

MPE/RF EXPOSURE EVALUATION REPORT



Evaluation of: Itron Inc NIC-510

to

To: FCC CFR 47 Part 15 RF Exposure requirements

Test Report Serial No.: ITRO01-U5 2.4G FHSS MPE Rev A

This report supersedes: NONE

Applicant: Itron, Inc.
230 W Tasman Dr
San Jose, California 95134
USA

Product Function: Modular radio device, will
communicate over 2.4 GHz.

Issue Date: 18th April 2018

This Test Report is Issued Under the Authority of:

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1. MAXIMUM PERMISSABLE EXPOSURE

Calculations for Maximum Permissible Exposure Levels

$$\text{Power Density} = P_d (\text{mW/cm}^2) = \text{EIRP} / (4 * \pi * d^2)$$

$$\text{EIRP} = P * G$$

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

$$\text{Numeric Gain} = 10 ^ (G (\text{dBi}) / 10)$$

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1 mW/cm²

These calculations represent worst case in terms of the exposure levels for the device operating in the 2400 – 2483.5 MHz band in FHSS mode.

Freq. Band (MHz)	Frequency of Calculation (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm ²) @ 20cm	Power Density Limit (mW/cm ²)	Min Calculated safe distance for Limit (cm)
2400 - 2483.5	2400.4	5.00	3.16	24.71	295.80	0.186	1	8.63

Note: for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

Specification

Maximum Permissible Exposure Limits

FCC §1.1310 Limit = 1 mW/cm² from 1.310 Table 1 for devices operating in the 2.4GHz band

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Specification - Maximum Permissible Exposure Limits

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1500	30
1,500-100,000	--	--	1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

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