1S8W4_3RP series

1W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

DC-DC Converter 1 Watt

- 4:1 input range
- SIP8 package
- Operating temperature range: -40°C to +85°C
- 3000VDC isolation
- Up to 81% efficiency
- Input undervoltage protection
- Short circuit protection (SCP)
- Overcurrent protection
- MTBF: 1,000,000 hours

Introducing our new 1S8W4_3RP series. Compact power meets rock-solid reliability. Designed in a robust SIP8 package, this DC/DC converter handles wide 4:1 input ranges with ease and delivers up to 81% efficiency across an operating temperature from -40°C to +85°C. With 3000VDC isolation voltage, integrated protection features against undervoltage, short circuit, and overcurrent, and an impressive MTBF of 1,000,000 hours, it's built for applications where performance and durability truly matter.

Common specifications

Short circuit protection	Continuous, self recovery
Switching frequency	250 kHz (full load, nominal input voltage)
Operation temperature	-40°C ~+85°C (with derating)
Storage temperature	-55°C ~+105°C
Pin welding can withstand the highest temperature	+260°C (soldering spot is 1.5mm away from case for 10 seconds)
Storage humidity	95% RH (non-condensing)
MTBF: (MIL-HDBK-217F@25°C)	1,000,000 hours
Input filter	Capacitance filter
Hot plug	Unavailable
Case material	Black plastic; flame-retardant and heat-resistant (UL 94V-0 rated)
Package dimensions	22.00 x 9.50 x 12.00mm
Weight	3.8g (typ.)
Cooling method	Free air convection

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/ no load)	12VDC Input 24VDC Input 48VDC Input		106/40 52/15 26/6	113/60 55/30 28/10	mA
Reflected ripple current			15		mA
Impulse voltage	12VDC Input 24VDC Input 48VDC Input	-0.7 -0.7 -0.7		25 50 100	VDC
Starting voltage	12VDC Input 24VDC Input 48VDC Input			4.5 9 18	VDC
Undervoltage protection	12VDC Input 24VDC Input 48VDC Input			4 8 16	VDC
CTRL	Turn off module Turn on module	No connected or 0-0.7V connected GND or 3.5-12V			

Example:
1S8W4_2405S3RP
1 = 1Watt; S8 = SIP; W4 = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 3 = 3000VDC isolation; R = Regulated Output; P = Short circuit protection;

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy (5% - 100% load)	Vo1 Vo2		±1.0 ±3.0	±3.0 ±5.0	%
Linear regulation	Full load, input voltage from low limit to high limit		±0.3	±0.5	%
Load regulation	10% - 100% Load		±0.5	±1.0	%
Ripple & noise	20MHz Bandwidth		50	150	mV
Transient recovery time	25% load step change		0.3	3	ms
Transient response deviation	25% load step change		±3	±5	%
Temperature coeffcient	Full load		±0.01	±0.02	%/°C
Over current protection		110	140		%

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

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	3000			VDC
Isolation resistance	Input-output, insulated voltage 500VDC	1000			M Ω
Isolation capacitance	Input-output, 100kHz/0.1V		25		pF

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. 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;
3. 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 datasheet;
4. The maximum capacitive load is tested within the input voltage range and under full load conditions;
5. Unless otherwise specified, all indicators in this manual are measured at Ta = 25°C, humidity <75% RH, nominal input voltage, and output rated load;
6. All indicator testing methods in this datasheet are based on our company's standards;
7. Product specifications are subject to change without prior notice.

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EMC specifications				
EMI	CE	CISPR32/EN55032	CLASS B (application circuit 3)	
EMI	RE	CISPR32/EN55032	CLASS B (application circuit 3)	
EMS	ESD	IEC/EN61000-4-2	Contact± 8kV	perf. criteria B

Product Selection Guide

Approval	Part number	Input Voltage (VDC)	Input Voltage max. (VDC)	Output Voltage (VDC)	Output Current (mA) max.	Full Load Efficiency (%) typ.	Capacitive Load max. (µF)
	1S8W4_1203S3RP	12 (4.5-18)	20	3.3	303	74	2700
	1S8W4_1205S3RP	12 (4.5-18)	20	5	200	78	2200
	1S8W4_1212S3RP	12 (4.5-18)	20	12	83	78	1000
	1S8W4_1215S3RP	12 (4.5-18)	20	15	67	80	680
	1S8W4_2403S3RP	24 (9-36)	40	3.3	303	75	2700
	1S8W4_2405S3RP	24 (9-36)	40	5	200	77	2200
	1S8W4_2412S3RP	24(9-36)	40	12	83	78	1000
	1S8W4_2415S3RP	24 (9-36)	40	15	67	78	680
	1S8W4_4803S3RP	48 (18-75)	80	3.3	303	74	2700
	1S8W4_4805S3RP	48 (18-75)	80	5	200	76	2200
	1S8W4_4812S3RP	48 (18-75)	80	12	83	79	1000
	1S8W4_4815S3RP	48 (18-75)	80	15	67	79	680

