

TEST REPORT

of

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

FCC ID: BEJRBHP-B213A

1. Equipment Under Test : BT + WIFI Combo Module
2. Model Name : RBHP-B213A
3. Variant Model Name(s) : -
4. Applicant : LG Electronics USA
5. Manufacturer : LG INNOTEK CO., LTD. AUTOMOTIVE COMPONENT & ELECTRONICS BUSINESS UNIT GWANG-JU PLANT
6. Date of Receipt : 2020.01.08
7. Date of Test(s) : 2020.01.09 ~ 2020.03.07
8. Date of Issue : 2020.04.21

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

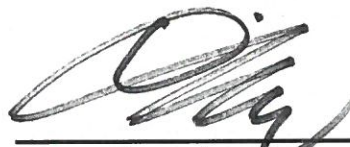
- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

Tested by:



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Report Number: F690501-RF-RTL000427-1

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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

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 : LG Electronics USA

Address : 1000 Sylvan Avenue, Englewood Cliffs, New Jersey, United States, 07632

Contact Person : Han, Kyung-su

Phone No. : +1 201 472 2623

1.3. Details of Manufacturer

Company : LG INNOTEK CO., LTD. AUTOMOTIVE COMPONENT & ELECTRONICS BUSINESS
UNIT GWANG-JU PLANT

Address : (Jangduk-dong) 26, Hanamsandan 5beon-ro, Gwangsan-gu, Gwangju, 62229, Korea

1.4. Description of EUT

Kind of Product		BT + WIFI Combo Module
Model Name		RBHP-B213A
Power Supply		DC 3.3 V
Frequency Range		2 412 MHz ~ 2 462 MHz (11b/g/n_HT20) 5 745 MHz ~ 5 825 MHz (Band 3: 11a/n_HT20, 11ac_VHT20) 5 755 MHz ~ 5 795 MHz (Band 3: 11n_HT40, 11ac_VHT40) 5 775 MHz (Band 3: 11ac_VHT80)
Modulation Technique		DSSS, OFDM
Number of Channels		11 channels (11b/g/n_HT20) 5 channels (Band 3: 11a/n_HT20, 11ac_VHT20) 2 channels (Band 3: 11n_HT40, 11ac_VHT40) 1 channel (Band 3: 11ac_VHT80)
Antenna Type		PCB antenna
Antenna Gain	ANT1	5 745 MHz ~ 5 850 MHz: 0.30 dBi (WLAN 5G)
	ANT2	2 412 MHz ~ 2 462 MHz: 1.60 dBi (WLAN 2.4 G) 5 745 MHz ~ 5 825 MHz: 0 dBi (WLAN 5G)

1.5. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL000427	2020.03.20	Initial
1	F690501-RF-RTL000427-1	2020.04.21	Added the note of the simultaneous transmission

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
300-1 500	-	-	f/1500	30
<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/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, 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.

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

Bluetooth

- Maximum tune up tolerance

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)
2 402 ~ 2 480	4	-1.6	0.000 346	1

WLAN (2.4G)

- Maximum tune up tolerance

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)
2 412 ~ 2 462	19	0.30	0.016 933	1

WLAN (5G)

- Maximum tune up tolerance

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)
5 745 ~ 5 825	15	3.16	0.013 024	1

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 dB i 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.d, Output Average Power to Antenna applied Maximum Tune up power considering tolerance.

Simultaneous transmission of RF Exposure test exclusion for worst case configuration.

Bluetooth: the ratio is 0.000 346 / 1

WLAN (2.4G): the ratio is 0.016 933 / 1

WLAN (5G): the ratio is 0.013 024 / 1

Confirm the sum result of individual MPEs ratio is ≤ 1.0 ;

Bluetooth + WLAN (2.4G) + WLAN (5G): $(0.016\ 933 / 1) + (0.013\ 024 / 1) + (0.000\ 346 / 1)$
= $0.030\ 303 \leq 1.0$

- End of the Test Report -