

RYS8839

Ultra-low power, L1 L5 Dual-band multi-constellation GNSS module

Datasheet



11mm*8mm*2.2mm



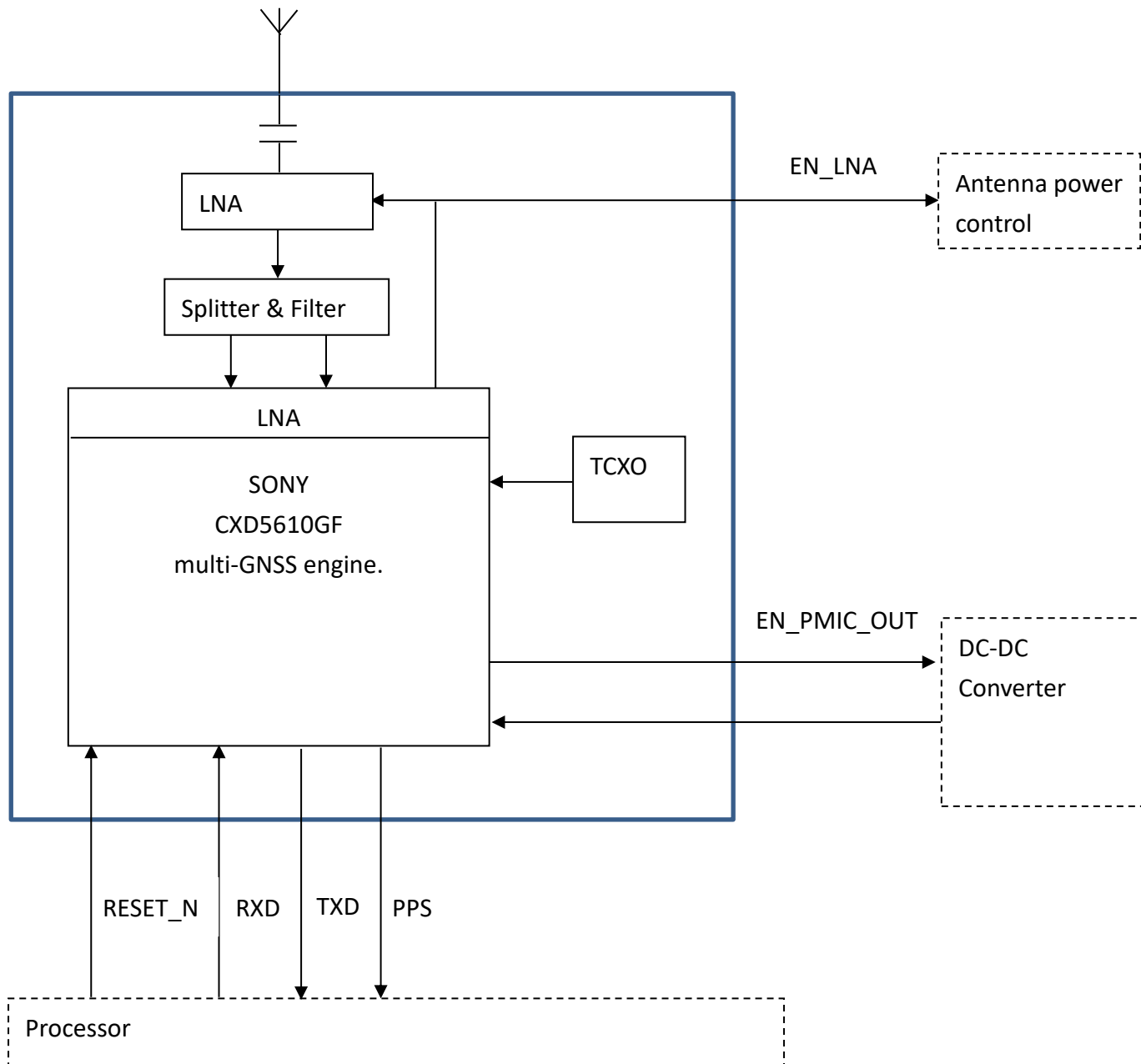
PRODUCT DESCRIPTION

The RYS8839 is an ultra-low power, L1 L5 Dual-band multi-constellation GNSS module. It also has integrated digital noise filters for coexistence with other radio systems.

