

Maximum Public Exposure to RF (MPE) CFR 15.247 (i), CFR 1.1310 (e)

The maximum exposure level to the public from the RF power of the EUT shall not exceed a power density, **S** as per the respective limits in Table 1 below, at a distance, d, of 20 cm (Mobile condition) from the EUT.

TABLE 1—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)
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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

Therefore, for:

MPE for 2400 MHz – 2483.5 MHz for ZigBee:

Limit: 1.0 mW/cm²

Peak Power (dBm) = 21.37 dBm

Peak Power (Watts) = 0.137 W

Gain of Transmit Antenna = +1.5 dBi = 1.41, numeric (Highest Gain

Antenna)

d = Distance = 20 cm = 0.2 m

$$\begin{aligned}
 S &= (PG/4\pi d^2) = EIRP/4A = 0.137 (1.41)/4*\pi*0.2*0.2 \\
 &= 0.1932/0.5030 = 0.3840 \text{ W/m}^2 \\
 &= (0.3840 \text{ W/m}^2) (1\text{m}^2/\text{W}) (0.1 \text{ mW/cm}^2) \\
 &= 0.03840 \text{ mW/cm}^2
 \end{aligned}$$

which is << less than S = 1.0 mW/cm²

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue date:
Customer:
Model:

FCC Part 15/IC RSS Certification
USKRM-10002705
11898A-10002705
18-0382
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Matrix Designs
RM-10002705

RF Exposure Evaluation – IC

According to RSS-102, 2.5.2 Exemption Limits for Routine Evaluation

At or above 300 MHz and below 6 GHz and the source based time averaged maximum EIRP of the device is equal to or less than $1.31 \times 10^{-2} \times f^{0.6834}$ in Watts (adjusted for tune up tolerance where applicable), where f= frequency in MHz

For 2.4 GHz Band:

$$\text{Limit} = 1.31 \times 10^{-2} \times 2440^{0.6834} = 2.7 \text{ Watts}$$

$$\text{Max EIRP for WiFi} = 21.37 \text{ dBm} + 1.5 \text{ dB} = 22.87 \text{ dBm} = 193.6 \text{ mW} \ll 2700 \text{ mW}$$

Note: There is no simultaneous operation between Zigbee and WiFi and 433MHz radio.