

User manual of SPW-B4339S

1. Introduction

SPW-B4339S is a Wi-Fi / Bluetooth Combo module compliant with IEEE802.11a/b/g/n/ac MAC/baseband/radio and Bluetooth 4.1 optimized for low-power applications.

The core chipset is from Broadcom, part number BCM4339

2. Hardware Architecture:

2.1 Main Chipset Information

Item	Vendor	Part Number
IEEE802.11a/b/g/n/ac mac/baseband/radio Bluetooth 4.1	Broadcom	BCM4339

2.2 Circuit Block Diagram

The major internal and external block diagram of SPW-B4339S is illustrated in Figure 1-1.

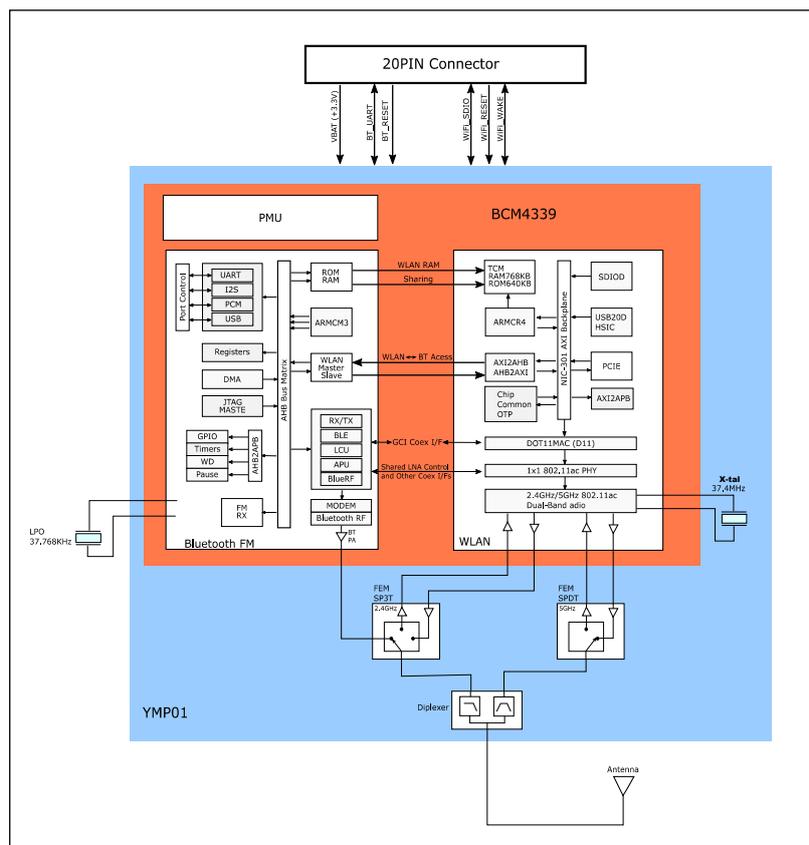


Figure 1-1 SPW-B4339S block diagram and System Interface

3. Operational Description

SPW-B4339S is the 802.11a/b/g/n /ac +Bluetooth 4.1 COMBO Module that acts as a communication controller for users of a wireless device to connect to Printer

- Features

- >IEEE 802.11ac compliant.
- >Dual-band 2.4GHz /5 GHz
- >Single-stream spatial multiplexing up to 433.3Mbps data rate
- >Support 20,40,80MHz channel with optional SGI(256QAM modulation)
- >On-chip power amplifiers and low-noise amplifiers for both bands.
- >Complies with Bluetooth Core Specification Version 4.0
- >Bluetooth Class 1 or 2 transmitter operation.
- >Adaptive frequency hopping (AFH) for reducing radio frequency interference

- Time base of the RF frequency

For IF and RF frequency, a crystal(37.4MHz) is a clock reference.

- Synthesizer

Synthesizer inside Transceiver. Internal voltage controlled oscillator (VCO) provides the desired LO signal base on the phase-locked loop (PLL) with a relatively wide tuning range for this application. Internal fractional nPLL allows support for a wide range of reference clock frequencies

- WIFI Transmission

Baseband data is modulated and upconverted to the 2.4GHz ISM and 5-GHz U-NII bands, respectively. Linear on chip power amplifier are included, which are capable of delivering high output powers while Meeting IEEE802.11ac and IEEE802.a/b/g/n specifications without the need for external PAs.

When using the internal PAs, closed-loop output power control is completely integrated.

