



## Evaluation of RF Exposure for G610 Wireless Communication Module

In this application we seek approval to the G610 modular wireless module for use in mobile configuration. Based on the FCC OET Bulletin 65 Supplement C and 47CFR 2.1091, we have concluded that the G610 will comply with the FCC rules on RF exposure for mobile devices if the antenna gain does not exceed 2dBi in GSM and PCS band. The following analysis will demonstrate such compliance. The analysis will be done in two US bands.

### Operation in cellular band( 824-849MHz)

The peak conducted output power of G610 in cellular band is 34.21dBm. 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:

$$\begin{aligned} \text{EIRP} &= 32.19 + 2 = 34.19 = 2624 \text{mW} \\ \text{Power Density} &= \text{EIRP} * \text{DutyCycle} / 4 \pi R^2 \\ &= 2624 * 0.25 / (4 \pi R^2) \\ &= 0.13 \text{mW/cm}^2 \end{aligned}$$

where DutyCycle is 0.25 for GPRS class 10 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 G610 in Cellular band is compliant with the FCC rules on RF exposure.

### Operation in cellular band (1850-1910MHz)

The peak conducted output power of G610 in cellular band is 29.37dBm. Take the worst case as an example, in which an antenna with 2dBi gain is used. The resulted ERP can be expressed as follows:

$$\text{ERP} = 29.37 + 2 - 2.15 = 29.22 \text{dBm} = 0.836 \text{W} < 3 \text{W}$$

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 G610 in PCS band is categorically excluded.