MORNSUN®

URA_YMD-6WR2 & URB_YMD-6WR2 Series

6W，ULTRA-WIDE INPUT, ISOLATED & REGULATED DUAL/SINGLE OUTPUT DIP PACKAGING, DC-DC CONVERTER

Patent Protection RoHS

FEATURES

- 4:1 wide input voltage range
- Efficiency up to 88%
- 1.5KVDC isolation
- Short circuit protection
- Output over voltage protection
- Operation temperature range: -40°C ~ +85°C
- Industry standard pinout
- Low ripple & noise
- Meet CISPR22/EN55022 CLASS A

PART NUMBER SYSTEM

URB2405YMD-6WR2

- Rated Power
- Package Style
- Output Voltage
- Input Voltage
- Product Series

APPLICATION

The URA_YMD-6WR2 & URB_YMD-6WR2 offer 6W of output, with ultra-wide input voltage of 9-36VDC, 18-75VDC and 1500VDC isolation voltage, output over- voltage protection and short-circuit protection. The products meet CISPR22/EN55022 CLASS A. All models are particularly suitable for industrial, electric power, instrumentation, telecommunication applications.

SELECTION GUIDE

Model Number	Input Voltage(VDC)		Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(Typ.)		Reflected Ripple Current (mA,Typ.)	Max. Capacitive Load# (μF)	Efficiency (%, Typ.) @Max. Load
	Nominal (Range)	Max **		Max.	Min.	@Max. Load	@No load			
URA2405YMD-6WR2	24 (9-36)	40	±5	±600	±30	301	7	20	470	83
*URA2412YMD-6WR2			±12	±250	±12	287			100	87
*URA2415YMD-6WR2			±15	±200	±10	284			100	88
URB2403YMD-6WR2			3.3	1500	75	261			1800	79
URB2405YMD-6WR2			5	1200	60	301			1000	83
URB2412YMD-6WR2			12	500	25	287			100	87
URB2415YMD-6WR2			15	400	20	284			100	88
*URB2424YMD-6WR2			24	250	12	284			47	88
*URA4805YMD-6WR2	48 (18-75)	80	±5	±600	±30	151	3		470	83
*URA4812YMD-6WR2			±12	±250	±12	143			100	87
*URA4815YMD-6WR2			±15	±200	±10	142			100	88
URB4803YMD-6WR2			3.3	1500	75	130			1800	79
URB4805YMD-6WR2			5	1200	60	151			1000	83
URB4812YMD-6WR2			12	500	25	143			100	87
URB4815YMD-6WR2			15	400	20	142			100	88
*URB4824YMD-6WR2			24	250	12	142			47	88

Note:1. *Designing. **Input voltage can't exceed this value, or will cause the permanent damage.
2. # For each output.

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. max.)	24V input	-0.7	--	50	VDC
	48V input	-0.7	--	100	
Start-up Voltage	24V input	--	--	9	
	48V input	--	--	18	
No-load Input Power		--	0.15	0.3	W
Input Filter		π Filter			

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Power		0.3	--	6	W
Output Voltage Accuracy		--	±1	±2	%
Output Voltage Balance	Dual output, balance load	--	±0.5	±1.5	
Line Regulation	Full load, Input voltage from low to high	--	±0.2	±0.5	
Load Regulation	5% to 100% load	--	±0.5	±1	
Cross Regulation	Dual output, main output 50% load, Supplement output from 10% to 100% load	--	--	±5	
Transient Recovery Time	25% load step change	--	300	500	μs
Transient Response Deviation		--	±3	±5	%
Temperature Drift	100% load	--	--	±0.03	%/°C
Ripple*	20MHz bandwidth	--	15	25	mVp-p
Noise*		--	50	75	
Output Over Voltage Protection	Input voltage range	110	--	140	%Vo
Output Short Circuit Protection		Continuous, automatic recovery			

Note: 1.Dual outpt models unbalanced load:±5%.
2.* Ripple and noise tested by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Tested for 1 minute and leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input/Output，100KHz/0.1V	--	1000	--	pF
Switching Frequency		--	300	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Case Material		Aluminum Alloy			
Weight		--	14	--	g

