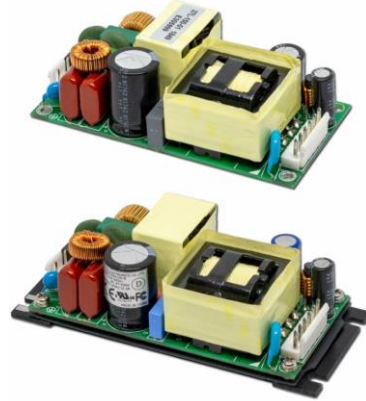




# CFM150S SERIES 150 WATT OPEN FRAME AC-DC MODULES

## Features

- Universal Input Range 90~264Vac
- High Efficiency up to 94%
- 2"x 4" Open Frame Compact Size
- Class I & Class II (NOTE7)
- 120W with Natural Convection (CFM150SXXX)
- 150W with Natural Convection (CFM150SXXXB)
- Peak Power Operation up to 180Watt for 5s
- No Load Input Power Consumption<150mW
- Approval Safety IEC/EN/UL 62368-1
- Operating Altitude 5000m
- Continuous Short Circuit Protection
- Over Voltage Protection
- Active PFC Function



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT		VOLTAGE ACCURACY NOTE1	RIPPLE & NOISE NOTE2	VLOTAGE ADJ. RANGE	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	% EFF. (Typ.) NOTE5
		NATURAL CONVECTION	BASE COOLING						
CFM150S120	12 V	10.0 A	12.5 A	1%	120 mV	±8%	±0.5%	±1%	93%
CFM150S240	24 V	5.0 A	6.25 A	1%	240 mV	±8%	±0.5%	±1%	94%
CFM150S280	28 V	4.28 A	5.35 A	1%	280 mV	±8%	±0.5%	±1%	94%
CFM150S360	36 V	3.33 A	4.16 A	1%	360 mV	±8%	±0.5%	±1%	94%
CFM150S480	48 V	2.5 A	3.125 A	1%	480 mV	±8%	±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<sub>ac</sub> to 264V<sub>ac</sub> 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. 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
CFM150	X	XXX	-X (Option)
CFM150	S : Single	120 : 12V 240 : 24V 280 : 28V 360 : 36V 480 : 48V	Blank : Open Frame B : Base Cooling

Part Number Example:

CFM150S120B: With Base, 150W, Single 12V<sub>dc</sub> Output



# CFM150S 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>
Operating Temperature	100Vac~264Vac See Derating Curve (V <sub>in</sub> =90V <sub>ac</sub> , 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 <sub>ac</sub>
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% Load, V <sub>in</sub> =100V <sub>ac</sub>	All			2	A
Power Factor	100% Load, V <sub>in</sub> =230V <sub>ac</sub>	All	0.9			
Inrush Current	V <sub>in</sub> =240V <sub>ac</sub> , Cold Start @25°C	All			100	A
Leakage Current (Touch)		All			0.1	mA
Leakage Current (Earth)		All			1	mA
Under Voltage Protection		All	60		75	V <sub>ac</sub>

### OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V <sub>in</sub> =90Vac~264Vac, I <sub>o</sub> =I <sub>o</sub> max., ambient temperature=25°C	CFM150S120/-B	11.88	12	12.12	V <sub>dc</sub>
		CFM150S240/-B	23.76	24	24.24	
		CFM150S280/-B	27.72	28	28.28	
		CFM150S360/-B	35.64	36	36.36	
		CFM150S480/-B	47.52	48	48.48	
Output Voltage Adjustment	CFM150S ≤ Rated output power 120W CFM150S-B ≤ Rated output power 150W	CFM150S120/-B	11.04		12.96	V <sub>dc</sub>
		CFM150S240/-B	22.08		25.92	
		CFM150S280/-B	25.76		30.24	
		CFM150S360/-B	33.12		38.88	
		CFM150S480/-B	44.16		51.84	
Operating Output Current Range	CFM150SXXX V <sub>in</sub> = 90V <sub>ac</sub> ~200V <sub>ac</sub> see typical current V <sub>in</sub> = 200V <sub>ac</sub> ~264V <sub>ac</sub> see max. current	CFM150S120	0	10	11.67	A
		CFM150S240	0	5	5.83	
		CFM150S280	0	4.28	4.99	
		CFM150S360	0	3.33	3.88	
		CFM150S480	0	2.5	2.92	
	V <sub>in</sub> =90V <sub>ac</sub> ~264V <sub>ac</sub> , <b>See Derating Curve</b>	CFM150S120/-B	0		12.5	A
		CFM150S240/-B	0		6.25	
		CFM150S280/-B	0		5.35	
		CFM150S360/-B	0		4.16	
		CFM150S480/-B	0		3.125	
Holdup Time	V <sub>in</sub> =115V <sub>ac</sub>	All	20	25		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	%



