



CFM40M SERIES 40W MEDICAL AC-DC OPEN FRAME

Features

- Universal Input Range 90~264Vac
- Efficiency to 88% Typical
- 2"x 3" Size
- Class I
- No Load Power Consumption < 0.3W
- Approval UL/EN/IEC 60601-1 2MOPP
- Approval EN 55011 and CISPR/FCC Class B
- Continuous Short Circuit Protection



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE NOTE2	Voltage Accuracy NOTE1	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
CFM40M033	3.3 V	6 A	50mV	±1%	±0.5%	±1%	76%
CFM40M050	5 V	6 A	±1%	±1%	±0.5%	±1%	80%
CFM40M090	9 V	4.45 A	±1%	±1%	±0.5%	±1%	84%
CFM40M120	12 V	3.34 A	±1%	±1%	±0.5%	±1%	86%
CFM40M150	15 V	2.67 A	±1%	±1%	±0.5%	±1%	87%
CFM40M240	24 V	1.67 A	±1%	±1%	±0.5%	±1%	88%
CFM40M300	30 V	1.33 A	±1%	±1%	±0.5%	±1%	88%
CFM40M360	36 V	1.11 A	±1%	±1%	±0.5%	±1%	88%
CFM40M480	48 V	0.834 A	±1%	±1%	±0.5%	±1%	88%

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 is measured from 10% to 100% full load.
5. Typical efficiency at 230 Vac and 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. Safety approvals does not apply to the covered and pins versions, only to the open-frame versions.

PART NUMBER

Series	Number of Outputs	Nominal Output Voltage	Type
CFM40M	O	XXX	-X (Option)
CFM40M	S : Single	033 : 3.3V 050 : 5V 090 : 9V 120 : 12V 150 : 15V 240 : 24V 300 : 30V 360 : 36V 480 : 48V	Blank: Wafer P: Input and Output with PIN C: With Cover

Part Number Example:

- CFM40M120:** Open Frame, 40W, Medical 12Vdc Output, Wafer
- CFM40M120-P:** Open Frame, 40W, Medical 12Vdc Output, Input and Output with PIN
- CFM40M120-C:** Open Frame, 40W, Medical 12Vdc Output, With Cover



CFM40M 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	Safety approvals only to the AC input	All	90		264	V _{ac}
			120		370	V _{dc}
Operating Temperature	See Derating Curve	All	-20		70	°C
Storage Temperature		All	-40		85	°C
Operating Altitude		All			3000	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} =100V _{ac}	All			1	A
Inrush Current	V _{in} =240V _{ac} , Cold start @25°C	All			60	A
Leakage Current (Earth)		All			300	uA
Leakage Current (Touch)		All			100	uA

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V _{in} =90V _{ac} ~264V _{ac} , I _o =I _o max., T _c =25°C	CFM40M033	3.267	3.3	3.33	V _{dc}
		CFM40M050	4.95	5	5.05	
		CFM40M090	8.91	9	9.09	
		CFM40M120	11.88	12	12.12	
		CFM40M150	14.85	15	15.15	
		CFM40M240	23.76	24	24.24	
		CFM40M300	29.7	30	30.3	
		CFM40M360	35.64	36	36.36	
		CFM40M480	47.52	48	48.48	
Operating Output Current Range	V _{in} =90V _{ac} ~264V _{ac}	CFM40M033	0		6	A
		CFM40M050	0		6	
		CFM40M090	0		4.45	
		CFM40M120	0		3.34	
		CFM40M150	0		2.67	
		CFM40M240	0		1.67	
		CFM40M300	0		1.33	
		CFM40M360	0		1.11	
		CFM40M480	0		0.834	
Holdup Time	V _{in} =115V _{ac}	All		10	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	%



