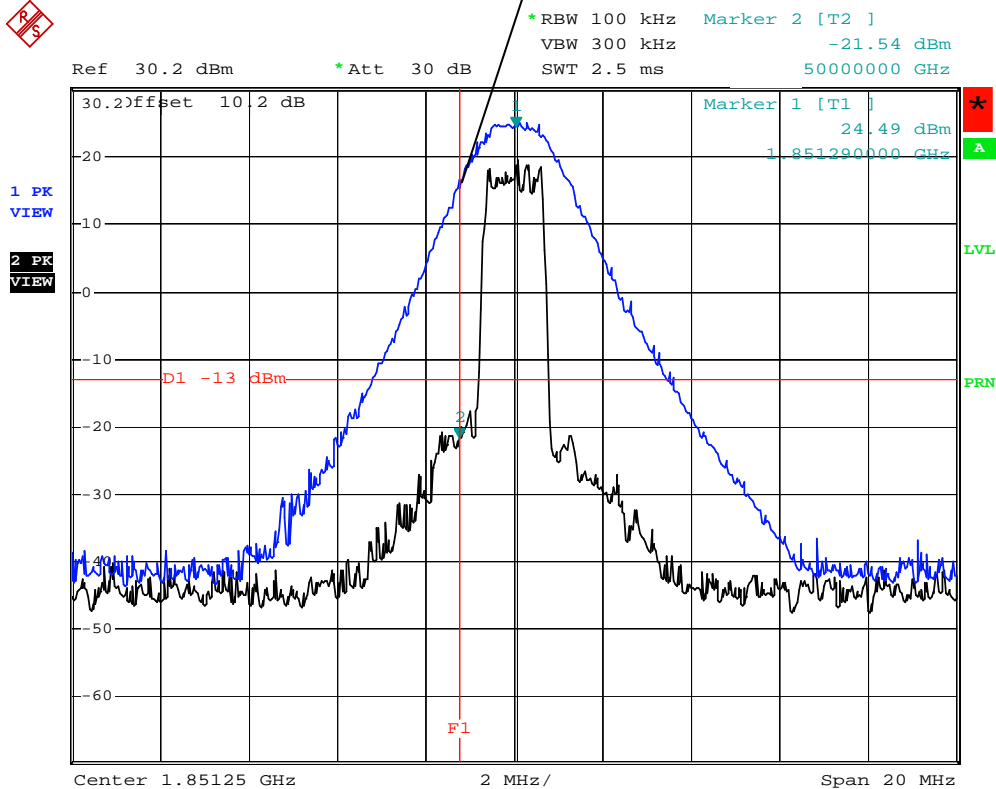
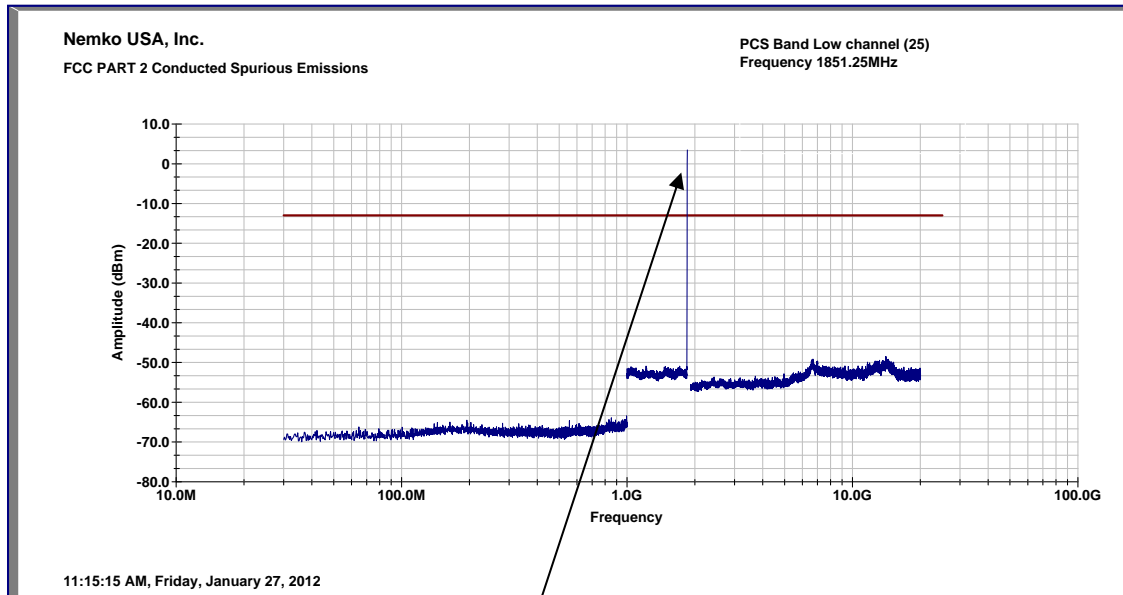