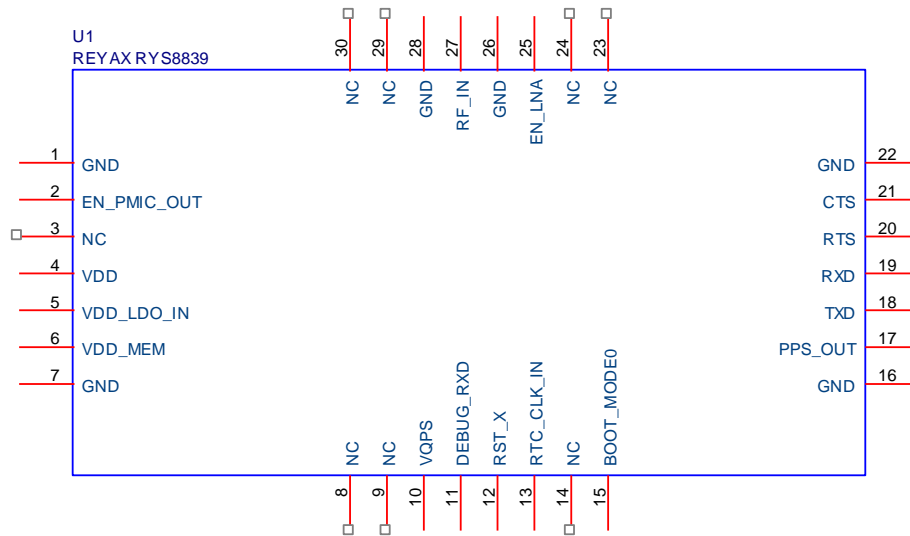
FEATURES

- SONY CXD5610GF Engine.
- A L1 L5 Dual-band GNSS receiver.
- Supports multi-constellation :
 - GPS(L1C/A,L5)
 - GLONASS(L1OF)
 - BeiDou(B1I, B1C, B2a)
 - Galileo(E1, E5a)
 - QZSS(L1C/A, L1S, L1C/B, L5)
 - IRNSS NavIC(L5)
 - SBAS(L1)
- *GNSS performance could depend on the setting.
- Embedded digital noise filters and spectrum analyzer.

