# AW-NB037H

## IEEE 802.11b/g/n Wi-Fi with Bluetooth 3.0 + HS class II Combo half Size Mini Card

### <Control pin separated-Pin 5/ Pin20>

# Datasheet

### Version 1.3

| Document Release | Date | Modification | Initials | Approved |
|---|---|---|---|---|
| Version 1.0 | 2010/5/18 | 1. First release | Amos | Eric Lee |
| Version 1.1 | 2010/6/7 | 1. Add device Label | Hannah | Ray Lee |
| Version 1.2 | 2010/7/9 | 1. Update device label | Hannah | Ray Lee |
| Version 1.3 | 2010/7/12 | 1. Update Block diagram for diversity | Amos | Antonio |

# 1. Introduction

**AzureWave Technologies, Inc.** introduces the pioneer of the IEEE 802.11b/g/n WiFi with Bluetooth 3.0 + HS class II combo half size mini card module ---**AW-NB037H.** The AW-NB037H 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. And it combines with Bluetooth 3.0+HS class II and provides a complete 2.4GHz Bluetooth system and is fully compliant to Bluetooth 3.0+HS and BT2.1 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, the AW-NB037H uses Direct Sequence Spread Spectrum (DSSS), Orthogonal Frequency Division Multiplexing (OFDM), BPSK, QPSK, CCK and QAM baseband modulation technologies.

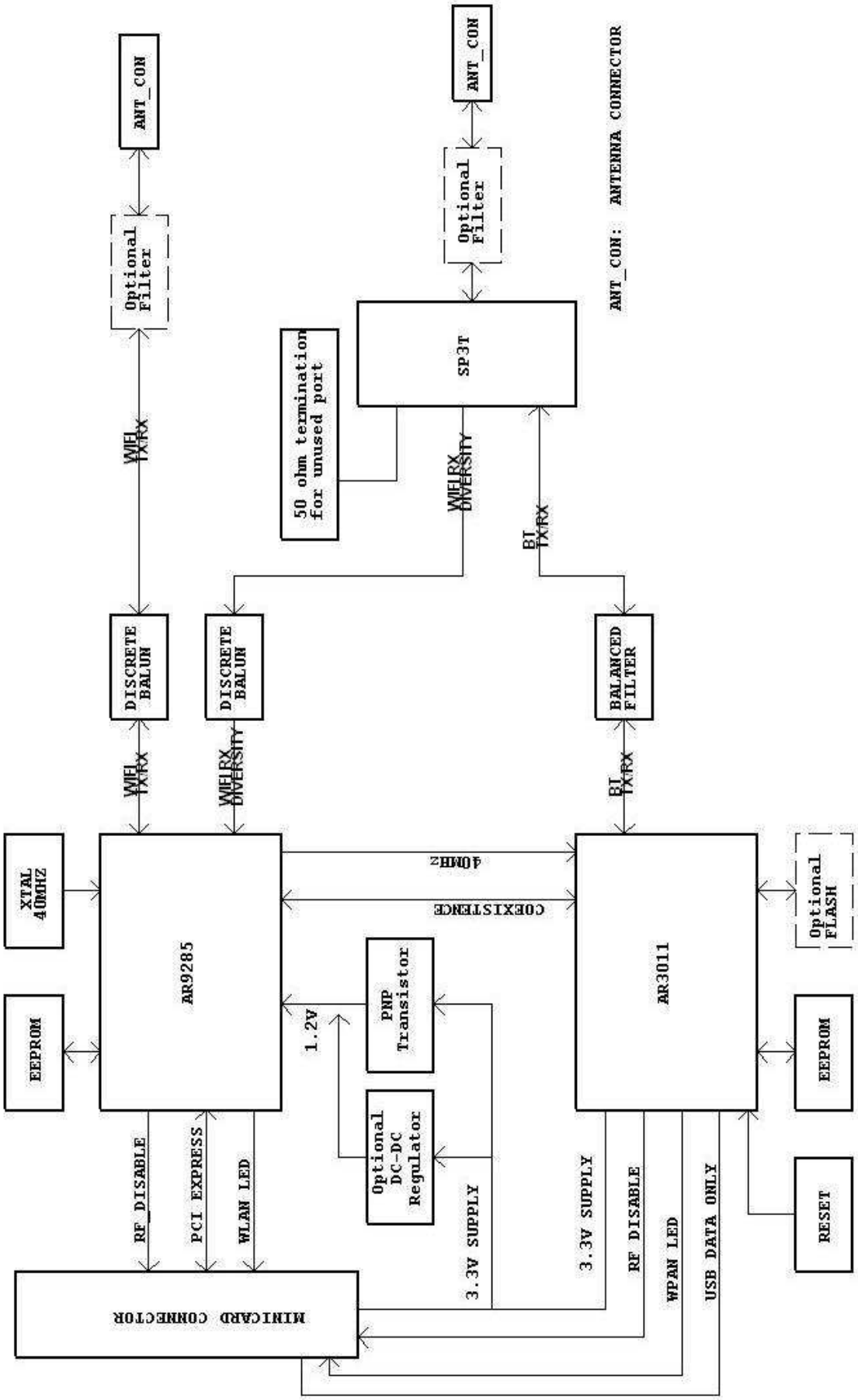
A high level of integration and full implementation of the power management functions specified in the IEEE 802.11 standard minimize system power requirements by using AW-NB037H.

