WS100A (VC7300)

Wi-Sun & Sub-GHz Solution

Design By

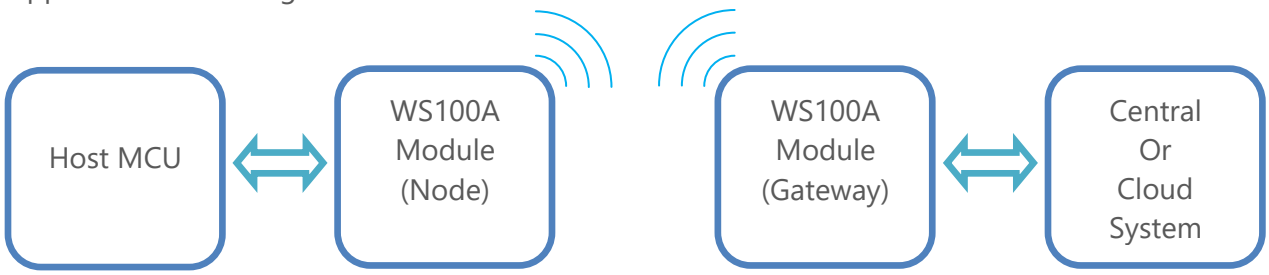
OPTO-SENSOR

OPTO-SENSOR
http:/www.opto-sensor.com.tw

WS100A is a module solution utilizing Vertexcom's VC7300BU Wireless Sub-GHz / Wi-Sun MCU. It is a highly integrated wireless MCU module featuring ultra-low power and powerful computation capabilities. Its size is 25*38mm. It supports Wi-Sun & Sub-GHz (IEEE802.15.4g) and M-bus protocol. It is a perfect fit to IoT networking and sensing applications.

Host MCU can use UART to talk with the module and communicate bi-directionally with portable smart devices. After receiving host data, the module (node) will automatically forward it to the gateway module. The gateway will send the data to cloud and share it with portable smart devices. Portable smart devices can also act in reverse and send data to the remote module. The module will then forward the data to the host MCU via UART. Module supports AT commands and configuration retention after device power off.

Application block diagram



Feature Overview

- ✓ **Compliant with IEEE 802.15.4g**
- ✓ **High RX Sensitivity**
- ✓ **Automatic Channel Hop**
- ✓ **Max Throughput up to 300Kbps**
- ✓ **Supports OTA**
- ✓ **Operating Voltage：2.0～3.6V (3.3V typical)**
- ✓ **Module Size：25*38 mm * TDB mm**
- ✓ **Operating Temperature：-40°C～85°C**

Applications

- ✓ **Smart Meter**
- ✓ **Smart Streetlight**
- ✓ **Public Infrastructure**
- ✓ **Factory Automation**
- ✓ **Automated Meter Polling For Existing Meters**

1. OPTO-SENSOR Wi-Sun / Sub-GHz Module EVK

This EVK made by OPTO-SENSOR includes “module” and “Carrier Board”.

The module allows users to evaluate the performance of Vertexcom VC7300BU IC.

Module dimension is 25*38mm (+/-TBD mm) * TBD (+/-TBD mm).

The Evaluation Kit can be connected to PC USB port with a Type A to Type C cable. The PC USB port provides power source and enables communication with the module through emulated UART interface.

