

**DC/DC CONVERTERS****HIGH DENSITY, 25 WATT, ALUMINUM CASE****FEATURES**

- UL1950 APPROVAL PENDING
- INPUT AND OUTPUT FILTERING
- SINGLE AND TRIPLE OUTPUTS
- EXTENDED TEMPERATURE RANGE:  
-40°C TO +85°C
- INDUSTRY STANDARD PINOUTS
- SIX-SIDED SHIELDING
- NEG. AND POS. GROUND MODELS
- REMOTE ON/OFF
- SELECTABLE OVER-TEMPERATURE SHUTDOWN
- REVERSE POLARITY PROTECTED INPUT
- OUTPUT VOLTAGE ADJUST  $\pm 10\%$
- RUGGED ALUMINUM CASE

**APPLICATIONS**

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

**DESCRIPTION**

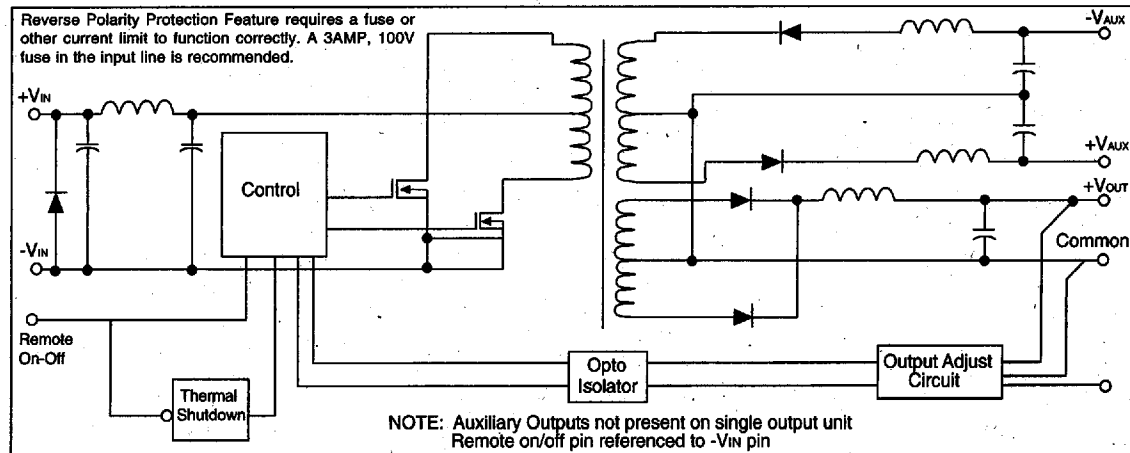
The WP25R Series is a family of high performance DC/DC converters available in two input ranges of 18-36V and 36-72V with four output combinations of singles and triples. The unit features industry-standard pinout and combines low cost with high performance.

Other features include a remote on/off pin, and an internal temperature shutdown which can be disabled. A  $\pm 10\%$  output adjust feature is provided,

allowing the user to compensate for long line lengths.

The units are constructed on an aluminum substrate printed wiring board which provides improved thermal performance. The WP25R Series is assembled by a fully automated process using surface mounted components for increased reliability.

Housing the units in a rugged low-profile aluminum housing provides excellent EMI/RFI shielding.

**SIMPLIFIED CIRCUIT DIAGRAM**

# ELECTRICAL SPECIFICATIONS

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

| MODEL         | NOMINAL<br>INPUT<br>VOLTAGE<br>(VDC) | RATED<br>OUTPUT<br>VOLTAGE<br>(VDC) | OUTPUT CURRENT  |                 |                 | INPUT<br>CURRENT<br>NOM LOAD<br>(A) | EFFICIENCY<br>(%) |
|---------------|--------------------------------------|-------------------------------------|-----------------|-----------------|-----------------|-------------------------------------|-------------------|
|               |                                      |                                     | MIN LOAD<br>(A) | NOM LOAD<br>(A) | MAX LOAD<br>(A) |                                     |                   |
| WP25R24S05 *  | 24                                   | 5.1 **                              | 0.5             | 5.0             | 5.0             | 1.3                                 | 80                |
| WP25R24S12 *  | 24                                   | 12                                  | 0.2             | 2.08            | 2.08            | 1.3                                 | 81                |
| WP25R24T512 * | 24                                   | 5±12                                | 0.5±0.1         | 3.0±0.412       | 4.0±0.83        | 1.3                                 | 82                |
| WP25R24T515 * | 24                                   | 5±15                                | 0.5±0.08        | 3.0±0.333       | 4.0±0.66        | 1.3                                 | 82                |
| WP25R48S05 *  | 48                                   | 5.1 **                              | 0.5             | 5.0             | 5.0             | 0.65                                | 80                |
| WP25R48S12 *  | 48                                   | 12                                  | 0.2             | 2.08            | 2.08            | 0.65                                | 81                |
| WP25R48T512 * | 48                                   | 5±12                                | 0.5±0.1         | 3.0±0.412       | 4.0±0.83        | 0.65                                | 82                |
| WP25R48T515 * | 48                                   | 5±15                                | 0.5±0.08        | 3.0±0.333       | 4.0±0.66        | 0.65                                | 82                |

