Plastic Case (Standard)

Size: 0.86” x 0.36” x 0.44”

Metal Case (Suffix “M”)

Size: 0.86” x 0.38” x 0.44”

FEATURES

- 0.86” x 0.44” x 0.36~0.38” SIP Package
- Under Voltage Protection
- High Efficiency up to 86%
- 2:1 Wide Input Voltage Ranges
- 6 Watts Maximum Output Power
- Remote ON/OFF Control
- 1600VDC I/O Isolation (Optional 3000VDC Isolation)
- Short Circuit Protection
- Plastic (Standard) & Metal (Suffix “M”) Case Types Available
- No Min. Load Required
- RoHS and REACH Compliant
- IEC/EN/UL62368-1 Safety Approvals

APPLICATIONS

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

DESCRIPTION

The DCPDL06 series of DC/DC power converters provides 6 watts of output power in a 0.86 x 0.36~0.38 x 0.44 inch SIP package. This series has single and dual output models with 2:1 wide input voltage ranges of 4.5-9VDC, 9-18VDC, 18-36VDC, and 36-75VDC. Some features include high efficiency up to 86%, 1600VDC (standard) or 3000VDC (suffix “H”) I/O isolation, remote ON/OFF control, and short circuit and input under voltage 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/EN/UL62368-1 safety approvals.

MODEL SELECTION TABLE

SINGLE OUTPUT MODELS

Model Number	Input Voltage Range	Output Voltage	Output Current	Output Ripple & Noise	No Load [2] Input Current	Output Power	Efficiency	Maximum Capacitive Load
DCPDL06-5S3.3	5 VDC (4.5 - 9 VDC)	3.3 VDC	1300mA	50mVp-p	65mA	4.3W	77%	6600µF
DCPDL06-5S05		5 VDC	1200mA	50mVp-p	105mA	6W	81%	3300µF
DCPDL06-5S09		9 VDC	666mA	50mVp-p	105mA	6W	83%	2000µF
DCPDL06-5S12		12 VDC	500mA	50mVp-p	105mA	6W	84%	1600µF
DCPDL06-5S15		15 VDC	400mA	50mVp-p	105mA	6W	84%	1400µF
DCPDL06-5S24		24 VDC	250mA	50mVp-p	105mA	6W	84%	680µF
DCPDL06-12S3.3	12 VDC (9 - 18 VDC)	3.3 VDC	1300mA	50mVp-p	40mA	4.3W	78%	6600µF
DCPDL06-12S05		5 VDC	1200mA	50mVp-p	55mA	6W	83%	3300µF
DCPDL06-12S09		9 VDC	666mA	50mVp-p	55mA	6W	85%	2000µF
DCPDL06-12S12		12 VDC	500mA	50mVp-p	55mA	6W	85%	1600µF
DCPDL06-12S15		15 VDC	400mA	50mVp-p	55mA	6W	85%	1400µF
DCPDL06-12S24		24 VDC	250mA	50mVp-p	55mA	6W	84%	680µF
DCPDL06-24S3.3	24 VDC (18 - 36 VDC)	3.3 VDC	1300mA	50mVp-p	20mA	4.3W	78%	6600µF
DCPDL06-24S05		5 VDC	1200mA	50mVp-p	28mA	6W	83%	3300µF
DCPDL06-24S09		9 VDC	666mA	50mVp-p	28mA	6W	85%	2000µF
DCPDL06-24S12		12 VDC	500mA	50mVp-p	28mA	6W	86%	1600µF
DCPDL06-24S15		15 VDC	400mA	50mVp-p	28mA	6W	86%	1400µF
DCPDL06-24S24		24 VDC	250mA	50mVp-p	28mA	6W	85%	680µF
DCPDL06-48S3.3	48 VDC (36 - 75 VDC)	3.3 VDC	1300mA	50mVp-p	14mA	4.3W	78%	6600µF
DCPDL06-48S05		5 VDC	1200mA	50mVp-p	14mA	6W	82%	3300µF
DCPDL06-48S09		9 VDC	666mA	50mVp-p	14mA	6W	84%	2000µF
DCPDL06-48S12		12 VDC	500mA	50mVp-p	14mA	6W	85%	1600µF
DCPDL06-48S15		15 VDC	400mA	50mVp-p	14mA	6W	86%	1400µF
DCPDL06-48S24		24 VDC	250mA	50mVp-p	14mA	6W	84%	680µF