## CFM150S Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Over Voltage Protection	Latch Off (AC recycle to reset)	CFM150S120/-B CFM150S240/-B CFM150S280/-B CFM150S360/-B CFM150S480/-B			14.2 29.2 34.2 44.2 58.2	V <sub>dc</sub>
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	CFM150S120/-B CFM150S240/-B CFM150S280/-B CFM150S360/-B CFM150S480/-B			120 240 280 360 480	mVp-p
Over Current Protection	Auto recovery	CFM150S CFM150S-B	150 120	160 130	170 140	%
Peak Power	1. V <sub>in</sub> = 115V <sub>ac</sub> and 230V <sub>ac</sub> 2. Ambient temperature=25°C 3. Peak power should be less than 5seconds, with a maximum 10% duty cycle, peak power function by 120% load 5S and 75% load 45S	All		120		%
Short Circuit Protection	Auto recovery	All				
Load Capacitance	1. Input voltage is 115V <sub>ac</sub> and 230V <sub>ac</sub> 2. Output is 100% full load 3. Ambient temperature=25°C	CFM150S120/-B CFM150S240/-B CFM150S280/-B CFM150S360/-B CFM150S480/-B			12500 6200 5340 4100 3080	uF
Efficiency	1. Input voltage is 230V <sub>ac</sub> . 2. Output is 75% full load 3. Ambient temperature=25°C	CFM150S120/-B CFM150S240/-B CFM150S280/-B CFM150S360/-B CFM150S480/-B		93% 94% 94% 94% 94%		%

### ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 Minute (without dielectric breakdown)	All			4000	V <sub>ac</sub>
Input to Earth (Ground)	1 Minute (without dielectric breakdown)	All			2500	V <sub>ac</sub>
Output to Earth (Ground)	1 Minute (without dielectric breakdown)	All			360	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		115		kHz

### GENERAL CHARACTERISTICS

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	All	350			k hours
Life Time	@75% Load, 40°C	All	26			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	Open Frame B (Base Cooling)	All		200 240		grams



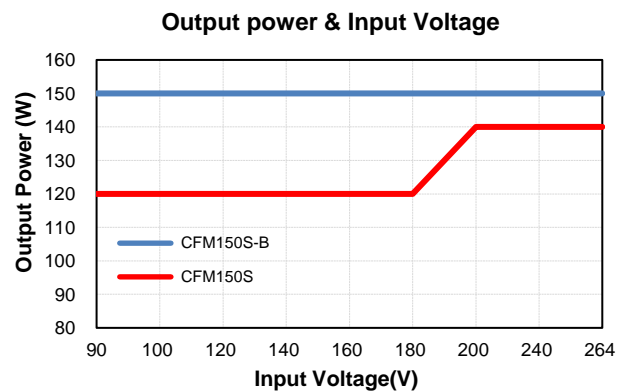
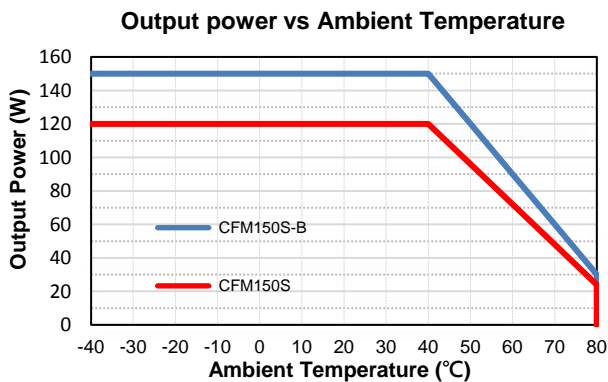
# CFM150S Series

