



MPE/RF EXPOSURE EVALUATION REPORT

FCC Part 15 RF Exposure Requirements

Report No.:ALNT91 Rev A FCC MPE

Company: Alien Technology, LLC.

Model: ALR-M702-FCC

MPE/RF EXPOSURE EVALUATION REPORT

FROM



Evaluation of: Alien Technology, LLC. ALR-M702-FCC

To: FCC CFR 47 Part 15 RF Exposure requirements

Test Report Serial No.: ALNT91 Rev A FCC MPE

This report supersedes: NONE

Applicant: Alien Technology, LLC.
845 Embedded Way
San Jose, California 95138
USA

Product Function RFID Module

Issue Date: 6th August 2019

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
575 Boulder Court
Pleasanton California 94566
USA
Phone: +1 (925) 462-0304
Fax: +1 (925) 462-0306
www.micomlabs.com



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1.1. MAXIMUM PERMISSABLE XPOSURE

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 $f/1500 \text{ mW/cm}^2$

These calculations represent worst case in terms of the exposure levels for the device operating in the 900 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)
902 - 928	927.3	0.80	1.20	29.89	974.99	0.25570	0.6	12.5

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 = $f/1500 \text{ mW/cm}^2$ from 1.310 Table 1 for devices operating in the 900 MHz band

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



575 Boulder Court
Pleasanton, California 94566, USA
Tel: +1 (925) 462 0304
Fax: +1 (925) 462 0306
www.micomlabs.com