

Edgecore ECW5410

Wireless Access Point Specification

Revision 1.0



OPEN
Compute Project

Revision History

| Revision | Date | Author | Description |
|----------|-----------|-------------|-----------------|
| .01 | 2/21/2016 | Jeff Catlin | Initial Draft |
| 1.0 | 3/6/2017 | Jeff Catlin | Initial release |
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| Description | Manufacturer | Part Number |
|----------------------------|---------------------|---------------------------------|
| CPU | Qualcomm | IPQ8068 |
| RF 5G | Qualcomm | QCA9994 |
| RF 2.4G | Qualcomm | QCA9994 |
| DDR III | Winbond | 2x W631GU6KB-12 64Mb x 16 SDRAM |
| NOR Flash | Macronix | MX25U12835FMI-10G |
| NAND Flash | Spansion | S34MS01G200BHV000 |
| PHY | Qualcomm | 2 x QCA8033 |
| TPM | Atmel | AT97SC3204T |
| PoE Power Converter | TI | TPS23751 |
| Bluetooth Radio (optional) | TI | CC2540/1BLE |

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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 ECW5410 Open Wireless Access Point submitted to the Open Compute Foundation.

Overview

The ECW5410 is an indoor 802.11ac Wave 2 4x4 802.11 a/b/g/n/ac dual-band, dual-radio Enterprise Access Point.

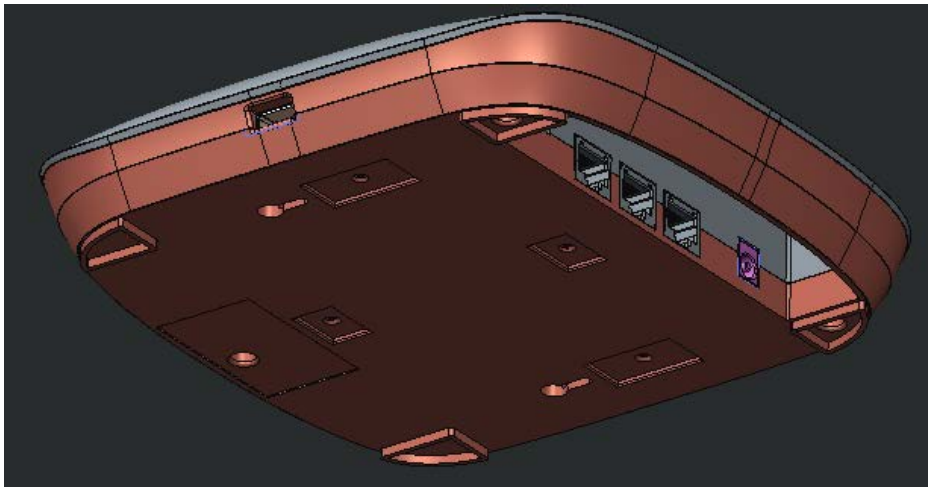
Through its two Gigabit Ethernet ports the 802.11ac dual-band wireless Access Point can connect to the backbone network. The ECW5410 supports 802.3at/af PoE which enables the Access Point to be powered remotely by a PoE switch. An AC power adapter option is also available for locations where PoE is not available.

The ECW5410 is designed so that it can easily be wall mounted or ceiling mounted to T-Bars.

Physical Overview

Dimensions

| | Inches | Millimeters |
|--------|--------|-------------|
| Length | 7.7 | 195 |
| Width | 7.7 | 195 |
| Height | 1.4 | 35.5 |
| | | |



