

MPE Calculation

Regulation(s): Part 1.1310, Part 2.1091

Method: KDB447498 D01v06

RF feature(Mode)	Frequency range (MHz)			Maximum EIRP (dBm)	Maximum EIRP (mW)	Maximum power density (mW/cm ²)	Requirement (mW/cm ²)	MPE Ratio
FMCW Radar	60500.0	~	63000.0	14.00	25.12	0.005	1.000	0.01
WLAN 2.4GHz	2412.0	~	2462.0	23.76	237.68	0.047	1.000	0.05
Lora	902.2	~	927.6	23.50	223.87	0.045	0.601	0.07
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Note: Please refer to the operation description for the max target power of 60GHz mmW.

The maximum power for the WLAN is taken from the FCC certified module (FCC ID: AC7Z-ESPS3WROOM1)

The maximum power for the Lora is taken from the FCC certified module (FCC ID: XMR2024KG200Z)

▪ Simultaneous Transmission Scenario and Σ of MPE ratios

60GHz mmW Radar + WLAN 2.4GHz = 0.06

60GHz mmW Radar + Lora = 0.08

▪ Requirement = Σ of MPE ratios ≤ 1

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user.

The MPE sample calculation for this exposure is shown below.

$$S = \text{EIRP} / (4 R^2 \pi)$$

$$= 25.119 / (4 \times 20^2 \times \pi)$$

$$= 0.005 \text{ mW/cm}^2$$

- Note

S= Maximum power density(mW/cm²)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenna(20cm)

Part 1.1310

▪ Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric Field strength (V/m)	Magnetic field strength (A/m)	Power Density (mW/cm ²)	Averaging time (minutes)
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 ~ 1,500			f / 1500	30
1,500 ~ 100,000			1.0	30

Conclusion : The exposure condition of this device is compliant with FCC