



# CFM81S SERIES 80 WATT OPEN FRAME AC-DC MODULES

## Features

- Universal Input Range 90~264Vac
- High Efficiency up to 91%
- 2"x 3" Open Frame Compact Size
- Class I and Class II
- No Load Power <0.3W
- Approval IEC/EN/UL 62368-1
- Approval IEC/EN 60335-1
- Approval EN55032 Class B and CISPR/FCC Class B
- Operating Altitude 5000m
- Continuous Short Circuit Protection
- Peak Load (2 Times of Rated Current (note7))



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	VOLTAGE ACCURACY NOTE1	RIPPLE& NOISE NOTE2	VOLTAGE ADJ. RANGE	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
CFM81S120	12 V	6.7 A	±1%	120 mV	11.4~12.6 V	±0.5%	±1%	89%
CFM81S150	15 V	5.36 A	±1%	150 mV	14.25~15.75 V	±0.5%	±1%	89%
CFM81S240	24 V	3.35 A	±1%	240 mV	22.8~25.2 V	±0.5%	±1%	90%
CFM81S480	48 V	1.67 A	±1%	480 mV	45.6~50.4 V	±0.5%	±1%	91%

**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 measurement @20MHz BW.
3. Line regulation is measured from 90Vac to 264Vac with 100% full load.
4. Load regulation is measured from 10% to 100% full load.
5. Typical efficiency at 230 Vac and 100% 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 and JST SVH-21/41T-P1.1 series crimp terminal.
7. PL (peak load function) lasting time < 10 seconds with a maximum 10% duty cycle.
8. Safety approvals do not apply to the covered version only to the open frame versions.

## PART NUMBER

Series	Number of Outputs	Nominal Output Voltage	Type
CFM81	X	XX	-XX (Option)
CFM81	S: Single	120: 12V 150: 15V 240: 24V 480: 48V	Blank: Wafer P: PCB Mount CA: Cover (note8)

**Part Number Example:**

**CFM81S120-P:** Open Frame, 80W, Single 12Vdc Output, PCB Mount



# CFM81S 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 <sub>ac</sub>
					370	V <sub>dc</sub>
Operating Case Temperature	See Derating Curve	All	-30		80	°C
Storage Temperature		All	-30		85	°C
Operating Altitude	IEC/EN/UL 62368-1	All			5000	m
	IEC/EN 60335-1					

### INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Voltage Range		All	100		240	V <sub>ac</sub>
Input Frequency Range		All	50		60	Hz
Maximum Input Current	100% Load, V <sub>in</sub> =100V <sub>ac</sub>	All			1.7	A
Leakage Current		All			0.25	mA
Inrush Current	V <sub>in</sub> =240V <sub>ac</sub> , Cold start at 25°C	All			100	A

### 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> =I <sub>o</sub> max., T <sub>c</sub> =25°C	CFM81S120	11.88	12	12.12	V <sub>dc</sub>
		CFM81S150	14.85	15	15.15	
		CFM81S240	23.76	24	24.24	
		CFM81S480	47.52	48	48.48	
Operating Output Current Range	V <sub>in</sub> =90V <sub>ac</sub> ~264V <sub>ac</sub> , See Derating Curve	CFM81S120			6.7	A
		CFM81S150			5.36	
		CFM81S240			3.35	
		CFM81S480			1.67	
Holdup Time	V <sub>in</sub> =115V <sub>ac</sub>	All		12		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	Built-in a TVS component to clamp output voltage	CFM81S120			16.2	V <sub>dc</sub>
		CFM81S150			18.9	
		CFM81S240			31.5	
		CFM81S480			58.8	
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	CFM81S120			120	mV
		CFM81S150			150	
		CFM81S240			240	
		CFM81S480			480	
Load Capacitance	1. V <sub>in</sub> =115V <sub>ac</sub> and 230V <sub>ac</sub> 2. Output is max. load 3. Ambient temperature=25°C	CFM81S120			13400	uF
		CFM81S150			11000	
		CFM81S240			6700	
		CFM81S480			3340	
Efficiency	1. Output is rated load 2. Ambient temperature=25°C 3. Input voltage is 230V <sub>ac</sub>	CFM81S120		89		%
		CFM81S150		89		
		CFM81S240		90		
		CFM81S480		91		



