AzureWave Technologies, Inc.

AW-CU300 V2

IEEE 802.11 b/g/n
WLAN Microcontroller Module

Datasheet

Rev. 0.1

Revision History

Revision	*Date*	*Description*	*Initials*	*Approved*
Version0.1	**2018/03/15**	**Initial Version**	**Alex Yu**	**Daniel Lee**

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1. Introduction

1.1 Product Overview

AzureWave presents **AW-CU300 V2** Wi-Fi Microcontroller Smart Energy Platform 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 platform builds upon the success of Marvell's Wi-Fi microcontroller platform using the Marvell 88MW320 Wi-Fi System-on-Chip (SoC) and Marvell Smart Connect software. Adding new enhancements and capabilities.

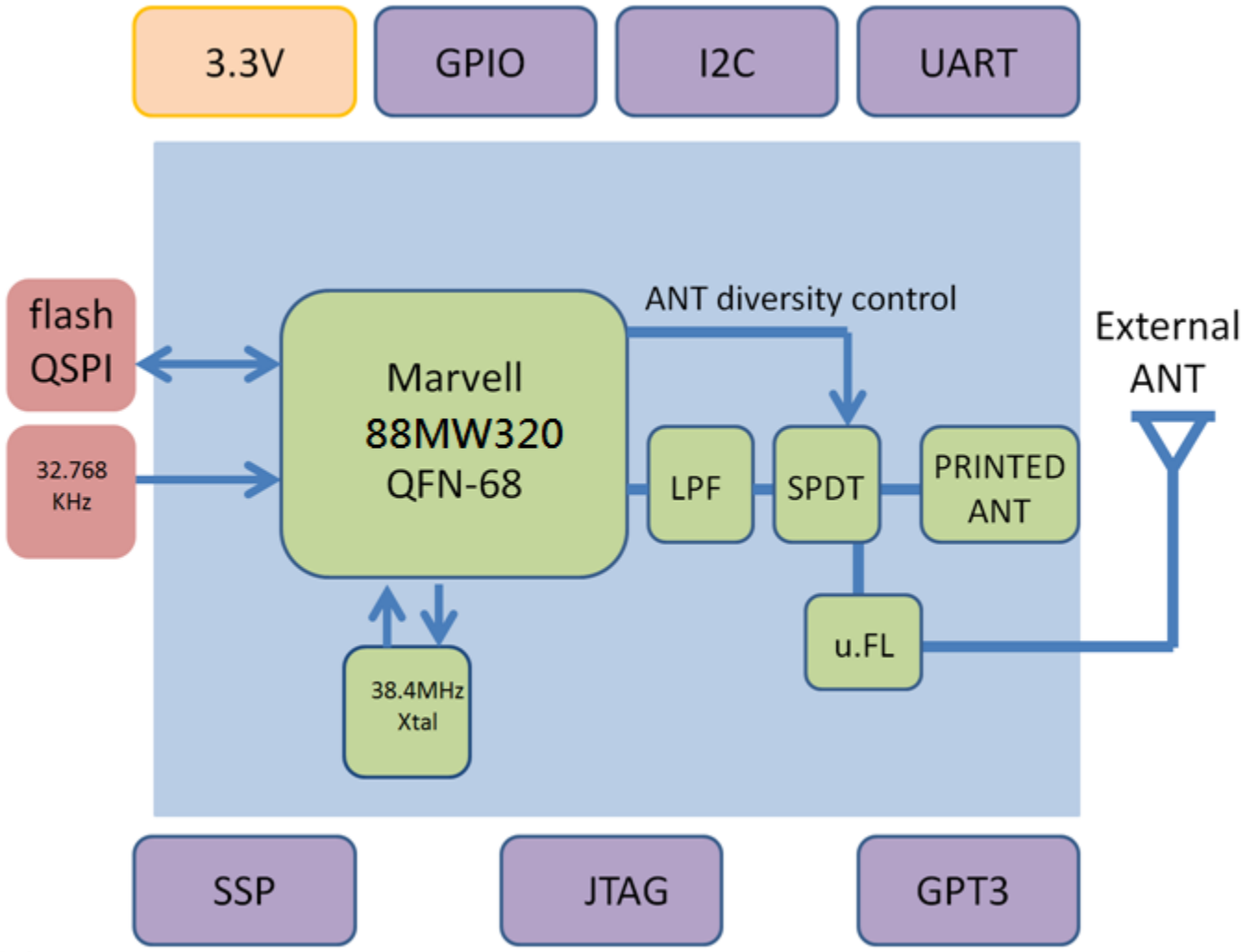
The **AW-CU300 V2** is powered by production quality, field-tested Marvell Smart Connect software that includes a rich set of software components that work together to support the development of Smart Energy devices, and enable these devices to connect to mobile clients such as smart-phones, Internet-based 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 Features

