



Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-0228/15-02-06

Certification numbers and labeling requirements	
FCC ID	2ABA7XPT
IC number	11536A-XPT
HVIN (Hardware Version Identification Number)	NXP2TX-C
PMN (Product Marketing Name)	XIRIUM PRO
FVIN (Firmware Version Identification Number)	-/-
HMN (Host Marketing Name)	-/-

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EUT technologies:

Technologies:	Max. power: (AVG)	Max. gain:	Min. pathloss:
WLAN 2.4 GHz)*	16.75 dBm	2.5 dBi	-/-
5 GHz radio (Proprietary standard)	20.80 dBm	9 dBi	-/-

)* according to FCC-ID: R68XPICOW, IC-ID: 3867A-XPICOW

Prediction of MPE limit at given distance - FCC

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

- where: S = Power density
P = Power input to the antenna
G = Antenna gain
R = Distance to the center of radiation of the antenna

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled "Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure"

Frequency Range (MHz)	Power Density (mW/cm ²)	Averaging Time (minutes)
300 -1500	f/1500	30
1500 - 100000	1.0	30

where f = Frequency (MHz)

Prediction: worst case

		> 1500 MHz	> 1500 MHz
	Technology	WLAN 2.4 GHz	5 GHz radio
P	Max power input to the antenna	16.75 dBm	20.80 dBm
R	Distance	20 cm	20 cm
G	Antenna gain	2.5 dBi	9 dBi
S	MPE limit for uncontrolled exposure	1 mW/cm ²	1 mW/cm ²
	Calculated Power density:	0.017 mW/cm²	0.19 mW/cm²
	Colocation (< 1)	0.207	

This prediction demonstrates the following:

The power density levels for FCC at a distance of 20 cm are below the maximum levels allowed by regulations.

Prediction of MPE limit at given distance - IC

RSS-102, Issue 5, 2.5.2

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}W$ (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} W$ (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

Prediction: worst case

	Technology	WLAN 2.4 GHz	5 GHz radio
P	Max power input to the antenna	16.75 dBm @2462 MHz	20.8 dBm @5745 MHz
G	Antenna gain	2.5 dBi	9 dBi
S	MPE limit for uncontrolled exposure	0.544 mW/cm ²	0.97 mW/cm ²
	Calculated output power:	0.017 mW/cm²	0.19 mW/cm²
	Colocation (< 1)	0.22	

Conclusion: for applications where minimum distance to radiating element is 20cm Annex C of RSS-102 should be filled out.