

Zinwell Corporation



Full HD Video Wireless Module

User Manual

Transmitter : RF-31100M

Receiver : RF-32100M

Version 0.1

Version: 0.1	Zinwell Corporation 7 th , No. 512, Yuan Shan Road, Chung Ho City, 235, Taipei County, Taiwan TEL:+886 2 22251929 FAX:+886 2 22269654 http://www.zinwell.com.tw	CONFIDENTIAL
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FEDERAL COMMUNICATIONS 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 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.

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 device is operation in 5.15 - 5.25GHz frequency range, then restricted in indoor use only.

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.

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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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: YG7RF31000M", FCC ID displayed on label.

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.

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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.
 - No line of sight needed between transmitter and receiver. It has a range of over 7 meters (LOS), suitable for almost any room.
 - 14mW typical transmission power per transmitting channel.
 - Maximum 20mW transmission power per transmitting channel.
- ◆ Power requirements:
 - 3.3V ($\pm 5\%$), ~5.3W

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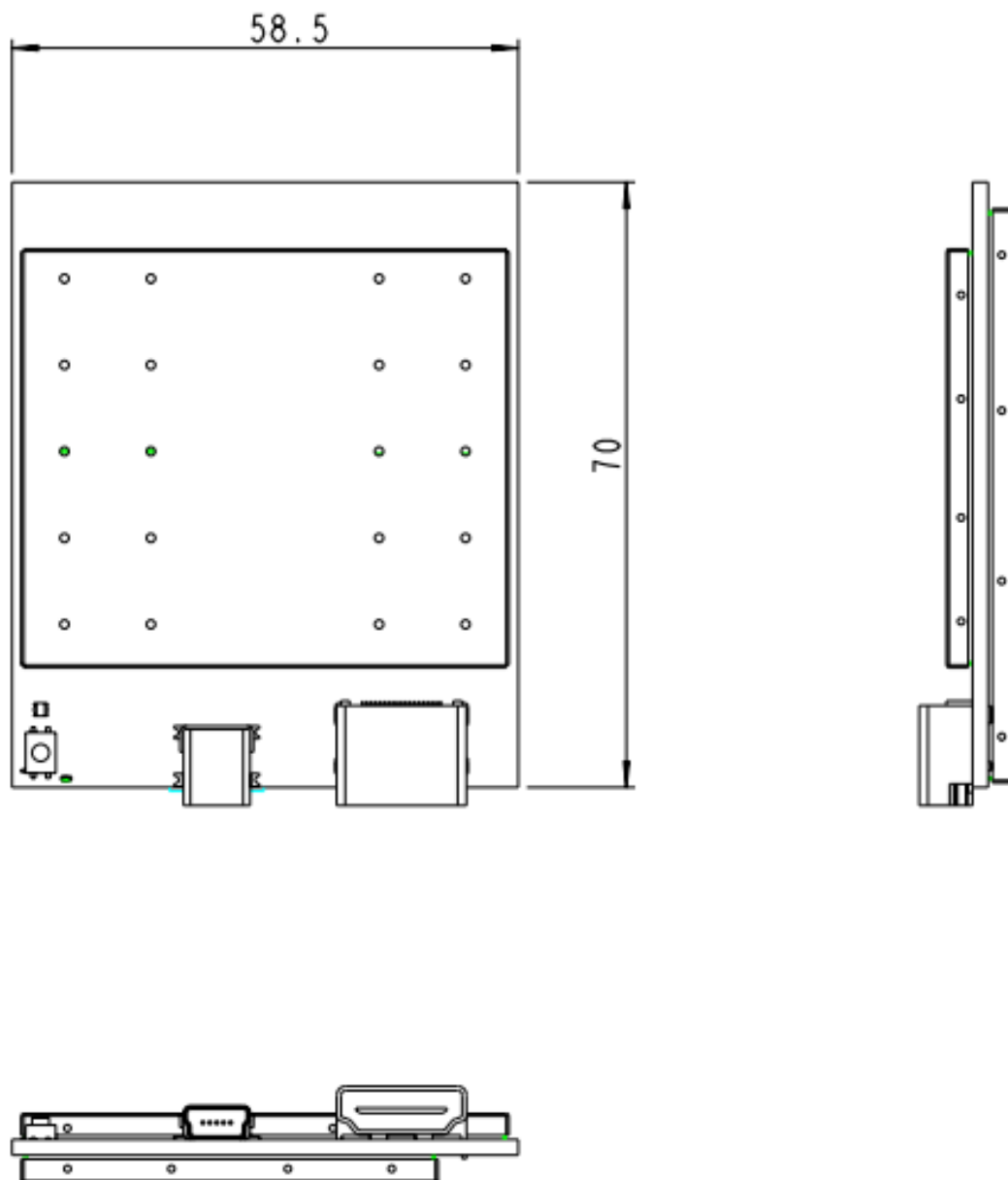
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2 Hardware Specifications