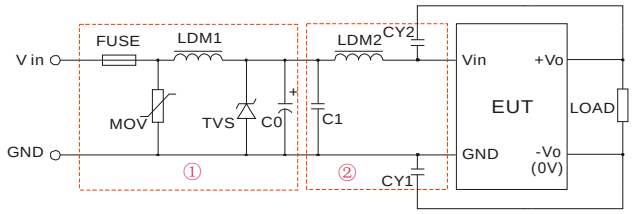
ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	5	--	95	%
Operating Temperature	Power derating (above 71℃)	-40	--	85	°C
Storage Temperature		-55	--	125	
The Max. Case Temperature	Operating Temperature curve range	--	--	105	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			
Shake		10-55Hz, 10G, 30 Min. along X, Y and Z			

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS A(Without External Circuit)/ CLASS B（External Circuit Refer to Figure 1-② or Figure 3）	
	RE	CISPR22/EN55022 CLASS A(Without External Circuit)/ CLASS B（External Circuit Refer to Figure 1-② or Figure 3）	
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 perf. Criteria B（External Circuit Refer to Figure 1-①）
		IEC/EN61000-4-4	±4KV perf. Criteria B（External Circuit Refer to Figure 3）
	Surge	IEC/EN61000-4-5	±2KV perf. Criteria B（External Circuit Refer to Figure 1-① or Figure 3）
	CS	IEC/EN61000-4-6	3 Vr.m.s perf. Criteria A
	Voltage dips、short and interruptions immunity	IEC/EN61000-4-29	0%-70% perf. Criteria B

EMC RECOMMENDED CIRCUIT

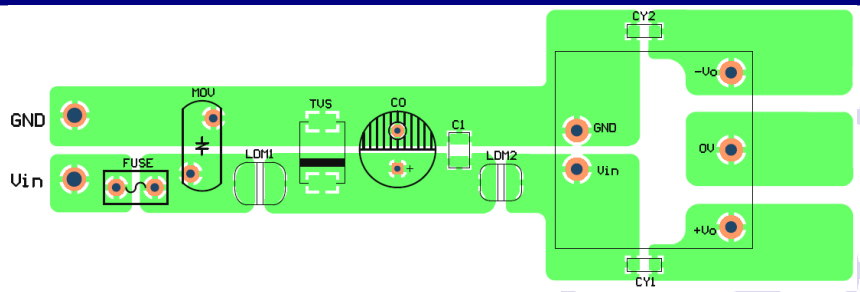


(Figure 1)

Note: In Figure 1,part①is EMS Recommended external circuit, part②is EMI recommended external circuit. Choose according to requirements.

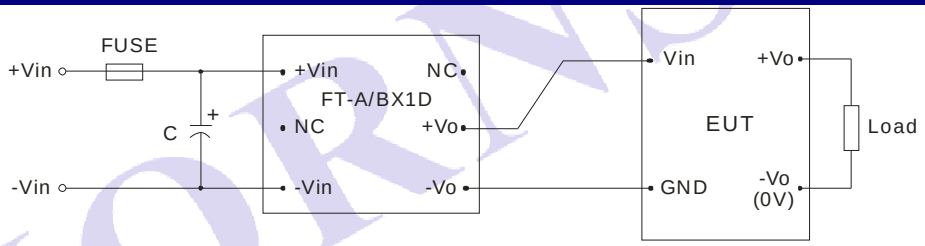
Parameters	Vin: 24V	Vin: 48V
FUSE	Choose according to practical input current	
MOV	10D560K	10D101K
LDM1	56μH	
TVS	SMCJ48A	SMCJ90A
C0	120μF/50V	120μF/100V
C1	1μF/50V	1μF/100V
LDM2	4.7μH	
CY1	1nF/2000V	
CY2	1nF/2000V	

EMC RECOMMENDED CIRCUIT PCB LAYOUT



(Figure 2)

