

Plastic Case (Standard)



Size: 0.86 x 0.44 x 0.36 inches

Metal Case (Suffix "M")



Size: 0.86 x 0.44 x 0.36 inches

FEATURES

- 0.86" x 0.44" x 0.36" SIP Package
- Input 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)
- Continuous Short Circuit Protection
- Plastic (Standard) & Metal (Suffix "M") Case Types Available
- CE Mark Meets 2006/95/EC, 93/68/EEC, & 2004/108/EC
- UL60950-1, EN60950-1, & IEC60950-1 Safety Approvals
- Compliant to RoHS EU Directive 2011/65/EU

DESCRIPTION

The DCPDL06 series of DC/DC power converters provides 6 watts of output power in a 0.86 x 0.44 x 0.36 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 compliant and have UL60950-1, EN60950-1, and IEC60950-1 safety approvals. This series is best suited for use in industry control systems, wireless networks, telecom/datacom, measurement equipment, and semiconductor equipment.

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
			Min Load	Max Load					
DCPDL06-5S3.3	5 VDC (4.5 - 9 VDC)	3.3 VDC	0mA	1300mA	50mVp-p	65mA	4.3W	77%	6600µF
DCPDL06-5S05		5 VDC	0mA	1200mA	50mVp-p	105mA	6W	81%	3300µF
DCPDL06-5S09		9 VDC	0mA	666mA	50mVp-p	105mA	6W	83%	2000µF
DCPDL06-5S12		12 VDC	0mA	500mA	50mVp-p	105mA	6W	84%	1600µF
DCPDL06-5S15		15 VDC	0mA	400mA	50mVp-p	105mA	6W	84%	1400µF
DCPDL06-5S24		24 VDC	0mA	250mA	50mVp-p	105mA	6W	84%	680µF
DCPDL06-12S3.3	12 VDC (9 - 18 VDC)	3.3 VDC	0mA	1300mA	50mVp-p	40mA	4.3W	78%	6600µF
DCPDL06-12S05		5 VDC	0mA	1200mA	50mVp-p	55mA	6W	83%	3300µF
DCPDL06-12S09		9 VDC	0mA	666mA	50mVp-p	55mA	6W	84%	2000µF
DCPDL06-12S12		12 VDC	0mA	500mA	50mVp-p	55mA	6W	85%	1600µF
DCPDL06-12S15		15 VDC	0mA	400mA	50mVp-p	55mA	6W	85%	1400µF
DCPDL06-12S24		24 VDC	0mA	250mA	50mVp-p	55mA	6W	84%	680µF
DCPDL06-24S3.3	24 VDC (18 - 36 VDC)	3.3 VDC	0mA	1300mA	50mVp-p	20mA	4.3W	78%	6600µF
DCPDL06-24S05		5 VDC	0mA	1200mA	50mVp-p	28mA	6W	83%	3300µF
DCPDL06-24S09		9 VDC	0mA	666mA	50mVp-p	28mA	6W	84%	2000µF
DCPDL06-24S12		12 VDC	0mA	500mA	50mVp-p	28mA	6W	85%	1600µF
DCPDL06-24S15		15 VDC	0mA	400mA	50mVp-p	28mA	6W	86%	1400µF
DCPDL06-24S24		24 VDC	0mA	250mA	50mVp-p	28mA	6W	85%	680µF
DCPDL06-48S3.3	48 VDC (36 - 75 VDC)	3.3 VDC	0mA	1300mA	50mVp-p	14mA	4.3W	78%	6600µF
DCPDL06-48S05		5 VDC	0mA	1200mA	50mVp-p	14mA	6W	82%	3300µF
DCPDL06-48S09		9 VDC	0mA	666mA	50mVp-p	14mA	6W	84%	2000µF
DCPDL06-48S12		12 VDC	0mA	500mA	50mVp-p	14mA	6W	85%	1600µF
DCPDL06-48S15		15 VDC	0mA	400mA	50mVp-p	14mA	6W	86%	1400µF
DCPDL06-48S24		24 VDC	0mA	250mA	50mVp-p	14mA	6W	84%	680µF

