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MEASUREMENT REPORT
FCC Part 22, 24

Applicant Name:
Itron Cellular Solutions
4400 Old Canton Road, Suite 300
Jackson, MS 39211
USA

Date of Testing:
September 04 - 24, 2013
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1308291711.QHC

FCC ID:	**QHC-OPENWAY1X**
APPLICANT:	**ITRON CELLULAR SOLUTIONS**

Application Type:	Class II Permissive Change
Model(s):	OPENWAY-1X
EUT Type:	Smartmeter
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§2 §22(H) §24(E)
Test Procedure(s):	ANSI/TIA-603-C-2004, KDB 971168
Test Device Serial No.:	*identical prototype* [S/N: 291044]
Class II Permissive Change:	Please see FCC change documents.
Original Grant Date:	January 12, 2011

Mode	Tx Frequency (MHz)	Emission Designator	ERP/EIRP	
			Max. Power (W)	Max. Power (dBm)
CDMA850	824.70 - 848.31	1M27F9W	0.071	18.52
CDMA1900	1851.25 - 1908.75	1M27F9W	0.194	22.87

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein 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.

Randy Ortanez
President

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

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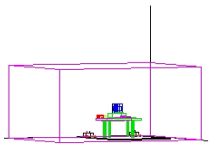


MEASUREMENT REPORT
FCC Part 22, 24

§2.1033 General Information

APPLICANT:	Itron Cellular Solutions
APPLICANT ADDRESS:	4400 Old Canton Road, Suite 300 Jackson, MS 39211, USA
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS:	6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S):	§2 §22(H) §24(E)
BASE MODEL:	OPENWAY-1X
FCC ID:	QHC-OPENWAY1X
FCC CLASSIFICATION:	PCS Licensed Transmitter (PCB)
MODE:	CDMA
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)
Test Device Serial No.:	291044 ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST:	September 04 - 24, 2013
TEST REPORT S/N:	0Y1308291711.QHC

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Internt'l (BWI) airport, the city of Baltimore and the Washington, DC area. (*See Figure 1-1*).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 6660-B Dobbin Road, Columbia, MD 21045. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on February 15, 2012.

