DC/DC Converter

SURC_D-30WR2 Series

30W,wide input isolated & regulated *three output* DC/DC converter

Patent Protection RoHS

FEATURES

- Wide range of input voltage (4:1)
- Efficiency up to 88%
- Isolation voltage :1500VDC
- Operating temperature range: -40℃ to +85℃
- Output over-voltage, over-current and short circuit protection
- Six-sided metal shielding package
- International standard pin-out
- Meet CISP22/EN55022 CLASS A

SURC_D-30WR2 series products are of 30W output power, wide range of voltage input of 9-36VDC, 18-75VDC, isolation voltage of 1500VDC, output over-current protection and output short circuit protection with the six-sided metal shielding package; these products are widely used in fields such as industrial control, electric power, instruments and communication.

Selection Guide

Part No.①	Input Voltage (VDC)		Output			Efficiency (%,Typ.) @ Full Load	Max. Capacitive Load③(μF)
	Nominal (Range)	Max.②	Output Voltage (VDC)	Output Current (mA)			
				Max.	Min.		
SURC240312D-30WR2	24 (9-36)	40	3.3/±12	3500/±625	175/±31	85	4700/300
SURC240315D-30WR2			3.3/±15	3500/±500	175/±25	86	4700/220
SURC240512D-30WR2			5/±12	3000/±625	150/±31	88	4700/300
SURC240515D-30WR2			5/±15	3000/±500	150/±25	88	4700/220
SURC480312D-30WR2	48 (18-75)	80	3.3/±12	3500/±625	175/±31	85	4700/300
SURC480315D-30WR2			3.3/±15	3500/±500	175/±25	85	4700/220
SURC480512D-30WR2			5/±12	3000/±625	150/±31	88	4700/300
SURC480515D-30WR2			5/±15	3000/±500	150/±25	87	4700/220

Note:
① Series with suffix "H" are heat sink mounting, such as SURC240515D-30WHR2 means with heat sink, SURC240515D-30WR2 means without heat sink;
② Absolute maximum rating without damage on the converter, but it isn't recommended;
③ The capacitive loads of positive and negative outputs are identical.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	24VDC input	--	1420/30	--	mA
	48VDC input	--	712/30	--	
Reflected Ripple Current	24VDC/48VDC input	--	30	--	
Input impulse Voltage (1sec. max.)	24VDC input	-0.7	--	50	VDC
	48VDC input	-0.7	--	100	
Starting Time	Nominal input& constant resistance load	--	10	--	ms
Input Filter		Pi filter			
Ctrl*	Module switch on	Ctrl suspended or connected to TTL high level (2.5-12VDC)			
	Module switch off	Ctrl pin connected to GND or low level (0-1.2VDC)			
	Input current when switched off	--	1	--	mA

Note: * the voltage of Ctrl pin is relative to input pin GND.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Main Output Voltage Accuracy		--	±1	±3	%
Secondary Output Voltage Accuracy		--	±3	±5	

Line Regulation	100% load, Input voltage from low to high (Main output)		--	---	±1	%
	100% load, Input voltage from low to high (Secondary output)		--	--	±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	
Cross Regulation	100% load(Main output and one secondary output)	Main output	--	--	±2	
	From 25% to 100% load input (the other one secondary output)	Secondary output	--	--	±5	
Transient Recovery Time	25% load step change		--	300	500	μs
Transient Response Deviation			--	±3	±5	%
Temperature Drift Coefficient	Full load		--	--	±0.03	%/℃
Ripple & Noise*	20MHz bandwidth		--	85	100	mV p-p
Output Over-voltage Protection	Input voltage range	3.3VDC output	--	3.9	--	VDC
		5VDC output	--	6.2	--	
		12VDC output	--	15	--	
		15VDC output	--	18	--	
Output Over-current Protection	Input voltage range		--	150	--	%Io
Output Short circuit Protection			Hiccup, continuous, self-recovery			
Note: *Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.						

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Isolation Resistance	Input-output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	2000	--	pF
Operating Temperature	see Fig. 1	-40	--	85	℃
Storage Temperature		-55	--	125	
Storage Humidity	Non-condensing	5	--	95	%RH
Max. Operating Temperature for casing	Within the operating temperature curve	--	--	105	℃
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Switching Frequency	PWM mode	--	400	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours

Physical Specifications

Casing Material	Aluminum alloy	
Package Dimensions	without heat sink	50.80*40.60*11.80 mm
	with heat sink	50.80*40.60*16.30 mm
Weight	without heat sink	50.0g (Typ.)
	with heat sink	70.0g (Typ.)
Cooling Method	Free air convection	

