



Size: 1in x 1in x 0.46in (25.4mm x 25.4mm x 11.7mm)

FEATURES

- 4:1 Wide Input Voltage Range
- High Efficiency up to 91.5%
- I/O Isolation Test Voltage: 1.5KVDC
- Industry Standard Pin-Out
- Input Under-Voltage, Output Over Voltage, Over Current, Over Temperature, and Short Circuit Protection
- RoHS Compliant
- EN62368 Approved

APPLICATIONS

- Industrial
- Communication
- Robotics

DESCRIPTION

The DCURB40 series of DC/DC converters offers up to 40 watts of output power in a 1" x 1" x 0.46" compact through hole 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 high efficiency, and I/O isolation test voltage of 1.5kVDC. This series has input under-voltage, and output over voltage, over current, over temperature and short circuit protection as well as EN62368 approvals.

MODEL SELECTION TABLE									
Model Number	Input Voltage Range		Output Voltage	Output Current		Output Power	Maximum Capacitive	Full Load Efficiency ⁽²⁾	
Wodel Nullibel	Nominal	Max. ⁽¹⁾	Output voltage	Min	Max	Output Fower	Load	Min.	Typ.
DCURB2403-40W			3.3VDC	0mA	10000mA		7200µF	87%	89.5%
DCURB2405-40W			5VDC	0mA	8000mA	40W	7200µF	88%	90%
DCURB2412-40W	24VDC	40\/DC	12VDC	0mA	3333mA		2000µF	89%	91.2%
DCURB2415-40W	(9-36)	9-36) 40VDC	15VDC	0mA	2667mA		1500µF	89%	91.5%
DCURB2424-40W			24VDC	0mA	1667mA		1000µF	88%	90.1%
DCURB2428-40W			28VDC	0mA	1429mA		1000µF	88%	90.1%
DCURB4803-40W		3.3VDC 0mA 10000mA			7200µF	87%	89%		
DCURB4805-40W	48VDC (18-75) 75VDC	75\/DC	5VDC	0mA	8000mA	40W	7200µF	88%	90%
DCURB4812-40W		75000	12VDC	0mA	3333mA		2000µF	89%	91%
DCURB4815-40W			15VDC	0mA	2667mA		1500μF	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			Тур	Max	Unit		
INPUT SPECIFICATIONS									
Input Voltage Range	24VDC Nomi	24VDC Nominal Input				36	VDC		
input voltage Nange	48VDC Nomi	nal Input	18	48	75	VDC			
		24VDC Nominal Input,	3.3Vout		1545	1580	mA		
	Full Load	Nominal Input Voltage	Others		1852	1894			
	Tull Load	48VDC Nominal Input,	3.3Vout		772	790			
Input Current		Nominal Input Voltage	Others		926	947			
input Current		24VDC Nominal Input,	3.3Vout		4	12	mA		
	No Load	Nominal Input Voltage	Others		4	12			
		48VDC Nominal Input,	3.3Vout		7	15			
		Nominal Input Voltage	Others		7	15			
Reflected Ripple Current	Nominal Inpu	t Voltage			100		mA		
Surge Voltage (1 sec. max.)	24VDC Nomi	24VDC Nominal Input				50	VDC		
Surge voltage (1 sec. max.)	48VDC Nomi	nal Input	-0.7		100	VDC			
Start Up Voltage	24VDC Nomi	24VDC Nominal Input				9	VDC		
Start Up Voltage	48VDC Nomi	nal Input			18	VDC			
Under-Voltage Protection	24VDC Nomi	24VDC Nominal Input					VDC		
Onder-voltage Protection	48VDC Nomi	nal Input	12	15		VDC			
	Module On	Module On				Ctrl Pin Open or Pulled High (TTL 3.5-12VDC)			
Ctrl ⁽⁴⁾	Module Off	Module Off				Ctrl Pin Pulled Low to GND (0-1.2VDC)			
	Input Current	When Off		6	12	mA			
Input Filter				Capacitance Filter					
Hot Plug				Unavailable					



