Enabler® LPP FCC MPE Calculation

Revision 1.0

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MPE Calculation for Enfora Enabler® LPP - OET Bulletin 65

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 **Enabler LPP** (**LPP0108-40**) radio module covers GSM850 and PCS1900 operating bands.

The MPE calculation as given in FCC OET Bulletin 65, page 19 is used to calculate the safe operating distance for the user.

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

Where S = Power density
EIRP = Effective Isotropically 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

Summary Conclusion

The required 20cm RF exposure limits for General Population / Uncontrolled Exposure FCC Rule Part 1.1310 will not be exceeded for the **Enabler LPP** using antennas having a maximum gain of 1.4dBi (850MHz) and 7.0dBi (1900MHz) respectively.

For the Enabler LPP @ GSM850

Requirement: From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310 for GSM850

$S = f/1500$ mW/cm^2 (f = operating frequency)

Transmitter frequency range = 824MHz to 849MHz

Max. Transmitter Power = 33dBm (2.0W) @ antenna socket

$S = 824/1500 = 0.55$ mW/cm^2 (worst case)

Calculation to Determine Maximum Antenna Gain (G)

$S = 0.55$ mW/cm^2
$P = 2000$mW
$R = 20$cm

$S = PxG/4 \pi R^2$
$G = S \times (4 \pi R^2) / P$
$G = 0.55 \times (12.56 \times 20^2) / 2000$
$G = 1.38$ (1.40dBi)

For the Enabler LPP @ GSM1900

Requirement: From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310 for PCS1900

$S = f/1500$ mW/cm^2 (f = operating frequency)

Transmitter frequency range = 1850MHz to 1910MHz

Max. Transmitter Power = 30dBm (1.0W) @ antenna socket

$S = 1.0$ mW/cm^2 (worst case)

Calculation to determine maximum Antenns Gain (G)

$S = 1.0$ mW/cm^2
$P = 1000$mW
$R = 20$cm

$S = P \times G / (4 \pi R^2)$
$G = S \times (4 \pi R^2) / P$
$G = 1 \times (12.56 \times 20^2) / 1000$
$G = 5.02$ (7.0dBi)