# Edgecore ECWO7220-L

## Outdoor Wireless Access Point Specification

**Revision 1.0**



OPEN Compute Project

## Revision History

| Revision | Date | Author | Description |
|---|---|---|---|
| .01 | 2/29/2016 | Jeff Catlin | Initial Release |
| 1.0 | 8/4/2017 | Jeff Catlin | Minor edits to license text |
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| **Description** | **Manufacturer** | **Part Number** |
|---|---|---|
| CPU | Broadcom | BCM53016A (Optional BCM5822B) |
| RF MAC/PHY/Radio 5G | Broadcom | BCM43460 |
| RF MAC/PHY/Radio 2.4G | Broadcom | BCM43431 |
| DDR III Memory | MICRON | MT41K128M16JT-125:K |
| NOR Flash | MXIC | MX25L25635E |
| NAND Flash | MICRON | MT29F4G08ABADAWP:D |
| Watchdog Timer | MAXIM | MAX6369 |
| TPM | Atmel | AT97SC3204T |
| PoE Power Converter | TI | TPS23754 |

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This specification is being submitted under the Open Compute Project Hardware License (Permissive)

## Scope

This document outlines the technical specifications for the Edgecore ECWO7220-L Outdoor open wireless Access Point  submitted to the Open Compute Foundation.

## Overview

The ECWO7220-L is an outdoor 802.11a/b/g/n/ac dual-band, dual-radio Access Point with a 3x3 MIMO antenna configuration.

Through its two Gigabit Ethernet ports the 802.11ac dual-band wireless Access Point can connect to the backbone network. The ECWO7220-L supports 802.3at/af PoE which enables the Access Point to be powered remotely by a PoE switch. An AC power adapter option is also included for locations where PoE is not available.

The ECWO7220-L is designed so that it can easily be wall mounted or pole mounted.

