

# Zinwell Corporation



## Full HD Video Wireless Module

### User Manual

Transmitter : ZRF-31100

Receiver : ZRF-32100

Version 0.1

<b>Version: 0.1</b>	<b>Zinwell Corporation</b> 7 <sup>th</sup> , No. 512, Yuan Shan Road, Chung Ho City, 235, Taipei County, Taiwan TEL:+886 2 22251929 FAX:+886 2 22269654 <a href="http://www.zinwell.com.tw">http://www.zinwell.com.tw</a>	<b>CONFIDENTIAL</b>
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**ZINWELL HD Wireless Video Transmission Product**  
**Full HD Video Wireless Module**

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## Revision History

Reversion	Date	Author	Descriptions
0.1	2010-09-14	Paul Chang	Initial Release. Preliminary Document.

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<b>Date: 2010-09-14</b>		<b>Page 2 of 14</b>

**ZINWELL HD Wireless Video Transmission Product**  
**Full HD Video Wireless Module**

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**CAUTION:**

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Outdoor operations in the 5150~5250MHz, 5600~5650MHz band is prohibited.

The Device not operation in 5600~5650MHz.

Industry Canada regulatory information Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The user is cautioned that this device should be used only as specified within this manual to meet RF exposure requirements. Use of this device in a manner inconsistent with this manual could lead to excessive RF exposure conditions.

The following statement must be included with all versions of this document supplied to an OEM or integrator, but should not be distributed to the end user.

- This device is intended for OEM integrators only.
- Please See the full Grant of Equipment document for other restrictions.
- This device must be operated and used with a locally approved access point.

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<b>Date: 2010-09-14</b>		<b>Page 3 of 14</b>

**ZINWELL HD Wireless Video Transmission Product**  
**Full HD Video Wireless Module**

---

The following regulatory and Safety notices must be published in documentation supplied to the end user of the product or system incorporating an adapter in compliance with local regulations, Host system must be labeled with "Contains FCC ID: XXX-XXXX", FCC ID displayed on label.

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<b>Date: 2010-09-14</b>		<b>Page 4 of 14</b>

# ZINWELL HD Wireless Video Transmission Product

## Full HD Video Wireless Module

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### 1 Product Features

- ◆ WHDI
  - Digital video: 24/ 30-bit RGB or YCrCb
  - Digital audio: I2S and SPDIF
  - Two-Wire serial bus slave interface
  - One interrupt line
- ◆ Supports any uncompressed video resolutions, including:
  - HD: 720p, 1080i, 1080p, 576p, 480p
  - PC: VGA (640x480), SVGA (800x600), XGA (1024x768)
- ◆ Audio:
  - Up to 3Mbps audio stream:
  - I2S: Two PCM channels (sampled up to 48 KHz x 24 bit)
  - SPDIF: Including AC-3, DTS
- ◆ Strong 256-bit AES encryption
- ◆ User-defined two-way channel with minimum 10 Kbps for data and control
- ◆ Less than 1mSec latency between source and sink
- ◆ Small mechanical footprint:
  - PCB integrated antennas
- ◆ RF characteristics:
  - MIMO technology, using 5GHz unlicensed band, 18MHz bandwidth.
  - Coexists with 802.11a/n and 5.8GHz cordless devices.
  - Support for Automatic Transmission Power Control (ATPC).
  - No line of sight needed between transmitter and receiver. It has a range of over 20 meters (LOS), suitable for almost any room.
  - 14mW typical transmission power per transmitting channel.
  - Maximum 20mW transmission power per transmitting channel.
  - Uplink antenna diversity
- ◆ Power requirements:
  - 3.3V ( $\pm 5\%$ ), ~5.3W

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<b>Date: 2010-09-14</b>		<b>Page 5 of 14</b>