## Channel 777 Spurious Emissions – Cellular Band High Channel



Date: 27.JAN.2012 13:45:16

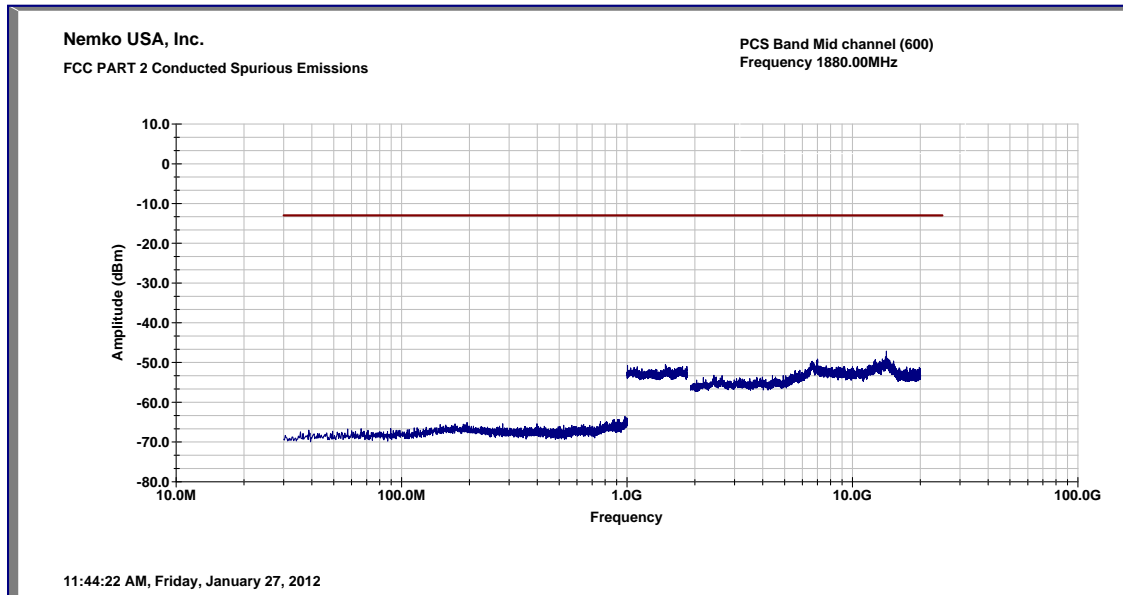
## Channel 25 Spurious Emissions – PCS Band Low Channel



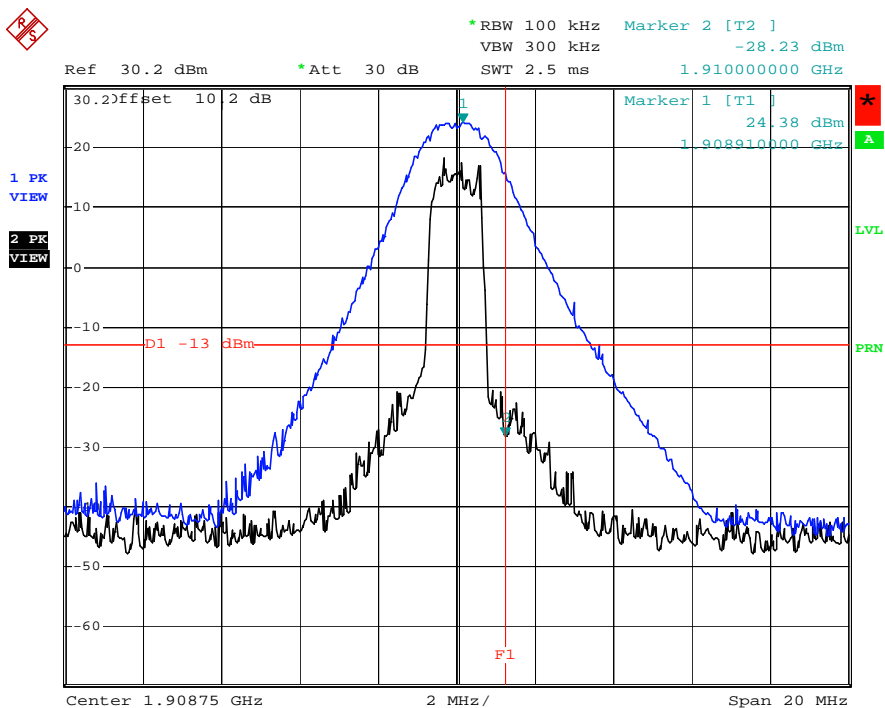
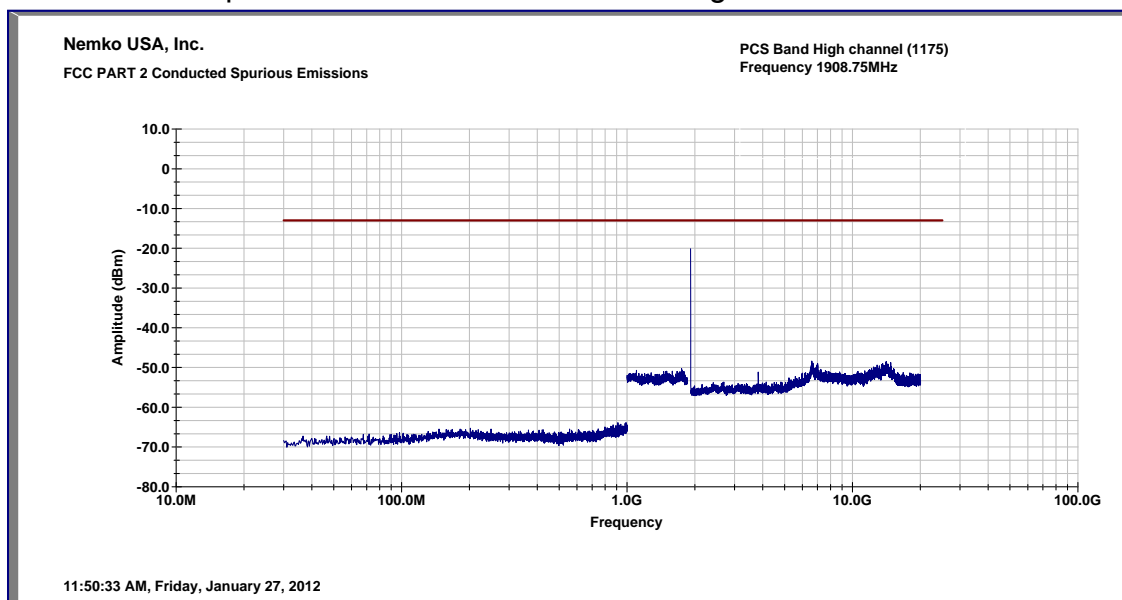
Date: 31.DEC.1996 23:48:29

