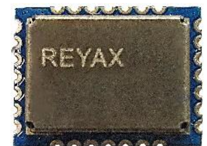
REYAX
TECHNOLOGY CORPORATION, LTD

01-JUL-2019 56312E31

RYLRC80

2.4GHz LoRa®
Low Power Long Range
Transceiver Module

Datasheet



11mm*8.3mm*2.2mm

PRODUCT DESCRIPTION

The REYAX RYLRC80 module provide ultra long range communication in the 2.4 GHz band with the linearity to withstand heavy interference. This makes them the ideal solution for robust and reliable wireless solutions. They are the first ISM band transceiver IC of their kind to integrate a time-of-flight functionality, opening up application solutions to track and localize people, pets, drones, or objects in a factory. These long range 2.4 GHz products include multiple physical layers and modulations to optimize long range communication at high data rate for video and security applications. Very small products for wearables can easily be designed thanks to the high level of integration and the ultra-low current consumption which allows the use of miniaturized batteries.

FEATURES

- Long Range 2.4 GHz transceiver
- High sensitivity, down to -132 dBm
- +12.5 dBm, high efficiency PA
- Low energy consumption, on-chip DC-DC
- LoRa®, FLRC, (G)FSK supported modulations
- Programmable bit rate
- Excellent blocking immunity
- Ranging Engine, Time-of-flight function
- BLE PHY layer compatibility
- Semtech SX1280 Engine

APPLICATIONS

- Home automation & appliances
- Security systems
- Tracking applications
- Wearables & sports/fitness sensors
- Radio-controlled toys & drones
- Smart watches & beacons
- Healthcare
- IoT Applications

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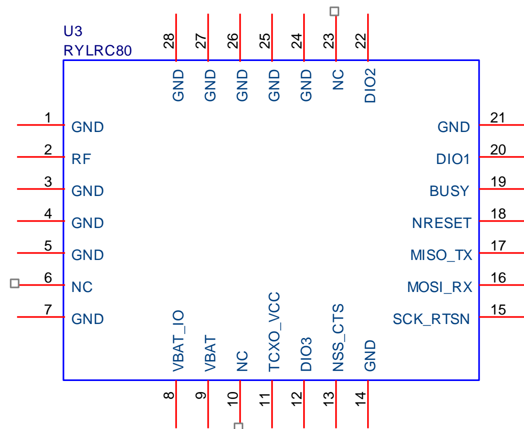
PIN DESCRIPTION



Pin	Name	I/O	Condition
1	GND	-	Ground
2	RF	I/O	RF Input/Output
3	GND	-	Ground
4	GND	-	Ground
5	GND	-	Ground
6	NC		Not connected
7	GND	-	Ground
8	VBAT_IO	I	Supply for the Digital IO interface
9	VBAT	I	Supply for the RF
10	NC		Not connected
11	TCXO_VCC	I	TCXO Power Supply
12	DIO3	I/O	Optional multi-purpose digital I/O
13	NCC_CTS	I	SPI Slave Select
14	GND	-	Ground
15	SCK_RTSN	I	SPI clock
16	MOSI_RX	I	SPI slave input
17	MISO_TX	O	SPI slave output
18	NRESET	I	Reset signal, active low with internal pull-up at 50 kΩ
19	BUSY	O	Transceiver busy indicator
20	DIO1	I/O	Optional multi-purpose digital I/O
21	GND	-	Ground
22	DIO2	I/O	Optional multi-purpose digital I/O
23	NC		Not connected
24	GND	-	Ground

