REGULATORY COMPLIANCE REPORT

TITLE: FCC MPE Report for 15.247 & RSS-247 Frequency Hopping Device
FCC ID: EWQ500GR, IC:874D-500GR, HVIN:7U
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REV	CCO	DESCRIPTION OF CHANGE	DATE	APPROVALS	
001		initial upload	01may17	Engineering	
				Regulatory	

REVISION HISTORY

				Engineering	
				Regulatory	
				Engineering	
				Regulatory	
				Engineering	
				Regulatory	

Test Data Summary
FCC 15.247 / ISED RSS-247 Frequency Hopping Transmitter;
500GR Remote Endpoint for utility gas meters – 902.2MHz – 927.75 MHz
FCC ID: EWQ500GR;   IC:864D-500GR, HVIN:7U

Rule	Description	Spec Limit	Max. Reading	Pass/Fail
Parts 2.1091(mobile) & 1.1310	Limits for Maximum Permissible Exposure (MPE)	0.601 mw/cm^2 @ 20cm	0.131 mw/cm^2	Pass
RSS-102 Sec 4.2	RF Field Strength Limits for Devices Used by the General Public	2.7 W/M^2 @ 0.2M	1.31 W/M^2	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	
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CONDITIONS DURING TESTING

No Modifications to the EUT were necessary during the testing.

FCC 15.31(m) – ANSI C63.4-2014 12.2.2.1 c);   Number of Channels
This device was tested on three channels.

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-7000-50x
Serial Number(s)   99808-cond and 0100002767, …2761, …2768, …2762, … 2706
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) (for reference)

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.

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/cm^2*

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 = 0.601 mW / cm^2 @ 20cm
IC Limits: 902.2MHz / 150   = 6.01 W / M^2 (@ 0.2M)   ← issue4
              f=902.2; 0.02619 x f^0.6834 w/m^2 = 2.74 W / M^2 (@ 0.2M)   ← issue5
        ISED max limit for calculation: 1.31 x 10-2 f^0.6834 watts eirp = 1.37 watts EIRP

Power level	Field strength (dBuV/m)	EIRP (dbm)	Conducted power (dbm)	Conducted power (milliwatts)	antenna gain (dbi)	antenna gain numeric	mW / cm^2 @ 20 cm	W/M^2 @ 0.2 M	Max EIRP (Watts)
0	88.4	-6.8	-6.81	0.2	0.0100	1.0023	0.0000	0.0004	0.0002
1	108.3	13.1	13.37	21.7	-0.2700	0.9397	0.0041	0.0406	0.0204
3-OOK	120	24.8	24.2	263.0	0.6000	1.1482	0.0601	0.6008	0.3020
3-150	122.9	27.7	26.49	445.7	1.2100	1.3213	0.1171	1.1715	0.5888
3-10	123.4	28.2	26.47	443.6	1.7300	1.4894	0.1314	1.3144	0.6607

(1) EIRP (dBm) used 412172 D01 Determining ERP and EIRP v01r01 to calculate EIRP
(2) Antenna gain (dBi) = EIRP (dBm) - Conducted power (dBm)
(3) P$_D$ = (mW x ant. gain numeric) / (4 x pi x 20cm^2) = mW / cm^2 @ 20 cm
(4) W/m^2 @ 0.2M = 10 x mW/cm^2 @ 20 cm
(5) dBm = 10log$_{10}$(mW)