3S8W_1.5RPR1 series

3W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

DC-DC Converter 3 Watt

- SIP8 package
- 1500VDC isolation
- Operating temperature range: -40°C to +105°C
- 2:1 input voltage range
- Up to 83% efficiency
- Overcurrent protection
- Short circuit protection (SCP)
- MTBF > 1,000,000 hours

Introducing our new SIP8 DC-DC converter 3S8W_3RPR1 series – a compact yet powerful solution designed for demanding industrial and embedded applications. With a wide 2:1 input voltage range, 1500VDC isolation, and an impressive operating temperature range from -40°C to +105°C, this converter delivers performance you can rely on — even in harsh environments. Engineered for durability, it features short circuit protection (SCP), overcurrent protection, and an MTBF greater than 1,000,000 hours, ensuring long-term operational stability. With up to 83% efficiency in a space-saving SIP8 package, it's the perfect choice where size, safety, and reliability matter most.

Common specifications

Short circuit protection	Continuous, self recovery
Switching frequency	150 kHz (min.); 208kHz (typ.); 300kHz (max.) 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	+300°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 12.00 x 9.50 mm
Weight	3.8g (typ.)
Cooling Method	Free air convection

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/ no load)	• 5VDC input 12VDC input • 3.3VDC Output • Other Output 24VDC input • 3.3VDC Output • Other Output 48VDC input • 3.3VDC Output • Other Output		800/60 277/25 314/25 140/8 154/8 69/3 78/3	846/65 286/30 338/30 145/13 163/13 72/10 85/10	mA
Reflected ripple current	5VDC Input 12VDC Input 24VDC Input 48VDC Input		20 20 55 55		
Impulse voltage	5VDC Input 12VDC Input 24VDC Input 48VDC Input	-0.7 -0.7 -0.7 -0.7		12 25 50 100	VDC
Starting voltage	5VDC Input 12VDC Input 24VDC Input 48VDC Input	3.5 4.5 11 24	4 8 16 33	4.5 9 18 36	VDC
CTRL	Module off 0 - 0.7V turn off Module on; No connect or 3.5 - 12V on				

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	5% - 100% Load		±1.0	±3.0	%
No-load output voltage accuracy	Input voltage range		±1.5	±5.0	%
Linear regulation	Full load, input voltage from low limit to high limit		±0.2	±0.5	%
Load regulation	5% - 100% load		±0.4	±0.75	%
Transient recovery time	25% load step change		0.5	3	ms
Transient response deviation	25% load step change		±2.5	±5	%
Temperature coeffcient	Full load		±0.02	±0.03	%/°C
Ripple & noise	20MHz bandwidth		See the datasheet for data		

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500			VDC
Isolation resistance	Input-output, isolated voltage 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		30	50	pF

Example:
3S8W_2405S1.5RPR1
3 = 3Watt; S8 = SIP; W = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 3 = 1500VDC isolation; R = Regulated Output; P = Short circuit protection; R1 = Revised version

1. The input voltage cannot exceed the specified range value, otherwise permanent and irreparable damage may be caused ;
2. Unless otherwise specified,the parameters in this datasheet were measured at 25°C, humidity 40%~75%, input nominal voltage and output pure resistance mode under full load;
3. All index test methods are based on our standards.

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EMC specifications				
EMC	EMI	CE	CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 3-2)	
EMC	EMI	RE	CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 3-2)	
EMC	EMS	ESD	IEC/EN61000-4-2 Contact ±4kV	Perf. Criteria B
EMC	EMS	RS	IEC/EN61000-4-3 10V/m	Perf. Criteria A
EMC	EMS	EFT	IEC/EN61000-4-4 ±2kV (The recommended circuit is shown in Figure 3-①)	Perf. Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5 line to line ±2kV (The recommended circuit is shown in Figure 3-①)	Perf. Criteria B
EMC	EMS	CS	IEC/EN61000-4-6 3 Vr.m.s	Perf. Criteria A
EMC	EMS	Voltage dips, DIPS and short interruptions	IEC/EN61000-4-29 0%, 70%	Perf. Criteria B

Product Selection Guide

Approval	Part number	Input Voltage Nominal Range (VDC)	Output Voltage (VDC)	Output Current (mA) Max.	Output Current (mA) Min.	Ripple & Noise Typ./Max. (mVp-p)	Full Load Efficiency (%) typ.	Capacitive Load max. (µF)
	3S8W_0503S1.5RPR1	5 (4.5-9)	3.3	758	38	40/75	69	1800
	3S8W_0505S1.5RPR1	5 (4.5-9)	5	500	25	40/75	74	2200
	3S8W_0512S1.5RPR1	5 (4.5-9)	12	208	10	40/75	78	680
	3S8W_0515S1.5RPR1	5 (4.5-9)	15	167	8	40/75	75	470
	3S8W_0524S1.5RPR1	5 (4.5-9)	24	104	5	40/75	77	330
	3S8W_1203S1.5RPR1	12 (9-18)	3.3	758	38	40/75	76	2700
	3S8W_1205S1.5RPR1	12 (9-18)	5	600	30	40/75	77	2200
	3S8W_1212S1.5RPR1	12 (9-18)	12	250	13	100/150	83	680
	3S8W_1215S1.5RPR1	12 (9-18)	15	200	10	100/150	84	470
	3S8W_1224S1.5RPR1	12 (9-18)	24	125	6	100/150	82	330
	3S8W_2403S1.5RPR1	24 (18-36)	3.3	758	38	40/75	75	2700
	3S8W_2405S1.5RPR1	24 (18-36)	5	600	30	40/75	82	2200
	3S8W_2412S1.5RPR1	24 (18-36)	12	250	13	40/75	84	680
	3S8W_2415S1.5RPR1	24 (18-36)	15	200	10	100/150	84	470
	3S8W_2424S1.5RPR1	24 (18-36)	24	125	6	100/150	84	330
	3S8W_4803S1.5RPR1	48 (36-75)	3.3	758	38	100/150	76	2700
	3S8W_4805S1.5RPR1	48 (36-75)	5	600	30	40/75	77	2200
	3S8W_4812S1.5RPR1	48 (36-75)	12	250	10	40/75	81	680
	3S8W_4815S1.5RPR1	48 (36-75)	15	200	10	70/100	85	470
	3S8W_4824S1.5RPR1	48 (36-75)	24	104	5	70/100	83	330

