CFM61S SERIES
60 WATT OPEN FRAME AC-DC MODULES

Features

- Universal Input Range 90~264Vac
- High Efficiency up to 90%
- 2"x 2" Compact Size
- Class II
- No Load Input Power Consumption < 0.15W
- Approved IEC/EN/UL 62368-1 Ed 3.0
- Approved EN55032 and CISPR/FCC Class B
- Continuous Short Circuit Protection
- Over Voltage Protection
- Peak Load (2 Times of Rated Current (Note7))

E176177

MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	VOLTAGE ACCURACY NOTE1	RIPPLE & NOISE NOTE2	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
CFM61S050	5 V	8 A	2%	50 mV	±1%	±1%	86%
CFM61S120	12 V	5 A	1%	120 mV	±1%	±1%	88%
CFM61S150	15 V	4 A	1%	150 mV	±1%	±1%	88%
CFM61S240	24 V	2.5 A	1%	240 mV	±1%	±1%	89%
CFM61S360	36 V	1.67 A	1%	360 mV	±1%	±1%	89%
CFM61S480	48 V	1.25A	1%	480 mV	±1%	±1%	90%

Note:

1. Voltage accuracy is set at 100% full load.
2. Add a0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
   (CFM61S050: Add a 0.1uF ceramic capacitor and a 47uF 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 10% 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. PL (Peak load function) Lasting time < 10 seconds with a maximum 10%.
   Duty cycle and must add external 100uF / 400V capacitor to BC+ & BC-.

PART NUMBER

Series	Number of Outputs	Nominal Output Voltage	Type	Type
CFM61	O	XXX	X	YZ (Option)
CFM61	S：Single	050：5V 120：12V 150：15V 240：24V 360：36V 480：48V	Blank：PCB Mount E：Encapsulated T：Wafer	Blank PL： Peak Load Function

Part Number Example:

CFM61S120-E: Encapsulated, Single 12Vdc Output

CFM61S120-E PL: Encapsulated, With PL, 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	90 120		264 370	V_{ac} V_{dc}
Operating Temperature	See Derating Curve	All	-30		70	℃
Storage Temperature		All	-30		85	℃
Operating Altitude		All			5000	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% Load, V_{in}=100V_{ac}	All			1.5	A
Inrush Current	V_{in}=240V_{ac}, Cold Start @25℃	All			120	A
Leakage Current (Touch)		All			0.25	mA

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V_{in}=90Vac~264Vac, I_o=Io max, ambient temperature=25℃.	CFM61S050 CFM61S120 CFM61S150 CFM61S240 CFM61S360 CFM61S480	4.9 11.88 14.85 23.76 35.64 47.52	5 12 15 24 36 48	5.1 12.12 15.15 24.24 36.36 48.48	V_{dc}
Operating Output Current Range	Vin=90V_{ac}~264V_{ac}, See Derating Curve	CFM61S050 CFM61S120 CFM61S150 CFM61S240 CFM61S360 CFM61S480	0 0 0 0 0 0		8 5 4 2.5 1.67 1.25	A
Holdup Time	V_{in}=115Vac	All		10		ms
Output Voltage Regulation						
Load Regulation	10% Load to full load	All			±1.0	%
Line Regulation	V_{in}=High line to low line	All			±1.0	%
Over Voltage Protection	Clamp output voltage	CFM61S050 CFM61S120 CFM61S150 CFM61S240 CFM61S360 CFM61S480		6.8 15 18 30 47 56		V_{dc}
Output Ripple and Noise	1. Add a 0.1uF ceramic capacitor and a 10uF aluminum electrolytic capacitor to output. (CFM61S050: Add a 0.1uF ceramic capacitor and 47uF aluminum electrolytic capacitor to output.) 2. Oscilloscope is 20MHz band width. 3. Ambient temperature=25℃	CFM61S050 CFM61S120 CFM61S150 CFM61S240 CFM61S360 CFM61S480			50 120 150 240 360 480	mV

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
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℃	CFM61S050			8000	uF
		CFM61S120			5000	
		CFM61S150			4000	
		CFM61S240			2400	
		CFM61S360			1680	
		CFM61S480			680	
Efficiency	1. Input voltage is 230$V_{ac.}$ 2. Output is 75% full load 3. Ambient temperature=25℃	CFM61S050		86		%
		CFM61S120		88		
		CFM61S150		88		
		CFM61S240		89		
		CFM61S360		89		
		CFM61S480		90		

