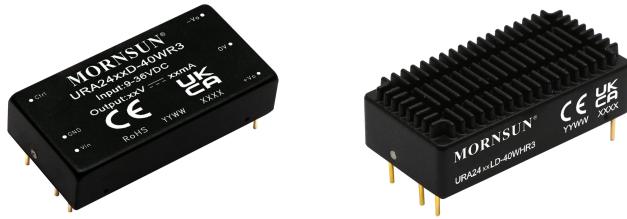


40W isolated DC-DC converter in DIP package
Ultra-wide input and regulated dual output



Patent Protection RoHS
CE Report EN62368-1
UK CA Report BS EN62368-1



FEATURES

- Ultra-wide 4:1 input voltage range
- High efficiency up to 90%
- No-load power consumption as low as 0.19W
- I/O isolation test voltage 2250 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

URA24_LD-40W(H)R3 series of isolated 40W DC-DC converter products with an ultra-wide 4:1 input voltage. They feature efficiencies up to 92%, input to output isolation is tested with 2250VDC and the converter safely operate ambient temperature of -40°C to +105°C, input under-voltage protection, output over-voltage, over-current, short-circuit protection. They are ideally and widely used in applications such as industrial control, electric power, instruments and communications fields.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency ^② (%) Min./Typ.	Capacitive Load (μF) ^③ Max.
		Nominal (Range)	Max. ^①	Voltage (VDC)	Current (mA) Max./Min.		
--	URA2412LD-40W(H)R3	24 (9-36)	40	±12	±1667/0	88/90	1500
	URA2415LD-40W(H)R3			±15	±1333/0	88/90	1100
	URA2424LD-40W(H)R3			±24	±833/0	88/90	700

Note:

- ① Exceeding the maximum input voltage may cause permanent damage;
② Efficiency is measured at nominal input voltage and rated output load;

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	nominal input voltage	±12V/±15V/±24V output	--	1852/8	1894/20	mA
Reflected Ripple Current	nominal input voltage, 100%load		--	100	--	
Surge Voltage (1sec. max.)			-0.7	--	50	VDC
Start-up Voltage			--	--	9	
Input Filter			PI filter			
Hot Plug			Unavailable			
Ctrl* ^①	Module open		Ctrl pin open or TTL pulled high (3-12VDC)			
	Module shutdown		Ctrl pin pulled GND or pulled low (0-1.2VDC)			

Note: ① The voltage of Ctrl pin is relative to input pin GND.

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy	5%-100% load		--	±1	±2	%
	0%-5% load		--	±2	±5	
Linear Regulation	Input voltage variation from low to high at full load		Vo1	±0.2	±0.5	
			Vo2	±0.5	±1	
Load Regulation ^①	5%-100% load		Vo1	±0.5	±1	
			Vo2	±0.5	±1.5	
Transient Response Deviation	25% load step change, nominal input voltage		--	±3	±5	

Transient Recovery Time	25% load step change, input voltage range	--	250	500	μs
Ripple & Noise ^②	20MHz bandwidth, 5%-100% load	±12V/±15V output	--	70	--
		±24V output	--	90	--
Over-voltage Protection	Input voltage range	110	140	160	%Vo
Over-current Protection		110	140	200	%Io
Short-circuit Protection ^③		Continuous, self-recovery			

Note:
 ①When the test condition is 0%~100% load regulation ratio is ±5%, Vo1 is positive output, and Vo2 is negative output.
 ②The "Tip and barrel method" is used for ripple and noise test, please refer to Figure 2 for the recommended circuits. Ripple & noise value less than 5% Vo when with 0%~5% load.
 ③For dual output models, when short circuit test is performed on one output, the other output should be at least with 5% load.