## Physical Overview

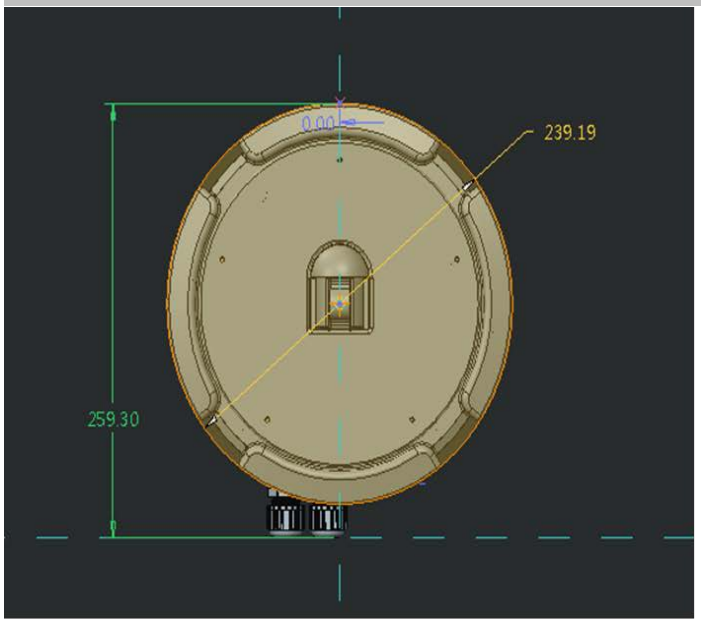
### Dimensions

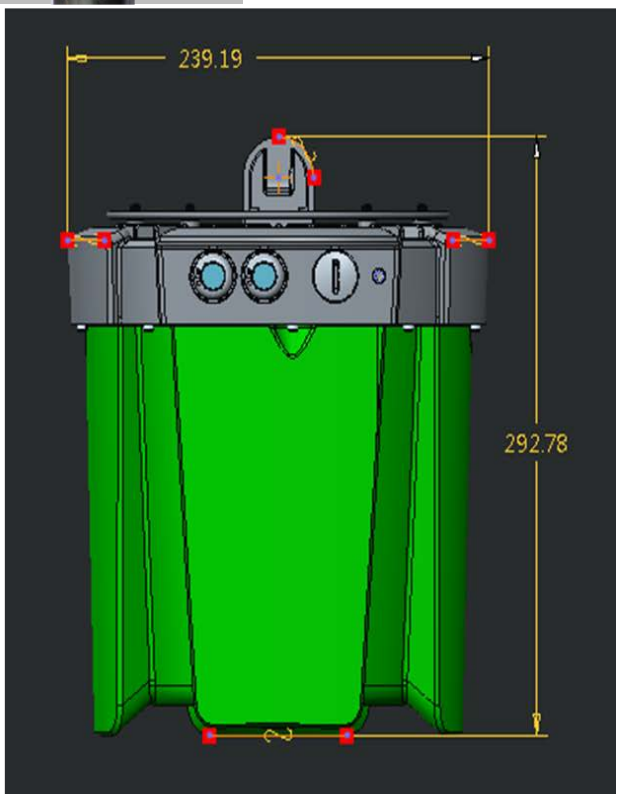
| | Inches | Millimeters |
|---|---|---|
| Height | 11.5 | 292.78 |
| Width | 10.2 | 259.30 |









239.19
259.30


239.19
292.78

## LEDs

| LED Name | Description | State |
|---|---|---|
| Status | A single led to indicate status of device viewed from bottom of enclosure | Green - Normal<br>Off – No Power<br>Red – System failure |

## Front View

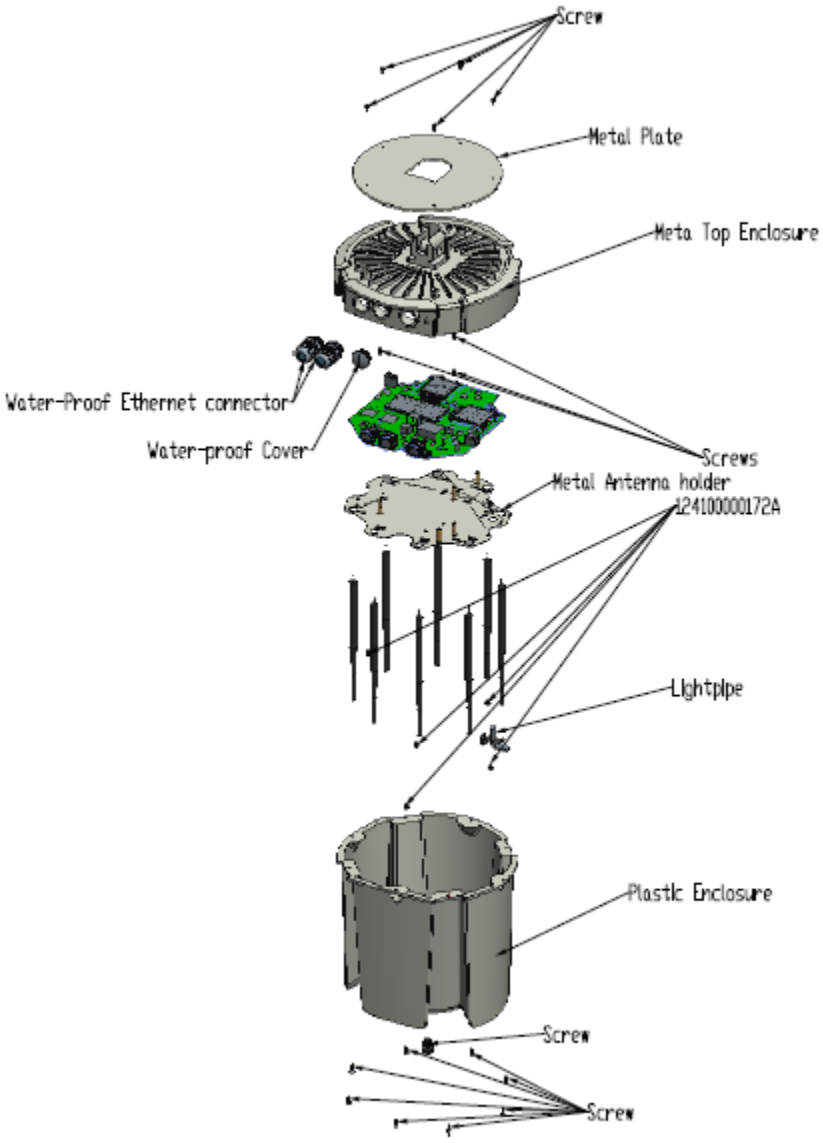



The front panel view of the ECWO7220-L includes the following key components:

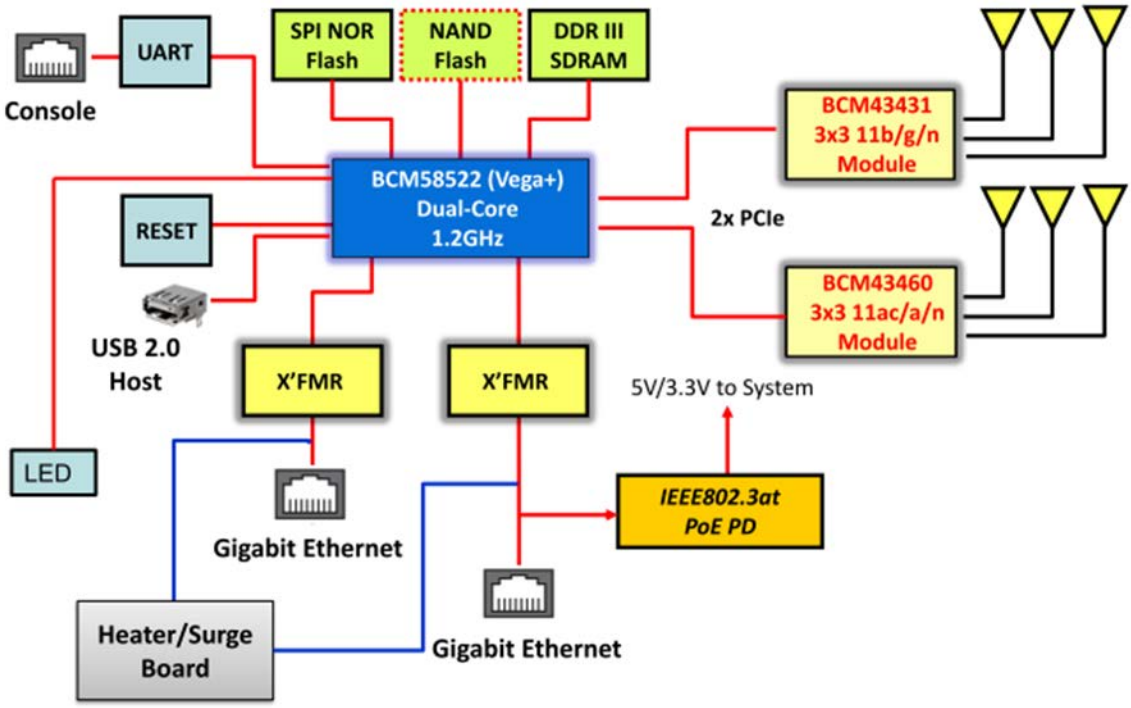
- Eth 1Gb Ethernet port (weatherproof connection)
  - Used for network connectivity
- Eth0/PoE Gb Ethernet port (weatherproof connection)
  - Used for network connectivity and to power device through PoE
- Console port (weatherproof connection)
  - Used for serial communication to the device

