AW-CU462

IEEE 802.11 b/g/n 1T1R WLAN and Bluetooth Low Energy Microcontroller Module

Datasheet

I

DF

(For Standard)
(Halogen Free)

Features

WiFi

802.11 b/g/n/ 1x1, 2.4GHz

Support 20MHz up to MCS7

Low power architecture

Support low power TX/RX for short range application

Low power beacon listen mode

Low power Rx mode

Very low power suspends mode (DLPS)

Bluetooth

Support BLE

Support both central and peripheral modes

High power mode (8 dbm, share the PA and WIFI)(optional)

Internal co-existence mechanism between and WIFI and BT to share the same antenna

Support BLE5.0

Peripheral Interface

USB host controller with HS/FS/LS capability

HS-SD/MMC 2.0

SDIO device with highest SDR25 supported

HS_UART/LP_UART supported

Standard and fast mode I2C supported

I2S with 8/12/16/24/32/48/…./176.4 KHz sampling rate

Maximum 2 SPI supported. One supports baud rate up to 50MHz;the other one supports baud rate up to 25MHz

Support PWM with configurable duration and duty cycle from 0~100%

Support External Timer Trigger Event (ETE function) with configurable period in low power mode

Revision History

Document NO: R2-2462-DST-01

Version	Revision Date	DCN NO.	Description	Initials	Approved
A	2019/11/18		● Initial	Peter Chen	N.C. Chen
B	2019/11/22		● Add pin map table	Peter Chen	N.C. Chen
C	2019/11/27		● Update the description of Pin A1 ● Add note on Pin K6 and K7	Peter Chen	N.C. Chen
D	2019/12/06		● Update pin map ● Update pin table	Peter Chen	N.C. Chen
E	2019/12/12		● Update 1.2 Block Diagram ● Update 1.3.1 Features	Peter Chen	N.C. Chen
F	2020/1/21		● Update 1.3.1 Features ● Add 5.2 Reel Information	Peter Chen	N.C. Chen
G	2020/2/19		● Modify 1.3.2 WLAN ● Modify 1.3.3 Bluetooth ● Modify 2.2 pin table	Peter Chen	N.C. Chen
H	2020/3/27		● Modify 1.3.2 WLAN ● Modify 1.3.3 Bluetooth ● Update 1.3.4 Operating Conditions ● Modify 3.4.1 UART Interface ● Modify 3.5 Power up Timing Sequence	Peter Chen	N.C. Chen
I	2020/4/15		● Modify 3.5 Power Sequence	Peter Chen	N.C. Chen

Table of Contents

1. Introduction

1.1 Product Overview

AzureWave presents AW-CU462 802.11b/g/n 1T1R WLAN and Bluetooth low energy (5.0) Microcontroller Solution provides a highly cost-effective, flexible and easy to-use hardware/software platform to build a new generation of connected, smart devices. These smart-connected devices enable device to deliver a broad-range of services to consumers including energy-management, demand-response, home automation and remote access. This allows a user to manage comfort and convenience, also run diagnostics and receive alerts and notifications, in addition to managing and controlling the device. Developers can leverage the rich connectivity features of these new smart devices to create a new generation of innovative new applications and services

The architecture features the Realtek RTL8721CSM-VA1 integrated single-chip low power dual band (2.4G) wireless LAN and Bluetooth Low Energy (5.0) communication controller. It consists of high-performance MCU (latest architecture v8m, Cortex-M4F instruction compatible) named KM4, a low power MCU (v8m, Cortex-M0 instruction compatible) named KM0, WLAN (802.11b/g/n) MAC, a 1T1R capable WLAN baseband, RF, Bluetooth and peripherals.

The AW-CU462 is powered by production quality, field-tested Realtek Easy Connect software that includes a rich set of software components that work together to support the development of Smart Energy devices, and enable these devices to connect to mobile clients such as smart-phones, Internet-based Cloud and Smart-Grid services. The feature-rich software stack enables OEMs to focus on application-specific software functionality, thus enabling rapid development and reduced software development costs and risks.

1.2 Specifications Table

1.2.1 General

Features	Description
Product Description	802.11b/g/n 1T1R WLAN and Bluetooth low energy (5.0) Microcontroller Module
Major Chipset	RTL8721CSM-VA1 (with pSRAM 4MB)
Host Interface	UART
Flash	Built-in SPI 32M-bit Serial Flash
Dimension	28.2 mm x 18 mm x 3.15 mm
Package	41-pin LGA
Antenna	Internal printing Antenna for WLAN/BT
Weight	TBD

1.2.2 WLAN

Features	Description
WLAN Standard	IEEE 802.11b/g/n, Wi-Fi compliant
Frequency Rage	2.4 GHz ISM radio band
Modulation	DSSS, OFDM, DBPSK, DQPSK, CCK, 16-QAM, 64-QAM for WLAN
Number of Channels	USA, North America, Canada and Taiwan – 1 ~ 11 China, Australia, Most European Countries – 1 ~ 13 Japan, 1 ~ 14(CH14 only for 802.11b)
Calibration Output Power	**2.4G**

	Min	Typ	Max	Unit
11b (11Mbps) @EVM<35%	15	18	20	dBm
11g (54Mbps) @EVM≦-27 dB	14	17	19	dBm
11n (HT20 MCS7) @EVM≦-28 dB	13	16	18	dBm
11n (HT40 MCS7) @EVM≦-28 dB	13	16	18	dBm

