

### Features

- Wide (2:1) input range
- Isolated & regulated 3W output
- Efficiency up to 83%
- Single voltage output
- DIP package style
- Industry standard pinout
- metal case
- No heatsink required
- 1K Vdc isolation
- MTBF >1,000,000 hours
- Temperature range: -40°C~+85°C
- RoHS Compliant



Model Number	Input Voltage			Output Voltage	Output Current		Efficiency	Package Style
	Nominal	Range	Max.		Max.	Min.		
VRB3-D5-S5-DIP	5 Vdc	4.5~9 Vdc	11 Vdc	5 Vdc	600 mA	60 mA	70%	DIP
VRB3-D5-S9-DIP	5 Vdc	4.5~9 Vdc	11 Vdc	9 Vdc	330 mA	33 mA	72%	DIP
VRB3-D5-S12-DIP	5 Vdc	4.5~9 Vdc	11 Vdc	12 Vdc	250 mA	25 mA	73%	DIP
VRB3-D5-S15-DIP	5 Vdc	4.5~9 Vdc	11 Vdc	15 Vdc	200 mA	20 mA	75%	DIP
VRB3-D12-S5-DIP	12 Vdc	9~18 Vdc	22 Vdc	5 Vdc	600 mA	60 mA	70%	DIP
VRB3-D12-S9-DIP	12 Vdc	9~18 Vdc	22 Vdc	9 Vdc	330 mA	33 mA	75%	DIP
VRB3-D12-S12-DIP	12 Vdc	9~18 Vdc	22 Vdc	12 Vdc	250 mA	25 mA	76%	DIP
VRB3-D12-S15-DIP	12 Vdc	9~18 Vdc	22 Vdc	15 Vdc	200 mA	20 mA	78%	DIP
VRB3-D24-S5-DIP	24 Vdc	18~36 Vdc	40 Vdc	5 Vdc	600 mA	60 mA	70%	DIP
VRB3-D24-S9-DIP	24 Vdc	18~36 Vdc	40 Vdc	9 Vdc	330 mA	33 mA	75%	DIP
VRB3-D24-S12-DIP	24 Vdc	18~36 Vdc	40 Vdc	12 Vdc	250 mA	25 mA	81%	DIP
VRB3-D24-S15-DIP	24 Vdc	18~36 Vdc	40 Vdc	15 Vdc	200 mA	20 mA	81%	DIP
VRB3-D48-S5-DIP	48 Vdc	36~72 Vdc	80 Vdc	5 Vdc	600 mA	60 mA	78%	DIP
VRB3-D48-S9-DIP	48 Vdc	36~72 Vdc	80 Vdc	9 Vdc	330 mA	33 mA	82%	DIP
VRB3-D48-S12-DIP	48 Vdc	36~72 Vdc	80 Vdc	12 Vdc	250 mA	25 mA	82%	DIP
VRB3-D48-S15-DIP	48 Vdc	36~72 Vdc	80 Vdc	15 Vdc	200 mA	20 mA	83%	DIP

### General Specifications

Output short circuit protection	continuous
Temperature rise at full load	30°C typ.
Cooling	Free air convection
No-load power consumption	100 mW (typ.)
Operating temperature range	-40°C to +85°C
Storage temperature range	-55°C to +125°C
Soldering temperature	300°C max.
Storage humidity range	<95%
Case material	Metal
MTBF	>1,000,000 hrs.

### Isolation Specifications

Item	Test Conditions	Min.	Typ.	Max.
Isolation Voltage	Flash tested for 1 min.	1500 Vdc		
Isolation Resistance	Test at 500 Vdc	1000 MΩ		

### Output Specifications

Item	Test conditions	Min.	Typ.	Max.
Output power	See below	0.3 W		3 W
Line Regulation	Input voltage from low to high		±0.2%	±0.5%
Load Regulation	From 10% to 100% load		±0.5%	±0.75%
Output voltage accuracy	refer to recommended circuit		±1%	±3%
Temperature drift	refer to recommended circuit			0.03%/°C
Ripple	20 Hz-300 KHz Bandwidth		30 mVp-p	60 mVp-p
Noise	DC-20MHz Bandwidth		80 mVp-p	150 mVp-p
Switching frequency	100% load	80 KHz		300 KHz
	10% load	250 KHz		600 KHz

#### Notes:

1. All specifications measured at TA=25 °C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
2. See recommended circuits below for more details.