\*NOTE: A "N" designator indicates the aluminum shell is connected internally to the negative input voltage pin.

A "P" designator indicates the aluminum shell is connected internally to the positive input voltage pin.

\*\* NOTE: Output set to 5.1 Volts to offset line length losses.

## COMMON SPECIFICATIONS

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

| Parameter                 | Conditions                                        | Min  | Typ  | Max  | Units                 |
|---------------------------|---------------------------------------------------|------|------|------|-----------------------|
| <b>INPUT</b>              |                                                   |      |      |      |                       |
| Voltage Range             |                                                   | 18   | 24   | 36   | VDC                   |
| Input Filter              | PI Type                                           | 36   | 48   | 72   | VDC                   |
| Reflected Ripple Current  |                                                   |      | 75   | 100  | mA                    |
| <b>INPUT CONTROL</b>      |                                                   |      |      |      |                       |
| Temperature Shutdown      |                                                   |      | 110  |      | $^{\circ}\text{C}$    |
| Temperature Hysteresis    |                                                   |      | 5    |      | $^{\circ}\text{C}$    |
| Quiescent Standby Current | Current into +Vin                                 |      | 4    | 6    | mA                    |
| I/P Shutdown Voltage      | Ref to Input Com                                  | 0    |      | 18V  | VDC                   |
| I/P Shutdown I            | Current from V shutdown @ 0V                      |      |      | -60  | $\mu\text{A}$         |
| Temp Shutdown Disable     |                                                   | 1V   |      | 18V  | VDC                   |
| I/P Enable Current        | V shutdown @ 5V                                   |      |      | 1    | mA                    |
| <b>ISOLATION</b>          |                                                   |      |      |      |                       |
| Rated Voltage             |                                                   | 500  |      |      | VDC                   |
| Test Voltage              | 60 Hz, 10 Seconds                                 | 1500 |      |      | Vpk                   |
| Resistance                |                                                   |      | 10   |      | G $\Omega$            |
| Capacitance               | @ 10kHz                                           |      | 1000 |      | pF                    |
| Leakage Current           | @ 500VDC                                          |      |      | 100  | nAms                  |
| <b>OUTPUT</b>             |                                                   |      |      |      |                       |
| Rated Power               |                                                   |      |      | 25   | W                     |
| Voltage Setpoint Accuracy |                                                   |      |      | ±1.5 | %                     |
| Single & Main Outputs     |                                                   |      |      | ±3   | %                     |
| Aux. Outputs, Triples     |                                                   |      |      |      | %                     |
| Temperature Coefficient   |                                                   |      | ±0.2 |      | %/ $^{\circ}\text{C}$ |
| Line Regulation           | High Line to Low Line                             |      |      |      | %                     |
| Singles & Main Outputs    |                                                   |      |      | ±0.2 | %                     |
| Aux. Outputs, Triples     |                                                   |      |      | ±1.5 | %                     |
| Load Regulation           | Min Load to Nom. Load, Main & Aux.                |      |      |      | %                     |
| Single & Main Outputs     |                                                   |      |      | ±0.5 | %                     |
| Aux. Outputs, Triples     |                                                   |      |      | ±3   | %                     |
| Ripple & Noise            |                                                   |      |      |      | mVp-p                 |
| Single & Main Outputs     | BW = 5Hz to 20MHz                                 |      | 50   | 80   | mVp-p                 |
| Aux. Outputs, Triples     | BW = 5Hz to 20MHz                                 |      | 90   | 120  | mVp-p                 |
| Output Adjust Range       | All Outputs                                       | ±8   | ±10  | ±12  | %                     |
| Output Adjust Current     | Current Sourced/Sank by Vadj Pin                  |      |      | ±0.5 | mA                    |
| Short Circuit Protection  | Single & Main Output                              |      |      | 7.5  | A                     |
|                           | Auxiliary Outputs 10 Sec                          |      |      |      |                       |
| <b>GENERAL</b>            |                                                   |      |      |      |                       |
| Switching Frequency       |                                                   |      | 250  |      | kHz                   |
| MTTF per MIL-HDBK-217     | Circuit Stress Method                             |      |      |      | kHr                   |
| Ground Benign             | $T_A = +25^{\circ}\text{C}$ , Unmodified Database |      | 291  |      | kHr                   |
| Fixed Ground              | $T_A = +85^{\circ}\text{C}$ , Unmodified Database |      | 177  |      | kHr                   |
| Package Weight            |                                                   |      | 85   |      | g                     |
| <b>TEMPERATURE</b>        |                                                   |      |      |      |                       |
| Specification             |                                                   | -25  |      | +70  | $^{\circ}\text{C}$    |
| Operation                 |                                                   | -25  |      | +110 | $^{\circ}\text{C}$    |
| Storage                   |                                                   | -55  |      | +125 | $^{\circ}\text{C}$    |

