C&D TECHNOLOG

Product Data Sheet

# 3 WATTS UNREGULATED DC/DC CONVERTERS

# PWR12XX


## DESCRIPTION

The PWR12XX Series offers a broad line of low-cost, high-performance, unregulated, single and dual output DC/DC converters in a 24-pin DIP package. These miniature converters offer better performance and lower cost in industry-standard packages and pinouts. The PWR12XX Series is internally filtered. No external parts are necessary.

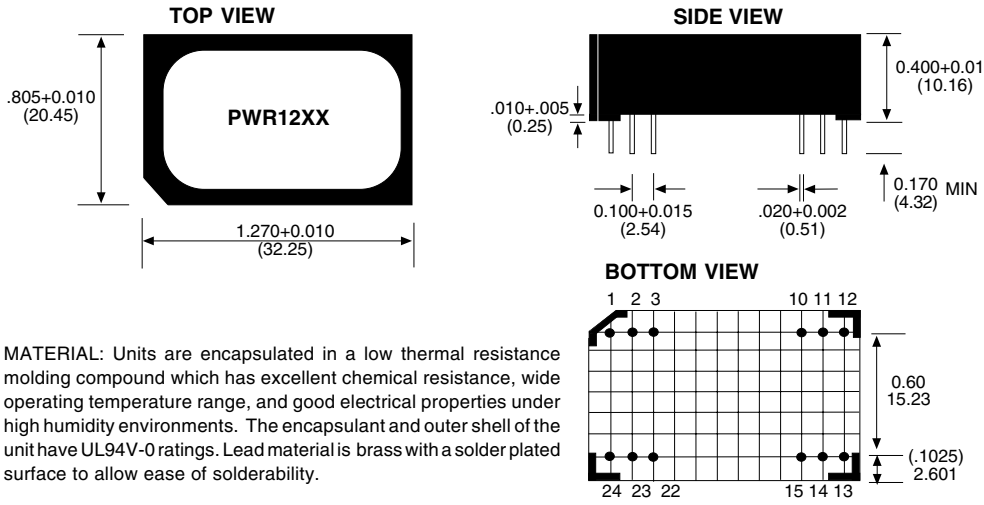
Surface mounted components and a low thermal resistance encapsulant allow for superior reliability, excellent thermal dissipation, and an extended temperature range of –25°C to +85°C at no extra cost.

The PWR12XX Series is ideal for use on high-density PC boards where isolated, unregulated, power is needed. Standoffs allow for PC board cleaning, helping preserve isolation. They also allow for visual inspection of solder joints.

## FEATURES

- LOW COST
- INDUSTRY-STANDARD PACKAGE
- SINGLE AND DUAL OUTPUTS
- 24-PIN DIP PACKAGE
- BUILT-IN STANDOFFS
- INTERNAL INPUT AND OUTPUT FILTERING

## MECHANICAL




NC = Do Not Connect
Duplicate pin functions are internally connected.
All dimensions are in inches (millimeters).
GRID: 0.100 inches (2.54 millimeters)
PIN PLACEMENT TOLERANCE: ±0.015"

| PIN # | SINGLES | DUALS |
|---|---|---|
| 1 | +VIN | +VIN |
| 2 | NC | –VOUT |
| 3 | NC | Common |
| 10 | –VOUT | Common |
| 11 | +VOUT | +VOUT |
| 12 | –VIN | –VIN |
| 13 | –VIN | –VIN |
| 14 | +VOUT | +VOUT |
| 15 | –VOUT | Common |
| 22 | NC | Common |
| 23 | NC | –VOUT |
| 24 | +VIN | +VIN |

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.