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 Minute (without dielectric breakdown)	All			3000	V_{ac}
Isolation Resistance	Input to output	All	100			MΩ

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency		All		65		kHz

GENERAL CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I_o=100%; T_a=25℃ per MIL-HDBK-217F	All	300			k hours
Life Time	@75% Load, 40℃	All	26			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		CFM61SXXX		93		grams
		CFM61SXXX-E		190		
		CFM61SXXX-T		96		
Dimension		CFM61SXXX	2.00x2.00x1.398 Inches (50.80x50.80x35.50 mm)			
		CFM61SXXX-E	2.136x2.136x1.409 Inches (54.25x54.25x35.80 mm)			
		CFM61SXXX-T	2.700x2.000x1.343 Inches (68.58x50.80x34.10 mm)			

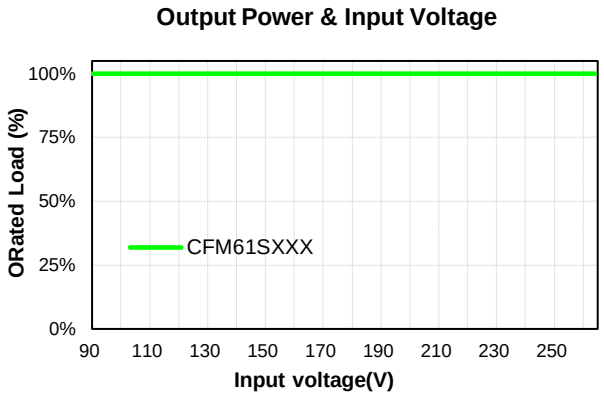
Safety	Class II, IEC/EN/UL 62368-1	Ed. 3.0
EMC Emission	EN55032,EN61000-3-2,EN6100-3-3, EN61000-6-3, EN61000-6-4, 47 CFR FCC Part 15 Subpart B, ICES-003 Issue 7	Class B
Conducted Disturbance	EN55032:2015+A11:2020, EN61000-6-3:2007+A1:2011+AC:2012, 47 CFR FCC Part 15 Subpart B	Class B
Radiated Disturbance	EN55032:2015+A11:2020, EN61000-6-3:2007+A1:2011+AC:2012, 47 CFR FCC Part 15 Subpart B	Class B
Harmonic Current Emissions	EN61000-3-2:2019	Class A
Voltage Fluctuations & Flicker	EN6100-3-3:2013+A1:2019	Criterion A
EMC Immunity	EN55035:2017+A11:2020, EN61204-3:2000, EN61000-6-1:2019, EN61000-6-2:2019	Criterion A
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008, Air discharge:±8kV, Contact discharge: ±4kV	Criterion A

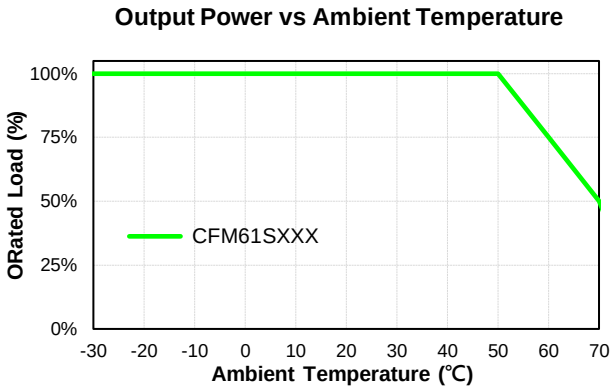
GENERAL CHARACTERISTICS

Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2020	Criterion A
Electrical Fast Transient (EFT)	IEC 61000-4-4:2012, ±2kV	Criterion A
Surge	IEC 61000-4-5:2014+A1:2017, L-N: ±1kV	Criterion A
Conducted Disturbances, Induced by RF Fields	IEC 61000-4-6:2013+COR1:2015	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	CFM61S Series App Notes	