CFM40M Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Protection	TVS component to clamp output voltage	CFM40M033		6.8		V _{dc}
		CFM40M050		6.8		
		CFM40M090		11		
		CFM40M120		15		
		CFM40M150		18		
		CFM40M240		30		
		CFM40M300		36		
		CFM40M360		43		
		CFM40M480		56		
Over Current Protection	Auto recovery	All	130	140	170	%
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 2. Oscilloscope is 20MHz band width 3. Ambient temperature=25°C	CFM40M033			50	mV _{p-p}
		CFM40M050			50	
		CFM40M090			90	
		CFM40M120			120	
		CFM40M150			150	
		CFM40M240			240	
		CFM40M300			300	
		CFM40M360			360	
		CFM40M480			480	
Load Capacitance	1. Input voltage is 115V _{ac} and 230V _{ac} 2. Output is 100% full load 3. Ambient temperature=25°C	CFM40M033			6000	uF
		CFM40M050			6000	
		CFM40M090			4400	
		CFM40M120			3400	
		CFM40M150			2600	
		CFM40M240			1600	
		CFM40M300			1300	
		CFM40M360			1100	
		CFM40M480			840	
Efficiency	1. Input voltage is 230V _{ac} 2. Output is 100% full load 3. Ambient temperature=25°C	CFM40M033		76%		%
		CFM40M050		80%		
		CFM40M090		84%		
		CFM40M120		86%		
		CFM40M150		87%		
		CFM40M240		88%		
		CFM40M300		88%		
		CFM40M360		88%		
		CFM40M480		88%		

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 Minute	All			4700	V _{ac}
Input to Earth	1 Minute	All			1900	V _{ac}
Output to Earth	1 Minute	All			1900	V _{ac}
Isolation Resistance	Input to output	All	100			MΩ

FEATURE CHARACTERISTICS

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



CFM40M Series

GENERAL CHARACTERISTICS

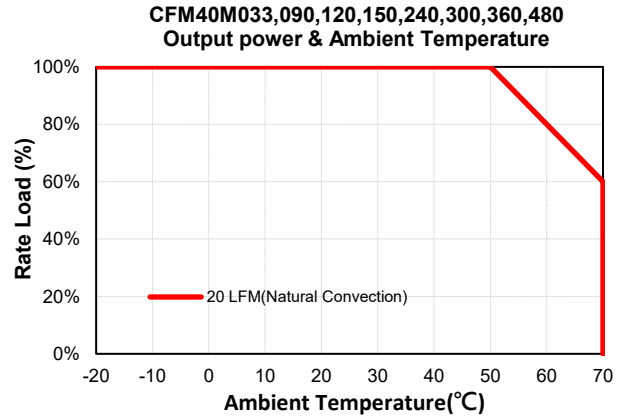
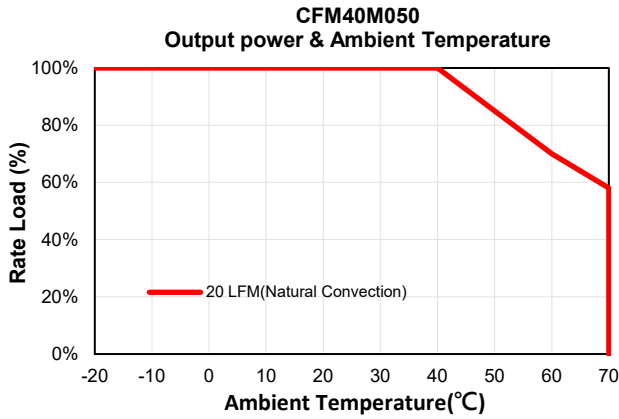
PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I _o =100%; T _a =25°C per MIL-HDBK-217F I _o =100%, T _a =25°C, Telcordia SR332	All	650 3000			k hours
Humidity	Non-condensing	All			93	% RH
Shock	Meets MIL-STD-810F Table 516.5, TABLE 516.5- I 10ms, each axis 3 times(±X · ±Y · ±Z axis)	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	CFM40MXXX CFM40MXXX-P CFM40MXXX-C	All		90 90 176		grams
Dimension	CFM40MXXX	All	3.000x2.000x0.909 Inches (76.20x50.80x23.10 mm)			
	CFM40MXXX-P		3.000x2.000x0.984 Inches (76.20x50.80x25.00 mm)			
	CFM40MXXX-C		3.200x2.441x1.260 Inches (81.28x62.00x32.00 mm)			
Safety	Class I IEC 60601-1:2005+A1+A2, EN 60601-1:2006 +A1:2013+A12:2014+A2:2021, ANSI/AAMEI ES60601-1:2005+A2:2010+A1:2012+A2:2021					Ed 3.2
EMC Emission	EN 55011:2016+A11:2020, IEC 61000-3-2:2019, IEC 61000-3-3:2013+A1:2019, FCC CFR 47 PART 18					
Conducted Disturbance	EN 55011:2016+A11:2020, FCC CFR 47 PART 18					Class B
Radiated Disturbance	EN 55011:2016+A11:2020, FCC CFR 47 PART 18					Class B
Harmonic Current Emissions	EN 61000-3-2:2019					Class A
Voltage Fluctuations & Flicker	EN 61000-3-3:2013					Criterion 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: ±15KV, Contact discharge: ±8KV					Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2020					Criterion A
Electrical Fast Transient (EFT)	IEC 61000-4-4:2012					Criterion A
Surge	IEC 61000-4-5:2014+A1:2017 Line to line ±1kV, Line to earth ±2kV					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 61000-4-11:2020, Dip: 30% Reduction, Dip >95% Reduction					Criterion A
Voltage Interruptions	IEC 61000-4-11:2020, >95% reduction					Criterion B
Application Note Link						CFM40M Series App Notes



