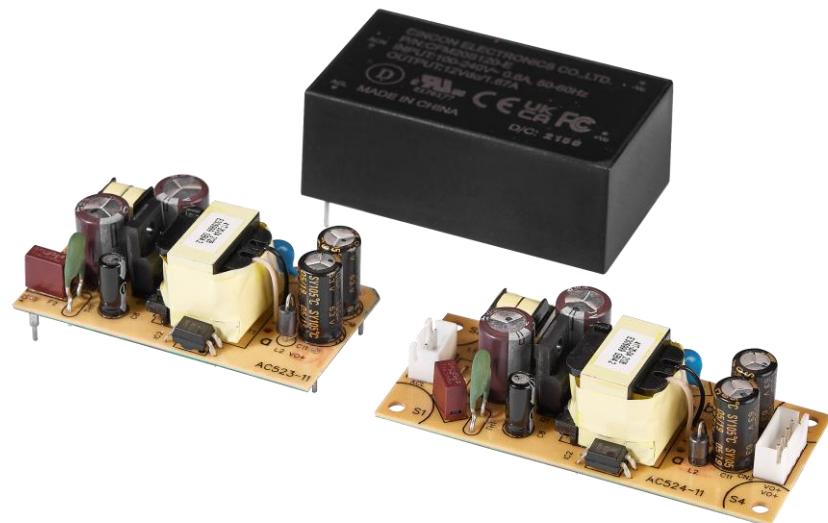




# CFM20S Series

## Application Note V10

### AC-DC Switching Power Module CFM20S Series APPLICATION NOTE



#### Approved By:

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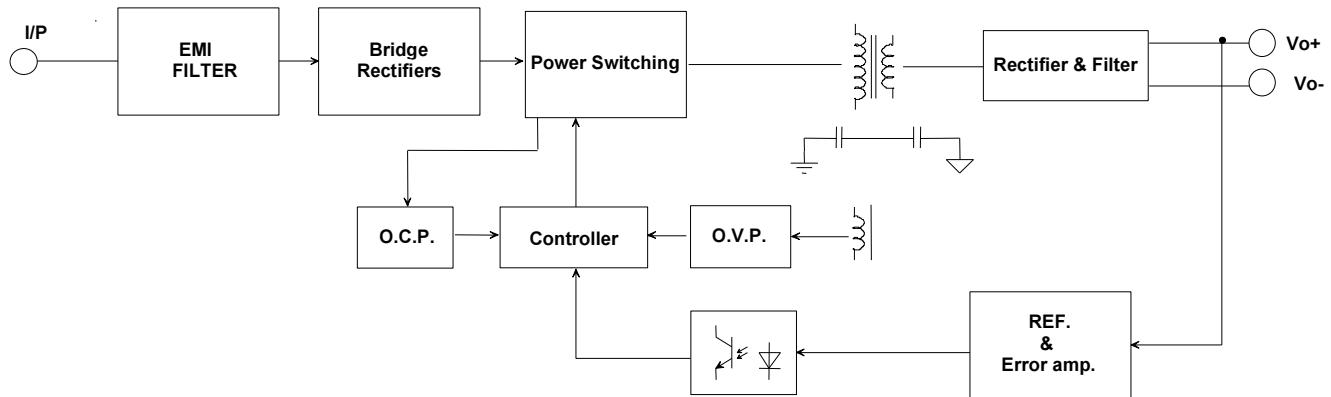
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### 1. Introduction

This application note describes the features and functions of Cincon's CFM20S 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 CFM20S 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 CFM20S series power modules has resulted in their ability to operate within ambient temperature environments from -40°C to 85°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. The power module will go to hiccup mode if the output current is set from 110% to 180% 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 CFM20S 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:

$V_o$  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.

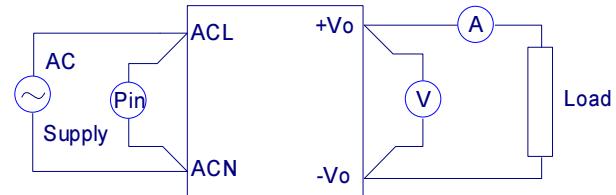


Figure 1. CFM20S Series Test Setup

#### 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  $C_2=0.1\mu F$  ceramic capacitor and a  $C_1=10\mu F$  electrolytic capacitor to output at 20 MHz Band Width.