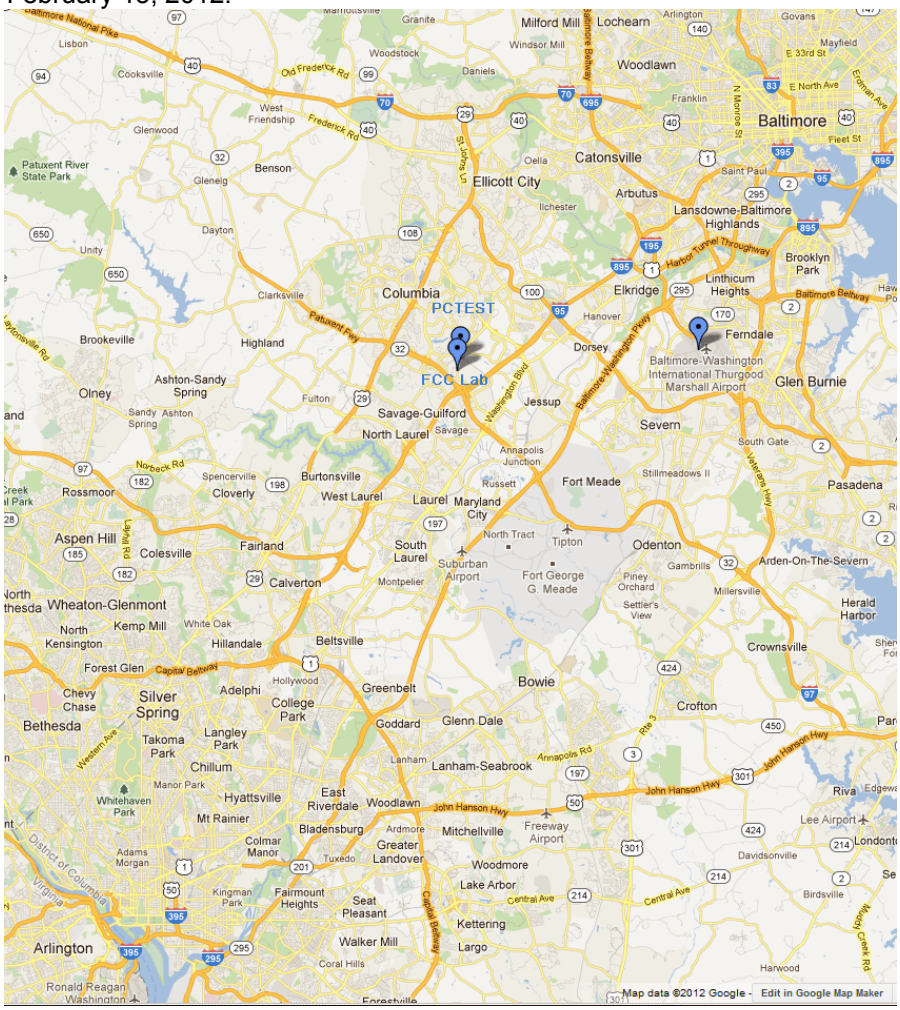


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Itron Smartmeter FCC ID: QHC-OPENWAY1X**. The test data contained in this report pertains only to the emissions due to the EUT's 2G/3G licensed transmitters.

2.2 Device Capabilities

This device contains the following capabilities:

CDMA 850/1900 and Zigbee Transmitter

2.3 Test Configuration

The Itron Smartmeter FCC ID: QHC-OPENWAY1X was tested per the guidance of ANSI/TIA-603-C-2004 and KDB 971168. See Section 3.0 of this test report for a description of the radiated emissions test.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

3.0 DESCRIPTION OF TESTS

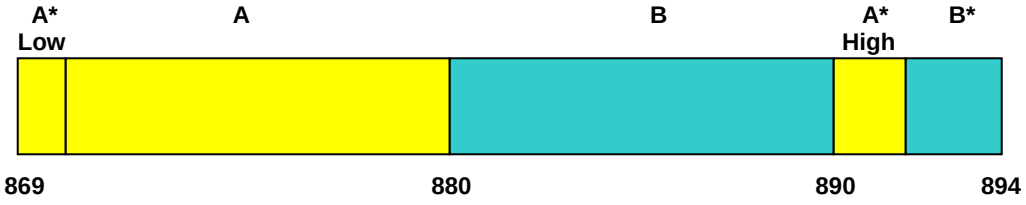
3.1 Evaluation Procedure

The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-C-2004) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems" (KDB 971168) were used in the measurement of the **Itron Smartmeter FCC ID: QHC-OPENWAY1X.**

Deviation from Measurement Procedure……..None

3.2 Cellular - Base Frequency Blocks

§22.905



BLOCK 1: 869 – 880 MHz (A* Low + A)

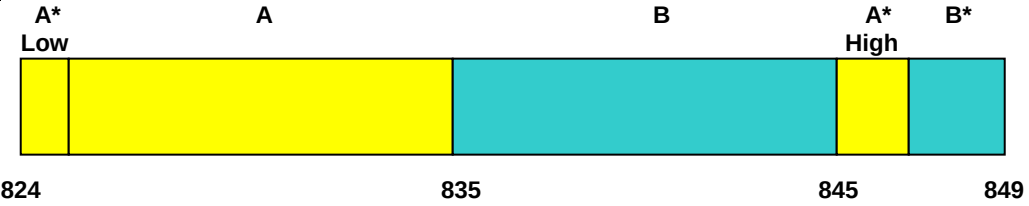
BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)

BLOCK 4: 891.5 – 894 MHz (B*)

3.3 Cellular - Mobile Frequency Blocks

§22.905



BLOCK 1: 824 – 835 MHz (A* Low + A)