Top View

The top view of the ECW5410 shows the following



LEDs

| | | | |
|----------|---|------------------|--|
| PWR | AP power / ready status | Off | No power to AP |
| | | Red | Initial power-up condition |
| | | Flashing – Green | Device booting, not ready |
| | | On – Green | Device ready |
| ENET0 | Ethernet Network Link Status / Activity | Off | Ethernet link unavailable |
| | | On – Red | 10/100/1000Mbps Ethernet Link /Active |
| | | On – Green | 10/100/1000Mbps Ethernet blinking |
| ENET1 | Ethernet Network Link Status / Activity | Off | Ethernet link unavailable |
| | | On – Red | 10/100/1000Mbps Ethernet Link /Active |
| | | On – Green | 10/100/1000Mbps Ethernet blinking |
| 11b/g/n | 2.4GHz Radio Status | Off | 2.4GHz radio disabled |
| | | On –Orange | 2.4GHz radio enabled in non-HT WLAN mode |
| | | On – Green | 2.4GHz radio enabled in HT WLAN mode |
| | | Flashing – Green | 2.4GHz Air Monitor |
| 11a/n/ac | 5GHz Radio Status | Off | 5GHz radio disabled |
| | | On –Orange | 5GHz radio enabled in non-HT WLAN mode |
| | | On – Green | 5GHz radio enabled in HT WLAN mode |
| | | Flashing – Green | 5GHz Air Monitor |

Front View

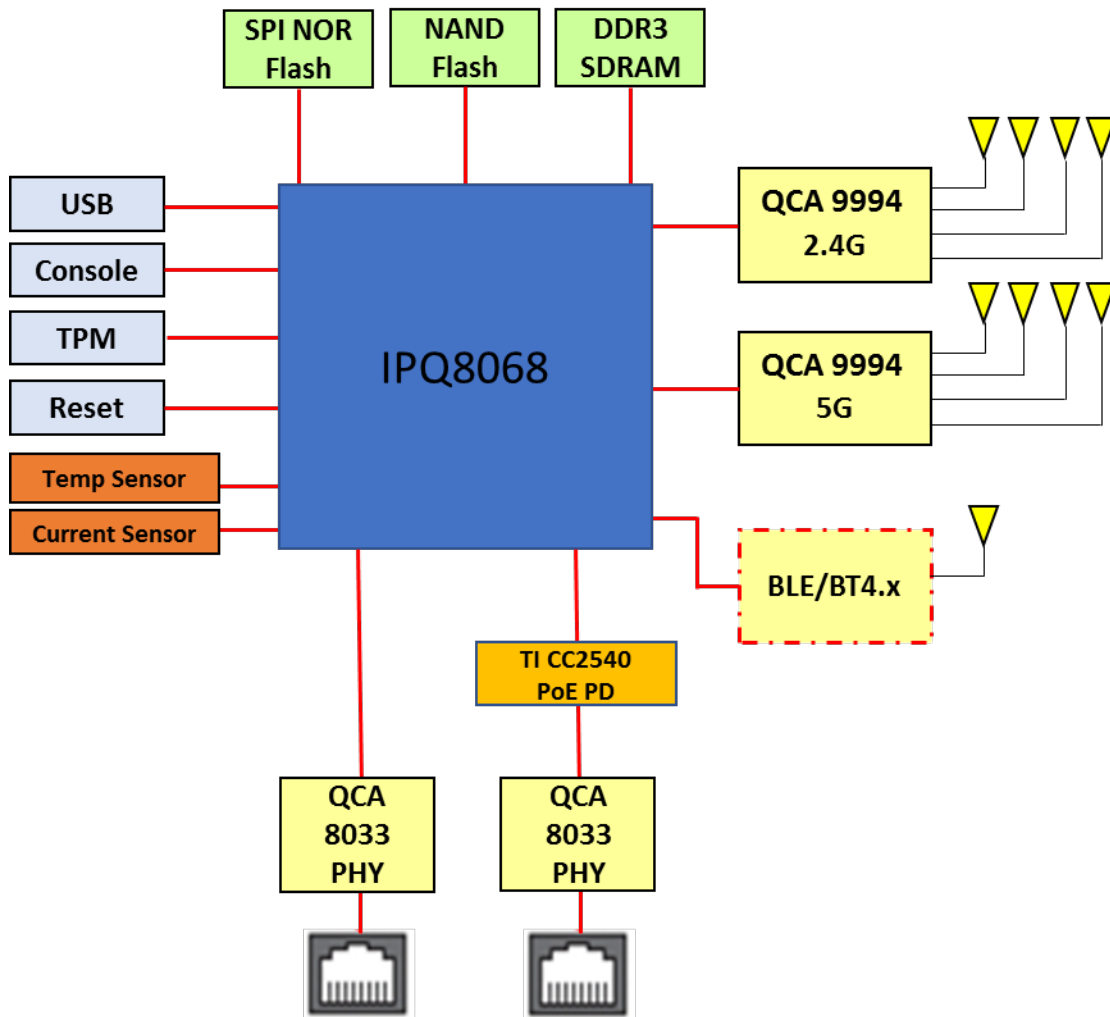


The front panel view of the ECW5410 includes the following key components:

- Reset button
 - Used to reset the CPU and associated components
- 12V power jack
 - Used with optional external 12V power module
- Eth0/PoE Gb Ethernet port
 - Used for network connectivity and to power device through PoE
- Eth 1Gb Ethernet port
 - Used for network connectivity
- Console port
 - Used for serial communication to the device
- USB 2.0 Host port (side of unit)

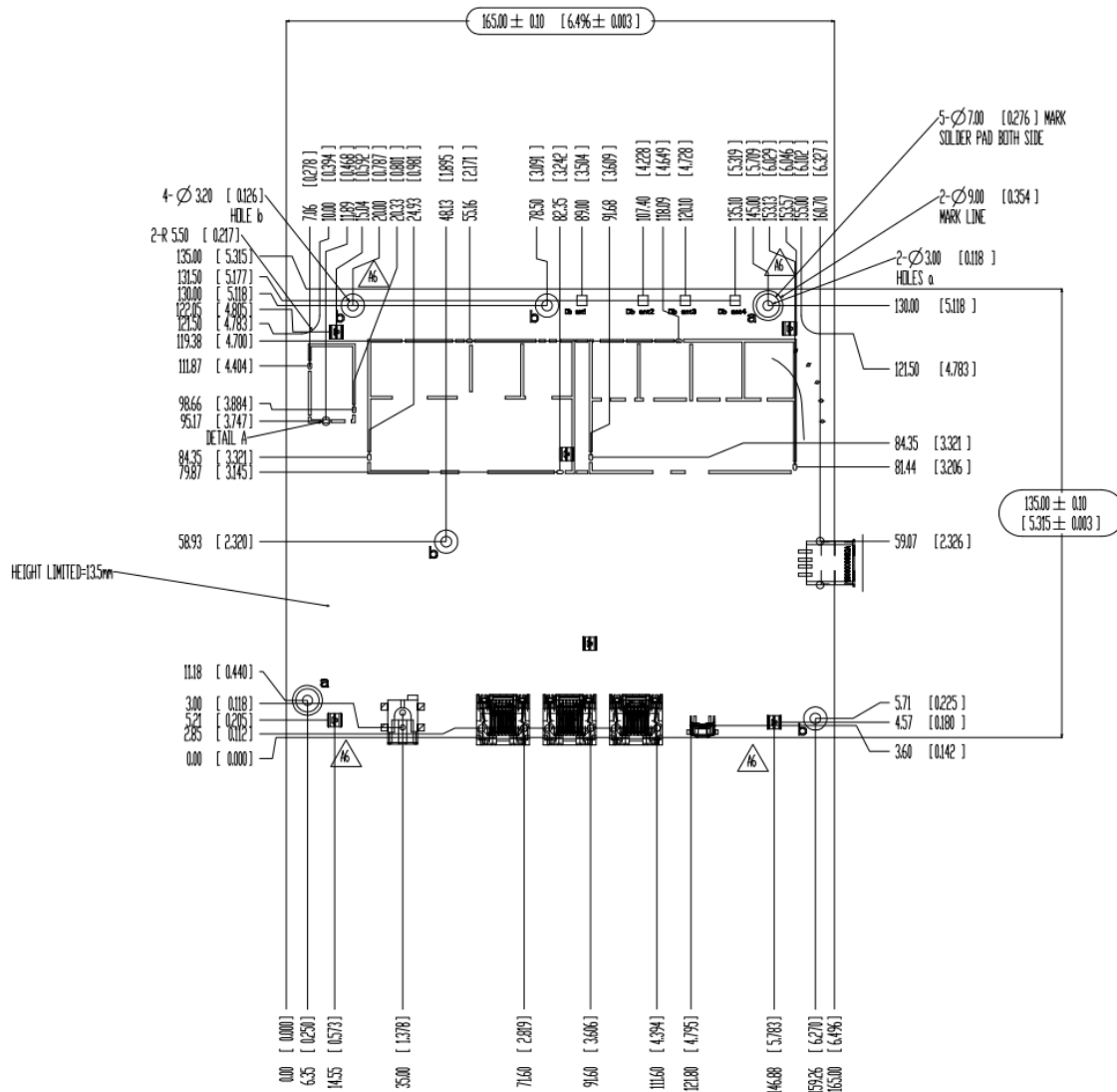
System Overview:

Main PCB Block Diagram



PCB Board mechanical outline

The ECW5410 is composed of 8 layer PCB assembly:



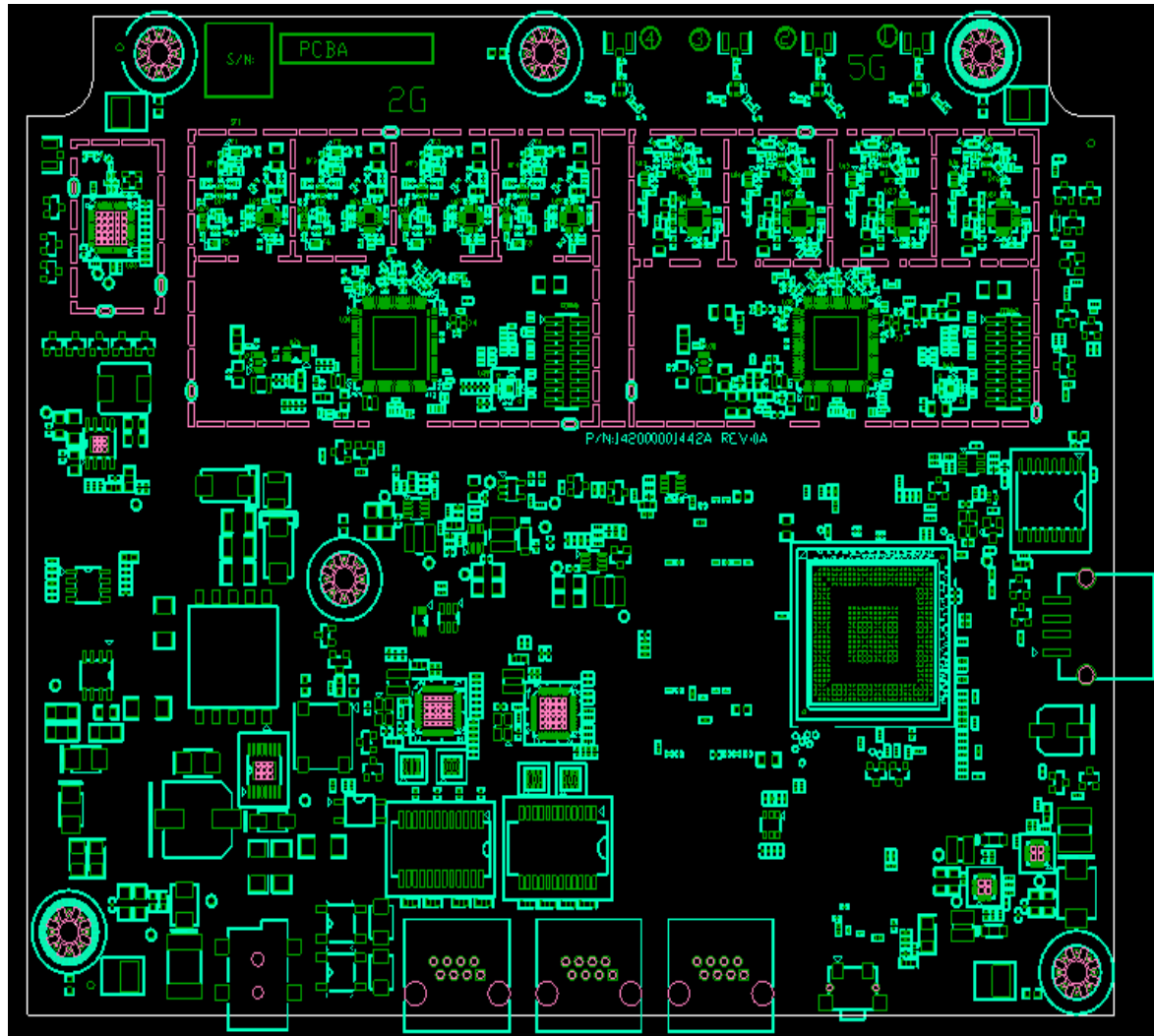
PCB

The ECW5410 PCB is an eight layer board supporting the CPU and radio silicon, front panel networking and management ports, and LEDs.