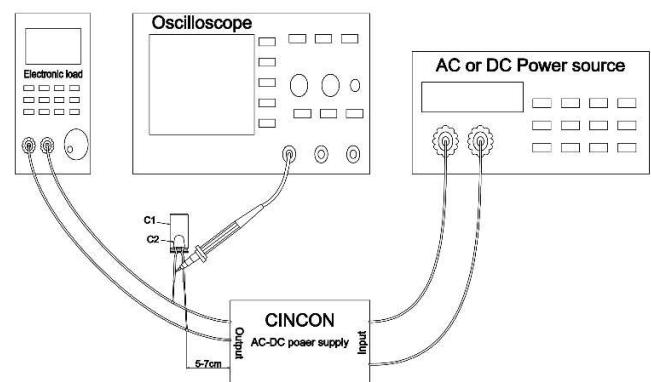


Figure 2. Output Voltage Ripple and Noise Measurement Set-Up

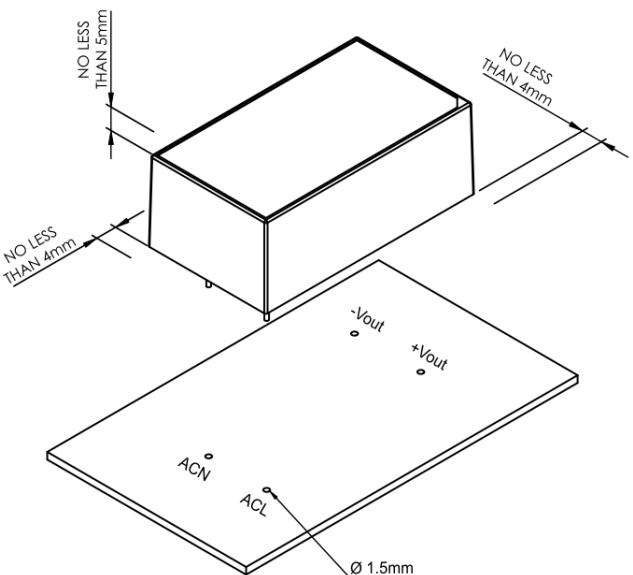
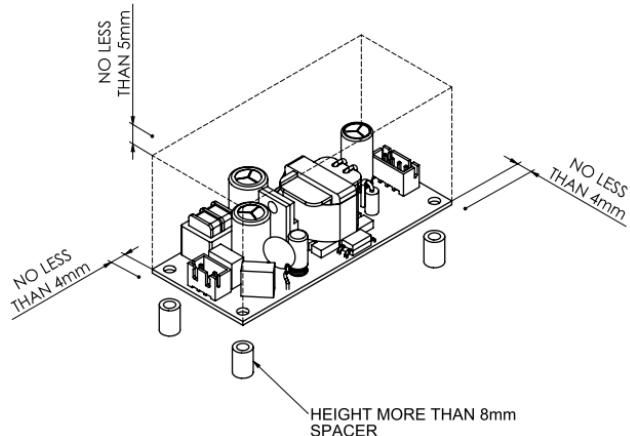


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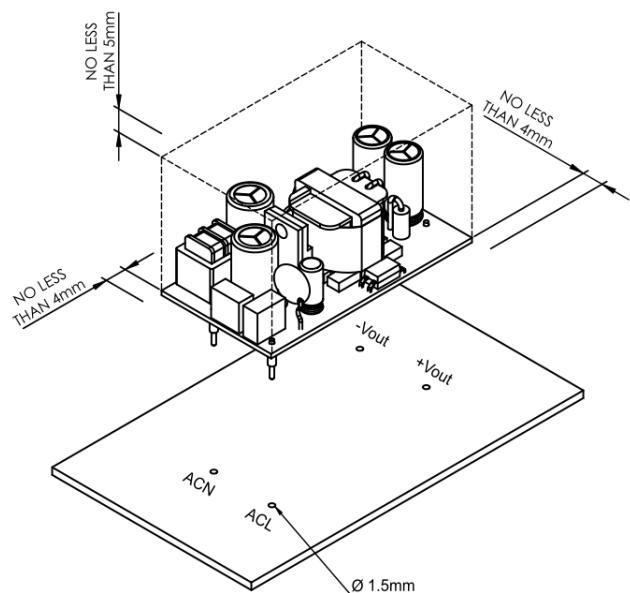
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### 4.3 Installation Instruction

The CFM20SXXX-T has four 3mm 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.



