PWR40XX

SERIES DC/DC CONVERTER

POWER: 4 Watt
LOW COST UNREGULATED
SIZE: 1.125" X 1.125" X 0.40"

C&D TECHNOLOGIES
Power Solutions
POWER ELECTRONICS DIVISION

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PRODUCT DATA SHEET

DESCRIPTION

The PWR40XX Series offers a low-cost alternative for some of the most popular DC/DC converters industry wide. Each model has a high-isolation version and an outstanding demonstrated MTTF of 5,000,000 hours at 25°C. The superior reliability and low cost make it an excellent choice for industry standard usages.

The series includes thirteen standard models (other input and output voltages are available upon request), all set in a flexible encapsulation material which has excellent thermal dissipation and low mechanical stress on internal components. The use of surface-mount devices and manufacturing processes, combined with the encapsulation process, provides the user a product that is environmentally rugged.

The PWR40XX has full isolation between input and output to give the designer maximum flexibility in grounding options and polarity configurations. The outputs are protected against momentary short circuits.

FEATURES

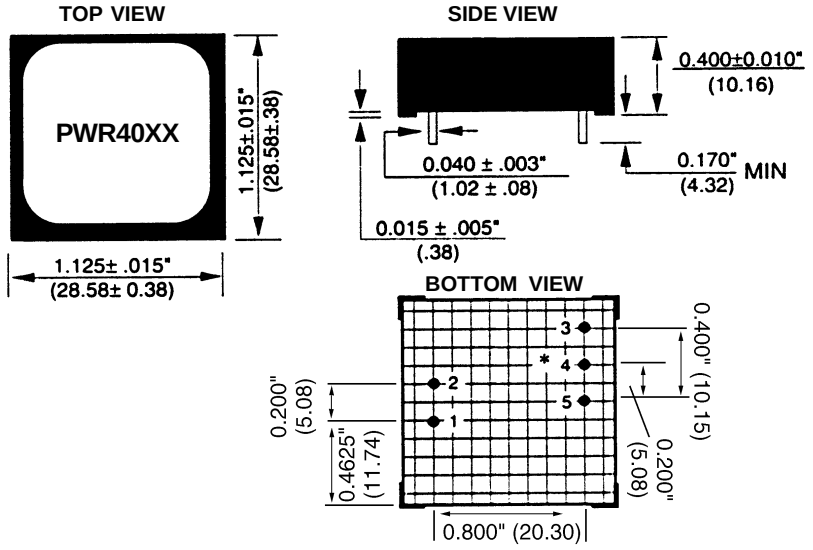
- **LOW COST**
- **INDUSTRY-STANDARD PACKAGE**
- **SINGLE AND DUAL OUTPUTS**
- **INTERNAL INPUT AND OUTPUT FILTERING**
- **HIGH ISOLATION VOLTAGE OPTION AVAILABLE**

MECHANICAL

Notes:
All dimensions are in inches (millimeters).
GRID: 0.100 inches (2.54 millimeters)
*Common pins not present on single output models.
PIN PLACEMENT TOLERANCE: ± 0.015"
Marked with: specific model ordered, date code, job code.

MATERIAL: Units are encapsulated in a low thermal resistance molding compound which has excellent chemical resistance, wide operating temperature range, and good electrical properties under high humidity environments. The encapsulant and outer shell of the unit have UL94V-0 ratings. Lead material is brass with a solder plated surface to allow ease of solderability.

PIN #	FUNCTION
1	$+V_{IN}$
2	$-V_{IN}$
3	$+V_{OUT}$
4	*Common
5	$-V_{out}$



ELECTRICAL SPECIFICATIONS

Specifications typical at T_A = +25°C, nominal input voltage and rated output current unless otherwise specified.

MODEL	MINIMUM INPUT VOLTAGE (V_{DC})	NOMINAL INPUT VOLTAGE (V_{DC})	MAXIMUM INPUT VOLTAGE (V_{DC})	RATED OUTPUT VOLTAGE (V_{DC})	RATED OUTPUT CURRENT (mA)	INPUT CURRENT		REFLECTED RIPPLE CURRENT (mAp-p)
						NO LOAD (mA)	RATED LOAD (mA)	
PWR4000	4.5	5	5.5	5	800	50	950	20
PWR4004	4.5	5	5.5	±12	±170	50	950	20
PWR4005	4.5	5	5.5	±15	±135	50	950	20
PWR4006	10.2	12	13.8	5	800	35	400	30
PWR4007	10.2	12	13.8	12	340	35	400	30
PWR4010	10.2	12	13.8	±12	±170	35	400	30
PWR4011	10.2	12	13.8	±15	±135	35	400	40
PWR4012	12.75	15	17.25	5	800	30	300	40
PWR4016	12.75	15	17.25	±12	±170	30	300	40
PWR4017	12.75	15	17.25	±15	±135	30	300	40
PWR4018	20.40	24	27.6	5	800	30	180	40
PWR4022	20.40	24	27.6	±12	±170	30	180	40
PWR4023	20.40	24	27.6	±15	±135	30	180	40

Other input and output voltage options may be available. Please contact factory.

