

MORNSUN®

URC_D-30W Series

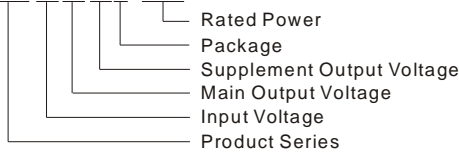
**30W, 4:1 WIDE INPUT, ISOLATED & REGULATED
THREE OUTPUT DIP DC-DC CONVERTER**



Patent Protection RoHS

PART NUMBER SYSTEM

URC240515D-30W



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

APPLICATION

URC_D-30W 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 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			
URC240312D-30W	24 (9-36)	40	3.3±12	3500±625	175±31	1450	30	30	4700/300	85
URC240315D-30W			3.3±15	3500±500	175±25			30	4700/220	86
URC240512D-30W			5±12	3000±625	150±31	1420		30	4700/300	88
URC240515D-30W			5±15	3000±500	150±25			30	4700/220	88
URC480312D-30W	48 (18-75)	80	3.3±12	3500±625	175±31	720	30	30	4700/300	85
URC480315D-30W			3.3±15	3500±500	175±25			30	4700/220	85
URC480512D-30W			5±12	3000±625	150±31	712		30	4700/300	88
URC480515D-30W			5±15	3000±500	150±25			30	4700/220	87

Note: 1.*Input voltage can't exceed this value, or will cause the permanent damage.
2. Add suffix "H" for heat sink mounted, for example URC240515D-30WH.

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit	
Under Voltage Lockout	Nominal Input (24V)	Models ON	--	--	9	VDC
		Models OFF	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(3.5-12VDC)				
	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
Output Power		1.5	--	30	W
Main Output Voltage Accuracy	Refer to recommended circuit	--	±1	±3	%
Supplement Output Voltage Accuracy		--	±3	±5	

Load Regulation*	From 10% to 100% load input, Nominal Input (Main output)		--	--	±2	%
	From 10% to 100% load input, Nominal Input (Supplement output)		--	--	±5	
Voltage Regulation	100% load, Input voltage from low to high (Main output)		--	---	±1	
	100% load, Input voltage from low to high (Supplement output)		--	--	±5	
Cross Regulation	100% load(Main output and one Supplement output).	Main output	--	--	±2	
	From 25% to 100% load input(the other one Supplement output)	Supplement output	--	--	±5	
Transient Response Deviation	load step change		--	±3	±5	
Transient Recovery Time			--	300	500	μs
Temperature Drift	100% full load		--	--	±0.03	%/°C
Ripple & Noise**	20MHz Bandwidth		--	85	120	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		110	130	--	%Io
Short Circuit Protection			Hiccup, continual, auto-recovery			
Note: *Triple output models unbalanced load (25/100%): ±5%Max. ** Ripple and noise tested by "parallel cable" method. See detailed operation instructions at DC-DC 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/1V	--	2000	--	pF
Switching Frequency	Full load, nominal input	--	400	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours
Case Material		Aluminum Alloy			
Weight	Without heatsink	--	40	--	g
	With heatsink	--	52	--	

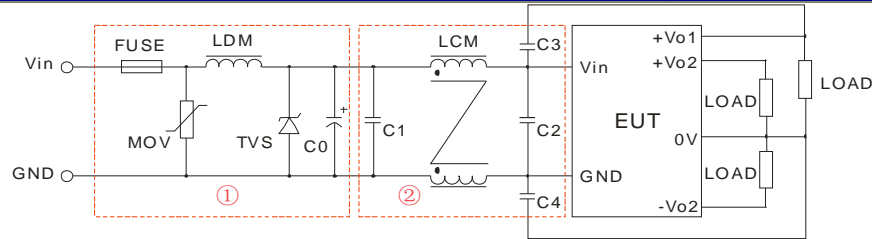
ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	5	--	95	%
Operating Temperature	Power derating (above 55°C)	-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 B (External Circuit Refer to Figure1)			
	RE	CISPR22/EN55022 CLASS B (External Circuit Refer to Figure1)			
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B	
	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B (External Circuit Refer to Figure1)	
	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B (External Circuit Refer to Figure1)	

