

User Manual

PRODUCT NAME : RF Module

MODEL NAME : LGSBWAC93

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REV.NO : V1.0

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LGSBWAC93(LGE)**

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1. Features

TWCM-K504D is the small size and low power module for IEEE 802.11ac wireless LAN & BT5.0 + HS. TWCM-K504D is based on Mediatek MT7668AUN solution.

- IEEE 802.11 a/b/g/n/ac Dual Band Dual Concurrent (DBDC)

- Bluetooth 5.0+ HS , BLE

(*This device does not support BT(BT 5.0+ HS, BLE) function as disabled by software.)

- Size : 68.0mm x 30.0 x 7.35 mm

- Two stream spatial multiplexing up to 300Mbps(802.11n) / 867Mbps(802.11ac)

- Use on-chip OTP (One-Time Programmable)

- Host Interface : USB2.0 (WLAN & BT)

- This model is using the common USB2.0 to control WLAN and BT

- Security : WAPI, WEP, WPA, WPA2, WMM, AES, TKIP, CKP

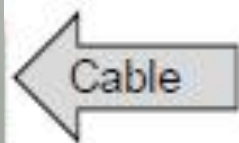
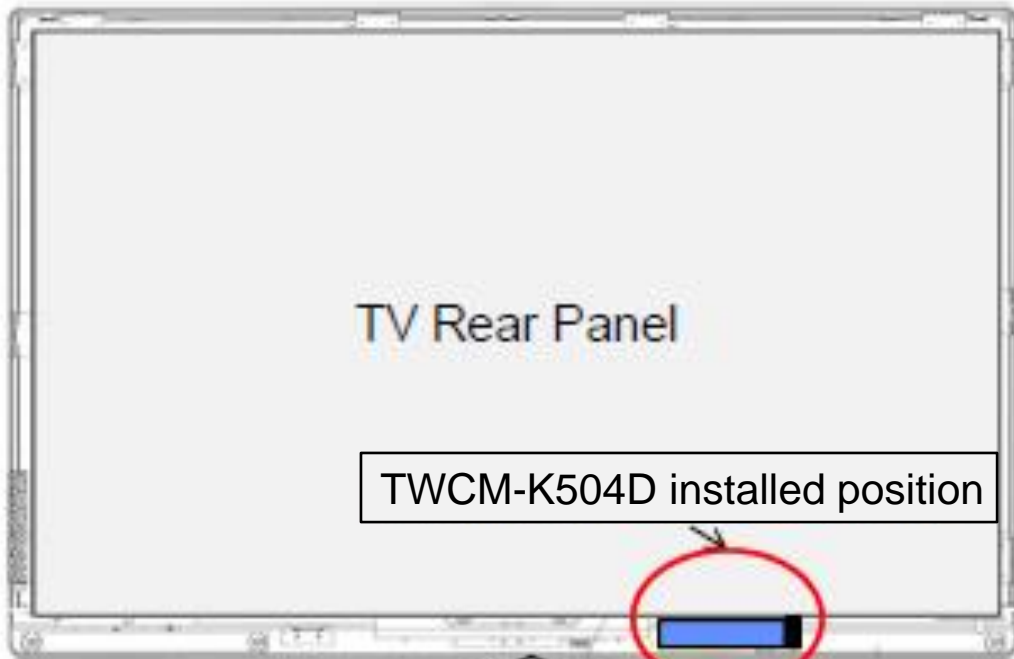
- Application: DTV, DVR, HD DVD Player, Blue-ray Disk Player, STB