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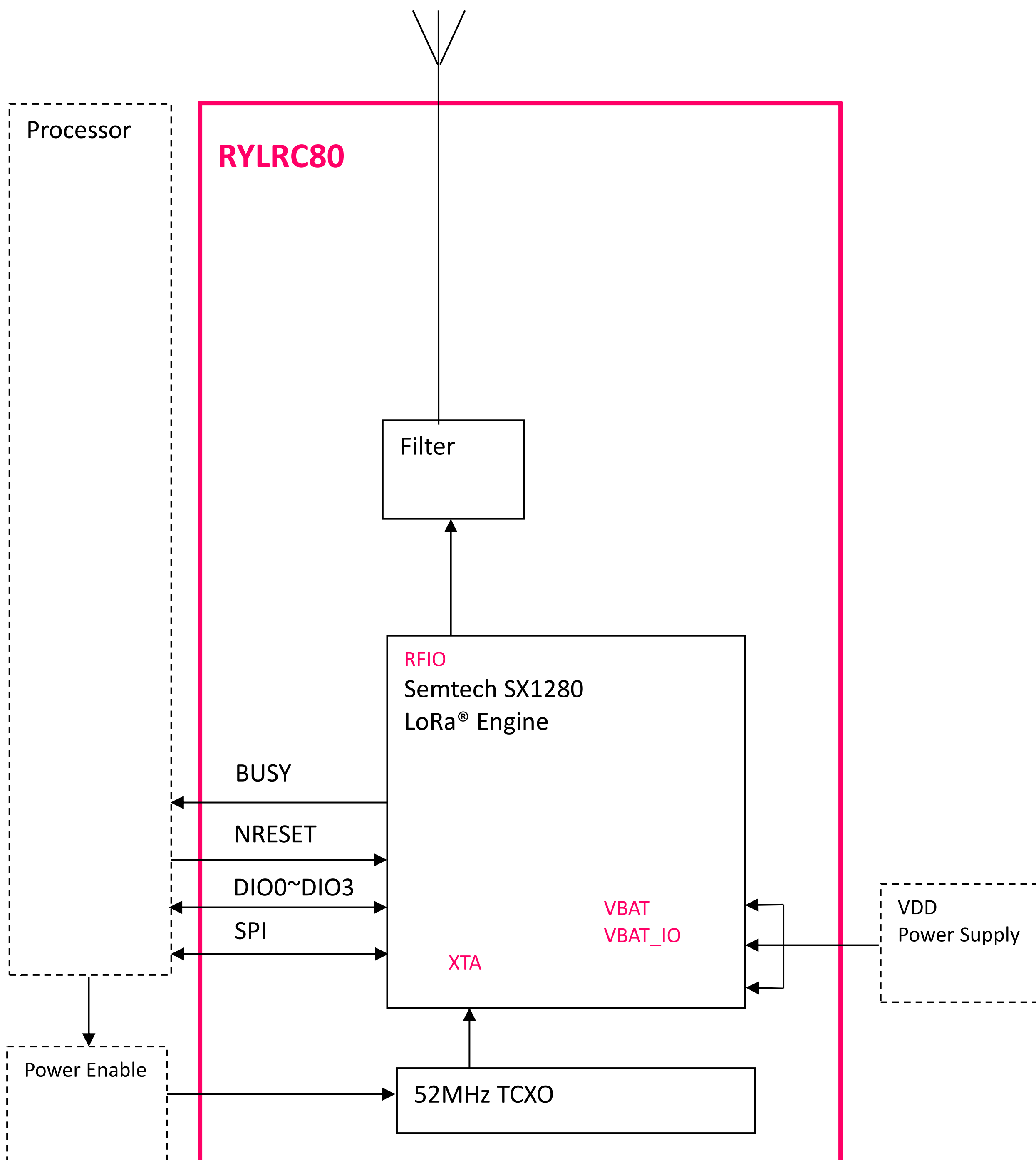
25	GND	-	Ground
26	GND	-	Ground
27	GND	-	Ground
28	GND	-	Ground

BLOCK DIAGRAM



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SPECIFICATION

Item	Min.	Typical	Max.	Unit	Condition
VDD Power Supply	1.8	3.3	3.7	V	
TCXO Power Supply	1.71	1.8	1.89	V	
TCXO Accuracy		±1.5		ppm	
TCXO Long-term Frequency Stability		±1		ppm/Year	
TCXO Current		1.7		mA	
RF Output Power Range	-18		12.5	dBm	
Filter insertion loss	1	2	3	dB	
Harmonic			-36	dBm	
RF sensitivity	-132			dBm	
RF Input Level			10	dBm	
Frequency Range	2400		2500	MHz	
Transmit Current		24		mA	RFOP = +12.5 dBm
Receive Current	5.5	6.2	8.2	mA	
Sleep Current		0.215		uA	
Communication Range		2		KM	
Digital input level high	0.8*		1	VBAT_IO	VIH
Digital input level low			0.2	VBAT_IO	VIL
Digital output level high	0.9			VBAT_IO	VOH Imax = 2.5mA
Digital output level low			0.1	VBAT_IO	VOL Imax = -2.5 mA
Operating Temperature	-40	25	+85	˚C	
Dimensions					11mm*8.3mm*2.2mm
Weight		1		g	

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REFLOW SOLDERING

Consider the "IPC-7530 Guidelines for temperature profiling for mass soldering (reflow and wave) processes, published 2001.