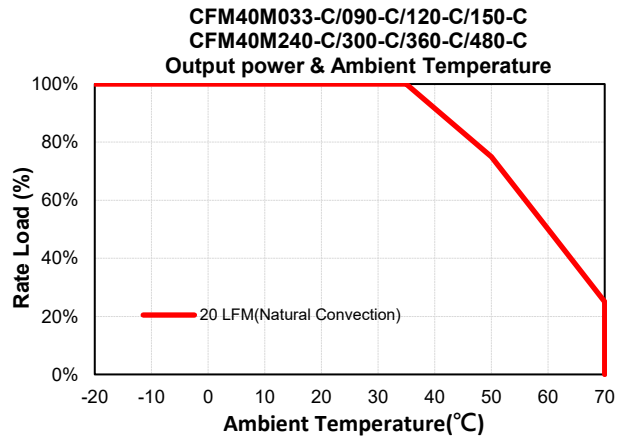
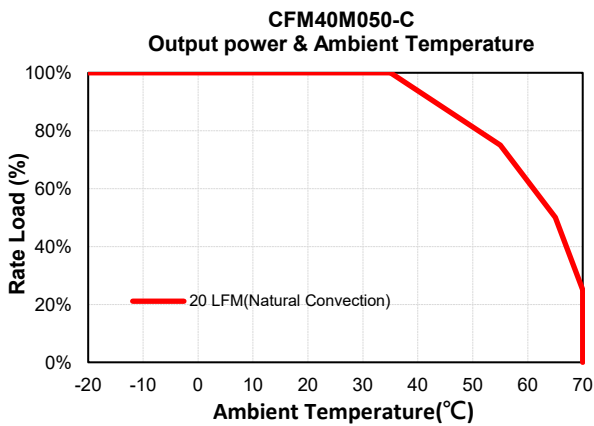
CHARACTERISTIC CURVE

Power Derating Curve

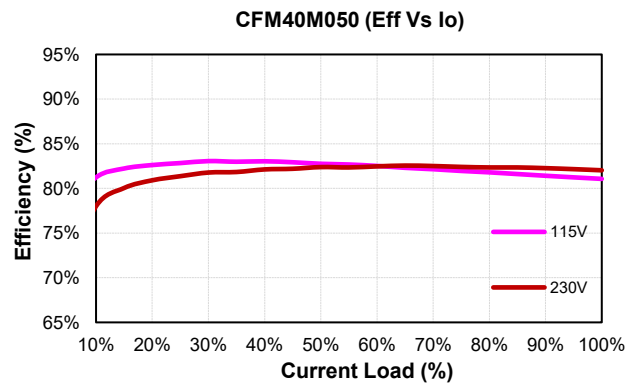
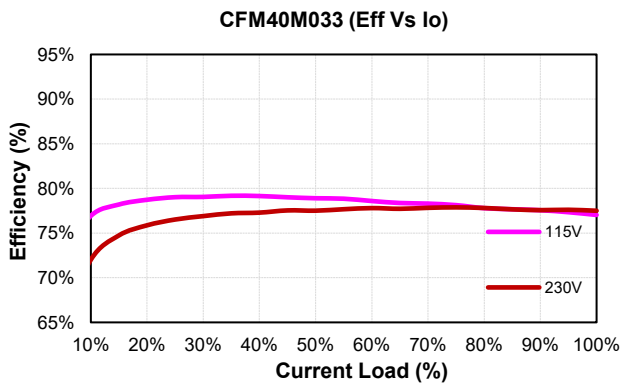
Open Frame & Pin version: CFM40MXXX