2. Picture of Product

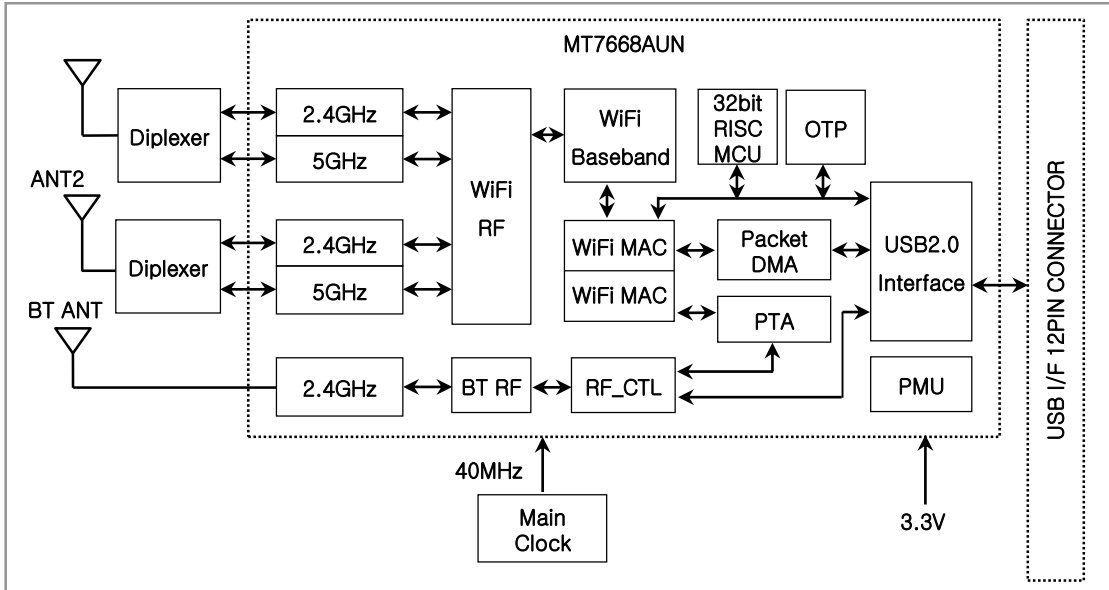


3. Installation Manual

Install the module like below in the back of the TV



4. Block Diagram



5. Absolute Maximum Ratings

Caution : The specifications in Table 1 define levels at which permanent damage to the device can occur. Function operation is not guaranteed under these conditions.

Operating at absolute maximum conditions for extend periods can adversely affect the long-term reliability of the device.

Parameter	Min	Max	Unit
Storage Temperature	-20	+80	°C
Storage Humidity (40°C)	-	90	%

. Other conditions

- 1) Do not use or store modules in the corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are contained.
Also, avoid exposure to moisture.
- 2) Store the modules where the temperature and relative humidity do not exceed 5 to 40°C and 20 to 60%.
- 3) Assemble the modules within 6 months.
Check the soldering ability in case of 6 months over.

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6. Operating Conditions

Parameter	Min	Typ	Max	Unit
Ambient Temperature	0	-	60	°C
Ambient Humidity (40°C)	-	-	85	%
Supply Voltage	3.135	3.3	3.6	Vdc

7. Standard Test Conditions

The Test for electrical specification shall be performed under the following condition
 Otherwise this following conditions, not guaranteed this performance.

7-1. Ambient condition

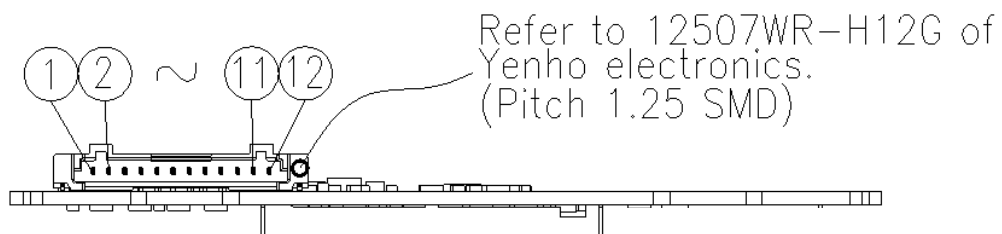
Temperature	25 ± 5°C
Humidity	65 ± 5%

7-2. Power supply voltages

Input Voltage	Supply Voltage
VDD_3.3V	3.135 ~ 3.6V

8. Pin Description

Pin No.	Pin Name	I/O	Pin Description
1	VCC	I	VDD 3.3V
2	D-	I/O	USB Communication signal USB_DN
3	D+	I/O	USB Communication signal USB_DP
4	GND	-	GND
5	WOWL	O	Wake On WLAN
6	VCC	I	VDD 3.3V
7	RESUME	I	SUSPEND_RESUME
8	GND	-	GND
9	RESET	I	Bluetooth device wake up (option)
10	WOBLE	O	Host wake up. (Signal from Wi-Fi module to the host)
11	GND	-	GND
12	VCC	-	VDD 3.3V



