

MORNSUN®

URC_D-30WR2 Series

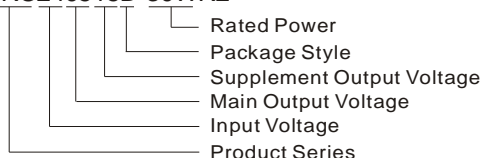
30W,4:1 WIDE INPUT, ISOLATED & REGULATED THREE OUTPUT DIP DC-DC CONVERTER



Patent Protected RoHS

PART NUMBER SYSTEM

URC240515D-30WR2



FEATURES

- Efficiency up to 88%
- 4:1 wide input voltage range
- 1500VDC isolation
- Six-sided metal shield
- Short circuit protection (automatic recovery)
- Operating temperature: -40°C to +85°C
- Industry standard pinout
- Meet CISP22/EN55022 CLASS A

APPLICATION

URC_D-30WR2 series offer 30W of output, wide input voltage: 9-36VDC, 18-75VDC, and features 1500VDC isolation, six-sided metal shield, over current and short circuit protection. All models are particularly suitable for industrial, telecommunication, electric power, test equipments applications.

SELECTION GUIDE

Model ①	Input Voltage(VDC)		Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(typ.)		Reflected Ripple Current (mA,typ.)	Max. Capacitive Load (μF) ③	Efficiency (% ,typ.) @Max. Load
	Nominal (Range)	Max ②		Max.	Min.	@Max. Load	@No Load			
URC240312D-30WR2	24 (9-36)	40	3.3/±12	3500/±625	175/±31	1450	30	4700/300	85	
URC240315D-30WR2			3.3/±15	3500/±500	175/±25					
URC240512D-30WR2			5/±12	3000/±625	150/±31	1420				
URC240515D-30WR2			5/±15	3000/±500	150/±25					
URC480312D-30WR2	48 (18-75)	80	3.3/±12	3500/±625	175/±31	720	30	4700/300	85	
URC480315D-30WR2			3.3/±15	3500/±500	175/±25					
URC480512D-30WR2			5/±12	3000/±625	150/±31	712				
URC480515D-30WR2			5/±15	3000/±500	150/±25					

Note:

- ①. series with suffix "H" are heat sink mounting, for example URC240515D-30WHR2 is with heatsink, URC240515D-30WR2 is without heat sink. If the application has a higher requirement for heat dissipation, you can choose modules with heat sink.
- ②. Absolute maximum rating without damage on the converter, but it isn't recommended.
- ③. For dual output converter, the given value is the same for each output.

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec.max.)	24VDC input	-0.7	--	50	VDC
	48VDC input	-0.7	--	100	
Under Voltage Lockout	Nominal Input (24V)	Models ON	--	9	
		Models OFF	7.8	--	
	Nominal Input (48V)	Models ON	--	17.8	
		Models OFF	16	--	
Start-up Time		--	10	--	ms
Ctrl*	Models ON	Ctrl leave open or connect TTL high level(2.5-12VDC)			
	Models OFF	Ctrl connect GND or low level(0-1.2VDC)			
	Input current (Models OFF)	--	1	--	mA
Input Filter		Pi Filter			

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

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Main Output Voltage Accuracy		--	±1	±3	%
Secondary Output Voltage Accuracy		--	±3	±5	
Load Regulation	From 5% to 100% load input, Nominal Input (Main output)	--	--	±2	%
	From 5% to 100% load input, Nominal Input (Secondary output)	--	--	±5	
Voltage Regulation	100% load, Input voltage from low to high (Main output)	--	---	±1	
	100% load, Input voltage from low to high (Secondary output)	--	--	±5	
Cross Regulation	100% load(Main output and one secondary output).	--	--	±2	Main output
	From 25% to 100% load input(the other one secondary output)				Secondary output
Transient Response Deviation	load step change	--	±3	±5	μs
Transient Recovery Time		--	300	500	
Temperature Drift	100% full load	--	--	±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth	--	85	100	mVp-p
Over Voltage Protection(Inside circuit)	3.3V output	--	3.9	--	VDC
	5V output	--	6.2	--	
	12V output	--	15	--	
	15V output	--	18	--	
Over Current Protection	Input voltage range	--	150	--	%Io
Short Circuit Protection		Hiccup, continual, auto-recovery			

