



### FEATURES

- RoHS compliant
- Safety approval (cULus)
- Meets EN55022 level A & B for conducted Emissions with a 10 micro farad external capacitor
- Industry standard pinouts
- Industry standard package
- Low profile 0.4 inch (10mm)
- Short circuit protection
- Temperature shutdown

### DESCRIPTION

The WPC10 series is a family of DC/DC converters that offer regulated outputs over an input voltage range 18 - 36V and over a wide specification case temperature range of -40°C to +100°C.

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 under very low load conditions, although the minimum load is required to guarantee full parametric functionality. A metal package is utilized for decreased radiated noise.

The product range has been recognised by Underwriters Laboratory (UL) to UL 1950 for operational insulation, file number E179522 applies.

### SELECTION GUIDE

| Order Code   | Nominal Input Voltage | Output Voltage | Output Current |               | Voltage Regulation |        | Noise | Efficiency |
|--------------|-----------------------|----------------|----------------|---------------|--------------------|--------|-------|------------|
|              | V                     | V              | Min Load mA    | Rated Load mA | Line ±             | Load ± | mVpp  | %          |
| WPC10R24S05C | 24                    | 5              | 200            | 2000          | 0.5%               | 1%     | 75    | 77         |
| WPC10R24S12C | 24                    | 12             | 83             | 833           | 0.5%               | 1%     | 75    | 78         |
| WPC10R24D15C | 24                    | ±15            | ±33            | ±333          | 0.5%               | 2%     | 75    | 79         |

### INPUT CHARACTERISTICS

| Parameter                | Conditions           | Min. | Typ. | Max. | Units |
|--------------------------|----------------------|------|------|------|-------|
| Voltage range            | Continuous operation | 18   | 24   | 36   | V     |
| Reflected ripple current |                      |      | 20   | 50   | mAp-p |

### OUTPUT CHARACTERISTICS

| Parameter                  | Conditions             | Min.    | Typ.  | Max. | Units |
|----------------------------|------------------------|---------|-------|------|-------|
| Rated Power                |                        |         |       | 10   | W     |
| Voltage set point 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 = 5Hz to 20MHz      |         |       | 75   | mVp-p |

### ABSOLUTE MAXIMUM RATINGS

|                                 |            |
|---------------------------------|------------|
| Output short circuit protection | Continuous |
| Internal power dissipation      | 2.5W       |
| Maximum case temperature        | +110°C     |

### ISOLATION CHARACTERISTICS

| Parameter              | Conditions                      | Min. | Typ. | Max. | Units |
|------------------------|---------------------------------|------|------|------|-------|
| Isolation test voltage | 60Hz, 10 seconds                | 1500 |      |      | Vpk   |
| Resistance             |                                 |      | 10   |      | GΩ    |
| Capacitance            |                                 |      | 1500 |      | pF    |
| Leakage current        | V <sub>iso</sub> = 240VAC, 60Hz |      | 100  |      | µArms |

### TEMPERATURE CHARACTERISTICS

| Parameter               | Conditions | Min. | Typ. | Max. | Units |
|-------------------------|------------|------|------|------|-------|
| Specification (ambient) |            | -40  |      | 71   | °C    |
| Case temperature        |            | -40  |      | 100  |       |
| Storage                 |            | -55  |      | 125  |       |

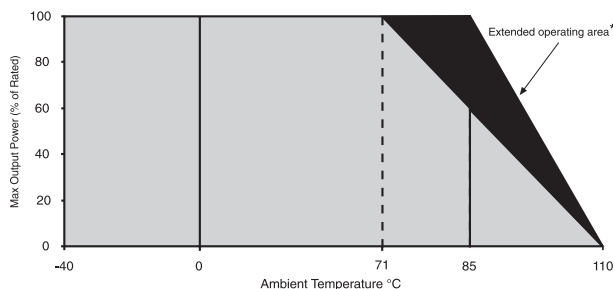
### GENERAL CHARACTERISTICS

| Parameter           | Conditions                  | Min. | Typ. | Max. | Units |
|---------------------|-----------------------------|------|------|------|-------|
| Switching frequency |                             |      | 350  |      | KHz   |
| MTTF                | MIL-HDBK-217F Ground benign |      | 933  |      | KHr   |

All specifications typical at T<sub>a</sub>=25°C, nominal input voltage and rated output current unless otherwise specified.



### THERMAL DERATING CURVE



\* For extended temperature operation, a forced air flow of 500 LFM is required

### TECHNICAL NOTES

#### ISOLATION VOLTAGE

'Hi Pot Test', 'Flash Tested', 'Withstand Voltage', 'Proof Voltage', 'Dielectric Withstand Voltage' & 'Isolation Test Voltage' are all terms that relate to the same thing, a test voltage, applied for a specified time, across a component designed to provide electrical isolation, to verify the integrity of that isolation.

