SWRE & SWRF P-3WR4

Product Feature

- Package Type：DIP24
- Universal Input：2:1
- Operating temperature range：-40℃ - +85℃
- Isolation voltage：3000VDC
- High efficiency up to：86%（Type）
- Input under-voltage protection; Output short-circuit protection, over-voltage protection, Over-current protection mechanism.
- Fields of application：Industry, Power, Instrumentation, Communication, Rail transit.

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency% (Typ.)	Capacitive Load(μF) Max.
	Nominal (Range)	Max.	Voltage (VDC)	Current (mA) Max. /Min.		
SWRF 0505 P-3WR4	5（4.5-9）	11	5	600/30	74	4700
SWRF 0512 P-3WR4	5（4.5-9）	11	12	250/12	77	2700
SWRF 0515 P-3WR4	5（4.5-9）	11	15	200/10	77	2200
SWRE 0505 P-3WR4	5（4.5-9）	11	±5	±300/±15	76	2200#
SWRE 0512 P-3WR4	5（4.5-9）	11	±12	±125/±6	78	1800#
SWRE 0515 P-3WR4	5（4.5-9）	11	±15	±100/±5	78	1000#
SWRF 1203 P-3WR4	12（9-18）	20	3.3	909/46	74	4700
SWRF 1205 P-3WR4	12（9-18）	20	5	600/30	81	4700
SWRF 1212 P-3WR4	12（9-18）	20	12	250/12	83	2700
SWRF 1215 P-3WR4	12（9-18）	20	15	200/10	82	2200
SWRF 1224 P-3WR4	12（9-18）	20	24	125/6	83	1800
SWRE 1205 P-3WR4	12（9-18）	20	±5	±300/±15	81	2200#
SWRE 1209 P-3WR4	12（9-18）	20	±9	±166/±8	84	2000#
SWRE 1212 P-3WR4	12（9-18）	20	±12	±125/±6	84	1800#
SWRE 1215 P-3WR4	12（9-18）	20	±15	±100/±5	85	1000#
SWRF 2403 P-3WR4	24（18-36）	40	3.3	909/46	78	4700
SWRF 2405 P-3WR4	24（18-36）	40	5	600/30	81	4700
SWRF 2409 P-3WR4	24（18-36）	40	9	333/16	81	2700
SWRF 2412 P-3WR4	24（18-36）	40	12	250/12	86	2700
SWRF 2415 P-3WR4	24（18-36）	40	15	200/10	86	2200
SWRF 2424 P-3WR4	24（18-36）	40	24	125/6	85	1800
SWRE 2405 P-3WR4	24（18-36）	40	±5	±300/±15	82	2200#
SWRE 2412 P-3WR4	24（18-36）	40	±12	±125/±6	84	1800#
SWRE 2415 P-3WR4	24（18-36）	40	±15	±100/±5	84	1000#
SWRF 4803 P-3WR4	48（36-75）	80	3.3	909/46	76	4700
SWRF 4805 P-3WR4	48（36-75）	80	5	600/30	82	4700
SWRF 4812 P-3WR4	48（36-75）	80	12	250/12	86	2700
SWRF 4815 P-3WR4	48（36-75）	80	15	200/10	86	2200
SWRE 4805 P-3WR4	48（36-75）	80	±5	±300/±15	82	2200#
SWRE 4812 P-3WR4	48（36-75）	80	±12	±125/±6	84	1800#

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SWRE 4815 P-3WR4	48（36-75）	80	±15	±100/±5	85	1000#

#Each output

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/no load)	5VDC Input	--	789/40	834/45	mA
	12VDC Input	--	316/30	348/35	
	24VDC Input	--	152/15	165/20	
	48VDC Input	--	77/5	85/10	
Reflected Ripple Current	5VDC Input	--	20	--	mA
	12VDC Input	--	30	--	
	24VDC Input	--	30	--	
	48VDC Input	--	30	--	
Input impulse voltage	5VDC Input	-0.7	--	12	VDC
	12VDC Input	-0.7	--	25	
	24VDC Input	-0.7	--	50	
	48VDC Input	-0.7	--	100	
Starting voltage	5VDC Input	--	--	4.5	VDC
	12VDC Input	--	--	9	
	24VDC Input	--	--	18	
	48VDC Input	--	--	36	
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy			--	±1.0	±3.0	%
Accuracy of no-load output voltage	Input voltage range		--	±1.5	±5.0	%
Linear Regulation	Input voltage from low limit to high limit, full load		--	±0.2	±0.5	%
Load Regulation	5%- 100% load		--	±0.2	±0.5	%
Ripple & Noise	25% load step change, nominal input voltage	24V output	--	100	120	mVp-p
		Others	--	50	80	
Transient Recovery Time	25% load step change		--	0.5	2	%
Transient response deviation	25% load step change		--	±2	±5	%
Temperature Drift Coefficient	Full Load		--	±0.02	±0.03	%/℃
Short-Circuit Protection	Input voltage range		Continuous, Self-Recovery			

