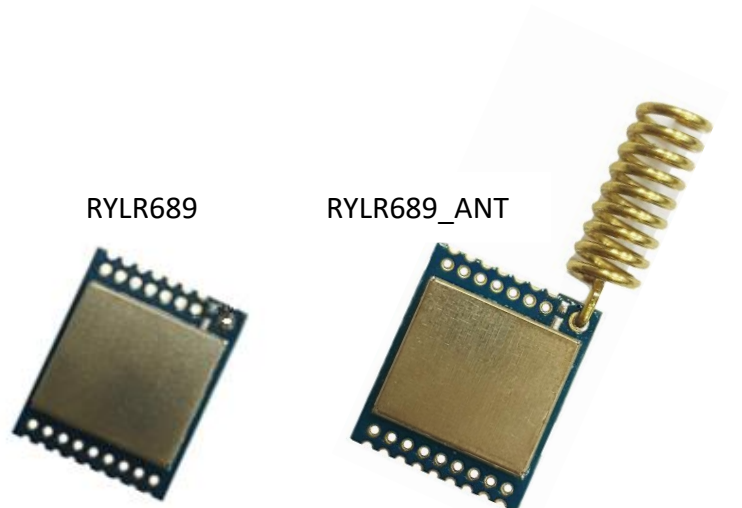


# RYLR689

868/915MHz Long Rang

LoRa/(G)FSK Transceiver Module

Datasheet



## PRODUCT DESCRIPTION

The REYAX RYLR689 is based on Semtech LLCC68 chip. It is ideal for long range wireless applications.