EMC RECOMMENDED CIRCUIT



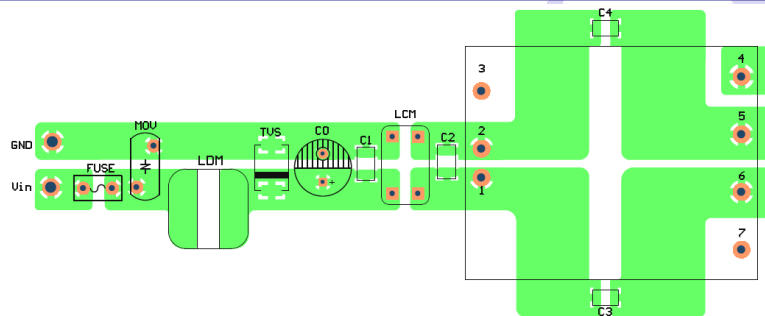
(Figure 1)

Recommended external circuit parameters:

Model	URC24_D-30W	URC48_D-30W
FUSE	Choose according to practical input current	
MOV	S10K35	S10K60
LDM	56 μ H	
TVS	SMCJ48A	SMCJ90A
C0	680 μ F/50V	680 μ F/100V
C1	1 μ F /100V	
LCM	1mH (0.1V 100KHz) 15T core: TS7 T12*6*4	
C2	2.2 μ F /100V	
C3	--	
C4	1nF/2KV	

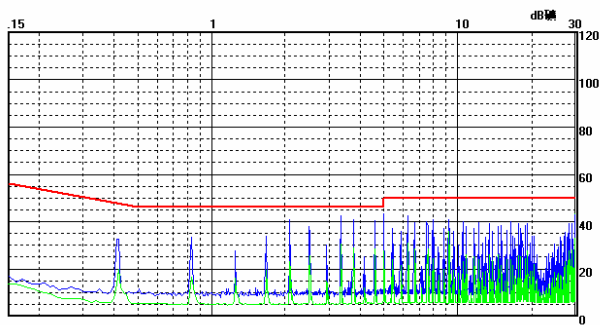
Note: 1. In Figure 1, part ① is EMS Recommended external circuit, part ② is EMI recommended external circuit. Choose according to requirements.
2. If want to meet higher level of RE, add a common mode inductance after Lcm in figure 1: 1.5mH 20T core:A10 T12*6*4.

EMC RECOMMENDED CIRCUIT PCB LAYOUT

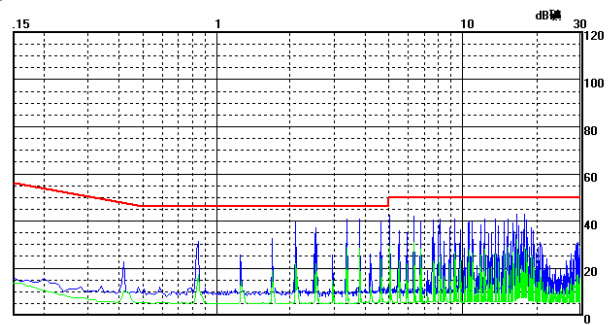


(Figure 2)

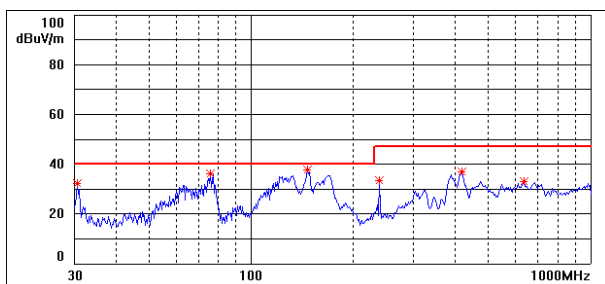
EMC TEST WAVEFORM (CLASS B TEST CIRCUIT)



