GTI-RW610N

IEEE 802.11 ax/ Wi-Fi6 + BLE5.2

Revision History

Revision	Date	Remark
Rev 1.0	Mar 12,2023	Preliminary

Table of contents

1. General Description

The GTI-RW610N is a high performance, low-power Wireless module with highly integrated MCU and Wi-Fi6 + Bluetooth Low Energy (LE) 5.2 radios.

The GTI-RW610N module has MCU subsystem that includes a 260 MHz Arm® Cortex®-M33 core with TrustZone™-M, 1.2 MB on-chip SRAM, and QSPI interface.

1-.1. Wi-Fi 6 Radio

- 1x1, 20MHz, IEEE 802.11ax, 2.4GHz/ 5GHz
- Target wake time, dual carrier modulation and extended range
- Integrated Wi-Fi PA, LNA and T/R switch
- WPA3 security
- Matter over Wi-Fi

1-.2. Bluetooth Low Energy 5.2

- Bluetooth 5.2 certified
- Bluetooth LE 2 Mbit/s high-speed mode, long-range advertising extensions
- Isochronous channels supporting LE Audio
- I2S audio interface
- Integrated PA/ LNA

1-.3. MCU

- 260 MHz ARM Cortex-M33 with TrustZone-M
- On-chip 1.2MB PSRAM
- Quad FlexSPIFlash XIP with on-the-fly decryption
- Flexcommconfigurable as SPI/ I2C/ I2S/ UART
- LCD interface

1-.4. MODULE FUNCTIONS

- 512Mb QSPI Flash memory

- On board dual-band 3D metal antenna
- U.FI connector for alternative 2.4G Wi-Fi or BLE external antenna
- USB2.0 interface
- LCD_SPI interface
- UART via configurable GPIOs
- JTAG via configurable GPIOs
- PWD via configurable GPIOs
- SDIO via configurable GPIOs
- I2S via configurable GPIOs
- SPI via configurable GPIOs
- I2C via configurable GPIOs
- Size: 37x15x6.2 mm
- Pin type: LGA 8x13 pads

1-.5. APPLICATIONS

☐ Industrial

- o Building automation
- o Smart lighting, security
- o Point of Sale (POS) Terminals

☐ Smart Home

- o Smart outlet
- o Sprinkler control
- o Light switch
- o Door lock, doorbell, garage door
- o Security camera
- o Security system
- o Thermostat
- o Smart display

☐ Smart Devices

- o Air purifier
- o Glucometer
- o Pet monitor
- o Blood pressure monitor
- o Weighing scale
- o Fitness equipment

☐ Smart Appliances

- o Refrigerator
- o Washer
- o Dishwasher
- o Dryer
- o Water heater
- o Oven Range
- o Air conditioner
- o Microwave
- o Robotic vacuum cleaner