2.1 Dimension

■ TX



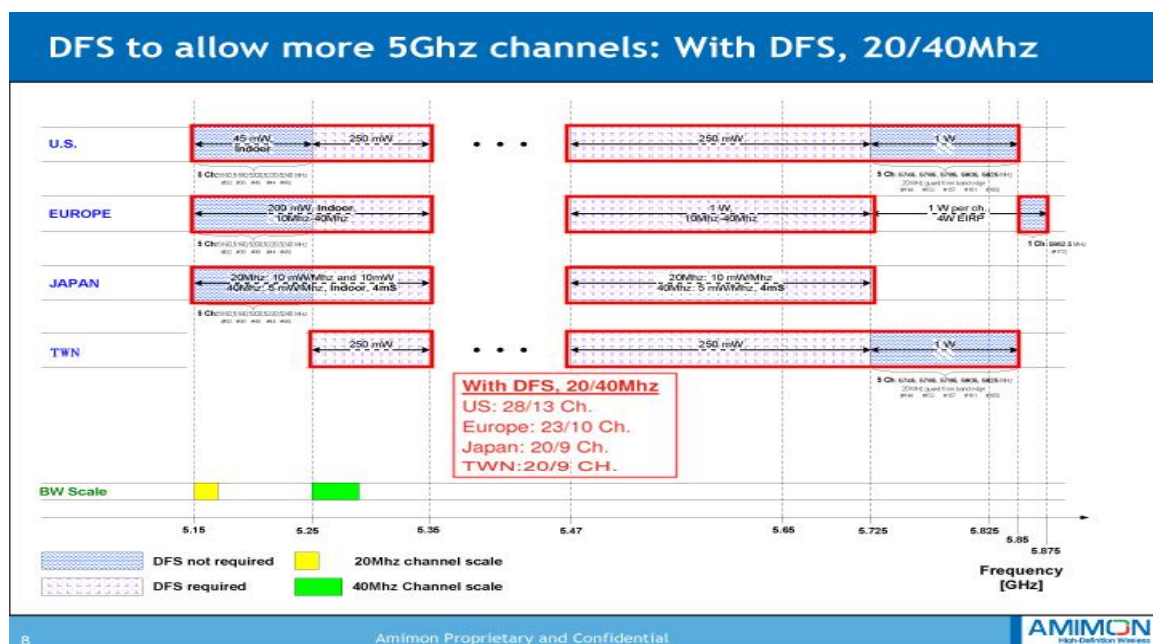
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3 Regional Frequency Selection

