Technical Description of Transceiver Module WL0217

The Equipment Under Test (EUT) is a WiFi transceiver module operating within the frequency band between 2412MHz and 2462MHz. It is intended to be used as short range radio communication for embedded application. The EUT is powered by USB port.

The EUT has two identical trace antennas. (Antenna 0 and 1: Trace antenna, Internal, Integral)

In 802.11b mode, the EUT employs Direct-Sequence Spread Spectrum (DSSS) modulation with maximum bit rate 11Mbps. Either one antenna is used (antenna 0 by default).

In 802.11g mode, the EUT employs Orthogonal Frequency Division Multiplexing (OFDM) modulation with maximum bit rate 54Mbps. Either one antenna is used (antenna 0 by default).

In 802.11n mode with 20MHz bandwidth, the EUT employs modulation type according to MCSn (Modulation and Coding Scheme) setting where n is 0 to 15, with maximum bit rate 65Mbps at n=7 and 130Mbps at n=15. Either one antenna is used (antenna 0 by default) when n=0 to 7. Both antennas are used simultaneously when n=8 to15

In 802.11n mode with 40MHz bandwidth, the EUT employs modulation type according to MCSn (Modulation and Coding Scheme) setting where n is 0 to 15, with maximum bit rate 150Mbps at n=7 and 300Mbps at n=15. Either one antenna is used (antenna 0 by default) when n=0 to 7. Both antennas are used simultaneously when n=8 to15

During 802.11b, 802.11g and 802.11n (20MHz bandwidth) mode, the EUT occupies 11 channels (2412MHz to 2462MHz).

During 802.11n (40MHz bandwidth) mode, the EUT occupies 7 channels (2422MHz to 2452MHz).

The modulation mode (802.11b/g/n20/n40), bit rate, channel selection, antenna selection and transmit power can be controlled by its control software.

This module is only approved for use when installed in devices produced by a specific manufacturer for professional installation and within the specified bandwith and transmit power.

1. U1 (BCM43235KMLG) and its associated network acts as the transceiver module and USB host. U2 (MX25L3206EZNI-12G) is 4Mbyte flash memory incorporating with U1.

2. U3, U4, FL1, FL2 and associated network act as the RF front-end. U3, U4 are RF switches (SKY 13343-92LF) for switching between transmit and receive mode of RF front-end. FL1, FL2 are Low-Pass-Filter (DEA162500LT-1217A1) for 2.4GHz band.

3. U5 (PAM2306AYPAA) and its associated network act as the 3.3V DC regulator for the module.

BCM43235

2.4 GHz 802.11n MAC/PHY/Radio Chip

GENERAL DESCRIPTION

The BCM43235 is a single-band (2.4 GHz) IEEE 802.11n-compliant MAC/PHY/Radio complete system-on-a-chip with a 2.4 GHz internal PA. The device enables the development of USB 2.0- or HSIC-based 802.11n WLAN client and router subsystem solutions. The BCM43235 is targeted for all WLAN markets that can take advantage of the high throughput and extended range of Broadcom's second generation MIMO solution. With MIMO, information is sent and received over two or more antennas simultaneously using the same frequency band thus providing greater range and increasing throughput, while maintaining compatibility with legacy IEEE 802.11b/g devices. This is accomplished through a combination of enhanced MAC and PHY implementations including spatial multiplexing modes in the transmitter and receiver and advanced digital signal processing techniques to improve receive sensitivity.

The BCM43235 architecture with its fully integrated single-band radio transceiver supports 2 × 2 antennas for Layer 2 throughput of over 200 Mbps.

State-of-the-art security is provided by industry standardized system support for WPA™, WPA2™ (802.11i), and hardware accelerated AES encryption/decryption, coupled with TKIP and IEEE 802.1X support. Embedded hardware acceleration enables increased system performance and significant reduction in host-CPU utilization in both client and access point configurations. The BCM43235 also supports Broadcom's widely accepted and deployed WPS for ease-of-use wireless secured networks.