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. TEST CONDITIONS SPECIFICATION Unit Max **OUTPUT SPECIFICATIONS** Output Voltage See Table Voltage Accuracy⁽⁵⁾ 5%-100% Load % ±1 ±3 Linear Regulation Input voltage variation from low to high line at full load ±0.2 ±0.5 % Load Regulation⁽⁶⁾ 5%-100% Load ±0.5 % ±1 Output Power See Table See Table Output Current Maximum Capacitive Load See Table Ripple & Noise(7) 20MHz bandwidth, Nominal Input Voltage, 5%-100% Load 100 150 mVp-p Trim Input Voltage Range 90 110 %Vo Transient Response Deviation 25% Load Step Change, Input Voltage Range % ±5 ±8 Transient Recovery Time 25% Load Step Change, Input Voltage Range 260 500 us Temperature Coefficient Full Load ±0.03 %/°C Start-Up Time Nominal input voltage & constant resistance load 30 100 ms PROTECTION Short Circuit Protection Input Voltage Range Hiccup, Continuous, Self-Recovery Over Current Protection Input Voltage Range 110 140 200 %lo Over Voltage Protection Input Voltage Range 110 140 160 %Vo Over Temperature Protection Max. Case Temperature 125 °C **ENVIRONMENTAL SPECIFICATIONS** Operating Temperature See Derating Curve -40 105 °C °C Max. Case Temperature Rated output load 110 °C Storage Temperature -55 125 Storage Humidity Non-Condensing 5 95 %RH Pin Soldering Resistance Temperature | Soldering spot is 1.5mm away from case for 10 seconds 300 ٥С Vibration 10-150Hz, 5G, 0.75mm, along X, Y, and Z MTBF MIL-HDBK-217F@25°C 1000 K hours **GENERAL SPECIFICATIONS** See Table Efficiency Full Load Switching Frequency⁽⁸⁾ PWM Mode Input-Output, Electric Strength Test for 1 minute with leakage Isolation 1500 **VDC** current of 1mA max. Input-Output, Resistance at 500VDC 1000 ΜΩ Insulation Resistance Input-Output capacitance at 24VDC Nominal Input 10 **Isolation Capacitance** nF 100KHz/0.1V 48VDC Nominal Input 22 PHYSICAL SPECIFICATIONS Weight Horizontal Package 0.71oz (20g) 1in x 1in x 0.46in Dimensions (L x W x H) Horizontal Package (25.40mm x 25.40mm x 11.70mm) Case Material Aluminum Alloy Cooling Method Free Air Convection SAFETY CHARACTERISTICS Approvals EN62368 Class B(10) CISPR32/EN55032 EMI Class B(10) CISPR32/EN55032 RF ESD IEC/EN61000-4-2 Perf. Criteria B Contact ±6kV RS IEC/EN61000-4-3 10V/m Perf. Criteria A ±2kV⁽⁹⁾ **Immunity EFT** IEC/EN61000-4-4 Perf. Criteria A Line to Line ±2kV⁽⁹⁾ Perf. Criteria A