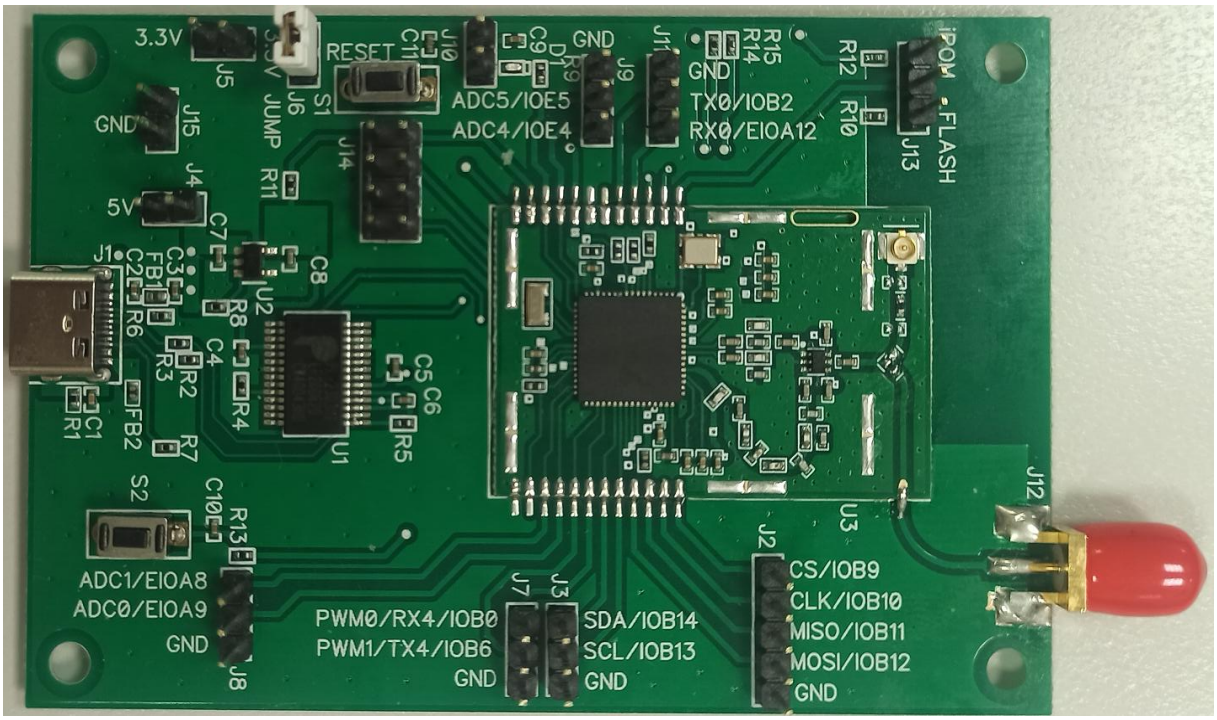


Fig 1. WS100A EVK

WS100A Module Spec. (Base on VC7300BU)

Product Specifications

MAIN CHIPSET

- VertexCom VC7300BU

FUNCTIONAL SPECIFICATIONS

- support IEEE 802.15.4g / Wi-SUN
- Support wireless M-Bus
- Modulation schemes: OOK, (G)FSK
- ISM frequency bands: 315, 433, 490, 868, 915 MHz

  (WS100A is designed for 915 MHz)
- -109dBm at 50kbps GFSK
- 50kbps, 100kbps, 150kbps, 300kbps supported data rates
- TX Power 0dBm, +13dBm, +20dBm
- 18mA peak RX, 45mA peak TX (13dBm)

ARM Cortex-M3 processor

- Serial Wire Debug (SWD)

Memory

- 1MB embedded flash program memory
- 128KB RAM
- 16KB SRAM

Flexible Power Management

- Supply voltage range 2V to 3.6 V
- 0.6μA at 3V OFF mode
- 1.1uA at Deep sleep mode
- 10μA at Sleep mode

10 bit ADC - 4 configurable channels

Maximum 14 General Purpose I/O Pins

Four 32 bit timers

2 channel PWM use 16 bit timers

SPI master/slave

I2C master/slave controller

3 UART (one for debug / two for application)

128/192/256-bit AES CODEC

ECC encrypt/decrypt accelerated engine

True random number generator (TRNG)

Pseudo random number generator

Real time clock (RTC)

