REYAX
TECHNOLOGY CORPORATION, LTD

21-JAN-2022 56312E39

RYS8839

Ultra-low power, L1 L5 Dual-band multi-constellation +1.8V GNSS module

Datasheet

11mm*8mm*2.2mm

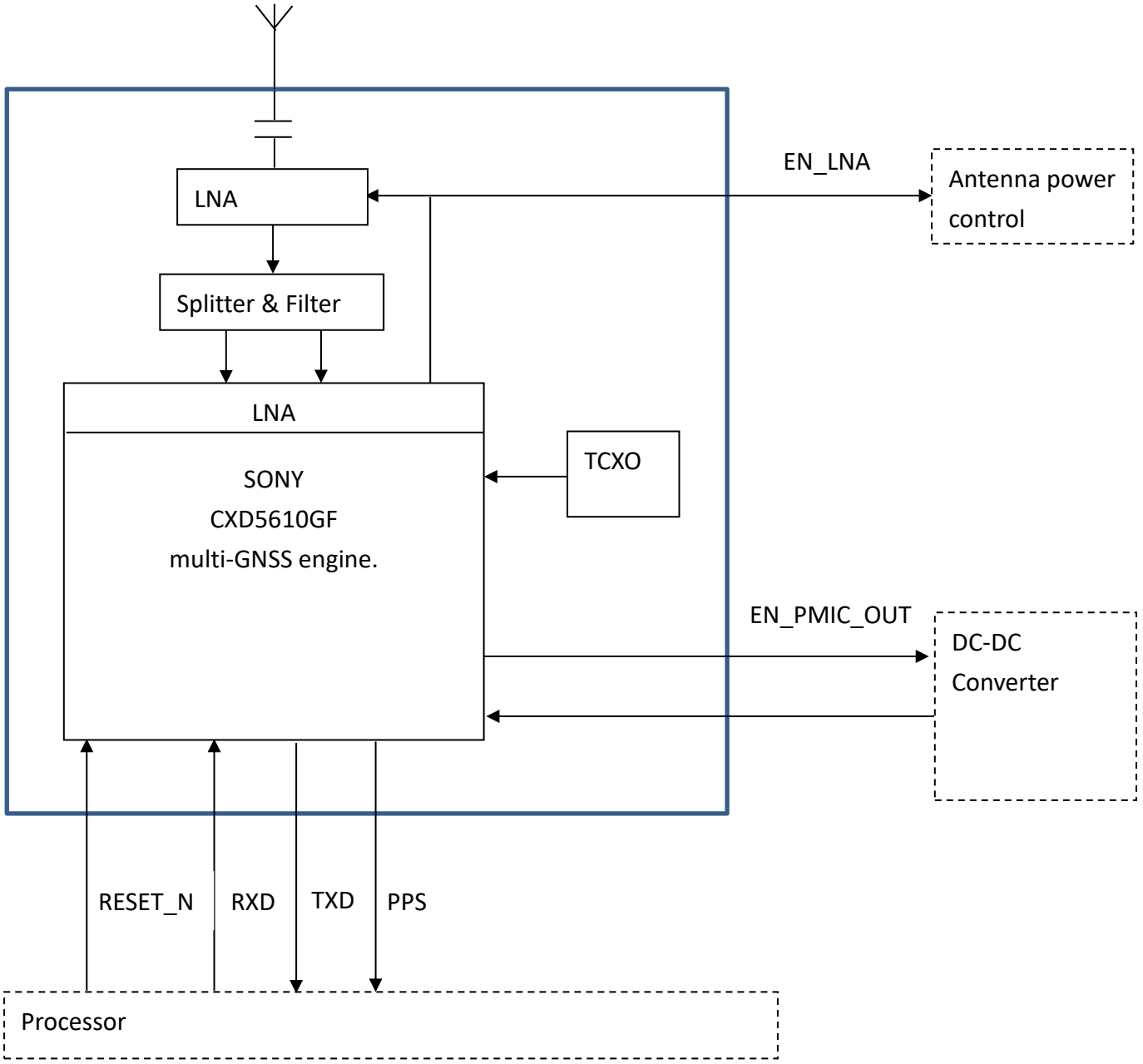
PRODUCT DESCRIPTION

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.