☐ Smart accessories

- o Smart speakers
- o Headset

- o   Alarm clock
- o   Gaming accessory

- o   Remote control

☐ Gateways

- o   Multi-radio hub
- o   Smart gateway for Internet connectivity

2. GTI-RW610N Module Apperance

2.1. Top side

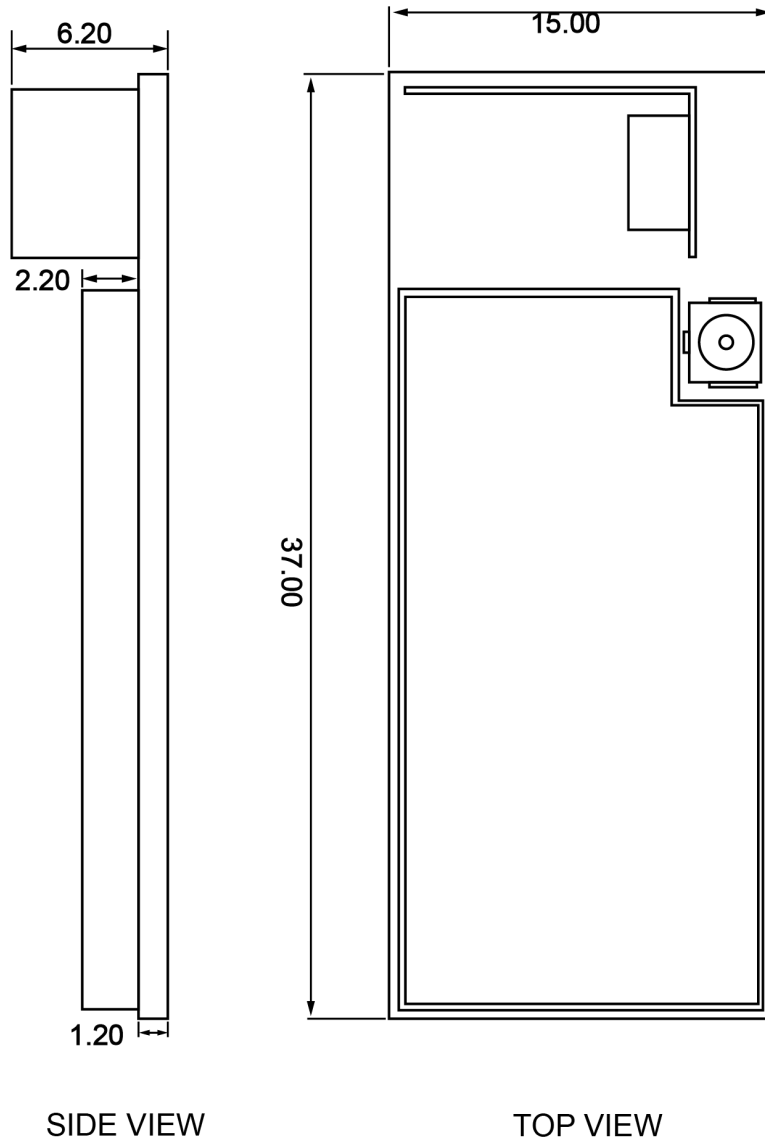External antenna
connector for BLE

3D metal antenna
for Wi-Fi dual band
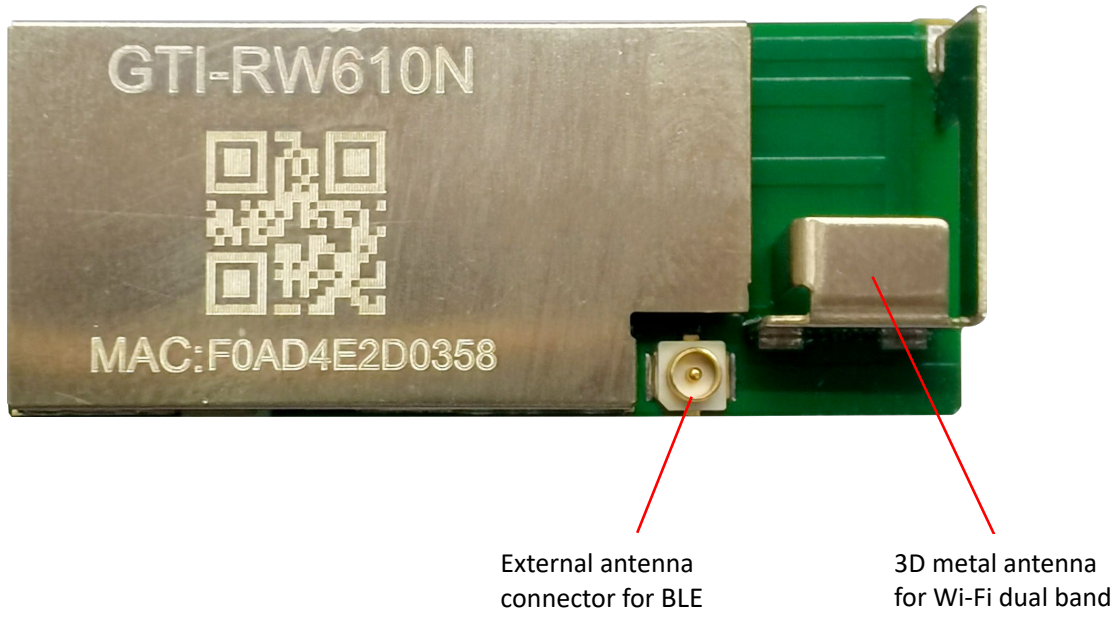
2.2. Bottom side
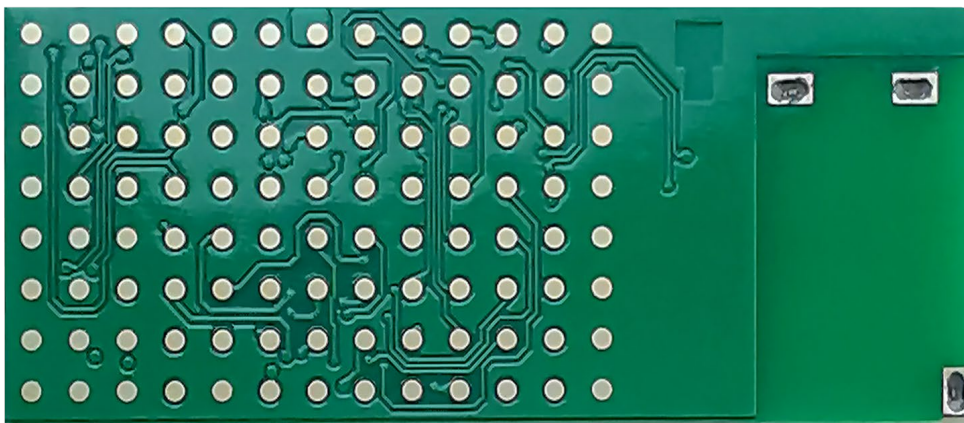
3. Module dimensions and LGA pads