Sweep at 1 MHz captures emissions across band edge

## Channel 600 Spurious Emissions - PCS Band Mid Channel



## Channel 1175 Spurious Emissions – PCS Band High Channel



Date: 31.DEC.1996 23:57:55

## A4. Field strength of Spurious Emissions

### Para. No.: FCC 2.1053 & RSS-GEN 6.5.2

Minimum Standard is part 22

Minimum Standard is part 24.236 and 24.238 for FCC see description of Spurious emission above

### RSS-133 4.9 Transmitter Unwanted Emissions

The measurement method shall be described in the test report. The same parameter, peak power or average power, used for the transmitter output power measurement shall be used for unwanted emission measurements.

The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate or carrier frequency), or from 30 MHz, whichever is the lower, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

Unless otherwise specified, compliance with the emission limits shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth for emissions below 1000 MHz and, an average detector with a minimum resolution bandwidth of 1 MHz for emissions above 1 GHz.

### RSS 129 10.0 and RSS 133 6.7 Field Receiver Spurious Emissions

If a radiated measurement is made, all spurious emissions shall comply with the limits of the following table. The resolution bandwidth of the spectrum analyzer shall be 100 kHz for spurious emissions measurements below 1.0 GHz, and 1.0 MHz for measurements above 1.0 GHz.

Spurious Frequency (MHz)	Field Strength (microvolts/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

For CDMA and FM, 960 to 1610 is 500  $\mu\text{V/m}$  at 3 meters and above 1610 is 1000  $\mu\text{V/m}$ .

### Conditions:

Model:	FW75	Temperature:	18°C
Date:	Jan. 31, 2012	Humidity:	45%
Modification State:	Modulated	Tester:	Alex Chang
		Laboratory:	Nemko

**Observations:**

No Emissions were noted within 20dB of the limit. Verification by substitution is not warranted when emissions are this low.

The emission's range was searched up to and including the 10<sup>th</sup> Harmonic.

**Test Results: Passed**

No emissions found within 20 dB of the limits from 30 MHz to 6000 MHz due to digital clocks of RF oscillators.