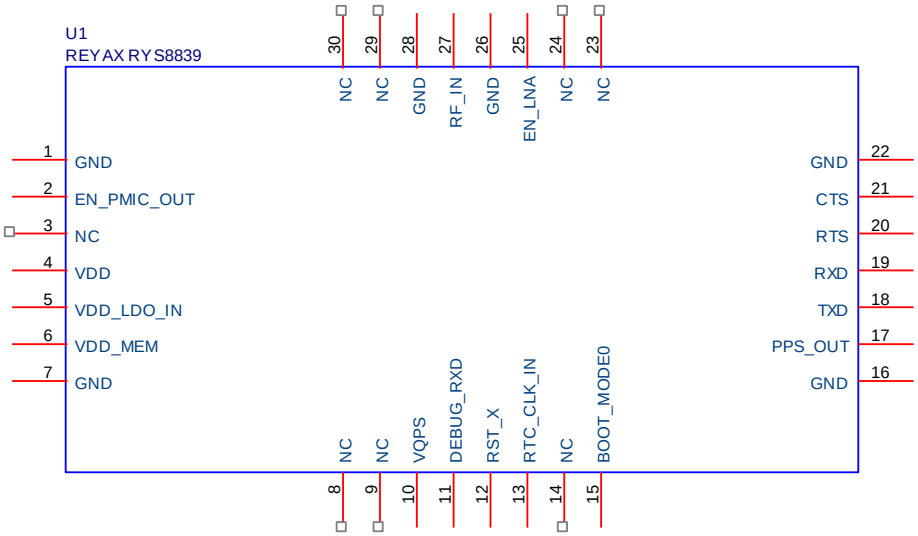
FEATURES

- 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

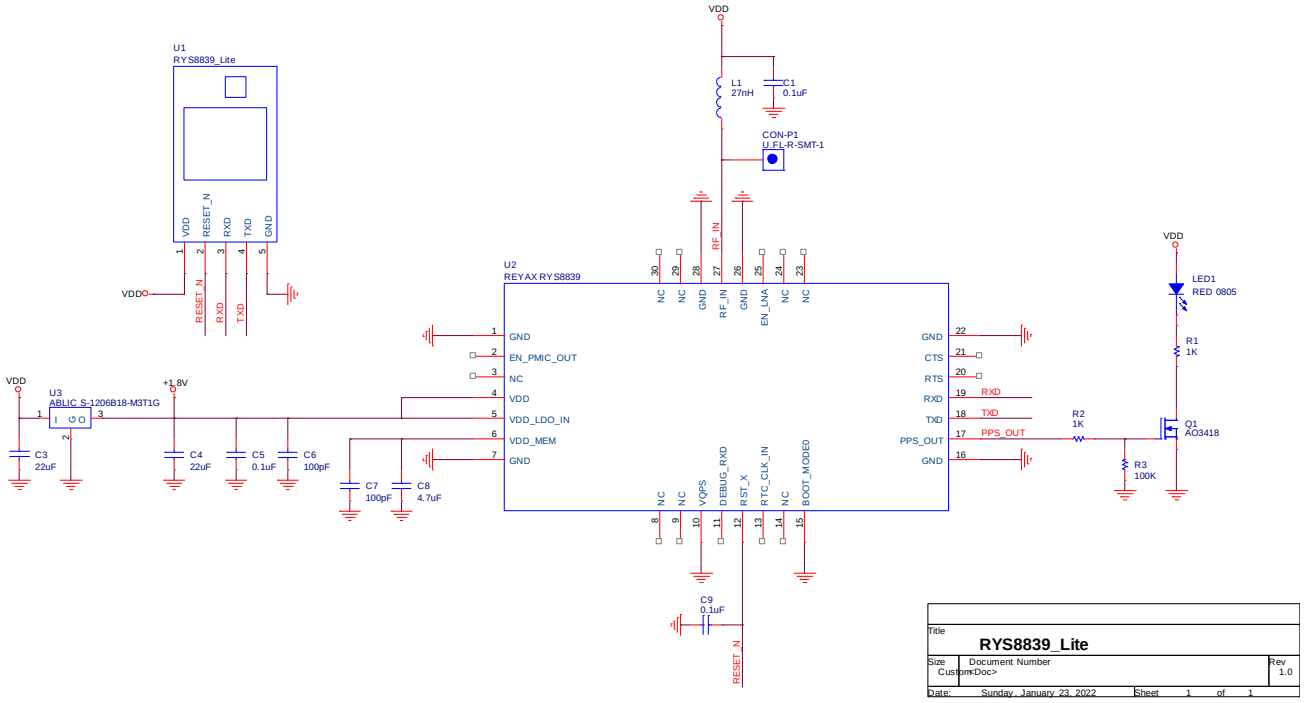


PIN DESCRIPTION

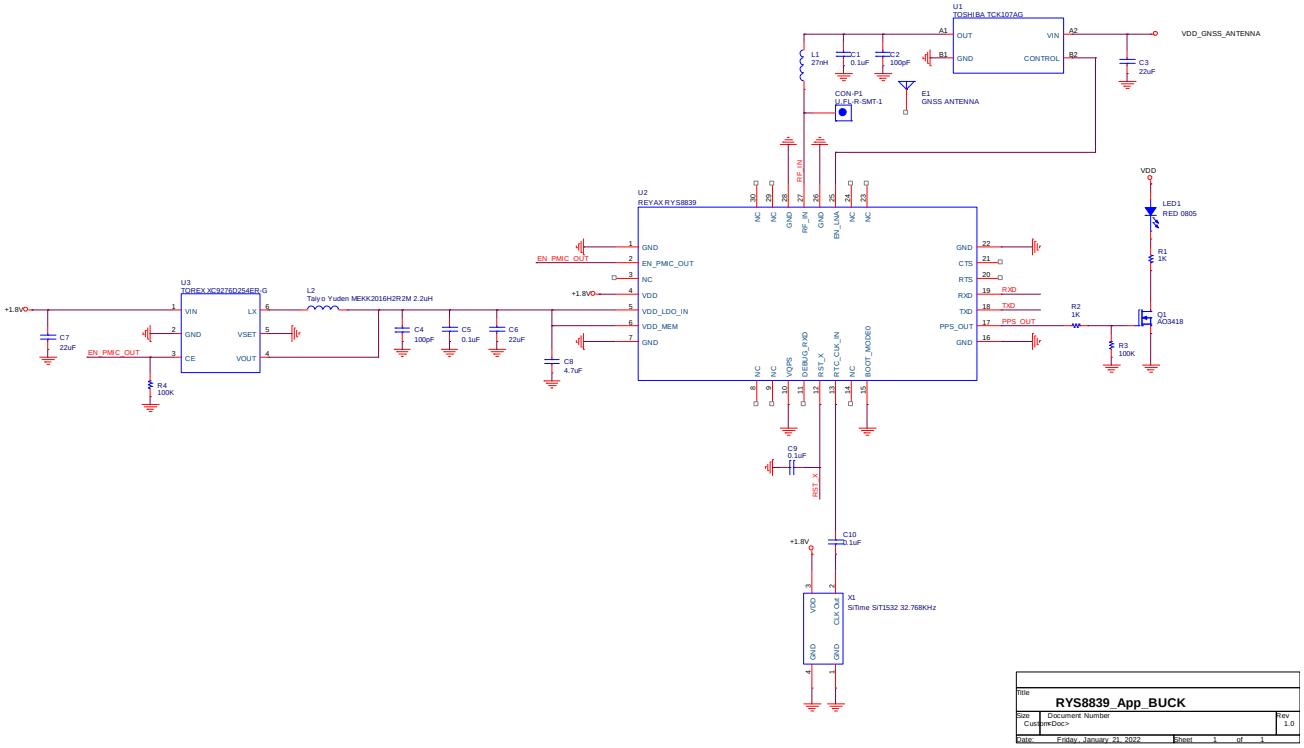


Pin	Name	I/O	Condition
1,7,16,22,26,28	GND	-	Ground
3,8,9,14,23,24,29,30	NC	-	Leave Unconnected.
2	EN_PMIC_OUT	O	To enable external PMIC, High active. (Optional)
4	VDD	I	+1.8V Power Supply and I/O Voltage.
5	LDO_IN	I	+0.8V~+1.8V Input
6	VDD_MEM	O	+0.8V Power for memory.
10	VQPS	I	Reserved, Connect to 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)



SPECIFICATION

Item	Min.	Typical	Max.	Unit	Condition
Power Supply Voltage	1.75	1.8	1.85	V	VDD noise level < 30mVpp
	0.75	1.8	1.98	V	VDD_LDO_IN noise level < 30mVpp
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					11mm*8mm*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

