REYAX
TECHNOLOGY CORPORATION, LTD

02-June-2023 56322E30

RYUW122

UART Interface
6.5 GHz and 8 GHz UWB Antenna Transceiver Module

Datasheet

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Represented by:

first FC components
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PRODUCT DESCRIPTION

REYAX RYUW122 is designed as smart algorithm and high quality UWB(Ultra Wide Band) module, It is good for secure and precise distance measurement.

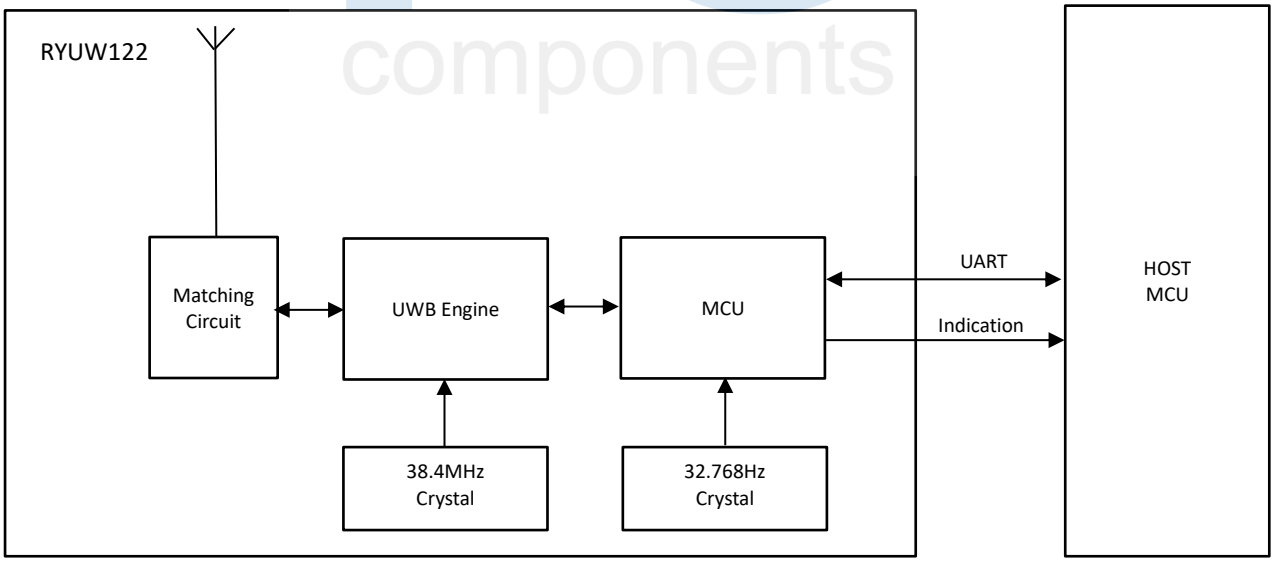
FEATURES

- Supports IEEE802.15.4-2015 UWB & IEEE802.15.4z (BPRF mode)
- Supports channels 5 & 9 (6489.6MHz & 7987.2 MHz)
- Worldwide UWB Radio Regulatory compliance
- Location to an accuracy of 10 cm
- Control easily by AT commands
- Provides precision location and data transfer simultaneously
- Designed with integrated antenna
- Integrated AES 128

APPLICATIONS

- Distance Measurement.
- Precision real time location systems (RTLS) using two-way ranging.
- Location aware wireless sensor Networks
- 2D / 3D positioning.

