REGULATORY COMPLIANCE REPORT

TITLE: FCC & IC MPE Report for 15.247 & RSS-210 Frequency Hopping Device
Actaris FCC ID: EWQ100GDLBS IC: 864D-100GDLBS
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REV	CCO	DESCRIPTION OF CHANGE	DATE	APPROVALS	
001		INITIAL RELEASE		Engineering	
				Regulatory	

REVISION HISTORY

002		updated for new RSS102i5_march2015 limits and updated for +50kHz		Engineering	
			02sep15	Regulatory	/s/jay r. holcomb
003		Updated for class II permissive change , inductor update	03mar17	Engineering	Mark Kvamme
			03mar17	Regulatory	/s/jay r. holcomb
				Engineering	
				Regulatory	

Test Data Summary

FCC 15.247 / ISED RSS-247; Frequency Hopping Transmitter;
100G DLS – Residential, 903MHz – 926.85 MHz
FCC ID: EWQ100GDLBS IC: 864D-100GDLBS HVIN: 10S

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	0.07375 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	0.7375 *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

Name	Title
Mark Kvamme	Test Technician
Jay Holcomb	Regulatory Manager
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-5006-005/006
Serial Number(s)	Conducted power test unit id: 105
	Radiated power test unit id:10101010
Power source	Fresh Batteries were used

Peripheral Devices
None

1.1310 & 2.1091(mobile) or 2.1093(portable) / RSS-102 Sec 4.2-Canada Safety Code 6; Table 5

Maximum Permissible Exposure (MPE) (reference from FCC)

Radiofrequency radiation exposure limits. - 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.

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.

Determine the maximum power density for the general / uncontrolled population minimum separation distance of 20 cm. (fMHz / 1500 mW/cm2 == fMHz / 150 W/M2)

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: 903MHz / 1500 = 0.602 mW / cm² @ 20cm
IC Limits: 903MHz / 150 = 6.02 W / M² (@ 0.2M) ← issue4
f=903; 0.02619 x f^0.6834 w/m^2 = 2.74 W / M² (@ 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[1] (dBm)	Conducted power (dBm)	Conducted power (milliwatts)	antenna gain[2] (dBi)	antenna gain numeric	mW / cm² @ 20cm [3]	W/M² @ 0.2 M [4]	Max EIRP (Watts)
1	105.12	9.92	6.09	4.0644	3.8300	2.4155	0.0019531	0.0195313	0.0098175
2	117.9	22.7	21.76	149.9685	0.9400	1.2417	0.0370450	0.3704505	0.1862087
3	120.89	25.69	25.16	328.0953	0.5300	1.1298	0.0737446	0.7374459	0.3706807

(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 20cm²) = mW / cm² @ 20 cm
(4) W/m² @ 0.2M = 10 x mW/cm² @ 20 cm
(5) dBm = $10\log_{10}$(mW)