Covered version: CFM40MXXX-C



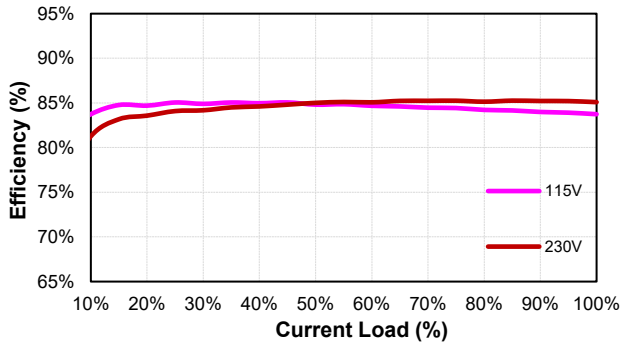
Performance Data



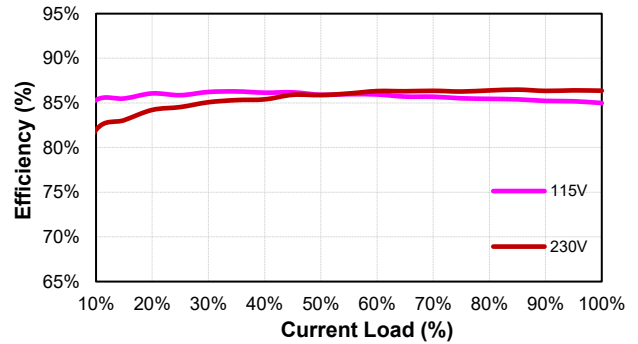


CFM40M Series

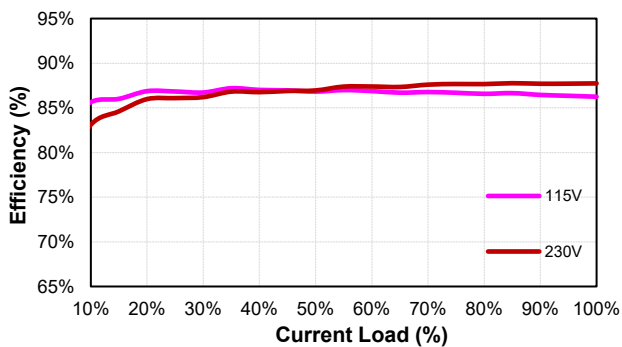
CFM40M090 (Eff Vs Io)



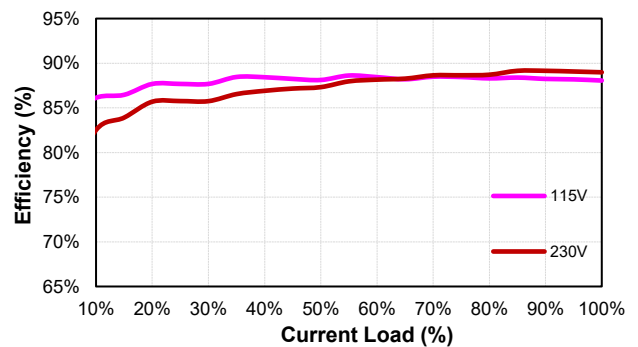
CFM40M120 (Eff Vs Io)



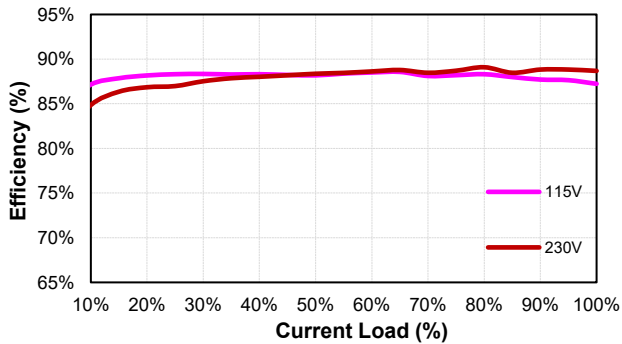
CFM40M150 (Eff Vs Io)