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
			Min Load	Max Load					
DCPDL06-5D05	5 VDC (4.5 - 9 VDC)	±5 VDC	0mA	±600mA	50mVp-p	105mA	6W	81%	±2000µF
DCPDL06-5D12		±12 VDC	0mA	±250mA	50mVp-p	105mA	6W	84%	±900F
DCPDL06-5D15		±15 VDC	0mA	±200mA	50mVp-p	105mA	6W	84%	±660µF
DCPDL06-12D05	12 VDC (9 - 18 VDC)	±5 VDC	0mA	±600mA	50mVp-p	55mA	6W	82%	±2000µF
DCPDL06-12D12		±12 VDC	0mA	±250mA	50mVp-p	55mA	6W	83%	±900F
DCPDL06-12D15		±15 VDC	0mA	±200mA	50mVp-p	55mA	6W	84%	±660µF
DCPDL06-24D05	24 VDC (18 - 36 VDC)	±5 VDC	0mA	±600mA	50mVp-p	28mA	6W	82%	±2000µF
DCPDL06-24D12		±12 VDC	0mA	±250mA	50mVp-p	28mA	6W	84%	±900F
DCPDL06-24D15		±15 VDC	0mA	±200mA	50mVp-p	28mA	6W	84%	±660µF
DCPDL06-48D05	48 VDC (36 - 75 VDC)	±5 VDC	0mA	±600mA	50mVp-p	14mA	6W	82%	±2000µF
DCPDL06-48D12		±12 VDC	0mA	±250mA	50mVp-p	14mA	6W	84%	±900F
DCPDL06-48D15		±15 VDC	0mA	±200mA	50mVp-p	14mA	6W	85%	±660µF

SPECIFICATIONS: DCPDL06 SERIES

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	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			
Input Reflected Ripple Current (See Note 1)				30		mAp-p
Input Filter			Capacitor type			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy	Full load an 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			
Minimum Load			0			%
Maximum Capacitive Load	Minimum input and constant resistive load		See Table			
Ripple & Noise	20MHz Bandwidth			50	75	mVp-p
Transient Response Recovery Time	25% load step change			500		µs
Start-Up Time	Power Up	Nominal input and constant resistive load		30		ms
	Remote On/Off			30		
Temperature Coefficient			-0.02		+0.02	%/°C
REMOTE ON/OFF						
Positive Logic	DC/DC ON	Referenced to -INPUT pin and CTRL pin applied current (See Application Circuits on page 4)	Open or high impedance			
	DC/DC OFF		2	3	4	mA
Negative Logic	DC/DC ON	Referenced to -INPUT pin and CTRL pin applied current (See Application Circuits on page 4)	2	3	4	mA
	DC/DC OFF		Open or high impedance			
Remote Off Input Current				2.5		mA
PROTECTION						
Short Circuit Protection			Continuous, automatic recovery			
Input Under Voltage Protection			yes			
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load		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 (only available with plastic case)	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 (only available with plastic case)				50	

SPECIFICATIONS: DCPDL06 SERIES

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
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	Without derating	Standard models	-40		+65	°C
		Suffix "M" models	-40		+70	°C
		Suffix "H" models	-40		+65	°C
Storage Temperature			-55		+125	°C
Relative Humidity			5		95	% RH
Thermal Shock						MIL-STD-810F
Vibration						MIL-STD-810F
MTBF	BELLCORE TR-NWT-000332. Case 1: 50% Stress, Ta = 40°C					2,097,000 hours
	MIL-HDBK-217F, Ta=25°C, Full load (G/B controlled environment)	Standard models				770,500 hours
		Suffix "H" models				770,500 hours
		Suffix "M" models				998,700 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		0.86x0.36x0.44 inch (21.8x9.1x11.2 mm)			
	Suffix "M" models		0.86x0.36x0.44 inch (21.8x9.1x11.2 mm)			
	Suffix "H" models		0.86x0.36x0.44 inch (21.8x9.1x11.2 mm)			
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			IEC60950-1, UL60950-1 ⁽⁵⁾ , EN60950-1			
EMI (See Note 1)	EN55022		Class A, Class B			
ESD	EN61000-4-2	Air ±8KV Contact ±6KV	Perf. Criteria A			
Radiated Immunity	EN61000-4-3	10 V/m	Perf. Criteria A			
Fast Transient (See Note 2)	EN61000-4-4	±2KV	Perf. Criteria A			
Surge (See Note 2)	EN61000-4-5	±1KV	Perf. Criteria A			
Conducted Immunity	EN61000-4-6	10 Vrms	Perf. Criteria A			

NOTES

- The DCPDL06 series can only meet EMI Class A or Class B and input reflected ripple current with external components added. Please contact factory for more information.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
 The following are the filter capacitors recommended: 5VDC input models: Nippon chemi-con KY series, 330µF/50V
 Other input models: Nippon chemi-con KY series, 220µF/100V
- 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 7 for ordering details.
- 1600VDC I/O isolation is standard; for 3000VDC I/O isolation add the suffix "H" to the model number (Ex: DCPDL06-24S12H). 3000VDC I/O isolation is only available for plastic case models.
- This product is Listed to applicable standards and requirements by UL.