3.1. Module dimensions

SIDE VIEW   TOP VIEW

3.2. Module LGA Pads
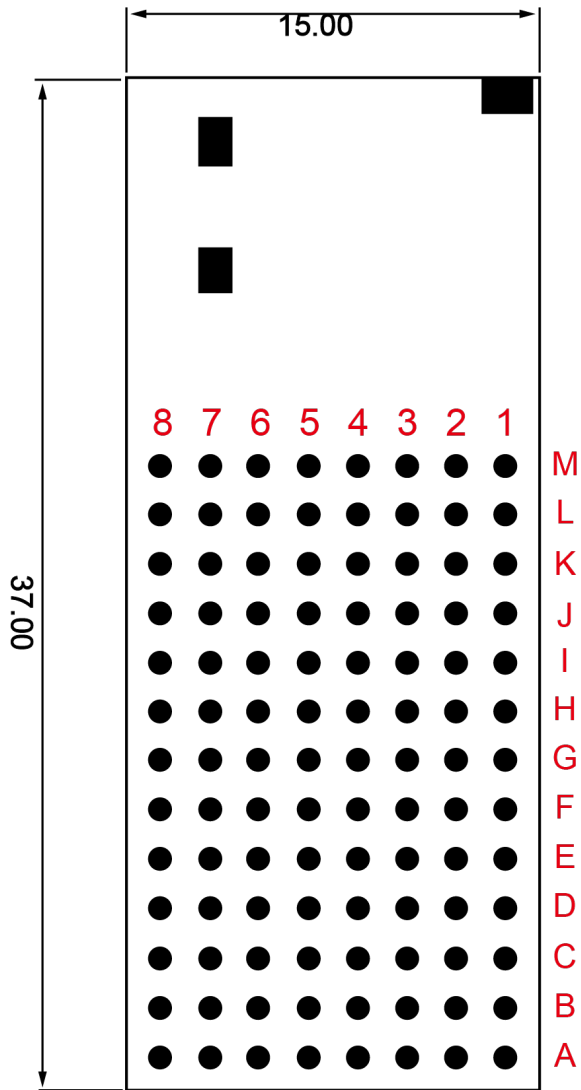
BACK VIEW   8x13 LGA

4. Pin Descriptions

Pad	External Name	Internal GPIO	Description
A1	GND	GND	
A2	GND	GND	
A3	GND	GND	
A4	GND	GND	
A5	GND	GND	
A6	GND	GND	
A7	GND	GND	
A8	GND	GND	
B1	GND	GND	
B2	GND	GND	
B3	GND	GND	
B4	GND	GND	
B5	SPI_D3	GPIO_33	QSPI Data 3/ connected to on board SPI flash
B6	SPI_CS	GPIO_28	QSPI Chip Select (active low)/ to on board SPI flash
B7	NC	VDDIO_2	
B8	GND	GND	
C1	GND	GND	
C2	GND	GND	
C3	XTAL32K_IN	GPIO_22	32k sleep clock in/ connected to on board 32.768KHz xtal
C4	GND	GND	
C5	SPI_CLK	GPIO_34	QSPI Clock/ connected to on board SPI flash
C6	SPI_D1	GPIO_31	QSPI Data 1/ connected to on board SPI flash
C7	NC		NC
C8	GND	GND	
D1	VIO0	VDDIO_0	Note*1
D2	NC	VBUCK_IN	
D3	GPIO_3	GPIO_3	
D4	XTAL32K_OUT	GPIO_23	32K oscillator clock out
D5	SPI_D0	GPIO_30	QSPI Data 0/ connected to on board SPI flash
D6	SPI_D2	GPIO_32	QSPI Data 2/ connected to on board SPI flash
D7	NC	VTR_VDD33	
D8	+1.8V_IBUCK	FLY18_O	+1.8V by internal buck regulator

Note *1

VIO0, VIO1

Extrenal 1.8V or 3.3V VIO power supply for GPIO, VIO_SD and VIO_RF, default is 3.3V

Please see also CH 4. GTI-RW610N Module Schematic Block Diagram

Pin Description (continued)

Pad	External Name	Internal GPIO	Description
E1	GND	GND	
E2	NC		
E3	PDn	RESTNn	Reset (active low)
E4	GPIO_4	GPIO_4	
E5	NC	VDDIO_AON	
E6	NC	GND	
E7	NC	GND	
E8	NC	GND	
F1	GPIO_43	GND	
F2	VIO1	VDDIO_1	Note*1
F3	EXT_GNT	EXT_GNT	External radio grant output signal (mandatory). Note* 2
F4	NC		
F5	NC		
F6	GPIO_27	GPIO_27	
F7	GPIO_26	GPIO_26	
F8	NC	VDDIO_3	
G1	NC	AVDD33	
G2	EXT_REQ	EXT_REQ	Note* 2
G3	GPIO_42	GPIO_42	
G4	LCD_SPI_SS	GPIO_49	
G5	GPIO_24	GPIO_24	
G6	GPIO_25	GPIO_25	
G7	GPIO_29	GPIO_29	
G8	M3V3	VBAT_IN	
H1	NC		
H2	GPIO_50	GPIO_50	
H3	GPIO_2	GPIO_2	
H4	LCD_SPI_SCK	GPIO_48	
H5	NC		
H6	NC		
H7	GPIO_13	GPIO_13	
H8	GPIO_14	GPIO_14	

Note *2

EXT_GNT

External radio grant output signal (mandatory).

EXT_REQ

Request from external radio (mandatory).

Pin Description (continued)

Pad	External Name	Internal GPIO	Description
I1	NC		
I2	EXT_FREQ	EXT_FREQ	Note *3
I3	SD_CMD	GPIO_17	
I4	USB_DP	USB_DP	
I5	USB_DM	USB_DM	
I6	USB_VBUS	USB_VBUS	
I7	SD_CLK	GPIO_15	
I8	USB_IDPIN	USB_IDPIN	
J1	EXT_PRI	EXT_PRI	Note *3
J2	SD_D3	GPIO_16	
J3	SD_D2	GPIO_18	
J4	SD_D1	GPIO_20	
J5	SD_D0	GPIO_19	
J6	GND	GND	
J7	I2S_SCK	GPIO_7	
J8	I2S_TXD	GPIO_8	
K1	NC		
K2	LCD_SPI_DC	GPIO_47	
K3	LCD_SPISDIO	GPIO_46	
K4	LCD_RESET_SPI	GPIO_44	
K5	LCD_TE_SPI	GPIO_45	
K6	I2S_RXD	GPIO_9	
K7	GPIO_5	GPIO_5	
K8	GPIO_10	GPIO_10	

Note *3

EXT_FREQ

External radio frequency input signal (optional) -muxed with WCI-2_SOUT signal of WCI-2 interface. Frequency overlap between external radio and Wi-Fi:
• 1: overlap
• 0: non-overlap
This signal is useful when the external radio is a frequency hopping device.

EXT_PRI

External radio input priority signal (optional)
Priority of the request from the external radio. Can support 1 bit priority (sample once). Can also have Tx/Rx info following the priority info if EXT_STATE is not used.

