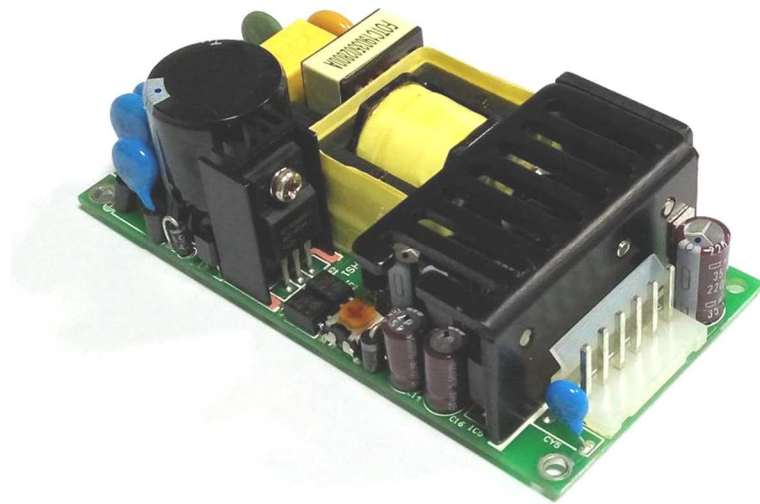




CFM40D/T Series Application Note V11

AC-DC Switching Power Module CFM40D/T Series APPLICATION NOTE



Approved By:

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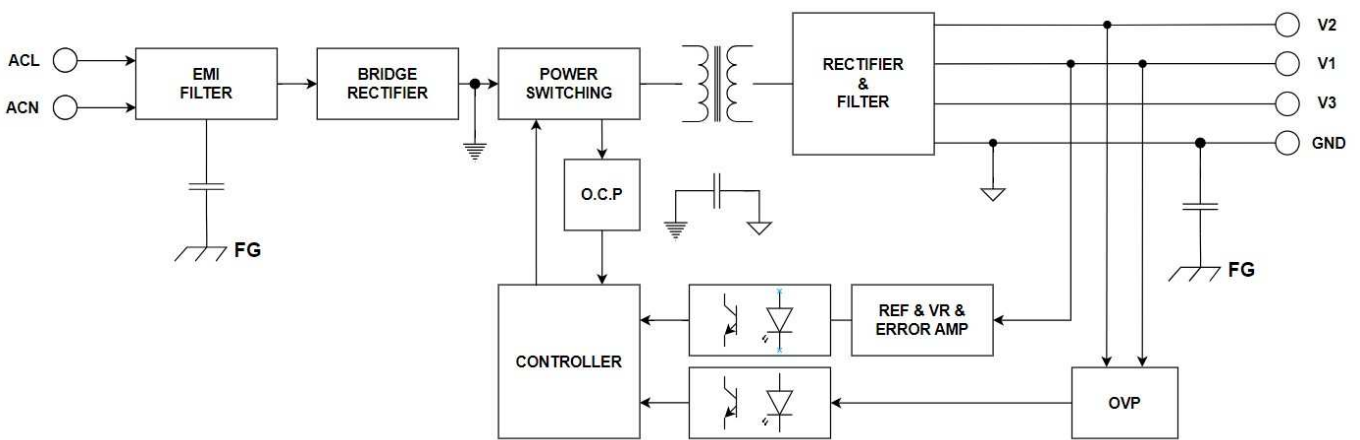
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1. Introduction

This application note describes the features and functions of Cincon's CFM40D/T series of open frame, switching AC-DC power module. These are highly efficient, reliable, compact, high power density, single output AC/DC power modules. The module 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 CFM40D/T series power module is extremely reliable.

2. Electrical Block Diagram





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3. Main Features and Functions

3.1 Operating Temperature Range

Cincon's CFM40D/T series power modules, which highly efficient design, has resulted in its ability to operate ambient temperature environment (0°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 module. The maximum power drawn is influenced by a number of factors, such as:

- Input voltage range
- Output load current
- These can be effective heat sinks for the power module.

3.2 Output Protection

The power modules provide 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 will operate normally once the fault condition is removed. The power module will be over voltage protected and auto-recovery while fault conditions moved.