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

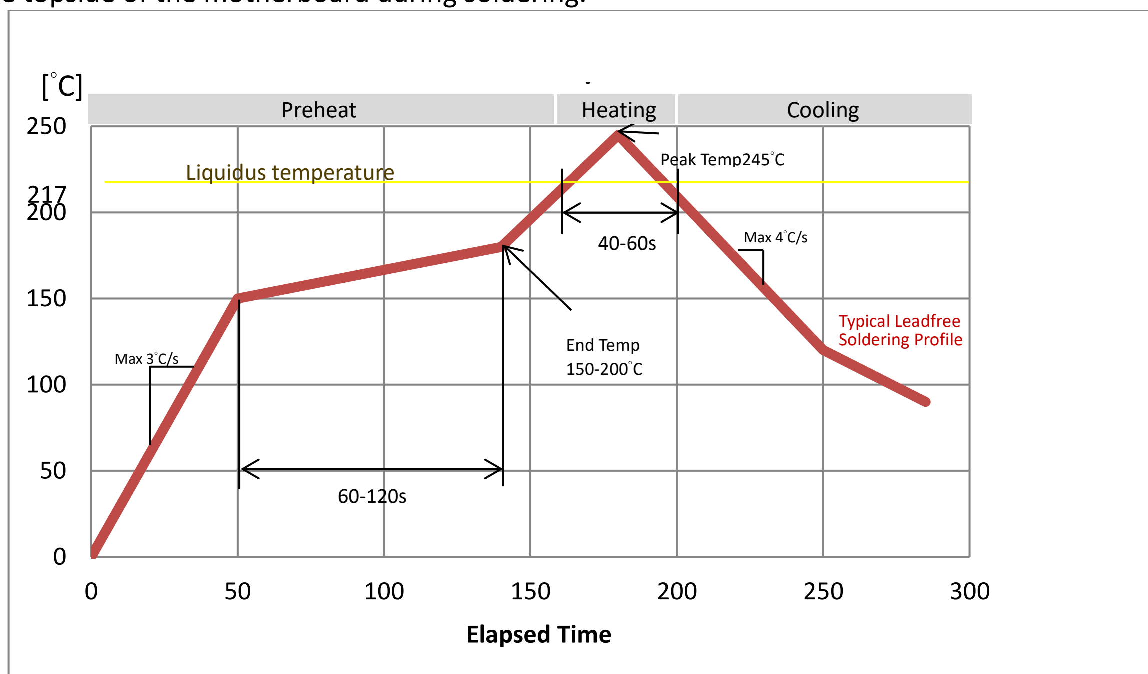
The temperature rises above the liquidus temperature of 217°C. Avoid a sudden rise in temperature as the slump of the paste could become worse.

- 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 RYB070I module should be placed on the topside of the motherboard during soldering.



Recommended soldering profile

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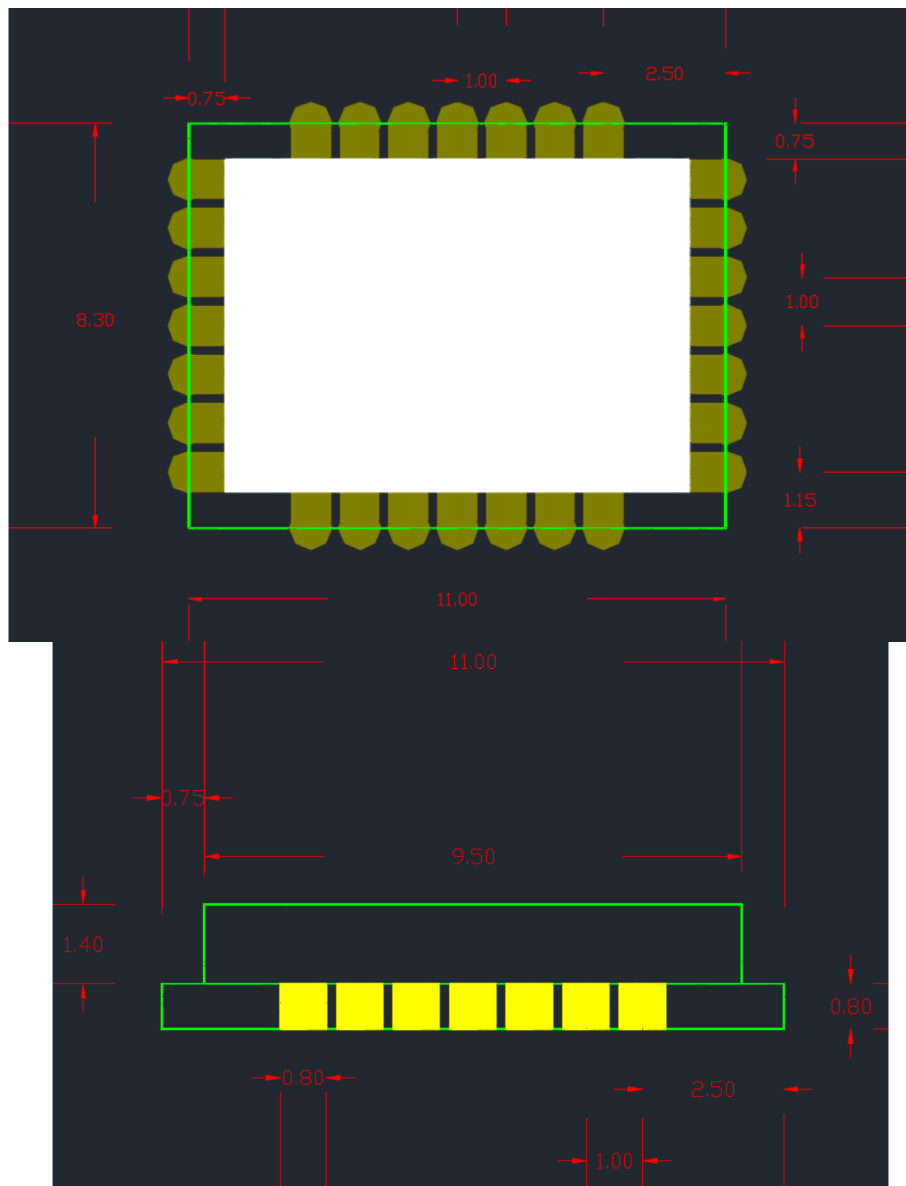
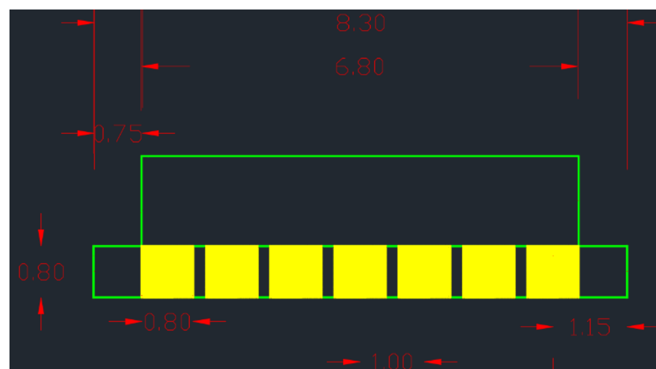
DIMENSIONS





