



# TR30RDM Series

## Application Note V14

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<p><b>30W AC-DC MEDICAL INTERCHANGEABLE PLUG ADAPTER TR30RDM Series APPLICATION NOTE</b></p>
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**Approved By:**

Department	Approved By	Checked By	Written By
Research and Development Department	Ovid	Yang/Shih Hang	Joyce
Design Quality Department	Benny	JoJo	



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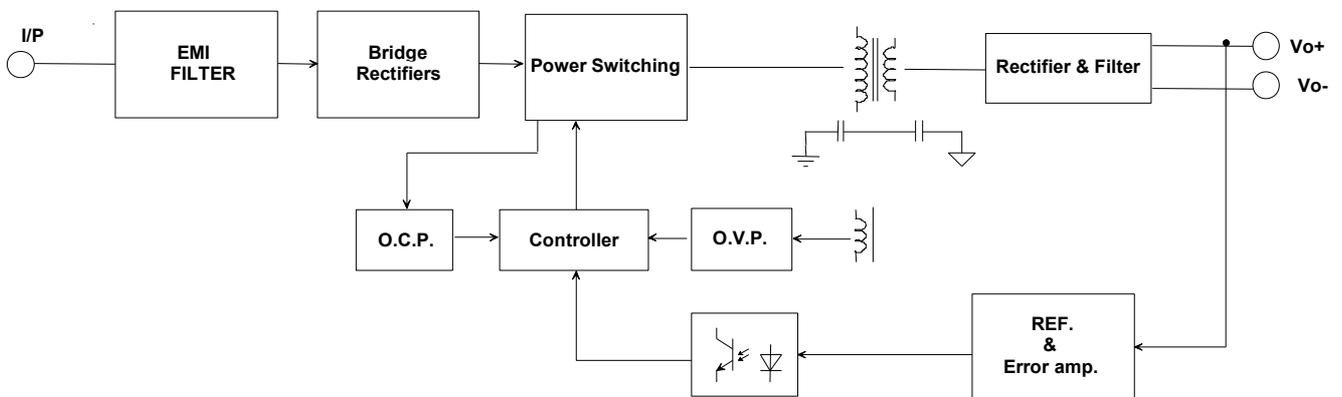
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### 1. Introduction

This application note describes the features and functions of Cincon's TR30RDM series of adapter, switching AC-DC power. These are highly efficient, reliable, compact, high power density, single output AC/DC power. The power is fully protected against short circuit and over-voltage conditions. Cincon's world class automated manufacturing methods, together with an extensive testing and qualification program, ensure that the TR30RDM series power is extremely reliable.

### 2. Electrical Block Diagram





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### 3. Main Features and Functions

#### 3.1 Operating Temperature Range

The highly efficient design of Cincon's TR30RDM series power has resulted in their ability to operate within ambient temperature environments from -25°C to 70°C. Due consideration must be given to the de-rating curves when ascertaining the maximum power that can be drawn from the power. The maximum power which can be drawn is influenced by a number of factors, such as:

- Input voltage range
- Permissible output load (per derating curve)

#### 3.2 Output Protection

All different voltage models have a full continuous short-circuit protection. The unit will auto recover once the short circuit is removed. To provide protection in a fault condition, the unit is equipped with internal over-current protection. The unit operates normally once the fault condition is removed. The power module will supply up to 110% - 160% of rated current. In the event of an over current converter will go into a hiccup mode protection.

### 4. Applications

#### 4.1 Test Set-Up

The basic test set-up to measure parameters such as efficiency and load regulation is shown in Figure 1. When testing the Cincon's TR30RDM series under any transient conditions, please ensure that the transient response of the source is sufficient to power the equipment under test. We can calculate the

- Efficiency
- Load regulation and line regulation

The value of efficiency is defined as:

$$\eta = \frac{V_o \times I_o}{P_{in}} \times 100\%$$

Where:

- Vo is output voltage,
- Io is output current,
- Pin is input power

The value of load regulation is defined as:

$$Load\ reg1. = \frac{V_{FL} - V_{NL}}{V_{NL}} \times 100\%$$

Where:

- V<sub>FL</sub> is the output voltage at 100% full load
- V<sub>NL</sub> is the output voltage at 60% full load

$$Load\ reg2. = \frac{V_{FL} - V_{NL}}{V_{NL}} \times 100\%$$

Where:

- V<sub>FL</sub> is the output voltage at 60% full load
- V<sub>NL</sub> is the output voltage at 20% full load

The value of line regulation is defined as:

$$Line\ reg. = \frac{V_{HL} - V_{LL}}{V_{LL}} \times 100\%$$

Where:

- V<sub>HL</sub> is the output voltage of maximum input voltage at 100% full load
- V<sub>LL</sub> is the output voltage of minimum input voltage at 100% full load

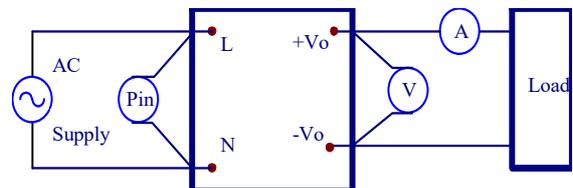


Figure 1. TR30RDM Series Test Setup

#### 4.2 Output Ripple and Noise Measurement

The test set-up for noise and ripple measurements is shown in Figure 2 Measured method:

Add a C1: 10uF electrolytic capacitor and a C2: 0.1uF ceramic capacitor to output at 20 MHz band width.