1.2.1 WLAN

- **88MW320 (Marvell 88MW320 is a WLAN IEEE 802.11 b/g/n standalone SoC)**
  - **Processor**
    - ARM Cortex-M4F, 32bit
    - 200MHz main bus clock
  - **Memory**
    - 128KB ROM
    - 512KB RAM
  - **Flash Controller**
    - 32KB SRAM cache to support XIP
    - Memory-mapped access to QSPI Flash devices
  - **Wireless**
    - IEEE 802.11 b/g/n HT20
    - Low-power with deep sleep and standby modes
    - Fully supports clients (stations) implementing IEEE Power Save mode
    - Wi-Fi direct connectivity
  - **Antenna**
    - Support printed Antenna for Internal Antenna
    - Support U.FL Connector for External Antenna
    - Antenna Diversity
  - **IO Interfaces**
    - UART
    - JTAG
    - GPIO
    - SSP
    - I2C
    - GPT
  - **High Integration and Low-RBOM**
    - Single 3.3V Power Input
  - **Package**
    - LGA Module – 23 mm x 15 mm x 2.35 mm 64 pin
  - **Certifications**
    - TBD

1.3 Block Diagram



Block Diagram of AW-CU300 V2

1.4 Specifications Table

1.4.1 General

Features	Description
Product Description	AW-CU300 V2 Wireless Smart Connect module
Major Chipset	Marvell 88MW320
Host Interface	UART/JTAG
Dimension	23 mm x 15 mm x 2.35 mm
Package	64-pin LGA
Antenna	Printed Antenna and U.FL Connector for WLAN
Weight	TBD

1.4.2 WLAN

Features	Description
WLAN Standard	IEEE 802.11b/g/n,Wi-Fi complaint
Frequency Rage	2.4 GHz ISM radio band
Modulation	DSSS and OFDM for WLAN
Number of Channels	802.11b: USA, Canada and Taiwan – 11 Most European Countries – 13 France – 4, Japan – 14 802.11g: USA, Canada and Taiwan – 11 Most European Countries – 13 Japan – 13 802.11n(HT20): Channel 1~13(2412~2472)
Output Power (Board Level Limit)*	Module for IEEE 802.11b/g/n spec: 802.11b dBm(+-1.5dBm) for IEEE 802.11b spec 802.11g dBm(+-1.5dBm) for IEEE 802.11g spec 802.11n dBm(+-1.5dBm) for IEEE 802.11n HT20 spec * FCC/CE output power limit spec: TBD
Receiver Sensitivity	WLAN: - dBm for 11M IEEE 802.11b - dBm for 54M IEEE 802.11g - dBm for MCS7 IEEE 802.11n HT20
Data Rate	WLAN 802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0-7,up to 72.2Mbps(20MHz channel)

1.4.3 Operating Conditions

Features	Description
Operating Conditions	
Voltage	3.3V +/- 10%
Operating Temperature	-30 ~ 85℃
Operating Humidity	TBD
Storage Temperature	-40 ~ 85℃
Storage Humidity	TBD
ESD Protection	
Human Body Model	TBD
Changed Device Model	TBD