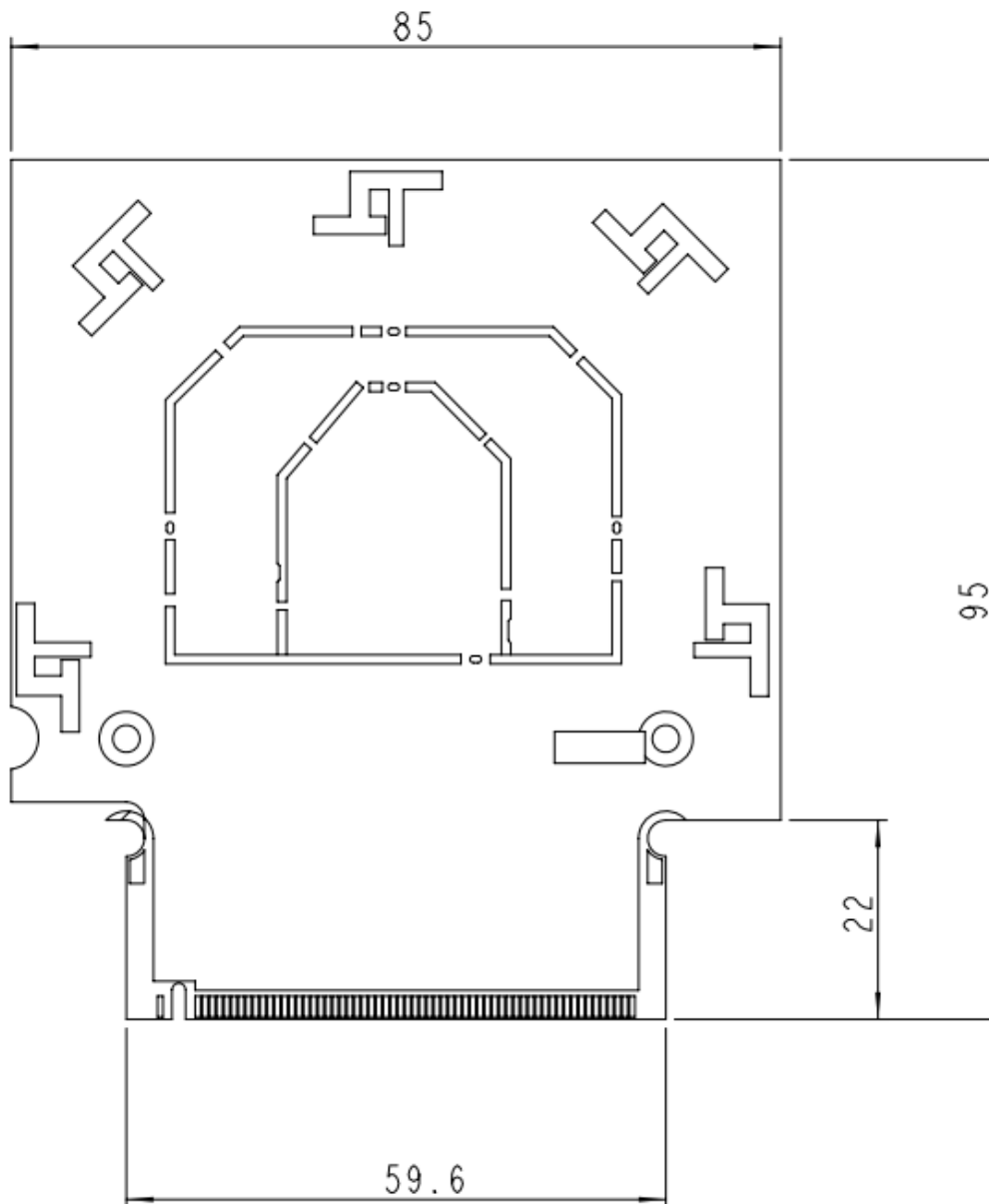
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**Full HD Video Wireless Module**

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**2 Hardware Specifications**