<table>
<tr><td>FCC/Japan
Limit Output Power</td><td>2.4G<table><tr><td></td><td>Min</td><td>Typ</td><td>Max</td><td>Unit</td></tr><tr><td>11b (11Mbps)
@EVM<35%</td><td>15</td><td>18</td><td>20</td><td>dBm</td></tr><tr><td>11g (54Mbps)
@EVM≦-27 dB</td><td>12</td><td>15</td><td>17</td><td>dBm</td></tr><tr><td>11n (HT20 MCS7)
@EVM≦-28 dB</td><td>12</td><td>15</td><td>17</td><td>dBm</td></tr></table></td></tr>
<tr><td>ETSI
Limit Output Power</td><td>2.4G<table><tr><td></td><td>Min</td><td>Typ</td><td>Max</td><td>Unit</td></tr><tr><td>11b (11Mbps)
@EVM<35%</td><td>11</td><td>14</td><td>16</td><td>dBm</td></tr><tr><td>11g (54Mbps)
@EVM≦-27 dB</td><td>12</td><td>15</td><td>17</td><td>dBm</td></tr><tr><td>11n (HT20 MCS7)
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<tr><td>Receiver Sensitivity</td><td>2.4G<table><tr><td></td><td>Min</td><td>Typ</td><td>Max</td><td>Unit</td></tr><tr><td>11b (11Mbps)</td><td></td><td>-90</td><td>-82</td><td>dBm</td></tr><tr><td>11g (54Mbps)</td><td></td><td>-77</td><td>-71</td><td>dBm</td></tr><tr><td>11n (HT20 MCS7)</td><td></td><td>-75</td><td>-67</td><td>dBm</td></tr></table></td></tr>
<tr><td>Data Rate</td><td>WLAN:
802.11b: 1, 2, 5.5, 11Mbps
802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps
802.11n: up to 150Mbps-single</td></tr>
<tr><td>Security</td><td>TBD</td></tr>
</table>

*HT40 is not yet supported in normal mode

1.2.3 Bluetooth

Features	Description
Bluetooth Standard	Bluetooth 5.0 complaint (BLE)
Frequency Rage	2402~2480MHz
Modulation	BLE
Output Power	<table><tr><th></th><th>Min</th><th>Typ</th><th>Max</th><th>Unit</th></tr><tr><td>LE 1M</td><td>1</td><td>4</td><td>7</td><td>dBm</td></tr><tr><td>LE 2M</td><td></td><td>TBD</td><td></td><td></td></tr></table>
Receiver Sensitivity	<table><tr><th></th><th>Min</th><th>Typ</th><th>Max</th><th>Unit</th></tr><tr><td>LE1M</td><td></td><td>-90</td><td>-70</td><td>dBm</td></tr><tr><td>LE2M</td><td></td><td>TBD</td><td></td><td></td></tr></table>

