Size:
1.25 x 0.80 x 0.40 inches
(31.8 x 20.3 x 10.2 mm)

Applications:
- Medical Equipment
- Telecom/Datacom
- Industry Control Systems
- Semiconductor Equipment
- PV Power Systems
- IGBT Gate Drivers

FEATURES

- 2µA Patient Leakage Current
- Single & Dual Outputs
- Under Voltage Protection
- High Efficiency up to 89%
- 2:1 Wide Input Voltage Ranges
- Built-in EMI Class A Filter
- Low Stand-by Power Consumption
- 6 Watts Output Power
- Reinforced Insulation for 300VAC Working Voltage
- Clearance and Creepage Distance: 6.6mm/2MOOP
- 3000VAC Input to Output 2MOOP Isolation
- Short Circuit, Over Voltage, and Over Load Protection
- CE Mark Meets 2006/95/EC, 2011/95/EC, and 2004/108/EC
- Compliant to RoHS EU Directive 2011/65/EU
- ANSI/AAMI ES60601-1, EN60601-1, & IEC60601-1 Safety Approvals
- Optional Remote ON/OFF Control and Trim Pin

DESCRIPTION

The DCMOP06 series of medical DC/DC power converters provides 6 Watts of output power in a 1.25" x 0.80" x 0.40" DIP package. This series consists of 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 89%, 3000VDC I/O (2 MOOP) isolation, and low stand-by power consumption. These converters are also protected against under voltage, short circuit, over voltage, and over load conditions. All models are RoHS compliant and have ANSI/AAMI ES60601-1, EN60601-1, and IEC60601-1 safety approvals. Remote ON/OFF and Trim functions are also available for this series.

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
DCMOP06-5S33x	5 VDC (4.5 - 9 VDC)	3.3 VDC	1800mA	30mVp-p	10mA	6W	82.5%	2100µF
DCMOP06-5S05x		5 VDC	1200mA	30mVp-p	10mA	6W	86%	1500µF
DCMOP06-5S12x		12 VDC	500mA	40mVp-p	15mA	6W	86%	260µF
DCMOP06-5S15x		15 VDC	400mA	40mVp-p	15mA	6W	86%	210µF
DCMOP06-5S24x		24 VDC	250mA	50mVp-p	20mA	6W	86.5%	75µF
DCMOP06-12S33x	12 VDC (9 - 18 VDC)	3.3 VDC	1800mA	30mVp-p	10mA	6W	83%	2100µF
DCMOP06-12S05x		5 VDC	1200mA	30mVp-p	10mA	6W	85.5%	1500µF
DCMOP06-12S12x		12 VDC	500mA	40mVp-p	10mA	6W	88%	260µF
DCMOP06-12S15x		15 VDC	400mA	40mVp-p	10mA	6W	89%	210µF
DCMOP06-12S24x		24 VDC	250mA	50mVp-p	10mA	6W	89%	75µF
DCMOP06-24S33x	24 VDC (18 - 36 VDC)	3.3 VDC	1800mA	30mVp-p	6mA	6W	83%	2100µF
DCMOP06-24S05x		5 VDC	1200mA	30mVp-p	6mA	6W	86.5%	1500µF
DCMOP06-24S12x		12 VDC	500mA	40mVp-p	6mA	6W	89%	260µF
DCMOP06-24S15x		15 VDC	400mA	40mVp-p	6mA	6W	89%	210µF
DCMOP06-24S24x		24 VDC	250mA	50mVp-p	6mA	6W	88.5%	75µF
DCMOP06-48S33x	48 VDC (36 - 75 VDC)	3.3 VDC	1800mA	30mVp-p	4mA	6W	82.5%	2100µF
DCMOP06-48S05x		5 VDC	1200mA	30mVp-p	4mA	6W	86.5%	1500µF
DCMOP06-48S12x		12 VDC	500mA	40mVp-p	4mA	6W	88%	260µF
DCMOP06-48S15x		15 VDC	400mA	40mVp-p	4mA	6W	89%	210µF
DCMOP06-48S24x		24 VDC	250mA	50mVp-p	4mA	6W	88%	75µF

