TEST REPORT

of

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

FCC ID: BEJTM13LNNAHK1

Equipment Under Test	:	LTE Module
Model Name	:	TM13LNNAHK1
Applicant	:	LG Electronics USA
Manufacturer	:	LG Electronics USA
Date of Receipt	:	2018.07.10
Date of Test(s)	:	2018.07.27 ~ 2018.10.22
Date of Issue	:	2018.11.23

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

Tested By:  **Date:** **2018.11.23**

Jinhyoung Cho

Technical Manager:  **Date:** **2018.11.23**

Harim Lee

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1. General information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
- Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- Designation number: KR0150

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1.2. Details of applicant

Applicant : LG Electronics USA
Address : 1000 Sylvan Avenue, Englewood Cliffs, New Jersey, United States, 07632
Contact Person : Han, Kyung-su
Phone No. : +2 201 472 2623

1.3. Details of manufacturer

Company : LG Electronics Inc.
Address : 222 LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Korea, 17709

1.4. Description of EUT

Kind of Product	LTE Module
Model Name	TM13LNNAHK1
Power Supply	DC 4.0 V
Frequency Range	CDMA BC0: 824 ㎒ ~ 849 ㎒ CDMA BC1: 1 850 ㎒ ~ 1 910 ㎒ LTE Band 2: 1 850 ㎒ ~ 1 910 ㎒ LTE Band 4: 1 710 ㎒ ~ 1 755 ㎒ LTE Band 5: 824 ㎒ ~ 849 ㎒ LTE Band 13: 777 ㎒ ~ 787 ㎒
Antenna Gain	777 ㎒ ~ 787 ㎒: 4.21 ㏈i, 824 ㎒ ~ 849 ㎒: 5.22 ㏈i, 1 710 ㎒ ~ 1 755 ㎒: 1.40 ㏈i, 1 850 ㎒ ~ 1 910 ㎒: 3.14 ㏈i,

1.5. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL013117	2018.10.30	Initial
1	F690501/RF-RTL013117-1	2018.11.23	Revised CDMA Output Average Power to Antenna

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 (㎒)	Electric Field Strength(V/m)	Magnetic Field Strength (A/m)	Power Density (㎽/㎠)	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
300 – 1 500	-	-	**f/1500**	**30**
1 500 – 100 000	-	-	**1.0**	**30**

2.1.1. Friis transmission formula: Pd = (Pout*G)/(4*pi*R^2)

Where Pd = power density in ㎽/㎠

Pout = output power to antenna in ㎽

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd the limit of MPE, 1 ㎽/㎠. 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

- LTE B2 1800MHz Max TX power : 23+/-2.7 dBm(Power Class3)
- LTE B4 1700MHz Max TX power : 23+/-2.7 dBm(Power Class3)
- LTE B5 800MHz Max TX power : 23+/-2.7 dBm(Power Class3)
- LTE B13 700MHz, Max TX power : 23+/-2.7 dBm(Power Class3)

- CDMA BC0 800MHz : 23.0~25.5 dBm (Power Class3)
- US PCS BC1 1900MHz : 23.0~25.5 dBm (Power Class2)

CDMA BC0
- Maximum tune up tolerance

Channel	Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	Limits (㎽/㎠)
1013	824.70	25.5	5.22	0.234 817	0.549 800

CDMA BC1
- Maximum tune up tolerance

Channel	Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	Limits (㎽/㎠)
25	1 851.25	25.5	3.14	0.145 455	1

LTE Band 2
- Maximum tune up tolerance

Channel	Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	Limits (㎽/㎠)
18607	1 850.70	25.7	3.14	0.152 311	1

LTE Band 4
- Maximum tune up tolerance

Channel	Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	Limits (㎽/㎠)
19957	1 710.70	25.7	1.40	0.102 031	1

LTE Band 5
- Maximum tune up tolerance

Channel	Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	Limits (㎽/㎠)
20407	824.70	25.7	5.22	0.245 884	0.549 800

LTE Band 13
- Maximum tune up tolerance

Channel	Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	Limits (㎽/㎠)
23205	779.50	25.7	4.21	0.194 863	0.519 667

Note :

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

- End of the Test Report -