

AW-NB057H

**IEEE 802.11b/g/n Wi-Fi with Bluetooth 3.0 with High
speed class II Combo Half Mini Card**

<Control Pin 5 /20 separate>

Datasheet

Version 0.7

Revision History

Document Release	Date	Modification	Initials	Approved
Version 0.1	2010/3/9	1. First release	Benson	Eric Lee
Version 0.2	2010/4/9	1. Remove PCIE bus interface 2. Update Pin definition description	Benson	Eric Lee
Version 0.3	2010/7/19	1. Update LED behavior	Benson	Antonio
Version 0.4	2010/8/19	1. Update tech. information	Benson	Antonio
Version 0.5	2010/9/14	1. Update Pin definition	Benson	Anotonio
Version 0.6	2011/10/05	Add Sub-system ID	Emily	Ray Lee
Version 0.7	2012/04/11	Add Module Photo	Emily	Kavin Chang

AZUREWAVE CONFIDENTIAL

for Compal Use Only

1. Introduction

AzureWave Technologies, Inc. introduces the pioneer of the IEEE 802.11b/g/n WiFi with Bluetooth 3.0 with High speed (BT3.0+HS) class II combo half mini card module ---**AW-NB057H**. The AW-NB057H IEEE 802.11 b/g/n PCIE WIFI with Bluetooth 3.0 + HS class II combo module is a highly integrated wireless local area network (WLAN) solution to let users enjoy the digital content through the latest wireless technology without using the extra cables and cords. It combines with Bluetooth 3.0 + HS class II and provides a complete 2.4GHz Bluetooth system which is fully compliant to Bluetooth v3.0 HS and v2.1 that supports EDR of 2Mbps and 3Mbps for data and audio communications. It enables a **high performance, cost effective, low power, compact solution** that easily fits onto two sides of the PCI Express and USB Combo half mini Card.

Compliant with the IEEE 802.11b/g/n standard, AW-NB057H uses Direct Sequence Spread Spectrum (**DSSS**), Orthogonal Frequency Division Multiplexing (**OFDM**), **BPSK**, **QPSK**, **CCK** and **QAM** baseband modulation technologies.

Compare to 802.11g technology, 802.11n standard makes big improvement on speed and range.

Faster Speed: WLAN up to 150Mbps data rate.