Frequency	QP Measured	Adjustments	Final Result	Limit	QP Margin	Ant. Ht.	EUT Rotation
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degrees
108.540	47.0	-21.5	25.4	43.5	-18.1	111	131
112.632	40.5	-20.9	19.6	43.5	-23.9	110	9
116.730	48.0	-20.3	27.7	43.5	-15.8	111	189
133.667	34.3	-18.4	15.9	43.5	-27.6	111	9
192.032	36.4	-15.1	21.3	43.5	-22.2	111	145
516.259	45.0	-14.0	31.0	46.0	-15.1	109	93
517.609	45.3	-14.0	31.3	46.0	-14.7	111	11
518.943	45.3	-14.0	31.4	46.0	-14.7	111	4
897.906	29.0	-4.0	25.0	46.0	-21.0	111	198

**Test Data:**

See attached tables

Example: A=RR+CL+AF

A = Amplitude dBμV/m

RR = Receiver Reading dBμV

CL = cable loss dB

AF = antenna factor dB/m

Example Frequency = 7405.0 MHz

36.6 dBμV (spectrum analyzer reading)

+14.6 dB (cable loss @ frequency)

51.2 dBμV

+35.1 dB/m (antenna factor @ frequency)

86.3 dBμV/m

-33.1 dB amplifier gain

53.2 dBμV/m

-95.3 dbm/ dBuV/m

-42.1 dBm Final adjusted value



Range data:

Radiated Emissions Data																							
Job # :	10219205			Date :	1/31/2012			Page	1		of	1											
NEX #:	195598			Time :	0800																		
				Staff :	AC																		
Client Name :	U-Blox							EUT Voltage :	3.9														
EUT Name :	CDMA 1xRTT Module							EUT Frequency :	DC														
EUT Model # :	FW75							Phase:	-														
EUT Serial # :	A10000157																						
EUT Config. :	Transmitting test mode																						
Specification :	CFR47 Part 2.1053							Distance < 1000 MHz:	3 m														
Loop Ant. #:	NA							Distance > 1000 MHz:	3 m														
Bicon Ant. #:	NA																						
Log Ant. #:	NA																						
DRG Ant. #	752																						
Cable LF#:	NA																						
Cable HF#:	WCC																						
Preamp LF#:	NA																						
Preamp HF#	317																						
				Temp. (°C) :	18																		
				Humidity (%) :	45																		
				Spec Analyzer #:	901																		
				Analyzer Display #:	901																		
				Quasi-Peak Detector #:	901																		
				Preselector #:	NA																		
<div style="float: right; border: 1px solid black; padding: 2px; margin-top: 10px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>Quasi-Peak</td> <td>RBW: 120 kHz</td> </tr> <tr> <td colspan="2">Video Bandwidth 300 kHz</td> </tr> <tr> <td>Peak</td> <td>RBW: 1 MHz</td> </tr> <tr> <td colspan="2">Video Bandwidth 3 MHz</td> </tr> <tr> <td>Average</td> <td>RBW: 1 MHz</td> </tr> <tr> <td colspan="2">Video Bandwidth 10 Hz</td> </tr> </table> </div>												Quasi-Peak	RBW: 120 kHz	Video Bandwidth 300 kHz		Peak	RBW: 1 MHz	Video Bandwidth 3 MHz		Average	RBW: 1 MHz	Video Bandwidth 10 Hz	
Quasi-Peak	RBW: 120 kHz																						
Video Bandwidth 300 kHz																							
Peak	RBW: 1 MHz																						
Video Bandwidth 3 MHz																							
Average	RBW: 1 MHz																						
Video Bandwidth 10 Hz																							
<div style="text-align: right; font-size: small;">                     Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.                      Measurements above 1 GHz are Average values, unless otherwise stated.                 </div>																							
Meas. Freq. (MHz)	Meter Reading Vertical	Meter Reading Horizontal	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dBµV)	Corrected Reading (dBm)	Spec. limit (dBm)	CR/SL Diff. (dB)	Pass Fail	Comment												
824.70 MHz channel 1013																							
1649.4	46.8	49.0	P	310.8	168.0	49.0	-50.0	-13.0	-37.0	Pass													
2474.1	42.9	43.2	P	311.0	114.5	43.2	-53.4	-13.0	-40.4	Pass													
3298.8	49.3	47.8	P	15.8	117.0	49.3	-44.1	-13.0	-31.1	Pass													
836.52 MHz channel 384																							
1673.0	45.4	44.9	P	9.8	135.0	45.4	-53.6	-13.0	-40.6	Pass													
2509.6	43.7	42.8	P	8.5	168.0	43.7	-51.9	-13.0	-38.9	Pass													
3346.1	47.2	46.9	P	12.0	112.0	47.2	-46.3	-13.0	-33.3	Pass													
848.31 MHz Channel 777																							
1696.6	49.3	50.1	P	104.3	131.6	50.1	-49.0	-13.0	-36.0	Pass													
2544.9	44.1	44.4	P	120.5	127.5	44.4	-51.1	-13.0	-38.1	Pass													
3393.2	45.9	49.2	P	50.3	101.8	49.2	-44.2	-13.0	-31.2	Pass													

### Radiated Emissions Data

Job # : 10219205 Date : 1/31/2012  
NEX #: 195598 Time : 0800  
Staff : AC

Page 1 of 1

Client Name : U-Blox  
EUT Name : CDMA 1xRTT Module  
EUT Model # : FW75  
EUT Serial # : A10000157  
EUT Config : Transmitting test mode