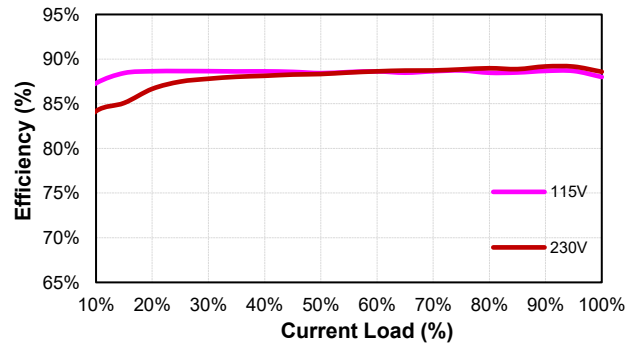
CFM40M240 (Eff Vs Io)



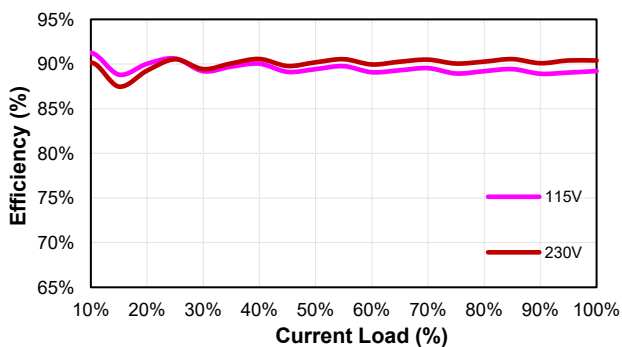
CFM40M300 (Eff Vs Io)



CFM40M360 (Eff Vs Io)



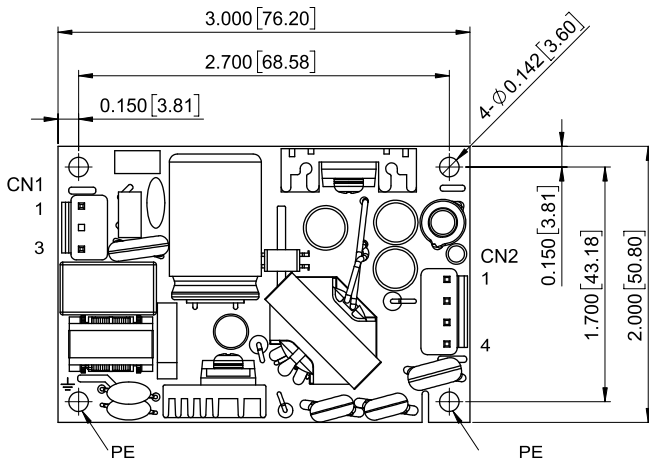
CFM40M480 (Eff Vs Io)





