



# TR70M Series Application Note V13

## 70W AC-DC Medical Switch Adapter TR70M Series APPLICATION NOTE



**Approved By:**

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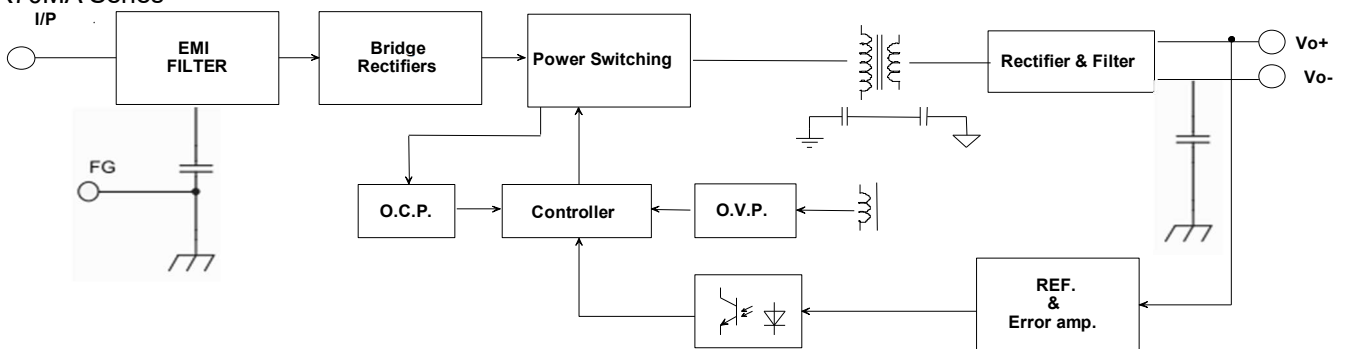
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### 1. Introduction

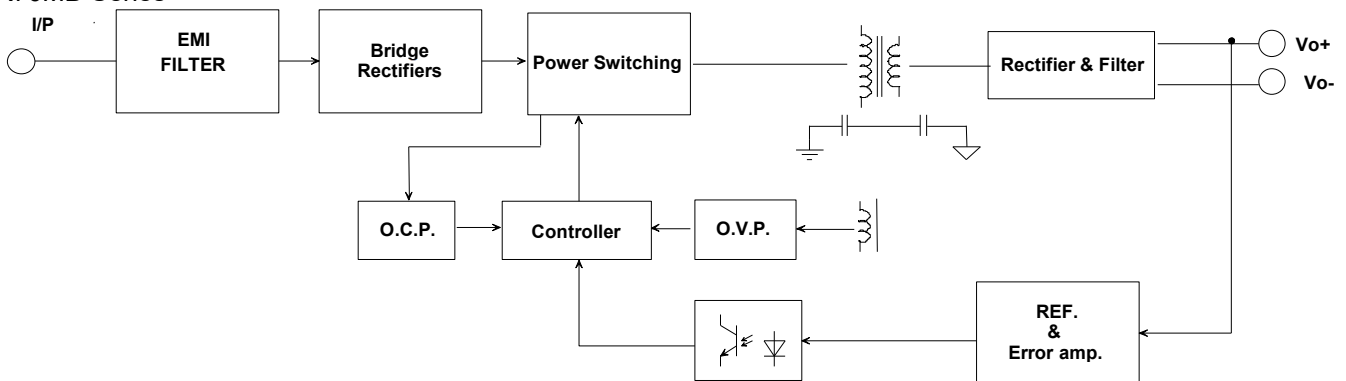
This application note describes the features and functions of Cincon's TR70MA/B series of AC-DC switch power adapter. These are highly efficient, reliable, compact, high power density, single output AC-DC switch power adapter. The switch power adapter is fully protected against short circuit and over-voltage conditions. Cincon's world class automated manufacturing methods, together with an extensive testing and qualification program, ensure that the TR70MA/B series switch power adapter is extremely reliable.

### 2. Electrical Block Diagram

TR70MA Series



TR70MB Series





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### 3. Main Features and Functions

#### 3.1 Operating Temperature Range

The highly efficient design of Cincon's TR70MA/B series switch power adapter has resulted in their ability to operate within ambient temperature environments from -20°C to 40°C. -30°C can be start-up at full load. Due consideration must be given to the de-rating curves when ascertaining the maximum power that can be drawn from the switch power adapter. 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)
- Effective heat sinks

#### 3.2 Output Protection (Over Current 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 120-140% 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 TR70MA/B 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 full load
- V<sub>NL</sub> is the output voltage at 60% load

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

Where:

- V<sub>FL</sub> is the output voltage at 60% load
- V<sub>NL</sub> is the output voltage at 20% 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 full load.
- V<sub>LL</sub> is the output voltage of minimum input voltage at full load.

