

1. CPU, U16, RTL8186 is a highly integrated System-on-a-Chip with a high-performance 32-bit RISC micro-controller, two Ethernet MACs, and a WLAN controller embedded onto a single chip. The embedded 32-bit RISC CPU runs at up to 180MHz and features separate 8K instruction and data caches. It needs an external 40MHz oscillator for reference frequency; this oscillator is also used for RF module. This chip is responsible to control RF-Baseband Transceiver (RTL8225).

The RTL8186 features two fast Ethernet MACs; one perhaps used for a LAN interface and the other connected to a WAN port. An IEEE 802.11a/b/g WLAN MAC and base-band processor is embedded.

The RTL8186 provides a glueless interface for external SDRAM and flash memory devices. It allows customers to use 1MB to 64MB SDRAM/flash memory with 16-bit or 32-bit variable length in great flexibility. The RTL8186/RTL8186P also supports NOR and NAND type flash, and system booting from the NAND type flash is at no extra cost.

Additionally, The RTL8186 provides UART, PCI, and PCM interfaces as well as up to 58 GPIO (General Purpose I/O) pins. With the PCM interface, wireless VoIP applications are made possible.

2. FLASH, U17, MX29LV160CBTC-70G, 16Mbits Flash, bottom boot sector, 70ns. It is used to store the normal and test firmware.
SDRAM, U18, M12L64164A-7TG is 67,108,864 bits synchronous Dynamic RAM organized as 4 x 1,048,576 words by 16bits. It is used to store the dynamic operation code.

3. The RTL8225 is a fully integrated RF transceiver compliant with IEEE Wireless LAN standards 802.11b, and 802.11g. When used with a baseband/MAC processor (e.g. RTL8186) and a 2.4GHz power amplifier, it forms a complete solution for the 2.4GHz ISM band. The RTL8225 uses direct conversion/zero-IF architecture to limit the number of required active blocks and avoid external, cumbersome, IF band-pass SAW filters for channel selection.

The receive path includes sets of single-ended Low Noise Amplifiers (LNA), followed by RF-to-baseband I/Q demodulators, baseband filters, and discrete-step variable-gain amplifiers. The entire receive chain provides linear and monotonic automatic gain control, RSSI signal, and fast DC offset cancellation mechanisms to a baseband processor.

The transmitter path includes integrated reconstruction filters, discrete-step variable-gain amplifiers, a baseband-to-RF I/Q modulator, and pre amplifiers. A linear and monotonic gain control is distributed throughout the transmitter chain to ensure high linearity as well as to simplify Automatic Gain Control (AGC).

The modulator and demodulator are driven by an internal Voltage Controlled Oscillator (VCO). The VCO is phase-locked by an internal 3-wire-interfaced PLL.

The RTL8225 needs two external LDO regulators, one is DC3V0 (U6), and other is 1V8 (U7). It is also need external oscillator to generate a 40MHz (X1) clock source as input to the RTL8225.

4. Driver amplifier, U10, SE2527L is a 2.4 GHz power amplifier designed for use in the 2.4 GHz ISM band for wireless LAN applications. The device incorporates a power detector for closed loop monitoring of the output power.

Power amplifier, U1, RF2163 is a linear, medium power, high efficiency amplifier IC has been designed for use as the final RF amplifier in 2.4GHz spread-spectrum transmitters. The device is provided in a 16-pin leadless chip carrier with a backside ground and is self-contained with the exception of the output matching network and power supply feed line.

5. Power part: there are several regulators are used on this system. U_5Vrf1, U_P1, MP1583DN is used to transfer DC18V to DC5V and DC3V3; U6, CM2838GPIM25 is used to transfer DC3V3 to DC3V; U7 CM2838GDIM25 is used to transfer DC3V3 to DC1V8, U2, 1117-ADJ is used to transfer DC3V3 to DC1V8.

6. U20, RTL8201CP is a single-chip/single-port PHYceiver with a MII (Media Independent Interface)/SNI (Serial Network Interface). It implements all 10/100M Ethernet Physical-layer functions including the Physical Coding Sublayer (PCS), Physical Medium Attachment (PMA), Twisted Pair Physical Medium Dependent Sublayer (TP-PMD), with an auto crossover detection function, 10Base-Tx Encoder/Decoder, and Twisted-Pair Medium Access Unit (TPMAU).

8. GaAs IC SPDT Switch, U5, AS193-73, features use where extremely high linearity, low control voltage, high isolation, low insertion loss and ultra miniature package size are required, and very low DC power consumption. It used to implementations a RF Transmit and Receive switch.