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 Ed 3.0
- Approval Safety IEC/EN 60335-1
- Operating Altitude 5000m
- Continuous Short Circuit Protection
- Over Voltage Protection
- Over Temperature Protection
- Active PFC Function



E176177

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	15.0 A	12.5 A	1%	120 mV	±0.5%	±1%	92%
CFM202S240	24 V	8.33 A	7.5 A	6.25 A	1%	240 mV	±0.5%	±1%	93%
CFM202S280	28 V	7.14 A	6.42 A	5.35 A	1%	280 mV	±0.5%	±1%	93%
CFM202S360	36 V	5.56 A	5.0 A	4.16 A	1%	360 mV	±0.5%	±1%	93%
CFM202S480	48 V	4.17 A	3.75 A	3.125 A	1%	480 mV	±0.5%	±1%	94%
CFM202S560	56 V	3.58 A	3.21 A	2.67 A	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 $0V_{ac}$ to $264V_{ac}$ 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℃.
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℃ unless otherwise noted.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage		All	90		264	V_{ac}
Operating Temperature	100Vac~264Vac See Derating Curve (V_{in}=90V_{ac}, Operate @-30℃~80℃)	All	-40		80	℃
Storage Temperature		All	-40		85	℃
Operating Altitude		All			5000	m

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Voltage Range		All	90		264	V_{ac}
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% Load, V_{in}=100V_{ac}	All			2.5	A
Power Factor	100% Load, V_{in}=230V_{ac}	All	0.9			
Inrush Current	V_{in}=240V_{ac}, Cold start @25℃	All			100	A
Leakage Current	Contact leakage current Earth leakage current	All			100 300	uA rms
Under Voltage Protection		All	60		75	V_{ac}

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V_{in}=90Vac~264Vac, I_o=I_o max., ambient temperature=25℃	CFM202S120	11.88	12	12.12	V_{dc}
		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	Vin=90V_{ac}~264V_{ac}, 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_{in}=115V_{ac}	All		12		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	Latch off (AC recycle to reset)	CFM202S120		13.5		V_{dc}
		CFM202S240		30		
		CFM202S280		35		
		CFM202S360		42		
		CFM202S480		56		
		CFM202S560		59.2		

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℃	CFM202S120 CFM202S240 CFM202S280 CFM202S360 CFM202S480 CFM202S560			120 240 280 360 480 560	mV
Over Current Protection	Auto recovery	All	120	150	180	%
Short Circuit Protection	Auto recovery	All				
Load Capacitance	1. Input voltage is 115V_{ac} and 230V_{ac} 2. Output is 100% full load 3. Ambient temperature=25℃	CFM202S120 CFM202S240 CFM202S280 CFM202S360 CFM202S480 CFM202S560			16670 8330 7140 5660 4170 3580	uF
Efficiency	1. Input voltage is 230$V_{ac.}$ 2. Output is 75% full load 3. Ambient temperature=25℃	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_{ac}
Input to Earth (Ground)	1 Minute (without dielectric breakdown)	All			2500	V_{ac}
Output to Earth (Ground)	1 Minute (without dielectric breakdown)	All			360	V_{ac}
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_o=100%; T_a=25℃ per MIL-HDBK-217F I_o=100%; T_a=25℃ per Telcordia SR332	All	640 2,643			k hours
Life Time	@75% Load, 40℃	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	All	4.00x2.00x1.311 Inches (101.60x50.80x33.30 mm)			
	Covered versions		4.598x2.520x1.358 Inches (116.80x64.00x34.50 mm)			

