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



E176177

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℃.
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

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TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, 100% full load at 25℃ 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	℃
Storage Temperature		All	-40		85	℃
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℃	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=Io max., T_c=25℃	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℃	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℃	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℃	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℃ 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	1.56x0.76x0.720 Inches (39.5x19.4x18.30 mm)			
	T (Wafer)	All	1.95x0.73x0.689 Inches (49.5x18.5x17.50 mm)			
	E (Encapsulated)	All	1.62x0.83x0.787 Inches (41.1x21.0x20.00 mm)			

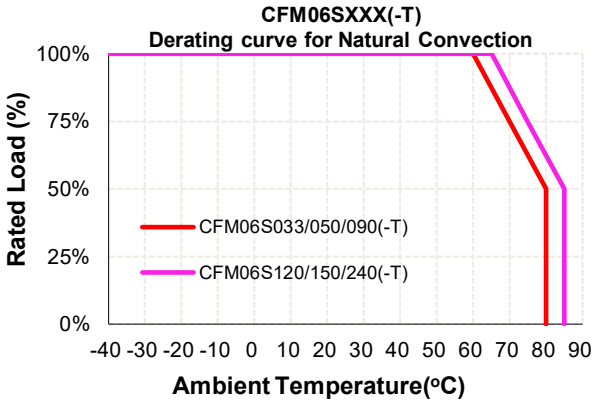
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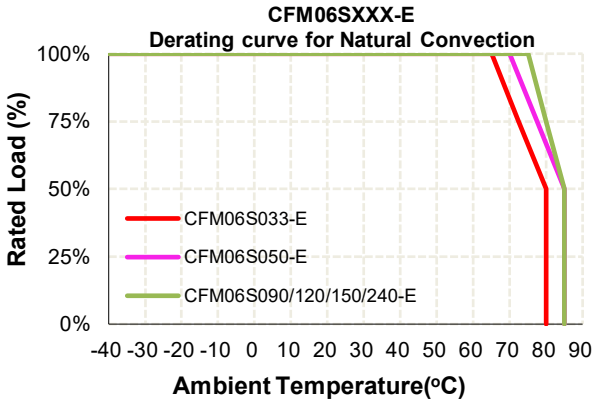
GENERAL SPECIFICATIONS

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: ±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, ±1.0kV, ±2kV	Criterion A
Surge	IEC 61000-4-5:2014+A1:2017, L-N: ±0.5kV, ±1kV	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