Note: 1.Auxiliary circuit output voltage(Vo2) maximum accuracy is ±5%;
2.Load regulation for 0%-100% load is ±5%;

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General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, test time 1 minute, leakage current less than 1mA	3000	--	--	VDC
Insulation Resistance	Input-output, insulated voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	1000	--	pF
Operating Temperature	Derating when operating temperature≥85℃, (See Figure 1)	-40	--	85	℃
Storage Temperature		-55	--	125	℃
Case Temperature Rise	Ta=25℃, nominal input, output load	--	25	--	℃
Pin welding can withstand the highest temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	℃
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	Full load, nominal input voltage	--	200	--	kHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K Hours

Mechanical Specification

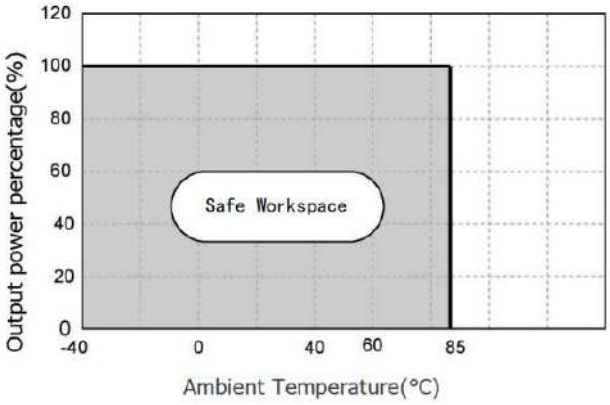
Case Material	Black flame retardant and heat-resistant plastic（UL 94V-0）
Package Dimensions	31.80 × 20.00 × 12.60mm
Weight	12.70g(Typ.)
Cooling Method	Free air convection

EMC Specifications

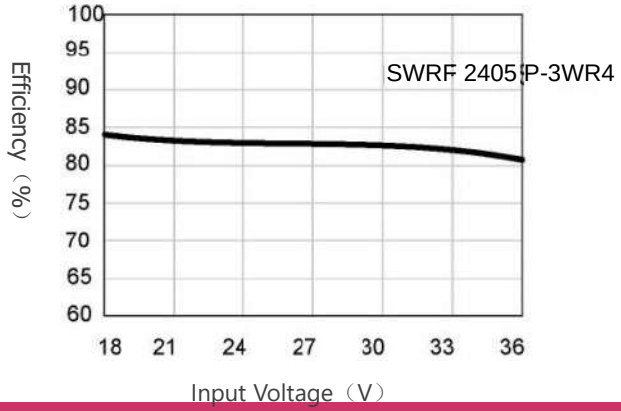
EMI	CE	CISPR32/EN55032	CLASS A (without extra components)/ CLASS B (Recommended circuit diagram 3-②)	
	RE	CISPR32/EN55032	CLASS A (without extra components)/ CLASS B (Recommended circuit diagram 3-②)	
EMS	ESD	IEC/EN61000-4-2	Contact±4KV	Perf.Criteria B
	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria A
	EFT	IEC/EN61000-4-4	±2KV (Recommended circuit diagram 3-①)	Perf.Criteria B
	Surge	IEC/EN61000-4-5	line to line±2KV (Recommended circuit diagram 3-①)	Perf.Criteria B
	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria A
	Voltage sag, drop, and short-term interruption immunity	IEC/EN61000-4-29	0% ~70%	Perf.Criteria B

