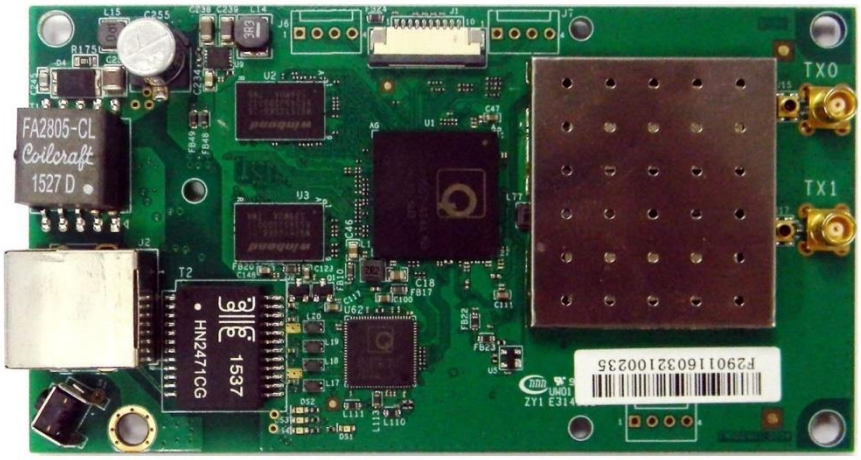


FWBD-2901

FWBD-2901 has 802.11ac 2×2 radio supporting up to 866.7 Mbps data-rate

The FWBD-2901 is consisting of two major sections, Digital section and Analog Section

DIGITAL SECTION

The section is made up of:

- QCA9557
- DDR2 Memory
- Flash Memory
- Power Supplies

QCA9557 (CPU)

The Qualcomm Atheros QCA9557 is a highly integrated and feature-rich IEEE 802.11n 2x2 2.4/5 GHz System-on-a-Chip (SoC) for advanced WLAN AP/router platforms. It includes a MIPS 74Kc processor, one PCI Express 1.1 Root Complex and one PCI Express Root Complex/Endpoint interfaces, one RGMII interface, one SGMII interface, two USB 2.0 MAC/PHY, and external memory interface for serial Flash, DDR1 or DDR2, I2S/SPDIF-Out audio interface, SLIC VOIP/PCM interface, two UARTs, and GPIOs that can be used for LED controls or other general purpose interface configurations. The QCA9557 supports 802.11n operations up to 144.4 Mbps for 20 MHz and 300 Mbps for 40 MHz, and 802.11a/b/g data rates. Additional features include Maximal Likelihood (ML) decoding, Low-Density Parity Check (LDPC), Maximal Ratio Combining (MRC), Tx Beamforming (TxBF), and On-Chip One-Time Programmable (OTP) memory.

The QCA9557 PCIE Root Complex interface can be used to connect to an endpoint such as the Qualcomm Atheros single-chip MAC/PHY/radio for dual concurrent WLAN applications. The QCA9557 supports booting from either SPI NOR or NAND flash. If NOR flash is used as boot codestore, an additional NAND flash device can still be connected, for end-user multi-media storage and other applications.

QCA9882 (Radio)

The Qualcomm Atheros QCA9882 s a highly integrated wireless local area network (WLAN) system-on-chip (SoC) for 5 GHz 802.11ac or 5 GHz 802.11n WLAN applications. The QCA9882 integrates an on-board CPU for low-level setup of WLAN physical layer (PHY) and RF to offload the host processor for other tasks. It enables high-performance 2x2 MIMO with three spatial streams for wireless applications demanding the highest robust link quality and maximum throughput and range.