Base-band Processing (BBP) IC has DSSS (BPSK/QPSK/CCK) and OFDM (BPSK/QPSK/16QAM/64QAM/25QAM) modulation function, it provides transmission data rate are 1, 2, 5.5, 11Mbps on DSSS and 6, 12, 18, 24, 36, 48, 54 Mbps on OFDM. Digital data signal will be converted to analog (TX IQ) signals through DAC in BBP IC, TX IQ pass through to low pass filter. TX I/Q signal use direct conversion (zero-IF) architecture converter to generate carrier frequency signal. Transceiver IC and internal PA magnify output power.

- WIFI Receiver

The BCM43569 has a wide dynamic range, direct conversion receiver that employs high-order on-chip channel filtering to ensure reliable operation in the noisy 2.4GHz ISM band or the entire 5GHz U-NII band. Control signals are available that can support the use of optional LNAs for each band, which can increase the receive sensitivity by several decibels.

Reverse direction isolation of LNA inside Transceiver IC suppresses unwanted radiation. Then RF signal will be directly down to IF signal (RX IQ) and high frequency spurious emissions are suppressed by LPF. At last RX IQ signal will be demodulated digital data.

- Bluetooth Low Energy

The SPW-B4339S support the Bluetooth Low Energy operating mode.

- Link Control Layer

The link control layer is part of the Bluetooth link control functions that are implemented in dedicated logic in the link control unit(LCU).

Each task performs a different state in the Bluetooth Link Controller.

- Wideband speech

The SPW-B4339S provides supports for wideband speech(WBS) using on-chip SmartAudio technology. The SPW-B4339S can perform subband-codec (SBC),as well as msbc encoding and decoding of linear 16bots at 16kHz(256kbps rate) transferred over the PCM bus.

- Adaptive Frequency Hopping

The SPW-B4339S gathers link quality statistics on a channel by basis to facilitate channel assessment and Channel map selection. The link quality is determined using both RF and baseband signal processing to Provide a more accurate frequency-hop map.

- Product Details

> Data Modulation

DSSS:CCK,BPSK,QPSK for 802.11b

OFDM:BPSK,QPSK,16QAM,64QAM,256QAM for 802.11a/g/n/ac

FHSS:GFSK,QPSK, 8DPSK, $\pi/4$ DPSK for Bluetooth

> Frequency : 2.4GHz / 5GHz

- Modulation modes

802.11n								802.11ac
HT	Modulation & Coding	Data Rate						VHT
MCS		(GI = 800ns)	(GI = 400ns)	(GI = 800ns)	(GI = 400ns)	(GI = 800ns)	(GI = 400ns)	MCS
Index		20MHz	20MHz	40MHz	40MHz	80MHz	80MHz	Index
0	BPSK 1/2	6.5	7.2	13.5	15	29.3	32.5	0
1	QPSK 1/2	13	14.4	27	30	58.5	65	1
2	QPSK 3/4	19.5	21.7	40.5	45	87.8	97.5	2
3	16-QAM 1/2	26	28.9	54	60	117	130	3
4	16-QAM 3/4	39	43.3	81	90	175.5	195	4
5	64-QAM 2/3	52	57.8	108	120	234	260	5
6	64-QAM 3/4	58.5	65	121.5	135	263.3	292.5	6
7	64-QAM 5/6	65	72.2	135	150	292.5	325	7
	256-QAM 3/4	78	86.7	162	180	351	390	8
	256-QAM 5/6	n/a	n/a	180	200	390	433.3	9



4. OEM Section - to whom wants to install the radio.

This device complies with part 15 of the FCC Rules and Industry Canada license-exempt RSS standard(s).. 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.

Caution: Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.

This appliance and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter.

A minimum separation distance of 20 cm must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirements.

Note: The use of the 5150-5250 MHz frequency band is restricted to Indoor Use Only.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et*
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

※ This appliance and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter.

A minimum separation distance of 20 cm must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirements.

※ Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

Operation of this device is restricted for indoor use only.

CE Statement

Hereby, we declare that this device is in compliance with the essential requirements and other relevant provisions of directive 1999/5/EC.

CE 11770!

Warning: Attaching any kind of external antenna is not allowed and it needs to additional test and certification.

–The module is limited to OEM installation ONLY.

