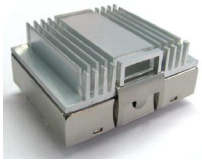
MORNSUN®

URC_D-30W Series

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



Patent Protection **RoHS**

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

PART NUMBER SYSTEM

URC240515D-30W

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

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	Approval
	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	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			π 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). From 25% to 100% load input(the other one Supplement output)	Main output	--	--	±2	
		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 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/1V	--	2000	--	pF
Switching Frequency	Full load, nominal input	--	400	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Case Material		Nickel- coated copper			
Weight	Without heatsink	--	50	--	g
	With heatsink	--	70	--	

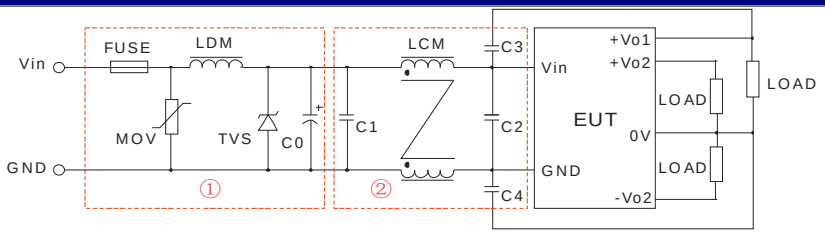
ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	5	--	95	%
Operating Temperature	Power derating (above 55℃)	-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



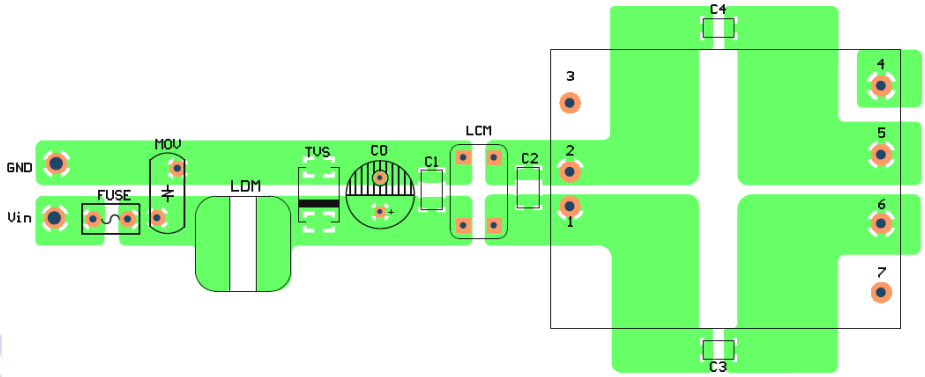
(Figure 1)

Recommended external circuit parameters:

Model	URC24_D-30W	URC48_D-30W
FUSE	Choose according to practical input current	
MOV	10D560K	10D101K
LDM	56μH	
TVS	SMCJ48A	SMCJ90A
C0	680μF/50V	680μF/100V
C1	1μF /100V	
LCM	1mH（0.1V 100KHz）15T core: TS7　T12*6*4	
C2	2.2μF /100V	
C3	--	
C4	1nF/2KV	

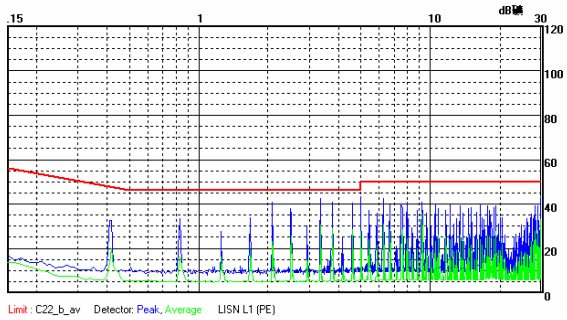
Note: 1. In Figure 1,part①is EMS Recommended external circuit, part②is EMI recommended external circuit. Choose according to requirements.
2. If want to meet higher level of RE, add a common mode inductance after Lcm in figure 1: 1.5mH 20T core:A10 T12*6*4.