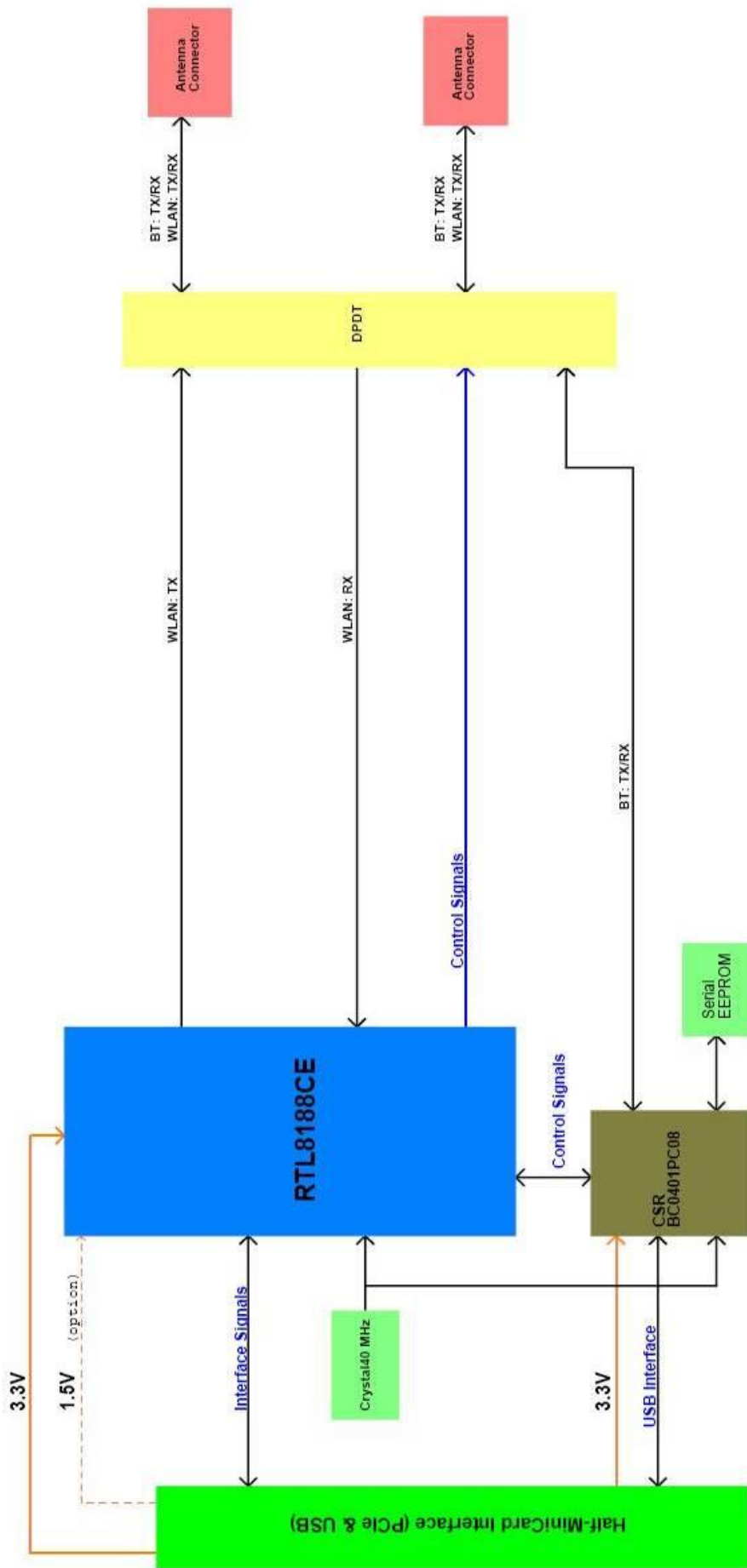
AW-NB057H module adopts Realtek **RTL8188CE** and CSR **BC04** solution. The module design is based on the Realtek RTL8188CE and CSR BC04 solution

2. Features

- ◆ High speed wireless connection up to 150 Mbps for Wi-Fi
- ◆ 2 antennas to support 1(Transmit) × 1(Receive) technology and Bluetooth
- ◆ Support WLAN TX/RX diversity function
- ◆ WCS(Wireless Coexistence System)
- ◆ Low power consumption and high performance
- ◆ Enhanced wireless security
- ◆ Fully qualified Bluetooth v 3.0+ High speed system
- ◆ Enhanced Data Rate(EDR) compliant for both 2Mbps and 3Mbps supported
- ◆ Fully speed operation with Piconet and Scatternet support
- ◆ Electrical compliant to USB1.1&2.0

AZUREWAVE CONFIDENTIAL
for Compal Use Only

3. Block Diagram



D E N T I A L

Use Only

4. General Specifications

Model Name	AW-NB057H
Product Description	IEEE 802.11 b/g/n Wi-Fi with Bluetooth 3.0 + HS class II Combo half mini card Module
BlueTooth Standard	IEEE 802.11b/g/n, Wi-Fi compliant / Bluetooth v3.0+HS Standard
Host Interface	Wi-Fi : PCI-E , BT : USB
Major Chipset	Realtek RTL8188CE + CSR BC04
Dimension	26.65 mm X 29.85 mm x 3.67 mm
Weight	4g
Antenna	Hirose* U.FL-R-SMT 1: Ant1 : Wi-Fi Tx/RX+ BT 2: Ant2 : Wi-Fi Tx/RX + BT
WiFi VID/PID	VID:1A3B / PID:2057
Bluetooth VID/PID	VID:13D3 / PID:3331
Operating Conditions	
Voltage	3.3V +/- 5%
Temperature	0~80 °C
Storage temperature	-40~85 °C
Electrical Specifications	
Frequency Range	Wi-Fi: 2.4 GHz ISM Bands 2.412-2.472 GHz, 2.484 GHz / BT: 2402MHz~2483MHz
Modulation	Wi-Fi: 802.11g/n: OFDM 802.11b: CCK(11, 5.5Mbps), DQPSK(2Mbps), BPSK(1Mbps) BT: Header GFSK Payload 2M: 4-DQPSK Payload 3M: 8DPSK
Output Power	Wi-Fi: 802.11b: 17 dBm +/-1.5dBm (11Mbps) 802.11g: 15 dBm +/-1.5dBm (54Mbps) 802.11n: 13 dBm +/-1.5dBm (HT20 MCS7) BT: -6 ≤ Output Power ≤ +4 dBm (Conductive)
Receive Sensitivity	Wi-Fi: 802.11b: less than -80 dBm (11Mbps) 802.11g: less than -68 dBm (54Mbps) 802.11n: less than -61 dBm at HT40 MCS7 less than -64 dBm at HT20 MCS7 BT: BER < 0.1% (Anritsu 8852B Tx -70Bm)

