

VRA_LD-20W Series 20W, 2:1 WIDE INPUT ISOLATED & REGULATED DUAL OUTPUT DC-DC CONVERTER



Patent Protection RoHS

FEATURES

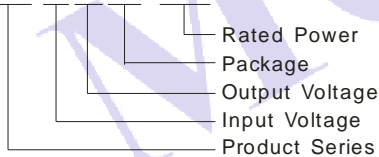
- Efficiency up to 89%
- Wide input voltage range(2:1)
- Good low and high temperature features
- Output short circuit protection
- Isolation voltage:1500VDC
- Operating temperature:-40℃~+85℃
- Internal SMD construction
- Six-sided metal shield
- Industry standard pinout
- MTBF>1,000,000 hours
- Industrial level specifications
- EMC application

APPLICATION

VRA_LD-20W series offer 20W of output, wide input voltage: 9-18VDC, 18-36VDC, 36-75VDC, Dual output, and features 1500VDC isolation, Under voltage lockout, over current, over voltage and short circuit protection. All models are particularly suited to tele-communications, industrial, test equipments power etc.

MODEL SELECTION

VRA2405LD-20W



PRODUCT PROGRAM

Model	Input			Output		Capacitor Load Max (3) (μF)	Efficiency (% Typ)
	Voltage (VDC)			Voltage (VDC)	Rated Current (2) (mA)		
	Nominal	Range	Max ⁽¹⁾				
VRA1205LD-20W	12	9~18	20	±5	±2000	±4800	84
VRA1212LD-20W				±12	±833	±800	88
VRA1215LD-20W				±15	±667	±500	88
VRA1224LD-20W				±24	±416	±300	87
VRA2405LD-20W	24	18~36	40	±5	±2000	±4800	84
VRA2412LD-20W				±12	±833	±800	89
VRA2415LD-20W				±15	±667	±500	88
VRA2424LD-20W				±24	±416	±300	87
VRA4805LD-20W	48	36~75	80	±5	±2000	±4800	85
VRA4812LD-20W				±12	±833	±800	87
VRA4815LD-20W				±15	±667	±500	88
VRA4824LD-20W				±24	±416	±300	87

Note: Add suffix "H" for heat sink mounted, for example VRA2405LD-20WH.

COMMON SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Storage Humidity		5	--	95	%
Operating Temperature		-40	--	85	℃
Storage Temperature		-55	--	125	
Maximum Case Temp.	On working temperature	--	--	105	
Lead Temperature	1.5mm from case for 10S	--	--	300	
Insulation Voltage	Test time:1min, Leakage current: < 1mA	1500	--	--	VDC
Isolation Resistance	Isolation voltage :500VDC	1000	--	--	MΩ
Isolation Capacitance	100kHz/0.1V	--	2000	--	pF
Switching Frequency	100% load, nominal input voltage	--	400	--	kHz
MTBF	MIL-HDBK-217F	1000	--	--	K.hours
Weight	Without heatsink	--	28	--	g
	With heatsink	--	36	--	
Cooling		Free air convection			
Case Material		Aluminum Alloy			

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INPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units	
Under Voltage Lockout	Nominal Input (12V)	Models ON	--	--	9.0	VDC
		Models OFF	7.8	--	--	
	Nominal Input (24V)	Models ON	--	--	17.8	
		Models OFF	16.0	--	--	
Nominal Input (48V)	Models ON	--	--	33.5		
	Models OFF	32.0	--	--		
Input Filter		Pi				
Start-up Time	Nominal input& constant resistance load	--	10	--	ms	
Ctrl(4)	Models ON	3.5 -12VDC OR Open Circuit				
	Models OFF	0-1.2VDC				
	Input current (Models OFF)	--	--	1	mA	

EMI SPECIFICATIONS

Item	Test conditions	Test Standard
Conduction	Refer to recommended circuit	EN55022/CLASS B
Radiation		

