



Size: 1.24in x 0.80in x 0.40in
(31.60mm x 20.30mm x 10.20mm)

FEATURES

- Ultra-Wide 4:1 Input Voltage
- High Efficiency
- Reinforced Isolation, I/O Isolation Test Voltage: 6KVDC and 2MOPP High Isolation
- Compact DIP Package
- Industry Standard Pin-Out
- Transformer Creepage Distance is 8mm, Transformer Clearance is 5mm
- No-Load Power Consumption as Low as 0.12W
- Leakage Current <5µA, Under 240VAC/60Hz Operating Conditions
- Input Under Voltage Protection
- Output Short Circuit, Over Current, and Over Voltage Protection
- Internal Surface Mounted Design
- International Standard Pin-Out
- RoHS Compliant
- EN60601-1 (3rd Edition Medical Grade) Approved, EN60601-1: 2006+A1: 2013

DESCRIPTION

The DCMHP06 series of DC/DC converters offers 6 watt of output power in a compact DIP package. This series consists of regulated single output models wide 4:1 input voltage range. Each model features internal surface mounted design, reinforced isolation, and high efficiency. This series is also RoHS compliant, has 2xMOPP insulation protection grade, and is EN60601-1 (3rd Edition medical grade) approved.

MODEL SELECTION TABLE

Model Number	Input Voltage		Output Voltage	Output Current		Max. Capacitive Load	Typ. Efficiency @Full Load		Certification	Output Power
	Nominal (Range)	Max ⁽¹⁾		Min.	Max.		Min.	Max.		
DCMHP06-24S05	24VDC (9-36VDC)	40VDC	5VDC	0mA	1200mA	2700µF	78%	80%	CE	6W
DCMHP06-24S06			6VDC	0mA	1000mA	2200µF	79%	81%		
DCMHP06-24S09			9VDC	0mA	667mA	1800µF	81%	83%		
DCMHP06-24S12			12VDC	0mA	500mA	1000µF	82%	84%		
DCMHP06-24S15			15VDC	0mA	400mA	680µF	83%	85%		
DCMHP06-24S18			18VDC	0mA	333mA	1200µF	83%	85%		
DCMHP06-24S24			24VDC	0mA	250mA	470µF	82%	84%		
DCMHP06-48S05	48VDC (18-75VDC)	80VDC	5VDC	0mA	1200mA	2700µF	79%	81%	CE	6W
DCMHP06-48S09			9VDC	0mA	667mA	1800µF	81%	83%		
DCMHP06-48S12			12VDC	0mA	500mA	1000µF	82%	84%		
DCMHP06-48S15			15VDC	0mA	400mA	680µF	83%	85%		
DCMHP06-48S24			24VDC	0mA	250mA	470µF	82%	84%		

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		See Table			
Input Current	No Load	24VDC Input	5	8	mA
		48VDC Input	4	7	
Surge Voltage (1 Sec. Max.)	Full Load	24VDC Input	309	317	mA
		48VDC Input	154	159	
Surge Voltage (1 Sec. Max.)	24VDC Input	-0.7		50	VDC
	48VDC Input	-0.7		100	
Input Filter		Pi Filter			
Reflected Ripple Current	24VDC Input		20		mA
	48VDC Input		20		
Hot Plug		Unavailable			
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Voltage Accuracy			±1	±3	%
Linear Regulation	Input Voltage Variation from Low to High at Full Load		±0.2	±0.5	%
Load Regulation ⁽²⁾	5-100% Load		±0.5	±1	%
Max. Capacitive Load		See Table			
Output Current		See Table			
Ripple & Noise ⁽³⁾	20MHz Bandwidth		100	180	mVp-p
Temperature Coefficient	Full Load			±0.03	%/°C
Transient Recovery Time	25% Load Step Change		300	500	µs
Transient Response Deviation	25% Load Step Change		±3	±5	%
Start-Up Voltage	24VDC Input			9	VDC
	48VDC Input			18	

