MPE Calculation / RF Exposure

Product: Bluetooth module
Applicant: Telechips
Model: TCM3903
Address: 19~23 Floor, Luther Building, 7-20 Sincheon-dong, Songpa-gu, Seoul, 138-240, Korea
FCC ID: 2ALS3-3903
IC: 22661-3903

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 the device to the body of the user. According to §2.1091, §2.1093 and §1.1307(b), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Classfication The antenna of this product is at least 20 cm away from the body of the user. So this product is classified as mobile device.

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

Where

S = Power density

EIRP = Effective Isotropically Radiated Power

R = distance to the centre of radiation of the antenna

Values

S = 1.0 mW/cm^2 for General population uncontrolled exposure (FCC Part 1.1310 Radiofrequency radiation exposure limits)

S = 1.0 mW/cm^2

PT(LE) = 2.70 dBm (1.86 mW) : measured maximum output power

PT(BDR/EDR) = 2.195 dBm(1.66 mW) : measured maximum output power

G = Antenna gain = 1.3 dBi (1.349 in linear terms)

EIRP = PT x G

R = 20 cm

Calculation

EIRP(LE) = 1.86 x 1.349 = 2.51 mW

S(LE) = 2.51/12.56 x $(20)^2$ = 2.51/5024

S(LE) = 0.0005 mW/cm^2

EIRP(BDR/EDR) = 1.66 x 1.349 = 2.24 mW

S(BDR/EDR) = 2.24/12.56 x $(20)^2$= 2.24/5024

S(BDR/EDR) = 0.00044 mW/cm^2

Conclusion **This confirms compliance to the required radio frequency radiation exposure limit of 1.0 mW/cm^2 at 20 cm operation.**