VC7300 Datasheet Download Link:
http://www.vertexcom.com/doc/VC7300_en.pdf

2. WS100A Module Layout

PIN 1

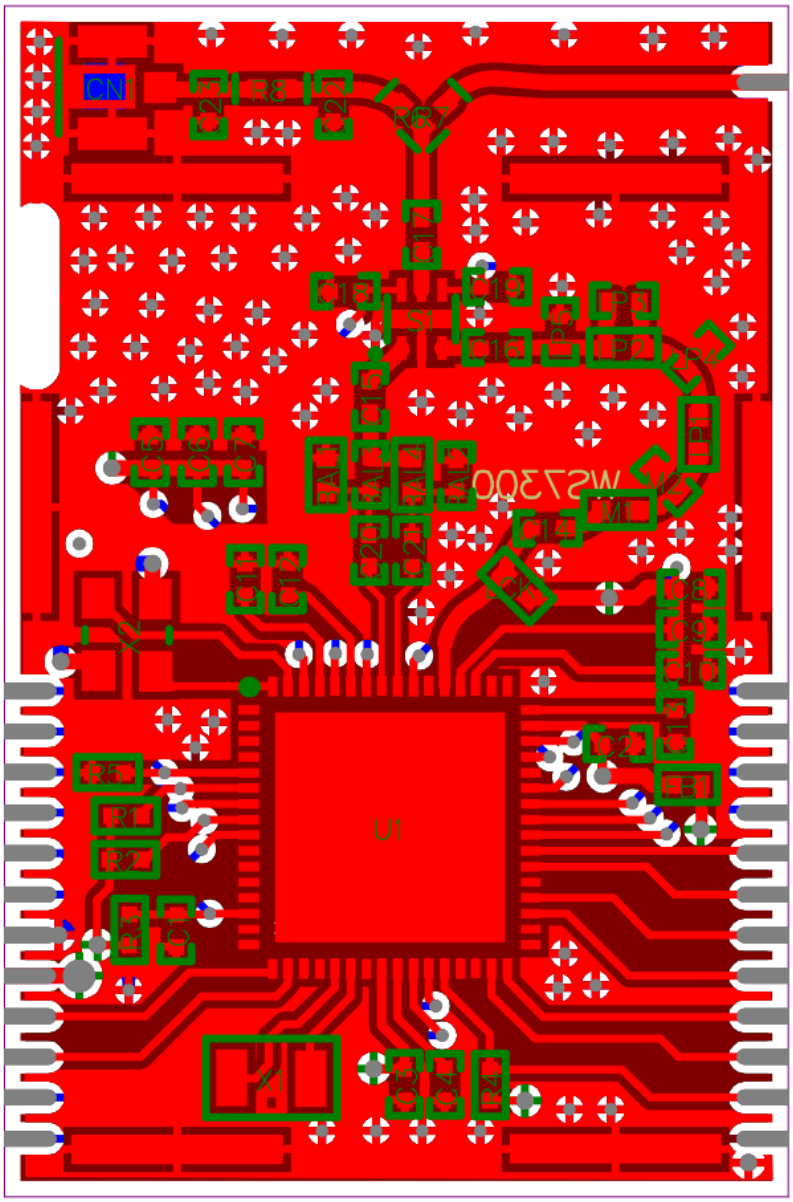


Fig 2. WS100A Module Layout

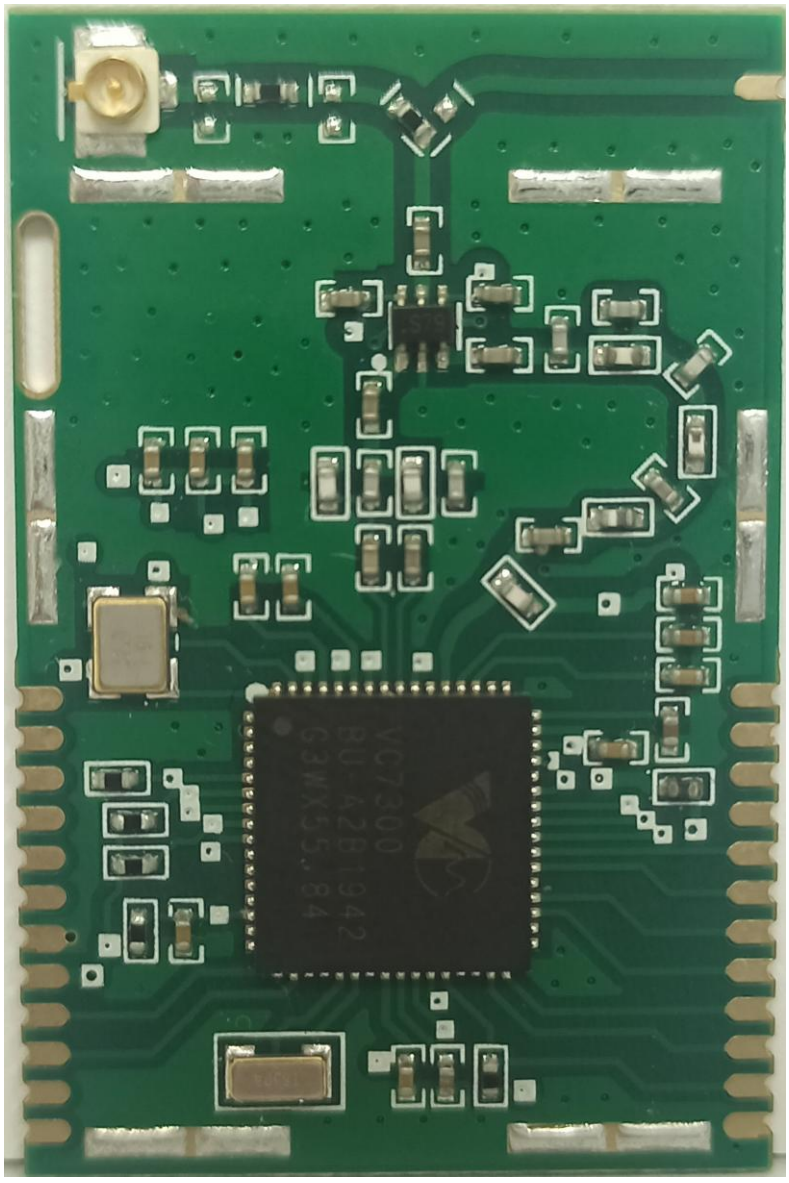


Fig 3. Module WS100A

3. Module PIN Definition

WS100A

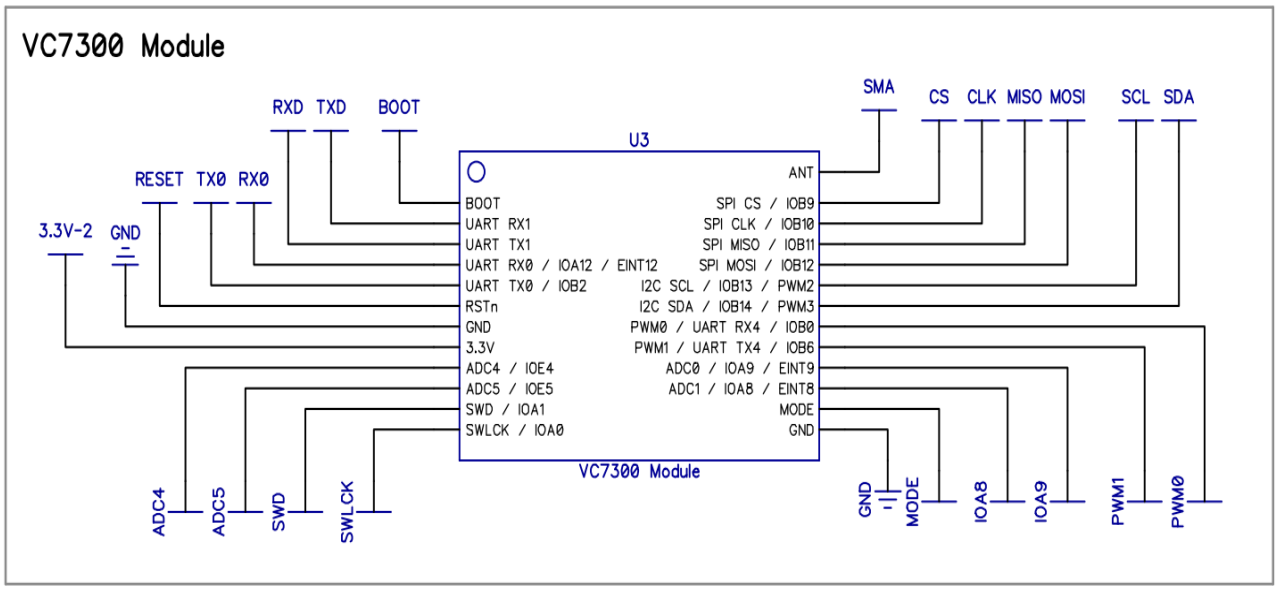


Fig 4. WS100A Module PIN Define

PIN	Name/Function	TYPE	Remark
1	BOOT	I/O	Default: General purpose IO, IOD0 Boot strap pin 0: Embedded flash boot. 1: Internal ROM boot.
2	UART RXD 1	I/O	Default: General purpose IO, IOA13 Function 2: EINT13 Function 3: UART RXD 1 (Application UART) Function 4: ISO7816 I/O 0
3	UART TXD 1	I/O	Default: General purpose IO, IOB3 Function 3: UART TXD 1 (Application UART) Function 4: ISO7816 CLK 0
4	UART RXD 0	I/O	Default: General purpose IO, IOA12 Function 2: EINT12 Function 3: UART RXD 0 (Debug UART) Function 4: Key scan input 3