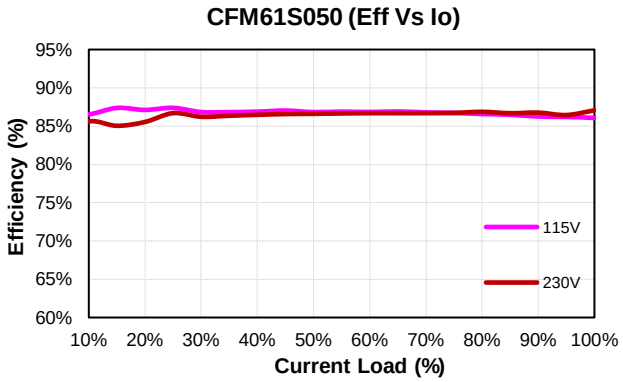
CHARACTERISTIC CURVE

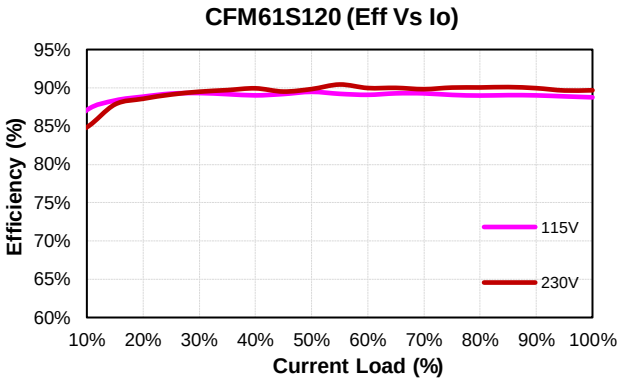
Power Derating Curve



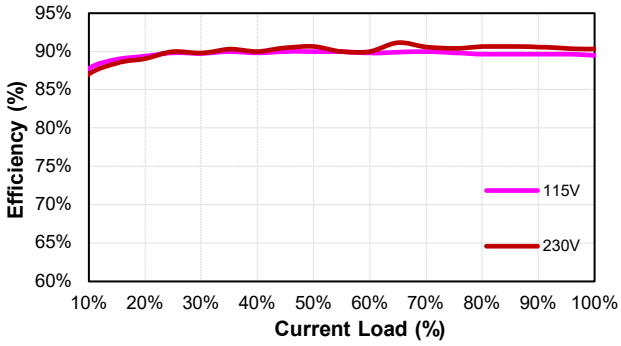


Performance Data

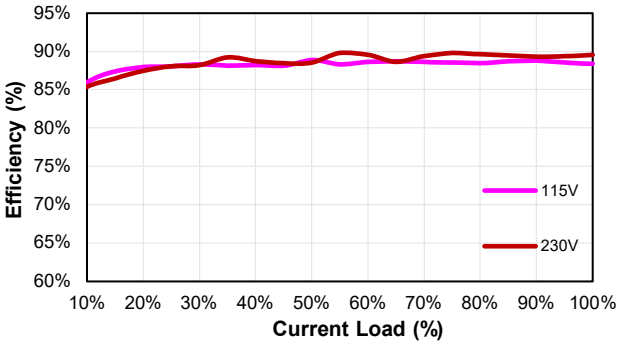




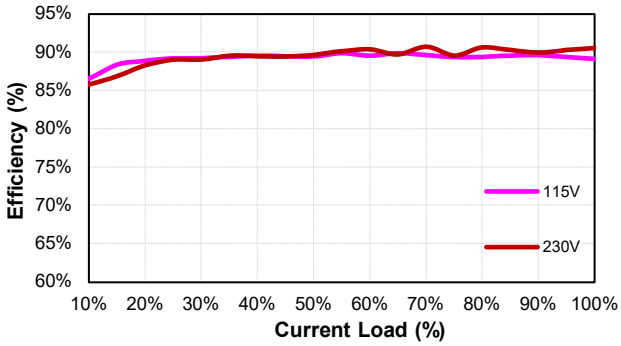
CFMS61S150 (Eff Vs Io)



CFM61S240 (Eff Vs Io)



CFM61S360 (Eff Vs Io)



