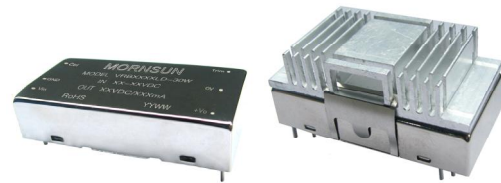


MORNSUN

VRB_LD-30W Series

**30W, WIDE INPUT, ISOLATED & REGULATED
SINGLE OUTPUT DC-DC CONVERTER**



multi-country patent protection **RoHS**

FEATURES

- High efficiency up to 88%
- 2:1 Wide Input Voltage Range
- 1.5KVDC Input/Output Isolation
- Six-sided Metal Shield
- Short Circuit Protection(automatic recovery)
- Operating Temperature: -40°C to +85°C
- Internal SMD construction
- Industry Standard Pin out
- MTBF>1,000,000 hours
- RoHS Compliance

PRODUCT PROGRAM

Part Number	Input			Output		Efficiency (%)	Capacitor Load Max
	Voltage (VDC)			Voltage (VDC)	Current (mA)		
	Nominal	Range	Max*				
VRB2403LD-30W	24	18 - 36	40	3.3	6000	84	6800
VRB2405LD-30W				5	6000	86	6800
VRB2412LD-30W				12	2500	87	680
VRB2415LD-30W				15	2000	87	680
VRB4803LD-30W	48	36-75	80	3.3	6000	84	6800
VRB4805LD-30W				5	6000	86	6800
VRB4812LD-30W				12	2500	88	680
VRB4815LD-30W				15	2000	87	680

*Input voltage above it may cause permanent damage to the device.

APPLICATION

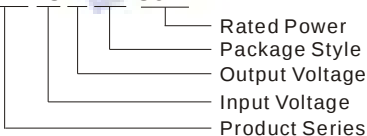
The VRB_LD-30W series offer 30W of output, with 2:1 wide input voltage of 18-36VDC, 36-75VDC and features 1500VDC isolation, short-circuit and over current protection, as well as six-sided metal shield. All models are particularly suited to tele-communications, industrial, test equipments power.

INPUT SPECIFICATIONS

Item	Test conditions		Min.	Typ.	Max.	Units
Start-up time			--	20	--	mS
Under Voltage lock off	Nominal (24V)	Models ON	--	--	17.8	VDC
		Models OFF	16	--	--	
	Nominal (48V)	Models ON	--	--	35.8	
		Models OFF	33	--	--	
Input filter			L-C			
Ctrl	Models ON		3-40VDC			
	Models OFF		0-1.2VDC			
	Input current (Models OFF)		--	--	1	mA

MODEL SELECTION

VRB4812LD-30W



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OUTPUT SPECIFICATIONS

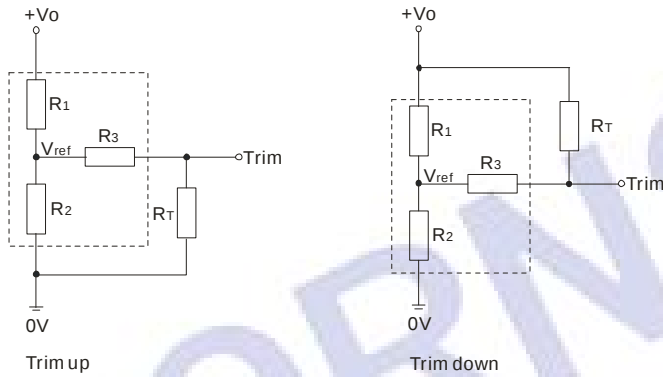
Item	Test conditions	Min	Typ	Max	Units
Output power		--	--	30	W
Output voltage accuracy	Refer to recommended circuit	--	±1	±3	%
Load regulation	From 10% to 100% load Nominal input	--	±0.5	±1	
Line regulation	Input voltage from low to high 100% load	--	±0.2	±0.5	
Ripple and noise	20MHz bandwidth	--	50	120	mV
Transient recovery time	25% load step change	--	200	500	uS
Transient peak deviation		--	--	±5	%
Over current protection	Input voltage range	--	130	150	%
Short circuit protection	Input voltage range	Hiccup, automatic recovery			
Over voltage protection	3.3V output	--	3.9	--	VDC
	5V output	--	6.2	--	
	12V output	--	15	--	
	15V output	--	18	--	
Temperature drift (Vout)		--	--	±0.02	%/°C
Trim		--	±10%Vo	--	VDC

