# M88WI6xxx Wi-Fi SoC module

Version: MWI042A

Date: 2015/3/2

## 1.1 Introduction

The M88WI6xxx is a stand-alone SoC Wi-Fi module providing fully integrated 2.4GHz 802.11 b/g/n radio.It also provides flexible peripheral interfaces such as USB2.0,Ethernet PHY,PCM,RMII Interface,SDIO,JTAG,PWM,UART,I2C,ADC, GPIO to connect various peripheral interfaces directly to the M88WI6xxx Wi-Fi module.

## 1.2 Block Diagram
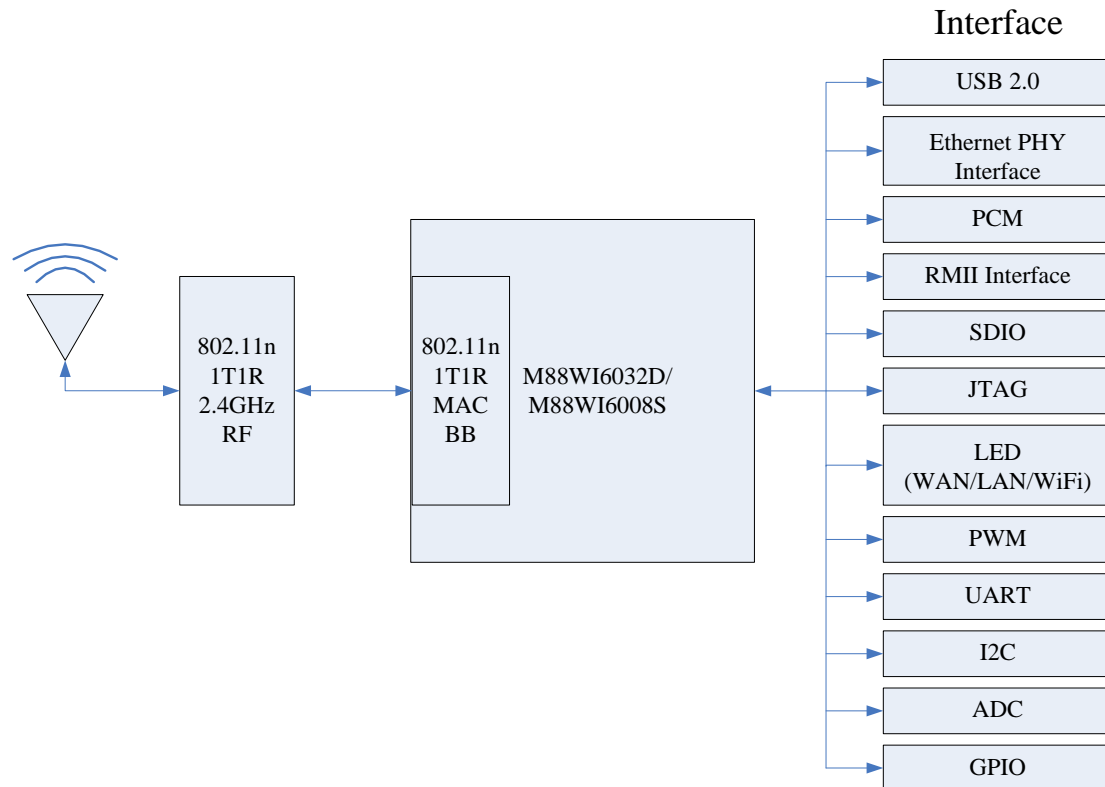
Interface



## 1.3 Features

*power supply +3.3VDC

*USB 2.0 Host

*Ethernet PHY Interface

*PCM

*RMII Interface

*SDIO

*JTAG

*LED x3(LAN/WAN/WIFI)

*PWM

*UART

*I2C

*ADC

*GPIO

*1x1 modes.

*150Mhz PHY Rate Support.

*20Mhz/40Mhz channel bandwidth.

*Multiple BSSID

*QoS-WMM,WMM Power Save

## 1.4 Pin Description

Table 1-1 shows a detailed pin functional description of module MWI042A.