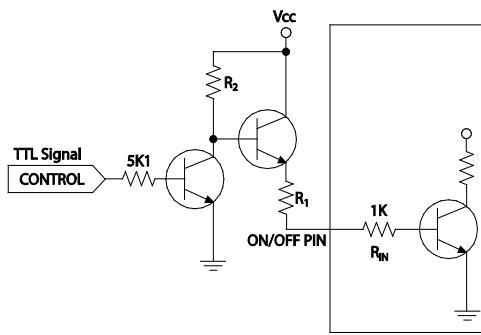
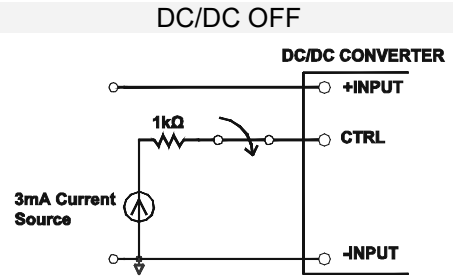
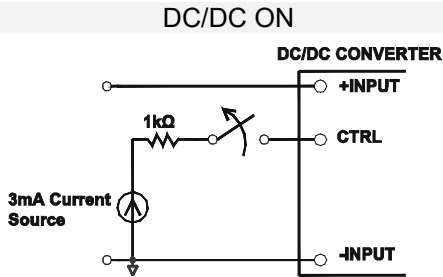
CAUTION: This power module is not internally fused. An input line fuse must always be used.

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

REMOTE ON/OFF APPLICATION CIRCUITS

Positive Logic

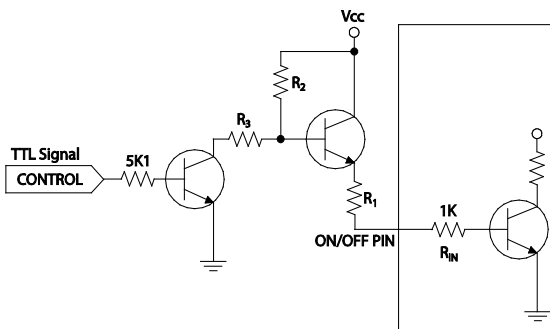
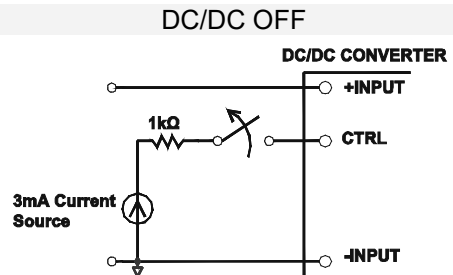
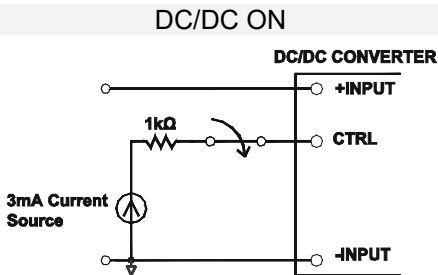
The positive logic structure turns the DC/DC module ON during a logic High on the CTRL pin and turns the DC/DC module OFF during a logic low on the CTRL pin. The CTRL pin is an open collector/drain logic input signal (Von/off) that is referenced to GND. When not using the remote ON/OFF feature please open circuit between the CTRL pin and input pin to turn the module ON.