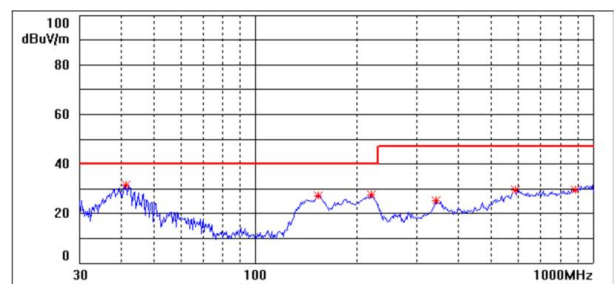
URC240515D-30W CE (Positive line)



URC240515D-30W CE (Negative line)

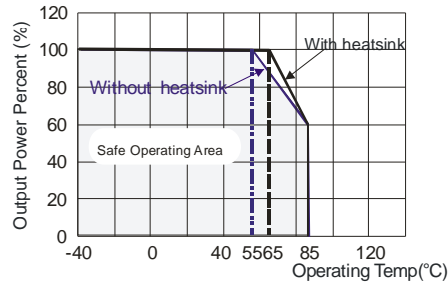


URC240515D-30W RE (Horizontal)

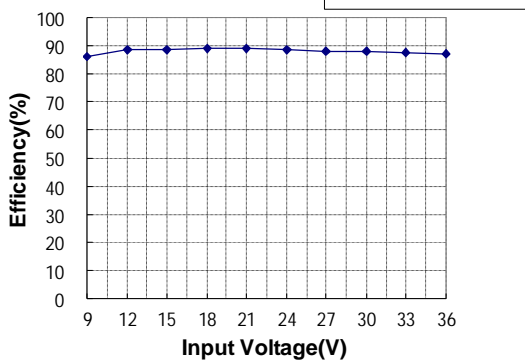


URC240515D-30W RE (Vertical)

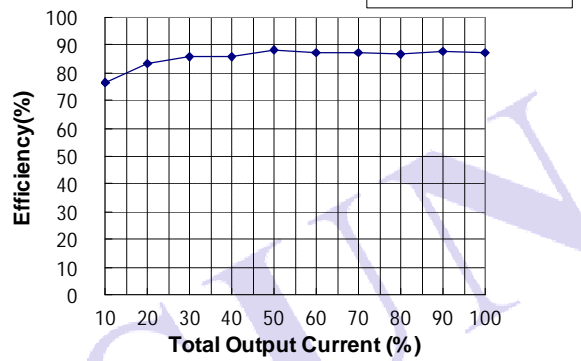
PRODUCT TYPICAL CURVE



Efficiency VS Input Voltage curve (Full Load)

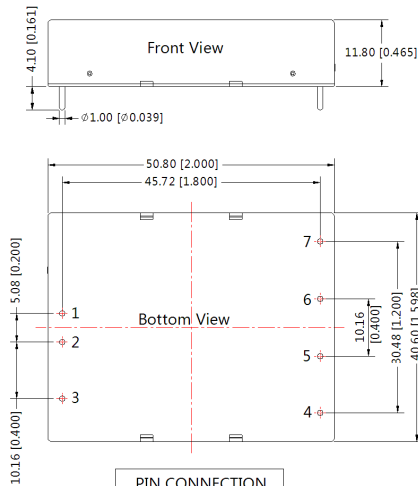


Efficiency VS Output Load curve (Vin=Vin-nominal)



OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING

MECHANICAL DIMENSIONS

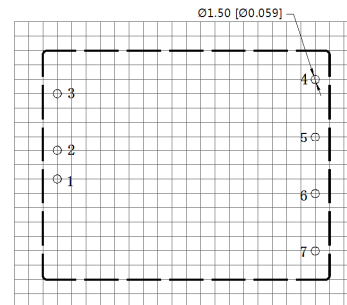


PIN CONNECTION	
Pin	Triple
1	Vin
2	GND
3	Ctrl
4	-Vo2
5	0V
6	+Vo1
7	+Vo2

Note:
 Unit :mm[inch]
 Pin diameter tolerances :±0.10[±0.004]
 Pin height tolerances :±0.50[±0.020]
 General tolerances:±0.30[±0.012]

