

# BD-SDMAC: IEEE 802.11ac SDIO Wireless LAN + Bluetooth Module

## Revision History

| Date       | Revision | Description                  |
|------------|----------|------------------------------|
| 09-20-2016 | 1.0      | First Draft                  |
| 05-31-2017 | 1.1      | Updated Power Specifications |
| 07-21-2017 | 1.2      | Updated Mechanical           |

## 1 Contents

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## 2 Overview

This document describes the BD-SDMAC.

BD-SDMAC is a dual-band 1x1 802.11a/b/g/n/ac plus Bluetooth 4.1+HS “Smart Ready” SDIO module based on the Silex SX-SDPAC/Qualcomm Atheros QCA9377 System-on-Chip (SoC). The BD-SDMAC is a pre-certified module with a compact 13mm x 18mm footprint.



BD-SDMAC provides an SDIO3.0 interface for WLAN and a hi-speed UART interface for BT. The module can be evaluated with any Boundary Devices single board computer and driver support is integrated in all Boundary Devices kernels.

### Features

- IEEE802.11a/b/g/n/ac compatible (2.4 GHz, 5 GHz)
- 5 GHz : Support 20/40/80 MHz bandwidth mode (Link rate 433 Mbps)
- 2.4 GHz : Support 20/40 MHz bandwidth mode (Link rate 200 Mbps)
- Bluetooth 4.1 BR/EDR/LE Smart Ready compatible. Backward-compatible to Bluetooth 1.x, 2.x, 3.0, 4.0
- SDIO3.0 as the Wireless LAN host interface
- UART as the Bluetooth host interface
- u.FL connector for external antenna
- Single antenna or optional dual antenna diversity controlled by software and signal pins
- Worldwide acceptance: FCC (USA), IC (Canada), ETSI (Europe)
- Modular certification allows reuse of FCC ID and ETSI certification without repeating the expensive testing on end product
- +3.3V main power supply and 1.8V IO power supply
- ROHS Compliant

## 3 Specifications

**Please see Silex SX-SDPAC datasheet for full performance details:**

<http://www.silexamerica.com/products/connectivity-solutions/embedded-wireless/sdio-radios/sx-sdpac-system-in-package-sip/>

## Environmental specifications

| Items                      | Specifications | Units | Remarks             |
|----------------------------|----------------|-------|---------------------|
| Operating Temperature      | -20 to +70C    | °C    | Ambient temperature |
| Operating humidity         | 85             | %RH   | Non condensing      |
| Storage temperature        | -40 ~ 85       | °C    |                     |
| Moisture Sensitivity Level | 3              | —     | IPC/JEDEC J-STD-020 |

## Electrical specifications

### Absolute Maximum Ratings

| Items | Specifications |      |      | Units | Remarks                                      |
|-------|----------------|------|------|-------|----------------------------------------------|
|       | Min.           | Typ. | Max. |       |                                              |
| VBAT  | -0.3           | —    | 4.0  | V     | Voltage Supply                               |
| VIO   | -0.3           | -    | 2.1  | V     |                                              |
| RFin  |                |      | +10  | dBm   | Maximum RF Input (reference to 50 Ohm input) |

### Recommended Operating Conditions

| Items | Specifications |      |       | Units | Remarks        |
|-------|----------------|------|-------|-------|----------------|
|       | Min.           | Typ. | Max.  |       |                |
| VBAT  | 3.135          | 3.3  | 3.465 | V     | Voltage Supply |
| VIO   | 1.71           | 1.8  | 1.89  | V     |                |

### Current Consumption – 2.4 GHz

| Items                          | Specifications |            |     | Units | Remarks |
|--------------------------------|----------------|------------|-----|-------|---------|
|                                | Mode           | Standards  | Typ |       |         |
| Current Consumption<br>2.4 GHz | Tx             | 11b        | 340 | mA    |         |
|                                | Tx             | 11g        | 320 | mA    |         |
|                                | Tx             | 11ng 20MHz | 330 | mA    |         |
|                                | Tx             | 11ng 40MHz | 305 | mA    |         |
|                                | Rx             | All mode   | 85  | mA    |         |

**Current Consumption – 5GHz**

| Items                        | Specifications |            |     | Units | Remarks |
|------------------------------|----------------|------------|-----|-------|---------|
|                              | Mode<br>s      | Standards  | Typ |       |         |
| Current Consumption<br>5 GHz | Tx             | 11a        | 490 | mA    |         |
|                              | Tx             | 11na HT20  | 490 | mA    |         |
|                              | Tx             | 11na HT40  | 470 | mA    |         |
|                              | Tx             | 11ac VHT80 | 410 | mA    |         |
|                              | Rx             | All mode   | 115 | mA    |         |

