

RF Exposure Evaluation declaration

Product Name : GSM/GPRS modem module

Model No. : Pluto

FCC ID VSYWGM100

Applicant : Winity Technology Inc.

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The declaration results relate only to the samples calculated.

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1. RF Exposure Evaluation

1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b).

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 23°C and 58% RH.

1.3. Test Result of RF Exposure Evaluation

Product : GSM/GPRS modem module
Test Item : RF Exposure Evaluation
Test Site : N/A

Antenna Gain

The Max. gain of the antenna for GSM 850 is -5.12dBi, and the Max. gain of the antenna for PCS1900 is -2.53dBi.

Output Power Into Antenna & RF Exposure Evaluation Distance

Band 850 / GSM

Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
824.2	1282.3306	0.0785
836.4	1345.8604	0.0824
848.8	1402.8137	0.0858

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

Band 850 / GPRS

Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
824.2	1270.5741	0.0778
836.4	1342.7650	0.0822
848.8	1406.0475	0.0860

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

Band 1900 / GSM

Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1850.2	928.9664	0.1032
1880	972.7472	0.1081
1909.8	986.2795	0.1096

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.

Band 1900 / GPRS

Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1850.2	948.4185	0.1054
1880	970.5100	0.1078
1909.8	1025.6519	0.1140

The distance r (4th column) calculated from the Fries transmission formula is far shorter than 20 cm separation requirement.