Internet: http://www.cdpowerelectronics.com

**Power Electronics Division, United States**
3400 E Britannia Drive, Tucson, Arizona 85706
Phone: 800.547.2537 Fax: 520.295.4197

**Power Electronics Division, Europe**
C&D Technologies (Power Electronics) Ltd.
132 Shannon Industrial Estate, Shannon, Co. Clare, Ireland
Tel: +353.61.474.133 Fax:+353.61.474.141

# 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) |
|---|---|---|---|---|---|---|
| PWR1200 | 5 | 5 | 600 | 30 | 800 | 45 |
| PWR1201 | 5 | 12 | 250 | 30 | 800 | 45 |
| PWR1202 | 5 | 15 | 200 | 30 | 800 | 45 |
| PWR1203 | 5 | ±5 | ±300 | 30 | 800 | 45 |
| PWR1204 | 5 | ±12 | ±125 | 30 | 800 | 45 |
| PWR1205 | 5 | ±15 | ±100 | 30 | 800 | 45 |
| PWR1206 | 12 | 5 | 600 | 30 | 330 | 25 |
| PWR1207 | 12 | 12 | 250 | 30 | 330 | 25 |
| PWR1208 | 12 | 15 | 200 | 30 | 330 | 25 |
| PWR1209 | 12 | ±5 | ±300 | 30 | 330 | 25 |
| PWR1210 | 12 | ±12 | ±125 | 30 | 330 | 25 |
| PWR1211 | 12 | ±15 | ±100 | 30 | 330 | 25 |
| PWR1212 | 15 | 5 | 600 | 30 | 265 | 20 |
| PWR1213 | 15 | 12 | 250 | 30 | 265 | 20 |
| PWR1214 | 15 | 15 | 200 | 30 | 265 | 20 |
| PWR1215 | 15 | ±5 | ±300 | 30 | 265 | 20 |
| PWR1216 | 15 | ±12 | ±125 | 30 | 265 | 20 |
| PWR1217 | 15 | ±15 | ±100 | 30 | 265 | 20 |
| PWR1218 | 24 | 5 | 600 | 30 | 165 | 20 |
| PWR1219 | 24 | 12 | 250 | 30 | 165 | 20 |
| PWR1220 | 24 | 15 | 200 | 30 | 165 | 20 |
| PWR1221 | 24 | ±5 | ±300 | 30 | 165 | 20 |
| PWR1222 | 24 | ±12 | ±125 | 30 | 165 | 20 |
| PWR1223 | 24 | ±15 | ±100 | 30 | 165 | 20 |
| PWR1240 | 5 | 9 | 333 | 30 | 800 | 45 |
| PWR1241 | 12 | 9 | 333 | 30 | 330 | 25 |
| PWR1242 | 15 | 9 | 333 | 30 | 265 | 20 |
| PWR1243 | 24 | 9 | 333 | 30 | 165 | 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 |
| | | 21.6 | 24 | 26.4 | VDC |
| **ISOLATION** | | | | | |
| Rated Voltage | | 500 | | | VDC |
| Test Voltage | 60 Hz, 10 Seconds | 500 | | | Vpk |
| Resistance | | | 10 | | GW |
| Capacitance | | | 90 | | pF |
| Leakage Current | VISO = 240VAC, 60HZ | | 10 | | µArms |
| **OUTPUT** | | | | | |
| Rated Power | | | 3 | | W |
| Voltage Setpoint Accuracy | Rated Load, Nominal VIN | | ±3 | ±5 | % |
| Temperature Coefficient | | | ±0.02 | | %/%°C |
| Ripple and Noise | | | | | |
| (BW = DC to 20MHz) | No External Components | | 150 | | mVp-p |
| | 10µF Across Each Output | | 10 | | mVrms |
| | 10µF Across Each Output | | 30 | | mVp-p |
| Voltage | No Load, VOUT = +5V | | | 7 | VDC |
| | No Load, VOUT = ±12V | | | ±15 | VDC |
| | No Load, VOUT = ±15V | | | ±18 | VDC |
| Line Regulation | | | 1.2 | | %/%$V_{IN}$ |
| Load | No Load To Rated Load | | 6 | | % |
| **GENERAL** | | | | | |
| Package Weight | | | 12 | | g |
| Switching Frequency | | | 150 | | kHz |
| MTTF per MIL-HDBK-217, Rev E* | Circuit Stress Method | | 700 | | kHr |
| Efficiency | | | 75 | | % |
| **TEMPERATURE** | | | | | |
| Specification | | –25 | +25 | +85 | °C |
| Operation | | –40 | | +125 | °C |
| Storage | | –40 | | +125 | °C |

