

# Operational Description

**Model Name: WP102**

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**Date: 2003/9/12**

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## WP102 circuit design:

1. **CPU:** U1, RTL8181, It is a Lexra LX5280 32-bit RISC processor integrated, operation frequency is 200MHz. It needs an external 44MHz crystal for reference frequency. This crystal is also used for RF module. This chip is responsible to control Ethernet port, RF module, Flash, SDRAM and LED. This chip includes two fast Ethernet MAC and an IEEE802.11b WLAN MAC+Baseband processor.
2. **SWITCH:** U5, RTL8305SB Rev. D, It is a 5-port Fast Ethernet switch controller that integrates memory, five MACs, and five physical layer transceivers for 10Base-T and 100Base-TX operation into a single chip. It contains 1K entry address look-up table. It supports 5 VLAN groups and QoS function. It supports IEEE802.3x full duplex flow control and back pressure half duplex flow control.
3. **FLASH:** U2, MX29LV160ABTC-90, 16Mbits Flash, bottom sector, 90ns. It is used to store the normal and test firmware.
4. **SDRAM:** U3, U4, EM638165TS-7, 4M x 16 bits SDRAM, Access time 7ns, Clock rate 143MHz.
5. **RF Transceiver:** U8, SA2400A, It is used to do signal modulation and have frequency up-converter and down-converter integrated. It supports DSSS and CCK modulation.
6. **RF PA:** U6, GA2P4W22, It is used to increase power of TX path.
7. **Power part:** There are three regulators are used on the base board. It is U13 (CS51031), U10 (AIC1117), and U12 (SP6201). U13 is used to transfer 3.3V voltage to provide the all IC which operate at 3.3V. U10 is used to transfer 3.3V to 1.8V voltage. U12 is used to transfer 3.3V to 3.0V.
8. **Reset bottom:** SW1, It is a factory reset.
9. **LED part:** LED1 indicates power ON. LED2 indicates software bug. LED3 indicates Link/Act for WLAN port. LED4, LED5, and LED6 indicate WEP, MAC enable, and Bridge mode. LED7, LED8 indicates Link/Act for two LAN port.

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## RF Module circuit design:

### (1) Power part :

RF transceiver is operated at 3.0V, and RF PA is operated at 3.3V

### (2) RF Transceiver (U8, SA2400A)

This chip is a fully integrated single IC RF transceiver designed for 2.45GHz WLAN applications. It has features as below.

Support IEEE 802.11 and 802.11b radios

Support IEEE 802.11 DSSS transmission mode

Support TX data rate : 1, 2, 5.5, 11Mbps ( DBPSK is for 1Mbps, DQPSK is for 2Mbps, and CCK is for 5.5 and 11Mbps)

Combine a low-noise AGC, TX and RX mixers, VCO, synthesizer and Zero IF

Quadrature down-converters from 2.45GHz RF directly to Zero IF

An I/Q up-converter from base band directly to 2.45GHz

+5 dBm maximum output

Support 3-wire bus for control

### (3) 2.4GHz Band Pass Filter : ( FL1, ACX BF3225 )

Band Pass Filter is used to decrease the out band spurious.

Pass Band : 2400~2500MHz

Insertion Loss : 2.5dB Max.

VSWR : 2.0 Max.

### (4) TX/RX Switch : ( U9, AS179-92 )

When the TX/RX switching, it is provide the fast switch ability.

Insertion Loss: 0.4 dB @2.0~3.0 dB

Isolation: 20 dB min @2.0~3.0 dB

### (5) Power Amplifier : ( U8, GA2P4W22 )

This PA is +22.5 dBm/2.4GHz Power Amplifier RFIC. It is used to increase the output power. It operates at 3.3V.

Output power: 22.5 dBm (Typical at ACPR )

Small signal gain: 30dB (Typical)

50ohm internal input and output matching