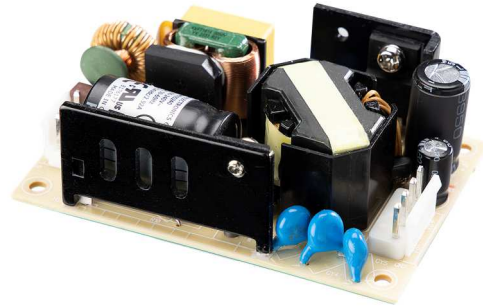




# CFM70S SERIES 70 WATT OPEN FRAME AC-DC MODULES

## 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 Input Power < 0.15W
- Approval IEC/EN/UL 62368-1
- Meets IEC/EN 60335-1
- Approval EN 55032 Class B and CISPR/FCC Class B
- Operating Altitude 5000m
- Continuous Short Circuit Protection
- Over Voltage Protection



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	VOLTAGE ACCURACY NOTE1	RIPPLE& NOISE NOTE2	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
CFM70S050	5 V	10.0 A	±2%	150 mV	±0.5%	±1%	86%
CFM70S120	12 V	5.80 A	±2%	120 mV	±0.5%	±1%	90%
CFM70S150	15 V	4.65 A	±1%	150 mV	±0.5%	±1%	90%
CFM70S240	24 V	2.92 A	±1%	240 mV	±0.5%	±1%	90%
CFM70S360	36 V	1.94 A	±1%	360 mV	±0.5%	±1%	90%
CFM70S480	48 V	1.46 A	±1%	480 mV	±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 90V<sub>ac</sub> to 264V<sub>ac</sub> with 100% full load.
4. Load regulation is measured from 10% to full load.
5. Typical efficiency at 230 V<sub>ac</sub> 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-41T-P1.1 series crimp terminal and output connectors wire 16AWG.
7. 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
CFM70	O	XX	-X (Option)
CFM70	S : Single	050 : 05V 120 : 12V 150 : 15V 240 : 24V 360 : 36V 480 : 48V	None : Wafer P : PCB Mount CA : Cover (note7)

Part Number Example:

**CFM70S120:** Open Frame, 70W, Single 12V<sub>dc</sub> Output



# CFM70S 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 (DC input no safety)	All	90		264	V <sub>ac</sub>
					370	V <sub>dc</sub>
Operating Temperature	See Derating Curve	All	-30		80	°C
Storage Temperature		All	-30		85	°C
Operating Altitude	IEC/EN/UL 62368-1	All			5000	m
	Meets IEC/EN 60335-1				3000	

### 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			1.5	A
Leakage Current		All			0.1	mA
Inrush Current	V <sub>in</sub> =240V <sub>ac</sub> , Cold start at 25°C	All		130		A

### OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V <sub>in</sub> =Nominal V <sub>in</sub> , I <sub>o</sub> =I <sub>o</sub> max., T <sub>c</sub> =25°C	CFM70S050	4.90	5	5.10	V <sub>dc</sub>
		CFM70S120	11.76	12	12.24	
		CFM70S150	14.85	15	15.15	
		CFM70S240	23.76	24	24.24	
		CFM70S360	35.64	36	36.36	
		CFM70S480	47.52	48	48.48	
Operating Output Current Range	V <sub>in</sub> =115V <sub>ac</sub> and 230V <sub>ac</sub> , T <sub>c</sub> =25°C	CFM70S050			10.0	A
		CFM70S120			5.80	
		CFM70S150			4.65	
		CFM70S240			2.92	
		CFM70S360			1.94	
		CFM70S480			1.46	
Holdup Time	V <sub>in</sub> =115V <sub>ac</sub>	All		10		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	Hiccup mode (Auto recovery)	CFM70S050			7.1	V <sub>dc</sub>
		CFM70S120			15.6	
		CFM70S150			18.0	
		CFM70S240			29.1	
		CFM70S360			43.3	
		CFM70S480			56.8	
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	CFM70S050			150	mV
		CFM70S120			120	
		CFM70S150			150	
		CFM70S240			240	
		CFM70S360			360	
		CFM70S480			480	



# CFM70S Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Load Capacitance	1. $V_{in}=115V_{ac}$ and $230V_{ac}$ 2. Output is max. load 3. Ambient temperature= $25^{\circ}C$	CFM70S050			10300	uF
		CFM70S120			6000	
		CFM70S150			4700	
		CFM70S240			2920	
		CFM70S360			1980	
		CFM70S480			930	
Efficiency	1. Output is rated load 2. Ambient temperature= $25^{\circ}C$ 3. Input voltage is $230V_{ac}$	CFM70S050		86		%
		CFM70S120		90		
		CFM70S150		90		
		CFM70S240		90		
		CFM70S360		90		
		CFM70S480		91		

## ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute	All			3000	$V_{ac}$
Isolation Resistance	Input to output	All	100			M $\Omega$

## 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	$I_o=100\%$ ; $T_a=25^{\circ}C$ per MIL-HDBK-217F	All	500			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( $\pm X$ · $\pm Y$ · $\pm Z$ 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		CFM70S CFM70S-P CFM70S-CA		96.1 94.1 183		grams
Dimensions	Open Frame (Wafer) P (PCB Mount) CA (Cover)	All	3.000x2.000x1.067 Inches (76.20x50.80x27.1 mm) 3.000x2.000x1.142 Inches (76.20x50.80x29mm) 3.598x2.520x1.358 Inches (91.40x64.00x34.50 mm)			
Safety	Class I, Class II, IEC/EN/UL62368-1 Safety approvals do not apply to the covered version only to the open frame versions					
EMC Emission	EN 55032: 2015+AC: 2016, 47 CFR FCC Part 15 Subpart B, EN 61000-3-2: 2019, EN 61000-3-3: 2013					Class B
Conducted Disturbance	EN 55032, 47 CFR FCC Part 15					Class B
Radiated Disturbance	EN 55032, 47 CFR FCC Part 15					Class B
Harmonic Current Emissions	EN 61000-3-2:2019					
Voltage Fluctuations & Flicker	EN 61000-3-3:2013					
EMC Immunity	EN 55035:2017					
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008, Air Discharge: $\pm 8kV$ , Contact Discharge: $\pm 4kV$					Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2020					Criterion A
Electrical Fast Transient (EFT)	IEC 61000-4-4:2012, $\pm 0.5kV$ , $\pm 1kV$ , $\pm 2kV$					Criterion A
Surge	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



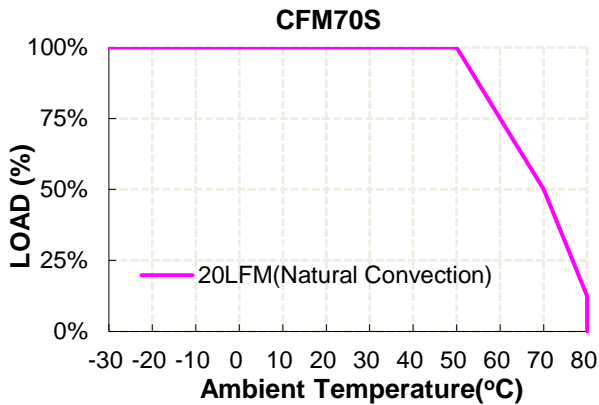
# CFM70S Series

## GENERAL SPECIFICATIONS

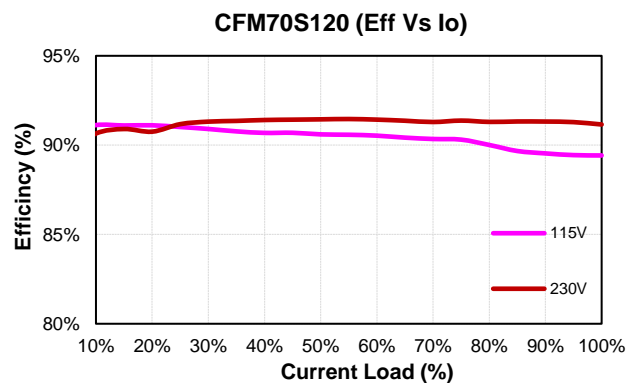
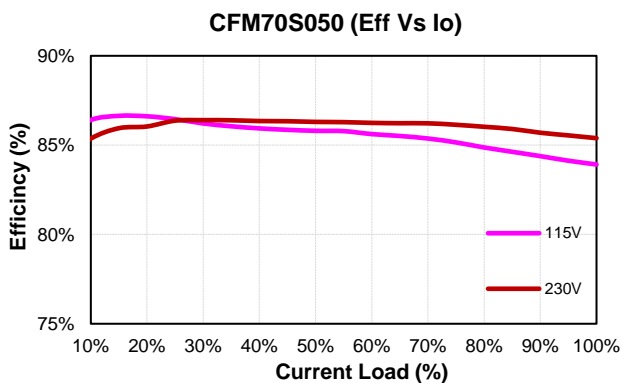
Power Frequency Magnetic Field	IEC 61000-4-8:2009	Criterion A
Voltage Dips	IEC 61000-4-11:2004, Dip: 30% Reduction, Dip >95% Reduction	Criterion A
Voltage Interruptions	IEC 61000-4-11:2004, >95% Reduction	Criterion B
Application Note Link	<a href="#">CFM70S Series App Notes</a>	

