

Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-1037/20-01-04-A MPE (FCC_ISED)

Certification numbers and labeling requirements	
FCC ID	PQC-IITBV1
ISED number	3549C-IITBV1
HVIN (Hardware Version Identification Number)	IITBV1
PMN (Product Marketing Name)	IITBV1
FVIN (Firmware Version Identification Number)	3.02
HMN (Host Marketing Name)	-/-

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EUT technologies:

Technologies:	Max. power [dBm]		Antenna gain max.: [dBi]	Declared by customer	#
	conducted	EIRP			
Proprietary 2450 MHz Antenna type 1	14.6	15.7	1.1	15.7 dBm	A
Proprietary 2450 MHz Antenna type 2	14.6	18.3	3.7	18.3 dBm	A

Details and origins of the measurements shown in the table above:

A	1-1037/20-01-02	CTC advanced GmbH report	Antenna Gains on page 22, Max conducted on page 26.
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Antenna type 1: Philips 453564817421 Antenna, for X3 and MX100

Antenna type 2: Philips 453564271931 Antenna, for MX400, MX450, MX500, MX550

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 = Output Power including antenna gain

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

PG	Declared max power (EIRP)	18.3	dBm
R	Distance	20	cm
S	MPE limit for uncontrolled exposure	1	mW/cm ²
	Calculated Power density:	0.0135	mW/cm ²
	Calculated percentage of Limit:	1.35	%

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 - ISED

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

	Frequency	2450	MHz
R	Distance	20	cm
P	Max power input to the antenna	14.6	dBm
G	Antenna gain	3.7	dBi
PG	Maximum EIRP	18.3	dBm
PG	Maximum EIRP	67.6	mW
	Exclusion Limit from above:	2.71	W
	Calculated percentage of Limit:	2.49	%

Conclusion: RF exposure evaluation is not required.