Operating Range	Wi-Fi: Open Space: TBD / Indoor: TBD
	(The transmission speed may vary according to the environment)
Regulatory	BT: TBD
	FCC, CE...

4-1. Absolute Maximum Ratings

Symbol	Parameter	Max. Rating	Unit
V _{dd33}	Maximum I/O supply voltage	3.6	V
RF _{in}	Maximum RF input (reference to 50 Ω)	0	dBm
T _{store}	Storage temperature	-40~90	°C

4-2. Recommended Operating Conditions

Symbol	Parameter	Rating	Unit
V _{dd33}	I/O voltage	3.135~3.465	V

PCI Express Bus Interface Characteristics

Signal Name	Mini PCI-E PIN	Type	Driver	PU/PD Resistance
PCIE_CLKREQ_L	7	OD	4 mA (default) 8 mA (max)	---

OD: A digital output signal with open drain

4-3. GPIO Interface Characteristics

Signal Name(To chip GPIO PIN)	Mini PCI-E PIN	Type	Driver	PU/PD Resistance
WLAN_LED	44	O	4 mA (default) 8 mA (max)	---
WLAN_DISABLE	20	I	4 mA (default) 8 mA (max)	---

4-4 Logic Level Characteristics

Vcc=+3.3V +/- 10%

VIH (min)= 2.0V (v)

VIL (max)= 0.8V (v)

