• **User Manual**

Description
 - Model : RBHA-C213x
 - Bluetooth: v4.0+EDR
 - WLAN : 802.11 b/g/n
 - Frequency Range : 2400MHz ~ 2483.5MHz

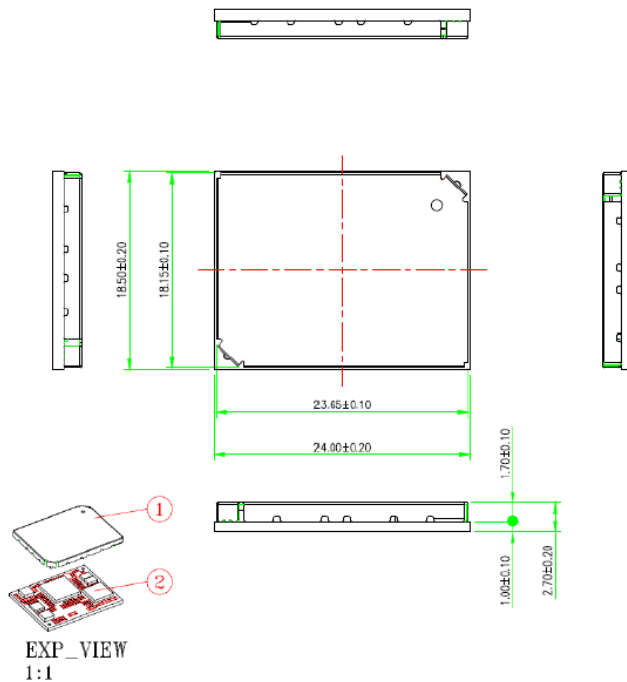### *Features*
 - Dimension : 24.0mm x 18.5mm x 2.7mm
 - Temperature Range : -40℃ ~ +85℃
 - Supply Voltage : VREGIN – 3.1V to 3.6V
 - Output Power
   BT: Typ. +1.5dBm(Class 2)
   WLAN : 12.5dBm(b), 10dBm(g), 10dBm(n),
 - Interface
   SDIO(WLAN), UART(BT),PCM/I2S

Application
  - Automotive

Dimensions

18.50±0.20 18.15±0.10

23.65±0.10
24.00±0.20

1.70±0.10
1.00±0.10 2.70±0.20

① ②
EXP_VIEW
1:1

PART NO.			NAME	MATERIAL	SPEC			FINISH		SIZE
							UNIT	SCALE		
Changes	`15.08.21 Released				DRAW	DSGD	CHKD	APPD	TITLE **User Manual(1/5)**	
NO.	0.1				J S Seo		I P Park	K S Kim	DOCUMENT NO. **RBHA-C213x**	

LG Innotek Co, Ltd

* Power Supply Specification
The power of DC3.1V ~ 3.6V is should be supplied to the Bluetooth module power(VDD). The module supplies the power to the each block depending on the function. Module input power in excess of the rated input power may cause damage to the internal components. And the influx of Surge and ESD also may lead to the damage of the modem in the vehicle. For the prevention of this, the module is necessary to design block the influx of Sugre and EDS.

Pin NO.	Signal Name	Function (Module case)	MIN	TYP	MAX
5,45,46	VDD3V3	In	3.1V	3.3V	3.6V

*Absolute maximum ratings
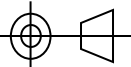
Parameter	Min	Max	Unit
Storage Temperature Range	-40	+105	℃
Supply Voltage : VDD_3V3	3.1	3.6	V
Other Pin Voltages	V_{SS}-0.4	V_{DD}+0.4	V
Input Current	-	600	mA

*Recommended operation conditions

Parameter	Min	Max	Unit
Operating Temperature Range	-40	+85	℃
Supply Voltage : VDD_3V3	3.1	3.6	V

*Current consumption

Parameter	Average	Unit
Stand-by (BT & WLAN)	10	mA
WLAN Continuous Rx	180	mA
WLAN Continuous Tx	400	mA
Bluetooth Connection	50	mA

PART NO.				NAME	MATERIAL	SPEC				FINISH	SIZE
						UNIT		SCALE			
Changes	`15.08.21 Released					DRAW	DSGD	CHKD	APPD	TITLE **User Manual(2/5)**	
NO.	0.1					J S Seo		I P Park	K S Kim	DOCUMENT NO. **RBHA-C213x**	

LG Innotek Co, Ltd

*Boot sequence

VDD3V3

RESET#

T≥0ms

The RESETB pin is an active low reset and is internally filtered using the internal low frequency clock oscillator. A reset in performed between 1 and 5ms following RESETB being active. LGIT recommends that RESETB be applied for a period greater than 10ms between the falling and the rising threshold voltage.

