



CFM06S SERIES 6 WATT OPEN FRAME AC-DC MODULES

Features

- Universal Input Range 90~264V_{ac}
- High Efficiency up to 83%
- 0.764"x1.555" 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_{ac} 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	90 120		264 370	V _{ac} V _{dc}
Operating Temperature	See Derating Curve	All	-40		80	°C
Storage Temperature		All	-40		85	°C
Operating Altitude	IEC/EN/UL 62368-1 OVC II IEC 62368-1 OVC III Meets IEC/EN 60335-1 OVC II	All			5000 2000 3000	m

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Voltage Range		All	100		240	V _{ac}
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% full Load, V _{in} =100V _{ac}	All			0.25	A
Leakage Current		All			0.25	mA
Inrush Current	V _{in} =240V _{ac} , Cold Start at 25°C	All			90	A

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V _{in} =Nominal V _{in} , I _o =I _o max., T _c =25°C	CFM06S033 CFM06S050 CFM06S090 CFM06S120 CFM06S150 CFM06S240	3.102 4.75 8.55 11.64 14.55 23.28	3.3 5.0 9.0 12 15 24	3.498 5.25 9.45 12.36 15.45 24.72	V _{dc}
Operating Output Current Range	V _{in} =90V _{ac} ~264V _{ac} , See Derating Curve	CFM06S033 CFM06S050 CFM06S090 CFM06S120 CFM06S150 CFM06S240			1.5 1.2 0.67 0.5 0.4 0.25	A
Holdup Time	V _{in} =115V _{ac}	All		12		ms
Output Voltage Regulation						
Load Regulation	10% Load to 100% full load	CFM06S033 CFM06S050 CFM06S090 CFM06S120 CFM06S150 CFM06S240			±6.0 ±5.0 ±5.0 ±3.0 ±3.0 ±3.0	%
Line Regulation	V _{in} =High line to low line	All			±1.0	%
Over Current Protection	Hiccup mode, auto recovery	All	110		200	%
Short Circuit Protection	Auto recovery	All				



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PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Over Voltage Protection	Hiccup mode (auto recovery)	CFM06S033	6.45		7.14	V_{dc}
		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	
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	μF
		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			M Ω

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°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 (±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 3hrs	All		4		g
Weight	Blank (PCB mount)	All		11		g
	T (Wafer)			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)			



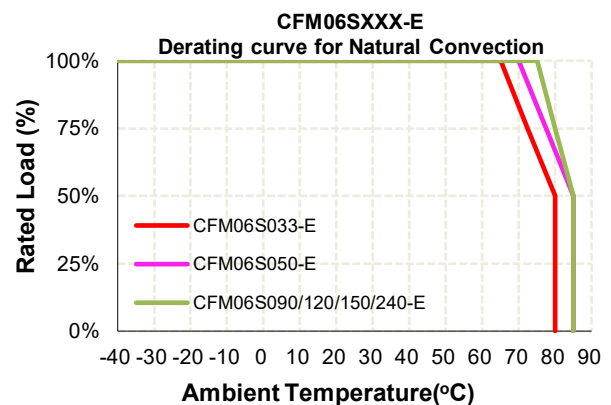
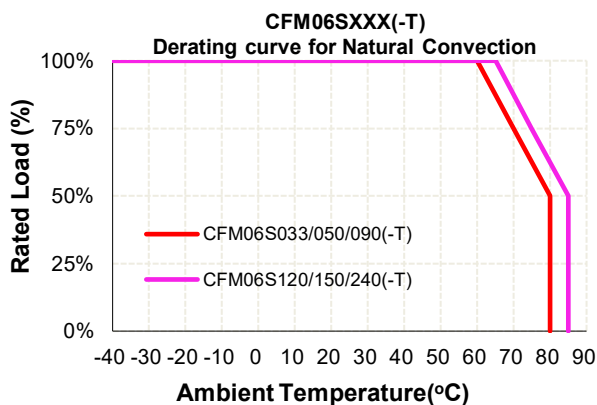
CFM06S Series

GENERAL SPECIFICATIONS

Safety	Class II, IEC/EN/UL 62368-1, IEC 60950-1	Ed.3.0
EMC Emission	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	
Voltage Fluctuations & Flicker	EN 61000-3-3:2013+A2:2021	
EMC Immunity	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	CFM06S Series App Notes	

