REYAX
TECHNOLOGY CORPORATION, LTD

13-JAN-2021 56312E39

# RYS8838

## 3.3V UART interface GNSS module with Untethered Dead Reckoning (UDR)

**Datasheet**


13mm*11mm*2.2mm

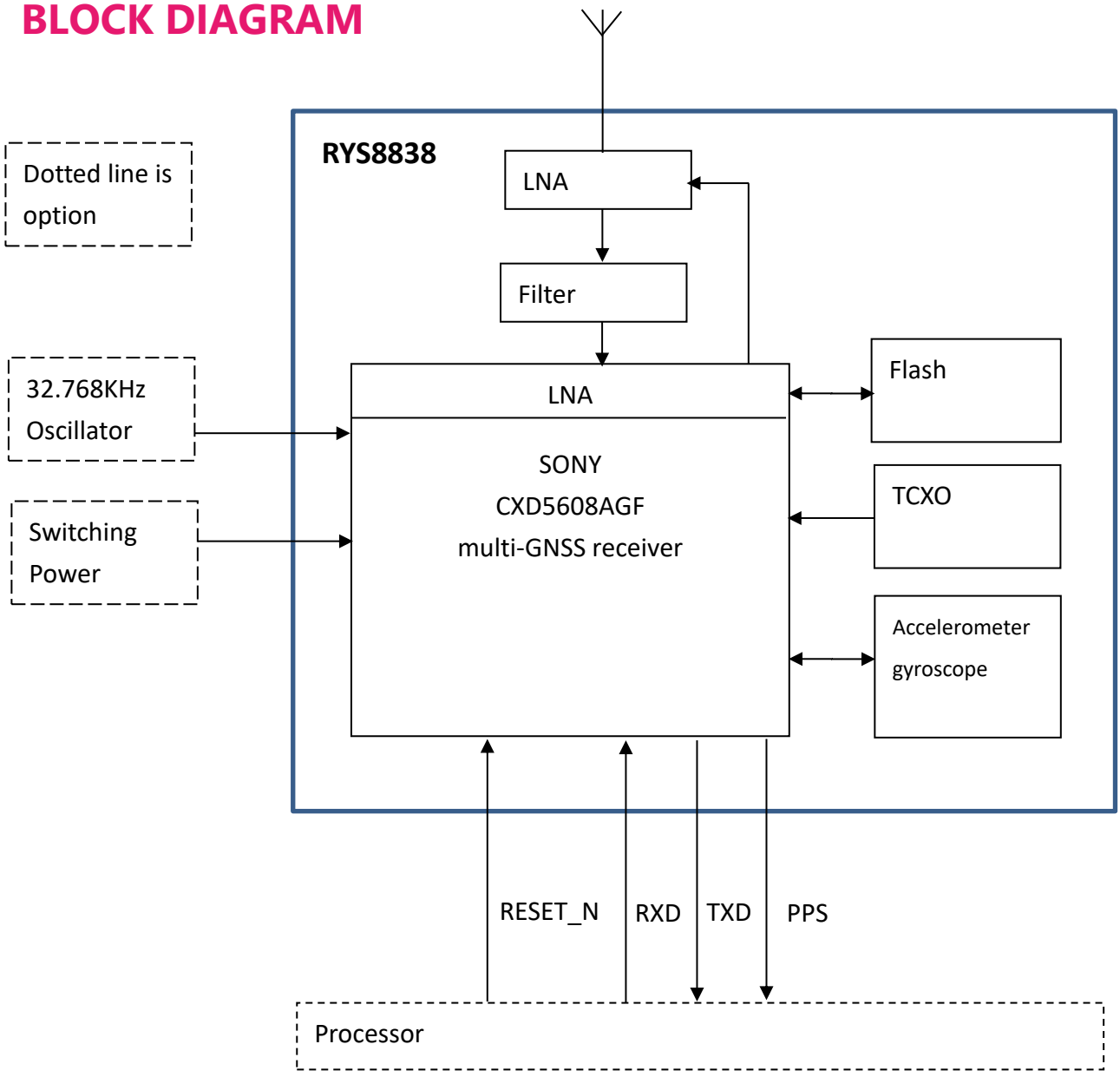
# PRODUCT DESCRIPTION

The RYS8838 is a multi-GNSS module with high sensitivity, fast acquisition engine and an Untethered Dead Reckoning (UDR) function.

