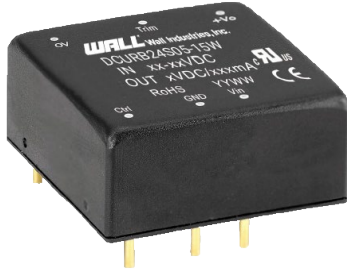


Standard DIP Package



Size: 1in x 1in x 0.46in (25.4mm x 25.4mm x 11.70mm)

Standard DIP Package with Heatsink ("H" Suffix)



Size: 1in x 1in x 0.64in (25.4mm x 25.4mm x 16.2mm)

Chassis Mount Package ("A2S" Suffix)



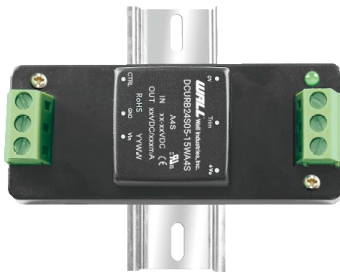
Size: 2.99in x 1.24in x 0.84in (76mm x 31.5mm x 21.2mm)

Chassis Mount Package with Heatsink ("HA2S" Suffix)



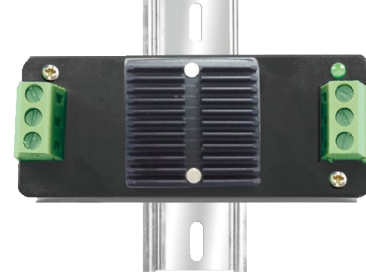
Size: 2.99in x 1.24in x 0.99in (76mm x 31.5mm x 25.2mm)

DIN Rail Package ("A24" Suffix)



Size: 2.99in x 1.24in x 1.02in (76mm x 31.5mm x 25.8mm)

DIN Rail Package with Heatsink ("HA4S" Suffix)



Size: 2.99in x 1.24in x 1.17in (76mm x 31.5mm x 29.8mm)



OPTIONS

- Case Type
 - DIP Case
 - Chassis Mount
 - DIN Rail Case
- Heatsink

FEATURES

- 4:1 Wide Input Voltage Range
- High Efficiency up to 91%
- I/O Isolation Test Voltage: 1500VDC
- DIP Case, Chassis Mount, or DIN Rail Case
- Input Reverse Polarity Protection Available with Chassis (A2S) or 35mm DIN Rail Mounting (A4S)
- Cooling by Free Air Convection
- Input Under-Voltage Protection
- Over Voltage, Over Current, and Short Circuit Protection
- Industry Standard Pin Out
- Heat Sink Available
- CISPR32/EN55032 Class A EMI Compliant without External Components
- Meets EN50155 Railway Standard
- IEC62368-1, UL62368-1, EN62368-1, and BS EN62368-1 Safety Approvals

APPLICATIONS

- Industrial
- Communication
- Railway
- Robotics

DESCRIPTION

The DCURB15 series of DC/DC converters offers up to 15 watts of output power in a compact DIP, chassis mount, or DIN Rail case. This series consists of single output models with a wide 4:1 input voltage range. Each model in this series is RoHS compliant, has industry standard pin out, high efficiency, and is cooled by free air convection. This series has input under-voltage, output over voltage, over current, and short circuit protection, IEC62368-1, UL62368-1, EN62368-1, and BS EN62368-1 safety approvals, and meets EN50155 railway standard.

MODEL SELECTION TABLE

Model Number ⁽¹⁾	Input Voltage Range		Output Voltage	Output Current		Input Current				Output Power	Maximum Capacitive Load	Efficiency ⁽⁴⁾		Certification
	Nominal ⁽²⁾	Max. ⁽³⁾		Min	Max	No Load		Full Load						
						Typ.	Max.	Typ.	Max.					
DCURB2403-15W	24VDC (9-36VDC)	40VDC	3.3VDC	0mA	4000mA	30mA	50mA	625mA	640mA	15W	4700µF	86%	88%	UL/EN/BS EN/IEC
DCURB2405-15W			5VDC	0mA	3000mA	30mA	55mA	694mA	710mA		4700µF	88%	90%	
DCURB2412-15W			12VDC	0mA	1250mA	6mA	15mA	694mA	710mA		1000µF	88%	90%	
DCURB2415-15W			15VDC	0mA	1000mA	6mA	15mA	687mA	703mA		820µF	89%	91%	
DCURB2424-15W			24VDC	0mA	625mA	10mA	20mA	687mA	703mA		270µF	89%	91%	
DCURB4803-15W	48VDC (18-75VDC)	80VDC	3.3VDC	0mA	4000mA	15mA	30mA	313mA	320mA	15W	4700µF	86%	88%	
DCURB4805-15W			5VDC	0mA	3000mA	15mA	30mA	348mA	356mA		4700µF	88%	90%	
DCURB4812-15W			12VDC	0mA	1250mA	3mA	11mA	344mA	352mA		1000µF	89%	91%	
DCURB4815-15W			15VDC	0mA	1000mA	3mA	11mA	344mA	352mA		820µF	89%	91%	
DCURB4824-15W			24VDC	0mA	625mA	4mA	11mA	344mA	352mA		270µF	89%	91%	