## CHARACTERISTIC CURVE

### Power Derating Curve



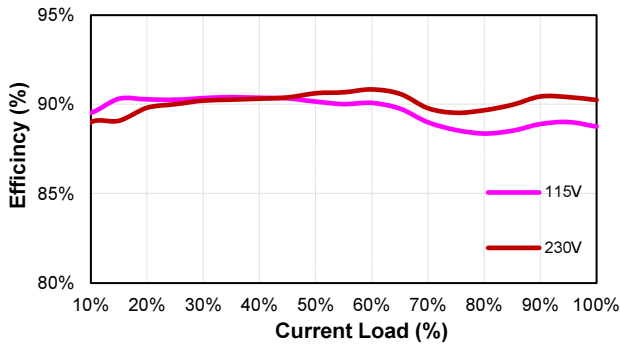
### Performance Data



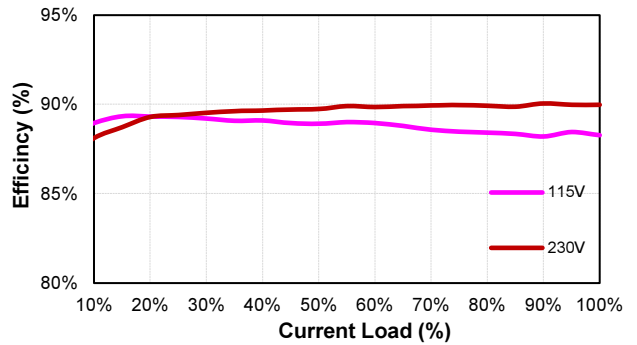


# CFM70S Series

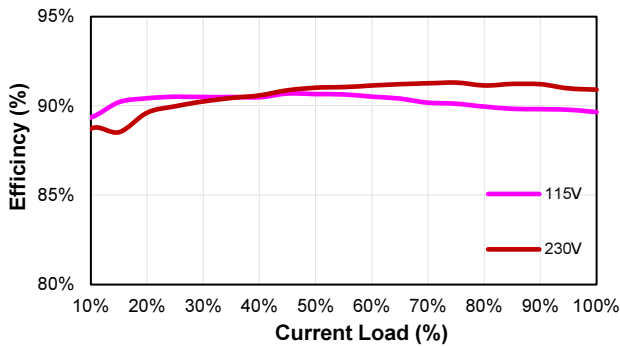
CFM70S150 (Eff Vs Io)



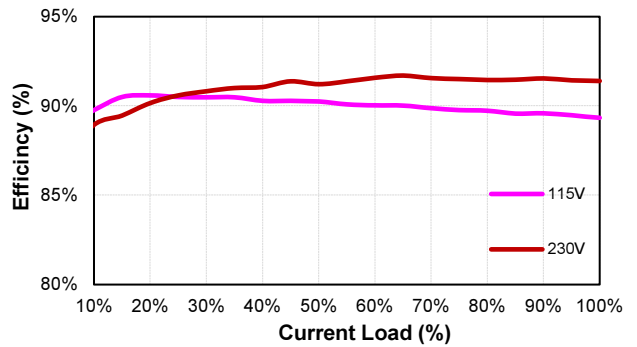
CFM70S240 (Eff Vs Io)



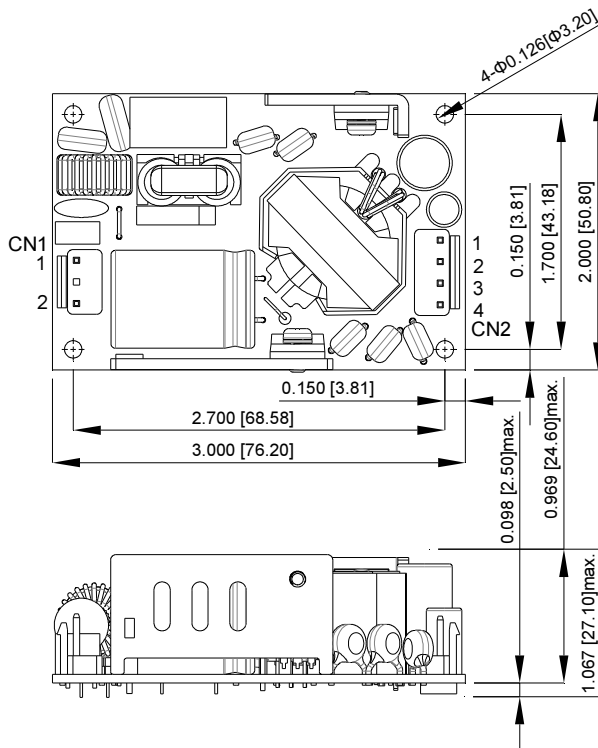
CFM70S360 (Eff Vs Io)



