

PCB Mount Package (A1 Suffix)



CE **RoHS**

Size: 3.5in x 2.5in x 0.98in
(89mm x 63.5mm x 25mm)

Chassis Mount (A2 Suffix)



CE **RoHS**

Size: 5.32in x 2.76in x 1.32in
(135mm x 70mm x 33.5mm)

DIN Rail (A4 Suffix)



CE **RoHS**

Size: 5.39in x 2.76in x 1.36in
(137mm x 70mm x 34.5mm)

OPTIONS

- Case Type
 - PCB Mount
 - Chassis Mount
 - DIN Rail

FEATURES

- Wide Universal 85~264VAC Input or 100~370VDC Input Range
- High I/O Isolation Test Voltage up to 4000VAC
- Regulated Output
- Low Ripple and Noise
- High Efficiency & Reliability
- Short Circuit, Over Current, and Over Voltage Protection
- Plastic Case meets UL94V-0 Flammability
- RoHS Compliant
- Meets EMI CISPR32/EN55032 Class B
- IEC62368, EN62368, and UL62368 Safety Standards

DESCRIPTION

The PSLHA40 series of AC/DC converters offers up to 40 watts of output power in either a PCB mount, chassis mount, or DIN rail mount package. This series consists of regulated single output models with a wide input voltage range of 85~264VAC (100~370VDC). Features of this series include high reliability, high efficiency, and low ripple and noise. This series also has short circuit, over current, and over voltage protection, is RoHS compliant, and meets IEC62368, EN62368, and UL62368 safety standards.

MODEL SELECTION TABLE

Model Number ⁽¹⁾	Input Voltage Range	Output Voltage	Output Current		Output Power	Maximum Capacitive Load	Efficiency
			Min Load	Max Load			
PSLHA40-03Sx	85~264VAC (100~370VDC)	3.3VDC	0%	8000mA	26.4W	60000µF	78%
PSLHA40-05Sx		5VDC	0%	8000mA	40W	40000µF	82%
PSLHA40-12Sx		12VDC	0%	3330mA	40W	9000µF	84%
PSLHA40-15Sx		15VDC	0%	2660mA	40W	7000µF	84%
PSLHA40-24Sx		24VDC	0%	1670mA	40W	2000µF	84%
PSLHA40-48Sx		48VDC	0%	830mA	40W	1000µF	84%

