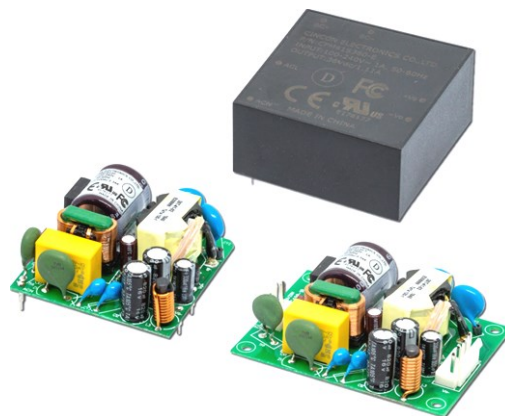




# CFM41S SERIES 40 WATT AC-DC AC-DC MODULES

## Features

- Universal Input Range 90~264Vac
- High Efficiency up to 90%
- 2"x 2" Open Frame Compact Size
- Class II
- No Load Power Consumption < 0.15W
- Approval IEC/EN/UL 62368-1 Ed 3.0
- Meet IEC/EN 60335-1
- Approval EN55032 and CISPR/FCC Class B
- Operating Altitude 5000m
- Continuous Short Circuit Protection
- Over Voltage Protection
- Peak Load (2 Times of Rated Current Note 6)



| MODEL NUMBER | OUTPUT VOLTAGE | OUTPUT CURRENT | RIPPLE & NOISE NOTE1 | Voltage Accuracy NOTE2 | LINE REGULATION NOTE3 | LOAD REGULATION NOTE4 | %EFF. (Typ.) NOTE5 |
|--------------|----------------|----------------|----------------------|------------------------|-----------------------|-----------------------|--------------------|
| CFM41S050    | 5 V            | 6 A            | 100 mV               | ±2%                    | ±0.5%                 | ±1%                   | 87%                |
| CFM41S120    | 12 V           | 3.34 A         | 120 mV               | ±1%                    | ±0.5%                 | ±1%                   | 90%                |
| CFM41S150    | 15 V           | 2.67 A         | 150 mV               | ±1%                    | ±0.5%                 | ±1%                   | 90%                |
| CFM41S240    | 24 V           | 1.67 A         | 240 mV               | ±1%                    | ±0.5%                 | ±1%                   | 90%                |
| CFM41S360    | 36 V           | 1.11 A         | 360 mV               | ±1%                    | ±0.5%                 | ±1%                   | 90%                |
| CFM41S480    | 48 V           | 0.83 A         | 480 mV               | ±1%                    | ±0.5%                 | ±1%                   | 90%                |

### Note:

1. Voltage accuracy is set at 100% full load.
2. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation is measured from 0V<sub>ac</sub> to 264V<sub>ac</sub> with 100% full load.
4. Load regulation is measured from 10% to 100% full load.
5. Typical efficiency at 230 Vac and full load at 25°C.
6. PL (peak load function) Lasting time < 10 seconds with a maximum 10% duty cycle and must add external 68uF / 400V capacitor to BC+& BC-.
7. CFM41SXXX-T input and output connectors (CN1 and CN2) wafer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST Housing VHR series or equivalent.

## PART NUMBER

| Series | Number of Outputs | Nominal Output Voltage                                                    | Type                                                            | Type                                         |
|--------|-------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------|
| CFM41S | O                 | XXX                                                                       | -X (Option)                                                     | YZ (Option)                                  |
| CFM41S | S : Single        | 050 : 5V<br>120 : 12V<br>150 : 15V<br>240 : 24V<br>360 : 36V<br>480 : 48V | Blank : PCB mount<br>E : Encapsulated<br>T : WAFER (without PL) | Blank : PCB mount<br>PL : Peak Load Function |

### Part Number Example:

**CFM41S120-E**: With Encapsulated, 40W, Single 12Vdc Output

**CFM41S120-E PL**: With Encapsulated, With PL, Single 12Vdc Output

**CFM41S120-T**: With Wafer, 40W, Single 12Vdc Output



# CFM41S Series

## TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25°C unless otherwise noted.)

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER             | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units           |
|-----------------------|----------------------|--------|------|------|------|-----------------|
| Input Voltage         |                      | All    | 90   |      | 264  | V <sub>ac</sub> |
|                       |                      |        | 120  |      | 370  | V <sub>dc</sub> |
| Operating Temperature | See Derating Curve   | All    | -40  |      | 85   | °C              |
| Storage Temperature   |                      | All    | -40  |      | 85   | °C              |
| Operating Altitude    |                      | All    |      |      | 5000 | m               |

