

**DC/DC CONVERTERS****SMALL PACKAGE, WIDE INPUT RANGE****FEATURES**

- SMALL PACKAGE SIZE: 1.6" x 2"
- INDUSTRY STANDARD PINOUT
- SURFACE MOUNT DEVICES (SMD)
- LOW-COST ALTERNATE SOURCE
- CONTINUOUS SHORT CIRCUIT PROTECTION
- UL1950 RECOGNITION (SOME MODELS PENDING)
- WITHIN FCC CLASS B LIMITS

**APPLICATIONS**

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

**DESCRIPTION**

The WP10R Series is a family of high performance DC/DC converters that offer high efficiency and regulated outputs over a 2:1 input voltage range of either 18-36VDC or 36-72 VDC.

Surface mount devices and manufacturing technology make it possible to offer performance equivalent to competition at a lower cost.

A self oscillating flyback topology coupled with a rugged MOSPOWER transistor are used to produce a highly reliable product with a minimum parts count. The internal body diodes of these FETS protect the unit against input voltage reversal. An external fuse is required to limit the body diode current to 2 amps.

No external heatsink is required for the WP10R Series

to supply its rated 10 watts. With a minimum amount of airflow, the temperature range may be extended from 70°C to 85°C. (See derating curve.)

The package of the WP10R Series is plastic. This eliminates the layout precautions required by metal enclosed devices. The encapsulant material is rated UL94V-0 for flammability and offers excellent heat transfer characteristics.

Internal circuitry provides continuous short-circuit protection and automatic restart after the short is removed.

# ELECTRICAL SPECIFICATIONS

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

MODEL	NOMINAL INPUT VOLTAGE (VDC)	RATED OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT		INPUT CURRENT		EFFICIENCY (%)
			MIN LOAD (mA)	RATED LOAD (mA)	MIN LOAD (mA)	RATED LOAD (mA)	
WP10R24S05	24	5	200	2000	60	520	80
WP10R24S12	24	12	84	834	60	520	80
WP10R24S15	24	15	67	667	60	520	80
WP10R24D12	24	$\pm 12$	$\pm 40$	$\pm 416$	60	520	80
WP10R24D15	24	$\pm 15$	$\pm 34$	$\pm 334$	60	520	80
WP10R48S05	48	5	200	2000	30	240	86
WP10R48S12	48	12	84	834	30	240	86
WP10R48S15	48	15	67	667	30	240	86
WP10R48D12	48	$\pm 12$	$\pm 40$	$\pm 416$	30	240	86
WP10R48D15	48	$\pm 15$	$\pm 34$	$\pm 334$	30	240	86

NOTE: Other input and output voltages may be available. Please consult factory.