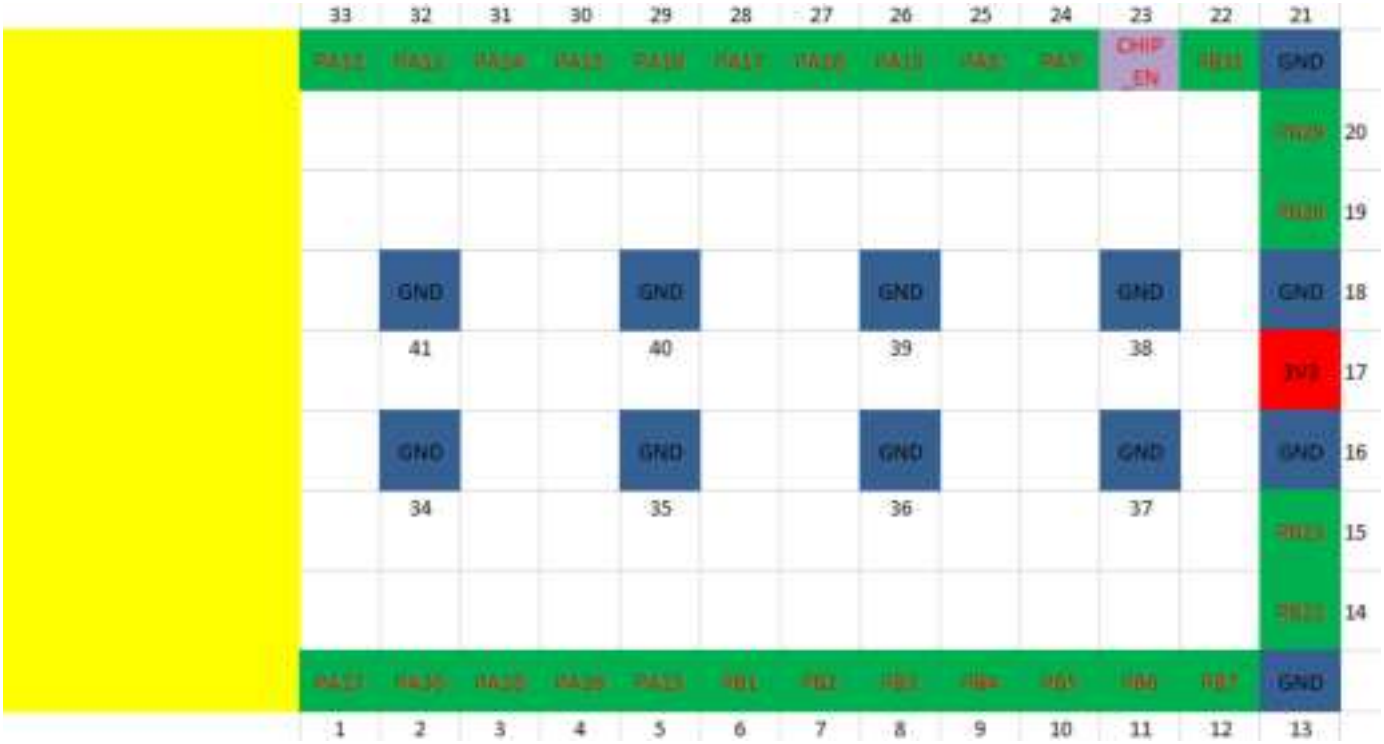
1.2.4 Operating Conditions

Features	Description
Operating Conditions	
Voltage	3.3V
Operating Temperature	-20 ~ 85℃
Operating Humidity	less than 85% R.H.
Storage Temperature	-40 ~ 85℃
Storage Humidity	less than 60% R.H.
ESD Protection	
Human Body Model	+/- 3.5KV
Changed Device Model	+/- 500V

2. Pin Definition

2.1 Pin Map

AW-CU462 Top View Pin Map



2.2 Pin Table

Pin No	Definition	Basic Description	Voltage	Type
1	PA27	LP_UART_RTS/SWD_DATA		I/O
2	PA30	HS_USI_SPI_CLK/HS_PWM7/LP_PWM1/EXTBT_UART_RTS		I/O
3	PA28	LP_UART_CTS/HS_USI_SPI_CS/HS_PWM6/LP_PWM_0		I/O
4	PA26	LP_UART_TXD/HS_USI_SPI_MISO/IR_RX/LP_I2C_SDA/HS_PWM5/LP_PWM5/USB_HSDP		I/O
5	PA25	LP_UART_RXD/HS_USI_SPI_MOSI/IR_TX/LP_I2C_SCL/HS_PWM4/LP_PWM4/USB_HSDM		I/O
6	PB1	LP_UART_TXD/DMIC_CLK		I/O
7	PB2	LP_UART_RXD/DMIC_DATA/PCM_CLK		I/O
8	PB3	SWD_CLK/PCM_CLK		I/O
9	PB4	SPI1_MOSI/RTC EXT_32K/HS_PWM8/LP_PWM2/I2S_SD_TX1/PCM_IN		I/O
10	PB5	SPI1_MISO/RTC_OUT/LP_I2C_SCL/HS_PWM9/LP_PWM3/I2S_SD_TX2/PCM_OUT		I/O
11	PB6	SPI1_CLK/LP_TIM4_TRIG/LP_I2C_SDA		I/O
12	PB7	SPI1_CS/LP_TIM5_TRIG/HS_PWM17/LP_PWM5		I/O
13	GND	Ground.		GND
14	PB22	LP_TIM4_TRIG/IR_RX/SPI_DATA3/HS_PWM14/LP_PWM2/I2S_SD_RX		I/O
15	PB23	LP_TIM5_TRIG/IR_TX/SPI_DATA2/HS_PWM15/LP_PWM3/I2S_MCLK/EXT_32K		I/O
16	GND	Ground.		GND
17	3V3	3.3V power supply		VCC
18	GND	Ground.		GND
19	PB26	I2S_SD_TX0		I/O
20	PB29	IR_RX/I2S_CLK		I/O
21	GND	Ground.		GND
22	PB31	IR_TX/I2S_WS		I/O
23	CHIP_EN	Enable Chip:1 Enable Chip, 0 Shut Down Chip		I
24	PA7	FW download and UART Log Tx		I/O
25	PA8	FW download and UART Log Rx		I/O
26	PA19	HS_UART0_RXD/SPI0_CS		I/O
27	PA18	HS_UART0_TXD/SPI0_CLK		I/O

28	PA17	HS_UART0_CTS/SPI0_MISO		I/O
29	PA16	HS_UART0_RTS/SPI0_MOSI		I/O
30	PA15	LP_UART_CTS/SPI1_CS		I/O
31	PA14	LP_UART_RTS/SPI1_CLK/I2S_SD_TX2		I/O
32	PA13	LP_UART_RXD/SPI1_MISO/HS_PWM1/LP_PWM1/I2S_SD_TX1		I/O
33	PA12	LP_UART_TXD/SPI1_MOSI/HS_PWM0/LP_PWM0/I2S_MCLK		I/O
34	GND	Ground.		GND
35	GND	Ground.		GND
36	GND	Ground.		GND
37	GND	Ground.		GND
38	GND	Ground.		GND
39	GND	Ground.		GND
40	GND	Ground.		GND
41	GND	Ground.		GND