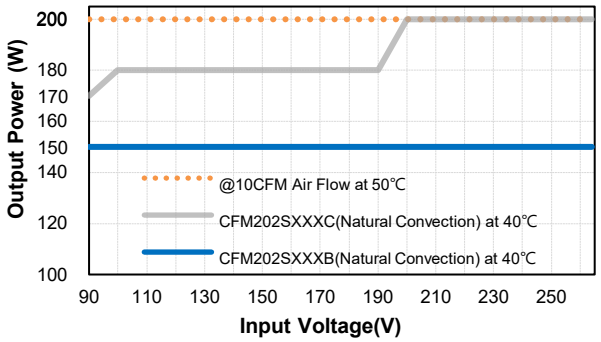
GENERAL CHARACTERISTICS

Safety	Class I & Class II, IEC/EN/UL 62368-1 (Ed 3.0), IEC/EN 60335-1	
EMC Emission	EN 55032 Class B, 47 CFR FCC Part 15 Subpart B, Oct.2014 EN 61000-3-2:2019, EN 61000-3-3:2013, EN 61000-6-3:2012, EN 61000-6-4:2019, EN 61204-3:2018	
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 61000-3-2:2019	Class A
Voltage Fluctuations & Flicker	EN 61000-3-3:2013	Criterion A
EMC Immunity	EN 55035, EN 61204-3:2018, EN 61000-6-1:2019, EN 61000-6-2:2019	Criterion A
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008 Air Discharge: ±8kV, Contact Discharge: ±4kV	Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2020	Criterion A
Electrical Fast Transient (EFT)	IEC 61000-4-4:2012, ±1kV, ±2kV	Criterion A
Surge	IEC 61000-4-5:2014, 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 61000-4-11:2020 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	CFM202S Series App Notes	

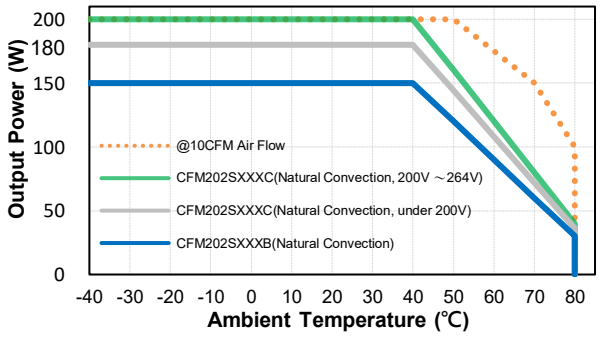
Power Derating Curve

CHARACTERISTIC CURVE

Output power & Input Voltage

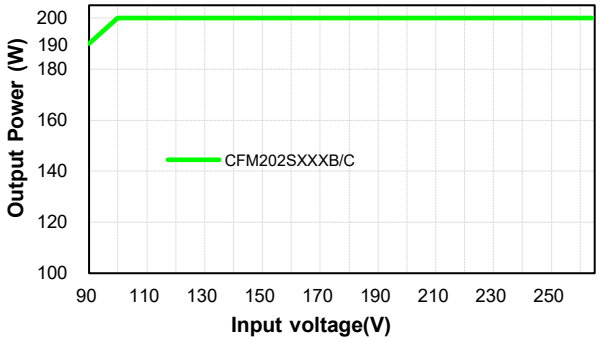


Output power vs Ambient Temperature

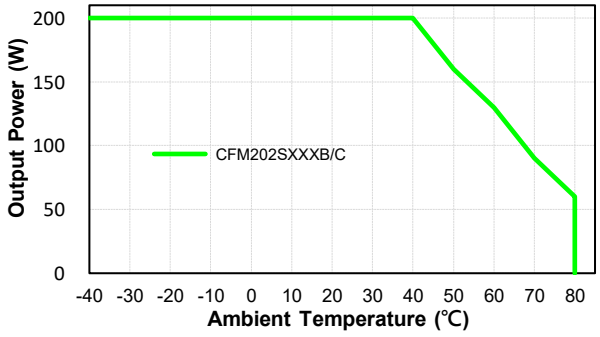


Conduction Convection with External Baseplate (35x20x0.2cm)