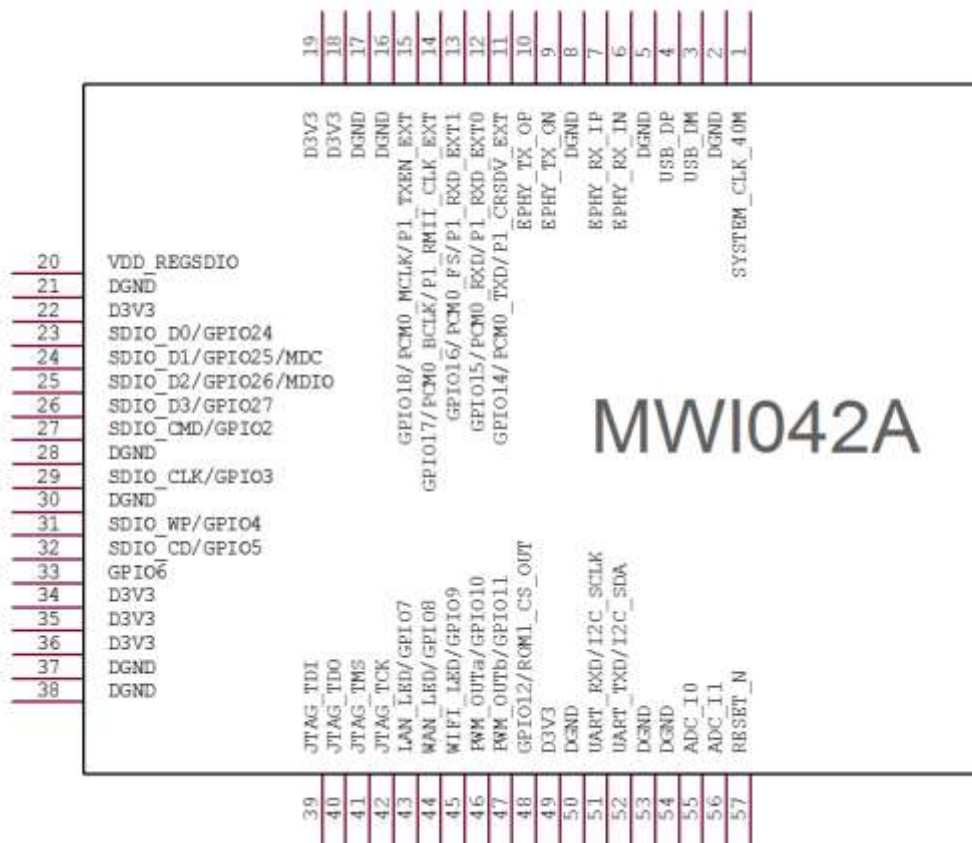Figure 1-1 MWI042A Pin Assignment Diagram

| Type | Description |
|---|---|
| I | Input pin |
| O | Output pin |
| I/O | Bidirectional input/output |
| P | Power |

| Pin No. | Label | Type | Description |
|---|---|---|---|
| 1 | SYSTEM_CLK_40M | O | Clock output pin for 40Mhz. |
| 2,5,8,16, 17,21,28, 30,37,38, 50,53,54 | DGND | P | These pins should be connected to ground plane. |
| 3 | USB_DM | I/O | USB data pin Data- |
| 4 | USB_DP | I/O | USB data pin Data+ |
| 6 | EPHY_RX_IN | I | Ethernet PHY RX differential input |
| 7 | EPHY_RX_IP | I | Ethernet PHY RX differential input |
| 9 | EPHY_TX_ON | O | Ethernet PHY TX differential output |
| 10 | EPHY_TX_OP | O | Ethernet PHY TX differential output |
| 11 | GPIO14/PCM0_TXD/ P1_CRSDV_EXT | I/O | GPIO14 or PCM data output signal or RMII CRSDV |
| 12 | GPIO15/PCM0_RXD/ P1_RXD_EXT0 | I/O | GPIO15 or PCM data input signal or RMII RXD0 |
| 13 | GPIO16/PCM0_FS/ P1_RXD_EXT1 | I/O | GPIO16 or PCM frame sync signal or RMII RXD1 |
| 14 | GPIO17/PCM0_BCLK/ P1_RMII_CLK_EXT | I/O | GPIO17 or PCM bit clock signal or RMII Clock |
| 15 | GPIO18/PCM0_MCLK/ P1_TXEN_EXT | I/O | GPIO18 or PCM master clock signal Or RMII TXEN |
| 18,19,22, 34,35,36, 49 | D3V3 | P | Digital 3.3 V power supply |
| 20 | VDD_REGSDIO | P | Regulator output for SDIO card |
| 23 | SDIO_D0/GPIO24 | I/O | SDIO data or GPIO24 |
| 24 | SDIO_D1/GPIO25/MDC | I/O | SDIO data or GPIO25 |

| 25 | SDIO_D2/GPIO26/MDIO | I/O | SDIO data or GPIO26 |
|---|---|---|---|
| 26 | SDIO_D3/GPIO27 | I/O | SDIO data or GPIO27 |
| 27 | SDIO_CMD/GPIO2 | I/O | SDIO command signal or GPIO2 |
| 29 | SDIO_CLK/GPIO3 | I/O | SDIO clock signal or GPIO3 |
| 31 | SDIO_WP/GPIO4 | I/O | SDIO write protection signal or GPIO4 |
| 32 | SDIO_CD/GPIO5 | I/O | SDIO card detection signal or GPIO5 |
| 33 | GPIO6 | I/O | GPIO6 |
| 39 | JTAG_TDI | I | JTAG data input |
| 40 | JTAG_TDO | O | JTAG data output |
| 41 | JTAG_TMS | I | JTAG mode select |
| 42 | JTAG_TCK | I | JTAG clock |
| 43 | LAN_LED/GPIO7 | I/O | LAN activity LED or GPIO7 |
| 44 | WAN_LED/GPIO8 | I/O | WAN activity LED or GPIO8 |
| 45 | WIFI_LED/GPIO9 | I/O | WIFI activity LED or GPIO9 |
| 46 | PWM_OUTa/GPIO10 | I/O | PWM driver output A or GPIO10 |
| 47 | PWM_OUTb/GPIO11 | I/O | PWM driver output B or GPIO11 |
| 48 | GPIO12/ROM1_CS_OUT | I/O | GPIO12 or ROM chip select |
| 51 | UART_RXD/I2C_SCLK | O | UART RX data input or I2C master serial clock line |
| 52 | UART_TXD/I2C_SDA | I/O | UART TX data input or I2C master serial clock line |
| 55 | ADC_I0 | I | General purpose ADC input 0 |
| 56 | ADC_I1 | I | General purpose ADC input 1 |
| 57 | RESET_N | I | Power on reset pin. Low Active. |

