



CWPL Series

# CWPL series

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Hardware  
Specification  
Rev. 0.3



<b>Document Revision</b>	<b>Date</b>	<b>Modifier</b>	<b>Comments</b>
0.1	Apr. 19, 2010	Yishin Wu	Initial release
0.2	Aug. 13, 2010	Yishin Wu	Add Power consumption, Tx power Spec, Rx Sensitivity, Module perspective, Mechanical drawing, Label drawing,
0.3	Aug. 23, 2010	Yishin Wu	Update Label content, Regulatory

## Document Revision History



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# 1. Introduction

## 1.1 Product Overview

The Sony **CWPL010** series wireless LAN module contains the Ralink® RT3370 single chip which is a highly integrated MAC/BBP for 2.4GHz RF transmission and supporting 150Mbps PHY rate. It fully complies with IEEE 802.11 b/g/n feature rich wireless connectivity at high standards, delivers reliable, cost-effective, throughput from an extended distance. The optimized radio frequency architecture and baseband algorithms provide super performance and low power consumption. Deploy a high efficient USB engine and hardware data processing accelerators without overloading the host processor. Security, quality of service and international regulation are supported by **CWPL010** series and giving end users the greatest performance anytime in any circumstance.

## 1.2 Key Features

- Legacy data rates 1, 2 in DSSS mode and rates 5.5, and 11 Mbps in CCK mode, 6, 9, 12, 18, 24, 36, 48, and 54 in OFDM mode
- Support 40MHz wide channel bandwidth
- Uses the 2.412 to 2.497GHz ISM frequency band defined by the IEEE 802.11b/g/n specifications
- Reverse direction grant data flow and frame aggregation
- WEP 64/128, WPA, WPA2, TKIP, AES
- QoS-WMM, WMM-PS, WPS, PIN, PBC
- Multiple BSSID Support
- Form Factor: PCI Express 1.1 Half Mini Card(single side)
- International Regulation – 802.11d + h
- Cisco CCX Support up to v5.0
- Operating Systems – Windows XP 32/64, 2000, Vista 32/64, Linux, Macintosh, Win7 32/64

## 2. System Architecture

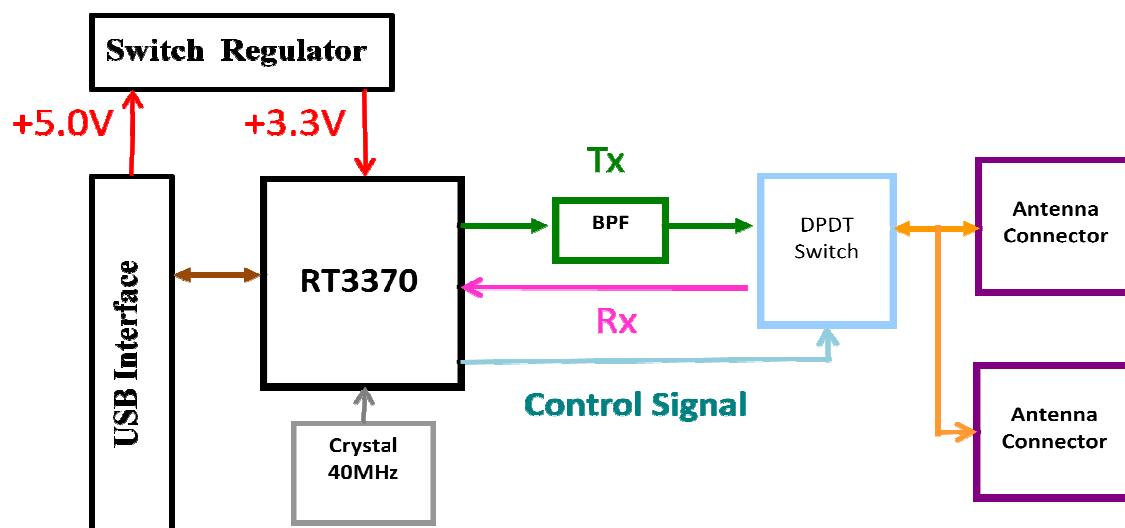


Figure 2.1 CWPL010 Series block diagram

## 3. Electrical Specifications

### 3.1 Pin Definitions

Table 3.1 Pin Definitions

Signal Group	Signal	Name	Pin No.	Direction	Description
USB Interface	D+	UDP	2	Input/Output	differential pair for transmit
	D-	UDM	3	Input/Output	differential pair for receive
Power +5.0V	+5.0V	UV+	4	Input	+5.0V source
	GND	GND	1	N/A	Return current path
WSP	WSP	WSP	6	Input/Output	
GND	GND	GND	5	N/A	Return current path



