Murata Power Solutions

PWR13xxC

1.5 Watts Unregulated DC/DC Converters



FEATURES

- ROHS COMPLIANT
- 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 PWR13XXC 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 PWR13XXC Series extensive testing was done to verify that subjecting the barrier to as many as ten barrier tests will not destroy the barrier.

The PWR13XXC 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 PWR13XXC Series.

The high efficiency of the PWR13XXC Series means less internal power dissipation. With less heat to dissipate, the PWR13XXC Series can operate over a wider ambient temperature range with no degradation of reliable operation.

The PWR13XXC 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 PWR13XXC isolation barrier is performed per the methods set forth by UL544, VDE750, CSA 22.2 and IEC 601-1.

RoHS COMPLIANT 2002/95/EC

For full details go to www.murata-ps.com/rohs

c UL us

ISO9001 CERTIFIED

ELECTRICAL SPECIFICATIONS

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

MODEL	NOMINAL INPUT VOLTAGE (VDC)	RATED OUTPUT VOLTAGE (VDC)	RATED OUTPUT CURRENT (mA)	INPUT CURRENT NO LOAD (mA)	INPUT CURRENT RATED LOAD (mA)	REFLECTED RIPPLE CURRENT (mAp-p)
PWR1300AC	5	5	300	50	400	30
PWR1301AC	5	12	125	50	400	30
PWR1302AC	5	15	100	50	400	30
PWR1303AC	5	± 5	±150	50	400	30
PWR1304AC	5	±12	±63	50	400	30
PWR1305AC	5	±15	±50	50	400	30
PWR1306AC	12	5	300	30	167	25
PWR1307AC	12	12	125	30	167	25
PWR1308AC	12	15	100	30	167	25
PWR1309AC	12	± 5	±150	30	167	25
PWR1310AC	12	±12	±63	30	167	25
PWR1311AC	12	±15	±50	30	167	25
PWR1312AC	15	5	300	30	133	20
PWR1313AC	15	12	125	30	133	20
PWR1314AC	15	15	100	30	133	20
PWR1315AC	15	± 5	±150	30	133	20
PWR1316AC	15	±12	±63	30	133	20
PWR1317AC	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	VDC
		10.8	12	13.2	VDC
		13.5	15	16.5	VDC
ISOLATION					
Rated Voltage		4,000			VDC
Test Voltage	60 Hz, 60 Seconds	8,000			Vpk
Resistance			10		GΩ
Capacitance			10		pF
Leakage Current	VISO= 240VAC, 60Hz		1	2	µArms
OUTPUT					
Rated Power			1.5		Watts
Voltage Setpoint Accuracy	Rated Load, Nominal Vin			±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	TA = +25°C		2,000,000		Hr
	TA = +85°C		90,000		Hr
Fixed Ground	TA = +35°C		540,000		Hr
Naval Sheltered	TA = +35°C		300,000		Hr
Airborne Uninhabited Fighter	TA = +35°C		55,000		Hr
TEMPERATURE					
Specification		-40	+25	+85	°C
Operation		-55		+100	°C
Storage		-55		+110	°C

ABSOLUTE MAXIMUM RATINGS

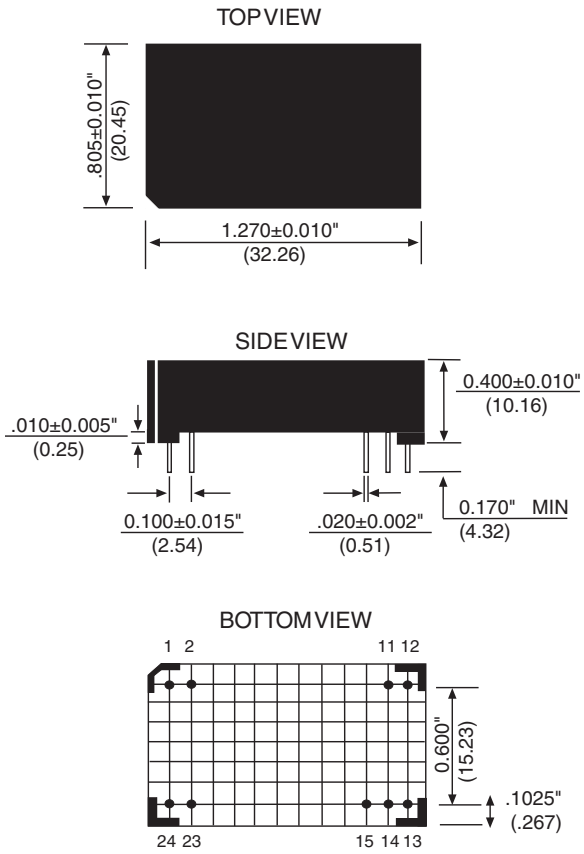
Output Short-Circuit Duration	5 seconds
Internal Power Dissipation	750mW
Lead Temperature (soldering, 10 seconds max)	+300°C

ORDERING INFORMATION

PWR 13XX A C

- Device Family: PWR indicates DC/DC converter
- Model Number: Selected from Table of Electrical Characteristics
- Package
- RoHS Compliant

MECHANICAL



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 matte tin 100 microinches min., over nickel, 40-80 microinches.