* Note: Pin 24 PA7: 1: Boot from flash. 0: Download image from UART

2.3 GPIO Function Table

Port Name	FUNC_ID0	FUNC_ID1	FUNC_ID2	FUNC_ID3	FUNC_ID4	FUNC_ID5	FUNC_ID6	FUNC_ID7	FUNC_ID8	FUNC_ID9	FUNC_ID10	FUNC_ID11	FUNC_ID12	FUNC_ID13	FUNC_ID14	FUNC_ID15
	gpio	UART DATA	LOG UART RTS/CTS	spi	RTC	IR	spi flash	i2c	sdio	HS pwm	LP pwm	swd	i2s/dmic	LCD	USB	HEADPHONE
PA[7]	PA[7]		UART_LOG_TXD													
PA[8]	PA[8]		UART_LOG_RXD													
PA[12]	PA[12]	LP_UART_TXD		SPI1_MOSI						HS_PWM0	LP_PWM0		I2S_MCLK			
PA[13]	PA[13]	LP_UART_RXD		SPI1_MISO						HS_PWM1	LP_PWM1		I2S_SD_TX1			
PA[14]	PA[14]		LP_UART_RTS	SPI1_CLK									I2S_SD_TX2			
PA[15]	PA[15]		LP_UART_CTS	SPI1_CS												
PA[16]	PA[16]		HS_UART0_RTS	SPI0_MOSI												
PA[17]	PA[17]		HS_UART0_CTS	SPI0_MISO												
PA[18]	PA[18]	HS_UART0_TXD		SPI0_CLK												
PA[19]	PA[19]	HS_UART0_RXD		SPI0_CS										LCD_D0		
PA[25]	PA[25]	LP_UART_RXD		HS_USI_SPI_MOSI		IR_TX		LP_I2C_SCL		HS_PWM4	LP_PWM4			LCD_D9	HSDM	
PA[26]	PA[26]	LP_UART_TXD		HS_USI_SPI_MISO		IR_RX		LP_I2C_SDA		HS_PWM5	LP_PWM5			LCD_D8	HSDP	
PA[27]	PA[27]		LP_UART_RTS									SWD_DATA				
PA[28]	PA[28]		LP_UART_CTS	HS_USI_SPI_CS						HS_PWM6	LP_PWM0			LCD_D7	#####	
PA[30]	PA[30]			HS_USI_SPI_CLK						HS_PWM7	LP_PWM1			LCD_D6	VBUS_DTD	
PB[1]	PB[1]	LP_UART_TXD											DMIC_CLK			
PB[2]	PB[2]	LP_UART_RXD											DMIC_DATA			
PB[3]	PB[3]											SWD_CLK				
PB[4]	PB[4]			SPI1_MOSI	RTC_EXT_32K					HS_PWM8	LP_PWM2		I2S_SD_TX1		ID_DTD	
PB[5]	PB[5]			SPI1_MISO	RTC_OUT			LP_I2C_SCL		HS_PWM9	LP_PWM3		I2S_SD_TX2			
PB[6]	PB[6]			SPI1_CLK	LP_TIM4_TRIG			LP_I2C_SDA								
PB[7]	PB[7]			SPI1_CS	LP_TIM5_TRIG					HS_PWM17	LP_PWM5					
PB[22]	PB[22]				LP_TIM4_TRIG	IR_RX	SPI_DATA3		SD_D0	HS_PWM14	LP_PWM2		I2S_SD_RX	LCD_RD	ID_DTD	QDEC_PHB
PB[23]	PB[23]				LP_TIM5_TRIG	IR_TX	SPI_DATA2		SD_D1	HS_PWM15	LP_PWM3		I2S_MCLK	LCD_WR		QDEC_PHA
PB[26]	PB[26]												I2S_SD_TX0			HEADPHONE_DET
PB[29]	PB[29]					IR_RX							I2S_CLK			
PB[31]	PB[31]					IR_TX							I2S_WS			QDEC_PHA

