

# DSP1D Series

## Dual Output DC-DC Converters

The DSP1D Series is specifically designed to convert a nominal 5 volt input into two isolated output voltages.

The dual semi-regulated output voltages were designed to allow analog circuits and three-terminal regulators to operate within their most efficient input voltage range.

This series achieves high power densities through the use of 350 kHz fixed-frequency switching converters.



### Key Features & Benefits

- RoHS lead solder exemption compliant
- Up to 1 Watt unregulated output power
- Single-In-Line package
- Four-terminal operation
- Efficiencies to 70%
- Output Voltages: 5V, 7V, 12V, 14V, 15V, 17V
- 700 V isolation
- -40 °C to +85 °C operation

## 1. MODEL SELECTION

MODEL	INPUT RANGE [VDC]			OUTPUT	
	MIN	MAX	[VDC]	[mA]	POWER [W]
DSP1N5D5	4.5	5.5	±5	±75	0.75
DSP1N5D7	4.5	5.5	±7	±70	1
DSP1N5D12	4.5	5.5	±12	±40	1
DSP1N5D14	4.5	5.5	±14	±35	1
DSP1N5D15	4.5	5.5	±15	±33	1
DSP1N5D17	4.5	5.5	±17	±30	1

Model numbers highlighted in yellow are not recommended for new designs.

## 2. GENERAL SPECIFICATIONS<sup>1</sup>

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
<i>Isolation</i>					
Isolation Voltage		500			VDC
Capacitance	Input to Output		10		pF
<i>Output Trim Function</i>					
Input Resistance			40		kΩ
Programming Range		+5, -34			%
<i>Environmental</i>					
Case Operating Range (T <sub>c</sub> ) <sup>2</sup>		-40		85	°C
Storage Range		-55		105	°C
Line Regulation			1		%
Load Regulation	20% to 100% Load		5		%
<i>General</i>					
MTBF	Calculated		700,000		hrs
Weight			0.1/28		oz/g
Case Material					Non Conductive Plastic

### NOTES

- <sup>1</sup> All parameters measured at T<sub>c</sub> = 25 °C, nominal input voltage and full rated load unless otherwise noted.
- <sup>2</sup> Derate output power linearly to 0.6 watts from 70 °C to 85 °C.

## 3. DSP1 SERIES APPLICATION NOTES

### EXTERNAL CAPACITANCE REQUIREMENTS

Output filtering is required for operation. A minimum of 10 F is specified for optimal performance. Output capacitance may be increased for additional filtering, and should not exceed 400  $\mu$ F. To meet the reflected ripple requirements of the converter, an input impedance of less than 0.5 Ohms from DC to 350 kHz is required. If a capacitive input source is farther than 2" from the converter, it is recommended to use a 10  $\mu$ F, 25 V solid tantalum capacitor.

### REGULATION

This converter uses a semi-regulated design. The output will vary as the load is changed, with output decreasing with increasing load. Additionally, output voltage will change in proportion to a change in input voltage. The typical output voltage will change 1% for each 1% change in input voltage.