SPECIFICATIONS

All specifications are based on 25°C, Humidity <75%RH, Nominal Input Voltage, and Rated Output Load unless otherwise noted.
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SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
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
Input Under-Voltage Protection	24VDC Input	5.5	6.5		VDC
	48VDC Input	12	15.5		
ENVIRONMENTAL SPECIFICATIONS					
Operating Temperature	Derating if the temperature is ≥71°C. See Derating Curve.	-40		85	°C
Storage Temperature		-55		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		10-55Hz, 2G, 30 Min. along X, Y, and Z			
MTBF	MIL-HDBK-217F@25°C	1000			k hours
GENERAL SPECIFICATIONS					
Efficiency	@Full Load	See Table			
Switching Frequency ⁽⁴⁾	PWM Mode (Nominal, Full Load)		300		kHz
Isolation	Input-Output, Electric strength test for 1 minute with a leakage current of 1mA max.	6000			VDC
Leakage Current ⁽⁵⁾	240VAC/60Hz		3.6	5	uA
Insulation Resistance	Input-Output, Resistance at 500VDC	10000			MΩ
Isolation Capacitance	Input-Output Capacitance at 100KHz/0.1V		13	20	pF
Application Part		CF Type			
Reinforced Isolation	Transformer Creepage	8.0			mm
	Transformer Clearance	5.0			
	PCB Creepage & Clearance	8.0			
	Optocoupler Creepage	8.0			
Insulation Protection Grade	240VAC/60Hz	2xMOPP			
PHYSICAL SPECIFICATIONS					
Weight		0.46oz (13g)			
Dimensions (L x W x H)		1.24in x 0.80in x 0.40in (31.60mm x 20.30mm x 10.20mm)			
Case Material		Black Flame-Retardant and Heat-Resistant Plastic (UL94-V0)			
Cooling Method		Free Air Convection			
SAFETY CHARACTERISTICS					
Safety Approval		EN60601-1: 2006+A1: 2013			
Emissions	CE	DCMHP06-24S18	CISPR32/EN55032	Class B ⁽⁶⁾	
		Others	CISPR32/EN55032	Class A (without extra components)	
Immunity	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	3 Vr.m.s.	Perf. Criteria A	
	Immunities of Voltage Dip, Drop and Short Interruption	IEC/EN61000-4-29	0-70%	Perf. Criteria B	

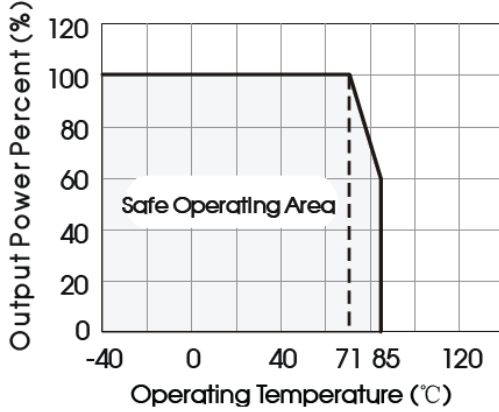
NOTES

- Exceeding the maximum input voltage may cause permanent damage.
- Load regulation for 0%-100% load is ±5%
- Ripple & Noise at <5% load is 5%Vo max. The parallel cable method is used for Ripple and Noise test, oscilloscope using the 1X probe. Contact factory for more information.
- Switching frequency is measured at full load. The module reduced the switching frequency for light load (below 50%) efficiency improvement.
- See Fig. 2 - ① for recommended circuit.
- See Fig. 2 - ② for recommended circuit.
- Maximum capacitive load offered was tested at input voltage range and full load.
- The performance indexes of the product models listed in this data sheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements. Please contact factory for more information.
- Product customization is available. Contact factory for more information.
- Products should be classified according to ISO14001 and related environmental laws and regulations and should be handled by qualified units.

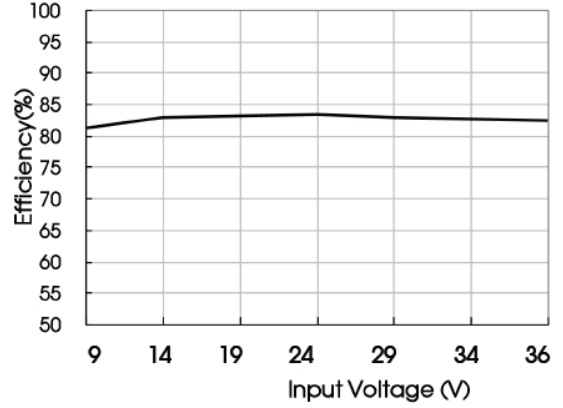
*Due to advances in technology, specifications subject to change without notice.

