



CFM25S Series

Application Note V17

AC-DC Switching Power Module CFM25S Series APPLICATION NOTE



Approved By:

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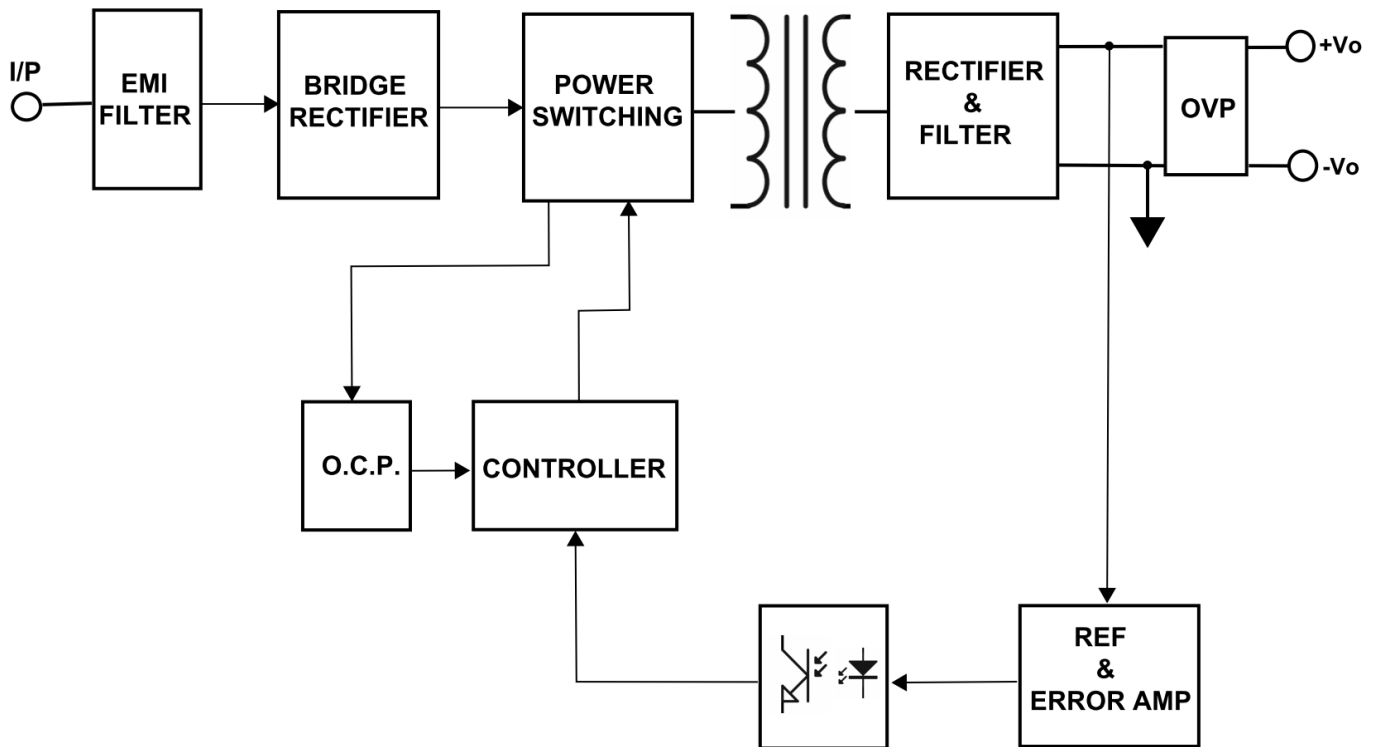
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1. Introduction

This application note describes the features and functions of Cincon's CFM25S 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 CFM25S series power module 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 CFM25S series power modules has resulted in their ability to operate within ambient temperature environments from -30°C to 70°C. Due consideration must be given to the derating curves when ascertaining the maximum power that can be drawn from the module. The maximum power which can be drawn is influenced by a number of factors, such as:

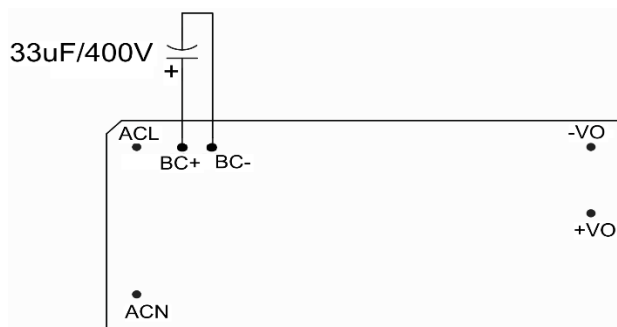
- Input voltage range
- Permissible output load (per derating curve)

3.2 Output Protection

The power modules 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.