COMMON SPECIFICATIONS

Item	Test conditions	Min	Typ.	Max	Units
Storage humidity		5	--	95	%
Operating temperature		-40	--	85	°C
Storage temperature		-55	--	105	
Temp. Rise at full load		--	--	105	
Lead temperature	1.5mm from case for 10 seconds	--	--	300	
Isolation voltage	Test 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	--	350	--	KHz
Cooling		Free Air Convection			
Case material		Nickel- coated copper			
MTBF		1000	--	--	K hours
Weight		--	40	--	g

TRIM APPLICATION & TRIM RESISTANCE

Application circuit for TRIM (Part in broken line is the interior of models)



Formula for resistance of Trim

$$\begin{aligned} \text{up: } R_T &= \frac{aR_2}{R_2-a} - R_3 & a &= \frac{V_{ref}}{V_o - V_{ref}} \cdot R_1 \\ \text{down: } R_T &= \frac{aR_1}{R_1-a} - R_3 & a &= \frac{V_o - V_{ref}}{V_{ref}} \cdot R_2 \end{aligned}$$

Note: Value for R1, R2, R3, and Vref refer to the following table.

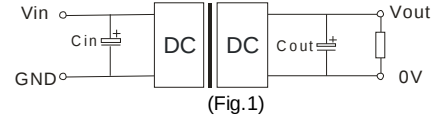
R_T: Resistance of Trim

a: User-defined parameter, no actual meanings.

Vo(V)	3.3	5	12	15
Resistance				
R1(KΩ)	4.801	2.883	10.971	14.497
R2(KΩ)	2.863	2.864	2.864	2.864
R3(KΩ)	15	10	17.8	17.8
Vref(V)	1.24	2.5	2.5	2.5

RECOMMENDED CIRCUIT

① Recommended Circuit



In order to obtain better performance for the DC/DC models, it's recommended that use input and output filters as Fig.1 shown.

② Recommended capacitance

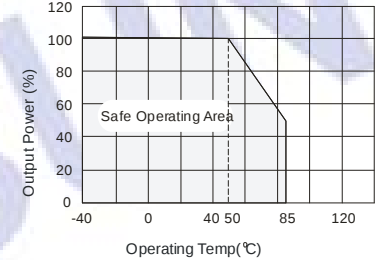
Capacitance	Cout (μF)	Cin (μF)
Output Voltage		
3.3	470/220	100
5	470/220	
12	220/100	
15	220/100	

③ No parallel connection or plug and play

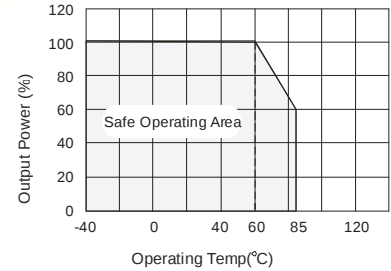
DERATING & EFFICIENCY CURVE

① Temperature derating curve (Free Air Convection)