COMMON SPECIFICATIONS

Specifications typical at T_A = +25°C, nominal input voltage and rated output current unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
ISOLATION (Standard)					
Rated Voltage		500			V_{DC}
Test Voltage	60Hz, 10 seconds	500			Vpk
Resistance			10		GW
Capacitance			50		pF
Leakage Current	V_{ISO} = 240VAC, 60Hz		5		µArms
ISOLATION (–HV Option)					
Rated Voltage		1000			V_{DC}
Test Voltage	60Hz, 60 seconds	3000			Vpk
Resistance			10		GΩ
Capacitance			50		pF
Leakage Current	V_{ISO} = 240V_{AC}, 60Hz		5	15	µArms
OUTPUT					
Rated Power			4.0		W
Voltage Setpoint Accuracy	Rated Load, Nominal V_{IN}		±3	+7, -5	%
Temperature Coefficient			±0.02		%/°C
Ripple & Noise	BW = DC to 10MHz		140		mVp-p
	BW = 10Hz to 20MHz		10		mVrms
Voltage	No Load, V_{OUT} = + 5V			7	V_{DC}
	No Load, V_{OUT} = ±12V			±15	V_{DC}
	No Load, V_{OUT} = ±15V			±18	V_{DC}
Line Regulation			1.0		%/%V_{IN}
Load Regulation			See Curves		
GENERAL					
Switching Frequency			170		kHz
Package Weight			16		g
MTTF per MIL-HDBK-217 Rev. E *	Circuit Stress Method		5,000,000		Hr
Efficiency			80		%
TEMPERATURE					
Specification		0	+25	+70	°C
Operation		–25		+85	°C
Storage		–40		+100	°C

ABSOLUTE MAXIMUM RATINGS

Output Short-Circuit Duration	1 second
Internal Power Dissipation	850mW
Lead Temperature (soldering, 10 seconds max)	+300°C

ORDERING INFORMATION

PWR 40XX -HV /H

Device Family
PWR indicates DC/DC converter

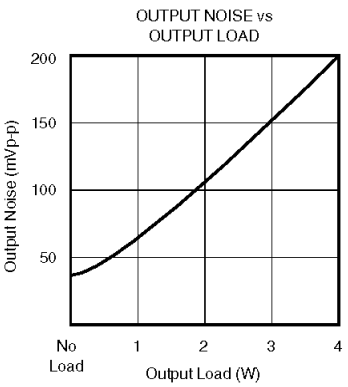
Model Number
Selected from Table of Electrical Characteristics

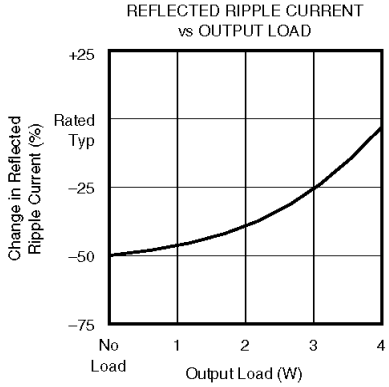
High Voltage Option
No Designator Indicates Standard Model

