

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

Attention: Reviewing Engineer

RE: RF exposure information for the equipment GM682PCS (FCC ID: RI7GM862P)

RF exposure information

The device GM862PCS (FCC ID: RI7GM862P) 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/cm²)	Averaging Time (minutes)
300 – 1500	f/1500	30
1500 – 100.000	1.0	30

The equipment GM862PCS transmits in the 1850.2 – 1909.8 MHz frequency range, so the applicable MPE limit is 1 mW/cm².

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

Conducted peak outupt power = 29.27 dBm at 1850.2 MHz = 845.28 mW

Using Equation from page 18 of OET Bulletin 65, Edition 97-01:

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

Where,

S = power density in mW/cm² (1 mW/cm² used for G)

P = power input to the antena

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)

We obtain the following results:

Antenna gain (dBi)	P·G - EIRP (dBm)	P·G - EIRP (mW)	R - Prediction distance (cm)	S - Power density (mW/cm ²)
0	29.27	845.28	20	0.17
1	30.27	1064.14	20	0.21
2	31.27	1339.68	20	0.26
3	32.27	1628.55	20	0.32
4	33.27	2123.24	20	0.42
5	34.27	2673.01	20	0.53
6	35.27	3365.11	20	0.67
7	36.27	4236.43	20	0.84
7.74	37.01	5026.40	20	1

These predictions demonstrate that:

1. The power density levels at a distance of 20 cm with typical antennas of 0-7 dBi are below the maximum levels allowed by the FCC rules.
2. The antenna gain for which 1 mW/cm² limit would be reached at 20 cm distance is 7.74 dBi.

Conclusion:

The equipment GM862PCS complies with the MPE limits if used with antennas with a gain of less than 7.74 dBi and these 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 a warning statement has been included in page 185 of the users manual.