Output power & Input Voltage

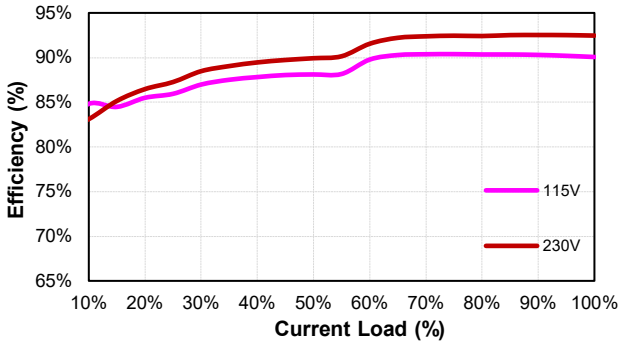


Output power vs Ambient Temperature

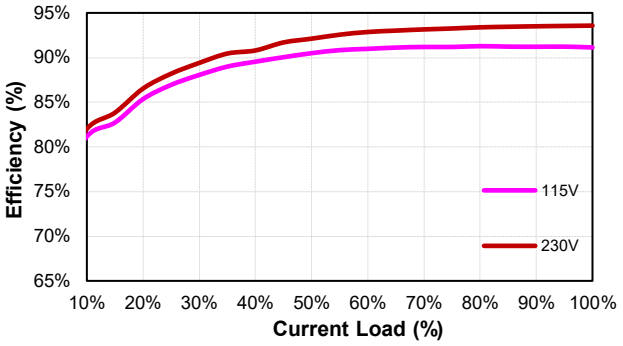


Performance Data

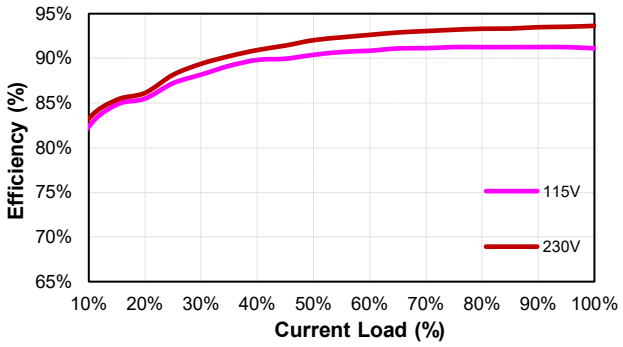
CFM202S120 (Eff Vs Io)



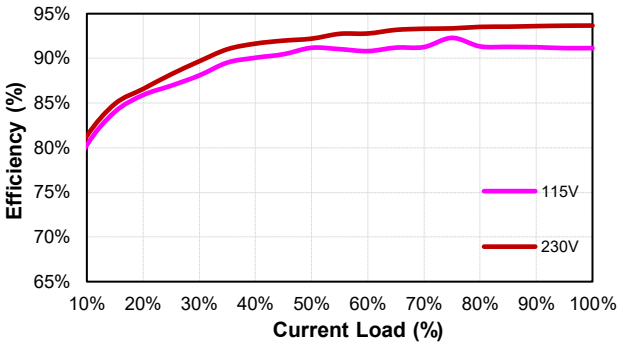
CFM202S240 (Eff Vs Io)



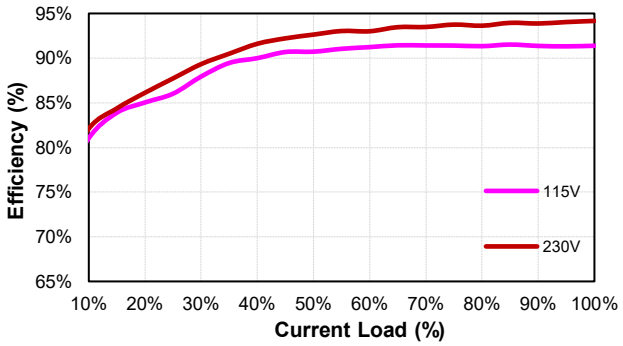
CFM202S280 (Eff Vs Io)



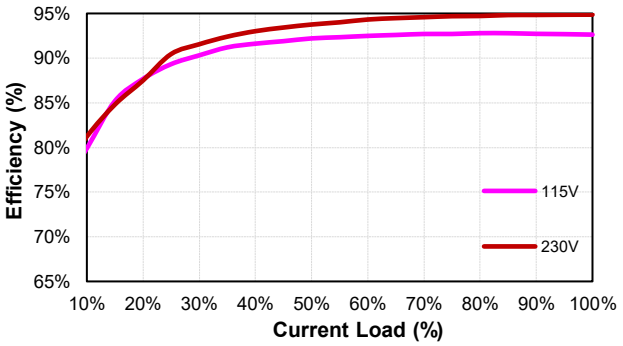
CFM202S360 (Eff Vs Io)