SPECIFICATIONS

All specifications are based on 25°C, Humidity <75%RH, 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	24VDC Input 48VDC Input	9 18	24 48	36 75	VDC
Input Current		See Table			
Reflected Ripple Current	Nominal Input		30		mA
Surge Voltage (1 sec. max.)	24VDC Input 48VDC Input	-0.7 -0.7		50 100	VDC
Start Up Voltage	24VDC Input 48VDC Input			9 18	VDC
Under-Voltage Protection	24VDC Input 48VDC Input	5.5 12	6.5 15.5		VDC
Ctrl ⁽⁵⁾	Module On Module Off Input Current When Off	Ctrl Pin Open or Pulled High (TTL 3.5-12VDC) Ctrl Pin Pulled Low to GND (0-1.2VDC)			
Input Filter		Pi Filter			
Hot Plug		Unavailable			
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Voltage Accuracy	0%-100% Load		±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load		±0.2	±0.5	%
Load Regulation	5%-100% Load		±0.5	±1	%
Output Power		See Table			
Output Current		See Table			
Maximum Capacitive Load	Tested at input voltage range and full load	See Table			
Ripple & Noise ⁽⁶⁾	20MHz bandwidth, 100% Load		50	100	mVp-p
Trim	Input Voltage Range	90		110	%Vo
Transient Response Deviation	25% Load Step Change, Nominal Input Voltage		±3	±7	%
	3.3V, 5V Output Others		±3	±5	
Transient Recovery Time	25% Load Step Change, Nominal Input Voltage		300	500	µs
Temperature Coefficient	Full Load			±0.03	%/°C
Start-Up Time	Nominal input voltage & constant resistance load		10		ms
PROTECTION					
Short Circuit Protection	Input Voltage Range	Continuous, Self-Recovery			
Over Current Protection	Input Voltage Range	110	150	190	%Io
Over Voltage Protection	Input Voltage Range	110		160	%Vo
ENVIRONMENTAL SPECIFICATIONS					
Operating Temperature	See Derating Curves			+95	°C
	3.3V, 5V Output Others			+105	
Storage Temperature		-40		125	°C
Storage Humidity	Non-Condensing	5		95	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds			300	°C
Vibration		IEC/EN61373-Category 1, Grade B			
MTBF	MIL-HDBK-217F@25°C	1000			K hours

