MPE REPORT

No. 2013TAR705

for

GSM Quad band module

Model Name: BGS5

with

Hardware Version: B2

Software Version: 00.282

Issued Date: Sep 24th, 2013

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

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1. Test Laboratory

1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No 51, Xueyuan Road, Haidian District, Beijing,P.R.China
Postal Code: 100191
Telephone: 00861062304633
Fax: 00861062304793

1.2. Testing Environment

Normal Temperature: 15-35℃
Relative Humidity: 20-75%

1.3. Project data

Project Leader: Xue Zhen
Testing Start Date: 2013-08-19
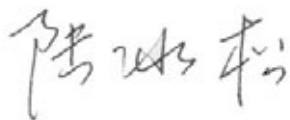Testing End Date: 2013-09-24

1.4. Signature

Xue Zhen

(Prepared this test report)

Song Chongwen

(Reviewed this test report)

Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Gemalto M2M GmbH
Address /Post:	St.-Martin-Str.60, 81541 München Germany
City:	Münche
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Country:	Germany
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2.2. Manufacturer Information

Company Name:	Gemalto M2M GmbH
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Contact Person:	Thorsten.liebig
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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	GSM Quad band module
Model name	BGS5
Marketing name	Cinterion BGS5
UMTS Frequency Band	N/A
GSM Frequency Band	850/900/1800/1900
Power Class	GSM850/900/1800/1900: 4/4/1/1
GPRS Class	Class 12
EGPRS Class	N/A
Extreme Temperature	-10/+55℃
Normal Voltage	3.8V
Extreme Low Voltage	3.3V
Extreme High Voltage	4.5V

Note1: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N01	004401080937622	B2	00.282	2013/06/25
N07	004401080934777	B2	00.282	2013/06/25
N04	004401080936418	B2	00.282	2013/06/25
N10	004401080937531	B2	00.282	2013/06/25
N09	004401080935170	B2	01.000	2013/09/20

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description	SN
AE1	RF cable	---
AE2	Charger	---

*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1. Reference Documents for testing

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

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

OET Bulletin 65 (Edition 97-01) and Supplement C(Edition 01-01): Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.

447498 23 D01 General RF Exposure Guidance v05: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

Canadian RSS-102 standard for uncontrolled environment requires the RF-exposure value in W/m^2 unit, therefore the MPE limit value determined in mW/cm^2 unit, should be multiplied by 10 to have the required unit. The MPE limits are the same like on FCC §1.1301 at table 1.

5. RF Exposure Limit

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

6. Friis Formula

Friis transmission formula : Pd = (Pout*G) / (4*Pi*r^2)

where

Pd = power density in **W/m^2**

Pout = output power to antenna in **W**

G = gain of antenna in linear scale

Pi = **3.1416**

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

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.

7. Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as Mobile Device.

8. Test Results

8.1. the maximum antenna gain

The reference antenna gain for external antenna is
GSM 850: 2.15 dBi
GSM1900: 2.15 dBi

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

Conducted Output power calculation:

mode	timeslot	Duty cycle	Peak Output Power (dBm)	Average Output Power(dBm)
GSM 850	1 slot	12.5%	33.7	24.67
GPRS 850	1 slot	12.5%	34	24.97
GPRS 850	2 slots	25%	32.86	26.84
GPRS 850	3 slots	37.5%	31.49	27.23
GPRS 850	4 slots	50%	30.23	27.22
GSM 1900	1 slot	12.5%	29.7	20.67
GPRS 1900	1 slot	12.5%	29.83	20.80
GPRS 1900	2 slots	25%	27.47	21.45
GPRS 1900	3 slots	37.5%	26.38	22.12
GPRS 1900	4 slots	50%	24.86	21.85

So the worst cases for each frequency band are:

Frequency band	Average Output Power(dBm)	Antenna gain(dBi)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
GSM 850	27.23	2.15	0.17	0.57
GSM 1900	22.12	2.15	0.05	1

So the limit is kept.

END OF REPORT