RESETB

10ms

Power-on-reset	Min.	Typ.	Max.	Unit
Falling Threshold	1.13	1.45	1.90	V
Rising Threshold	1.20	1.50	1.95	V
Period	1	10	-	ms

PART NO.				NAME		MATERIAL		SPEC			FINISH		SIZE

							UNIT	SCALE		

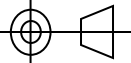| NO. | Changes | `15.08.21 Released | | | | | DRAW | DSGD | CHKD | APPD | TITLE **User Manual(3/5)** |
| 0.1 | | | | | | | J S Seo | | I P Park | K S Kim | DOCUMENT NO. **RBHA-C213x** |

LG Innotek Co, Ltd

General Features

RBHA-C213x satisfies the following standards

1)Bluetooth Features
• Bluetooth Power Class 2
• Embedded Fully Bluetooth v2.0/v2.1 + EDR System Compliant
• Piconet and scatternet support
• Support UART to 4Mbps
• Integrated CSR AuriStream® low-power codec for wide-band voice quality
• Bluetooth v3.0 specification compliant
• Full qualified Bluetooth v4.0 system
• Dual-mode Bluetooth low energy radio
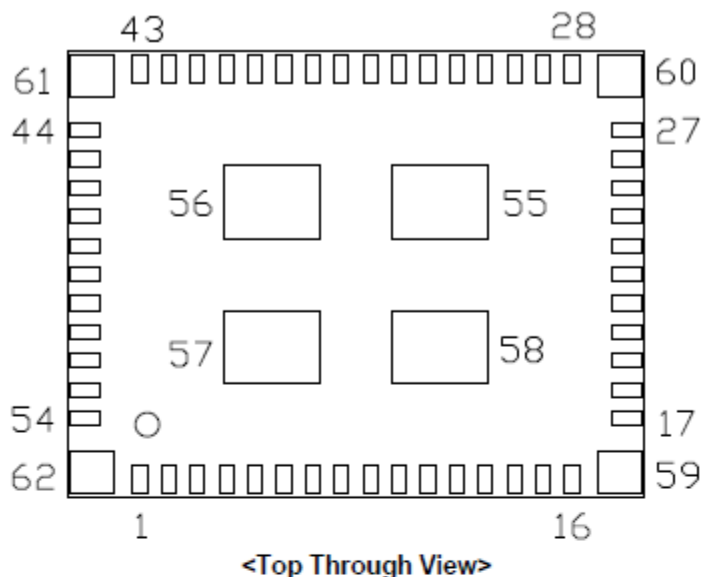• Support for Bluetooth basic rate/EDR and low energy connections

2) WLAN Features
• Support for IEEE 802.11b/g
• Support for IEEE 802.11n(20MHz) single partial stream 2.4GHz
• IEEE 802.11n support, including MPDU and MSDU aggregation, immediate block
acknowledgement, PSMP and STBC.
• Full support for IEEE 802.11 and WFA WPA / WPA2 security.
• SDIO(SD1-bit / SD4-bit) up to maximum burst rate 200Mbit/s(In SD4-bit mode).
• Encryption support for WEP40/64, WEP104/128, TKIP, CCMP (AES), BIP and CKIP
provides functionality for WPA, WPA2, IEEE 802.11i™, IEEE 802.11w™ and CCX
advanced security mechanisms. CSR6030 QFN Automotive adds SMS4 encryption
hardware for WAPI security in China.
• Support Access Point tethering functionality(Soft AP)
• Design for Wi-Fi Direct

PART NO.			NAME	MATERIAL	SPEC				FINISH	SIZE
					⊕ ◁		UNIT	SCALE		
NO.	Changes				DRAW	DSGD	CHKD	APPD	TITLE **User Manual(4/5)**	
0.1	`15.08.21 Released				J S Seo		I P Park	K S Kim	DOCUMENT NO. **RBHA-C213x**	

🅛 LG Innotek Co, Ltd

PIN Description

<Top Through View>
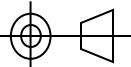
No	Pin Name	Description
1	GND	Ground
2	RF_ANT	WLAN&BT RF Input/Output
3	GND	Ground
4	BT_EEPROM_WP	Bluetooth EEPROM Write-Protect. Internal pull-up. If tied to VSS, normal memory operation is enabled.
5	VDD_3V3_BT	Power supply for CSR8311
6	GND	Ground
7	BT_SPI_CLK	Bluetooth SPI Interface, Serial Peripheral Interface clock
8	BT_SPI_CS#	Bluetooth SPI Interface, Chip select for Synchronous Serial Interface, active low
9	BT_SPI_MOSI	Bluetooth SPI Interface, Serial Peripheral Interface data input
10	BT_SPI_MISO	Bluetooth SPI Interface, Serial Peripheral Interface data output
11	GND	Ground
12	BT_RST#	Bluetooth Reset if low. Input debounced so must be low for >5ms to cause a reset
13	BT_PCM_OUT	Bluetooth PCM Interface, Synchronous data output
14	BT_PCM_SYNC	Bluetooth PCM Interface, Synchronous data sync
15	BT_PCM_CLK	Bluetooth PCM Interface, Synchronous data clock
16	BT_PCM_IN	Bluetooth PCM Interface, Synchronous data input
17	BT_USB_DN	Bluetooth USB Interface, USB data minus
18	BT_USB_DP	Bluetooth USB Interface, USB data plus with selectable internal 1.5Ω pull-up resistor
19	BT_UART_RTS	Bluetooth UART Interface, UART request to send active low
20	BT_UART_Tx	Bluetooth UART Interface, UART data output active high
21	BT_UART_CTS	Bluetooth UART Interface, UART clear to send active low
22	BT_UART_Rx	Bluetooth UART Interface, UART data input active high
23	GND	Ground