## ABSOLUTE MAXIMUM RATINGS

|                                                   |            |
|---------------------------------------------------|------------|
| Short Circuit Protection .....                    | Continuous |
| Internal Power Dissipation .....                  | 7W         |
| Lead Temperature (soldering 10seconds, max) ..... | +300°C     |
| Maximum Case Temperature .....                    | +110°C     |

## ORDERING INFORMATION

Device Family WP25R xyzz(z) P/N /H  
 Indicates Wide Input Voltage 25 Watt Regulated Unit

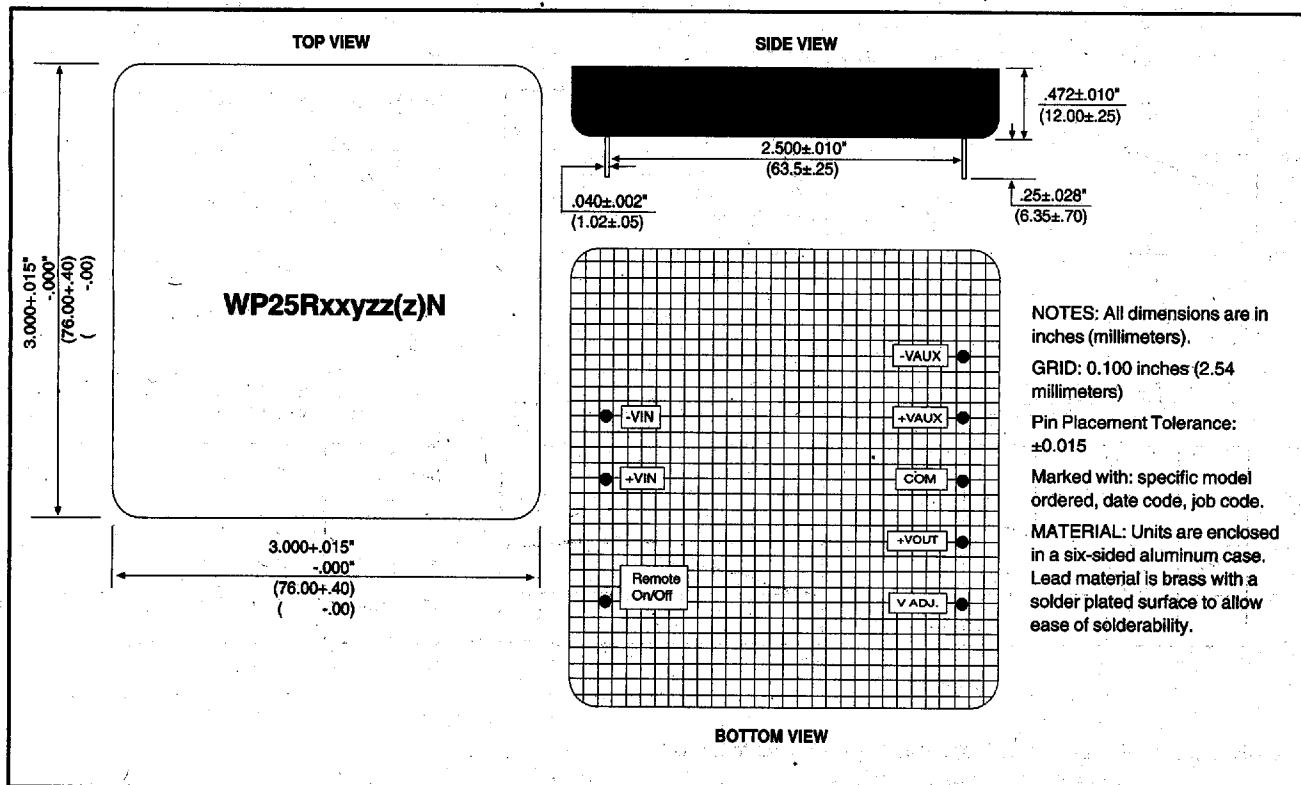
Model Number \_\_\_\_\_  
 Selected from Table of Electrical Characteristics