## 4 Signal Descriptions

| Pin | Pin Name      | VDD  | Description                  |
|-----|---------------|------|------------------------------|
| 1   | VBAT          |      |                              |
| 2   | No Connect    | 1.8V |                              |
| 3   | No Connect    |      | No Connect                   |
| 4   | SDIO_INT_L    | 1.8V | WLAN Interrupt Request       |
| 5   | BT_EN         | 1.8V | Bluetooth Enable             |
| 6   | No Connect    |      |                              |
| 7   | Debug_UART_RX | 1.8V | WLAN Test UART RX            |
| 8   | Debug_UART_TX | 1.8V | WLAN Test UART TX            |
| 9   | No Connect    |      |                              |
| 10  | WL_EN         | 1.8V | WLAN Enable                  |
| 11  | 1P8V          |      | Power Supply for Digital IO  |
| 12  | GND           |      | GND                          |
| 13  | SDIO_DAT3     | 1.8V | SDIO Interface, HOST Pull up |
| 14  | SDIO_DAT2     | 1.8V | SDIO Interface, HOST Pull up |
| 15  | SDIO_DAT1     | 1.8V | SDIO Interface, HOST Pull up |
| 16  | SDIO_DAT0     | 1.8V | SDIO Interface, HOST Pull up |
| 17  | SD_CMD        | 1.8V | HOST Pull up                 |
| 18  | SDIO_CLK      | 1.8V | HOST Pull up                 |
| 19  | LF_CLK_IN     | 1.8V | 32.768KHz Clock              |
| 20  | No Connect    |      |                              |
| 21  | No Connect    |      | No Connect                   |
| 22  | No Connect    |      | No Connect                   |
| 23  | No Connect    |      |                              |
| 24  | No Connect    |      |                              |
| 25  | No Connect    |      |                              |
| 26  | No Connect    |      | Connect to GND               |
| 27  | No Connect    |      | Connect to GND               |
| 28  | No Connect    |      |                              |
| 29  | No Connect    |      | Connect to GND               |
| 30  | GND           |      |                              |
| 31  | No Connect    |      |                              |
| 32  | No Connect    |      |                              |
| 33  | PCM_SYNC      | 1.8V | PCM I/F                      |
| 34  | BT_UART_RXD   | 1.8V | BT RX                        |
| 35  | BT_UART_RTS   | 1.8V | BT RTS                       |
| 36  | BT_UART_TXD   | 1.8V | BT TX                        |
| 37  | PCM_CLK       | 1.8V | PCM I/F                      |
| 38  | PCM_OUT       | 1.8V | PCM I/F                      |
| 39  | BT_UART_CTS   | 1.8V | BT CTS                       |
| 40  | PCM_IN        | 1.8V | PCM I/F                      |

|    |              |      |                   |
|----|--------------|------|-------------------|
| 41 | CLK_REQ_OUT  |      |                   |
| 42 | BT_HOST_WAKE | 1.8V |                   |
| 43 | No Connect   |      |                   |
| 44 | GND          |      |                   |
| 45 | GND          |      |                   |
| 46 | GND          |      |                   |
| 47 | GND          |      |                   |
| 48 | ANT1         |      | WLAN + BT Antenna |
| 49 | GND          |      |                   |
| 50 | GND          |      |                   |
| 51 | GND          |      |                   |
| 52 | GND          |      |                   |

#### Standards Compliance

Part Number: BD-SDMAC

Model: SX-SDPAC

FCC ID: N6C-SDPAC

IC: 4908A-SDPAC

Modular certification for US, Canada, Europe, Aus, NZ

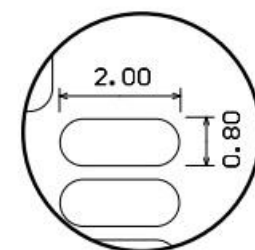
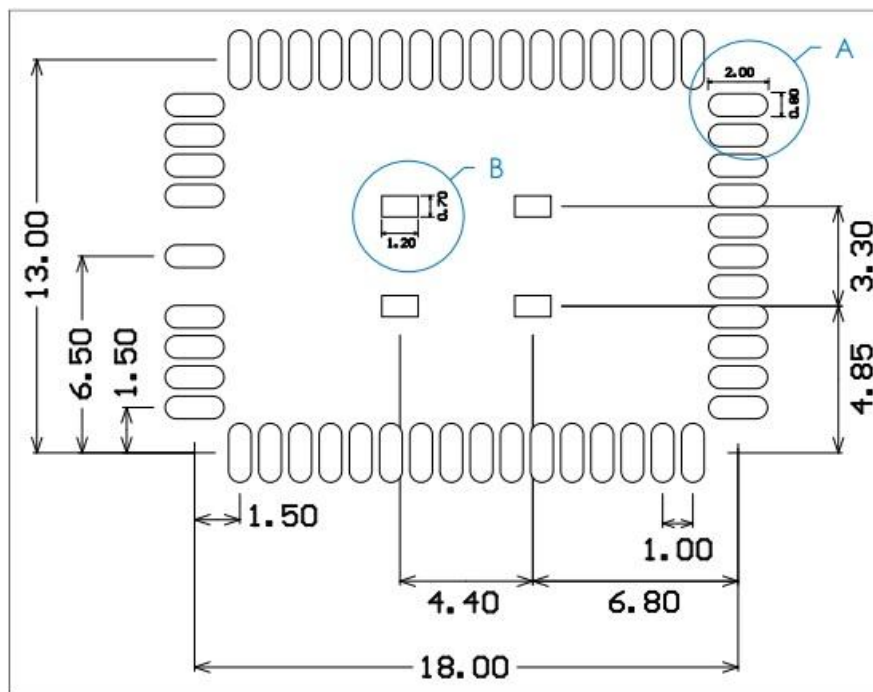
#### List of All Suitable Antennas:

Molex 146153

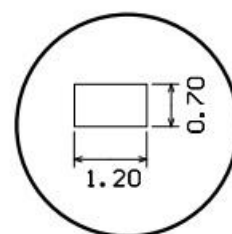
Unictron H2B1PC1A1C (AA258)

Unictron H2B1PD1A1C (AA222)

## 5 Mechanical Specifications



DETAIL A (Scale 8:1)



DETAIL B (Scale 8:1)

