



# 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<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. 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

**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			2.5	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			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 <sub>in</sub> =90Vac~264Vac, I <sub>o</sub> =I <sub>o</sub> max, Ambient temperature=25°C.	CFM202S120	11.88	12	12.12	V <sub>dc</sub>
		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 <sub>in</sub> =90V <sub>ac</sub> ~264V <sub>ac</sub> , 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 <sub>in</sub> =115Vac	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	Clamp output voltage	CFM202S120		13.5		V <sub>dc</sub>
		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 <sub>ac</sub> and 230V <sub>ac</sub> 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 <sub>ac</sub> . 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 <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	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

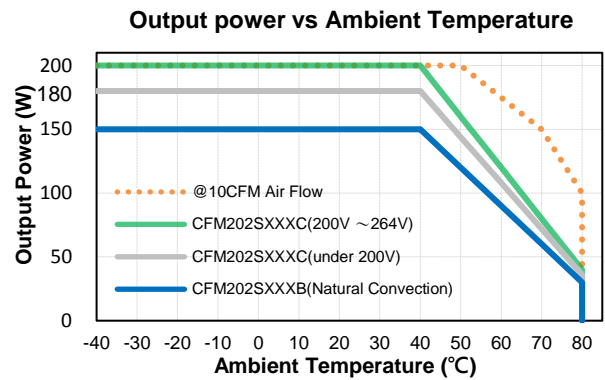
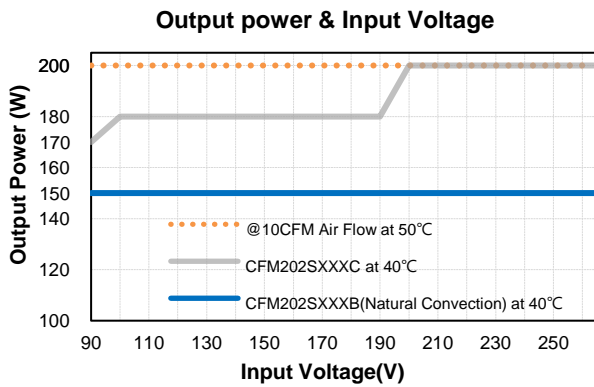


## GENERAL CHARACTERISTICS

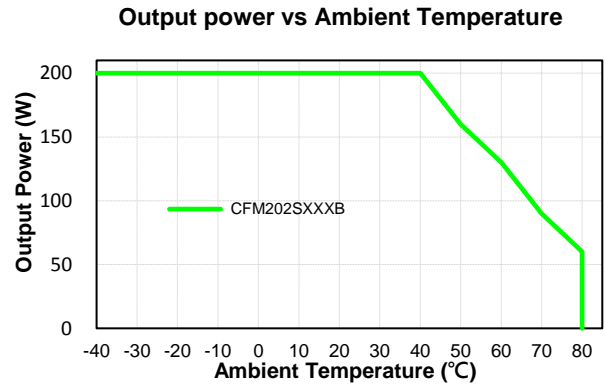
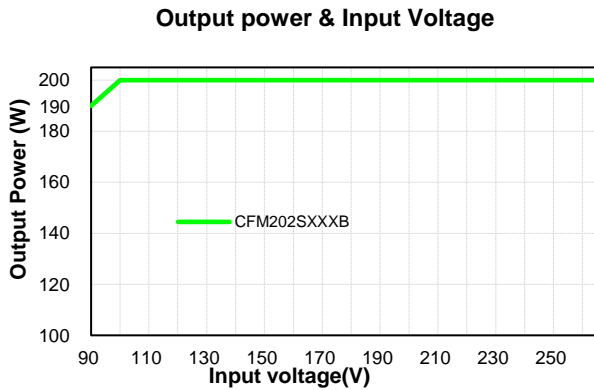
Surge	I IEC61000-4-5:2014, L-N: $\pm 0.5kV, \pm 1kV$ , L-E(Ground): $\pm 0.5kV, \pm 1kV, \pm 2kV$	Criterion A
Conducted Disturbances, Induced by RF Fields	IEC 61000-4-6:2013	Criterion A
Power Frequency Magnetic Field	IEC 61000-4-8:2009	Criterion A
Voltage Dips	IEC 61000-4-11:2004, Dip: 30% 10ms, Dip: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