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

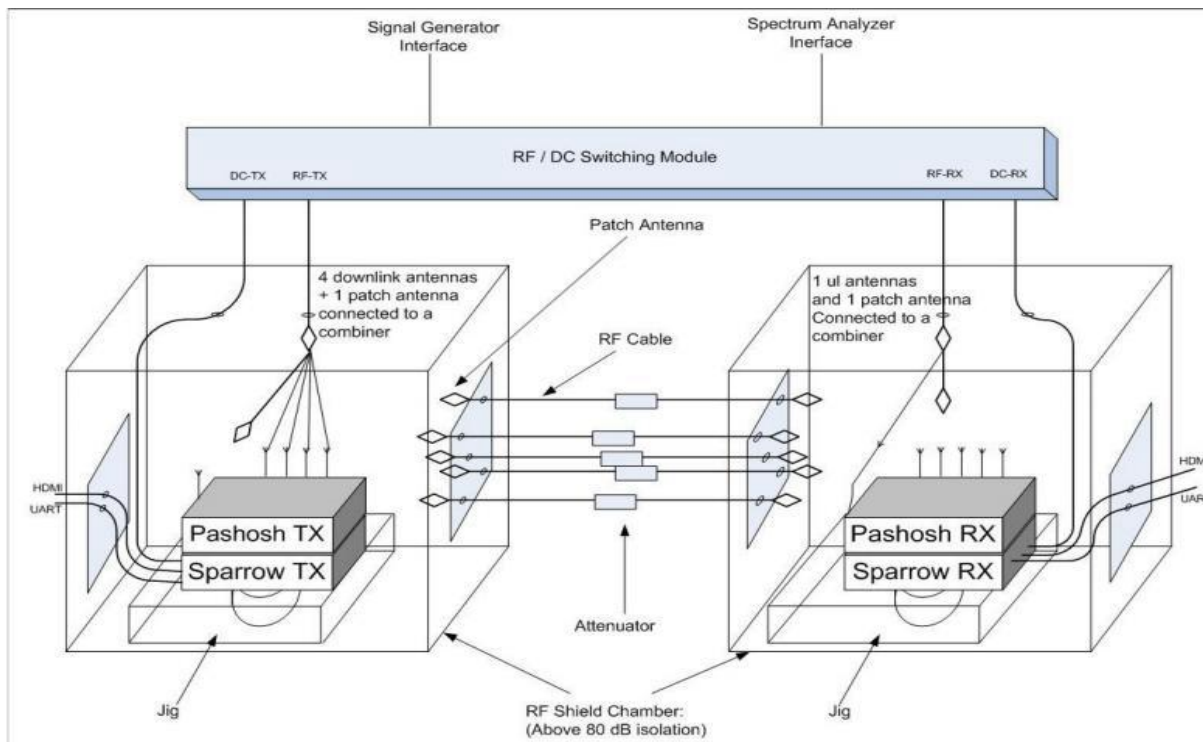
During this test sequence a WHDI link is established (registration + authentication). The video signal is captured using the DVI capture card. The attenuated RF cables connecting the two chambers are calibrated to emulate a 20m link. The following sequence is applied through RX UART interface.

- 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.


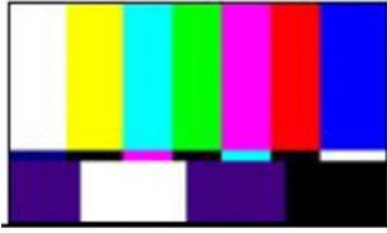
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Criteria