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.	2250	--	--	VDC
	Input/output-case Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500	--	--	
Insulation Resistance	Input-output resistance at 500VDC	100	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	1300	--	pF
Operating Temperature	See Fig. 1	-40	--	+105	°C
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Soldering Resistance Temperature*	<u>Soldering spot is 1.5mm away from case for 10 seconds</u>	--	--	300	°C
	<u>Wave soldering, 10 seconds</u>	255	260	265	
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency*	PWM mode	--	370	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	k hours

Note: *The pin resistance temperature is not the actual set temperature of the soldering iron, but the temperature required for a good solder joint. The actual set temperature by the customer needs to be comprehensively set based on the thickness of the PCB, the size of the copper cladding, the power of the soldering iron, and the selection of the soldering iron tip.
 *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	Without heat sink	Horizontal package	50.80 x 25.40 x 11.80 mm		
	With heat sink		51.40 x 26.20 x 16.50 mm		
Weight	Without heat sink		41.0g (Typ.)		
	With heat sink		50.8g (Typ.)		
Cooling Method	Free air convection				

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A (see Fig.3-①) / CLASS B (see Fig.3-②)		
	RE	CISPR32/EN55032	CLASS A (see Fig.3-①) / CLASS B (see Fig.3-②)		
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV		perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m		perf. Criteria A
	EFT	IEC/EN61000-4-4	100kHz ±2KV (see Fig.3-②)		perf. Criteria A
	Surge	IEC/EN61000-4-5	line to line ±2KV (see Fig.3-②)		perf. Criteria A
	CS	IEC/EN61000-4-6	10 Vr.m.s		perf. Criteria A