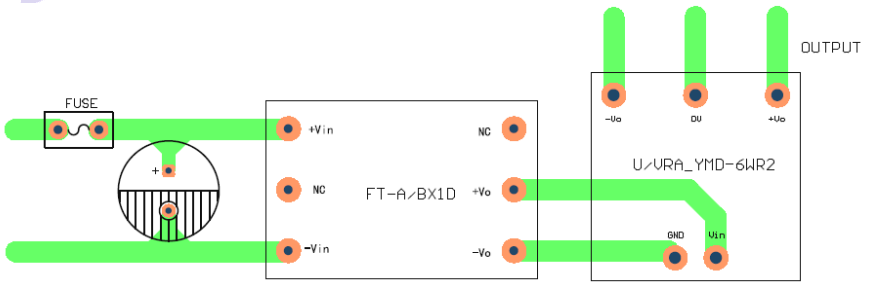
EMC MODULE RECOMMENDED CIRCUIT



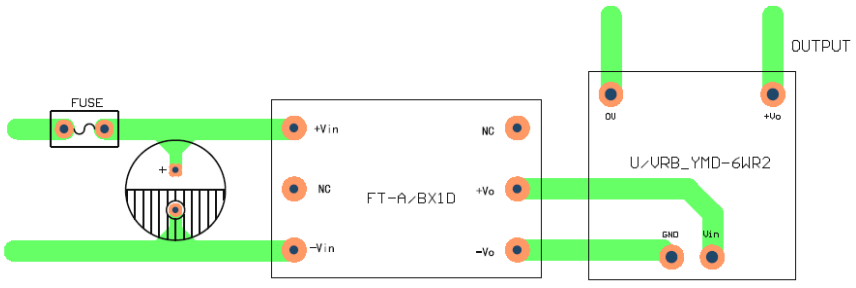
Nominal Voltage<48V, C≥330uF/50V
Nominal Voltage =48V, C≥330uF/100V
(Figure 3)

EMC MODULE RECOMMENDED CIRCUIT PCB LAYOUT

DUAL

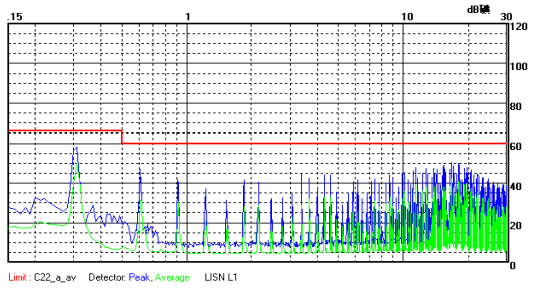


SINGLE

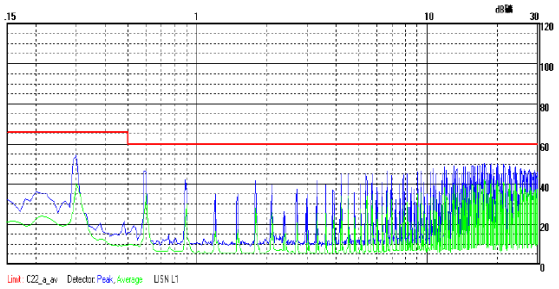


(Figure 4)

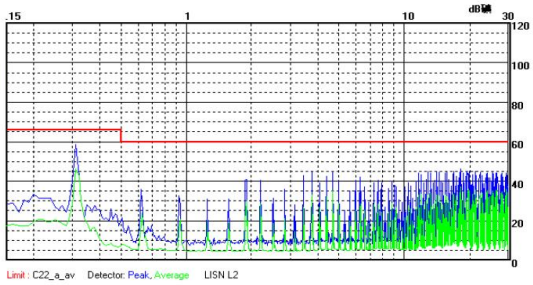
EMI TEST WAVEFORM (NOMINAL AND FULL LOAD)



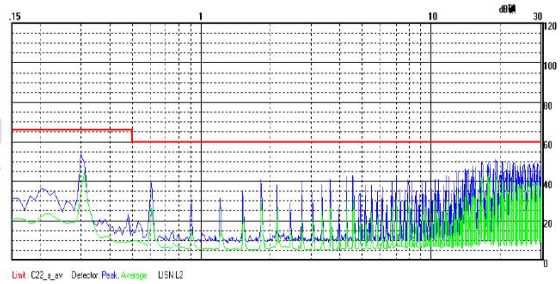
URA2405YMD-6WR2 Without External Circuit Power+（Class A）



