

Product Data Sheet

2:1 WIDE INPUT RANGE DC/DC CONVERTER

WPC10R



FEATURES

- SAFETY APPROVALS (cULus, CE)
- MEETS EN55022 LEVEL A & B FOR CONDUCTED EMISSIONS WITH A 10 MFD EXTERNAL CAPACITOR
- OPERATING TEMPERATURE RANGE: -40°C TO +100°C
- INDUSTRY STANDARD PINOUTS
- INDUSTRY STANDARD PACKAGE
- LOW PROFILE 0.4 INCH (10MM)
- SHORT CIRCUIT PROTECTION
- **TEMPERATURE SHUTDOWN**
- REMOTE ON/OFF (OPTIONAL)
- **LOW RADIATED EMISSIONS**

APPLICATIONS

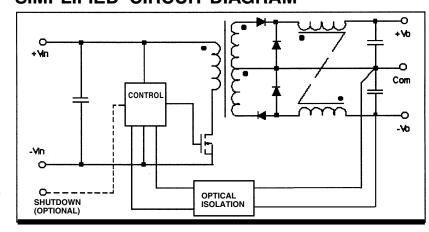
- TELECOMMUNICATION APPLICATIONS
- BATTERY POWERED SYSTEMS
- PORTABLE INSTRUMENTS
- PROCESS CONTROL EQUIPMENT
- TRANSPORTATION EQUIPMENT
- DISTRIBUTED POWER SYSTEMS

DESCRIPTION

The WPC10R is a family of high performance DC/DC converters that offer regulated outputs over two input voltage ranges of 18 - 36 and 28 - 75V and over a wide operating temperature range of -40°C to +100°C without derating.

The 350kHz switching frequency and forward converter topology provide optimum performance in a space-saving package. The design uses all surface mounted components, including magnetics, to provide enhanced reliability. All models will operate even under no-load conditions, although a minimum load is specified for load regulation measurement purposes. A metal package is utilized for decreased radiated noise and an optional remote enable feature allows low power standby operation.

SIMPLIFIED CIRCUIT DIAGRAM





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ELECTRICAL SPECIFICATIONS

Specifications typical at $T_A = +25^{\circ}C$, nominal input voltage, rated output current unless otherwise specified.

| | NOMINAL RATED OUTPUT CURREN | | T CURRENT | VOLTAGE REGULATION | | | | |
|-------------|-----------------------------|----------------------------|------------------|--------------------|-------------|-------------|-----------------|----------------|
| MODEL | INPUT VOLTAGE (VDC) | OUTPUT VOLTAGE (VDC) | MIN LOAD (mA) | RATED LOAD (mA) | LINE (±) | LOAD (±) | NOISE (mVpp) | EFFICIENCY (%) |
| WPC10R24S03 | 24 | 3.3 | 300 | 3000 | 0.5% | 1% | 75 | 75 |
| WPC10R24S05 | 24 | 5 | 200 | 2000 | 0.5% | 1% | 75 | 77 |
| WPC10R24S12 | 24 | 12 | 83 | 833 | 0.5% | 1% | 75 | 78 |
| WPC10R24S15 | 24 | 15 | 67 | 666 | 0.5% | 1% | 75 | 79 |
| WPC10R24D05 | 24 | ±5 | ±100 | ±1000 | 0.5% | 2% | 75 | 77 |
| WPC10R24D12 | 24 | ±12 | ±42 | ±417 | 0.5% | 2% | 75 | 78 |
| WPC10R24D15 | 24 | ±15 | ±33 | ±333 | 0.5% | 2% | 75 | 79 |
| WPC10R48S03 | 48 | 3.3 | 300 | 3000 | 0.5% | 1% | 75 | 77 |
| WPC10R48S05 | 48 | 5 | 200 | 2000 | 0.5% | 1% | 75 | 79 |
| WPC10R48S12 | 48 | 12 | 83 | 833 | 0.5% | 1% | 75 | 80 |
| WPC10R48S15 | 48 | 15 | 67 | 666 | 0.5% | 1% | 75 | 81 |
| WPC10R48D05 | 48 | ±5 | ±100 | ±1000 | 0.5% | 2% | 75 | 79 |
| WPC10R48D12 | 48 | ±12 | ±42 | ±417 | 0.5% | 2% | 75 | 80 |
| WPC10R48D15 | 48 | ±15 | ±33 | ±333 | 0.5% | 2% | 75 | 81 |