### 3.2 DC Specifications

The Max Power (as max defined in USB Spec) is 2500mW → 500mA

For all USB voltage rails (5.0V), it is recommended not to exceed 100mVpp noise in the frequency range of 10-500KHz.

**Table 3.2 DC Specifications**

Parameters	Symbol	Conditions	Min.	Typ.	Max.	Unit
5V Supply Voltage	+UV	-	4.75	5.0	5.25	V

#### 3.2.1 Power Consumption Specifications

Power consumption is measured using current probe loop on the Power rails of the USB interface (Pins). Assuming ASMP enabled (L1-active enabled and L0s is disabled).

**Table 3.3 Power Consumption Specifications**

Test Mode	Description
Idle	Power Consumption of idle. Assuming average power consumption is in room temperature. Average Power: <b>575</b> mW
1 Stream Transmitting and Receiving	Power Consumption of Transmit and Receive state, assuming Single spatial stream transmission for 802.11b network Average Power: <b>1085</b> mW
1 Stream Transmitting and Receiving	Power Consumption of Transmit and Receive state, assuming Single spatial stream transmission for 802.11g network Average Power: <b>930</b> mW
1 Stream Transmitting and Receiving	Power Consumption of Transmit and Receive state, assuming Single spatial stream transmission for 802.11n (HT20) network Average Power: <b>985</b> mW
1 Stream Transmitting and Receiving	Power Consumption of Transmit and Receive state, assuming Single spatial stream transmission for 802.11n (HT40) network Average Power: <b>975</b> mW





## 4. RF Specification

### 4.1 TX Specifications

Table 4.1 TX Specifications

Mod Data Rate (Mbps)	Modulation	Tx Target Power (dBm)	Data Rate (Mbps)	Modulation	Tx Target Power (dBm)
1	DBPSK	15	HT20-7.22	BPSK	15
2	DQPSK	15	HT20-14.44	QPSK	15
5.5	CCK	15	HT20-21.67	QPSK	15
11	CCK	15	HT20-28.89	16-QAM	15
6	OFDM	15	HT20-43.33	16-QAM	15
9	OFDM	15	HT20-57.78	64-QAM	15
12	OFDM	15	HT20-65	64-QAM	14
18	OFDM	15	HT20-72.22	64-QAM	14
24	OFDM	15	HT40-15	BPSK	15
36	OFDM	15	HT40-30	QPSK	15
48	OFDM	15	HT40-45	QPSK	15
54	OFDM	15	HT40-60	16-QAM	15
			HT40-90	16-QAM	15
			HT40-120	64-QAM	15
			HT40-135	64-QAM	14
			HT40-150	64-QAM	14

※Each tolerance is  $\pm 1.5$ dBm



## 4.2 RX Specifications

Table 4.2 RX Specifications

Data Rate (Mbps)	Modulation	Rx Sensitivity (dBm)	Data Rate (Mbps)	Modulation	Rx Sensitivity (dBm)
1	DBPSK	-92	HT20-7.22	BPSK	-87
2	DQPSK	-91	HT20-14.44	QPSK	-83
5.5	CCK	-91	HT20-21.67	QPSK	-82
11	CCK	-88	HT20-28.89	16-QAM	-79
6	OFDM	-88	HT20-43.33	16-QAM	-76
9	OFDM	-87	HT20-57.78	64-QAM	-72
12	OFDM	-85	HT20-65	64-QAM	-70
18	OFDM	-83	HT20-72.22	64-QAM	-67
24	OFDM	-81	HT40-15	BPSK	-85
36	OFDM	-77	HT40-30	QPSK	-81
48	OFDM	-73	HT40-45	QPSK	-79
54	OFDM	-70	HT40-60	16-QAM	-77
			HT40-90	16-QAM	-73
			HT40-120	64-QAM	-69
			HT40-135	64-QAM	-67
			HT40-150	64-QAM	-65

## 4.3 Antenna Specifications

Nominal antenna port impedance specification is 50 ohms for the Sony **CWPL010** series hardware.