9. Outline Drawing

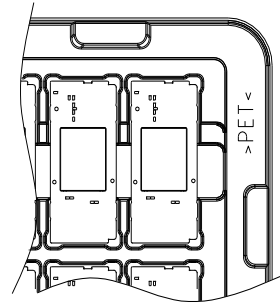
LG Innotek Confidential		2	3	4													
F	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">DIMENSIONAL TOLERANCE</th> </tr> <tr> <td>~ up to 6</td> <td>±0.3</td> </tr> <tr> <td>over 6 up to 30</td> <td>±0.5</td> </tr> <tr> <td>over 30 up to 120</td> <td>±0.5</td> </tr> <tr> <td colspan="2">UNLESS OTHERWISE SPECIFIED</td> </tr> </table>		DIMENSIONAL TOLERANCE		~ up to 6	±0.3	over 6 up to 30	±0.5	over 30 up to 120	±0.5	UNLESS OTHERWISE SPECIFIED		C H A N G E S	REV. NO.	DATE (YY MM DD)	SIGNATURE	CHANGE CONTENTS
	DIMENSIONAL TOLERANCE																
	~ up to 6	±0.3															
	over 6 up to 30	±0.5															
over 30 up to 120	±0.5																
UNLESS OTHERWISE SPECIFIED																	
				A													
				B													
				C													
<p>RELEASING THIS DRAWING WITHOUT PERMISSION OF LG Innotek SHOULD BE ACCUSED ACCORDING TO THE LAWS AND COMPANY RULES</p>																	
<p>Notes</p> <ol style="list-style-type: none"> Tolerances are ±0.3, Radii are 0.5, unless otherwise specified. Lot No. shall be conformed to LGIT standard specification. As long as the outer appearance doesn't affect the performance of the product, it can be changed without prior notice. '[X.XX]' these dimensions inside of the square are cutting area. Label information is based on specification 																	
A	RELATED P/N	 THIRD ANGLE PROJECT	SCALE	UNIT	DESIGN	TITLE											
			1:1	mm	<i>KS Lee</i>	Outline Drawing											
					CHECKED	<i>I.H Park</i>	PART NO										
					APPROVED	MODEL											
					<i>SD Chal</i>	TWCM-K504D											
LGIT_STD A4_VER					2	3	4										
LG Innotek Co., Ltd.																	

All parts which supply to LG Innotek must not contain prohibited substances including RoHS Hazardous substances and for more details refer to LG Innotek's "Manual for management of hazardous substances in Product"

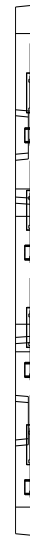
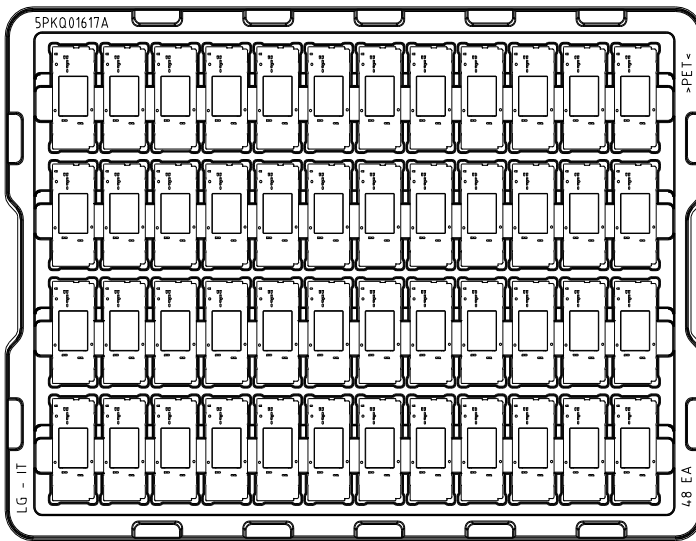
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10. Packing Information

