Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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DSP1S Series

Single Output DC-DC Converters

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.

RoHS Compliant

Key Features & Benefits

- RoHS lead solder exemption compliant
- Up to 1 Watt unregulated output power
- Single-In-Line package
- Four-terminal operation
- Efficiencies to 75%
- 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]*
DSP1N5S5	4.5	5.5	5	150	0.75
DSP1N5S7	4.5	5.5	7	140	1
DSP1N5S12	4.5	5.5	12	80	1
DSP1N5S14	4.5	5.5	14	70	1
DSP1N5S15	4.5	5.5	15	65	1
DSP1N5S17	4.5	5.5	17	60	1

2. GENERAL SPECIFICATIONS [1]

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
Isolation					
Isolation Voltage	Input to Output 10 µA	700			VDC
Capacitance	Input to Output		25		pF
Environmental					
Case Operating Range (T_C)[2]		-40		85	°C
Storage Range		-55		105	°C
Thermal Impedance [3]			58		°C / Watt
General					
MTBF	Calculated		700,000		hrs
Weight			0.1/28		oz/g
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. Derate output power linearly to 0.6 watts from 70 °C to 85 °C.
3. The case Thermal Impedance is specified as the case temperature rise over ambient per package dissipated.

3. INPUT SPECIFICATIONS[1]

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
Voltage Range		4.5		5.5	VDC
Reflected Ripple [2]	DSP1N5S5 DSP1N5S7 / DSP1N5S12 / DSP1N5S14 / DSP1N5S15 / DSP1N5S17		50 65		mApp
Input Current	Full Load DSP1N5S5 DSP1N5S7 DSP1N5S12 DSP1N5S14 DSP1N5S15 DSP1N5S17		221 280 263 268 267 279		mA
	No Load (all models)		20		mA
Efficiency	DSP1N5S5 DSP1N5S7 DSP1N5S12 / DSP1N5S14 / DSP1N5S15 / DSP1N5S17		68 70 73		%
Switching Frequency			350		kHz

4. OUTPUT SPECIFICATIONS[1]

PARAMETER	CONDITIONS / DESCRIPTION		MIN	TYP	MAX	UNITS
Output Voltage		DSP1N5S5 DSP1N5S7 DSP1N5S12 DSP1N5S14 DSP1N5S15 DSP1N5S17		5 7 12 14 15 17		VDC
Output Voltage Accuracy [3]		DSP1N5S5 DSP1N5S7 DSP1N5S12 DSP1N5S14 DSP1N5S15 DSP1N5S17	4.75 6.65 11.40 13.30 14.25 16.15	5.00 7.00 12.00 14.00 15.00 17.00	5.25 7.35 12.60 14.70 15.75 17.85	VDC
Output Voltage, No Load		DSP1N5S5 DSP1N5S7 DSP1N5S12 DSP1N5S14 DSP1N5S15 DSP1N5S17		7 10 16 19 21 24		VDC
Rated Load Range		DSP1N5S5 DSP1N5S7 DSP1N5S12 DSP1N5S14 DSP1N5S15 DSP1N5S17	0		150 140 80 70 65 60	mA
Load Regulation [4]	75% - 20% Load 75% - 100% Load			+8 -5		%
Line Regulation [5]				1.6		%
Noise, Peak – Peak [2]				70		mVpp
Temperature Coefficient				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.

5. 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, not to exceed 400 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 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. 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.