**2.1 Dimension**

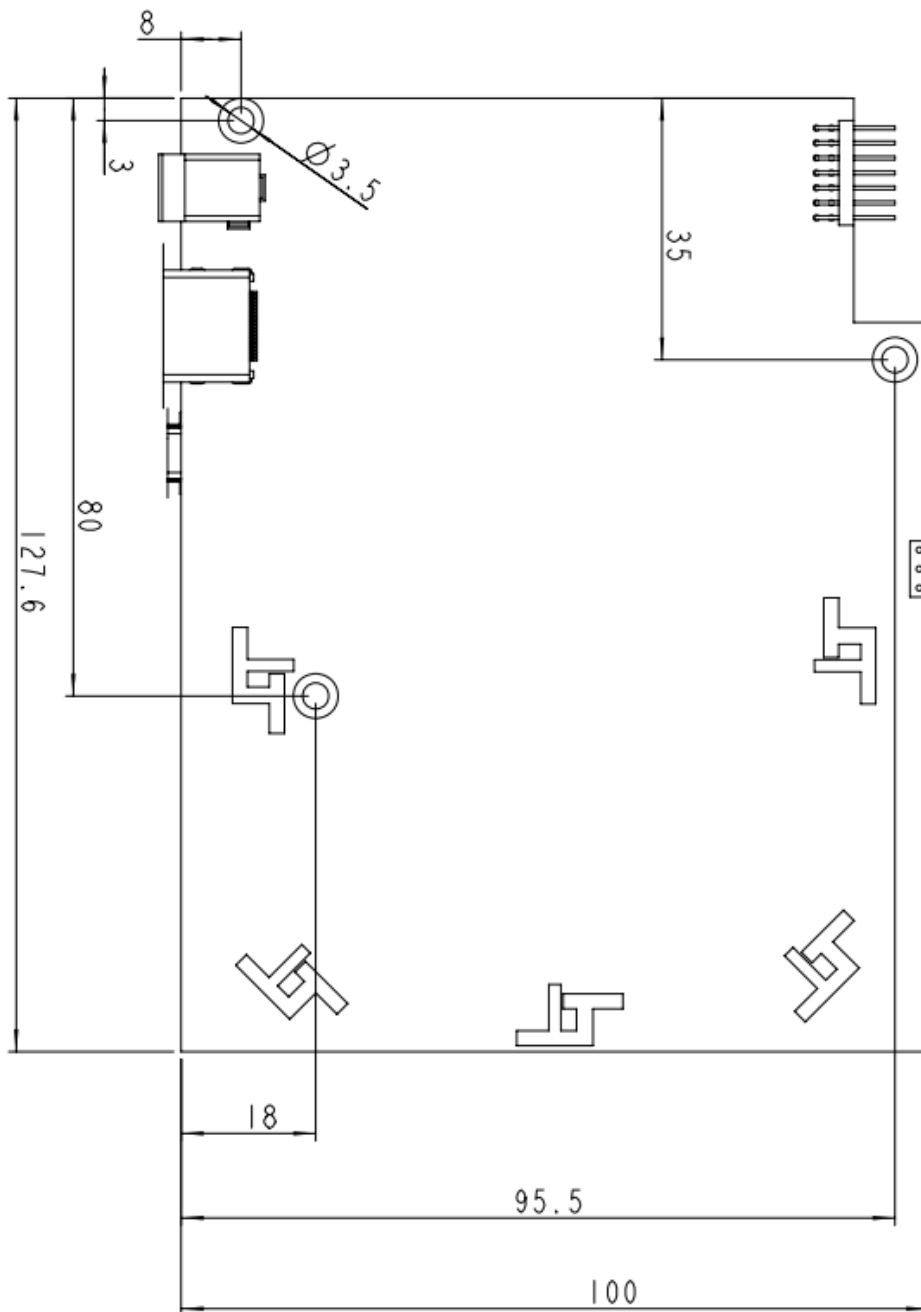
■ TX



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<b>Date: 2010-09-14</b>		<b>Page 6 of 14</b>