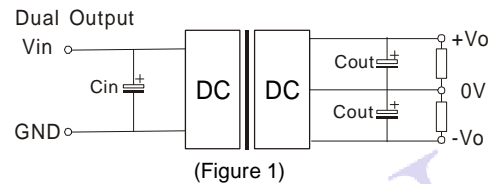
OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Unit
Output Power	See product program	2	--	20	W
Output Voltage Accuracy	Refer to recommended circuit	--	±1	±3	%
Load Regulation	From 10% to 100% load input	--	±0.5	±1	
Voltage Regulation	Input voltage from low to high 100% load	--	±0.2	±0.5	
Cross Regulation	Main load 55% load, Supplement output from 10% to 100% load	--	--	±5	mV
Ripple	20MHz bandwidth	--	40	50	
Noise		--	75	100	
Transient Recovery Time	25% rated load range	--	200	500	us
Transient Peak Deviation		--	±3	±5	%
Over Current Protection	Full input voltage	120	140	150	%
Short Circuit Protection	Full input voltage	Hiccup, continual, auto-recovery			
Over Voltage Protection	±5V output	--	±6.1	--	VDC
	±12V output	--	±15	--	
	±15V output	--	±18	--	
	±24V output	--	±28	--	
Temperature Drift	Refer to recommended circuit	--	±0.02	--	%/°C

RECOMMENDED CIRCUIT

1) Recommended Circuit

All the URA_LD-20W 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).



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.

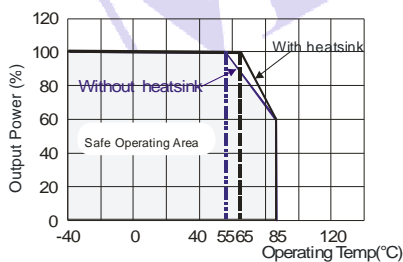
2) Recommended capacitance

Capacitance	Cout (μF)	Cin (μF)
Output voltage		
±5(VDC)	±220	100
±12(VDC)	±100	
±15(VDC)	±100	
±24(VDC)	±47	

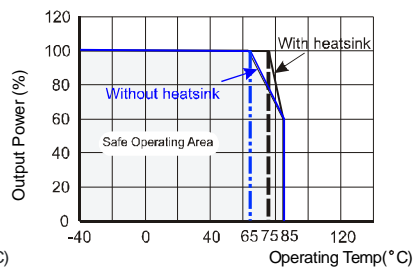
3) No parallel connection or plug and play

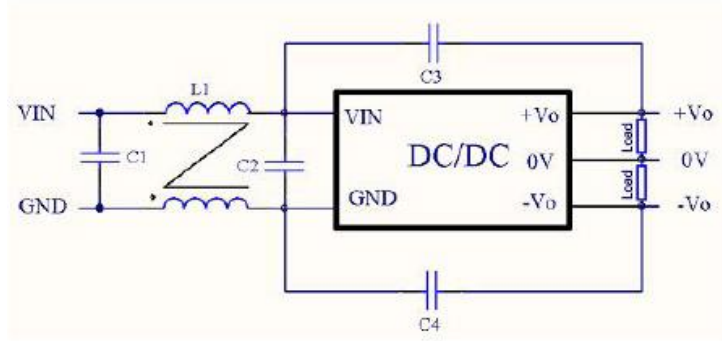
TEMPERATURE DERATING CURVE

(Output voltage ≤ 5V)

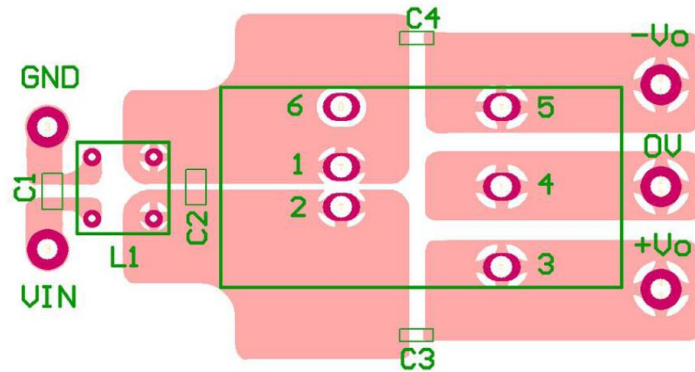


(Output voltage > 5V)





