MORNSUN®

URB_YMD-6WR2 Series

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

Patent Protection RoHS

FEATURES

- 4:1 wide input voltage range
- Efficiency up to 88%
- 1.5KVDC isolation
- Output over voltage protection
- Short circuit protection
- 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 URB_YMD-6WR2 series offer 6W of output, with 4:1 wide input voltage of 9-36VDC, 18-75VDC and features 1500VDC isolation, output over voltage and short-circuit protection. The products meet CISPR22/EN55022 CLASS A. All models are particularly suited to industrial control, electric power, instrumentation, tele-communications etc.

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			
URB2403YMD-6WR2	24 (9-36)	40	3.3	1500	75	261	7	20	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
URB4803YMD-6WR2	48 (18-75)	80	3.3	1500	75	130	3	20	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

*Input voltage can't exceed this value, or will cause the permanent damage.

INTPUT 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
Short Circuit Input Power		--	--	3	
Input Filter		π Filter			

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Power		0.3	--	6	W
Output Voltage Accuracy		--	±1	±2	%
Line Regulation	Full load, Input voltage from low to high	--	±0.2	±0.5	
Load Regulation	5% to 100% load	--	±0.5	±1	
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	--	10	25	mVp-p
Noise*		--	70	100	

Output Over Voltage Protection	Input voltage range	110-140%Vo
Output Short Circuit Protection		Continuous, automatic recovery
* 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			
Weight		--	14	--	g

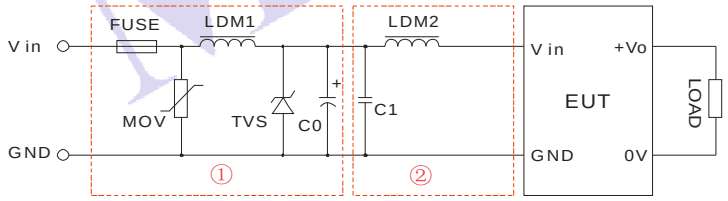
ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity		5	--	95	%
Operating Temperature	Power derating (above 71℃)	-40	--	85	℃
Storage Temperature		-55	--	125	
The Max. Case Temperature	Operating Temperature curve range	--	--	105	
Soldering 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 Figure1-②）
	RE	CISPR22/EN55022	CLASS A（Without External Circuit）/ CLASS B（External Circuit Refer to Figure1-②）
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV 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 Figure1-①）
	Surge	IEC/EN61000-4-5	±2KV perf. Criteria B（External Circuit Refer to Figure1-①）
	CS	IEC/EN61000-4-6	10 Vr.m.s perf. Criteria B
	Voltage dips、short and interruptions immunity	IEC/EN61000-4-29	0%-70% perf. Criteria B

EMC RECOMMENDED CIRCUIT



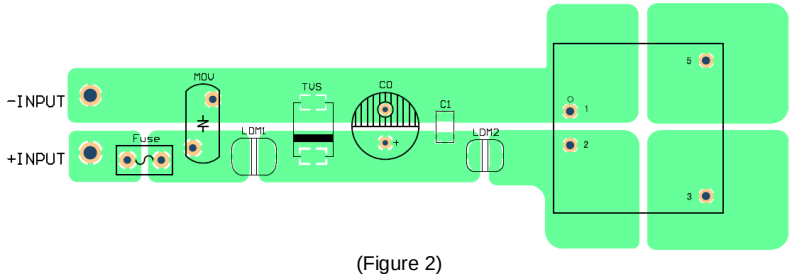
(Figure1)

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

Recommended external circuit parameters:

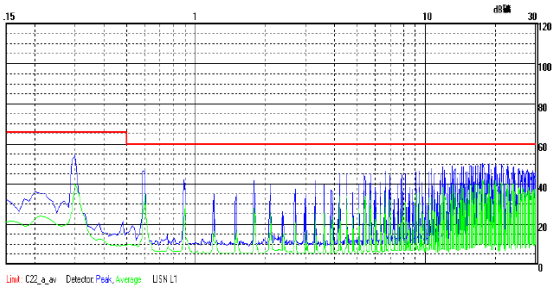
Model	URB24**YMD-6WR2	URB48**YMD-6WR2
FUSE	Choose according to practical input current	
MOV	10D560K	10D101K
LDM1	56μH	56μH
TVS	SMCJ48A	SMCJ90A
C0	120μF/50V	120μF/100V
C1	225K/50V	225K/100V
LDM2	4.7μH	4.7μH