### INPUT CHARACTERISTICS

| PARAMETER               | NOTES and CONDITIONS                                   | Device | Min. | Typ. | Max. | Units           |
|-------------------------|--------------------------------------------------------|--------|------|------|------|-----------------|
| Operating Voltage Range |                                                        | All    | 100  |      | 264  | V <sub>ac</sub> |
| Input Frequency Range   |                                                        | All    | 47   |      | 63   | Hz              |
| Maximum Input Current   | 100% Load, V <sub>in</sub> =100V <sub>ac</sub>         | All    |      |      | 1    | A               |
| Inrush Current          | V <sub>in</sub> =240V <sub>ac</sub> , Cold start @25°C | All    |      |      | 70   | A               |
| Leakage Current         |                                                        | All    |      |      | 250  | uA              |

### OUTPUT CHARACTERISTICS

| PARAMETER                      | NOTES and CONDITIONS                                                                                                                                                                                                                                         | Device     | Min.  | Typ. | Max.  | Units           |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|------|-------|-----------------|
| Output Voltage Set Point       | V <sub>in</sub> =90V <sub>ac</sub> ~264V <sub>ac</sub> , I <sub>o</sub> =Full load,<br>Ambient temperature=25°C                                                                                                                                              | CFM41S050  | 4.9   | 5    | 5.1   | V <sub>dc</sub> |
|                                |                                                                                                                                                                                                                                                              | CFM41S120  | 11.88 | 12   | 12.12 |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S150  | 14.85 | 15   | 15.15 |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S240  | 23.76 | 24   | 24.24 |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S360  | 35.64 | 36   | 36.36 |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S480  | 47.52 | 48   | 48.48 |                 |
| Operating Output Current Range | V <sub>in</sub> =90V <sub>ac</sub> ~264V <sub>ac</sub> , See Derating Curve                                                                                                                                                                                  | CFM41S050  | 0     |      | 6     | A               |
|                                |                                                                                                                                                                                                                                                              | CFM41S120  | 0     |      | 3.34  |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S150  | 0     |      | 2.67  |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S240  | 0     |      | 1.67  |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S360  | 0     |      | 1.11  |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S480  | 0     |      | 0.83  |                 |
| Holdup Time                    | V <sub>in</sub> =115V <sub>ac</sub>                                                                                                                                                                                                                          | All        |       | 10   |       | ms              |
| Output Voltage Regulation      |                                                                                                                                                                                                                                                              |            |       |      |       |                 |
| Load Regulation                | 10% Load to full load                                                                                                                                                                                                                                        | All        |       |      | ±1.0  | %               |
| Line Regulation                | V <sub>in</sub> =High line to low line                                                                                                                                                                                                                       | All        |       |      | ±0.5  | %               |
| Over Voltage Protection        | TVS component to clamp output voltage                                                                                                                                                                                                                        | CFM41S050  |       | 6.8  |       | V <sub>dc</sub> |
|                                |                                                                                                                                                                                                                                                              | CFM41S120  |       | 15   |       |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S150  |       | 18   |       |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S240  |       | 30   |       |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S360  |       | 43   |       |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S480  |       | 56   |       |                 |
| Short Circuit Protection       | Auto recovery                                                                                                                                                                                                                                                | All        |       |      |       |                 |
| Output Ripple and Noise        | 1. Add a 0.1uF ceramic capacitor and a 10uF aluminum electrolytic capacitor to output<br>(CFM41S050: Add a 0.1uF ceramic capacitor and 47uF aluminum electrolytic capacitor to output)<br>2. Oscilloscope is 20MHz band width<br>3. Ambient temperature=25°C | CFM41S050  |       |      | 100   | mV              |
|                                |                                                                                                                                                                                                                                                              | CFM41S120  |       |      | 120   |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S150  |       |      | 150   |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S240  |       |      | 240   |                 |
|                                |                                                                                                                                                                                                                                                              | CFM41S360  |       |      | 360   |                 |
|                                |                                                                                                                                                                                                                                                              | CFM130S480 |       |      | 480   |                 |



