



CFM202S SERIES 200 WATT OPEN FRAME AC-DC MODULES

Features

- Universal Input Range 90~264Vac
- High Efficiency up to 94%
- 2"x 4" Open Frame Compact Size
- Class I & Class II (NOTE8)
- 150W with Natural Convection (CFM202SXXXB)
- 180W with Natural Convection (CFM202SXXXC)
- 200W with Fan-Cooled
- No Load Input Power Consumption<150mW
- Approval Safety IEC/EN/UL 62368-1
- Approval Safety IEC/EN 60335-1
- Operating Altitude 5000m
- Continuous Short Circuit Protection
- Over Voltage Protection
- Over Temperature Protection
- Active PFC Function



| MODEL NUMBER | OUTPUT VOLTAGE | OUTPUT CURRENT | | | VOLTAGE ACCURACY NOTE1 | RIPPLE & NOISE NOTE2 | LINE REGULATION NOTE3 | LOAD REGULATION NOTE4 | %EFF. (Typ.) NOTE5 |
|--------------|----------------|----------------|-------------|-----------|------------------------|----------------------|-----------------------|-----------------------|--------------------|
| | | With Fan NOTE7 | Without Fan | | | | | | |
| | | | Cover | Baseplate | | | | | |
| CFM202S120 | 12 V | 16.66 A | 15.0A | 12.5A | 1% | 120 mV | ±0.5% | ±1% | 92% |
| CFM202S240 | 24 V | 8.33 A | 7.5A | 6.25A | 1% | 240 mV | ±0.5% | ±1% | 93% |
| CFM202S280 | 28 V | 7.14 A | 6.42A | 5.35A | 1% | 280 mV | ±0.5% | ±1% | 93% |
| CFM202S360 | 36 V | 5.56 A | 5.0A | 4.16A | 1% | 360 mV | ±0.5% | ±1% | 93% |
| CFM202S480 | 48 V | 4.17 A | 3.75A | 3.125A | 1% | 480 mV | ±0.5% | ±1% | 94% |
| CFM202S560 | 56 V | 3.58A | 3.21A | 2.67A | 1% | 560 mV | ±0.5% | ±1% | 94% |

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_{ac} to 264V_{ac} with 100% full load.
4. Load regulation measured from 0% to 100% full load.
5. Typical efficiency at 230 Vac and 75% full load at 25°C.
6. Standard input and output connectors (CN1 and CN2) wafer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST housing VHR series or equivalent.
7. Forced air convection with 10CFM.
8. Conductive: Class I & Class II meets Class B Radiation: Class I meet Class B, Class II meet Class A.

PART NUMBER

| Series | Number of Outputs | Nominal Output Voltage | Type |
|--------|-------------------|--|--------------------------------------|
| CFM202 | O | XXX | X (Option) |
| CFM202 | S : Single | 120 : 12V 240 : 24V 280 : 28V 360 : 36V 480 : 48V 560 : 56V | B : With Baseplate C : With Cover |

Part Number Example:

- CFM202S120B:** With Base, 200W, Single 12Vdc Output
- CFM202S120C:** With Case, 200W, Single 12Vdc Output



CFM202S 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 _{ac} |
| Operating Temperature | 100Vac~264Vac See Derating Curve (V _{in} =90V _{ac} , Operate @-30°C ~80°C) | All | -40 | | 80 | °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 | 90 | | 264 | V _{ac} |
| Input Frequency Range | | All | 47 | | 63 | Hz |
| Maximum Input Current | 100% Load, V _{in} =100V _{ac} | All | | | 2.5 | A |
| Power Factor | 100% Load, V _{in} =230V _{ac} | All | 0.9 | | | |
| Inrush Current | V _{in} =240V _{ac} , Cold Start @25°C | All | | | 100 | A |
| Leakage Current (Touch) | | All | | | 100 | uA |
| Under Voltage Protection | | All | 60 | | 75 | V |

