Size: 1.24in x 0.80in x 0.40in (31.6mm x 20.30mm x 10.20mm)

FEATURES

- Ultra Wide 4:1 Input Voltage Range
- International Standard Pin-Out
- High Efficiency
- Isolated & Regulated Single Output
- RoHS Compliant
- Over Current, Over Voltage, and Short Circuit Protection
- Input Under Voltage Protection
- Transformer Creepage 8mm
- Transformer Clearance 5mm
- CE Certified
- EN60601-1 (3rd Edition) Medical Approval

DESCRIPTION

The DCUPH6 series of DC/DC converters offers up to 6 watts of output power in an ultra-compact 1.24” x 0.80” x 0.40” DIP package. This series consists of single output models with an ultra-wide 4:1 input voltage range. Each model in this series features high efficiency, international standard pin-out, as well as protection against over current, over voltage, short circuit, and input under voltage conditions. This series has EN60601-1 (3rd Edition) approval and is RoHS compliant.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current		Maximum Capacitive Load	Efficiency (Typ. @Full Load)	Ripple & Noise	Output Power
			Min Load	Max Load				
DCUPH6-24S05	24VDC (9~36VDC)	5VDC	0mA	1200mA	2700µF	79/81%	100mVp-p	6W
DCUPH6-24S06		6VDC	0mA	1000mA	2200µF	79/81%		
DCUPH6-24S09		9VDC	0mA	667mA	1800µF	81/83%		
DCUPH6-24S12		12VDC	0mA	500mA	1000µF	82/84%		
DCUPH6-24S15		15VDC	0mA	400mA	680µF	83/85%		
DCUPH6-24S24		24VDC	0mA	250mA	470µF	82/84%		
DCUPH6-48S05	48VDC (18~75VDC)	5VDC	0mA	1200mA	2700µF	79/81%	100mVp-p	6W
DCUPH6-48S09		9VDC	0mA	667mA	1800µF	81/83%		
DCUPH6-48S12		12VDC	0mA	500mA	1000µF	82/84%		
DCUPH6-48S15		15VDC	0mA	400mA	680µF	83/85%		
DCUPH6-48S24		24VDC	0mA	250mA	470µF	82/84%		

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current 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 Nominal Input		9	24	36	VDC
	48VDC Nominal Input		18	48	75	
Absolute Maximum Input Voltage(1)	24VDC Nominal Input				40	VDC
	48VDC Nominal Input				80	
Input Current	No Load	24VDC Nominal Input		5	8	mA
		48VDC Nominal Input		4	7	
	Full Load	24VDC Nominal Input		309	317	mA
		48VDC Nominal Input		154	159	
Input Impulse Voltage (1 sec. max)	24VDC Nominal Input		-0.7		50	VDC
	48VDC Nominal Input		-0.7		100	
Reflected Ripple Current	24VDC Nominal Input			20		mA
	48VDC Nominal Input			20		
Starting Voltage	24VDC Nominal Input				9	VDC
	48VDC Nominal Input				18	
Input Under-Voltage Protection	24VDC Nominal Input		5.5	6.5		VDC
	48VDC Nominal Input		14	15.5		
Input Filter			Pi Filter			
Hot Plug			Unavailable			

SPECIFICATIONS

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

SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
OUTPUT SPECIFICATIONS					
Output Voltage			See Table		
Voltage Accuracy			±1	±3	%
Line Voltage Regulation	Full Load, from low to high voltage		±0.2	±0.5	%
Load Regulation(2)	5%-100% Load		±0.5	±1	%
Output Power			See Table		
Output Current			See Table		
No Load Power Consumption		0.12			W
Maximum Capacitive Load	Tested within input voltage range and under full load condtions		See Table		
Ripple & Noise(3)	20MHz bandwidth		100	180	mVp-p
Transient Recovery Time	25% load step change		300	500	µs
Transient Response Deviation	25% load step change		±3	±5	%
Temperature Drift Coefficient	Full Load			±0.03	%/ºC
PROTECTION					
Short Circuit Protection	Input Voltage Range		Continuous, Self-Recovery		
Over Current Protection	Input Voltage Range	110	150	260	%Io
Over Voltage Protection	Input Voltage Range	110		160	%Vo
ENVIRONMENTAL SPECIFICATIONS					
Operating Temperature	Derating if temperature ≥71ºC	-40		85	ºC
Storage Temperature		-55		125	ºC
Storage Humidity	Without condensation	5		95	%RH
Lead Temperature	Welding spot is 1.5mm away from the casing, 10 seconds			300	ºC
Vibration			10-55Hz, 10G, 30min. along X, Y, and Z		
MTBF	MIL-HDBK-217F@25ºC	1000			KHrs
GENERAL SPECIFICATIONS					
Efficiency			See Table		
Switching Frequency(4)	PWM mode (nominal, full load)		300		KHz
Insulation Voltage	Input to Output, test time of 1 minute & leak current lower than 1mA	6000			VDC
Insulation Resistance	Input to Output, Insulation Voltage 500VDC	10000			MΩ
Isolation Capacitance	Input to Output, 100KHz/0.1V		13	20	pF
Enhanced Isolation	Transformer Creepage	8.0			mm
	Transformer Clearance	5.0			
	PCB Creepage & Clearance	8.0			
	Optocoupler Creepage	8.0			
PHYSICAL SPECIFICATIONS					
Weight			0.46oz (13g) typ.		
Dimensions (L x W x H)			1.24in x 0.80in x 0.40in (31.6mm x 20.30mm x 10.20mm)		
Case Material			Black Flame-Retardant and Heat-Resistant Plastic (UL94-V0)		
Cooling			Free Air Convection		
SAFETY CHARACTERISTICS					
Safety Approvals	EN60601-1 (3rd Edition)				
EMI	CE	CISPR22/EN55022	Class A (Bare Component)		
EMS	ESD	IEC/EN61000-4-2	Contact ±6kV	Perf. Criteria B	
	EFT	IEC/EN61000-4-4	±2kV(5)	Perf. Criteria B	
	Surge	IEC/EN61000-4-5	±2kV(5)	Perf. Criteria B	
	CS	IEC/EN61000-4-6	3Vr.m.s	Perf. Criteria A	
	Immunities of Voltage Dip, Drop & Short Interruption	IEC/EN61000-4-29	0-70%	Perf. Criteria A	

