MPE REPORT

Report No. 2013SAR185

FCC ID:	UDV-SIM900E
Applicant:	Shanghai Simcom Ltd
Product:	GSM/GPRS module
Model:	SIM900E
HW Version:	V1.02
SW Version:	SIM900 R11.0
Issue Date:	2013-07-04

Prepared by: Yin Xiaoming **Reviewed by:** Xue Jianguo **Approved by:** Wang Jianrong (General Manager)

Remark: This report details the results of the testing carried out on the samples specified in this report, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. The report shall be reproduced except in full, without written approval of the Company.

Applicable Standard	**FCC RULES 47 CFR2.1091:** Radiofrequency radiation exposure evaluation: mobile device
	OET65C-97-01: Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
Test Results	Pass

Change History

Version	Change Contents	Author	Date
V1.0	First edition	Yin xiaoming	2013-06-03
V2.0	Page10, add detailed calculation for MPE.	Yin xiaoming	2013-06-27
V3.0	Page10, update antenna gain for evaluation.	Yin xiaoming	2013-07-04

CONTENTS:

1. Test Laboratory

1.1 Testing Location:

Company: Shanghai Tejet Communications Technology Co., Ltd Testing Center.
Address: Room 6205-6208, Building 6, No.399 Cailun Rd. Zhangjiang Hi-Tech Park, Shanghai, China
Post Code : 210203
Tel: +86-21-61650880
Fax: +86-21-61650881
Website: www.tejet.cn

1.2 Laboratory Environment

Temperature	20° C～ 25 ° C
Relative humidity	20%～70%

1.3 Testing date

Test Date: 2012-05-27

2. Client Information

2.1 Applicant information

Company Name:	Shanghai Simcom Ltd.
Address:	Building A, SIM Technology Building,No.633 Jinzhong Road, Changning District,Shanghai
Contact :	xing chen
Email:	xing chen @sim.com
Tel:	021-32523300
Fax:	021-32523020

2.2 Manufacturer Information

Company Name:	Shanghai Simcom Ltd.
Address:	Building A, SIM Technology Building,No.633 Jinzhong Road, Changning District,Shanghai
Contact :	xing chen
Email:	xing chen @sim.com
Tel:	021-32523300
Fax:	021-32523020

3.Equipment Under Test (EUT) and Accessory Equipment (AE)

3.1 Information of EUT

Device type	Initial model	
Product name	GSM/GPRS module	
Device operation configuration:		
IMEI or S/N	860718020000705	
Operating mode(s):	GSM850	
	GSM1900	
Test modulation	(GSM)GMSK	
Rated output power	GSM 850:33dBm	
	GSM1900: 30dBm	
Operating frequency range(s):	Band	Tx(MHz)
	GSM850	824.2～848.8
	GSM1900	1850.2～1909.8
Power class	GSM850: 4,test with power level 5	
	GSM1900: 1,test with power level 0	

4. Reference Documents

4.1 Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
OET65C	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields	1997-01

4.2 RF Exposure Limit

According to OET65C: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation 。

Table 1. *FCC Limits for Maximum Permissible Exposure (MPE)*

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

The maximum permissible exposure for GSM850/1900 is.

BAND	**The** maximum permissible exposure
GSM850	**0.55 W/ m^2**
GSM1900	**1 W/ m^2**

5. Friis Formula

Friis transmission formula : Pd = (Pout*G) *DutyFactor / (4*Pi*r^2)
where
Pd = power density in **mW/cm^2**
Pout = output power to antenna in m**W**
G = gain of antenna in linear scale
Pi = **3.1416**
R = distance between observation point and center of the radiator in **cm**
Pd is the limit of MPE. If we know the maximum Gain of the antenna and the total power input to the antenna, through the calculation, we will know the MPE value at distance 20cm.
Of GSM Duty Factor=1：8.3.

6. Classification

The product under normal use condition is at least 20cm away from the body of the user.

So, this device is classified as Mobile Device.

