

MPE Calculation / RF Exposure

Product: Infortab

Applicant: PARTRON ESL Co., Ltd.

Model: IE213

Address: 829~836, 42, Changeop-ro, Sujeong-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

FCC ID: 2BKXU-IE213

This document is prepared to show compliance with the RF Exposure requirements as required in §1.1310 of the FCC Rules and Regulations.

The limit for Maximum Permissible Exposure (MPE), specified in FCC §1.1310 is listed in below table. According to FCC §1.1310: the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b).

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
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
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

MPE Prediction Prediction of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

Classification The antenna of this product is at least 20 cm away from the body of the user. So this product is classified as mobile device.

Max. tune-up power(dBm)

Zigbee
2.0

$$S = \text{ERP}/4 \pi R^2$$

In other words, $R = \sqrt{\text{ERP}/4\pi \times S(Pd)}$

Where S = Power density
 ERP = Effective Radiated Power
 R = distance to the centre of radiation of the antenna

Values $S = 1.0 \text{ mW/cm}^2$ for General population uncontrolled exposure (FCC Part 1.1310 Radiofrequency radiation exposure limits)
S = 1.0 mW/cm²
 $\text{PT} = 2.00 \text{ dBm (1.58 mW)}$: measured maximum output power
 $G = \text{Antenna gain} = 1.38 \text{ dBi (1.374 in linear terms)}$
 $\text{EIRP} = \text{PT} \times G$
 $R = 20 \text{ cm}$

Calculation $\text{EIRP} = 1.58 \times 1.374 = 2.18 \text{ mW}$
 $S = 2.18/12.56 \times (20)^2 = 2.18/5024$
S = 0.000 43 mW/cm²

Conclusion This confirms compliance to the required radio frequency radiation exposure limit of 1.0 mW/cm² at 20 cm operation.

Results: Compliant

This confirms compliance to the required radio frequency radiation exposure limit of 1.0 mW/cm² at 20 cm operation.