## GENERAL CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Dimension	Open Frame B (Base Cooling)	All	4.000x2.000x1.283 Inches (101.6x50.80x32.6 mm) 4.598x2.000x1.362 Inches (116.8x50.80x34.6 mm)			
<b>Safety</b>	Class I & Class II, IEC/EN/UL 62368-1					
<b>EMC Emission</b>	EN 55032:2015+A11:2020 Class B, 47 CFR FCC Part 15 Subpart B, EN 61204-3:2018, EN 61000-3-2:2019, EN 61000-3-3:2013+A1:2019, EN 61000-6-3:2007+A1:2011+AC:2012, EN 61000-6-4:2019					
Conducted Disturbance	EN 55032:2015+A11:2020, 47 CFR FCC Part 15 (Class I & Class II meets Class B)				Class B	
Radiated Disturbance	EN 55032:2015+A11:2020, 47 CFR FCC Part 15 (Class I Meet Class B; Class II Meet Class A)				Class B	
Harmonic Current Emissions	EN 61000-3-2:2019				Class A	
Voltage Fluctuations & Flicker	EN 61000-3-3:2013+A1:2019				Criterion A	
<b>EMC Immunity</b>	EN 55035:2017+A11:2020, EN 61000-6-1:2019, EN 61000-6-2:2019, EN 61204-3:2018				Criterion A	
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008 Air Discharge: $\pm 8\text{kV}$ , Contact Discharge: $\pm 4\text{kV}$				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): $\pm 2\text{kV}$				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% 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="#">CFM150S Series App Notes</a>

## CHARACTERISTIC CURVE

### Power Derating Curve

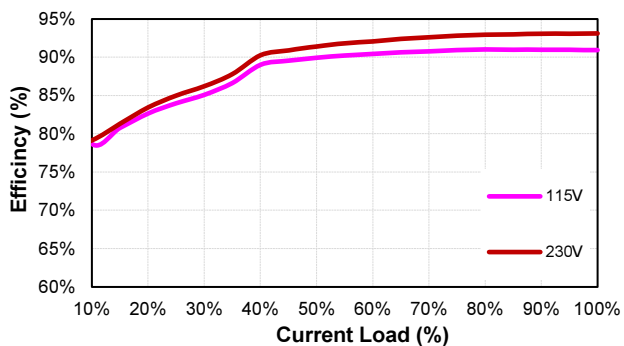




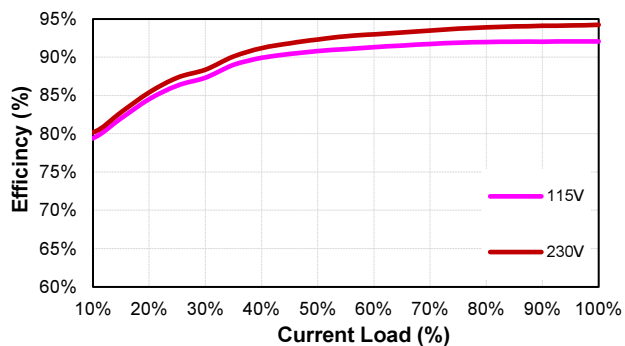
# CFM150S Series

## Performance Data

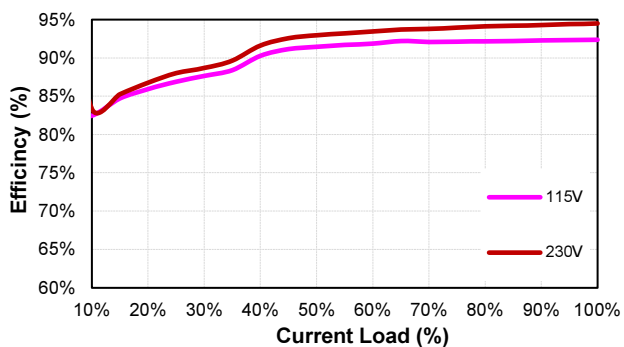
CFM150S120 (Eff Vs Io)



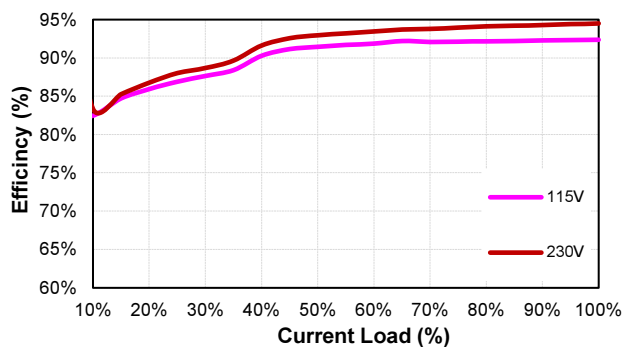
CFM150S240 (Eff Vs Io)