DUAL 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
DCMOP06-5D05x	5 VDC (4.5 - 9 VDC)	±5 VDC	±600mA	30mVp-p	25mA	6W	84%	±860µF
DCMOP06-5D12x		±12 VDC	±250mA	40mVp-p	25mA	6W	86.5%	±150µF
DCMOP06-5D15x		±15 VDC	±200mA	40mVp-p	25mA	6W	87.5%	±110µF
DCMOP06-12D05x	12 VDC (9 - 18 VDC)	±5 VDC	±600mA	30mVp-p	10mA	6W	84%	±860µF
DCMOP06-12D12x		±12 VDC	±250mA	40mVp-p	10mA	6W	89%	±150µF
DCMOP06-12D15x		±15 VDC	±200mA	40mVp-p	10mA	6W	88%	±110µF
DCMOP06-24D05x	24 VDC (18 - 36 VDC)	±5 VDC	±600mA	30mVp-p	6mA	6W	85%	±860µF
DCMOP06-24D12x		±12 VDC	±250mA	40mVp-p	6mA	6W	88.5%	±150µF
DCMOP06-24D15x		±15 VDC	±200mA	40mVp-p	6mA	6W	88%	±110µF
DCMOP06-48D05x	48 VDC (36 - 75 VDC)	±5 VDC	±600mA	30mVp-p	4mA	6W	85%	±860µF
DCMOP06-48D12x		±12 VDC	±250mA	40mVp-p	4mA	6W	88%	±150µF
DCMOP06-48D15x		±15 VDC	±200mA	40mVp-p	4mA	6W	88%	±110µF

SPECIFICATIONS: DCMOP06 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 12VDC nominal input models 24VDC nominal input models 48VDC nominal input models		4.5 9 18 36	5 12 24 48	9 18 36 75	VDC
Start-Up Voltage	5VDC nominal input models 12VDC nominal input models 24VDC nominal input models 48VDC nominal input models				4.5 9 18 36	VDC
Shutdown Voltage	5VDC nominal input models 12VDC nominal input models 24VDC nominal input models 48VDC nominal input models			4 8 16 33		VDC
Input Surge Voltage (3sec, max.)	5VDC nominal input models 12VDC nominal input models 24VDC nominal input models 48VDC nominal input models				16 25 50 100	VDC
Input Current	No Load		See Table			
Input Filter			Pi type			
Remote ON/OFF Control *(Only for "B" type pin connection models)*	Referenced to –INPUT pin	DC/DC ON DC/DC OFF	Open or 0 ~ 1.2VDC 2.2 ~ 12 VDC			
Input Current of CTRL Pin	Nominal Vin		-0.5		1	mA
Remote OFF Input Current	Nominal Vin			2.5		mA
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy			-1.0		+1.0	%
Line Regulation	Low line to high line at full load	Single Output Models Dual Output Models	-0.2 -0.5		+0.2 +0.5	%
Load Regulation	No load to full load	Single Output Models Dual Output Models	-0.2 -1.0		+0.2 +1.0	%
Cross Regulation	Asymmetrical load 25%/100% FL	Dual Output Models	-5.0		+5.0	%
Voltage Adjustability *(Only for "B" type pin connection models)*	Single Output Models	3.3V, 5V, 12V Output Models 15V, 24V Output Models	-10 -10		+10 +20	%
	Dual Output Models	±5V, ±12V, ±15V Output Models	-10		+10	%
Output Power			See Table			
Output Current			See Table			
Maximum Capacitive Load	Minimum input and constant resistive load		See Table			
Ripple & Noise (20MHz BW)	Measured with a 10µF/25V X7R MLCC Measured with a 10µF/25V X7R MLCC Measured with a 4.7µF/50V X7R MLCC	3.3V, 5V Output Models 12V, 15V Output Models 24V Output Models		30 40 50		mVp-p
Transient Response Recovery Time	25% load step change			250		µs
Start-Up Time	Constant resistive load	Power Up Remote On/Off		30 30		ms
Temperature Coefficient			-0.02		+0.02	%/°C
PROTECTION						
Short Circuit Protection			Continuous, automatic recovery			
Over Load Protection	% of rated Iout; hiccup mode			150		%
Over Voltage Protection	Continuous clamp	3.3V Output Models 5V Output Models 12V Output Models 15V Outputs Models 24V Output Models	3.7 5.6 13.5 18.3 29.1		5.4 7.0 19.6 22.0 32.5	VDC