Port Name	FUNC_ID0	FUNC_ID16	FUNC_ID18	FUNC_ID20	FUNC_ID21	FUNC_ID22	FUNC_ID23	FUNC_ID28	FUNC_ID29	FUNC_ID30	FUNC_ID31
	gpio	SGPIO	Wifi only RFE control	Ext BT	Combo RFE control	HS timer trig	Debug Port	Ext32K	key scan/ROW	key scan/COL	WAKEUP
PA[7]	PA[7]		ANT_SEL_P								
PA[8]	PA[8]		ANT_SEL_N								
PA[12]	PA[12]		ANT_SEL_N	GRANT_BT	EN_EXLNA				KEY_ROW0		LGPIO[0]
PA[13]	PA[13]		ANT_SEL_P	GRANT_BT_N	EN_EXPA				KEY_ROW1		LGPIO[1]
PA[14]	PA[14]		ANT_SEL_N	BT_DIS				RTC_OUT	KEY_ROW2		LGPIO[2]
PA[15]	PA[15]		ANT_SEL_P	BT_WAKE_HOST				RTC EXT_32K	KEY_ROW3	KEY_COL6	LGPIO[3]
PA[16]	PA[16]		ANT_SEL_N	HOST_WAKE_BT			wlmac_dbgpio[10]		KEY_ROW4	KEY_COL5	
PA[17]	PA[17]		ANT_SEL_P	BT_CLK_REQ			wlmac_dbgpio[11]		KEY_ROW5	KEY_COL4	
PA[18]	PA[18]			MBOX_I2C_SDA			wlmac_dbgpio[12]	RTC_OUT	KEY_ROW6	KEY_COL4	
PA[19]	PA[19]			MBOX_I2C_SCL			wlmac_dbgpio[13]			KEY_COL3	
PA[25]	PA[25]			MBOX_I2C_INT			wlmac_dbgpio[0]			KEY_COL1	
PA[26]	PA[26]			BT_ACT			wlmac_dbgpio[1]			KEY_COL0	
PA[27]	PA[27]			WLAN_ACT			wlmac_dbgpio[2]				
PA[28]	PA[28]			BT_CX			wlmac_dbgpio[3]				
PA[30]	PA[30]			EXTBT_UART_RTS			wlmac_dbgpio[4]				
PB[1]	PB[1]	SGPIO_OUT	ANT_SEL_N	BT_STE	EN_EXLNA	HS_TIM4_TRIG	wlmac_dbgpio[5]				
PB[2]	PB[2]	SGPIO	ANT_SEL_P	PCM_CLK	EN_EXPA	HS_TIM5_TRIG	wlmac_dbgpio[6]				
PB[3]	PB[3]			PCM_SYNC			wlmac_dbgpio[7]				
PB[4]	PB[4]			PCM_IN		HS_TIM6_TRIG	wlmac_dbgpio[14]				
PB[5]	PB[5]			PCM_OUT		HS_TIM5_TRIG	wlmac_dbgpio[15]				
PB[6]	PB[6]			EXTBT_UART_TXD			wlmac_dbgpio[16]				
PB[7]	PB[7]			EXTBT_UART_RXD			wlmac_dbgpio[17]				
PB[22]	PB[22]	SGPIO_OUT		EXTBT_UART_CTS			wlmac_dbgpio[8]				
PB[23]	PB[23]	SGPIO_OUT		EXT_32K			wlmac_dbgpio[9]				
PB[26]	PB[26]	SGPIO	TRSW_N								
PB[29]	PB[29]	SGPIO	TRSW_P				wlmac_dbgpio[29]				
PB[31]	PB[31]	SGPIO					wlmac_dbgpio[31]				

3. Electrical Characteristics

3.1 Absolute Maximum Ratings

Symbol	Parameter	Minimum	Typical	Maximum	Unit
3V3	3.3V Power supply		3.3	3.6	V

3.2 Recommended Operating Conditions

Symbol	Parameter	Minimum	Typical	Maximum	Unit
3V3	3.3V Power supply	3.0	3.3	3.6	V

3.3 Digital IO Pin DC Characteristics

Symbol	Parameter	Minimum	Typical	Maximum	Unit
VIH	Input high voltage	2	--		V
VIL	Input low voltage		--	0.8	V
VOH	Output high voltage	2.4	--		V
VOL	Output low voltage		--	0.4	V

3.4 Host Interface

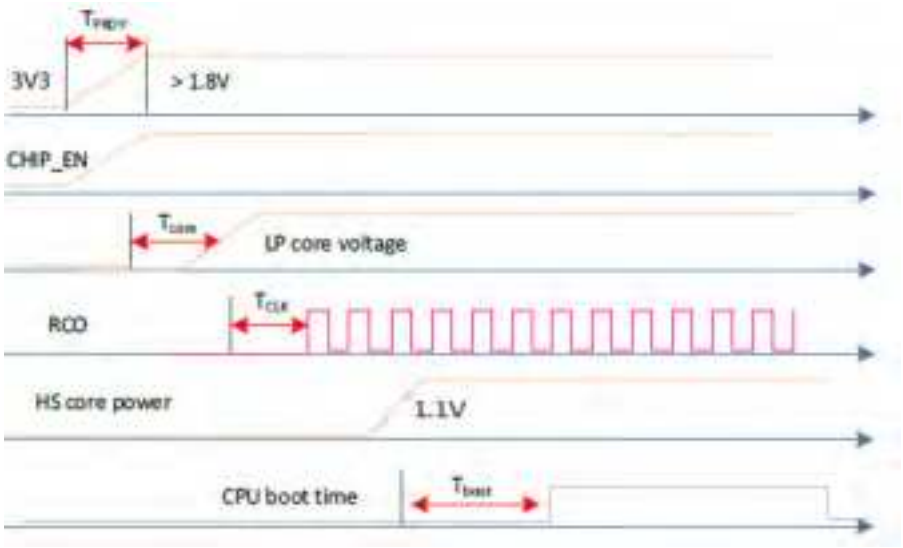
3.4.1 UART Interface

Support UART format: 1 start bit, 7/8 data bits, 0/1 parity bit and 1/2 stop bit
Support a very wide range of baud rate
Support auto flow control
Support interrupt control
Support IrDA
Support loopback mode for test
Differentiate clock for Tx path and Rx path
Fractional baud rate generator for Tx path
Low power mode for Rx path
Monitor and eliminate Rx baud rate error and own frequency drift automatically for new Rx path
Support DMA mode
Option for UART Rx to be DMA flow controller

