

WAG102 Operation Principle

1. CPU, U10, The Atheros AR5312 is part of the three-chip AR5002AP solution for dual, concurrent IEEE 802.11a/b/g 2.4/5GHz WLAN AP applications. The AR5312 supports 802.11 a/b/g MAC/Baseband processing; two 802.3 MAC and MII interfaces to external Ethernet PHY; SDRAM Controller; external memory interface for Flash, ROM or RAM; GPIO; LED controls; a high speed UART with DMA supporting data rates up to 1 Mbps for serial port applications; and a flexible local bus.
2. FLASH, U11, AM29LV160DB-90, 16Mbits Flash, Bottom sector, and 90ns. It is used to store the normal and test firmware.
3. 2.4GHz Transceiver, U9, The AR2112 operates in the 2.4GHz frequency bands. The transmitter combines baseband in-phase(I) and quadrature-phase(Q) signals, up-converts them to the desired frequency channel, and drives the RF signal off-chip through the integrated power amplifier. The receiver uses an integrated dual conversion architecture and requires no off-chip intermediate frequency(IF) filter.
4. 2.4/5GHz Transceiver, U3, The AR5112 can operate in either the 2.4GHz frequency band or the 5GHz band. The transmitter combines baseband in-phase(I) and quadrature-phase(Q) signals, up-converts them to the desired frequency channel, and drives the RF signal off-chip through the integrated power amplifier. The receiver uses an integrated dual conversion architecture and requires no off-chip intermediate frequency(IF) filter.
5. 2.4GHz~2.5GHz Power Amplifier, U8, The LX5510 is a power amplifier optimized for WLAN applications in the 2.4GHz-2.5GHz frequency range. The PA is implemented as a two-stage monolithic microwave integrated circuit (MMIC) with active bias and input/output pre-matching.
6. 4.5GHz~6GHz Power Amplifier, U2, The LX5506 is a power amplifier designed for the FCC Unlicensed National Information Infrastructure (U-NII) band, HyperLAN2 and Japan WLAN applications in the 4.9~5.95GHz frequency range. The PA is implemented as a three-stage monolithic microwave integrated circuit (MMIC) with active bias and complete on-chip input matching.
7. 10/100 Ethernet PHY, U5, RTL8201CP is a single-chip/single port PHYceiver with MII/SNI. 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

Media Access Unit (TPMAU).

8. Power part: there are 6 regulators used on the board. U102, TPS40060 is used to transfer DC24V to DC4.5V ;VR2&VR5, AME8805DEFT is used to transfer DC4.5V to DC2.5V ;VR1&VR3, AME8805AEGT is used to transfer DC 4.5V to DC3.3V; VR6, AME8807 is used to transfer DC2.5V to DC1.3V. The core of CPU is operate at 1.3V.

9. LED part:

LED	Color	Description
Power	Green	On - power on Off - no power
Status	Yellow	On - Error condition. Off - Normal operation Blinking - This LED blinks during start up.
LAN	Green	On – Link Blinking - Data is transmitted or received via Ethernet Off –No Link
WLAN 2.4G	Green	On - Wireless connection available; Wireless Access Point is ready for use. Off - No Wireless connection available. Blinking - Data is transmitted or received via the Wireless access point.
WLAN 5G	Green	On - Wireless connection available; Wireless Access Point is ready for use. Off - No Wireless connection available. Blinking - Data is transmitted or received via the Wireless access point.

10. Switch button, SW1, it is used to reset the AR5312.

11. Multi-layer Band-Pass Filters, F10, LFB2H2G45SG7A204, Freq. Range: 2.4~2.5GHz; IL@BW: 3.3dB

12. Multi-layer Band-Pass Filters, F13, DEA252400BT-2030A1, Freq. Range: 2.3~2.5GHz; IL@BW: 1.4dB

13. Multi-layer Band-Pass Filters, F8, LFB215G37SG8A185, Freq. Range: 4.9~5.85GHz; IL@BW: 2.5dB

14. Multi-layer Band-Pass Filters, F3, DEA205425BT-2028A4, Freq. Range: 4.9 ~5.95GHz; IL@BW: 2dB

15. GaAs IC DPDT Switch, S1.S2, MASWSS0094, features low insertion loss and positive voltage operation with very low DC power consumption.