RF Exposure Considerations for FCC ID: YVELB1DX

The FCC requires that the calculated MPE be equal to or less than a given limit dependent on frequency at a distance of 20 cm from a device to the body of a user.

The following FCC Rule Parts and procedures are applicable:

Part 1.1310 – Radiofrequency radiation exposure limits

Part 2.1091 – Radiofrequency radiation exposure evaluation: mobile devices

KDB447498 D01 v06
Mobile and Portable Devices RF Exposure Procedures and Equipment Authorisation Policies

MPE CALCULATIONS

The MPE calculation used to calculate the safe operating distance for the user.

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

Where

S = Power density

EIRP = Effective Isotropic Radiated Power (EIRP = P x G)

P = Conducted Transmitter Power

G = Antenna Gain (relative to an isotropic radiator)

R = distance to the centre of radiation of the antenna (safe operating distance)

For BT

Values:

Transmitter frequency range = 2402MHz to 2480MHz

P = 14dBm average max (0.025mW)

G = 2.0dBi (x1.58)

R = 20cm

Power Density Requirement

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310 for 2400MHz

$S = 1.0\ mW/cm^2$

Calculation:

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

$S = 0.025 \times 1.58/(12.56 \times 20^2)$

$S = 0.034/(5024)$

ie:

$S < 1.0\ mW/cm^2$)

For BT LE

Values:

Transmitter frequency range = 2402MHz to 2480MHz

P = 10dBm average max (0.010mW)

G = 2.0dBi (x1.58)

R = 20cm

Power Density Requirement

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310 for 2400MHz

$S = 1.0\ mW/cm^2$

Calculation:

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

$S = 0.01 \times 1.58/(12.56 \times 20^2)$

$S = 0.016/(5024)$

ie:

$S < 1.0\ mW/cm^2$)

For WIFI

Values:

Transmitter frequency range = 2412MHz to 2462MHz

P = 19dBm average max (0.079mW)

G = 2.0dBi (x1.58)

R = 20cm

Power Density Requirement

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310 for 2400MHz

S = 1.0 mW/cm^2

Calculation:

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

$S= 0.079 \times 1.58/(12.56 \times 20^2)$

$S = 0.125/(5024)$

ie:

$S < 1.0$ mW/cm^2)

Conclusion

The required 20cm RF exposure limits for General Population/ Uncontrolled Exposure will not be exceeded for the using antennas having a maximum gain of 2.0dBi.