Unit : mm

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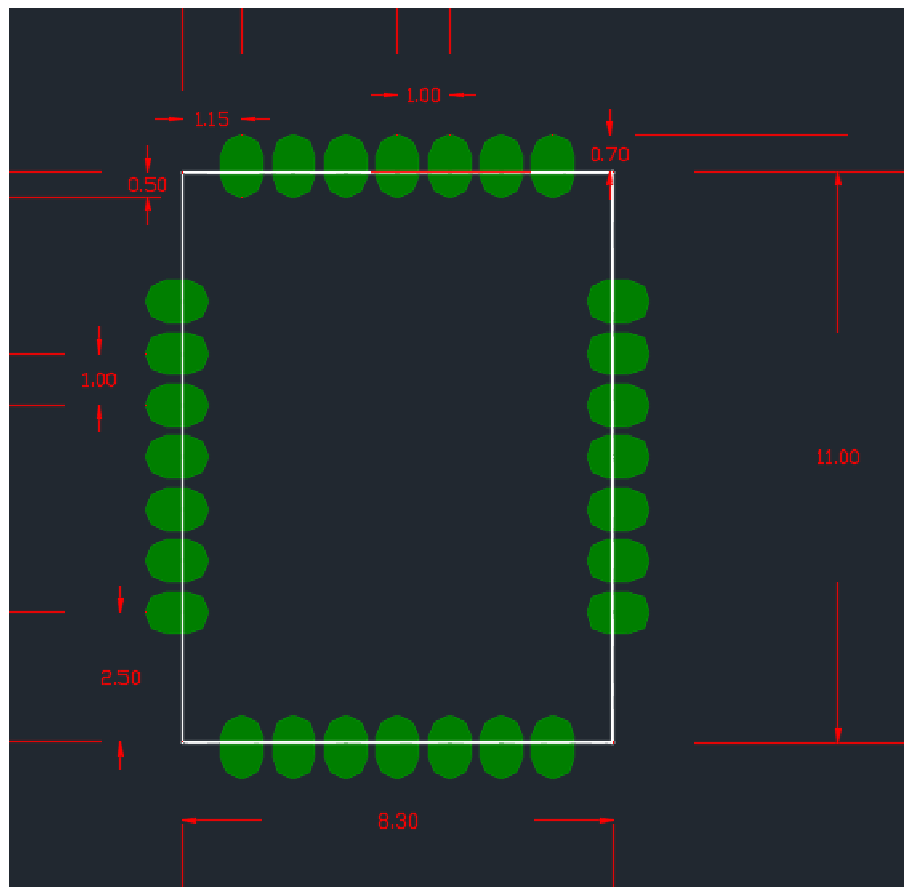
LAYOUT FOOTPRINT RECOMMENDATIONS



Unit : mm

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