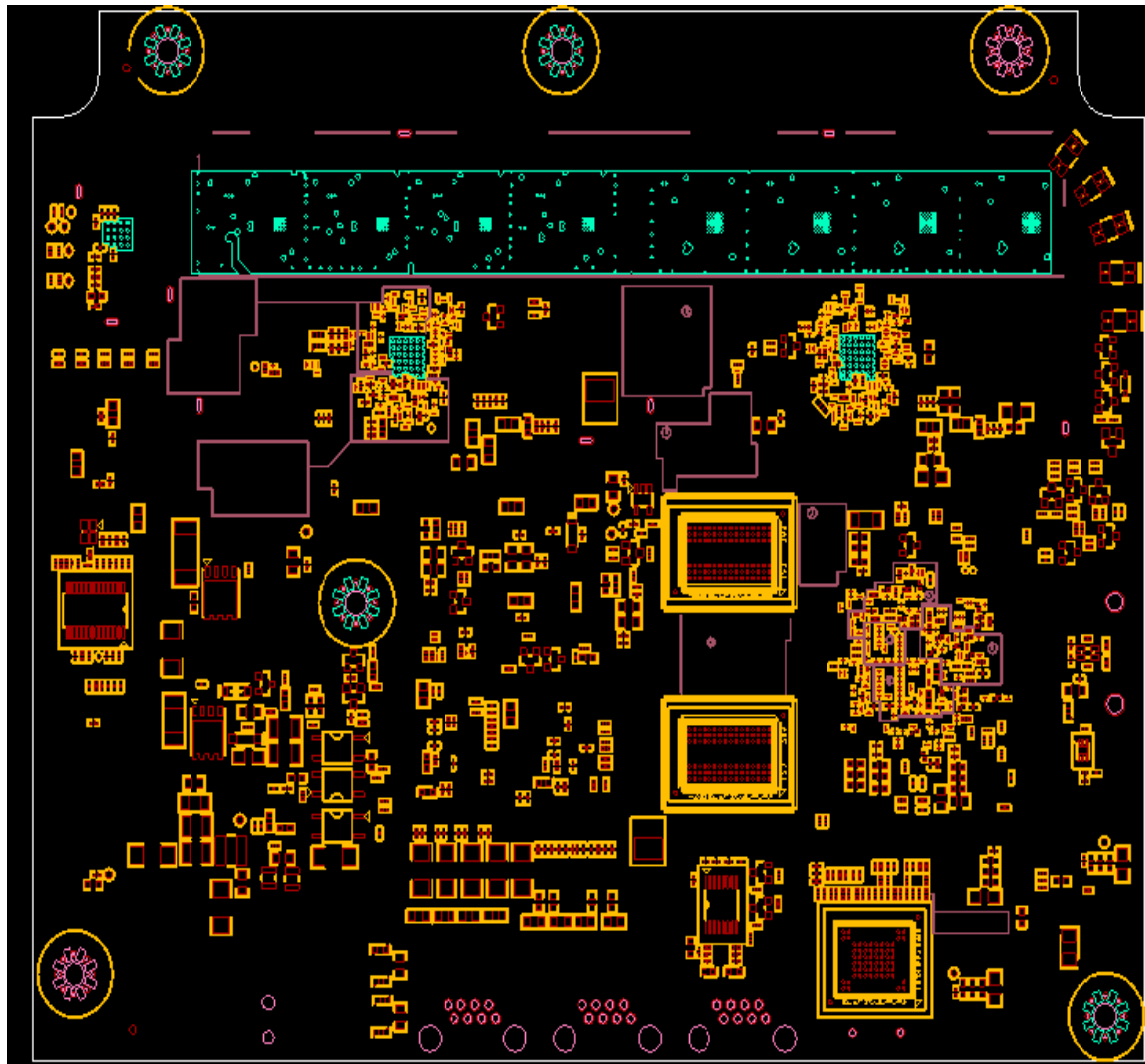
PCB Dimensions

| | Inches | Millimeters |
|--------|--------|-------------|
| Length | 5.3 | 135 |
| Width | 6.5 | 165 |

PCB Top view



PCB bottom view



CPU Subsystem

The ECW5410 utilizes the Qualcomm IPQ48068 communications processor supporting the following:

- NOR Flash 16Mbytes
- NAND Flash 128Mbytes
- 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 |
|-----------|----------|----------|---------------------|-----------|
| 7 | 1 | DCD | Data Carrier Detect | IN |
| 6 | 2 | RXD | Receive Data | IN |
| 3 | 3 | TXD | Transmit Data | OUT |
| 2 | 4 | DTR | Data Terminal Ready | OUT |
| 4,5 | 5 | Sig. GND | Signal Ground | - |
| - | 6 | DSR | Data Set Ready | IN |
| 1 | 7 | RTS | Request To Send | OUT |
| 8 | 8 | CTS | Clear To Send | IN |

Thermal Monitoring

The ECW5410 supports a Texas instruments TMP423AID thermal sensor used to monitor system temperature.

Current Monitoring

The ECW5410 supports a Texas Instruments INA219 for monitoring system current.

TPM

The ECW5410 supports the AT97SC3205T 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 ECW5410 supports a base software package composed of the following components:

U-Boot

The EC5410 supports U-Boot version U-Boot 2012.07 or newer

ONIE

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

Specifications

Power Consumption

