Plastic Case (Standard)

Size: 0.86 x 0.36 x 0.44 inches

Metal Case (Suffix "M")

Size: 0.86 x 0.38 x 0.44 inches

FEATURES

- 0.86" x 0.44" x 0.36" SIP Package
- High Efficiency up to 87%
- Remote ON/OFF Control
- 4:1 Ultra Wide Input Voltage Ranges
- 6 Watts Maximum Output Power
- Low Standby Power
- No Minimum Load Required
- 1600VDC I/O Isolation (Optional 3000VDC Isolation)
- Short Circuit and Over Current Protection
- Plastic (Standard) & Metal (Suffix "M") Case Types Available
- IEC/ENUL62368-1 Safety Approvals
- RoHS and REACH Compliant

APPLICATIONS

- Automation
- Datacom
- IPC
- Industrial
- Measurement
- Telecom

DESCRIPTION

The DCPDLW06 series of DC/DC power converters provides 6 watts of output power in a 0.86" x 0.44" x 0.36" SIP package. This series has single and dual output models with 4:1 ultra-wide input voltage ranges of 9-36VDC and 18-75VDC. Some features include high efficiency up to 87%, 1600VDC (standard) or 3000VDC (suffix "H") I/O isolation, remote ON/OFF control, and continuous short circuit protection. Both plastic (standard) and metal (suffix "M") case types are available for this series. All models are RoHS and REACH compliant and have IEC/ENUL62368-1 safety approvals. This series is best suited for use in automation, datacom, IPC, industrial, measurement, telecom applications.

MODEL SELECTION TABLE

SINGLE OUTPUT MODELS

Model Number[1]	Input Voltage Range	Output Voltage	Output Current	Output Ripple & Noise	No Load Input Current	Output Power	Efficiency	Maximum Capacitive Load
DCPDLW06-24S3.3	24 VDC (9 - 36 VDC)	3.3 VDC	1500mA	50mVp-p	4mA	5W	81%	2200µF
DCPDLW06-24S05		5 VDC	1200mA	50mVp-p	4mA	6W	84%	1100µF
DCPDLW06-24S09		9 VDC	666mA	50mVp-p	4mA	6W	86%	680µF
DCPDLW06-24S12		12 VDC	500mA	75mVp-p	4mA	6W	87%	470µF
DCPDLW06-24S15		15 VDC	400mA	75mVp-p	4mA	6W	88%	470µF
DCPDLW06-24S24		24 VDC	250mA	75mVp-p	4mA	6W	87%	180µF
DCPDLW06-48S3.3	48 VDC (18 - 75 VDC)	3.3 VDC	1500mA	50mVp-p	4mA	5W	81%	2200µF
DCPDLW06-48S05		5 VDC	1200mA	50mVp-p	4mA	6W	84%	1100µF
DCPDLW06-48S09		9 VDC	666mA	50mVp-p	4mA	6W	85%	680µF
DCPDLW06-48S12		12 VDC	500mA	75mVp-p	4mA	6W	87%	470µF
DCPDLW06-48S15		15 VDC	400mA	75mVp-p	4mA	6W	87%	470µF
DCPDLW06-48S24		24 VDC	250mA	75mVp-p	4mA	6W	87%	180µF

MODEL SELECTION TABLE

DUAL OUTPUT MODELS

Model Number	Input Voltage Range	Output Voltage	Output Current	Output Ripple & Noise	No Load Input Current	Output Power	Efficiency	Maximum Capacitive Load
DCPDLW06-24D05	24 VDC (9 - 36 VDC)	±5 VDC	±600mA	50mVp-p	6mA	6W	84%	±680µF
DCPDLW06-24D12		±12 VDC	±250mA	75mVp-p	6mA	6W	87%	±330µF
DCPDLW06-24D15		±15 VDC	±200mA	75mVp-p	8mA	6W	87%	±180µF
DCPDLW06-48D05	48 VDC (18 - 75 VDC)	±5 VDC	±600mA	50mVp-p	6mA	6W	84%	±680µF
DCPDLW06-48D12		±12 VDC	±250mA	75mVp-p	6mA	6W	87%	±330µF
DCPDLW06-48D15		±15 VDC	±200mA	75mVp-p	8mA	6W	87%	±180µF