URB2405YMD-6WR2 Without External Circuit Power+（Class A）

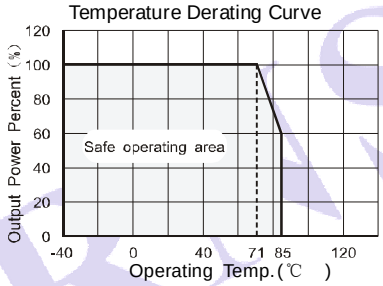


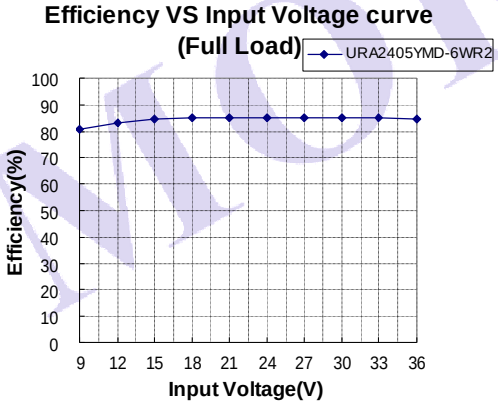
URA2405YMD-6WR2 Without External Circuit Power-（Class A）

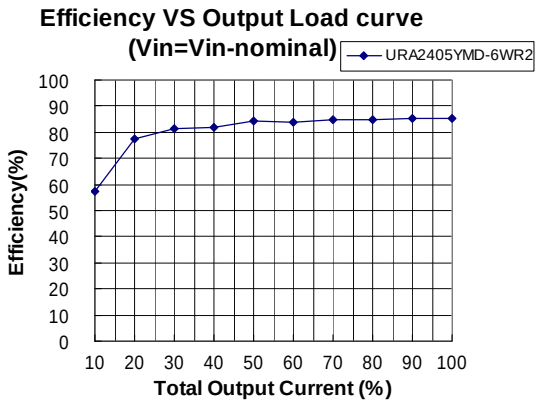


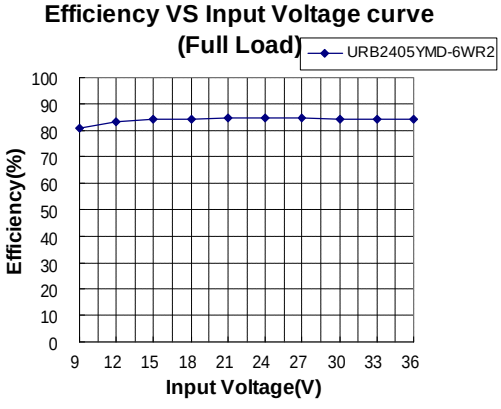
URB2405YMD-6WR2 Without External Circuit Power-（Class A）