PART NO.	NAME	MATERIAL	SPEC				FINISH		SIZE
					UNIT	SCALE			
			DRAW	DSGD	CHKD	APPD	TITLE		
							User Manual(5/5)		
Changes	`15.08.21 Released		J S Seo		I P Park	K S Kim	DOCUMENT NO.		
NO. 0.1							**RBHA-C213x**		

LG Innotek Co, Ltd

PIN Description

No	Pin Name	Description
24	NC	
25	GND	Ground
26	WLAN_EEPROM_WP	WLAN EEPROM Write-Protect. Internal pull-up. If tied to VSS, normal memory operation is enabled.
27	WLAN_PIO[5]	WLAN Programmable digital input/output line
28	WLAN_PIO[4]	WLAN Programmable digital input/output line
29	WLAN_RST#	WLAN Reset if low. Input debounced so must be low for >5ms to cause a reset
30	WLAN_DEBUG_SPI_CLK	WLAN SPI Interface, Serial Peripheral Interface clock
31	WLAN_DEBUG_SPI_MISO	WLAN SPI Interface, Serial Peripheral Interface data output
32	WLAN_DEBUG_SPI_MOSI	WLAN SPI Interface, Serial Peripheral Interface data input
33	WLAN_DEBUG_SPI_CS#	WLAN SPI Interface, Chip select for Synchronous Serial Interface, active low
34	GND	Ground
35	WLAN_SDIO_DATA[2]	WLAN SDIO Interface, SDIO bidirectional data line (not used in CSPI mode)
36	WLAN_SDIO_DATA[3]	WLAN SDIO Interface, SDIO bidirectional data line or CSPI chip select
37	WLAN_SDIO_CLK	WLAN SDIO Interface, SDIO or CSPI clock line
38	WLAN_SDIO_CMD	WLAN SDIO Interface, SDIO bidirectional command line or CSPI MOSI
39	WLAN_SDIO_DATA[0]	WLAN SDIO Interface, SDIO bidirectional data line or CSPI MISO
40	WLAN_SDIO_DATA[1]	WLAN SDIO Interface, SDIO bidirectional data line or CSPI interrupt
41	GND	Ground
42	NC	
43	NC	
44	WLAN_LDO_SD	WLAN LDO Shut-down. Using Power Reset for WLAN 1V8 rail(CSR6030)
45	VDD_3V3_WLAN	Power supply for CSR6030 A10, 1,8V LDO.
46	VDD_3V3_FEM	Power supply for WLAN Front-End Module
47	GND	Ground
48	NC	
49	NC	
50	NC	
51	WLAN_PIO[12]	WLAN Programmable digital input/output line
52	BT_SPI_PCM#_SEL	High switches SPI/PCM lines to SPI, low switches SPI/PCM lines to PCM/PIO use. Internal pull-up set to SPI.
53	NC	
54	NC	
55	GND	Ground
56	GND	Ground
57	GND	Ground
58	GND	Ground
59	GND	Ground
60	GND	Ground
61	GND	Ground
62	GND	Ground

FCC Information

This device complies with part 15 of the FCC Results. Operation is subject to the following two conditions :

    (1) This device may not cause harmful interface, and

    (2) This device must accept any interference received, including interference that

        may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for CLASS B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

1.1. Reorient or relocate the receiving antenna.

1.2. Increase the separation between the equipment and receiver.

1.3. Connect the equipment into an outlet on a circuit different from that to which receiver is connected.

1.4. Consult the dealer or experienced radio/TV technician for help.

WARNING

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

IC Information

This device complies with Industry Canada license-exempt RSS standard(s). Operation in subject to The following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme avec Industrie Canada RSS standard exempts de licence(s), Son utilisation est soumise à Les deux conditions suivantes: (1) cet appareil ne peut pas provoquer d'interférences et (2) cet appareil doit accepter Toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement du dispositif.

Information for OEM Integrator

This device is intended only for OEM integrators under the following conditions:

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and

2) The transmitter module may not be co-located with any other transmitter or antenna.

End product labelling

The label for end product must include "Contains FCC ID: YZP-RBHAC213B, IC ID: 7414A-RBHAC213B".

"CAUTION : Exposure to Radio Frequency Radiation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated with minimum distance of 20cm between the radiator and your body. This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users."

- For external antenna :
  Dipole Antenna and Antenna Max Peak Gain(2.41 dBi)