ZINWELL HD Wireless Video Transmission Product  
Full HD Video Wireless Module

■ RX



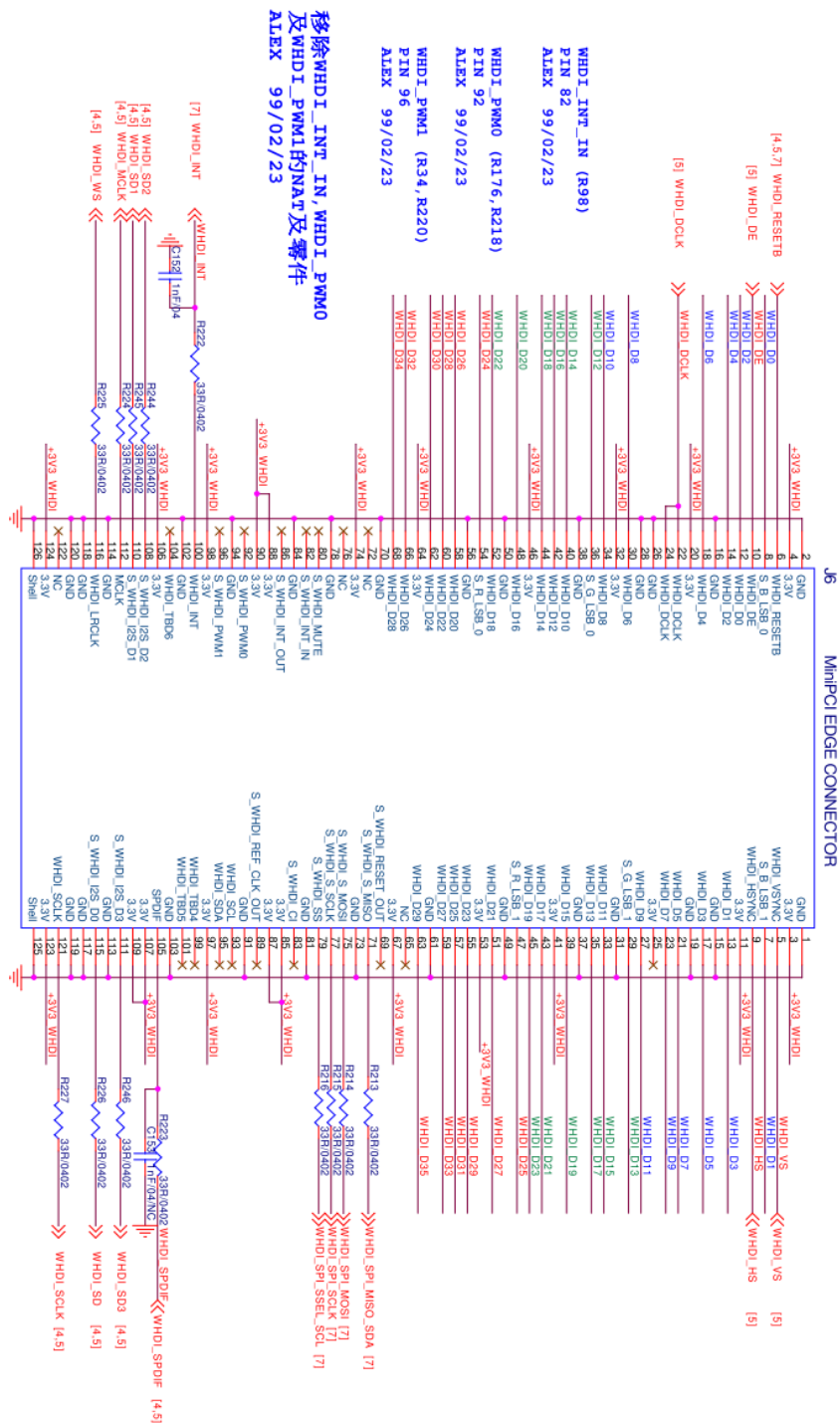
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Date: 2010-09-14		Page 7 of 14

# ZINWELL HD Wireless Video Transmission Product

## Full HD Video Wireless Module

### 2.2 Pin definitions of connector

■ TX :