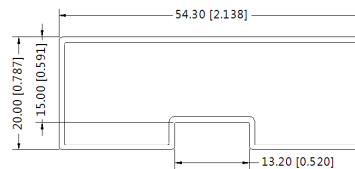
THIRD ANGLE PROJECTION

RECOMMENDED FOOTPRINT DETAILS



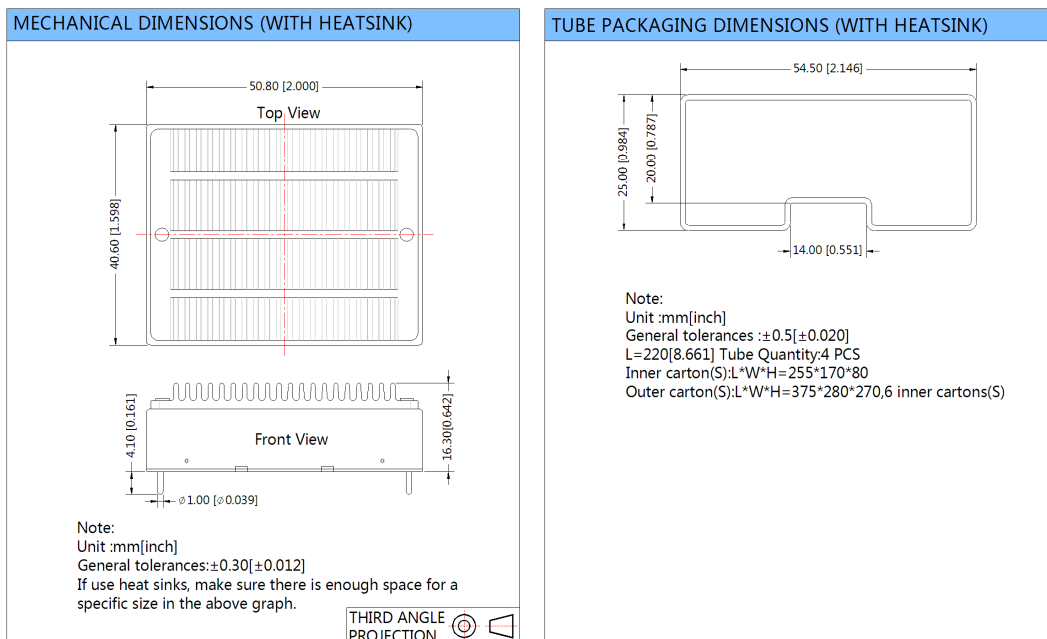
Note : Grid 2.54*2.54mm

TUBE PACKAGING DIMENSIONS (WITHOUT HEATSINK)



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

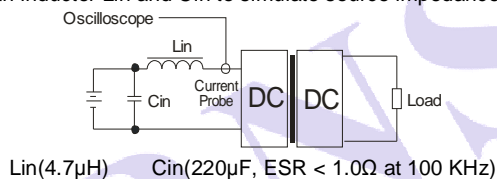
HEATSINK ASSEMBLY & PACKAGE DIAGRAM



TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

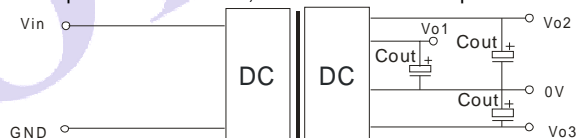
Input reflected-ripple current is measured with an inductor L_{in} and C_{in} to simulate source impedance.



RECOMMENDED CIRCUIT

If you want to further decrease the Input surge current and output ripple, an capacitor filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 3).

It should also be noted that the capacitance of filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the recommended capacitance of its filter capacitor sees (Table 1).



(Figure 3) Recommended Circuit

EXTERNAL CAPACITOR TABLE (Table 1)

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

Note:

1. The load shouldn't be less than 5%, otherwise ripple will increase dramatically.
2. Max. Capacitive Load is tested on V_{in} -nominal and full load.
3. All specifications measured at $T_a=25^\circ C$, 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 corporate standards.
5. Only typical models listed, other models may be different, please contact our technical person for more details.
6. Specifications subject to change without 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)