## CHARACTERISTIC CURVE

### Power Derating Curve



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

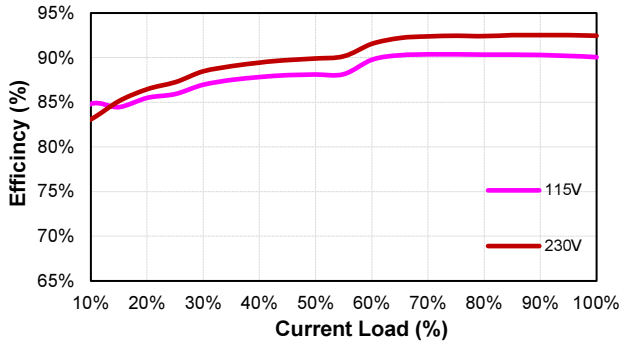




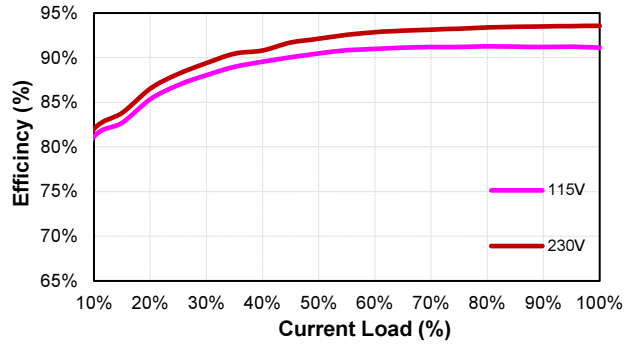
# CFM202S Series

## Performance Data

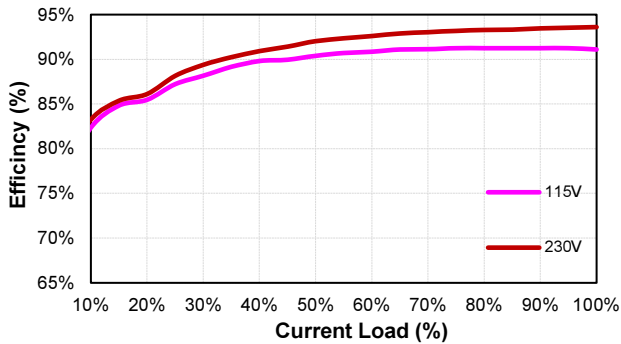
CFM202S120 (Eff Vs Io)



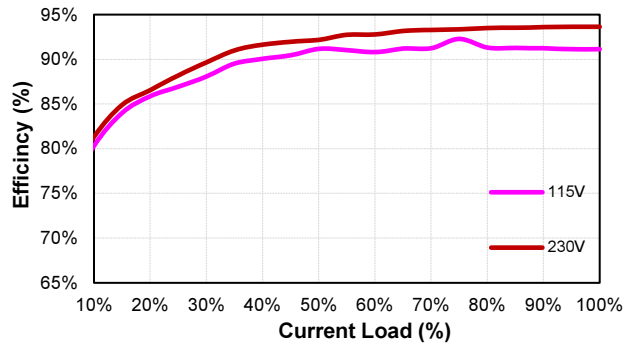
CFM202S240 (Eff Vs Io)



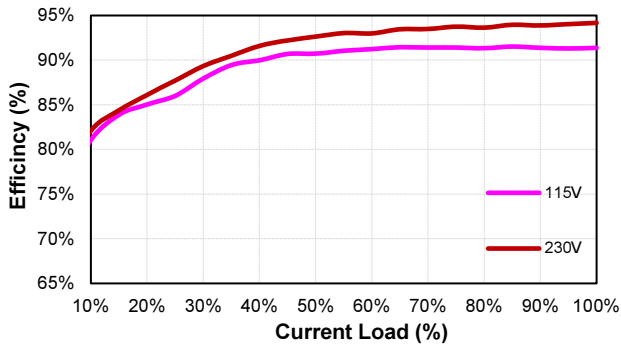
CFM202S280 (Eff Vs Io)



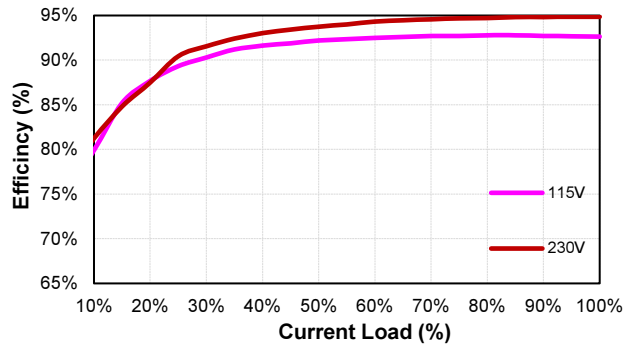
CFM202S360 (Eff Vs Io)



