



Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-4809/17-01-02

Certification numbers and labeling requirements	
FCC ID	OAYSRR2A
IC number	-/-
HVIN (Hardware Version Identification Number)	-/-
PMN (Product Marketing Name)	-/-
FVIN (Firmware Version Identification Number)	-/-
HMN (Host Marketing Name)	-/-

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Document authorized:

Karsten Gerdly
Lab Manager
Radio Communications & EMC

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
 PG = EIRP

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

E	Maximum field strength (worst case = pos-peak) see test report 1-4809/17-01-02-A	109.7 dBµV/m @3m
P	Max power input to the antenna	-/- dBm
G	Antenna gain	-/- dBi
PG	EIRP	14.4 dBm / 27.8 mW
R	Distance	20 cm
S	MPE limit for uncontrolled exposure	1 mW/cm ²
	Calculated Power Density	0.0055 mW/cm²

with EIRP [dBm] = E [dBµV/m] + 20lg(d [m]) - 104.8

Conclusion:

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

E	Maximum field strength (worst case = pos-peak) see test report 1-4809/17-01-02-A	109.7 dB μ V/m @3m
P	Max power input to the antenna	-/- dBm
G	Antenna gain	-/- dBi
PG	EIRP	14.4 dBm / 27.8 mW
R	Distance	20 cm
S	MPE limit for uncontrolled exposure	1 mW/cm ²
	Calculated Power Density	0.0055 mW/cm²

with EIRP [dBm] = E [dB μ V/m] + 20lg(d [m]) - 104.8

Conclusion:

For applications where minimum distance to radiating element is ≤ 20 cm, Annex C of RSS-102 should be filled out.