BLOCK DIAGRAM

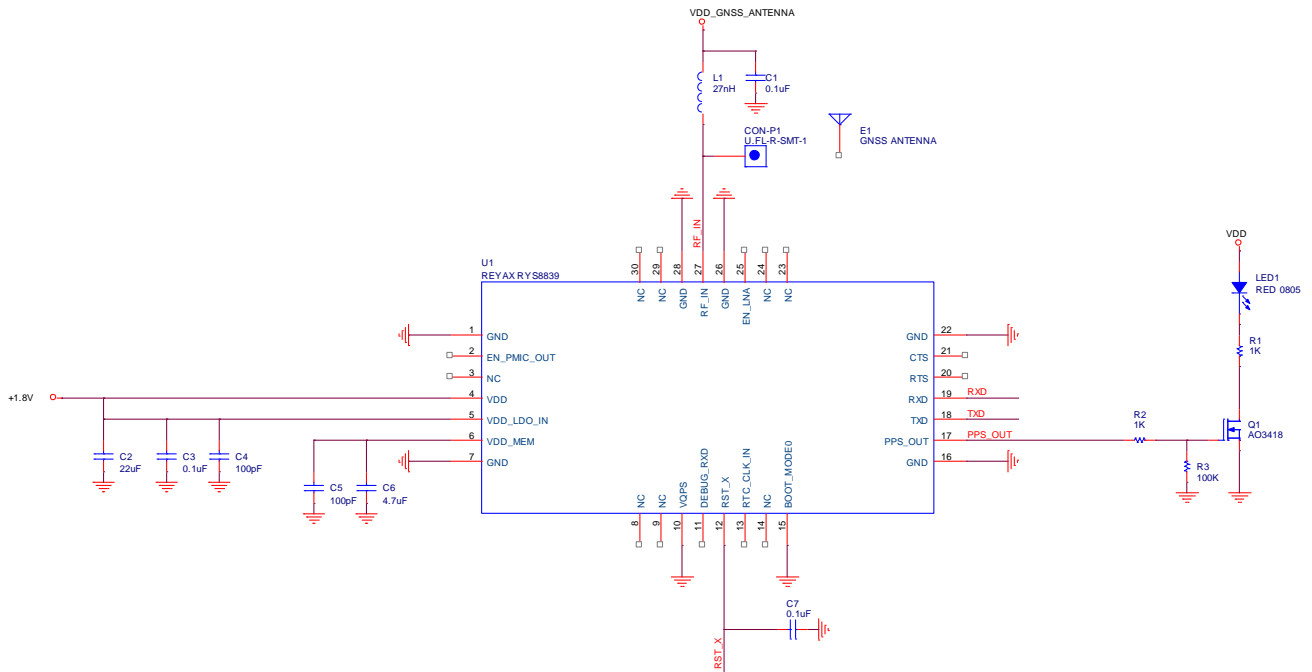


PIN DESCRIPTION

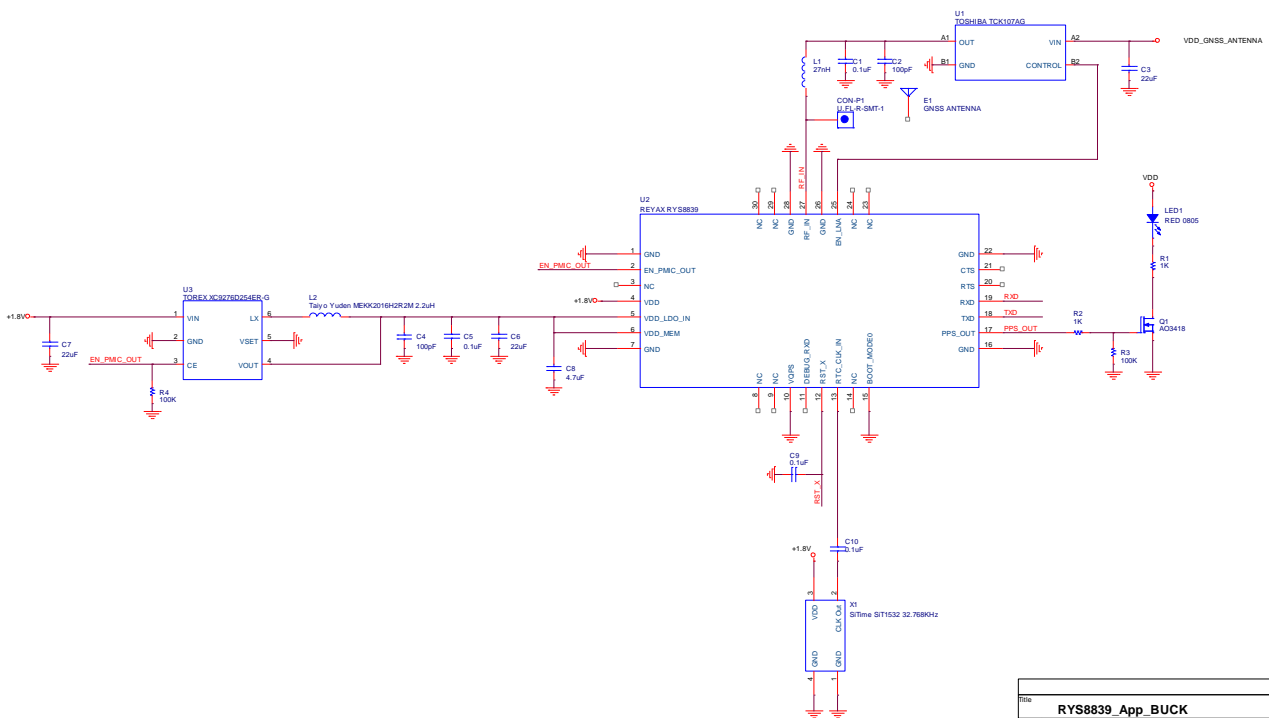


| Pin | Name | I/O | Condition |
|----------------------|-------------|-----|---|
| 1,7,16,22,26,28 | GND | - | Ground |
| 3,8,9,14,23,24,29,30 | NC | - | Leave Unconnected. |
| 2 | EN_PMIC_OUT | O | To enable external PMIC, High active. (Optional) |
| 4 | VDD | I | +1.8V Power Supply and I/O Voltage. |
| 5 | LDO_IN | I | +0.8V~+1.8V Input |
| 6 | VDD_MEM | O | +0.8V Power for memory. |
| 10 | VQPS | I | Reserved, Connect to GND. |
| 11 | DEBUG_RXD | I | Reserved, Leave Unconnected. |
| 12 | RST_X | I | Reset input, Normal High. |
| 13 | RTC_CLK_IN | I | 32.768KHz RTC clock input. *If not used, Please Leave Unconnected. |
| 15 | BOOT_MODE0 | I | GND : UART Interface, VDD : I2C Interface. |
| 17 | PPS_OUT | O | Time pulse output. |
| 18 | TXD/SCL | O | Serial interface Output / I2C interface |
| 19 | RXD/SDA | I/O | Serial interface Input / I2C interface |
| 20 | RTS | I | Request to send |
| 21 | CTS | O | Clear to Send |
| 25 | EN_LNA | O | To enable external active antenna, High active. (Optional) |
| 27 | RF_IN | I | GNSS RF Signal input. |

APPLICATION SCHEMATIC (UART Interface)



APPLICATION SCHEMATIC (Use buck regulator)



| | | |