Typical Characteristic Curves

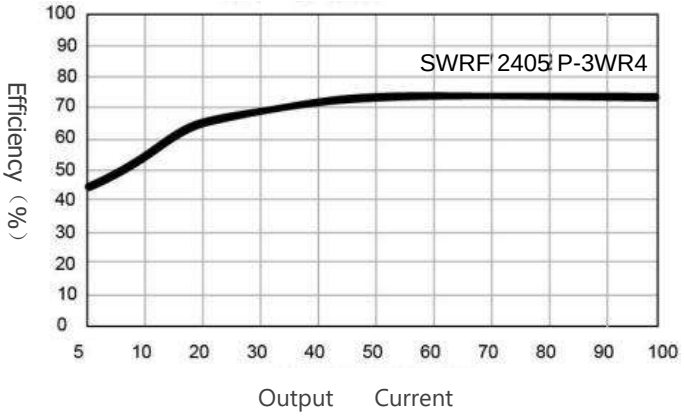
Temperature Derating Curve（Figure 1）



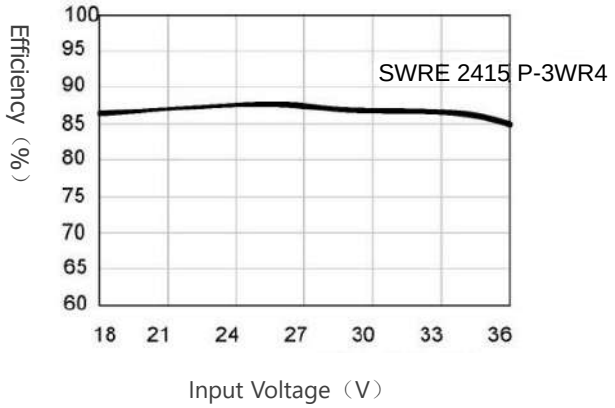
Efficiency VS Input Voltage Curve (Full load)



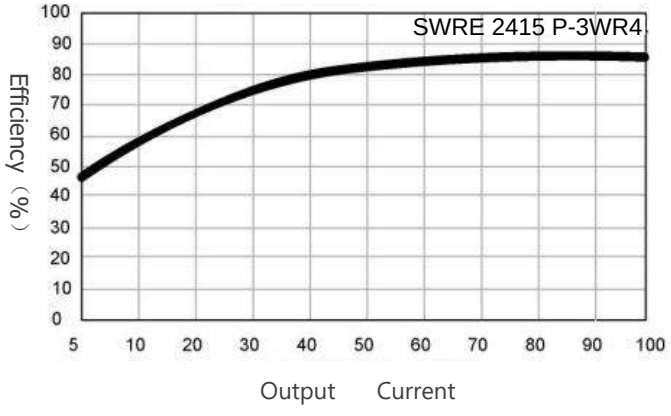
Efficiency VS Output Load（Vin=24V）



Efficiency VS Input Voltage Curve (Full load)



Efficiency VS Output Load（Vin=24V）



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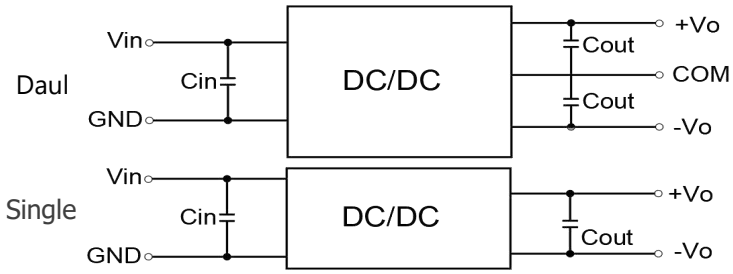
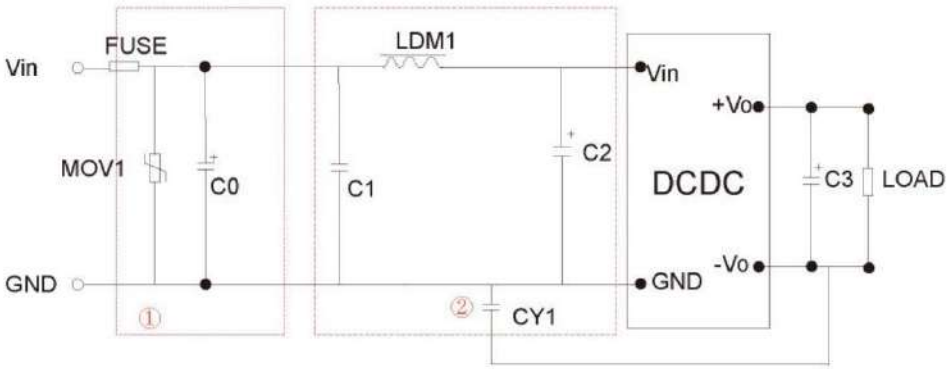
Typical Circuit Design and Application