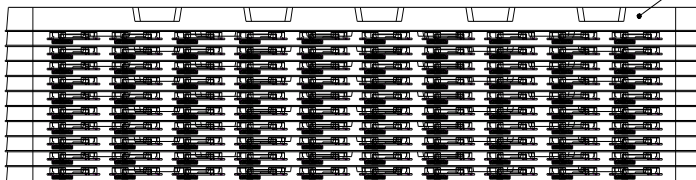
PACKING SPECIFICATION



o Module packing direction



Empty tray on top



Zigzag stack

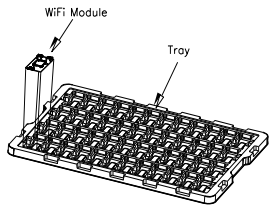
PART NO.		NAME		MATERIAL		SPEC.		FINISH		A4 SIZE
						UNIT mm	SCALE N/A	TWCM-K504D		
						APPD. '19.03.27 Choi Seok Dong.	CHKD. '19.03.27 Lee Kap Soul.	DSGD.	DRAW. '19.03.27 Baskara Bebey	TITLE EXP. Packing Specification
ZONE	SYMB	DATE OR NO.	APPD	CHKD	DSGD			DOCUMENT NO.		1/2

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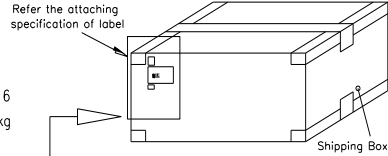
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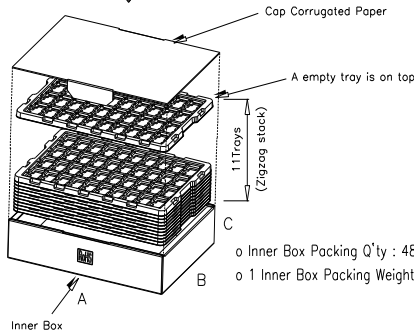
DIMENSIONAL TOLERANCE		C H A N G E S	REV. NO.	DATE (YY MM DD)	SIGNATURE	CHANGE CONTENTS
~ up to 6	±0.3					
over 6 up to 30	±0.5					
over 30 up to 120	±0.5					
UNLESS OTHERWISE SPECIFIED						



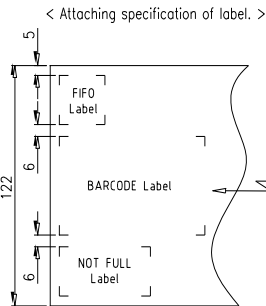
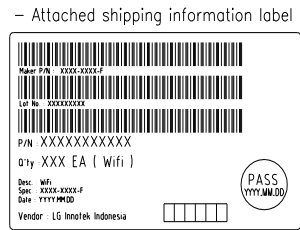
- o 1 Tray Packing Q'ty : 48EA
- o Size : W X D X H : 503 * 355 * 16
- o 1 Tray Packing Weight : 0.6±0.1kg (1 Module Weight : 8.3±1g)



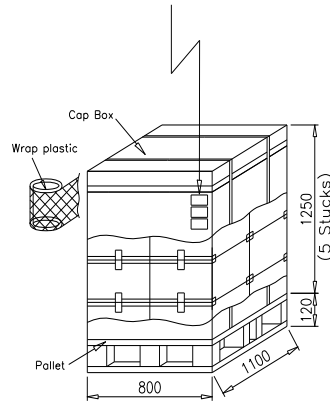
- o Carton Box Packing Q'ty : 960EA
- o Size : W X D X H : 514 * 394 * 243
- o 1 Carton Box Packing Weight : 14.0±0.8kg



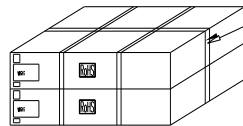
- o Inner Box Packing Q'ty : 480EA
- o 1 Inner Box Packing Weight : 6.6±0.5kg



- Attached inner box label and FIFO label
- "NOT FULL" label attached in inner and outer box if in inner box have loose q'ty.



