

MPE/RF EXPOSURE EVALUATION REPORT



Evaluation of: Applus Laboratories
to

To: FCC CFR 47 Part 15 RF Exposure requirements

Test Report Serial No.: APPU08-U2 FCC MPE Rev A

This report supersedes: NONE

Applicant: SALTO Systems
C/Arkotz nº9 Pol. Lanbarren
Arkotz Kalea
Oiartzun 20180 Spain

Product Function: Wireless Lock

Issue Date: 1st June 2017

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



MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

1. MAXIMUM PERMISSABLE EXPOSURE

Calculations for Maximum Permissible Exposure Levels

Power Density = P_d (mW/cm²) = $EIRP / (4 * \pi * d^2)$

$EIRP = P * G$

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

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

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

These calculations represent worst case in terms of the exposure levels.

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance @ mW/cm ²	Calculated Power Density @ 20cm	Minimum Separation Distance (cm)
13.56	0.0	0.00	0.00000599	1.00	0.00020	4.90	0.13
2400.0 - 2483.5	0.5	1.12	1.14	1.30	0.00029	1.00	0.34

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

1. Assessment for simultaneous operation: 13.56MHz NFC, 2.4GHz BLE 1x1

Freq. Band (MHz)	Total Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance for Summation (cm)	Power Density Limit (mW/cm ²) E_{ref}	Power Density (mW/cm ²) @ New Distance E_i	Summation E_i/E_{ref}
13.56	1.0	0.00	0.00000599	1.00	0.00020	4.90	0.13	0.00004
2400.0 - 2483.5	1.0	1.12	1.14	1.30	0.00029	1.00	0.34	0.00029
Total Evaluation:								0.00033

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where

E_i : calculated E-field Strength for transmitter

E_{ref} : E-field strength related limit

Specification

Maximum Permissible Exposure Limits

FCC §1.1309 Limit = $(900/f^2)$ Power density (mW/cm²) Table 1 for devices operating in the 2400 MHz band, where f = frequency in MHz

FCC §1.1310 Limit = $f/1500$ from 1.310 Table 1 for devices operating in the 2400 MHz band, where f = frequency in MHz



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