MPE Calculation

IC: 20845-STACK002

FCC: 2AGFX-STACK002

Remark: Average ≤ 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 ≥ 20 cm

Power density limit for mobile devices at 2.4 GHz: S ≤ 10 W/m^2

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
0.052933	0.026607	4	3.141593	0.2
W/m^2	Peak Power			20cm

$P_{conducted}$ dBm	mW
9.06	8.053784412

$G_{antenna}$ dBi	mW
5.19	3.30369541
PG =	26.60725060 mW

0.005293 mW/cm^2

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 = 20cm is defined:

PD = P / (4 * pi * r2)

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

Power Density in watts/$meter^2$

Therefore for power at 0.026607 watts

PD = 0.052933 W/m^2

PD = 0.005293 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.