Recommended circuit(EN55022 CLASS B conducted emission application)



Recommended PCB layout with filter

To meet conducted emissions(EN55022 CLASS B)following components are needed:

VRA12/24XXLD-20W:

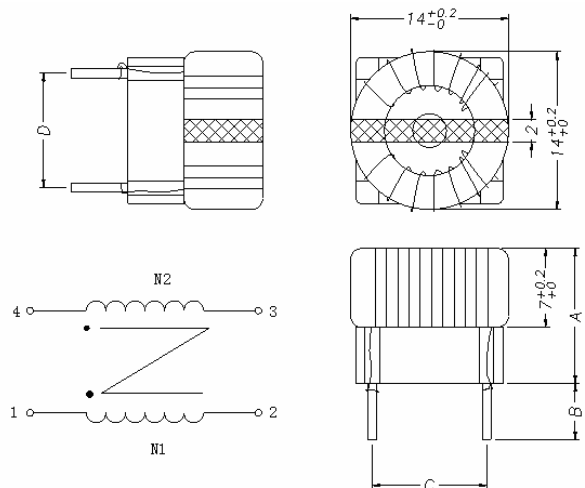
Component	Value	Voltage	Reference
C1,C2	4.7 μ F	50V	1210MLCC
C3,C4	1000pF	2KV	1206MLCC
L1(Common Choke)	1250 μ H	—	P/N:(Refer follow)

VRA48XXLD-20W:

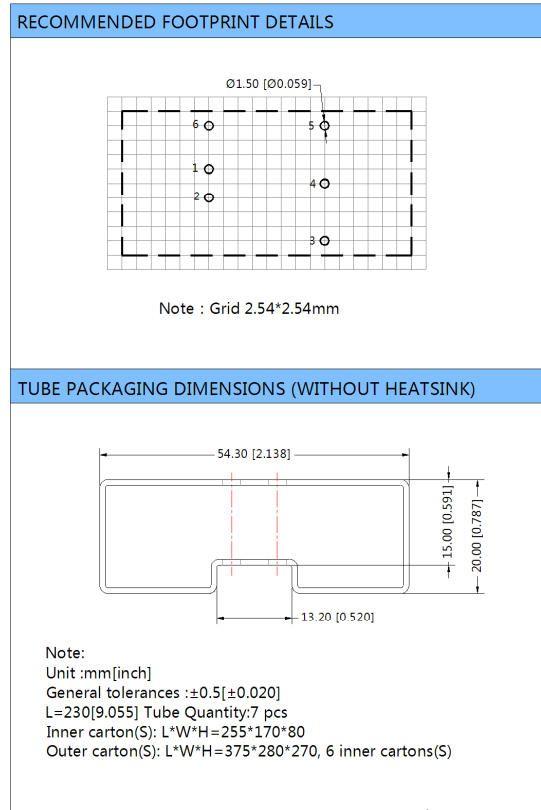
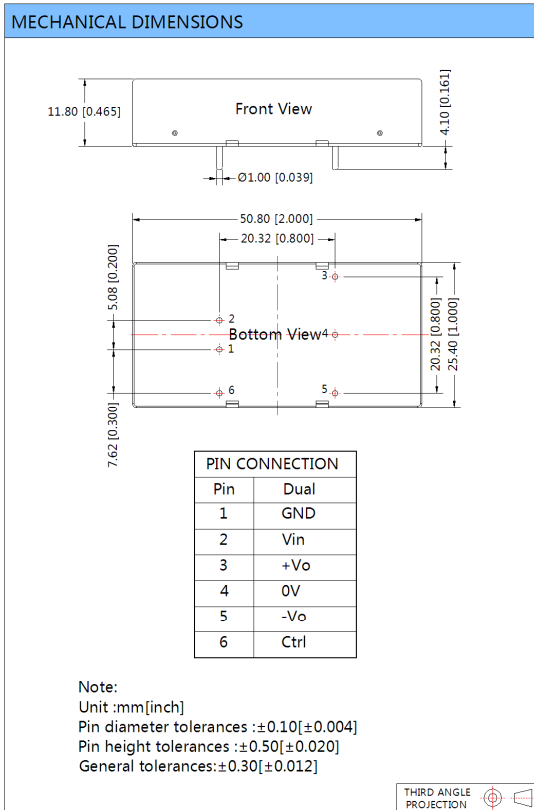
Component	Value	Voltage	Reference
C1,C2	1.0 μ F	100V	1210MLCC
C3,C4	1000pF	2KV	1206MLCC
L1(Common Choke)	1250 μ H	—	P/N: (Refer follow)