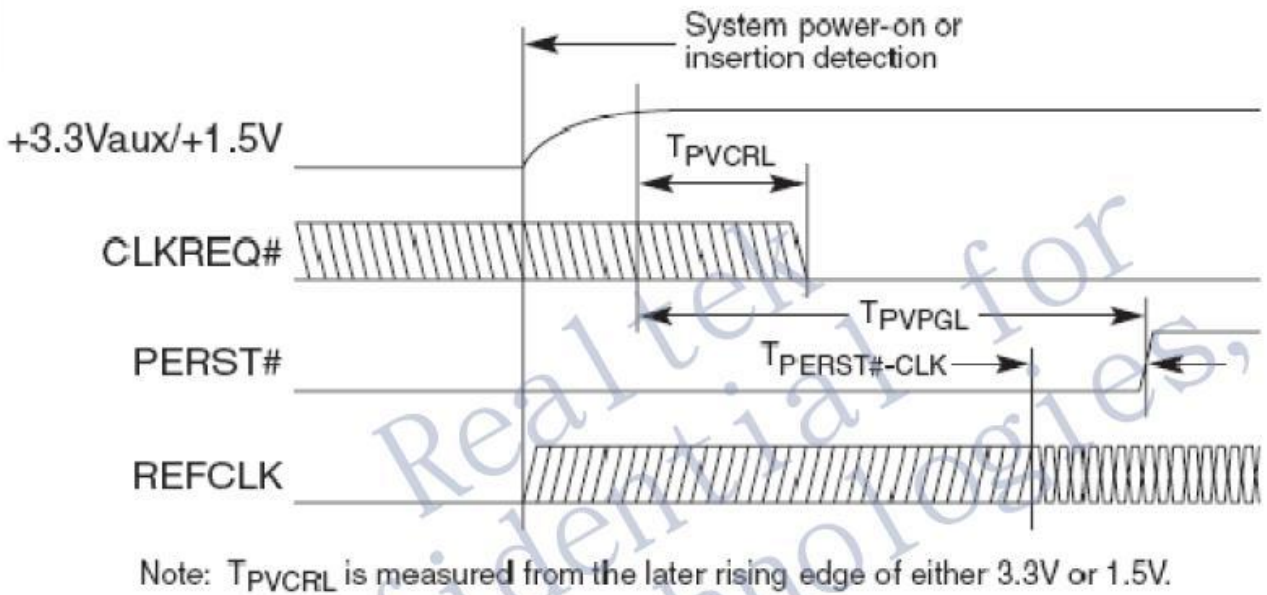
VIH = Voltage input high

VIL= Voltage input low

4-5 LED mode behavior

State	Definition	Interpretation
OFF	The LED is emitting no light.	Radio is incapable of transmitting. This state is indicated when the card is not powered, the W_DISABLE# signal is asserted to disable the radio, or when the radio is disabled by software.
ON	The LED is emitting light.	Radio is capable of transmitting. The LED should remain ON even if the radio is not actually transmitting. For example, the LED remains ON during temporary radio disablements performed by the Mini Card of its own volition to do scanning, switching radios/bands, power-management, etc. If the card is in a state wherein it is possible that radio can begin transmitting without the system user performing any action, this LED should remain ON.

4-6. Power UP Sequencing



Symbol	Parameter	Min	Max	Units
T_{PVCRL}	Power Valid to CLKREQ# Output active		100	μ s
T_{PVPGI}	Power Valid to PERST# Input inactive	1		ms
$T_{PERST\#-CLK}$	REFCLK stable before PERST# inactive	100		μ s

4-7. Power Consumption

States	States	Current(mA)/3.3V
Max TX power Consumption	Cont Tx	185
Max RX power Consumption	Cont Rx	168