3.3 Peak Load Function

CFM25SXXX PL and CFM25SXXX-E PL has a very powerful peak load function which can provide twice the rated power. However, the duration of the peak load should be less than 10 seconds, with a maximum 10% duty cycle and must externally add a 33uF/ 400V capacitor to BC+ & BC-, but this is not needed when input is exceed to 200Vac.



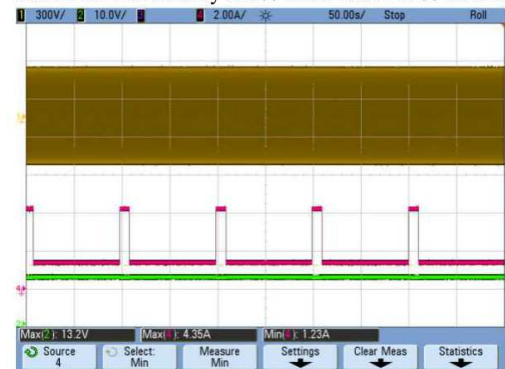
Vin=90Vac&115Vav&230Vac&264Vac
Peak Load Function by 200% Load 10S & 65% Load 90S.



CH1:Vin, CH2:Vout, CH4:Iout
Average Power:19.78W
add external 33u / 400V capacitor to BC+& BC-.

Vin=230Vac&264Vac

Peak Load Function by 200% Load 10S & 65% Load 90S



CH1:Vin, CH2:Vout, CH4:Iout
Average Power:19.78W

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 CFM25S 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:

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



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Where:

V_o is output voltage

I_o is output current

P_{in} is input power

The value of load regulation is defined as:

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

Where:

V_{FL} is the output voltage at 100% full load

V_{NL} is the output voltage at 10% 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 100% full load.

V_{LL} is the output voltage of minimum input voltage at 100% full load.

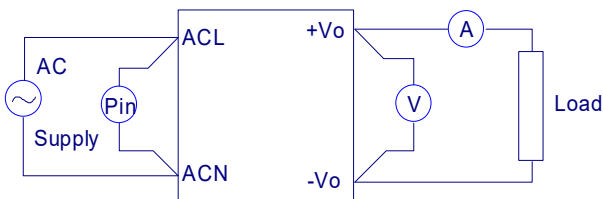


Figure 1. CFM25S Series Test Setup

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

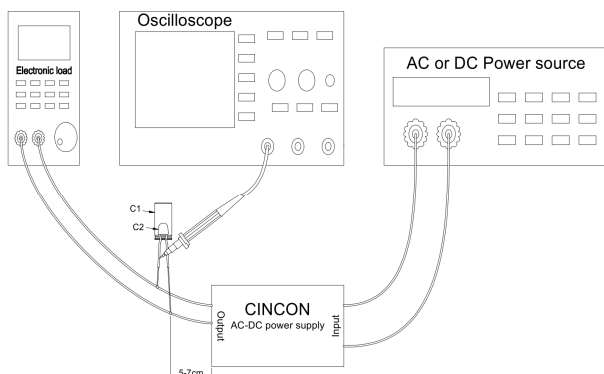
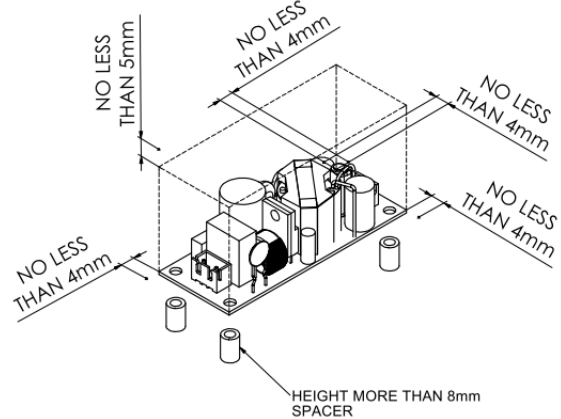


Figure 2. Output Voltage Ripple and Noise Measurement Set-Up

4.3 Installation Instruction

The CFM25SXXX-T has four 3.5mm 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.