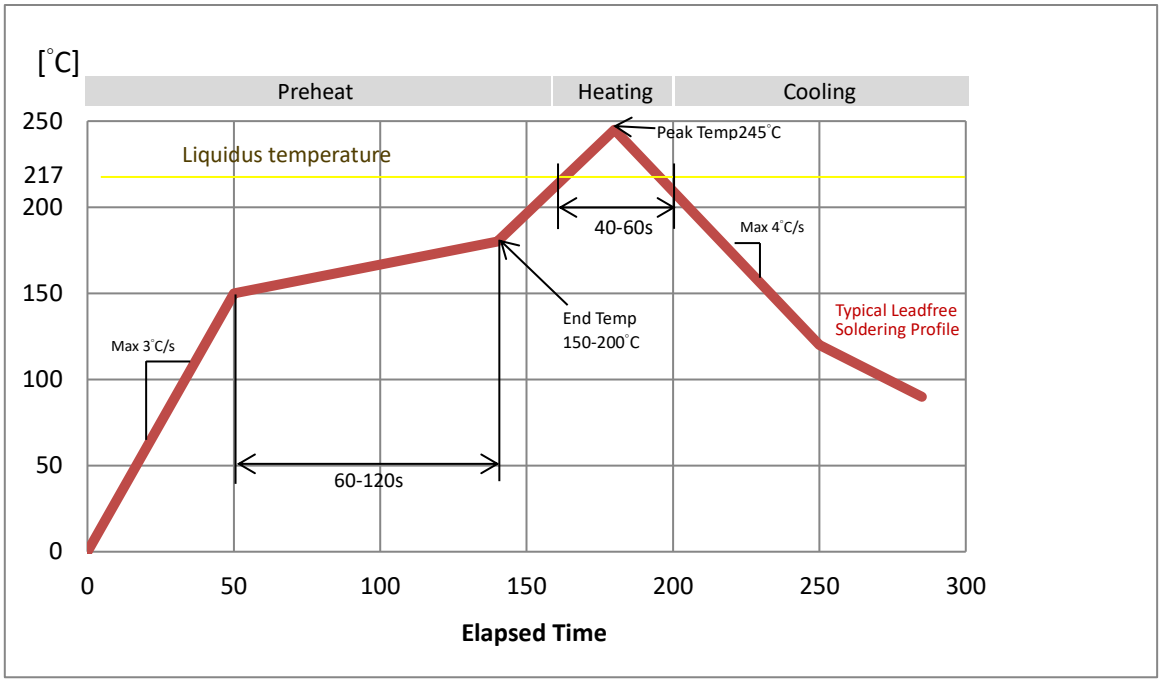
The temperature rises above the liquidus temperature of 217°C. Avoid a sudden rise in temperature as the slump of the paste could become worse.

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

Cooling phase

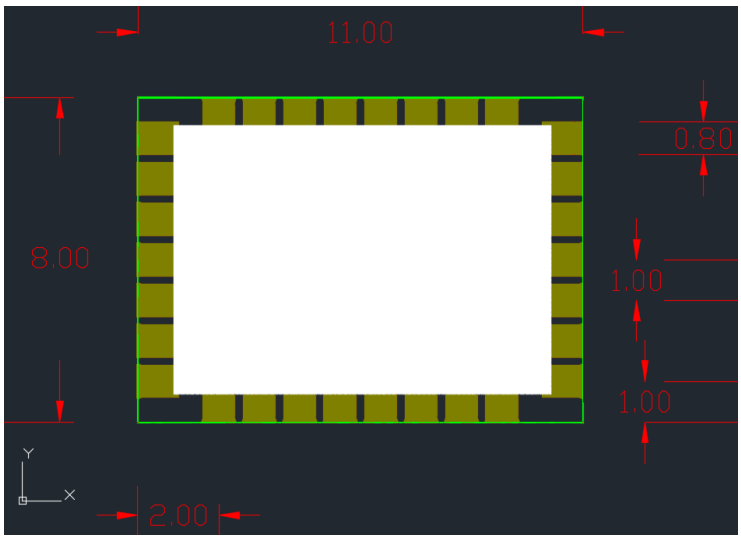
A controlled cooling avoids negative metallurgical effects (solder becomes more brittle) of the solder and possible mechanical tensions in the products. Controlled cooling helps to achieve bright solder fillets with a good shape and low contact angle.