SPECIFICATIONS: DCMOP06 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
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load			See Table		
Switching Frequency			225	250	275	kHz
Isolation Voltage	1 minute	Input to Output	3000			VAC
Isolation Capacitance				12	17	pF
Leakage Current	240VAC, 60Hz				2	µA
Clearance/Creepage			6.6			mm
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	Without derating		-40		+88	°C
	With derating		+88		+105	
Storage Temperature Range			-55		+125	°C
Thermal Impedance	Natural convection (20LFM)			18		°C/W
Relative Humidity			5		95	% RH
Thermal Shock				MIL-STD-810F		
Vibration				MIL-STD-810F		
MTBF	MIL-HDBK-217F Ta=25°C, full load (G/B, controlled environment)			1,115,000 hours		
PHYSICAL SPECIFICATIONS						
Weight				0.48oz (14g)		
Dimensions (L x W x H)				1.25x0.80x0.40 inches (31.8x20.3x10.2mm)		
Case Material				Non-conductive black plastic		
Base Material				Non-conductive black plastic		
Potting Material				Silicon (UL94-V0)		
SAFETY & EMC CHARACTERISTICS						
Safety Approvals (pending)				ANSI/AAMI ES60601-1, IEC60601-1, EN60601-1		
EMI (See Note 2)	EN55011, EN55022, and FCC Part 18					Class A
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 3)	EN61000-4-4	±2kV				Perf. Criteria A
Surge (See Note 3)	EN61000-4-5	±2kV				Perf. Criteria A
Conducted Immunity	EN61000-4-6	10 Vrms				Perf. Criteria A

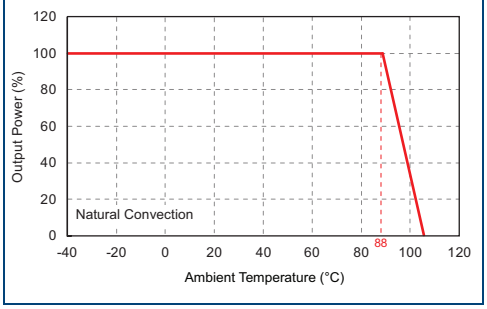
NOTES

1. The "**x**" in the model number represents the Pin Connection type. It can be "**A**" for pin connection type A or "**B**" for pin connection type B. See mechanical drawings on page 4 for more information.
2. The DCMOP06 series meets EMI Class A without an external filter added. This series can only meet EMI Class B with external components added. Please contact factory for more information.
3. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
   - For 5VDC nominal input models we recommend connecting an aluminum electrolytic capacitor (Nippon Chemi-con KY series, 1000µF/25V) and a reverse diode (Vishay V10P45) in parallel.
   - For 12VDC & 24VDC nominal input models we recommend connecting an aluminum electrolytic capacitor (Nippon Chemi-con KY series, 470µF/50V) in parallel.
   - For 48VDC nominal input models we recommend connecting an aluminum electrolytic capacitor (Nippon Chemi-con KY series, 330µF/100V) in parallel.
4. Remote ON/OFF control is optional and is only available for "B" type pin connection models. To order the converter with remote ON/OFF add the suffix "-P" to the model number (Ex: DCMOP06-48S12B-P).
5. Trim function is optional and is only available for "B" type pin connection models. To order the converter with Trim pin add the suffix "-T" to the model number (Ex: DCMOP06-48S12B-T).

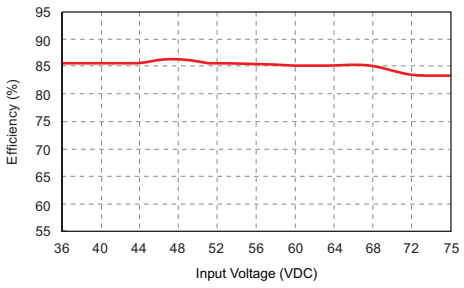
CAUTION: This power module is not internally fused. An input line fuse must always be used.