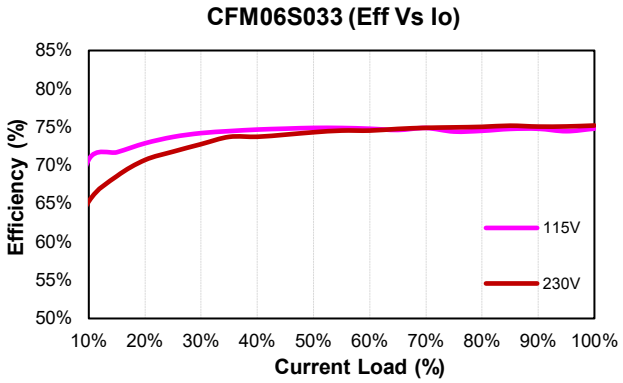
Power Derating Curve

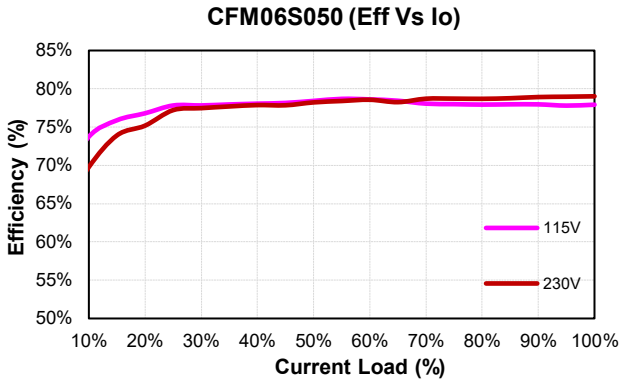


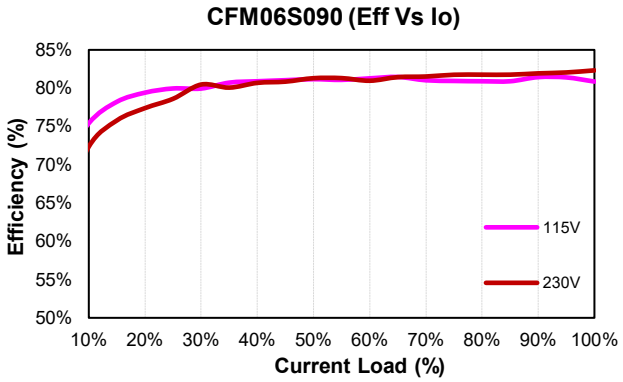


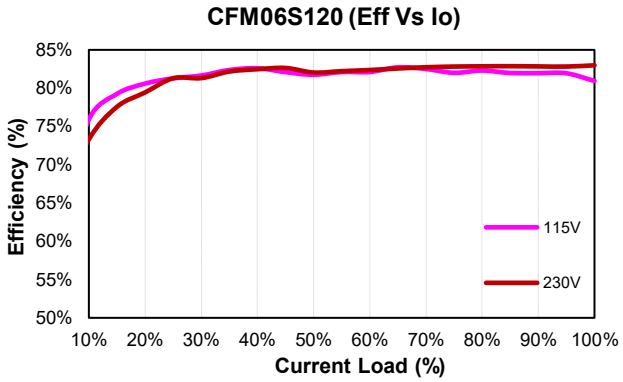
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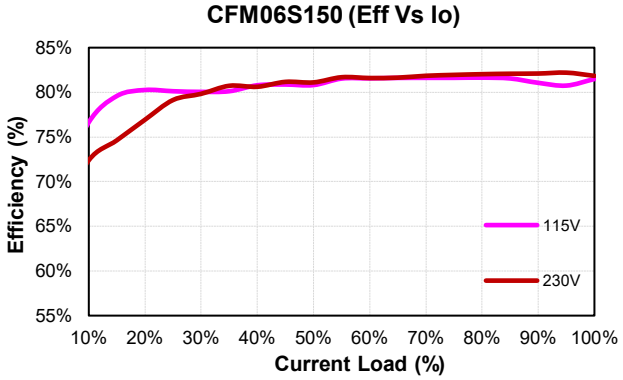
Performance Data