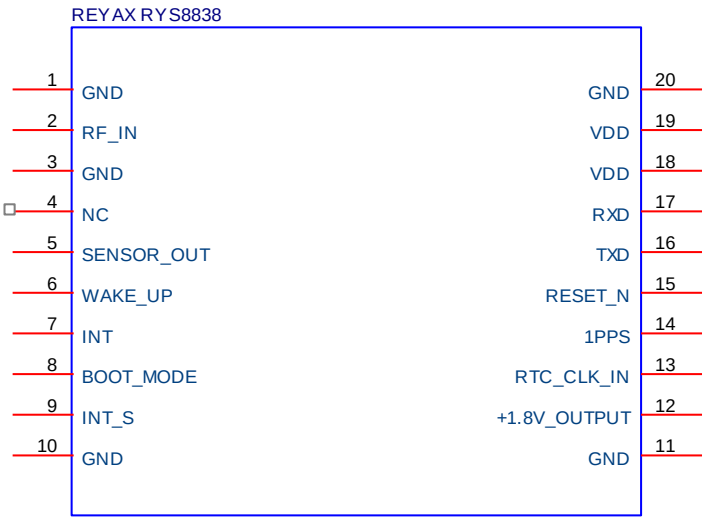
# FEATURES

- SONY CXD5608AGF Engine.
- A multi-GNSS module for GPS(L1 C/A), GLONASS(L1 OF), SBAS(L1 C/A), QZSS(L1 C/A), BeiDou(B1) and Galileo(E1 CBOC).
- Including SAW filter, LNA and TCXO.
- Embedded digital noise filters and spectrum analyzer.
- Untethered Dead Reckoning (UDR) function

