



## 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

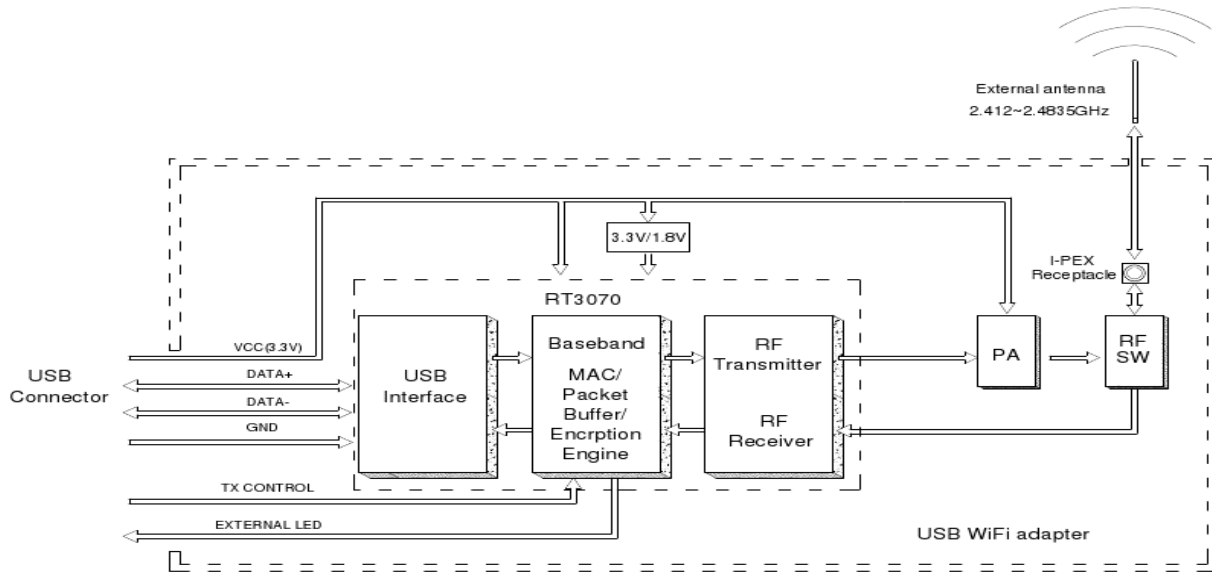
- Personal Digital Assistants (PDA)
- Hand-held Data Transfer Devices
- Video
- IP Cameras
- IP set top box
- GPS
- Internet radio apparatus

### Ordering Information

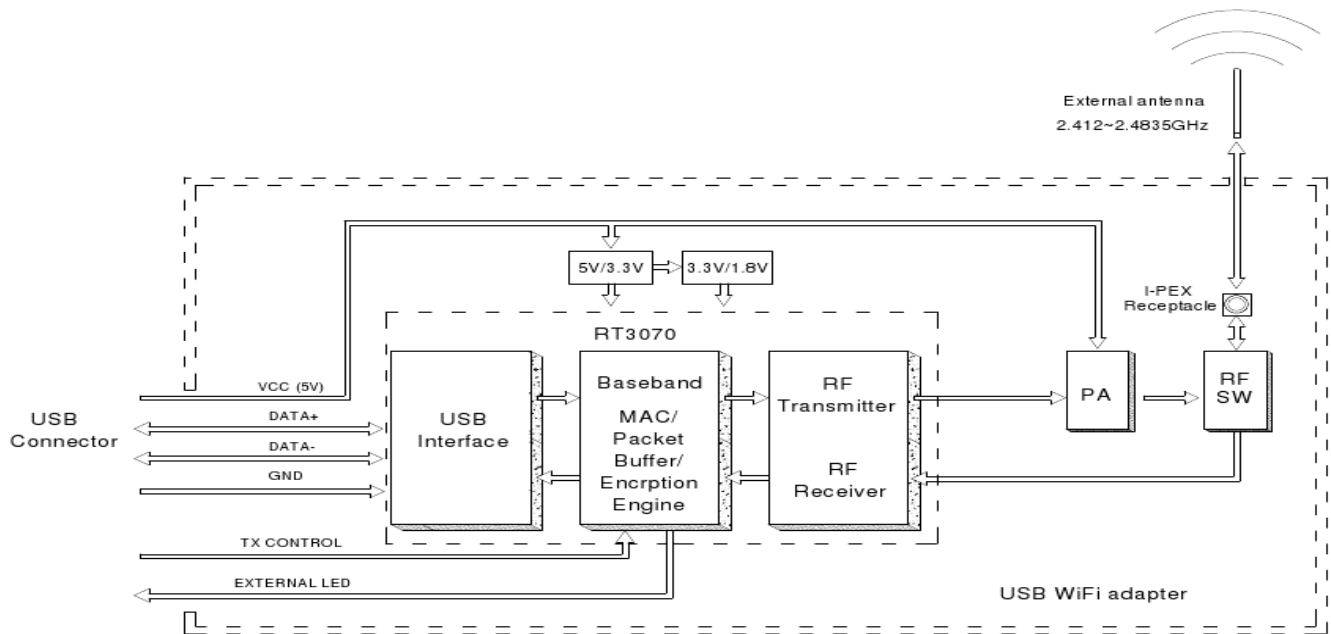
SG901-1059B-3.3-C (connector) – Bulk only  
SG901-1059B-5.0-C (connector) – Bulk only  
SG901-1059B-3.3-H (header) – Bulk only  
SG901-1059B-5.0-H (header) – Bulk only  
Eval Kit SG923-0012-3.3-C  
Eval Kit SG923-0012-3.3-H  
Eval Kit SG923-0012-5.0-H  
Eval Kit SG923-0012-5.0-C



