REGULATORY COMPLIANCE REPORT

TITLE: FCC MPE Report for 15.247 & RSS-247 Frequency Hopping Device
FCC ID: EWQRIVAW
AUTHOR: Roger Mulcahy

REV	CCO	DESCRIPTION OF CHANGE	DATE	APPROVALS	
001		INITIAL RELEASE		Engineering	
				Regulatory	

REVISION HISTORY

002		update for new PO #s		Engineering	
				Regulatory	
				Engineering	
				Regulatory	
				Engineering	
				Regulatory	

Test Data Summary

FCC 15.247; Frequency Hopping Transmitter;
RIVAW – 902.4MHz – 927.6 MHz
FCC ID: EWQRIVAW
OATS Registration Number: FCC 90716, IC 864D-1; 500051-0 NVLAP, ICSI; 0803.05-A2LA, CKC

Rule	Description	Spec Limit	Max. Reading	Pass/ Fail
Parts 2.1091(mobile) & 1.1310	Limits for Maximum Permissible Exposure (MPE)	0.602 mw/cm^2	0.445mW / cm^2 @ 20 cm	Pass

Rule versions: FCC Part 1; FCC Part 2; FCC Part 15, RSS-102 Issue 5 (03-2015); RSS-247 Issue 1 (5-2015); RSS-Gen Issue 4 (12-2014).
Reference docs: ANSI C63.4-2014; ANSI C63.10-2013; DA 00-705 (03-30-2000); OET65 (08-1997); OET65C (06-2001); IEEE C95.3-2002.

Cognizant Personnel	
Name	Title
Roger Mulcahy	Test Technician
Name	Title
Jay Holcomb	Regulatory
Name	Title
Johann De Jager	Project Lead

CONDITIONS DURING TESTING

No Modifications to the EUT were necessary during the testing.

ANSI C63.4 - Temperature and Humidity During Testing
The temperature during testing was within +10º C and +40º C.
The Relative humidity was between 10% and 90%.
RSS-Gen 4.3: Tests shall be performed at ambient temperature

EQUIPMENT UNDER TEST (EUT) DESCRIPTION
Itron declares that the EUT tested was representative of a production unit.

EQUIPMENT UNDER TEST

EUT Module

Manuf:	Itron, Inc.
Itron p/n:	ERW-1601-001
Serial Number(s)	unit 1
Power source	Fresh Batteries were used

Peripheral Devices
None

2.1091(mobile) & 1.1310 / RSS-102i5 Sec 4 (table4) - Canada Safety Code 6; Table 5

Maximum Permissible Exposure (MPE)

2.1091. Radiofrequency radiation exposure evaluation: mobile devices. (a) Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See subpart I of part 1 of this chapter, in particular § 1.1307(b). (b) For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

1.1307 (b) In addition to the actions listed in paragraph (a) of this section, Commission actions granting construction permits, licenses to transmit or renewals thereof, equipment authorizations or modifications in existing facilities, require the preparation of an Environmental Assessment (EA) if the particular facility, operation or transmitter would cause human exposure to levels of radiofrequency radiation in excess of the limits in §§1.1310 and 2.1093 of this chapter.

1.1310. Radiofrequency radiation exposure limits. - (e) Table 1 below sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields. (The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.)

2.1093. Radiofrequency radiation exposure evaluation: portable devices.

Power level	Field(1) strength (dBuV/m)	EIRP(2) (dbm)	Conducted(3) power (dbm)	Conducted power (milliwatts)	antenna(4) gain (dbi)	antenna gain numeric	mW / cm^2 @ 20 cm	W/M^2 @ 0.2 M	Max EIRP (Watts)
0	90.9	-4.8	-6.27	0.24	1.47	1.4	0.000066	0.00066	0.00033
10	111.3	16.1	10.59	11.46	5.51	3.56	0.0081	0.081	0.041
27	128.7	33.5	26.61	458.14	6.89	4.89	0.445	4.45	2.24

(1) Field strength (dBuV/m) CKC report 98804-15and CKC report 98804-13

(2) EIRP (dbm) used 412172 D01 Determining ERP and EIRP v01r01 to calculate EIRP

(3) Conducted power (dbm) From Itron Report FCC-1601-001

(4) Antenna gain (dbi) = EIRP-Conducted power

Determine the maximum power density for the general / uncontrolled population minimum separation distance of 20 cm. *The power density is calculated as:*

P_d = power density in *mW/cm²*

P_t = transmit power in milliwatts

$$P_d = \frac{P_t \times G}{4 \times \pi \times r^2}$$

G = numeric antenna gain

r = distance between body and transmitter in centimeters.

FCC Limits: 902.2MHz / 1500 = 0.602 mW / cm^2 @ 20cm

Power level +0

Max antenna gain = 1.47 dBi = 1.4 numeric

Max TX power = -6.27 dBm = .24milliwatts Max EIRP = 0.00033Watts

results: P_D = (-5.02 x 1.05 / (4 x pi x 20cm^2) = 0.000066 mW / cm^2 @ 20 cm

Power level 1 (+10dBm nominal)

Max antenna gain = 5.51 dBi = 3.56 numeric

Max TX power = 10.59 dBm = 11.46 milliwatts Max EIRP = 0.041 Watts

results: P_D = (_11.46 x 3.56 / (4 x pi x 20cm^2) = 0.0081 mW / cm^2 @ 20 cm

Power level 3 (+27dBm nominal)

Max antenna gain = 6.89 dBi = 4.89 numeric

Max TX power = 26.61 dBm = 458.14milliwatts Max EIRP = 2.239 Watts

results: P_D = (458.14 * 4.89 / (4 x pi x 20cm^2) = 0.445 mW / cm^2 @ 20 cm