OPERATION DESCRIPTION

1. T/R switch:

a. TX or RX multiplexing switch , TX/RX are half duplex

b. Antenna A or B switch

2. SA2400: Single chip transceiver for 2.45 GHz ISM band

The SA2400A is a fully integrated single IC RF transceiver designed for 2.45 GHz wireless LAN (WLAN) applications. It is a direct conversion radio architecture that is fabricated on an advanced 30 GHz fT BiCMOS process. The SA2400A combines a low-noise AGC, pre-driver, receive and transmit mixers, VCO, synthesizer, receive and transmit filters, and input/output buffers into a single IC. The receiver typical system performance parameters are gain of 92 dB, noise figure (NF) of 6 dB, third order intercept point (IP3) of –8 dBm, I/Q output DC error of –10 dBc, AGC settling time of 8 _sec, DC cancellation time of 5 _sec, and Tx to Rx switching time of 8 _sec. The transmitter typical system performance parameters are output power range from –9 dBm to +5 dBm, gain step of 1 dB, carrier leakage of –25 dBc before calibration, sideband rejection of 28 dBc, in-band common mode rejection of 35 dB, and Rx to Tx switching time of 5 _sec. Briefly. The SA2400A is a fully integrated single IC RF transceiver with zero IF architecture, designed for 2.45 GHz wireless LAN (WLAN) applications, specifically for IEEE 802.11b in 1 and 2 Mbit/s DSSS modulation, and 5.5 and 11 Mbit/s CCK modulation standards. It combines a LNA, receive and transmit mixers, VCO, synthesizer, receive and transmit filters, and input/output buffers.

3. SA2411: 2.4GHz Power Amplifier

The SA2411 is a fully integrated power amplifier designed for 2.45 GHz wireless LAN (WLAN) applications. It is fabricated on an advanced 30 GHz fT BiCMOS process. The SA2411 functions from a Vcc = 3 V and has internally matched 100 ohms differential inputs and a internally matched 50 ohms single ended output. The SA2411 also contains a power detector, a pin to reduce the DC bias point for lower Pout requirements, and a self–biasing circuit that automatically adjusts with changing Pout so the efficiency remains optimized.
The typical system performance parameters for CCK modulation are a gain of 13 dB, and Pout of 19 dBm which meets the 30 dBc ACPR specification with an Icc = 200 mA at 3 V.

3. RTL8180L: WIRELESS LAN NETWORK INTERFACE CONTROLLER

The Realtek RTL8180 is a highly integrated and cost-effective wireless LAN network interface controller that integrates a wireless LAN MAC and a direct sequence spread spectrum baseband processor into one chip. It provides 32-bit performance, PCI bus master capability, and full compliance with IEEE 802.11 and IEEE 802.11b specifications.

The RTL8180 has on board A/D and D/A converters for analog I and Q inputs and outputs. Differential phase shift keying modulation schemes DBPSK and DQPSK, with data scrambling capability, are available along with complementary code keying to provide a variety of data rates. Both receive and transmit AGC functions obtain maximum performance in the analog portions of the transceiver. The RTL8180 also includes a built-in enhanced signal detector to alleviate severe multipath effects. The target environment for 11Mbps is 125ns RMS delay spread. It also supports short preamble and antenna diversity. For security issues, the RTL8180 also implements a high performance internal WEP engine supporting up to 104 bit WEP.

It also supports Advanced Configuration Power management Interface (ACPI), PCI power management system for modern operating systems that are capable of Operating System directed Power Management (OSPM) to achieve the most efficient power management possible.

In addition to the ACPI feature, the RTL8180 also supports remote wake-up (including AMD Magic Packet and Microsoft wake-up frame) in both ACPI and APM environments. The RTL8180 is capable of performing an internal reset through the application of auxiliary power. When the auxiliary power is applied and the main power remains off, the RTL8180 is ready and waiting for the Magic Packet or wake-up frame to wake the system up. Also, the LWAKE pin provides four different output signals including active high, active low, positive pulse, and negative pulse. The versatility of the RTL8180 LWAKE pin provides motherboards with Wake-On-LAN (WOL) functionality.

PCI Vital Product Data (VPD) is also supported to provide the information that uniquely identifies hardware (i.e., the RTL8180 LAN card). The information may consist of part number, serial number, and other detailed information.

The RTL8180 supports an enhanced link list descriptor-based buffer management architecture, which is an essential part of a design for a modern network interface card. It contributes to lowering CPU utilization. Also, the RTL8180 boosts its PCI performance by supporting PCI Memory Read Line & Memory Read Multiple when transmitting, and Memory Write and Invalidate when receiving.

The RTL8180 keeps network maintenance costs low and eliminates usage barriers. The RTL8180 is highly integrated and requires no "glue" logic or external memory.