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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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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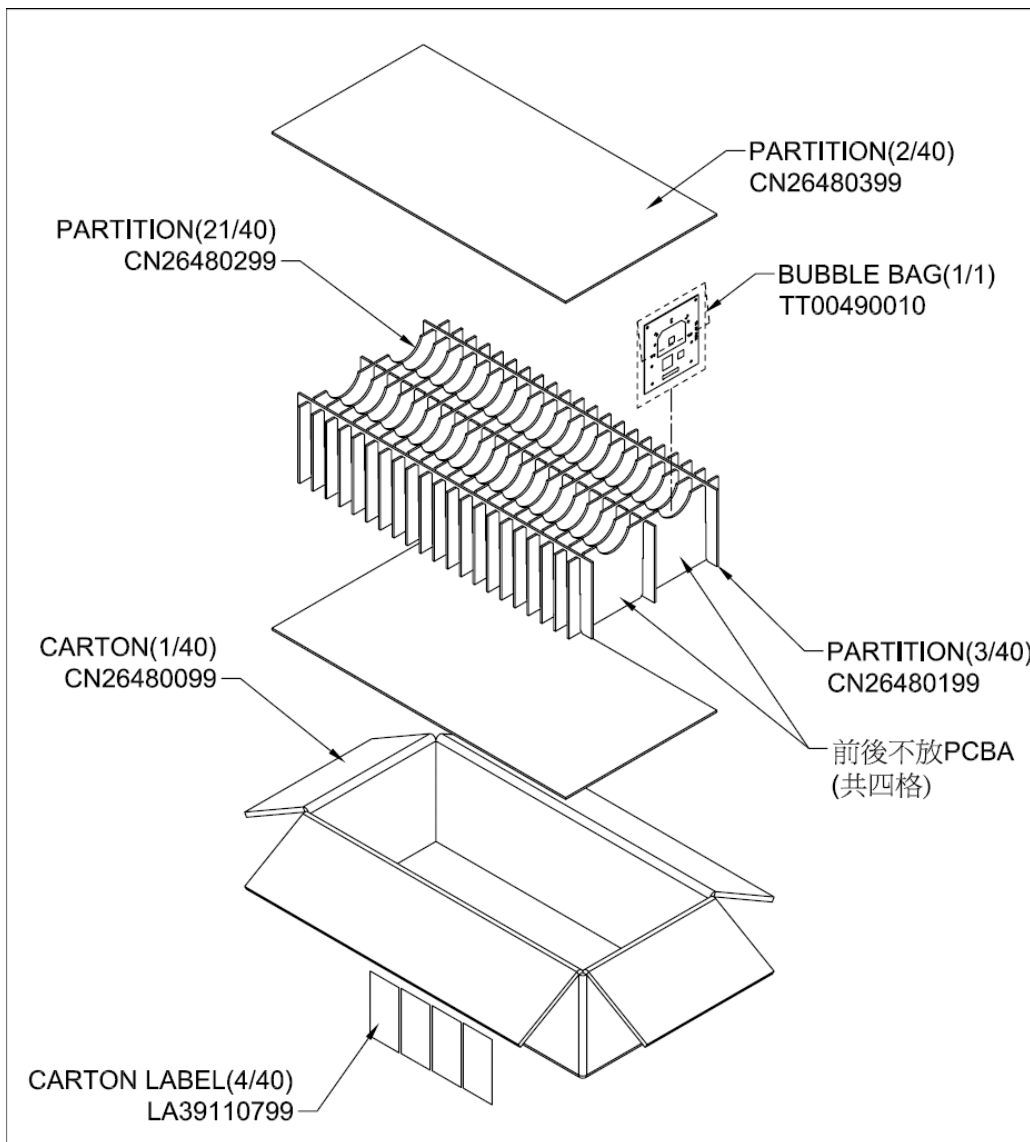
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5 Packing