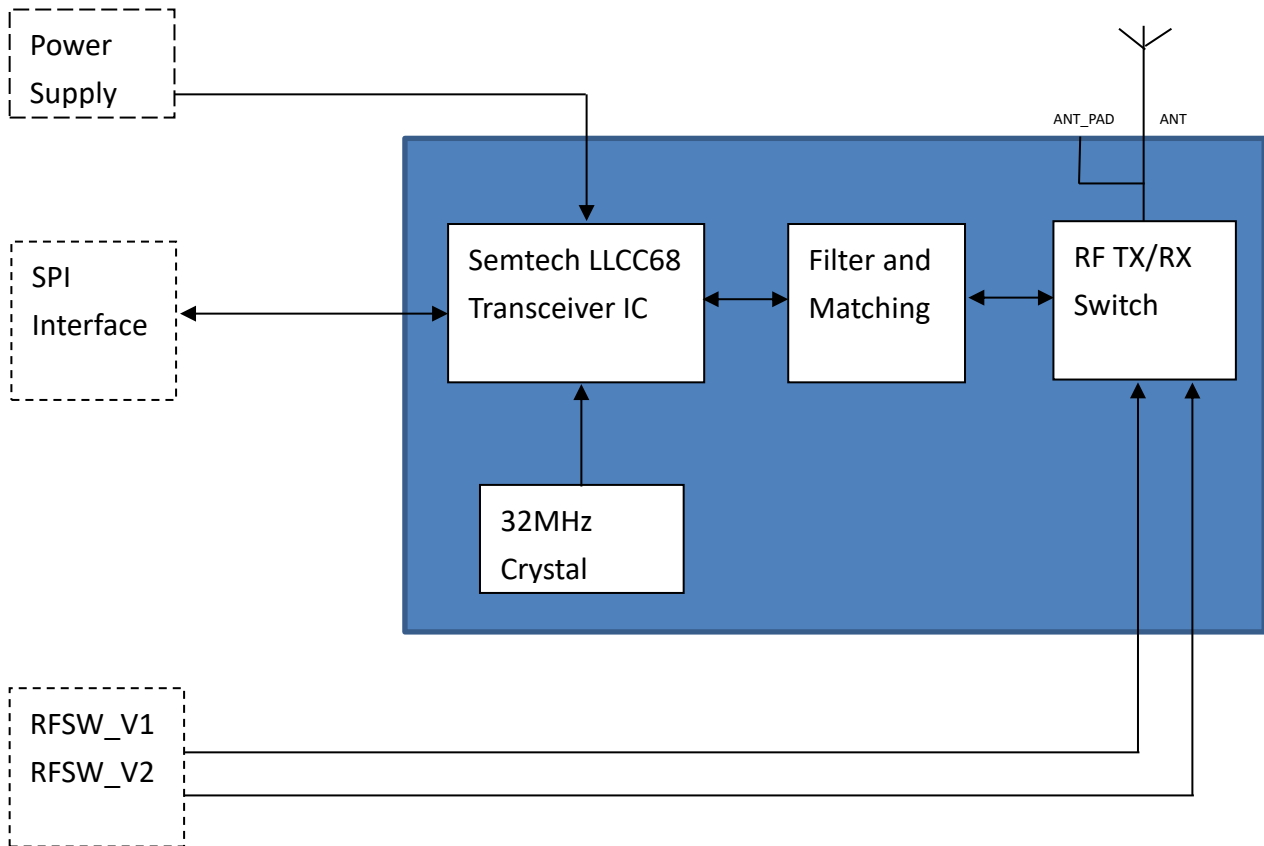
## FEATURES

- LoRa and (G)FSK modulation.
- Programmable TX power level from – 20dBm to 22dBm.
- Designed with SMT/DIP option.
- Designed with Antenna option.
- Metal cover against EMI interference

## APPLICATIONS

- Smart meters
- Supply chain and logistics
- Building automation
- Agricultural sensors
- Smart cities
- Retail store sensors
- Asset tracking
- Street lights
- Parking sensors
- Environmental sensors
- Healthcare
- Safety and security sensors
- Remote control applications

## BLOCK DIAGRAM



## SPECIFICATION

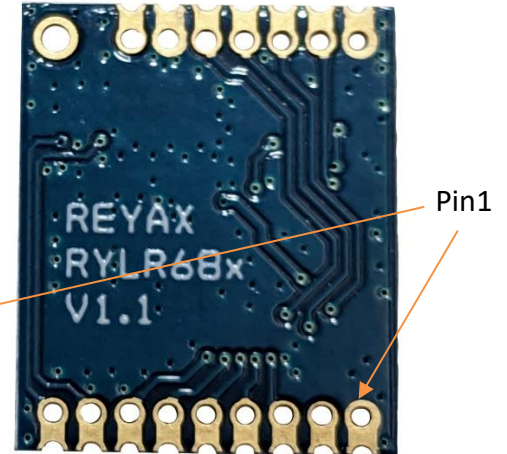
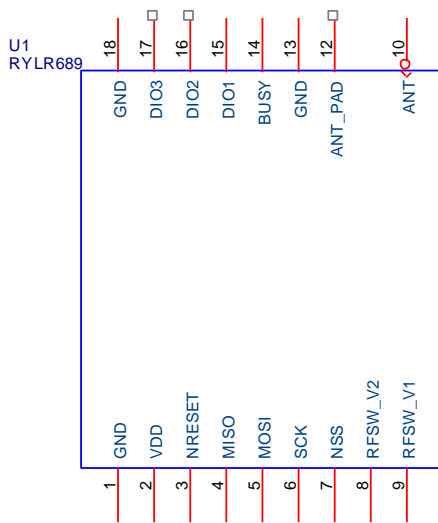
Item	Min.	Typical	Max.	Unit	Condition
VDD Power supply	1.8	3.3	3.7	V	VDD
RF Output power range	-20		22	dBm	
Filter insertion loss	1	2	3	dB	
RF Sensitivity	-129			dBm	
RF Input level			10	dBm	
Frequency range	858	915	938	MHz	
Frequency accuracy		±10		ppm	
Transmit Mode current		107		mA	RFOP = +22dBm
Receive Mode current		5.3		mA	
Sleep mode current		600		nA	
RF TX/RX Switch Speed		100	200	nS	
RF TX/RX Switch Current		10	30	uA	
Weight		6		g	
Operating temperature	-40	25	+85	°C	