The QCA9880 supports up to two simultaneous traffic streams integrating two Tx and three Rx chains for high throughput and extended coverage. Tx chains combine PHY in-phase (I) and quadrature (Q) signals, convert them to the desired frequency, and drive the RF signal to multiple antennas. Rx chains use an integrated architecture. The frequency synthesizer supports 1-MHz steps to match frequencies defined by IEEE 802.11a/n/ac specifications. The QCA9882 supports frame data transfer to and from the host using a PCIE interface providing interrupt generation and report

Power Supplies

The 48V/0.5A DC input voltage is regulated to the following voltages for various purposes:

- +1.2V for CPU core voltage
- +3.3V for CPU, Flash, DDR
- +5V RF

ANALOG SECTION

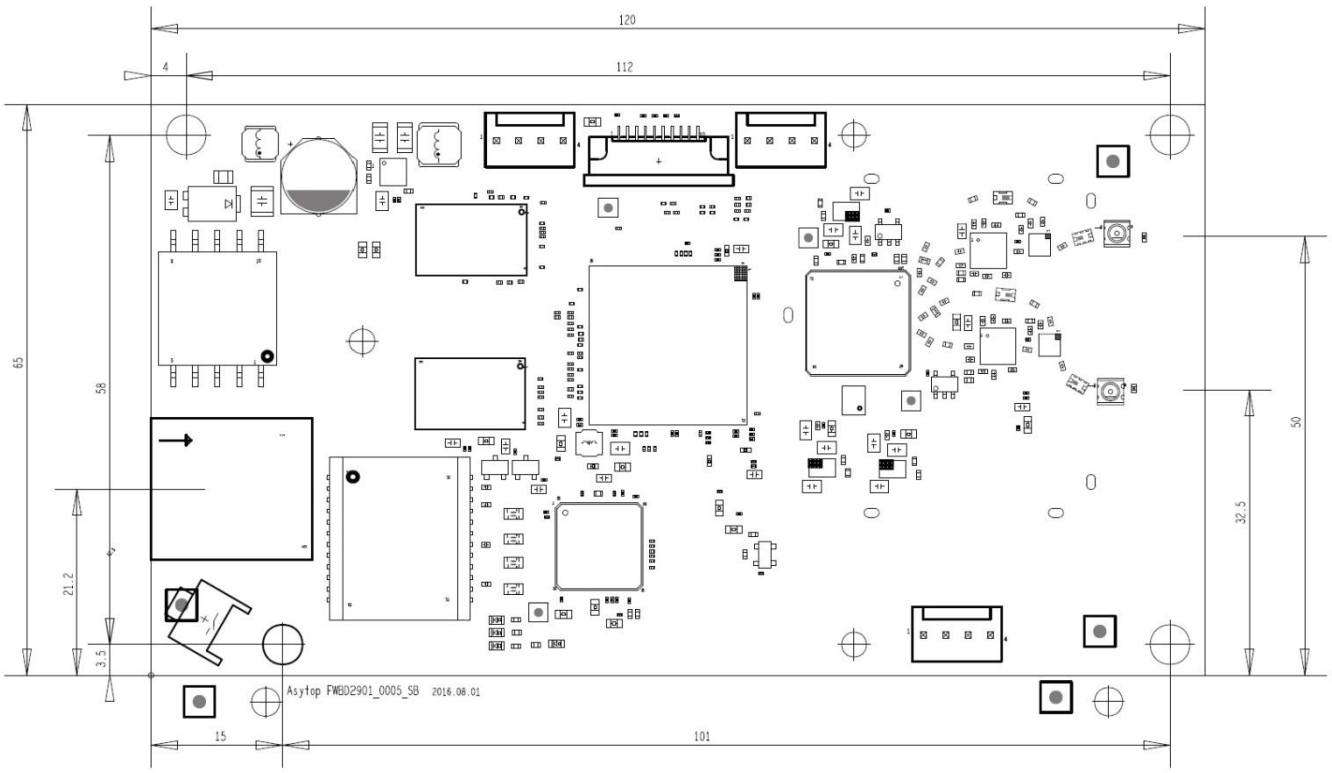
QCA9882 has integrated 2T2R MAC, BBP and RF. Each TX/RX chain only needs out-of-band rejection filters, Low noise power amplifier, Power amplifier and a switch to switch between transmission and reception mode. The switch and LNA on/off are controlled by the QCA9882 BBP integrated module.

