

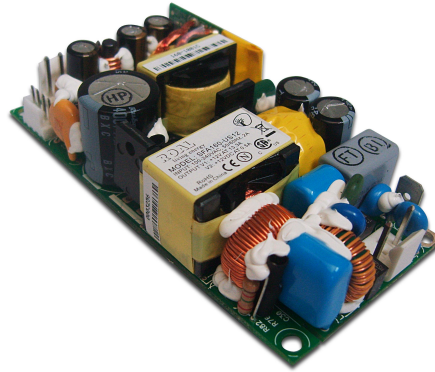
DESCRIPTION

The SFA160 is a series of high efficiency, small form factor and single output AC-DC power supplies.

Offering 160W of regulated DC power from in an industry standard 2x4x1 inch open-frame footprint, the SFA160 series consumes 46% less space in a system, enabling designers to offer smaller systems or to integrate more advanced features into their system without compromising on system size.

By converting energy at >90% efficiency, the SFA160 generates less heat facilitating higher reliability and space saving designs.

The SFA160 series is available in four different high power output voltages at 5.1V, 12V, 24V or 48V and is equipped with an auxiliary low power 12V output, which can be used as the supply voltage for an external fan.



2 YEAR WARRANTY

KEY FEATURES

160W PFC Power Supply
Very small form factor of 2 x 4 x 1 in
Extremely high efficiency >90% (typ.)
5.1V, 12V, 24V and 48V standard output variants

Universal Input Voltage Range
OVP and Short Circuit Protection
Over Temperature Protection
Auxiliary Fan +12V Output
RoHS-6 Compliant (Directive 2002/95/EC)

TARGET APPLICATIONS

Networking and Communications Equipment
DSL, Wi-Fi & WiMax Basestations
Video and Broadcast Equipment
Audio, Music and Radio Industries

Industrial Computers
Industrial Displays & Monitors
Automation, Drives & Industrial Controls
Test & Measurement Equipment

MODELS AND OUTPUT SPECIFICATIONS

Model	V1	I1 Current ¹ Convection	I1 Current ^{2,3} Fan Cooled	V1 Ripple ⁴ Pk-Pk	V2	I2 Current ¹ Convection	I2 Current ^{2,3} Fan Cooled
SFA160-US05	5.1V	15.6A	19.6A	50mV	12V	0.5A	0.5A
SFA160-US12	12V	8,3A	13,3A	120mV	12V	0.5A	0.5A
SFA160-US24	24V	4,2A	6,66A	240mV	12V	0.5A	0.5A
SFA160-US48	48V	2,1A	3,33A	480mV	12V	0.5A	0.5A

¹ The combined output power of V1 and V2 must not exceed 80W for 5V model or 100W for 12V, 24V and 48V models when convection cooled.

² The combined output power of V1 and V2 must not exceed 100W for 5V model or 160W for 12V, 24V and 48V at 400LFM.

³ The fan is rated at 200LFM for the 5V unit and 500LFM for 12V, 24V and 48V units.

⁴ Measured at 20MHz Bandwidth.

INPUT SPECIFICATIONS

Specification	Test Conditions / Notes	Minimum	Nominal	Maximum	Units
AC Input Voltage		90	115/230	264	Vac
DC Input Voltage		170		370	Vdc
Input Frequency		47		63	Hz
Input Current	100/200Vac			2.5/1.25	A
Inrush Current	230Vac Cold start, No Damage				A
Efficiency	Rated at full load, Nominal Vin				
	5V Unit		85%		
	12V, 24V, 48V Units		90%		
Power Factor	90 Vac		0.98		
Harmonic Current Limit	Complies with EN-61000-3-2		D		
Leakage Current	120Vac, 60Hz			275	µA

OUTPUT SPECIFICATIONS

Specification	Test Conditions / Notes	Minimum	Nominal	Maximum	Units
Output Voltage V1	5.1V	5.05	5.1	5.15	V
	12V	11.88	12	12.12	V
	24V	23.76	24	24.24	V
	48V	47.52	48	48.48	V
Output Power V1	5.1V Unit			80	W
Convection Rating	12V, 24V, 48V Units			100	W
Output Power V1	5.1V Unit			100	W
500 LFM Fan Rating	12V, 24V, 48V Units			160	W
Output Voltage V2	All Models			12	V
Output Current V2	All Models, from convection to 500LFM cooling			0.5	A
Voltage Set Point Accuracy	Main Output (V1)			±1%	
Voltage Adjustment Range	Main Output (V1)			±10%	
Line regulation	90Vac-264Vac (V1)			±0,1%	
Load Regulation	V1			±1%	
	V2 at 50% Load			±20%	
Cross Regulation	V1: Test at 50% Full Load on V1 and 0-100% Load Swing on V2			±1%	
Cross Regulation	V2: Test at 50% Full Load on V2 and 0-100% Load Swing on V1			±15%	
Transient Response (Voltage Deviation)	50% Load Changes at 0.1A/µs 5V at 2000µF Load / Iout>1A 12V at 1000µF Load / Iout>1A 24V at 470µF Load / Iout>0.5A 48V at 220µF Load / Iout>0.5A			±5%	
Ripple & Noise	Peak-peak 20MHz Bandwidth			1%	
Rise Time	230Vac at Minimum Load	0,2		20	ms
Start-up Delay				500	ms
Turn-on Overshoot	Percentage of V1		10%		
	Percentage of V2		30%		
Hold-up Time	At Full Load	16			ms
Minimum Load		0			A
Temperature Drift		-0,25		+0,25	mV/°C

