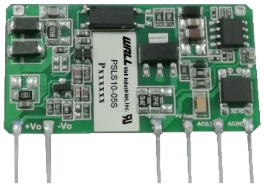
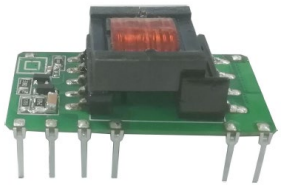
SIP



Size: 1.75in x 0.87in x 0.59in
(44.5mm x 22mm x 15mm)

90º Bent Pins (-F)



Size: 1.75in x 0.88in x 0.59in
(44.5mm x 22.45mm x 15mm)

FEATURES

- Ultra Wide Input Voltage Range of 85~305VAC/100~430VDC
- Accepts AC or DC input (Dual-Use of Same Terminal)
- Low Power Consumption
- Green Power
- High Efficiency and High Power Density
- 90 Degree Bent Pin Option
- RoHS Compliant
- Over Current, Over Voltage, and Short Circuit Protection
- Designed to Meet IEC/EN/UL60335 Safety Standards
- IEC/EN/UL62368 Safety Approvals

DESCRIPTION

This PSLS10 series of AC/DC converters offers up to 10 watts of output power in either a SIP model or SIP model with a 90º bend. This series consists of single output models with an ultra-wide input voltage range of 85~305VAC/100~430VDC. Each model in this series has low power consumption, high efficiency and high power density, as well as over current, over voltage, and short circuit protection. This series is designed to meet IEC/EN/UL60335 standards and has IEC/EN/UL62368 safety approvals.

MODEL SELECTION TABLE

Model Number[1]	Input Voltage Range	Output Voltage	Output Current	Max. Ripple & Noise	Output Power	Max. Capacitive Load	Efficiency
PSLS10-03S (-F)	85-305VAC (100-430VDC)	3.3V	2000mA	150mV	6.6W	1500µF	70%
PSLS10-05S (-F)		5V	2000mA	150mV	10W	1500µF	76%
PSLS10-09S (-F)		9V	1100mA	150mV	10W	1000µF	78%
PSLS10-12S (-F)		12V	830mA	150mV	10W	680µF	80%
PSLS10-15S (-F)		15V	670mA	150mV	10W	470µF	81%
PSLS10-24S (-F)		24V	420mA	150mV	10W	330µF	82%

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage (115V & 230V), <75% Humidity 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		305	VAC
	DC Input		100		430	VDC
Input Frequency			47		63	Hz
Input Current	@115VAC				0.3	A
	@230VAC				0.15	
Inrush Current	@115VAC			15		A
	@230VAC			30		
Recommended External Input Fuse			1A, Slow-Blow, Required			
Hot Plug			Unavailable			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy	0%-100% Load	3.3V Model		±1.5	±3	%
		Other Models		±1	±2	
Line Regulation	Rated Load			±1	±1.5	%
Load Regulation	0%-100% Load			±2.5		%
Output Power			See Table			
Output Current			See Table			
Min. Load			0			%
Maximum Capacitive Load			See Table			
Ripple & Noise[3]	20MHz bandwidth (peak to peak value)			80	150	mV
Temperature Coefficient				±0.02		%/ºC
PROTECTION						
Short Circuit Protection			Continuous, Self-Recovery			
Over Current Protection	Self-Recovery			≥110		% Io
Over Voltage Protection	Output Voltage Clamp or Hiccup	3.3VDC/5VDC Output		≤9		VDC
		9VDC Output		≤15		
		12VDC/15VDC Output		≤25		
		24VDC Output		≤35		

