C&D TECHNOLOGIES

Product Data Sheet

1.5 WATTS UNREGULATED DC/DC CONVERTERS

PWR13XX

FEATURES

- HIGH ISOLATION - 4000V RATING
- 8000V ISOLATION TEST VOLTAGE
- BARRIER 100% PRODUCTION TESTED
- LOW BARRIER CAPACITANCE - 10PF
- LOW LEAKAGE CURRENT - 2µA MAX
- 24-PIN DIP PACKAGE
- INTERNAL FILTERING

APPLICATIONS

- BIOMEDICAL DATA ACQUISITION
- INDUSTRIAL PROCESS CONTROL
- ANALYTICAL MEASUREMENTS
- GROUND LOOP ELIMINATION
- INTRINSIC SAFETY SYSTEMS

DESCRIPTION

The PWR13XX Series offers a broad line of low-cost, high-isolation voltage, unregulated, single and dual output DC/DC converters in a 24-pin DIP package. These small converters offer a 4000V isolation rating in a 1.25" x 0.8" package area.

The dielectric withstand characteristics of each converter is tested in production to ensure barrier integrity. During the development of the PWR13XX Series extensive testing was done to verify that subjecting the barrier to as many as ten barrier tests will not destroy the barrier.

The PWR13XX Series uses advanced circuit design and packaging technology to realize superior reliability and performance. A 220kHz driven push-pull oscillator is used to ensure stable frequency and non-saturating operation of the input stage. This means there are no high peak voltages or currents like other design topologies, which can reduce unit reliability. Reliability is further enhanced by the use of MOSPOWER transistors. These rugged devices permit higher frequency operation with less complicated drive circuitry than is possible with bipolar power transistors. Reduced parts count adds to the reliability of the PWR13XX Series.

The high efficiency of the PWR13XX Series means less internal power dissipation. With less heat to dissipate, the PWR13XX Series can operate over a wider ambient temperature range with no degradation of reliable operation.

The PWR13XX Series offers the user low cost without sacrificing reliability. The use of surface mounted devices and manufacturing technologies make it possible to offer premium performance and low cost. Testing of the PWR13XX isolation barrier is performed per the methods set forth by UL544, VDE750, CSA 22.2 and IEC 601-1.

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ELECTRICAL SPECIFICATIONS

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

MODEL	NOMINAL INPUT VOLTAGE (V_{DC})	RATED OUTPUT VOLTAGE (V_{DC})	RATED OUTPUT CURRENT (mA)	INPUT CURRENT NO LOAD (mA)	INPUT CURRENT RATED LOAD (mA)	REFLECTED RIPPLE CURRENT (mAp-p)
PWR1300	5	5	300	50	400	30
PWR1301	5	12	125	50	400	30
PWR1302	5	15	100	50	400	30
PWR1303	5	± 5	±150	50	400	30
PWR1304	5	±12	±63	50	400	30
PWR1305	5	±15	±50	50	400	30
PWR1306	12	5	300	30	167	25
PWR1307	12	12	125	30	167	25
PWR1308	12	15	100	30	167	25
PWR1309	12	± 5	±150	30	167	25
PWR1310	12	±12	±63	30	167	25
PWR1311	12	±15	±50	30	167	25
PWR1312	15	5	300	30	133	20
PWR1313	15	12	125	30	133	20
PWR1314	15	15	100	30	133	20
PWR1315	15	± 5	±150	30	133	20
PWR1316	15	±12	±63	30	133	20
PWR1317	15	±15	±50	30	133	20

COMMON SPECIFICATIONS

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

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT					
Voltage Range		4.5	5	5.5	V_{DC}
		10.8	12	13.2	V_{DC}
		13.5	15	16.5	V_{DC}
ISOLATION					
Rated Voltage		4,000			V_{DC}
Test Voltage	60 Hz, 60 Seconds	8,000			Vpk
Resistance			10		GΩ
Capacitance			10		pF
Leakage Current	V_{ISO}= 240VAC, 60Hz		1	2	µArms
OUTPUT					
Rated Power			1.5		Watts
Voltage Setpoint Accuracy	Rated Load, Nominal V_{in}			±5	%
Ripple & Noise	BW = DC to 10MHz		40		mVp-p
	BW = 10Hz to 2MHz		10		mVrms
REGULATION					
Line Regulation	High Line to Low Line		1.5		%/%
Load Regulation	See Performance Curves				
GENERAL					
Efficiency			75		%
Switching Frequency			220		kHz
Package Weight			12		g
MTTF per MIL-HDBK-217, Rev. E	Circuit Stress Method				
Ground Benign	T_A = +25°C		2,000,000		Hr
	T_A = +85°C		90,000		Hr
Fixed Ground	T_A = +35°C		540,000		Hr
Naval Sheltered	T_A = +35°C		300,000		Hr
Airborne Uninhabited Fighter	T_A = +35°C		55,000		Hr
TEMPERATURE					
Specification		-40	+25	+85	°C
Operation		-55		+100	°C
Storage		-55		+110	°C

ABSOLUTE MAXIMUM RATINGS

Output Short-Circuit Duration ..... 5 seconds
Internal Power Dissipation 750mW
Lead Temperature (soldering, 10 seconds max) ..... +300°C

ORDERING INFORMATION

PWR 13XX A /H

Device Family
PWR indicates DC/DC converter

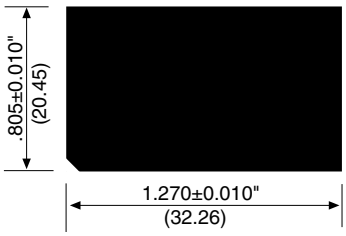
Model Number
Selected from Table of Electrical Characteristics