# BLOCK DIAGRAM

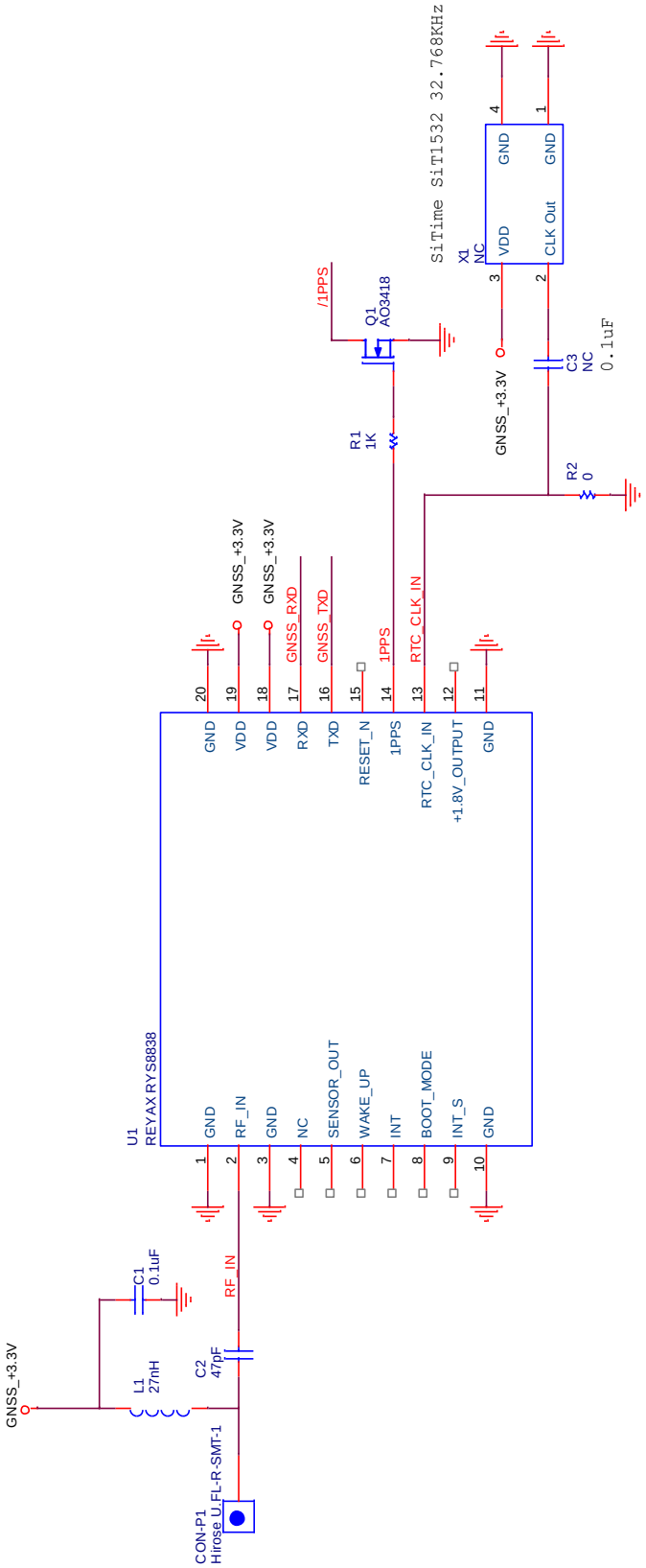


# PIN DESCRIPTION




| Pin | Name | I/O | Condition |
|---|---|---|---|
| 1 | GND | - | Ground |
| 2 | RF_IN | I | GNSS RF Signal input. |
| 3 | GND | - | Ground |
| 4 | NC | - | Leave Unconnected. |
| 5 | SENSOR_OUT | - | Leave Unconnected. |
| 6 | WAKE_UP | - | Leave Unconnected. |
| 7 | INT | - | Leave Unconnected. |
| 8 | BOOT_MODE | I | BOOT Recovery. *If not used, Please connect to GND. |
| 9 | INT_S | - | Leave Unconnected. |
| 10 | GND | - | Ground |
| 11 | GND | - | Ground |
| 12 | +1.8V_OUTPUT | | +1.8V 20mA power output |
| 13 | RTC_CLK_IN | I | 32.768KHz RTC clock input.<br>*If not used, Please Leave Unconnected. |
| 14 | 1PPS | O | Time pulse output. |
| 15 | RESET_N | I | Low reset pin. |
| 16 | TXD | O | Serial interface Output |
| 17 | RXD | I | Serial interface Input |
| 18 | VDD | I | Power Supply and I/O Voltage. |
| 19 | VDD | I | Power Supply and I/O Voltage. |
| 20 | GND | - | Ground |