Note:* Ripple and noise tested with "parallel cable" method. See detailed operation instructions at *DC-DC application notes*.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output ,Tested for 1 minute ,leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Input-Output, Test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output, 100KHz/0.1V	--	2000	--	pF
Switching Frequency	PWM mode	--	400	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours
Case Material	Aluminum Alloy				
Size	Without heatsink	50.8x40.6x11.8			mm
	With heatsink	50.8x40.6x16.3			
Weight	Without heatsink	--	50	--	g
	With heatsink	--	70	--	

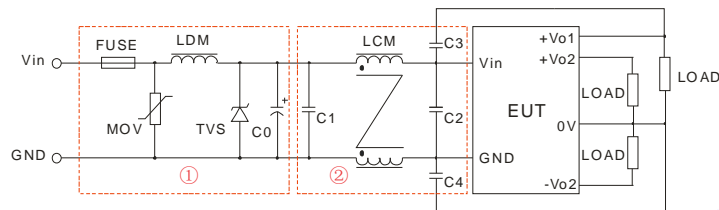
ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	5	--	95	%
Operating Temperature	Power derating (above 60°C,see Figure 3)	-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				

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 ±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 Figure1-①)
	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B (External Circuit Refer to Figure1-①)
	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



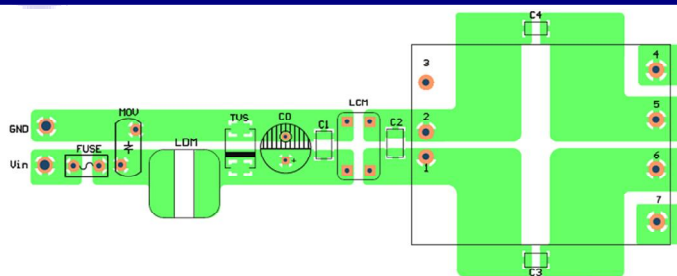
(Figure 1)

Recommended external circuit parameters:

Model	URC24_D-30WR2	URC48_D-30WR2
FUSE	Choose according to actual input current	
MOV	10D560K	10D101K
LDM	56μH	
TVS	SMCJ48A	SMCJ90A
C0	120μF/50V	120μF/100V
C1	4.7μF /50V	2.2μF /100V
LCM	2.2mH (FL2D-30-222)	
C2	4.7μF /50V	2.2μF /100V
C3	1nF /2KV	2nF /2KV
C4	1nF /2KV	2nF /2KV

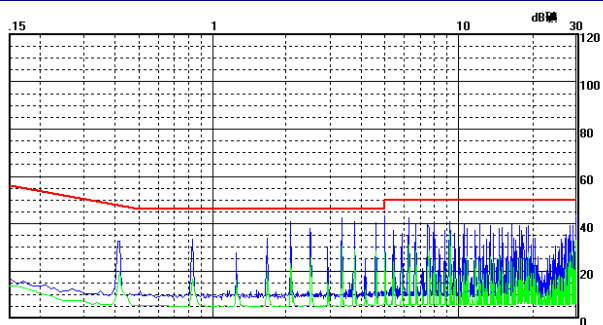
Note: 1. In Figure 1, part① is EMS Recommended external circuit, part② is EMI recommended external circuit. Choose according to requirements.
2. FL2D-30-222 is the EMC auxiliary component of our company.

EMC RECOMMENDED CIRCUIT PCB LAYOUT

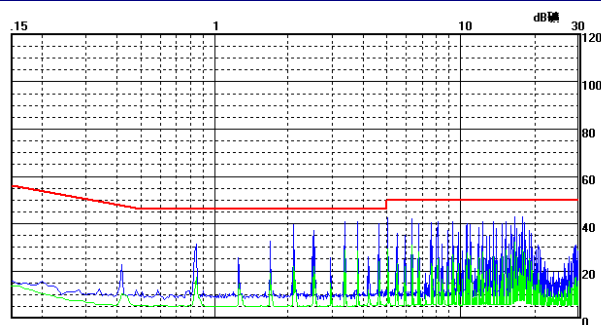


(Figure 2)

