

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:



Hyunchoe 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>

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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

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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 Modem
Model Name	LTD-VL3010
Power Supply	DC 4.0 V
Frequency Range	CDMA BC0: 824 MHz ~ 849 MHz CDMA BC1: 1 850 MHz ~ 1 910 MHz 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
Antenna Type	Dipole Antenna
Antenna Gain	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, 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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RTT5041-19(2017.07.10)(0)

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

A4(210 mm x 297 mm)

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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

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.

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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 ²)	Limits (mW/cm ²)
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 ²)	Limits (mW/cm ²)
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 ²)	Limits (mW/cm ²)
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 ²)	Limits (mW/cm ²)
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 ²)	Limits (mW/cm ²)
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 ²)	Limits (mW/cm ²)
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/cm².

- End of the Test Report -

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