



Maximum Permissible Exposure (MPE) & Exposure evaluation FCC/IC/EN

Report identification number: 1-1504/16-01-05-A

Certification numbers and labeling requirements	
FCC ID	AHV-CPAC1054 Module: PVH0965
IC number	10111A-CPAC1054 Module: 5325A-0965
HVIN (Hardware Version Identification Number)	CPAC-1054
PMN (Product Marketing Name)	CPAC-1054
FVIN (Firmware Version Identification Number)	1.0.0
HMN (Host Marketing Name)	-/-

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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 (declared by provider)
R = Distance to the center of radiation of the antenna

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)

	Technology	WLAN 5 GHz
P	Maximum Output Power	15 dBm
R	Distance	20 cm
L	Cable Loss	16.3 dB
G	Antenna gain	23 dBi
S	MPE limit for uncontrolled exposure	1.0 mW/cm ²
	Calculated Power density:	0.029 mW/cm²

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 – 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 $4.49/f^{0.5} \text{ W}$ (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 $1.31 \times 10^{-2} f^{0.6834} \text{ W}$ (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).

	Technology	WLAN 5 GHz
P	Maximum Output Power	15 dBm
R	Distance	20 cm
L	Cable Loss	16.3 dB
G	Antenna gain	23 dBi
S	MPE limit for uncontrolled exposure	4478 mW)*
	Calculated output power:	147.9 mW (21.7 dBm)

)* lowest limit at 5100 MHz

Conclusion: for applications where minimum distance to radiating element is 20cm Annex C of RSS-102 should be filled out.

Prediction of MPE limit at given distance – EN 62311

$$S = PG / 4\pi R^2$$

where: S = Power density
P = Power input to the antenna
G = Antenna gain (declared by provider)
R = Distance to the center of radiation of the antenna

Human exposure limit for uncontrolled exposure according to ICNIRP Guideline and Council Recommendation 1999/519/EC

Frequency Range (MHz)	Power Density (W/m ²)	Averaging Time (minutes)
2000 - 300000	10	6

where f = Frequency (MHz)

	Technology	WLAN 5 GHz
P	Maximum Output Power	15 dBm
R	Distance	20 cm
L	Cable Loss	16.3 dB
G	Antenna gain	23 dBi
S	MPE limit for uncontrolled exposure	10 W/m ²
	Calculated Power density:	0.29 W/m²

This prediction demonstrates the following:

The power density levels for EN 62311 at a distance of 20 cm are below the maximum levels allowed by regulations.