SPECIFICATIONS

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

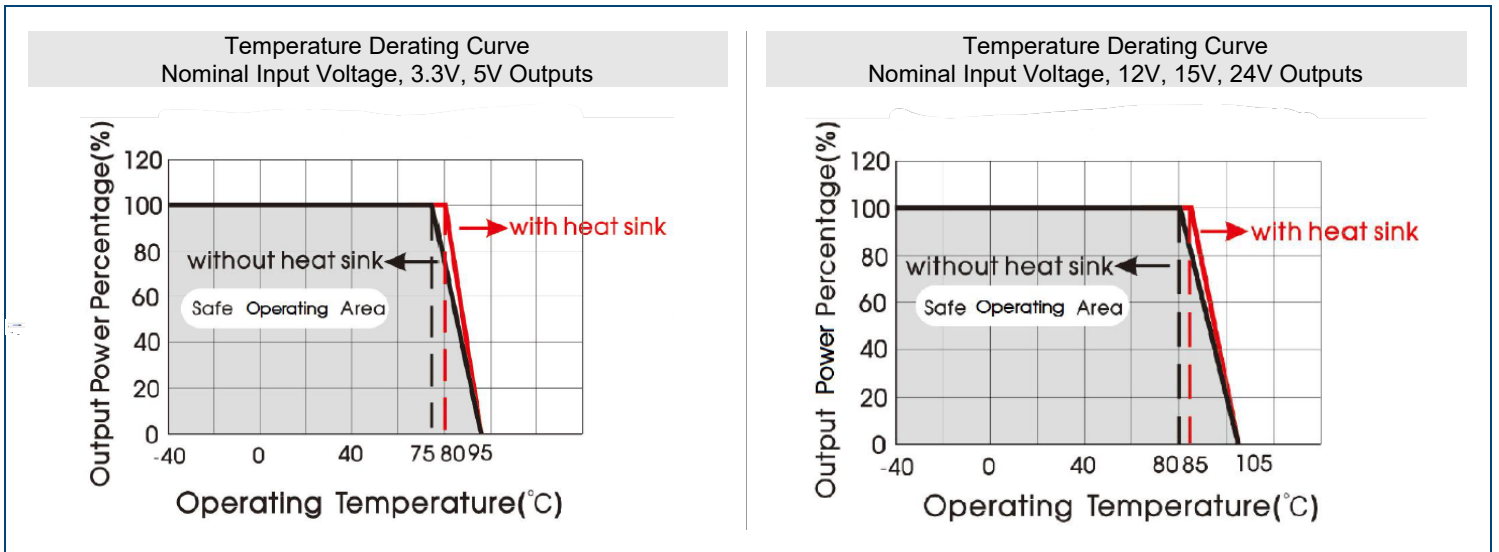
SPECIFICATION		TEST CONDITIONS		Min	Typ	Max	Unit
GENERAL SPECIFICATIONS							
Efficiency	Full Load		See Table				
Switching Frequency ⁽⁸⁾	PWM Mode	3.3V, 5V Output			300		kHz
		Others			270		
Isolation	Electric Strength Test for 1 minute with leakage current of 1mA max.	Input-Output		1500			VDC
		Input/Output-Case		1000			
Insulation Resistance	Input-Output, Resistance at 500VDC		1000				MΩ
Isolation Capacitance	Input-Output capacitance at 100KHz/0.1V				2000		pF
PHYSICAL SPECIFICATIONS							
Weight	Without Heatsink	DIP Package		0.53oz (15g)			
		Chassis Mount		1.34oz (38g)			
		DIN Rail Mount		2.05oz (58g)			
	With Heatsink	DIP Package		0.67oz (19g)			
		Chassis Mount		1.48oz (42g)			
		DIN Rail Mount		2.19oz (62g)			
Dimensions (L x W x H)	Without Heatsink	DIP Package		1in x 1in x 0.46in (25.40mm x 25.40mm x 11.70mm)			
		Chassis Mount		2.99in x 1.24in x 0.83in (76mm x 31.50mm x 21.20mm)			
		DIN Rail Mount		2.99in x 1.24in x 1.02in (76mm x 31.50mm x 25.80mm)			
	With Heatsink	DIP Package		1in x 1in x 0.64in (25.40mm x 25.40mm x 16.20mm)			
		Chassis Mount		2.99in x 1.24in x 0.99in (76mm x 31.50mm x 25.20mm)			
		DIN Rail Mount		2.99in x 1.24in x 1.17in (76mm x 31.50mm x 29.80mm)			
Case Material			Aluminum Alloy				
Cooling Method			Free Air Convection				
SAFETY CHARACTERISTICS							
Approvals				IEC62368-1, UL62368-1 ⁽⁹⁾ , EN62368-1, BS EN62368-1, EN50155			
EMC	Emissions	CE	CISPR32/EN55032	Class A (without external components) Class B ⁽¹⁰⁾			
		RE	CISPR32/EN55032	Class A (without external components) Class B ⁽¹⁰⁾			
	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 ⁽¹¹⁾	Perf. Criteria A			
	Surge	IEC/EN61000-4-5	Line to Line ±2kV ⁽¹¹⁾	Perf. Criteria B			
	CS	IEC/EN61000-4-6	3 Vr.m.s	Perf. Criteria A			
EMC (EN50155)	Emissions	CE	EN50121-3-2	150kHz-500kHz	99dBuV ⁽¹⁰⁾		
			EN55016-2-1	500kHz-30MHz	93dBuV ⁽¹⁰⁾		
		RE	EN50121-3-2	30MHz-230MHz	40dBuV/m at 10m ⁽¹⁰⁾		
			EN55016-2-1	230MHz-1GHz	47dBuV/m at 10m ⁽¹⁰⁾		
	ESD	EN50121-3-2	Contact ±6kV/Air±8kV	Perf. Criteria A			
	RS	EN50121-3-2	20V/m	Perf. Criteria A			
	EFT	EN50121-3-2	±2kV 5/50ns 5kHz ⁽¹¹⁾	Perf. Criteria A			
	Surge	EN50121-3-2	Line to line ±1kV (42Ω, 0.5μF) ⁽¹¹⁾	Perf. Criteria A			
CS	EN50121-3-2	0.15MHz-80MHz 10Vr.m.s	Perf. Criteria A				