Pin Description (continued)

Pad	External Name	Internal GPIO	Description
L1	NC		
L2	NC		
L3	NC		
L4	NC		
L5	GPIO_12	GPIO_12	
L6	GPIO_6	GPIO_6	
L7	NC		
L8	GPIO_11	GPIO_11	
M1	GND	GND	
M2	GND	GND	
M3	GND	GND	
M4	GND	GND	
M5	GND	GND	
M6	GND	GND	
M7	GND	GND	
M8	GND	GND	

5. GPIO Mapping for advanced user

Note: This is only for reference

GTI RW-610N module I/O map

GPIO	QSPI	LCD	SDIO	I2S	I2C	UART	SPI
2				FC0_I2S_RXD	FC0_I2C_SDA	FC0_RXD	FC0_MOSI
3				FC0_I2S_TXD	FC0_I2C_SCL	FC0_TXD	FC0_MISO
4				FC0_I2S_SCK		FC0_USART_clock	FC0_SCLK
5						FC0_RTS	
6	JTAG_TCK					FC1_CTS	FC1_SSEL
7	JTAG_TMS			FC1_I2S_SCK		FC1_USART_clock	FC1_SCLK
8	JTAG_TDI			FC1_I2S_TXD	FC1_I2C_SCL	FC1_TXD	FC1_MISO
9	JTAG_TDO			FC1_I2S_RXD	FC1_I2C_SDA	FC1_RXD	FC1_MOSI
10	JTAG_TRSTN					FC1_RTS	
11	GPIO/PWM output 8						
12	GPIO/SD_HOST_INT						
13	SWDIO			FC2_I2S_RXD	FC2_I2C_SDA	FC2_RXD	FC2_MOSI
14	SWCLK			FC2_I2S_TXD	FC2_I2C_SCL	FC2_TXD	FC2_MISO
15			SD_CLK-SDIO	FC2_I2S_SCK		FC2_USART_clock	FC2_SCLK
16			SD_DAT-SDIO		FC2_I2C_SDA(backup)	FC2_CTS	FC2_SSEL
17			SD_CMD-SDIO		FC2_I2C_SCL(backup)	FC2_RTS	
18			SD_DAT-SDIO				
19			SD_DAT-SDIO		FC3_I2C_SCL(backup)	FC3_RTS	
20			SD_DAT-SDIO		FC3_I2C_SDA(backup)	FC3_CTS	FC3_SSEL
22	XTAL32K_IN						
23	XTAL32K_OUT						
24				FC3_I2S_RXD	FC3_I2C_SDA	FC3_RXD	FC3_MOSI
25				FC3_I2S_SCK	FC3_I2C_SCL	FC3_USART_clock	FC3_SCLK
26				FC3_I2S_TXD		FC3_TXD	FC3_MISO

GTI RW-610N module I/O map

GPIO	QSPI	LCD	SDIO	I2S	I2C	UART	SPI
27	GPIO/PWM output 5						
28	QSPI_CS						
29	QSPI_DQS						
30	QSPI_D0						
31	QSPI D1						
32	QSPI_D2						
33	QSPI D3						
34	QSPI_CK						
42	GPIO/ADC0 channel 0						

GTI RW-610N module I/O map

GPIO		QSPI	LCD	SDIO	I2S	I2C	UART	SPI
27	GPIO/PWM output 5							
28		QSPI_CS						
29		QSPI_DQS						
30		QSPI_D0						
31		QSPI D1						
32		QSPI_D2						
33		QSPI D3						
34		QSPI_CK						
42	GPIO/ADC0 channel 0							
43	GPIO/ADC0 channel 1							
44			LCD_RESET_SPI					
45			LCD_TE_SPI					
46			LCD_SPI_SDIO					
47			LCD_SPI_DC					
48			LCD_SPI-SCK					
49			LCD_SPI_SS					
50	GPIO/ADC_DAC_TRIGGER0: Bit 2 of ADC/DACexternal trigger							