# System Overview

## Exploded system view

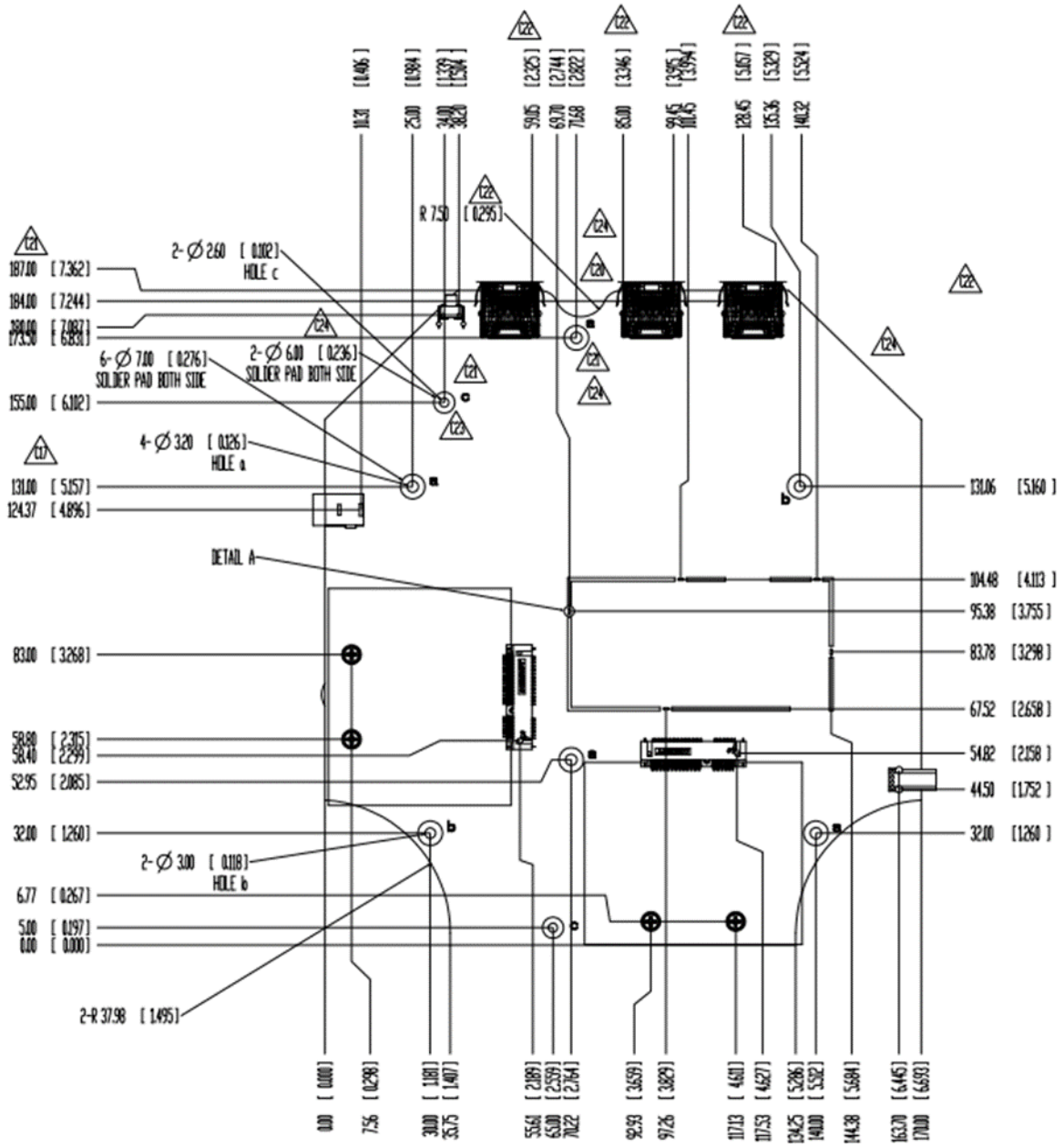


## Main PCB Block Diagram



## PCB Board mechanical outline

The ECWO7220-L is composed of 6 layer PCB assembly:



## PCB

The PCB is a six layer board supporting the CPU and radio silicon, front panel networking and management ports, and LED.