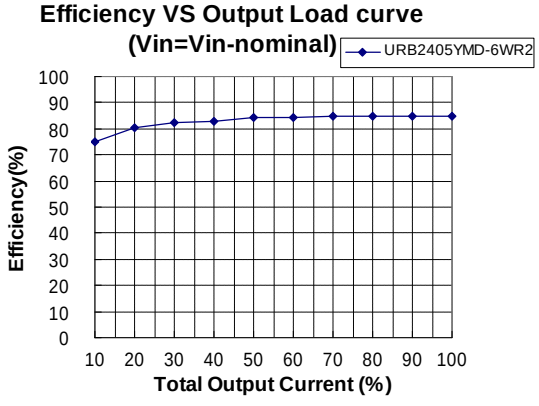
PRODUCT TYPICAL CURVE





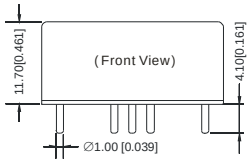


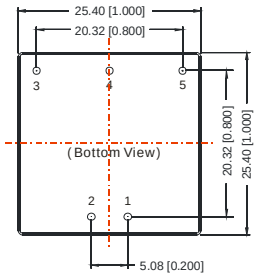




OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING

MECHANICAL DIMENSIONS



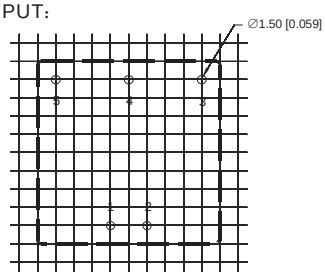


Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10mm[±0.004inch]
Pin height tolerances: ±0.50mm[±0.020inch]
General tolerances: ±0.25mm[±0.010inch]

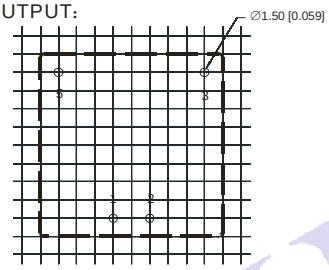
FOOTPRINT DETAILS		
Pin	SINGLE	DUAL
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	No Pin	0V
5	0V	-Vo

RECOMMENDED FOOTPRINT

DUAL OUTPUT:

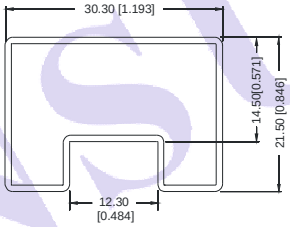


SINGLE OUTPUT:



Note: grid 2.54*2.54mm.

TUBE OUTINE DIMENSIONS

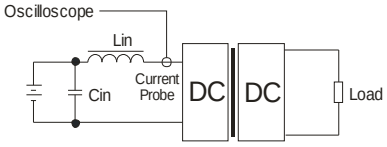


Note:
Unit: mm[inch]
General tolerances: ±0.50mm[±0.020inch]
L=530mm[20.866inch] Devices per tube quantity: 19pcs
L=220mm[8.661inch] Devices per tube quantity: 7pcs
Short tube inner packaging dimensions:
L*W*H=255*170*80 mm;
Short tube outer packaging dimensions(with six inner packaging boxes):
L*W*H=375*280*270 mm;
Long tube inner packaging dimensions:L*W*H= 580*200*100 mm;
Long tube outer packaging dimensions(with two inner packaging boxes):
L*W*H=600*215*220 mm;
Long tube outer packaging dimensions(with three inner packaging boxes):
L*W*H=600*215*325 mm.

TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin and Capacitor Cin to simulate source impedance.



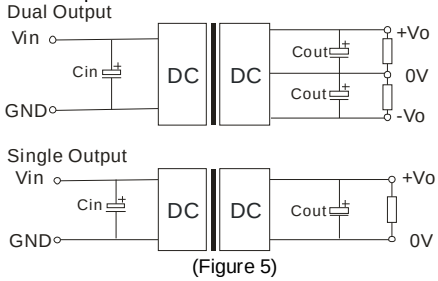
Lin(4.7μH) Cin(220μF, ESR < 1.0Ω at 100 KHz)

DESIGN CONSIDERATIONS

1) Recommended circuit

All the URA_YMD-6WR2 & URB_YMD-6WR2 Series have been tested according to the following recommended testing circuit before leaving factory (see Figure 5).

If you want to further decrease the output ripple, you can increase a capacitance properly or choose capacitors with low ESR, but the greatest capacitance of its filter capacitor must less than the Max. Capacitive Load.



(Figure 5)

2) Cannot use in parallel and hot swap

Note:

1. Min. load shouldn't be less than 5%, otherwise ripple maybe increase dramatically. Operation under minimum load will not damage the converter, however, they may not meet all specification listed.
2. Max. Capacitive Load tested at input voltage range and full load.
3. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
4. In this datasheet, all the test methods of indications are based on our corporate standards.
5. All characteristics are for listed model, non-standard models may perform differently, please contact our technical person for more detail.
6. Contact us for your specific requirement.
7. Specifications subject to change without prior notice.

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