2. Pin Definition

2.1 Pin Map

	GND	GPIO_6	GPIO_9	GPIO_7	GPIO_26	GPIO_22	GPIO_43	GND	8
		RESET	GPIO_10	GPIO_8	GPIO_25	GPIO_23	B_3.3V	M_3.3V	7
	GND	GND	GND	GND	GND	GPIO_27	GPIO_16	GPIO_30	6
	GND	GND	GND	GND	GND	GND	GPIO_29	GPIO_33	5
	GND	GND	GND	GND	GND	GND	GPIO_28	GPIO_31	4
	GND	GND	GND	GND	GND	GPIO_24	GPIO_32	GPIO_41	3
	GND	GPIO_5	GPIO_3	GPIO_1	GPIO_49	GPIO_47	GPIO_39	GPIO_40	2
	GND	GPIO_4	GPIO_2	GPIO_0	GPIO_48	GPIO_46	GPIO_42	GND	1
	H	G	F	E	D	C	B	A	

2.2 Pin Table

2.2.1 Power

Pin No	Definition	Basic Description	Type	Level
B7	B_3V3	3.3V Power input	PWR	3.3V
A7	M_3V3	3.3V Power input	PWR	3.3V

2.2.2 GPIO

Pin No	Definition	Function 0	Function 1	Function 2	Function 3	Function 4	Function 5	Type	Level
E1	GPIO_0	GPIO_0	GPT0_CH0	UART0_CTS	SSP0_CLK			I/O	3.3V
E2	GPIO_1	GPIO_1	GPT0_CH1	UART0_RTS	SSP0_FRM			I/O	3.3V
F1	GPIO_2	GPIO_2	GPT0_CH2	UART0_TXD	SSP0_TXD			I/O	3.3V
F2	GPIO_3	GPIO_3	GPT0_CH3	UART0_RXD	SSP0_RXD			I/O	3.3V
G1	GPIO_4	GPIO_4	GPT0_CH4	I2C0_SDA	AUDIO_CLK			I/O	3.3V
G2	GPIO_5	GPIO_5	GPT0_CH5	I2C0_SCL				I/O	3.3V
B2	GPIO_39	GPIO_39	GPT3_CLKIN	UART1_RXD	SSP1_RXD			I/O	3.3V
G8	GPIO_6	JTAG TDO	GPIO_6	I2C1_SDA				I/O	3.3V
E8	GPIO_7	JTAG TCK	GPIO_7	UART2_CTS	SSP2_CLK	I2C0_SDA		I/O	3.3V
E7	GPIO_8	JTAG TMS	GPIO_8	UART2_RTS	SSP2_FRM	I2C0_SDL		I/O	3.3V
F8	GPIO_9	JTAG TDI	GPIO_9	UART2_TXD	SSP2_TXD	I2C1_SDA		I/O	3.3V
F7	GPIO_10	JTAG TRST	GPIO_10	UART2_RXD	SSP2_RXD	I2C1_SDL		I/O	3.3V
B6	GPIO_16	GPIO_16	CON[5]		AUDIO_CLK			I/O	3.3V
C6	GPIO_27	GPIO_27	CON[4]	UART0_TXD				I/O	3.3V
C8	GPIO_22	WAKE_UP_0	GPIO_22					I/O	3.3V
C7	GPIO_23	WAKE_UP_1	GPIO_23	UART0_CTS			COMP_IN_P	I/O	3.3V
C3	GPIO_24		GPIO_24	UART0_RXD	GPT1_CH5		COMP_IN_N	I/O	3.3V
D8	GPIO_26	32KHzCLK_OUT	GPIO_26	I2C1_SCL				I/O	3.3V
A2	GPIO_40	GPIO_40	ADC_DAC_TRIGGER0	ACOMP0_GPIO_OUT	ACOMP1_GPIO_OUT			I/O	3.3V
A3	GPIO_41	GPIO_41	ADC_DAC_TRIGGER1	ACOMP0_EDGE_PULSE	ACOMP1_EDGE_PULSE			I/O	3.3V
B1	GPIO_42	GPIO_42	ADC_0/ ACOMP0	UART1_CTS	SSP_CLK			I/O	3.3V
B8	GPIO_43	GPIO_43	ADC_1/ ACOMP1	UART1_RTS	SSP1_FRM			I/O	3.3V