## 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
Reflected Ripple Current		36	48	72	VDC
			20	70	mA <sub>p-p</sub>
<b>ISOLATION</b>					
Rated Voltage		500			VDC
Test Voltage	60 Hz, 10 Seconds	500			V <sub>pk</sub>
Resistance		10			GΩ
Capacitance			470		pF
Leakage Current	$V_{180} = 240\text{VAC}$ , 60Hz		50		μA <sub>rms</sub>
<b>OUTPUT</b>					
Rated Power			10		W
Voltage Setpoint Accuracy			$\pm 1$	$\pm 3$	%
Temperature Coefficient			$\pm 0.02$		%/ $^{\circ}\text{C}$
Line Regulation	Low Line to High Line		$\pm 0.1$	$\pm 0.5$	%
Load Regulation	Min Load to Rated Load		$\pm 0.2$	$\pm 0.5$	%
Ripple and Noise					
5VOUT Models	BW = 20Hz to 10MHz		50	100	mV <sub>p-p</sub>
12VOUT Models	BW = 20Hz to 10MHz		80	150	mV <sub>p-p</sub>
15VOUT Models	BW = 20Hz to 10MHz		120	200	mV <sub>p-p</sub>
Dual Output Models	BW = 20Hz to 10MHz		50	100	mV <sub>p-p</sub>
Transient Response	Rated Load to Min Load		3		mS
	Min Load to Rated Load		3 <sub>s</sub>		mS
Overvoltage Protection Threshold	5V Output		6.8		VDC
	12V Output		15		VDC
	15V Output		18		VDC
<b>GENERAL</b>					
Switching Frequency			140		kHz
Package Weight			30		g
MTTF per MIL-HDBK-217 Revision F	Ground Benign, Circuit Stress Method		636,843		Hr
	$T_A = +25^{\circ}\text{C}$		199,000		Hr
	$T_A = +70^{\circ}\text{C}$		122,009		Hr
	$T_A = +85^{\circ}\text{C}$				
MTTF per Bellcore TR-NWT-000322 Issue 4, September, 1992	Environmental Stress = 1.0		1,079,617		Hr
	$T_A = +25^{\circ}\text{C}$		205,055		Hr
	$T_A = +70^{\circ}\text{C}$		98,839		Hr
	$T_A = +85^{\circ}\text{C}$				
<b>TEMPERATURE</b>					
Specification	No Power Derating	-40		+70	$^{\circ}\text{C}$
Operation		-40		+100	$^{\circ}\text{C}$
Storage		-55		+110	$^{\circ}\text{C}$

## ABSOLUTE MAXIMUM RATINGS

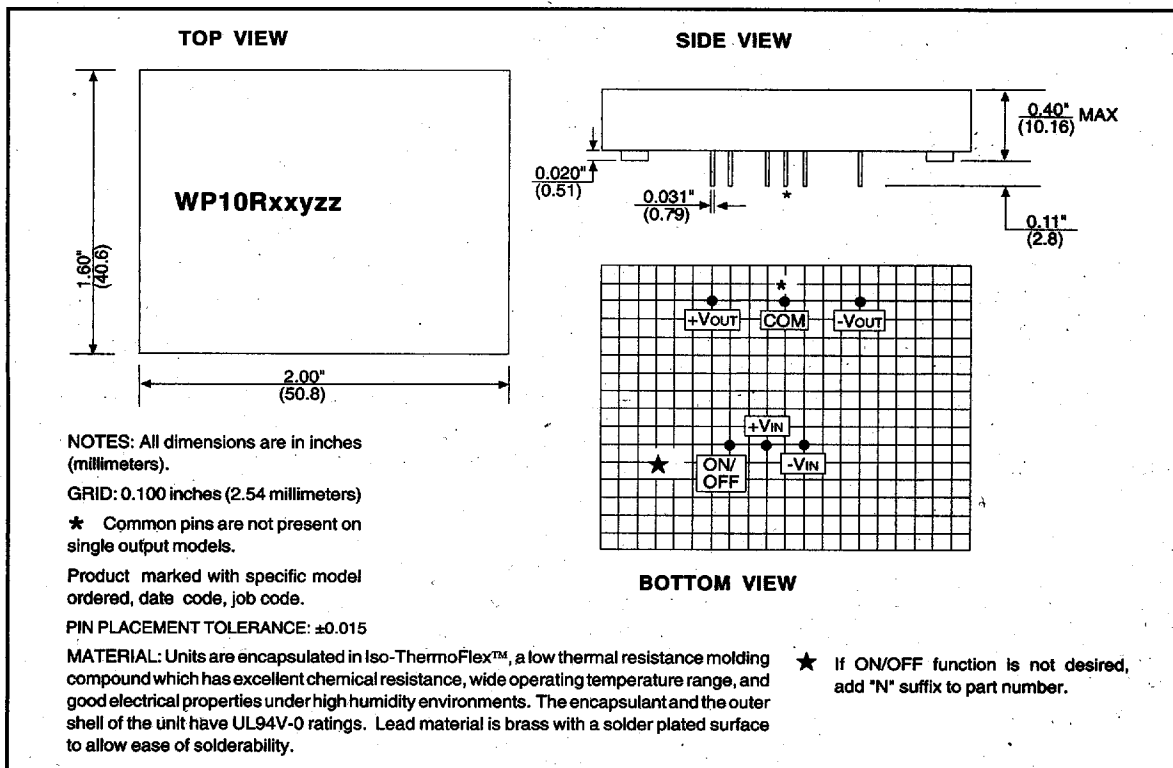
Output Short-Circuit Duration.....Continuous  
Case Temperature .....100°C  
Lead Temperature (soldering, 10 seconds max).....+300°C

