



# CFM06S SERIES 6 WATT OPEN FRAME AC-DC MODULES

## Features

- Universal Input Range 90~264V<sub>ac</sub>
- High Efficiency up to 83%
- 0.764" x 1.555" Compact Size
- Class II
- No Load Power <0.075W
- Approval IEC/EN/UL 62368-1 Ed 3.0
- Design 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
- Over Voltage Category OVC II & OVC III



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE NOTE2	VOLTAGE ACCURACY NOTE1	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
CFM06S033	3.3 V	1.5 A	100 mV	±6%	±1%	±6%	75%
CFM06S050	5.0 V	1.2 A	100 mV	±5%	±1%	±5%	78%
CFM06S090	9.0 V	0.67 A	100 mV	±5%	±1%	±5%	81%
CFM06S120	12 V	0.5 A	120 mV	±3%	±1%	±3%	81%
CFM06S150	15 V	0.4 A	150 mV	±3%	±1%	±3%	81%
CFM06S240	24 V	0.25 A	240 mV	±3%	±1%	±3%	83%

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 high line to low line with 100% full load.
4. Load regulation is measured from 10% to 100% full load.
5. Typical efficiency at 230 V<sub>ac</sub> and 100% full load at 25°C.
6. T Version wafer with JST B3B-PH/B2B-PH and mate with JST PH series or equivalent.

## PART NUMBER

Series	Number of Outputs	Nominal Output Voltage	Type
CFM06	X	XXX	-X
CFM06	S : Single	033 : 3.3V 050 : 5.0V 090 : 9.0V 120 : 12V 150 : 15V 240 : 24V	Blank : PCB mount T : Wafer E : Encapsulated

Part Number Example:

- CFM06S120:** 6W, Single 12Vdc Output, PCB Mount Type
- CFM06S120-T:** 6W, Single 12Vdc Output, Wafer Type



# CFM06S Series

## TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, 100% 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>
				120		370
Operating Temperature	See Derating Curve	All	-40		80	°C
Storage Temperature		All	-40		85	°C
Operating Altitude	IEC/EN/UL 62368-1 OVC II	All			5000	m
	IEC 62368-1 OVC III			2000		
	Meets IEC/EN 60335-1 OVC II			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	47		63	Hz
Maximum Input Current	100% full Load, V <sub>in</sub> =100V <sub>ac</sub>	All			0.25	A
Leakage Current		All			0.25	mA
Inrush Current	V <sub>in</sub> =240V <sub>ac</sub> , Cold Start at 25°C	All			90	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	CFM06S033	3.102	3.3	3.498	V <sub>dc</sub>
		CFM06S050	4.75	5.0	5.25	
		CFM06S090	8.55	9.0	9.45	
		CFM06S120	11.64	12	12.36	
		CFM06S150	14.55	15	15.45	
		CFM06S240	23.28	24	24.72	
Operating Output Current Range	See derating curve	CFM06S033			1.5	A
		CFM06S050			1.2	
		CFM06S090			0.67	
		CFM06S120			0.5	
		CFM06S150			0.4	
		CFM06S240			0.25	
Holdup Time	V <sub>in</sub> =115V <sub>ac</sub>	All		12		ms
Output Voltage Regulation						
Load Regulation	10% Load to 100% full load	CFM06S033			±6.0	%
		CFM06S050			±5.0	
		CFM06S090			±5.0	
		CFM06S120			±3.0	
		CFM06S150			±3.0	
		CFM06S240			±3.0	
Line Regulation	V <sub>in</sub> =High line to low line	All			±1.0	%
Over Current Protection	Hiccup mode, auto recovery	All	110		200	%
Short Circuit Protection	Auto recovery	All				
Over Voltage Protection	Hiccup mode (auto recovery)	CFM06S033	6.45		7.14	V <sub>dc</sub>
		CFM06S050	6.45		7.14	
		CFM06S090	10.5		12.1	
		CFM06S120	14.3		15.8	
		CFM06S150	17.1		19.5	
		CFM06S240	28.5		31.5	



# CFM06S Series

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 bandwidth 3. Ambient temperature=25°C	CFM06S033			100	mV
		CFM06S050			100	
		CFM06S090			100	
		CFM06S120			120	
		CFM06S150			150	
		CFM06S240			240	
Load Capacitance	1. $V_{in}=115V_{ac}$ and $230V_{ac}$ 2. Output is 100% full load 3. Ambient temperature=25°C	CFM06S033			1500	uF
		CFM06S050			1200	
		CFM06S090			670	
		CFM06S120			500	
		CFM06S150			400	
		CFM06S240			250	
Efficiency	1. $V_{in}=230V_{ac}$ 2. Output is 100% full load 3. Ambient temperature=25°C	CFM06S033		75		%
		CFM06S050		78		
		CFM06S090		81		
		CFM06S120		81		
		CFM06S150		81		
		CFM06S240		83		

## ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 Minute	All			4300	$V_{ac}$
Isolation Resistance	Input to output	All	100			MΩ

## FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	$P_{out}$ =max. rated power	All	30		70	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			1120	k hours
Humidity	Non-condensing	All			93	% RH
Shock	Meet MIL-STD-810F Table 516.5, Table 516.5-1 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 3hrs	All		4		g
Weight	Blank (PCB mount)			11		g
	T (Wafer)	All		12		
	E (Encapsulated)			30		
Dimensions	Blank (PCB mount)	All	1.555x0.764x0.720 Inches (39.50x19.40x18.30 mm)			
	T (Wafer)	All	1.950x0.728x0.689 Inches (49.53x18.50x17.50 mm)			
	E (Encapsulated)	All	1.618x0.827x0.787 Inches (41.10x21.00x20.00 mm)			
<b>Safety</b>	Class II, IEC/EN/UL 62368-1, IEC 60950-1					Ed.3.0
<b>EMC Emission</b>	EN 55032:2015+A1:2020, EN 55032:2015+A11:2020, CISPR PUB. 22, FCC Part 15 Subpart B, EN 61000-6-3:2021, EN 61000-6-4:2019, EN 61000-3-2:2019+A1:2021, EN 61000-3-3:2013+A2:2021					Class B
Conducted Disturbance	EN 55032:2015+A1:2020, EN 55032:2015+A11:2020, CISPR PUB. 22, FCC Part 15 Subpart B, EN 61000-6-3:2021, EN 61000-6-4:2019					Class B
Radiated Disturbance	EN 55032:2015+A1:2020, EN 55032:2015+A11:2020, CISPR PUB. 22, FCC Part 15 Subpart B, EN 61000-6-3:2021, EN 61000-6-4:2019					Class B
Harmonic Current Emissions	EN 61000-3-2:2019+A1:2021					



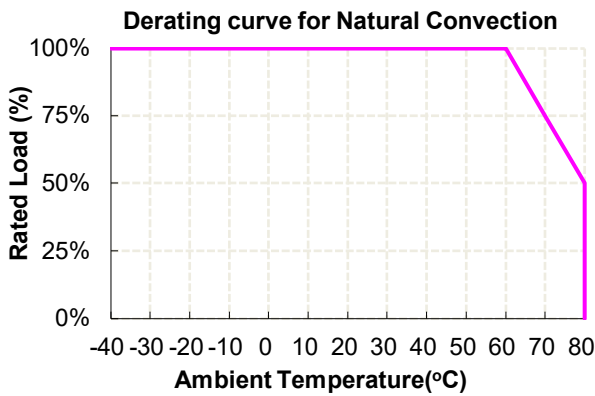
# CFM06S Series

## GENERAL SPECIFICATIONS

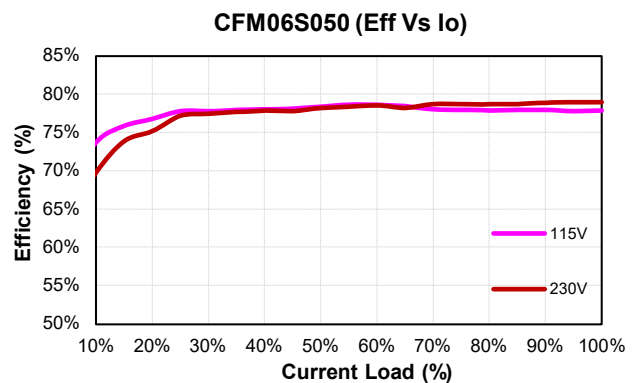
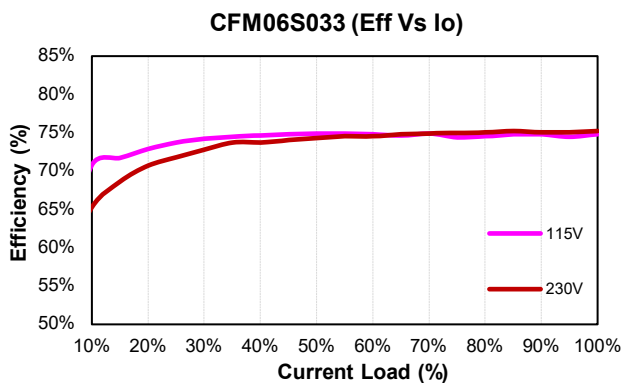
Voltage Fluctuations & Flicker	EN 61000-3-3:2013+A2:2021	
<b>EMC Immunity</b>	EN 55035:2017+A11:2020, EN 61000-6-1:2019, EN 61000-6-2:2019, IEC 61000-4-2,3,4,5,6,11	
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008, Air Discharge: $\pm 8\text{kV}$ , Contact Discharge: $\pm 4\text{kV}$	Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2020	Criterion A
Electrical Fast Transient (EFT)	IEC 61000-4-4:2012, $\pm 1.0\text{kV}$ , $\pm 2\text{kV}$	Criterion A
Surge	IEC 61000-4-5:2014+A1:2017, L-N: $\pm 0.5\text{kV}$ , $\pm 1\text{kV}$	Criterion A
Conducted Disturbances, Induced by RF Fields	IEC 61000-4-6:2013+COR1:2015	Criterion A
Voltage Dips	IEC 61000-4-11:2020, Dip: 30% Reduction, Dip >95% Reduction	Criterion A
Voltage Interruptions	IEC 61000-4-11:2020, >95% Reduction	Criterion B
Application Note Link	<a href="#">CFM06S Series App Notes</a>	

