

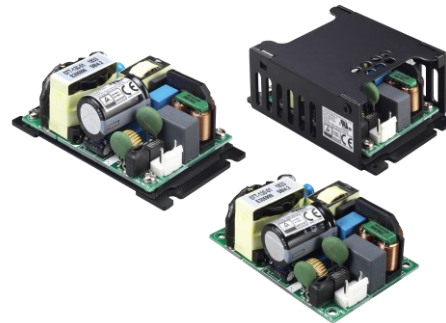


CFM130M SERIES

130 WATT MEDICAL AC-DC POWER SUPPLY WITH PFC

Features

- Universal Input Range 80~264Vac
- High Efficiency up to 94%
- 2"x 3" Open Frame Compact Size
- Class I & Class II (NOTE8)
- No Load Input Power Consumption<150mW
- Peak Power Operation up to 150Watt for 5s
- Approval Safety IEC/EN/UL 60601-1 2 MOPP
- Operating Altitude 5000m
- 100W with Natural Convection
- 130W with Fan-Cooled
- Continuous Short Circuit Protection
- Active PFC Function



| MODEL NUMBER | OUTPUT VOLTAGE | OUTPUT CURRENT | | RIPPLE & NOISE NOTE2 | VOLTAGE ACCURACY NOTE1 | LINE REGULATION NOTE3 | LOAD REGULATION NOTE4 | %EFF. (Typ.) NOTE5 |
|--------------|----------------|--------------------|------------------|----------------------|------------------------|-----------------------|-----------------------|--------------------|
| | | NATURAL CONVECTION | FAN COOLED NOTE7 | | | | | |
| CFM130M120 | 12 V | 8.34 A | 10.8 A | 120 mV | ±2% | ±0.5% | ±1% | 93% |
| CFM130M180 | 18 V | 5.56 A | 7.2 A | 180 mV | ±2% | ±0.5% | ±1% | 93% |
| CFM130M190 | 19 V | 5.26 A | 6.8 A | 190 mV | ±2% | ±0.5% | ±1% | 93% |
| CFM130M240 | 24 V | 4.2 A | 5.4 A | 240 mV | ±2% | ±0.5% | ±1% | 93% |
| CFM130M360 | 36 V | 2.8 A | 3.6 A | 360 mV | ±2% | ±0.5% | ±1% | 94% |
| CFM130M480 | 48 V | 2.1 A | 2.7 A | 480 mV | ±2% | ±0.5% | ±1% | 94% |

Note:

1. Voltage accuracy is set at 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 100Vac to 240Vac with full load.
4. Load regulation is measured from 10% 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 JSThousing VHR series or equivalent.
7. Requires 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 |
|--------|-------------------|--|--|
| CFM130 | X | XXX | -X (Option) |
| CFM130 | M : MEDICAL | 120 : 12V 180 : 18V 190 : 19V 240 : 24V 360 : 36V 480 : 48V | Blank : Wafer B : Base Cooling C : Cover |

Part Number Example:

CFM130M120-B: Open Frame, 130W, Medical 12Vdc Output, Base Cooling



CFM130M 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 | 80 | | 264 | V _{ac} |
| Operating Temperature | See Derating Curve | All | -30 | | 70 | °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 | | 240 | V _{ac} |
| Input Frequency Range | | All | 47 | | 63 | Hz |
| Maximum Input Current | 100% Load, V _{in} =100Vac | All | | | 1.8 | A |
| Inrush Current | V _{in} =240V _{ac} , Cold start @25°C | All | | | 100 | A |
| Leakage Current | | All | | | 100 | uA |
| Under Voltage Protection | | All | 55 | 62 | 70 | V _{ac} |