For regulatory requirements, it is assumed that the antenna gain is:

- ◆ Antenna gain for the 2.4GHz band : 1.6dBi

There are two antennas supporting 2.4-2.5GHz band.

The Sony HD96017 connector will be used on the Sony **CWPL010** series hardware.

The antenna will be defined Main and Aux where is listing below:

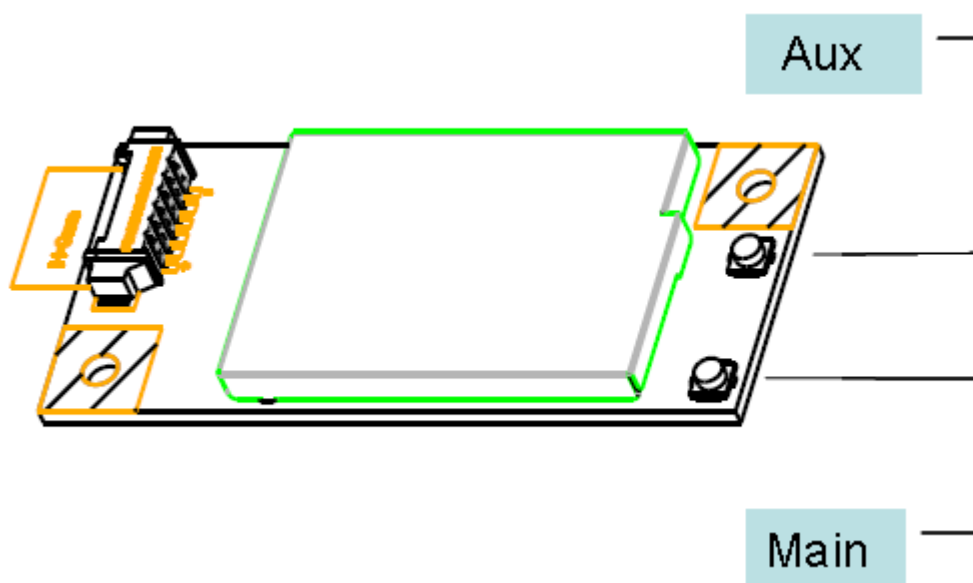


Figure 4.1 Two Connector- **CWPL010** series Perspective

## 5. Mechanical Specifications

### 5.1 Mechanical Drawing

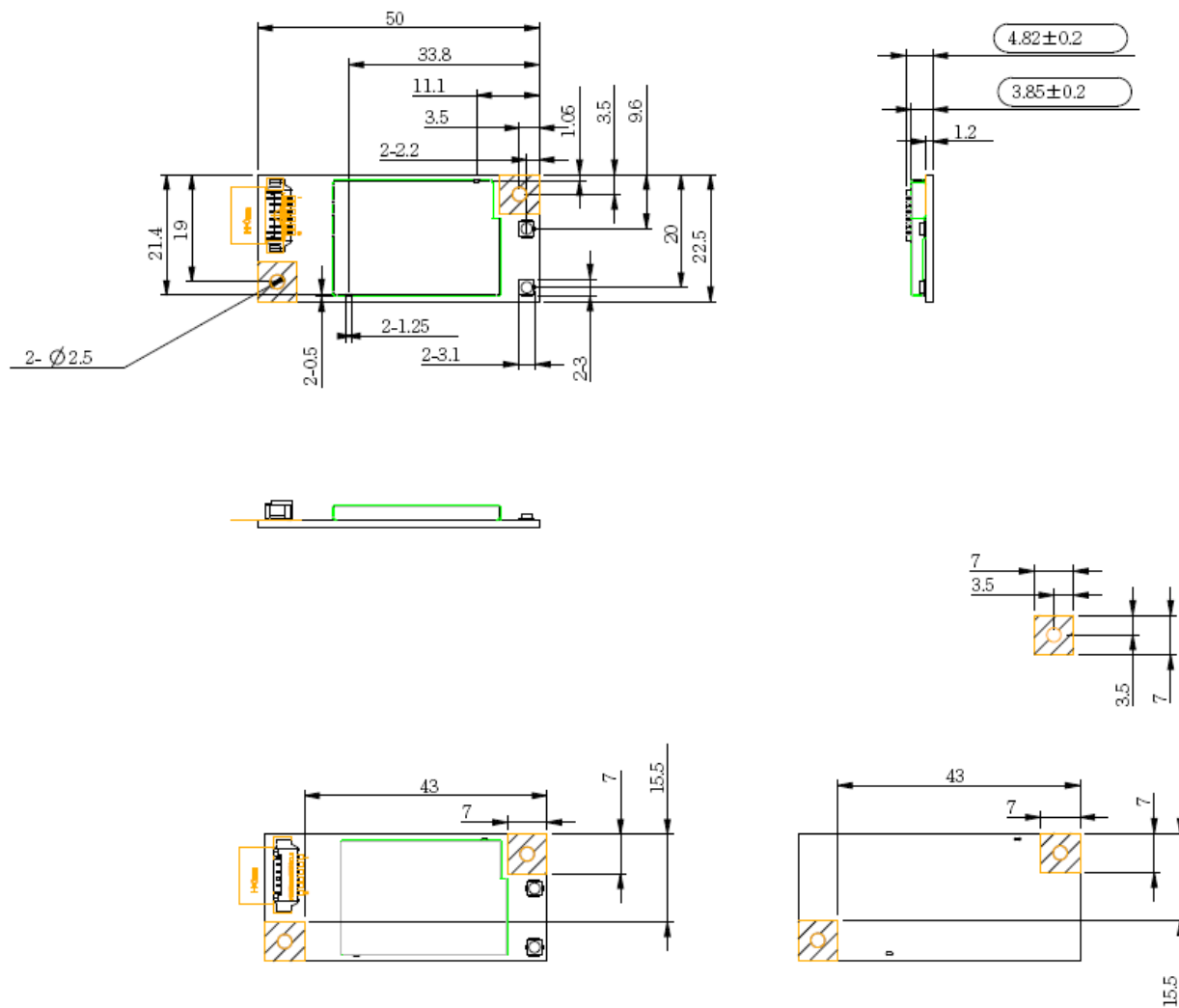


Figure 5.1 Two Connector- **CWPL010** series mechanical drawing



## 5.2 RF connector

Manufacturer: Sony

Manufacturer P/N: HD96017

### 5.2.1 Specification

Operating temperature range:  $-40^{\circ}\text{C} \sim 90^{\circ}\text{C}$

