



SG901-1059B 802.11 b/g/n Wireless USB Module

Overview

The SG901-1059B is a high speed module supporting all data rates of the latest standards including Wi-Fi 802.11B/G/N using a USB 2.0 interface. This module's high level of interoperability and its low cost is desirable for high volume applications. The product is suited for many embedded systems able to support Windows and Linux OS including high bandwidth applications such as set top box.

The SG901-1059B WLAN module is designed to operate in the 2.4GHz ISM frequency band. It utilizes a highly integrated MAC/BBP and RF single chip RT3070 design with 150Mbps PHY rate support. The module fully complies with IEEE802.11n draft 3.0 and IEEE802.11b/g feature sets.



Features

- 802.11b: 1, 2, 5.5, 11Mbps
- 802.11g: 6, 9, 12, 24, 36, 48, 54Mbps
- 802.11n:
 - (20MHz) MCS0-7, up to 72Mbps
 - (40MHz) MCS0-7, up to 150Mbps
- OFDM, Peak rate 150Mbps, 90Mbps peak throughput
- Security support for 64/128 WEP, WPA, WPA2, TKIP, AES
- Operates in the 2.4GHz frequency band.
- Low Power Consumption
- Single antenna configuration; I-PEX receptacle for external antenna.
- FCC Certified

Applications

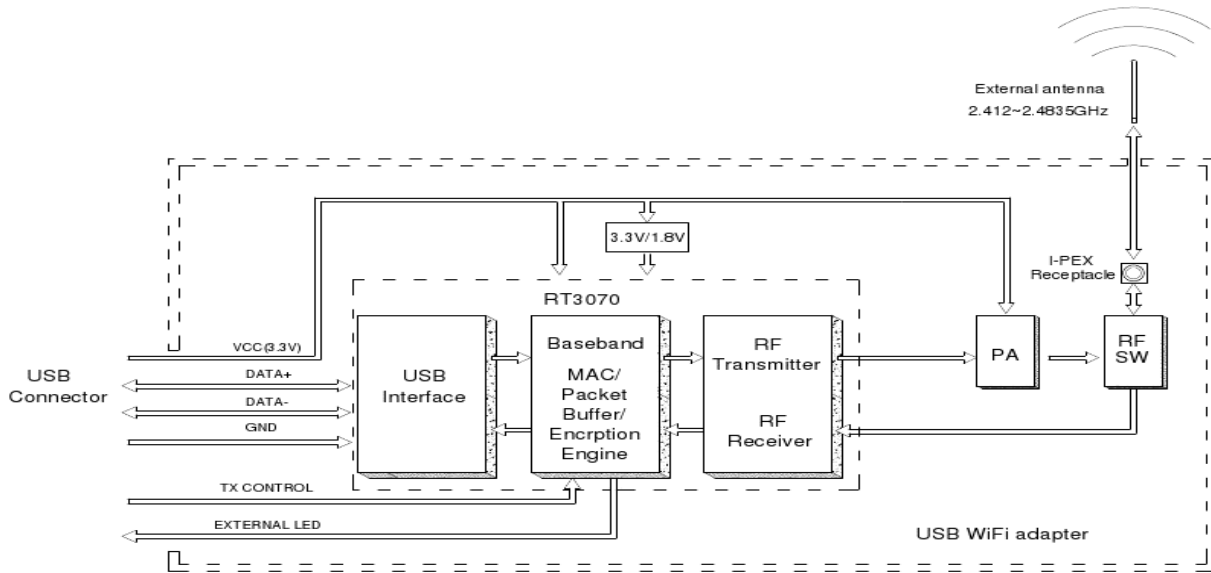
- Personal Digital Assistants (PDA)
- Hand-held Data Transfer Devices
- Video
- IP Cameras
- IP set top box
- GPS
- Internet radio apparatus