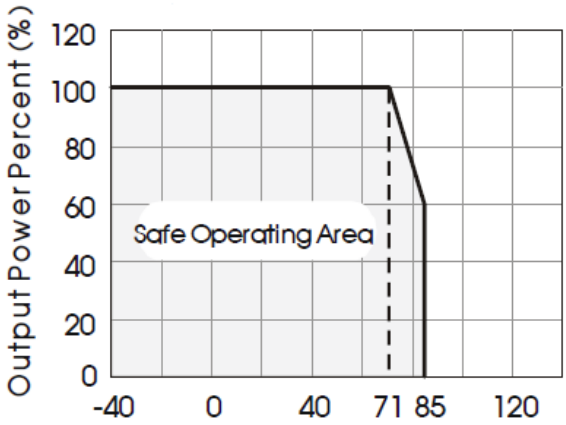
NOTES

1. This is the absolute maximum rating the converter can operate at without damage, but it is not recommended.
2. When testing from 0% to 100% load working conditions, load regulation index of ±5%.
3. 0%-5% load ripple & noise is no more than 5%Vo. Ripple and noise tested with “parallel cable” method, oscilloscope using the 1X probe. Contact factory for more specific operation methods.
4. This series uses frequency technology, the switching frequency is the test value for full load. When load is reduced below 50%, the switching frequency decreases with decreasing load.
5. See EMC solution ① for recommendation circuit.
6. Customization available.

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

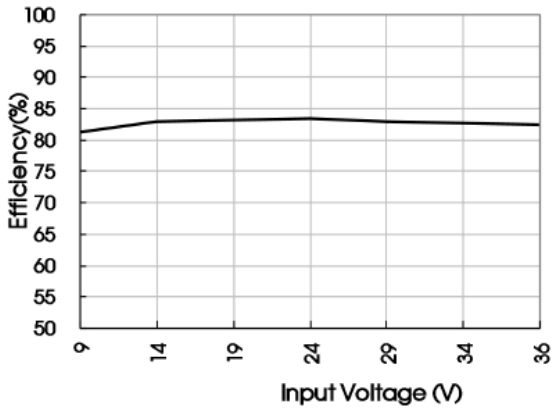
DERATING CURVES

Temperature Derating Curve

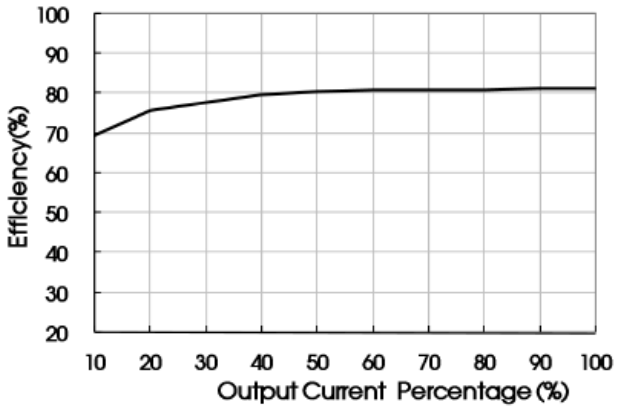


EFFICIENCY GRAPHS

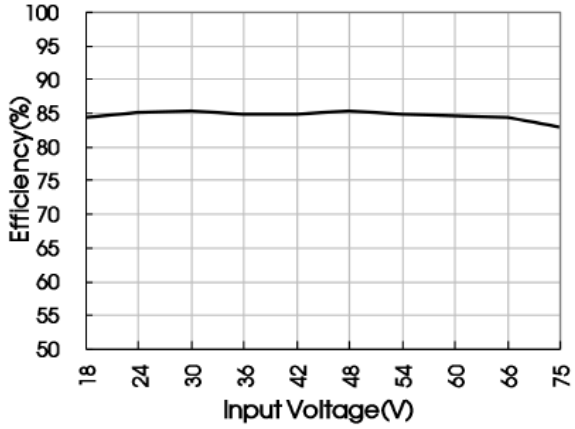
Efficiency vs. Input (Full Load) DCUPH6-24S05