Pin 14	USB_DP
Pin 15	USB_DM
Pin 18	USB_ID
Pin 16	USB_VBUS

6. Strap configuration

STRAP
CONFIG

VBAT

R530   10K R0201
R529   NL   R0201
RF_CNTL_0

CON[5]
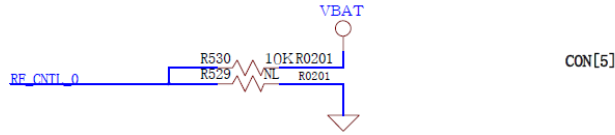
STRAP/CONFIG
TABLE

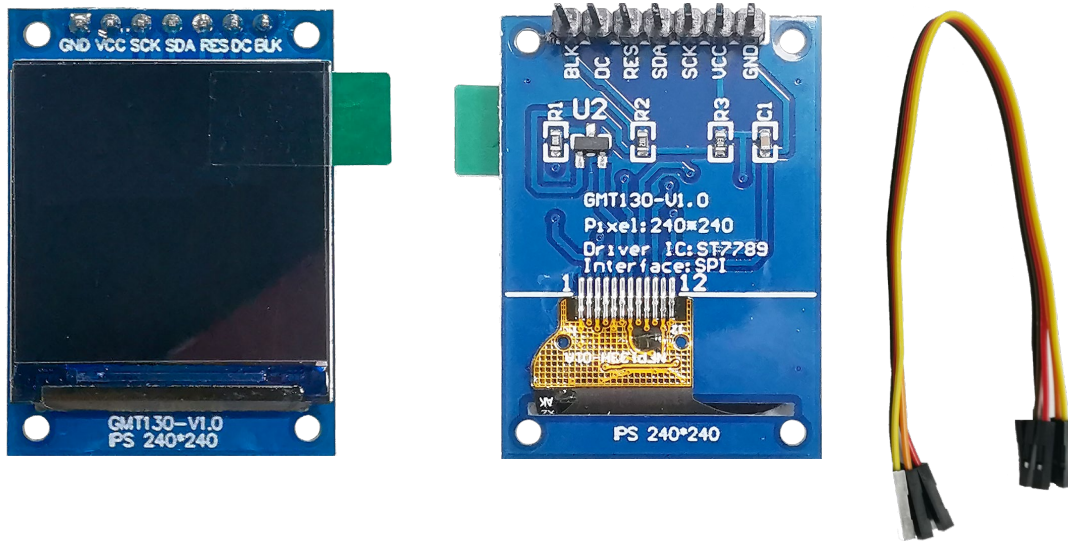| CON	FUNCTION	
[5]	CONFIG XOSC_SEL: RF_CNTL0 1 : 40 MHz (Default) 0 : 38.4 MHz	
[3:0]	CONFIG HOST BOOT[3:0]	
	CON[3:0]	Boot
	1111	Boot from QSPI Flash (Default)
	1110	ISP boot
	1101	Serial Boot
	1100	SDIO boot
	1011	USB boot
	1010	SPI EEPROM boot