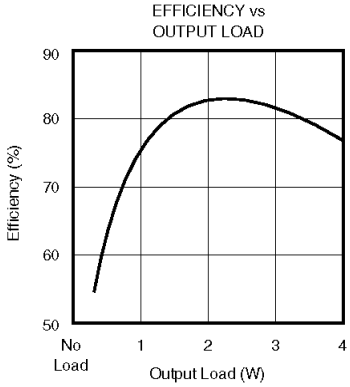
Optional Screening

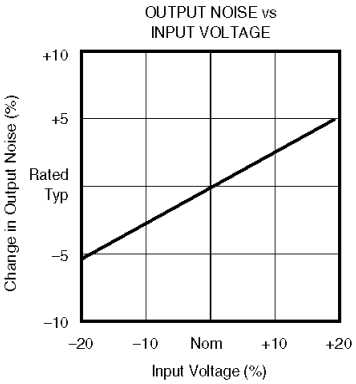
TYPICAL PERFORMANCE CURVES

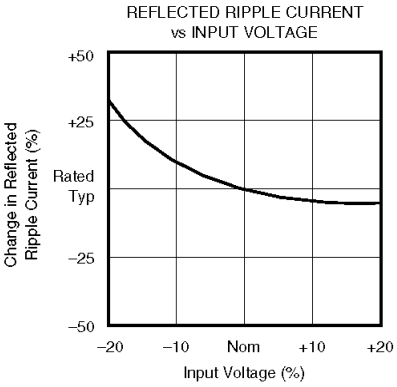
T_A = +25°C, Rated Input Voltage, rated Output Current unless otherwise noted.

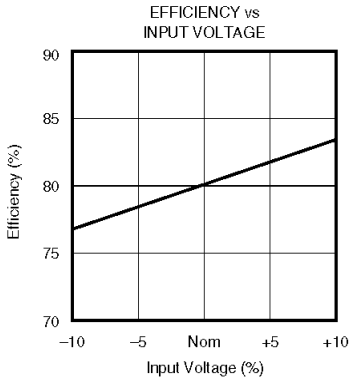






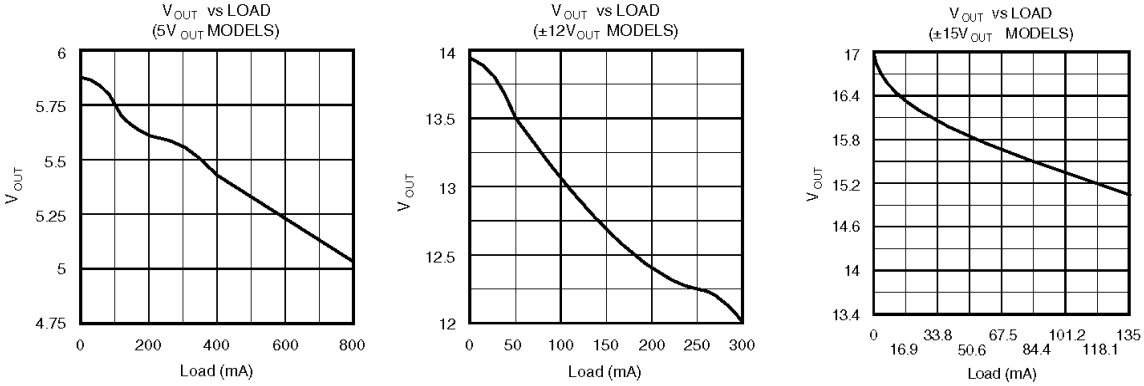


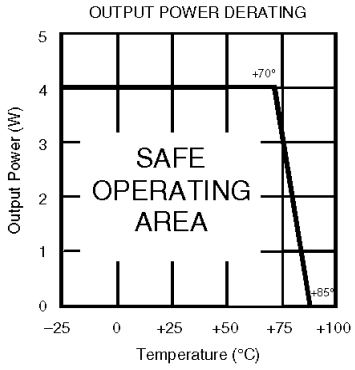




TYPICAL PERFORMANCE CURVES

T_A = +25°C, rated input voltage, rated output current unless otherwise noted.





APPLICATION NOTES

SHORT CIRCUIT PROTECTION

To maintain low cost, the PWR40XX Series provides limited short-circuit protection. To protect against continuous short circuits, a fuse is required. It is recommended that the fuse be placed in series with the input of the converter. The required I^2t will vary with input voltage.

Input Voltage	Littlefuse© Part Number
5V	229.015
12V	229.500
15V	229.375
24V	229.250

TABLE I. Recommended Fuses (or Equivalent).

OUTPUT POWER

The PWR40XX series was designed to meet power requirements up to 4W. Due to the nature of unregulated power supplies, a higher-than-rated output voltage will result when less-than-rated power is used (see Typical Performance Curves). This series has been designed to run from no load to 4W without derating up to +70°C.

UNBALANCED LOADS

Unbalanced loads may be used on dual output models with each side sourcing up to 200mA as long as the total power out is not more than 4W. With an unbalanced load, the output voltages will track within 5% of each other.

OUTPUT NOISE

The output noise can be reduced to less than 50mVp-p by adding a low ESR 10µf tantalum capacitor across each output.

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