CHARACTERISTIC CURVES

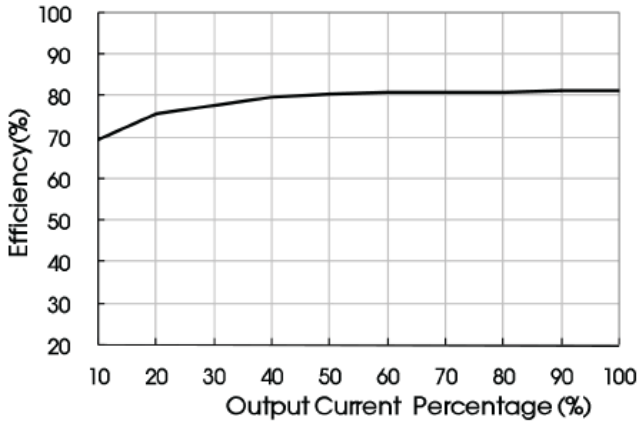
Temperature Derating Curve



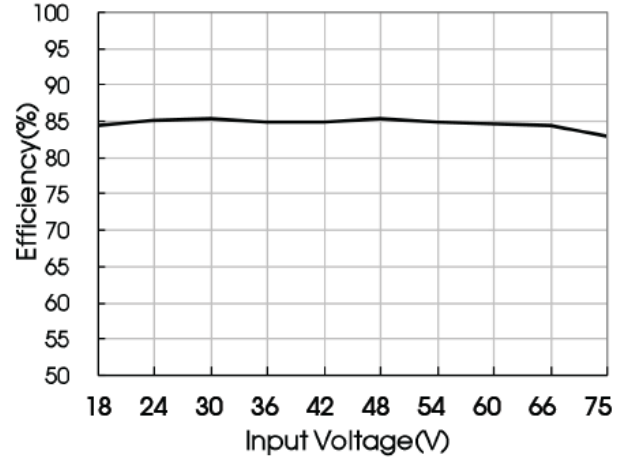
Efficiency vs. Input (Full Load) DCMHP06-24S05



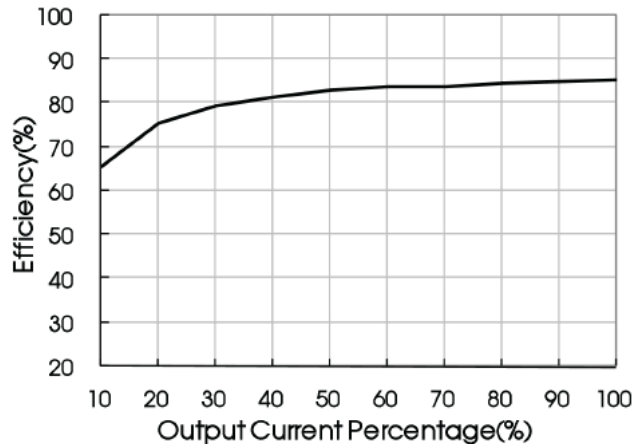
Efficiency vs. Output Load (Vin=Vin-nominal) DCMHP06-24S05



Efficiency vs. Input Voltage (Full Load) DCMHP06-48S15



Efficiency vs. Output Load (Vin=Vin-nominal) DCMHP06-48S15



MECHANICAL DRAWINGS

THIRD ANGLE PROJECTION

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

Note:
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 before delivery using the recommended circuit shown in Fig. 1. 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 is not exceeding the specified max. capacitive load value of the product.

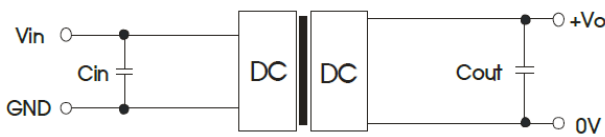


Fig. 1

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

2. EMC Solution-Recommended Circuit

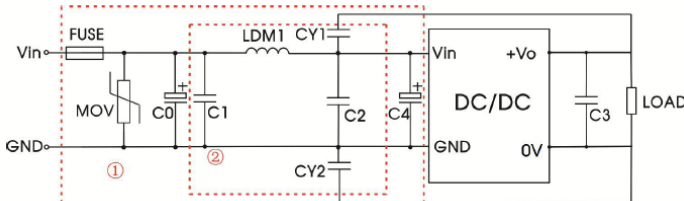


Fig. 2

Notes: For EMC tests we use part ① in Fig. 2 for immunity and part ② for emissions test. Select based on needs.

Parameter Description:

Model	Vin:24V	Vin:48V
Fuse	Choose According to Actual Input Current	
MOV	S20K30	S14K60
C0, C4	330uF/50V	330uF/100V
C1, C2	10uF/50V	-
C3	Refer to Cout in Fig. 1	
LDM1	10uH	-
CY1, CY2	1nF	-

3. The 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.

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