CHARACTERISTIC CURVE

Power Derating Curve

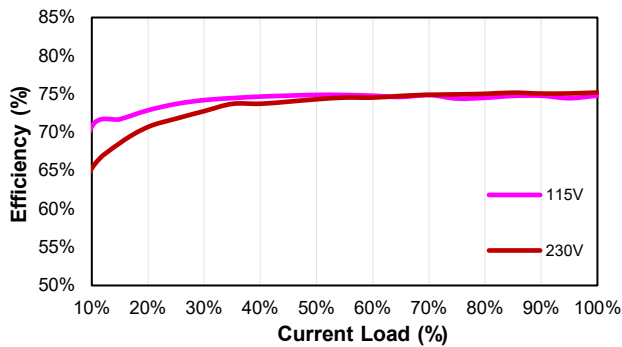




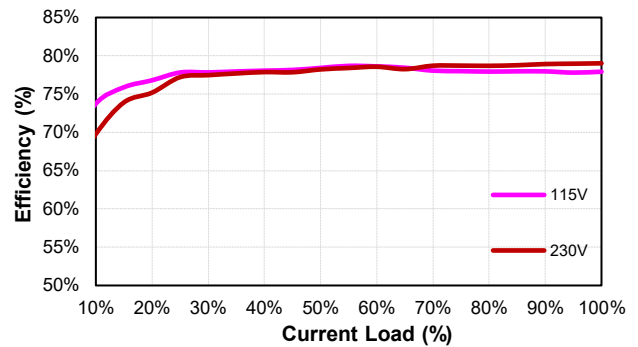
CFM06S Series

Performance Data

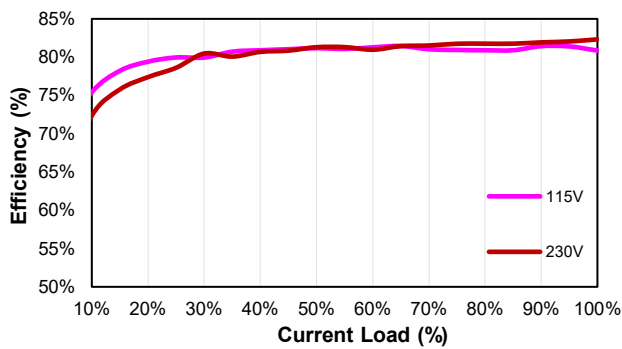
CFM06S033 (Eff Vs Io)



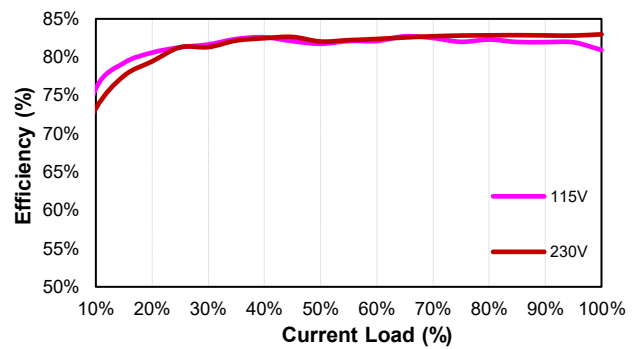
CFM06S050 (Eff Vs Io)



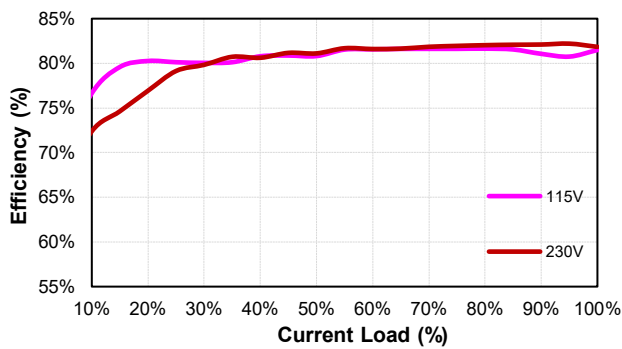
CFM06S090 (Eff Vs Io)



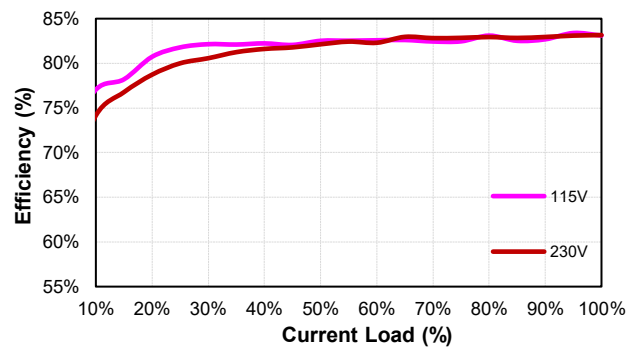
CFM06S120 (Eff Vs Io)



CFM06S150 (Eff Vs Io)



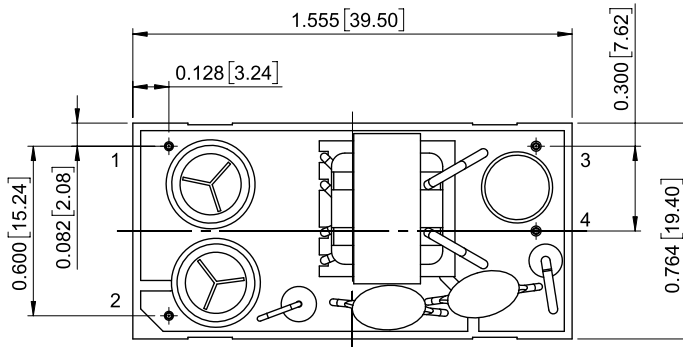
CFM06S240 (Eff Vs Io)