# CFM41S Series

| PARAMETER        | NOTES and CONDITIONS                                                                                                        | Device    | Min. | Typ. | Max. | Units |
|------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------|------|------|------|-------|
| Load Capacitance | 1. Input voltage is 115V <sub>ac</sub> and 230V <sub>ac</sub><br>2. Output is max. full load<br>3. Ambient temperature=25°C | CFM41S050 |      |      | 6000 | uF    |
|                  |                                                                                                                             | CFM41S120 |      |      | 3330 |       |
|                  |                                                                                                                             | CFM41S150 |      |      | 2650 |       |
|                  |                                                                                                                             | CFM41S240 |      |      | 1650 |       |
|                  |                                                                                                                             | CFM41S360 |      |      | 1090 |       |
|                  |                                                                                                                             | CFM41S480 |      |      | 810  |       |
| Efficiency       | 1. Input voltage is 230V <sub>ac</sub><br>2. Output is 75% full load<br>3. Ambient temperature=25°C                         | CFM41S050 |      | 87%  |      | %     |
|                  |                                                                                                                             | CFM41S120 |      | 90%  |      |       |
|                  |                                                                                                                             | CFM41S150 |      | 90%  |      |       |
|                  |                                                                                                                             | CFM41S240 |      | 90%  |      |       |
|                  |                                                                                                                             | CFM41S360 |      | 90%  |      |       |
|                  |                                                                                                                             | CFM41S480 |      | 90%  |      |       |

## ISOLATION CHARACTERISTICS

| PARAMETER            | NOTES and CONDITIONS                    | Device | Min. | Typ. | Max. | Units           |
|----------------------|-----------------------------------------|--------|------|------|------|-----------------|
| Input to Output      | 1 Minute (without dielectric breakdown) | All    |      |      | 3000 | V <sub>ac</sub> |
| Isolation Resistance | Input to output                         | All    | 100  |      |      | MΩ              |

## FEATURE CHARACTERISTICS

| PARAMETER           | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|---------------------|----------------------|--------|------|------|------|-------|
| Switching Frequency |                      | All    |      | 65   |      | kHz   |

## GENERAL SPECIFICATIONS

| PARAMETER                                        | NOTES and CONDITIONS                                                                                                       | Device | Min.                                             | Typ.            | Max. | Units       |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------|-----------------|------|-------------|
| MTBF                                             | I <sub>o</sub> =100%; T <sub>a</sub> =25°C per MIL-HDBK-217F<br>I <sub>o</sub> =100%; T <sub>a</sub> =25°C Telcordia SR332 | All    | 390<br>3170                                      |                 |      | k<br>hours  |
| Life Time                                        | @75% Load, 40°C                                                                                                            | All    | 26                                               |                 |      | k<br>hours  |
| Humidity                                         | Non-condensing                                                                                                             | All    |                                                  |                 | 93   | % RH        |
| Shock                                            | Meets MIL-STD-810F Table 516.5, TABLE 516.5-I 10ms, each axis 3 times(±X 、 ±Y 、 ±Z axis)                                   | All    |                                                  | 75              |      | g           |
| Vibration                                        | Meets MIL-STD-810F Table 514.5C-VIII, 15~2000Hz, X 、 Y 、 Z axis, 1 hr (each axis),. total 3 hrs.                           | All    |                                                  | 4               |      | g           |
| Weight                                           | Blank : PCB mount<br>E : Encapsulated<br>T : WAFER                                                                         | All    |                                                  | 61<br>142<br>64 |      | grams       |
| Dimensions                                       | Blank : PCB mount                                                                                                          | All    | 2.000x2.000x1.01 inches<br>(50.80x50.80x25.6 mm) |                 |      |             |
|                                                  | E : Encapsulated                                                                                                           |        | 2.14x2.14x1.043 inches<br>(54.37x54.37x26.5 mm)  |                 |      |             |
|                                                  | T : WAFER                                                                                                                  |        | 2.70x2.00x0.941 inches<br>(68.58x50.80x23.9 mm)  |                 |      |             |
| Safety                                           | Class II, IEC/EN/UL 62368-1                                                                                                |        |                                                  |                 |      | Ed3.0       |
| EMC Emission                                     | EN 55032, EN 61000-3-2, EN 61000-3-3, EN 61000-6-3, EN 61000-6-4, 47 CFR FCC Part 15 Subpart B                             |        |                                                  |                 |      | Class B     |
| Conducted Disturbance                            | EN 55032:2015+A11:2020, EN 61000-6-3:2012, 47 CFR FCC Part 15 Subpart B                                                    |        |                                                  |                 |      | Class B     |
| Radiated Disturbance                             | EN 55032:2015+A11:2020, EN 61000-6-3:2012, 47 CFR FCC Part 15 Subpart B                                                    |        |                                                  |                 |      | Class B     |
| Harmonic Current Emissions                       | EN 61000-3-2:2019                                                                                                          |        |                                                  |                 |      | Class A     |
| Voltage Fluctuations & Flicker                   | EN 61000-3-3:2013+A1:2019                                                                                                  |        |                                                  |                 |      | Criterion A |
| EMC Immunity                                     | EN 55035:2017+A11:2020, EN 61204-3:2000, EN 61000-6-1:2019, EN 61000-6-2:2019                                              |        |                                                  |                 |      | Criterion A |
| Electrostatic Discharge (ESD)                    | IEC 61000-4-2:2008, Air discharge:±8kV, Contact discharge:±4kV                                                             |        |                                                  |                 |      | Criterion A |
| Radio-Frequency, Continuous Radiated Disturbance | IEC 61000-4-3:2020                                                                                                         |        |                                                  |                 |      | Criterion A |
| Electrical Fast Transient (EFT)                  | IEC 61000-4-4:2012, ±2 kV                                                                                                  |        |                                                  |                 |      | Criterion A |