# CFM81S Series

## ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute	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	Pout=max. rated power	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	All	300			k hours
Humidity	Non-condensing	All			93	% RH
Shock	Meet MIL-STD-810F Table 516.5, Table 516.5-I 10ms, each axis 3 times(±X · ±Y · ±Z axis)	All		75		g
Vibration	Meet MIL-STD-810F Table 514.5C-VIII, 15~2000Hz, X · Y · Z axis, 1 hour (each axis),. Total 3 hrs.	All		4		g
Weight		CFM81S CFM81S-P CFM81S-CA		135 133 174		grams
Dimensions	Open Frame (Wafer)	All	3.000x2.000x1.339 Inches (76.20x50.80x34.00 mm)			
	P (PCB Mount)	All	3.000x2.000x1.413 Inches (76.20x50.80x35.90mm)			
	CA (Cover)	All	3.200x2.441x1.575 Inches (81.28x62.00x40.00mm)			
Safety	Class I, Class II, IEC/EN/UL 62368-1, IEC/EN 60335-1 Safety approvals do not apply to the covered version only to the open frame versions					
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					Class B
Conducted Disturbance	EN55032, EN61204-3:2000, EN61000-6-3:2012, EN61000-6-4:2011, Class B, 47 CFR FCC Part 15 Subpart B					Class B
Radiated Disturbance	EN55032, EN61204-3:2000, EN61000-6-3:2012, EN61000-6-4:2011, Class B, 47 CFR FCC Part 15 Subpart B					Class B
Harmonic Current Emissions	EN61000-3-2:2014					
Voltage Fluctuations & Flicker	EN61000-3-3:2013					
EMC Immunity	EN55035, EN61204-3:2000, EN61000-6-1:2019, EN61000-6-2:2019					
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008, Air Discharge: ±0kV, 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
Surge	IEC61000-4-5:2014, L-N: ±0.5kV, ±1kV, L-E(Ground): ±0.5kV, ±1kV, ±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 61000-4-11:2004, Dip: 30% Reduction, Dip >95% Reduction					Criterion A
Voltage Interruptions	IEC 61000-4-11:2004, >95% Reduction					Criterion B
Application Note Link						<a href="#">CFM81S Series App Notes</a>