CON[3] EXT_FREQ
CON[2] EXT_PRI
CON[1] EXT_GNT
CON[0] EXT_REQ

7. Simple Evaluation Board

7.1 EVB
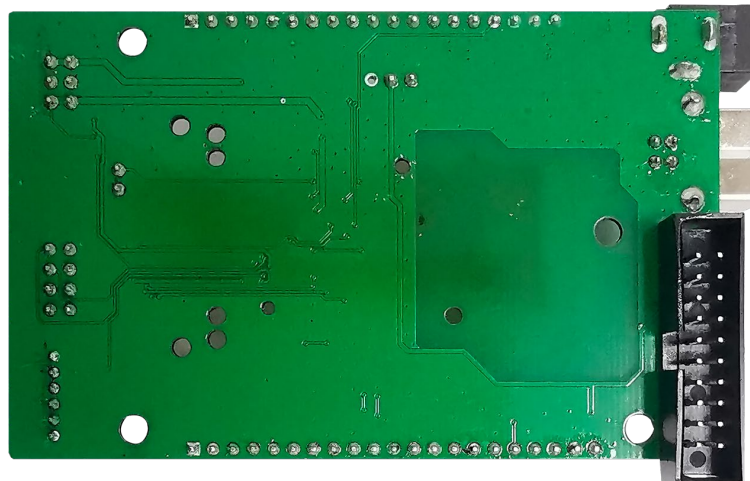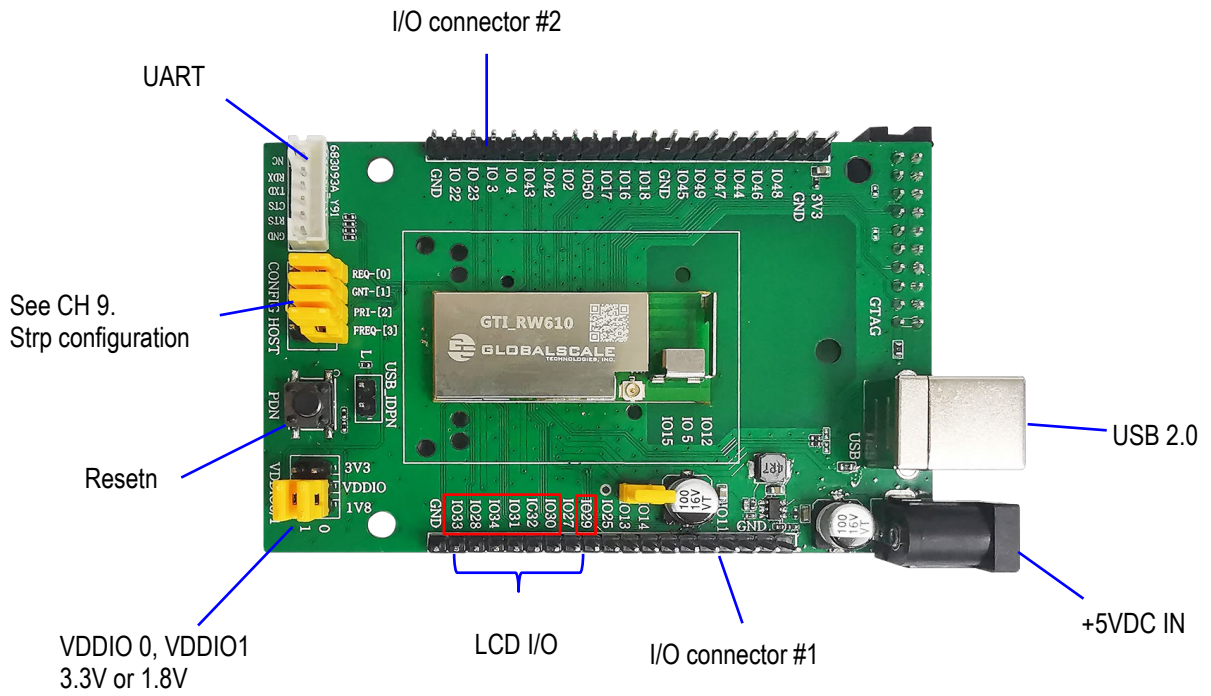
7.2 LCD module

8.Wi-Fi Radio Specifications

8.1 - 2.4G Wi-Fi receiver Performace

Parameter	Condition	Min	Typ	Max	Units
RF frequency range	—	2412	—	2484	MHz
RF signal bandwidth	—	20	—	20	MHz
S11	—	—	-10	20	dB
Total Max Rx gain	Pin to ADC input	—	85	—	dBr
Image rejection	After calibration	—	—	-48	dBrc
Receiver sensitivity					
Receiver sensitivity 802.11b	20 MHz 1 Mbps	—	-100	—	dBm
Receiver sensitivity 802.11b	20 MHz 11 Mbps	—	-91.5	—	dBm
Receiver sensitivity 802.11g	20 MHz 6 Mbps	—	-94.5	—	dBm
Receiver sensitivity 802.11g	20 MHz 54 Mbps	—	-78	—	dBm
Receiver sensitivity 802.11n	20 MHz MCS0 Nss1 BCC	—	-93.75	—	dBm
Receiver sensitivity 802.11n	20 MHz MCS7 Nss1 BCC	—	-75	—	dBm
Receiver maximum input level (MIL)					
Receiver maximum input level DSS	802.11b DSSS MIL	—	0	—	dB
Receiver maximum input level OFDM	802.11b CCK MIL	—	-5	—	dB
Receiver maximum input level OFDM	OFDM MIL	—	-10	—	dB
Receiver adjacent channel interference (ACI)					
Receiver ACI 802.11b	20 MHz 1 Mbps	—	49	—	dB
Receiver ACI 802.11b	20 MHz 11 Mbps	—	43	—	dB
Receiver ACI 802.11g	20 MHz 6 Mbps	—	30	—	dB
Receiver ACI 802.11g	20 MHz 54 Mbps	—	23	—	dB
Receiver ACI 802.11n	20 MHz MCS0 Nss1 BCC	—	29	—	dB
Receiver ACI 802.11n	20 MHz MCS7 Nss1 BCC	—	22	—	dB
Receiver alternate adjacent channel interference (AACI)					
Receiver AACI 802.11b	20 MHz 1 Mbps	—	51	—	dB
Receiver AACI 802.11b	20 MHz 11 Mbps	—	44	—	dB
Receiver AACI 802.11g	20 MHz 6 Mbps	—	44	—	dB
Receiver AACI 802.11g	20 MHz 54 Mbps	—	27	—	dB
Receiver AACI 802.11n	20 MHz MCS0 Nss1 BCC	—	43	—	dB
Receiver ACAI 802.11n	20 MHz MCS7 Nss1 BCC	—	23	—	dB

8.2   - 5G Wi-Fi receiver Performace

Parameter	Condition	Min	Typ	Max	Units
RF frequency range	—	4915	—	5825	MHz
RF signal bandwidth	—	20	—	20	MHz
S11	—	—	-10	—	dB
Total Max Rx gain	Pin to ADC input	—	85	—	dBr
Image rejection	After calibration	—	—	-48	dBrc
Receiver sensitivity					
Receiver sensitivity 802.11a	20 MHz 6 Mbps	—	-93.5	—	dBm
Receiver sensitivity 802.11a	20 MHz 54 Mbps	—	-77	—	dBm
Receiver sensitivity 802.11n	20 MHz MCS0 Nss1 BCC	—	-93.25	—	dBm
Receiver sensitivity 802.11n	20 MHz MCS7 Nss1 BCC	—	-73.5	—	dBm
Receiver adjacent channel interference (ACI)					
Receiver ACI 802.11a	20 MHz 6 Mbps	—	24	—	dB
Receiver ACI 802.11a	20 MHz 54 Mbps	—	14	—	dB
Receiver ACI 802.11n	20 MHz MCS0 Nss1 BCC	—	21	—	dB
Receiver ACI 802.11n	20 MHz MCS7 Nss1 BCC	—	9	—	dB
Receiver alternate adjacent channel interference (AACI)					
Receiver AACI 802.11a	20 MHz 6 Mbps	—	44	—	dB
Receiver AACI 802.11a	20 MHz 54 Mbps	—	25	—	dB
Receiver AACI 802.11n	20 MHz MCS0 Nss1 BCC	—	43	—	dB
Receiver ACAI 802.11n	20 MHz MCS7 Nss1 BCC	—	24	—	dB

8.3 - 2.4G Wi-Fi transmitter Performace

Parameter	Condition	Min	Max	Units
RF frequency range	2.4 GHz	2412	2484	MHz
Maximum linear output power with 20 MHz bandwidth	802.11b 1 Mbps	—	—	dBm
	802.11b 11 Mbps	—	—	dBm
	802.11g 6 Mbps	—	—	dBm
	802.11g 54 Mbps	—	—	dBm
	802.11n MCS7	—	—	dBm
Analog/RF maximum gain	—	—	—	dB
Analog/RF gain range	—	—	—	dB
Transmit I/Q suppression with IQ calibration	After calibration	—	-48	dBc
Second harmonic (HD2)	At 21 dBm, CW	—	—	dBr
Third harmonic (HD3)	At 21 dBm, CW	—	—	dBr
Transmit power accuracy	With Manufacturing time calibration per board	13.53	16.33	dB
Transmit power control resolution	—	—	—	dB
Out-of-band noise floor at different operation standard frequency range Transmit 1 Mbps at 18 dBm with 100% duty cycle	—	—	—	dBm/Hz
Return loss	—	—	—	TBD
Transmit carrier suppression	—	—	—	TBD
Transmit frequency error	—	—	—	TBD
Transmit output power control step	—	—	—	TBD
Transmit output power level control range	—	—	—	TBD
Transmit general spurs harmonic and subharmonic 6 Mbps Tx at 18 dBm with 100% duty cycle	< 1 GHz	—	—	dBm/100kHz
	1 GHz to 18 GHz	—	—	dBm/100kHz
	Second harmonic	—	—	dBm/1MHz
	Third harmonic	—	—	dBm/1MHz
	LO leakage	—	—	dBm