OUTPUT CHARACTERISTICS

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|--------------------------------|---|------------|-------|------|-------|-----------------|
| Output Voltage Set Point | V _{in} =90Vac~264Vac, I _o =I _o max, Ambient temperature=25°C. | CFM202S120 | 11.88 | 12 | 12.12 | V _{dc} |
| | | CFM202S240 | 23.76 | 24 | 24.24 | |
| | | CFM202S280 | 27.72 | 28 | 28.28 | |
| | | CFM202S360 | 35.64 | 36 | 36.36 | |
| | | CFM202S480 | 47.52 | 48 | 48.48 | |
| | | CFM202S560 | 55.44 | 56 | 56.56 | |
| Operating Output Current Range | V _{in} =90V _{ac} ~264V _{ac} , See Derating Curve | CFM202S120 | 0 | | 16.66 | A |
| | | CFM202S240 | 0 | | 8.33 | |
| | | CFM202S280 | 0 | | 7.14 | |
| | | CFM202S360 | 0 | | 5.56 | |
| | | CFM202S480 | 0 | | 4.17 | |
| | | CFM202S560 | 0 | | 3.58 | |
| Holdup Time | V _{in} =115Vac | All | | 12 | | ms |
| Output Voltage Regulation | | | | | | |
| Load Regulation | 10% Load to full load | All | | | ±1.0 | % |
| Line Regulation | V _{in} =High Line to low line | All | | | ±0.5 | % |
| Over Voltage Protection | Clamp output voltage | CFM202S120 | | 13.5 | | V _{dc} |
| | | CFM202S240 | | 30 | | |
| | | CFM202S280 | | 35 | | |
| | | CFM202S360 | | 42 | | |
| | | CFM202S480 | | 56 | | |
| | | CFM202S560 | | 59.2 | | |
| Output Ripple and Noise | 1. Add a 0.1uF ceramic capacitor and a 10uF aluminum electrolytic capacitor to output. 2. Oscilloscope is 20MHz band width. 3. Ambient temperature=25°C | CFM202S120 | | | 120 | mV |
| | | CFM202S240 | | | 240 | |
| | | CFM202S280 | | | 280 | |
| | | CFM202S360 | | | 360 | |
| | | CFM202S480 | | | 480 | |
| | | CFM202S560 | | | 560 | |
| Over Current Protection | Auto recovery | All | 120 | 150 | 180 | % |



CFM202S Series

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|--------------------------|---|--|------|--|---|-------|
| Short Circuit Protection | Auto recovery | All | | | | |
| Load Capacitance | 1. Input voltage is 115V _{ac} and 230V _{ac} 2. Output is 100% full load 3. Ambient temperature=25°C | CFM202S120 CFM202S240 CFM202S280 CFM202S360 CFM202S480 CFM202S560 | | | 16670 8330 7140 5660 4170 3580 | uF |
| Efficiency | 1. Input voltage is 230V _{ac} . 2. Output is 75% full load 3. Ambient temperature=25°C | CFM202S120 CFM202S240 CFM202S280 CFM202S360 CFM202S480 CFM202S560 | | 92% 93% 93% 93% 94% 94% | | % |

ISOLATION CHARACTERISTICS

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|--------------------------|---|--------|------|------|------|-----------------|
| Input to Output | 1 minute (without dielectric breakdown) | All | | | 4000 | V _{ac} |
| Input to Earth (Ground) | 1 minute (without dielectric breakdown) | All | | | 2500 | V _{ac} |
| Output to Earth (Ground) | 1 minute (without dielectric breakdown) | All | | | 360 | V _{ac} |
| Isolation Resistance | Input to Output | All | 100 | | | MΩ |

FEATURE CHARACTERISTICS

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|---------------------|----------------------|--------|------|------|------|-------|
| Switching Frequency | | All | | 115 | | kHz |