PROTECTION FEATURES & SAFETY APPROVALS

Specification	Test Conditions / Notes	Minimum	Nominal	Maximum	Units
Input Under Voltage Lockout	Auto Recovery, Hiccup Mode	60	75		Vac
Input Fuse	Line and Neutral		3		A
Over Current Protection	Auto Recovery, Hiccup Mode	110		130%	I _{max}
Over Voltage Protection	Under fault conditions, the maximum voltage			130%	V1 _{max}
Short Circuit Protection	Auto Recovery, Hiccup Mode		Yes		
Over Temperature Protection	Shutdown with Auto Recovery			Yes	
Isolation Input/Output		4000			Vac
Isolation Input/Ground		1500			Vac
Isolation V1/V2		100			Vdc
Isolation Output/Ground		500			Vac
Safety Approvals	cCSAus, Nemko, CB Certificate				
Safety Standards	IEC, UL, EN60950-1; CSAC22.2 No.60950-1-03				
Agency File Numbers	CSA: 2022889 Nemko: P08209255 CB: No 47520 CB Report: 104220				

ELECTRO-MAGNETIC COMPATABILITY EMC

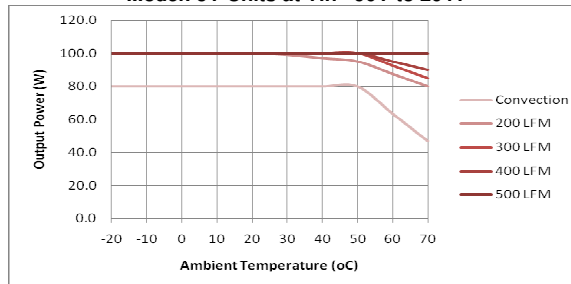
Specification	Test Conditions / Notes	Standard	Performance criteria
Conducted EMI	Class B	EN55022	B
Radiated EMI	At 10m distance	EN55022	A
Line Voltage Fluctuation & Flicker	At 20%, 50% and 100% Maximum Load	EN61000-3-3	A
ESD	15kV air discharge, 8kV contact at any point of System Level 4	EN61000-4-2	A
Harmonic Current Emission	All Load Conditions	EN61000-3-2	D
Radiated Field	3V/m, 80-2500MHz, 1KHz/2Hz 80% AM modulation. Dwell time is 3 sec for 2 Hz modulation Dwell time is 1 sec for 1KHz modulation	EN61000-4-3	A
EFT	2KV on AC and DC 5KHz repetition 1KV on I/O	EN61000-4-4	A
Surge	2KV CM, 1KV DM (5min surges at each phase angle)	EN61000-4-5	A
Conducted RF Immunity	3Vrms, 0,15-80MHz, 1KHz/2Hz 80% AM modulation	En61000-4-6	A
Magnetic Field Immunity	50 and 60 Hz, 3A/m	EN61000-4-8	A
Dips and Interruptions	Dip to 40% for 5 cycles (100ms) Dip to 70% for 25 cycles (500ms) Drop-out to 5%for 10 ms Interrupts > 95% for 5 s	EN61000-4-11 EN61000-4-11 EN61000-4-11 EN61000-4-11	B B B C