# APPLICATION SCHEMATIC



# SPECIFICATION

| Item | Min. | Typical | Max. | Unit | Condition |
|---|---|---|---|---|---|
| Power Supply Voltage | 3.2 | 3.3 | 3.4 | V | VDD |
| | | | | | |
| **GNSS continuous mode** | | | | | |
| Satellite acquisition Current | | 32 | | mA | |
| Satellite tracking Current | | 28 | | mA | |
| Idle Current | | 17 | | mA | Waiting for command |
| | | | | | |
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| | | | | | |
| | | | | | |
| Default Baud Rate | | 115200 | | bps | 8,N,1 |
| Digital input level high | 0.7*VDD | | VDD+0.3 | V | VIH |
| Digital input level low | -0.3 | | 0.3*VDD | V | VIL |
| Digital output level high | 0.8*VDD | | VDD | V | VOH 2mA |
| Digital output level low | 0 | | 0.2*VDD | V | VOL 2mA |
| | | | | | |
| GNSS Center Frequency | | 1561.098<br>1575.42<br>1602.5625 | | MHz | BeiDou<br>GPS<br>Glonass |
| Navigation update rate | | 1 | | Hz | |
| Accuracy | | 1 | | M | Signal strength is -130dBm |
| Cold starts | | 35 | | Sec. | Signal strength is -130dBm |
| Hot starts | | 2 | | Sec. | |
| Tracking Sensitivity | | -161 | | dBm | |
| Hot starts Sensitivity | | -160 | | dBm | |
| Cold starts Sensitivity | | -147 | | dBm | |
| Operating Temperature | -40 | 25 | +85 | ˚C | |
| Dimensions | | | | | 13mm*11mm*2.2mm |
| Weight | | 0.8 | | g | |

# 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

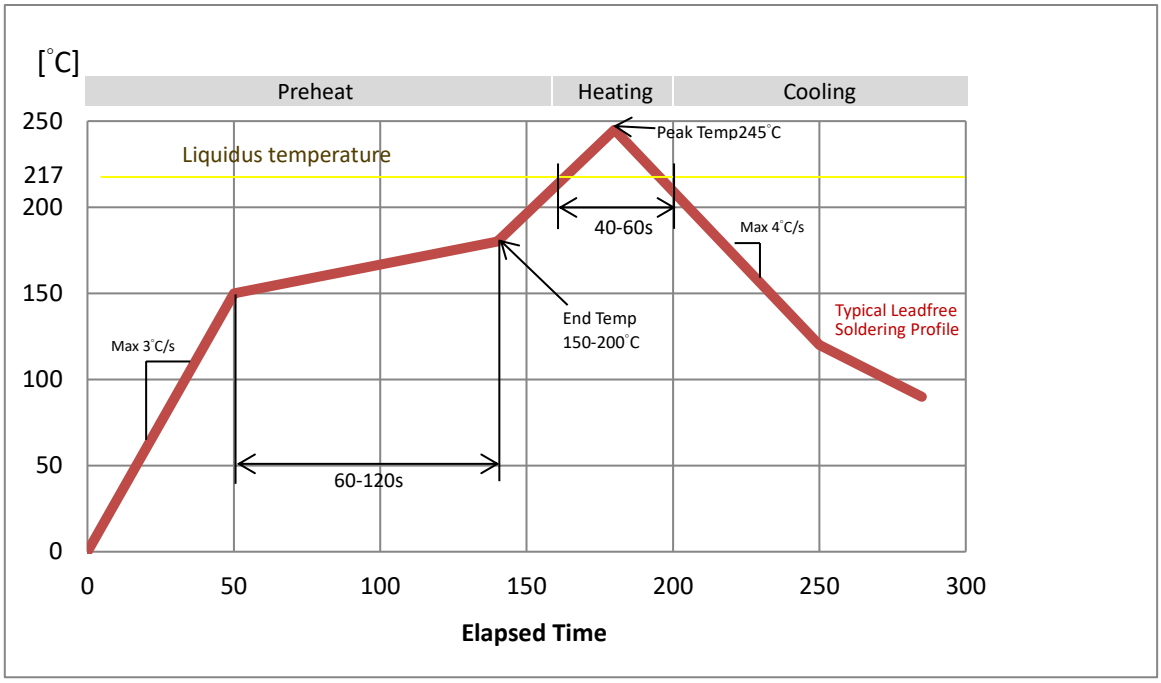
The temperature rises above the liquidus temperature of 217°C. Avoid a sudden rise in temperature as the slump of the paste could become worse.

