

User Manual

PRODUCT NAME : RF Module

MODEL NAME : TWFM-K305D

H/W version : v100

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1. Features

TWFM-K305D is the module for IEEE 802.11b/g/n wireless LAN.

TWFM-K305D is based on MTK MT7601U solution.

- IEEE 802.11 b/g/n single band WLAN infrastructure
- Size : 45mm x 20mm x 10 mm
- Auto-calibration
- 1T2R mode with 150Mbps PHY rate
- USB 2.0 interface
- Supports drivers for Windows 7, Vista, XP, 2000 and Linux
- Security : WFA, WPA, WPA2, WPS2.0, WAPI
- Application : DTV, DVR, HD DVD Player, Blue-ray Disk Player, STB

3. Absolute Maximum Ratings

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

Caution : The specifications above the Table 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.

- 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.

4. Operating Test Conditions

Parameter	Min	Typ	Max	Unit
Operating Temperature ¹⁾	0	-	+65	°C
Operating Humidity (40°C)	-	-	85	%
Supply Voltage	3.15	3.3	3.45	Vdc

¹⁾ It can be applied in condition of TX/RX switching at 1 second intervals

5. Electrical Characteristics

5-1. RF Characteristics for IEEE802.11b (11Mbps mode unless otherwise specified)

Items	Contents			
Specification	IEEE802.11b			
Mode	DSSS/CCK			
Channel frequency	2400 ~ 2483 MHz			
Data rate	1,2,5.5,11Mbps			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level	13	16	19	dBm
Spectrum Mask				
1 st side lobes (to fc \pm 11MHz)	-	-	-30	dBr
2 nd side lobes (to fc \pm 22MHz)	-	-	-50	dBr
Modulation Accuracy (EVM)	-	-	35	%
Power On/Off ramp	-	-	2.0	Usec
Freq. Tolerance	-25	-	25	ppm
Chip Clock Freq. Tolerance	-25	-	25	ppm
RX Characteristics	Min.	Typ.	Max.	Unit
Minimum Input Level Sens. (FER \leq 8%)		-	-76	dBm
Maximum Input Level (FER \leq 8%)	-10	-	-	dBm

* Normal Condition : 25°C, VDD=3.3V.

* RF characteristics is board limit. It can differ according to standards

5-2. RF Characteristics for IEEE802.11g (54Mbps mode unless otherwise specified)

Items	Contents			
Specification	IEEE802.11g			
Mode	OFDM			
Channel frequency	2400 ~ 2483 MHz			
Data rate	6,9,12,18,24,36,48,54Mbps			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level	11	14	17	dBm
Spectrum Mask				
at $f_c \pm 11\text{MHz}$	-	-	-20	dBr
at $f_c \pm 20\text{MHz}$	-	-	-28	dBr
at $f_c \geq \pm 30\text{MHz}$	-	-	-40	dBr
Constellation Error (EVM)	-	-	-25	dB
Freq. Tolerance	-20	-	20	ppm
Chip Clock Freq. Tolerance	-20	-	20	ppm
RX Characteristics	Min.	Typ.	Max.	Unit
Minimum Input Level Sens. (PER \leq 10%)	-	-	-65	dBm
Maximum Input Level (PER \leq 10%)	-20	-	-	dBm

* Normal Condition : 25°C, VDD=3.3V.

* RF characteristics is board limit. It can differ according to standards

5-3. RF Characteristics for IEEE802.11gn (MCS7 mode unless otherwise specified)

Items	Contents			
Specification	IEEE802.11n – 2.4GHz			
Mode	OFDM			
Channel frequency	2400 ~ 2483 MHz			
Data rate	6.5,13,19.5,26,39,52,58.5,65Mbps			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (HT20 : MCS7)	10	13	16	dBm
Power Level (HT40 : MCS7)	10	13	16	dBm
Spectrum Mask (HT20)				
at $f_c \pm 11\text{MHz}$	-	-	-20	dBr
at $f_c \pm 20\text{MHz}$	-	-	-28	dBr
at $f_c \pm 30\text{MHz}$	-	-	-40	dBr
Constellation Error (EVM)	-	-	-28	dB
Freq. Tolerance	-20	-	20	ppm
Chip Clock Freq. Tolerance	-20	-	20	ppm
RX Characteristics	Min.	Typ.	Max.	Unit
Minimum Input Level Sens. (HT20,PER ≤ 10%)	-	-	-64	dBm
Minimum Input Level Sens. (HT40,PER ≤ 10%)	-	-	-61	dBm
Maximum Input Level (PER ≤ 10%)	-20	-	-	dBm

* Normal Condition : 25°C, VDD=3.3V.

