

# MORNSUN



## VRA\_LD-15W & VRB\_LD-15W Series 15W, WIDE INPUT, ISOLATED & REGULATED SINGLE/DUAL OUTPUT DC-DC CONVERTER

multi-country patent protection **RoHS**

### FEATURES

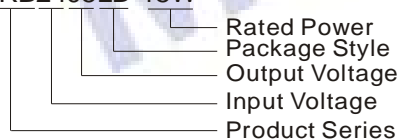
- Efficiency up to 87%
- Wide (2:1) Input Range
- 1.5KVDC Input/Output Isolation
- Short Circuit Protection(automatic recovery)
- Operating Temperature: -40°C to +85°C
- Internal SMD construction
- Metal Shielding Package
- Industry Standard Pin out
- MTBF>1,000,000 hours
- RoHS Compliance

### APPLICATION

The VRA\_LD-15W & VRB\_LD-15W series offer 15W of output, the VRA\_LD-15W & VRB\_LD-15W series with 2:1 wide input voltage of 9-18, 18-36 and 36-75VDC and features 1500VDC isolation, short-circuit and over current protection, as well as six sided shielding. All models are particularly suited to tele-communications, industrial, test equipments power.

### MODEL SELECTION

VRB2405LD-15W



Rated Power  
Package Style  
Output Voltage  
Input Voltage  
Product Series

### MORNSUN Science & Technology co.,Ltd.

Address: 2th floor 6th building, Huangzhou Industrial District, Guangzhou, China  
Tel: 86-20-38601850  
Fax: 86-20-38601272  
[Http://www.mornsun-power.com](http://www.mornsun-power.com)

### PRODUCT PROGRAM

Part Number	Input			Output		Efficiency (%)	Capacitor Load Max			
	Voltage (VDC)			Voltage (VDC)	Current (mA)					
	Nominal	Range	Max*							
VRA1205LD-15W	12	9-18	20	±5	±1500	82	±1020			
VRA1212LD-15W				±12	±625	85	±495			
VRA1215LD-15W				±15	±500	85	±165			
VRB1203LD-15W				3.3	4000	79	10500			
VRB1205LD-15W				5	3000	82	4020			
VRB1212LD-15W				12	1250	85	1035			
VRB1215LD-15W				15	1000	84	705			
VRA2405LD-15W				24	18-36	40	±5	±1500	84	±1020
VRA2412LD-15W							±12	±625	86	±495
VRA2415LD-15W	±15	±500	86				±165			
VRB2403LD-15W	3.3	4000	80				10500			
VRB2405LD-15W	5	3000	83				4020			
VRB2412LD-15W	12	1250	85				1035			
VRB2415LD-15W	15	1000	85				705			
VRA4805LD-15W	48	36-75	80				±5	±1500	85	±1020
VRA4812LD-15W							±12	±625	87	±495
VRA4815LD-15W				±15	±500	87	±165			
VRB4803LD-15W				3.3	4000	81	10500			
VRB4805LD-15W				5	3000	83	4020			
VRB4812LD-15W				12	1250	86	1035			
VRB4815LD-15W				15	1000	86	705			

\* Input voltage can't exceed this value, or will cause the permanent damage.

### INPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Start-up voltage	12 Vin models			9	VDC
	24 Vin models			17.8	
	48 Vin models			35.8	
Input filter			L-C		
Start-up time			10		mS
Ctrl	On	3.5 - 40VDC or open			
	Off	0-1.2VDC			

### OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Output voltage accuracy	Refer to recommended circuit		±1	±3	%
Load regulation	From 10% to 100% load		±0.5	±1	
Line regulation	Input voltage from low to high		±0.2	±0.5	
Cross regulation(Dual)				±5	
Ripple and noise	20MHz Bandwidth		75	150	mV
Transient recovery time	25% load step change		200	300	uS
Transient peak deviation			±3	±5	%Vo
Over current protection	Input voltage range	120	130	150	%
Output Short Circuit	Input voltage range	Hiccup, automatic recovery			
Trim			±10%Vo		VDC
Temperature drift (Vout)			±0.02	±0.03	%/°C

