



TR160M Series Application Note V11

160W AC-DC Medical Switch Power Adapter TR160M Series APPLICATION NOTE



Approved By:

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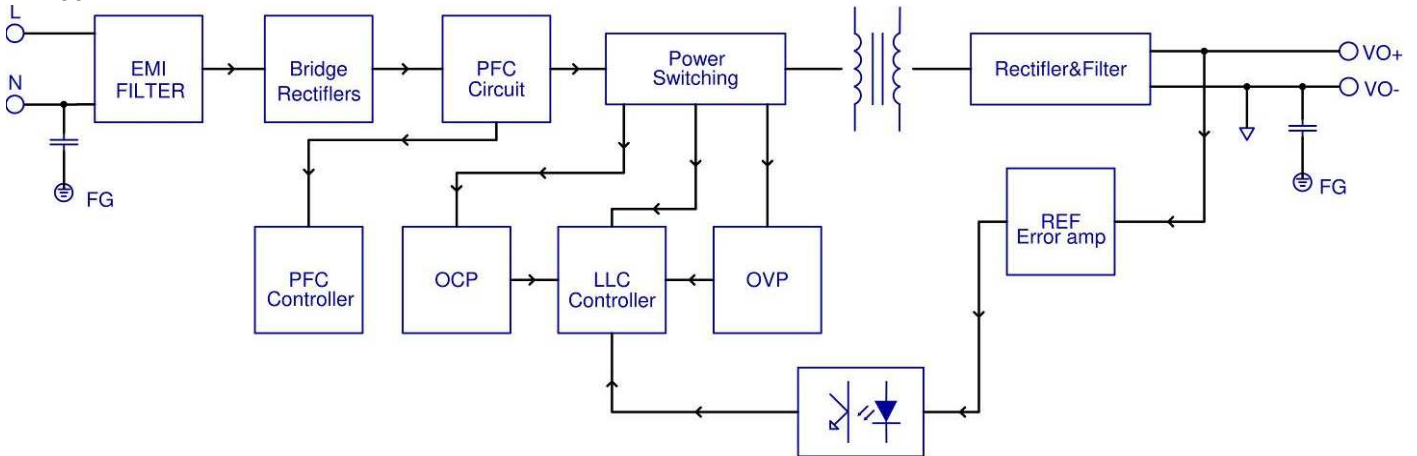
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1. Introduction

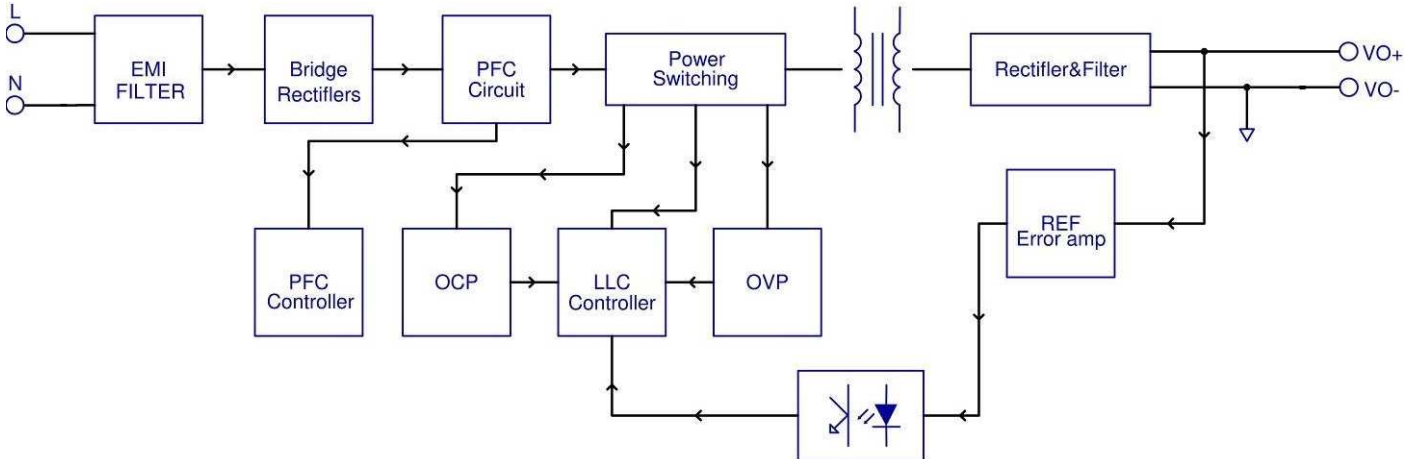
This application note describes the features and functions of Cincon's TR160MA/B series of AC-DC switch power adapter. These are highly efficient, reliable, compact, high power density, single output AC/DC switch power adapter. The switch power adapter is fully protected against short circuit and over-voltage conditions. Cincon's world class automated manufacturing methods, together with an extensive testing and qualification program, ensure that the TR160MA/B series switch power adapter is extremely reliable.

