

# 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-U6 2.4G DTS 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: 18<sup>th</sup> April 2018

## **This Test Report is Issued Under the Authority of:**

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**Title:** ITRON Inc. NIC-510  
**To:** FCC CFR 47 Part 1.1310  
**Serial #:** ITRO01-U6 Rev A FCC DTS MPE  
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## 1. MAXIMUM PERMISSABLE EXPOSURE

### Calculations for Maximum Permissible Exposure Levels

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

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

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

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

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1 mW/cm<sup>2</sup>

These calculations represent worst case in terms of the exposure levels for the device operating in the 2400 – 2483.5 MHz band in DTS 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 <sup>2</sup> ) @ 20cm	Power Density Limit (mW/cm <sup>2</sup> )	Min Calculated safe distance for Limit (cm)
2400 - 2483.5	2476.8	5.00	3.16	25.17	328.85	0.21	1	9.1

**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/cm<sup>2</sup> 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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	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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