SPECIFICATIONS: DCPDLW06 SERIES

All specifications are typical at 25°C, Nominal Input, and Full 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 nominal input models		9	24	36	VDC
	48VDC nominal input models		18	48	75	
Input Surge Voltage (1 sec. max.)	24VDC nominal input models				50	VDC
	48VDC nominal input models				100	
Input Current	No Load		See Table			
Input Filter			Capacitor type			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy			-1.0		+1.0	%
Line Regulation	Low line to high line at full load		-0.2		+0.2	%
Load Regulation	No load to full load	Single Output Models	-0.5		+0.5	%
		Dual Output Models	-1.0		+1.0	
Cross Regulation (Dual Output Models)	Asymmetrical load 25% / 100% FL		-5.0		+5.0	%
Output Power			See Table			
Output Current			See Table			
Maximum Capacitive Load			See Table			
Ripple & Noise	20MHz Bandwidth	3.3V, 5V, 9V output model		50		mVp-p
		12V, 15V, 24V output models		75		
Transient Response Recovery Time	25% load step change			250		µs
Start-Up Time, Power Up	Constant Resistive Load			30		ms
Start-Up Time, Remote On/Off				30		
Temperature Coefficient			-0.02		+0.02	%/°C
REMOTE ON/OFF(2)						
DC/DC ON			Open or 0~0.5VDC			
DC/DC OFF			3		12	VDC
Input Current of Ctrl Pin			0.5		3.5	mA
Remote Off Input Current				2.5		mA
PROTECTION						
Short Circuit Protection			Continuous, automatic recovery			
Over Load Protection	% of rated Iout; Hiccup Mode			180		%
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load		See Table			
Switching Frequency			522	580	638	KHz
Isolation Voltage (1 min), Input to Output	Standard models		1600			VDC
	Suffix “M” models		1600			
	Suffix “H” models		3000			
Isolation Voltage (1 min), Input to Case	Suffix “M” models		1000			VDC
Isolation Voltage (1 min), Output to Case	Suffix “M” models		1000			VDC
Isolation Resistance	500VDC		1			GΩ
Isolation Capacitance	Standard models				50	pF
	Suffix “M” models				50	
	Suffix “H” models (only available with plastic case)				50	
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	With derating	Standard models	-40		+100	°C
		“M” Suffix models	-40		+100	
		“H” Suffix models	-40		+100	
		M3 Version, “M” Suffix models	-55		+100	°C
		M3 Version, “H” Suffix models	-55		+100	
Maximum Case Temperature					100	°C
Storage Temperature			-55		+125	°C
Relative Humidity			5		95	% RH
Thermal Shock			MIL-STD-810F			
Vibration			MIL-STD-810F			
MTBF	MIL-HDBK-217F	Standard models and Suffix “H” models	2.928 x 10^6 Hours			
		Suffix “M” models	3.161 x 10^6 Hours			

SPECIFICATIONS: DCPDLW06 SERIES

All specifications are typical at 25°C, Nominal Input, and Full Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
PHYSICAL SPECIFICATIONS						
Weight	Standard models			0.17oz (4.8g)		
	Suffix “M” models			0.21oz (5.9g)		
	Suffix “H” models			0.17oz (4.8g)		
Dimensions (L x W x H)	Standard models, Suffix “H” models			0.86in x 0.36in x 0.44in (21.8mm x 9.1mm x 11.2 mm)		
	Suffix “M” models			0.86in x 0.38in x 0.44in (21.8mm x 9.6mm x 11.2mm)		
Case Material	Standard models			Non-conductive black plastic		
	Suffix “M” models			Copper		
	Suffix “H” models			Non-conductive black plastic		
Base Material				none		
Potting Material				Silicon (UL94-V0)		
SAFETY & EMC CHARACTERISTICS						
Safety Approvals		IEC/EN/UL62368-1[3]				CB: UL (Demko)
EMI	EN55032	With external components				Class A, Class B
EMS	EN55035					
ESD	EN61000-4-2	Air ±8KV and Contact ±6KV				Perf. Criteria A
Radiated Immunity	EN61000-4-3	20 V/m				Perf. Criteria A
Fast Transient[4]	EN61000-4-4	±2KV				Perf. Criteria A
Surge[4]	EN61000-4-5	±2KV				Perf. Criteria A
Conducted Immunity	EN61000-4-6	10 Vrms				Perf. Criteria A
Power Frequency Magnetic Field	EN61000-4-8	100A/m continuous; 1000A/m 1 second				Perf. Criteria A

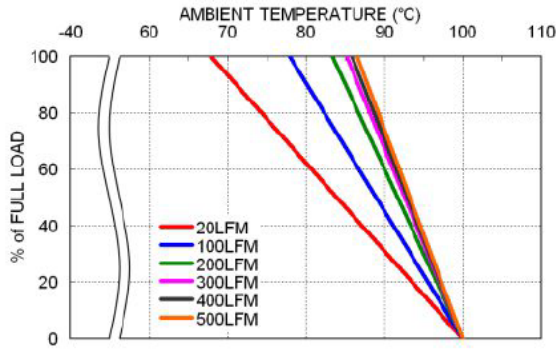
NOTES

1. Two case types are available for this series. Plastic case is standard; for the metal case add the suffix “M” to the model number. See the model number setup on page 6 for more details.
2. Referred to -Vin pin
3. This product is Listed to applicable standards and requirements by UL.
4. 24Vin: With an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220µF/100V) and a TVS (SMDJ70A, 70V, 3000Watt peak pulse power) in parallel.
   48Vin: With an aluminum electrolytic capacitor (Nippon chemi-com KY series, 220µF/100V) and a TVS (SMDJ120A, 120V, 3000Wat peak pulse power) in parallel.