Without heat sink



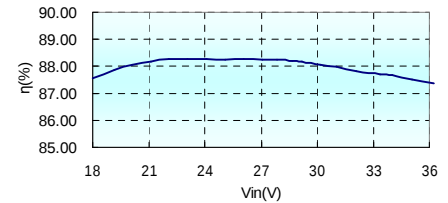
With heat sink



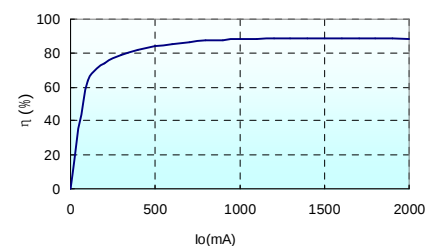
② Efficiency curve

VRB2415LD-30W

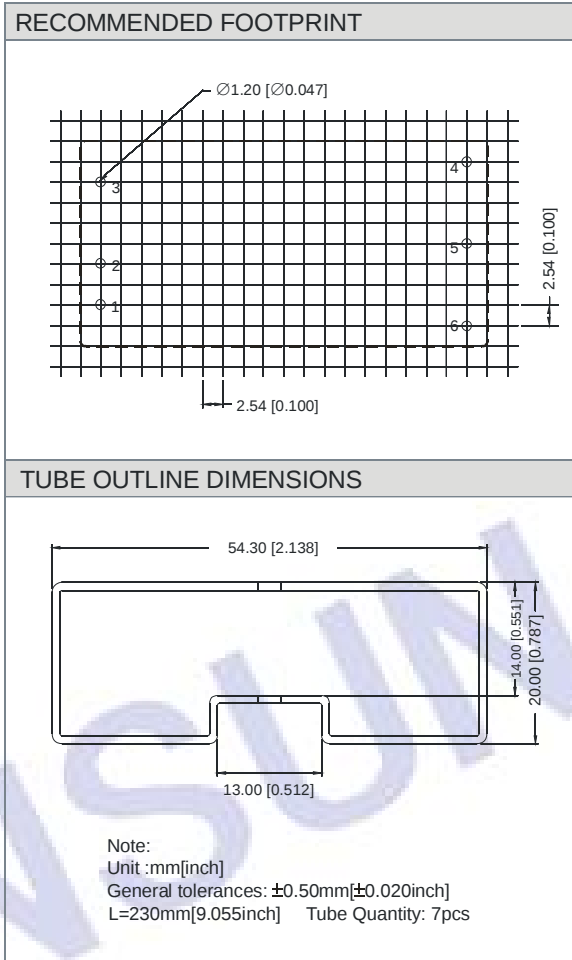
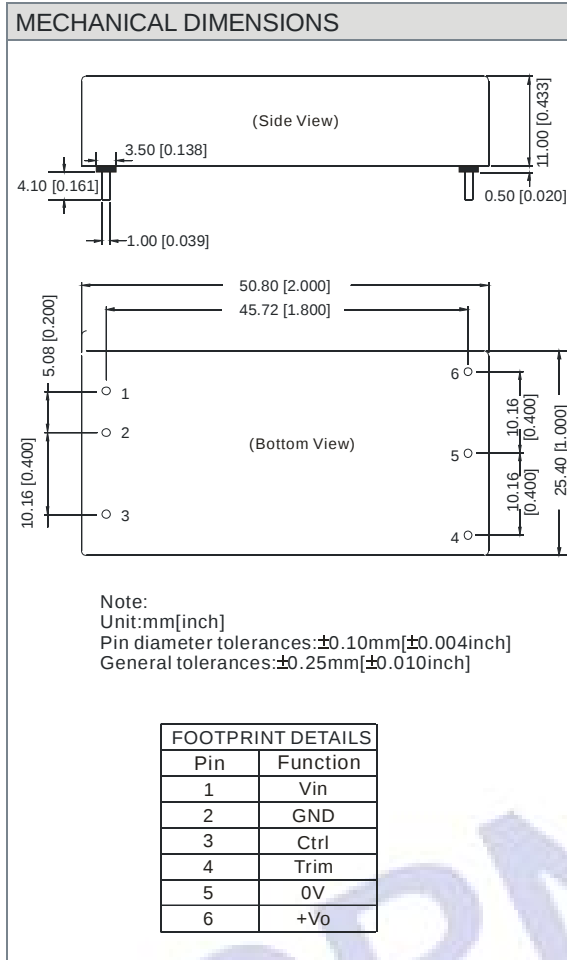
η VS Vin



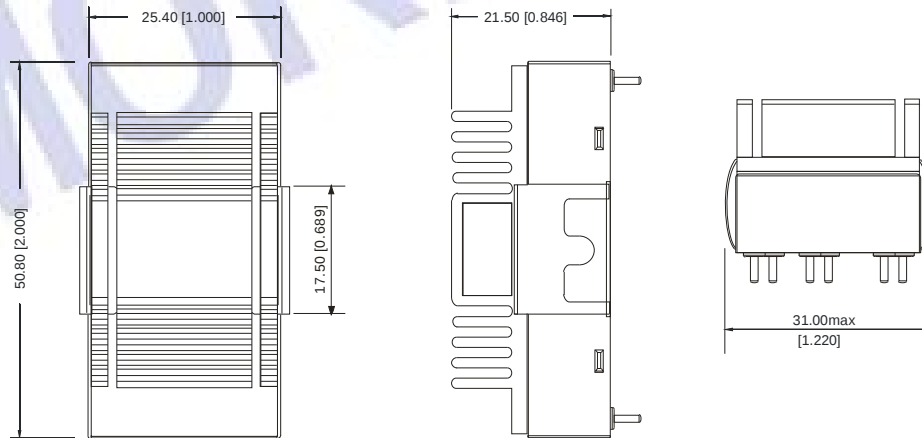
η VS Io



OUTLINE DIMENSIONS & FOOTPRINT DETAILS



HEAT SINK DIMENSIONS



- Note:
Unit: mm[inch] tolerances: $\pm 0.5\text{mm}$ [$\pm 0.020\text{inch}$]
1. If use heat sinks, make sure there is enough space for a specific size in the above chart;
2. Products will be supplied with heat sinks already mounted, separate heat sinks are not available .

Note:

- All specifications are measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- In this datasheet, all the test methods of indications are based on corporate standards.
- Only typical model listed. Non-standard models will be different from the above, please contact us for more details.
- The CTRL control pin voltage is referenced to GND.
- Capacitor MAX load tested at nominal input voltage, full load and constant resistive load.