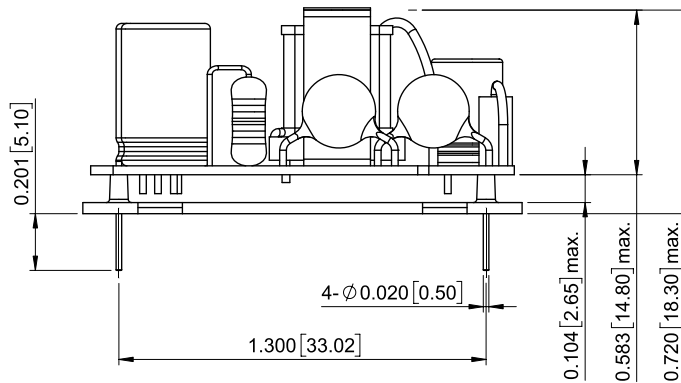
CFM06S Series

MECHANICAL SPECIFICATION



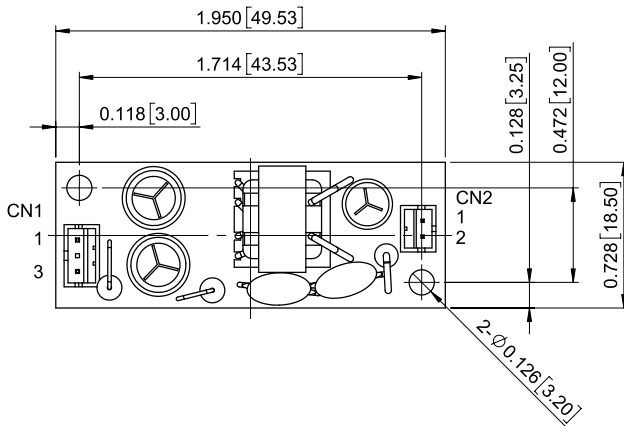
CFM06SXXX

All Dimensions in Inches[mm]
Tolerance Inches: x.xxx=±0.020
Millimeters: x.xx=±0.50



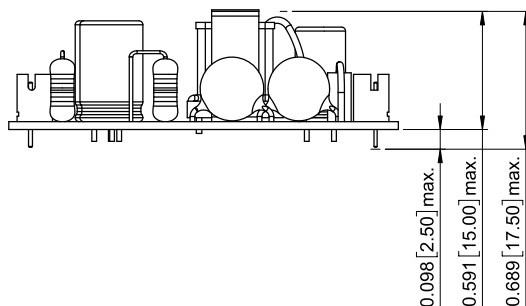
Pin Connection

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



CFM06SXXX-T

All Dimensions in Inches[mm]
Tolerance Inches: x.xxx=±0.020
Millimeters: x.xx=±0.50



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

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

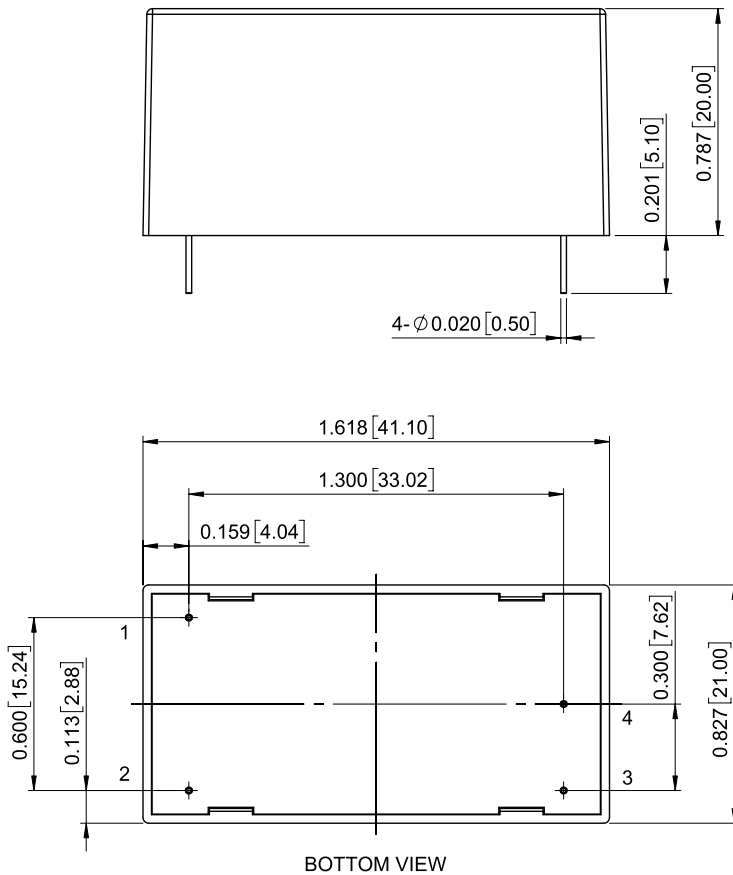
DC Output Connector(CN2):JST B2B-PH-K-S(LF)(SN) or equivalent

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



CFM06S Series

MECHANICAL SPECIFICATION



CFM06SXXX-E

All Dimensions in Inches[mm]

Tolerance Inches: x.xxx=±0.020

Millimeters: x.xx=±0.50

Pin Connection

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