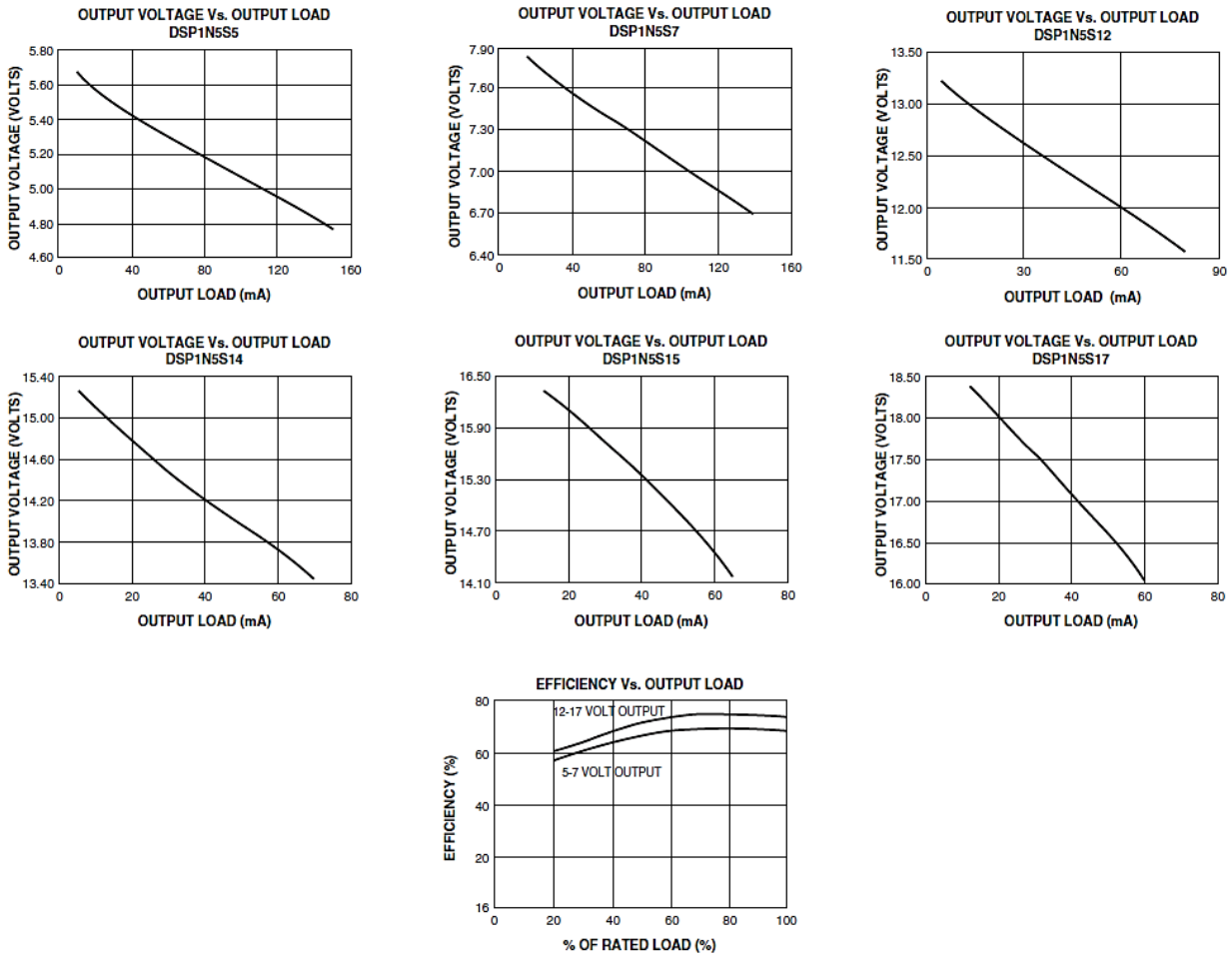
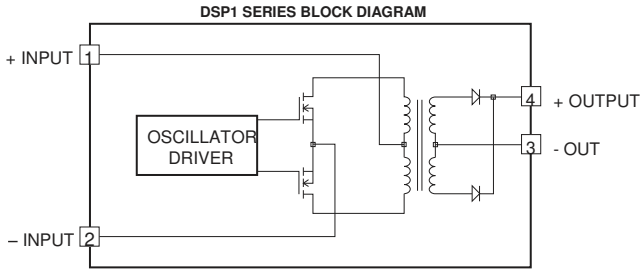


Figure 1. Typical Performance (Tc = 25°C)



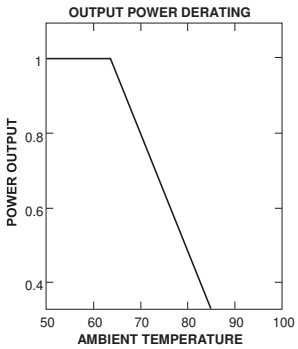


Figure 2. Block Diagram

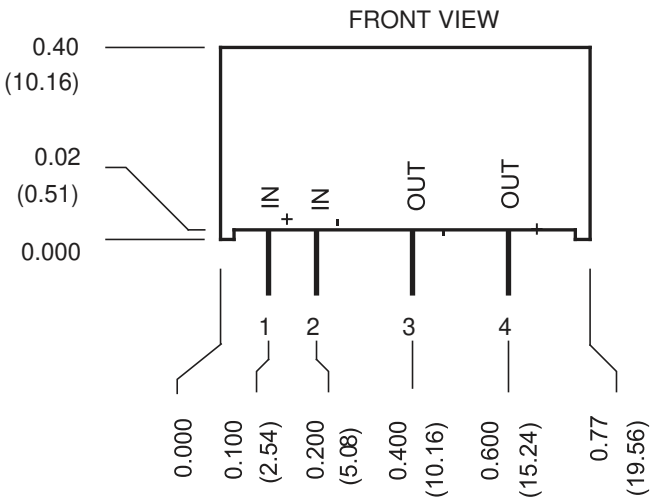


Figure 3. Mechanical Dimensions

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

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

For more information on these products consult: tech.support@psbel.com

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