**\*For more detail, please refer to the Semtech LLCC68 Product Information.**

<https://www.semtech.com/>

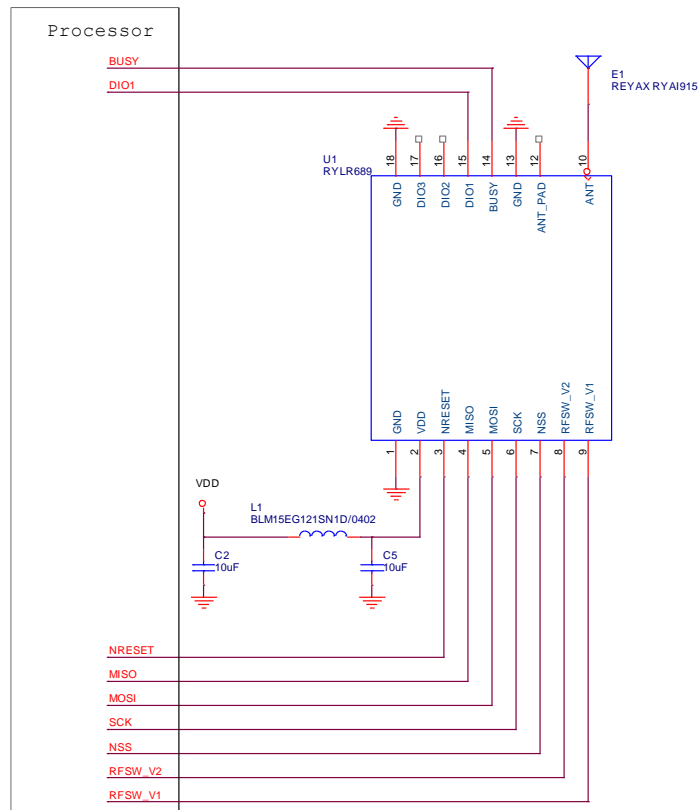
[https://github.com/Lora-net/llcc68\\_driver](https://github.com/Lora-net/llcc68_driver)

## PIN DESCRIPTION

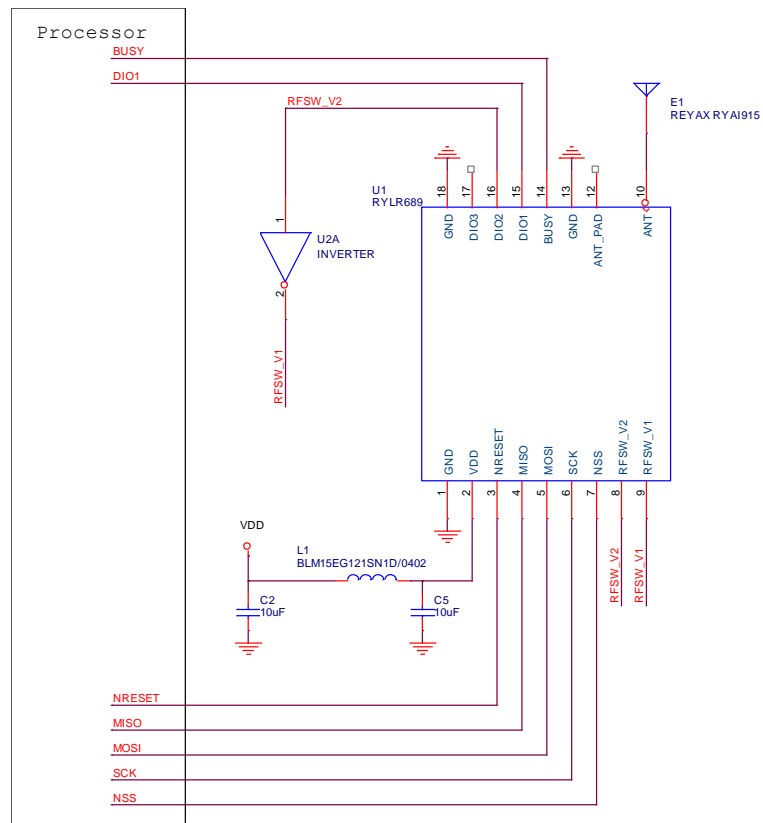


Pin	Name	I/O	Condition
1	GND	-	Ground
2	VDD	P	Supply for the RFIC
3	NRESET	I	Reset signal, active low
4	MISO	O	SPI slave output
5	MOSI	I	SPI slave input
6	SCK	I	SPI clock
7	NSS	I	SPI Slave Select
8	RFSW_V2	I	RX : RFSW_V1 =1, RFSW_V2=0
9	RFSW_V1	I	TX : RFSW_V1=0, RFSW_V2=1
10	ANT	-	ANTENNA DIP Port
12	ANT_PAD	-	ANTENNA SMT PAD
13	GND	-	Ground
14	BUSY	O	Busy indicator
15	DIO1	I/O	Multi-purpose digital IO
16	DIO2	I/O	Multi-purpose digital I/O -
17	DIO3	I/O	Multi-purpose digital I/O -
18	GND	-	Ground