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

### Cooling phase

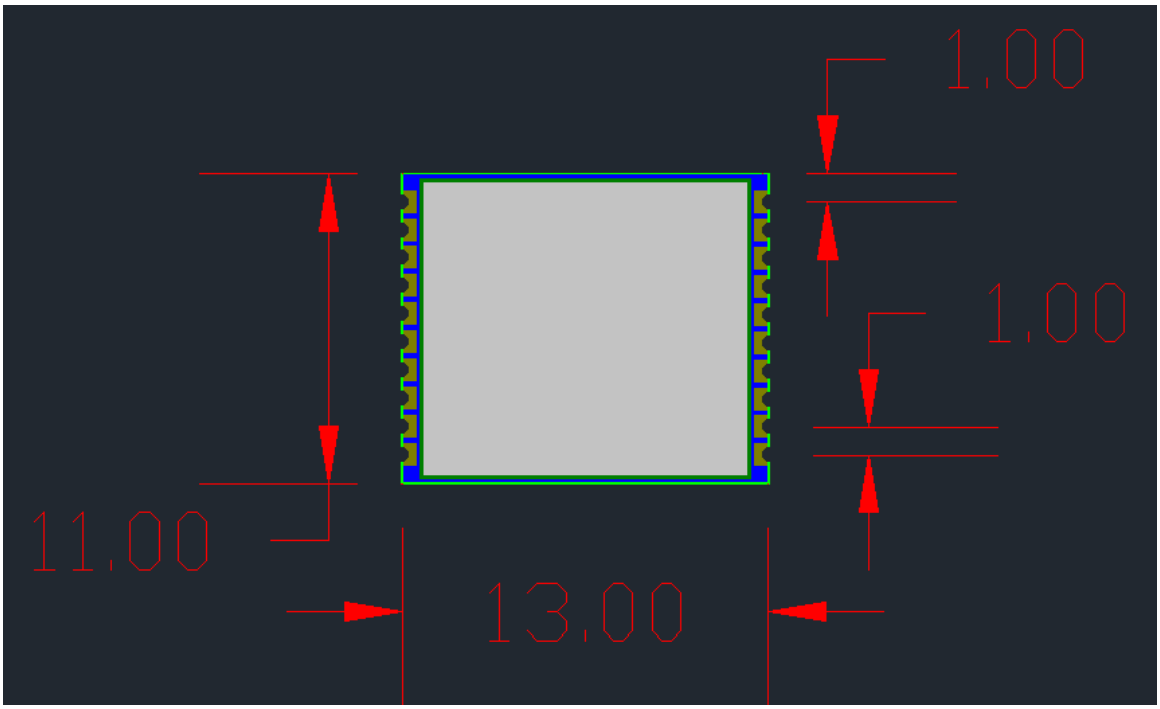
A controlled cooling avoids negative metallurgical effects (solder becomes more brittle) of the solder and possible mechanical tensions in the products. Controlled cooling helps to achieve bright solder fillets with a good shape and low contact angle.