Storage temperature range:  $-40^{\circ}\text{C} \sim 90^{\circ}\text{C}$

Characteristic impedance:  $50\Omega$  (0~3GHz)

Voltage standing wave ratio:  $\text{VSWR} \leq 1.3$  (0.045~3GHz)

### 5.2.2 Dimensions: (Unit: mm)

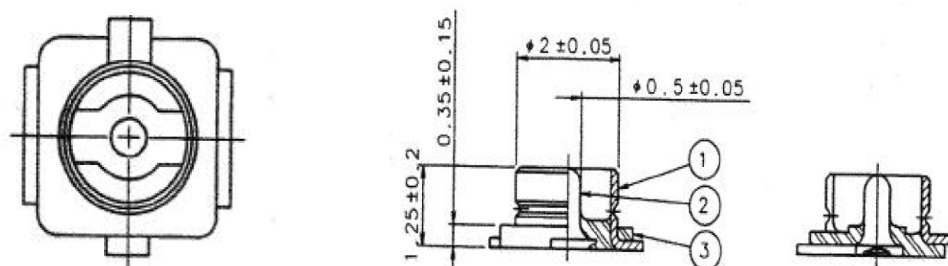


Figure 5.2 RF connector dimensions

## 5.3 Label Specifications



Figure 5.3 **CWPL0102U** Label Drawing

## 6. Environmental Specifications

The following tables provide normal operating conditions and maximum rating requirements for **CWPL010** series hardware.

**Table 6.1 Operating Conditions**

Environment	Limits
Operating	0-70°C

※The radio parts at operating state and above temperature of T-shield.

