PART NUMBER: VASD1-DIP Series **DESCRIPTION:** dc-dc converter

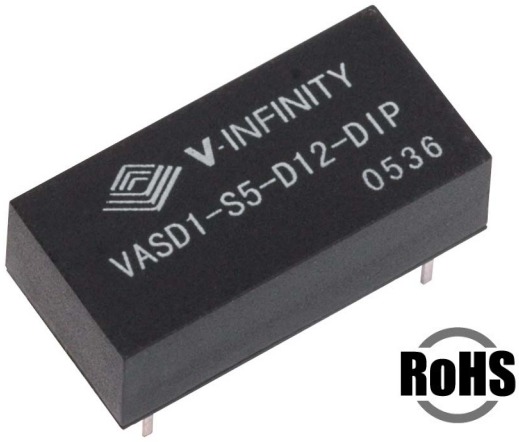
description

Designed to convert fixed voltages into an isolated regulated voltage, the VASD1-DIP series is well suited for providing board-mount local supplies in a wide range of applications, including mixed analog/digital circuits, test & measurement equip., process/machine controls, datacom/telecom fields, etc...

The semi-regulated output can be followed by 3-terminal regulators to provide output protection, in addition to output regulation.

features

- **isolated 1 W output**
- **temperature range: -40°C~+85°C**
- **unregulated**
- **high efficiency to 80%**
- **dual voltage output**
- **small footprint**
- **DIP package style**
- **industry standard pinout**
- **UL94-V0 package**
- **no heatsink required**
- **1K Vdc isolation**
- **power density 0.85 W/cm³**
- **no external component required**
- **low cost**



MODEL

	input voltage		output voltage	output current		efficiency	
	nominal (V dc)	range (V dc)	(V dc)	max. (mA)	min. (mA)	typ. (%)	UL60950-1
VASD1-S5-D5-DIP	5	4.5~5.5	±5	±100	±10	72	YES
VASD1-S5-D9-DIP	5	4.5~5.5	±9	±56	±6	77	YES
VASD1-S5-D12-DIP	5	4.5~5.5	±12	±42	±5	79	YES
VASD1-S5-D15-DIP	5	4.5~5.5	±15	±33	±4	80	YES
VASD1-S12-D5-DIP	12	10.8~13.2	±5	±100	±10	72	YES
VASD1-S12-D9-DIP	12	10.8~13.2	±9	±56	±6	78	YES
VASD1-S12-D12-DIP	12	10.8~13.2	±12	±42	±5	79	YES
VASD1-S12-D15-DIP	12	10.8~13.2	±15	±33	±4	78	YES
VASD1-S15-D5-DIP	15	13.5~16.5	±5	±100	±10	72	NO
VASD1-S24-D5-DIP	24	21.6~26.4	±5	±100	±10	73	YES
VASD1-S24-D9-DIP	24	21.6~26.4	±9	±56	±6	79	YES
VASD1-S24-D12-DIP	24	21.6~26.4	±12	±42	±5	80	YES
VASD1-S24-D15-DIP	24	21.6~26.4	±15	±33	±4	80	YES

OUTPUT

parameter	conditions/description		min	nom	max	units
output power			0.1		1	W
voltage accuracy	refer to recommended circuit			±1	±2	%
ripple	@ 20MHz Bandwidth	5/12/15V		50	75	mVpp
		24 V		100	150	mVpp
line regulation	input voltage from low to high				±1.2	%
load regulation	10% to 100% full load	5V		10.5	15	%
		9V		8.3	15	%
		12V		6.8	15	%
		15V		6.3	15	%
temperature coefficient	refer to recommended circuit				0.03	%/°C
switching frequency	100% load, nominal input			100		kHz

note: 1. All specifications measured at TA-25°C, humidity <75%, normal input voltage and rated output load unless otherwise specified.