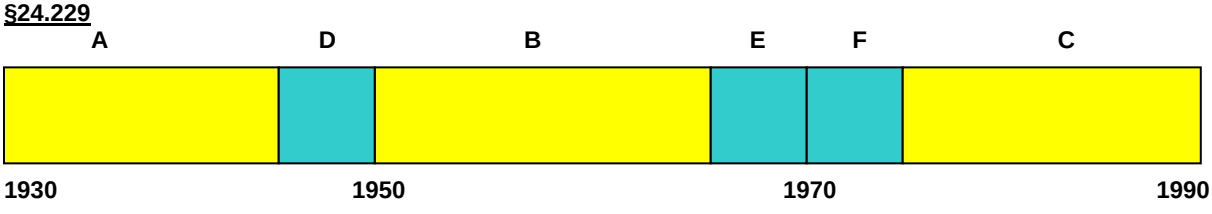
BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)

BLOCK 4: 846.5 – 849 MHz (B*)

3.4 PCS - Base Frequency Blocks

§24.229



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 2: 1945 – 1950 MHz (D)

BLOCK 3: 1950 – 1965 MHz (B)

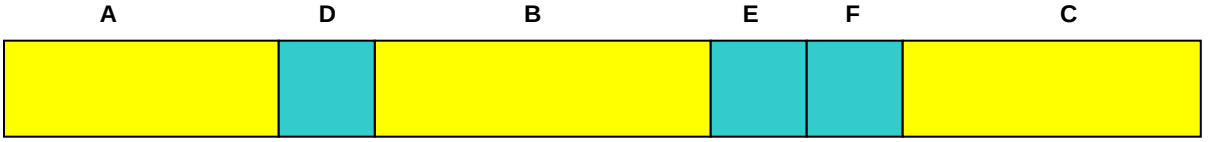
BLOCK 4: 1965 – 1970 MHz (E)

BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 6: 1975 – 1990 MHz (C)

3.5 PCS - Mobile Frequency Blocks

§24.229



BLOCK 1: 1850 – 1865 MHz (A)

BLOCK 2: 1865 – 1870 MHz (D)

BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 4: 1885 – 1890 MHz (E)

BLOCK 5: 1890 – 1895 MHz (F)

BLOCK 6: 1895 – 1910 MHz (C)

3.6 Radiated Power and Radiated Spurious Emissions

§2.1053 §22.913(a.2) §22.917(a) §24.232(c) §24.238(a) RSS-132(4.4) RSS-132(4.5.1) RSS-133(6.4) RSS-133(6.5.1)

Radiated power measurements are performed on the 3 meter OATS per the guidelines of ANSI/TIA-603-C-2004. The measurement area is situated on an 18 meter x 20 meter galvanized 1/2" hardware cloth as the conducting ground plane. This material is sewn together in sections 4 feet wide and 60 feet long. A total of eighteen sections are required to cover the entire measurement area. Sections are laid across the width of the pad, overlapped 1" and sewn and soldered together at intervals of 3" (7.6 cm.) The terrain of the test site is reasonably flat and level. Power and cable to the test site are buried 18" deep into the ground outside the perimeter of the site. An all-weather non-metallic housing is situated on a 2 x 3 meter area adjacent to the measurement area to house the test equipment. The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168.

Per the guidance of ANSI/TIA-603-C-2004, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_{d\ [dBm]} = P_{g\ [dBm]} - \text{cable loss}_{\ [dB]} + \text{antenna gain}_{\ [dBd/dBi]}$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_{g\ [dBm]} - \text{cable loss}_{\ [dB]}$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power}_{\ [Watts]})$ specified in 22.917(a) and 24.238(a).