Murata Power Solutions WPC10 series of dc/dc converters are all 100% production tested at their stated isolation voltage. This is 1500V Vpk for 10 seconds.

A question commonly asked is, "What is the continuous voltage that can be applied across the part in normal operation?"

The WPC10 series has been recognized by Underwriters Laboratory, both input and output should normally be maintained within SELV limits i.e. less than 42.4V peak, or 60VDC. The isolation test voltage represents a measure of immunity to transient voltages and the part should never be used as an element of a safety isolation system. The part could be expected to function correctly with several hundred volts offset applied continuously across the isolation barrier; but then the circuitry on both sides of the barrier must be regarded as operating at an unsafe voltage and further isolation/insulation systems must form a barrier between these circuits and any user-accessible circuitry according to safety standard requirements.

#### REPEATED HIGH-VOLTAGE ISOLATION TESTING

It is well known that repeated high-voltage isolation testing of a barrier component can actually degrade isolation capability, to a lesser or greater degree depending on materials, construction and environment. While manufactured parts can withstand several times the stated test voltage, the isolation capability does depend on the wire insulation. Any material, including this enamel (typically polyurethane) is susceptible to eventual chemical degradation when subject to very high applied voltages thus implying that the number of tests should be strictly limited. We therefore strongly advise against repeated high voltage isolation testing, but if it is absolutely required, that the voltage be reduced by 20% from specified test voltage.

#### FUSING

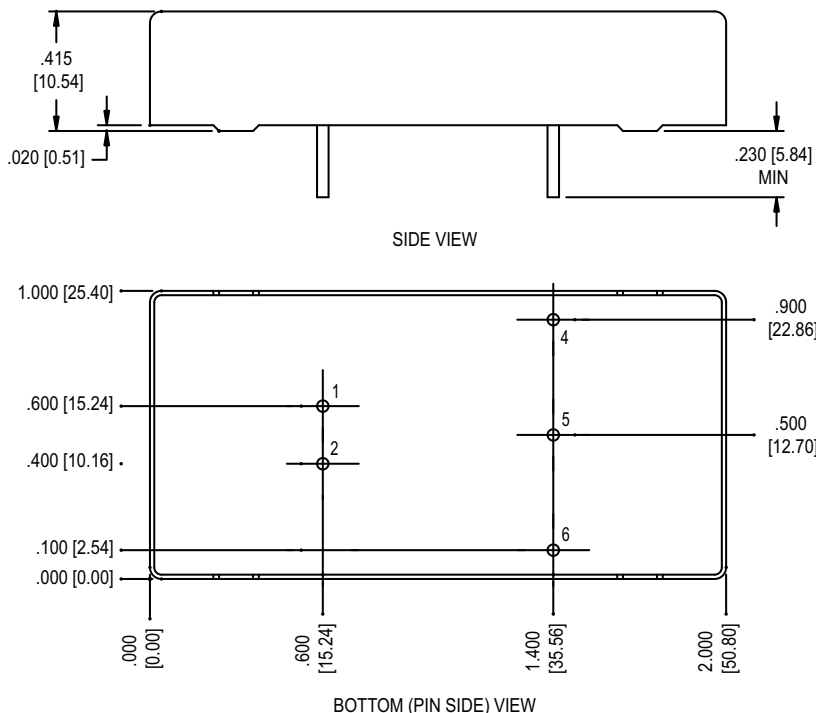
The WPC10 series DC/DC converter may be optionally fused with a 2A fuse. The input must be SELV or TNV according to EN60950/IEC950. UL recognition was obtained without an input fuse.

### RoHS COMPLIANCE INFORMATION



This series is compatible with RoHS soldering systems with a peak wave solder temperature of 260°C for 10 seconds. The pin termination finish on this product series is UNS C36000 brass plated with matte tin 100 micro-inches min., over nickel, 40-80 micro-inches. The series is backward compatible with Sn/Pb soldering systems. For further information, please visit [www.murata-ps.com/rohs](http://www.murata-ps.com/rohs)

**MECHANICAL DIMENSIONS**



**PIN CONNECTIONS**

| Pin | Function          |                   |
|-----|-------------------|-------------------|
|     | Singles           | Duals             |
| 1   | +V <sub>IN</sub>  | +V <sub>IN</sub>  |
| 2   | -V <sub>IN</sub>  | -V <sub>IN</sub>  |
| 4   | +V <sub>OUT</sub> | +V <sub>OUT</sub> |
| 5   | No pin            | Common            |
| 6   | -V <sub>OUT</sub> | -V <sub>OUT</sub> |

Weight: 35g (Typ.)

All pins on a 0.1 (2.54) pitch and within ±0.01 (0.25) of true position.

Unless otherwise stated all dimensions are in inches (mm) ±0.01 (0.25).