15W&20W,Ultra wide input isolated & regulated DC/DC converter

Patent Protection RoHS c UL us

FEATURES

- Ultra wide range of input voltage (4:1)
- Efficiency up to 88%
- Output Short circuit protection
- Isolation voltage :1.5K VDC
- Operating temperature range: -40℃ to +85℃
- Six-sided metal shielding package
- Industry standard pinout
- Industrial level specifications

URA_LD-15W & URA_LD-20W series are applied to wide voltage range input situation such as data transmission device, battery power supply device, telecommunication device ,distributed power supply system, remote control system, industrial robot system etc.

Selection Guide

Part No. ①	Input Voltage (VDC)		Output		Efficiency (%,Typ.) @ Full Load	Max. Capacitive Load③(μF)
	Nominal (Range)	Max.②	Output Voltage (VDC)	Output Current (mA)(Max./Min.)		
URA2405LD-15W	24 (9-36)	40	±5	±1500/±150	86	4800
URA2412LD-15W			±12	±625/±62.5	87	800
URA2415LD-15W			±15	±500/±50	87	500
URA4805LD-15W	48 (18-75)	80	±5	±1500/±150	84	4800
URA4812LD-15W			±12	±625/±62.5	87	800
URA4815LD-15W			±15	±500/±50	87	500
URA2405LD-20W	24 (9-36)	40	±5	±2000/±200	84	4800
URA2412LD-20W			±12	±833/±83.3	87	800
URA2415LD-20W			±15	±667/±66.7	87	500
URA4805LD-20W	48 (18-75)	80	±5	±2000/±200	85	4800
URA4812LD-20W			±12	±833/±83.3	87	800
URA4815LD-20W			±15	±667/±66.7	88	500

Note: ①Series with suffix "H" are heat sink mounting;
②Absolute maximum rating without damage on the converter, but it isn't recommended;
③The capacitive loads of positive and negative outputs are identical.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	URA_LD-15W	24VDC input	--	727/17	--	mA
		48VDC input	--	359/11	--	
	URA_LD-20W	24VDC input	--	958/7	--	
		48VDC input	--	479/8	--	
Reflected Ripple Current	24VDC/48VDC input		--	30/200	--	
Input impulse Voltage (1sec. max.)	24VDC input		-0.7	--	50	VDC
	48VDC input		-0.7	--	100	
Starting Voltage	24VDC input		--	8.7	9	
	48VDC input		--	17.6	18	
Under Voltage Shutdown	24VDC Input		--	--	9	
	48VDC Input		--	--	18	
Start-up Time	Nominal input& constant resistance load		--	10	--	ms
Short Circuit Input Power			--	--	3.5	W
Input Filter			Pi filter			
Ctrl*	Module switch on		Ctrl suspended or connected to TTL high level (3.5-12VDC)			
	Module switch off		Ctrl pin connected to GND or low level (0-1.2VDC)			
	Input current when switched off		--	--	1	mA

Note: * the voltage of Ctrl pin is relative to input pin GND.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Power	URA_LD-15W	1.5	--	15	W
	URA_LD-20W	2	--	20	
Voltage Accuracy		--	±1	±3	%
Balance of Output Voltage	Dual output, balanced load	--	±0.5	--	
Line Regulation	Full load, the input voltage is from low voltage to high voltage	--	±0.2	±0.5	
Load Regulation	10%-100% load	--	±0.5	±1	
Cross Regulation	Dual output, main circuit with 50% load, auxiliary circuit with 25%-100% load	--	--	±5	
Transient Recovery Time	25% load step change	--	200	500	μs
Transient Response Deviation		--	±3	±5	%
Temperature Drift Coefficient	Full load	--	±0.02	--	%/℃
Ripple & Noise *	20MHz bandwidth	--	75	100	mV p-p
Trim		--	±10%	--	VDC
Output Over-voltage Protection	±5VDC output	--	±6.1	--	
	±12VDC output	--	±15	--	
	±15VDC output	--	±18	--	
Output Over-current Protection	Input voltage range	120	140	150	%
Output Short circuit Protection		Hiccup, Continuous, self-recovery			