Ordering Information

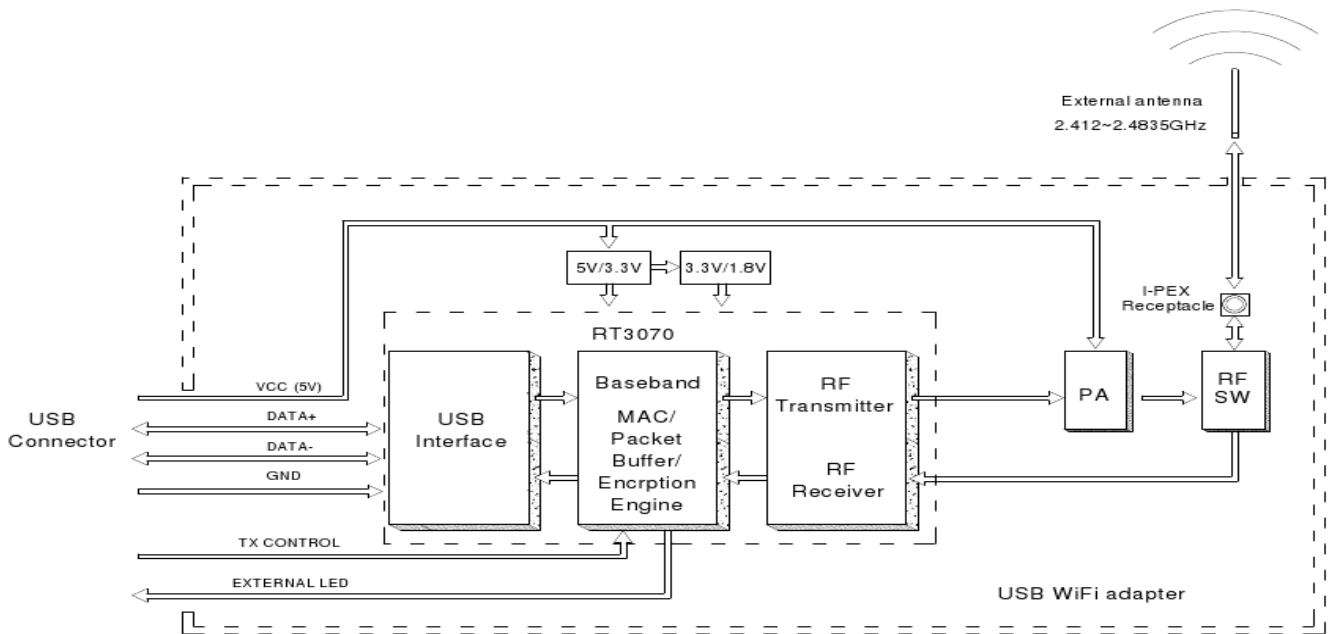
SG901-1059B-3.3-C (connector) – Bulk only
SG901-1059B-5.0-C (connector) – Bulk only
SG901-1059B-3.3-H (header) – Bulk only
SG901-1059B-5.0-H (header) – Bulk only
Eval Kit SG923-0012-3.3-C
Eval Kit SG923-0012-3.3-H
Eval Kit SG923-0012-5.0-H
Eval Kit SG923-0012-5.0-C



Block Diagram



System Block Diagram of SG901-1059B-3.3 WLAN Module



System Block Diagram of SG901-1059B-5.0 WLAN Module



General Electrical Specifications

| Parameter | Test Condition / Comment | Min. | Typ. | Max. | Units |
|--|--------------------------|------|-------------|------|-------|
| Absolute Maximum Ratings | | | | | |
| USB Supply | | -0.3 | | 7 | V |
| Operating Conditions and Input Power Specifications | | | | | |
| Operating Temperature Range | Normal Operating Range | -15 | | 65 | 8C |
| | Storage Range | -20 | | 85 | 8C |
| PC Interface | | | USB 2.0/1.1 | | |
| Plug & Play Compatible | | | YES | | |
| Supply Voltage | SG901-1059B-5.0 | 4.75 | | 5.2 | V |
| | SG901-1059B-3.3 | 3.14 | 3.3 | 3.48 | V |