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage (115V & 230V), <75% Humidity 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
ENVIRONMENTAL SPECIFICATIONS						
Operating Temperature			-40		+85	ºC
Storage Temperature			-40		+105	ºC
Storage Humidity					95	%RH
Power Derating	-40~25ºC		2.67			%/ºC
	+55~+85°C		2.5			
	85VAC-100VAC		1			%/VAC
	277VAC-305VAC		0.54			
MTBF	MIL-HDBK-217F@25ºC		300,000			Hours
GENERAL SPECIFICATIONS						
Efficiency	@230VAC		See Table			
Isolation Test	Input-Output, Electric Strength Test for 1 minute, Leakage Current <5mA		3000			VAC
PHYSICAL SPECIFICATIONS						
Weight			0.39oz (11g)			
Dimensions (L x W x H)	SIP Model		1.75in x 0.87in x 0.59in (44.5mm x 24mm x 15mm)			
	SIP Model with 90º Bend		1.75in x 0.88in x 0.59in (44.5mm x 22.45mm x 15mm)			
Cooling			Free Air Convection			
SAFETY CHARACTERISTICS						
Safety Standard	IEC/EN/UL62368, IEC/EN/UL60335(4)					
Safety Certification	IEC/EN/UL62368(4)					
Safety Class	Class II					
Emissions	CE	CISPR22/EN55032 CISPR22/EN55032	Class A (Recommended Circuit 1,4) Class B (Recommended Circuit 2, 3)			
	RE	CISPR22/EN55032 CISPR22/EN55032	Class A (Recommended Circuit 1,4) Class B (Recommended Circuit 2, 3)			
ESD	IEC/EN61000-4-2	Contact ±6kV	Perf. Criteria B			
RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A			
EFT	IEC/EN61000-4-4 IEC/EN61000-4-4	±2kV (Recommended Circuit 1,2) ±4kV (Recommended Circuit 3,4)	Perf. Criteria B Perf. Criteria B			
Surge	IEC/EN61000-4-5	Line to Line ±1kV (Recommended Circuit 1,2)	Perf. Criteria B			
	IEC/EN61000-4-5 IEC/EN61000-4-5	Line to Line ±2kV (Recommended Circuit 3,4) Line to Line ±4kV (Recommended Circuit 4)	Perf. Criteria B			
CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A			
Voltage Dips, Short Interruptions and Voltage Variations Immunity	IEC/EN61000-4-11	0%, 70%	Perf. Criteria B			

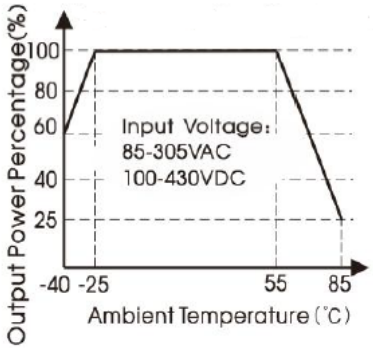
NOTES

1. Add -F to model name to indicate 90º corner model.
2. If product is being used in a severe vibration application, it needs to be glued and fixed.
3. Ripple & Noise are measured by “parallel cable” method.
4. This product is Listed to applicable standards and requirements by UL.
5. External electrolytic capacitors are required to modules. For more details, refer to typical applications.
6. This part is open frame, at least 6.4mm safety distance between the primary and secondary external components of the module is needed to meet safety requirement.
7. In order to improve efficiency at light load, audible noise will be generated, but it will not affect the product’s reliability and performance.
8. Product customization available.
9. Products shall be classified according to ISO14001 and related environmental laws and regulations and should be handled by qualified units.

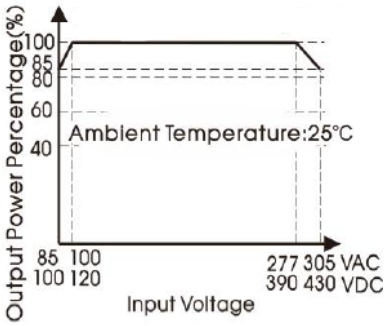
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVES

Temperature Derating Curve



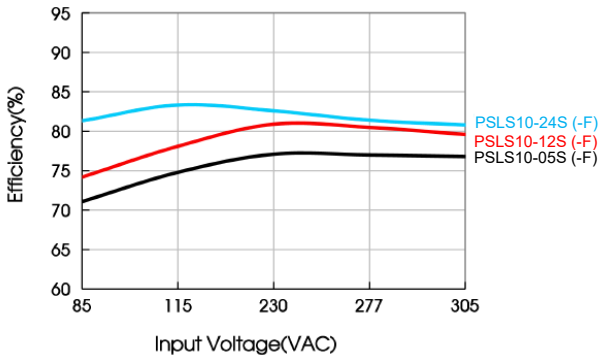
Input Voltage Derating Curve



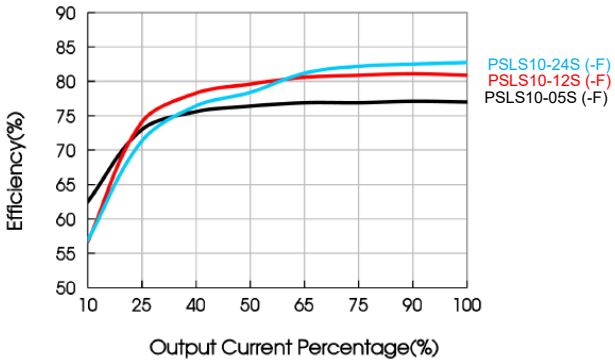
1. With AC Input between 85-100VAC/277-305VAC and a DC Input between 100-120VDC/390-430VDC, output power must be derated as per temperature derating curves.
2. This product is suitable for use in natureal air cooling environments, if in a closed environment, please contact factory.

EFFICIENCY GRAPHS

Efficiency vs Input Voltage (Full Load)

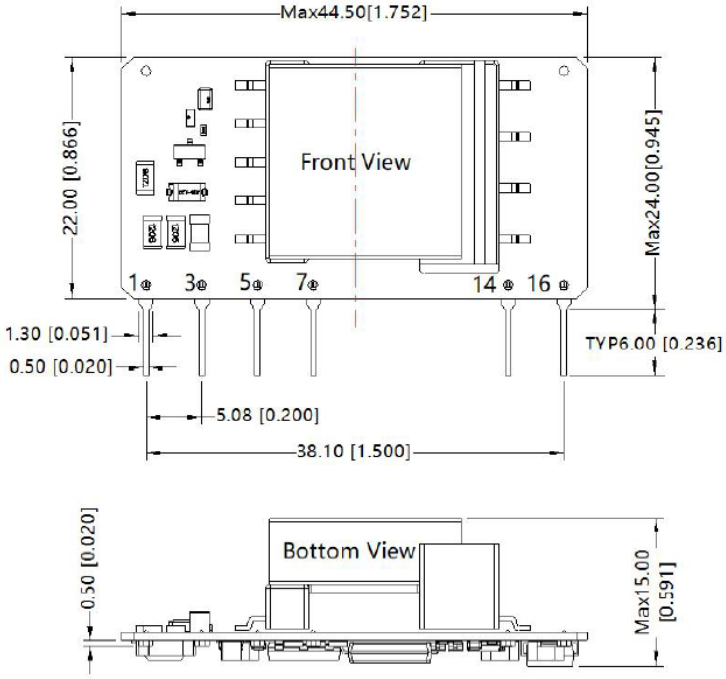


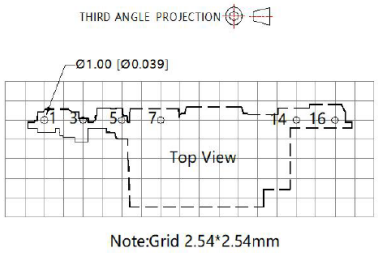
Efficiency vs Output Load (Vin=230VAC)