REMOTE ON/OFF ACTIVE LOW	MIN.	MAX
ON - Logic Low	0	1.2V
OFF - Logic High	2.0V	18.0V

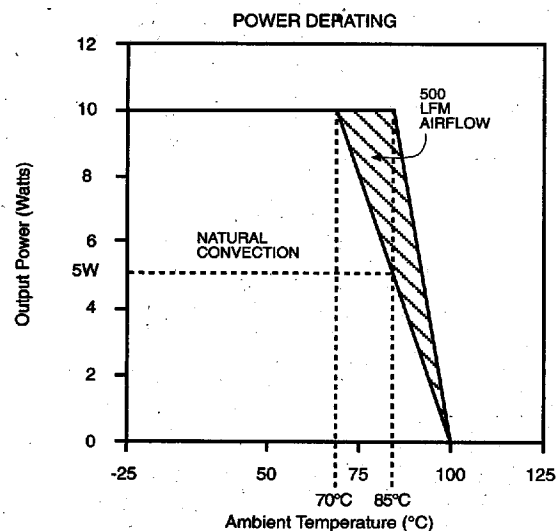
## ORDERING INFORMATION

Device Family **WP10R** **xyzz** **/H**  
Indicates Wide Input Power 10 Watt Regulated Unit  
Model Number \_\_\_\_\_  
Selected From Table of Electrical Characteristics  
Where:  
xx = Input Voltage  
y = Number of Outputs (Single "S", Dual "D")  
zz = Output Voltage  
Screening Option \_\_\_\_\_

## MECHANICAL



## APPLICATION NOTES



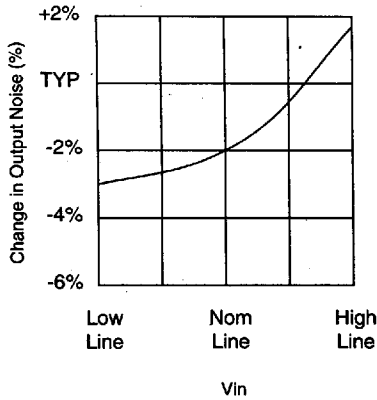
## FUSING

For maximum safety and system protection, a Buss PC-TRON, PCB 2A fuse or equivalent should be used in series with the input.