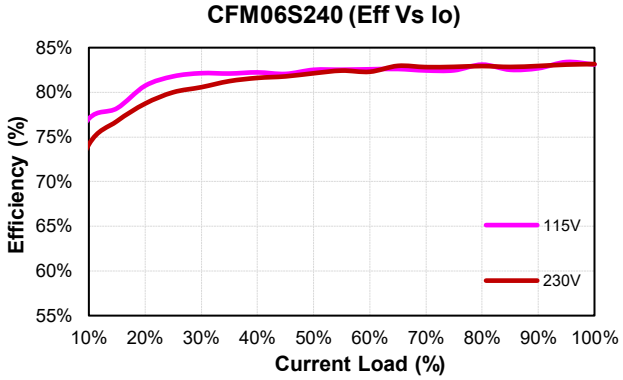






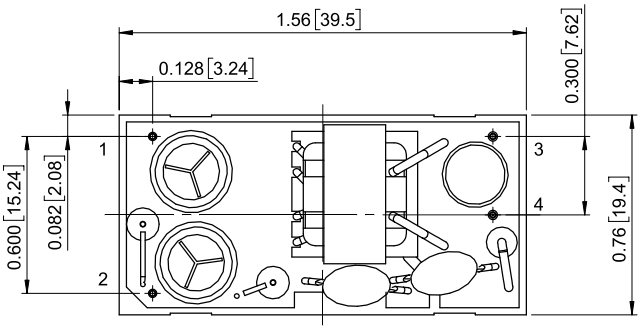


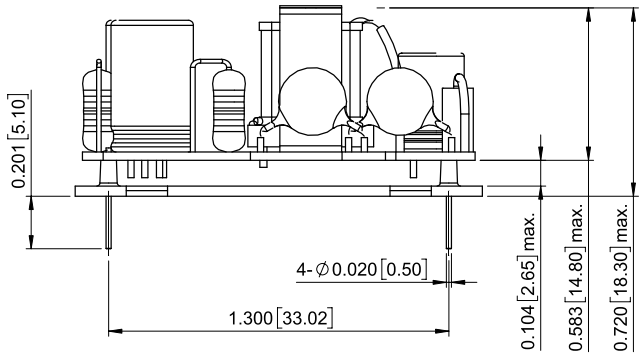




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MECHANICAL SPECIFICATION



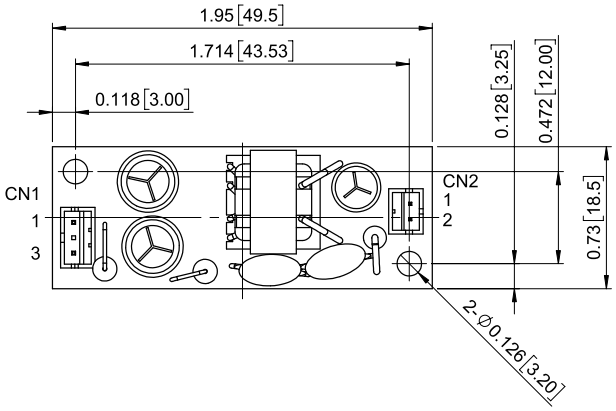


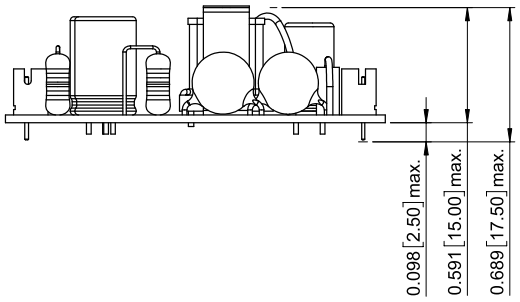
CFM06SXXX

All Dimensions in Inches[mm]
Tolerance Inches: x.xx=±0.03, x .xxx=±0.020
Millimeters: x.x=±0.7, 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.xx=±0.03, x .xxx=±0.020
Millimeters: x.x=±0.7, x.xx=±0.50

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

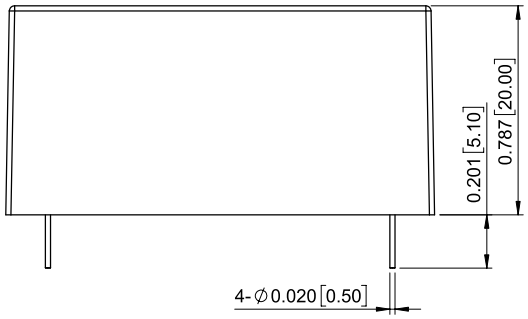
Pin	Function	Mating Housing	Terminal
1	ACN	TKP PHR-3 or equivalent	TKP SPH-002T-P0.5L or equivalent
2	-		
3	ACL		

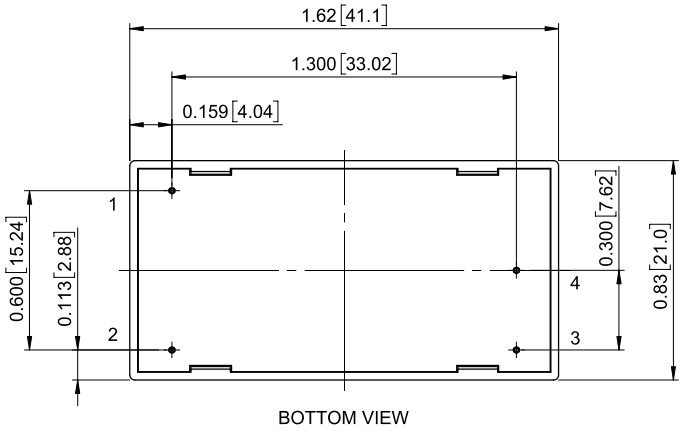
DC Output Connector(CN2):JST B2B-PH-K-S(LF)(SN) or equivalent

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

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MECHANICAL SPECIFICATION





BOTTOM VIEW

CFM06SXXX-E

All Dimensions in Inches[mm]
Tolerance Inches: x.xx=±0.03, x .xxx=±0.020
Millimeters: x.x=±0.7, x.xx=±0.50

Pin Connection

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

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