EUT Voltage : 3.9  
EUT Frequency : DC  
Phase : -

Distance < 1000 MHz: 3 m  
Distance > 1000 MHz: 3 m

Specification : CFR47 Part 2.1053  
Loop Ant. #: NA  
Bicon Ant. #: NA Temp. (°C) : 18  
Log Ant. #: NA Humidity (%) : 45  
DRG Ant. # : 752 Spec Analyzer #: 901  
Cable LF#: NA Analyzer Display #: 901  
Cable HF#: WCC Quasi-Peak Detector #: 901  
Preamp LF#: NA Preselector #: NA  
Preamp HF# : 317

Quasi-Peak	RBW: 120 kHz
	Video Bandwidth 300 kHz
Peak	RBW: 1 MHz
	Video Bandwidth 3 MHz
Average	RBW: 1 MHz
	Video Bandwidth 10 Hz

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.

Measurements above 1 GHz are Average values, unless otherwise stated.

Meas. Freq. (MHz)	Meter Reading Vertical	Meter Reading Horizontal	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dBμV)	Corrected Reading (dBm)	Spec. limit (dBm)	CR/SL Diff. (dB)	Pass Fail	Comment
3702.5	45.9	46.2	P	53.0	137.3	46.2	-43.8	-13.0	-30.8	Pass	1851.25 MHz channel 25
5553.8	36.8	39.6	P	20.0	119.9	39.6	-43.8	-13.0	-30.8	Pass	
7405.0	35.5	36.6	P	64.3	126.3	36.6	-42.1	-13.0	-29.1	Pass	
3760.0	47.0	45.0	P	39.0	135.4	47.0	-43.0	-13.0	-30.0	Pass	1880.00 MHz channel 600
3817.5	47.2	46.6	P	56.3	118.7	47.2	-42.8	-13.0	-29.8	Pass	1908.75 MHz channel 1175
5726.3	39.3	38.1	P	25.8	101.1	39.3	-43.1	-13.0	-30.1	Pass	

**Digital Emissions****Horizontal**

Measurement Frequency (MHz)	Meter Reading (dB $\mu$ V)	Turn Table (degrees)	Antenna Height (cm)	Corrected Reading (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB $\mu$ V/m)	Pass Fail	Comments
52.73	24.6	0	284	0.1	40	-39.9	Pass	Emission caused by DC power source
77.49	25.3	0	110	-4.1	40	-44.1	Pass	Emission caused by DC power source
109.79	24.7	0	111	0.7	43.5	-42.8	Pass	Emission caused by DC power source
122.01	31.6	0	105	9.4	43.5	-34.1	Pass	Emission caused by DC power source

**Vertical**

Measurement Frequency (MHz)	Meter Reading (dB $\mu$ V)	Turn Table (degrees)	Antenna Height (cm)	Corrected Reading (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB $\mu$ V/m)	Pass Fail	Comments
55.99	57.3	1	111	31.7	40	-8.3	Pass	Emission caused by DC power source
86.00	62.5	225	111	34.4	40	-5.6	Pass	Emission caused by DC power source
135.98	47.9	351	210	23.4	43.5	-16.6	Pass	Emission caused by DC power source
154.01	54.9	288	111	20.1	43.5	-8.7	Pass	Emission caused by DC power source

## A5. Frequency Stability

Para. No.: FCC 2.1055 & RSS-GEN 4.7

22.X

### 24.235 Frequency stability

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

*RSS 129*

*RSS 133*

### 6.3 Frequency Stability

The carrier frequency shall not depart from the reference frequency, in excess of  $\pm 2.5$  ppm for mobile stations and  $\pm 1.0$  ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

#### Conditions:

Model:	FW75	Temperature:	20°C
Date:	Feb. 03, 2012	Humidity:	14%
Modification State:	CW	Tester:	Alex Chang
		Laboratory:	Nemko

#### Observations:

The CW mode was used for this evaluation.  
Spectrum analyser, max hold, peak

Test Results: Passed

## Frequency Stability data:

Channel	1013	Cellular band		
Frequency	824.7	MHz		
Voltage Volt	Temp. °C	Peak Power dBm	Frequency Error HZ	Frequency Error (PPM)
3.4	20	29.19	-43	-0.0521
3.9		29.4	-17	-0.0206
4.3		29.22	12	0.0146
3.9	0		-23	-0.0279
3.9	10		-45	-0.0546
3.9	30		37	0.0449
3.9	40		-30	-0.0364
3.9	50		-16	-0.0194
3.9	-10		-37	-0.0449
3.9	-20		-26	-0.0315
3.9	-30		50	0.0606

Channel	25	PCS band		
Frequency	1851.25	MHz		
Voltage Volt	Temp. °C	Peak Power dBm	Frequency Error HZ	Frequency Error (PPM)
3.4	20	26.85	44	0.0238
3.9		26.97	15	0.0081
4.3		26.84	-28	-0.0151
3.9	0		-5	-0.0027
3.9	10		-23	-0.0124
3.9	30		8	0.0043
3.9	40		-15	-0.0081
3.9	50		-7	-0.0038
3.9	-10		26	0.0140
3.9	-20		-50	-0.0270
3.9	-30		2	0.0011

## Frequency Stability

Voltage input reduced while monitoring frequency until transmission expires.