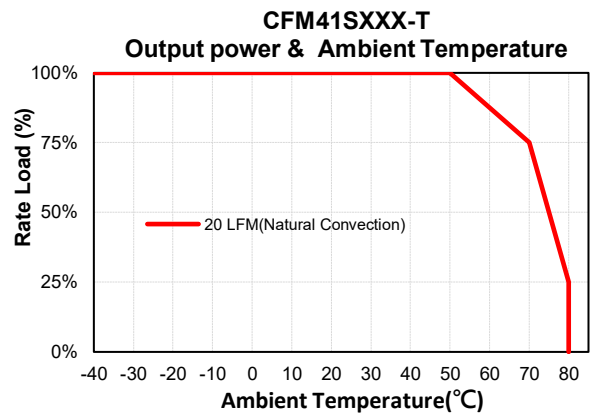
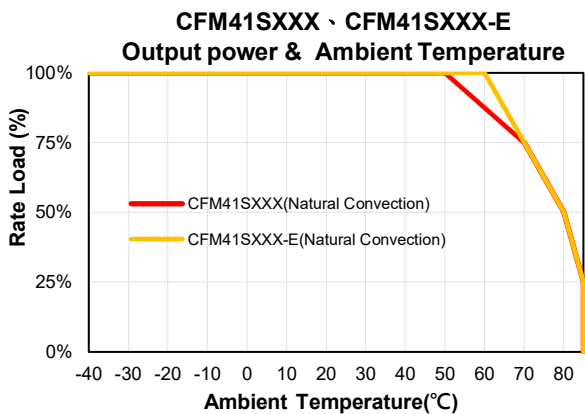
# CFM41S Series