NOTES

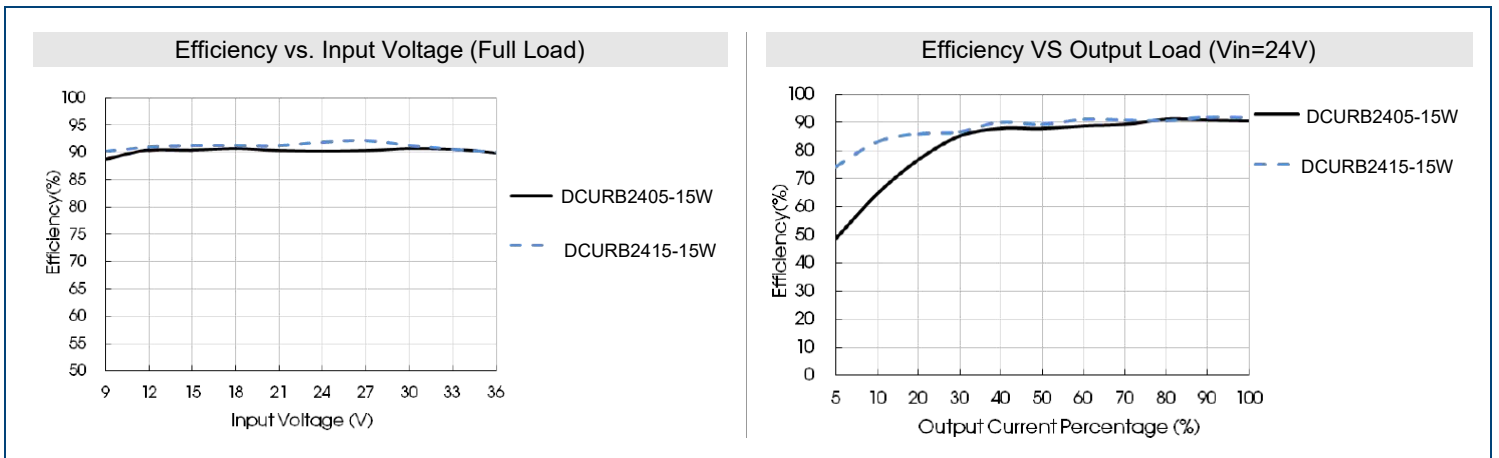
1. Part number with suffix "H" are heat sink mounting, parts with suffix "A2S" are chassis mounted, parts with suffix "A4S" are DIN Rail mounted, for example DCURB2405-15WHA2S is chassis mounted with heat sink. We recommend to choose modules with a heat sink for enhanced heat dissipation and applications with extreme temperature requirements.
2. The A2S and A24 models start-up and minimum input voltages are increased by 1VDC due to input reverse polarity protection circuit.
3. Exceeding the maximum input voltage may cause permanent damage.
4. Efficiency measured at nominal input and rated output load. Efficiency of A2S and A4S is decreased by 2% due to the input reverse polarity protection circuit.
5. Ctrl pin voltage is referenced to input GND.
6. Under 0%-5% load conditions, ripple & noise does not exceed 5%Vo. Parallel cable method is used for Ripple & Noise test.
7. It is recommended to use module with more than 5% load, if not, the ripple of the product may exceed the specification, but does not affect the reliability of the product.
8. Switching frequency is measured at full load. Module reduces switching frequency for light load (below 50%) efficiency improvement.
9. This product is Listed to applicable standards and requirements by UL.
10. See Design Reference-EMC compliance circuit ② for recommended circuit.
11. See Design Reference-EMC compliance circuit ① for recommended circuit.
12. If product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the data sheet.
13. Customization is available
14. Products shall be classified according to ISO14001 and related environmental laws and regulations and should be handled by qualified units.

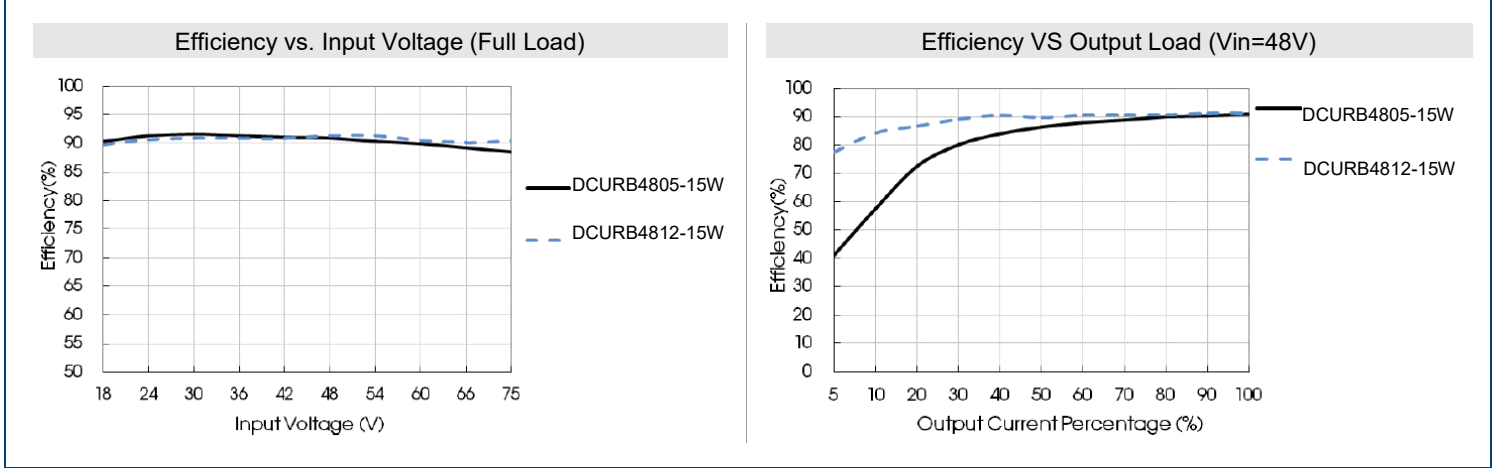
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVES

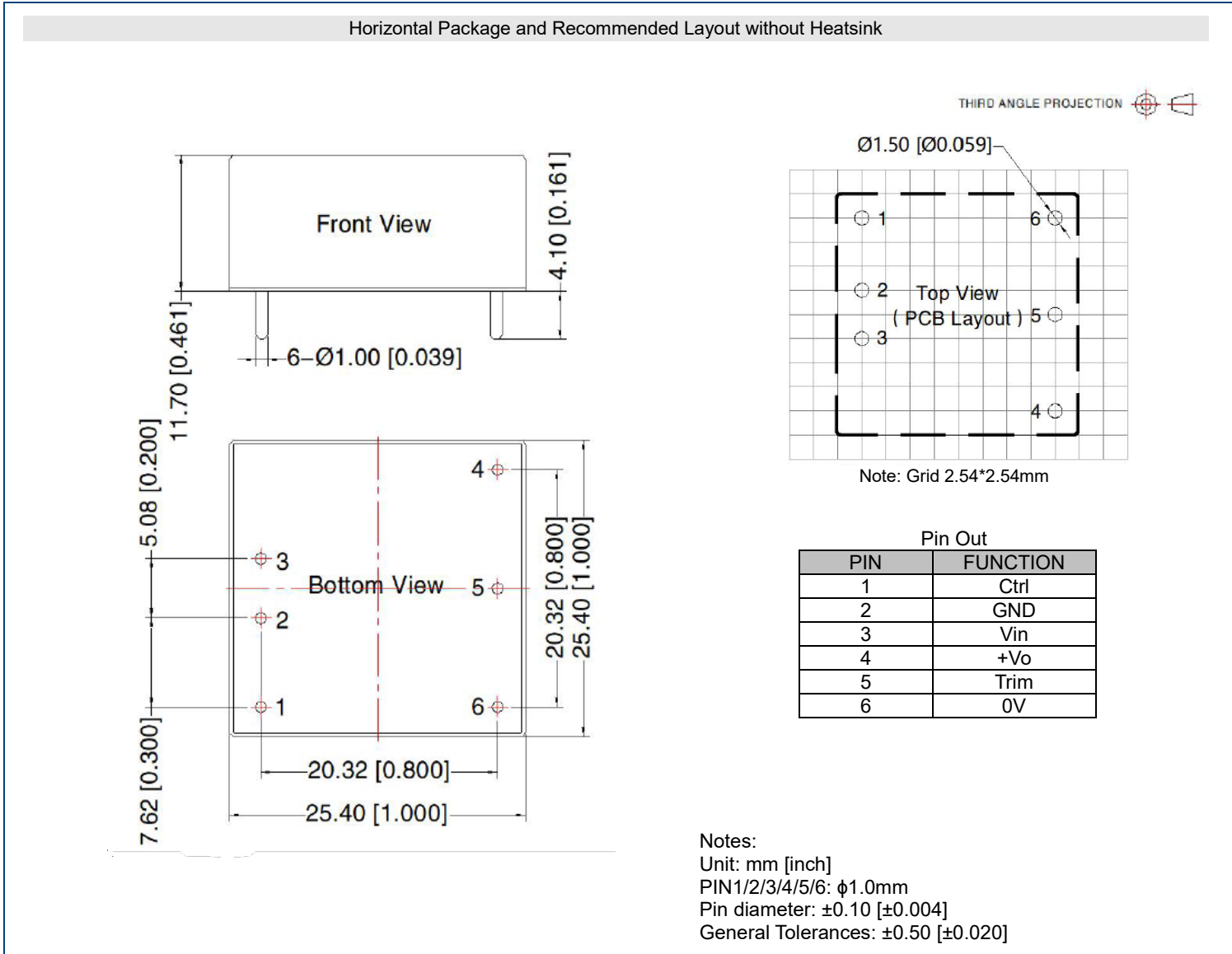


EFFICIENCY GRAPHS

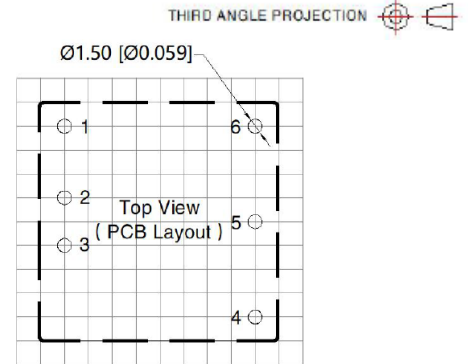
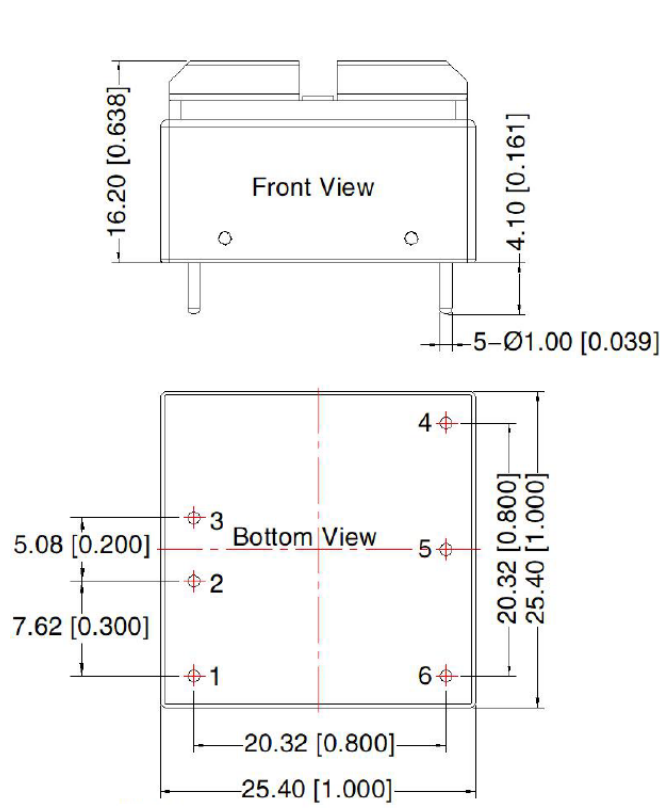




MECHANICAL DRAWINGS



Horizontal Package Dimensions with Heatsink



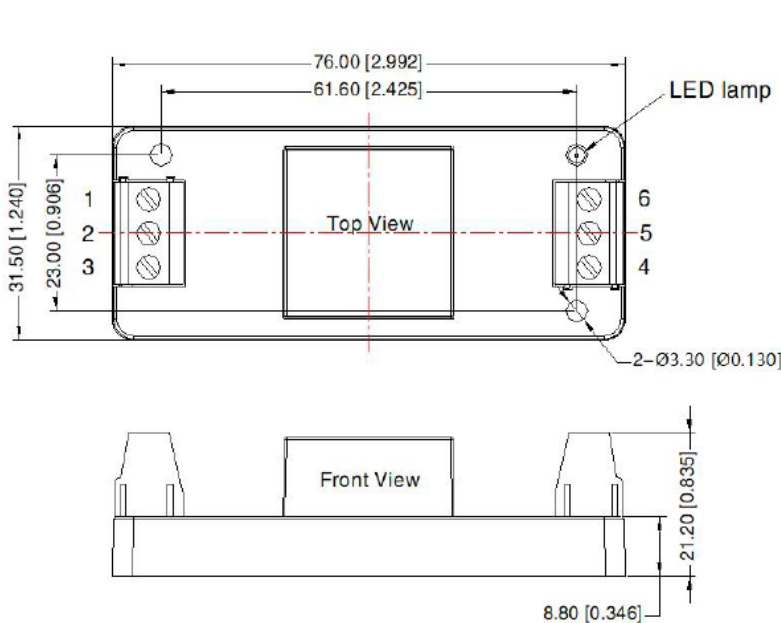
Note: Grid 2.54*2.54mm

Pin Out

Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V

Notes:
Unit: mm[inch]
PIN1/2/3/4/5/6: ϕ 1.0mm
Pin diameter tolerances: \pm 0.10 [\pm 0.004]
General Tolerances: \pm 0.50 [\pm 0.020]

Chassis Mounting ("A2S Suffix)