Typical Characteristic Curve

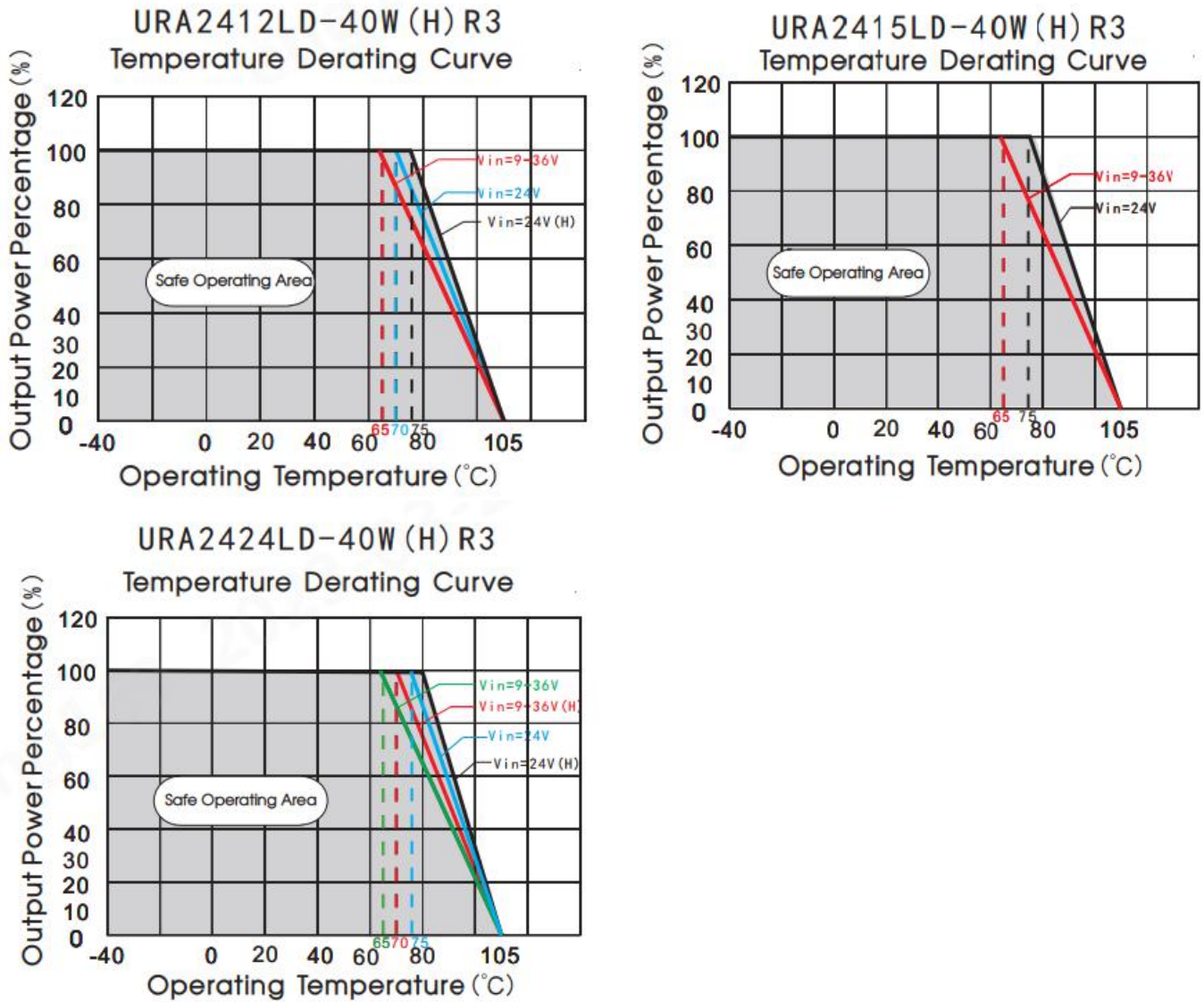


Fig. 1

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 specified max. capacitive load value of the product.



Fig. 2

C_{in}	C_{out}
100 μ F/50V	100 μ F/50V

2. EMC compliance circuit

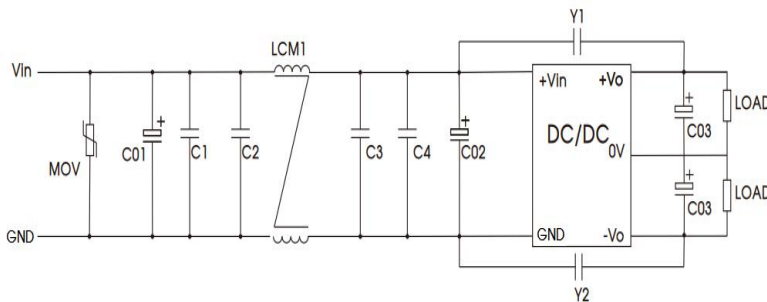


Fig.3-①

Parameter description:

Model	Parameter
C1/C2	4.7uF/50V
C3/C4	10uF/50V
C01	680uF/50V
C02	330uF/50V
C03	100uF/50V
Y1/Y2	2.2nF/Y1
LCM1	10.0mH (Min.)/180mΩ (Max.)
MOV	14D470

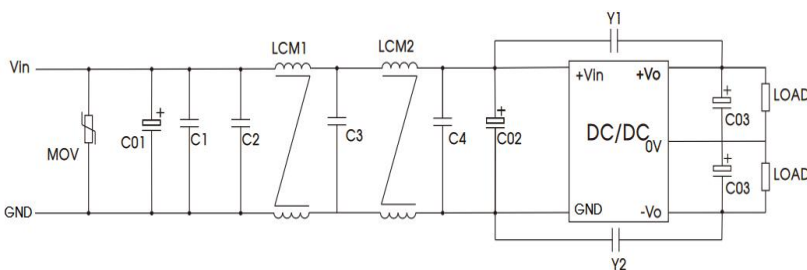


Fig.3-②

Parameter description:

Model	Parameter
C1/C2	4.7uF/50V
C3	10uF/50V
C4	47uF/50V
C01	680uF/50V
C02	330uF/50V
C03	100uF/50V
Y1/Y2	2.2nF/Y1
LCM1/LCM2	10.0mH (Min.)/180mΩ (Max.)
MOV	14D470

3. Recommended scheme for thermal testing

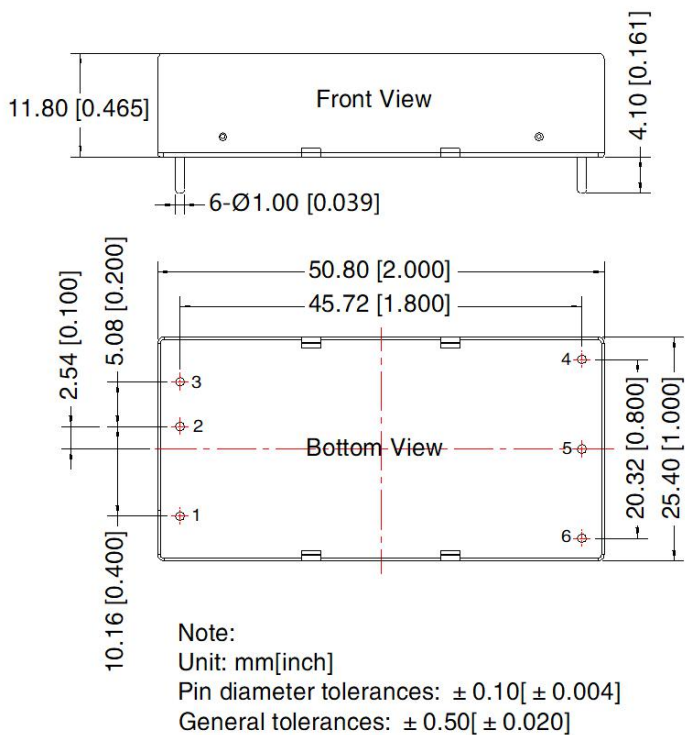
In the application process, the thermal design of the product can be evaluated with the product temperature derating curve; or by testing the temperature of point A in Fig.4 to determine the stable working range of the product, when the temperature of point A is lower than 100°C, it is the stable working range of the product.