EMC RECOMMENDED CIRCUIT PCB LAYOUT

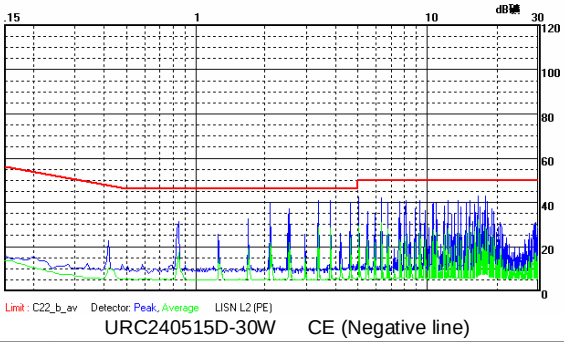


(Figure 2)

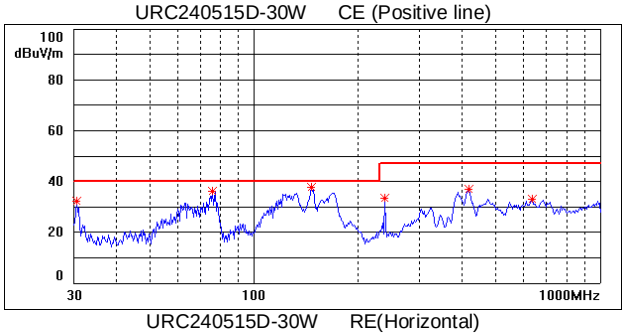
EMC TEST WAVEFORM(CLASS B TEST CIRCUIT)



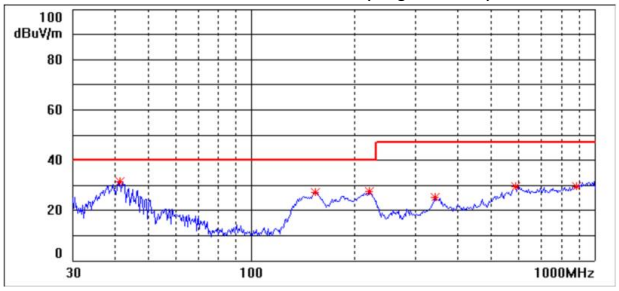
URC240515D-30W　CE (Positive line)



URC240515D-30W　CE (Negative line)

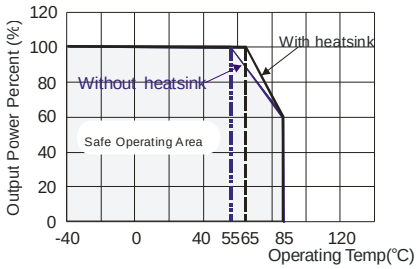


URC240515D-30W　RE(Horizontal)

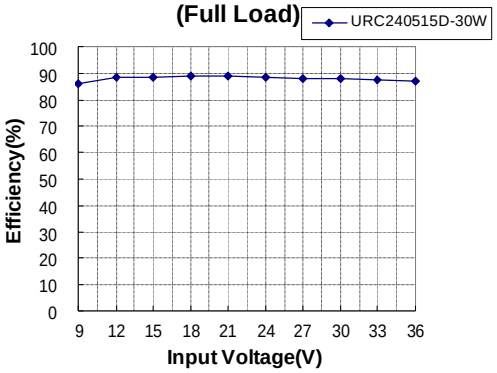


URC240515D-30W　RE(Vertical)

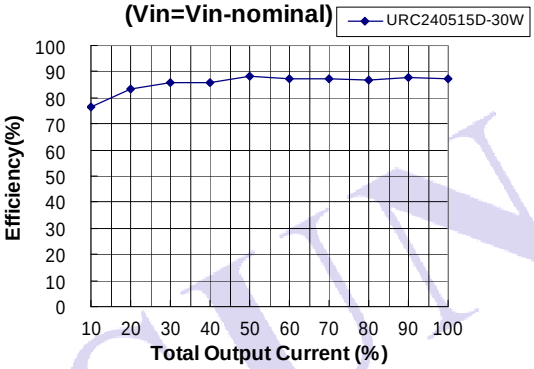
PRODUCT TYPICAL CURVE



Efficiency VS Input Voltage curve (Full Load)

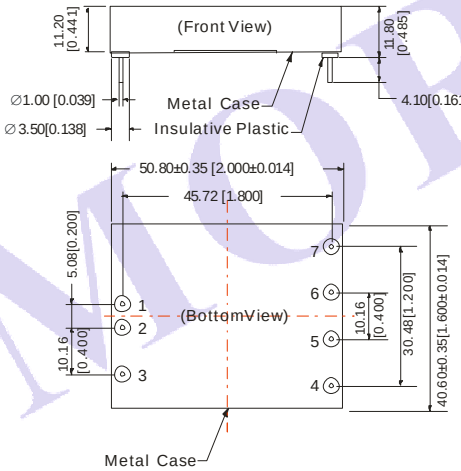


Efficiency VS Output Load curve (Vin=Vin-nominal)