ENVIRONMENTAL SPECIFICATIONS

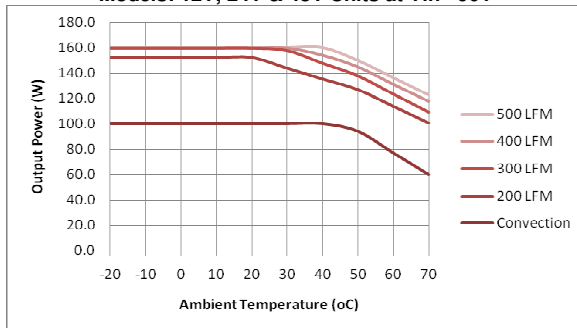
Specification	Test Conditions / Notes	Min	Nominal	Max	Units
Operating Temperature Range	No de-rating up to 50°C	-20		50	°C
De-rated Operating Temperature Range	Linearly de-rate from full load at 50°C to half load at 70°C			70	°C
Storage Temperature Range		-40		85	°C
Humidity	RH, Non-condensing Operating			90	%
	Non-operating			95	%
Operating Altitude				3000	m
Shock	Operating: Half-sine 11ms, 2 shock on each axis			10	G
	Non-operating: Half-sine 2ms, 2 shock on each axis			140	G
Vibration	Operating: 5-500Hz, 3 axis			2	G
MTBF	75% Full Load, Nominal Vin, 25°C, MIL-HDBK-217-E-1	235000			Hours
Cooling	See Graph and Application Notes	Convection		500	LFM

COOLING & POWER DERATING CURVES

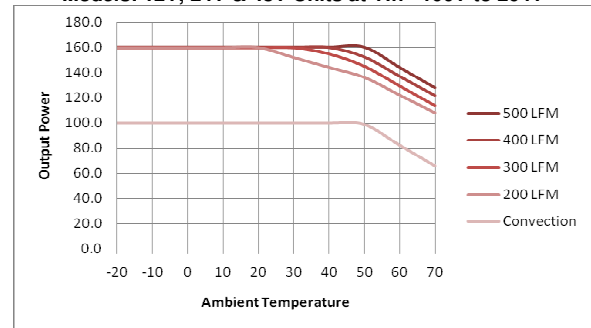
Model: 5V Units at Vin =90V to 264V



Models: 12V, 24V & 48V Units at Vin =90V

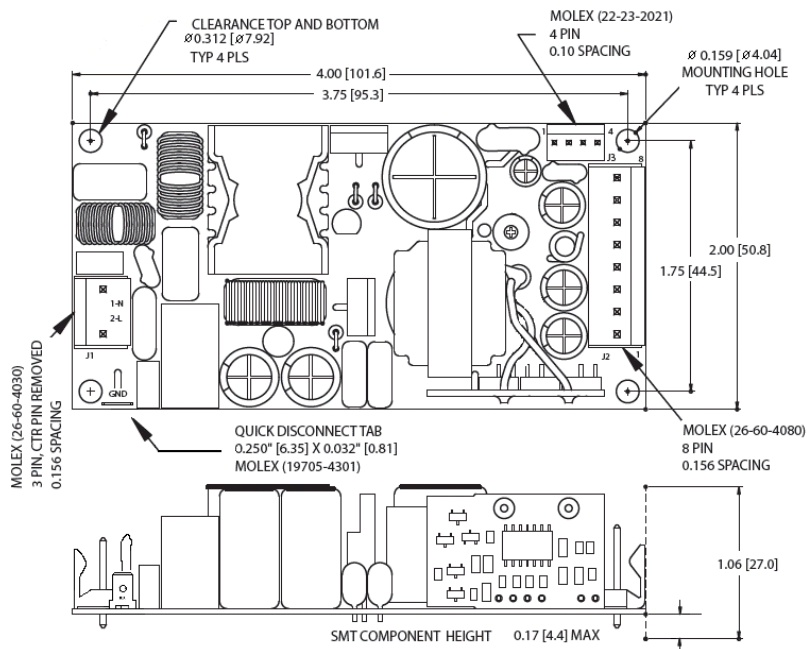


Models: 12V, 24V & 48V Units at Vin =100V to 264V



MECHANICAL SPECIFICATION

Connector	Manufacturer and Part Number
Input Connector J1	Molex 26-60-4030 or equivalent
J1 Mating Connector	Molex 09-91-0300 (Crimp Terminal Housing) Molex 08-50-0105 (Crimp Terminal, 18-24 AWG)
Ground Connector GND	Molex 19705-4301 or equivalent
Ground Mating Connector	Molex 0190030001 or equivalent
Output Connector J2	Molex 26-60-4080 or equivalent
J2 Mating Connector	Molex 09-91-0800 (Crimp Terminal Housing) Molex 08-50-0105 (Crimp Terminal, 18-24 AWG)
Output Connector J3	Molex 22-23-2041 or equivalent
J3 Mating Connector	Molex 22-01-2047 (Crimp Terminal Housing) Molex 08-50-0113 (Crimp Terminal, 22-30 AWG)



Input Connector J1

Pin Number	Pin Function
1	AC Neutral
2	AC Line

Input Ground Connector GND

GND	AC Ground
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Output Connector J2

Pin Number	Pin Function
1	DC Return
2	DC Return
3	DC Return
4	DC Return
5	V1
6	V1
7	V1
8	V1

Output Connector J3

Pin Number	Pin Function
1	Ground
2	Ground
3	12V (Fan)
4	12V (Fan)

Recommended Air Flow Direction

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