SPECIFICATIONS

All specifications are based on 25°C, Humidity <75%, Nominal Input Voltage, and Rated Output Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION		TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS							
Input Voltage Range	AC Input		85			264	VAC
	DC Input		100			370	VDC
Input Frequency			47			63	Hz
Input Current	115VAC					1.0	A
	230VAC					0.6	
Inrush Current	115VAC			50			A
	230VAC			70			
Hot Plug		Unavailable					
OUTPUT SPECIFICATIONS							
Output Voltage		See Table					
Voltage Accuracy	All Load Ranges			±2			%
Line Regulation	Rated Load			±0.5			%
Load Regulation	0%-100% Load (3.3V & 5V Output)			±1		±3	%
	0%-100% Load (12V, 15V, 24V, 48V Output)			±1			
Output Power		See Table					
Output Current		See Table					
Minimum Load		0					%
Maximum Capacitive Load		See Table					
Ripple & Noise (20MHz bandwidth) ⁽²⁾	Peak-to-peak value			80		150	mV
Stand-By Power Consumption						0.5	W
Hold-Up Time	115VAC			10			mS
	230VAC			50			
Temperature Coefficient				±0.02			%/°C
PROTECTION							
Short Circuit Protection	Hiccup, Continuous	Self-Recovery					
Over Current Protection	Self-Recovery			≥110			%I _o
Over Voltage Protection	3.3V Output					5.5	V
	5V Output					9	
	12V Output					16	
	15V Output					24	
	24V Output					35	
	48V Output					56	
ENVIRONMENTAL SPECIFICATIONS							
Operating Temperature			-40			+70	°C
Storage Temperature			-40			+85	°C
Soldering Temperature	Wave-Soldering	260 ± 5°C; 5-10s					
	Manuel-Welding	360 ± 10°C; time: 3-5s					
Storage Humidity						95	%RH
Power Derating	-40°C to -30°C	PSLHA40-03SA1 & PSLHA40-05SA1	4.0				% / °C
		PSLHA40-12SA1 & PSLHA40-15SA1	3.0				
		PSLHA40-24SA1 & PSLHA40-48SA1	2.0				
	+45°C to +70°C	PSLHA40-03SA1 & PSLHA40-05SA1	3.0				
		PSLHA40-12SA1 & PSLHA40-15SA1	3.7				
	+55°C to +70°C	PSLHA40-24SA1 & PSLHA40-48SA1	2.7				
MTBF	85VAC-100VAC		1.33				%/VAC
	MIL-HDBK-217F, 25°C		300,000				H
Cooling Method		Free Air Convection					
GENERAL SPECIFICATIONS							
Efficiency		See Table					
Switching Frequency				65			kHz
Isolation Voltage	Input-Output, Electric Strength Test for 1min, leakage current <10mA	4000					VAC
PHYSICAL SPECIFICATIONS							
Weight	PCB Mount Package (A1 Suffix)	8.46oz (215g)					
	Chassis Mount Package (A2 Suffix)	11.81oz (300g)					
	DIN Rail Package (A4 Suffix)	14.17oz (360g)					
Dimensions (L x W x H)	PCB Mount Package (A1 Suffix)	3.5 x 2.5 x 0.98in (89 x 63.5 x 25mm)					
	Chassis Mount Package (A2 Suffix)	5.32 x 2.76 x 1.32in (135 x 70 x 33.5mm)					
	DIN Rail Package (A4 Suffix)	5.39 x 2.76 x 1.36in (137 x 70 x 39mm)					
Case Material	UL94V-0	Flame & Heat Resistant Black Plastic					

SPECIFICATIONS

All specifications are based on 25°C, Humidity <75%, Nominal Input Voltage, and Rated Output Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS			Min	Typ	Max	Unit
SAFETY CHARACTERISTICS							
Safety Standards & Certifications	IEC62368/EN62368/UL62368 ⁽⁶⁾						
Safety Certification	EN62368						
Safety Class							Class II
Emissions	CE	CISPR32/EN55032					Class B
	RE	CISPR32/EN55032					Class B
Immunity	ESD	IEC/EN61000-4-2	Contact ±6kV/Air±8kV				Perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m				Perf. Criteria A
	EFT	IEC/EN61000-4-4	±2kV				Perf. Criteria B
			±4kV ⁽³⁾				Perf. Criteria B
	Surge	IEC/EN61000-4-5	Line to Line ±1KV				Perf. Criteria B
	CS	IEC/EN61000-4-6	Line to Line ±2kV/Line to Ground ±4kV ⁽³⁾				Perf. Criteria B
			10Vr.m.s				Perf. Criteria A

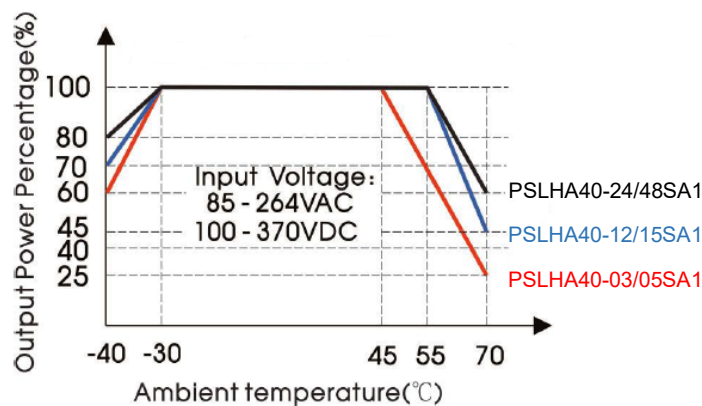
NOTES

1. "X" in model number indicates package mount type. "X" can be "A1" for PCB Mount, "A2" for Chassis Mount, or "A4" for DIN Rail Mount.
2. Ripple and noise are measured by "parallel cable" method. Contact factory for more information.
3. See Design Reference: EMC Solution-Recommended Circuit for the recommended circuit.
4. Product customization is available, please contact factory for more information
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations and should be handled by qualified units.
6. This product is Listed to applicable standards and requirements by UL.