Specification

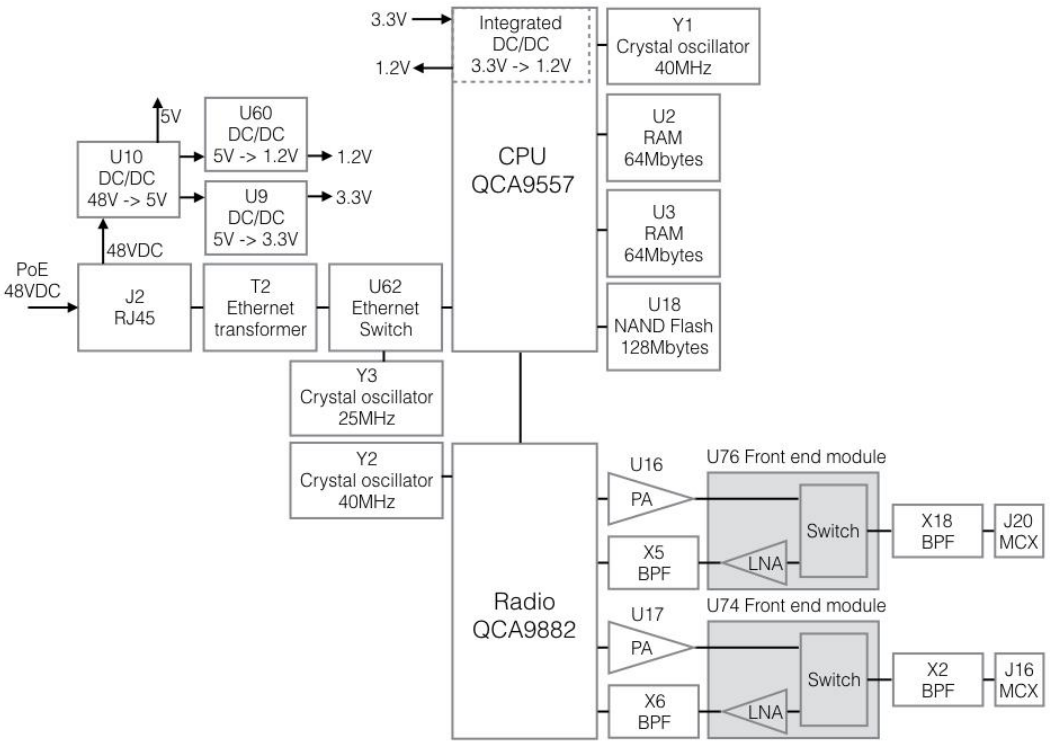
Feature	Description
Operating band	IEEE 802.11a: 5180MHz-5240MHz, 5745MHz-5825MHz IEEE 802.11nHT20: 5180MHz-5240MHz, 5745MHz-5825MHz IEEE 802.11nHT40: 5190MHz-5230MHz, 5755MHz-5795MHz IEEE 802.11ac:5210MHz, 5775MHz
CPU	QCA9557
RAM	128MB
Flash memory	128MB
Watchdog timer	Built into CPU
Reset push button	Connected to GPIO
LED's	Special connector to connect external LED board
Ethernet	One 10/100/1000 Ethernet port
Power options	802.3af/at PoE (RJ45)
Power supply range	48-56V
Serial port (UART)	3.3V TTL level, not end user accessible
Operating temperature range	From -40^{0}C to 70^{0}C