* RF characteristics is board limit. It can differ according to standards

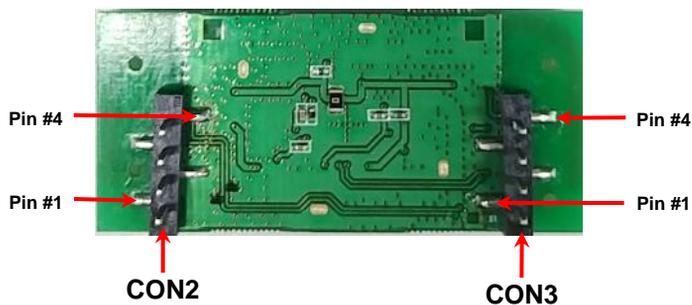
6. Pin Description

Connector	Pin No.	Pin Name	I/O	Pin Description
CON2	1	3_3VD	P	VDD 3.3V
	2	GND	P	Ground
	3	UDM	I/O	USB Communication signal(USB_DN)
	4	UDP	I/O	USB Communication signal(USB_DP)
CON3	1	N/C	-	Not connected
	2	GND	P	Ground
	3	RST_N	-	Reset
	4	WL_WAKE_HOST	-	Wake-up host

< TOP View >



< Bottom View >



Note. Recommend a Module install sequence for prevent USB device failure

- Connect the GND and then supply 3.3V power
- Connect to data signal (USB_DP, USB_DN)

6. Outline Drawing

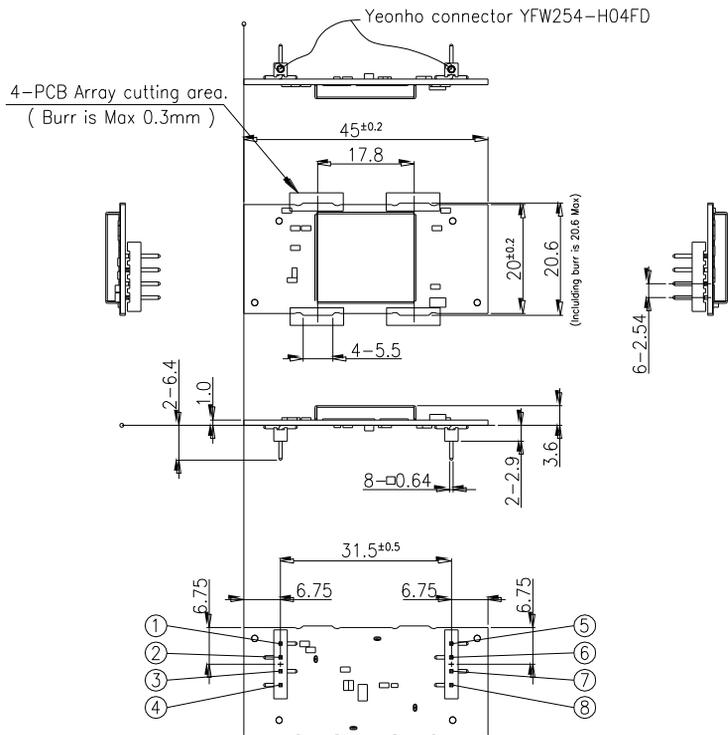
LG Innotek Confidential

DIMENSIONAL TOLERANCE up to 6 ±0.3 over 6 up to 30 ±0.5 over 30 up to 120 ±0.5 UNLESS OTHERWISE SPECIFIED	CHANGES REV. NO. DATE (YY MM DD) SIGNATURE CHANGE CONTENTS	2	3	4
		△		
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RELEASING THIS DRAWING WITHOUT PERMISSION OF LG Innotek SHOULD BE ACCUSED ACCORDING TO THE LAWS AND COMPANY RULES

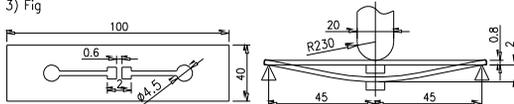
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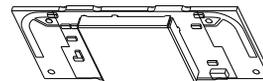


Notes

- Refer to the tolerance table, 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.
- PCB Worpages are max. 0.6mm.
- Label information is based on specification
- Caution for handling.
 - Don't touch the circuit components.
 - Don't drop the wifi module 50cm high. (Allowed 1 time for 50cm high Max)
 - Don't twist the wifi module.
- Reliability for PCB bending.
 - Requirement : No apparent damage
 - Test method : Solder the sample PCB, band down to 2mm
 - Fig



3D View



RELATED P/N THIRD ANGLE PROJECT	SCALE	UNIT	DESIGN	TITLE
	1:1	mm	'18.08.13 KS Lee	Outline Drawing
	APPROVED '18.08.13 SD Chol			PART NO
LG Innotek			CHECKED	MODEL
			'18.08.13 HS Kim	TWFM-K305D
			DWG NO	

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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.

“CAUTION : Exposure to Radio Frequency Radiation.

Antenna shall be mounted in such a manner to minimize the potential for human contact during normal operation. The antenna should not be contacted during operation to avoid the possibility of exceeding the FCC radio frequency exposure limit.

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-TWFMK305D, Contains IC: 7414C-TWFMK305D”.

“ CAUTION: Exposure to Radio Frequency Radiation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should 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.”