## CHARACTERISTIC CURVE

### Power Derating Curve



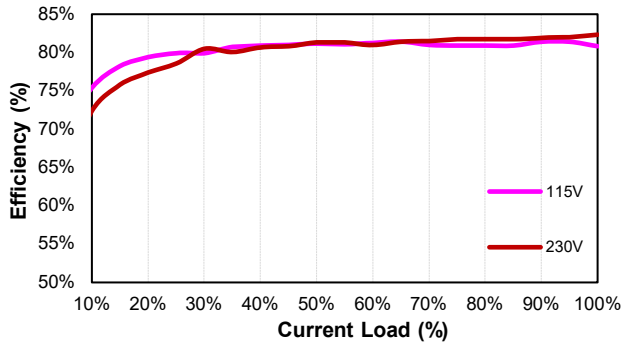
### Performance Data



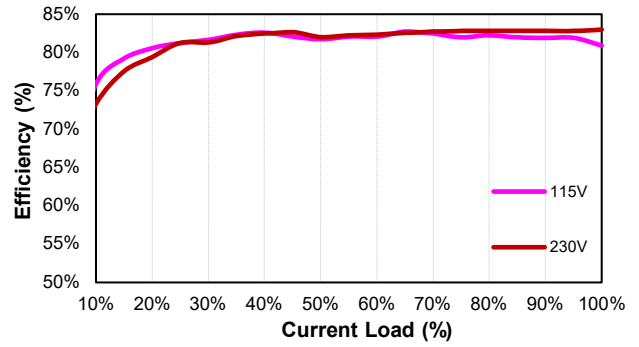


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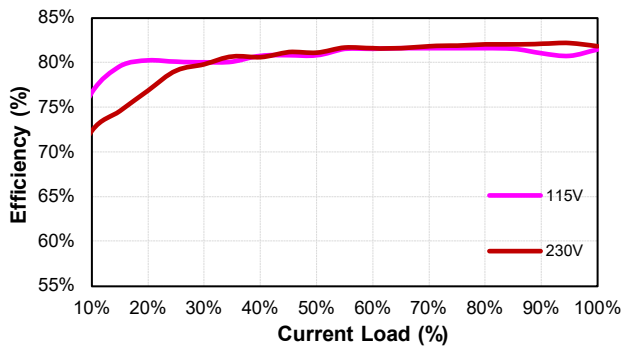
### CFM06S090 (Eff Vs Io)



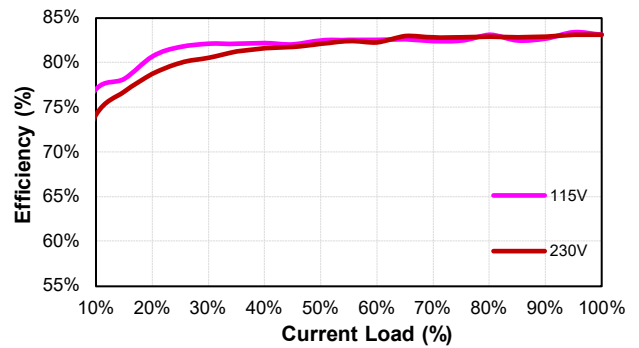
### CFM06S120 (Eff Vs Io)