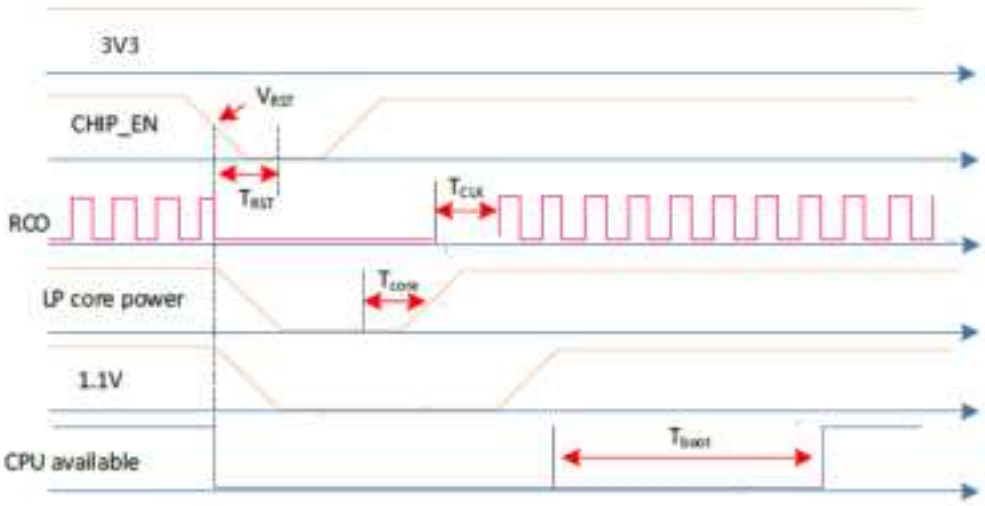
3.5 Power Sequence

Symbol	Parameter	Min	Typ	Max	Unit
T_{PRDY}	3V3 ready time	0.6	0.6	1	ms
T_{CLK}	Internal ring clock stable time after 3V3 ready	1	-	-	ms
T_{core}	LP core power ready time	1.5	1.5	-	ms
T_{boot}	HS MCU boot time	200	-	-	ms
V_{RST}	Shutdown occurs after CHIP_EN lower than this voltage	0	0	1.65	V
T_{RST}	The required time that CHIP_EN lower than VRST	1	1	-	ms