OUTLINE DIMENSIONS、RECOMMENDED FOOTPRINT & PACKAGING

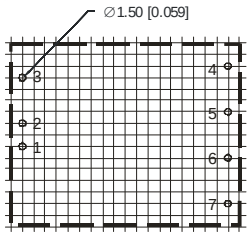
MECHANICAL DIMENSIONS



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

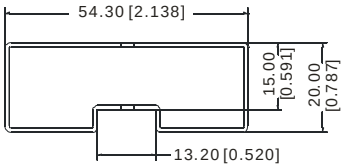
Note:
Unit:mm[inch]
Pin diameter tolerances:± 0.10mm[± 0.004inch]
General tolerances:± 0.25mm[± 0.010inch]

RECOMMENDED FOOTPRINT



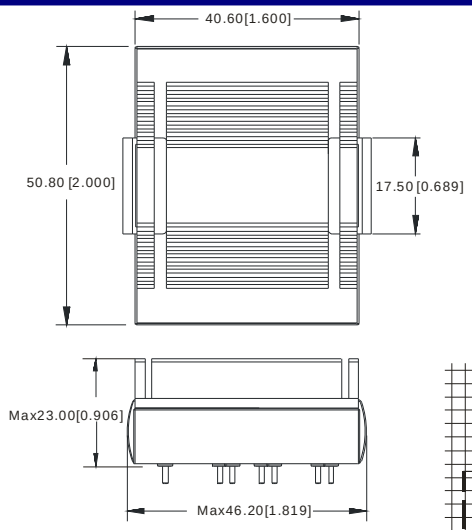
Note:grid 2.54*2.54mm .

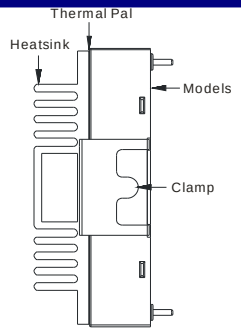
TUBE OUTLINE DIMENSIONS

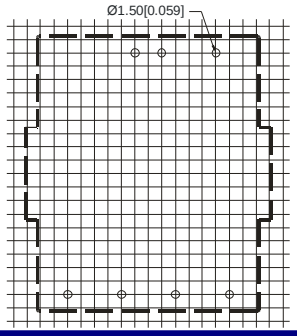


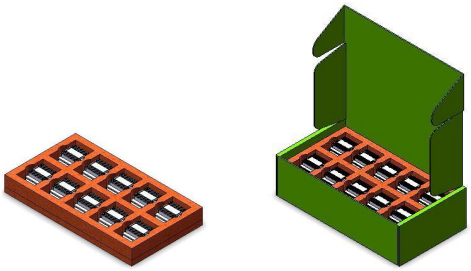
Note:
Unit :mm[inch]
General tolerances: ± 0.50mm[± 0.020inch]
L=220mm[8.661inch] pcs/tube: 4
Inner package box dimensions:L*W*H=255*170*80mm
Outer package carton dimensions(with six inner packaging boxes):
L*W*H=375*280*270mm

HEATSINK ASSEMBLY & PACKAGE DIAGRAM









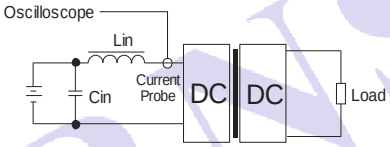
Inner package box dimensions:
L*W*H=355*192*93mm
Package quantity：20pcs
Outer package carton dimensions:
L*W*H=405*380*305mm
Package quantity：120pcs

Note:
Unit: mm [inch]
Tolerances:± 0.50mm[± 0.020inch]
1.If use heat sinks, make sure there is enough space for a specific size in the above graph;
2.Products will be supplied with heat sinks already mounted, separate heat sinks are not available

TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

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

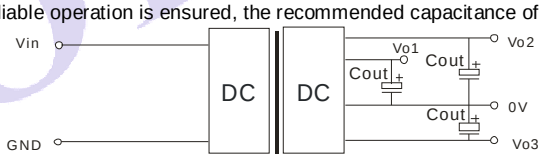


Lin(4.7μH) Cin(220μF, ESR < 1.0Ω at 100 KHz)

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 Vin-nominal 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 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.

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