CHARACTERISTIC CURVES

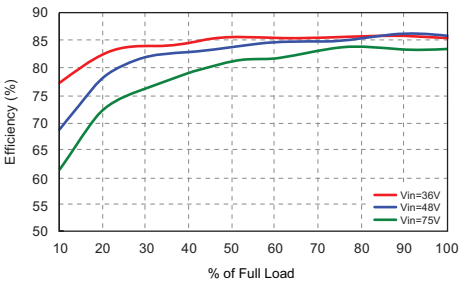
DCMOP06-48S05A Derating Curve



DCMOP06-48S05A Efficiency vs Input Voltage



DCMOP06-48S05A Efficiency vs Output Load

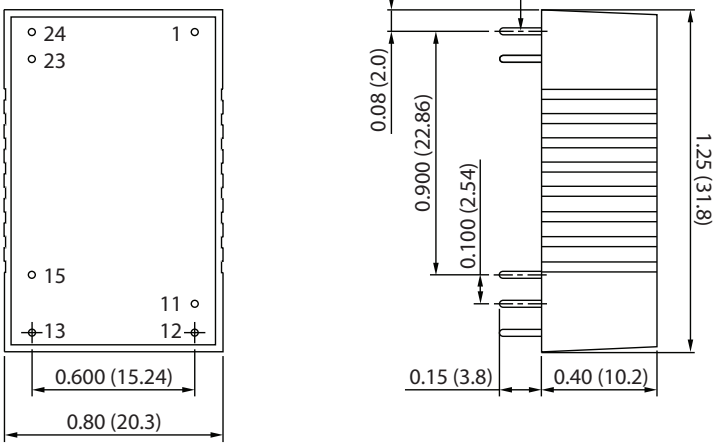


MECHANICAL DRAWINGS

A Type Pin Connection (Suffix "A")

Unit: inches (mm)

Pin size is 0.023 (0.60) Dia



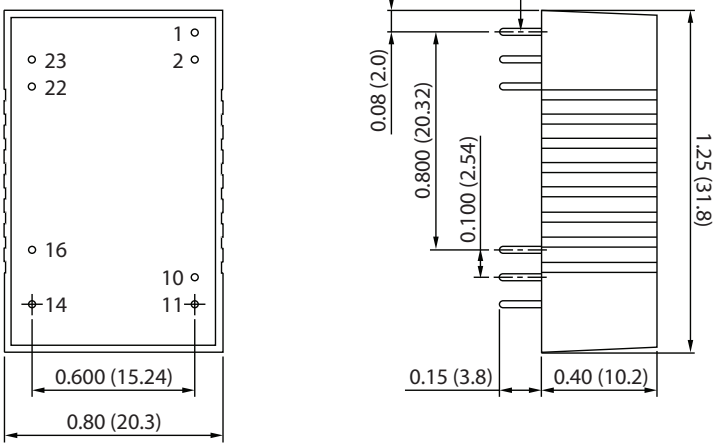
PIN CONNECTIONS		
PIN	SINGLE	DUAL
1	+INPUT	+INPUT
11	NO PIN	COMMON
12	-OUTPUT	NO PIN
13	+OUTPUT	-OUTPUT
15	NO PIN	+OUTPUT
23	-INPUT	-INPUT
24	-INPUT	-INPUT

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)

B Type Pin Connection (Suffix "B")

Unit: inches (mm)

Pin size is 0.023 (0.60) Dia



PIN CONNECTIONS		
PIN	SINGLE	DUAL
1	CTRL (Optional)	CTRL (Optional)
2	-INPUT	-INPUT
10	TRIM (Optional)	TRIM (Optional)
11	**NO PIN / NC	-OUTPUT
14	+OUTPUT	+OUTPUT
16	-OUTPUT	COMMON
22	+INPUT	+INPUT
23	+INPUT	+INPUT

**: For Single Output Models Pin 11 is "NO PIN" with the Trim pin option (Suffix "–T") and "NC" without the trim pin option.

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)

MODEL NUMBER SETUP

DCMOP	06	-	48	S	05	B	-	P (1)	T (1)
Series Name	Output Power		Input Voltage	Output Quantity	Output Voltage	Pin Connection		Remote ON/OFF Option	Trim Option
	06: 6 Watts		**5:** 5 VDC	**S:** Single Output	**33:** 3.3 VDC	**A:** A Type		**None:** No Remote ON/OFF	**None:** No Trim
			12: 12 VDC		**05:** 5 VDC	**B:** B Type		**P:** Remote ON/OFF	**T:** Trim
			24: 24 VDC		**12:** 12 VDC				
			48: 48 VDC		**15:** 15 VDC				
					24: 24 VDC				
				D: Dual Output	**05:** ±5 VDC				
					12: ±12 VDC				
					15: ±15 VDC				

(1) Remote ON/OFF Control and Trim options are only available for "B" type pin connection models.

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 ISO9001-2008 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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