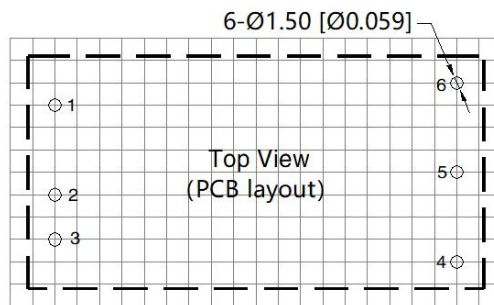
Fig.4

4. The products do not support parallel connection of their output
5. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

URA24_LD-40WR3 Dimensions and Recommended Layout



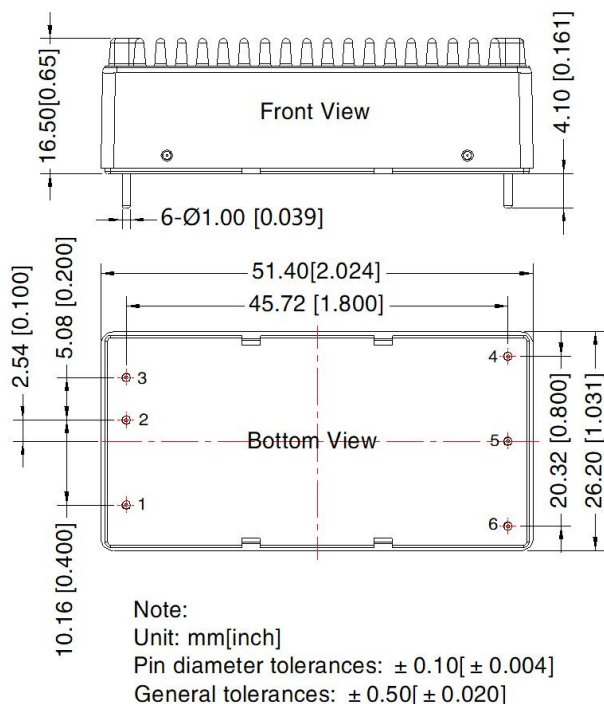
THIRD ANGLE PROJECTION



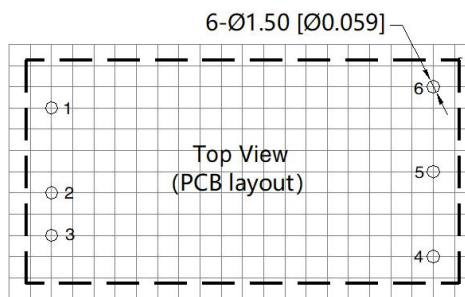
Note: Grid 2.54*2.54mm

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

URA24_LD-40WHR3 Dimensions and Recommended Layout



THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

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

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58200035(Without heat sink), 58200051(With heat sink);
2. It is recommended to use more than 5% load, if less than 5% load, the ripple index of product may exceed the specification, but does not affect the reliability of the product;
3. If the product works under the minimum required load, it is not guaranteed that the product performance meets all the performance indicators in this manual;
4. The maximum capacitive load offered were tested at input voltage range and full load;
5. 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;
6. All index testing methods in this datasheet are based on company corporate standards ;
7. We can provide product customization service, please contact our technicians directly for specific information;
8. Products are related to laws and regulations: see "Features" and "EMC";
9. 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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