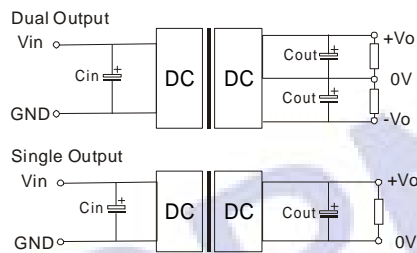
## COMMON SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Storage Humidity				95	%
Operating Temperature		-40		85	°C
Storage Temperature		-55		105	
Temp. Rise at Full Load	Case surface		50		
Lead Temperature	1.5mm from case for 10 seconds			300	
Isolation voltage	Tested for 1 minute and 1 mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	100KHz /0.1V		1000		pF
Switching Frequency	Nominal, full load		500		KHz
MTBF		1000			K hours
Cooling		Free Air Convection			
Case material		Nickel- coated copper			
Weight			30		g

## APPLICATION NOTE

### ① Recommended circuit

All the VRA\_LD-15W & VRB\_LD-15W 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).



(Figure 1)

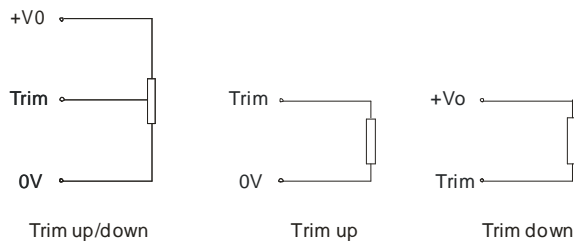
If you want to further decrease the output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance can't exceed the maximum capacitor load in the list.

### ② Recommended capacitance

To ensure these series can operate efficiently and reliably, the recommended capacitance of input and output sees the below table.

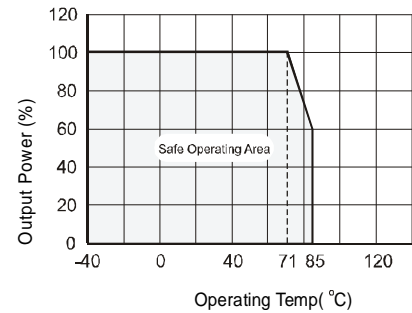
Capacitance		Cout	Cin (12V,24V,48V Input)
Output Voltage			
Single	3.3V,5V	220uF	100uF
	12V,15V	100uF	
Dual	±5V	±220uF	
	±12V,±15V	±100uF	