7. Test Results

7.1 Output Power Into Antenna & RF Exposure value at distance 20cm

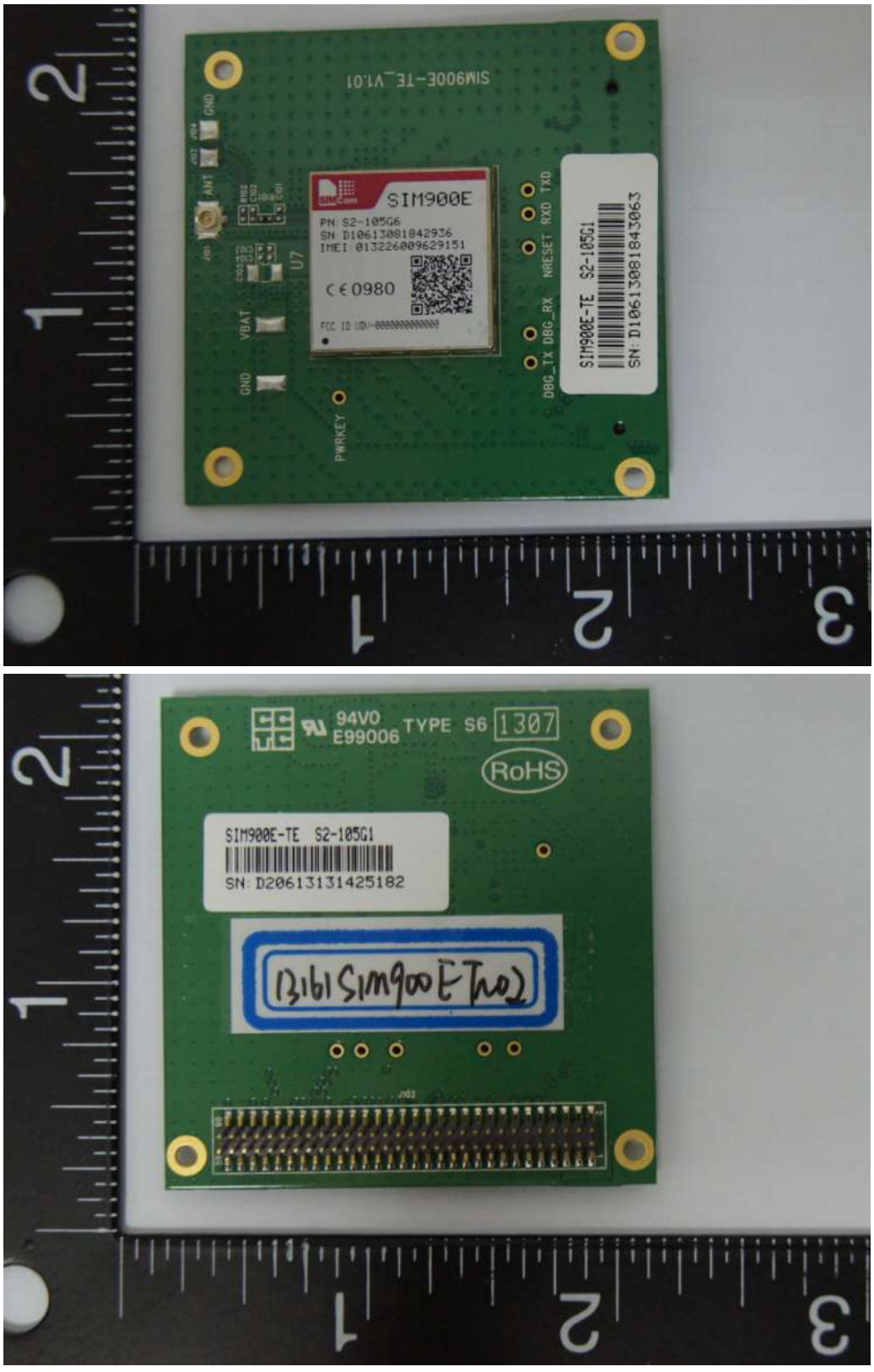
For maximum EIRP,
GSM850=38dBm，
GSM1900=33dBm
Maximum Antenna Gain,
GSM850=38 -33.5 =4.5 dBi
GSM1900=33-30.5=2.5 dBi
So ， the connected antenna gain should be lower than the maximum gain for each band.