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 CFM40D/T 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:

$$\eta = \frac{V_{o1} \times I_{o1} + V_{o2} \times I_{o2} + V_{o3} \times I_{o3}}{P_{in}} \times 100\%$$

Where:

- Vo1 is output voltage for V1
- Io1 is output current for V1
- Vo2 is output voltage for V2
- Io2 is output current for V2
- Vo3 is output voltage for V3
- Io3 is output current for V3
- Pin is input power

The value of load regulation is defined as:

$$Load\ reg. = \frac{V_{L(100\%)} - V_{L(60\%)}}{V_{L(60\%)}} \times 100\% - A$$

$$Load\ reg. = \frac{V_{L(60\%)} - V_{L(20\%)}}{V_{L(20\%)}} \times 100\% - B$$

Where:

- V_{L(100%)} is the output voltage at full load
- V_{L(60%)} is the output voltage at 60% load
- V_{L(20%)} is the output voltage at 20% load
- Other output set to 60% rated load, A and B must comply with the specifications.

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.

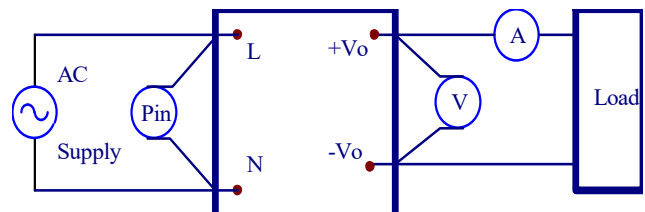


Figure 1. CFM40D/T Series Test Set-up

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

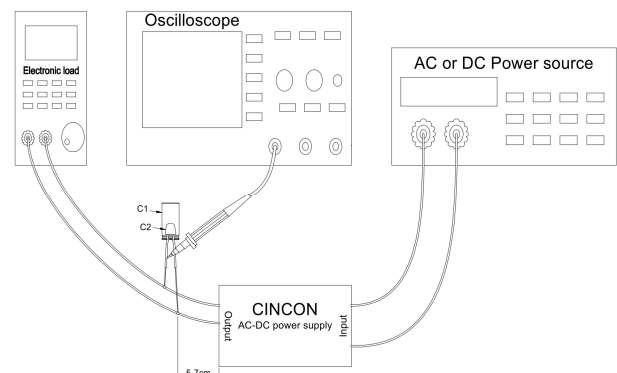


Figure 2. Output Voltage Ripple and Noise Measurement Set-up



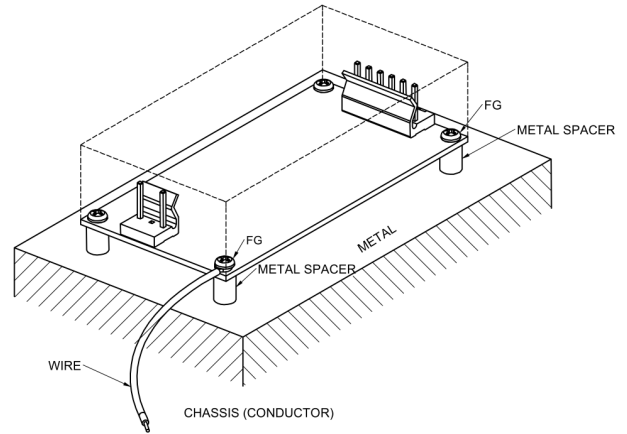
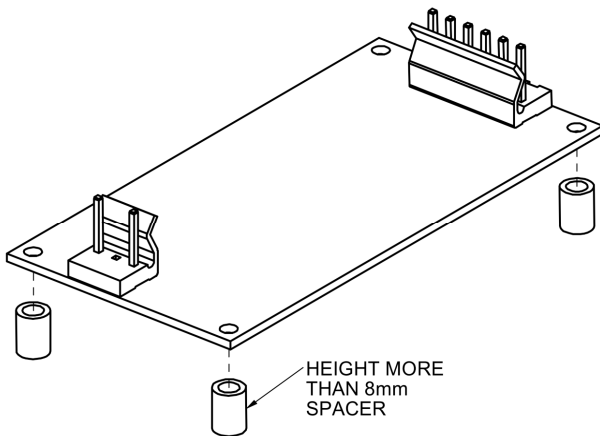
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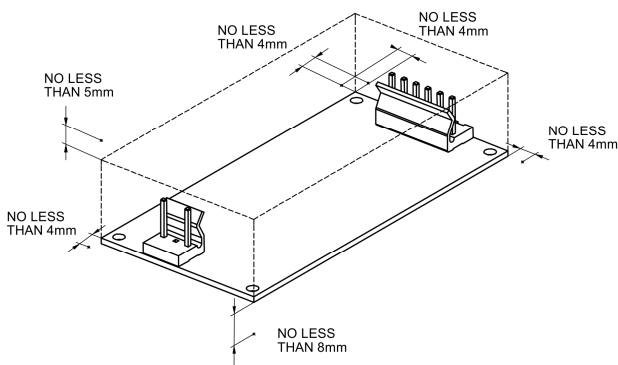
4.3 Installation Instruction