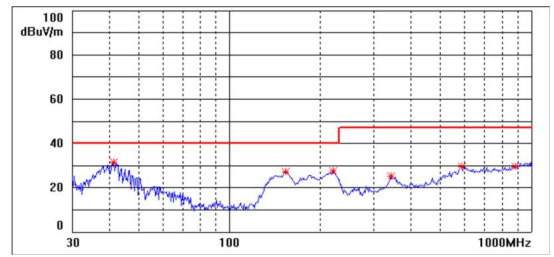
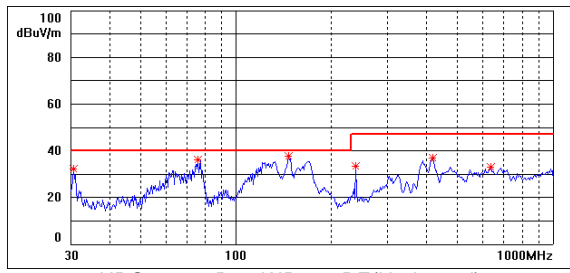
EMC TEST WAVEFORM(CLASS B TEST CIRCUIT)



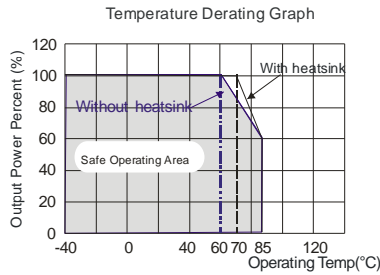
Limit: C22_b_av Detector: Peak, Average LISN L1 (PE)
URC240515D-30WR2 CE (Positive line)



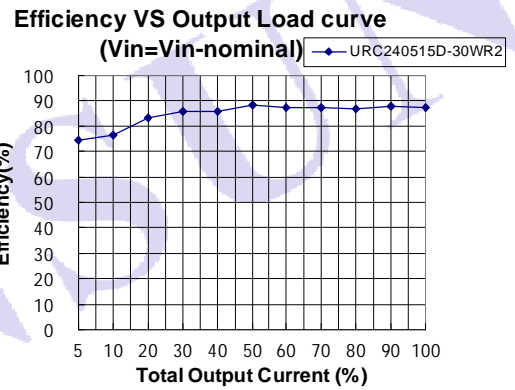
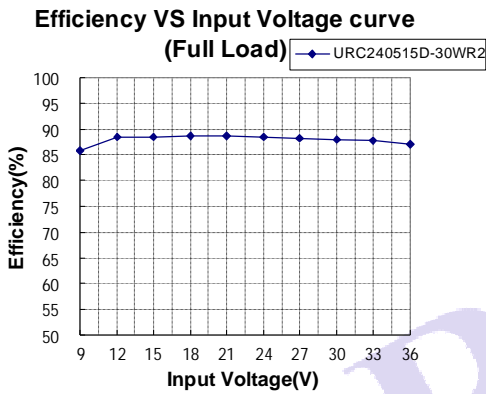
Limit: C22_b_av Detector: Peak, Average LISN L2 (PE)
URC240515D-30WR2 CE (Negative line)



PRODUCT TYPICAL CURVE



(Figure 3)



DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING

MECHANICAL DIMENSIONS

PIN CONNECTION

Pin	Triple
1	Vin
2	GND
3	Ctrl
4	-Vo2
5	0V
6	+Vo1
7	+Vo2

Note:
 Unit :mm[inch]
 Pin diameter tolerances :±0.1mm[±0.004inch]
 Pin height tolerances :±0.5mm[±0.020inch]
 General tolerances:±0.25mm[±0.010inch]