OUTPUT CHARACTERISTICS

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|--------------------------------|---|------------|-------|------|-------|-----------------|
| Output Voltage Set Point | V _{in} =80V _{ac} ~264V _{ac} , I _o =Full load, Ambient temperature=25°C | CFM130M120 | 11.76 | 12 | 12.24 | V _{dc} |
| | | CFM130M180 | 17.64 | 18 | 18.36 | |
| | | CFM130M190 | 18.62 | 19 | 19.38 | |
| | | CFM130M240 | 23.52 | 24 | 24.48 | |
| | | CFM130M360 | 35.28 | 36 | 36.72 | |
| | | CFM130M480 | 47.04 | 48 | 48.96 | |
| Operating Output Current Range | V _{in} =80V _{ac} ~264V _{ac} , See Derating Curve | CFM130M120 | | | 10.8 | A |
| | | CFM130M180 | | | 7.2 | |
| | | CFM130M190 | | | 6.8 | |
| | | CFM130M240 | | | 5.4 | |
| | | CFM130M360 | | | 3.6 | |
| | | CFM130M480 | | | 2.7 | |
| Holdup Time | V _{in} =115V _{ac} | All | 20 | | | 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 | Auto recovery | CFM130M120 | | 13.5 | | V _{dc} |
| | | CFM130M180 | | 20.5 | | |
| | | CFM130M190 | | 23 | | |
| | | CFM130M240 | | 30 | | |
| | | CFM130M360 | | 42 | | |
| | | CFM130M480 | | 54 | | |
| Peak Power | 1. V _{in} =115V _{ac} and 230V _{ac} 2. Ambient temperature=25°C 3. Peak power should be less than 5seconds, with a maximum 10% duty cycle, peak power function by 115% load 5S and 75% load 45S | All | | 115 | | % |
| Over Current Protection | Auto recovery | All | 115 | 130 | 145 | % |
| Short Circuit Protection | Auto recovery | All | | | | |



CFM130M Series

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|-------------------------|---|------------|------|------|------|-------|
| 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 | CFM130M120 | | | 120 | mV |
| | | CFM130M180 | | | 180 | |
| | | CFM130M190 | | | 190 | |
| | | CFM130M240 | | | 240 | |
| | | CFM130M360 | | | 360 | |
| | | CFM130M480 | | | 480 | |
| Load Capacitance | 1. Input voltage is 115V _{ac} and 230V _{ac} . 2. Output is max. full load 3. Ambient temperature=25°C | CFM130M120 | | | 8400 | uF |
| | | CFM130M180 | | | 5600 | |
| | | CFM130M190 | | | 5200 | |
| | | CFM130M240 | | | 4200 | |
| | | CFM130M360 | | | 2720 | |
| | | CFM130M480 | | | 2040 | |
| Efficiency | 1. Input voltage is 230V _{ac} 2. Output is 75% full load 3. Ambient temperature=25°C | CFM130M120 | | 93 | | % |
| | | CFM130M180 | | 93 | | |
| | | CFM130M190 | | 93 | | |
| | | CFM130M240 | | 93 | | |
| | | CFM130M360 | | 94 | | |
| | | CFM130M480 | | 94 | | |

ISOLATION CHARACTERISTICS

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|--------------------------|---|--------|------|------|------|-----------------|
| Input to Output | 1 Minute (without dielectric breakdown) | All | | | 4400 | V _{ac} |
| Input to Earth (Ground) | 1 Minute (without dielectric breakdown) | All | | | 1800 | V _{ac} |
| Output to Earth (Ground) | 1 Minute (without dielectric breakdown) | All | | | 1800 | V _{ac} |
| Isolation Resistance | Input to output | All | 100 | | | MΩ |

FEATURE CHARACTERISTICS

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|---------------------|----------------------|--------|------|------|------|-------|
| Switching Frequency | | All | | 105 | | kHz |

