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RF Exposure Considerations for the 2ALA3-CBUA2D

FCC ID: 2ALA3-CBUA2D

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 transmitter operation for the 2ALA3-CBUA2D covers the 2.4GHz operating band using LE Bluetooth technology

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 is:

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

which can be transposed to:

$$R = \sqrt{EIRP/4\pi S}$$

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 2.4GHz

Power Density Requirement

        From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of
        FCC Rule Part 1.1310 for 2.4GHz

        S_{req1} = 1.0 mW/cm²

Values:

Transmitter frequency range = 2400 MHz to 2480 MHz

P = -9 dBm (+5 dbm) max. (0.398 mW)

G = 2.0 dBi (x1.58)

EIRP = 0.629 mW (= 0.398 mW x 1.58)

S = 1.0 mW/cm²

Calculation:

$$R = \sqrt{0.629 \ mW / 4\pi \ x \ 1.0 \ mW / cm^2}$$

$$R = \sqrt{0.629 \ mW / 12.5664 \ mW / cm^2}$$

$$R = \sqrt{0.050 \ cm^2}$$

$$\boldsymbol{R = 0.224 \ cm}$$

Conclusion

The required 20 cm RF exposure limits for General Population/ Uncontrolled Exposure will not be exceeded for the 2ALA3-CBUA2D using antennas having a maximum gain of 2.0 dBi.