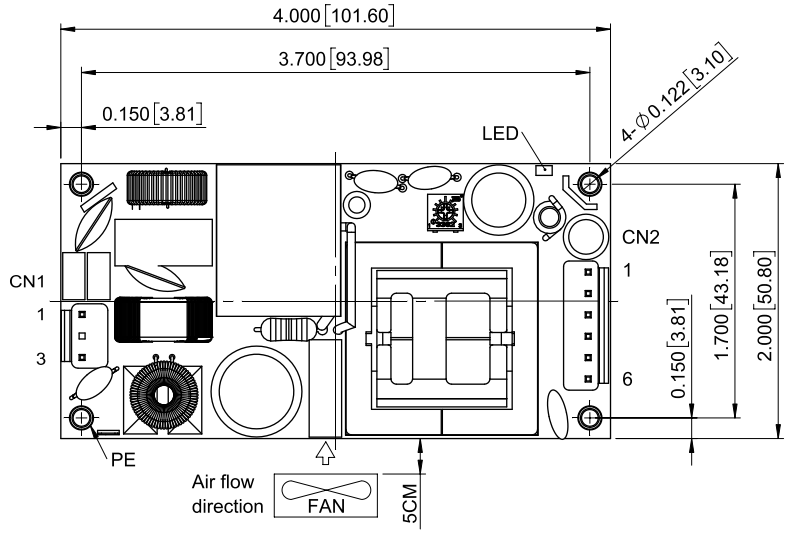
CFM202S480 (Eff Vs Io)

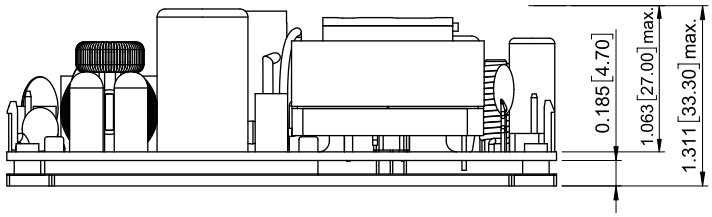


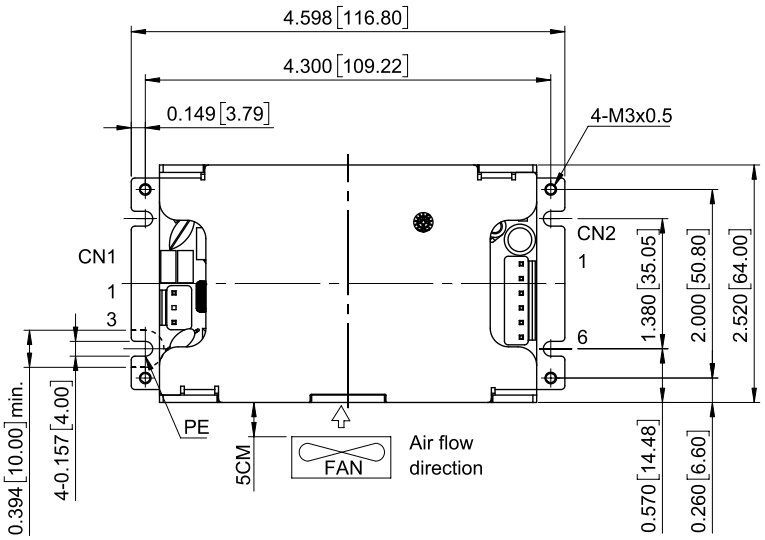
CFM202S560 (Eff Vs Io)

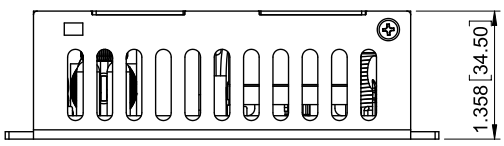


MECHANICAL SPECIFICATION









CFM202S-B

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-06 or equivalent

Pin	Function	Mating Housing	Terminal
1	+Vout	JST VHR-6N or equivalent	JST SVH-21T-P1.1 or equivalent
2	+Vout		
3	+Vout		
4	-Vout		
5	-Vout		
6	-Vout		

CFM202S-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-06 or equivalent

Pin	Function	Mating Housing	Terminal
1	+Vout	JST VHR-6N or equivalent	JST SVH-21T-P1.1 or equivalent
2	+Vout		
3	+Vout		
4	-Vout		
5	-Vout		
6	-Vout		

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