5	UART_TX_0	I/O	Default: General purpose IO, IOB2 Function 3: UART TXD 0 (Debug UART)
6	RSTn		External reset pin, low active.
7	GND	G	
8	VDD	P	2.0V~3.6V input 3.3 V is recommended.
9	IOE4	I/O	Default: General purpose IO, IOE4. Function 1: ADC channel 4 input
10	IOE5	I/O	Default: General purpose IO, IOE5 Function 1: ADC channel 5 input
11	SWIO	I/O	Default: General purpose IO, IOA1 (MODE=1), SWIO (MODE=0). Function 2: EINT1
12	SWCK	I/O	Default: General purpose IO, IOA0 (MODE=1), SWCK (MODE=0). Function 2: EINT0
13	GND	G	Ground
14	MODE	I	Debug mode or normal mode selection 0: Debug mode 1: Normal mode The signal level of this pin should be the same as DVDD33, and the state of this IO should not change during normal or debug operation.
15	IOA8	I/O	Default: General purpose IO, IOA8. Function 1: EINT8 Function 2: ADC channel 0 input

16	IOA9	I/O	Default: General purpose IO, IOA9. Function 1: EINT9 Function 2: ADC channel 1 input
17	IOB6	I/O	Default: General purpose IO, IOB6. Function 2: PWM1 output Function 3: UART TXD 4 Function 4: RTCLK clock output
18	IOB0	I/O	Default: General purpose IO, IOB0. Function 2: PWM0 output Function 3: UART RXD 4
19	IOB14	I/O	Default: General purpose IO, IOB14. Function 2: PWM3 output Function 3: I 2 C SDA Function 4: Key scan output 2
20	IOB13	I/O	Default: General purpose IO, IOB13. Function 2: PWM2 output Function 3: I 2 C SCL Function 4: Key scan output 1
21	IOB12	I/O	Default: General purpose IO, IOB12. Function 2: SPI1 MOSI
22	IOB11	I/O	Default: General purpose IO, IOB11. Function 2: SPI1 MISO
23	IOB10	I/O	Default: General purpose IO, IOB10. Function 2: SPI1 CLK
24	IOB19	I/O	Default: General purpose IO, IOB9. Function 2: SPI1 CSN
25	EANT	A	External antenna pin

