

# TEST REPORT

of

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

FCC ID: YZP-RBHAT223A

Equipment Under Test : Wi-Fi + BT Combo module  
Model Name : RBHA-T223A  
Applicant : LG INNOTEK CO., LTD.  
Manufacturer : LG INNOTEK CO., LTD.  
Date of Test(s) : 2015.10.08 ~ 2015.11.24  
Date of Issue : 2015.11.30

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

**Tested By:**



Jinhyoung Cho

**Date:**

2015.11.30

**Approved By:**



Denny Ham

**Date:**

2015.11.30

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# INDEX

<u>Table of Contents</u>	Page
1. General Information -----	3
2. RF Exposure Evaluation -----	5

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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>

## 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

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>.

Telephone : +82 31 688 0901

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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 10 2326 9972

### 1.3. Description of EUT

<b>Kind of Product</b>	Wi-Fi + BT Combo module
<b>Model Name</b>	RBHA-T223A
<b>Power Supply</b>	DC 3.3 V
<b>Frequency Range</b>	2 402 MHz ~ 2 480 MHz (Bluetooth, Bluetooth Low Energy), 2 412 MHz ~ 2 462 MHz (11b/g/n_HT20), 2 422 MHz ~ 2 452 MHz (11n_HT40)
<b>Modulation Technique</b>	DSSS, OFDM, GFSK, $\pi/4$ DQPSK, 8DPSK
<b>Number of Channels</b>	79 channel (Bluetooth), 40 channel (Bluetooth Low Energy), 11 channel (11b/g/n_HT20), 7 cahnnel (11n_HT40)
<b>Operation Temperature</b>	-40 °C ~ 85 °C
<b>Antenna Type</b>	Dipole Antenna
<b>Antenna Gain</b>	1.82 dBi

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RTT5041-20(2015.10.01)(3)

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

A4(210 mm x 297 mm)

**1.4. Test report revision**

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL009285	2015.11.25	Initial
1	F690501/RF-RTL009285-1	2015.11.30	Modified applicant address

**1.5. Declaration by the manufacturer**

- WLAN & BT do not transmit simultaneously.

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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
300 – 1 500	-	-	f/1500	30
<b>1 500 – 100 000</b>	-	-	<b>1.0</b>	<b>30</b>

#### 2.1.1. Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

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

BT

- Maximum tune up tolerance

Operating Frequency Range (MHz)	Maximum Average Output 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> )
2 402 ~ 2 480	4	1.82	0.000 760	1

BT LE

- Maximum tune up tolerance

Operating Frequency Range (MHz)	Maximum Average Output 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> )
2 402 ~ 2 480	11	1.82	0.003 808	1

WLAN (2.4G)

- Maximum tune up tolerance

Operating Frequency Range (MHz)	Maximum Average Output 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> )
2 412 ~ 2 462	19	1.82	0.024 029	1

Note :

1. 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>.

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