GENERAL CHARACTERISTICS

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|--|---|--------|--|------------|------|-------------|
| MTBF | I _o =100%; T _a =25°C per MIL-HDBK-217F | All | 640 | | | k hours |
| Life Time | @75% Load, 40°C | All | 35 | | | k 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 | Baseplate versions Covered versions | All | | 250 330 | | grams |
| Dimension | Baseplate versions Covered versions | All | 4.00x2.00x1.311 Inches (101.60x50.80x33.30 mm) 4.598x2.520x1.358 Inches (116.80x64.00x34.50 mm) | | | |
| Safety | Class I & Class II, IEC/EN/UL 62368-1, IEC/EN 60335-1 | | | | | |
| EMC Emission | EN55032 Class B, 47 CFR FCC Part 15 Subpart B, Oct.2014 EN61000-3-2:2014, EN61000-3-3:2013, EN61000-6-3:2012, EN61000-6-4:2011, EN61204-3:2000 | | | | | |
| Conducted Disturbance | EN 55032, 47 CFR FCC Part 15 (Class I & Class II meets Class B) | | | | | Class B |
| Radiated Disturbance | EN 55032, 47 CFR FCC Part 15 (Class I Meet Class B; Class II Meet Class A) | | | | | Class B |
| Harmonic Current Emissions | EN 61000-3-2:2014 | | | | | Class A |
| Voltage Fluctuations & Flicker | EN 61000-3-3:2013 | | | | | Criterion A |
| EMC Immunity | EN55035, EN61204-3:2000, EN61000-6-1:2019, EN61000-6-2:2019 | | | | | Criterion A |
| Electrostatic Discharge (ESD) | IEC 61000-4-2:2008 Air Discharge: ±8kV, Contact Discharge: ±4kV | | | | | Criterion A |
| Radio-Frequency, Continuous Radiated Disturbance | IEC 61000-4-3:2010 | | | | | Criterion A |
| Electrical Fast Transient (EFT) | IEC61000-4-4:2012, ±1kV, ±2kV | | | | | Criterion A |



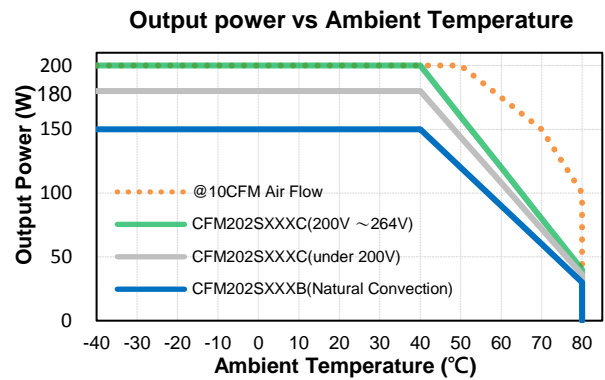
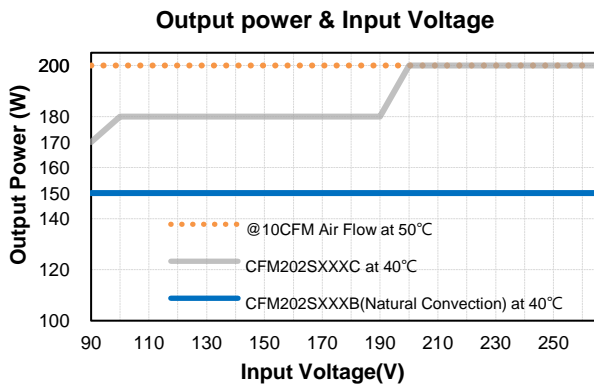
CFM202S Series

