

Evaluation of RF Exposure for SB555 Embedded Modem

The SB555 embedded modem is properly defined as a mobile device per 47 CFR §2.1091, which states that mobile devices are defined as transmitters designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between radiating antennas and the body of the user or nearby persons. The FCC OET Bulletin 65 Supplement C states that mobile devices identified in 47 CFR §2.1091 that operate at 1.5 GHz or below with an effective radiated power (ERP) of 1.5 watts or more, or those that operate at frequencies above 1.5 GHz 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. The following analysis will demonstrate compliance with the FCC rules on RF exposure. Since the SB555 embedded modem is a dual band device, the analysis will be done in both bands.

Operation in cellular band (824 – 849 MHz)

The maximum conducted output power of SB555 is 23.5 dBm. Take the worst case as an example, in which an antenna with 10 dBi gain is used. The resulted ERP can be expressed as follows:

$$\text{ERP} = 23.5 + 10 - 2.15 = 31.35 \text{ dBm (1.36 W)} < 1.5 \text{ W}$$

As we can see this resulted ERP is below 1.5 W, therefore routine environmental evaluation for RF exposure prior to equipment authorization or use for SB555 in cellular band is categorically excluded.

Operation in PCS band (1850 – 1910 MHz)

The maximum conducted output power of SB555 is 23.5 dBm. In order to satisfy the EIRP limit under Part 24, the antenna peak gain can not exceed 9.5 dBi. Take the worst case as an example, in which an antenna with 9.5 dBi gain is used. The resulted ERP can be expressed as follows:

$$\text{ERP} = 23.5 + 9.5 - 2.15 = 30.85 \text{ dBm (1.22 W)} < 3 \text{ W}$$

As we can see this resulted ERP is below 3 W, therefore routine environmental evaluation for RF exposure prior to equipment authorization or use for SB555 in PCS band is also categorically excluded.

In summary, the analysis shown above has clearly demonstrated that routine environmental evaluation for RF exposure prior to equipment authorization or use for the SB555 embedded modem is categorically excluded if the peak gain of the antenna does not exceed 10 dBi in cellular band and 9 dBi in PCS band.