The total estimated system power consumption of the ECW5410 is ~20.14 Watts. This is based upon worst case power assumptions for traffic and environmental conditions. Typical power consumption will be less.

Regulatory Compliances

The ECW5410 is designed and validated to comply with the following standards

- FCC part 15B, 15C, and 15E
- CE EN 300 328, EN 301 489-1&-17, CE EN 301 893, EN60601-1-2
- EMI: FCC/CE class B,
- DFS (software dependent)
- R&TTE Directive 1995/5/EC
- Low Voltage Directive 72/23/EEC
- EN 300 328
- EN 301 489
- EN 301 893
- UL/IEC/EN 60950
- EN 60601-1-1, EN60601-1-2

Radio Regulatory Compliance

- FCC
 - 2.4GHz: FCC part 15C 15.247
 - 5GHz: FCC part 15C 15.247 + part 15E 15.407
 - Band-2 & Band-3 DFS: option (software dependent)
- CE
 - 2.4GHz: EN 300 328 V1.8.1
 - 5GHz: EN301 893 V1.7.1

EMC

- FCC
 - FCC Part 15, Subpart B
- CE
 - EN55022+24:2010 Class B
 - EN 301 489-1 V1.9.2
 - EN 301 489-17 V2.2.1

Safety & ESD

- UL/IEC/EN 60950
- EN 60601-1-1, EN60601-1-2

Environmental

- Weight .98 g (2.16 lb)
- Temperature: IEC 68-2-14
 - +0 to +50 degrees C (Operating)
 - -20 to 70 degree C (Non-operating)
- Humidity: 5% to 95% (Non-condensing)
- Climatic: IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14, IEC 60068-2-30, IEC 60068-2-40, IEC 60068-2-41
- Vibration and Shock Test: IEC 60068-2-64, IEC 60068-2-6, IEC 60068-2-27
- Bump Test: IEC 68-2-29
- Drop Test: IEC 60068-2-31

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)