### CFM06S150 (Eff Vs Io)



### CFM06S240 (Eff Vs Io)

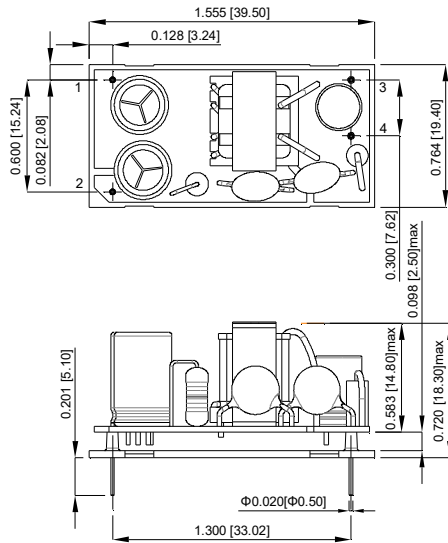




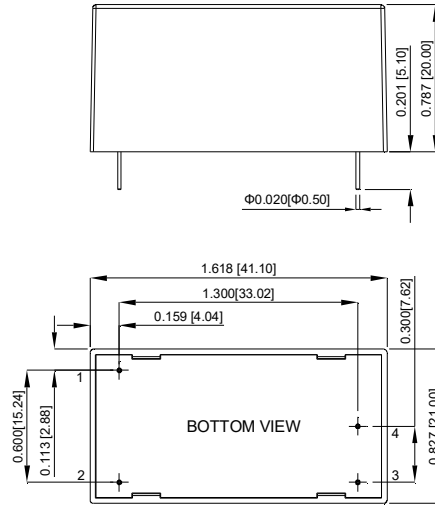
# CFM06S Series

## MECHANICAL SPECIFICATION

CFM06SXXX

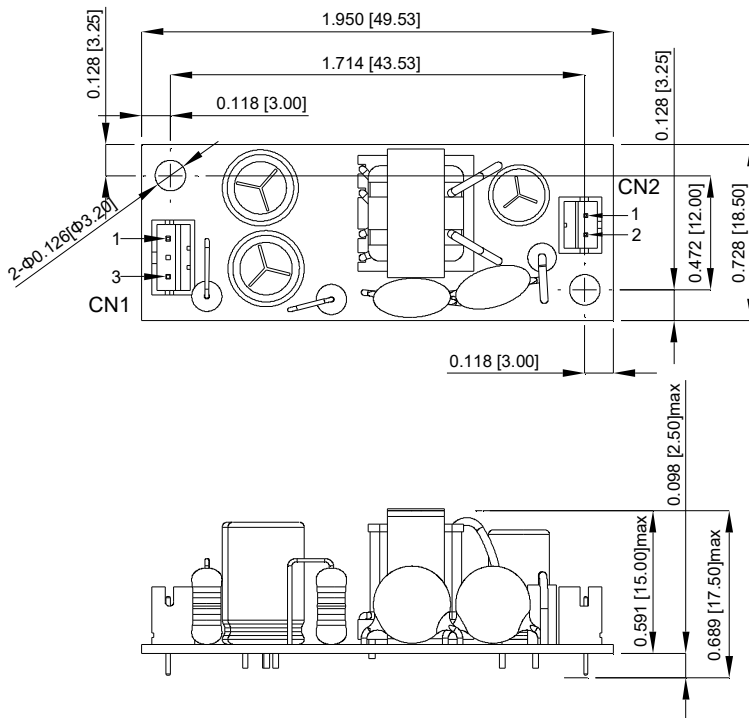


CFM06SXXX-E



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

All Dimensions In Inches[mm]  
Tolerance Inches:x.xxx= ± 0.02  
Millimeters: x.xx = ± 0.5



CFM06SXXX-T

AC Input Connector(CN1):JST B3B-PH-K-S(LF)(SN) or equivalent

Pin	Function	Mating Housing	Terminal
1	ACN	PHR-3 or equivalent	SPH-002T-P0.5L or equivalent
2	-		
3	ACL		

DC Output Connector(CN2):JST B2B-PH-K-S(LF)(SN) or equivalent

Pin	Function	Mating Housing	Terminal
1	+Vout	PHR-2 or equivalent	SPH-002T-P0.5L or equivalent
2	-Vout		

All Dimensions In Inches[mm]  
Tolerance Inches:x.xxx= ± 0.02  
Millimeters: x.xx = ± 0.5

CINCON Electronics Co. Ltd.  
Add: 14F, No. 306, Sec.4, Hsin Yi Rd., Taipei, Taiwan  
Tel: 886-2-27086210  
Fax: 886-2-27029852  
E-mail: [sales@cincon.com.tw](mailto:sales@cincon.com.tw)  
Web: [www.cincon.com](http://www.cincon.com)

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