GENERAL SPECIFICATIONS

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|--------------|--|-----------|--|------|------|---------|
| MTBF | I _o =100%; T _a =25°C per MIL-HDBK-217F | All | 500 | | | k hours |
| | I _o =100%; T _a =25°C Telcordia SR332 | | 3160 | | | |
| Humidity | Non-condensing | All | | | 93 | % RH |
| Shock | Meets MIL-STD-810F Table 516.5, TABLE 516.5-1 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 | | CFM130M | | 135 | | grams |
| | | CFM130M-B | | 170 | | |
| | | CFM130M-C | | 218 | | |
| Dimensions | Open Frame (Wafer) | All | 3.000x2.000x1.201 Inches (76.20x50.80x30.50 mm) | | | |
| | B (Base Cooling) | | 3.598x2.000x1.299 Inches (91.40x50.80x33.00mm) | | | |
| | C (Cover) | | 3.598x2.520x1.358 Inches (91.40x64.00x34.50mm) | | | |
| Safety | Class I & Class II, IEC 60601-1:2005/AMD2:2020, EN 60601-1:2006+A1+A12+A2, ANSI/AAMI ES 60601-1:2005 & A1:2012 & A2:2021 | | | | | Ed 3.2 |
| EMC Emission | EN 55011, Class B, IEC 61000-3-2:2018, IEC 61000-3-3:2013+A1: 2017, FCC CFR 47 Part 18 | | | | | |



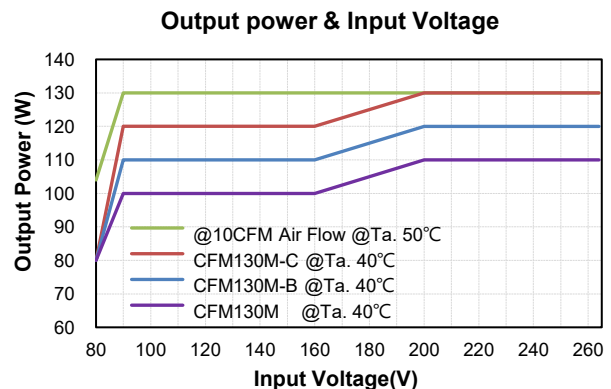
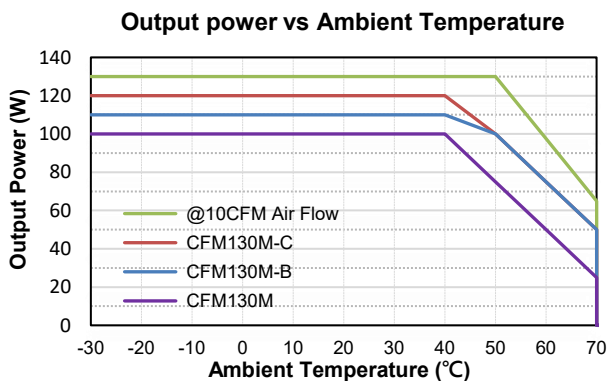
CFM130M Series

GENERAL SPECIFICATIONS

| | | |
|--|---|-------------|
| Conducted Disturbance | EN 55011, FCC CFR 47 Part 18 (Class I & Class II meets Class B) | Class B |
| Radiated Disturbance | EN 55011, FCC CFR 47 Part 18 Class I (Class I Meet Class B; Class II Meet Class A) | Class B |
| Harmonic Current Emissions | IEC 61000-3-2:2018 | Class A |
| Voltage Fluctuations & Flicker | EN 61000-3-3:2013+A1: 2017 | Criteria A |
| EMC Immunity | EN 60601-1-2:2015+A1:2021, IEC 61000-4-2, 3, 4, 5, 6, 8, 11 | Ed 4.1 |
| Electrostatic Discharge (ESD) | IEC 61000-4-2:2008 Air Discharge: $\pm 15\text{kV}$, Contact Discharge: $\pm 8\text{kV}$ | Criterion A |
| Radio-Frequency, Continuous Radiated Disturbance | IEC 61000-4-3:2020 | Criterion A |
| Electrical Fast Transient (EFT) | IEC 61000-4-4:2012, $\pm 2\text{kV}$ | Criterion A |
| Surge | IEC 61000-4-5:2014+A1:2017, L-N: $\pm 1\text{kV}$, L-E (Ground): $\pm 1\text{kV}$, $\pm 2\text{kV}$ | 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% Reduction, Dip >95% Reduction | Criterion A |
| Voltage Interruptions | IEC 61000-4-11:2020, >95% reduction | Criterion B |
| Application Note Link | CFM130M Series App Notes | |