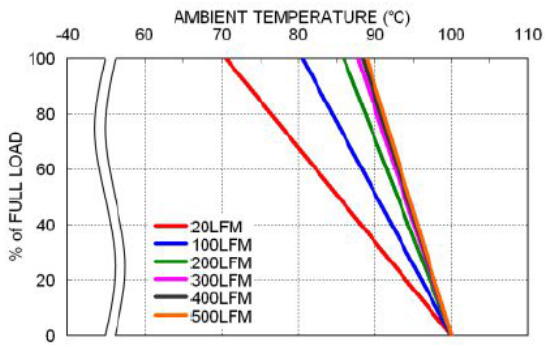
CAUTION: This power module is not internally fused. An input line fuse must always be used.
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVES

DCPDLW06-48S05 Derating Curve

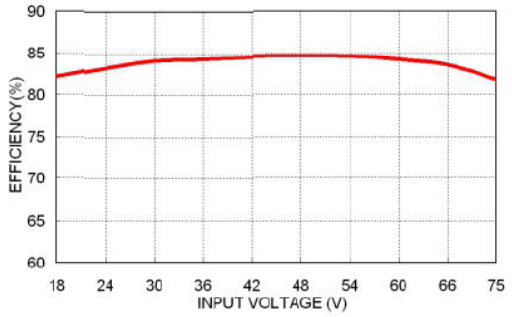


DCPDLW06-48S05M Derating Curve

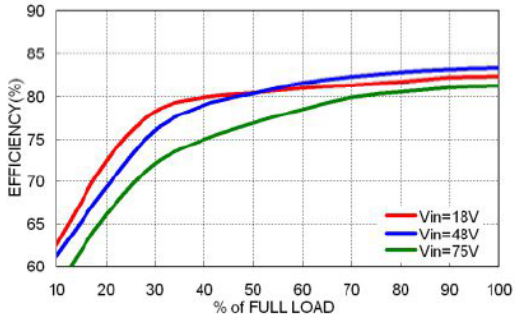


EFFICIENCY CURVES

DCPDLW06-48S05 Efficiency vs Input Voltage

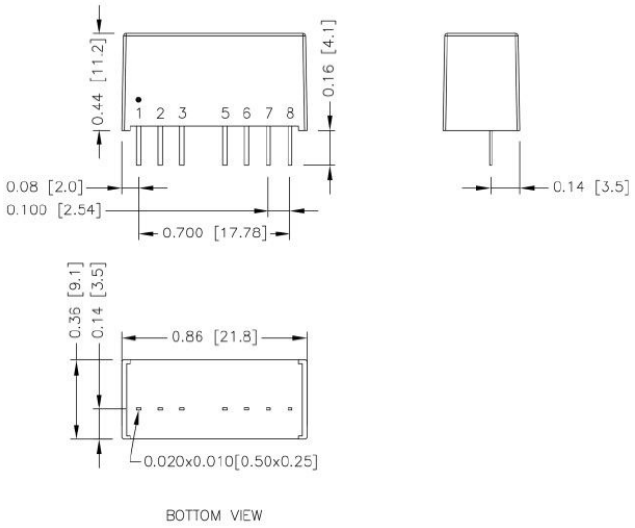


DCPDLW06-48S05 Efficiency vs Output Current



MECHANICAL DRAWINGS

Standard Case, “H” Suffix



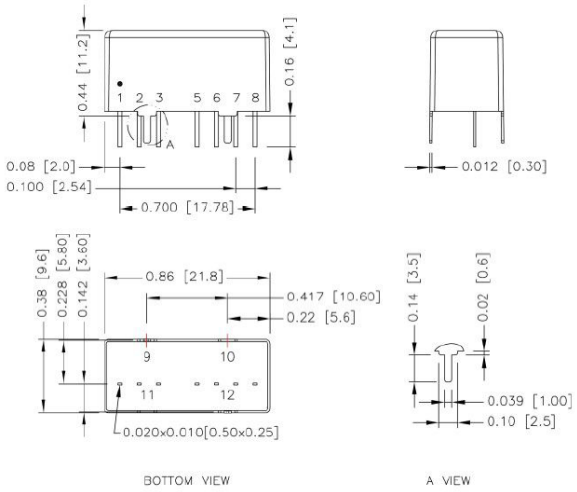
Pin Connection

PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
5	NC*/No Pin**	NC*/No Pin**
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

