

Federal Communication Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

Attention: Reviewing Engineer

RE: RF exposure information for the equipment GC864-QUAD and GC864-PY (FCC ID: RI7GC864)

RF exposure information

The device RI7GC864 is designed as module to be installed in other devices. This device is to be used only for fixed and mobile applications. If the final product after integration is intended for portable use, a new application and FCC is required.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all the persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Power Density (mW/cm ²)	Averaging Time (minutes)
300 – 1500	f/1500	30
1500 – 100.000	1.0	30

The equipment RI7GC864 transmits in the following frequency ranges so that the applicable limits are:

Frequency range	Limit
1850.2 - 1909.8 MHz	1 mW/cm ²
824.2 - 848.8 MHz	0.54 mW/cm ²

The equipment is a GPRS Class 10, so the maximum duty cycle is $2/8 = 1/4$

Under conditions stated above MPE limits can be guaranteed as the calculation below shows:

850 MHz frequency band

Maximum conducted output power: 2.06 W

Duty cycle: 1/4

Equivalent conducted output power = Maximum conducted output power x Duty cycle = 2.06 W x

1/4 = 0.515 W = 515 mW

Maximum antenna gain (as stated in the User's guide) = 3 dBi (numerical gain)

Using the equation:

$$S = P \cdot G / 4 \cdot \pi \cdot R^2$$

Where,

S = power density in mW/cm²

P = power input to the antenna in mW

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna in cm (20 cm Prediction distance)

$$S = 515 \text{ mW} \cdot 2 / 4 \cdot \pi \cdot (20 \text{ cm})^2 = 0.21 \text{ mW/cm}^2 < 0.54 \text{ mW/cm}^2 \text{ (limit)}$$

1900 MHz frequency band

Maximum conducted output power: 0.90 W

Duty cycle: 1/4

Equivalent conducted output power = Maximum conducted output power x Duty cycle = 0.90 W x 1/4 = 0.225 W = 225 mW

Maximum antenna gain (as stated in the User's guide) = 3 dBi (numerical gain)

Using the equation:

$$S = P \cdot G / 4 \cdot \pi \cdot R^2$$

Where,

S = power density in mW/cm²

P = power input to the antenna in mW

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna in cm (20 cm Prediction distance)

$$S = 225 \text{ mW} \cdot 2 / 4 \cdot \pi \cdot (20 \text{ cm})^2 = 0.089 \text{ mW/cm}^2 < 1 \text{ mW/cm}^2 \text{ (limit)}$$

These predictions demonstrate that:

The power density levels at a distance of 20 cm with typical antennas of a gain of less than 3 dBi are below the maximum levels allowed by the FCC rules.

Conclusion:

The equipment RI7GC864 complies with the MPE limits if used with antennas with a gain of less than 3 dBi and this antenna is installed to provide a separation distance of at least 20 cm from all the persons.

Warning:

To ensure the compliance with the MPE limits the antenna gain has been limited in page 17 of the user's guide and a warning statement has been included in page 56.

Signed on behalf of Telit Communications S.p.A. by



P.A.

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