

MPE CALCULATION

RF Exposure Requirements:	47 CFR §1.1307(b)
RF Radiation Exposure Limits:	47 CFR §1.1310
RF Radiation Exposure Guidelines:	FCC OST/OET Bulletin Number 65
EUT Frequency Band:	902.75-927.25 MHz, 2402-2480 MHz, 2412 - 2462 MHz; 5180 - 5825MHz
Limits for General Population/Uncontrolled Exposure in the band of:	300-1500 MHz, 1500 - 100,000 MHz
Power Density Limit:	0.62 mW / cm ² (300-1500 MHz), 1 mW / cm ² (2402-2480 MHz, 2412 - 2462 MHz; 5180 - 5825MHz)

Equation: $S = PG / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$

Where, S = Power Density

P = Power Input to Antenna

G = Antenna Gain

R = distance to the center of radiated antenna

Prediction distance 20cm

BT-ZBR radio (2402-2480MHz): Power = -4.0 dBm, antenna gain = 3.81 dBi, Power density = 0.00019 mW/cm²

WLAN N radio (2412-2462MHz): Power = 16.37 dBm, antenna gain = 2.2 dBi, Power density = 0.014 mW/cm²

WLAN N radio (5180-5825MHz): Power = 16.28 dBm, antenna gain = 5.0 dBi, Power density = 0.0267 mW/cm²

UHF RFID (902.75-927.25MHz): Power = 28.11dBm, Antenna gain= -36dBi, Power density=0.000032 mW/cm²

BT and N radio can work simultaneously, so the total ratio of MPE is,

$$\text{Total Ratio of BT + N radio } 2.4\text{GHz + RFID} = (P_{\text{RFID}}/0.62) + (P_{\text{N Radio}}/1) + (P_{\text{BT}}/1) = 0.00019/1 + 0.014/1 + 0.000032/0.62 = 0.01424 < 1$$

$$\text{Total Ratio of BT + N radio } 5\text{GHz + RFID} = (P_{\text{RFID}}/0.62) + (P_{\text{N Radio}}/1) + (P_{\text{BT}}/1) = 0.00019/1 + 0.0267/1 + 0.000032/0.62 = 0.02694 < 1$$

Maximum MPE is 0.02694, which is less than 1.

The Above Result had shown that Device complied with MPE requirement.

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