Where:  
 xx = Input Voltage  
 y = Number of Outputs (Single "S", Triple "T")  
 zz(z) = Output Voltages

Ground Option \_\_\_\_\_  
 "P" = Positive  
 "N" = Negative

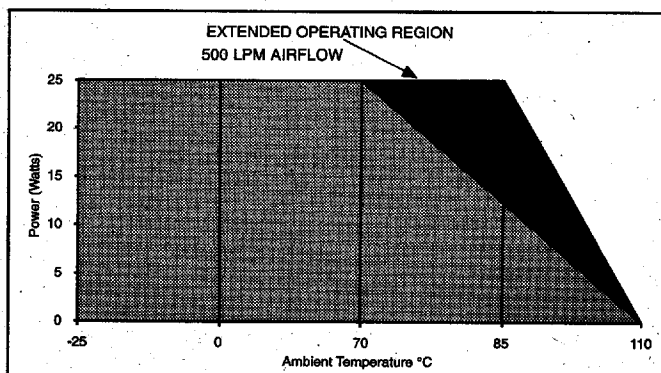
Screening Option \_\_\_\_\_

## MECHANICAL



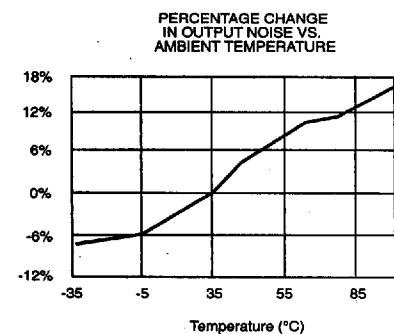
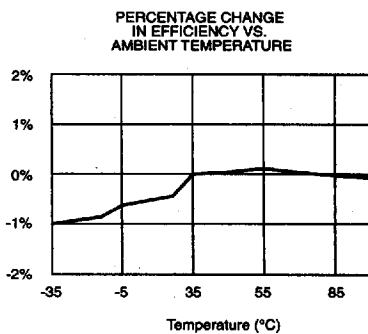
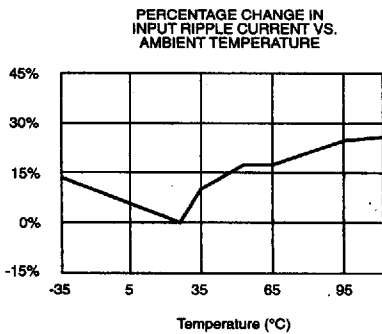
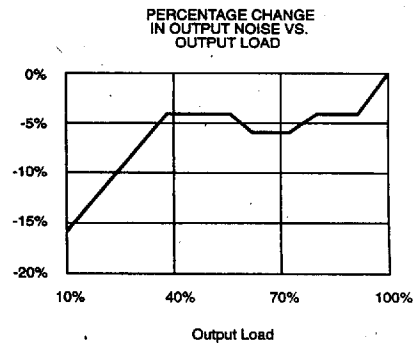
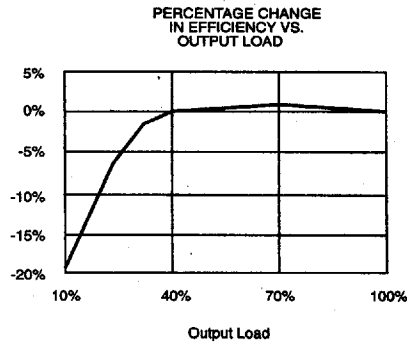
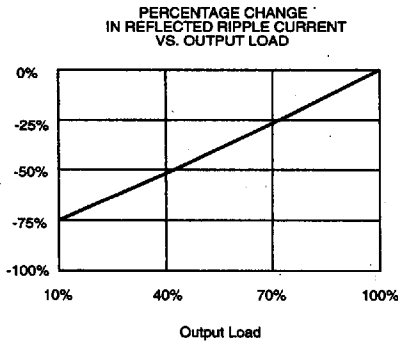
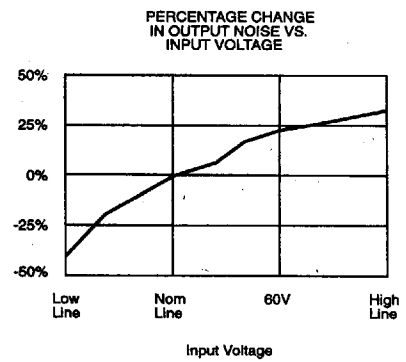
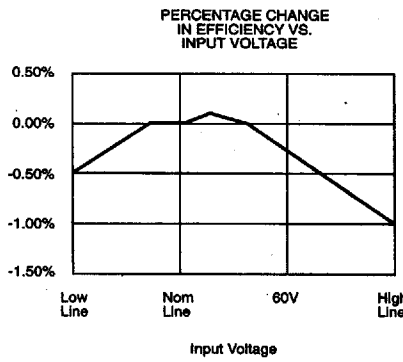
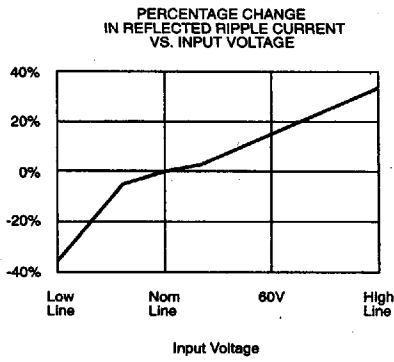
| REMOTE ON/OFF PIN | OUTPUT | TEMPERATURE SHUTDOWN* |
|-------------------|--------|-----------------------|
| Floating          | On     | Enabled               |
| High > 1.0V       | On     | Disabled              |
| Low < 1.0V        | Off    |                       |

