

Luoding Ruilvte Electronic Technology Co., Ltd.

VRB****LD-15WR3 Series

DC-DC Power Supply Module/1500V Isolation
Wide input voltage range/Regulated single output

Product features
2:1 wide input voltage range
Short circuit and overcurrent protection:
resettable
Isolation Voltage: 1500Vdc isolation
Operating Temperature: -45°C-85°C
No additional components required
Stable performance, high reliability,
MTBF≥1 million hours
Metal packaging, six-sided shielding
Compliant with the RoHS Directive

Module selection guide

Model number	Input		Output			Conversion efficiency (%)
	Nominal voltage (V)	Voltage range (V)	Rated voltage (V)	Minimum current (A)	Maximum current (A)	
VRB2405LD-15WR3	24	18-36	5	0.30	3.0	88
VRB2409LD-15WR3			9	0.16	1.66	89
VRB2412LD-15WR3			12	0.13	1.25	89
VRB2415LD-15WR3			15	0.10	1.00	89
VRB2424LD-15WR3			24	0.06	0.625	89
VRB2430LD-15WR3			30	0.05	0.50	89
VRB4805LD-15WR3	48	36-72	5	0.30	3.0	86
VRB4809LD-15WR3			9	0.16	1.66	88
VRB4812LD-15WR3			12	0.13	1.25	89
VRB4815LD-15WR3			15	0.10	1.00	89
VRB4824LD-15WR3			24	0.06	0.625	89
VRB4830LD-15WR3			30	0.05	0.50	89
VRB****LD-15WR3	* Tailored model based on client needs. *					

Input characteristics

Input specifications	Item	Test conditions	Minimum value	Typical value	Maximum value	Unit
	Maximum input voltage		24Vdc input (9-36Vdc)			40
48Vdc input (18-72Vdc)					80	
Control pin (Ctrl)		When the module is enabled, Ctrl is left floating.				
		When the module is disabled, Ctrl is connected to low level.			1.2	
Hot swap		Non hot-swap				

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General characteristics

Switching frequency	300KHz	Nominal input voltage, 100% load
Output short-circuit duration	Durable, resettable	
Casing's temperature rise during operation	35°C (Typ.)	
Temperature coefficient	0.03%/°C	100% full load
Pin soldering temperature	300°C	Soldering time≤3s
Isolation voltage (input and output)	1500VDC	Test time 1 minute, leakage current less than 1mA.
Insulation resistance	1000MΩ	Insulation voltage: 500V
Isolation capacitor	100pF(Typ.)	Input/Output 100KHz/V
No-load power consumption	500mW (Typ.)	
Operating temperature	-40~+85°C	Operating ambient temperature
Storage temperature	-55~+125°C	
Storage humidity	<95%	Non-condensing
Cooling method	Natural air cooling	
Weight	15g	Standard

Input characteristics

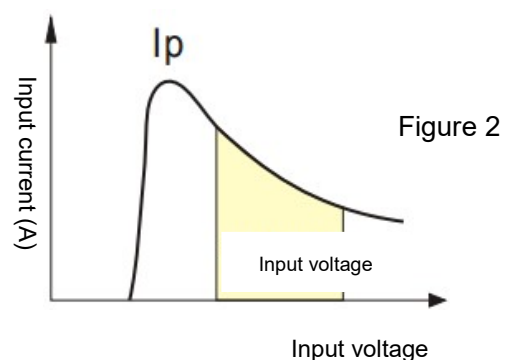
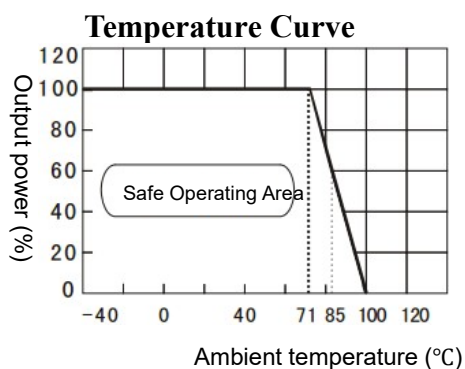
Input voltage (Vdc)		Maximum value (Vdc)	No-load current	*The input voltage must not exceed this value, otherwise it may cause permanent damage to the module.
2:1	18-36	40	35	
	36-72	80	20	