THIRD ANGLE PROJECTION

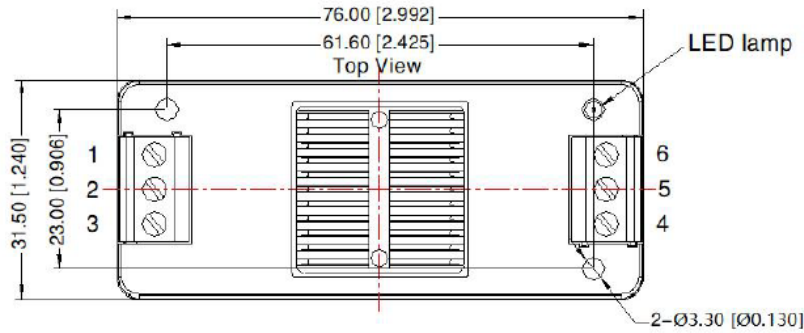
Pin Out

PIN	FUNCTION
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V

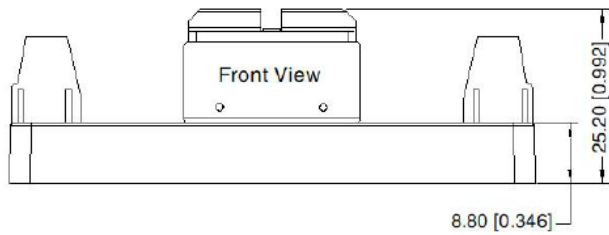
Notes:
Unit: mm [inch]
Wire Range: 24~12AWG
Tightening Torque: Max 0.4 N·m
General Tolerances: \pm 1.00 [\pm 0.039]

Chassis Mounting with Heatsink ("HA2S" Suffix)

THIRD ANGLE PROJECTION 



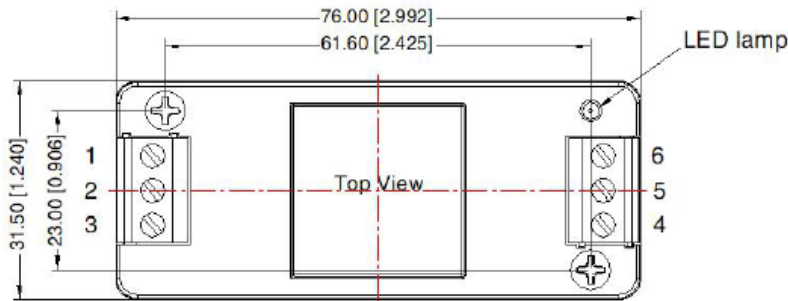
Pin Out	
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V



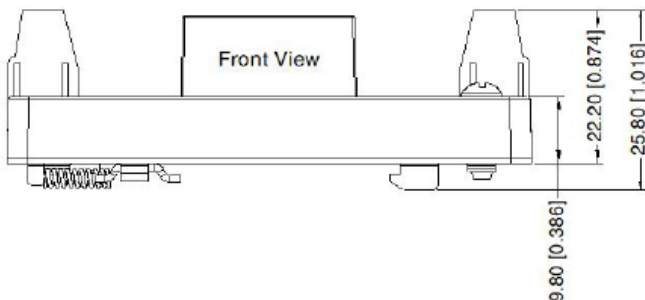
Notes:
Unit: mm[inch]
Wire Range: 24~12AWG
Tightening Torque: Max 0.4 N·m
General Tolerances: ±1.00[±0.039]

DIN Rail Mounting ("A4S" Suffix)

THIRD ANGLE PROJECTION 

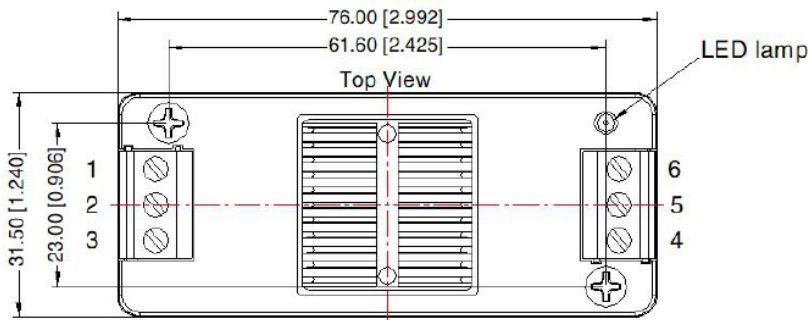


Pin Out	
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V



Notes:
Unit: mm[inch]
Wire Range: 24~12AWG
Tightening Torque: Max 0.4 N·m
Mounting Rail: TS35
General Tolerances: ±1.0[±0.039]