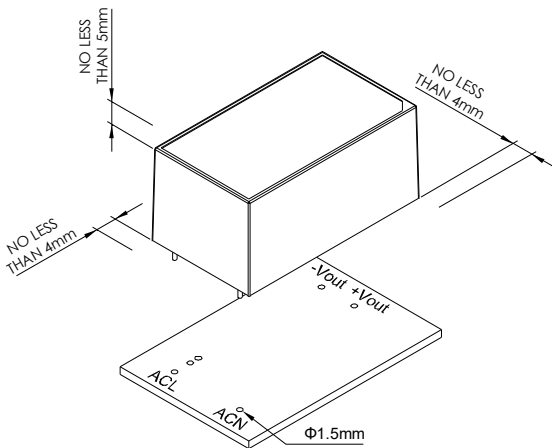
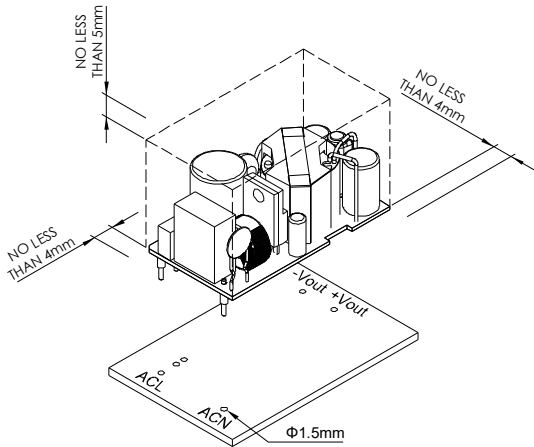




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The CFM25SXXX and CFM25SXXX-E mounting holes are 1.5mm. Please allow 4mm side clearance from the components and all side of the PCB and CASE. Allow 5mm clearance above the highest parts on the PCB and CASE.





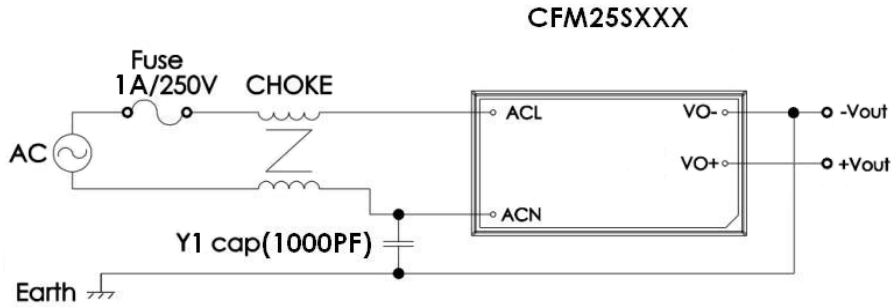
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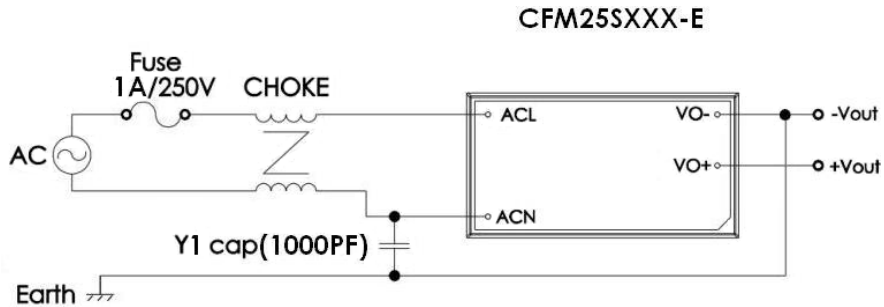
4.4 Class I EMI Solution

The CFM25S series need additional inductance and YCap to meet EN55032 CLASS B when test condition is Class I. If customers use in Class II systems, please ignore this section.