CFM40M Series

MECHANICAL SPECIFICATION



CFM40MXXX

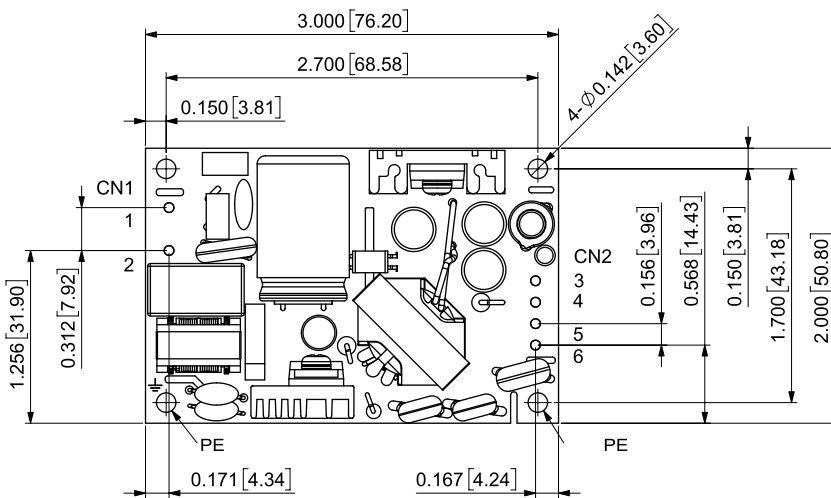
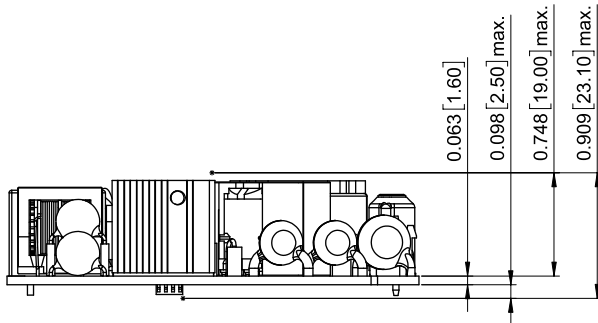
All Dimensions in Inches[mm]
 Tolerance Inches: x.xxx=±0.020
 Millimeters: x.xx=±0.50

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

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

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		

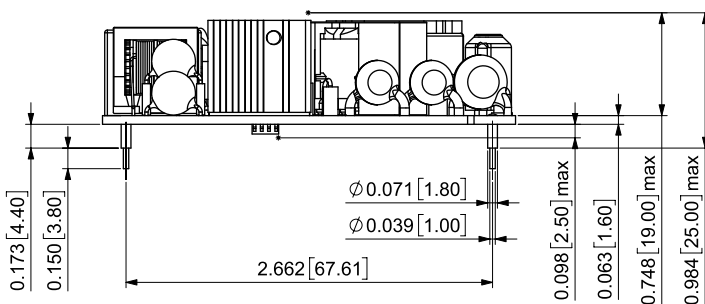


CFM40MXXX-P

All Dimensions in Inches[mm]
 Tolerance Inches: x.xxx=±0.020
 Millimeters: x.xx=±0.50

Pin Connection

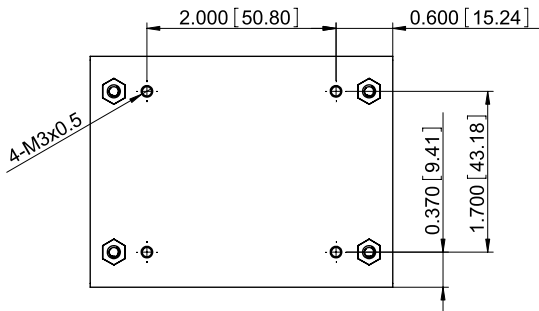
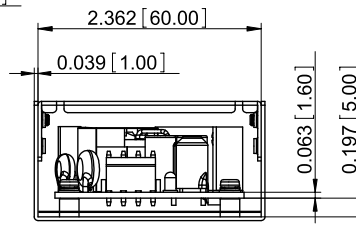
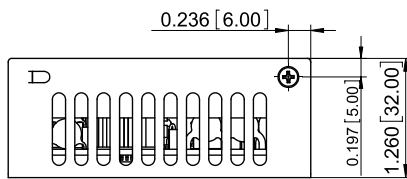
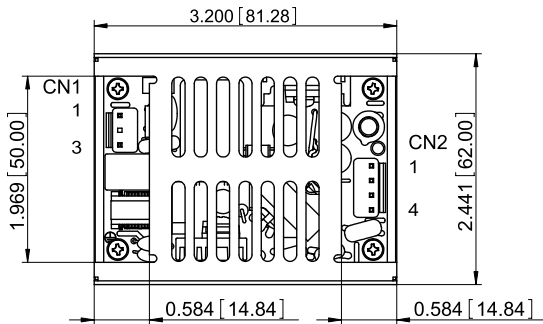
Pin	Function
1	ACN
2	ACL
3	+Vout
4	+Vout
5	-Vout
6	-Vout





CFM40M Series

MECHANICAL SPECIFICATION



CFM40MXXX-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	ACN	JST VHR-3N or equivalent	JST SVH-21T-P1.1 or equivalent
2	-		
3	ACL		

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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