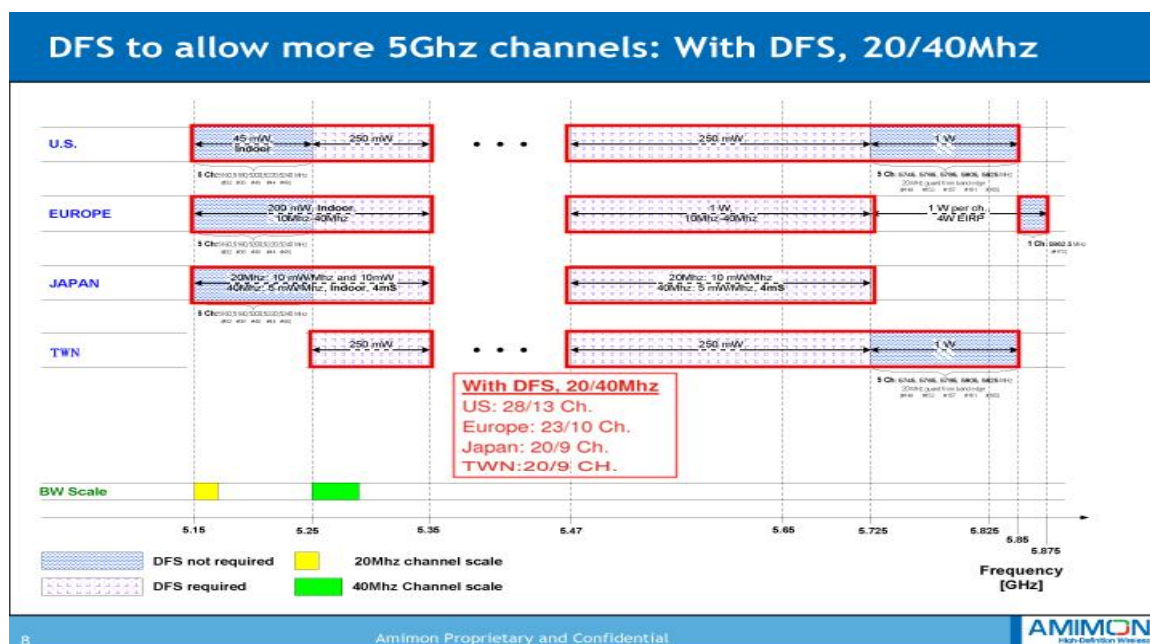


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## Full HD Video Wireless Module

### 3 Regional Frequency Selection

Transmitter and Receiver Units are able to support regional frequency by different country's definition with different software configuration. Support regions: US and EU by different models' definitions.



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## 4 RF test

### 4.1 PSNR test

**Purpose:**

This test verifies the PSNR value of TX box to RX box meet AMIMON Specification.

**Instrument**

Shield Box: ETS 5240-24

Attenuator: ATM AF085-30

AMIMON patch antenna

### Test Methodology

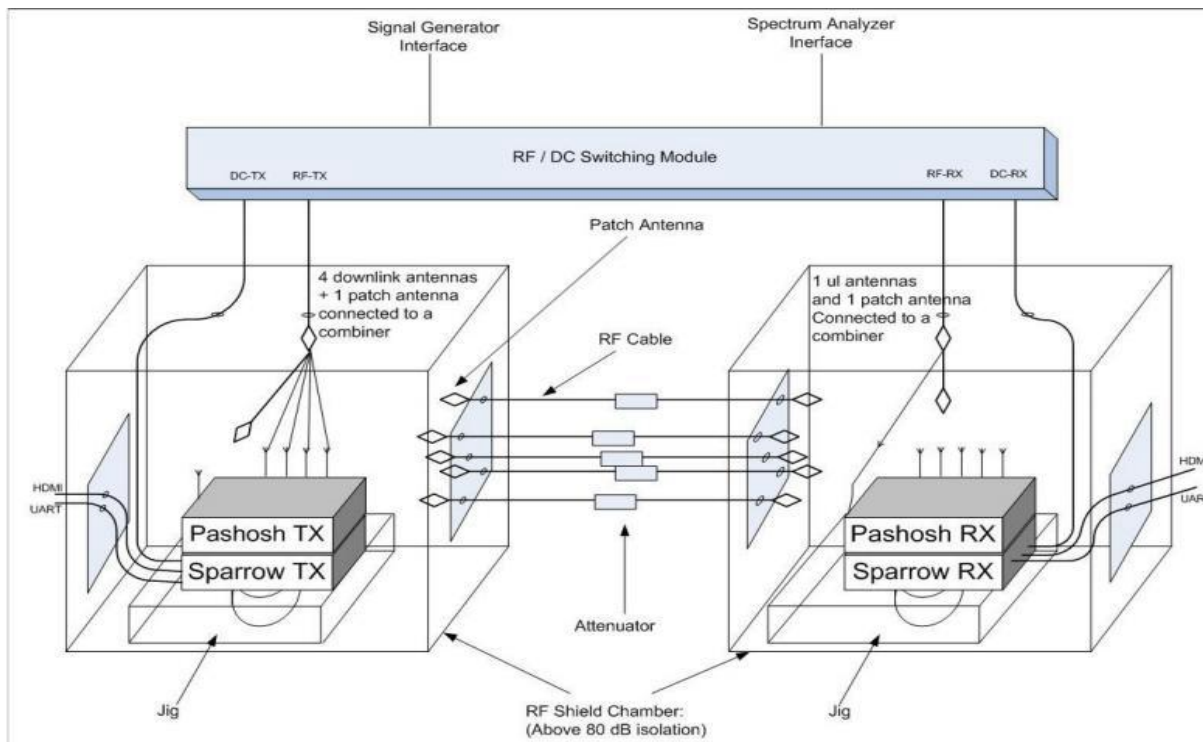
During this test sequence a WHDI link is established (registration + authentication). The video signal is captured using the DVI capture card. The attenuated RF cables connecting the two chambers are calibrated to emulate a 20m link. The following sequence is applied through RX UART interface.