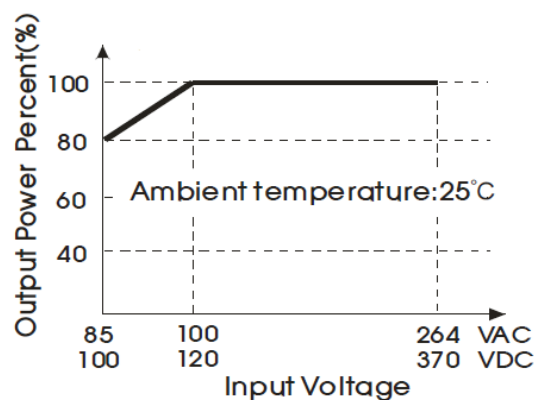
*Due to advances in technology, specifications subject to change without notice.

DERATING CURVES

Temperature Derating Curve



Input Voltage Derating Curve

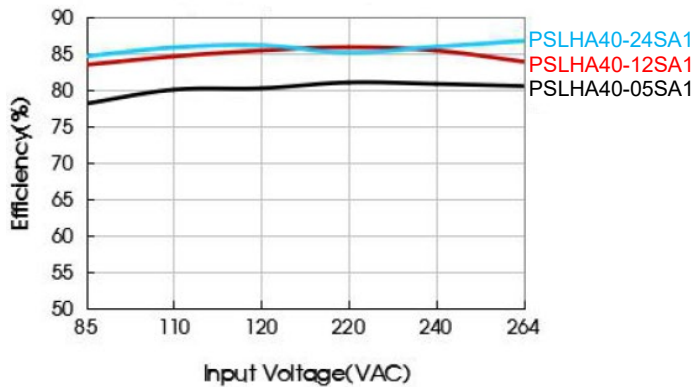


Notes:

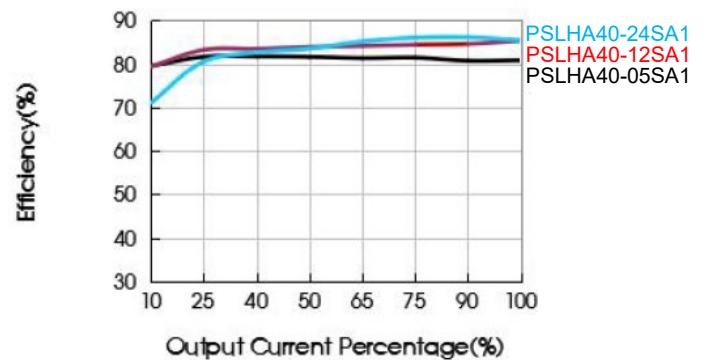
1. With an AC input between 85-100VAC and a DC input between 100-120VDC, the output power must be derated as per temperature derating curves.
2. This product is suitable for applications using natural air cooling, for applications in a closed environment, please contact factory.

EFFICIENCY GRAPHS

Efficiency vs. Input Voltage (Full Load)

