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RF Exposure Considerations for the ZLLLS5004M-01

FCC ID: 2AJR7ZLLLS5004M01

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 ZLLLS5004M-01 covers the 2.4GHz operating band using ZigBee 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:

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

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

Values:

Transmitter frequency range = 2400 MHz to 2483.5 MHz

P = 3.16mW (+5.0dBm) max.

G = 2.2dBi (x1.66)

R = 20cm

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/cm^2

Calculation:

$S = 3.16 \times 1.66/4 \pi R^2$

$S = 5.25/(12.56 \times 20^2)$

$S = 5.25/(5024)$

S <1.0 mW/cm^2

Conclusion

The required 20cm RF exposure limits for General Population/ Uncontrolled Exposure will not be exceeded for the ZLLLS5004M-01 using antennas having a maximum gain of 2.2 dBi.

Yours faithfully,

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