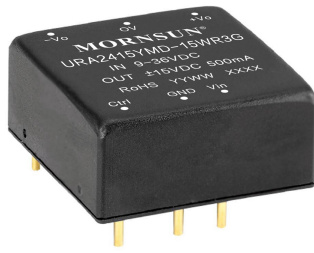


DC/DC Converter

URA2415YMD-15WR3G

MORNSUN®

15W isolated DC-DC converter in DIP package
Ultra-wide input and regulated dual output



Patent Protection RoHS

FEATURES

- Ultra-wide 4:1 input voltage range
- High efficiency up to 89%
- No-load power consumption as low as 0.24W
- I/O isolation test voltage 1.5k VDC
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Operating ambient temperature range: -40°C to +105°C
- Industry standard pin-out

URA2415YMD-15WR3G is isolated 15W DC-DC converter products have an ultra-wide 4:1 input voltage and feature efficiency of up to 89%, input to output isolation is tested with 1500VDC and the converters safely operate in an ambient temperature of -40°C to +105°C, input under-voltage protection, output short-circuit, over-current, over-voltage protection. They are widely used in applications such as industrial control, electric power, instruments, communication and railway fields.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency ^② (%) Min./Typ.	Capacitive Load ^③ (μF)Max.
		Nominal (Range)	Max. ^①	Voltage(VDC)	Current (mA) Max./Min.		
--	URA2415YMD-15WR3G	24 (9-36)	40	±15	±500/0	87/89	330

Notes:
① Exceeding the maximum input voltage may cause permanent damage;
② Efficiency is measured at nominal input voltage and rated output load;
③ The specified maximum capacitive load value for positive and negative output is identical.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	nominal input voltage	--	702/10	719/20	mA
Reflected Ripple Current		--	30	--	
Surge Voltage (1sec. max.)		-0.7	--	50	VDC
Start-up Voltage		--	--	9	
Input Under-voltage Protection		5.5	6.5	--	
Start-up Time	Nominal input voltage & constant resistance load	--	10	--	ms
Input Filter		Pi filter			
Hot Plug		Unavailable			
Ctrl *	Module on	Ctrl pin open or pulled high (3.5-12VDC)			
	Module off	Ctrl pin pulled low to GND (0-1.2VDC)			
	Input current when off	--	2	7	mA

Note: *The Ctrl pin voltage is referenced to input GND.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy ^①	5%-100% load	--	±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load	--	±0.2	±0.5	
		--	±0.2	±1	
Load Regulation ^②	5%-100% load	--	±0.5	±1	
Cross Regulation	Dual output, Vo1 load at 50%, Vo2 load at range of 25%-100%	--	--	±5	μs
Transient Recovery Time	25% load step change, nominal input voltage	--	300	500	
Transient Response Deviation		--	±3	±5	%

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Temperature Coefficient	Full load	--	--	±0.03	%/°C
Ripple & Noise ^①	20MHz bandwidth, 5%-100% load	--	100	200	mVp-p
Over-voltage Protection	Input voltage range	110	--	160	%Vo
Over-current Protection		110	200	270	%Io
Short-circuit Protection		Continuous, self-recovery			
Note: ①Output voltage accuracy for 0%-5% load is ±4% max; ②Load regulation for 0%-100% load is ±5%; ③Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The “parallel cable” method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.					

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max	1500	--	--	VDC
	Input/output-case Electric Strength Test for 1 minute with a leakage current of 1mA max.	1000	--	--	
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	2000	--	pF
Operating Temperature	See Fig. 1	-40	--	+105	°C
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	°C
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency *	PWM mode	--	270	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	k hours
Note: *Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.					

Mechanical Specifications

Case Material	Aluminum alloy
Dimensions	25.40 x 25.40 x 11.70 mm
Weight	15.0g (Typ.)
Cooling Methods	Free air convection

Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)			
	RE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)			
EMS	ESD	IEC/EN61000-4-2	Contact ±4kV	perf. Criteria B	
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A	
	EFT	IEC/EN61000-4-4	±2kV (see Fig.3-① for recommended circuit)	perf. Criteria B	
	Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig.3-① for recommended circuit)	perf. Criteria B	
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A	