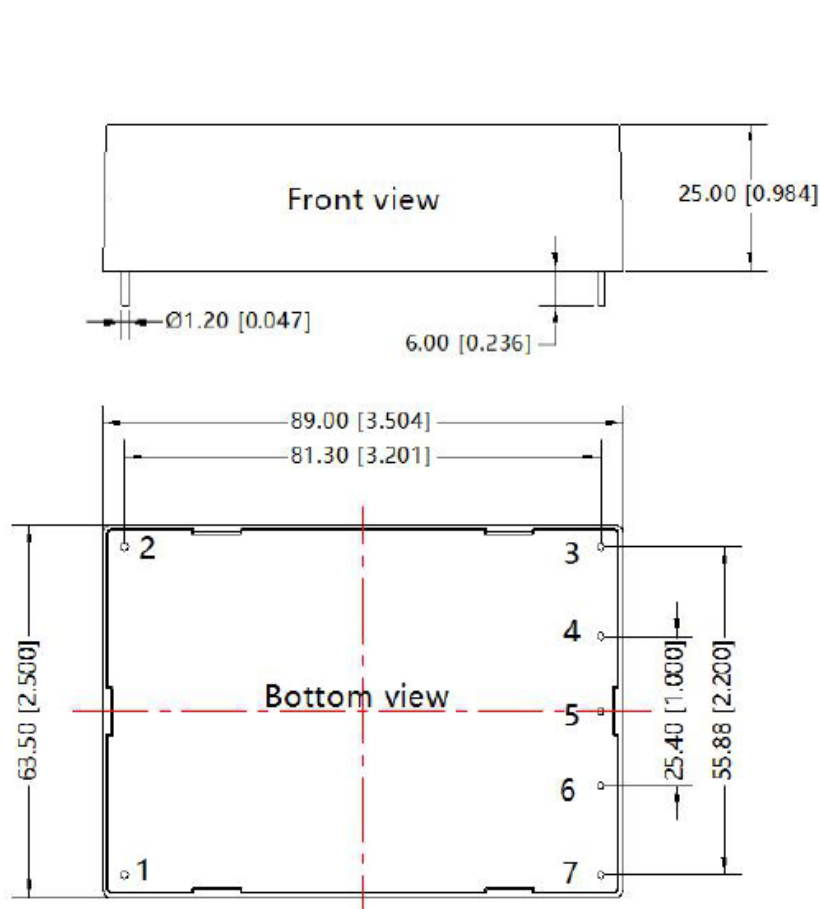


Efficiency vs. Output Load (Vin=230VAC)

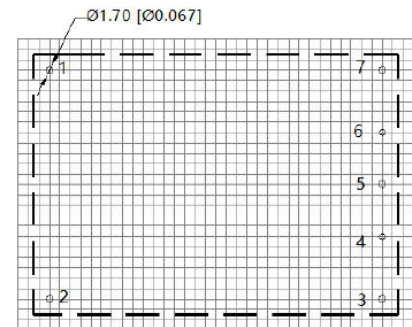


MECHANICAL DRAWINGS

PCB Mount (A1 Suffix)



THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

Pin Out

Pin	PSLHA40-xxSA1
1	AC (L)
2	AC (N)
3	Trim
4	No Pin
5	-Vo
6	No Pin
7	+Vo

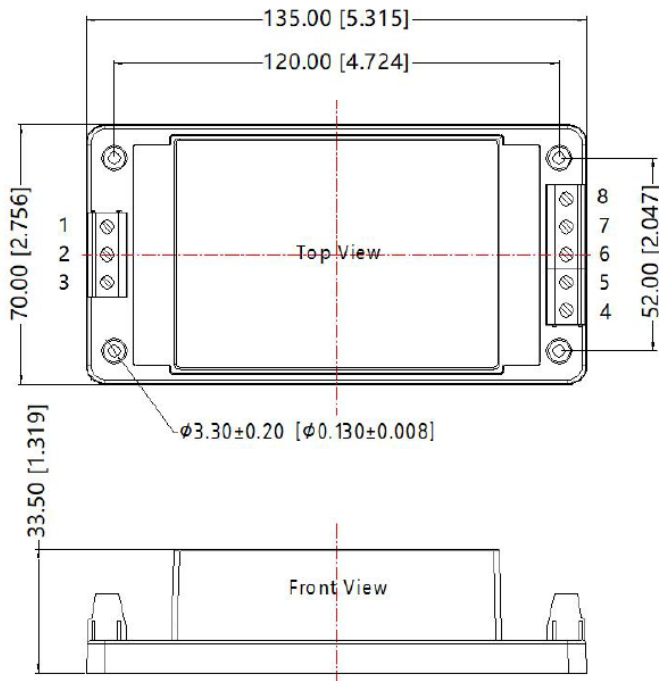
Note:

Unit: mm [inch]

Pin diameter tolerances: ± 0.10 [± 0.004]

General Tolerances: ± 0.50 [± 0.020]

Chassis Mount (A2 Suffix)



THIRD ANGLE PROJECTION

Pin Out

Pin	PSLHA40-xxSA1
1	AC (L)
2	AC (N)
3	NC
4	Trim
5	NC
6	-Vo
7	NC
8	+Vo

Note:

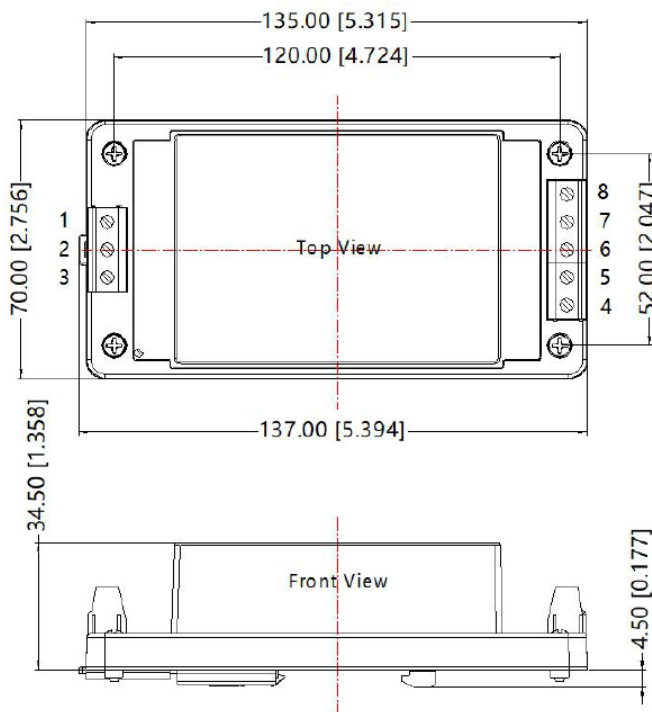
Unit: mm [inch]

Wire range: 24-12 AWG

Tightening Torque: Max 0.4 N·m

General Tolerances: ± 1.00 [± 0.040]

DIN Rail Mount (A4 Suffix)



THIRD ANGLE PROJECTION

Pin Out

Pin	PSLHA40-xxSA1
1	AC (L)
2	AC (N)
3	NC
4	Trim
5	NC
6	-Vo
7	NC
8	+Vo

Note:

Unit: mm [inch]

Wire range: 24-12 AWG

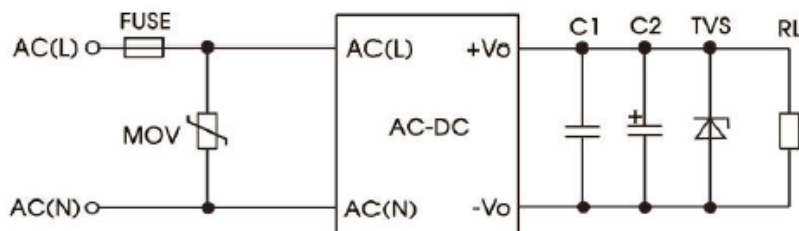
Tightening Torque: Max 0.4 N·m

Mounting Rail: TS35, rail needs to connect safely to ground

General Tolerances: ± 1.00 [± 0.040]