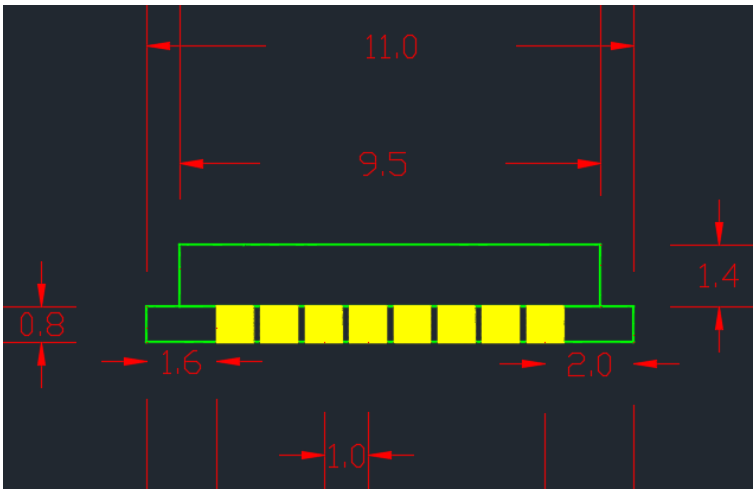
- Temperature fall rate: max 4 °C/s To avoid falling off, the REYAX module should be placed on the topside of the motherboard during soldering.

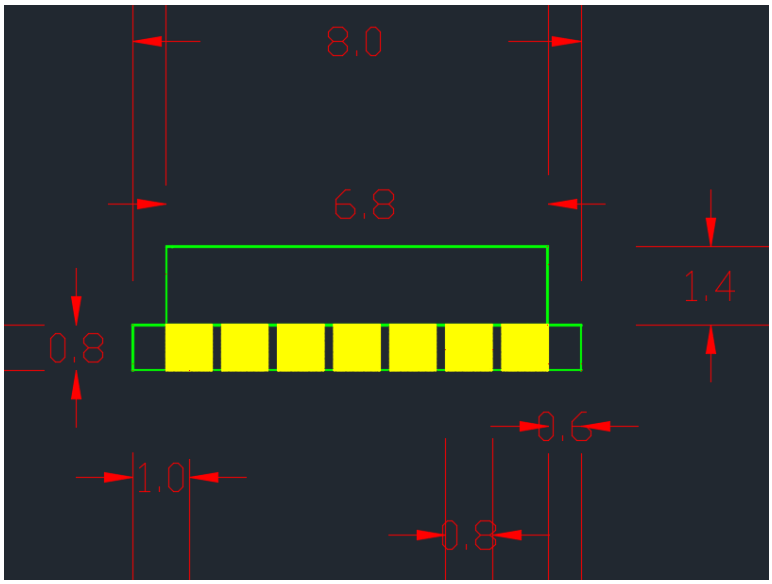


Recommended soldering profile

DIMENSIONS

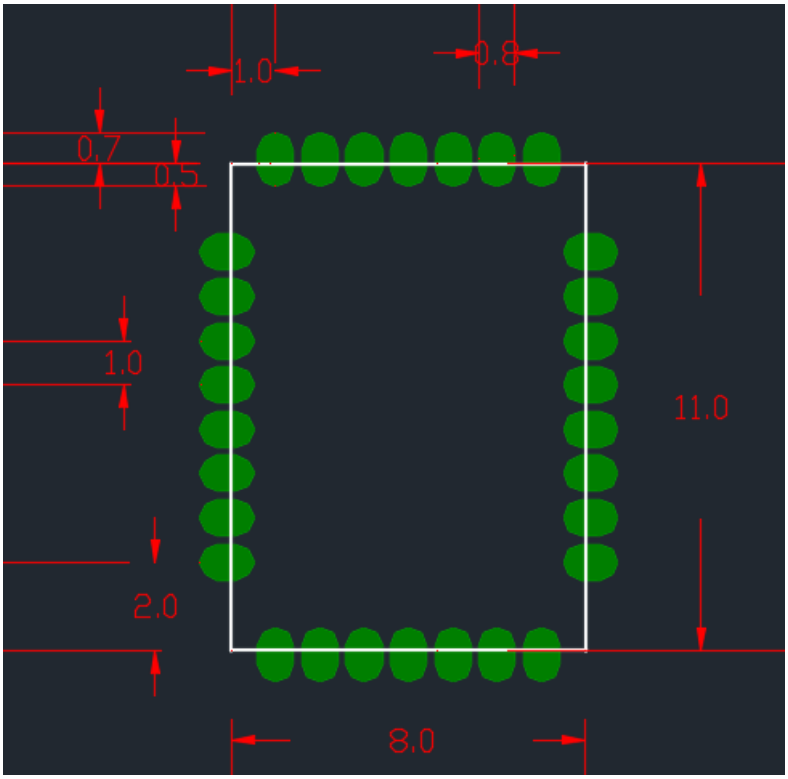






Unit : mm

LAYOUT FOOTPRINT RECOMMENDATIONS



Unit : mm

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