This common choke L1 has been defined as follow(Can be assembled by hand):

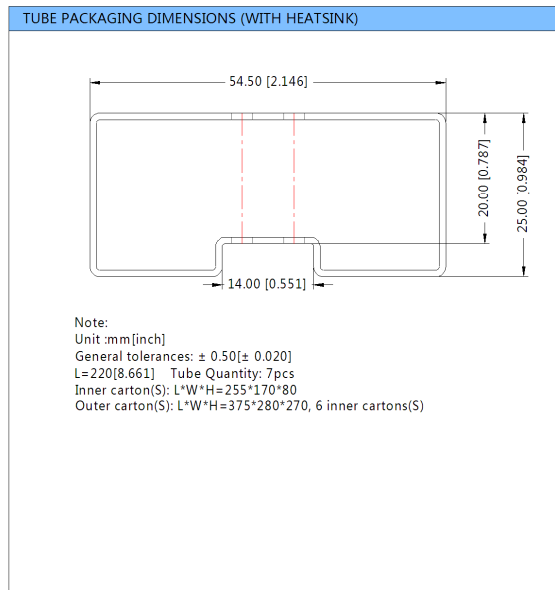
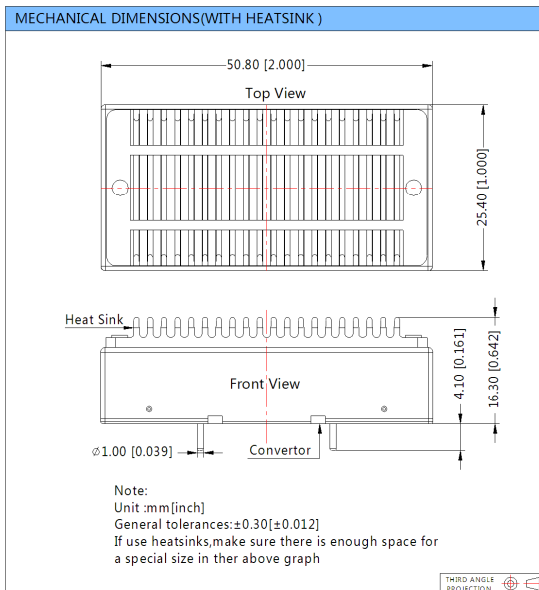
- Core:P5T14*8*7,Base (Optical)
L:1250 μ H \pm 25%/DCR:250m Ω ,max
- Wire: diameter 0.4mm
A Height:11.2mm,max
B Terminal Length: 4.0mm,max
C Terminal Pitch: 7.5mm,max
D Terminal Pitch: 7.5mm,max
- Test condition: 100KHz/100mV
- Recommended through hole: \varnothing 0.9mm
- All dimensions in millimeters



OUTLINE DIMENSIONS & PIN CONNECTIONS



HEATSINK ASSEMBLY & PACKAGE DIAGRAM (WITH HEATSINK)



NOTES

1. Input voltage can't exceed this value, or will cause the permanent damage.
2. Minimum operating current for 10% of rated current, if less than 10% rated current, output ripple may increase rapidly, the amplitude ≤ 1V.
3. Capacitor MAX load tested at nominal input voltage and constant resistive load.
4. The CTRL control pin voltage is referenced to GND.
5. Only typical model listed. Non-standard models will be different from the above, please contact us for more details.
6. All specifications are measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
7. In this datasheet, all the test methods of indications are based on corporate standards.