MORNSUN
Industrial DC&AC converter professional

VRA_D-20W & VRB_D-20W Series

20W, 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
- Over Voltage protection
- Output Short Circuit Protection
- Operating Temperature: -40°C to +71°C
- Internal SMD construction
- Metal Shielding Package
- Industry Standard Pin out
- MTBF>1,000,000 hours
- RoHS Compliance

Application

The VRA_D-20W & VRB_D-20W series offer 20W of output, the VRA_D-20W & VRB_D-20W 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

VRB1203D-20W

- Rated Power
- Package Style
- Output Voltage
- Input Voltage
- Product Series

PRODUCT PROGRAM

Part Number	Input Voltage (VDC) Nominal	Input Voltage (VDC) Range	Output Voltage (VDC)	Output Current (mA)	Efficiency (%, Typ)	capacitance (max,UF)
VRA1205D-20W	12	9-18	±5	±2000	80	±3400
VRA1212D-20W			±12	±833	82	±680
VRA1215D-20W			±15	±666	82	±450
VRA1224D-20W *			±24	±416	83	±220
VRB1203D-20W			3.3	5400	86	13000
VRB1205D-20W			5	4000	79	6800
VRB1212D-20W			12	1666	81	2200
VRB1215D-20W			15	1333	82	755
VRB1224D-20W			24	833	83	500
VRA2405D-20W	24	18-36	±5	±2000	81	±3400
VRA2412D-20W			±12	±833	86	±680
VRA2415D-20W			±15	±666	86	±450
VRA2424D-20W *			±24	±416	86	±220
VRB2403D-20W			3.3	5400	86	13000
VRB2405D-20W			5	4000	81	6800
VRB2412D-20W			12	1666	83	2200
VRB2415D-20W			15	1333	85	755
VRB2424D-20W			24	833	85	500
VRA4805D-20W	48	36-75	±5	±2000	81	±3400
VRA4812D-20W			±12	±833	86	±680
VRA4815D-20W			±15	±666	86	±450
VRA4824D-20W *			±24	±416	86	±220
VRB4803D-20W			3.3	5400	87	13000
VRB4805D-20W			5	4000	83	6800
VRB4812D-20W			12	1666	84	2200
VRB4815D-20W			15	1333	84	755
VRB4824D-20W			24	833	86	500

*Designing.

INPUT SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Start voltage	12Vinput models	8.6	8.8	9	VDC
	24Vinput models	17.5	17.8	18	
	48Vinput models	34	35	36	
Input filter			L-C		
Start up time			20		MS
Method of Remote (Reference point: GND)	on	3.5-40VDC or open circuit			
	off	GND or Low Voltage(<1.2V)			

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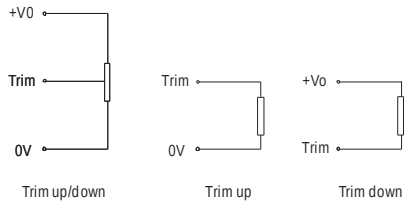
OUTPUT SPECIFICATIONS

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				±5	
Ripple and noise	Tested under 20MHz brand	50	75	150	mV
Transient recovery time	25%load change		200	300	us
Transient peak deviation			±2	±5	%
Over load protection*	Input voltage range	120	130	150	%
Output Short Circuit		Hiccup, automatics recovery			
Over voltage protection	3.3V	3.63		4.29	VDC
	5V	5.5		6.5	
	12V	13.2		15.6	
	15V	16.5		19.5	
	24	26.4		31.2	
Temperature drift (Vout)			0.02		%/℃
Trim			±10%Vo		VDC

OUTPUT VOLTAGE TRIM



RECOMMENDED CIRCUIT

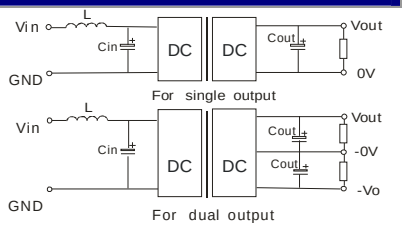


Fig.1

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

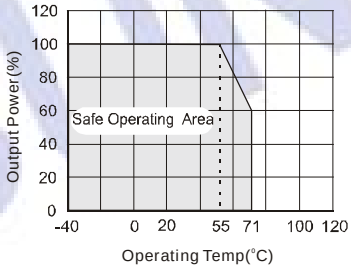
COMMON SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Operating Temperature		-40		71	℃
Storage Temperature		-55		105	
Storage Humidity		5		95	
Isolation voltage	Test for 1 minute and 1 mA max		1500		VDC
Isolation resistance			500		MΩ
Isolation Capacitance	100KHz / 1V		1000		pF
Switching frequency	Nominal, full load		300		KHz
MTBF			100		K hours
Case Material			Aluminous alloy		
Weight			39		G

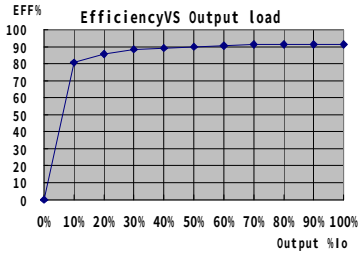
Note:
1. All specifications are measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. The CTRL control pin voltage is referenced to GND.
3. Typical Eff value at nominal input voltage and full load.
4. Capacitor MAX load tested at nominal input voltage and constant resistive load.
5. Refer to the diagram of Output Voltage trim up/down for trim applications.
6. The products cannot be used in parallel and in plug and play.

DERATING & EFFICIENCY CURVE

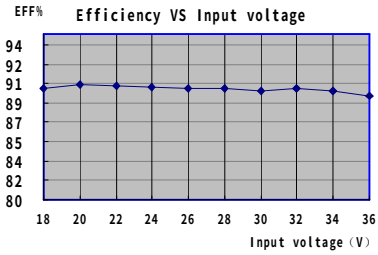
Temperature derating curve



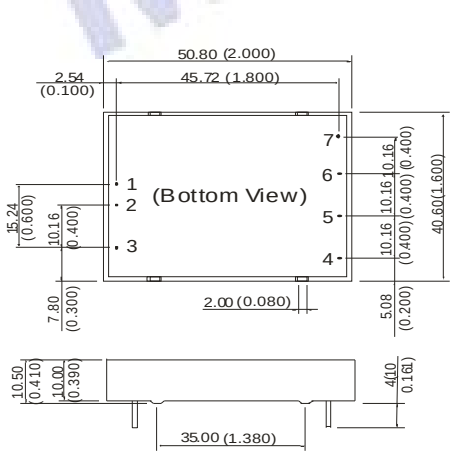
Curve of Efficiency VS output load
VRA2412D-20W



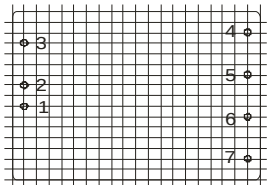
Curve of Efficiency VS input Voltage
VRA2412D-20W



OUTLINE DIMENSIONS & FOOTPRINT DETAILS



RECOMMENDED FOOTPRINT
Top view,grid:2.54mm(0.1inch), diameter:1.50mm(0.059inch)



FOOTPRINT DETAILS

Pin	Single	Dual
1	Vin	Vin
2	GND	GND
3	Ctrl	Ctrl
4	Trim	Trim
5	0V	-Vo
6	+Vo	Com
7	No pin	+Vo

Note:
Unit:mm(inch)
Pin section:1.00mm(0.039inch)
Pin section tolerances:±0.05mm(±0.002inch)
General tolerances:±0.25mm (±0.010inch)