

# 1 WATT REGULATED

DC/DC CONVERTERS VPAC AND SIPAC SERIES

## FEATURES

- Ultra-compact SIP and DIP packages
- Input/Output isolated
- Designed to meet FCC Sec 15, Sub Part J, A&B
- PC mountable
- No derating to 71°C
- Short circuit protected, self recovering
- 100 KHz Switching Frequency
- Proven reliability (MTBF >150,000 hours), demonstrated
- 100% burned-in and triple tested
- 3 year warranty

## GENERAL DESCRIPTION

This series of 1 watt regulated DC/DC converters provides an economical and space efficient solution in applications where systems voltage conversion, regulation and isolation are required at point of load. Wherever 5 or 12 VDC power is available, these converters enable the designer to have other positive and negative regulated voltages in a form factor compatible with IC assembly techniques. The converters are encapsulated and operate without derating or heatsinking over their full specified temperature range. Solid tantalum capacitors are used for enhanced reliability. The units are specifically designed for applications where low ripple and noise are required, as in circuits using OP-AMPS, A/D, D/A and F/V converters, RAMS, EPROMS and microprocessors. They can also be used for negative voltage bias applications.

**GENERAL ELECTRICAL SPECIFICATIONS**

(Specifications at Nominal Input and 25°C)

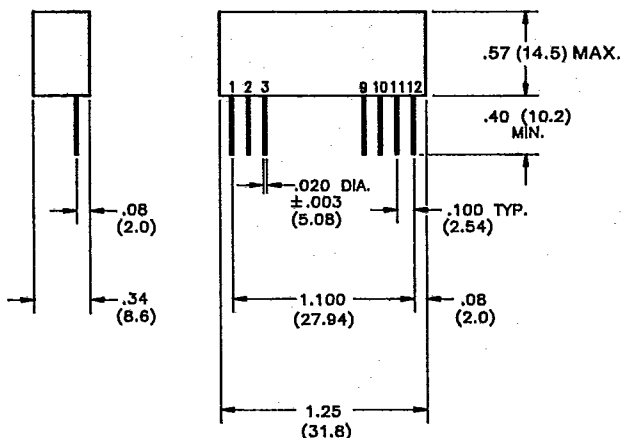
PARAMETER	LIMIT	CONDITIONS
Input Voltage Range	4.75 - 5.25VDC 10.8 - 13.2VDC	5V Input Devices 12V Input Devices
Input Filter	Filter Capacitor	See Filtering Options
Input/Output Isolation	10 <sup>3</sup> megohms (Min.) 40 pf (Max.) 500 VDC (Min.)	All Device Types
Output Accuracy	±5%	Nom. Line at Full Load
Load Regulation	Dual Output: 0.5% Single Output: 1% V5R5-5: 2%	NL to FL NL to FL NL to FL
Line Regulation	0.5%	Low Line to High Line
Output Voltage Temperature Coefficient	±.015%/°C	Typical
Output Noise/Ripple	Dual 30mV, P-P Single 100mV, P-P	20HZ-20 MHZ Bandwidth (15µf, across each output)
Short Circuit Protection Duration	Current Limited Continuous	All Units
Switching Frequency	100 KHZ	Typical
Operating Temperature Derating	-25°C to +71°C None	To 71°C
Storage Temperature	-55°C to +125°C	

**SELECTION GUIDE  
STANDARD PRODUCTS**

DEVICE TYPE	INPUT VOLTAGE VDC (MAX)	INPUT CURRENT A (MAX)	OUTPUT VOLTAGE VDC	OUTPUT CURRENT ma	PACKAGE
S5R5	5	.275	+ or - 5	100	SA
V5R5	5	.275	+ or - 5	100	VA
S5R12	5	.400	+ or - 12	80	SA
V5R12	5	.400	+ or - 12	80	VA
S5R15	5	.365	+ or - 15	65	SA
V5R15	5	.365	+ or - 15	65	VA
V5R5-5	5	.450	±5	±100	VB
V5R12-12	5	.440	±12	±40	VB
V5R15-15	5	.500	±15	±33	VB
S12R5	12	.120	+ or - 5	100	SA
V12R5	12	.120	+ or - 5	100	VA
S12R12	12	.177	+ or - 12	80	SA
V12R12	12	.177	+ or - 12	80	VA
S12R15	12	.177	+ or - 15	65	SA
V12R15	12	.177	+ or - 15	65	VA
V12R12-12	12	.185	±12	±40	VB
V12R15-15	12	.185	±15	±33	VB
V24R12-12	24	.185	±12	±40	VB