Pin type: "O"=Output, "I"= Input, "P"=Power, "G"=Ground , "A" = antenna

4. WS100A Reference

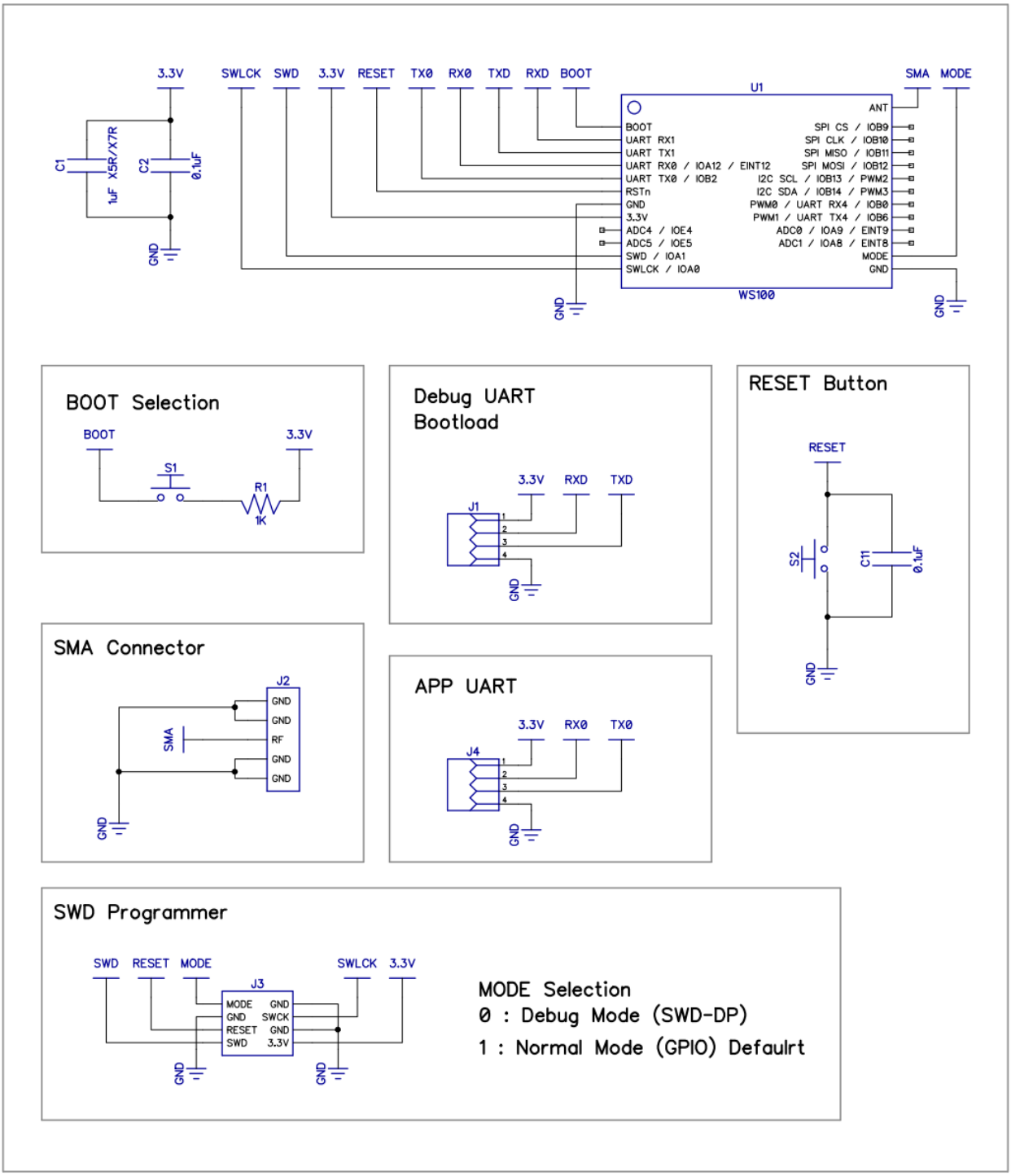


Fig 5. WS100A Reference

5. Mechanical Specifications

Unit: mm

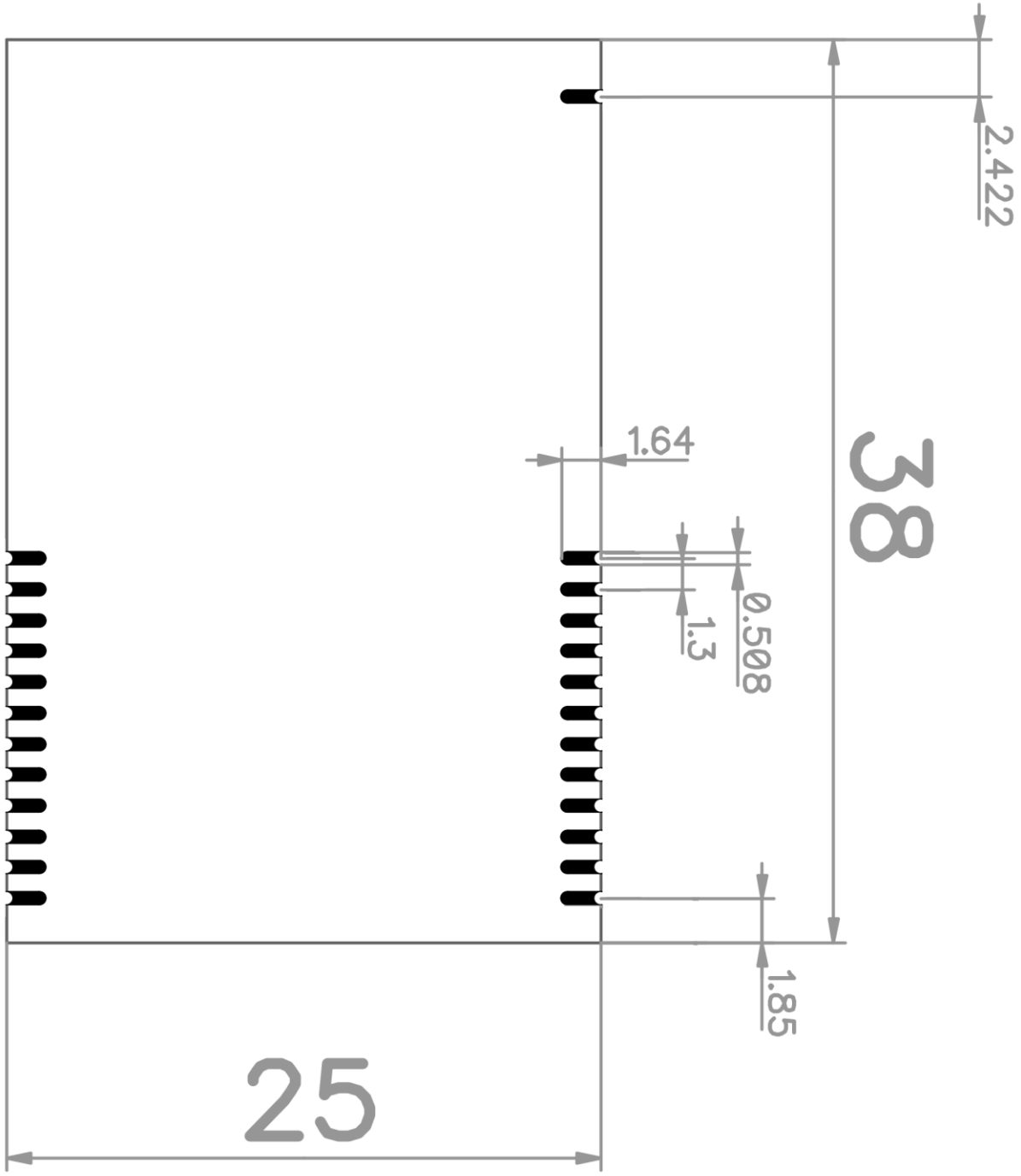


Fig 6. Mechanical Outline

6. Recommended Footprint Design

Unit: mm

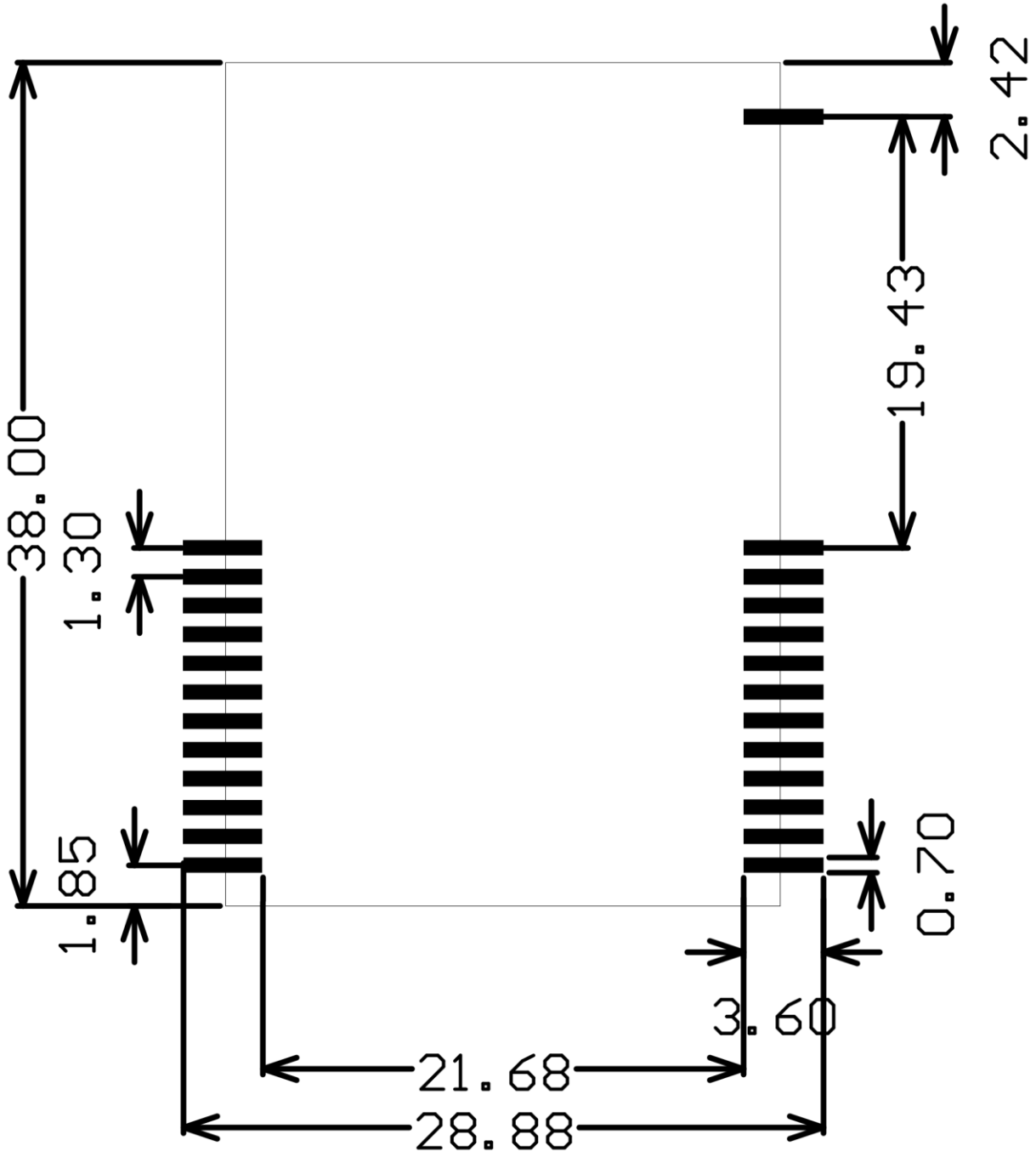


Fig 7. Recommended footprint

Revision history

Date	Version	Description
2020-07-02	V1.0 E	Initial draft.

More Information

For more information please feel free to contact us at anytime, your inquiry will be answered promptly. Thank you very much.

http://www.opto-sensor.com.tw

Taiwan Taipei - TEL:+886-2-27975689

China Shenzhen - TEL:+86-755-82931949

Fuchance Enterprise Co., Ltd.

Address : 5F.-3, No.2, Lane 258, Ruiguang Rd., Neihu Dist., Taipei City 11491, Taiwan (R.O.C.)

Phone : (886) 02-2797-5689

Fax : (886) 02-2797-8928

Site : www.opto-sensor.com.tw

E-mail : info@opto-sensor.com.tw

Branch Company Information

China Shenzhen

- **Opto-Sensor Shenzhen Branch**
- Address : Room 701-704, Block A, International Chamber of Commerce Building, No.138 Fuhua 1 Road, Shenzhen, China (Post Code ：518048)
- Postal Code：518048
- Phone : (86) 755-8293-1949
- Fax : (86) 755-8293-1951