8.4 - 5G Wi-Fi transmitter Performace

Parameter	Condition	Min	Max	Units
RF frequency range	5 GHz	4915	5825	MHz
Maximum linear output power with 20 MHz bandwidth	—	—	—	dBm
	—	—	—	dBm
	802.11n MCS7	—	—	dBm
Analog/RF maximum gain	—	—	—	dB
Analog/RF gain range	—	—	—	dB
Transmit I/Q suppression with IQ calibration	After calibration	—	-48	dBc
Second harmonic (HD2)	At 20 dBm, CW	—	-25	dBr
Third harmonic (HD3)	At 20 dBm, CW	—	-45	dBr
Transmit power accuracy	With Manufacturing time calibration per board	12.27	15.94	dB
Transmit power control resolution	—	—	—	dB
Out-of-band noise floor at different operation standard frequency range Transmit 1 Mbps at 18 dBm with 100% duty cycle	—	—	—	dBm/Hz
Return loss	—	—	—	TBD
Transmit carrier suppression	—	—	—	TBD
Transmit frequency error	—	—	—	TBD
Transmit output power control step	—	—	—	TBD
Transmit output power level control range	—	—	—	TBD
Transmit general spurs harmonic and subharmonic 6 Mbps Tx at 18 dBm with 100% duty cycle	< 1 GHz	—	—	dBm/100kHz
	1 GHz to 18 GHz	—	—	dBm/100kHz
	Second harmonic	—	—	dBm/1MHz
	Third harmonic	—	—	dBm/1MHz
	LO leakage	—	—	dBm

9. Bluetooth LE Radio Specifications

9.1 – Bluetooth LE receiver Performace

Parameter	Condition	Min	Max	Units
RF frequency range	—	2402	2480	MHz
S11	—	—		dB
Receiver sensitivity				
Bluetooth LE 1Mbps		—	—	dBm
Bluetooth LE 2Mbps		—	—	dBm
Bluetooth LE 125Kbps		—	—	dBm
Bluetooth LE 500Kbps		—	—	dBm
Receiver maximum input level (MIL)				
Bluetooth LE 1Mbps		—	—	dBm
Bluetooth LE 2Mbps		—	—	dBm
Bluetooth LE 125Kbps		—	—	dBm
Bluetooth LE 500Kbps		—	—	dBm
Receiver adjacent channel interference (ACI)CCI performancr				
Bluetooth LE 1Mbps				
Receiver ACI @ -5 MHz (image -1)	Bluetooth LE 1 Mbps	—	—	dB
Receiver ACI @ -4 MHz (image)	Bluetooth LE 1 Mbps	—	—	dB
Receiver ACI @ -3 MHz (image +1)	Bluetooth LE 1 Mbps	—	—	dB
Receiver ACI @ -2 MHz	Bluetooth LE 1 Mbps	—	—	dB
Receiver ACI @ -1 MHz	Bluetooth LE 1 Mbps	—	—	dB
Receiver CCI	Bluetooth LE 1 Mbps	—	—	dB
Receiver ACI @ +1 MHz (image -1)	Bluetooth LE 1 Mbps	—	—	dB
Receiver ACI @ +2 MHz (image -1)	Bluetooth LE 1 Mbps	—	—	dB
Receiver ACI @ +3 MHz (image -1)	Bluetooth LE 1 Mbps	—	—	dB
Bluetooth LE 2Mbps				
Receiver ACI @ -6 MHz (image -2)	Bluetooth LE 2 Mbps	—	—	dB
Receiver ACI @ -4 MHz (image)	Bluetooth LE 2 Mbps	—	—	dB
Receiver ACI @ -2 MHz (image +2)	Bluetooth LE 2 Mbps	—	—	dB
Receiver ACI @ -2 MHz	Bluetooth LE 2 Mbps	—	—	dB
Receiver ACI @ -4 MHz	Bluetooth LE 2 Mbps	—	—	dB
Receiver CCI	Bluetooth LE 2 Mbps	—	—	dB
Receiver ACI @ +2MHz	Bluetooth LE 2 Mbps	—	—	dB
Receiver ACI @ +4 MHz	Bluetooth LE 2 Mbps	—	—	dB
Receiver ACI @ +6MHz	Bluetooth LE 2 Mbps	—	—	dB

9.1 – Bluetooth LE receiver Performace (continued)

Receiver adjacent channel interference (ACI)CCI performancr				
Bluetooth LR 125Kbps				
Receiver ACI @ -3MHz (image -1)	Bluetooth LR 125 Kbps	—	—	dB
Receiver ACI @ -4 MHz (image)	Bluetooth LR 125 Kbps	—	—	dB
Receiver ACI @ -3 MHz (image +1)	Bluetooth LR 125 Kbps	—	—	dB
Receiver ACI @ -2 MHz	Bluetooth LR 125 Kbps	—	—	dB
Receiver ACI @ -1 MHz	Bluetooth LR 125 Kbps	—	—	dB
Receiver CCI	Bluetooth LR 125 Kbps	—	—	dB
Receiver ACI @ +1 MHz	Bluetooth LR 125 Kbps	—	—	dB
Receiver ACI @ +2 MHz	Bluetooth LR 125 Kbps	—	—	dB
Receiver ACI @ +3 MHz	Bluetooth LR 125 Kbps	—	—	dB
Bluetooth LE 500K bps				
Receiver ACI @ -3MHz (image -1)	Bluetooth LR 500 Kbps	—	—	dB
Receiver ACI @ -4 MHz (image)	Bluetooth LR 500 Kbps	—	—	dB
Receiver ACI @ -3 MHz (image +1)	Bluetooth LR 500 Kbps	—	—	dB
Receiver ACI @ -2 MHz	Bluetooth LR 500 Kbps	—	—	dB
Receiver ACI @ -1 MHz	Bluetooth LR 500 Kbps	—	—	dB
Receiver CCI	Bluetooth LR 500 Kbps	—	—	dB
Receiver ACI @ +1 MHz	Bluetooth LR 500 Kbps	—	—	dB
Receiver ACI @ +2 MHz	Bluetooth LR 500 Kbps	—	—	dB
Receiver ACI @ +3 MHz	Bluetooth LR 500 Kbps	—	—	dB