- 1) Switch TX power ON
- 2) Switch RX power ON
- 3) Sparrow TX – Set VGA level to 60dBm (frequency is selected automatically through a AFS mechanism)
- 4) Link registration. Allow 10 seconds for completion.
- 5) Generate video test pattern through the Laptop's HDMI port.
- 6) Capture 30 frames from the video signal using the DVI capture card.
- 7) Calculate min/max/stdev PSNR for the captured frames with the MATLAB application, and compare with test limits.
- 8) Repeat steps 6-8 for every video test pattern (GrayBar,Cyp3)
- 9) Un-register.



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<b>Date: 2010-09-14</b>		<b>Page 10 of 14</b>

## ZINWELL HD Wireless Video Transmission Product

### Full HD Video Wireless Module



### Criteria

Pattern Name	Sample Image	Mean TCbCr PSNR	Low Limit YCbCr PSNR
GrayBar		38.5 dB	38 dB
Cyp3		26.8 dB	26.6 dB

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## ZINWELL HD Wireless Video Transmission Product

### Full HD Video Wireless Module

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#### 4.2 BER test

##### **Purpose:**

This test verifies the BER value of Transmitter/Receiver UUT meet Specification.

##### **Instrument**

Shield Box: ETS 5240-24

Attenuator: ATM AF085-30

AMIMON patch antenna

##### **Test Methodology**

During this test sequence a WHDI link is established (registration + authentication). The audio signal is analyzing by audio analyzer in baseband chip. The attenuated RF cables connecting the two chambers are calibrated to emulate a 20m link. The following sequence is applied through Sparrow RX UART interface.

1. Switch TX power ON
2. Switch RX power ON
3. TX – Set VGA level to 60dBm (frequency is selected automatically through a AFS mechanism)
4. Link registration. Allow 10 seconds for completion.
5. Generate audio test pattern through the Laptop's HDMI port.
6. Hear 30's audio signal from the TV or speaker.
7. Calculate Bit Error Rate for 30's audio analyzer, and compare with test limits.