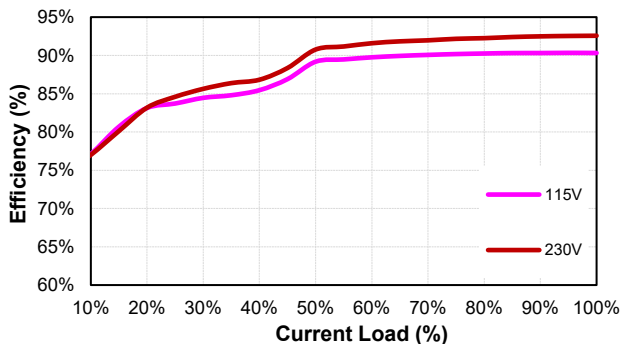
CHARACTERISTIC CURVE

Power Derating Curve

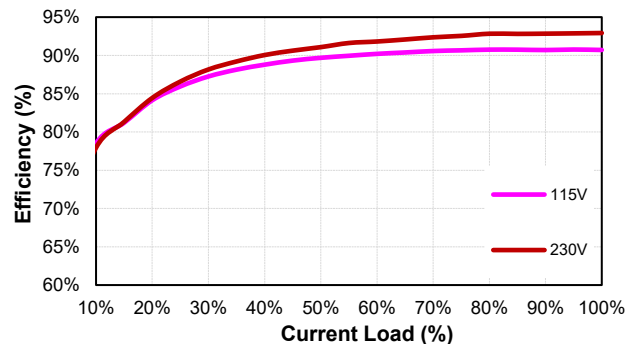


Performance Data

CFM130M120 (Eff Vs Io)



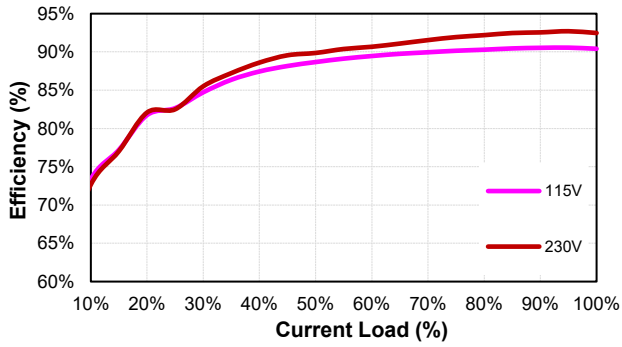
CFM130M180 (Eff Vs Io)