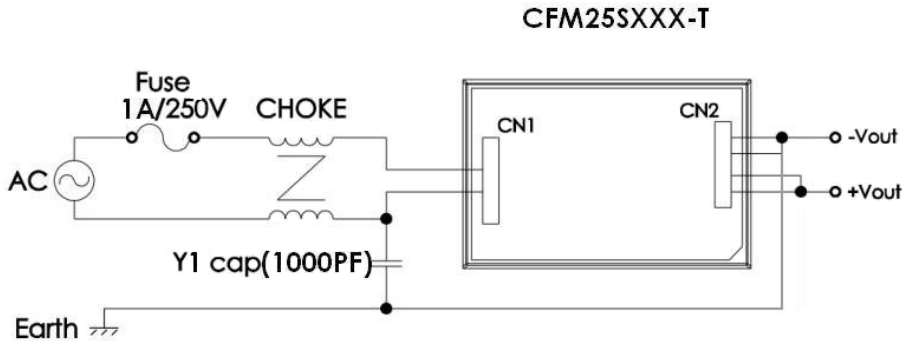
CFM25SXXX



CFM25SXXX-E



CFM25SXXX-T



Additional Inductance related parameters:

Specification	Inductance	Duplex Winding /turns	Manufacturers
UU9.8 R12K	10mH	2-U EW ϕ 0.27*85Ts	SEND POWER

Additional Safety YCap related parameters:

Subclass	WITHSTANDVOLTAGE	Capacitance	Manufacturers
Y1 CAP	250V(min)	1000pF(typ.)	TDK

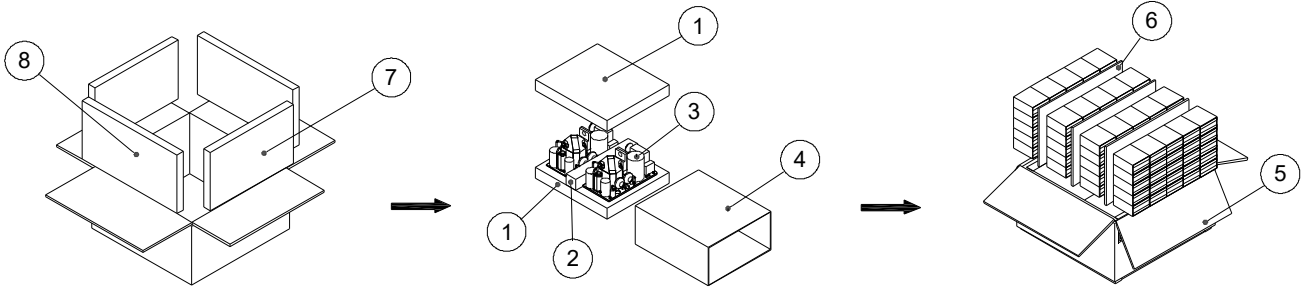


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5. Packing Information

The packing information for CFM25SXXX series is showing as follows:

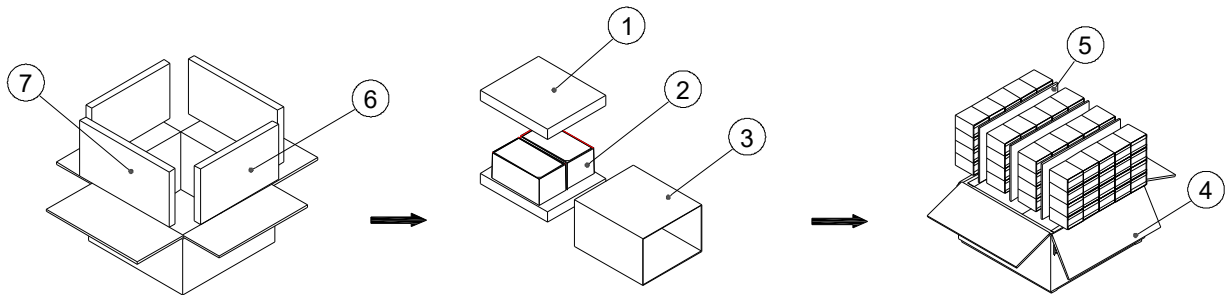


ITEM	PART NO.	NAME	OUTSIDE DIM(mm)	PCS
1	G64308311	Antistatic Foam	75x65x10mm	200
2	G64301178	Antistatic Foam	65x10x10mm	100
3		CFM25S Product	50.8x27.94x20.5mm	200
4	G64304163	Inner Box	76x66x35mm	100
5	G64114346	No.148 Cardboard Box	393x385x220mm	1
6	G64U10075	Partition	326x200x6mm	3
7	G64301114	Antistatic Foam	326x200x25mm	2
8	G64301113	Antistatic Foam	373x200x25mm	2