##### **Criteria**

**BER  $\leq 10^{-4}$**

**Block Error Rate = 0**

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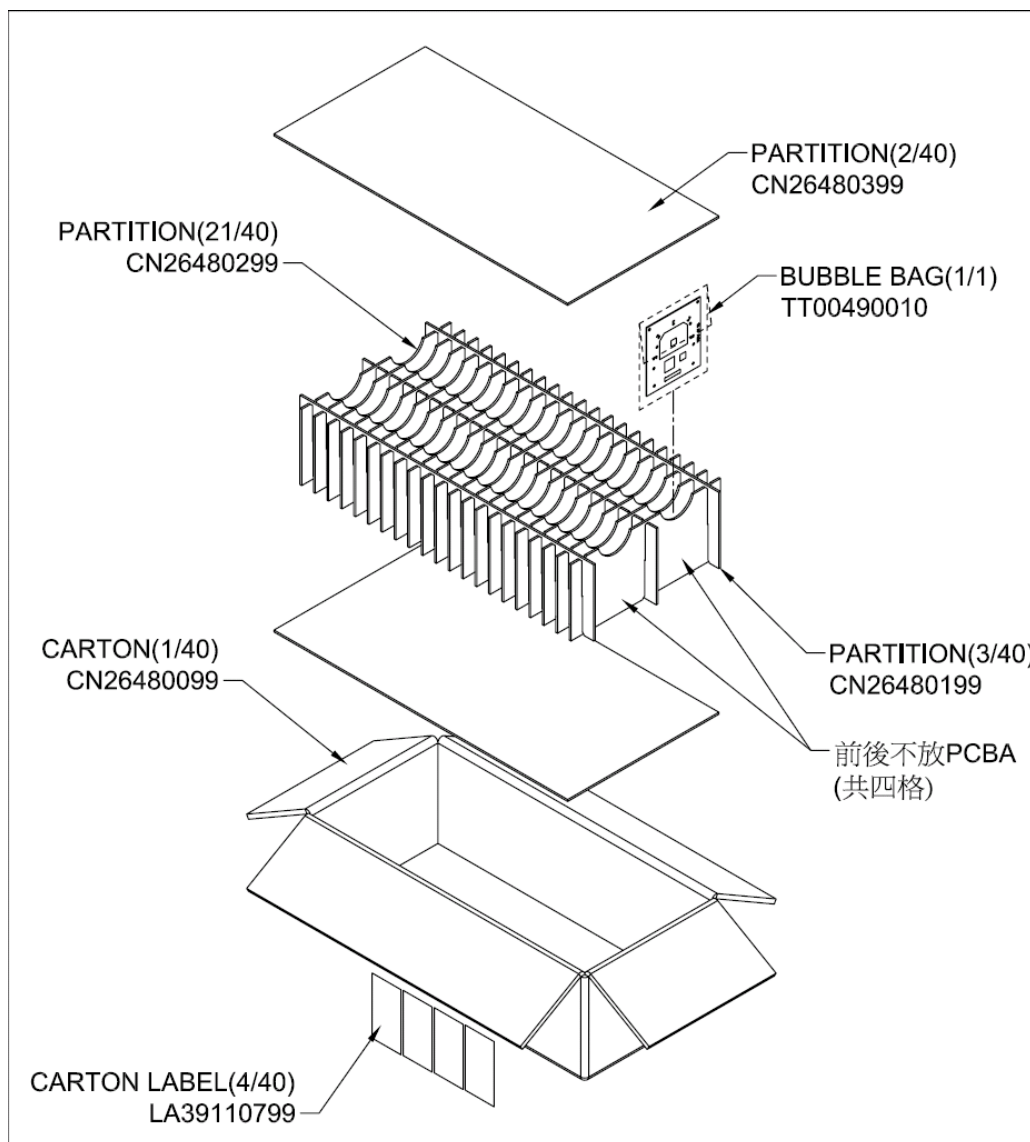
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### Full HD Video Wireless Module