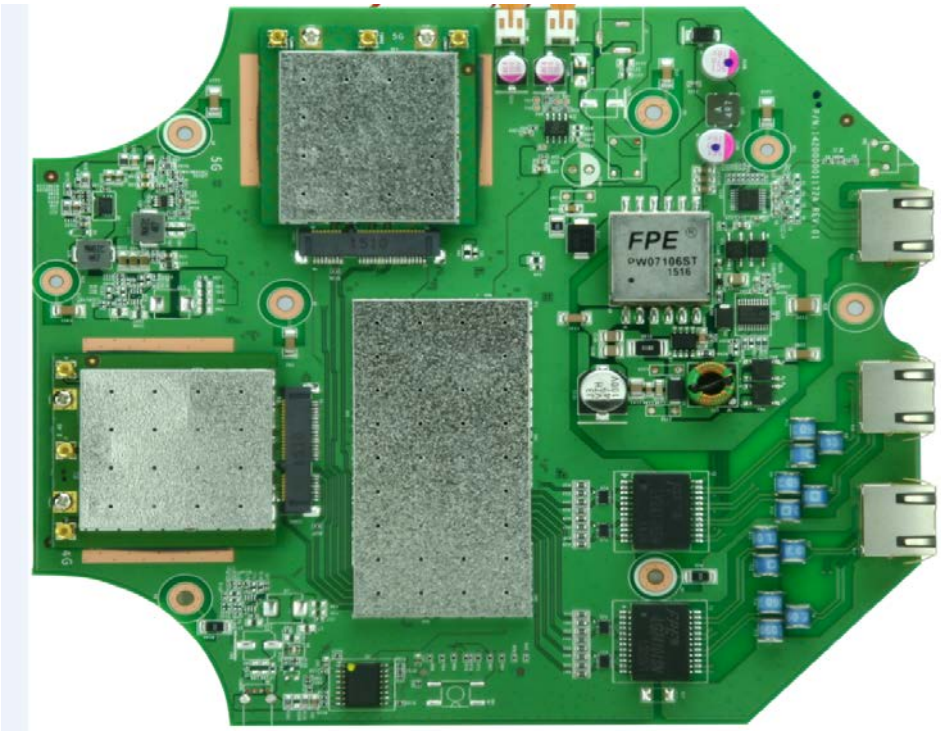
### PCB Dimensions

| | Inches | Millimeters |
|---|---|---|
| 7.36 | 7.36 | 187 |
| Width | 6.70 | 170 |