* For demonstrated MTTF results reference Power Convertible's Reliability Report PWR1205

## ABSOLUTE MAXIMUM RATINGS

Output Short-Circuit Duration ..... Momentary
Internal Power Dissipation ..... 1.3W
Lead Temperature (soldering, 10 seconds max) ..... +300°C

## ORDERING INFORMATION

**PWR** **12XX**

Device Family
PWR indicates DC/DC converter

Model Number
Selected from Table of Electrical Characteristics

# APPLICATION NOTES

### UNBALANCED LOADS

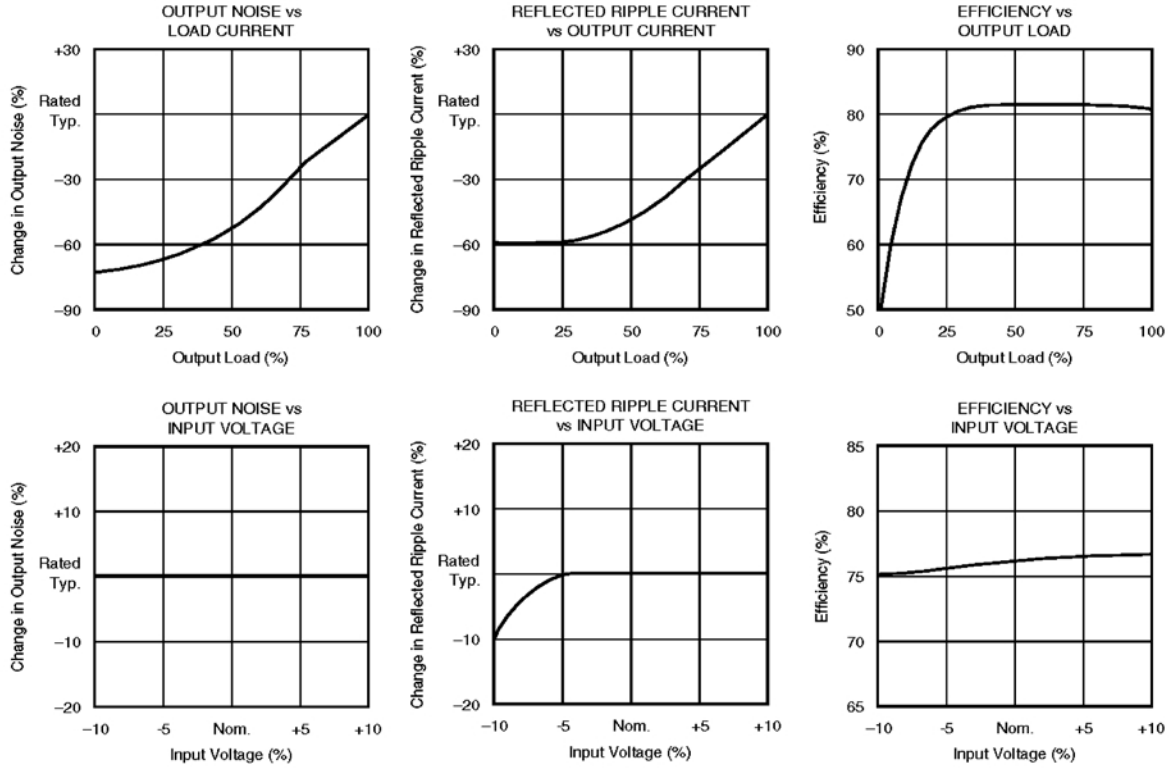
Unbalanced loads may be used on dual output models with either side providing up to its rated current. Output voltages, by design, will track each other in an unbalanced state within ±10% of one another.