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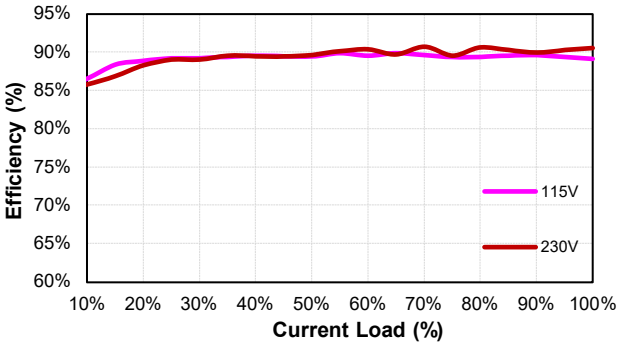
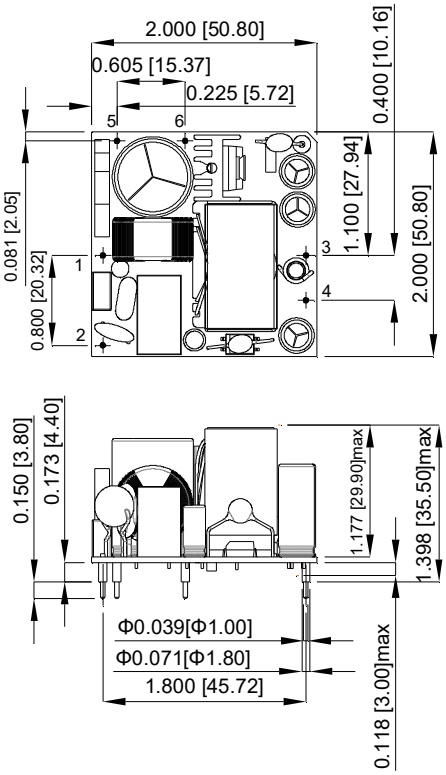
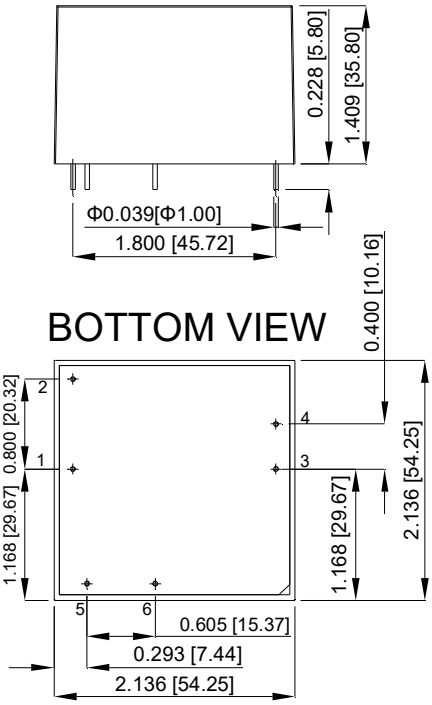


MECHANICAL SPECIFICATION

CFM61SXXX



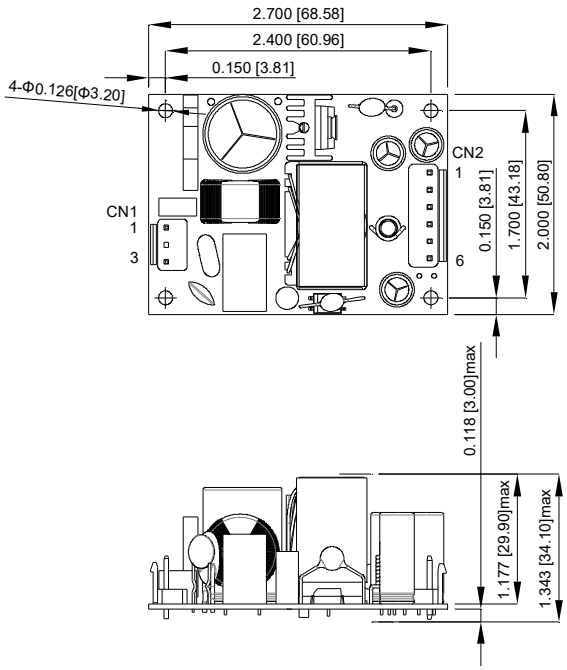
CFM61SXXX-E



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

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

CFM61SXXX-T



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		

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
Web: www.cincon.com