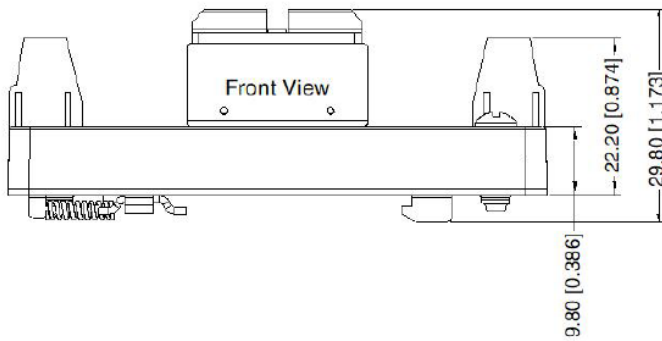
DIN Rail Mounting with Heatsink ("HA4S" Suffix)



THIRD ANGLE PROJECTION

Pin Out

Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V



Notes:
Unit: mm[inch]
Mounting Rail: TS35
Wire Range: 24~12AWG
Tightening Torque: Max 0.4 N·m
General Tolerances: ±1.00[±0.039]

DESIGN REFERENCES

1. Typical Application

All the DC/DC converters of this series are tested before delivery using the recommended circuit shown below. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance does not exceed the specified max. capacitive load value of the product.

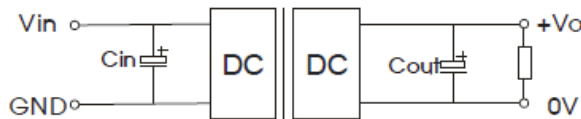


Fig. 1

Vin (VDC)	Vout (VDC)	Cin (μF)	Cout (μF)
24	3.3/5	100μF/50V	100μF/16V
	12/15		100μF/25V
	24		47μF/50V
48	3.3/5	100μF/50V	100μF/16V
	12/15		100μF/25V
	24		47μF/50V

2. EMC Compliance Circuit

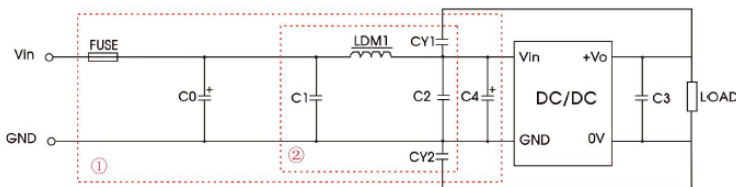


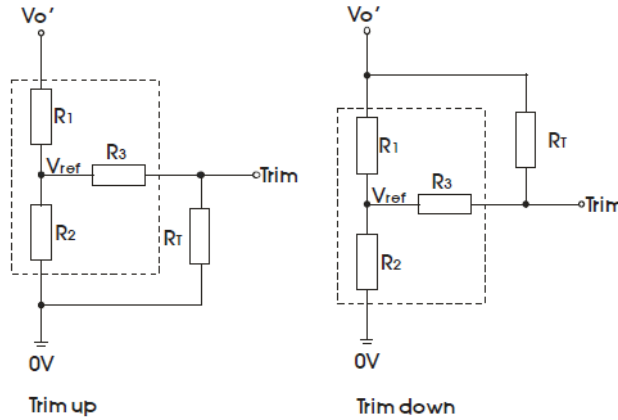
Fig. 2

Note: Part ① in the figure is for immunity tests and part ② is for emissions test. Select based on needs

Parameter Description

Model	Vin:24V	Vin:48V
Fuse	Choose according to actual input current	
C0, C4	330μF/50V	330μF/100V
C1, C2	4.7μF/50V	4.7μF/100V
C3	Refer to the Cout in Fig. 1	
LDML	2.2μH/4A	2.2μH/2A
CY1, CY2	1nF/2kV	

3. Trim Function for Output Voltage Adjustment (Open if Unused)



TRIM Resistor Connection (dashed line shows internal resistor network)

Calculation formula of Trim resistance:

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V_{o'} - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \quad a = \frac{V_{o'} - V_{ref}}{V_{ref}} \cdot R_2$$

R_T is Trim resistance
 a is a self-defined parameter, with no real meaning.

Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	4.772	2.87	15	1.25
5	2.894	2.87	10	2.5
12	11.000	2.87	17.4	2.5
15	14.494	2.87	17.4	2.5
24	24.872	2.87	20	2.5

4. Products do not support parallel connection of their output

MODEL NUMBER SETUP

DCURB	24	03	-	15W	A2S	H
Series Name	Input Power	Output Voltage		Output Power	Case Option	Heatsink
	24: 24 48: 48	03: 3.3VDC 05: 5VDC 12: 12VDC 15: 15VDC 24: 24VDC		15W: 15 Watts	Blank: DIP A2S: Chassis Mounting A4S: DIN Rail Mouting	Blank: None H: Heatsink

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.

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