Note: * Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Isolation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	2000	--	pF
Operating Temperature	see Fig. 1	-40	--	85	℃
Storage Temperature		-55	--	125	
Storage Humidity	Non-condensing	5	--	95	%RH
Max. Operating Temperature for casing	Within the operating temperature curve	--	--	105	℃
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Switching Frequency	Full load, nominal input	--	400	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours

Physical Specifications

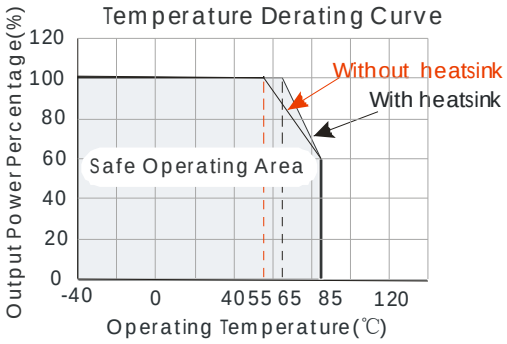
Casing Material	Aluminum alloy	
Package Dimensions	Without heat sink	50.80*25.40*11.80mm
	With heat sink	50.80*25.40*16.30mm
Weight	Without heat sink	28.00g(Typ.)
	With heat sink	36.00g(Typ.)
Cooling Method		Free air convection

EMC Specifications

EMI	Conducted disturbance	CISPR22/EN55022	CLASS B (see Fig.3-② for recommended circuit)	
	Radiated emission	CISPR22/EN55022	CLASS B (see Fig.3-② for recommended circuit)	
EMS	Electrostatic discharge	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
	EFT	IEC/EN61000-4-4	±2KV (see Fig.3-① for recommended circuit)	perf. Criteria B
	Surge immunity	IEC/EN61000-4-5	±2KV (see Fig.3-① for recommended circuit)	perf. Criteria B

Product Characteristic Curve

(Output voltage≤5V)



(Output voltage>5V)

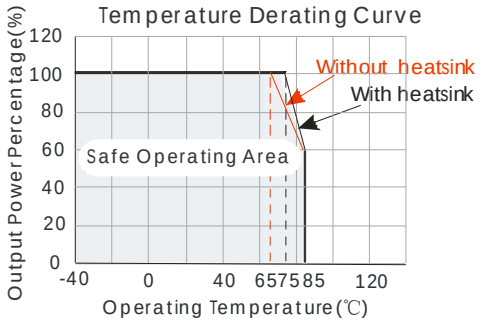
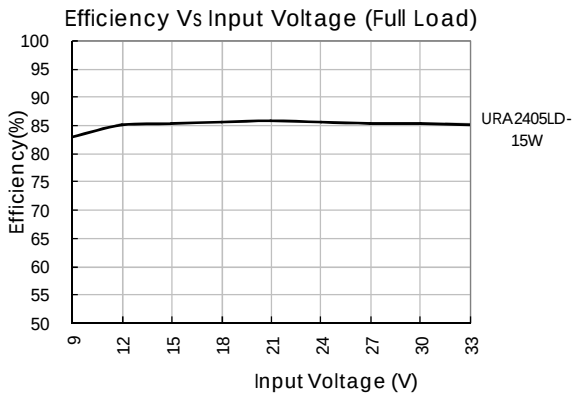
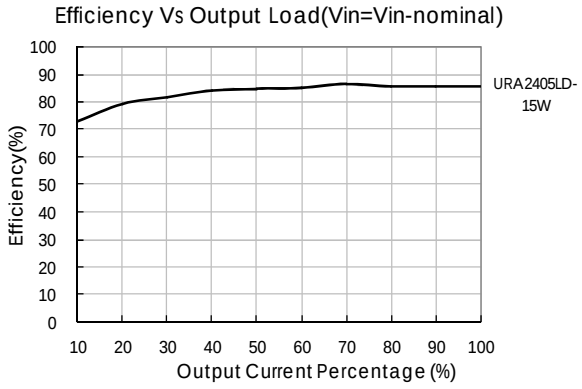
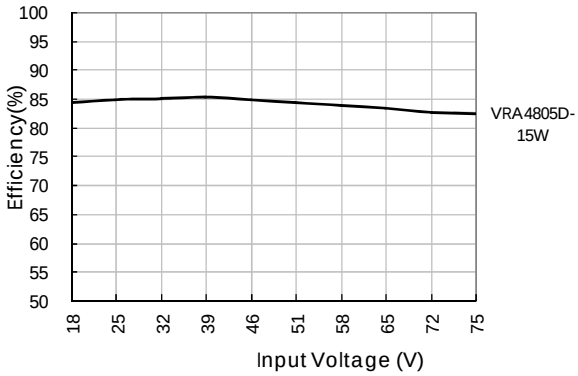
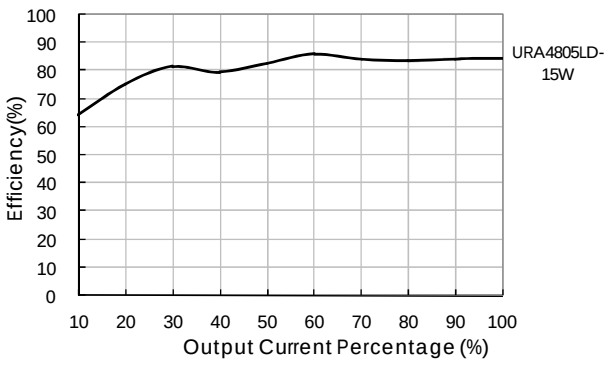