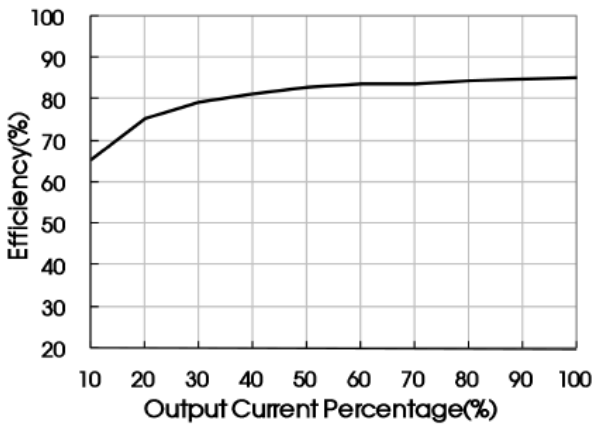
Efficiency vs. Output Load (Vin=Vin-nominal) DCUPH6-24S05



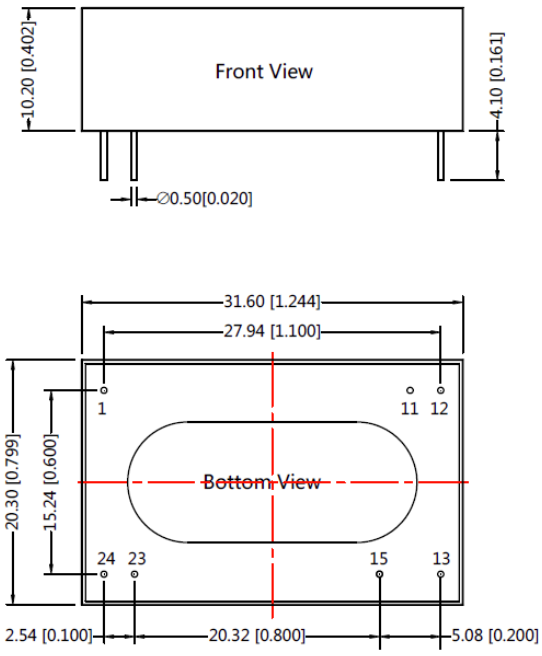
Efficiency vs. Input Voltage (Full Load) DCUPH6-48S15

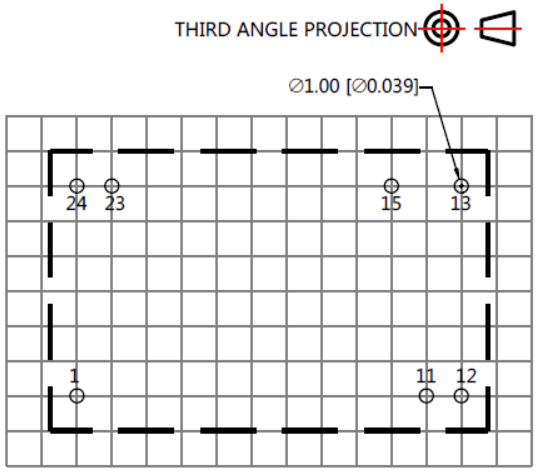


Efficiency vs. Output Load (Vin=Vin-nominal) DCUPH6-48S15



MECHANICAL DRAWINGS





Note: Grid 2.54*2.54mm

Pin Out

Pin	Function
1	Vin
11	No Pin
12	0V
13	+Vo
15	No Pin
23	GND
24	GND

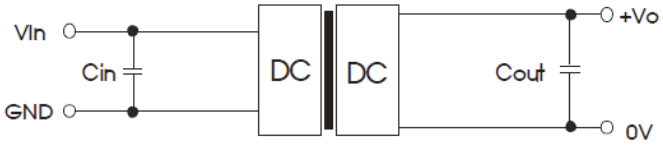
NC: No Connection

Notes:
Unit: mm [inch]
Pin diameter tolerances: ±0.10 [±0.004]
General Tolerances: ±0.50 [±0.020]

DESIGN REFERENCE

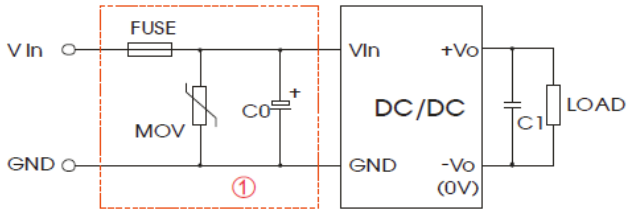
1. Typical Application

All the DC/DC converters of this series are tested according to the recommended circuit before delivery. If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.



Vin	Cin	Cout
24VDC	100uF	10μF
48VDC	10μF-47μF	10μF

2. Recommended Circuit



Notes: Part ① above is used for EMS test.

Parameter Description

Model	Vin:24V	Vin:48V
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0	330μF/50V	330μF/100V
C1	Refer to Cout in “Typical Application” above	

3. The product does not support output in parallel with power per liter.

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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