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
DCPDL06-5D05	5 VDC (4.5 - 9 VDC)	±5 VDC	±600mA	50mVp-p	105mA	6W	81%	±2000µF
DCPDL06-5D12		±12 VDC	±250mA	50mVp-p	105mA	6W	84%	±900F
DCPDL06-5D15		±15 VDC	±200mA	50mVp-p	105mA	6W	84%	±660µF
DCPDL06-12D05	12 VDC (9 - 18 VDC)	±5 VDC	±600mA	50mVp-p	55mA	6W	82%	±2000µF
DCPDL06-12D12		±12 VDC	±250mA	50mVp-p	55mA	6W	85%	±900F
DCPDL06-12D15		±15 VDC	±200mA	50mVp-p	55mA	6W	85%	±660µF
DCPDL06-24D05	24 VDC (18 - 36 VDC)	±5 VDC	±600mA	50mVp-p	28mA	6W	82%	±2000µF
DCPDL06-24D12		±12 VDC	±250mA	50mVp-p	28mA	6W	85%	±900F
DCPDL06-24D15		±15 VDC	±200mA	50mVp-p	28mA	6W	85%	±660µF
DCPDL06-48D05	48 VDC (36 - 75 VDC)	±5 VDC	±600mA	50mVp-p	14mA	6W	82%	±2000µF
DCPDL06-48D12		±12 VDC	±250mA	50mVp-p	14mA	6W	84%	±900F
DCPDL06-48D15		±15 VDC	±200mA	50mVp-p	14mA	6W	85%	±660µF

SPECIFICATIONS: DCPDL06 SERIES

All specifications are based on 25°C, Nominal Input Voltage, 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		5VDC nominal input models		4.5	5	9	VDC
		12VDC nominal input models		9	12	18	
		24VDC nominal input models		18	24	36	
		48VDC nominal input models		36	48	75	
Input Surge Voltage (1 sec)		5VDC nominal input models				15	VDC
		12VDC nominal input models				36	
		24VDC nominal input models				50	
		48VDC nominal input models				100	
Input Current		No Load		See Table			
Start Up Voltage		5VDC nominal input models				4.5	VDC
		12VDC nominal input models				9	
		24VDC nominal input models				18	
		48VDC nominal input models				36	
Shutdown Voltage		5VDC nominal input models		2	3.5	4	VDC
		12VDC nominal input models		5	7	8	
		24VDC nominal input models		12	15	17	
		48VDC nominal input models		26	33	35	
Input Filter				Capacitor type			
OUTPUT SPECIFICATIONS							
Output Voltage				See Table			
Voltage Accuracy		Full load and nominal Vin		-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	-1.0		+1.0	%
			Dual Output Models	-1.0		+1.0	
Cross Regulation (Dual Output Models)		Asymmetrical load 25% / 100% FL		-5		+5	%
Output Power				See Table			
Output Current				See Table			
Maximum Capacitive Load				See Table			
Ripple & Noise		20MHz Bandwidth			50		mVp-p
Transient Response Recovery Time		25% load step change			500		µs
Start-Up Time	Power Up	Constant resistive load			5	10	ms
	Remote On/Off				5	10	
Temperature Coefficient				-0.02		+0.02	%/°C
REMOTE ON/OFF[2]							
DC-DC ON				Open or high impedance			
DC-DC OFF				2	3	4	mA
Remote Off Input Current						2.5	mA
PROTECTION							
Short Circuit Protection				Continuous, Automatic Recovery			
Input Under Voltage Protection				Yes			
GENERAL SPECIFICATIONS							
Efficiency				See Table			
Switching Frequency		Full load to minimum load		100			KHz
Isolation Voltage (1 min)	Input to Output	Standard models		1600			VDC
		Suffix “M” models		1600			
		Suffix “H” models		3000			
	Input to Case	Suffix “M” models		1000			VDC
	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				50	

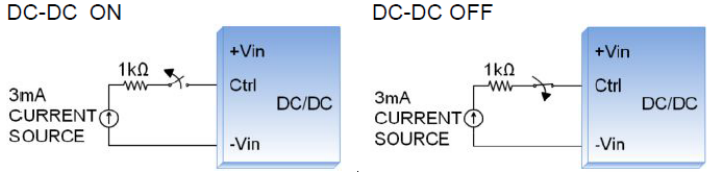
SPECIFICATIONS: DCPDL06 SERIES

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

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	With derating	Standard models	-40		+90	°C
		Suffix “M” models	-40		+95	°C
		Suffix “H” models	-40		+90	°C
Storage Temperature			-55		+125	°C
Maximum Case Temperature					105	°C
Relative Humidity			5		95	% RH
Thermal Shock			MIL-STD-810F			
Vibration			MIL-STD-810F			
MTBF	MIL-HDBK-217F	Standard models	2.135×10^6 hours			
		Suffix “H” models	2.135×10^6 hours			
		Suffix “M” models	2.360×10^6 hours			
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		0.86in x 0.36in x 0.44in (21.8mm x 9.1mm x 11.2mm)			
	Suffix “M” models		0.86in x 0.38in x 0.44in (21.8mm x 9.6mm x 11.2mm)			
	Suffix “H” models		0.86in x 0.36in x 0.44in (21.8mm x 9.1mm 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	10 V/m	Perf. Criteria A			
Fast Transient(4)	EN61000-4-4	±2KV	Perf. Criteria A			
Surge(4)	EN61000-4-5	±1KV	Perf. Criteria A			
Conducted Immunity	EN61000-4-6	10 Vrms	Perf. Criteria A			
Power Frequency Magnetic Filed	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 ordering details.
2. Ctrl pin applied current via 1kΩ
   Application Circuit