AW-NB037H module adopts Atheros **AR9285 with AR3011**solution. The module design is based on the AR9285 with AR3011 solution.

# 2. Features

- **PCIE half size Mini-Card**
- **Compliant with IEEE802.11 b/g/n standard**
- **2 Antenna to support 1(Transmit) × 1 (Receive) technology and Bluetooth**
  **Antenna 1: WiFi → TX/RX**
  **Antenna 2: Bluetooth → TX/RX**
- **High speed wireless connection up to 150 Mbps**
- **Low power consumption and high performance**
- **Enhanced wireless security**
- **Fully qualified Bluetooth v3.0+HS system**
- **Fully speed operation with Piconet and Scatternet support**

# 3. Block Diagram

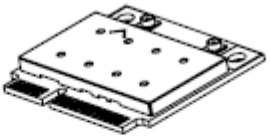


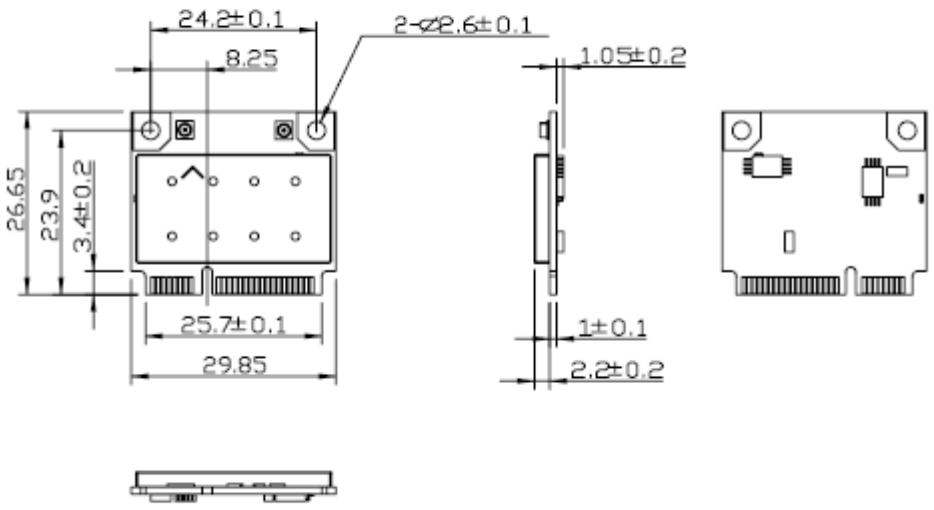
# 4. General Specifications

| Model Name | AW-NB037H |
|---|---|
| **Product Description** | IEEE 802.11 b/g/n Wi-Fi with Bluetooth 3.0+HS class II Combo half size mini card |
| **BlueTooth Standard** | IEEE 802.11b/g/n, Wi-Fi compliant / Bluetooth v3.0+HS Standard |
| **Host Interface** | PCIE / USB |
| **Major Chipset** | Atheros AR9285(MAC/Baseband/RF) with AR3011 |
| **Dimension** | 29.85mm x 26.65mm x 4.25 mm |
| **Weight** | 3.4g |
| **Antenna** | Hirose* U.FL-R-SMT<br>1: WiFi → TX/RX<br>2: Bluetooth → TX/RX |
| **Operating Conditions** | |
| **Voltage** | 3.3V +/- 5% |
| **Temperature** | Operating: 0-80 °C |
| **Storage temperature** | -40 °C~ 85 °C |
| **Electrical Specifications** | |
| **Frequency Range** | Wi-Fi: 2.4 GHz ISM Bands 2.412-2.472 GHz, 2.484 GHz /<br>BT: 2402MHz~2483MHz |
| **Modulation** | Wi-Fi:<br>802.11 g/n: OFDM<br>802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps)<br>BT:<br>Header GFSK<br>Payload 2M: 4-DQPSK<br>Payload 3M: 8DPSK |
| **Output Power** | Wi-Fi: 802.11b: Typical 17 dBm at all rates +/- 1.5dBm<br>802.11g: Typical 15 dBm at 54Mbps / 17dBm at 6Mbps +/- 1.5dBm<br>802.11n 2.4G HT20 : Typical 13 dBm at MCS15/17dBm at MCS0+/-1.5dBm<br>802.11n 2.4G HT40 : Typical 11 dBm at MCS15/16dBm at MCS0+/- 1.5dBm<br>BT: -6 ≤ Output Power ≤ +4 dBm (Conductive) |
| **Receive Sensitivity** | 802.11b: less than -78 dBm (11Mbps)<br>802.11g: less than -68 dBm (54Mbps)<br>802.11n: less than -62 dBm at HT40 MCS7<br>less than -65 dBm at HT20 MCS7<br>BT: BER < 0.1% (Anritsu 8852B Tx -70Bm) |
| **Power consumption** | Wi-Fi:<br>Idle mode: 252.1 mA(Max.)<br>Connect AP: 265.6 mA(Max.)<br>BT:<br>Idle mode: 96.1 mA(Max.)<br>Connect AP: 92.3 mA(Max.) |