*NC Pin for standard type model
**No pin for 3kVD isolation model (suffix “H”)

Notes:
1. All dimensions in inch [mm]
2. Tolerance: x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
3. Pin dimension tolerance ±0.004 [0.10]

“M” Suffix



Pin Connection

PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
5	NC	NC
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout
9	Case	Case
10	Stand Off	Stand Off
11	Stand Off	Stand Off
12	Case	Case

Notes:
1. All dimensions in inch [mm]
2. Tolerance: x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
3. Pin dimension tolerance ±0.004 [0.10]

* Case pins should not be connected to any cicuit

FUSE CONSIDERATION

The power module is not internally fused. An input line fuse must always be used.
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-along operation to an integrated part of sophisticated power architecture.
To maximize flexibility, internal fusing is not included however to achieve maximum safety and system protection, always use an input line fuse.
Suggested input line fuse below:

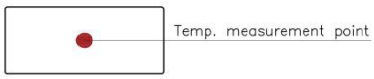
Model	Fuse Rating (A)	Fuse Type
DCPDLW06-24xxx	1.6	Slow-Blow
DCPDLW06-48xxx	1	Slow-Blow

Table based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

THERMAL CONSIDERATION

The power module operates in a variety of thermal environments.
However, sufficient cooling should be provided to help ensure reliable operation of the unit.
Heat is removed by conduction, convection, and radiation to the surrounding environment.
Proper cooling can be verified by measuring the point as shows in the figure below.
The temperature at this location should not exceed “Maximum case temperature”
When operating, adequate cooling must be provided to maintain the test point temperature at or below “Maximum case temperature”
You can limit this temperature to a lower level value for extremely high reliability.

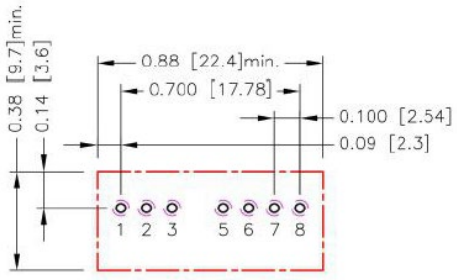
- Thermal test condition with vertical direction by natural convection (20LFM)



TOP VIEW

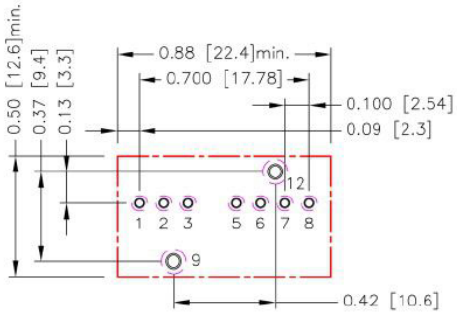
RECOMMENDED PAD LAYOUT

Standard Type, “H” Suffix



All dimensions in inch [mm]
Pad size (lead free recommended)
Through Hole 1.2.3.5.6.7.8: ϕ0.031 [0.80]
Top View Pad 1.2.3.5.6.7.8: ϕ0.039 [1.00]
Bottom View Pad 1.2.3.5.6.7.8: ϕ0.063[1.60]

“M” Suffix



All dimensions in inch [mm]
Pad size (lead free recommended)
Through Hole 1.2.3.5.6.7.8: ϕ0.031 [0.80]
Through Hold 9.12: ϕ0.051 [1.30]
Top View Pad 1.2.3.5.6.7.8: ϕ0.039 [1.00]
Top View Pad 9.12: ϕ0.064 [1.63]
Bottom View Pad 1.2.3.5.6.7.8: ϕ0.063[1.60]
Bottom View Pad 9.12: ϕ0.102 [2.60]

MODEL NUMBER SET

DCPDLW	06	-	48	S	12	M	M3
Series Name	Output Power		Input Voltage	Output Quantity	Output Voltage	Assembly Options	Operating Temp. Options
	6: 6 Watts		**24:** 9-36 VDC	**S:** Single Output	**33:** 3.3 VDC	**None:** Plastic Case w/ 1600VDC isolation	**None:** Standard -40~100°C with derating
			48: 18-75 VDC		**05:** 5 VDC	**H:** Plastic Case w/ 3000VDC Isolation	**M3:** Plastic Case: -55~100°C with derating
					09: 9 VDC	**M:** Metal Case w/ 1600VDC isolation	Metal Case: -55~100°C with derating
					12: 12 VDC		
					15: 15 VDC		
					24: 24 VDC		
				D: Dual Output	**05:** ±5 VDC		
					12: ±12 VDC		
					15: ±15 VDC		

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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