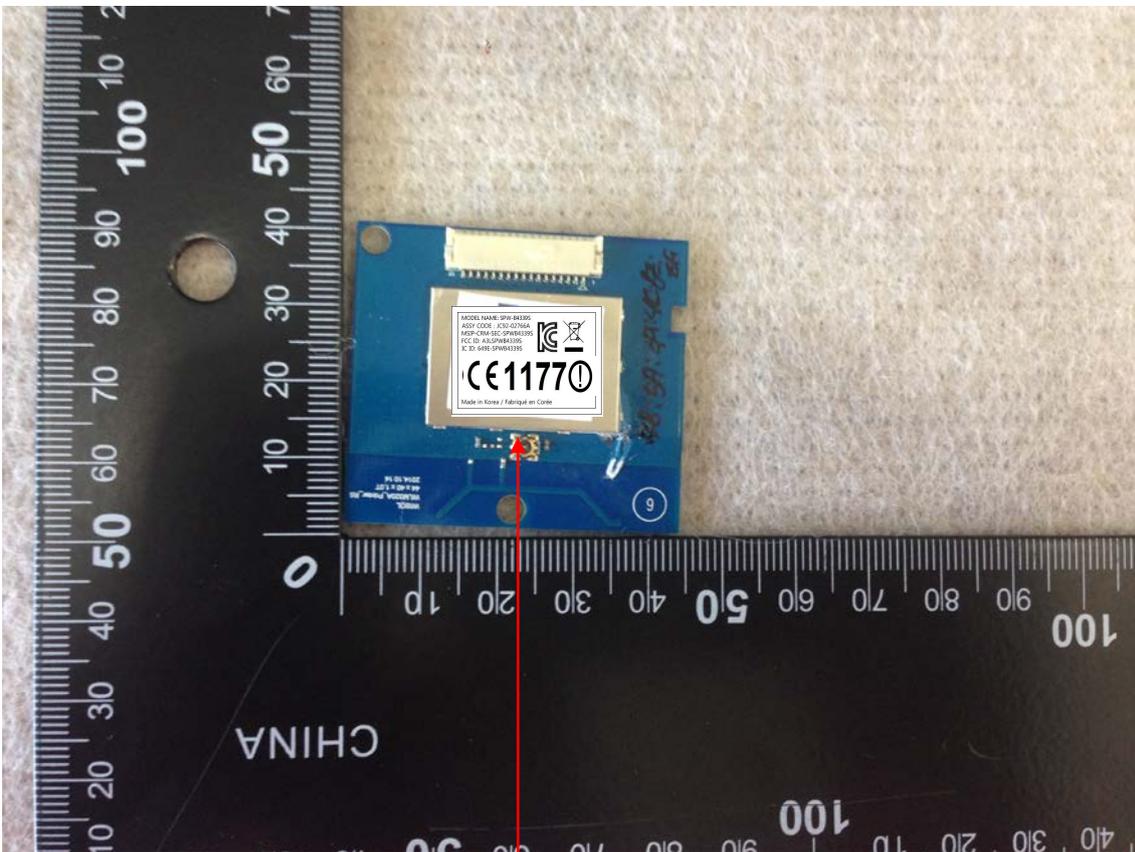
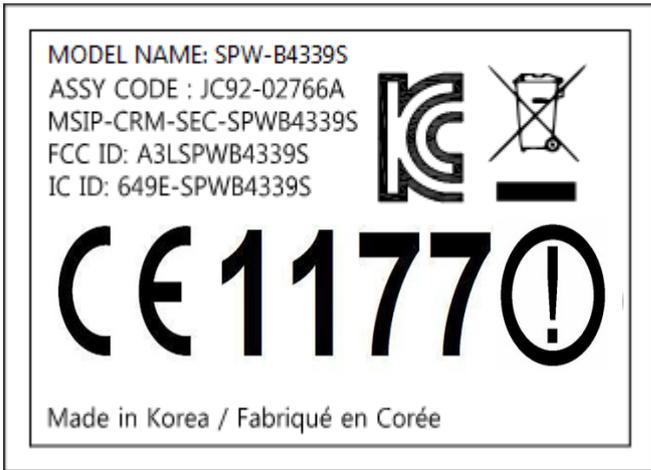
–OEM integrators are responsible for ensuring that the end–user has no manual instructions to remove or install module.

–Separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations.

–Do the labeling on finished products that this product contains Transmitter Module.

Example: “Contains Transmitter Module FCC ID: A3LSPWB4339S”

or “Contains FCC ID: A3LSPWB4339S” etc.



Label Location (Onto the Shield Can)