## GENERAL SPECIFICATIONS

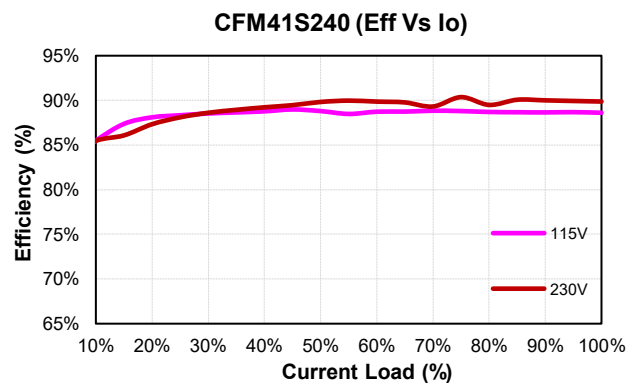
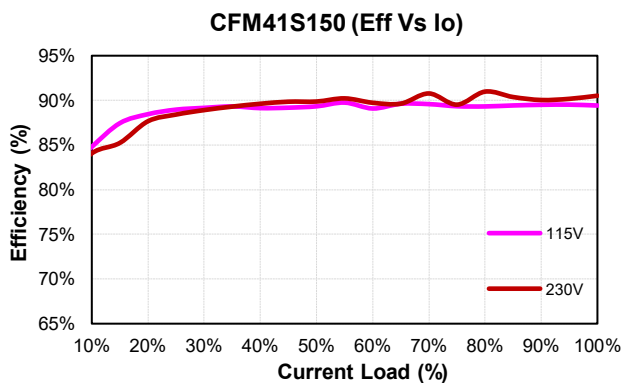
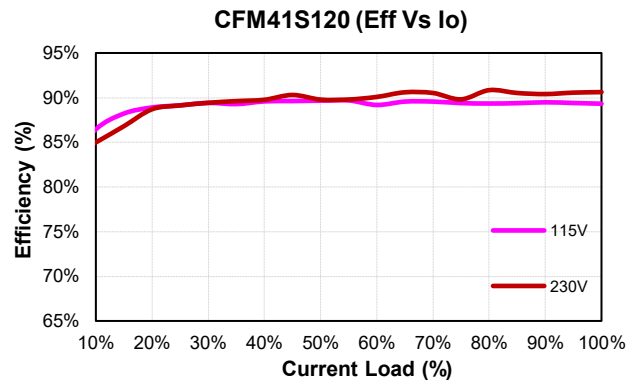
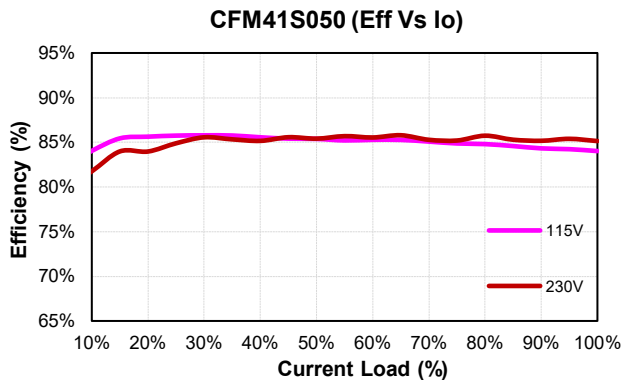
|                                              |                                                                     |             |
|----------------------------------------------|---------------------------------------------------------------------|-------------|
| Surge                                        | IEC 61000-4-5:2014+A1:2017, L-N: $\pm 1\text{kV}$                   | Criterion A |
| Conducted Disturbances, Induced by RF Fields | IEC 61000-4-6:2013+COR1:2015                                        | Criterion A |
| Power Frequency Magnetic Field               | IEC 61000-4-8:2009                                                  | Criterion A |
| Voltage Dips                                 | IEC 61000-4-11:2020, Dip: 30% 10ms, Dip: 60% 100ms, Dip >95% 5000ms | Criterion A |
| Voltage Interruptions                        | IEC 61000-4-11:2020, >95% 5000ms                                    | Criterion B |
| Application Note Link                        | <a href="#">CFM41S Series App Notes</a>                             |             |