C1	GPIO_46	GPIO_46	ADC_4/ ACOMP4	UART2_CTS	SSP2_CLK			I/O	3.3V
C2	GPIO_47	GPIO_47	ADC_5/ ACOMP5	UART2_RTS	SSP2_FRM			I/O	3.3V
D1	GPIO_48	GPIO_48	ADC_6/ ACOMP6	UART2_TXD	SSP2_TXD			I/O	3.3V
D2	GPIO_49	GPIO_49	ADC_7/ ACOMP7	UART2_RXD	SSP2_RXD			I/O	3.3V
D7	GPIO_25	32KHz_CLK_ IN	GPIO_25	I2C1_SDA				I/O	3.3V
G7	RESETN	RESETN	Host reset					I/O	3.3V(internal pull high 51k ohm)
B4	GPIO_28	QSPI_SSn	GPIO_28	I2C0_SDA			GPT1_CH0	I/O	3.3V
B5	GPIO_29	QSPI_Clk	GPIO_29	I2C0_SCL			GPT1_CH1	I/O	3.3V
A6	GPIO_30	QSPI_D0	GPIO_30	UART0_CTS	SSP0_CLK		GPT1_CH2	I/O	3.3V
A4	GPIO_31	QSPI_D1	GPIO_31	UART0_RTS	SSP0_FRM		GPT1_CH3	I/O	3.3V
B3	GPIO_32	QSPI_D2	GPIO_32	UART0_TXD	SSP0_TXD		GPT1_CH4	I/O	3.3V
A5	GPIO_33	QSPI_D3	GPIO_33	UART0_RXD	SSP0_RXD		GPT1_CH5	I/O	3.3V

2.2.3 GND

Pin No Definition		Basic Description	Remark
C4	G3	GND	
C5	G4		
D3	G5		
D4	G6		
D5	H1		
D6	H2		
E3	H3		
E4	H4		
E5	H5		
E6	H6		
F3	H8		
F4	A1		
F5	A8		
F6			

2.2.4 NC (Floating)

Pin No Definition		Basic Description	Remark
H7		DNS(Don't connect)	

2.2.5 CONFIGURATION PINS

Pin No	Definition	Basic Description	Remark
C4	G3	GND	
C5	G4		
D3	G5		
D4	G6		
D5	H1		
D6	H2		
E3	H3		
E4	H4		
E5	H5		
E6	H6		
F3	H8		
F4	A1		
F5	A8		
F6			

3. Electrical Characteristics

3.1 Absolute Maximum Ratings

Symbol	Parameter	Minimum	Typical	Maximum	Unit
B_3V3	3.3V power supply		3.3	3.6	V
M_3V3	3.3V power supply		3.3	3.6	V

3.2 Recommended Operating Conditions

Symbol	Parameter	Minimum	Typical	Maximum	Unit
B_3V3	3.3V power supply		3.3	3.6	V
M_3V3	3.3V power supply		3.3	3.6	V

3.3 Digital IO Pin DC Characteristics

Symbol	Parameter	Minimum	Typical	Maximum	Unit
VIH	Input High Voltage				
VIL	Input Low Voltage				