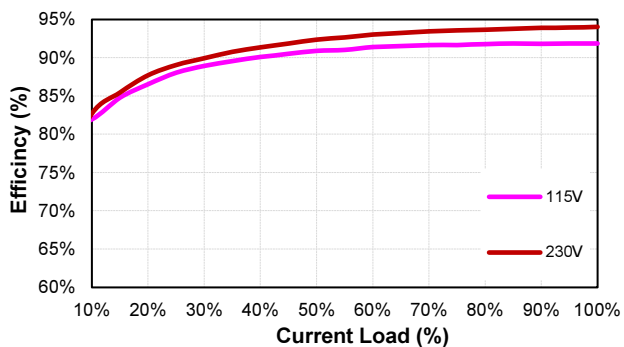
CFM150S280 (Eff Vs Io)



CFM150S280 (Eff Vs Io)



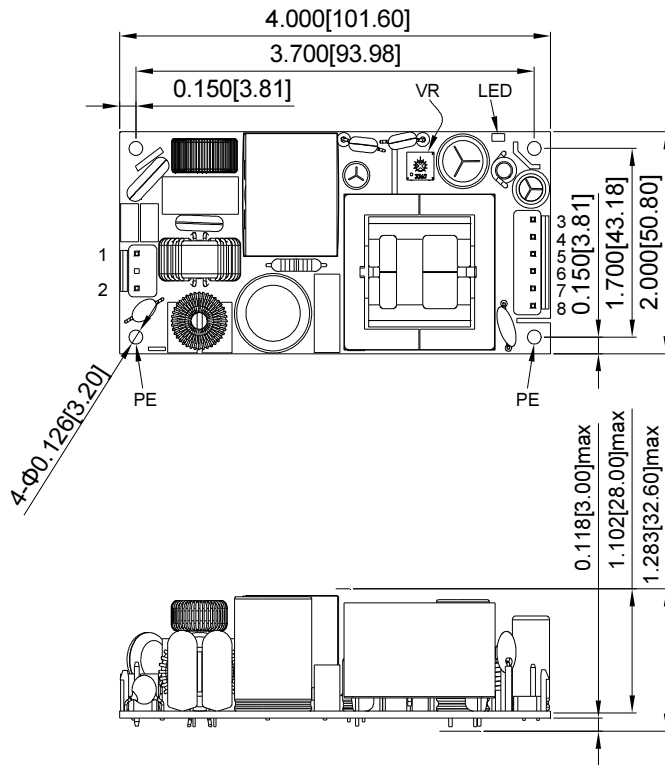
CFM150S480 (Eff Vs Io)





# CFM150S Series

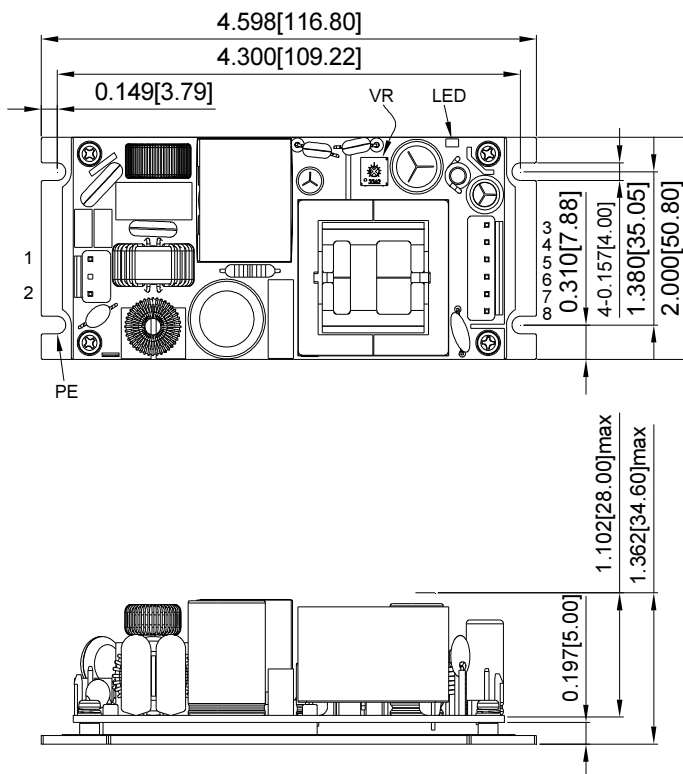
## MECHANICAL SPECIFICATION



CFM150SXXX

Pin	Function
1	ACL
2	ACN
3	V+
4	V+
5	V+
6	V-
7	V-
8	V-

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



CFM150SXXX-B

Pin	Function
1	ACL
2	ACN
3	V+
4	V+
5	V+
6	V-
7	V-
8	V-

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

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