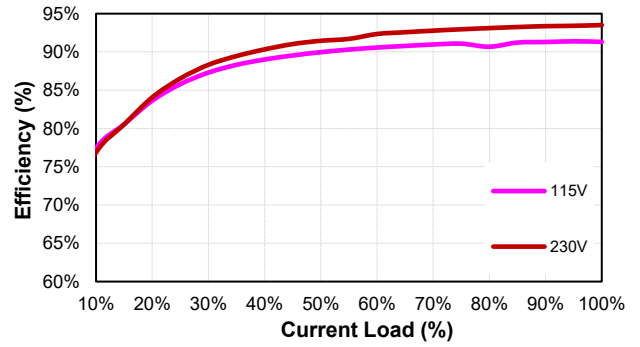


CFM130M Series

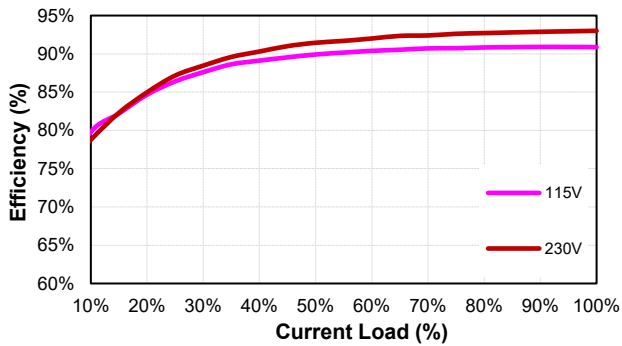
CFM130M190 (Eff Vs Io)



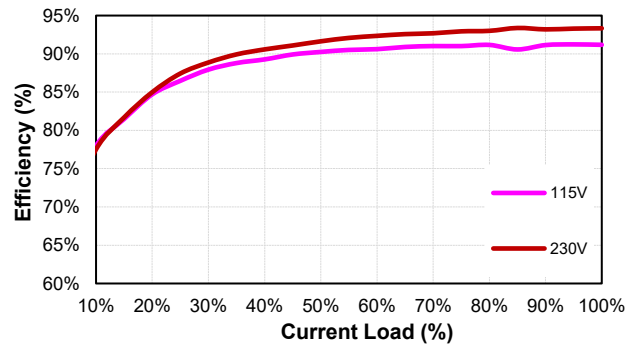
CFM130M240 (Eff Vs Io)



CFM130M360 (Eff Vs Io)



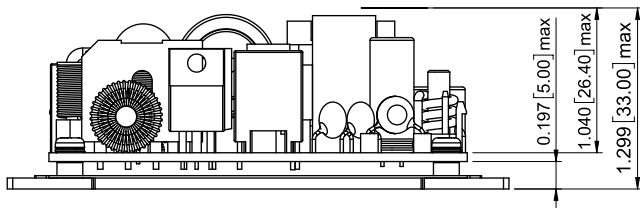
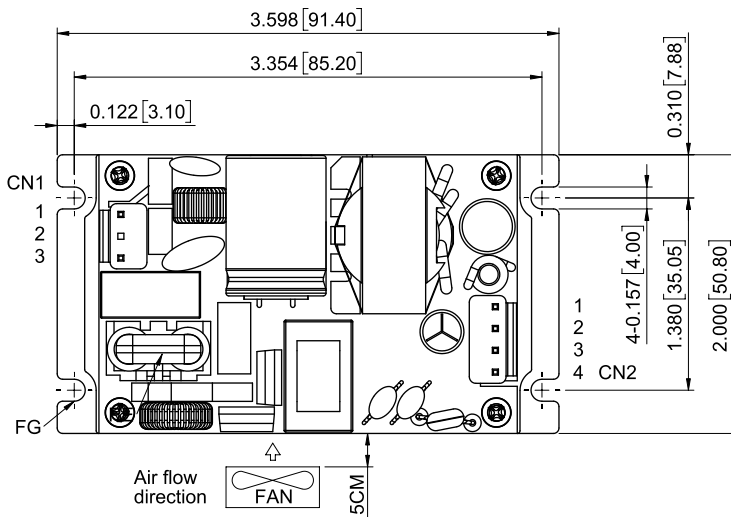
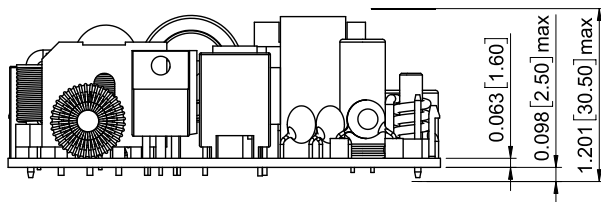
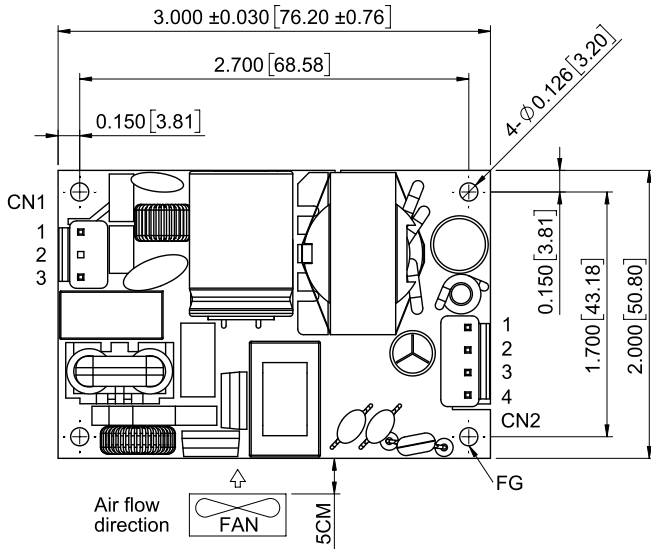
CFM130M480 (Eff Vs Io)





