

MPE Calculation

IC: 20845-STACK002

FCC: 2AGFX-STACK002

Remark: Average $\leq$ Peak, which means that calculating the power density applying Peak power is worst case. The worst case operation mode generating the highest power in each frequency range is taken for calculation. Duty cycle is 100%

Frequency range: 2405-2480 MHz

Typical use distance: $d \geq 20$ cm

Power density limit for mobile devices at 2.4 GHz: $S \leq 10$ W/m²

$$S = PG / (4 * \pi * R^2)$$

where: S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

S	PG in watts	constant	pi	distance in meters	P _{conducted} dBm	mW
0.052933	0.026607	4	3.141593	0.2	9.06	8.053784412
W/m ²	Peak Power			20cm		
0.005293					5.19	3.30369541
mW/cm ²					PG =	26.60725060 mW

Industry Canada RF exposure evaluation is exempt for a separation distance between the user and the device greater than 20 cm as the device operates at or above 1.5 GHz and the e.i.r.p. of the device is equal to or less than 5 W. In this case, the information below contains the RF exposure technical brief that demonstrates how the e.i.r.p. was derived.

The power density from an isotropic source at distance $r = 20$ cm is defined:

$$PD = P / (4 * \pi * r^2)$$

Where P is the total power radiated in watts and r is the distance in meters

Power Density in watts/meter²

Therefore for power at 0.026607 watts

$$PD = 0.052933 \text{ W/m}^2$$

$$PD = 0.005293 \text{ mW/cm}^2$$

The limit for FCC is stated in mW/cm² and IC is stated in W/m². Both limits are the same at 1 mW/cm² or 10 W/m² for the frequency range of 2.4 GHz to 2.4835 GHz.