EMC RECOMMENDED CIRCUIT PCB LAYOUT

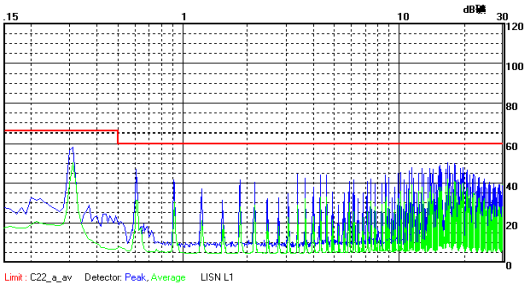


(Figure 2)

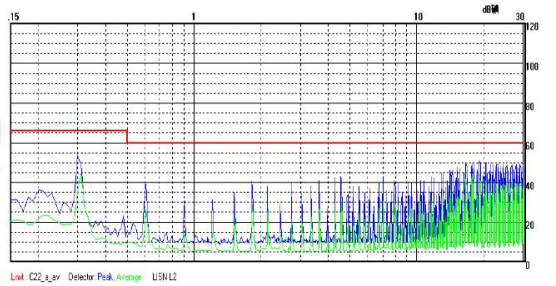
EMI TEST WAVEFORM (FULL LOAD)



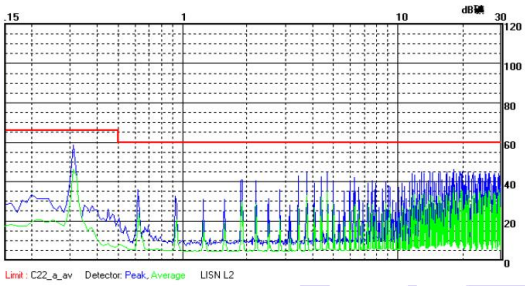
URB2405YMD-6WR2 Without External Circuit Power+（Class A）



URB4805YMD-6WR2 Without External Circuit Power-（Class A）

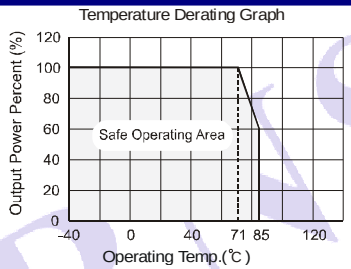


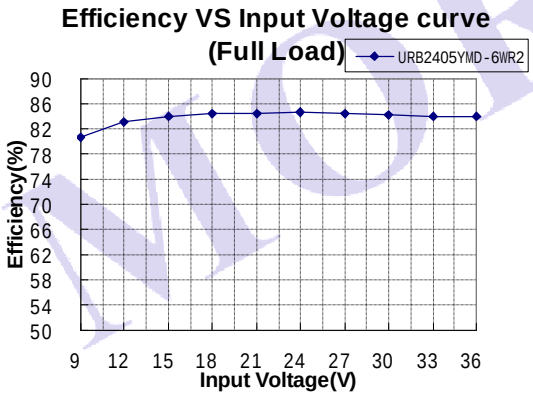
URB2405YMD-6WR2 Without External Circuit Power+（Class A）