Fig. 1









Design Reference

1. Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery.

If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

Fig. 2

Vout(VDC)	Cin(μF)	Cout(μF)
±5	100	220
±12/±15		100

2. EMC solution-recommended circuit

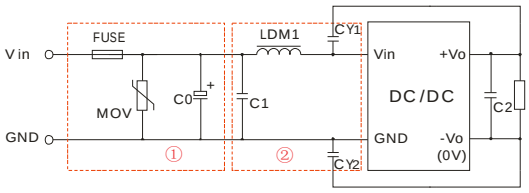


Fig. 3

Notes: Part ① in the Fig. 3 is used for EMS test and part ② for EMI filtering; selected based on needs.

Parameter description

Model	Vin:24V	Vin:48V
FUSE	Choose according to actual input current	
MOV	14D560K	14D101K
C0	330μF/50V	330μF/100V
C1	1μF/50V	1μF/100V
C2	Refer to the Cout in Fig.2	
LDM1	4.7μH	
CY1、CY2	1nF/2KV	

EMC solution-recommended circuit PCB layout

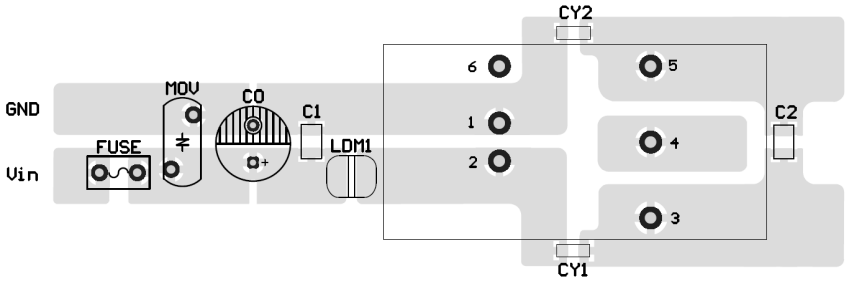


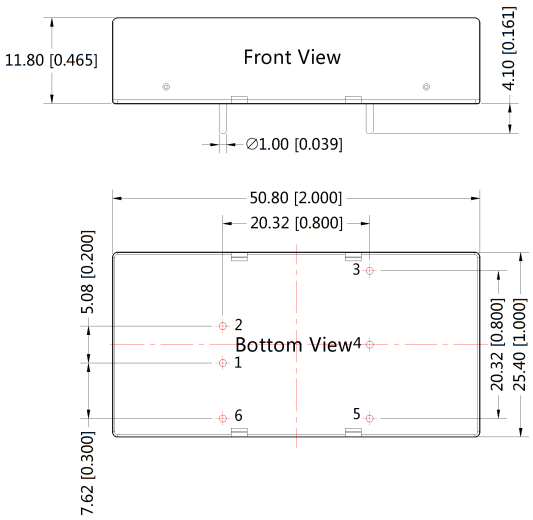
Fig. 4

Note: the min. distance of the bonding pads between input & output isolation capacitors (CY1/CY2) shall be ≥ 2mm.

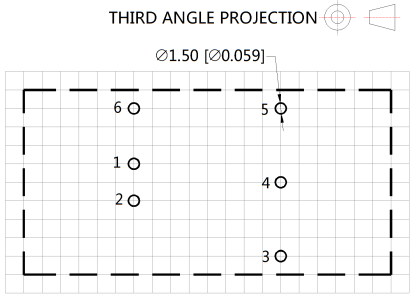
3. The product does not support output in parallel with power per liter or hot-plug use

4. For more information please find the application notes on www.mornsun-power.com

Dimensions and Recommended Layout(Without heatsink)



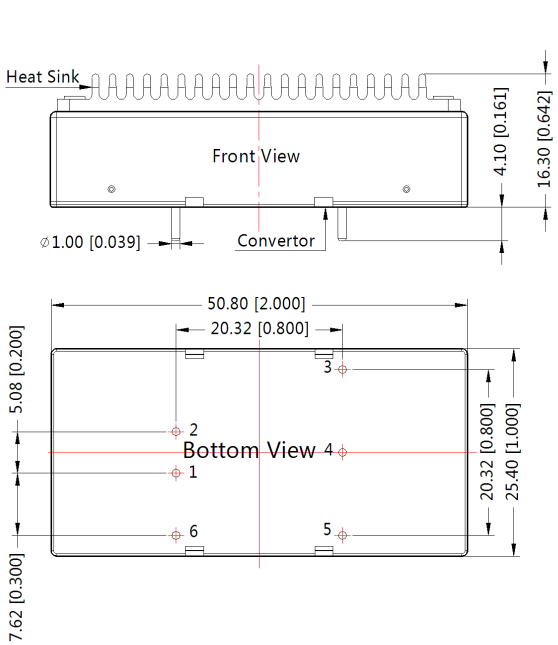
Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
3	+Vo
4	0V
5	-Vo
6	Ctrl

Dimensions (With heatsink)



Pin-Out		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	Trim	0V
5	0V	-Vo
6	Ctrl	Ctrl

Note:
Unit :mm[inch]
General tolerances:±0.50[±0.020]
If use heatsinks,make sure there is enough space for a special size in ther above graph

Notes:

1. Packing Information please refer to 'Product Packing Information'. The Packing bag number of Horizontal package: 58200035(without heatsink),58200051(with heatsink);
2. Recommended used in more than 10% load, if the load is lower than 10%, then the ripple index of the product may exceed the specification, but does not affect the reliability of the product;
3. The unbalance degree of the recommended dual output module load: ≤ 5%; if the degree exceeds ±5%, then the product performances cannot be guaranteed to comply with all the performance indicators in the manual, and please directly contact our technicians for specific information;
4. The max. capacitive load should be tested within the input voltage range and under full load conditions;
5. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25℃, humidity<75% when inputting nominal voltage and outputting rated load;
6. All index testing methods in this datasheet are based on our Company's corporate standards;
7. The performance indexes of the product models listed in this datasheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
8. We can provide product customization service;
9. Specifications of this product are subject to changes without prior notice.

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