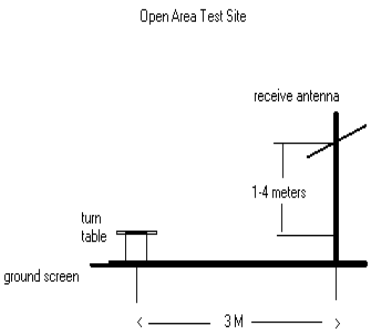


Figure 3-1. Diagram of 3-meter outdoor test range

4.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	3/29/2013	Annual	3/29/2014	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	3/29/2013	Annual	3/29/2014	N/A
-	RE1-S2	Radiated Emissions Cable (UHF/EHF)	8/8/2013	Annual	8/8/2014	13121701 001
Agilent	8447D	Broadband Amplifier	5/31/2013	Annual	5/31/2014	1937A03348
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	4/17/2013	Annual	4/17/2014	3008A00985
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/10/2012	Annual	10/10/2013	3613A00315
Agilent	N9038A	MXE EMI Receiver	12/8/2012	Annual	12/8/2013	MY51210133
Mini-Circuits	VHF-1300+	High Pass Filter	1/21/2013	Annual	1/21/2014	30716
Mini-Circuits	VHF-3100+	High Pass Filter	1/21/2013	Annual	1/21/2014	31144
Rohde & Schwarz	CMU200	Base Station Simulator	5/3/2013	Annual	5/3/2014	836371/0079
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/14/2011	Biennial	11/14/2013	9105-2404
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	11/14/2011	Biennial	11/14/2013	9105-2403
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	6/19/2013	Biennial	6/19/2015	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/26/2012	Biennial	1/26/2014	A051107
Sunol	DRH-118	Horn Antenna (1-18 GHz)	6/19/2013	Biennial	6/19/2015	A042511

Table 4-1. Test Equipment

5.0 SAMPLE CALCULATIONS

CDMA Emission Designator

Emission Designator = 1M25F9W

CDMA BW = 1.25 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data) (Measured at the 99.75% power bandwidth)

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

The receive spectrum analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm – (-24.80) = 50.3 dBc.

6.0 TEST RESULTS

6.1 Summary

Company Name: Itron Cellular Solutions

FCC ID: QHC-OPENWAY1X

FCC Classification: PCS Licensed Transmitter (PCB)

Mode(s): CDMA

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
2.1053 22.917(a) 24.238(a)	Undesirable Emissions	> 43 + $\log_{10}$ (P[Watts]) for all out-of-band emissions	RADIATED	PASS	Sections, 6.3, 6.4
22.913(a.2)	RSS-132(4.4) [SRSP-503(5.1.3)]	Effective Radiated Power	< 7 Watts max. ERP	PASS	Section 6.2
24.232(c)	RSS-133(6.4) [SRSP-510(5.1.2)]	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP	PASS	Section 6.2

Table 6-1. Summary of Test Results

Notes:

1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.

6.2 Radiated Power (ERP/EIRP)

§22.913(a)(2) RSS-132(4.4) [SRSP-503(5.1.3)]

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 v02r01 – Section 5.2.1

ANSI/TIA-603-C-2004 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

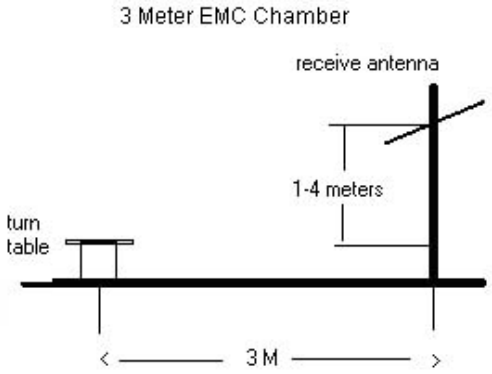


Figure 6-1. Test Instrument & Measurement Setup

Test Notes

1) The worst case test configuration was found in the EUT in the V positioning.

2) This unit was tested while powered by an AC power source.

3) The worst case test configuration was found in the EUT in the V positioning. The data reported in the table above was measured in this test setup.