## 5 Packing

### Mass Carton Box Artwork and Dimension

■ TX



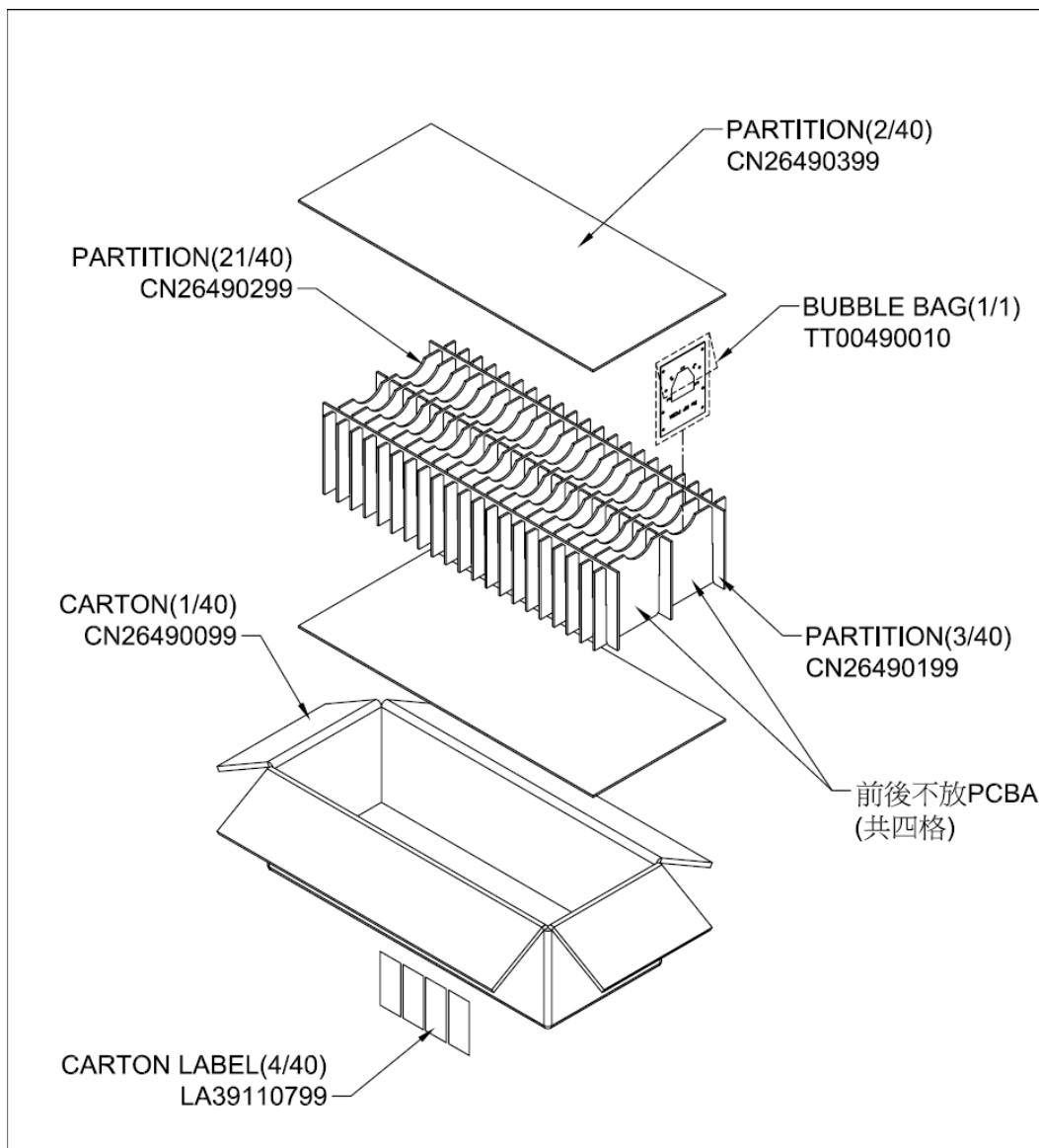
MATERIAL		THIRD ANGLE						
FINISHING								
TREATMENT		UNIT: M.M.	SYM	DESCRIPTION				
SCALE		TOLERANCE		PART NAME				
		F	G	H	J	K	L	PACKING DRAWING
QUANTITY		±0.05	±0.1	±0.2	±0.3	±0.4	±0.5	BASE MODEL
SHEET	1 of 1	DATE	8/27/2009			MODEL NO.	ZRF11310	
APPROVED BY	CHECKED BY	DRAWING BY	DESIGNED BY		DRAWING NO.	PD02750000		
		王文淵	王文淵		<b>ZINWELL®</b>			

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<b>Date: 2010-09-14</b>		<b>Page 13 of 14</b>

# ZINWELL HD Wireless Video Transmission Product

## Full HD Video Wireless Module

■ RX



MATERIAL							THIRD ANGLE			
FINISHING										
TREATMENT							UNIT:M.M.	SYM	DESCRIPTION	
SCALE	TOLERANCE							PART NAME	PACKING DRAWING	
QUANTITY		F	G	H	J	K	L	BASE MODEL		
		±0.05	±0.1	±0.2	±0.3	±0.4	±0.5	MODEL NO.	ZRF12310	
SHEET	1 of 1		DATE	8/27/2009			DRAWING NO.	PD02760000		
APPROVED BY	CHECKED BY	DRAWING BY	DESIGNED BY							
		王文淵	王文淵					<b>ZINWELL®</b>		

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<b>Date: 2010-09-14</b>		<b>Page 14 of 14</b>