Overview

The Wi-Fi module is a 2.4GHz IEEE 802.11b/g/n Wi-Fi single chip solution with standard security features. With optimized power and RF performance, robustness, versatility, reliability, various power profiles, full features and functions, the chip is designed for a wide variety of applications, including Smart home, Wearable devices and IoT (Internet of Things).

It integrates a 32-bit microcontroller, 802.11b/g/n Wi-Fi baseband, a 2.4GHz RF transceiver with antenna switch, RF balun, PA (power amplifier), LNA (low noise receive amplifier) and filters, ample memory space, a general-purpose ADC(Analog-to-Digital Converter), 6-channel PWM(Pulse Width Modulation), flexible I/O interfaces, and multi-stage power management module. With the highly-integrated SoC, few external components and minimal PCB(Printed Circuit Board) area are needed to build Wi-Fi applications.

The Wi-Fi module has many features of the state-of-the-art low power chips, such as good resolution clock gating, advanced management of multi-stage power modes, and dynamic power scaling.

The Wi-Fi module CMOS for single-chip fully-integrated radio and Baseband, and also integrates advanced calibration circuitries that allow the solution to dynamically adjust itself to remove external circuit imperfections or adjust to changes in external conditions.

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM,16QAM,QPSK,BPSK)
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps IEEE for 802.11g: 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps

	IEEE for 802.11n(HT20): 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps IEEE for 802.11n(HT40): 13.5Mbps/27Mbps/40.5Mbps/54Mbps/81Mbps/108Mbps/121.5Mbps/135Mbps
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Power Supply:	DC 3.3V
RF Chip:	TR6260-S1
Crystal oscillator:	40MHz

Transmitter Operational Description

The 2.4 GHz transmitter up-converts the quadrature baseband signals to the 2.4 GHz RF signal, and drives the antenna with a high powered Complementary Metal Oxide Semiconductor (CMOS) power amplifier. The use of digital calibration further improves the linearity of the power amplifier, enabling state-of-the-art performance of delivering +18.5 dBm of average power for 802.11b transmission and +14 dBm for 802.11n transmission. Additional calibrations are integrated to cancel any imperfections of the radio, such as:

• Carrier leakage

• I/Q phase matching

• Baseband nonlinearities

• RF nonlinearities

• Antenna matching

These built-in calibration routines reduce the amount of time and required for product test and make test equipment unnecessary

Receiver Operational Description

The 2.4 GHz receiver down-converts the 2.4 GHz RF signal to quadrature baseband signals and converts them to the digital domain with 2 high-resolution, high-speed ADCs. To adapt to varying signal channel conditions, RF filters, Automatic Gain Control (AGC), DC offset cancelation circuits and baseband filters are integrated within Wi-Fi Module.