CFM202S480 (Eff Vs Io)



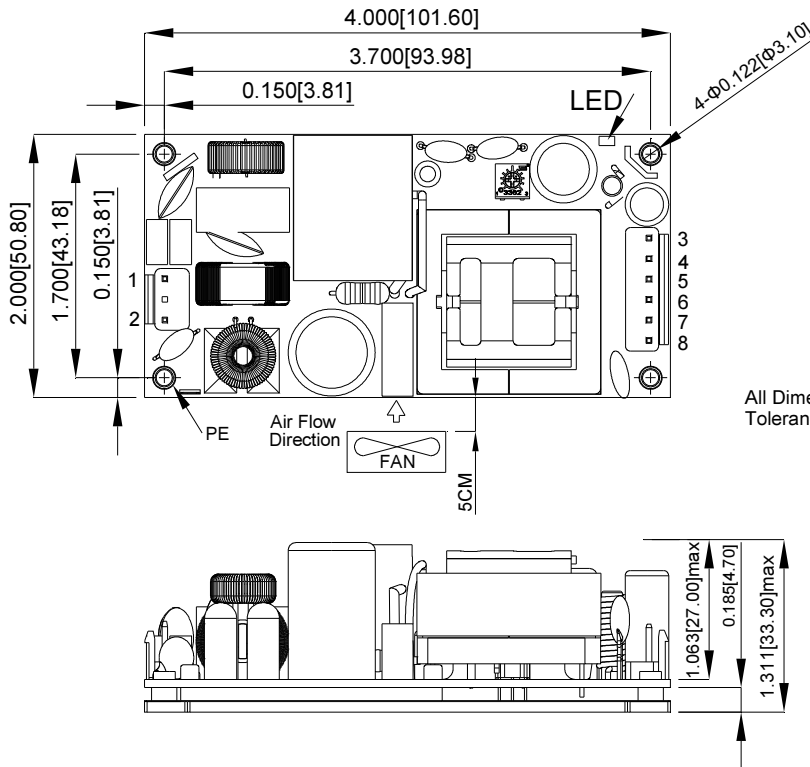
CFM202S560 (Eff Vs Io)





## MECHANICAL SPECIFICATION

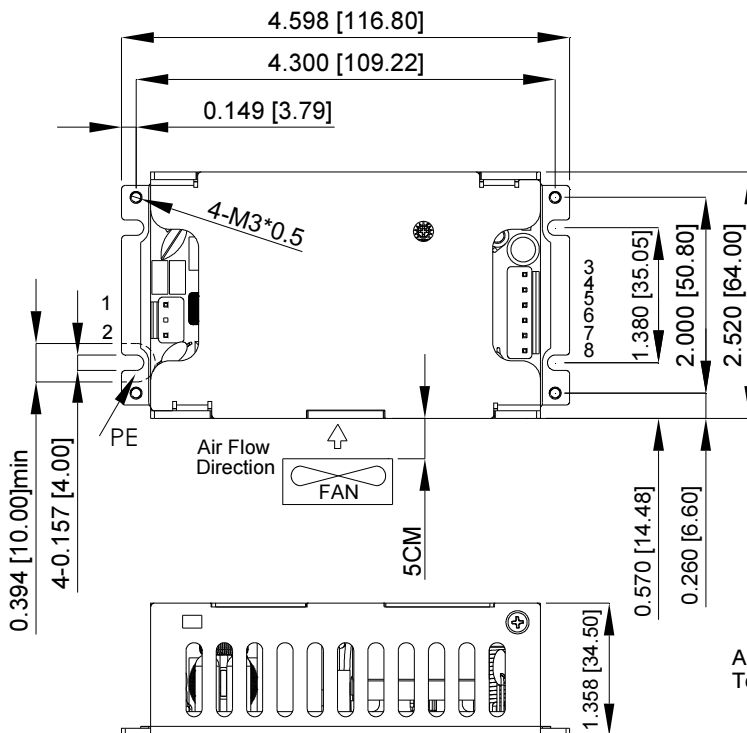
### CFM202S-B



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