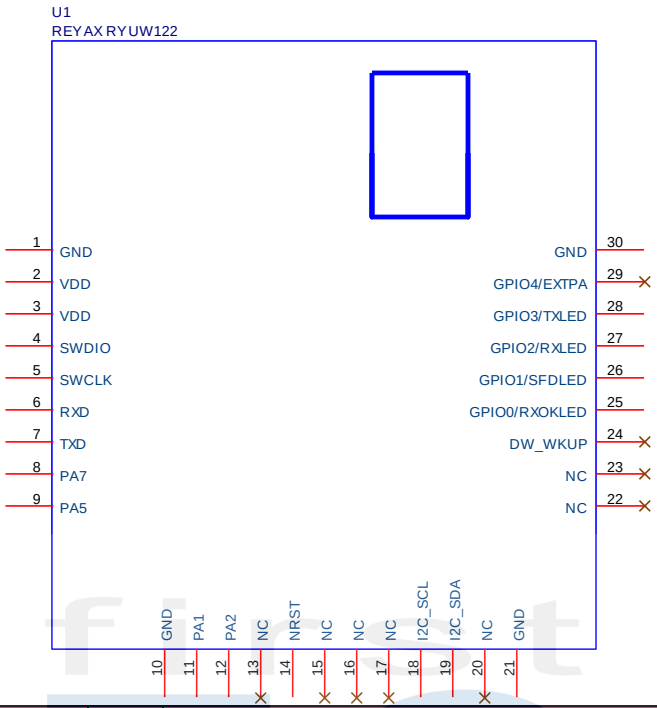
BLOCK DIAGRAM



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PIN DESCRIPTION

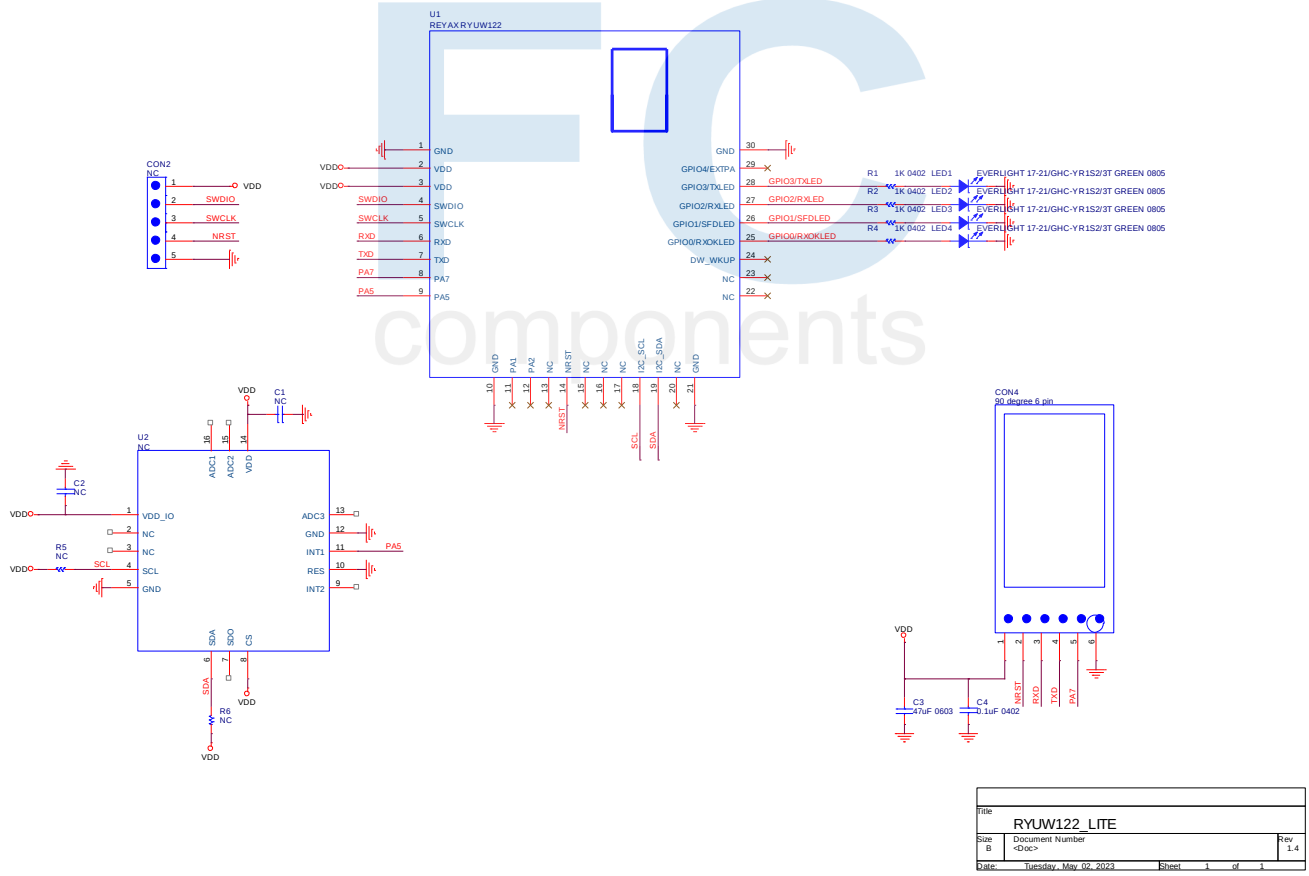


Pin	Name	I/O	Condition
1	GND	-	Ground
2	VDD	P	Power supply
3	VDD	P	Power supply
4	SWDIO	I/O	Not Connected, Reserved for future applications
5	SWCLK	I/O	Not Connected, Reserved for future applications
6	RXD	I	UART Data Input
7	TXD	O	UART Data Output
8	PA7	O	Mode Indicator Hi : Normal mode, Low : Sleep mode.
9	PA5	I/O	Not Connected, Reserved for future applications
10	GND	-	Ground
11	PA1	I/O	Not Connected, Reserved for future applications
12	PA2	I/O	Not Connected, Reserved for future applications
13	NC		Not Connected.
14	NRST	I	Low reset trigger input
15	NC		Not Connected.
16	NC		Not Connected.
17	NC		Not Connected.
18	I2C_SCL	I/O	Not Connected, Reserved for future applications

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19	I2C_SDA	I/O	Not Connected, Reserved for future applications
20	NC		Not Connected.
21	GND	-	Ground
22	NC		Not Connected.
23	NC		Not Connected.
24	DW_WKUP	O	Leave Unconnected.
25	GPIO0/RXOKLED	O	Not Connected, Reserved for debug.
26	GPIO1/SFDLED	O	Not Connected, Reserved for debug.
27	GPIO2/RXLED	O	Not Connected, Reserved for debug.
28	GPIO3/TXLED	O	Not Connected, Reserved for debug.
29	GPIO4/EXTPA	O	Not Connected, Reserved for debug.
30	GND	-	Ground

RYUW122_Lite EVB SCHEMATIC



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SPECIFICATION

Item	Min.	Typical	Max.	Unit	Condition
VDD Power Supply	2.4	3.3	3.6	V	VDD
RF Output Power Range		-32		dBm	
RF Sensitivity		-100		dBm	
RF Input Level			14	dBm	
Frequency Range		6489.6 7987.2		GHz	Channel 5 Channel 9