3.5.1 Power On Sequence



3.5.2 Shutdown Sequence



3.6 Power Consumption*

3.6.1 WLAN

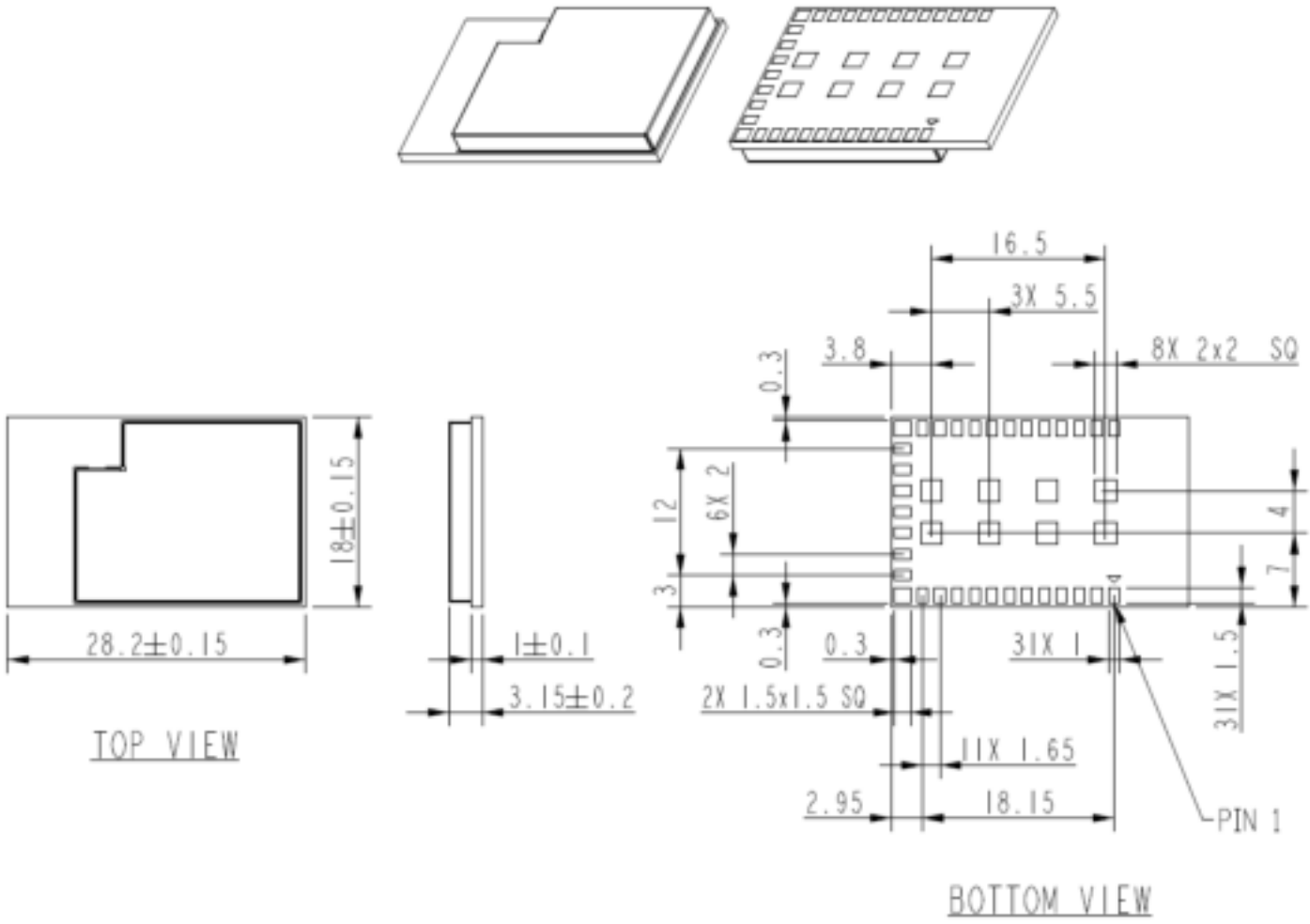
TBD

3.6.2 Bluetooth

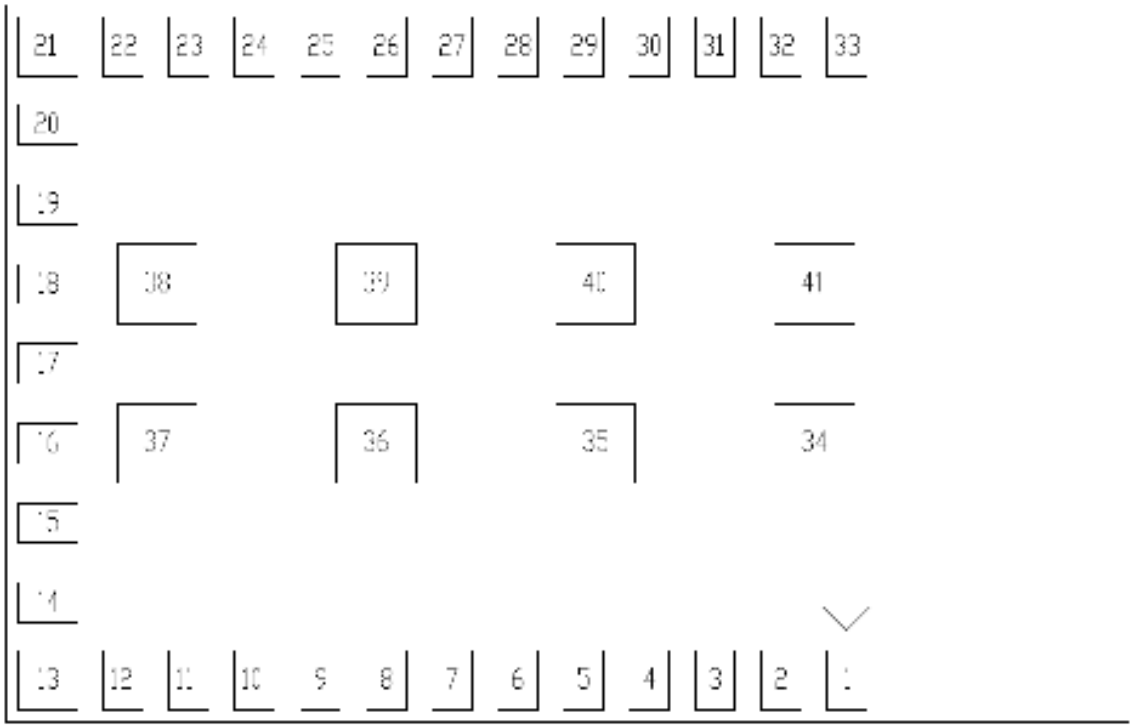
TBD

4. Mechanical Information

4.1 Mechanical Drawing



DIM.	X≤80	80<X≤180	180<X≤315	315<X≤800
TOL.	±0.1	±0.15	±0.20	±0.25

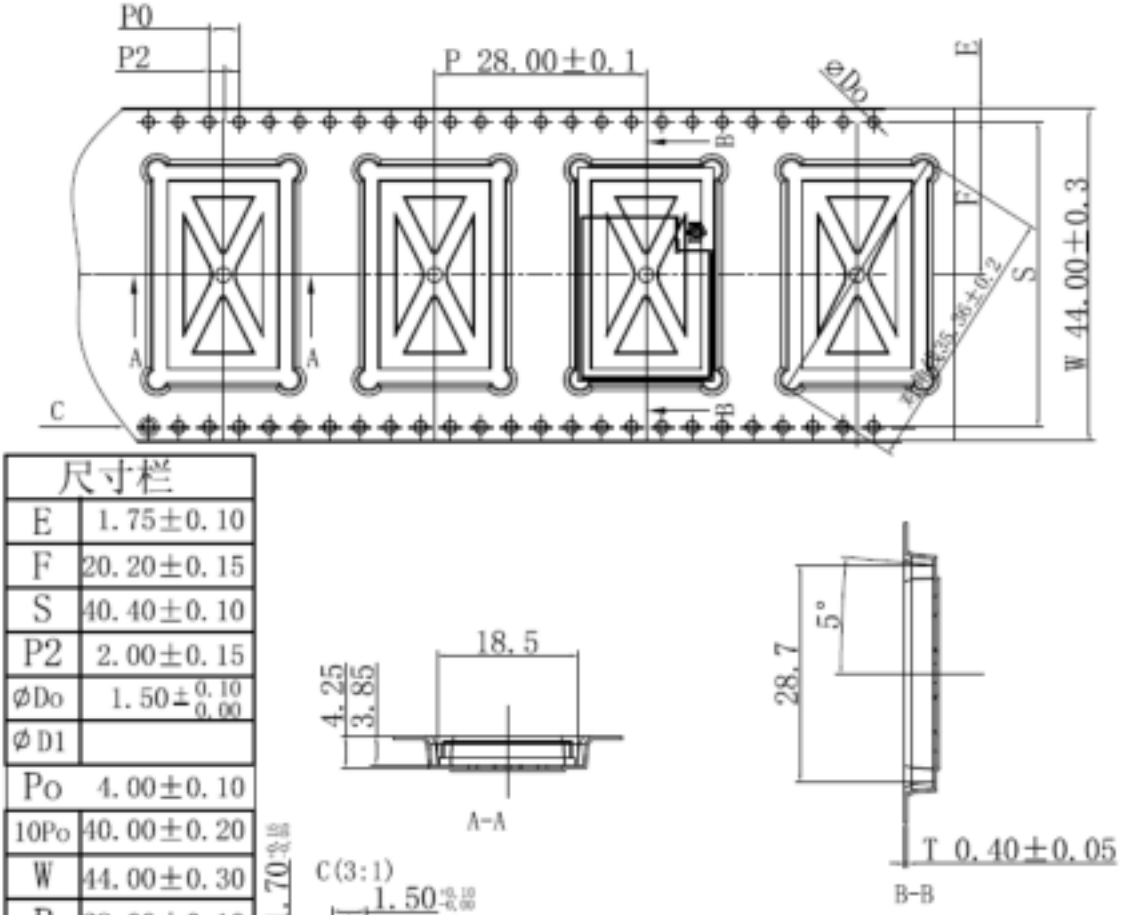


PIN DEFINED(BOTTOM V FW)

5. Packaging Information

5.1 Tape information

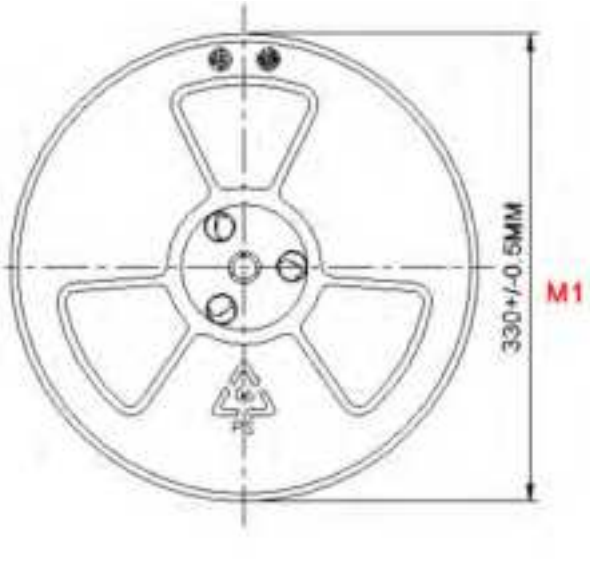
- Material: PS
- Color: Black
- Thickness: 0.40 mm



尺寸栏	
E	1.75±0.10
F	20.20±0.15
S	40.40±0.10
P2	2.00±0.15
øDo	1.50±0.10/0.00
ø D1	
Po	4.00±0.10
10Po	40.00±0.20
W	44.00±0.30
P	28.00±0.10
对角线	35.36±0.20
Ao	18.50±0.10
BO	28.70±0.10
KO	4.25±0.10
T	0.40±0.05

5.2 Reel information

- Material: Antistatic HIPS
- Color: Blue
- Dimension: 13 inch



Available Reel Size (mm)				
Product	Tape Width	B±0.5mm	W1±0.2mm	W2Max
R1212P2-41G	12mm	100mm	12.4	18.4
R1316P2-41G	16mm		16.4	22.4
R1324P2-41G	24mm		24.4	30.4
R1332P2-41G	32mm		32.4	38.4
R1344P2-41G	44mm		44.4	50.4
R1356P2-41G	56mm		56.4	62.4
R1372P2-41G	72mm		72.4	78.4
R1388P2-41G	88mm		88.4	94.4

FCC Statement

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

IMPORTANT NOTE:

This module is intended for OEM integrator. This module is only FCC authorized for the specific rule parts listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Additional testing and certification may be necessary when multiple modules are used.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: TLZ-CU462 ".

This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
1	Azurewave	AW-CU462	PCB Printing Antenna	N/A	2.1	1TX/1RX

IC Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes au (x) RSS (s) exemptés de licence d'Innovation, Sciences et Développement économique Canada. L'opération est soumise aux deux conditions suivantes:
(1) Cet appareil ne doit pas provoquer d'interférences.
(2) Cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable de l'appareil.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.
Pour les produits disponibles aux États-Unis / Canada du marché, seul le canal 1 à 11 peuvent être exploités. Sélection d'autres canaux n'est pas possible.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures.
Referring to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without reassessment permissive change.
Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

IMPORTANT NOTE:
This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.
Additional testing and certification may be necessary when multiple modules are used.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such

configuration, the IC RSS-102 radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. Operation is subject to the following two conditions: (1) this device may not cause harmful interference (2) this device must accept any interference received, including interference that may cause undesired operation.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains IC: 6100A-CU462 ".

The Host Model Number (HMN) must be indicated at any location on the exterior of the end product or product packaging or product literature which shall be available with the end product or online.

VCCI Statement

Registered Class B ITE:

この装置は、クラスB機器です。この装置は、住宅環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

Translation:
This is a Class B equipment. Although this equipment is intended for use in a residential environment, it could cause poor reception if used near a radio or a television receiver. Please follow instructions in the instruction manual. VCCI-B