MECHANICAL DRAWINGS

SIP Package





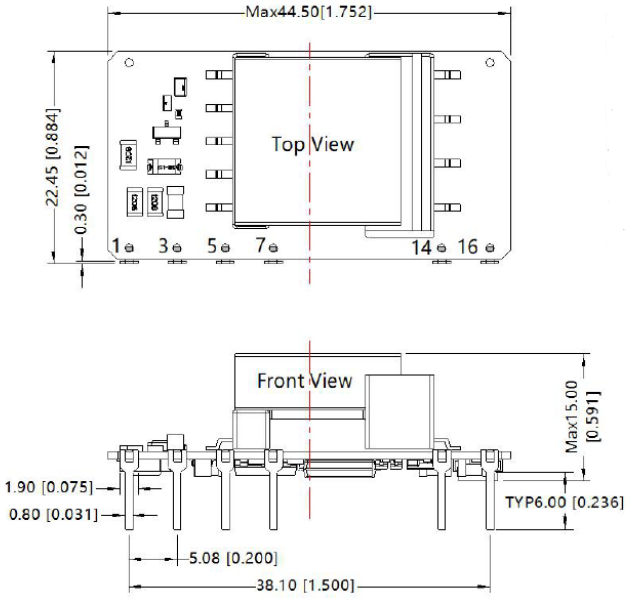
Note:Grid 2.54*2.54mm

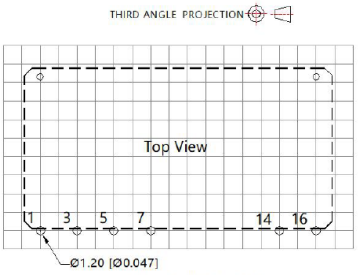
Pin-Out	
Pin	Function
1	AC (N)
3	AC (L)
5	+V (cap)
7	-V (cap)
14	-Vo
16	+Vo

1. It is necessary to add C1 between pin5 and pin 7
2. It is necessary to add circuit to the output, such as recommended circuit 1.

Note:
Units in mm [inch]
Pin diameter tolerances: ±0.10[±0.004]
General Tolerances: ±0.50[±0.020]
The layout of the device is for reference only, please refer to the actual product.

SIP Package with 90ºC Bend (-F Suffix)





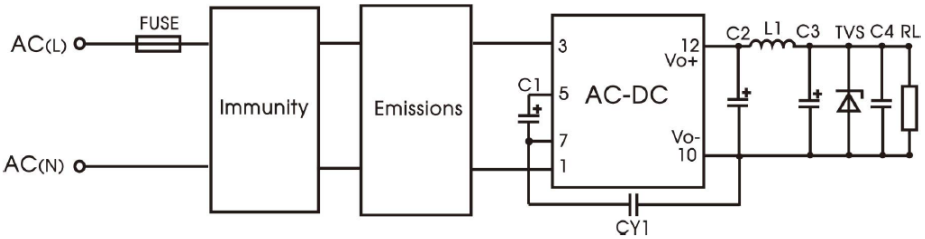
Note:Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	AC (N)
3	AC (L)
5	+V (cap)
7	-V (cap)
14	-Vo
16	+Vo

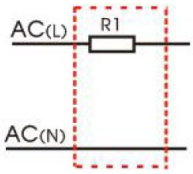
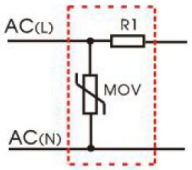
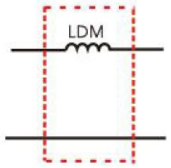
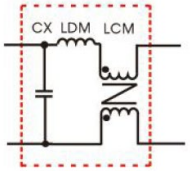
1. It is necessary to add C1 between pin5 and pin 7
2. It is necessary to add circuit to the output, such as recommended circuit 1.

Note:
Units in mm [inch]
Pin diameter tolerances: ±0.10[±0.004]
General Tolerances: ±0.50[±0.020]
The layout of the device is for reference only, please refer to the actual product.

ADDITIONAL CIRCUITS DESIGN REFERENCE



PSLS10 (-F) Series Additional Circuits Design Reference

Immunity Design Circuits for Reference		Emissions Design Circuits for Reference	
Class III	Class IV	Class A	Class B
			

PSLS10 (-F) Series Additional Components Selection Guide

Model	FUSE (Required)	C1 (Required)	C2 (Required)	L1 (Required)	C3 (Required)	C4	CY1 (Required)
PSLS10-03S (-F)	1A/300V	22μF/400V	470μF/16V (solid-state capacitor)	4.7μF (Max. 60mΩ)	150μF/35V	0.1μF/50V	1.0nF/400VAC
PSLS10-05S (-F)							
PSLS10-09S (-F)			270μF/16V (solid-state capacitor)		100μF/35V		
PSLS10-12S (-F)							
PSLS10-15S (-F)			470uF/35V		47μF/35V		
PSLS10-24S (-F)			220uF/35V				

Note:
1. C1: Input capacitors, C2: Output Storage Capacitors, they must be connected externally
2. We recommend using an electrolytic capacitor with high frequency and low ESR rating for C3 (refer to data sheet). Combined with C2, L1, they form a pi-type filter circuit. Choose a capacitor voltage rating with at least 20% margin (not exceeding 80%). C4 is a ceramic capacitor, used for filtering high frequency noise. A suppressor diode (TVS) is recommended to protect the application in case of a converter failure and specification should be 1.2 times of the output voltage.

