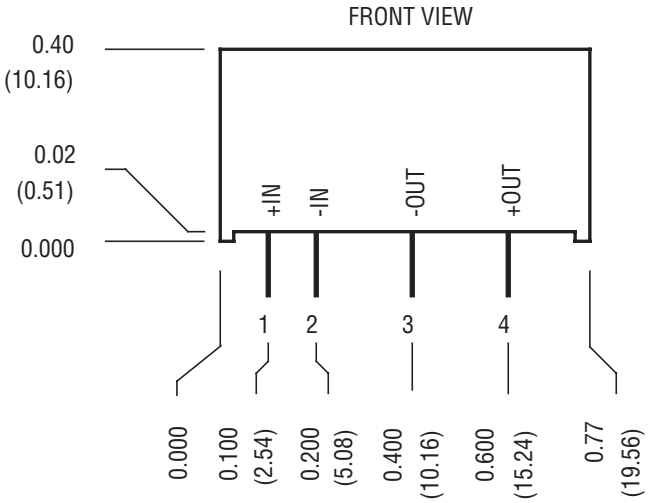
Description

The DSP1 Series is specifically designed to convert a nominal 5 volt input into an isolated output voltage. The 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.

Features

- RoHS lead solder exemption compliant
- Up to 1 watt unregulated output power
- Single in line package
- Four-terminal operation
- Efficiencies to 75%
- 350 kHz fixed-frequency operation
- 700 V isolation
- -40 °C to +85 °C operation



Mechanical tolerances unless otherwise noted:
X.XX dimensions: ±0.020 inches
X.XXX dimensions: ±0.010 inches
* This dimension to decrease to 0.24±0.01" (6.09±0.25) in 1998
** This dimension to decrease to 0.035±0.015" (0.89±0.38) in 1998

Pin	Function
1	+INPUT
2	-INPUT
3	-OUT
4	+OUT

Selection Chart

Model	Input Range VDC		Output VDC	Output mA	Power W
	Min	Max			
DSP1N5S5	4.5	5.5	5	150	0.75
DSP1N5S7	4.5	5.5	7	140	1.0
DSP1N5S12	4.5	5.5	12	80	1.0
DSP1N5S14	4.5	5.5	14	70	1.0
DSP1N5S15	4.5	5.5	15	65	1.0
DSP1N5S17	4.5	5.5	17	60	1.0

General Specifications (1)

All Models			Units
Isolation			
Isolation Voltage Input to Output 10µA	MIN	700	VDC
Input to Output Capacitance	TYP	25	pF
Environmental			
Case Operating Range, Tc (3)	MIN MAX	-40 +85	°C
Storage Range	MIN MAX	-55 105	°C
Thermal Impedance (2)	TYP	58	°C/Watt
General			
MTBF (Calculated)	TYP	700,000	HRS
Unit Weight	TYP	0.1 / 2.8	oz / gm
Case Material	Non Conductive Plastic		

NOTES

(1) All parameters measured at Tc = 25 °C, nominal input voltage and full rated load unless otherwise noted.
(2) The case Thermal Impedance is specified as the case temperature rise over ambient per package dissipated.
(3) Derate output power linearly to 0.6 watts from 70 °C to 85 °C.

Input Parameters (1)								
Model		**DSP1N5S5**	**DSP1N5S7**	**DSP1N5S12**	**DSP1N5S14**	**DSP1N5S15**	**DSP1N5S17**	**Units**
Voltage Range	MIN MAX	4.5 5.5						VDC
Reflected Ripple (2)	TYP	50	65					mA_{pp}
Input Current Full Load No Load	TYP TYP	221 20	280 20	263 20	268 20	267 20	279 20	mA
Efficiency	TYP	68	70	73	73	73	73	%
Switching Frequency	TYP	350						kHz

Output Parameters (1)								
Model		**DSP1N5S5**	**DSP1N5S7**	**DSP1N5S12**	**DSP1N5S14**	**DSP1N5S15**	**DSP1N5S17**	**Units**
Output Voltage		5	7	12	14	15	17	VDC
Output Voltage Accuracy (3)	MIN TYP MAX	4.75 5.00 5.25	6.65 7.00 7.35	11.40 12.00 12.60	13.30 14.00 14.70	14.25 15.00 15.75	16.15 17.00 17.85	VDC
Output Voltage, No Load	TYP	7	10	16	19	21	24	VDC
Rated Load Range	MIN MAX	0 150	0 140	0 80	0 70	0 65	0 60	mA
Load Regulation (4) 75% - 20% Load 75% - 100% Load	TYP TYP	+8 -5						%
Line Regulation (5)	TYP	1.6						%
Noise, Peak - Peak (2)	TYP	70						mV_{PP}
Temperature Coefficient	TYP	400						ppm/°C
Short Circuit Protection to Common (6)		Momentary						

NOTES

(1) All parameters measured at Tc= 25 °C, nominal input voltage and full rated load unless otherwise noted.
(2) Noise measurement bandwidth is 20 MHz. Input Reflected Ripple and output noise are measured with an external 10µF/25V tantalum capacitor connected across the input and output pins.
(3) Output Voltage Accuracy measured at 75% of maximum Rated Load.
(4) Load Regulations measured relative to 75% of maximum Rated Load Current.
(5) Line Regulation is for a 1.0% change in input Voltage.
(6) Use input fuse for protection. See Applying the input.

DSP1 Series Application Notes:

External Capacitance Requirements

Output filtering is required for operation. A minimum of 10 µF is specified for optimal performance. Output capacitance may be increased for additional filtering, not to exceed 400 µF. 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 µF, 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. See Output Voltage vs. Output Load curves. Additionally, output voltage will change in proportion to a change in input voltage. The typical output voltage will change 1.2% for each 1% change in input voltage.

Negative Outputs

A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting -OUT as the negative output.