### OUTPUT NOISE

Output noise can be reduced to 30mVp-p, typically, by adding a 10µF tantalum capacitor with an equivalent series resistance (ESR) of less than 150mW at 10kHz across each output.

# TYPICAL PERFORMANCE CURVES

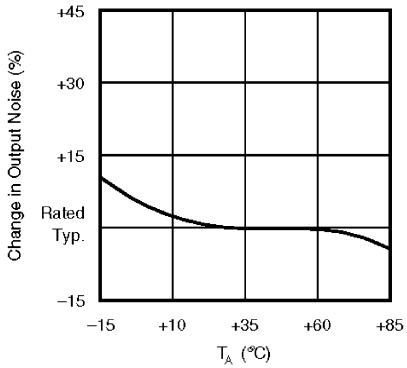
$T_A$ = +25°C, Rated Input Voltage, Rated Output Current unless otherwise noted.



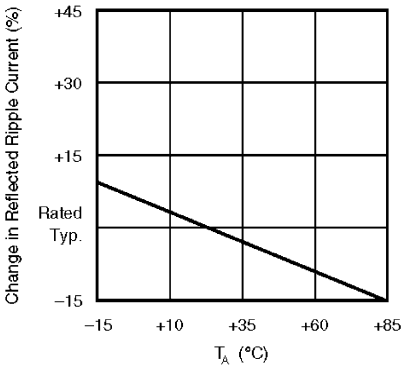
# TYPICAL PERFORMANCE CURVES

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

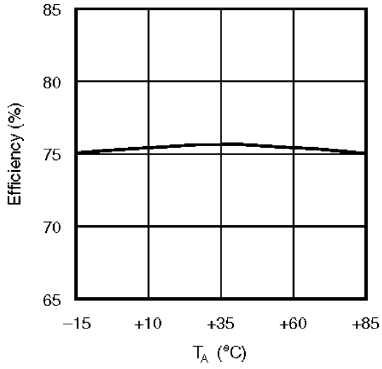
OUTPUT NOISE vs AMBIENT TEMPERATURE



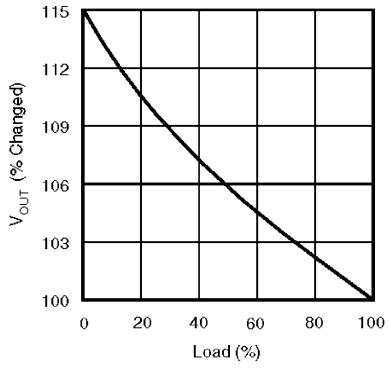

REFLECTED RIPPLE CURRENT vs AMBIENT TEMPERATURE



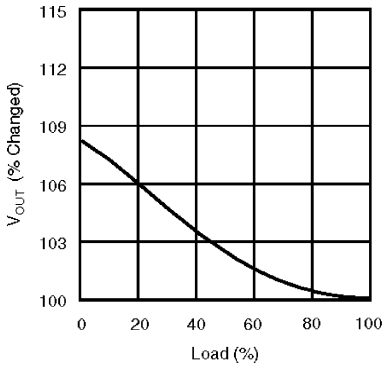

EFFICIENCY vs AMBIENT TEMPERATURE



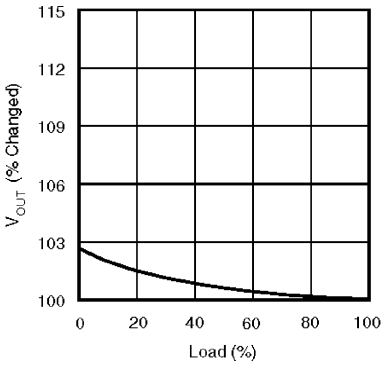

$V_{OUT}$ vs LOAD ($5V_{OUT}$ MODELS)




$V_{OUT}$ vs LOAD ($\pm 12V_{OUT}$ MODELS)




$V_{OUT}$ vs LOAD ($\pm 15V_{OUT}$ MODELS)




OUTPUT POWER DERATING