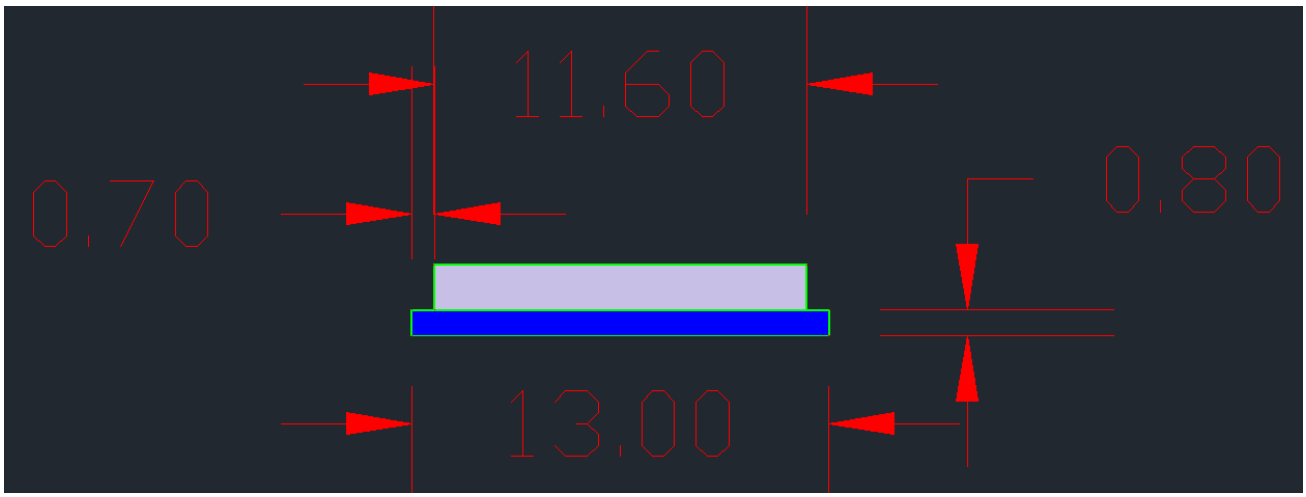
- Temperature fall rate: max 4 °C/s To avoid falling off, the REYAX module should be placed on the topside of the motherboard during soldering.