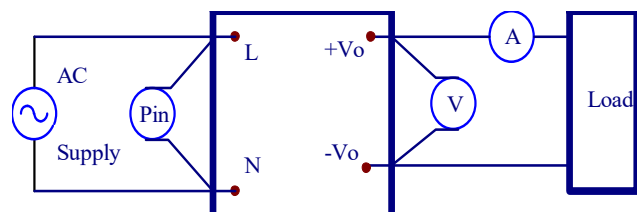


Figure 1. TR70MA/B Series Test Setup

#### 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 C1:10 uF electrolytic capacitor and a C2:0.1 uF ceramic capacitor to output at 20 MHz Band Width.

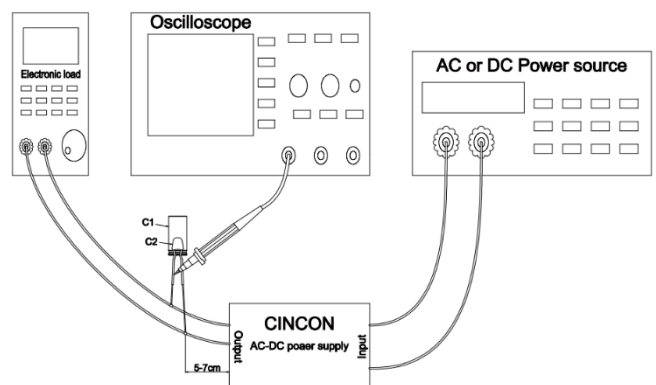


Figure 2. Output Voltage Ripple and Noise Measurement Set up

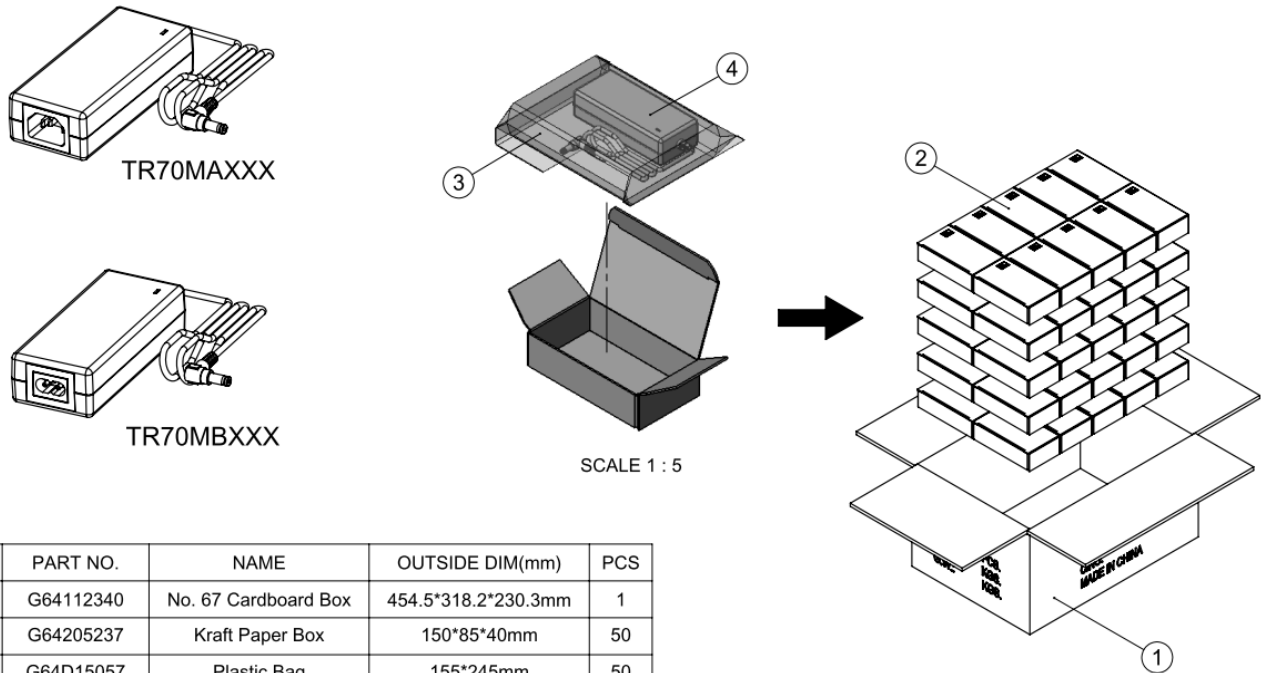


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### 5. Packing Information

The packing information for TR70MA/BXXX series is showing as follows:



ITEM	PART NO.	NAME	OUTSIDE DIM(mm)	PCS
1	G64112340	No. 67 Cardboard Box	454.5*318.2*230.3mm	1
2	G64205237	Kraft Paper Box	150*85*40mm	50
3	G64D15057	Plastic Bag	155*245mm	50
4	G98~	TR70MXXXX Product	120*52*31mm	50

Each Box Packaging 50 PCS Products  
 Gross weight Ref. 17.5 Kg  
 Net weight 15.0 Kg

#### 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:

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