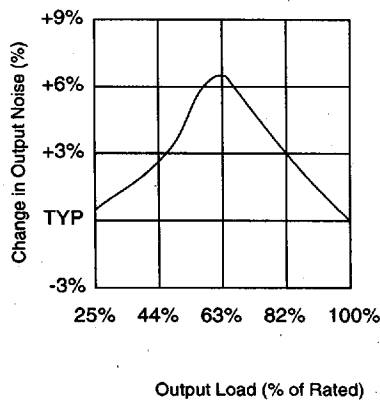
# TYPICAL PERFORMANCE CURVES

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

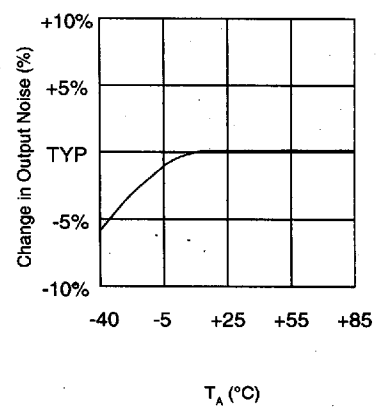
EFFICIENCY vs INPUT VOLTAGE



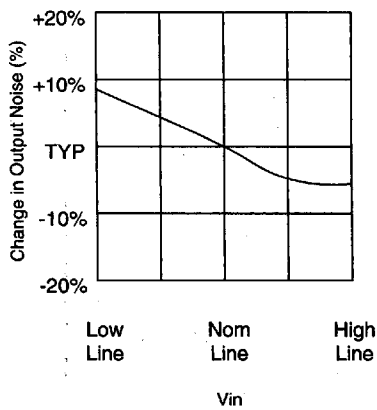
EFFICIENCY vs OUTPUT LOAD



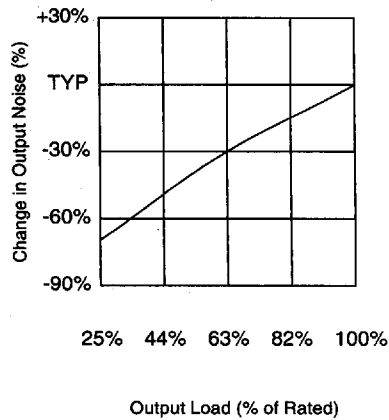
EFFICIENCY vs TEMPERATURE



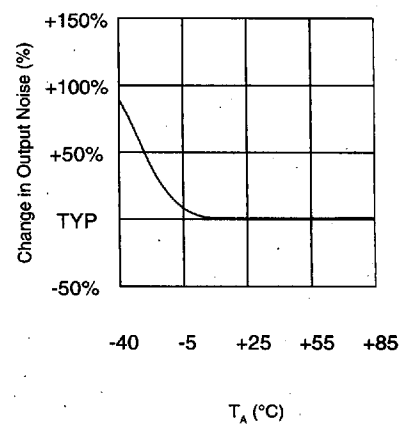
OUTPUT NOISE vs INPUT VOLTAGE



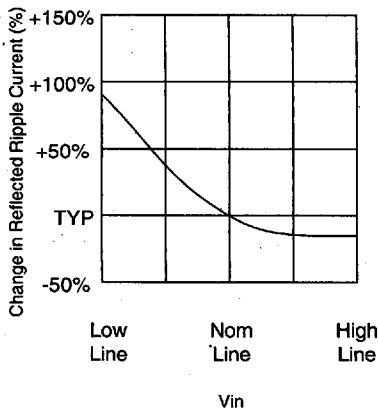
OUTPUT NOISE vs OUTPUT LOAD



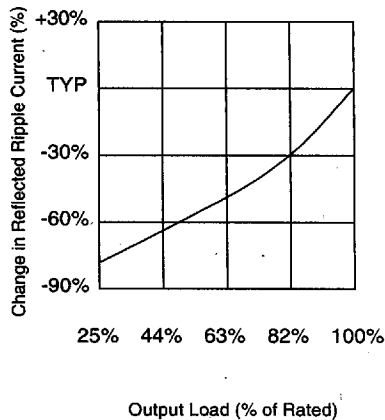
OUTPUT NOISE vs TEMPERATURE



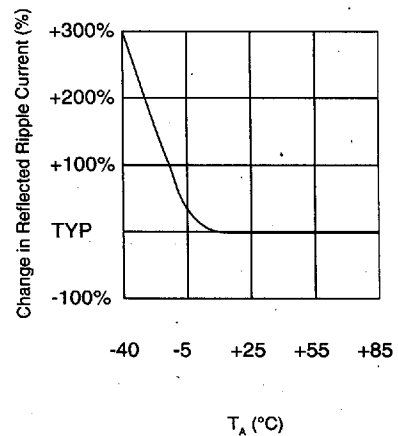
REFLECTED RIPPLE CURRENT vs INPUT VOLTAGE



REFLECTED RIPPLE CURRENT vs OUTPUT LOAD



REFLECTED RIPPLE CURRENT vs TEMPERATURE



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