GENERAL CHARACTERISTICS

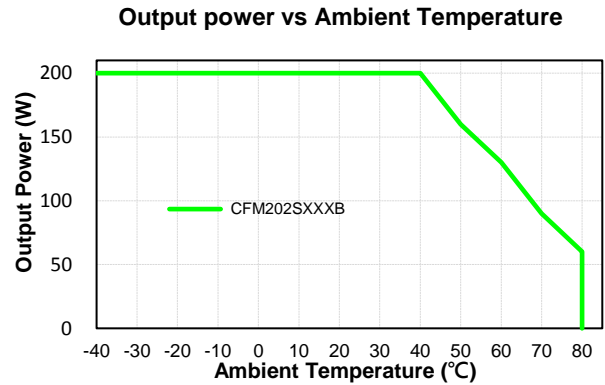
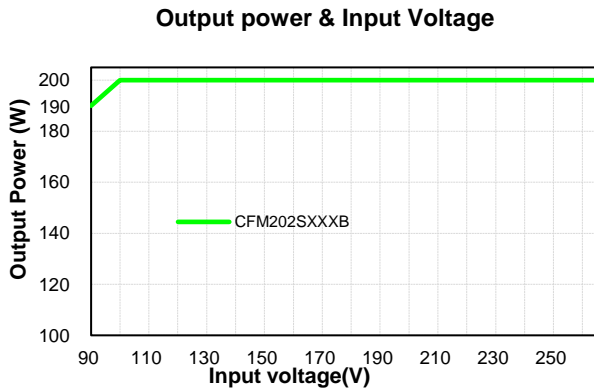
| | | |
|--|---|-------------|
| Surge | I IEC61000-4-5:2014, L-N: $\pm 0.5\text{kV}$, $\pm 1\text{kV}$, L-E(Ground): $\pm 0.5\text{kV}$, $\pm 1\text{kV}$, $\pm 2\text{kV}$ | Criterion A |
| Conducted Disturbances, Induced by RF Fields | IEC 61000-4-6:2013 | Criterion A |
| Power Frequency Magnetic Field | IEC 61000-4-8:2009 | Criterion A |
| Voltage Dips | IEC 61000-4-11:2004, Dip: 30% 10ms, Dip: 60% 100ms, Dip >95% 5000ms | Criterion A |
| Voltage Interruptions | IEC 61000-4-11:2004, >95% 5000ms | Criterion B |
| Application Note Link | CFM202S Series App Notes | |

CHARACTERISTIC CURVE

Power Derating Curve



Conduction Convection with External Baseplate (35x20x0.2cm)