SOLDERING INFORMATION

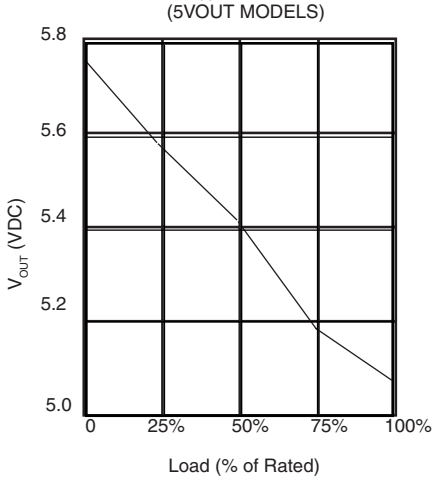
The PWR13XXC devices are intended for wave soldering or manual soldering.
They are not intended to be subject to surface mount processes under any circumstances.

The normal wave soldering process can be used with these devices where the device is subjected to a maximum wave temperature of 260°C for a period of no more than 10 seconds. Within this time and temperature range, the integrity of the device's plastic body will not be compromised and internal temperatures within the converter will not exceed 175°C. Care should be taken to control manual soldering limits identical to that of wave soldering.

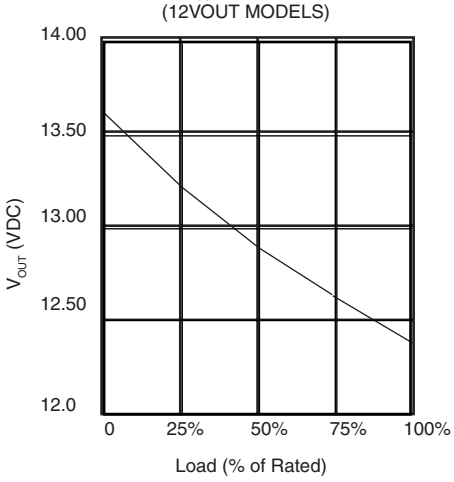
TYPICAL PERFORMANCE CURVES

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

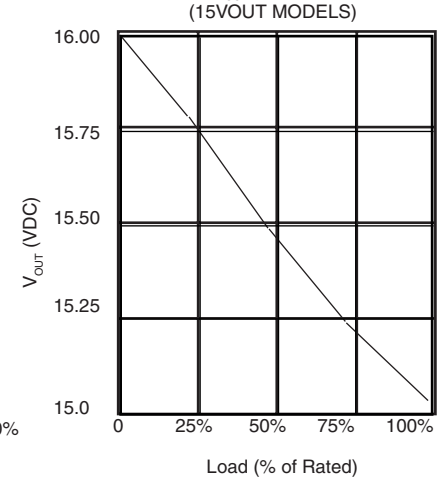
V_{OUT} VS LOAD (5VOUT MODELS)



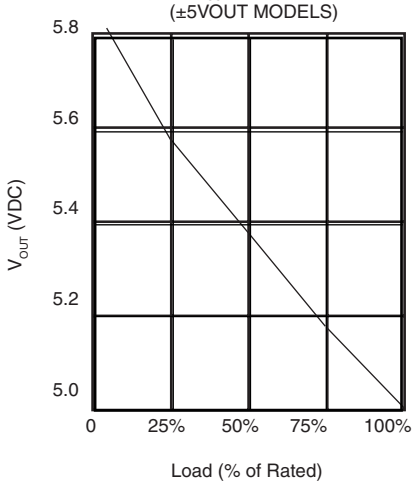
V_{OUT} VS LOAD (12VOUT MODELS)



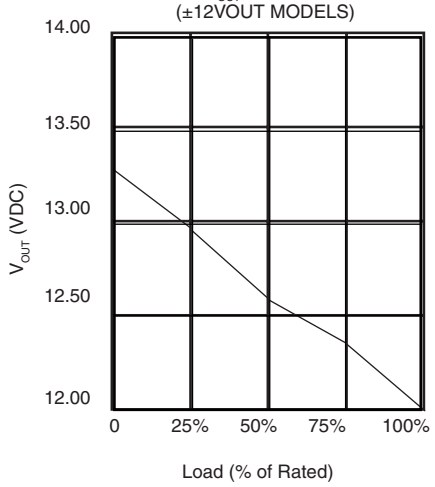
V_{OUT} VS LOAD (15VOUT MODELS)



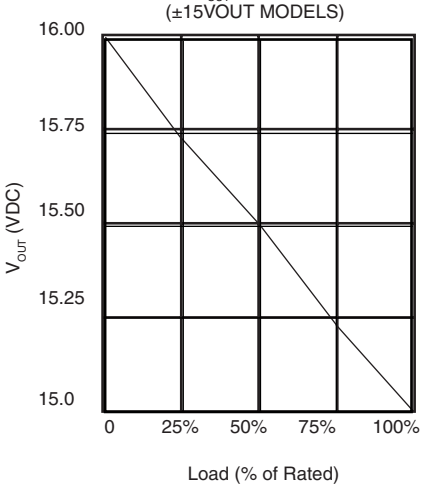
V_{OUT} VS LOAD (±5VOUT MODELS)



V_{OUT} VS LOAD (±12VOUT MODELS)



V_{OUT} VS LOAD (±15VOUT MODELS)



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