|------------------|--------------------------|--------------|
| Title | | |
| RYS8839_App_BUCK | | |
| Docu | Document Number | Rev |
| Client | Client/Docu | 1.0 |
| Date | Friday, January 21, 2022 | Sheet 1 of 1 |

SPECIFICATION

| Item | Min. | Typical | Max. | Unit | Condition |
|-------------------------------|---------|---|---------|------|---------------------------------------|
| Power Supply Voltage | 1.75 | 1.8 | 1.85 | V | VDD |
| GNSS continuous mode | | | | | |
| Satellite acquisition Current | | 24 | | mA | L1+L5 Acquisition |
| Satellite tracking Current | | 16 | | mA | L1+L5 Acquisition with 64-SV |
| Idle Current | | 2 | | mA | Waiting for command |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 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 | | 1176.45 1561.098 1575.42 1602.5625 | | MHz | GPS L5 BeiDou GPS L1 Glonass |
| Navigation update rate | | 1 | 25 | Hz | |
| Accuracy | | 1 | | M | L1 L5 Signal strength is -130dBm |
| Cold starts | | 24 | | Sec. | L1 L5 Signal strength is -130dBm |
| Hot starts | | 1 | | Sec. | L1 L5 Signal strength is -130dBm |
| Tracking Sensitivity | | -167 | | dBm | |
| Hot starts Sensitivity | | -163 | | dBm | |
| Cold starts Sensitivity | | -149 | | 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