RF Characteristics

| Parameter | Test Condition / Comment | Min. | Typ. | Max. | Units |
|----------------------------|----------------------------------|------|------------|------|-------|
| Internal Antenna Impedance | | | | | |
| RX Sensitivity | 11b, 11Mbps | | -85 | | dBm |
| | 11g, 54Mbps | | -70 | | dBm |
| | (HT20) 11n, MSC7 | | -66 | | dBm |
| | (HT40) 11n, MSC7 | | -62 | | dBm |
| TX Output Power | 11b, 11Mbps | 18 | 19 | 20 | dBm |
| | 11g, 54Mbps | 14.5 | 16 | 17.5 | dBm |
| | 802.11n (HT20) | 13.5 | 15 | 16.5 | dBm |
| | 802.11n (HT40) | 13.5 | 15 | 16.5 | dBm |
| TX Spectral MASK | CCK | | PASS | | |
| | OFDM | | PASS | | |
| | QPSK | | PASS | | |
| | BPSK | | PASS | | |
| Preamble Length | | | Long/Short | | |
| Operating Current | 3.3V supply, typical association | | | 170 | mA |
| | 5V supply, typical association | | | 110 | mA |

Interface Details

| Sagrad Part # | Item | Supplier Part Number | Mate | Comment |
|------------------|--------------------------|----------------------------|--|---|
| SG901-1066 | Antenna | | | External Antenna via an I-PEX receptacle (IPEX 20279-001E-01) |
| SG901-1059B-xx-C | Host Interface Connector | ACESCONN 87213-0600I | ACESCONN 87214-0600 / 87214-WX Alt. JST SHR-06V-S-B / SSH-003T-P0.2 | 6 Pin 1.0mm Pitch Connector. |
| SG901-1059B-xx-H | Host Interface Connector | SAMTEC TMM-106-02-L-S | Compatible 2mm 1x6 Socket Application Dependent | 6 Pin 2.0mm Male Header |
| SG901-1059B-xx-X | Antenna Connector | Taoglas RECE-20279-001E-01 | IPEX / U.FL Plug | IPEX / U.FL Receptacle |



Connector Pin List (Host Interface)

6-pin 1.0mm pitch connector

| SIGNAL NAME | PIN NUMBER | DESCRIPTION | NOTES |
|----------------------|------------|--|-----------------------|
| VCC (3.3 or 5.0 VDC) | 1 | Supply | USB Standard Function |
| UD- | 2 | Complementary USB Data | USB Standard Function |
| UD+ | 3 | Complementary USB Data | USB Standard Function |
| GND | 4 | Ground | USB Standard Function |
| LED | 5 | WLAN TX Active | See description below |
| TX | 6 | Low disables RF, internal pullup to 3.3V | |

6-pin 2.0mm pitch male header

| SIGNAL NAME | PIN NUMBER | DESCRIPTION | NOTES |
|----------------------|------------|--|-----------------------|
| VCC (3.3 or 5.0 VDC) | 1 | Supply | USB Standard Function |
| UD- | 2 | Complementary USB Data | USB Standard Function |
| UD+ | 3 | Complementary USB Data | USB Standard Function |
| GND | 4 | Ground | USB Standard Function |
| TX | 5 | Low disables RF, internal pullup to 3.3V | |
| LED | 6 | WLAN TX Active | See description below |

The LED blinks at 0.5Hz rate when searching. During TX, the LED blinks at 500Hz. Otherwise, it is off.

An onboard blue LED is driven by the WLAN IC through a 1K resistor. High voltage turns the LED on. The LED pin is connected between the LED and the resistor and is about 2.8V when the LED is on. An external LED may be connected between the LED pin and GND with current limited by the 1K resistor. For more than about 1mA of LED current, a transistor or logic gate will be needed to drive the LED.

Software Information

MIPS:

A 300-400 MIPS CPU can drive the SG901-1059B alone at its maximum performance level. If other network interfaces are being used in the device, more MIPS will be necessary.

Source Code:

A device driver for the SG901-1059B is included in the Linux kernel under the name `rt2800usb`. For the very latest Linux driver, download the `compat-wireless` package from <http://linuxwireless.org/en/users/Download>

Supported Systems:

The SG901-1059B has been tested on:

x86 – Windows XP (32 bit only)

x86 – Linux (32 and 64 bit)

ARM – Linux 32 bit

Security Support

Complete Security Features – WPA/WPA2, 64/128 WEP, TKIP, AES



For custom applications: the direction of the male header can be mounted upside down, please contact Sagrad Inc. for availability.

Regulatory Approval

| Agency | Approval |
|-------------|----------|
| FCC Part 15 | ✓ |
| CE | ✓ |
| RoHS | ✓ |

Suggested Antenna

- Sagrad part number SG901-1066



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