COMMON SPECIFICATIONS

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

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|------------------------------|---------------------------------|------|-------|------|-------|
| INPUT | | | | | |
| Voltage Range | | 18 | 24 | 36 | VDC |
| | VIN=34-75 for 3.3Vout | 28 | 48 | 75 | VDC |
| Reflected Ripple Current | | | 20 | 50 | mAp-p |
| ISOLATION | | | | | |
| Test Voltage | 60 Hz, 10 Seconds | 1500 | | | Vpk |
| Resistance | , | | 10 | | ĠΩ |
| Capacitance | | | 1500 | | pF |
| Leakage Current | V _{ISO} = 240VAC, 60Hz | | 100 | | mArms |
| OUTPUT | | | | | |
| Rated Power | | | | 10 | Watts |
| Voltage Setpoint Accuracy | | | ±1 | | % |
| Temperature Coefficient | | | ±0.02 | | %/°C |
| Line Regulation | Low Line to High Line | | | | |
| Singles | | | ±0.2 | | % |
| Duals | | | ±0.2 | | % |
| Load Regulation | Min Load to Rated Load | | | | |
| Singles | | | ±0.2 | | % |
| Duals | | | ±0.5 | | % |
| Ripple & Noise | BW = 5 Hz to 20 MHz | | | 75 | mVp-p |
| GENERAL | | | | | |
| Switching Frequency | 0: "0: 14 !! | | 350 | | kHz |
| MTTF per MIL-HDBK-217, Rev F | Circuit Stress Method, | | | | |
| Ground Benign | $T_A = +25^{\circ}C$ | | 933 | | khr |
| Package Weight | | | 35 | | g |
| TEMPERATURE | | | | | |
| Specification (ambient) | | -25 | | +71 | °C |
| Specification (case) | | -25 | | +100 | °C |
| Operation (case) | | -40 | | +100 | °C |
| Storage | | -55 | | +125 | °C |

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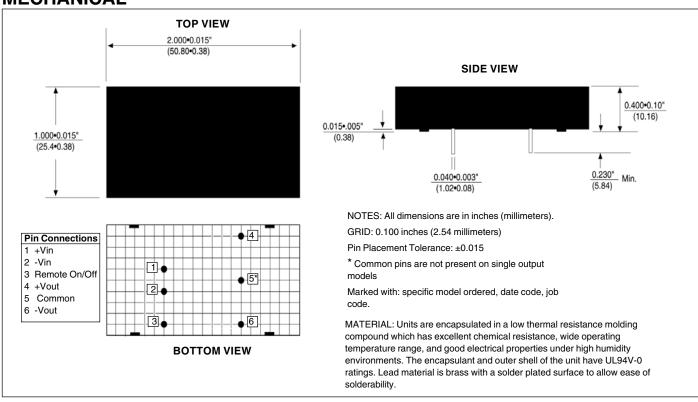
ABSOLUTE MAXIMUM RATINGS

| Output Short Circuit Protection | |
|---|------------|
| (at T _A = 25°C, nominal input voltage) | Continuous |
| Internal Power Dissipation | 2.5W |
| Lead Temperature (soldering 10seconds, max) | +300°C |
| Maximum Case Temperature | +110°C |

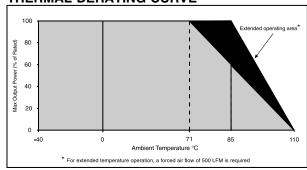
ORDERING INFORMATION

| | WPC10R | xxyzz | N/P/F | R |
|-----|--|-------|-------|---|
| De | evice Family ———————————————————————————————————— | | | |
| Inc | dicates Wide Input Voltage 10 Watt Regulated Unit | | | |
| Mo | odel Number | | | |
| | Selected from Table of Electrical Characteristics | | | |
| | xx = Input Voltage | | | |
| | y = Number of Outputs (Single "S", Dual "D") | | | |
| | zz = Output Voltage | | | |
| Ca | ase Ground Option———————————————————————————————————— | | | |
| | "P" = Positive Input Connection | | | |
| | "N" = Negative Input Connection | | | |
| | "F" = Floating Input Connection | | | |
| F | Remote ON/OFF (optional)———————————————————————————————————— | | | |
| 1 | | | | |

MECHANICAL



THERMAL DERATING CURVE



REMOTE ON/OFF CONTROL

| Logic Compatibility | CMOS or Open Collector TTL |
|-----------------------|----------------------------|
| EC On | Open Circuit or > 2VDC |
| EC Off | < 1.3VDC |
| Shutdown Idle Current | <10mA |
| Control Common | Vin |

Hiweise:

- Geraet wird mit einer 2A Sicherung abgesichert
- Eingangspannung muss SELV oder TNV nach EN60950, IEC60950 entsprechen
- Ein-und Ausgang des Converters muessen mit dem Schutzleiter verbunden werden
- Power supply must be fused with a 2A fuse or current limited to 2A max
- Input must be SELV or TNV according to EN60950/ IEC950
- One input and output pin must be tied to safety earth ground

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ENGINEERING NOTES

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