

DC/DC Converter

URA(B)_YMD-6WR3G Series

MORNSUN®

6W isolated DC-DC converter in YMD package
Ultra-wide input and regulated dual/single output



Patent Protection RoHS

FEATURES

- Ultra-wide 4:1 input voltage range
- High efficiency up to 86%
- No-load power consumption as low as 0.12W
- isolation voltage: 1500VDC
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Operating ambient temperature range: -40℃ to +85℃
- Industry standard pin-out

URA_YMD-6WR3G & URB_YMD-6WR3G series of isolated 6W DC-DC converter with 4:1 input voltage with efficiencies of up to 86%, 1500VDC input to output isolation and the converter safely operate ambient temperature of -40℃ to +85℃, input under-voltage protection, output over-voltage, over-current, short-circuit protection. They are widely used in medical care, industrial control, electric power, instruments and 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.		
--	URA2405YMD-6WR3G	24 (9-36)	40	±5	±600/0	80/82	470
	URA2412YMD-6WR3G			±12	±250/0	82/84	100
	URA2415YMD-6WR3G			±15	±200/0	82/84	100
	URA2424YMD-6WR3G			±24	±125/0	84/86	100
	URB2403YMD-6WR3G			3.3	1500/0	74/76	1800
	URB2405YMD-6WR3G			5	1200/0	79/81	1000
	URB2409YMD-6WR3G			9	667/0	81/83	680
	URB2412YMD-6WR3G			12	500/0	82/84	470
	URB2415YMD-6WR3G			15	400/0	83/85	220
	URB2424YMD-6WR3G			24	250/0	83/85	100

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 Vo1 and Vo2 output is identical.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	24VDC nominal input series, nominal input voltage	3.3V output	--	270/5	279/12	mA
		Others	--	307/5	317/12	
Reflected Ripple Current	Nominal input voltage		--	20	--	VDC
Surge Voltage (1sec. max.)	24VDC nominal input series		-0.7	--	50	
Start-up Voltage	24VDC nominal input series		--	--	9	
Input Under-voltage Protection	24VDC nominal input series		5.5	6.5	--	
Input Filter			PI filter			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy ^①	0% - 100% load	--	±1	±3	%

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Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	%
		Vo2	--	±0.5	±1	
Load Regulation ^②	5% -100% load	Vo1	--	±0.5	±1	
		Vo2	--	±0.5	±1.5	
Cross Regulation	Dual output, Vo1 load at 50%, Vo2 load at range of 10% - 100%		--	--	±5	
Transient Recovery Time	25% load step change, nominal input voltage		--	300	500	μs
Transient Response Deviation		3.3V, 5V, ±5V output	--	±5	±8	%
		Others	--	±3	±5	
Temperature Coefficient	Full load		--	--	±0.03	%/°C
Ripple & Noise ^③	20MHz bandwidth, 5% - 100% load		--	50	85	mV p-p
Over-voltage Protection	Input voltage range		110	--	160	%Vo
Over-current Protection			110	140	190	%Io
Short-circuit Protection			Continuous, self-recovery			
Note: ①Output voltage accuracy of 3.3VDC/5VDC/9VDC/±5VDC output converter for 0%-5% load is ±5% max; ②Load regulation for 0%-100% load is ±5%; ③Ripple & Noise at ≤ 5% load is 5%Vo Max. 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
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	1000	--	pF
Operating Temperature	See Fig. 1	-40	--	+85	°C
Storage Humidity	Non-condensing	5	--	95	%RH
Storage Temperature		-55	--	+125	°C
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	
Vibration		IEC/EN61373 - Category 1, Grade B			
Switching Frequency *	PWM mode	--	300	--	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	12.5g (Typ.)
Cooling method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig.3-② for recommended circuit)		
	RE	CISPR32/EN55032	CLASS B (see Fig.3-② for recommended circuit)		
Immunity	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 V _{r.m.s}		perf. Criteria A

Typical Characteristic Curve

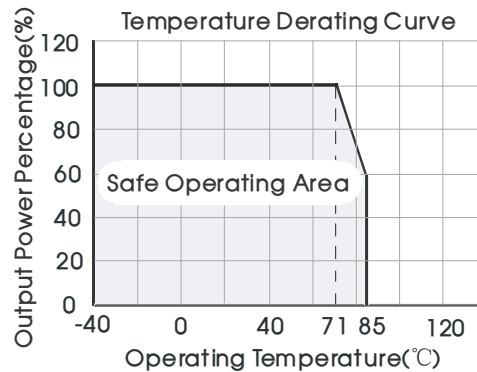


Fig. 1

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.