Frequency band	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Duty fator	The maximum sourced based time-averaged transmit power(mW)	Calculated RF Exposure	Limit (mW/ cm²)
GSM850	4.5	2.82	33.5	2238.72	0.12	269.73	0.151	**0.55**
GSM1900	2.5	1.78	30.5	1122.02	0.12	135.18	0.048	**1**

For GSM850 , Pd = (Pout*G) *DutyFactor / (4*Pi*r^2)
= (2238.72*2.82)*0.12/(4*3.1416*20^2)
=0.151**(mW/ cm²)**
For GSM1900 , Pd = (Pout*G) *DutyFactor / (4*Pi*r^2)
= (1122.02*1.78)*0.12/(4*3.1416*20^2)
= 0.048**(mW/ cm²)**

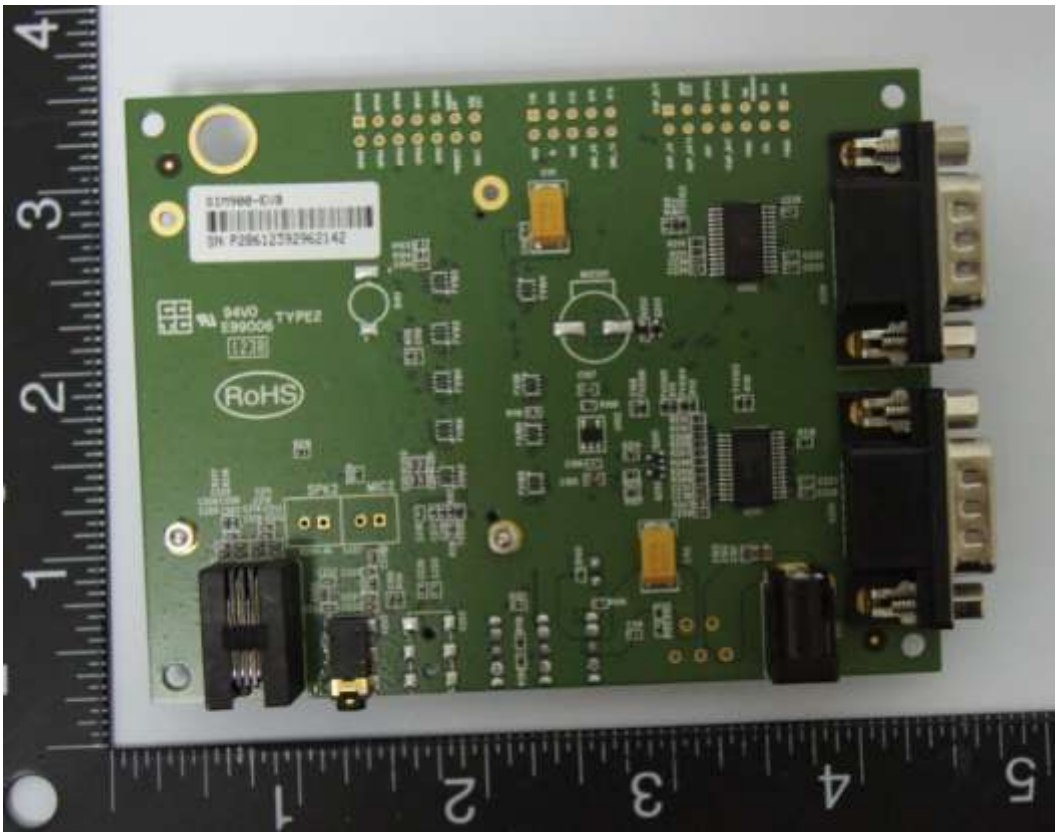
So the limit is kept.

ANNEX A: EUT Photograph



EUT

SIM900E Accessories Photos



ANNEX B: Test Instruments

No.	Name	Type	S/N	Calibration Date	Valid Period
01	BTS	CMU200	121464	Oct 30st, 2012	One year

ANNEX C: Measurement Uncertainty

Expanded uncertainty (confidence interval of 95 %)（k=2）	0.4 dB

----------END OF REPORT----------