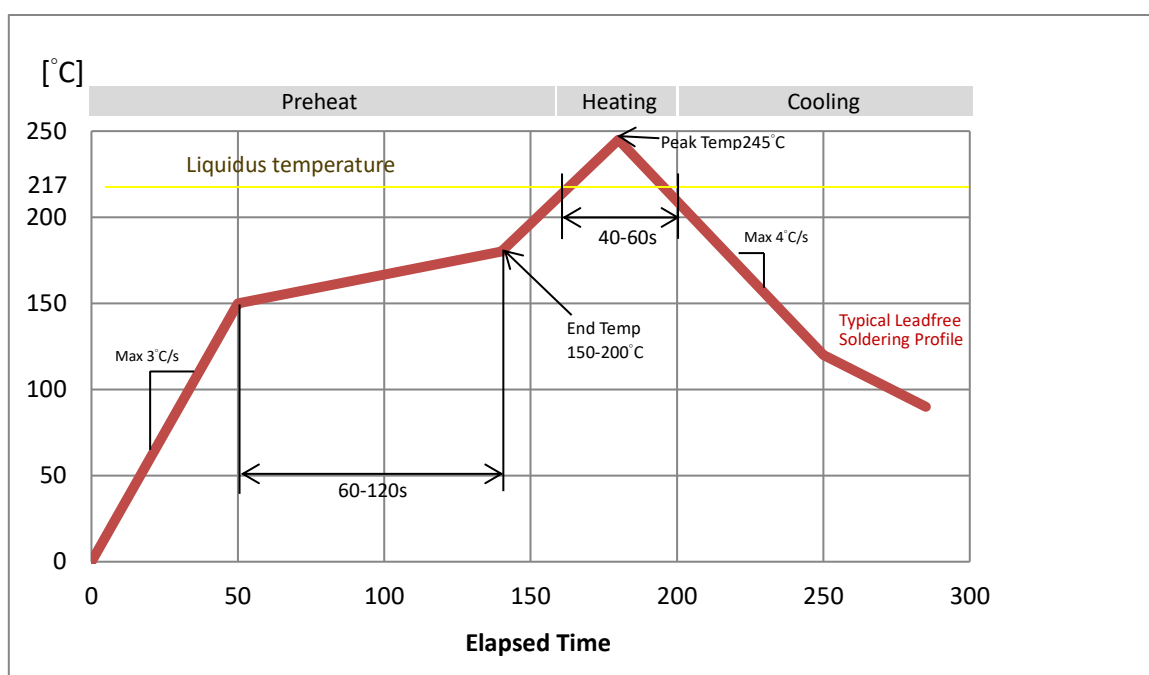
The temperature rises above the liquidus temperature of 217°C. Avoid a sudden rise in temperature as the slump of the paste could become worse.

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

Cooling phase

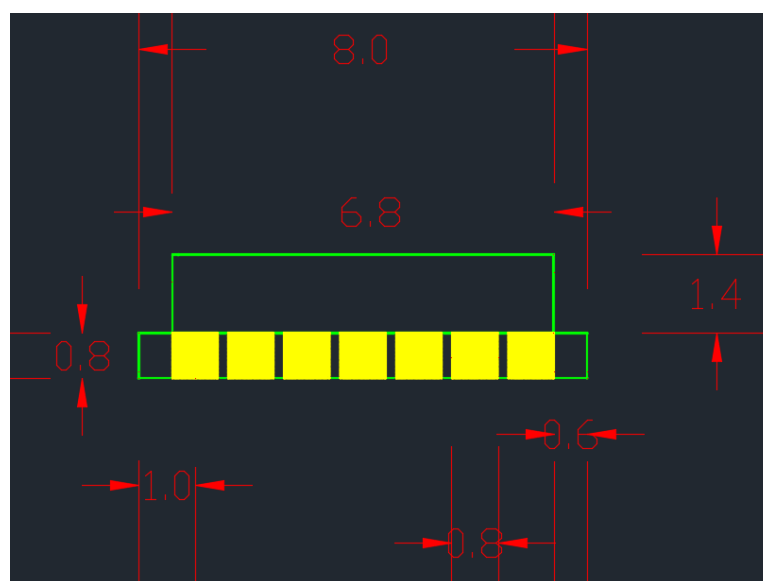
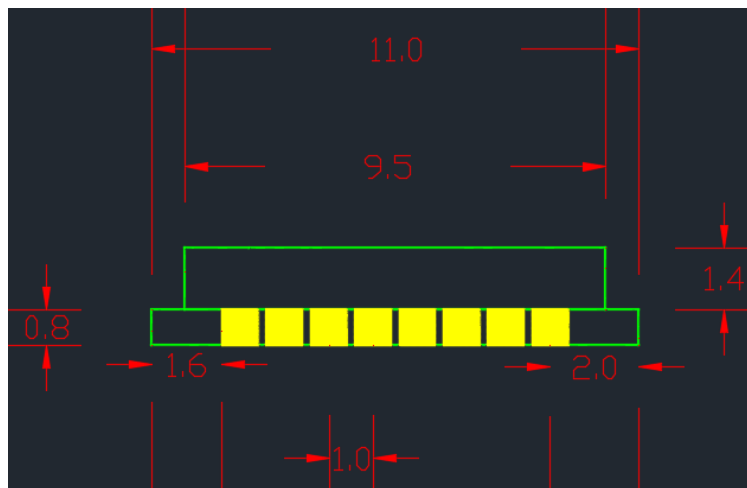
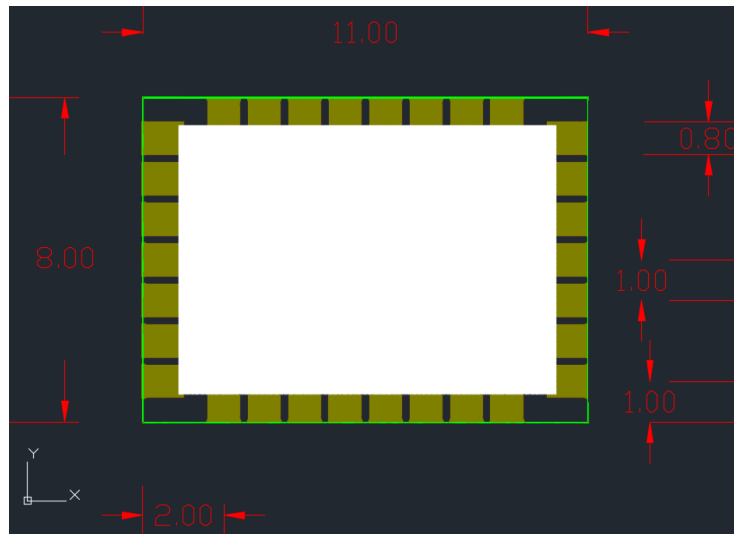
A controlled cooling avoids negative metallurgical effects (solder becomes more brittle) of the solder and possible mechanical tensions in the products. Controlled cooling helps to achieve bright solder fillets with a good shape and low contact angle.