- (CARTON BOX : 20EA)
- o Box Material : Corrugated Paper
- o Total Packing Q'TY : 19,200EA
- o Total Packing Weight : 295±10kg



A	RELATED P/N	THIRD ANGLE PROJECT	SCALE	UNIT	DESIGN	19.03.27 Baskara Bebey	TITLE	EXP. Packing Specification
			-	mm	CHECKED	19.03.27 Lee Kap Soul.	PART NO	
					APPROVED	19.03.27 Choi Seok Dong.	MODEL	TWCM-K504D
						DWG NO	(2/2)	

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<FCC Compliance>

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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 to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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<Regulatory notice to host manufacturer according to KDB 996369 D03 OEM Manual v01>**2.2 List of applicable FCC rules**

This module has been granted modular approval as below listed FCC rule parts.

- FCC Rule parts 15C(15.247) and 15E(15.407)

2.3 Summarize the specific operational use conditions

- The OEM integrator should use equivalent antennas which is the same type and equal or less gain than an antenna listed in 2.7 in this instruction manual.

2.4 Limited module procedures

- N/A

2.5 Trace antenna designs

- N/A

2.6 RF exposure considerations

The module has been certified for integration into products only by OEM integrators under the following condition:

- The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.
- Mobile use

As long as the three conditions above are met, further transmitter testing will not be required. OEM integrators should provide the minimum separation distance to end users in their end-product manuals.

2.7 Antennas list

This module is certified with the following integrated antenna.

- Type: FPCB antenna (Peak gain (dBi): 2.89 (Ant1) / 2.91 (Ant2))

Any new antenna type, higher gain than listed antenna should be met the requirements of FCC rule 15.203 and 2.1043 as permissive change procedure.

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2.8 Label and compliance information**End Product Labeling**

The module is labeled with its own FCC ID and IC Certification Number. If the FCC ID and IC Certification Number are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

“Contains FCC ID: BEJLGSBWAC93”

“Contains IC: 2703H-LGSBWAC93”

2.9 Information on test modes and additional testing requirements

- OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, additional transmitter in the host, etc.).

2.10 Additional testing, Part 15 Subpart B disclaimer

- The final host product also requires Part 15 subpart B compliance testing with the modular transmitter installed to be properly authorized for operation as a Part 15 digital device.

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2. ISED**RSS-GEN, Sec. 7.1.3– (licence-exempt radio apparatus)**

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure

The antenna (or antennas) must be installed so as to maintain at all times a distance minimum of at least **20 cm** between the radiation source (antenna) and any individual. This device may not be installed or used in conjunction with any other antenna or transmitter.

l'exposition aux RF

L'antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance minimum de au moins **20 cm** entre la source de radiation (l'antenne) et toute personne physique.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment. Attention:

Les changements ou modifications de cet appareil non expressément approuvé par le fabricant peuvent annuler votre droit à utiliser cet équipement.

Étiquetage du produit final (IC)

Le module BT111 est étiqueté avec sa propre identification FCC et son propre numéro de certification IC. Si l'identification FCC et le numéro de certification IC ne sont pas visibles lorsque le module est installé à l'intérieur d'un autre dispositif, la partie externe du dispositif dans lequel le module est installé devra également présenter une étiquette faisant référence au module inclus. Dans ce cas, le produit final devra être étiqueté sur une zone visible avec les informations suivantes :

- « Contient module émetteur identification FCC ID: BEJLGSBWAC93
- « Contient module émetteur IC : 2703H- LGSBWAC93”

“The 5150-5250 MHz band is restricted to indoor use only.”

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3. CE**Simplified EU Declaration of Conformity**

Hereby, LG Electronics Inc. declares that the radio equipment type RF Module is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <http://www.lg.com/global/support/cedoc/cedoc#>

RF Exposure

The antenna (or antennas) must be installed so as to maintain at all times a distance minimum of at least 20 cm between the radiation source (antenna) and any individual. This device may not be installed or used in conjunction with any other antenna or transmitter

The use of the 5150 – 5350 MHz band is restricted to indoor use only. This restriction will be applied in all member states.

Manufacturer name: LG Electronics Inc.

The postal address: LG Electronics European Shared Service Center B.V. Krijgsman 1, 1186 DM Amstelveen, The Netherlands

The host manufacturer has the responsibility that the host device should be compliance with all essential requirement of RED.