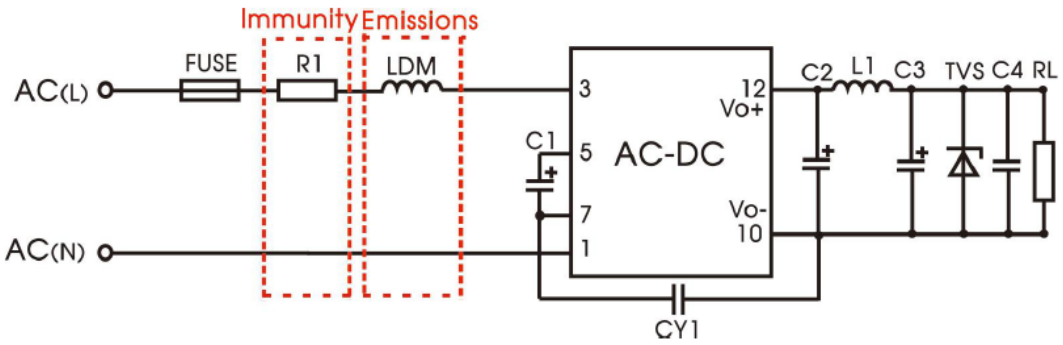
ENVIRONMENTAL APPLICATION EMC SOLUTION

PSLS10 (-F) Series Environmental Application EMC Solution Selection Table

Recommended Circuit	Application Environment	Typical Industry	Input Voltage Range	Environment Temperature	Emissions	Immunity
1	Basic Application	None	85~305VAC	-40°C~+85°C	CLASS A	CLASS III
2	Indoor Civil Environment	Smart Home/Home Appliances (2Y)		-25°C~+55°C	CLASS B	CLASS III
	Indoor General Environment	Intelligent Building/Intelligent Agriculture				
3	Indoor Industrial Environment	Manufacturing Workshop		-25°C~+55°C	CLASS B	CLASS IV
4	Outdoor General Environment	ITS/Video Monitoring/Charging point/Communication/Security and Protection		-40°C~+85°C	CLASS A	CLASS IV
	Outdoor Harsh Environment	On-line power meter Communication base station		-40°C~+85°C	CLASS A	>CLASS IV Surge: Line to Ground ±4KV EFT: CLASS IV

ADDITIONAL CIRCUITS DESIGN REFERENCE

1. Recommended Circuit 1-Basic Application

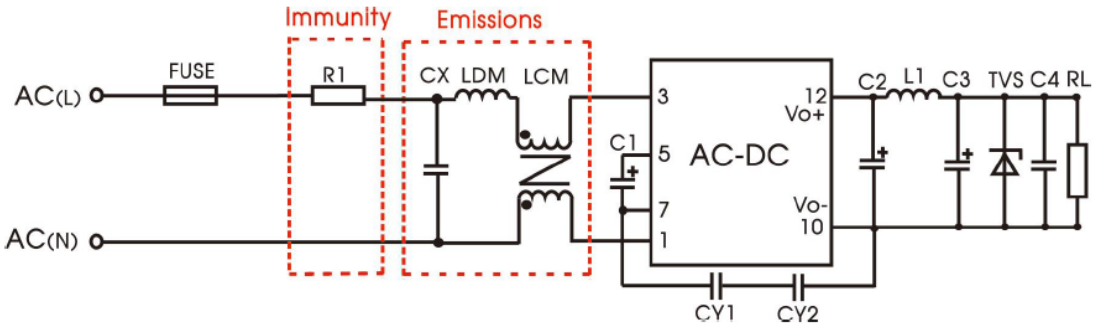


Recommended Circuit 1

Application Environmental	Ambient Temperature Range	Immunity CLASS	Emissions CLASS
Basic Application	-40°C~+85°C	CLASS III	CLASS A