Bandwidth		850 6.8		KHz MHz	
Location accuracy		10		cm	Open Field Environment
Frequency Accuracy		±10		ppm	
Communication Range		60		M	RYUW122 to RYUW122 Open Field Environment Anchor at a height of 3M. Tag at a height of 1M.
ANCHOR mode Current		8		mA	
TAG mode Current		81		mA	
RF Transmit current		86		mA	
RF disable Current		4		uA	
Sleep mode Current		2		uA	
Baud rate	9600	115200	115200	bps	8, N, 1
Digital Input Level High	0.7*VDD		VDD	V	VIH
Digital Input Level Low	0		0.3*VDD	V	VIL
Digital Output Level High	0.9		VDD	V	VOH
Digital Output Level Low			0.1	V	VOL
Cycling (erase / write) Flash data memory		100		K	Cycles
Weight		1		g	
Operating Temperature	-40	25	+85	˚C	

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REFLOW SOLDERING

Consider the "IPC-7530 Guidelines for temperature profiling for mass soldering (reflow and wave) processes, published 2001. **Only single reflow soldering processes are recommended for REYAX modules. Repeated reflow soldering processes and soldering the module upside down are not recommended.**

Preheat phase

Initial heating of component leads and balls. Residual humidity will be dried out. Please note that this preheat phase will not replace prior baking procedures.

- Temperature rise rate: max. 3 °C/s If the temperature rise is too rapid in the preheat phase it may cause excessive slumping.
- Time: 60 - 120 s If the preheat is insufficient, rather large solder balls tend to be generated.
  Conversely, if performed excessively, fine balls and large balls will be generated in clusters.
- End Temperature: 150 - 200 °C If the temperature is too low, non-melting tends to be caused in
  areas containing large heat capacity.