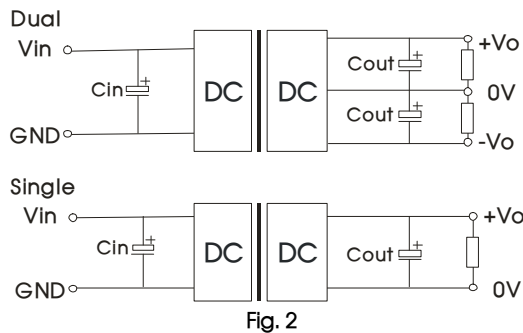


Fig. 2

Vin(VDC)	Cin	Cout
24	100μF/50V	10μF/50V

2. EMC compliance circuit

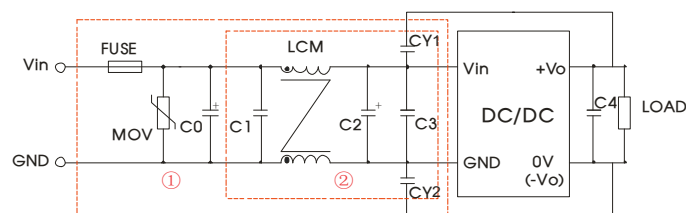


Fig. 3

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

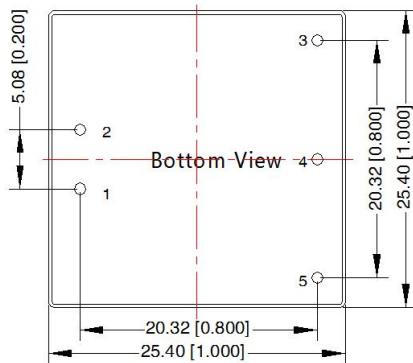
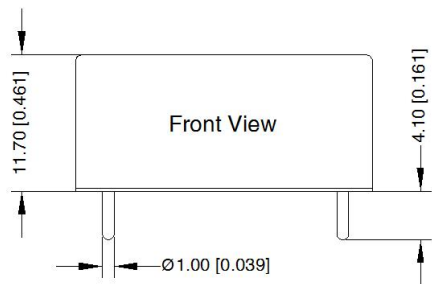
Parameter description:

Model	Vin: 24VDC
FUSE	Choose according to actual input current
MOV	20D470K
C0	680μF/50V
C1	1μF/50V
C2	330μF/50V
C3	4.7μF/50V
C4	Refer to the Cout in Fig.2
LCM	4.7mH
CY1/CY2	1nF/2kV

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

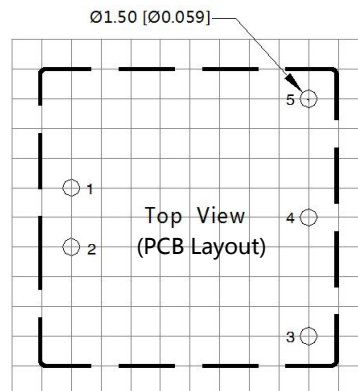
4. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin diameter tolerances: $\pm 0.10 [\pm 0.004]$
General tolerances: $\pm 0.50 [\pm 0.020]$

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	No Pin	0V
5	0V	-Vo

Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210003;
- It is recommended that the load imbalance of the dual output is $\leq \pm 5\%$. If it exceeds $\pm 5\%$, the performance of the product cannot be guaranteed to meet as datasheet marked. For details, please contact our technical staff;
- The maximum capacitive load offered were tested at input voltage range and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^\circ\text{C}$, humidity $<75\%\text{RH}$ 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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