<b>Date:</b>	<b>Feb. 03, 2012</b>			
<b>Mode:</b>	Cellular Band		PCS Band	
<b>Channel:</b>	1013	824.7 MHz	25	1851.25 MHz

Voltage	Frequency Error	Frequency Error	Frequency Error	Frequency Error
Volt DC	HZ	(PPM)	HZ	(PPM)
2.65Vdc	EUT turns OFF			
2.7Vdc	-11	-0.013	EUT turns OFF	
2.75Vdc	-30	-0.036	-39	-0.021
2.8Vdc	37	0.045	-45	-0.024
2.85Vdc	15	0.018	-45	-0.024
2.9Vdc	-27	-0.033	27	0.015
2.95Vdc	5	0.006	43	0.023
3Vdc	-47	-0.057	46	0.025
3.1Vdc	-43	-0.052	41	0.022
3.2Vdc	43	0.052	50	0.027
3.3Vdc	-50	-0.061	34	0.018
3.4Vdc	-50	-0.061	47	0.025
3.5Vdc	-47	-0.057	26	0.014
3.6Vdc	31	0.038	35	0.019
3.7Vdc	45	0.055	20	0.011
3.8Vdc	43	0.052	49	0.026

## A6. Receiver Spurious

Para. No.: RSS-GEN 4.10

### **RSS 133**

#### 6.6 Receiver Spurious Emissions

Receiver spurious emissions shall comply with the limits specified in RSS-Gen.

#### 4.10 Receiver Spurious Emissions

The receiver shall be operated in the normal receive mode near the mid-point of the band over which the receiver is designed to operate.

Unless otherwise specified in the applicable RSS, the radiated emission measurement is the standard measurement method (with the device's antenna in place) to measure receiver spurious emissions.

Radiated emission measurements are to be performed using a calibrated open-area test site. As an alternative, the conducted measurement method may be used when the antenna is detachable. In such a case, the receiver spurious signal may be measured at the antenna port.

#### 6. Receiver Spurious Emission Standard

The following receiver spurious emission limits shall be complied with: (b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5 nanowatts above 1 GHz.

Test Results: Complies

Test Data:

Direct conducted measurement

No emissions evident within 20 dB of the conducted Limits.

RBW 5 kHz, VBW 20 kHz, max hold peak.

Limit

2 nanowatts = -57dBm

5 nanowatts = -53 dBm

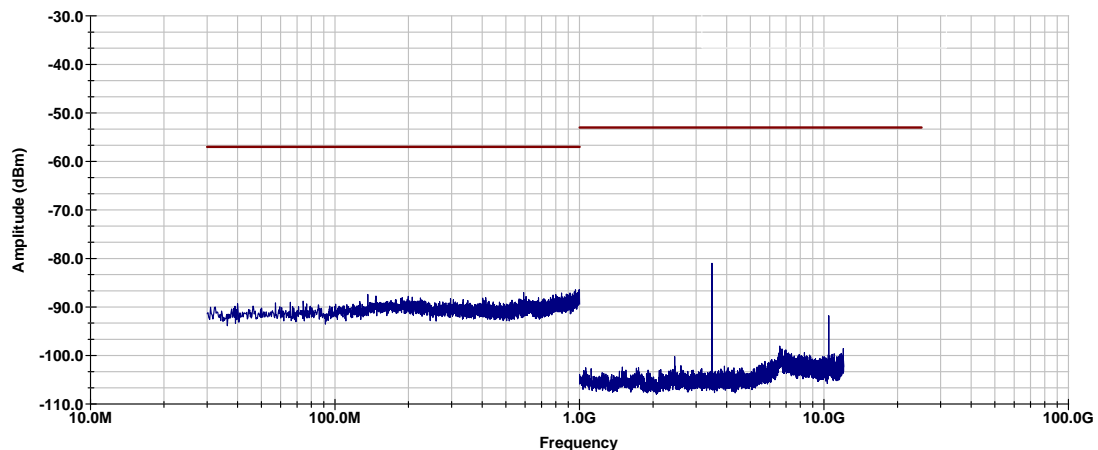
Nemko USA, Inc.