Mass Carton Box Artwork and Dimension

■ TX



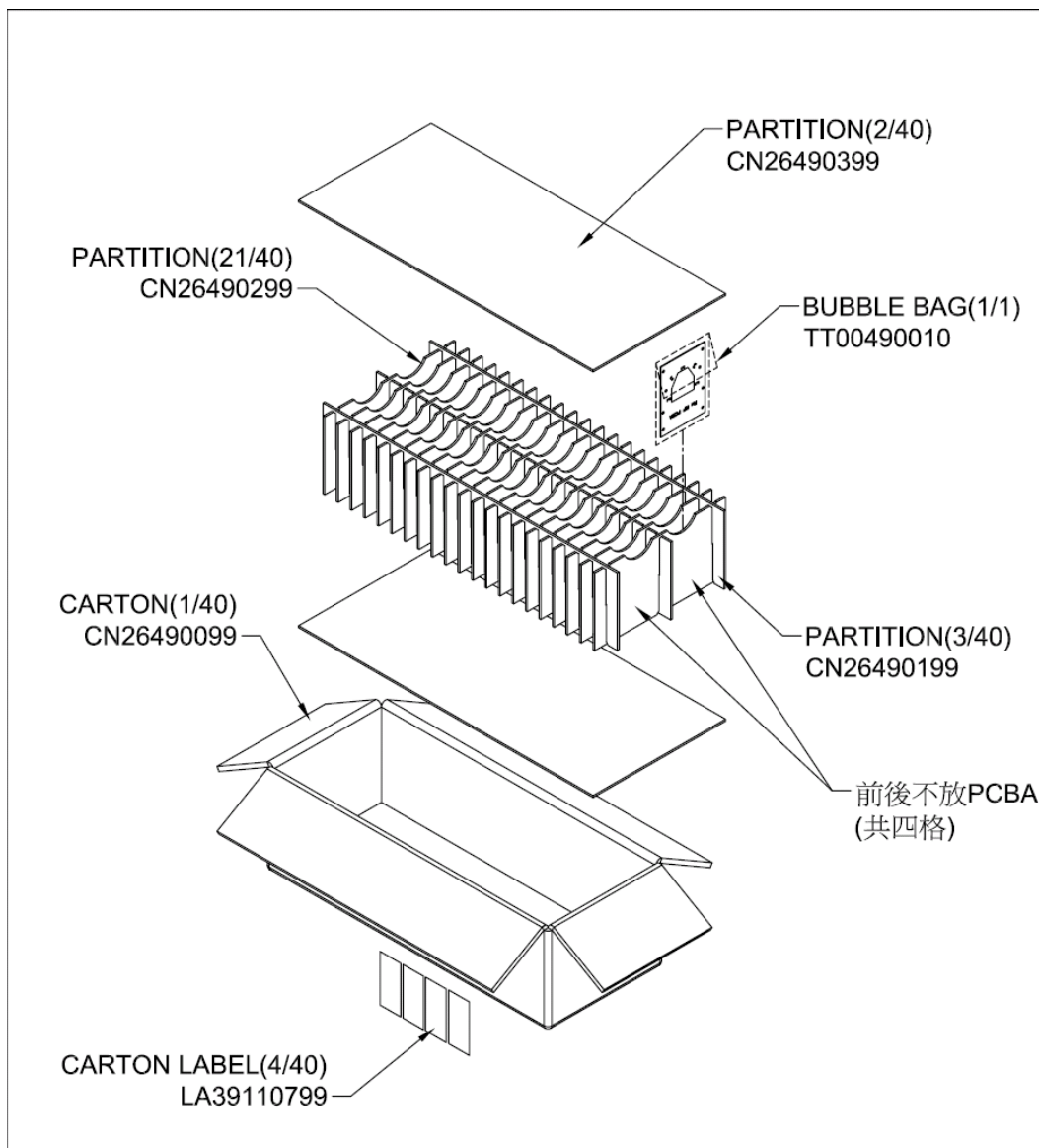
MATERIAL		THIRD ANGLE	△	
FINISHING		⊕	△	
TREATMENT		UNIT: M.M.	SYM	DESCRIPTION
SCALE		TOLERANCE	PART NAME	PACKING DRAWING
QUANTITY		F G H J K L	BASE MODEL	
SHEET	1 of 1	DATE	MODEL NO.	ZRF11310
APPROVED BY	CHECKED BY	DRAWING BY	DESIGNED BY	DRAWING NO. PD02750000
		王文淵	王文淵	ZINWELL®

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■ RX



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

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