

REGULATORY COMPLIANCE REPORT

TITLE: FCC & IC MPE Report for 15.247 & RSS-210 Frequency Hopping Device
 900 Belt Clip Radio: FCC ID: EO9BCR900; IC: 864A-BCR900

AUTHOR:

REV	CCO	DESCRIPTION OF CHANGE	DATE	APPROVALS	
001		INITIAL RELEASE	7/12/13	Engineering	D. Whitcomb
				Regulatory	

REVISION HISTORY

a		initial upload		Engineering	
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Test Data Summary

FCC 15.247 / IC RSS-210; Frequency Hopping Transmitter;
 903MHz – 926.8 MHz ISM radio, 952-959.85 MHz MAS radio
 FCC ID:EO9BCR900; IC:864A-BCR900
 IC Device Model (for IC): 900 BCR Radio

Rule	Description	Spec Limit	Max. Reading	Pass/Fail
Parts 1.1310 & 2.1091(mobile) or 2.1093 (portable) / RSS-102 Sec 4.2	Limits for Maximum Permissible Exposure (MPE)	formula	0.0073 mW / cm ² @ 20 cm 0.073 W/M ² @ 0.2 M	Pass

Rule versions: FCC Part 1; FCC Part 2; FCC Part 15, RSS-102 Issue 4 (03-2010); RSS-210 Issue 8 (12-2010); RSS-Gen Issue 3 (12-2010).
 Reference docs: ANSI C63.4-2003; 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.

ANSI C63.4 - Temperature and Humidity During Testing

The temperature during testing was within +10° C and +40° 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.

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)

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.

MPE report:
ISM CKC 91909-10

radio	frequency range (MHz)	measured output power (dbm)	conducted power (watts)	maximum mobile antenna gain (dbi)	antenna gain numeric	maximum EIRP (dBm)
Bluetooth	2402-2480	0.0	0.001	0.0	1.00	0.0
ISM	902-928	10.5	0.0112	5.00	3.16	15.50

FCC:

radio	frequency range (MHz)	EIRP (mW)	distance (cm)	power density (mW/cm ²)	limit (mW/cm ²)	Duty Cycle
Bluetooth	2402-2480	1.00	20	0.0002	1.0	100%
ISM	902-928	35.48	20	0.0071	0.610	100%
	(combined)			(0.0073)	(0.610)	(100%)
total			20	0.0073	0.610	100%

Industry Canada:

radio	frequency range (MHz)	EIRP (W)	distance (m)	power density (W/m ²)	limit (W/m ²)	Duty Cycle
Bluetooth	2402-2480	0.001	0.2	0.002	10	100%
ISM	902-928	0.010	0.2	0.071	6.10	100%
	(combined)			(0.073)	(6.10)	(100%)
total			0.20	0.073	6.10	100%

Determine the maximum power density for the general / uncontrolled population minimum separation distance of 20 cm.

$$\begin{aligned} \text{for frequencies } < 1 \text{ GHz:} & \quad f_{\text{MHz}} / 1500 \text{ mW/cm}^2 & == f_{\text{MHz}} / 150 \text{ W/m}^2 \\ \text{for frequencies } > 1 \text{ GHz:} & \quad 1 \text{ mW/cm}^2 & == 10 \text{ W/cm}^2 \end{aligned}$$

The power density is calculated as:

$$P_d = \text{power density in mW/cm}^2$$

$$P_t = \text{transmit power in milliwatts}$$

$$G = \text{numeric antenna gain}$$

$$r = \text{distance between body and transmitter in centimeters.}$$

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

FCC Limits: 2.4GHz = 1 mW / cm² @ 20cm
915MHz/1500 = 0.610 mW / cm² @ 20cm

IC Limits: 2.4GHz = 10 W / M² @ 0.2m
915MHz / 150 = 6.10 W / M² @ 0.2m

Bluetooth

Max antenna gain = 0.0 dBi = 1.0 numeric

Max TX power = 0 dBm = 1.0 milliwatts

results: $P_D = (1.0 \times 1.0) / (4 \times \pi \times 20\text{cm}^2) = 0.000199 \text{ mW} / \text{cm}^2 @ 20\text{cm}$
 $\text{W/m}^2 = 10 \text{ times mW/cm}^2 = 0.00199 \text{ W/M}^2 @ 0.2\text{m}$

ISM

Max antenna gain = 5.0 dBi = 3.16 numeric

Max TX power = 10.5 dBm = 11.22 milliwatts

results: $P_D = (11.22 \times 3.16) / (4 \times \pi \times 20\text{cm}^2) = 0.00705 \text{ mW} / \text{cm}^2 @ 20\text{cm}$
 $\text{W/m}^2 = 10 \text{ times mW/cm}^2 = 0.0705 \text{ W/M}^2 @ 0.2\text{m}$