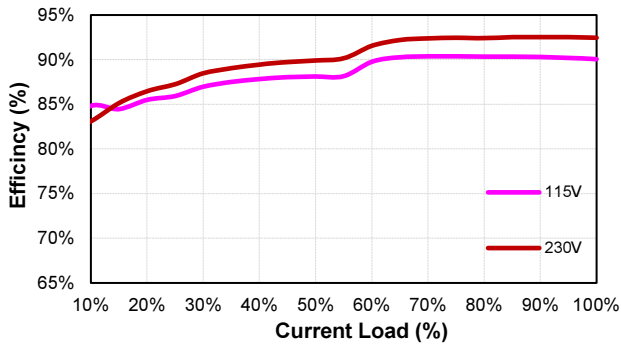




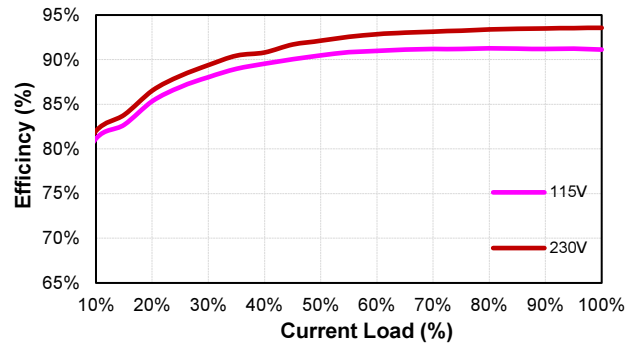
CFM202S Series

Performance Data

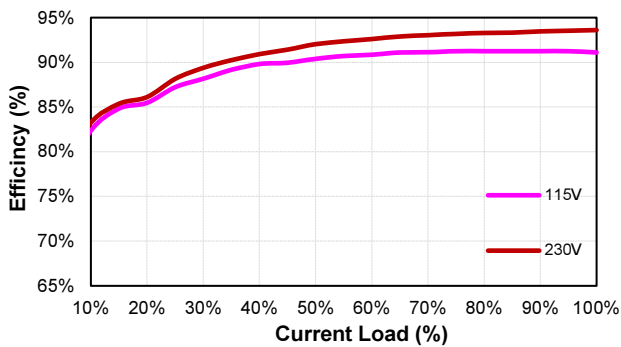
CFM202S120 (Eff Vs Io)



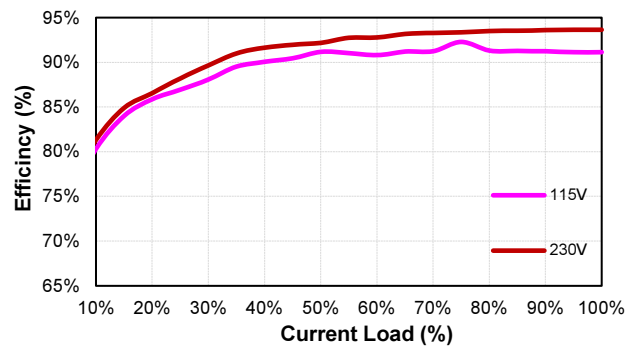
CFM202S240 (Eff Vs Io)



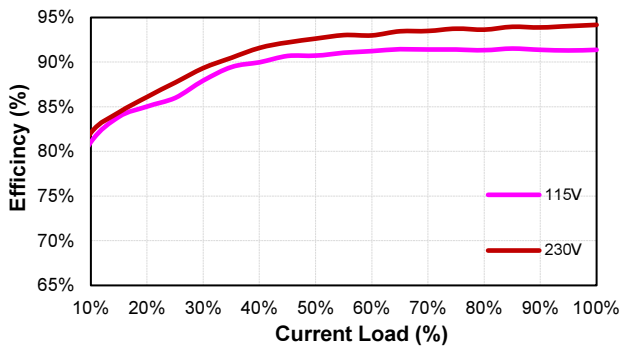
CFM202S280 (Eff Vs Io)



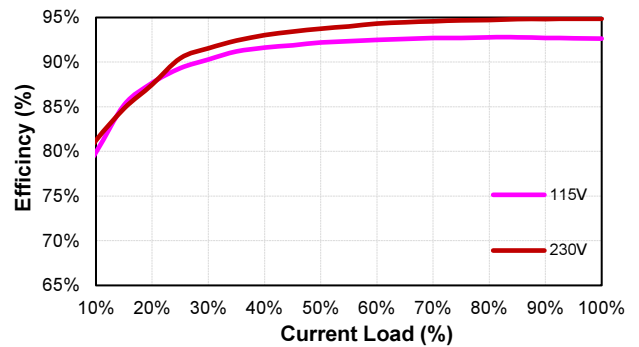
CFM202S360 (Eff Vs Io)



CFM202S480 (Eff Vs Io)



CFM202S560 (Eff Vs Io)