#### Applications:

The VRB3-DIP Series are specially designed for applications where wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

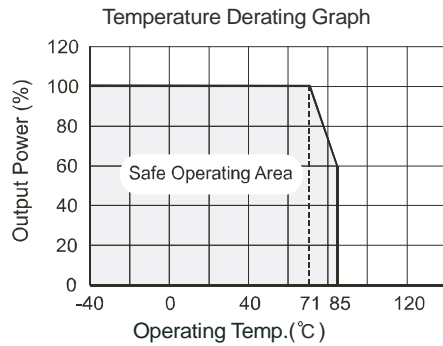
These products apply to:

- 1) Where the voltage of the input power supply is wide range (voltage range: 2:1);
- 2) Where isolation is necessary between input and output (Isolation Voltage = 1500 Vdc)
- 3) Where the regulation of the output voltage and the output ripple noise are demanding.

These products don't apply to:

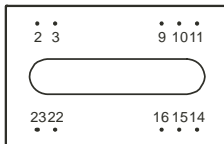
- 1) Where the input voltage is required to be more than 2:1;
- 2) Where the isolation voltage between input and output is required to be >1500VDC;
- 3) The output load's actual power consumption is less than 1W.

### Typical Characteristics



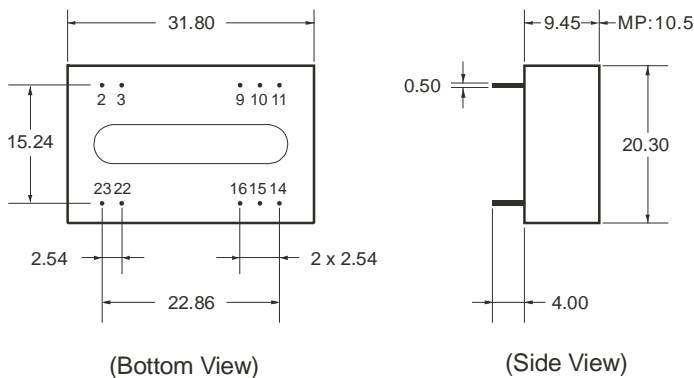
### Pin Connections

Bottom View



Pin	Function
2,3	GND
9,10,11,15	NC
14	+Vo
16	0V
22	Vin
23	Vin

### Outline Dimensions & Recommended Footprint Details



Note: All Pins on a 2.54mm pitch; All Pin diameters are 0.50 mm(Tolerance:±0.10); All dimensions in mm.

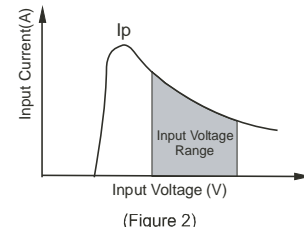
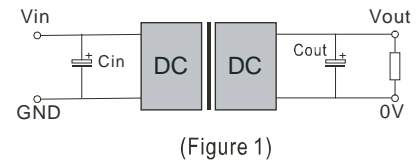
#### Application Note

##### Recommended circuit

All the VRB3-DIP Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load. Never be tested under no load (See Figure 1 & 2). If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high.(See table 1).If you want to use the products in high EMI, please choose our metal packaged products.

##### Input Current

When it is used in unregulated power supply., be sure that the fluctuating range of the power supply and the rippled voltage do not exceed the module standard. Input current of power supply should afford the start-up current of this kind of DC/DC module. (See figure 2)



#### External Capacitor

Although this series of DC/DC converter can work without external capacitor, in order to keep an optimum performance, however, it needs external capacitor. (See Table 1)

#### Requirement on Output Load

To ensure this module operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, the minimum output load is not less than **10%** Of the full load, and that this product **should never be operated under no load!!!** If the actual load is less below the specified minimum load, the output ripple of this type of DC/DC converter will increase drastically and at the same time efficiency & reliability of the circuit will decrease deeply .If the actual output power from the load in your circuit is very small, please connect a resistor with proper resistance at the output end to in parallel to increase the load, or use our company's other products with a lower rated output power.

**The products cannot be used in parallel.**

Table 1

Vin	Cin	Cout (0+70°C)	Cout (-40+85°C)
5V & 12V	100uF	100uF (electrolytic capacitor)	47uF (tantalum capacitor)
24V & 48V	10uF		