

MPE TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID: UK4JTGM-1100

Equipment Under Test : Vehicle Fleet Management Service System
Model Name : JTGM-1100
Serial No. : N/A
Applicant : Jastec Co., Ltd.
Manufacturer : Jastec Co., Ltd.
Date of Test(s) : 2013.04.26 ~ 2013.04.30
Date of Issue : 2013.06.12

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Alvin Kim

Date:

2013.06.12

Approved By:



Feel Jeong

Date:

2013.06.12

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 3FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

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1.2. Details of Applicant

Applicant : Jastec Co., Ltd.

Address : 92-7 Kumgok-Dong, Boondang-Gu, Seongnam-Si, Gyeonggi-Do, 463-804, KOREA

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1.3. Description of EUT

| | |
|--------------------|---|
| Kind of Product | Vehicle Fleet Management Service System |
| Model Name | JTGM-1100 |
| Serial Number | N/A |
| Power Supply | DC 12 V (power source used on vehicle) |
| Frequency Range | GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1 850.2 MHz ~ 1 909.8 MHz |
| Number of Channels | GSM850 : 125 GSM1900 : 300 |
| Class of GPRS | Class 10, Class B |
| Antenna Type | Inverted F Antenna |
| Antenna Gain | GSM850 : 0.93 dB i GSM1900 : 5.10 dB i |

1.4. Test report revision

| Revision | Report number | Description |
|----------|------------------------|-------------------------------|
| 0 | F690501/RF-RTL006497 | Initial |
| 1 | F690501/RF-RTL006497-1 | Add max power tolerance value |

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2. RF Exposure Evaluation

2.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

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 |
|---|---------------------------------|-------------------------------------|--|--------------|
| (A) Limits for Occupational /Control Exposures | | | | |
| 300 – 1 500 | -- | -- | F/300 | 6 |
| 1 500 – 100 000 | -- | -- | 5 | 6 |
| (B) Limits for General Population/Uncontrol Exposures | | | | |
| 300 – 1 500 | -- | -- | F/1500 | 6 |
| 1 500 – 100 000 | -- | -- | 1 | 30 |

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

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 the limit of MPE, F/1500 mW/cm² and 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 where the MPE limit is reached.

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2.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data

Test Mode : Normal Operation

2.1.3. Output Power into Antenna & RF Exposure Evaluation Distance

GSM850(GPRS)

| | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Duty Cycle (%) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|-----------|--|---------------------|----------------|--|------------------------------|
| Max power | 32.50 | 0.93 | 12.5 | 0.054 782 | 0.55 |

GSM850(GPRS)

| Channel | Channel Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Duty Cycle (%) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|---------|-------------------------|--|---------------------|----------------|--|------------------------------|
| Low | 824.2 | 32.08 | 0.93 | 12.5 | 0.049 732 | 0.55 |
| Middle | 836.6 | 32.16 | 0.93 | 12.5 | 0.050 657 | 0.56 |
| High | 848.8 | 32.18 | 0.93 | 12.5 | 0.050 891 | 0.57 |

GSM850(EGPRS)

| Channel | Channel Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Duty Cycle (%) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|---------|-------------------------|--|---------------------|----------------|--|------------------------------|
| Low | 824.2 | 26.54 | 0.93 | 12.5 | 0.013 888 | 0.55 |
| Middle | 836.6 | 26.33 | 0.93 | 12.5 | 0.013 232 | 0.56 |
| High | 848.8 | 26.36 | 0.93 | 12.5 | 0.013 324 | 0.57 |

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GSM1900(GPRS)

| | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Duty Cycle (%) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|-----------|--|---------------------|----------------|--|------------------------------|
| Max power | 30.50 | 5.10 | 25 | 0.143 440 | 1 |

GSM1900(GPRS)

| Channel | Channel Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Duty Cycle (%) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|---------|-------------------------|--|---------------------|----------------|--|------------------------------|
| Low | 1850.2 | 29.27 | 5.10 | 25 | 0.136 041 | 1 |
| Middle | 1880.0 | 29.36 | 5.10 | 25 | 0.138 890 | 1 |
| High | 1909.8 | 29.25 | 5.10 | 25 | 0.135 416 | 1 |

GSM1900(EGPRS)

| Channel | Channel Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Duty Cycle (%) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|---------|-------------------------|--|---------------------|----------------|--|------------------------------|
| Low | 1850.2 | 25.50 | 5.10 | 25 | 0.057 104 | 1 |
| Middle | 1880.0 | 25.62 | 5.10 | 25 | 0.058 704 | 1 |
| High | 1909.8 | 25.52 | 5.10 | 25 | 0.057 368 | 1 |

Note :

1. The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of F/1500 mW/cm² and 1 mW/cm².

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