

TEST REPORT

of

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

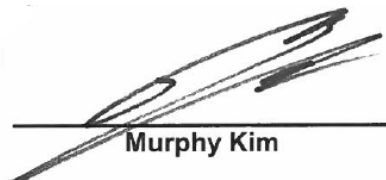
FCC ID: YZP-VL3020

Equipment Under Test : Telematics Module
Model Name : LTD-VL3020
Variant Model Name(s) : -
Applicant : LG Innotek Co., Ltd.
Manufacturer : LG Innotek Co., Ltd.
Date of Receipt : 2020.12.07
Date of Test(s) : 2020.12.07 ~ 2021.01.22
Date of Issue : 2021.02.09

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

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- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.
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Tested by:



Murphy Kim

**Technical
Manager:**



Jungmin Yang

SGS Korea Co., Ltd. Gunpo Laboratory



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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
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- Designation number: KR0150

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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 Module |
| Model Name | LTD-VL3020 |
| Serial Number | ATML4VZH02.KM00 |
| Power Supply | DC 4.0 V |
| Frequency Range | LTE Band 2: 1 850 MHz ~ 1 910 MHz LTE Band 4: 1 710 MHz ~ 1 755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 13: 777 MHz ~ 787 MHz |
| Modulation Technique | QPSK, 16QAM |
| Antenna Type | Dipole Antenna |
| Antenna Gain | 777 MHz ~ 787 MHz: 4.5 dB i 824 MHz ~ 849 MHz: 4.5 dB i 1 850 MHz ~ 1 910 MHz: 2.0 dB i 1 710 MHz ~ 1 755 MHz: 2.0 dB i |
| H/W Version | Rev A.2 |
| S/W Version | 01C_DCUSKU1 |

1.5. Test Report Revision

| Revision | Report Number | Date of Issue | Description |
|----------|----------------------|---------------|-------------|
| 0 | F690501-RF-RTL001669 | 2021.02.10 | Initial |

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 ²) | 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 ² | 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 ² | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| <u>300-1 500</u> | - | - | <u>f/1500</u> | <u>30</u> |
| <u>1 500-100 000</u> | - | - | <u>1.0</u> | <u>30</u> |

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^2

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, $1 mW/cm^2$. 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.

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 | 23dBm | +2.7dBm / -2.7dBm |

LTE Band 2

- Maximum tune up tolerance

| Frequency Range (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|-----------------------|--|---------------------|--|------------------------------|
| 1 850 ~ 1 910 | 25.7 | 2.0 | 0.117 146 | 1 |

LTE Band 4

- Maximum tune up tolerance

| Frequency Range (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|-----------------------|--|---------------------|--|------------------------------|
| 1 710 ~ 1 755 | 25.7 | 2.0 | 0.117 146 | 1 |

LTE Band 5

- Maximum tune up tolerance

| Frequency Range (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|-----------------------|--|---------------------|--|------------------------------|
| 824 ~ 849 | 25.7 | 4.5 | 0.208 319 | 0.549 333 |

LTE Band 13

- Maximum tune up tolerance

| Frequency Range (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm ²) | Limits (mW/cm ²) |
|-----------------------|--|---------------------|--|------------------------------|
| 777 ~ 787 | 25.7 | 4.5 | 0.208 319 | 0.518 000 |

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/cm².
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
- This equipment should be installed and operated with minimum 20 cm between the radiator and your body.
- The antenna gain of this transmitter is less than 6 dBi and must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.
- According to KDB 447498 D01 RF Exposure Guidance 4.1.

- End of the Test Report -