# MECHANICAL DIMENSIONS AND PIN CONNECTIONS



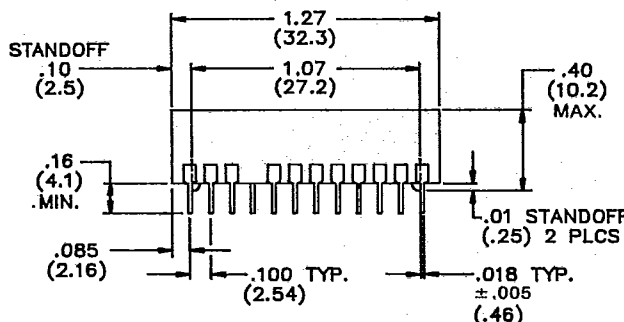
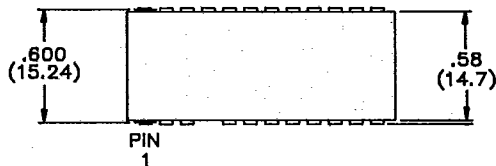
**SA**

PIN	SINGLE OUTPUT
1	+ INPUT
2	NC
3	NC
9	NC
10	- OUTPUT
11	+ OUTPUT
12	- INPUT

Note: All dimensions in parentheses are mm.  
Tolerances unless otherwise specified: .XX ± .03  
.XXX ± .010

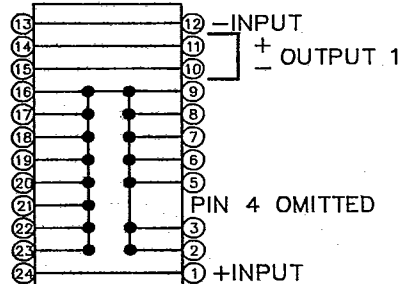
TOP

SIDE

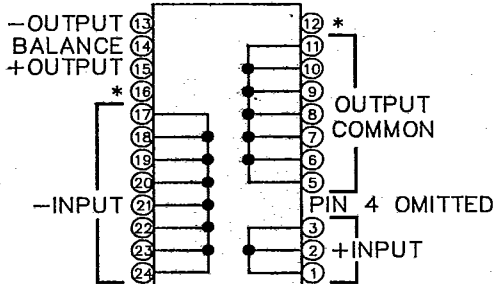


TOP VIEW VA

TOP VIEW VB



ALL SINGLE OUTPUT UNITS

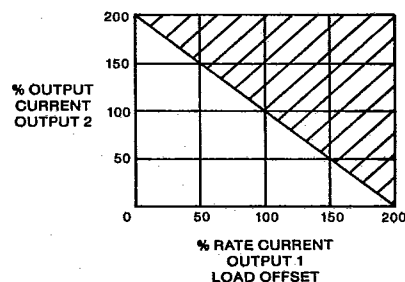
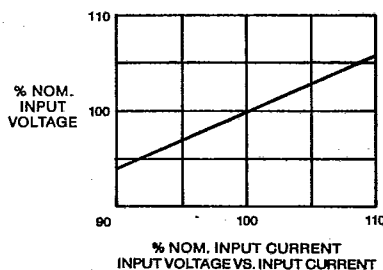
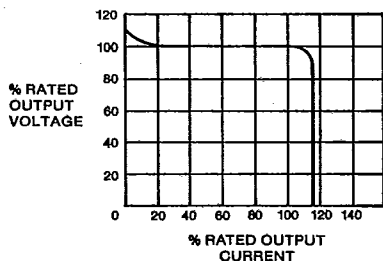


ALL DUAL OUTPUT UNITS

\*Pins for internal use only. Do not use.