## CHARACTERISTIC CURVE

### Power Derating Curve



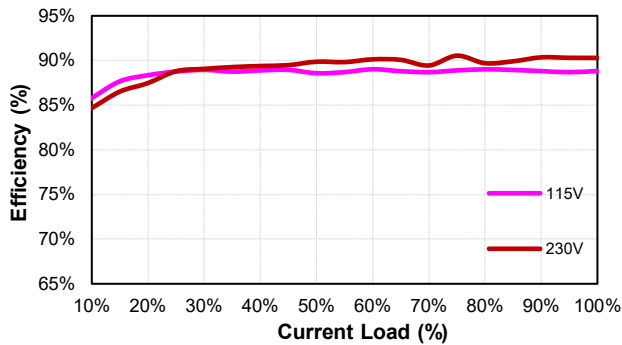
### Performance Data



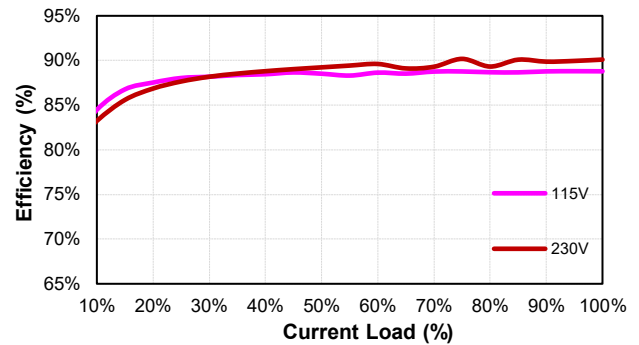


# CFM41S Series

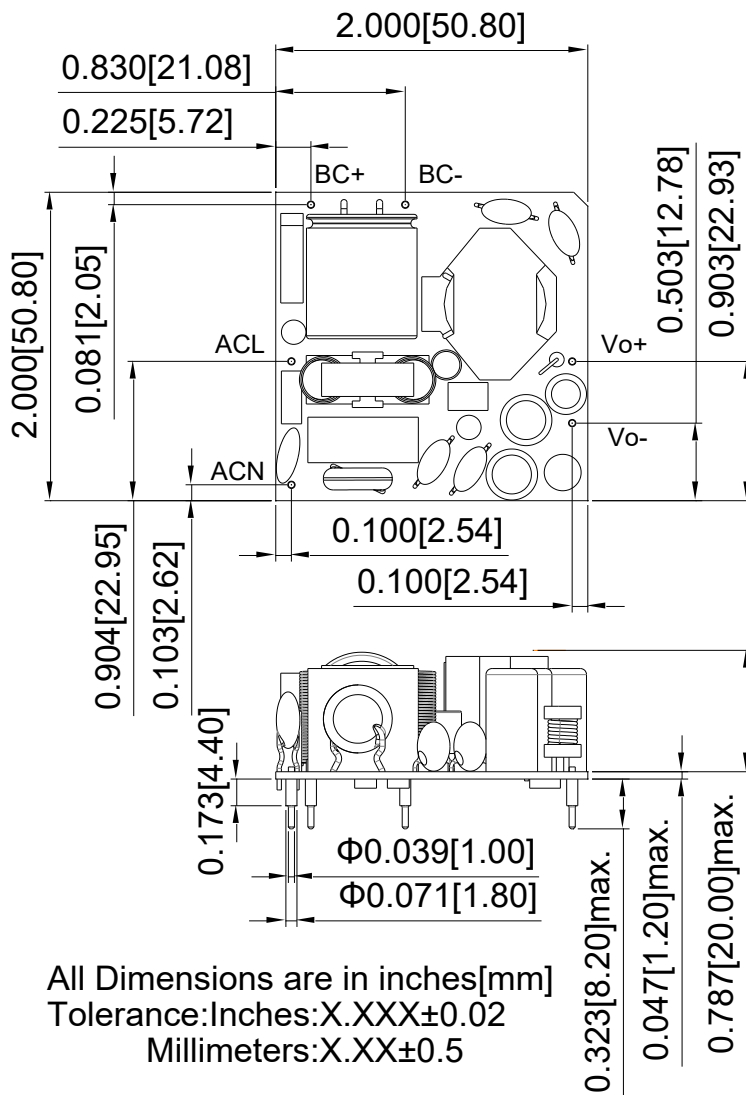
CFM41S360 (Eff Vs Io)



CFM41S480 (Eff Vs Io)