FCC PART 2 Conducted Spurious Emissions

Cellular Band Low channel (1013)

Frequency 824.70 MHz

Module Tx OFF



09:21:06 AM, Wednesday, March 14, 2012

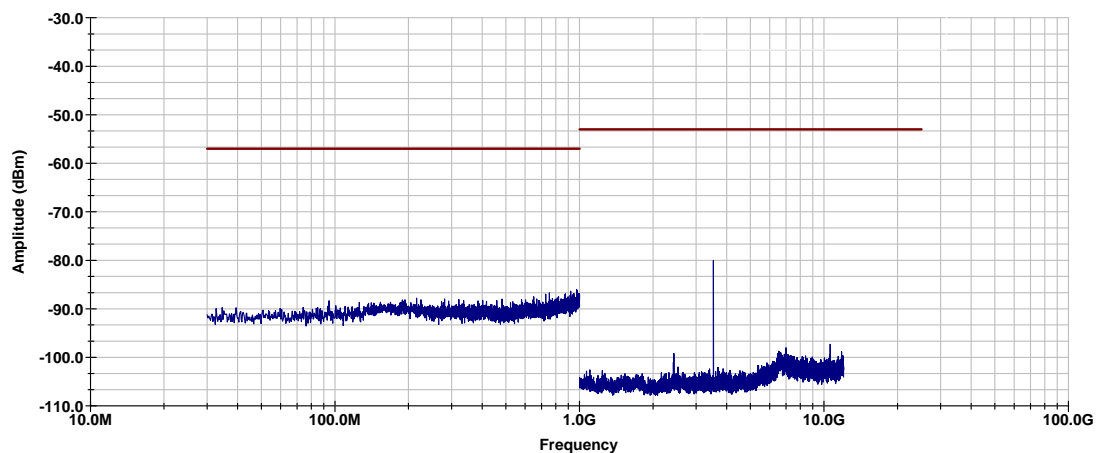
Nemko USA, Inc.

FCC PART 2 Conducted Spurious Emissions

Cellular Band Mid channel (384)

Frequency 836.52 MHz

Module Tx OFF



09:36:08 AM, Wednesday, March 14, 2012



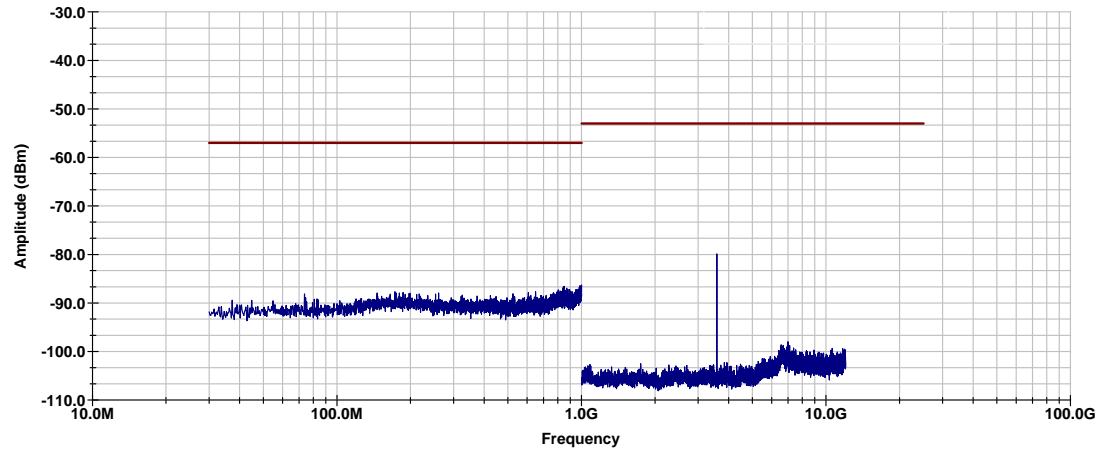
Nemko USA, Inc.

FCC PART 2 Conducted Spurious Emissions

Cellular Band Mid channel (777)

Frequency 848.31 MHz

Module Tx OFF



10:02:38 AM, Wednesday, March 14, 2012

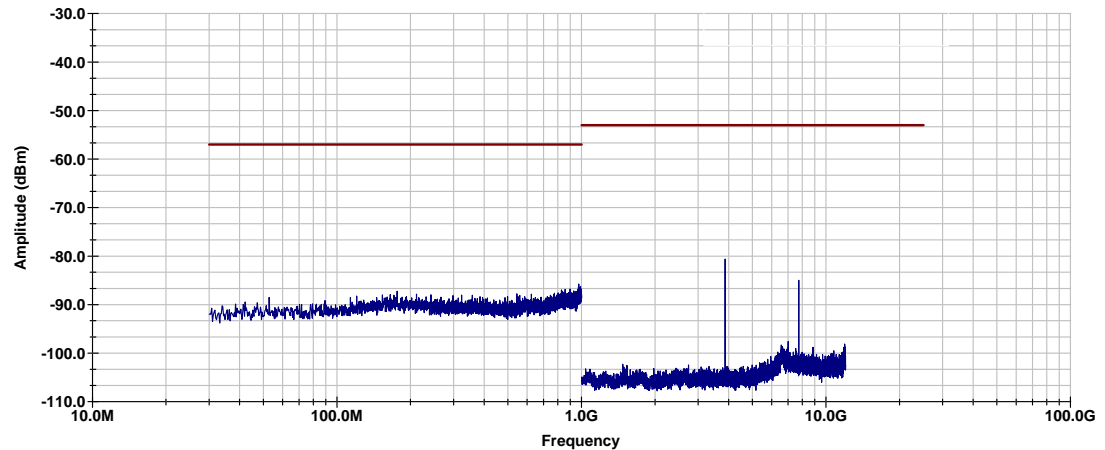
Nemko USA, Inc.