Each Box Packaging 200 PCS Products
 Net weight Ref. 8 Kg
 Gross weight Ref. 9.5 Kg

CFM25S 200Pcs a box, including the total weight of package material about 9.5Kg

The packing information for CFM25SXXX-E series is showing as follows:



ITEM	PART NO.	NAME	OUTSIDE DIM(mm)	PCS
1	G64308311	Antistatic Foam	75x65x10mm	160
2		CFM25S-E Product	53.1x30.3x24.8mm	160
3	G64304175	Inner Box	76x66x45mm	80
4	G64114346	No.148 Cardboard Box	393x385x220mm	1
5	G64U10075	Partition	326x200x6mm	3
6	G64301114	Antistatic Foam	326x200x25mm	2
7	G64301113	Antistatic Foam	373x200x25mm	2

Each Box Packaging 160 PCS Products
 Net weight Ref. 12.8 Kg
 Gross weight Ref. 14 Kg

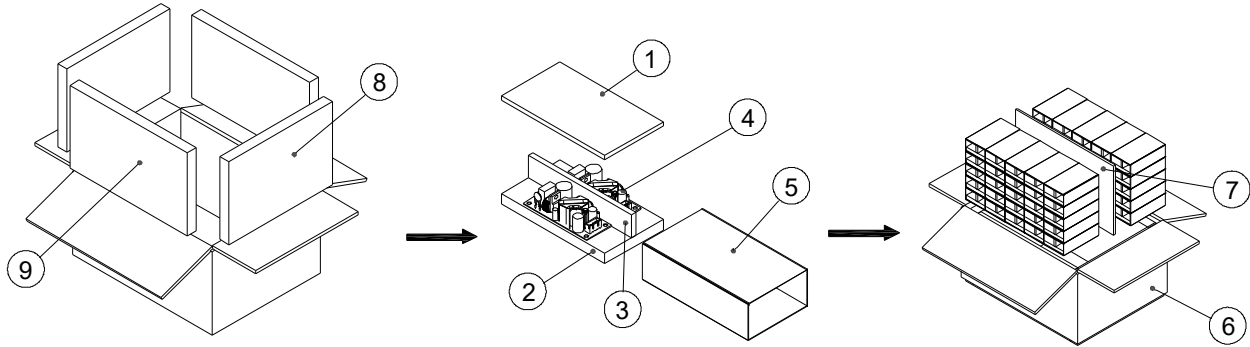
CFM25S-E 160Pcs a box, including the total weight of package material about 14Kg



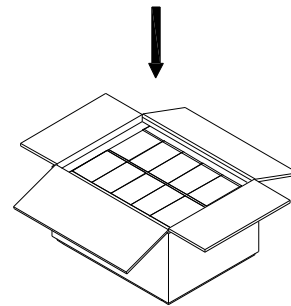
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The packing information for CFM25SXXX-T series is showing as follows:



ITEM	PART NO.	NAME	OUTSIDE DIM	PCS
1	G64308313	Antistatic Foam	115x65x5.5mm	50
2	G64308312	Antistatic Foam	115x65x10mm	50
3	G64301182	Antistatic Foam	115x5x22mm	50
4		CFM25S-T Product	70.5x27.94x20.5mm	100
5	G64304165	Inner Box	115x65x35mm	50
6	G64114347	No.149 Cardboard Box	388x300x220mm	1
7	G64U10075	Partition	326x200x6mm	1
8	G64301115	Antistatic Foam	288x200x25mm	2
9	G64301114	Antistatic Foam	326x200x25mm	2



Each Box Packaging 100 PCS Products
 Net weight Ref. 4.1 Kg
 Gross weight Ref. 5.3 Kg

CFM25S-T 100Pcs a box, including the total weight of package material about 5.3Kg

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