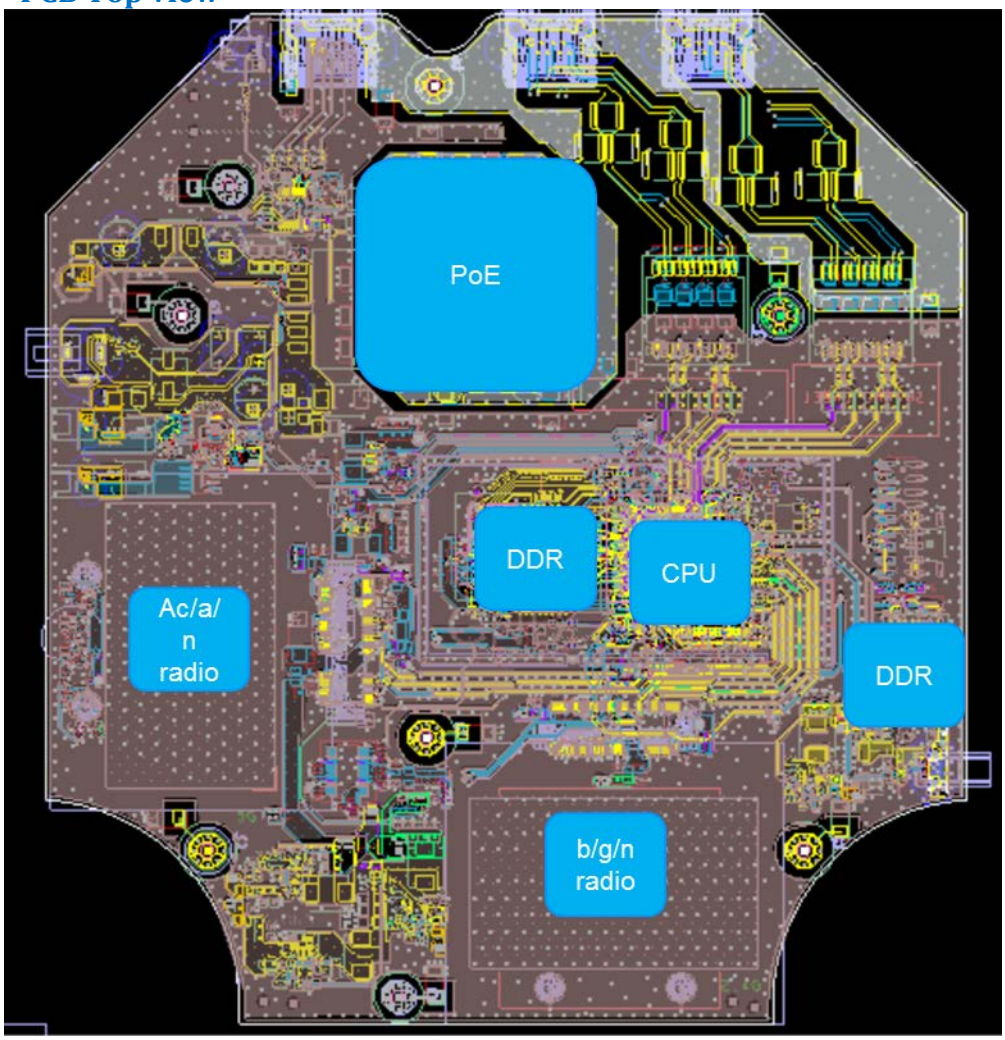
### PCB major components

| **Description** | **Manufacturer** | **Part Number** |
|---|---|---|
| CPU | Broadcom | BCM 53016 (optional BCM5822) |
| 3x3 802.11ac/a/n MAC/PHY Radio | Broadcom | BCM 43460 |
| 3x3 802.11b/g/n MAC/PHY Radio | Broadcom | BCM 43431 |
| DDR III Memory | MICRON | MT41K128M16JT-125:K |
| NOR Flash | Micron | N25Q128A13ESF40F |
| NAND Flash | MICRON | MT29F4G08ABADAWP:D |
| Watchdog Timer | MAXIM | MAX6369 |
| Trusted Platform Module (TPM) | Atmel | AT97SC3204T |
| PoE Power Converter | TI | TPS23754 |