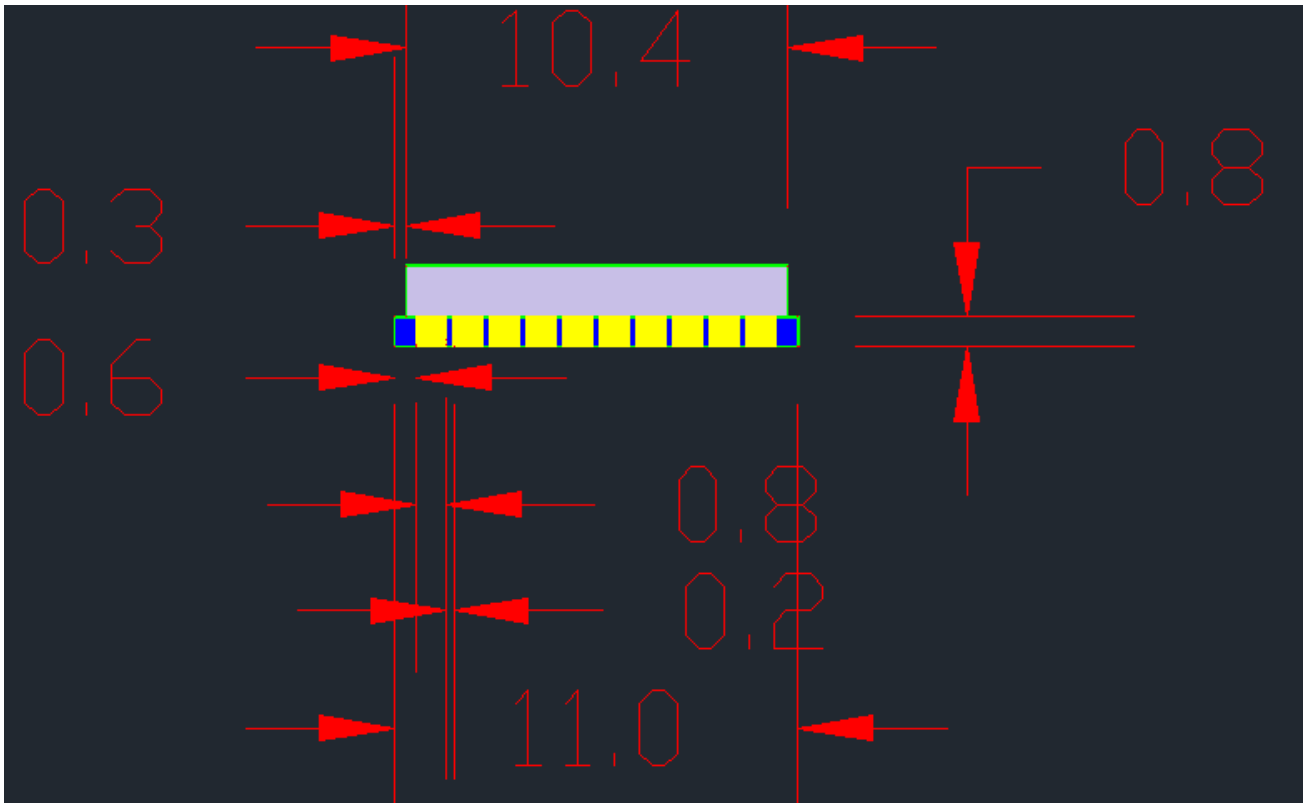



**Recommended soldering profile**

# DIMENSIONS

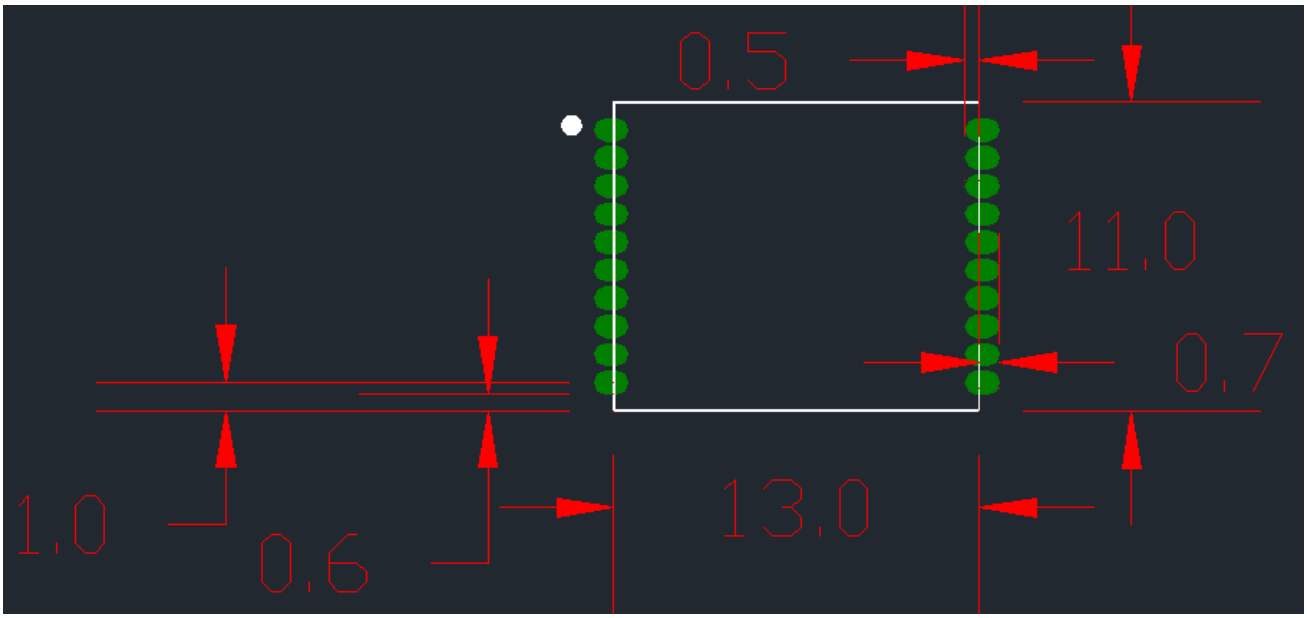





Unit : mm

# LAYOUT FOOTPRINT RECOMMENDATIONS




Unit : mm

REYAX
TECHNOLOGY CORPORATION, LTD

**Taiwan:** sales@reyax.com
**China:** sales@reyax.com.cn
***http://reyax.com***