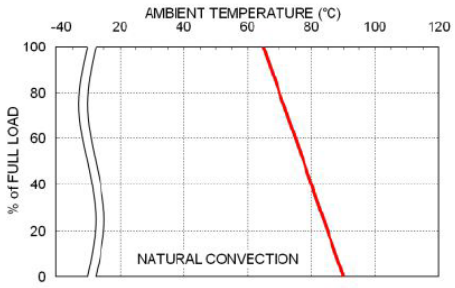
3. This product is Listed to applicable standards and requirements by UL.
4. 5VDC Input: With an external input filter capacitor (Nippon chemi-con KY series, 330µF/50V)
   Others: With an external input filter capacitor (Nippon chemi-con KY series, 220µF/100V)

CAUTION: This power module is not internally fused. An input line fuse must always be used.

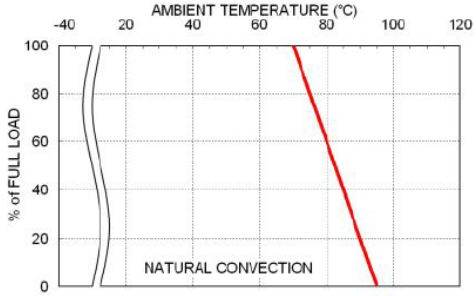
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVES

DCPDL06-48S05 Derating Curve

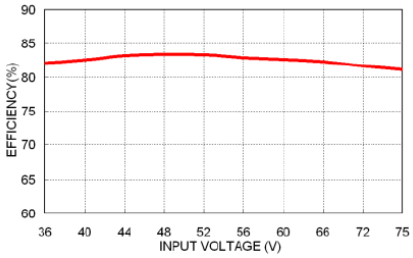


DCPDL06-48S05M Derating Curve

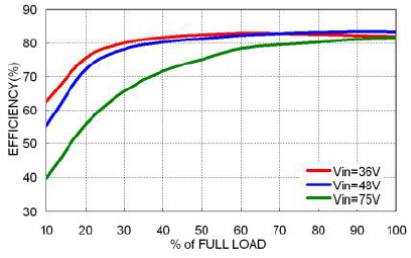


EFFICIENCY CURVES

DCPDL06-48S05 Efficiency vs Input Voltage



DCPDL06-48S05 Efficiency vs Output Current



FUSE CONSIDERATION

This 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-alone operation to an integrated part of sophisticated power architecture.
To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.
Suggested input line fuse:

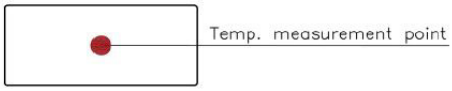
Model	Fuse Rating (A)	Fuse Type
5VDC nominal input models	3	Slow-Blow
12VDC nominal input models	1.6	Slow-Blow
24VDC nominal input models	1	Slow-Blow
48VDC nominal input models	0.5	Slow-Blow

The table based on information provided in 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.

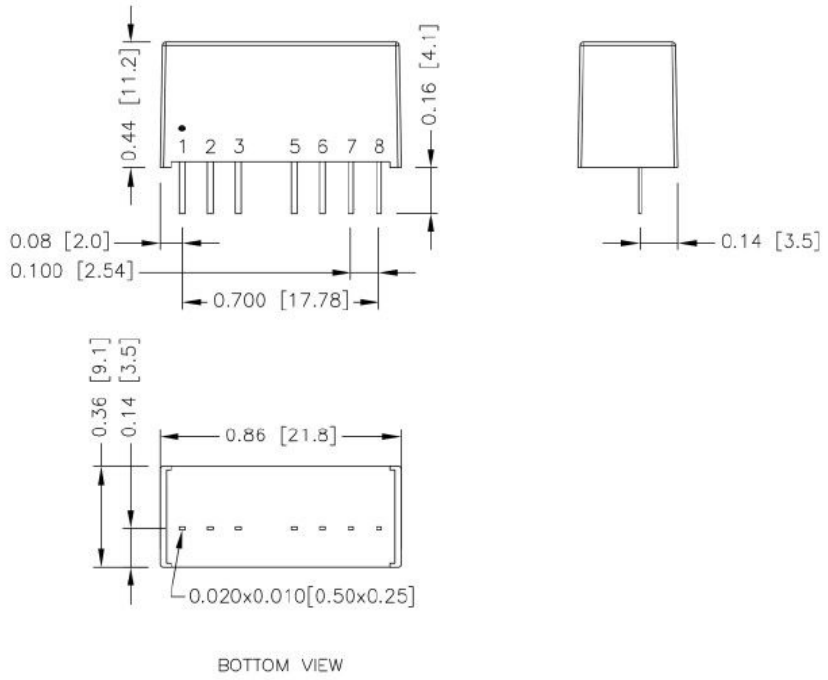
- Thermal test condition with vertical direction by natural convection (20LFM)