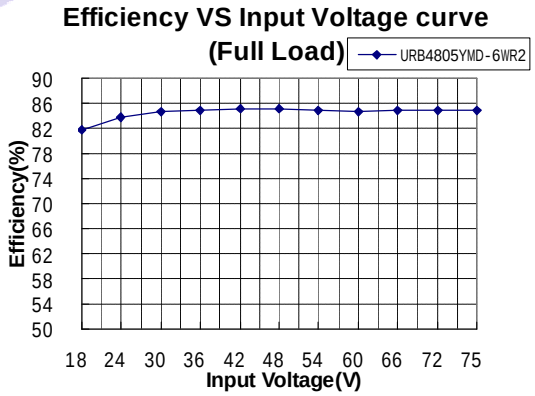


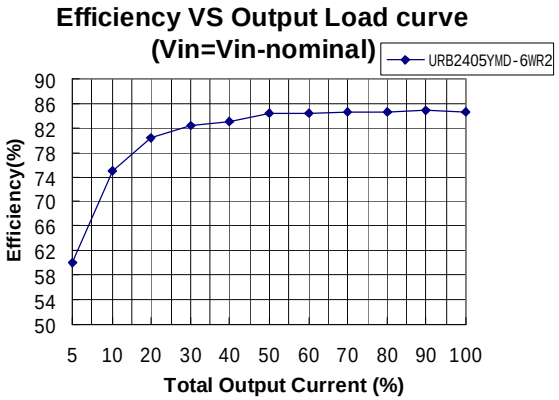
URB4805YMD-6WR2 Without External Circuit Power-（Class A）

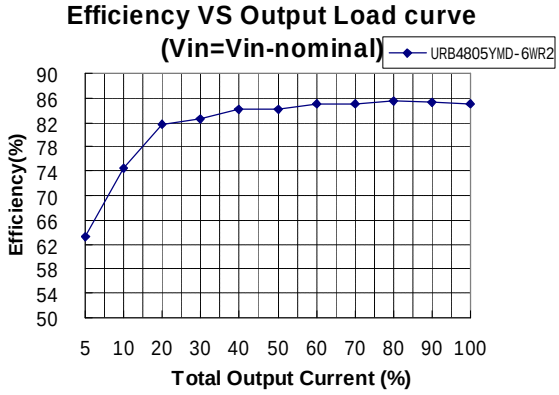
PRODUCT TYPICAL CURVE





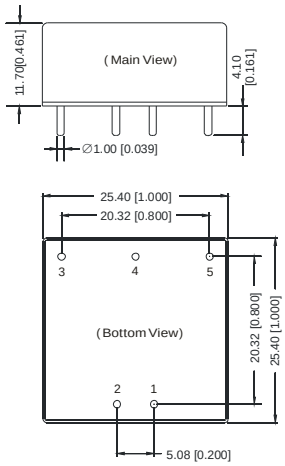






OUTLINE DIMENSIONS、RECOMMENDED FOOTPRINT & PACKAGING

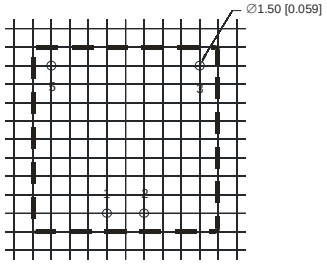
MECHANICAL DIMENSIONS



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

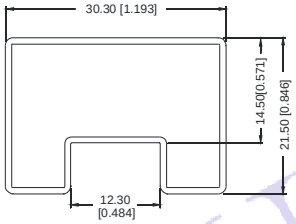
FOOTPRINT DETAILS	
Pin	Function
1	GND
2	Vin
3	+Vo
4	No Pin
5	0V

RECOMMENDED FOOTPRINT



Note: grid 2.54*2.54mm.

TUBE OUTINE DIMENSIONS

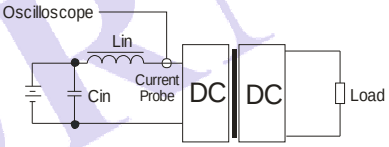


Note:
Unit: mm[inch]
General tolerances: ±0.50mm[±0.020inch]
L=530mm[20.866inch] Devices per tube quantity: 19pcs
L=220mm[8.661inch] Devices per tube quantity: 7pcs
Short tube inner packaging dimensions: L*W*H=255*170*80mm;
Short tube outer packaging dimensions(with six inner packaging boxes): L*W*H=375*280*270mm;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

TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

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



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

DESIGN CONSIDERATIONS

① **Recommended circuit**

All the URB_YMD-6WR2 Series have been tested according to the following recommended testing circuit before leaving factory (see Figure 3). If you want to further decrease the input/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 3)

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.

MORNSUN Science & Technology Co.,Ltd.
Address: No. 5, Kehui St. 1, Kehui development center, Science Ave., Guangzhou Science City, Luogang district, Guangzhou,P.R.China.
Tel: 86-20-28203030
Fax:86-20-38601272
Http://www.mornsun-power.com