3.4 Power up Timing Sequence

TBD

3.5 Power Consumption*

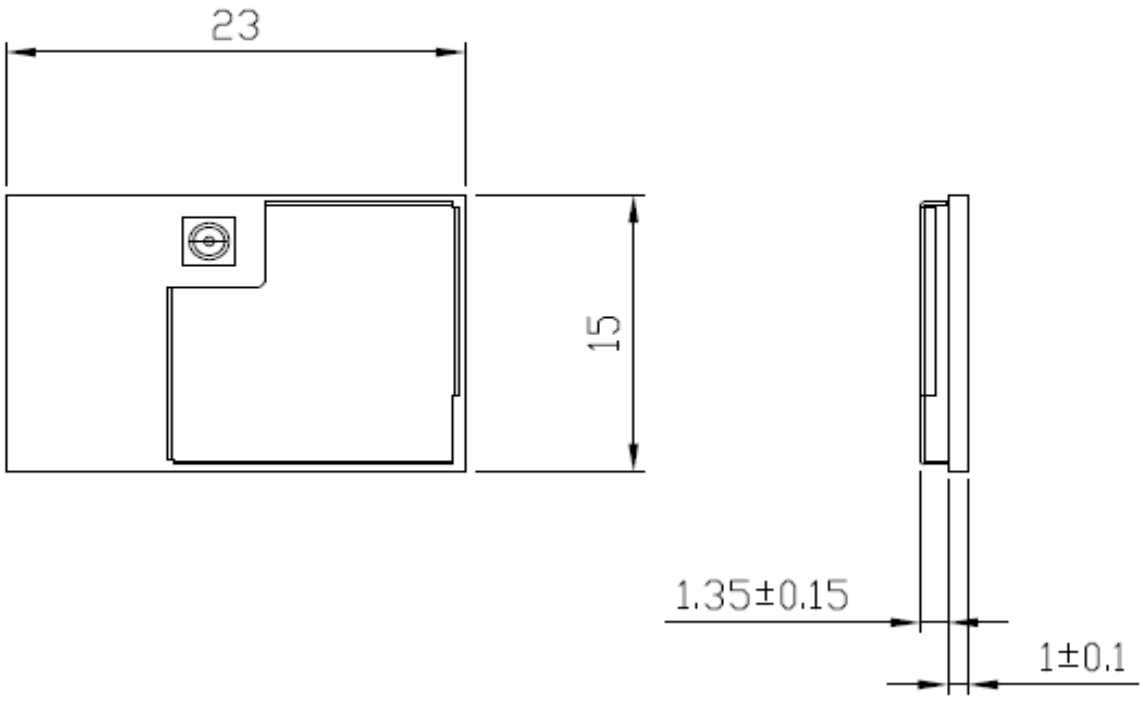
3.5.1 WLAN

	Item			VBAT=3.3V				
Band (GHz)	Mode	BW (MHz)	RF Power (dBm)	Transmit			Receive	
				Max.	Avg.	DUTY %	Max.	Avg.

* The power consumption is based on Azurewave test environment, these data for reference only.

