

RF Exposure information

The ES7502HC_B is classified as mobile.

The ES7502HC_B includes transmitters operating according to FCC part 15 subpart C section 15.231 and section 15.247 (DTS) and also single modular approved transmitter FCC ID:RI7LE910NAV2 (GSM module).

The standard section 15.231 does not contain RF Exposure limits.

The FCC power density limit for general population/uncontrolled exposure is 1 mW/cm² for 2.4 GHz (BLE).

Limit for power density for general population/uncontrolled exposure is 1 mW/cm² for 1500 -100000 MHz frequency range.

The power density **P (mW/cm²) = $P_T / 4\pi r^2$**

P_T is the transmitted power, which is equal to the peak transmitter output power 13.68 dBm plus maximum antenna gain 2 dBi, the maximum equivalent isotropically radiated power EIRP is

$$P_T = 15.68 \text{ dBm} = 36.98 \text{ mW}.$$

The power density at 20 cm (minimum safe distance, required for mobile devices), calculated as follows:

$$36.98 \text{ mW} / 4\pi (20 \text{ cm})^2 = 0.00736 \text{ mW/cm}^2 \ll 1 \text{ mW/cm}^2$$

Maximum conducted output power given in FCC ID: RI7LE910NAV2 module grant is 232 mW (23.7 dBm) in 1852.4-1907.6 MHz and 229 mW (23.6 dBm) in 826.4-846.6 MHz band.

Limit for power density is $f/1500 = 0.56 \text{ mW/cm}^2$ for 824-849 MHz and 1 mW/cm² for 1500 -100000 MHz frequency range for general population/uncontrolled exposure.

The gain of antenna used with the module in the control panel is (-2) dBi.

The maximum equivalent isotropically radiated power EIRP is

$$P_T = 23.7 \text{ dBm} - 2 \text{ dBi} = 21.7 \text{ dBm} = 147.9 \text{ mW (in 1852.4-1907.6 MHz)}$$

$$P_T = 23.6 \text{ dBm} - 2 \text{ dBi} = 21.6 \text{ dBm} = 144.5 \text{ mW (in 826.4-846.6 MHz)}$$

The power density at 20 cm is calculated as follows:

$$144.5 \text{ mW} / 4\pi (20 \text{ cm})^2 = 0.029 \text{ mW/cm}^2 < 0.56 \text{ mW/cm}^2$$

$$147.9 \text{ mW} / 4\pi (20 \text{ cm})^2 = 0.03 \text{ mW/cm}^2 < 1 \text{ mW/cm}^2$$

Assessment of RF hazard from BLE and GSM module

$$S1/\text{Limit} + S2/\text{Limit} + S3/\text{Limit} < 1, \text{ i.e}$$

$$0.00736/1 + 0.029/0.56 + 0.03/1 = 0.0891 < 1$$

The aggregated ratio of transmit power to the relevant power limits does not exceed 100 % and meets the safety requirements.