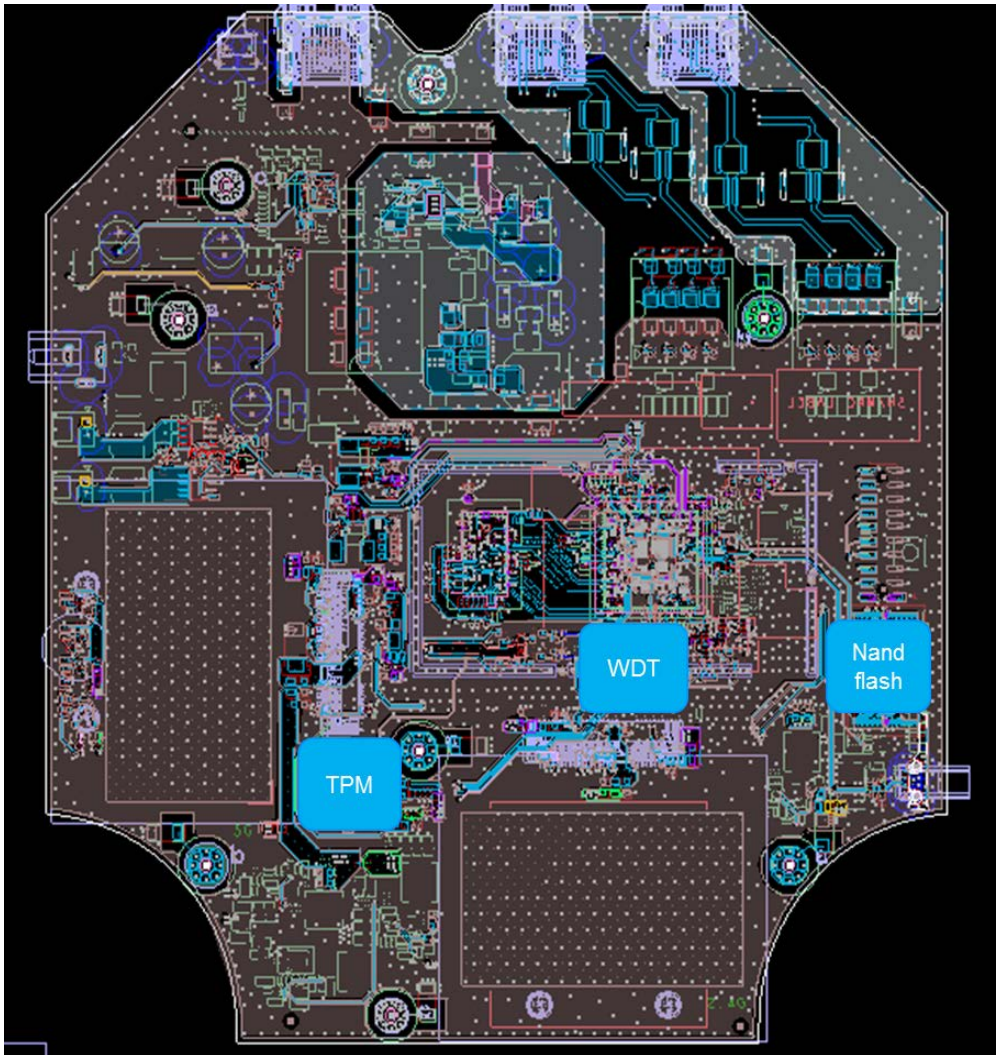
## Populated PCB Photograph



## PCB Top view



## PCB Bottom View



## CPU Subsystem

The ECWO7220-L utilizes the Broadcom 53016 communications processor supporting the following:

- NOR Flash 32MBytes
- NAND Flash 512MBytes
- DDR III 256Mbytes

## Console Port

A RJ45 connector is located on the front panel equips with DTE configuration for console usage. A special cable to translate the RJ45 to DB9 is used with the pin out is shown below. In the list below, the directions 'IN' and 'OUT' are relative to the board. (i.e. 'IN' means input to the board)

| RJ45 Pin# | DB9 Pin# | Mnemonic | Detail | Direction | BCM53016 Pin Name |
|---|---|---|---|---|---|
| 7 | 1 | DCD | Data Carrier Detect | IN | NC |
| 6 | 2 | RXD | Receive Data | IN | UART_RX |
| 3 | 3 | TXD | Transmit Data | OUT | UART_TX |
| 2 | 4 | DTR | Data Terminal Ready | OUT | NC |
| 4,5 | 5 | Sig. GND | Signal Ground | – | GND |
| - | 6 | DSR | Data Set Ready | IN | NC |
| 1 | 7 | RTS | Request To Send | OUT | UART_RTS |
| 8 | 8 | CTS | Clear To Send | IN | UART_CTS |

## Thermal Monitoring

The ECWO7220-L supports a LM56 thermal sensor used to monitor system temperature.

## Watchdog Timer

The ECWO7220-L supports the MAX6369 pin-selectable watchdog timers that supervise microprocessor (µP) activity and signal when a system is operating improperly. During normal operation, the microprocessor should repeatedly toggle the watchdog input (WDI) before the selected watchdog timeout period elapses to demonstrate that the system is processing code properly. If the µP does not provide a valid watchdog input transition before the timeout period expires, the supervisor asserts a watchdog (WDO) output to signal that the system is not executing the desired instructions within the expected time frame. The watchdog output pulse can be used to reset the µP or interrupt the system to warn of processing errors.

## TPM

The ECWO7220-L supports the AT97SC3204T which is a fully integrated security module designed to be integrated into embedded systems and implements version 1.2 of the Trusted computing Group (TCG) specification.

## Software Support

The ECWO7220-L supports a base software package composed of the following components:

### U-Boot

The ECWO7220-L Supports U-Boot version 1.4.0.2 or greater

### ONIE

Please check http://onie.org/ for the latest supported version

# Specifications

## Power Consumption

The total estimated system power consumption of the ECWO7220-L is ~22Watts. This is based upon worst case power assumptions for traffic and environmental conditions. Typical power consumption will be less.

## Emissions

FCC Part 15 Subpart B, Class B
CE

## Environmental

Weight 2824g g (6.23 lb.)
Temperature Operating: -40° C to 55° C (with optional heater)
Storage: -40° C to 70° C (-40° F to 158° F)
Humidity Operating: 5% to 95% (non-condensing)
Water / Dust Proof IP67

## ROHS

Restriction of Hazardous Substances (6/6)

Compliance with Environmental procedure 020499-00 primarily focused on Restriction of Hazardous Substances (ROHS Directive 2002/95/EC) and Waste and Electrical and Electronic Equipment (WEEE)