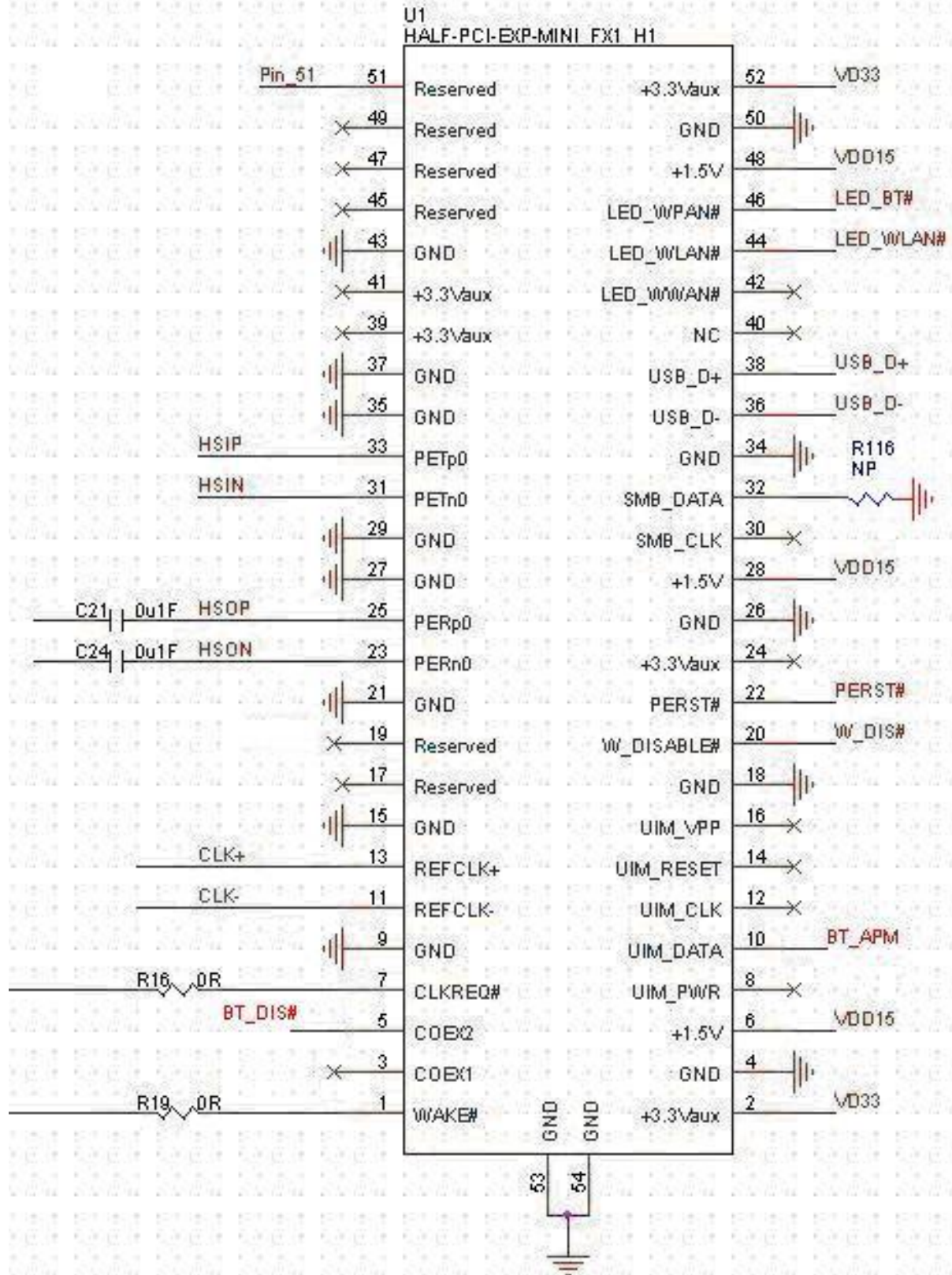
5. Connector Pin-out Definitions

Pin No.	Definition	Basic Description	Type
1	WAKE#	Power management event : open drain,active low Use to reactivate the PCI Express slot's main power rails and reference clocks.	O/D
2	3.3V	3.3V power supply	VCC
3	Reserve	No connect. Should be left open. not connected internally to RTL8188CE	N/C
4	GND	Ground	GND
5	BT_DISABLE_L (COEX2)	BT disable control (Module default pull high, Module Internal 10K Resister Pull-High)	Input
6	1.5V	The pin is defined according to PCI-E standard. (Note) this module does not use power source 1.5V. not connected internally to RTL8188CE	VCC
7	CLKREQ_L	Reference clock request signal.this signal is use by the RTL8188CE to request starting of the PCI Express reference clock.	Output
8	UIM_PWR	No connect. Should be left open. not connected internally to RTL8188CE	N/C
9	GND	Ground	GND
10	UIM_DATA	No connect. Should be left open. not connected internally to RTL8188CE	N/C
11	REFCLK-	Differential reference clock (100 MHz)	Input
12	UIM_CLK	No connect. Should be left open. not connected internally to RTL8188CE	N/C
13	REFCLK+	Differential reference clock (100 MHz)	Input
14	UIM_RESET	No connect. Should be left open. not connected internally to RTL8188CE	N/C
15	GND	Ground	GND
16	UIM_VPP	No connect. Should be left open. not connected internally to RTL8188CE	N/C
17	RESERVED	No connect. Should be left open. not connected internally to RTL8188CE	N/C
18	GND	Ground	GND
19	RESERVED	No connect. Should be left open. not connected internally to RTL8188CE	N/C
20	WLAN_DISABLE#	WLAN disable control. (Module default pull high, Module Internal 10K Resister Pull-High)	Input
21	GND	Ground	GND
22	PERST#	PCI express reset signal : active low When the PERSTB is asserted at power-on state, the RTL8188CE returns to a pre-defined reset state and is ready for initialization and configuration after the de-assertion of the PERSTB.	Input
23	PERn0	Differential transmit	Output
24	3.3VAUX	The pin is defined according to PCI-E standard. (Note) this module does not use power source 3.3V AUX. not connected internally to RTL8188CE	VCC
25	PERp0	Differential transmit	Output
26	GND	Ground	GND
27	GND	Ground	GND
28	1.5V	The pin is defined according to PCI-E standard. (Note) this module does not use power source 1.5V. not connected internally to RTL8188CE	VCC
29	GND	Ground	GND
30	SMB_CLK	No connect. Should be left open. not connected internally to RTL8188CE	N/C
31	PETn0	Differential receive	Input