| | | |
|---|---|---|
| | Radio off: 118.2 mA (Max) | Radio off: 61.0 mA (Max) |
| **Operating Range** | **Wi-Fi:**<br>**Open Space: ~300m; Indoor: ~100m**<br>**(The transmission speed may vary according to the environment)**<br>**BT: 10m (depending on environment and NB model)** | |
| **Regulatory** | **FCC, CE…** | |

# 5. Mechanical Dimensions






Tolerances unless otherwise specified : ±0.15mm

# 6. Connector Pin-out Definitions

| Pin No. | Definition | Basic Description | Type |
|---|---|---|---|
| 1 | WAKE_L | No connect. Should be left open | |
| 2 | 3.3V | 3.3V power supply | VCC |
| 3 | Reserve | No connect. Should be left open | |
| 4 | GND | Ground | GND |
| 5 | Radio DISABLE_L | 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.<br>Note: this module does not use power source 1.5V | VCC |
| 7 | CLKREQ_L | Reference clock request. | Output |
| 8 | NC | No connect. Should be left open. | |
| 9 | GND | Ground | GND |
| 10 | NC | No connect. Should be left open. | |
| 11 | REFCLK- | Differential reference clock | CLK |
| 12 | NC | No connect. Should be left open. | |
| 13 | REFCLK+ | Differential reference clock | CLK |
| 14 | NC | No connect. Should be left open. | |
| 15 | GND | Ground | GND |
| 16 | NC | No connect. Should be left open. | |
| 17 | NC | No connect. Should be left open. | |
| 18 | GND | Ground | GND |
| 19 | NC | No connect. Should be left open. | |
| 20 | Radio DISABLE_L | WLAN disable control. (Module default pull high, Module Internal 10K Resister Pull-High ) | Input |
| 21 | GND | Ground | GND |
| 22 | PERST_L | PCI express fundamental reset | Input |
| 23 | PERn0 | Differential transmit | Output |
| 24 | 3.3VAUX | The pin is defined according to PCI-E standard.<br>Note: this module does not use power source 3.3V AUX. | 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.<br>Note: this module does not use power source 1.5V | VCC |
| 29 | GND | Ground | GND |
| 30 | NC | No connect. Should be left open. | |
| 31 | PETn0 | Differential receive | Input |
| 32 | NC | No connect. Should be left open. | |
| 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.<br>Note: this module does not use power source 3.3V AUX. | VCC |
| 40 | GND | Ground | GND |
| 41 | 3.3VAUX | The pin is defined according to PCI-E standard.<br>Note: this module does not use power source 3.3V AUX. | VCC |
| 42 | NC | No connect. Should be left open. | |
| 43 | GND | Ground | GND |
| 44 | LED_WLAN_L | Active low signal. The signal is used to provide | Output |

| | | | |
|---|---|---|---|
| | | status indicators via LED. | |
| 45 | NC | No connect. Should be left open. | |
| 46 | LED_BT_L | Active low signal. The signal is used to provide status indicators via LED. | Output |
| 47 | NC | No connect. Should be left open. | |
| 48 | 1.5V | The pin is defined according to PCI-E standard.<br>Note: this module does not use power source 1.5V | VCC |
| 49 | NC | No connect. Should be left open. | |
| 50 | GND | Ground | GND |
| 51 | NC | No connect. Should be left open. | |
| 52 | 3.3V | 3.3V power supply | VCC |

# 7. Device Label

<Front>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