

# THEORY OF OPERATION

This WLAN 802.11g PC Card basically is based on Ralink solution, including RT2560F and RT2525L. RT2560F is an BBP/MAC IC, and RT2525L is an RF transceiver IC. Besides, there is an RFIC Power Amplifier, (named AP1091) between antennas and RT2525L. It can enhance output power of TX signal.

## BLOCK DIAGRAM

Block diagram is shown Figure 1.

RT2560F integrates BBP and MAC function, and it communicates with computer via cardbus interface. It also can modulate TX or RX signal in BBP part.

RT2525L is an RF transceiver IC. It works in 2.4GHz ISM band. The main function of RT2525L is up-convert base band TX IQ signal to RF signal and down-convert RX RF signal to base band IQ signal.

AP1091 is a power amplifier that is used to enhance signal strength. That way, communication distance can be increased a lot.

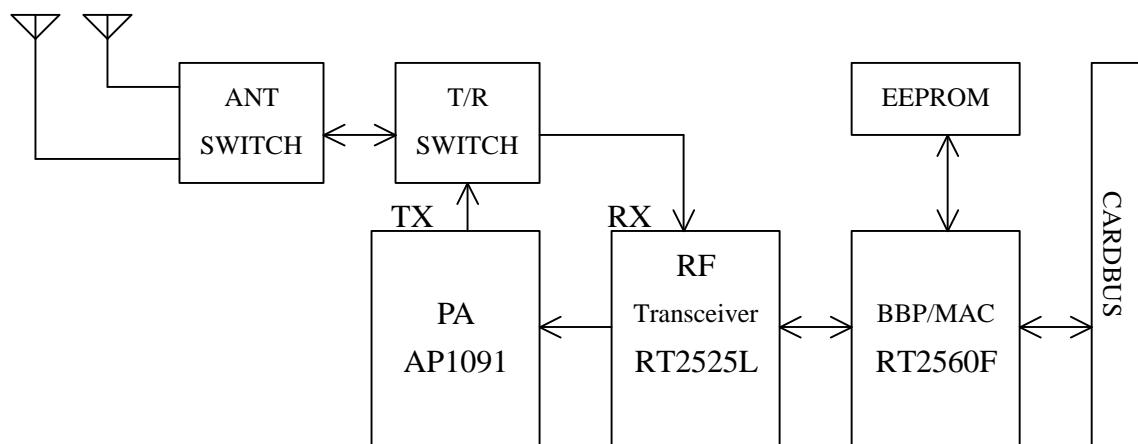


Figure 1

## ■ RT2560F

### Application

1. IEEE 802.11b/g Wireless Local Area Networks
2. Wireless Portable Device/Notebook Computer

### Features

1. Host interface: Cardbus/mimi-PCI/PCI
2. Supported Operating System:  
WindowsXP, Windows2000, WindowsME, 98SE, LINUX
3. Security: 64/128 WEP, WPA, AES
4. Advanced Power Saving Algorithm for Dynamic Network Traffic Environment
5. On-Chip A/D and D/A Converters for I/Q Data, TSSI and AGCs
6. Supports 6, 9, 12, 18, 24, 36, 48, 54 Mbps for OFDM; 5.5, 11 Mbps for CCK; and 1, 2 Mbps for Barker Modulation
7. Support 72 Mbps and 100 Mbps turbo mode
8. Supports Short Preamble and Antenna Diversity
9. Proprietary Robust Demodulator with Patent Protection
10. Mitigates Multi-path Delay Spread up to 100ns at 54 Mbps
11. 8 GPIOs or 2 Serial Interface for WAN extension Such as GPRS etc.
12. 2 configurable LEDs to release CPU from LED Routine Loading
13. 180 TFBGA Single Chip

## ■ RT2525L

RT2525L is a monolithic SiGe half-duplex radio transceiver designed for IEEE802.11g WLAN systems or other wireless LAN applications operating in 2.4GHz ISM band. The transceiver achieves low noise figure, high input sensitivity, and high linearity, while consuming low dc power. The receive chain features a gain selectable, low-noise amplifier (LNA), followed by a RF-to-IF (374MHz) image-rejection down-converter, a variable gain amplifier and an I/Q demodulator. The LNA has 3 different gains. The transmit chain includes an I/Q modulator, a discrete-step variable-gain amplifier for power-level control, an IF-to-RF single-sideband up-converter and a pre-driver for power amplifier. The up/down-converters and de/modulators are driven by internal RF and IF VCOs. Both VCOs are phase-locked by internal 3-wireinterfaced PLLs.

The RT2524 is housed in a 48-pin 7x7mm2 leadless MLF package well suited for PCMCIA board or embedded applications.

## Features

1. A single-chip transceiver
2. Low noise figure
3. High linearity
4. Low power consumption
5. Linear gain-control slope
6. Pre-driver for power amplifier
7. Power management/standby mode
8. Single supply 2.7V to 3.3V operation

## ■ AP1091

AP1091 is a linear, two stages power amplifier MMIC with high output power in 2.4GHz band utilizing InGaP/GaAs HBT process. With the excellent linearity performance, the device delivers 26dBm of linear output power (at 5V power supply) compliant with the IEEE802.11b standard, and 19dBm output power, under 54Mbps OFDM (IEEE802.11g) modulation, with only 3% EVM. The PA also includes on-chip power detector, providing a DC voltage proportional to the output power of the device. It features a small signal gain of 28dB and P1dB of 26.5 dBm at 3.3V power supply. AP1091 is housed in a 3X3 (mm), 16 Pin QFN leadless package.

### **Application**

1. IEEE 802.11b WLAN System
2. IEEE 802.11g WLAN System
3. 2.4GHz ISM Radios

### **Features**

1. 26/24 dBm Linear Output Power at 5/3.3V Power Supply With 11Mb/s CCK Modulation
2. 19dBm Linear Output Power With 54Mb/s, OFDM Modulation (about 3% EVM)
3. 28dB Small Signal Gain
4. Single 3.3V Power Supply
5. On-Chip Power Detector