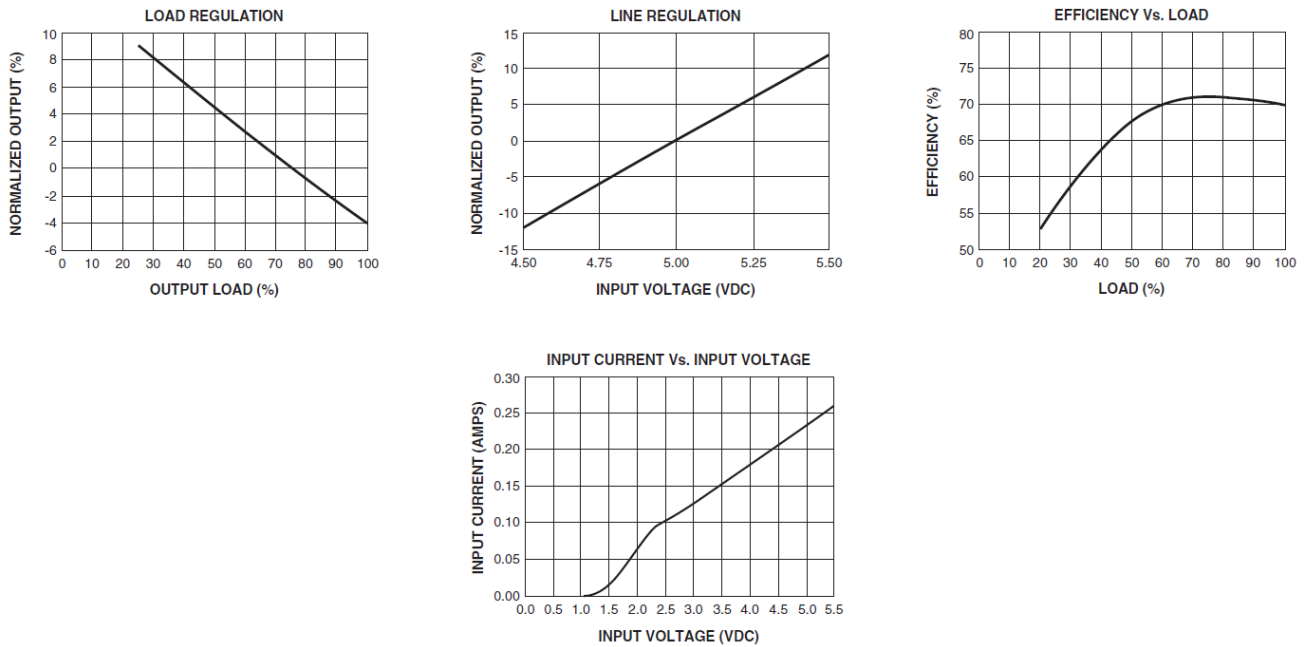


Figure 1. Typical Performance ( $T_c = 25^\circ\text{C}$ )

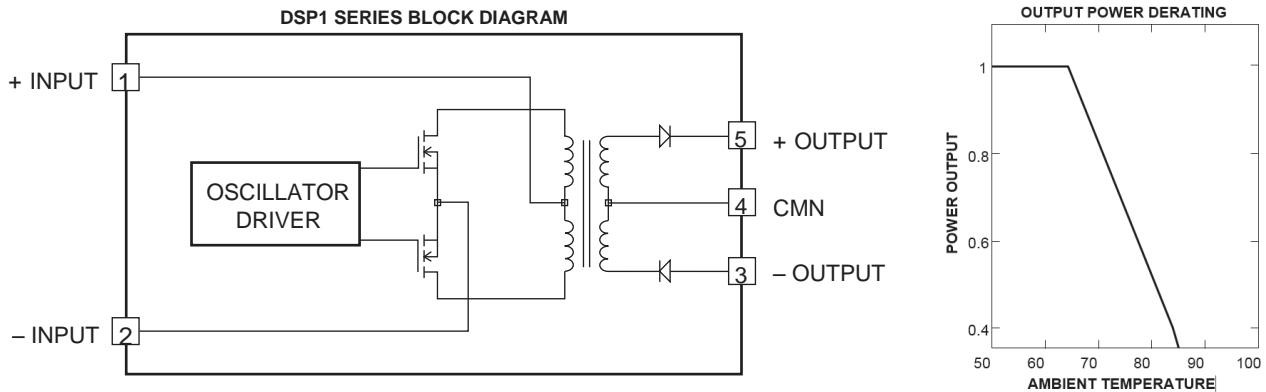


Figure 2. Block Diagram

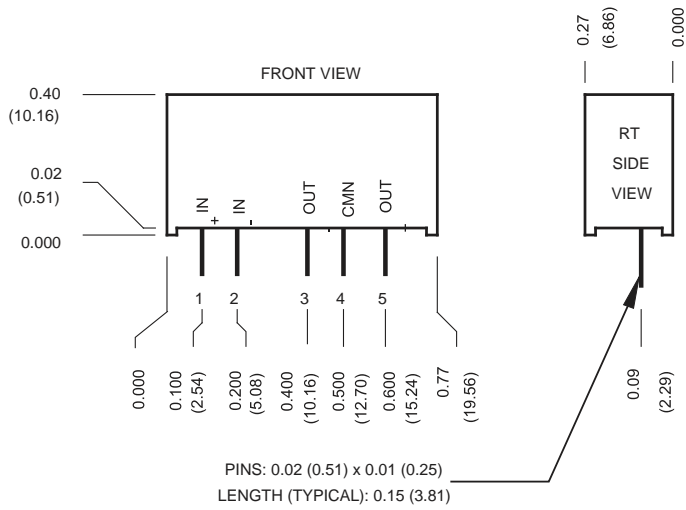


Figure 3. Mechanical Dimensions

PIN	FUNCTION
1	+INPUT
2	-INPUT
3	- OUT
4	COMMON
5	+OUT

Mechanical tolerances unless otherwise noted:

X.XX dimensions: ±0.020 inches  
 X.XXX dimensions: ±0.010 inches

**For more information on these products consult: [tech.support@psbel.com](mailto:tech.support@psbel.com)**

**NUCLEAR AND MEDICAL APPLICATIONS** - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

**TECHNICAL REVISIONS** - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.



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