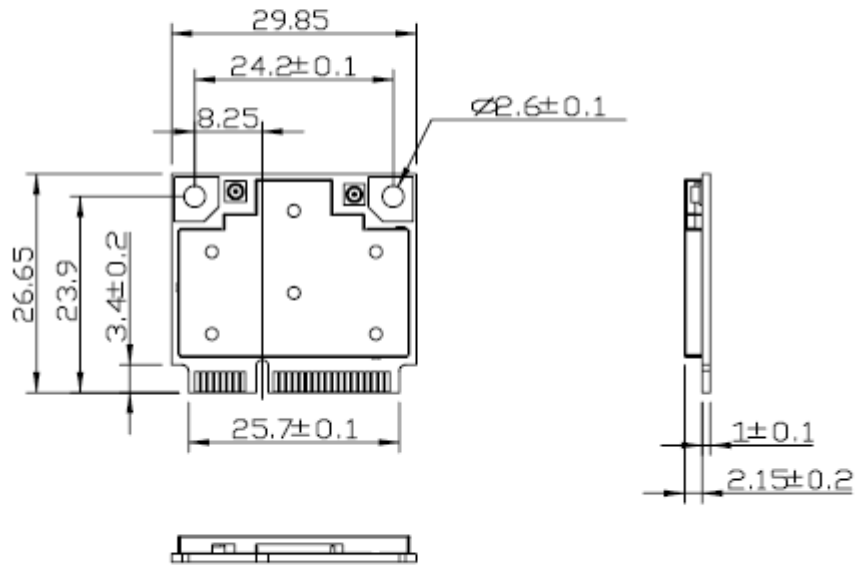
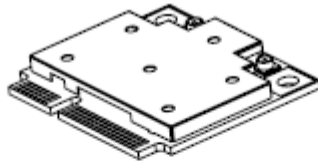
32	SMB_DATA	No connect. Should be left open. not connected internally to RTL8188CE	N/C
33	PETp0	Differential receive	Input
34	GND	Ground	GND
35	GND	Ground	GND
36	USB_D-	USB Differential signal	Output/Input
37	GND	Ground	GND
38	USB_D+	USB Differential signal	Output/Input
39	3.3VAUX	The pin is defined according to PCI-E standard. (Note) this module does not use power source 3.3V AUX. not connected internally to RTL8188CE	VCC
40	NC	No connect. Should be left open.	N/C
41	3.3VAUX	The pin is defined according to PCI-E standard. (Note) this module does not use power source 3.3V AUX. not connected internally to RTL8188CE	VCC
42	LED_WWAN#	No connect. Should be left open. not connected internally to RTL8188CE	N/C
43	GND	Ground	GND
44	LED_WLAN_L	Active low signal. The signal is used to provide status indicators via LED.	Output
45	RESERVED	No connect. Should be left open. not connected internally to RTL8188CE	N/C
46	LED_BT_L	Active low signal. The signal is used to provide status indicators via LED.	Output
47	RESERVED	No connect. Should be left open. not connected internally to RTL8188CE	N/C
48	1.5V	The pin is defined according to PCI-E standard. (Note) this module does not use power source 1.5V. not connected internally to RTL8188CE	VCC
49	RESERVED	No connect. Should be left open. not connected internally to RTL8188CE	N/C
50	GND	Ground	GND
51	RESERVED	No connect. Should be left open. not connected internally to RTL8188CE	N/C
52	3.3V	3.3V power supply	VCC

O/D : open drain

AZUREWAVE



6. Mechanical Dimensions



Tolerances unless otherwise specified : $\pm 0.15\text{mm}$

AZUREWAVE
 for Compal Use

7. Module Photo



AZUREWAVE

for Compal Use Only