Application circuit（Figure 2）	Recommended Capacitive Load Value Table		
	Vin	5V、12V	24V、48V
	Cin	100uF	10-47uF
	Cout	10uF	

EMC Solutions - Recommended Circuits（Figure 3）



EMI Recommended Parameters Table

	Vin ： 5V	Vin ： 12V	Vin：24V	Vin：48V
FUSE	Select based on the actual input current of the customer			
MOV	--	14D330K	20D470K	14D101K
LDM1	12uH			
C0	1000uF/16V	1000uF/25V	330uF/50V	330μF/100V
C1	4.7μF/50V			4.7μF/ 100V
C2	4.7μF/50V			4.7μF/ 100V
C3	10uF			
CY1	1nF/3KV			

Application circuit description:

1. All DC/DC converters in this series are tested according to the recommended testing circuit (Figure 2) before leaving the factory.

2. If further reduction of input and output ripple is required, the external capacitance C in can be connected to the input and output Cout increases or selects capacitors with small series equivalent impedance values, but the capacitance value cannot exceed the maximum capacitive load of the product.

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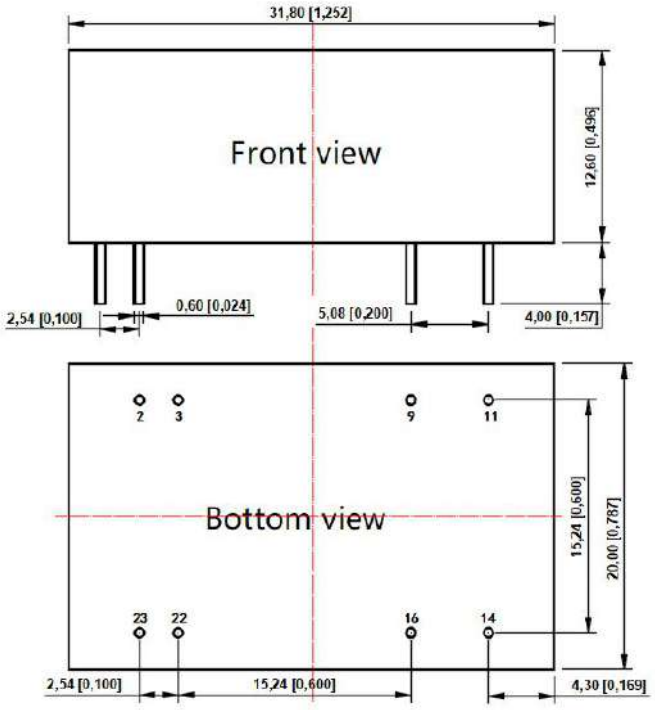
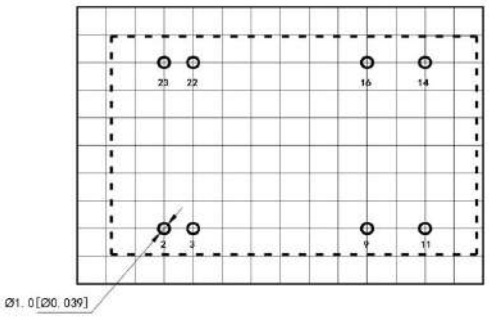
Dimensions and Recommended Layout

Dimensions



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

PCB Printing Layout



The grid distance is 2.54mm x2.54mm

Pin Definition Table

Pin	Single	Dual
2	-Vin	-Vin
3	-Vin	-Vin
9	No pin	Com
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Com
22	+Vin	+Vin
23	+Vin	+Vin
NC：Pin to be isolated from circuity		

Note：

- The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
- Suggested dual output module load imbalance: ≤ ± 5%. If it exceeds ± 5%, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
- The maximum capacitive load is tested within the input voltage range and under full load conditions;
- Unless otherwise specified, all indicators in this manual are measured at Ta=25 ℃, humidity<75% RH, nominal input voltage, and output rated load;
- All indicator testing methods in this manual are based on our company's corporate standards;
- Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
- Product specifications are subject to change without prior notice.