Component	Recommended Value
R1	12Ω/3W
LDM	4.7mH

2. Recommended Circuit 2- Indoor civil/universal system recommended circuits for general environment

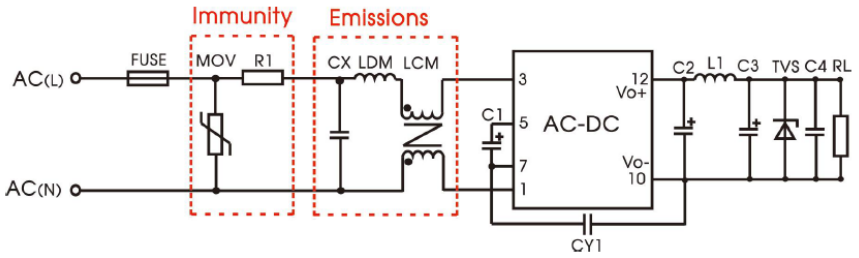


Recommended Circuit 2

Application Environmental	Ambient Temperature Range	Immunity CLASS	Emissions CLASS
Indoor civil/general	-25°C~+55°C	CLASS III	CLASS B

Component	Recommended Value
R1	12Ω/3W
CY1 (CY2)	1.0nF/400VAC
LCM	3.5mH
LDM	0.33mH
CX	0.1μF/310VAC
FUSE (Required)	1A/300V, Slow-Blow
Note: In the home appliance application environment, the two Y capacitors of the primary and secondary need to be externally connected (CY1/CY2, value at 2.2nF/400VAC), which can meet the EN60335 certification. In other industries, only one Y capacitor is needed.	

3. Recommended Circuit 30-Universal system recommended circuit for indoor industrial environment

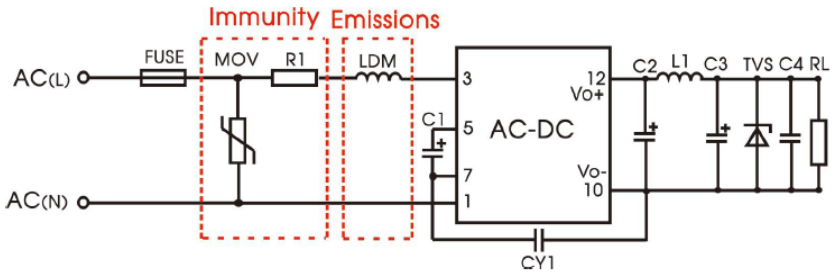


Recommended Circuit 3

Application Environmental	Ambient Temperature Range	Immunity CLASS	Emissions CLASS
Indoor Industrial	-25°C~+55°C	CLASS IV	CLASS B

Component	Recommended Value
MOV	S14K350
C1	450V/22uF
CY1	2.2nF/400VAC
CX	0.1μF/310VAC
LCM	3.5mH
LDM	0.33mH
R1	12Ω/3W
FUSE (Required)	2A/300V, slow-blow

4. Recommended Circuit 4-Universal system recommended circuit for outdoor general/harsh environment



Recommended Circuit 4

Application Environmental	Ambient Temperature Range	Immunity CLASS	Emissions CLASS
Outdoor General Environment	-40°C~+85°C	CLASS IV	CLASS A

Component	Recommended Value
MOV	S14K350
C1	450V/22uF
LDM	4.7mH
R1	12Ω/3W
FUSE (Required)	2A/300V, slow-blow

Application Environmental	Ambient Temperature Range	Immunity CLASS	Emissions CLASS
Outdoor Harsh Environment	-40°C~+85°C	>CLASS IV Surge: Line to Ground ±4KV EFT: Class IV	CLASS A

Component	Recommended Value
MOV	S20K350
C1	450V/33uF (Surge Protection Priority)
LDM	4.7mH
R1	33Ω/5W
FUSE (Required)	6.3A/300V, slow-blow

MODEL NUMBER SETUP

PSLS	10	-	05	S	-	F
Series Name	Output Power		Input Voltage	Output Quantity		Pin Option
			03: 3.3V **05:** 5V **09:** 9V **12:** 12V **15:** 15V **24:** 24V			**Blank:** Straight Pins **F:** 90 Degree Bent Pins

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: 2015 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:

Phone: ☎(603)778-2300
Toll Free: ☎(888)597-9255
Fax: ☎(603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 37 Industrial Drive
Exeter, NH 03833