- 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.



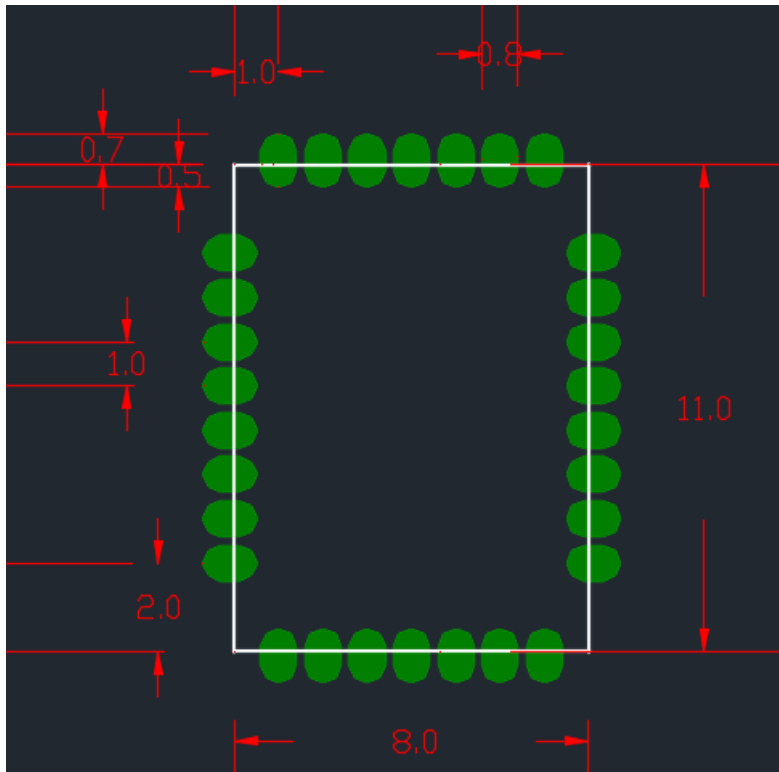
Recommended soldering profile

DIMENSIONS



Unit : mm

LAYOUT FOOTPRINT RECOMMENDATIONS



Unit : mm