FEATURES

- IEEE 802.11n-compliant
- 2.4 GHz internal PA
- Two-stream spatial multiplexing up to 300 Mbps
- Uses on-chip OTP (One-Time Programmable) memory instead of SROM for substantial RBOM savings.
- Supports MCS 0–15 and MCS 32 modulation and coding rates.
- Supports 20 MHz and 40 MHz channels with optional SGI.
- Support for STBC in both TX and RX
- Greenfield, mixed mode, and legacy modes supported
- Full IEEE 802.11b/g legacy compatibility with enhanced performance.
- Supports one USB 2.0 host port or one 480 MHz HSIC port.
- UART and JTAG interface, up to eight GPIOs.
- Supports up to 32 MB of serial flash memory.
- ARM® Cortex-M3™ CPU core plus 256 KB ROM and 448 KB RAM.
- Supports Broadcom's OneDriver™ software.
- Supports WHQL certified drivers for Windows® Vista 32- and 64-bit, Windows XP, and Windows 2000 operating systems for client applications.
- Supports Linux® and VxWorks® for access point and router applications.
- Comprehensive wireless network security support that includes WPA, WPA2, and AES encryption/decryption coupled with TKIP and IEEE 802.1X support.
- BCM43235 package: 10 mm x 10 mm 88-pin QFN

APPLICATIONS

- USB 2.0 dongles
- HSIC media modules

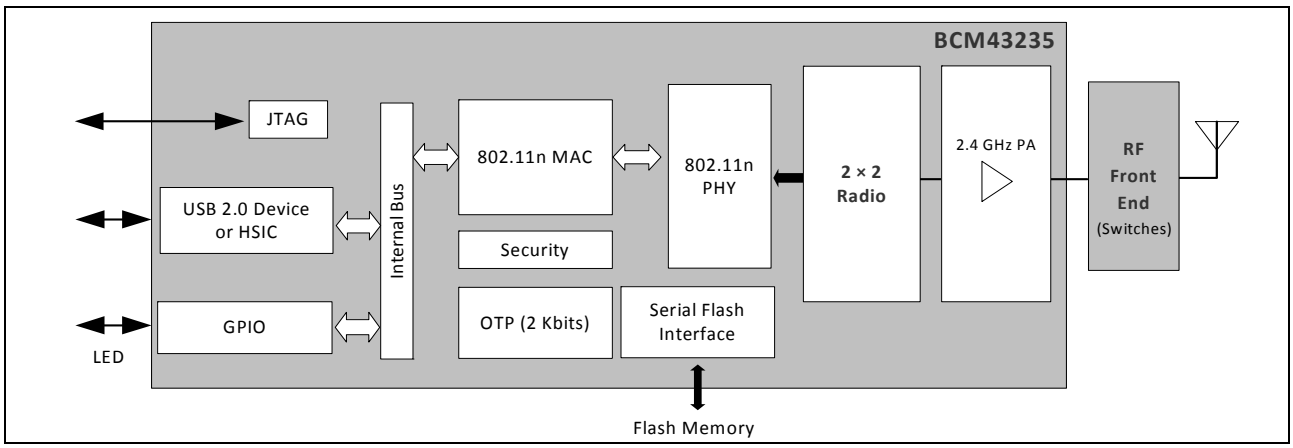

Figure 1: BCM43235 Block Diagram

5300 California Avenue • Irvine, CA 92617 • Phone: 949-926-5000 • Fax: 949-926-5203

Channel Occupation of WL0217

channel (b/g/n20)	frequency (MHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

channel (n40)	frequency (MHz)
1	N/A
2	N/A
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	N/A
11	N/A

The EUT was tested in according with the following power output setting and in actual application the below limit shall not be exceeded.

802.11b	-18dBm
802.11g	-15dBm
802.11n (20MHz)	-14dBm
802.11n (40MHz)	-10dBm