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RF Exposure Considerations for the 2ALA3-CBUASR

FCC ID: 2ALA3-CBUASR

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-CBUASR 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

$$S_{\text{req1}} = 1.0 \text{ mW/cm}^2$$

Values:

Transmitter frequency range = 2400 MHz to 2480 MHz

P = 0 dBm (+3 dbm) max. (2.0 mW)

G = 2.0 dBi (x1.58)

EIRP = 3.16 mW (= 2.0 mW x 1.58)

S = 1.0 mW/cm²

Calculation:

$$R = \sqrt{3.16 \text{ mW} / 4\pi \times 1.0 \text{ mW/cm}^2}$$

$$R = \sqrt{3.16 \text{ mW} / 12.5664 \text{ mW/cm}^2}$$

$$R = \sqrt{0.2515 \text{ cm}^2}$$

$$R = 0.5015 \text{ cm}$$

Conclusion

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