Heating/ Reflow phase

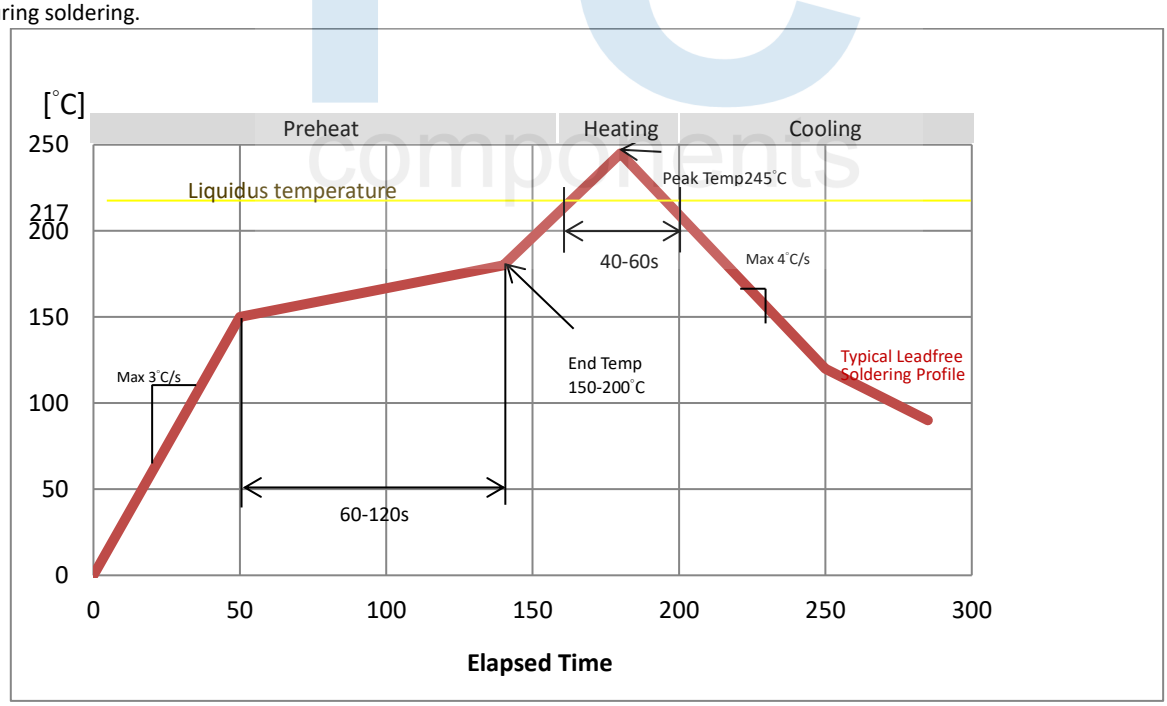
The temperature rises above the liquidus temperature of 217°C. Avoid a sudden rise in temperature as the slump of the paste could become worse.

- Limit time above 217 °C liquidus temperature: 40 - 60 s
- Peak reflow temperature: 245 °C

Cooling phase

A controlled cooling avoids negative metallurgical effects (solder becomes more brittle) of the solder and possible mechanical tensions in the products. Controlled cooling helps to achieve bright solder fillets with a good shape and low contact angle.

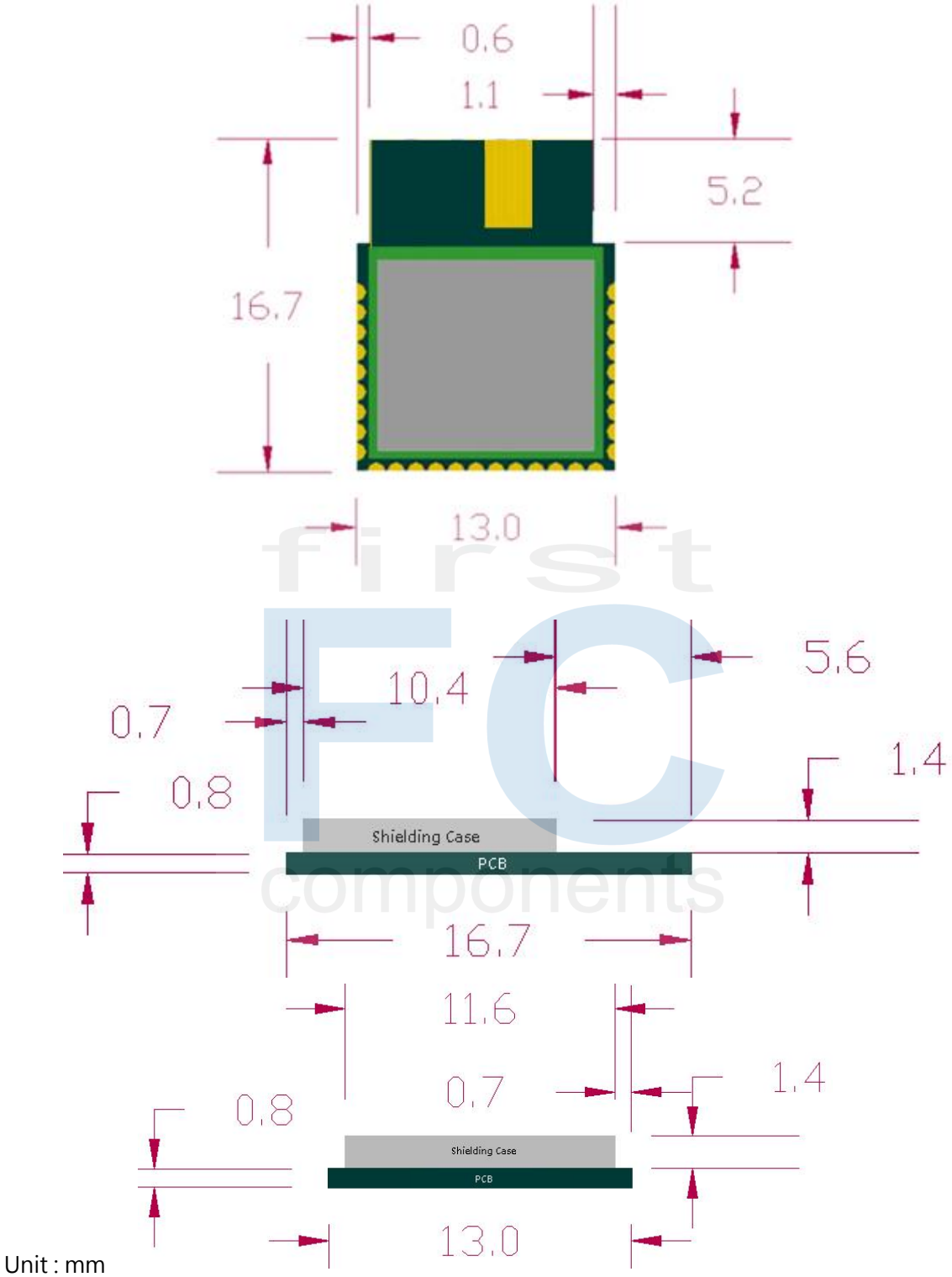
- Temperature fall rate: max 4 °C/s To avoid falling off, the REYAX module should be placed on the topside of the motherboard during soldering.