Frequency [MHz]	Mode	Substitute Level [dBm]	Antenna Gain [dBd]	EUT Pol [H/V]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	CDMA850	18.06	-0.85	V	17.21	0.053	38.45	-21.24
836.52	CDMA850	19.02	-0.80	V	18.22	0.066	38.45	-20.23
848.31	CDMA850	19.28	-0.76	V	18.52	0.071	38.45	-19.93

Table 6-2. ERP (Cellular CDMA)

Frequency [MHz]	Mode	Substitute Level [dBm]	Antenna Gain [dBi]	EUT Pol [H/V]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1851.25	CDMA1900	12.86	8.16	V	21.02	0.126	33.01	-11.99
1880.00	CDMA1900	14.64	8.23	V	22.87	0.194	33.01	-10.14
1908.75	CDMA1900	13.75	8.31	V	22.06	0.161	33.01	-10.95

Table 6-3. EIRP (PCS CDMA)

6.3 Cellular CDMA Radiated Measurements

§2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	824.70	MHz		
CHANNEL:	1013			
MEASURED OUTPUT POWER:	17.21	dBm	=	0.053 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	30.21	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	EUT POL (H/V)	(dBc)
1649.40	-61.06	6.34	-54.72	V	71.9
2474.10	-85.45	6.59	-78.86	V	96.1
3298.80	-83.06	6.97	-76.10	V	93.3
4123.50	-81.23	7.61	-73.62	V	90.8
4948.20	-81.22	9.08	-72.14	V	89.3

Table 6-4. Radiated Spurious Data (Cellular CDMA Mode – Ch. 1013)

NOTES:

1) This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.

2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The “H” positioning is defined with the EUT lying flat on the test surface, the “H2” positioning is defined with the EUT standing up on its side, and the “V” positioning is defined with the EUT standing upright. The worst case test configuration was found in the EUT in the V positioning. The data reported in the table above was measured in this test setup.

Cellular CDMA Radiated Measurements (Cont'd)

§2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.52	MHz		
CHANNEL:	384			
MEASURED OUTPUT POWER:	18.22	dBm	=	0.066 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	31.22	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	EUT POL (H/V)	(dBc)
1673.04	-63.43	6.19	-57.24	V	75.5
2509.56	-86.06	6.58	-79.48	V	97.7
3346.08	-83.94	7.16	-76.78	V	95.0
4182.60	-82.99	7.99	-75.00	V	93.2
5019.12	-82.19	8.98	-73.21	V	91.4

Table 6-5. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)

NOTES:

1) This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.

2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found in the EUT in the V positioning. The data reported in the table above was measured in this test setup.

Cellular CDMA Radiated Measurements (Cont'd)

§2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	848.31	MHz		
CHANNEL:	777			
MEASURED OUTPUT POWER:	18.52	dBm	=	0.071 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	31.52	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	EUT POL (H/V)	(dBc)
1696.62	-60.45	6.04	-54.42	V	72.9
2544.93	-85.39	6.71	-78.68	V	97.2
3393.24	-83.46	7.35	-76.11	V	94.6
4241.55	-82.16	8.26	-73.90	V	92.4
5089.86	-80.15	8.84	-71.32	V	89.8

Table 6-6. Radiated Spurious Data (Cellular CDMA Mode – Ch. 777)

NOTES:

1) This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.

2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found in the EUT in the V positioning. The data reported in the table above was measured in this test setup.

6.4 PCS CDMA Radiated Measurements

§2.1053 §24.238(a) RSS-133(6.5.2)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1851.25	MHz		
CHANNEL:	25			
MEASURED OUTPUT POWER:	21.02	dBm	=	0.126 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	34.02	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	EUT POL (H/V)	(dBc)
3702.50	-39.89	9.92	-29.97	V	51.0
5553.75	-80.11	11.11	-69.00	V	90.0
7405.00	-74.94	10.75	-64.19	V	85.2
9256.25	-74.07	12.31	-61.76	V	82.8
11107.50	-71.10	12.90	-58.20	V	79.2

Table 6-7. Radiated Spurious Data (PCS CDMA Mode – Ch. 25)

NOTES:

1) This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.