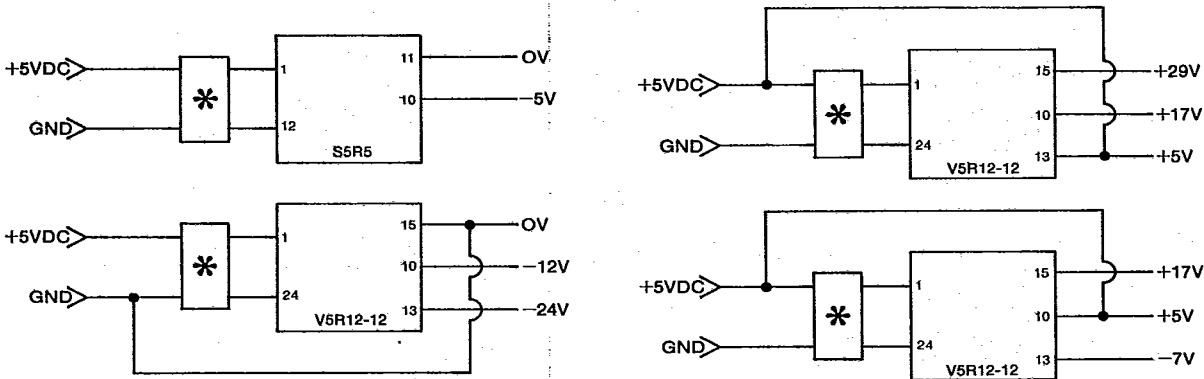
Note: Balance technique. This optional feature may be used to balance the output voltage, by selection of values of  $R_A$  or  $R_B$ .

## PERFORMANCE DATA



Note: V5R5-5 may limit either output current to 100 ma.

# OUTPUT CONFIGURATION OPTIONS

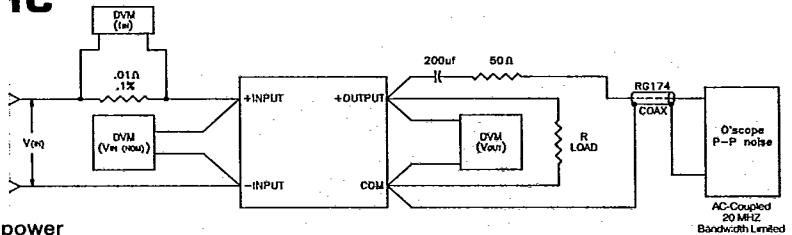


Standard isolated outputs: 5, 12, 15,  $\pm 5$ ,  $\pm 12$ ,  $\pm 15$ VDC  
 Combined isolated outputs: 10, 24, 30VDC  
 Combined non-isolated outputs: -3, -7, -12, -15, -24, -30, +17, +20, +29, +35, +36, +42VDC

- Achieving these voltages is dependent on model type selected and configuration used. Please contact factory for assistance in selection.
- Total load is 1 watt. This load may be split unequally between the two outputs. Maximum load for 5VDC outputs is 0.5 watt.

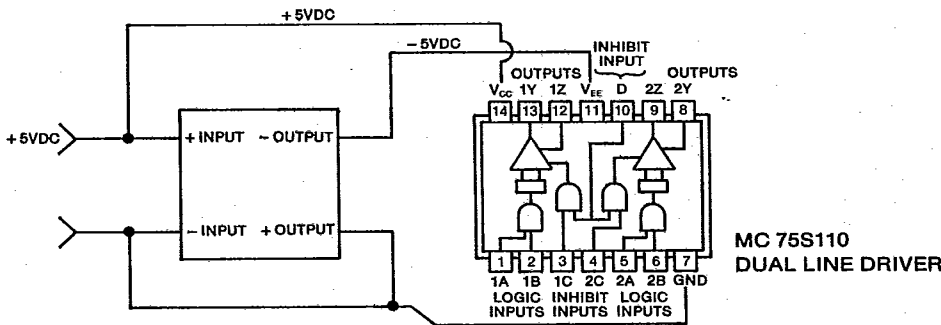
## TEST CIRCUIT SCHEMATIC

- When measuring output noise use most direct possible connections to ensure correct readings.
- All noise measurements between 20HZ to 20MHZ BW.
- R (LOAD) Selected for maximum rated output current.



**Caution:** (1) Do not insert or remove device with power applied. (2) Care must be taken to observe input polarity.

## TYPICAL APPLICATION

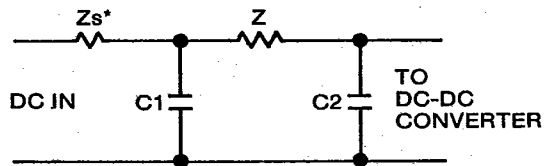


## \* FILTERING OPTIONS

If the reflected ripple from a V-PAC OR S-PAC series device requires reduction, this filter option may be connected externally. A recommended filter configuration with various component values is represented here:

Z	C1*, C2* 15μf, 20V	39μF, 10V
3μH	-60db	-70db
1Ω	-40db	-50db

\*Low ESR Tantalum Capacitor



\*Zs is Source Impedance