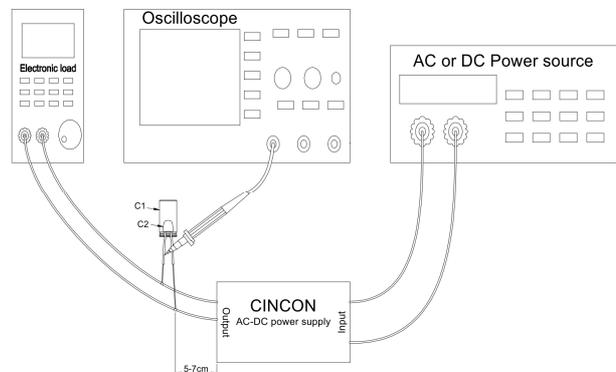


Figure 2. Output Voltage Ripple and Noise Measurement Set-Up

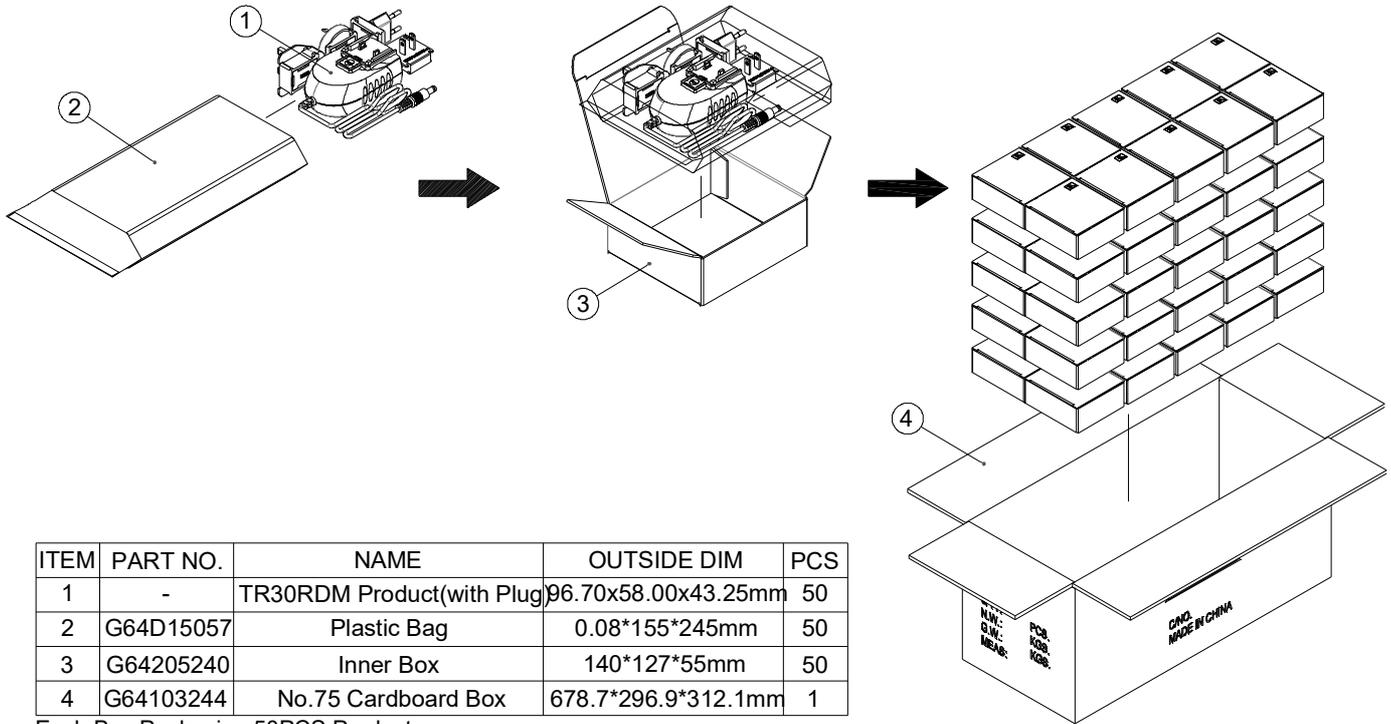


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### 5. Packing Information

The packing information for TR30RDM series is showing as follows:



ITEM	PART NO.	NAME	OUTSIDE DIM	PCS
1	-	TR30RDM Product(with Plug)	96.70x58.00x43.25mm	50
2	G64D15057	Plastic Bag	0.08*155*245mm	50
3	G64205240	Inner Box	140*127*55mm	50
4	G64103244	No.75 Cardboard Box	678.7*296.9*312.1mm	1

Each Box Packaging 50PCS Products  
Gross weight Ref. 12.0Kg

TR30RDM 50pcs a box, including the total weight of package material about 12.0Kg

#### Headquarters:

14F, No.306, Sec.4, Hsin Yi Rd.  
Taipei, Taiwan  
Tel: 886-2-27086210  
Fax: 886-2-27029852  
E-mail: [sales@cincon.com.tw](mailto:sales@cincon.com.tw)  
Web Site: <https://www.cincon.com>

#### CINCON ELECTRONICS CO., LTD.

#### Factory:

No. 8-1, Fu Kung Rd.  
Fu Hsing Industrial Park  
Fu Hsing Hsiang,  
Chang Hua Hsien, Taiwan  
Tel: 886-4-7690261  
Fax: 886-4-7698031

#### Cincon North America:

1655 Mesa Verde Ave. Ste 180  
Ventura, CA 93003  
Tel: 805-639-3350  
Fax: 805-639-4101  
E-mail: [info@cincon.com](mailto:info@cincon.com)