4. Mechanical Information

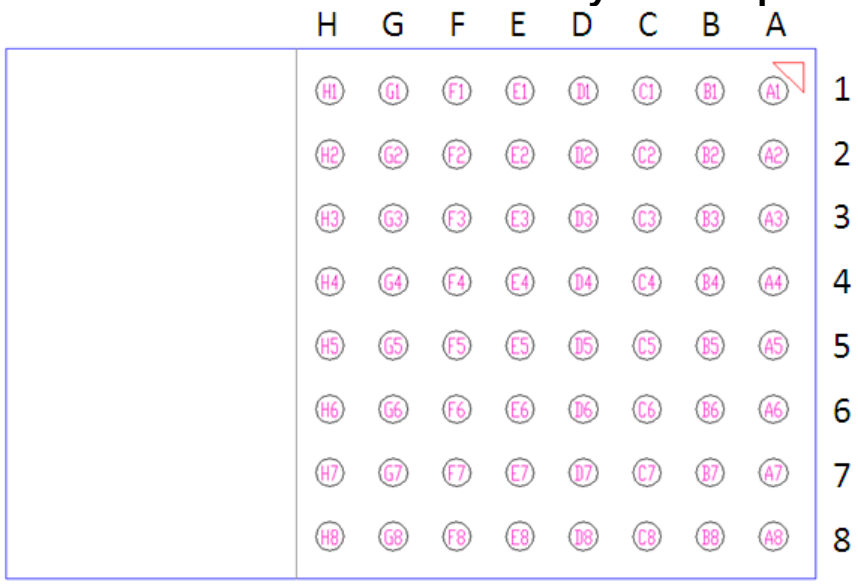
4.1 Mechanical Drawing

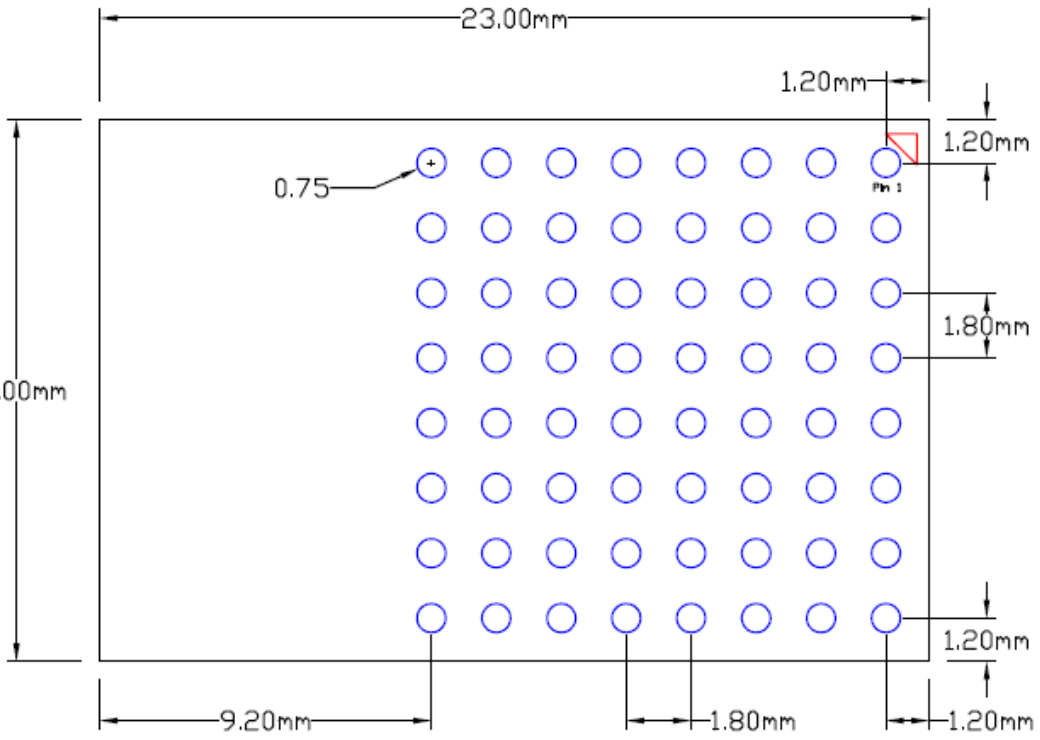


4.2 PCB Footprint

The size and thickness of the AW-CU300 V2 LGA package module is listed below:

AW-CU300 V2 TOP View PCB Layout Footprint





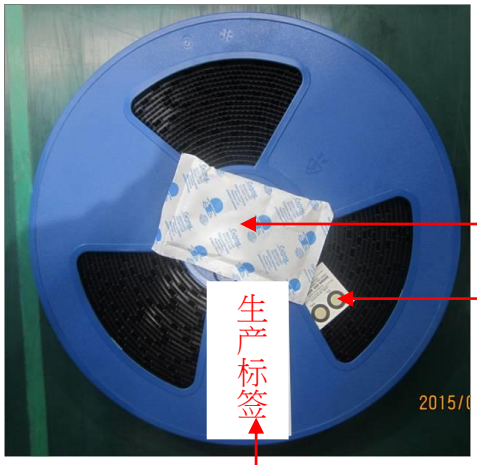
TOP VIEW

5. Packaging Information

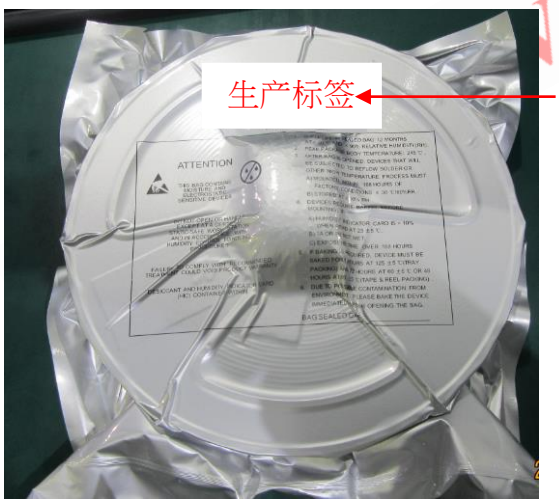
1 Tape reel = 1 Box = 1,000 pcs

1 Carton = 3 Boxes = 3,000 pcs

5.1 Tape & Reel Picture



5.2 Packing Picture



5.3 Inside of Inner Box Picture

PINK BUBBLE WRAP

5.4 Inner Box Picture

AFFIX PACKING LABEL

5.5 Inside of Carton Picture

1 Carton = 3 Boxes

5.6 Carton and Label Picture

AFFIX SHIPPING LABEL

AFFIX PACKING LABEL

AFFIX BOX LABEL