\* The Temperature Shutdown Feature is designed to protect the unit from excessive temperatures in operation. The sole reason for disabling this feature is to allow for Elevated Temperature Reliability testing of the units. The user may disable this feature for incoming Reliability testing but it is recommended that this feature is not disabled in operation.

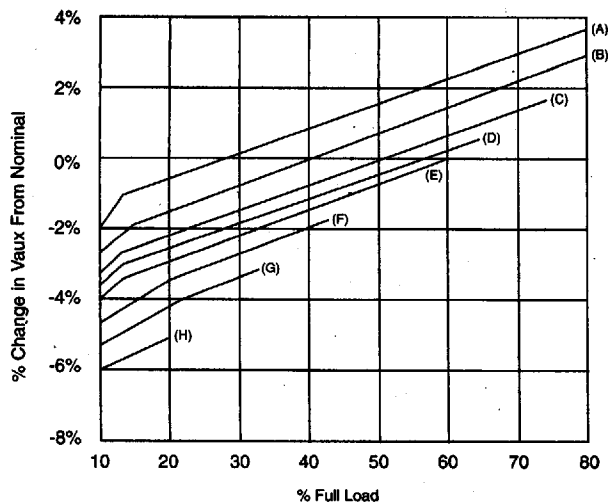


# TYPICAL PERFORMANCE CURVES

$T_A = +25^\circ\text{C}$ , nominal input voltage, rated load, recommended external components applied, unless otherwise specified.



## % CHANGE IN AUXILIARY OUTPUT VOLTAGES FROM NOMINAL WP25R CROSS REGULATION



| AUXILIARY<br>OUTPUT<br>CURRENT |
|--------------------------------|
| 0.08A (A)                      |
| 0.15A (B)                      |
| 0.22A (C)                      |
| 0.27A (D)                      |
| 0.33A (E)                      |
| 0.44A (F)                      |
| 0.55A (G)                      |
| 0.66A (H)                      |

Shown for:  
WP25R24T515 and  
WP25R48T515 Models