Approval	Part number	Input Voltage (VDC)	Input Voltage max. (VDC)	Output Voltage (VDC)	Output Current (mA) max.	Full Load Efficiency (%) typ.	Capacitive Load Max. (µF)
	1S8W4_1205D3RP	12 (4.5-18)	20	±5	±100	77	#1000
	1S8W4_1212D3RP	12 (4.5-18)	20	±12	±42	80	#470
	1S8W4_1215D3RP	12 (4.5-18)	20	±15	±33	78	#330
	1S8W4_2405D3RP	24 (9-36)	40	±5	±100	79	#1000
	1S8W4_2412D3RP	24 (9-36)	40	±12	±42	78	#470
	1S8W4_2415D3RP	24 (9-36)	40	±15	±33	78	#330
	1S8W4_4805D3RP	48 (18-75)	80	±5	±100	76	#1000
	1S8W4_4812D3RP	48 (18-75)	80	±12	±42	78	#470
	1S8W4_4815D3RP	48 (18-75)	80	±15	±33	80	#330

Typical characteristics

Temperature derating graph

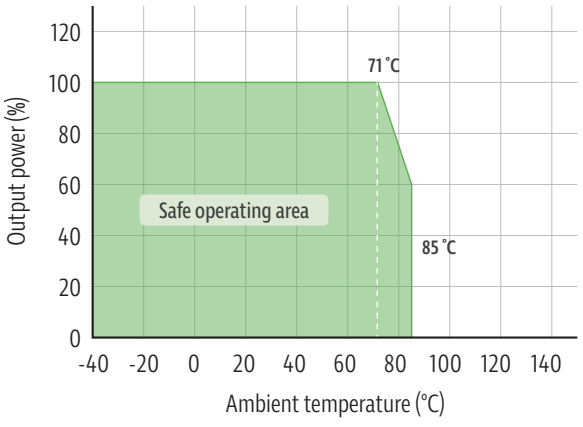


Figure 1

Typical circuit design and application

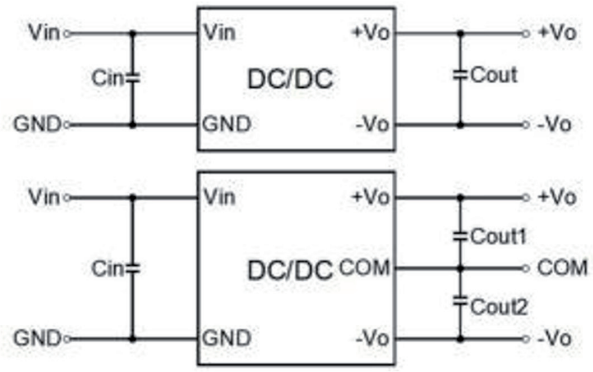


Figure 2

Recommended Capacitive Load Value Table

Cin (μF)	100
Cout (μF)	22
Cout 1 (μF)	22
Cout 2 (μF)	22

All DC-DC converters of this series are tested in accordance with the recommended test circuit (Figure 2) before shipment. If further reduction of input/output ripple is required, the input/output external capacitors Cin and Cout can be enlarged or capacitors with small series equivalent impedance values can be used, but the capacitance value should not be larger than the maximum capacitive load of the product.

Recommended EMC circuit diagram

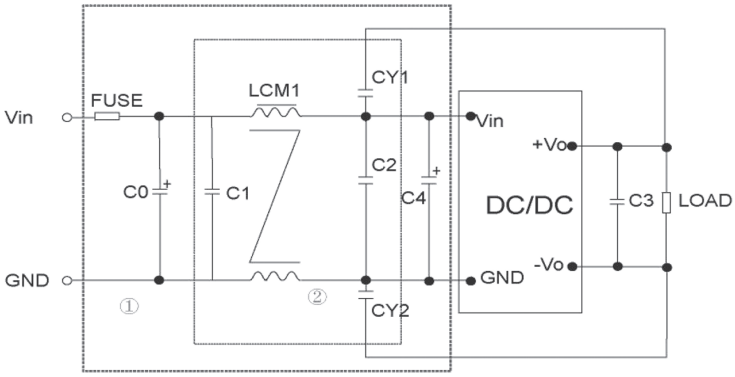


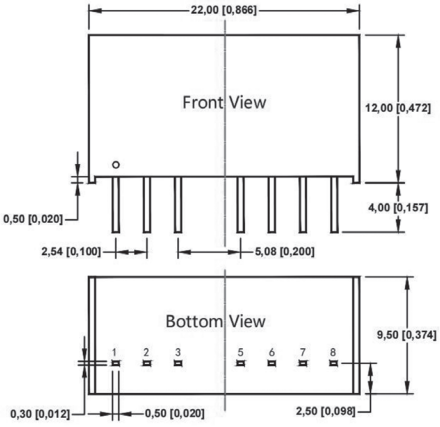
Figure 3

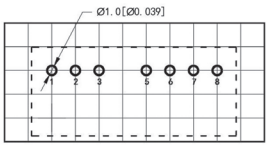
Recommended Parameter Table

Vin	Vin: 12V	Vin: 24V	Vin: 48V
FUSE	Select according to the actual input current of the customer		
C0, C4	330uF/35V	330uF/50V	100uF/100V
C1, C2	10μF/50V		
LCM	1.4-1.7mH		
C3	22μF/50V		
CY1, CY2	1nF/400VAC		

Note: Part ① of Figure 3 is used for EMC testing; Part 2 is used for EMI filtering and can be selected according to needs

Mechanical dimensions





The grid distance is 2.54mm x2.54mm

Pin Definition Table

Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	CTRL	CTRL
5	NC	NC
6	+Vo	+Vo
7	-Vo	COM
8	NC	-Vo

NC: Not available for electrical connection

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