Positive Logic	R1 (KΩ)	R2 (KΩ)
Vcc = 4.5~9 VDC	0	7.5
Vcc = 9~18 VDC	2.2	16
Vcc = 18~36 VDC	6.8	33
Vcc = 36~75 VDC	15	68

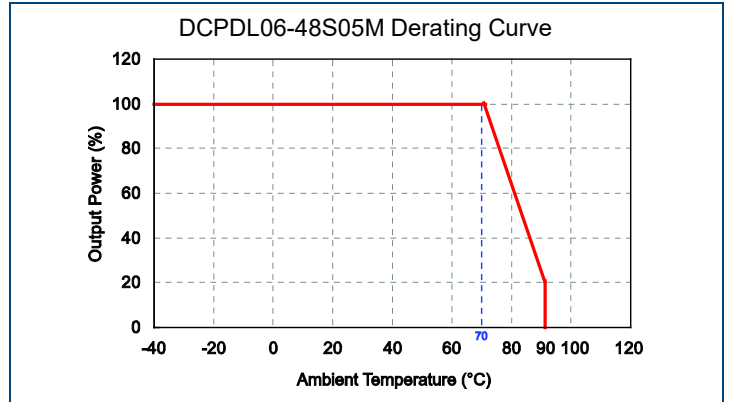
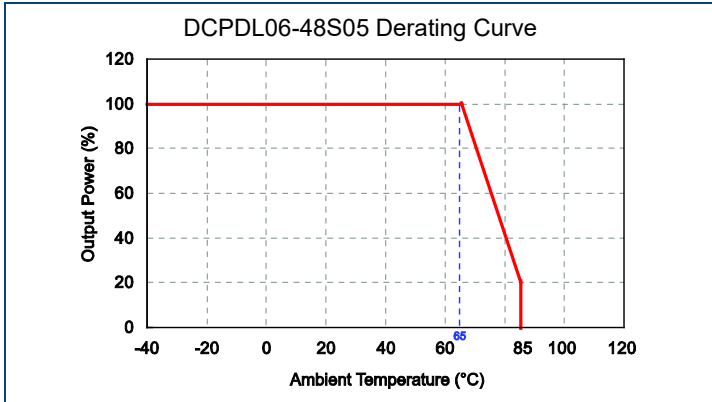
Negative Logic

The negative logic structure turns the DC/DC module OFF during a logic High on the CTRL pin and turns the DC/DC module ON during a logic low on the CTRL pin. The CTRL pin is an open collector/drain logic input signal (Von/off) that is referenced to GND. When not using the remote ON/OFF feature please open circuit between the CTRL pin and input pin to turn the module ON.

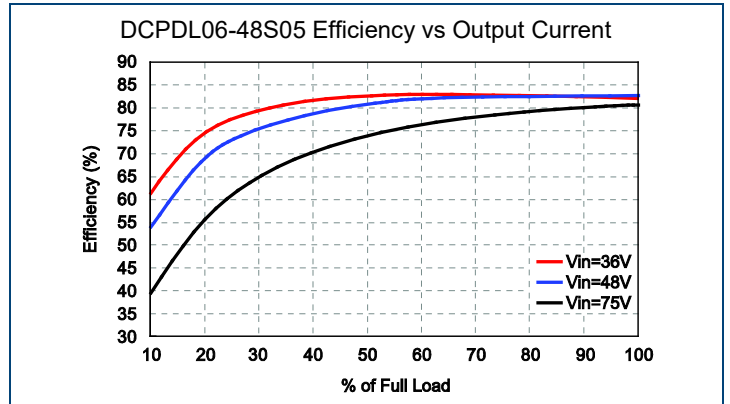
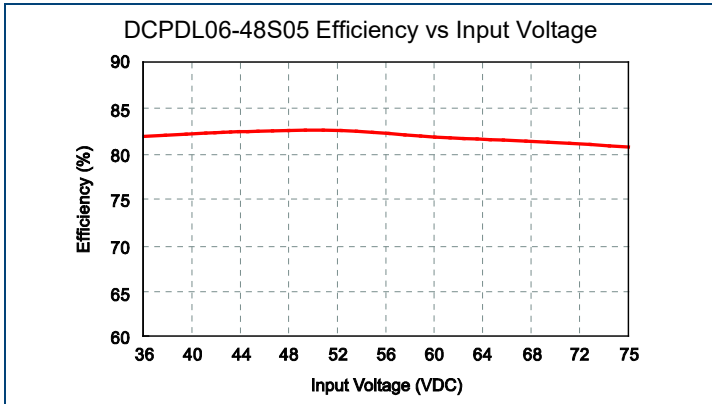


Negative Logic	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)
Vcc = 4.5~9 VDC	0.36	5.1	7.5
Vcc = 9~18 VDC	2.7	5.1	16
Vcc = 18~36 VDC	7.5	5.1	33
Vcc = 36~75 VDC	16	5.1	68

