

# TEST REPORT

of

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

FCC ID: YZP-VL3010

Equipment Under Test : Telematics Modem  
Model Name : LTD-VL3010  
Applicant : LG Innotek Co., Ltd.  
Manufacturer : LG Innotek Co., Ltd.  
Date of Receipt : 2018.12.18  
Date of Test(s) : 2018.12.20 ~ 2019.01.31  
Date of Issue : 2019.02.12

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

Tested By:



Murphy Kim

Date:

2019.02.12

Technical  
Manager:



Hyunchae You

Date:

2019.02.12

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SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

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## 1. General information

### 1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

-Wireless Div. 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

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>.

Phone No. : +82 31 688 0901

Fax No. : +82 31 688 0921

### 1.2. Details of applicant

Applicant : LG Innotek Co., Ltd.

Address : 26, Hanamsandan 5beon-ro, Gwangsan-gu, Gwangju, 62229, Korea

Contact Person : Jeong, In-Chang

Phone No. : +82 62 950 0332

### 1.3. Details of manufacturer

Company : Same as applicant

Address : Same as applicant

### 1.4. Description of EUT

|                 |                                                                                                                                                                                                             |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kind of Product | Telematics Modem                                                                                                                                                                                            |
| Model Name      | LTD-VL3010                                                                                                                                                                                                  |
| Power Supply    | DC 4.0 V                                                                                                                                                                                                    |
| Frequency Range | CDMA BC0: 824 MHz ~ 849 MHz<br>CDMA BC1: 1 850 MHz ~ 1 910 MHz<br>LTE Band 2: 1 850 MHz ~ 1 910 MHz<br>LTE Band 4: 1 710 MHz ~ 1 755 MHz<br>LTE Band 5: 824 MHz ~ 849 MHz<br>LTE Band 13: 777 MHz ~ 787 MHz |
| Antenna Type    | Dipole Antenna                                                                                                                                                                                              |
| Antenna Gain    | 824 MHz ~ 849 MHz: 4.5 dB i,<br>1 850 MHz ~ 1 910 MHz: 2.0 dB i,<br>1 710 MHz ~ 1 755 MHz: 2.0 dB i,<br>777 MHz ~ 787 MHz: 4.5 dB i                                                                         |

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## 1.5. Test report revision

| Revision | Report number        | Date of Issue | Description |
|----------|----------------------|---------------|-------------|
| 0        | F690501/RF-RTL013503 | 2019.02.12    | Initial     |

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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

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz)                                   | Electric Field Strength(V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time     |
|---------------------------------------------------------|------------------------------|-------------------------------|-------------------------------------|------------------|
| (A) Limits for Occupational/Controlled Exposure         |                              |                               |                                     |                  |
| 0.3 – 3.0                                               | 614                          | 1.63                          | *100                                | 6                |
| 3.0 – 30                                                | 1842/f                       | 4.89/f                        | *900/f <sup>2</sup>                 | 6                |
| 30 – 300                                                | 61.4                         | 0.163                         | 1.0                                 | 6                |
| 300 – 1 500                                             | -                            | -                             | f/300                               | 6                |
| 1 500 – 100 000                                         | -                            | -                             | 5                                   | 6                |
| (B) Limits for General Population/Uncontrolled Exposure |                              |                               |                                     |                  |
| 0.3 – 1.34                                              | 614                          | 1.63                          | *100                                | 30               |
| 1.34 – 30                                               | 824/f                        | 2.19/f                        | *180/f <sup>2</sup>                 | 30               |
| 30 – 300                                                | 27.5                         | 0.073                         | 0.2                                 | 30               |
| <b><u>300 – 1 500</u></b>                               | -                            | -                             | <b><u>f/1500</u></b>                | <b><u>30</u></b> |
| <b><u>1 500 – 100 000</u></b>                           | -                            | -                             | <b><u>1.0</u></b>                   | <b><u>30</u></b> |

#### 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/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

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

$P_d$  the limit of MPE, 1 mW/cm<sup>2</sup>. 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

| Power Index table                                 |              |           |
|---------------------------------------------------|--------------|-----------|
| 1. Maximum output Power (Target Power, Tolerance) |              |           |
|                                                   | Target Power | Tolerance |
| LTE B2, B4, B5, B13                               | 23           | ±2.7      |
| CDMA BC0, BC1                                     | 24           | +1.7/-3.7 |

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### CDMA BC0

#### - Maximum tune up tolerance

| Channel | Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|---------|-----------------|----------------------------------------|---------------------|----------------------------------------------|------------------------------|
| 1013    | 824.70          | 25.7                                   | 4.5                 | 0.208 320                                    | 0.549 800                    |

### CDMA BC1

#### - Maximum tune up tolerance

| Channel | Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|---------|-----------------|----------------------------------------|---------------------|----------------------------------------------|------------------------------|
| 25      | 1 851.25        | 25.7                                   | 2.0                 | 0.117 147                                    | 1                            |

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#### LTE Band 2

##### - Maximum tune up tolerance

| Channel | Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|---------|-----------------|----------------------------------------|---------------------|----------------------------------------------|------------------------------|
| 18607   | 1 850.70        | 25.7                                   | 2.0                 | 0.117 147                                    | 1                            |

#### LTE Band 4

##### - Maximum tune up tolerance

| Channel | Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|---------|-----------------|----------------------------------------|---------------------|----------------------------------------------|------------------------------|
| 19957   | 1 710.70        | 25.7                                   | 2.0                 | 0.117 147                                    | 1                            |

#### LTE Band 5

##### - Maximum tune up tolerance

| Channel | Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|---------|-----------------|----------------------------------------|---------------------|----------------------------------------------|------------------------------|
| 20407   | 824.70          | 25.7                                   | 4.5                 | 0.208 320                                    | 0.549 800                    |

#### LTE Band 13

##### - Maximum tune up tolerance

| Channel | Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|---------|-----------------|----------------------------------------|---------------------|----------------------------------------------|------------------------------|
| 23205   | 779.50          | 25.7                                   | 4.5                 | 0.208 320                                    | 0.519 667                    |

Note:

- The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>.

### - End of the Test Report -

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