## OUTPUT VOLTAGE TRIM UP/DOWN



## DERATING & EFFICIENCY CURVE

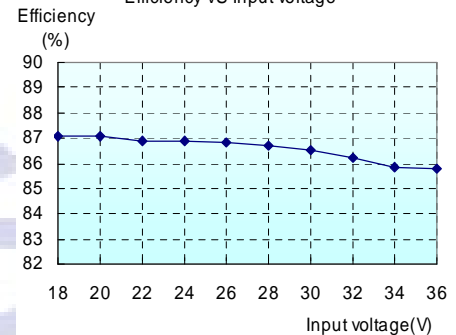
### 1. Temperature derating curve



### 2. Efficiency Vs Input voltage

#### VRA2412LD-15W

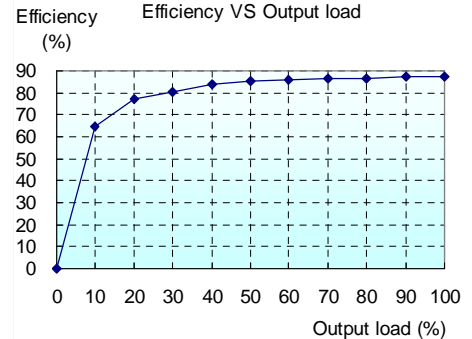
Efficiency VS Input voltage



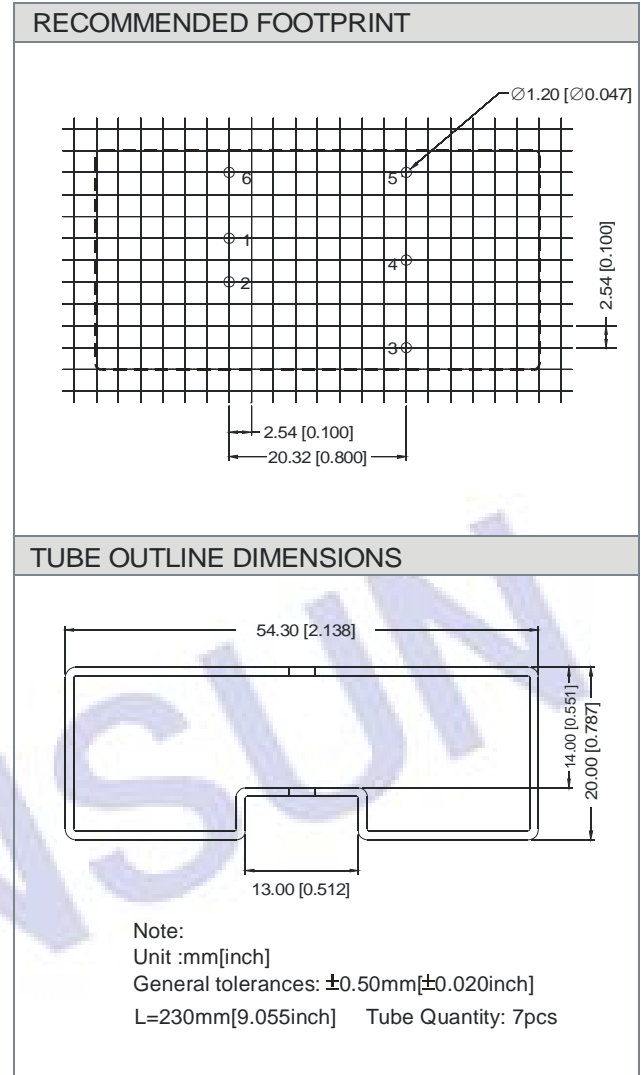
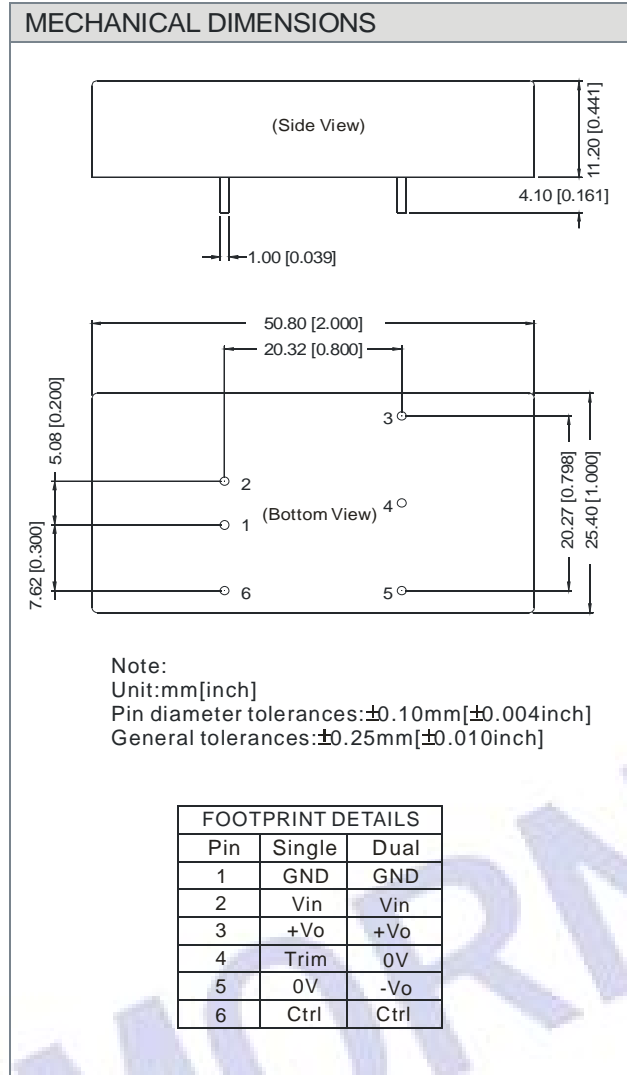
### 3. Efficiency Vs Output Power

#### VRA2412LD-15W

Efficiency VS Output load



## OUTLINE DIMENSIONS & FOOTPRINT DETAILS



Note:

1. All specifications are measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. In this datasheet, all the test methods of indications are based on corporate standards.
3. Only typical model listed. Non-standard models will be different from the above, please contact us for more details.
4. The products cannot be used in parallel and in plug and play.
5. The CTRL control pin voltage is referenced to GND.
6. Capacitor MAX load tested at nominal input voltage and constant resistive load.
7. Refer to the diagram of Output Voltage trim up/down for trim applications.