Package

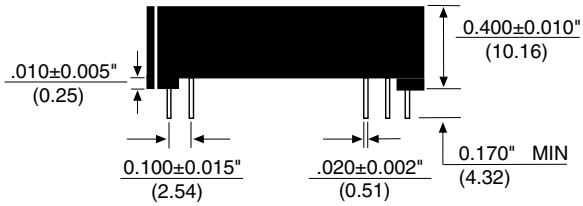
Screening Option

MECHANICAL

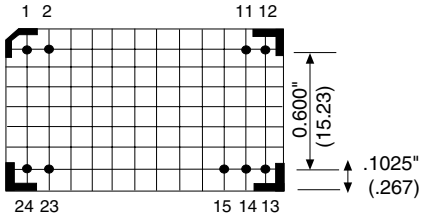
TOP VIEW



SIDE VIEW



BOTTOM VIEW



PIN CONNECTIONS

PIN	SINGLE MODELS	DUAL MODELS
1	$+V_{IN}$	$+V_{IN}$
2	$+V_{IN}$	$+V_{IN}$
11	$+V_{OUT}$	$+V_{OUT}$
12	$+V_{OUT}$	$+V_{OUT}$
13	$-V_{OUT}$	Common
14	$-V_{OUT}$	Common
15	No Pin	$-V_{OUT}$
23	$-V_{IN}$	$-V_{IN}$
24	$-V_{IN}$	$-V_{IN}$

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"

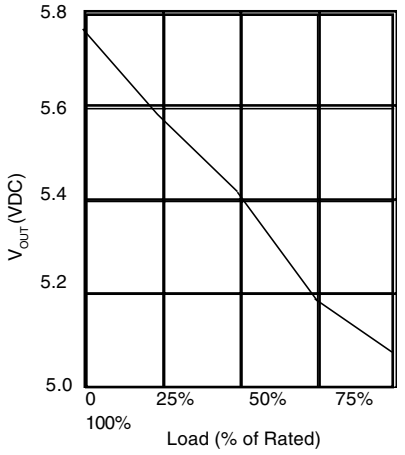
Marked with: specific model ordered, date code, job code.

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.

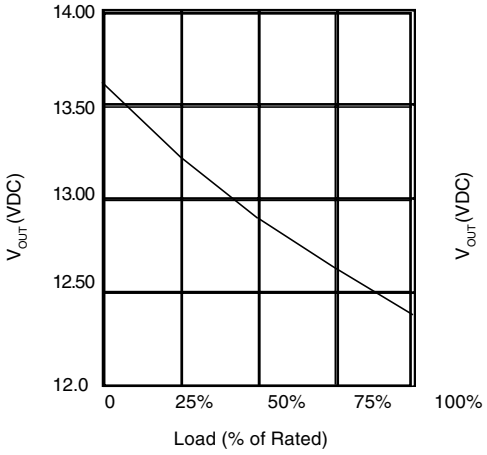
TYPICAL PERFORMANCE CURVES

Specifications at T_A = +25°C, nominal input voltage, rated output current

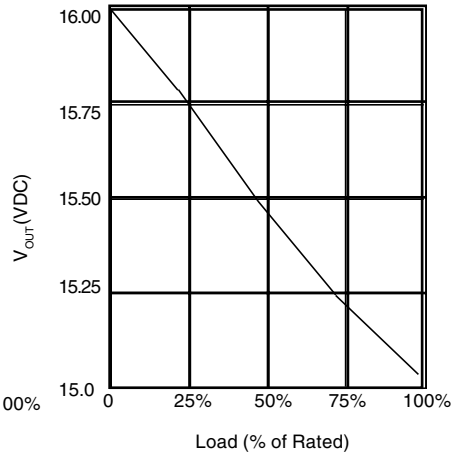
V_{OUT} VS LOAD
(5VOUT MODELS)



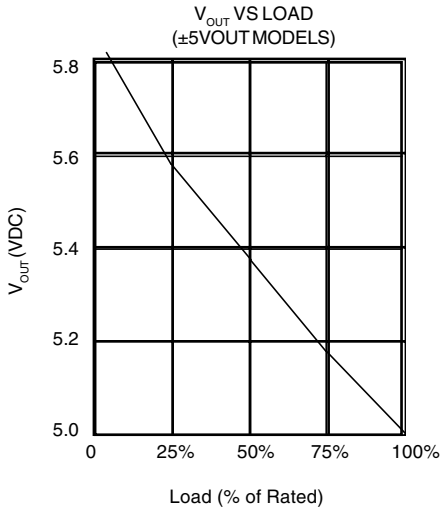
V_{OUT} VS LOAD
(12VOUT MODELS)



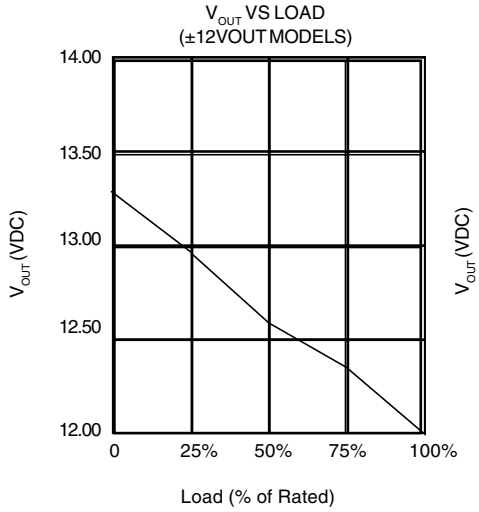
V_{OUT} VS LOAD
(15VOUT MODELS)



V_{OUT} VS LOAD
(±5VOUT MODELS)



V_{OUT} VS LOAD
(±12VOUT MODELS)



V_{OUT} VS LOAD
(±15VOUT MODELS)