



Project No.: SZ1105052

Evaluation of RF Exposure for AP-BX-GX Wireless Communication Module

In this application we seek approval to the AP-BX-GX fixed wireless phone for use in mobile configuration. Based on the FCC OET Bulletin 65 Supplement C and 47CFR 2.1091, we have concluded that the AP-BX-GX will comply with the FCC rules on RF exposure for mobile devices if the antenna gain does not exceed 0dBi in GSM and PCS band. The following analysis will demonstrate such compliance.

Operation in cellular band (824-849MHz)

The peak conducted output power of AP-BX-GX in cellular band is 31.98dBm. Take the worst case as an example, in which an antenna with 2dBi gain is used. The resulted power density at a distance of 20cm can be deducted as follows:

$$\begin{aligned} \text{EIRP} &= 31.98 + 2 = 33.98 = 2500 \text{mW} \\ \text{Power Density} &= \text{EIRP} * \text{DutyCycle} / 4 \pi R^2 \\ &= 2500 * 0.5 (4 \pi R^2) \\ &= 0.25 \text{mW/cm}^2 \end{aligned}$$

where DutyCycle is 0.5 for GPRS class 12 and R is 20cm

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 824 / 1500 = 0.55 \text{mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore AP-BX-GX in Cellular band is compliant with the FCC rules on RF exposure.

Operation in cellular band (1850-1910MHz)

The peak conducted output power of AP-BX-GX in cellular band is 28.69dBm. Take the worst case as an example, in which an antenna with 2dBi gain is used. The resulted ERP can be expressed as follows:

$$\text{ERP} = 28.69 + 2 - 2.15 = 28.54 \text{dBm} = 0.71 \text{W} < 3 \text{W}$$

The FCC OET Bulletin 65 Supplement C states that mobile devices identified in 47 CFR 2.1091 that operate at frequencies above 1.5GHz with an ERP OF 3.0 watts or more are required to perform routine environmental evaluation for RF exposure prior to equipment authorization or use; otherwise, they are categorically excluded.

As we can see this resulted ERP is below 3W, therefore routine environmental evaluation for RF exposure prior to equipment authorization or use for AP-BX-GX in PCS band is categorically excluded.