CFM130M Series

MECHANICAL SPECIFICATION



CFM130M

All Dimensions in Inches[mm]
Tolerance Inches: x.xxx=±0.020
Millimeters: x.xx=±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 | | |

CFM130M-B

All Dimensions in Inches[mm]
Tolerance Inches: x.xxx=±0.020
Millimeters: x.xx=±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 | | |

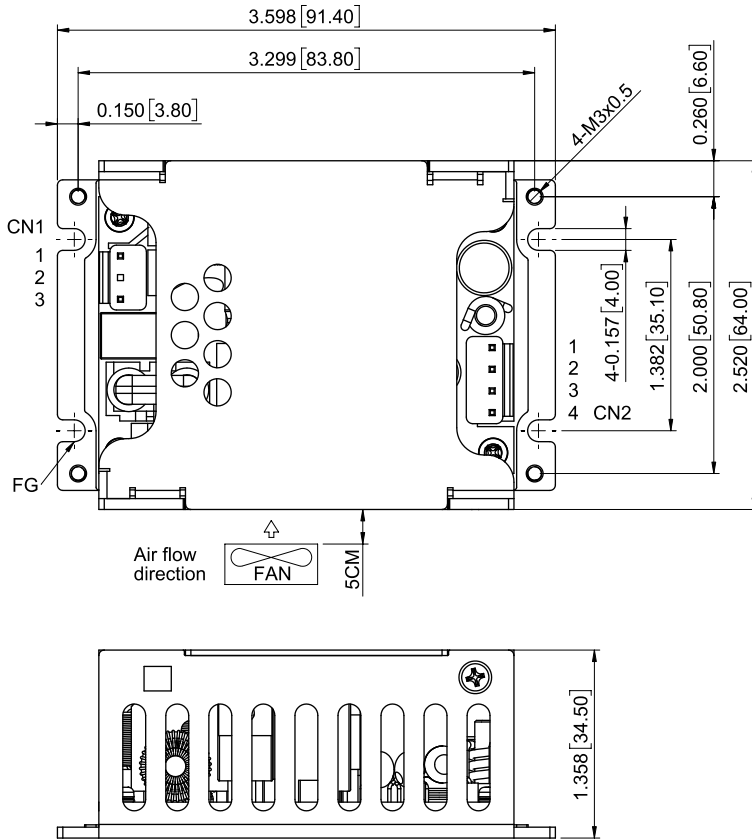
DC Output Connector(CN2):TKP PVHI-04 or equivalent

| 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 | | |



CFM130M Series

MECHANICAL SPECIFICATION



CFM130M-C

All Dimensions in Inches[mm]
 Tolerance Inches: x .xxx=±0.020
 Millimeters: x.xx=±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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