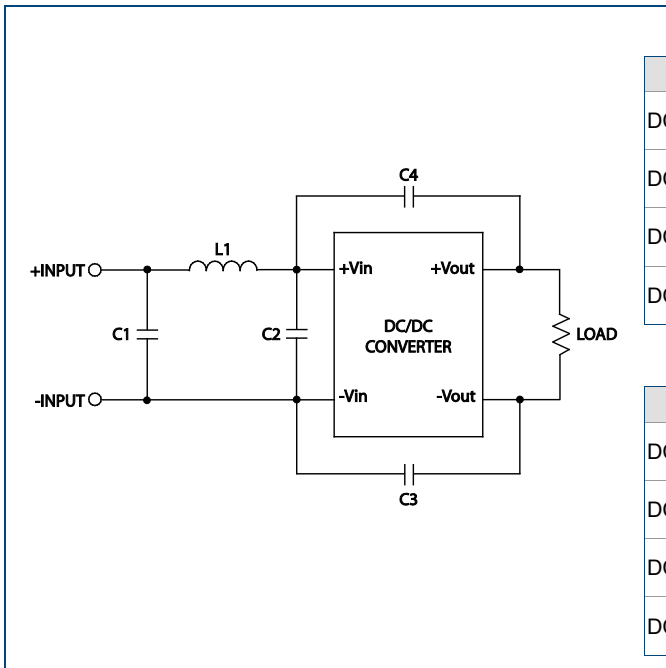
DERATING CURVES



EFFICIENCY CURVES



RECOMMENDED EMI FILTER



EN55022 Class A

Model	C1	C2	C3	L1
DCPDL06-05xxx	22µF/10V 1210 MLCC	22µF/10V 1210 MLCC	150pF/3KV 1808 MLCC	2.2µH 0504 SMD Inductor PMT-059
DCPDL06-12xxx	22µF/25V 1812 MLCC	N/A	680pF/3KV 1808 MLCC	8.2µH 0504 SMD Inductor PMT-077
DCPDL06-24xxx	10µF/50V 1210 MLCC	N/A	1000pF/3KV 1808 MLCC	10µH 0504 SMD Inductor PMT-047
DCPDL06-48xxx	4.7µF/100V 1812 MLCC	N/A	1000pF/3KV 1808 MLCC	33µH 0504 SMD Inductor PMT-089

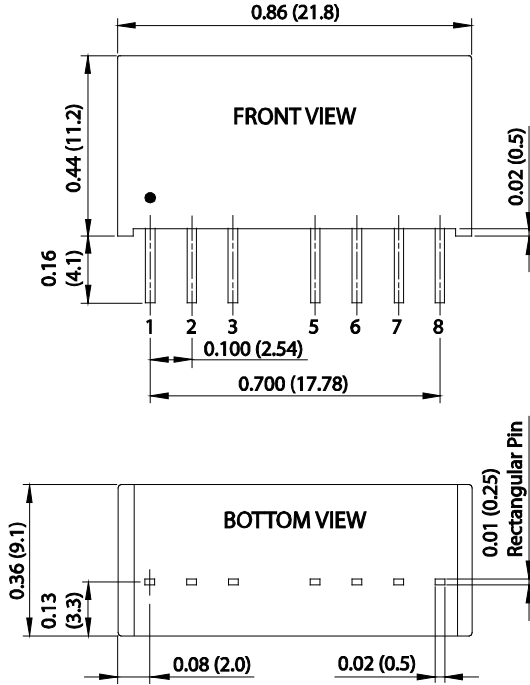
EN55022 Class B

Model	C1	C2	C3	C4	L1
DCPDL06-05xxx	47µF/16V 1210 MLCC	47µF/16V 1210 MLCC	150pF/3KV 1808 MLCC	N/A	3.3µH 0504 SMD Inductor PMT-044
DCPDL06-12xxx	22µF/25V 1812 MLCC	22µF/25V 1812 MLCC	330pF/3KV 1808 MLCC	330pF/3KV 1808 MLCC	8.2µH 0504 SMD Inductor PMT-077
DCPDL06-24xxx	10µF/50V 1210 MLCC	10µF/50V 1210 MLCC	330pF/3KV 1808 MLCC	330pF/3KV 1808 MLCC	10µH 0504 SMD Inductor PMT-047
DCPDL06-48xxx	4.7µF/100V 1812 MLCC	4.7µF/100V 1812 MLCC	330pF/3KV 1808 MLCC	330pF/3KV 1808 MLCC	33µH 0504 SMD Inductor PMT-089