The CFM20SXXX and CFM20SXXX-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.



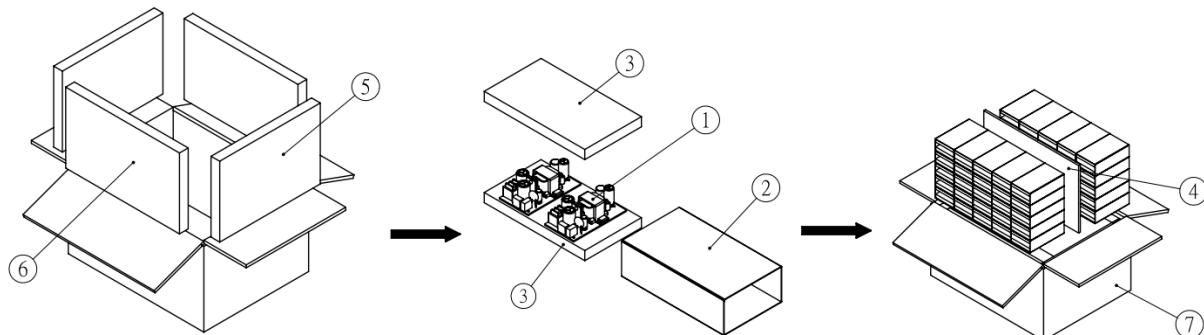


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### 5. Packing Information

The packing information for CFM20SXXX series is showing as follows:

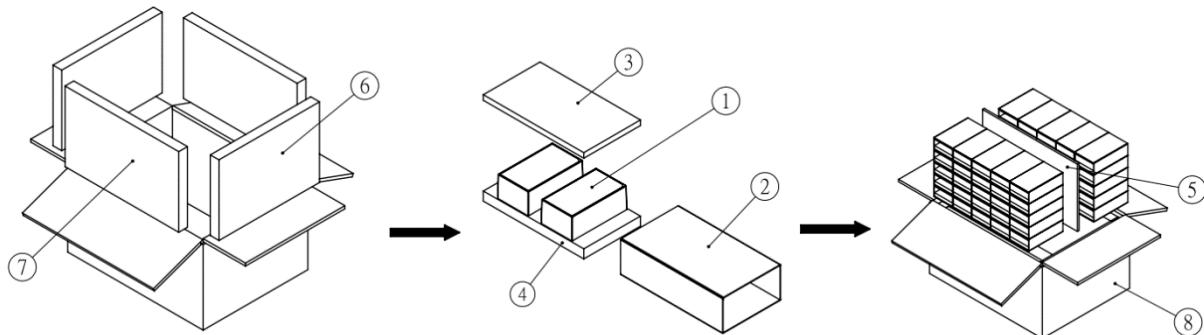


ITEM	PART NO.	NAME	OUTSIDE DIM(mm)	PCS
1	-	CFM20SXXX Product	60.5x33.02x23	100
2	G64304165	Inner Box	115x65x35	50
3	G64308312	Antistatic Foam	115x65x10	100
4	G64U10075	Partition	326x200x6	1
5	G64301115	Antistatic Foam	288x200x25	2
6	G64301114	Antistatic Foam	326x200x25	2
7	G64114347	No.149 Cardboard Box	388x300x220	1

Each Box Packaging 100 PCS Products  
Gross weight Ref. 5.5 Kg

CFM20SXXX 100pcs a box, including the total weight of package material about 5.5Kg

The packing information for CFM20SXXX-E series is showing as follows:



ITEM	PART NO.	NAME	OUTSIDE DIM(mm)	PCS
1	-	CFM20SXXX-E Product	63.04x35.6x23.7	100
2	G64304165	Inner Box	115x65x35	50
3	G64308313	Antistatic Foam	115x65x5.5	50
4	G64308312	Antistatic Foam	115x65x10	50
5	G64U10075	Partition	326x200x6	1
6	G64301115	Antistatic Foam	288x200x25	2
7	G64301114	Antistatic Foam	326x200x25	2
8	G64114347	No.149 Cardboard Box	388x300x220	1

Each Box Packaging 100 PCS Products  
Gross weight Ref. 11.5 Kg

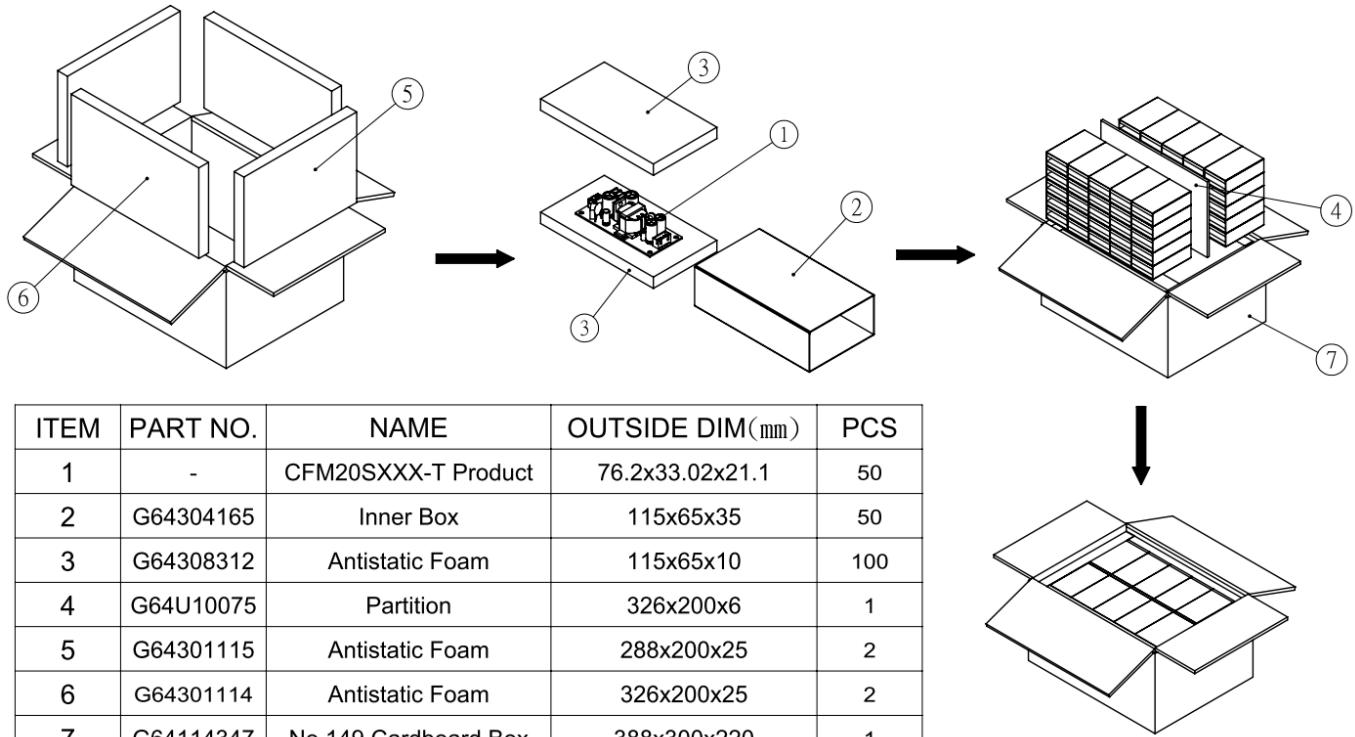
CFM20SXXX-E 100 pcs a box, including the total weight of package material about 11.5Kg



# CFM20S Series

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The packing information for CFM20SXXX-T series is showing as follows:



Each Box Packaging 50 PCS Products  
Gross weight Ref. 4 Kg

CFM20SXXX-T 50pcs a box, including the total weight of package material about 4Kg

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