TOP VIEW

MECHANICAL DRAWINGS

Standard Case, “H” Suffix



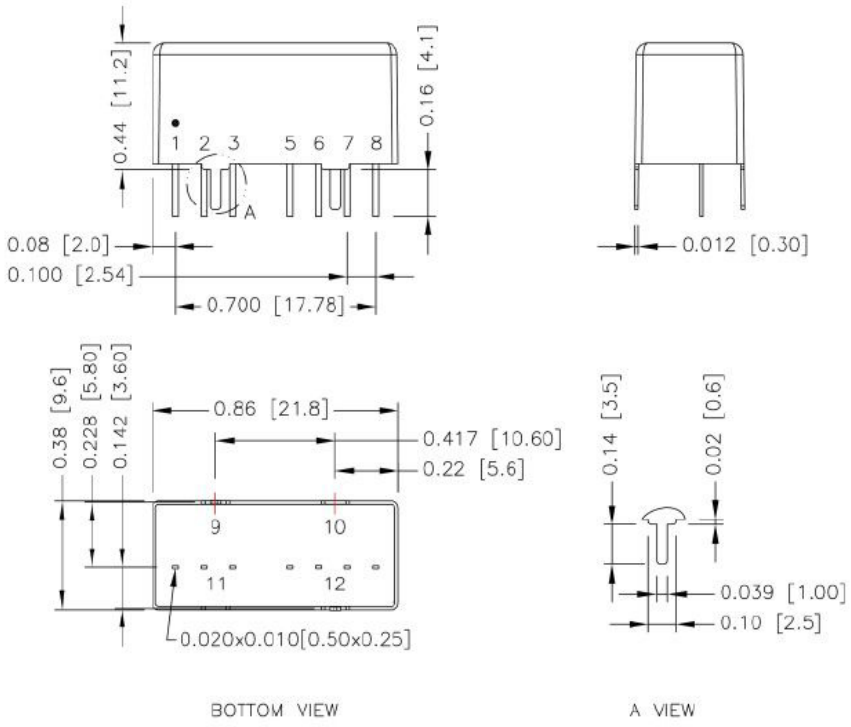
Pin Connection

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 3kVDC 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

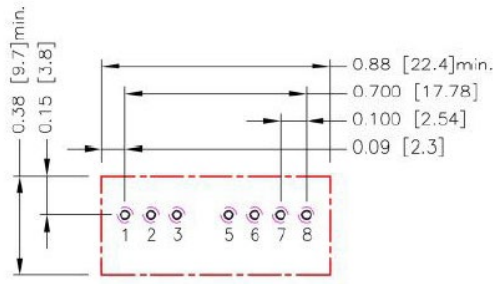
PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
5	NC	NC
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout
9	Case	Case
10	Stand Off	Stand Off
11	Stand Off	Stand Off
12	Case	Case

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

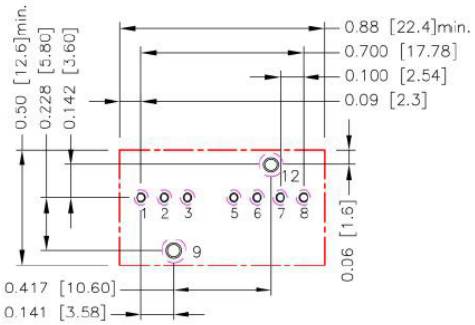
RECOMMENDED PAD LAYOUT

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

DCPDL	06	-	48	S	12	M
Series Name	Output Power		Input Voltage	Output Quantity	Output Voltage	Assembly Options
	6: 6 Watts		**5:** 4.5-9 VDC	**S:** Single Output	**33:** 3.3 VDC	**None:** Plastic Case w/ 1600VDC isolation
			12: 9-18 VDC		**05:** 5 VDC	**H:** Plastic Case w/ 3000VDC Isolation
			24: 18-36 VDC		**09:** 9 VDC	**M:** Metal Case w/ 1600VDC isolation
			48: 36-75 VDC		**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.

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