MECHANICAL DRAWINGS

Plastic Case (Standard)

Unit: inches (mm)



PIN CONNECTIONS (Standard Models)		
PIN	SINGLE	DUAL
1	-INPUT	-INPUT
2	+INPUT	+INPUT
3	CTRL	CTRL
5	NC	NC
6	+OUTPUT	+OUTPUT
7	-OUTPUT	COMMON
8	NC	-OUTPUT

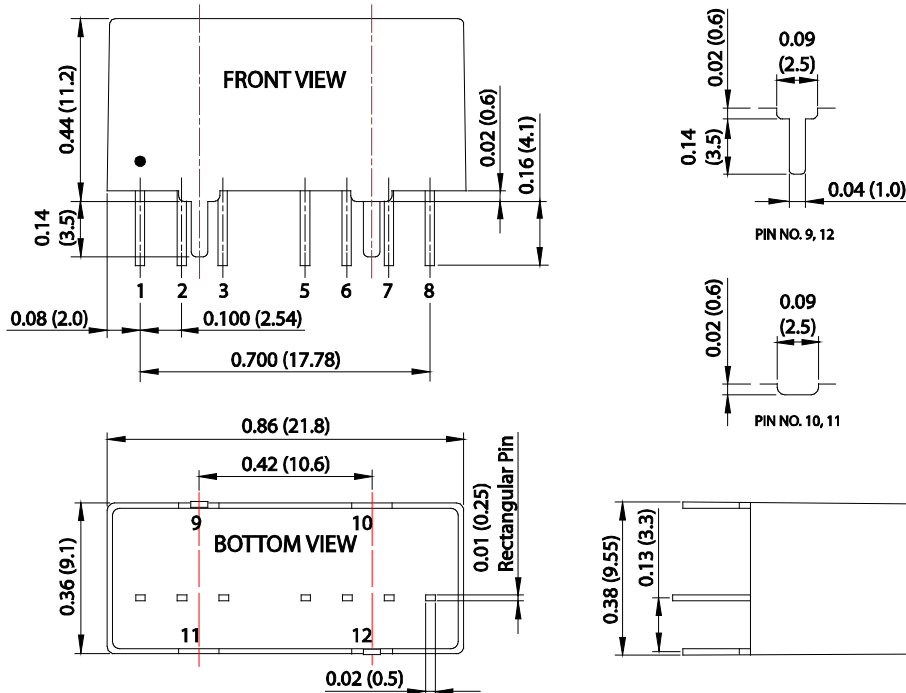
PIN CONNECTIONS (Suffix "H" Models)		
PIN	SINGLE	DUAL
1	-INPUT	-INPUT
2	+INPUT	+INPUT
3	CTRL	CTRL
5	NO PIN	NO PIN
6	+OUTPUT	+OUTPUT
7	-OUTPUT	COMMON
8	NC	-OUTPUT

NOTES

1. Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
2. Pin Pitch Tolerance: ±0.01 (±0.25)
3. Pin Dimension Tolerance: ±0.004 (±0.1)
4. All dimensions are for reference only

Metal Case (Suffix "M")

Unit: inches (mm)



PIN CONNECTIONS		
PIN	SINGLE	DUAL
1	-INPUT	-INPUT
2	+INPUT	+INPUT
3	CTRL	CTRL
5	NC	NC
6	+OUTPUT	+OUTPUT
7	-OUTPUT	COMMON
8	NC	-OUTPUT
9	CASE	CASE
10	STAND OFF	STAND OFF
11	STAND OFF	STAND OFF
12	CASE	CASE

NOTES

1. Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
2. Pin Pitch Tolerance: ±0.01 (±0.25)
3. Pin Dimension Tolerance: ±0.004 (±0.1)
4. All dimensions are for reference only

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 12: 9-18 VDC 24: 18-36 VDC 48: 36-75 VDC	S: Single Output D: Dual Output	33: 3.3 VDC 05: 5 VDC 09: 9 VDC 12: 12 VDC 15: 15 VDC 24: 24 VDC 05: ±5 VDC 12: ±12 VDC 15: ±15 VDC	None: Plastic Case w/ 1600VDC isolation H: Plastic Case w/ 3000VDC Isolation M: Metal Case w/ 1600VDC isolation

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 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:

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