## APPLICATION SCHEMATIC 1



## APPLICATION SCHEMATIC 2



## 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

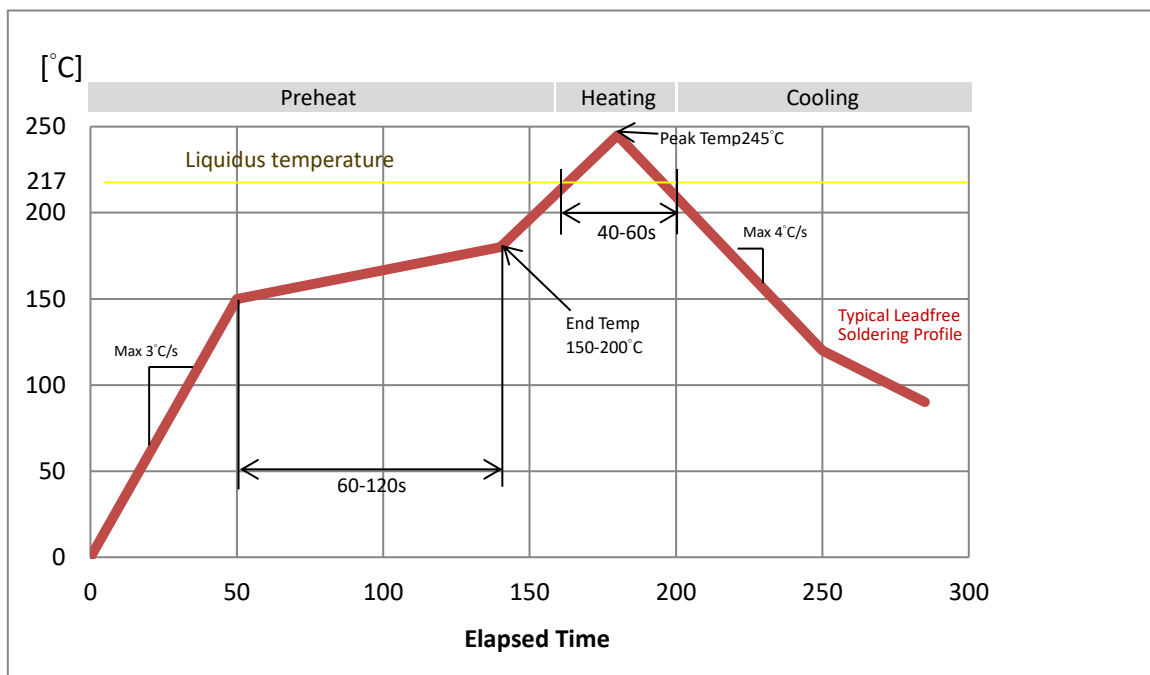
The temperature rises above the liquidus temperature of 217°C. Avoid a sudden rise in temperature as the slump of the paste could become worse.

- 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.

