

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

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

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

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

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

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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