The CFM40D/T series has four 3.17mm diameter mounting holes. Please use the mounting holes as follows:

Insert the spacer (6mm diameter max.) of 8mm height or more to mount the unit. The vibration specification applies when the unit is mounted on 8mm spacers.



Please allow 4mm side clearance from the components and all side of the PCB. Allow 5mm clearance above the highest parts on the PCB. Be especially careful to allow 8mm between the solder side of the PCB and the mounting surface. If the clearances are not sufficient, the specifications for isolation and withstand will not be valid



FG should be connected to the earth (ground) terminal of the apparatus. If not, the conducted noise and output noise will increase.

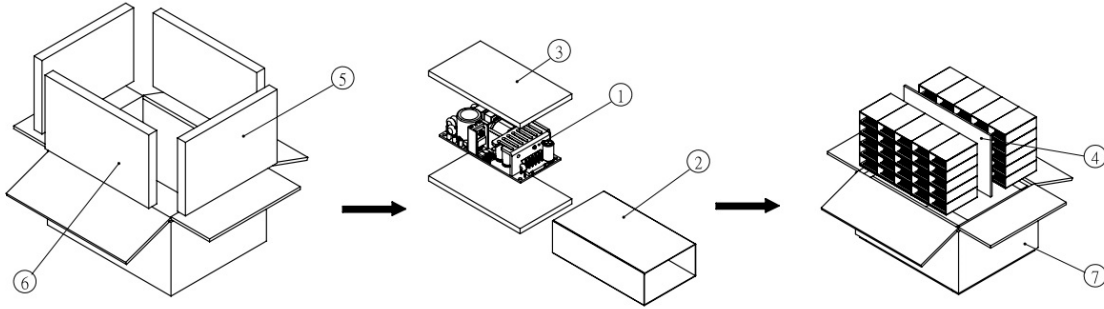


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5. Packing Information

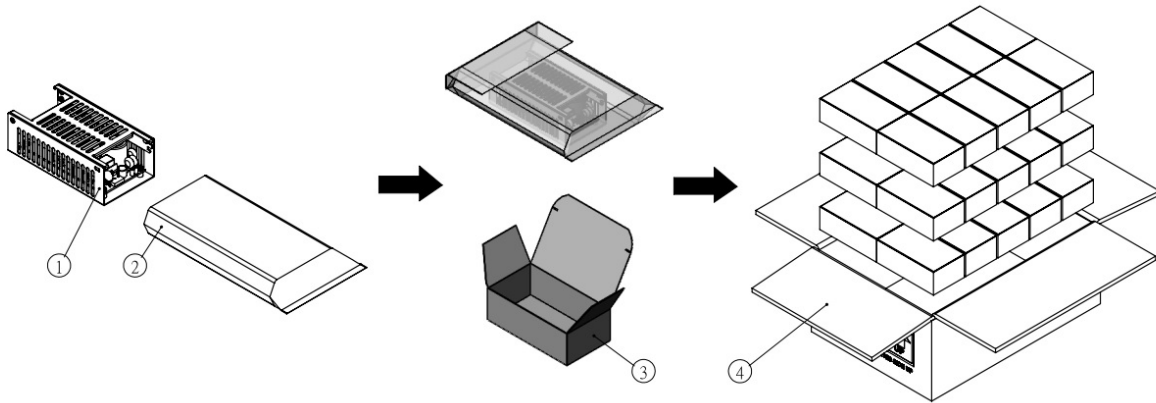
The packing information for CFM40D-XX series is showing as follows:



ITEM	PART NO.	NAME	OUTSIDE DIM(mm)	PCS
1		CFM40D-XX	101.6x50.8x31.1	50
2	G64304165	Inner Box	115x65x35	50
3	G64308313	Antistatic Foma	115x65x5.5	100
4	G64U10075	Partition	326x200x6	1
5	G64301115	Antistatic Foam	288x200x25	2
6	G64301114	Antistatic Foam	326x200x25	2
7	G64114347	No.149 Cardboard Box	388x300x220	1

Each Box Packaging 50 PCS Products
Gross weight Ref. 11 Kg

The packing information for CFM40D-XX-CA series is showing as follows:



ITEM	PART NO.	NAME	OUTSIDE DIM(mm)	PCS
1		CFM40D-XX-CA	117x63x40	30
2	G64D15057	Plastic Bag	245x155x0.08	30
3	G64304071	Inner Box	121.5x66x42	30
4	G64112339	No.59 Cardboard Box	360.6x257.6x148.5	1

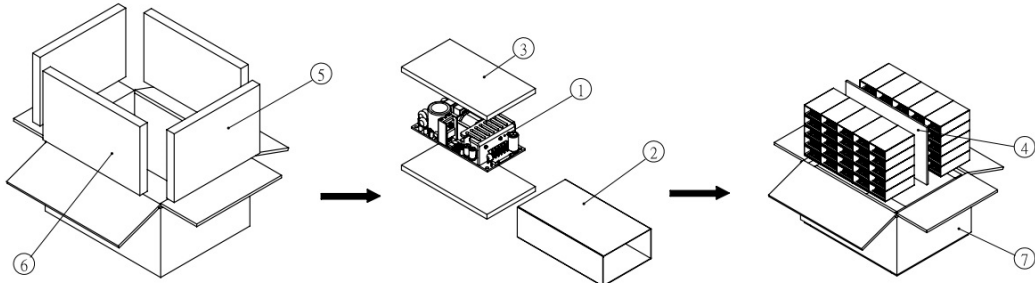
Each Box Packaging 30 PCS Products
Gross weight Ref. 8.6 Kg



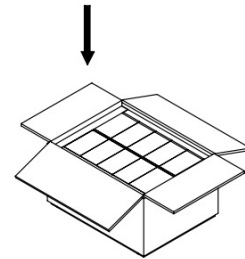
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The packing information for CFM40T-XX series is showing as follows:

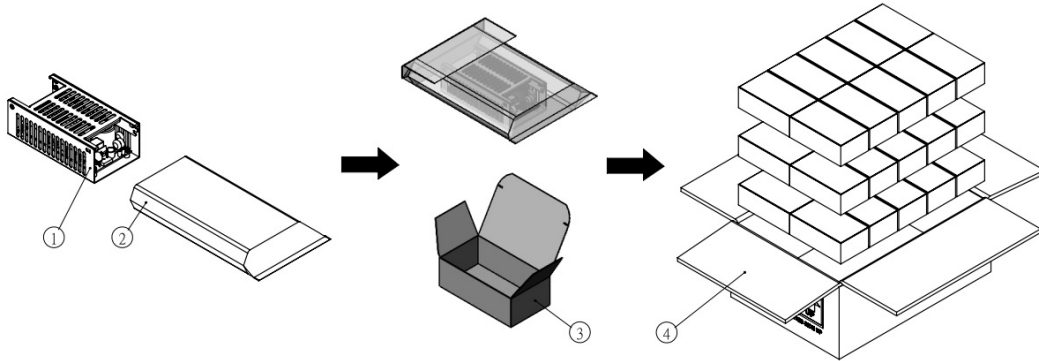


ITEM	PART NO.	NAME	OUTSIDE DIM(mm)	PCS
1		CFM40T-XX	101.6x50.8x31.1	50
2	G64304165	Inner Box	115x65x35	50
3	G64308313	Antistatic Foma	115x65x5.5	100
4	G64U10075	Partition	326x200x6	1
5	G64301115	Antistatic Foam	288x200x25	2
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ITEM	PART NO.	NAME	OUTSIDE DIM(mm)	PCS
1		CFM40T-XX-CA	117x63x40	30
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4	G64112339	No.59 Cardboard Box	360.6x257.6x148.5	1

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