Recommended soldering profile

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DIMENSIONS

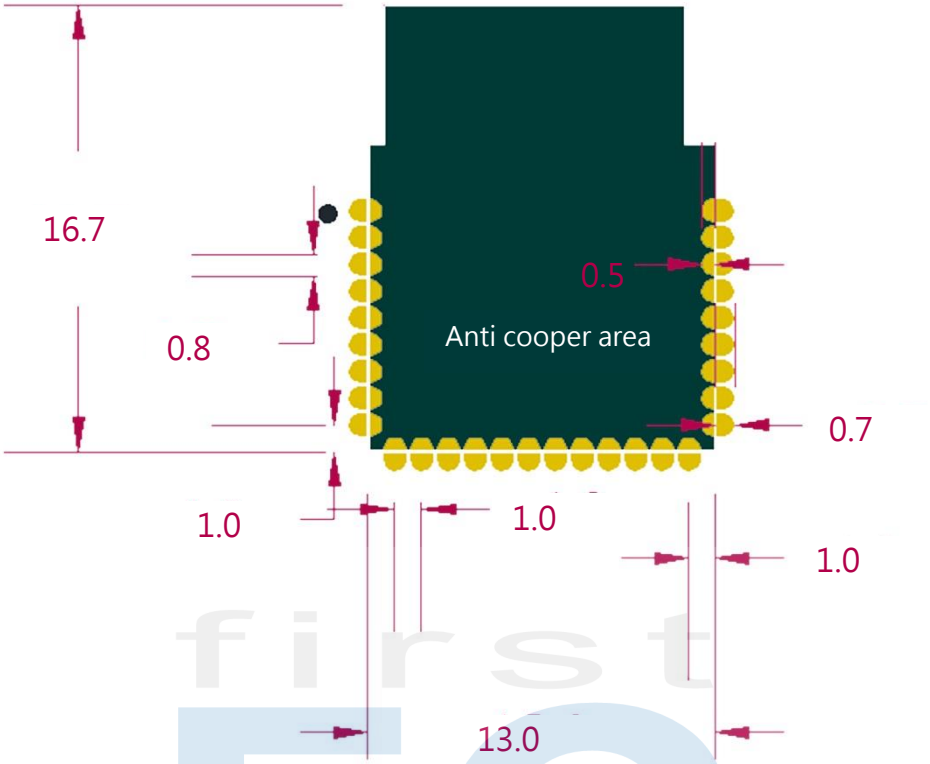


Unit : mm

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LAYOUT FOOTPRINT RECOMMENDATIONS



Unit : mm

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