9.2 - Bluetooth LE transmitter Performace

Parameter	Condition	Min	Max	Units
RF frequency range		2402	2480	MHz
S22	—	—	—	dB
Bluetooth LE maximum transmit power	—	—	—	dBm
Out-of band noise floor at different operation standard frequency range Transmit at 15 dBm with 100% duty cycle	—	—	TBD	dBm/Hz
Transmit frequency error	—	TBD	TBD	kHz
Transmit output power accuracy	—	1.74	2.22	dBm
Transmit output power control step	—	—	—	dB
Transmit output power level control range	—	TBD	TBD	dBm
Transmit general spurs harmonic and subharmonic Transmit at 20 dBm with 100% duty cycle	< 1 GHz	—	—	dBm/100kHz
	1 GHz to 18 GHz	—	—	dBm/100kHz
	Second harmonic	—	—	dBm/1MHz
	Third harmonic	—	—	dBm/1MHz
	LO leakage	—	—	dBm

10. WIFI 2.4GHZ EVM/Power/Frequency Error/Rx table

(TBD

11. Electrical Characteristics

(TBD)

12. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

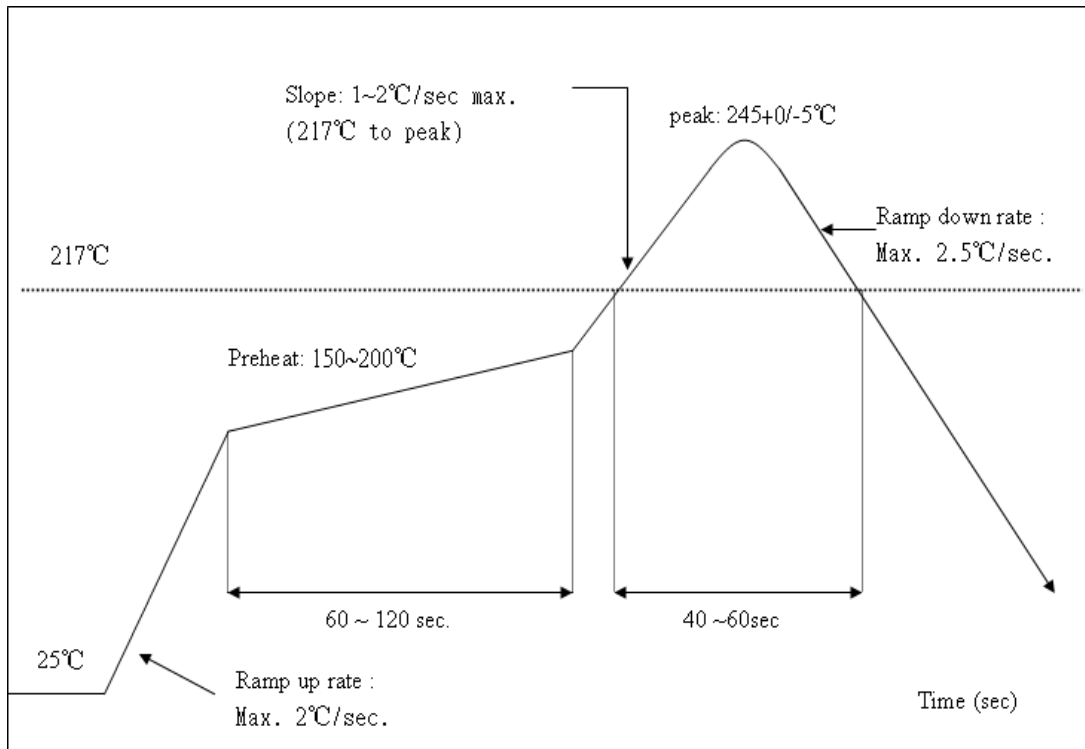PeakTemperature : <250°C

Number of Times : 2 times

Figure 1-Reflow Soldering Profile

13. Package and order information

(TBD)

14. FCC Warning

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

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.

Note: 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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This transmitter must not be colocated or operating in conjunction with any other antenna or transmitter.This equipment should be installed and operated with minimum distance 20cm between the radiator &you body.

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C and CFR 47 FCC PART 15 SUBPART E has been investigated. It is applicable to the modular.

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance of 20cm from your body. Additional RF exposure statement: the modular transmitter must comply with any applicable RF exposure requirements (as defined §2.1091 and §2.1093,) in its final configuration, per KDB996369 D03.

2.7 Antennas

This radio transmitter FCC ID:YCJ-GTIRW610N has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna type	Input impedance (Ohm)	Maximum antenna gain
PIFA	50	0.67dBi/2.4-2.5GHz
PIFA	50	2.24 dBi/5.15-5.85GHz
FPC	50	2dBi/2.4-2.5GHz

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID:YCJ-GTIRW610N

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

The OEM integrator or the host manufacturer is responsible for the overall compliance of the host products, the module grantees to ensure that proper test data for multiple transmitter operations are included in the application filings for the modules.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B

15. Contact information

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