EMC Specifications

EMI	Conducted disturbance	CISPR22/EN55022 CLASS A (Bare component)/ CLASS B (see Fig.3-② for recommended circuit)
	Radiated emission	CISPR22/EN55022 CLASS A (Bare component)/ CLASS B (see Fig.3-② for recommended circuit)

EMS	Electrostatic discharge	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
	Radiation immunity	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±2KV (see Fig.3-① for recommended circuit)	perf. Criteria B
	Surge immunity	IEC/EN61000-4-5	±2KV (see Fig.3-①for recommended circuit)	perf. Criteria B
	Conducted disturbance immunity	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29	0-70%	perf. Criteria B

Product Characteristic Curve

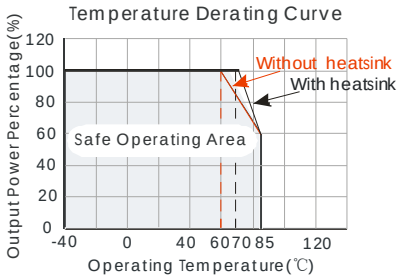
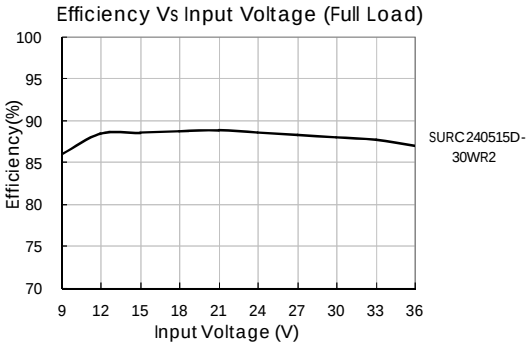
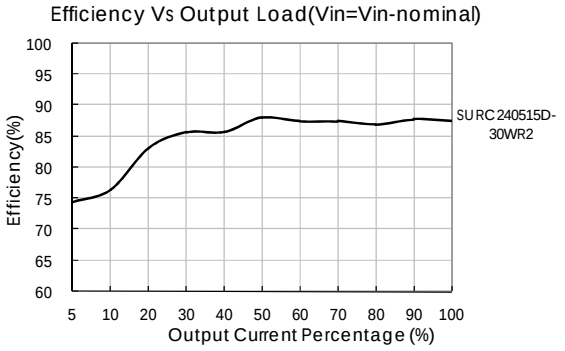


Fig. 1





Design Reference

1. Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery.
If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

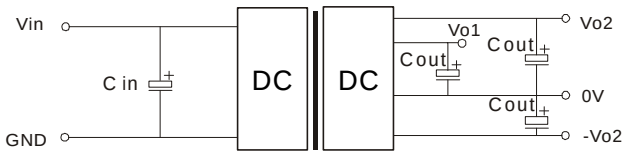


Fig. 2

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

2. EMC solution-recommended circuit

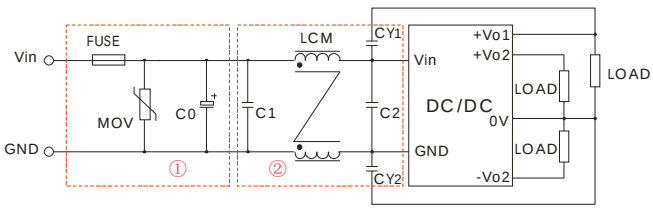


Fig. 3

Notes: Part ① in the Fig. 3 is used for EMS test and part ② for EMI filtering; selected based on needs.

Parameter description

Model	Vin:24V	Vin:48V
FUSE	Choose according to actual input current	
MOV	S14K35	S14K60
C0	330μF/50V	330μF/100V
C1, C2	4.7μF/50V	2.2μF/100V
LCM	2.2mH(FL2D-30-222)	
CY1, CY2	1nF/2KV	2.2nF/2KV

