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

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Attention: Reviewing Engineer

RE: RF exposure information for the equipment GE863-SIM (FCC ID: RI7GE863S)

RF exposure information

The device GE863-SIM (FCC ID: RI7GE863S) is designed as module in order to be installed in other devices.

This device is to be used only for mobile and fixed application.

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

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

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm2)	Averaging time (minutes)
300–1500	....	....	f/1500	30
1500–100,000	....	....	1.0	30

The equipment GE863-SIM transmits in the following frequency ranges so that the applicable limits are:

Frequency range   ***Limit***

 824.2 - 848.8 MHz   0.54 mW/cm^2
1850.2 - 1909.8 MHz   1   mW/cm^2

The equipment is a *GPRS Class 10*, so the maximum duty cicle is 2/8 = 1/4.
Under conditions stated above, MPE limits can be guaranteed as the calculation shows below:

850 MHz frequency band

Maximum conducted output power: 2.06 W (33.13 dBm)
Duty cycle: 1/4
Equivalent conducted output power = Maximum conducted output power x Duty cycle =
                  = 2.06 W x 1/4 = 515 mW
Maximum antenna gain (as stated in the User Guide) = 3 dBi (numerical gain)

Using the equation:

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

Where,

S = power density in mW/cm^2
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)

$S = 515$ mW $\cdot 2 / 4 \cdot pi \cdot (20$ cm$)^2 = 0.21$ mW/cm$^2 < 1$ mW/cm^2 (limit)

1900 MHz frequency band

Maximum conducted output power: 0.90 W (29.55 dBm)
Duty cycle: 1/4
Equivalent conducted output power = Maximum conducted output power x Duty cycle =
                  = 0.90 W x 1/4 = 225 mW
Maximum antenna gain (as stated in the User Guide) = 3 dBi (numerical gain)

Using the equation:

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

Where,

S = power density in mW/cm^2
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)

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

These predictions demonstrate that:

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

Conclusion:

The equipment GE863-SIM complies with the MPE limits if used with antennas with a gain of less than 3dBi and this antenna is installed to provide a separation distance of at least 20 cm from all the people.

Warning:

To ensure the compliance with the MPE limits the antenna gain has been limited in page 30 of the Hardware User Guide, and a warning statement has been included in:

a. Hardware User Guide,   page 78
b. Technical specifications, last page

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

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