3 Vr.m.s

IEC/EN61000-4-5

IEC/EN61000-4-6

Surge

CS

Perf. Criteria A

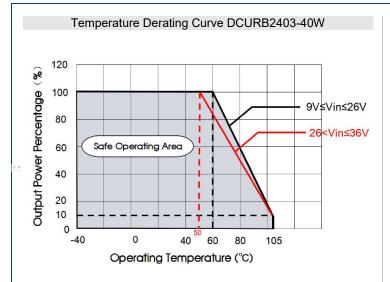


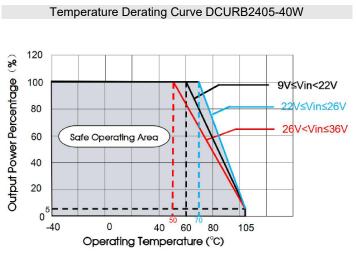
NOTES

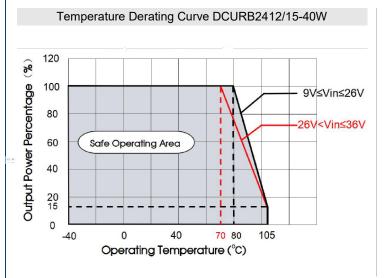
- 1. Exceeding maximum input voltage may cause permanent damage.
- 2. Efficiency measured at nominal input and rated output load.
- 3. Rated output load is derated to 75% at minimum input voltage.
- 4. Ctrl pin voltage is referenced to input GND.
- 5. Output voltage accuracy for 0%-5% load is ±5% max.
- 6. Load regulation for 0%-100% load increases to ±3%
- 7. Under 0%-5% load conditions, ripple & noise does not exceed 5%Vo. The "parallel cable" method is used for ripple and noise test, please contact factory for more information.
- 8. Switching frequency is measured at full load. Module reduces switching frequency for light load (below 50%) efficiency improvement.
- 9. See Fig. 2-1 for recommended circuit
- 10. See Fig. 2-2 for recommended circuit
- 11. Maximum capacitive load offered were tested at input voltage range and full load
- 12. Customization is available
- 13. Products shall be classified according to ISO14001 and related environmental laws and regulations and should be handled by qualified units.

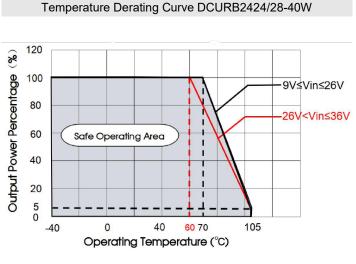
*Due to advances in technology, specifications subject to change without notice

CHARACTERISTIC CURVES -



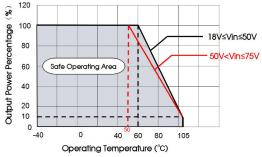




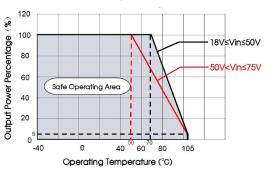




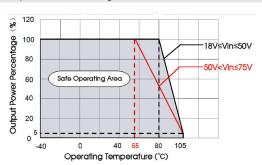




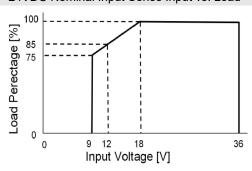
Temperature Derating Curve DCURB4805-40W



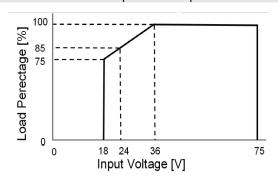
Temperature Derating Curve DCURB4812/15-40W



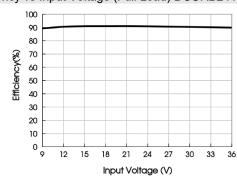
24VDC Nominal Input Series Input vs. Load



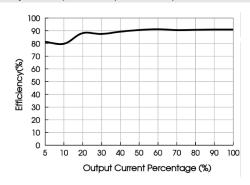
48VDC Nominal Input Series Input vs. Load



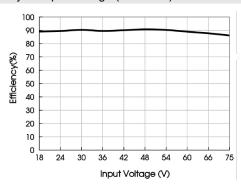
Efficiency vs Input Voltage (Full Load) DCURB2415-40W



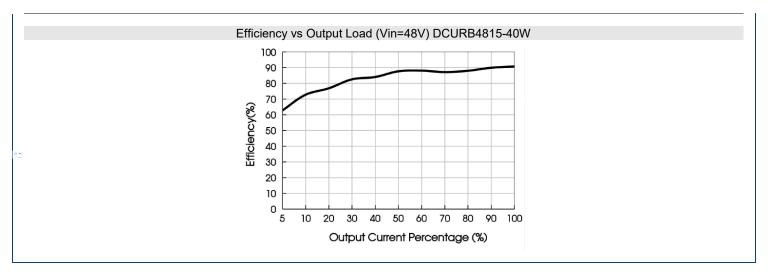
Efficiency vs Output Load (Vin=24Vin) DCURB2415-40W



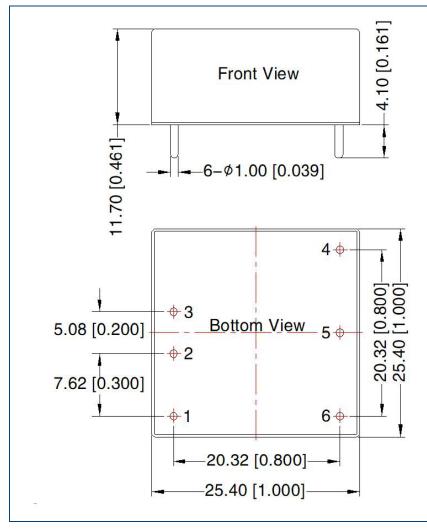
Efficiency vs Input Voltage (Full Load) DCURB4815-40W