EMC solution-recommended circuit PCB layout

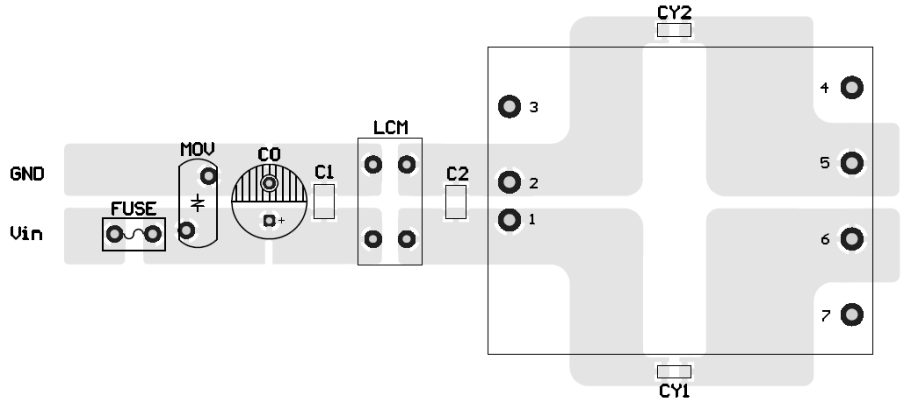
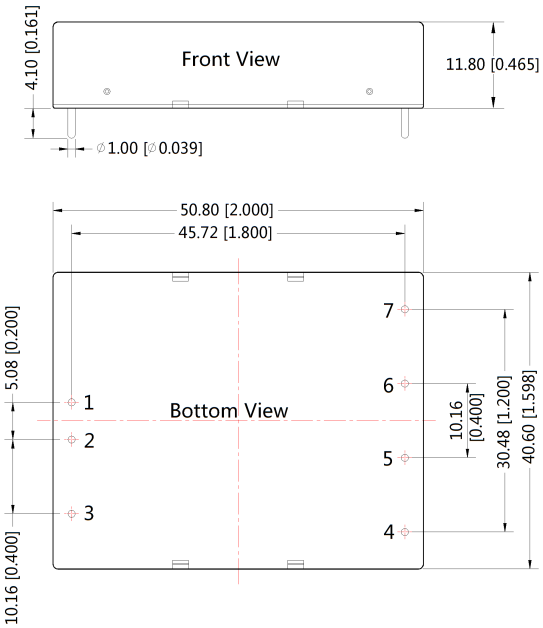


Fig. 4
Note: the min. distance of the bonding pads between input & output isolation capacitors (CY1/CY2) shall be ≥ 2mm.

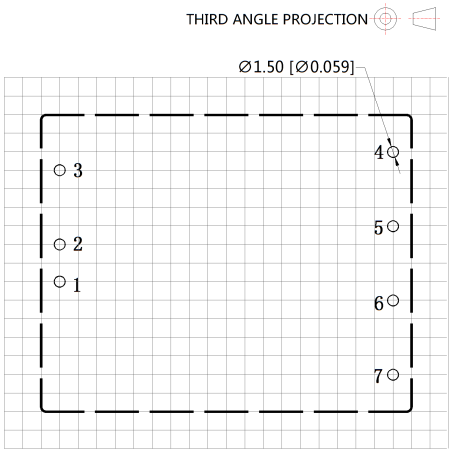
3. The product does not support output in parallel with power per liter or hot-plug use

4. For more information please find the application notes on www.schmid-m.com

Horizontal Package Dimensions and Recommended Layout (without heat sink)



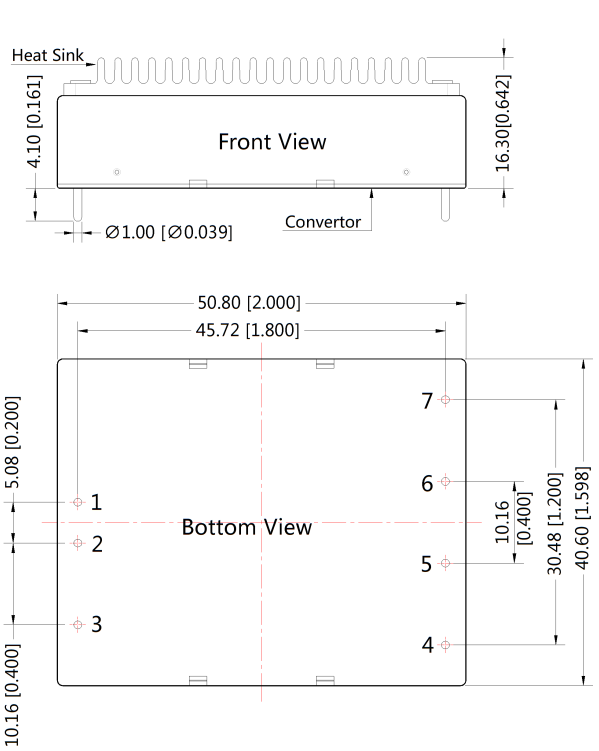
Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]



Note : Grid 2.54*2.54mm

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

Horizontal Package Dimensions (with heat sink)



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

Note:
Unit :mm[inch]
General tolerances:±0.50[±0.020]
If use heat sinks, make sure there is enough space for a specific size in the above graph.

Notes:

1. Recommended used in more than 10% load, if the load is lower than 10%, then the ripple index of the product may exceed the specification, but does not affect the reliability of the product;
2. The max. capacitive load should be tested within the input voltage range and under full load conditions;
3. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25℃, humidity<75% when inputting nominal voltage and outputting rated load;
4. All index testing methods in this datasheet are based on our company's corporate standards;
5. The performance indexes of the product models listed in this datasheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
6. We can provide product customization service;
7. Specifications of this product are subject to changes without prior notice.