CFM70S480 (Eff Vs Io)



## MECHANICAL SPECIFICATION



CN1

PIN CONNECTION	
PIN	Function
1	ACL
2	ACN

CN2

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

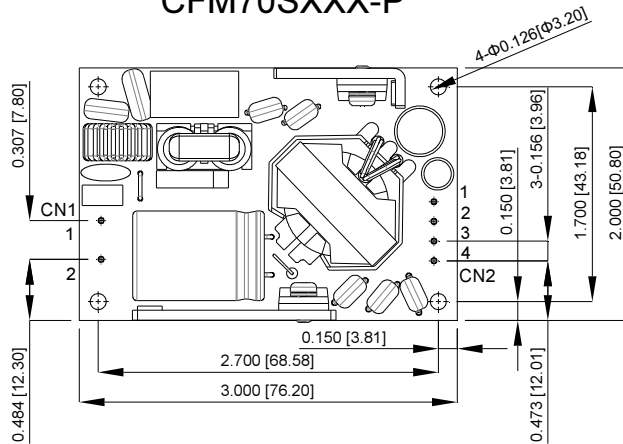
All Dimensions in Inches[mm]  
 Tolerance Inches : X.XXX=±0.02  
 Millimeters : X.XX=±0.5



# CFM70S Series

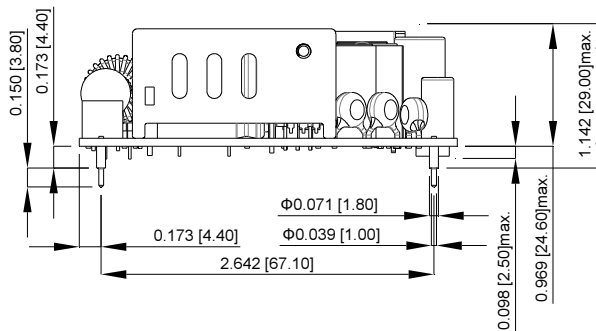
## MECHANICAL SPECIFICATION

### CFM70SXXX-P



CN1

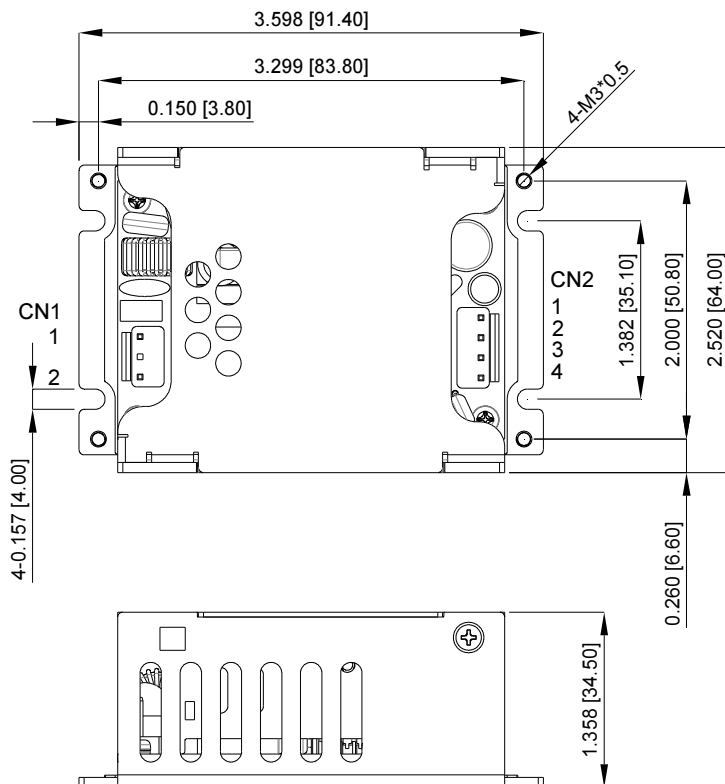
PIN CONNECTION	
PIN	Function
1	ACL
2	ACN



CN2

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

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



### CFM70SXXX-CA

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

CN1

PIN CONNECTION	
PIN	Function
1	ACL
2	ACN

CN2

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

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