MPE Calculation - Contains FCC ID: 2BLGZ-MK5LINK

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 MK5 LINK covers the 2.4GHz operating bands.

Simultaneous transmission is not supported between any of the transmitters.

The following FCC Rule Parts are applicable:

Part 1.1310 – Radiofrequency radiation exposure limits
Part 2.1091(c) – Radiofrequency radiation exposure evaluation: mobile devices

CALCULATION

The following far field power density equation is applicable:

$$S = EIRP/(4 * \pi * R^2)$$

Where S = Power density

EIRP = Effective Isotropic Radiated Power (EIRP = P * 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)

Calculation for 2.4GHz BT LE:

Values:

Transmitter frequency range = 2402 – 2480MHz

P = 12.0dBm (including max. tune up tolerance)

G = 3.1dBi

EIRP = 15.1dBm = 32.4 mW

R = 20cm

Power Density Requirement

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

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

Calculation:

$S = EIRP/(4 * \pi * R^2)$

$= 32.4/(4 * \pi * 20^2)$

$S_1 = 0.006$

(Equivalent to 1.61 cm safe operating distance)

Calculation for 2.4GHz WLAN

Values:

Transmitter frequency range = 2412 – 2462MHz

P = 18 dBm (including max. tune up tolerance)

G = 3.1 dBi

EIRP = 21.1dBm = 129 mW

R = 20cm

Power Density Requirement

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

$S_{req2} = 1.0\ mW/cm^2$

Calculation:

$S = EIRP/(4 * \pi * R^2)$

$= 129/(4 \times \pi \times 20^2)$

$S_2 = 0.0257$

(Equivalent to 3.20 cm safe operating distance)

Conclusion

The required 20cm RF exposure limits for General Population/ Uncontrolled Exposure FCC Rule Part 1.1310 limits will not be exceeded for the MK5 LINK using antennas having a maximum gain of 3.1 dBi.

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26/03/2025