Module dimensions

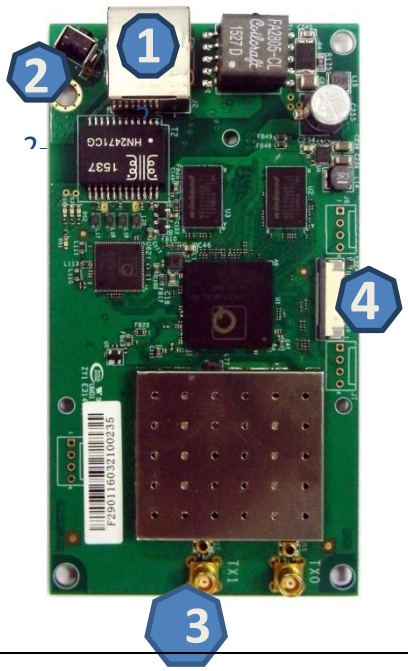
Unit : mm



Block diagram

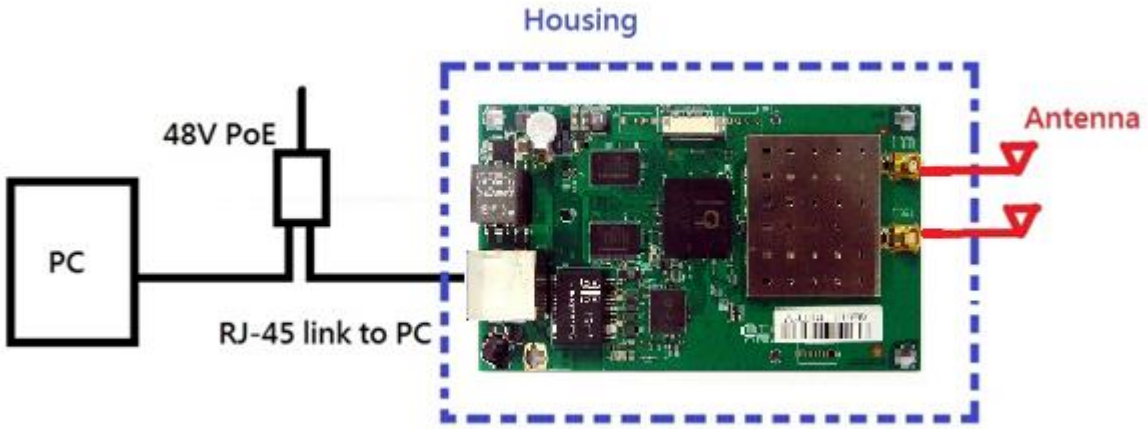


Module



1- 1000 Base-T Ethernet port
2- Buttons(reset and user-GPIO connected)
3- MCX RF connector
4- LED (GPIO connected)

Hardware Setup



Software Source

Software of FWBD-2901 module base on OpenWrt Linux, OpenWrt source code be used for FWBD-2901
The Product is a FIXED Point TO Point DEVICE ONLY, and it should be installed by professional installer.
and can also work within the temperature of -30 ℃ to 50 ℃.

The EUT has the ability to be maintained within the authorized band within a Max tolerance of ±116KHz of centre frequency.

Antenna Type:

LigoDLB PRO sector antenna:

Manufacture: LigoWave

Model : FWA-40

17dBi sector antenna with two antennas, directional gain 20dBi.

PTP5-23 PRO panel antenna:

Manufacture: LigoWave

Model : FWA-1-1

20dBi panel antenna with two antennas, directional gain 23dBi.

Dish antenna:

Manufacture: ARC Wireless LLC

Model : ARC-DA5830SD1

27dBi dish antenna with two antennas, directional gain 30dBi

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

The modular can be installed or integrated in the fixed point to point operating devices only.

FCC Radiation Exposure Statement

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 280 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: V2V-2901 or Contains FCC ID: V2V-2901”

When the module is installed inside another device, the user manual of the host must contain below warning statements;

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Any company of the host device which install this modular with limit modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C : 15.407 and 15.209 requirement, Only if the test result comply with FCC part 15C : 15.407 and 15.209 requirement， then the host can be sold legally.