## 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
<b>Absolute Maximum Ratings</b>					
USB Supply		-0.3		7	V
<b>Operating Conditions and Input Power Specifications</b>					
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			50		Ohms
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

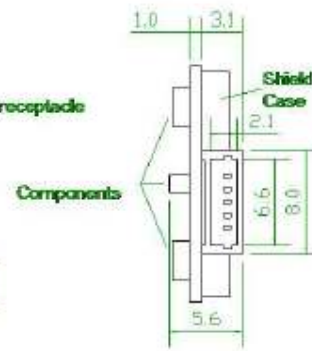
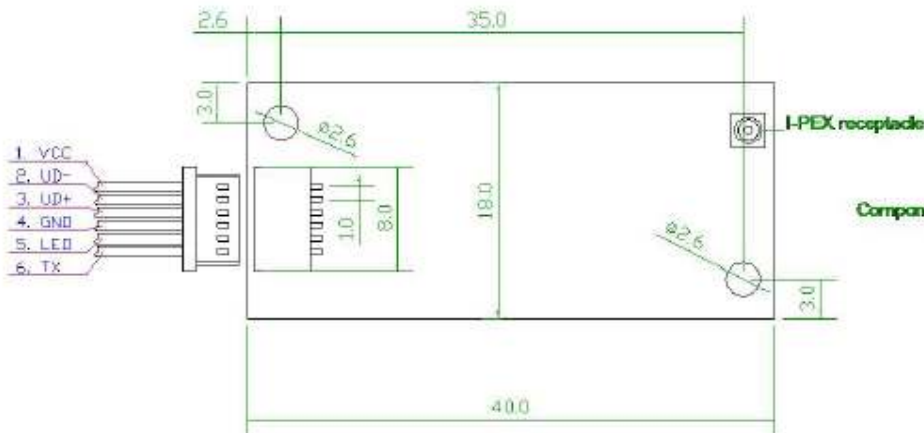
### Security Support

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



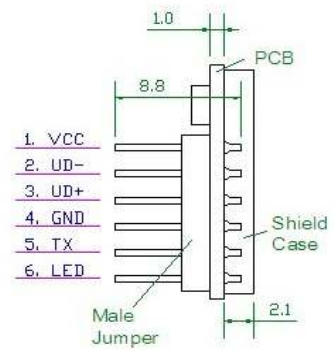
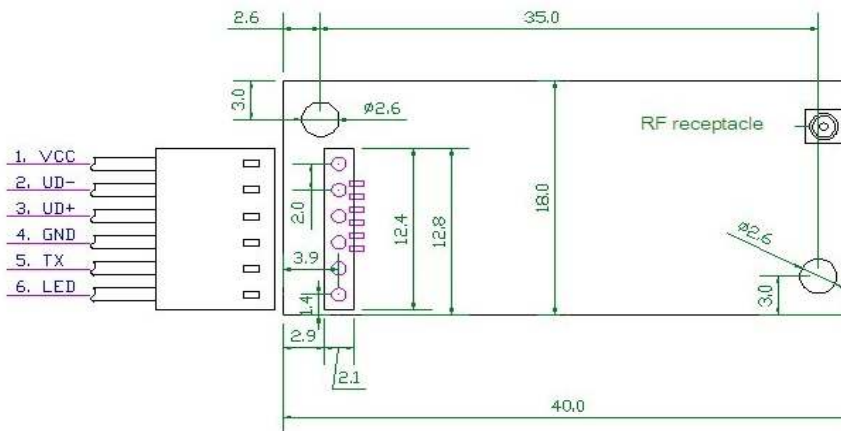
## Mechanical Drawing

### 6-pin 1.0 mm pitch male connector – Top View



Unit: mm

### 6-pin 2.0 mm pitch male header – Top View



Unit: mm



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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