2. Electrical Block Diagram

TR160MA Series



TR160MB Series





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3. Main Features and Functions

3.1 Operating Temperature Range

The highly efficient design of Cincon's TR160MA/B series switch power adapter has resulted in their ability to operate within ambient temperature environments from -20°C to 70°C (40°C~70°C with 2.5%/°C de-rating). Due consideration must be given to the de-rating curves when ascertaining the maximum power that can be drawn from the module. The maximum switch power adapter 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)

The switch power adapter provide 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 will operate normally once the fault condition is removed. The switch power adapter will go to hiccup mode if the output current is set from 110% to 130% of rated current.

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 TR160MA/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_{FL} is the output voltage at full load
- V_{NL} is the output voltage at 60% load

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

Where:

- V_{FL} is the output voltage at 60% load
- V_{NL} 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_{HL} is the output voltage of maximum input voltage at full load
- V_{LL} is the output voltage of minimum input voltage at full load

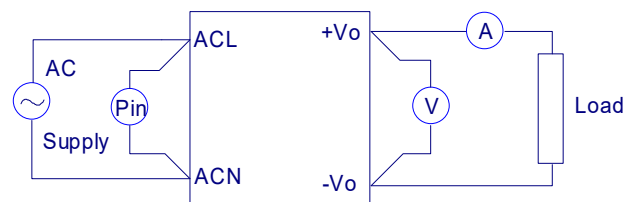


Figure 1. TR160MA/B Series Test Setup

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

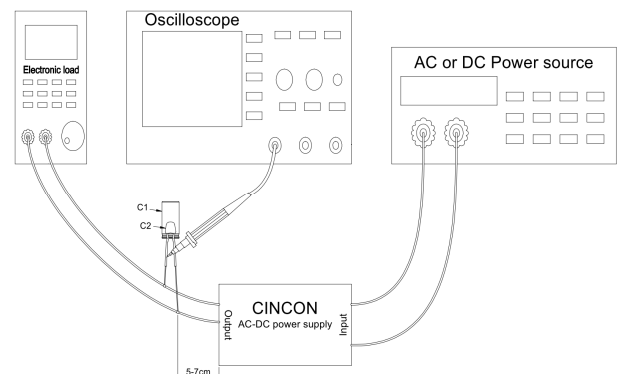


Figure 2. Output Voltage Ripple and Noise Measurement Set up

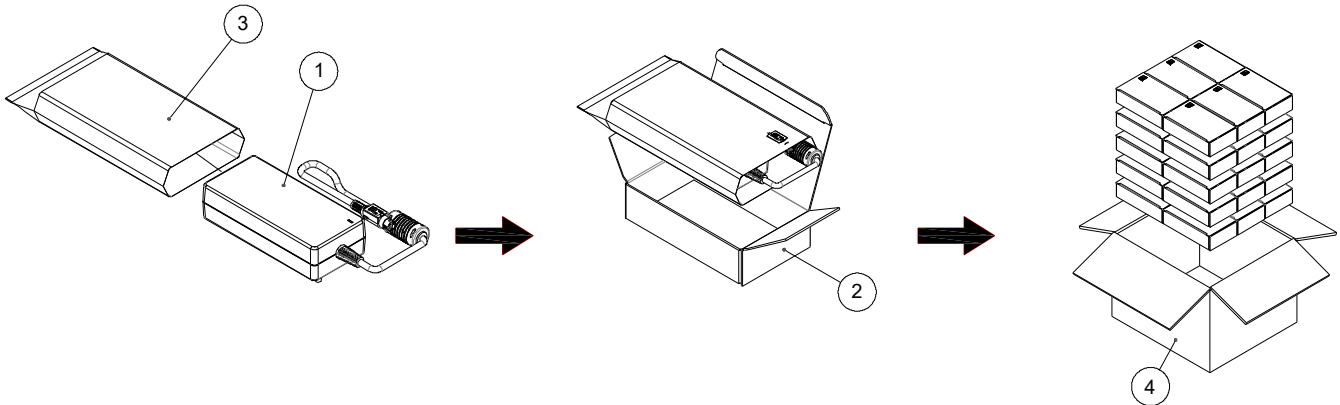


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5. Packing Information

The packing information for TR160MA/BXXX series is showing as follows:



ITEM	PART NO.	NAME	OUTSIDE DIM	PCS
1		TR160MXXXX Proudct	150x70x39mm	30
2	G64205321	Inner Box	185x110x50mm	30
3	G64D15057	Plasitc Bag	155x245x0.08mm	30
4	G64114345	NO.163 Cardboard Box	385x345x280mm	1

Each Box Packaging 30 PCS Products

Net weight Ref. 17.1 Kg

Gross weight Ref. 18.5 Kg

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