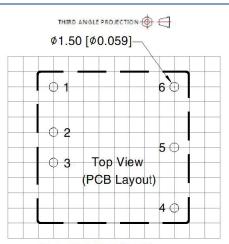






MECHANICAL DRAWINGS





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]

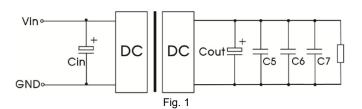
Pin diameter tolerances: ±0.10 [±0.004] General Tolerances: ±0.80 [±0.031]



DESIGN REFERENCES :

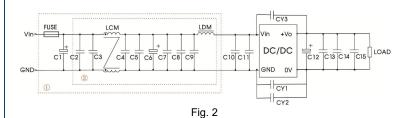
1. Typical Application

All the DC/DC converters of this series are tested before delivery using the recommended circuit shown below in Fig. 1. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout 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.



	Vin (VDC)	Vout (VDC)	Cin	Cout	C5	C6	C7
		3.3-5	100uF	470uF /50V	10uF	/	
	24	12/15	/50V		10uF/25V		/
		24/28	/50 V		10uF/50V		/
	48	3.3/5	100uF		22uF/ 16V	1uF/1 6V	10uF/ 16V
		12/15	/100V		22uF/ 25V	1uF/2 5V	10uF/ 25V

2. EMC Compliance Circuit



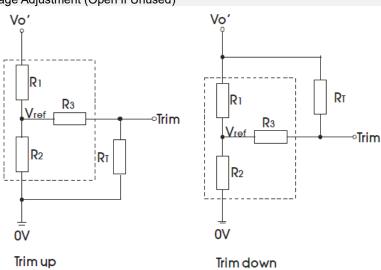
Note: We use part ① in Fig. 2 for immunity tests and part ② for emissions test. Select based on needs.

Parameter Description

Parameter Description						
Model	Vin:24VDC	Vin:48VDC				
Fuse	Choose according to actual input current					
C1	1000uF/50V	680uF/100V				
C2/C3/C4/C5 /C7/C8/C9	4.7uF/50V	4.7uF/100V				
LCM	350uH*2, contact factory for recommendation	10mH*2, contact factory for recommendation				
C6	220uF/50V	100uF/100V				
LDM	2.2uH	6.8uH				
C12	Refer to Cout in Fig. 1					
C13/C14	Refer to the C5,C6 in Fig. 1					
C15	1	Refer to C7 in Fig. 1				
C10/C11	1	4.7uF/100V				
CY1	Y2/222K/250VAC	2200PF/3000VDC				
CY2/CY3	1	2200PF/3000VDC				

*Note: The part ② of the circuit can be simplified, and ClassA can be satisfied by removing the LCM

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



TRIM Resistor Connection (dashed line shows internal resistor network)

Wall Industries, Inc. • Tel: 603-778-2300 • Toll Free: 888-597-9255 • website: www.wallindustries.com • e-mail: sales@wallindustries.com



Calculating Trim resistance Values

$$up: R_T = \frac{aR_2}{R_2 - a} - R_3 \qquad a = \frac{V_{ref}}{Vo' - V_{ref}} \cdot R_1$$
 R_T= Trim Resistor Value

$$down: R_T = \frac{aR_1}{R_1 - a} - R_3 \qquad a = \frac{Vo' - V_{ref}}{V_{ref}} \cdot R_2$$

$$a = \text{self-defined p no real meaning}$$

R_T= Trim Resistor Value a= self-defined parameter with no real meaning

Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	4.83	2.87	4.7	1.25
5	2.87	2.87	5.6	2.5
12	10.91	2.87	15	2.5
15	14.35	2.87	15	2.5
24	24.77	2.87	17.4	2.5
28	29.41	2.87	17.4	2.5

4. Products do not support parallel connection of their output.

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

©2023 Wall Industries, Inc. Specifications subject to change without notice. Wall Industries is not responsible for typographical errors. The information contained herein is for informational purposes only. This information is provided by Wall Industries and we make no representations or warranties of any kind, express or implied, about the completeness, accuracy, reliability, suitability or availability with respect to the information contained in this document for any purpose. All product and manufacturer names are trademarks or registered trademarks of their respective companies.