Output characteristics

Item	Test conditions	Typical value	Maximum value	
Linear voltage regulation rate	From the lowest to the highest input voltage	<0.2%	<0.5%	
Load regulation	10% to 100% load	<0.5%	<1.0%	
Output voltage accuracy	Specified input range and load	±1%	±3%	
Overcurrent protection	Full voltage input range	≥ 1.5 times the rated output current		
Ripple and noise	20MHz bandwidth	3.3V/5V/12V/15V	50mVp-p	100mVp-p
		24V	100mVp-p	150mVp-p

Unless otherwise specified, all parameters are tested under nominal input voltage, resistive load, and at room temperature of 25°C.

Curves for typical characteristics



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Caution

1. Recommended circuit: If input and output ripple needs further reduction, connect an 'LC' filter network at the input and output ends with appropriate filter capacitors. It is recommended to use ceramic capacitors or high-frequency low-impedance electrolytic capacitors. Using tantalum capacitors may cause module damage. Excessive capacitance and low ESR values may cause instability in module operation, or lower current limit and output voltage. The recommended value for output capacitance is 220uF/A (the current here is the rated output current). For each output, the maximum capacitive load value, ensuring safe and reliable operating conditions, can be found in the Maximum Capacitive Load Value Table.
2. Input current: When using an unstable power supply, please ensure that the power supply's fluctuation range and ripple voltage are within the module's input requirements. The input current of the power source must be sufficient to accommodate the DC/DC module's instantaneous start-up current I_p (Figure 2), which is approximately 1.4 times the average input current, i.e., $I_p \leq 1.4 * I_{in-max}$.
3. Load requirements: The minimum load should be no less than 10%. Otherwise, the output ripple will increase rapidly. If the product operates below the minimum required load, the module will not be damaged, but the performance specified in this datasheet cannot be guaranteed.
4. This product cannot be used in parallel and does not support hot swapping.

Recommended circuit for basic application

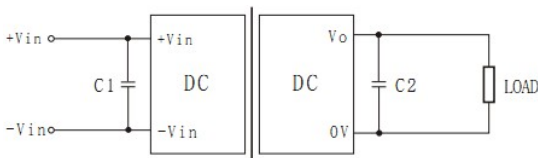
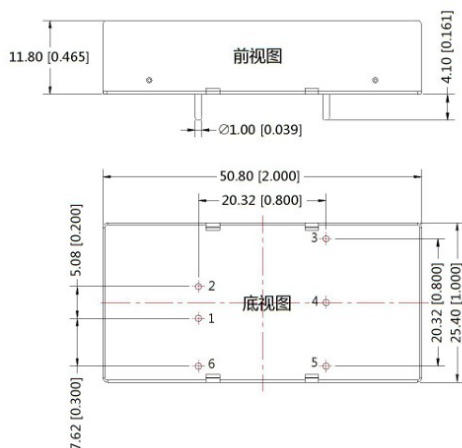


Figure 1

Maximum Capacitive Load

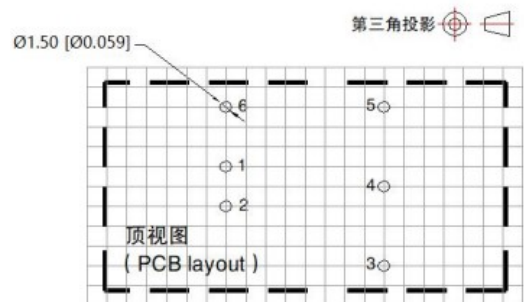
Single output (Vdc)	External capacitor	Dual output (Vdc)	External capacitor
3.3	2200	±5	680
5	1000	±9	470
12	470	±12	330
15	330	±15	220
24	220	±24	100

Dimensions and pinout



(Unit: mm)
(Tolerance: ±0.25)

Recommended PCB layout



Grid: 2.54*2.54mm

VRB***LD-15WR3 (Single output)						
Pin	6	1	2	3	4	5
Function	Ctrl	-Vin	+Vin	+Vo	Trim	0V
Description	Control pin	Negative input	Positive input	Positive output	Trim pin	Ground

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