DESIGN REFERENCE

Typical Application Circuit

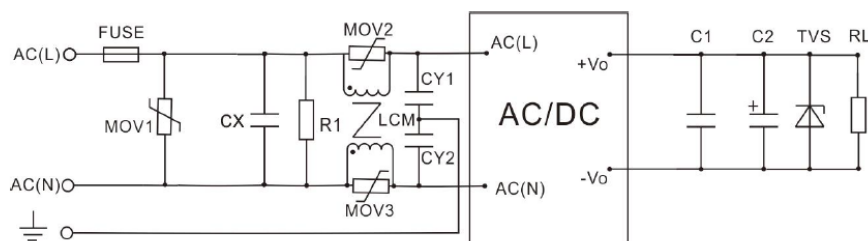


PSLHA40-xxSA1 Typical Application Circuit

Model	C2 (uF)	C1 (uF)	TVS
PSLHA40-03SA1	680	1	SMBJ7.0A
PSLHA40-05SA1	680	1	SMBJ7.0A
PSLHA40-12SA1	220	1	SMBJ20A
PSLHA40-15SA1	220	1	SMBJ20A
PSLHA40-24SA1	120	1	SMBJ30A
PSLHA40-48SA1	100	1	SMBJ64A

Note: We recommend using an electrolytic capacitor with high frequency and low ESR rating for C2 (see data sheet). Choose a capacitor voltage rating with at least 20% margin (not exceeding 80%). C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of converter failure.

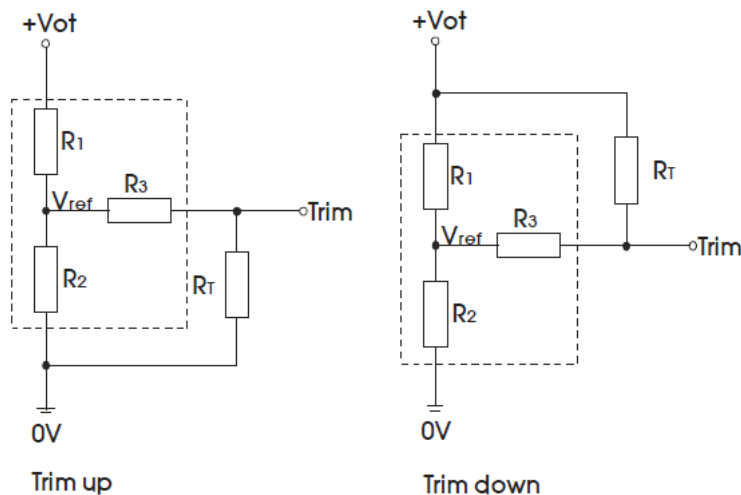
EMC Solution-Recommended Circuit



Output External Circuit Refer to the Typical Application Circuit

Component	Recommended Value
MOV1	S14K350
MOV2, MOV3	S07K350
CX	0.15uF/300VAC
CY1	2.2nF/400VAC
CY2	2.2nF/400VAC
R1	1MΩ/2W
LCM	2.2mH, contact factory for recommendation
FUSE	3.15A/250V slow fusing, required

Application of Trim and Calculation of Trim Resistance



TRIM resistor connection (dashed line shows internal resistor network)

Calculating Trim Resistor Values:

$$\text{Up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V_{ot} - V_{ref}} \cdot R_1$$

$$\text{Down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \quad a = \frac{V_{ot} - V_{ref}}{V_{ref}} \cdot R_2$$

R_T = Trim resistance value
 a = self-defined parameter
 V_{ot} = desired output voltage ($\pm 10\%$ max.)

Vout	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Vref (V)	Vot (V)
3.3V	2	1.2	1	1.24	Resulting Trimmed Output Voltage; range $\pm 10\%$
5V	3.3	3.3	1	2.5	
12V	3.83	1	1	2.5	
15V	7.5	1.5	1	2.5	
24V	8.66	1	1	2.5	
48V	22	1.2	1	2.5	

MODEL NUMBER SETUP

PSLHA	40	-	03	S	A1
Series Name	Output Power		Output Voltage	Output Quantity	Case Type
			03: 3.3VDC 05: 5VDC 12: 12VDC 15: 15VDC 24: 24VDC 48: 48VDC	S: Single	A1: PCB Mount A2: Chassis Mount A4: DIN Rail

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

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