## MECHANICAL SPECIFICATION



## CFM41SXXX

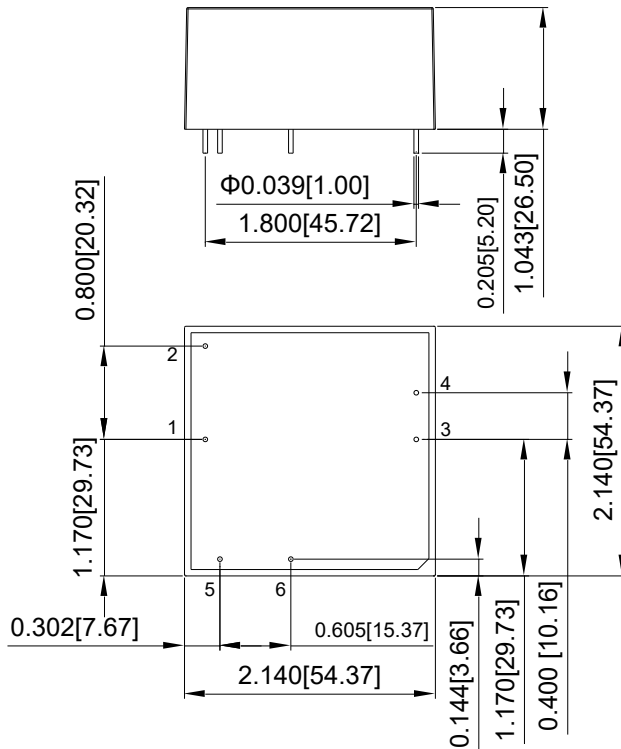
### PIN CONNECTION

| Pin | Function |
|-----|----------|
| 1   | ACL      |
| 2   | ACN      |
| 3   | +Vout    |
| 4   | -Vout    |
| 5   | BC+      |
| 6   | BC-      |



# CFM41S Series

## MECHANICAL SPECIFICATION

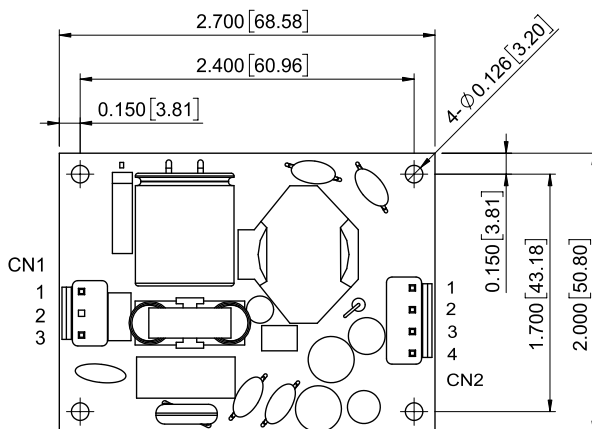


### CFM41SXXX-E

All Dimensions are in inches[mm]  
Tolerance: Inches: X.XXX $\pm$ 0.02  
Millimeters: X.XX $\pm$ 0.5

#### PIN CONNECTION

| Pin | Function |
|-----|----------|
| 1   | ACL      |
| 2   | ACN      |
| 3   | +Vout    |
| 4   | -Vout    |
| 5   | BC+      |
| 6   | BC-      |



### CFM41SXXX-T

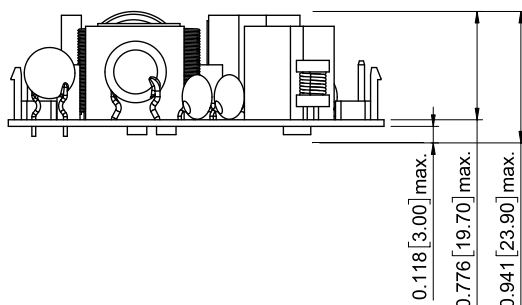
All Dimensions in Inches[mm]  
Tolerance Inches: x.xxx $\pm$ 0.020  
Millimeters: x.xx $\pm$ 0.50

AC Input Connector(CN1):TKP PVHI-03N2 or equivalent

| Pin | Function | Mating Housing           | Terminal                       |
|-----|----------|--------------------------|--------------------------------|
| 1   | ACL      | JST VHR-3N or equivalent | JST SVH-21T-P1.1 or equivalent |
| 2   | -        |                          |                                |
| 3   | ACN      |                          |                                |

DC Output Connector(CN2):TKP PVHI-04 or equivalent

| Pin | Function | Mating Housing           | Terminal                       |
|-----|----------|--------------------------|--------------------------------|
| 1   | +Vout    | JST VHR-4N or equivalent | JST SVH-21T-P1.1 or equivalent |
| 2   | +Vout    |                          |                                |
| 3   | -Vout    |                          |                                |
| 4   | -Vout    |                          |                                |



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