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PART NUMBER: VASD1-DIP Series **DESCRIPTION:** dc-dc converter

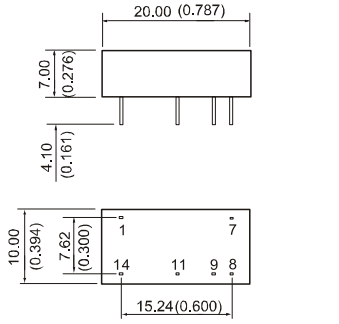
GENERAL SPECIFICATIONS

parameter	conditions/description
output short circuit protection	<1 second
temperature rise at full load	15°C typ., 25°C max.
cooling	free air convection
operating temp. range	-40°C ~ +85°C
storage temp. range	-55°C ~ +125°C
storage humidity range	≤95%
case material	plastic (UL94-V0)
MTBF	>3,500,000 hours

ISOLATION SPECIFICATIONS

parameter	conditions/description	min	nom	max	units
isolation voltage	flash tested for 1 minute		1000		V dc
isolation resistance	test at 500 V dc		1000		MΩ

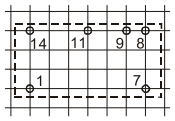
OUTLINE DIMENSIONS & RECOMMENDED LAYOUT PATTERN



Note:
Unit:mm(inch)
Pin section:0.50*0.30mm(0.020*0.012inch)
Pin tolerances:±0.10mm(±0.004inch)
General tolerances:±0.25mm (±0.010inch)

First Angle Projection

RECOMMENDED FOOTPRINT
Top view,grid:2.54mm(0.1inch), diameter:1.00mm

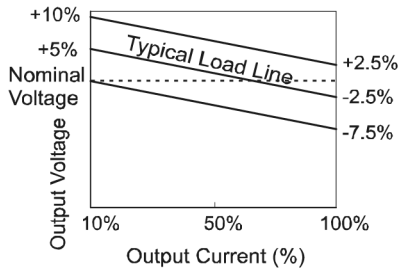


FOOTPRINT DETAILS

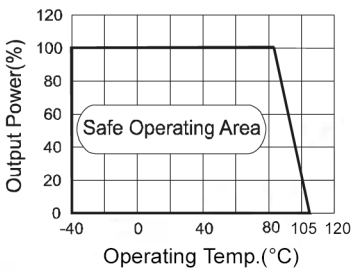
Pin	Dual
1	GND
7	NC
8	0V
9	+Vo
11	-V0
14	Vin

TYPICAL CHARACTERISTICS

Tolerance Envelope Graph



Temperature Derating Graph



PART NUMBER: VASD1-DIP Series

DESCRIPTION: dc-dc converter

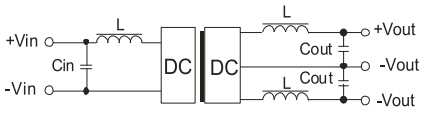
APPLICATION NOTES:

- Requirement on output load
  To ensure this module can operate efficiently and reliably, the minimum output load should not be less than 10% of the full load. Also, this product should never be operated under no load conditions. If the actual output power is too small, please connect a resistor with proper resistance at the output end in parallel to increase the load.

- Overload protection
  Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to connect a self-recovery fuse in series at the input end or to add a circuit breaker to the circuit.

- Recommended circuit
  If you want to further decrease the input/output ripple, an “LC” filtering network may be connected to the input and output ends of the dc-dc converter, see (Figure 1).

FIGURE 1



It should also be noted that the inductance and the frequency of the “LC” filtering network should be staggered with the dc-dc frequency to avoid mutual interference. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided that safe and reliable operation is ensured, the recommended capacitance of its filter capacitor see (Table 1).

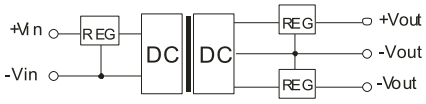
TABLE 1

Vin (VDC)	Cin (uF)	Vout (VDC)	Cou (uF)
5	4.7	±5	4.7
12	2.2	±9	2.2
15	2.2	±12	1
24	1	±15	0.47

It is not recommended to connect any external capacitor in the application field with less than a 0.5 watt output.

- Output voltage regulation and over-voltage protection circuit
  The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).

FIGURE 2



No parallel connection or plug and play.