Table 1-1

## 2. Hardware Introduction

### 2.1 Top View
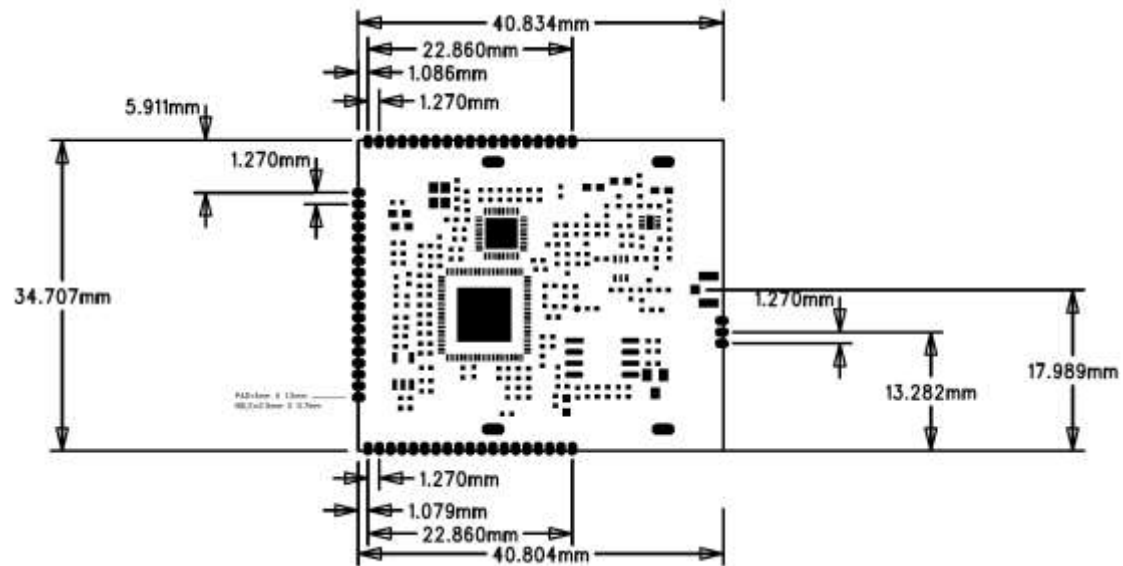


### 2.2 Electronic Specification

| Model Name | |
|---|---|
| Product Name | WLAN 11n Wi-Fi SoC module |
| Standard | 802.11b/g/n, 802.3, 802.3u |
| Data Transfer Rate | 1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 150Mbps |
| Modulation Method | BPSK/ QPSK/ 16-QAM/ 64-QAM |
| Frequency Band | 2.4GHz ISM Band |
| Spread Spectrum | IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE 802.11g/n:OFDM (Orthogonal Frequency Division Multiplexing) |
| RF Output Power | 802.11b:17 dBm +/-1.5dBm(11Mbps)<br>802.11g:14 dBm +/-1.5dBm(54Mbps)<br>802.11n @2.4GHz:14dBm +/-1.5dBm(HT20 MCS7) |

| | |
|---|---|
| | 802.11n @2.4GHz:14 dBm +/-1.5dBm(HT40 MCS7) |
| Operation Mode | AP mode, Station mode |
| Receiver Sensitivity | 802.11b: 1M -91dBm +/-1.5dBm<br>802.11b: 2M -89dBm +/-1.5dBm<br>802.11g: 54M -70dBm +/-1.5dBm<br>802.11n@2.4GHz:HT20 MCS7 -67dBm +/-1.5dBm<br>802.11n@2.4GHz:HT40 MCS7 -65dBm +/-1.5dBm |
| LED | WAN/LAN/WIFI |
| Security | WEP, TKIP, AES, WPA, WPA2 |
| Supply Voltage | 3.3V+-10% |
| Power Consumption | TX peak:400mA,RX peak:300mA(D3V3=3.3V) |
| Operating Temperature | 0 – 70° C ambient temperature |
| Dimension | 40.83x34.7x1.0mm (LxWxH) |

Federal Communications Commission (FCC) Statement

15.21
You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)
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 or more 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.

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 of the device.

RF Radiation Exposure Statement:
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.
This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Only those antennas with same type and lesser gain filed under this FCC ID number can be used with this device.

The final system integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter module.

Required end product labeling:

Any device incorporating this module must include an external, visible, permanent marking or label which states: "Contains FCC ID: 2AEDFM88WI6000SIP