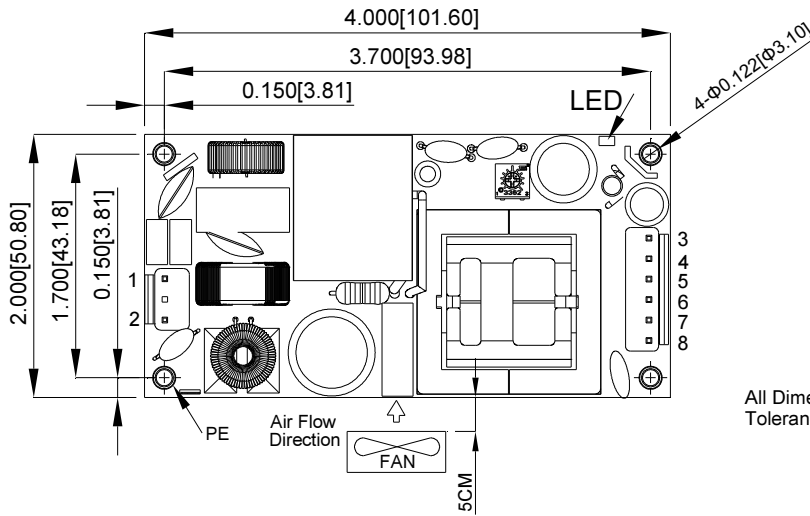




CFM202S Series

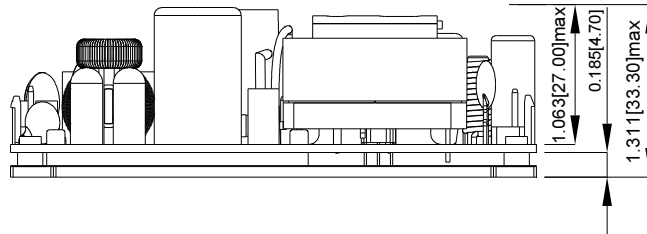
MECHANICAL SPECIFICATION

CFM202S-B

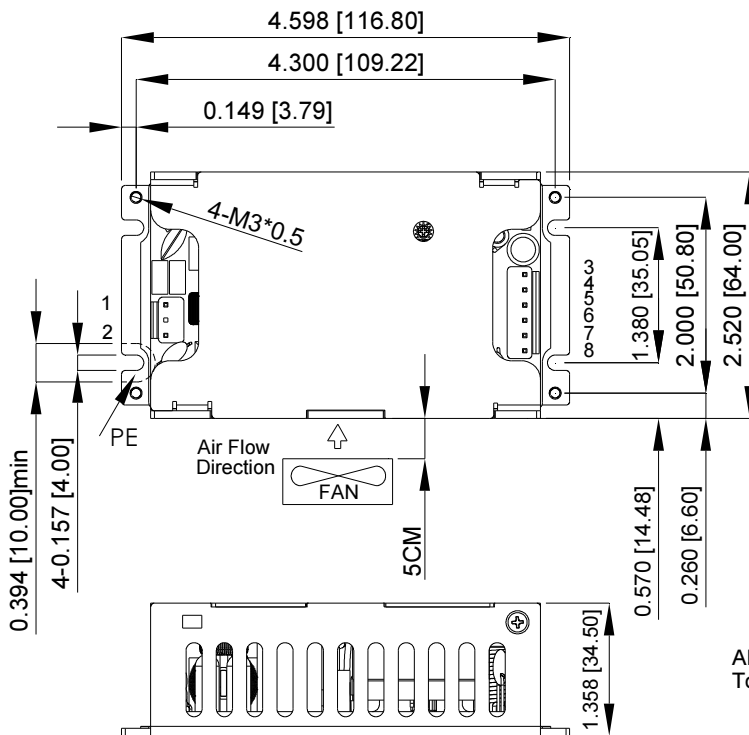


| PIN | Function |
|-----|----------|
| 1 | ACL |
| 2 | ACN |
| 3 | +Vout |
| 4 | +Vout |
| 5 | +Vout |
| 6 | -Vout |
| 7 | -Vout |
| 8 | -Vout |

All Dimensions In Inches[mm]
 Tolerance Inches:x.xxx= \pm 0.02
 Millimeters: x.xx = \pm 0.5



CFM202S-C



| PIN | Function |
|-----|----------|
| 1 | ACL |
| 2 | ACN |
| 3 | +Vout |
| 4 | +Vout |
| 5 | +Vout |
| 6 | -Vout |
| 7 | -Vout |
| 8 | -Vout |

All Dimensions In Inches[mm]
 Tolerance Inches:x.xxx= \pm 0.02
 Millimeters: x.xx = \pm 0.5