Typical Characteristic Curves

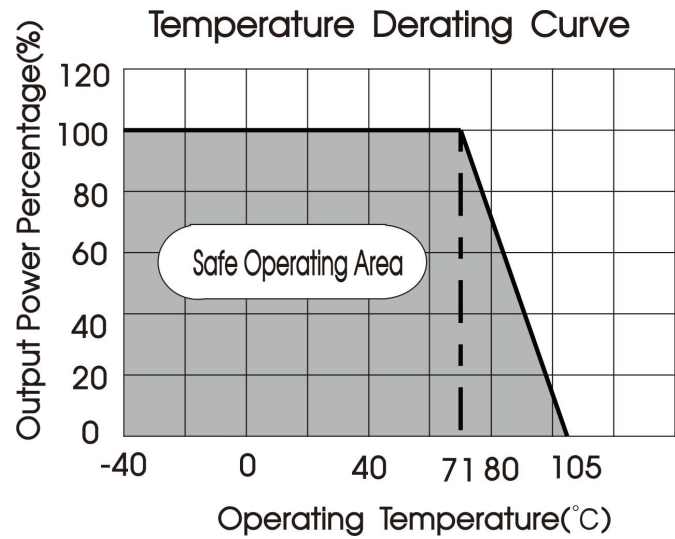


Fig. 1

Design Reference

1. Typical application

All the DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the max capacitive load value of the product.



Fig. 2

Vin	24VDC
Cin	100μF/50V
Cout	10μF/25V

2. EMC compliance circuit

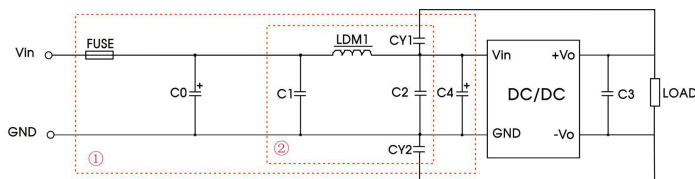


Fig.3

Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

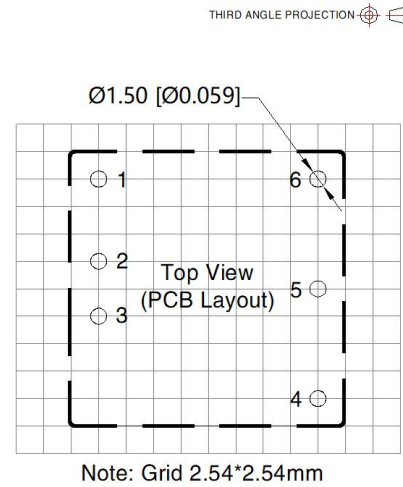
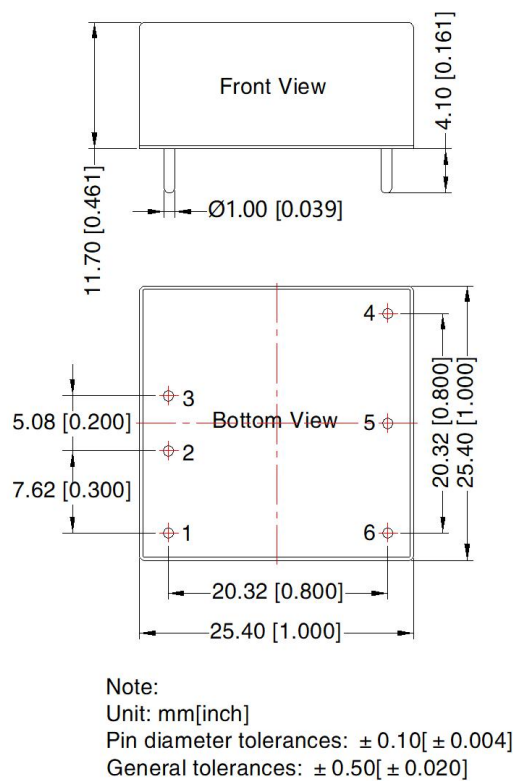
Parameter description:

Model	Vin: 24VDC
FUSE	Choose according to actual input current
C0/C4	330μF/50V
C1/C2	4.7μF/50V
C3	Refer to the Cout in Fig.2
LDM1	4.7μH
CY1/CY2	1nF/2kV

3. The products do not support parallel connection of their output

4. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



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

Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210003;
- If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
- The maximum capacitive load offered were tested at nominal input voltage and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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