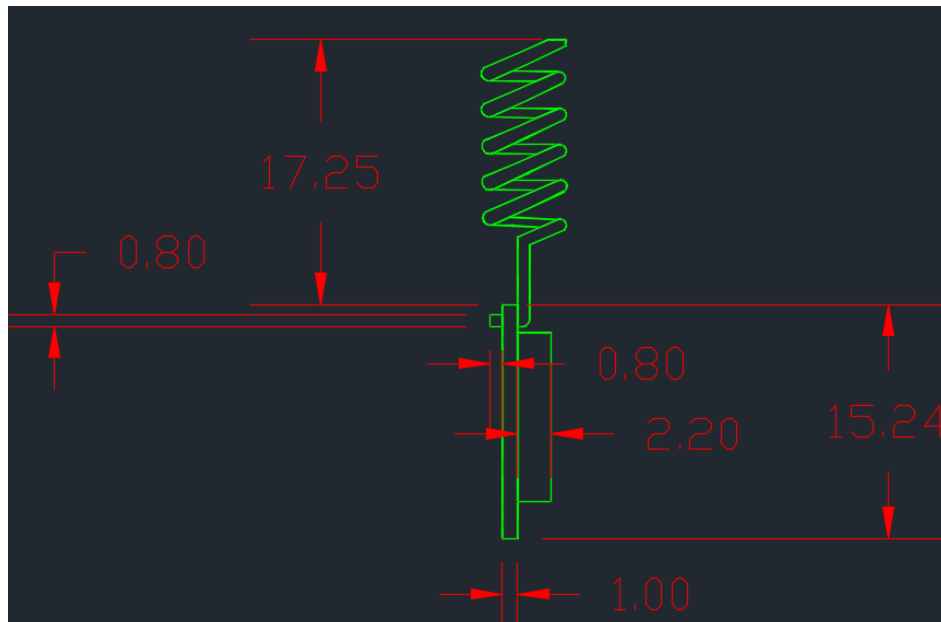
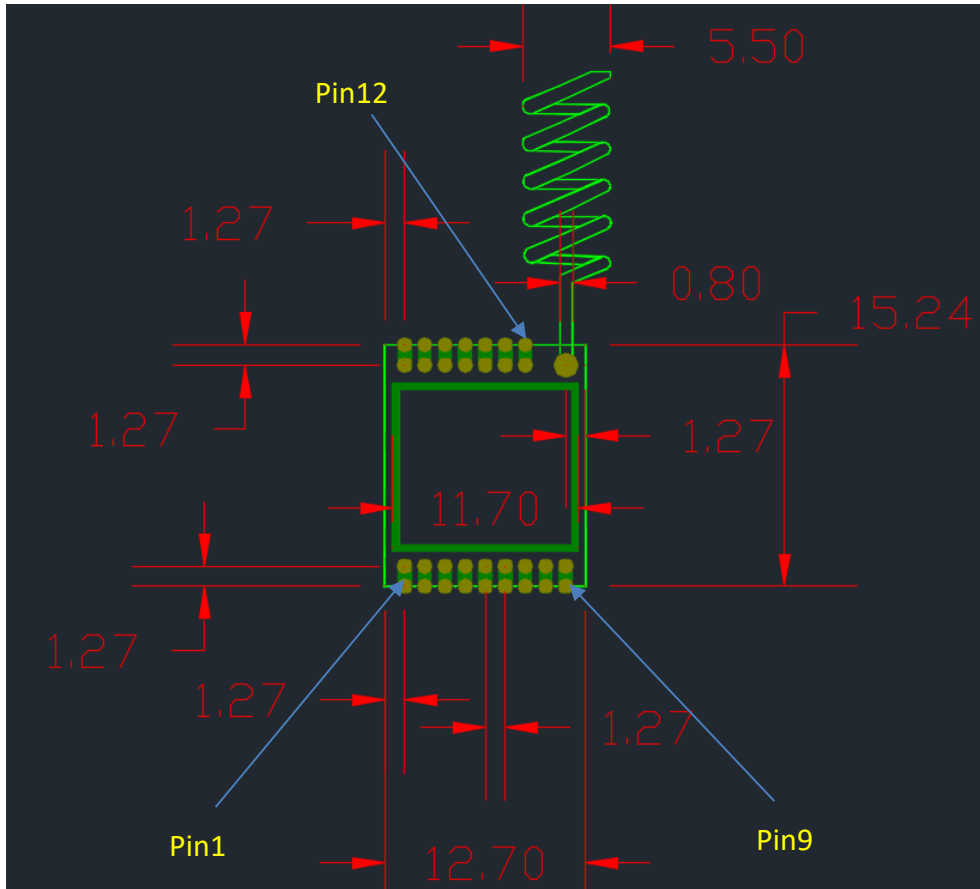
- Temperature fall rate: max 4 °C/s To avoid falling off, the REYAX module should be placed on the topside of the motherboard during soldering.