2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The “H” positioning is defined with the EUT lying flat on the test surface, the “H2” positioning is defined with the EUT standing up on its side, and the “V” positioning is defined with the EUT standing upright. The worst case test configuration was found in the EUT in the V positioning. The data reported in the table above was measured in this test setup.

PCS CDMA Radiated Measurements (Cont'd)

§2.1053 §24.238(a) RSS-133(6.5.2)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880.00	MHz		
CHANNEL:	661			
MEASURED OUTPUT POWER:	22.87	dBm	=	0.194 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.87	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	EUT POL (H/V)	(dBc)
3760.00	-41.48	9.70	-31.78	V	54.6
5640.00	-80.14	11.25	-68.89	V	91.8
7520.00	-75.16	10.99	-64.17	V	87.0
9400.00	-73.83	12.26	-61.57	V	84.4
11280.00	-70.70	12.95	-57.75	V	80.6

Table 6-8. Radiated Spurious Data (PCS CDMA Mode – Ch. 600)

NOTES:

1) This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.

2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found in the EUT in the V positioning. The data reported in the table above was measured in this test setup.

PCS CDMA Radiated Measurements (Cont'd)

§2.1053 §24.238(a) RSS-133(6.5.2)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1908.75	MHz		
CHANNEL:	1175			
MEASURED OUTPUT POWER:	22.06	dBm	=	0.161 W
MODULATION SIGNAL:	CDMA			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.06	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	EUT POL (H/V)	(dBc)
3817.50	-34.61	9.49	-25.12	V	47.2
5726.25	-80.00	11.30	-68.70	V	90.8
7635.00	-75.42	11.22	-64.21	V	86.3
9543.75	-73.80	12.34	-61.46	V	83.5
11452.50	-69.92	13.11	-56.81	V	78.9

Table 6-9. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

NOTES:

1) This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.

2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found in the EUT in the V positioning. The data reported in the table above was measured in this test setup.

6.5 RF Exposure

The procedure used to determine the RF power density was based upon a calculation for determining compliance with the MPE requirements.

The power generated by each transmitter used in this product was initially measured by a power meter and the powers were recorded. Through use of the Friis transmission formula and knowledge of the maximum antenna gain to be used, the power density level is calculated at a distance of 20cm.

The ERP and EIRP levels were used to calculate the MPE in all relevant bands of operation.

Friis Transmission Formula

Friis transmission formula: $P_d = (P_{out}*G) / (4\pi r^2)$

Where,

P_d = Power Density (mW/cm^2) π = 3.1416
P_{out} = output power to antenna (mW) r = distance between observation point and center of the radiator (cm)
G = gain of antenna in linear scale

Calculated MPE

The power density limit for General Population/Uncontrolled Exposure at each frequency is determined based on the information as specified in §1.1307(b).

There is no co-location between the electric fields of any two transmitters therefore following power densities are calculated for each individual transmitter by frequency at 20cm spacing:

Frequency	848.31	MHz	
Limit	0.566	mW/cm^2	
Distance (cm), R =	20	cm	
ERP Power (dBm), P =	18.52	dBm	71.12 mW
Power Density (S) =	**0.014**	mW/cm^2	(at 20cm)
Minimum Distance =	**3.2**	cm	

Table 6-10. Calculated MPE Data for Cellular Band

Frequency:	1880	MHz	
Limit:	1.000	mW/cm^2	
Distance (cm), R =	20	cm	
EIRP Power (dBm), P =	22.87	dBm	193.64 mW
Power Density (S) =	**0.039**	mW/cm^2	(at 20cm)
Minimum Distance =	**3.9**	cm	

Table 6-11. Calculated MPE Data for PCS Band

7.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Itron Smartmeter FCC ID: QHC-OPENWAY1X** complies with all the requirements of Parts 2, 22, 24 of the FCC rules.