FCC PART 2 Conducted Spurious Emissions

PCS Band Low channel (25)

Frequency 1851.25 MHz

Module Tx OFF



09:03:47 AM, Wednesday, March 14, 2012

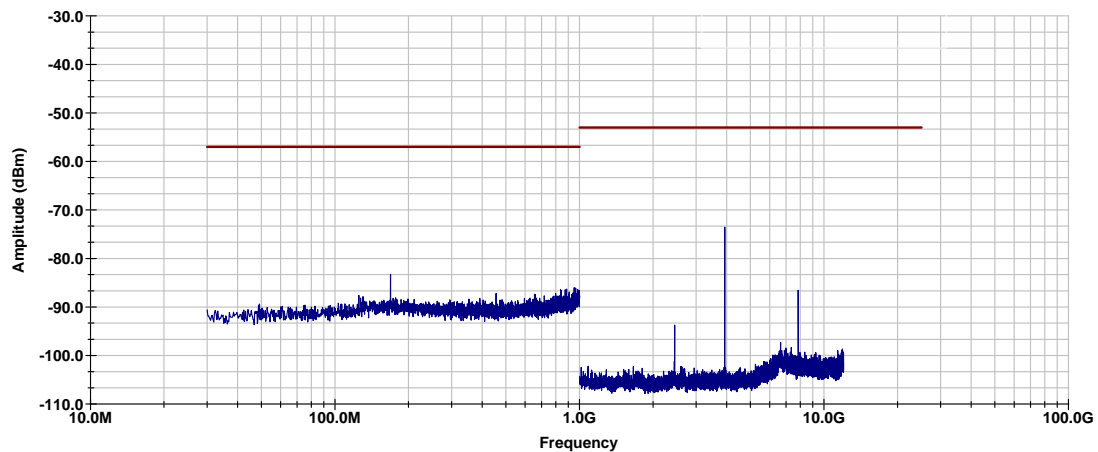
Nemko USA, Inc.

FCC PART 2 Conducted Spurious Emissions

PCS Band Mid channel (600)

Frequency 1880 MHz

Module Tx OFF



08:35:46 AM, Wednesday, March 14, 2012

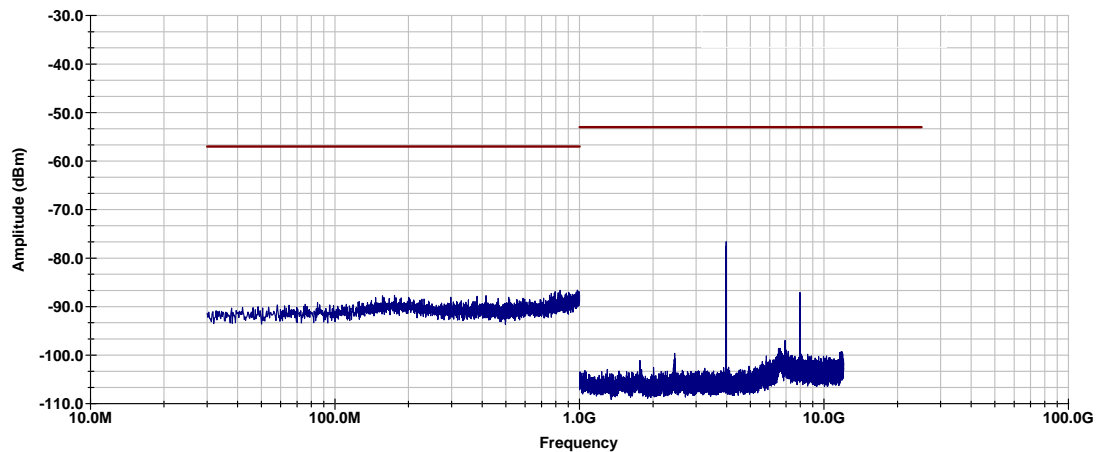
Nemko USA, Inc.

FCC PART 2 Conducted Spurious Emissions

PCS Band High channel (1175)

Frequency 1908.75MHz

Module Tx OFF



05:01:19 PM, Tuesday, March 13, 2012