REGULATORY COMPLIANCE REPORT

TITLE: FCC & ISED MPE Report for 15.247 & RSS-247 Frequency Hopping Device
Residential FCC ID: EWQ500GA;   IC: 864D-500GA
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REV	CCO	DESCRIPTION OF CHANGE	DATE	APPROVALS	
001		INITIAL RELEASE		Engineering	
				Regulatory	

REVISION HISTORY

				Engineering	
				Regulatory	
				Engineering	
				Regulatory	
				Engineering	
				Regulatory	

Test Data Summary
FCC 15.247 / ISED RSS-247; Frequency Hopping Transmitter;
100GA – Residential, 902.2MHz – 927.75 MHz
FCC ID: EWQ100GA;   IC: 864D-100GA   IC Device HVIN/Models: 1U,2U,8U
OATS Registration Number: FCC 90716,   IC 864D-1, 500051-0 NVLAP, ICSI

Rule	Description	Spec Limit	Max. Reading	Pass/ Fail
Parts 2.1091(mobile) & 1.1310	Limits for Maximum Permissible Exposure (MPE)	formula	0.087mW / cm^2 @ 20 cm	Pass
RSS-102i5 Sec. 4, Table 4	RF Field Strength Limits for Devices Used by the General Public	formulas	0.87W/M^2 @ 0.2 M	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
Mark Kvamme	Test Technician
Name	Title
Jay Holcomb	Regulatory Manager
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: ERG-7000-001/002/003/004/009
Serial Number(s)   12
Power source   Fresh Batteries were used

Peripheral Devices
None

2.1091(mobile) & 1.1310 / RSS-102 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 (watts)	antenna[4] gain (dbi)	antenna gain numeric
0	N/A	N/A	-3.27[5]	.00054	0.51[5]	1.12[5]
+10	102.62	7.42	6.91	0.005	0.51	1.12
+24	119.02	23.82	22.33	0.171	1.49	1.41
+27	121.62	26.42	26.28	0.424	0.14	1.03

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 / cm² @ 20cm
IC Limits:　　　902.2MHz; 0.02619 x f^0.6834 w/m^2 = 2.74 W / M² (@ 0.2M)
　　　IC max limit for calculation: 1.31 x 10-2 ƒ^0.6834 watts eirp = 1.37 watts EIRP

Power level 0
Max antenna gain = 0.51 dBi = 1.12 numeric
Max TX power = -3.27dBm = 0.54milliwatts　　　Max EIRP = 0.00054Watts
results:　　P_D = (0.54 x 1.12) / (4 x pi x 20cm²)　　= 0.00012 mW / cm² @ 20 cm
　　　W/m2 = 10 times mW/cm²　　= 0.0012 *W/M²* @ 0.2 M

Power level +10
Max antenna gain = 0.51 dBi = 1.12 numeric
Max TX power = 6.91dBm = 5milliwatts　　　Max EIRP = 0.0056Watts
results:　　P_D = (5 x 1.12) / (4 x pi x 20cm²)　　= 0.001 mW / cm² @ 20 cm
　　　W/m2 = 10 times mW/cm²　　= 0.01 *W/M²* @ 0.2 M

Power level +24
Max antenna gain = 1.49 dBi =1.41 numeric
Max TX power = 22.33 dBm = 171 milliwatts   Max EIRP =0.171Watts
results: P_D = (171 x 1.41) / (4 x pi x 20cm^2)   = 0.048 mW / cm^2 @ 20 cm
                      W/m2 = 10 times mW/cm^2 = 0.48 *W/M^2* @ 0.2 M

Power level +27
Max antenna gain = 0.14 dBi = 1.03 numeric
Max TX power = 26.28 dBm = 424 milliwatts   Max EIRP = 0.424 Watts
results: P_D = (424 x 1.03) / (4 x pi x 20cm^2)   = 0.087 mW / cm^2 @ 20 cm
                      W/m2 = 10 times mW/cm^2 = 0.87 *W/M^2* @ 0.2 M

notes:
(1) Field strength (dBuV/m) from International Certification Services Report # 060616
(2) EIRP (dbm) used 412172 D01 Determining ERP and EIRP v01r01 to calculate EIRP
(3) Conducted power (dbm) From Itron Report FCC-7000-001
(4) Antenna gain (dbi) = EIRP-Conducted power
(5) Conducted power (dbm) From Itron Report FCC-7000-002 and the antenna gain used
     was calculated at power level +10dbm.