Recommended soldering profile

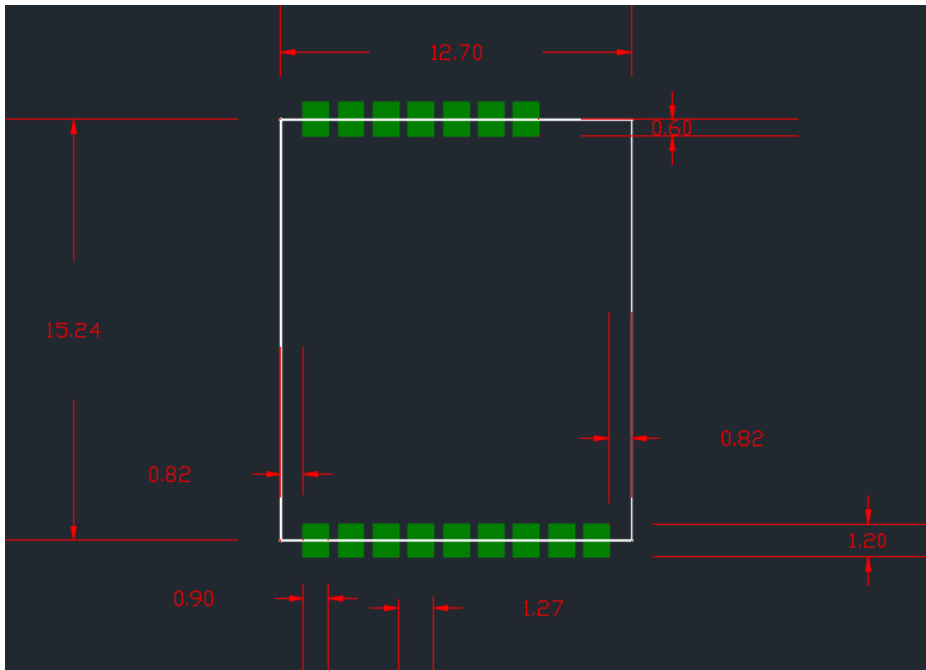


## DIMENSIONS RYLR689\_ANT

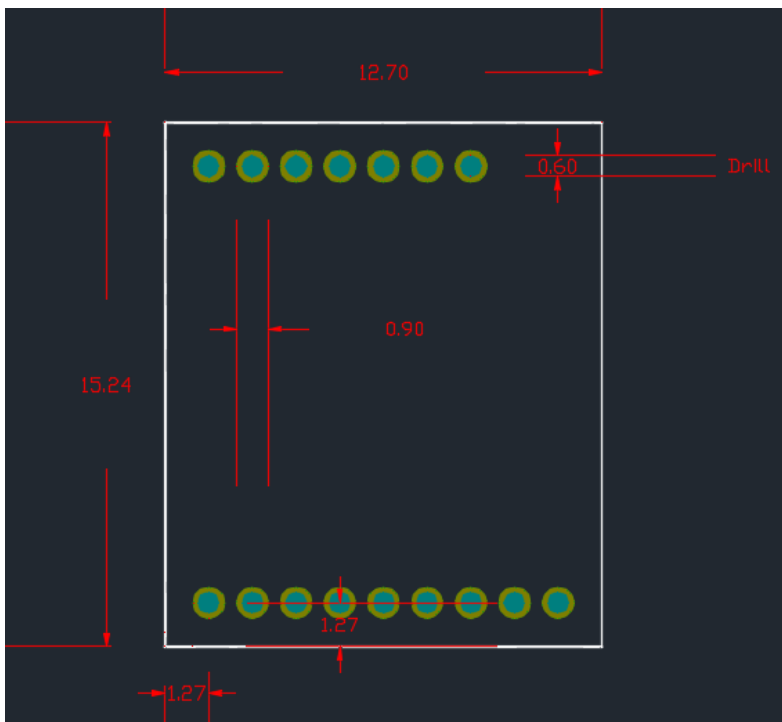


Unit : mm

## RYLR68x SMT FOOTPRINT



## RYLR68x DIP FOOTPRINT



Unit : mm

## ORDER INFORMATION

Ordering No.	Antenna
RYLR689	No
RYLR689_ANT	Yes



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