THIRD ANGLE PROJECTION

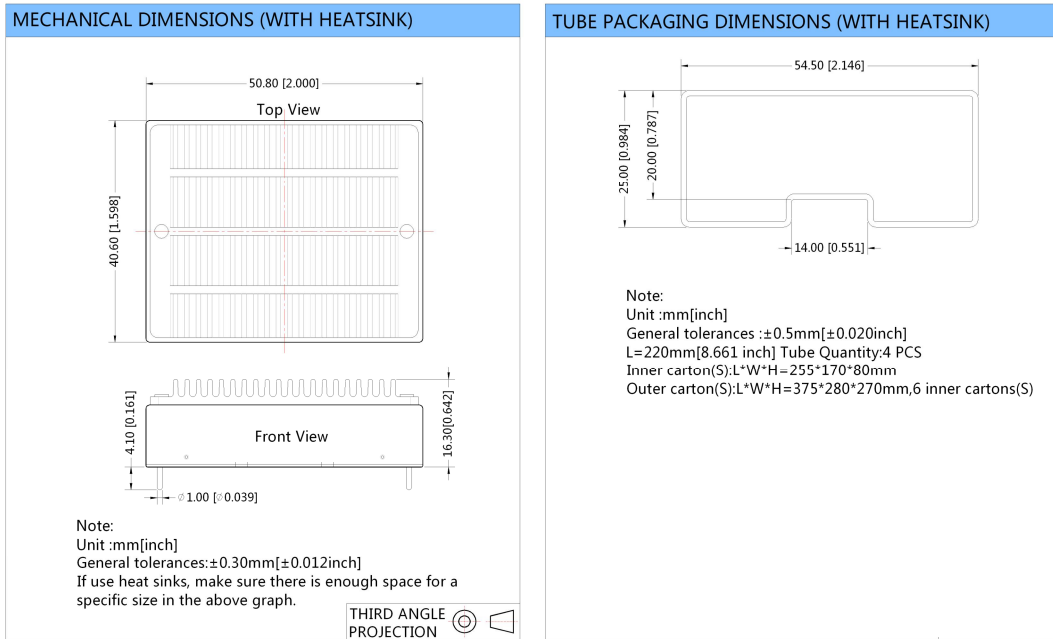
RECOMMENDED FOOTPRINT DETAILS

Note : Grid 2.54*2.54mm

TUBE PACKAGING DIMENSIONS (WITHOUT HEATSINK)

Note:
 Unit :mm[inch]
 General tolerances :±0.50mm[±0.020inch]
 L=220mm[8.661 inch] Tube Quantity:4 pcs
 Inner carton(S):L*W*H=255*170*80mm
 Outer carton(S):L*W*H=375*280*270mm,6 inner cartons(S)

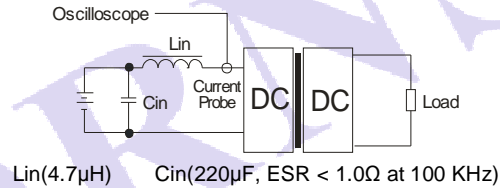
HEATSINK ASSEMBLY & PACKAGE DIAGRAM



TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor L_{in} and C_{in} to simulate source impedance.



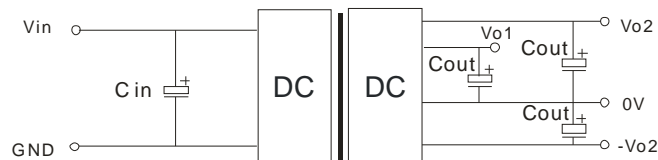
DESIGN CONSIDERATIONS

1) Recommended circuit

All the URC_D-30WR2 Series have been tested according to the following recommended test circuit before leaving the factory (see Figure 4).

If you want to further decrease the input/output ripple, you can increase a capacitance-values properly or choose capacitors with low ESR, but the total capacitance of the filter capacitor must not exceed the Max. Capacitive Load.

Recommend external capacitor see table 1.



(Figure 4)

(Table 1)

Vout (VDC)	Cin (µF)	Cout (µF)
3.3/5	10µF	10µF
±12/±15	10µF	4.7µF

2) It is not recommended to increase the output power capability by connecting two or more converters in parallel. The product is not hot-swappable

Note:

1. Min. load shouldn't be less than 5%, otherwise ripple maybe increased dramatically, If the product operates under min. load, it may not be guaranteed to meet all specifications listed. Operation under minimum load will not damage the converter.
2. Recommended Dual output models unbalanced load is $\leq \pm 5\%$, If the product operates $> \pm 5\%$, it may not be guaranteed to meet all specifications listed. Please contact our technical support for more details.
3. Max. Capacitive Load is tested at input voltage range and full load.
4. All specifications measured at $T_a=25^\circ\text{C}$, humidity $<75\%$, nominal input voltage and rated output load unless otherwise specified.
5. In this datasheet, all test methods are based on our corporate standards.
6. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more details.
7. Please contact our technical support for any specific requirement.
8. Specifications of this product are subject to changes 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: 86-20-38601850

Fax:86-20-38601272

E-mail: info@mornsun.cn

[Http://www.mornsun-power.com](http://www.mornsun-power.com)

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