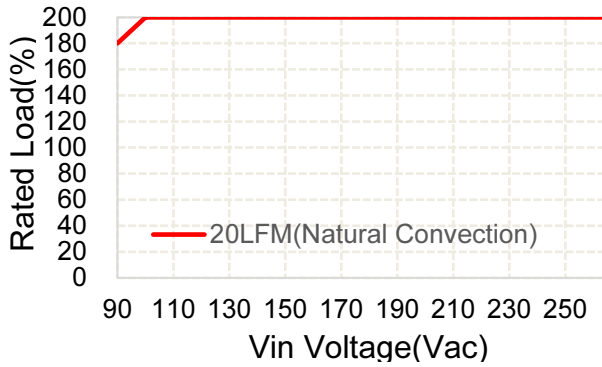


# CFM81S Series

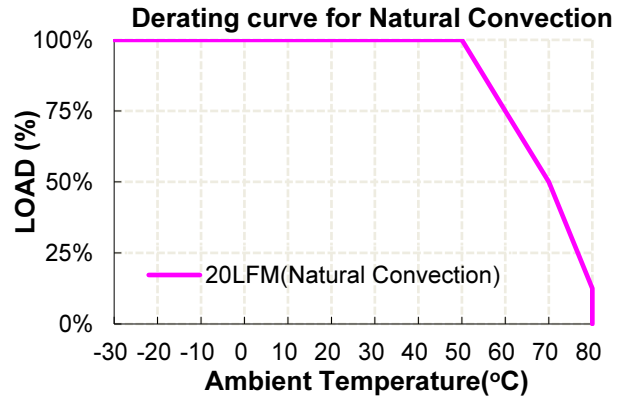
## CHARACTERISTIC CURVE

### Power Derating Curve

Peak Load Vin De-Rating

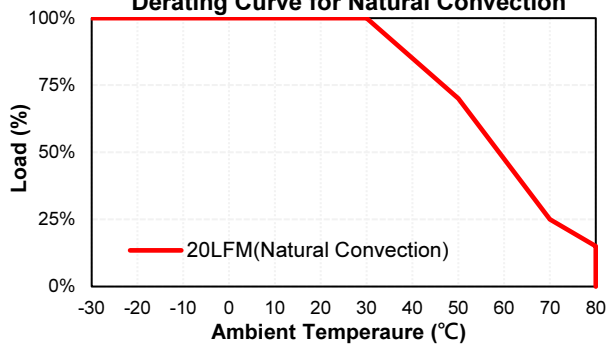


Power Derating



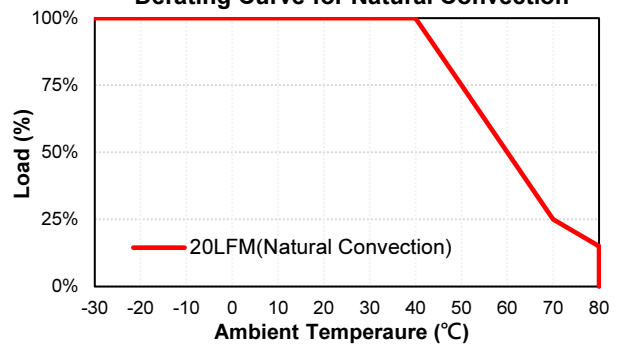
CFM81S120-CA

Derating Curve for Natural Convection



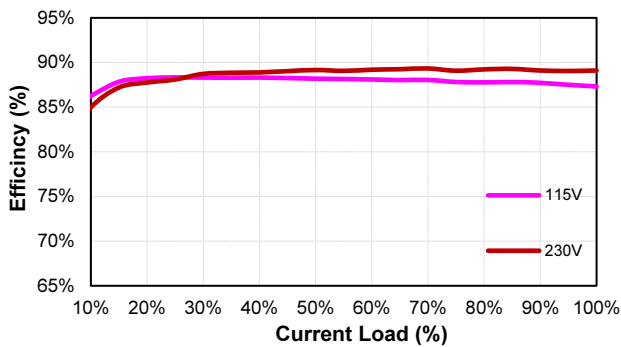
CFM81S150/240/480-CA

Derating Curve for Natural Convection

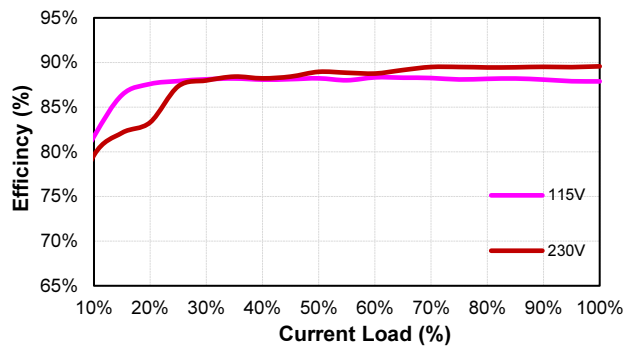


### Performance Data

CFM81S120 (Eff Vs Io)



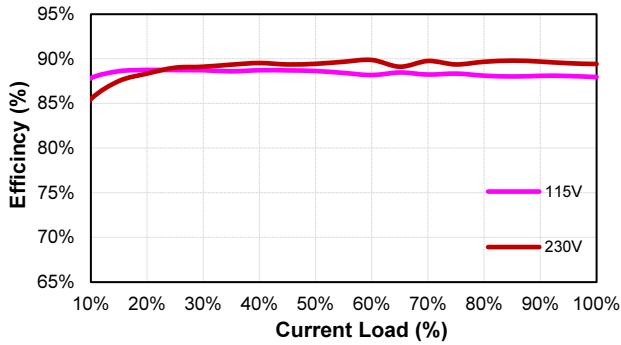
CFM81S150 (Eff Vs Io)



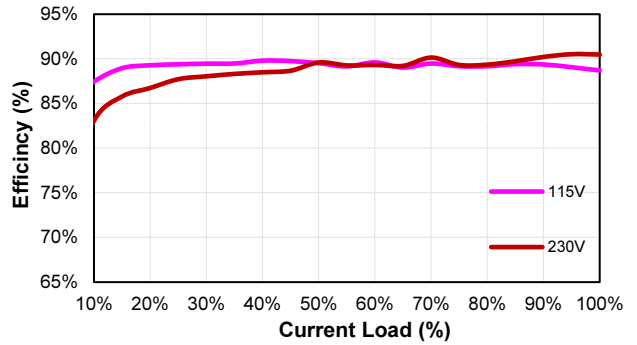


# CFM81S Series

CFM81S240 (Eff Vs Io)

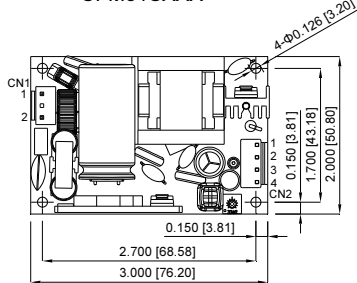


CFM81S480 (Eff Vs Io)

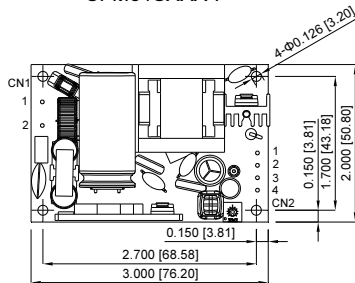


## MECHANICAL SPECIFICATION

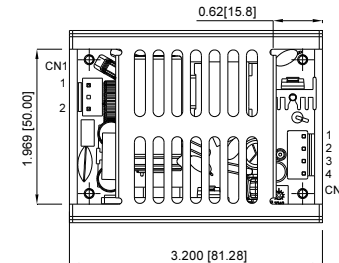
CFM81SXXX



CFM81SXXX-P



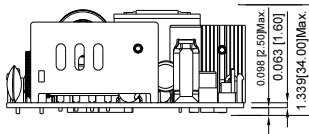
CFM81SXXX-CA



CN1

PIN CONNECTION	
Pin	Function
1	ACN
2	ACL

All Dimensions In Inches[mm]  
Tolerance: inches:x.xxx=+0.039/-0  
Millimeters:x.xx= +1.0/-0



CN2

PIN CONNECTION	
Pin	Function
1	-Vout
2	-Vout
3	+Vout
4	+Vout