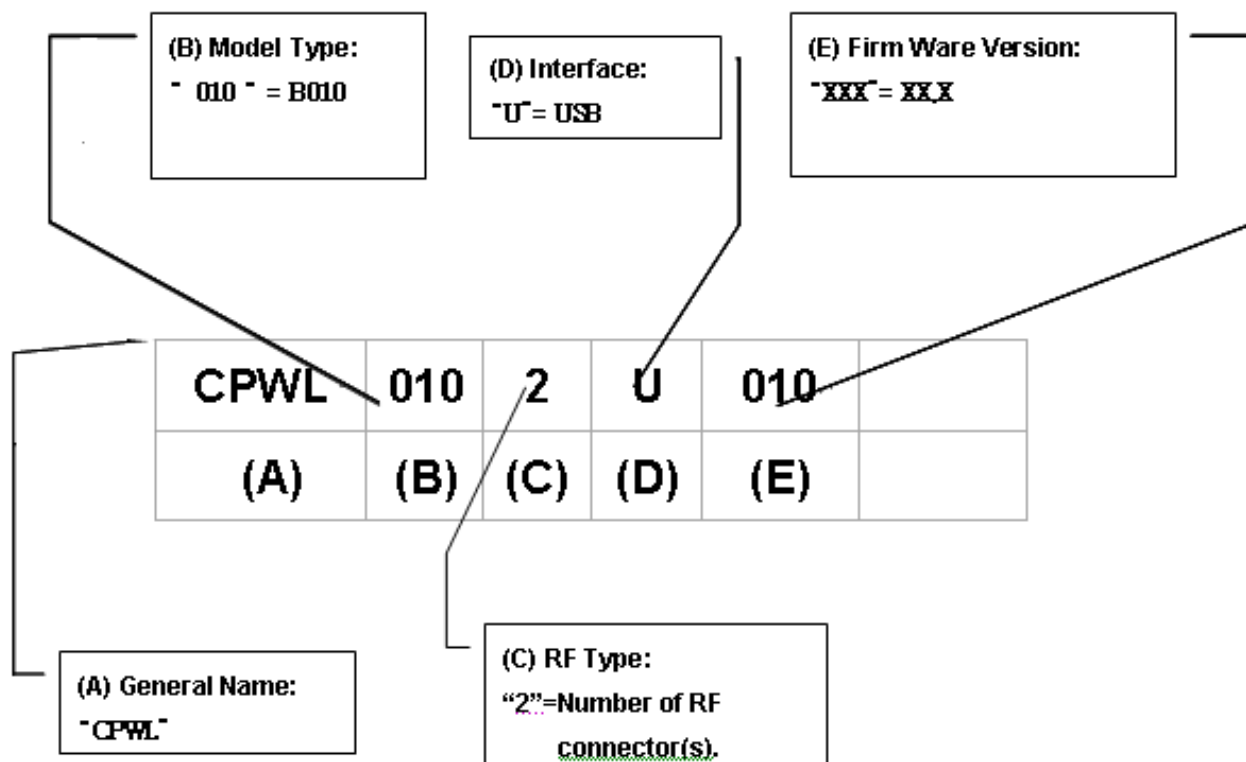
**Table 6.2 Non-operating Conditions**

Environment	Temperature				Humidity			
	Min.	Typ.	Max.	Unit	Min.	Typ.	Max.	Unit
Non-Operating	-25	25	65	°C	45	-	90	%

※ Temperature condition for storage (Packaged) in warehouse is Maximum 40°C up to 6 months.

## 7. Part Numbering

### 7.1 Part Numbering



**Figure 7.1 Part Numbering**



## 7.2 ID Definitions

Table 7.1 ID Definitions

WLAN Type	Mode	PID	VID
CPWL101UXXX-RT3370	BGN	0x0006	0x0489

## 8. Regulatory

Channel Setting	Active	Passive	Disable
FCC	Ch1-Ch11	Ch12-Ch13	Ch14

## Federal Communication Commission Interference Statement

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 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.

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

### IMPORTANT NOTE:

#### FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.**

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna,
- 3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirement, etc.).



IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

#### End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID:AK8CPWL0102U".

#### Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.