Approval	Part number	Input Voltage Nominal Range (VDC)	Output Voltage (VDC)	Output Current (mA) Max.	Output Current (mA) Min.	Ripple & Noise Typ./Max. (mVp-p)	Full Load Efficiency (%) typ.	Capacitive Load max. (µF)
	3S8W_0505D1.5RPR1	5 (4.5-9)	±5	±250	±13	40/75	75	1000
	3S8W_0512D1.5RPR1	5 (4.5-9)	±12	±104	±5	40/75	78	470
	3S8W_0515D1.5RPR1	5 (4.5-9)	±15	±83	±4	40/75	78	330
	3S8W_0524D1.5RPR1	5 (4.5-9)	±24	±52	±3	40/75	77	220
	3S8W_1205D1.5RPR1	12 (9-18)	±5	±300	±15	40/75	79	1000
	3S8W_1212D1.5RPR1	12 (9-18)	±12	±125	±6	40/75	80	470
	3S8W_1215D1.5RPR1	12 (9-18)	±15	±100	±5	40/75	81	330
	3S8W_2405D1.5RPR1	24 (18-36)	±5	±300	±15	40/75	80	1000
	3S8W_2412D1.5RPR1	24 (18-36)	±12	±125	±6	40/75	84	470
	3S8W_2415D1.5RPR1	24 (18-36)	±15	±100	±4	40/75	84	330
	3S8W_4805D1.5RPR1	48 (36-75)	±5	±300	±15	40/75	80	1000
	3S8W_4812D1.5RPR1	48 (36-75)	±12	±125	±6	40/75	83	470
	3S8W_4815D1.5RPR1	48 (36-75)	±15	±100	±5	40/75	83	330

Typical characteristics

Temperature derating graph

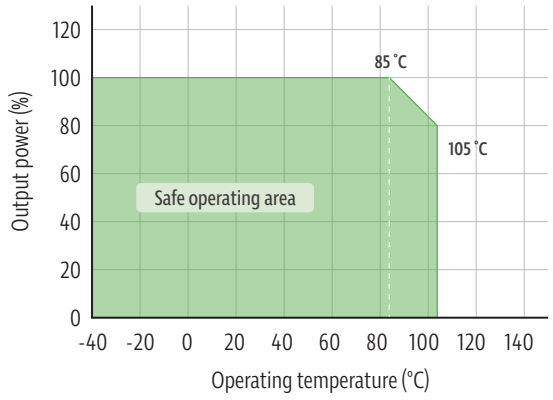
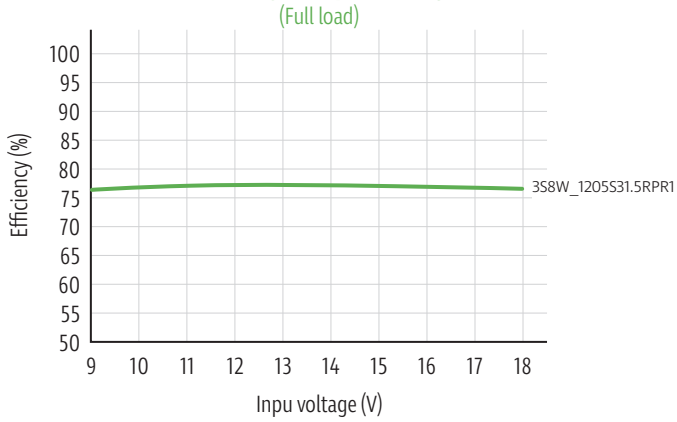
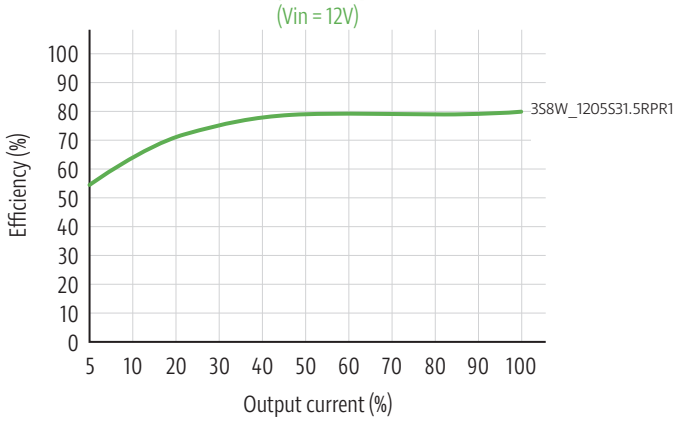


Figure1

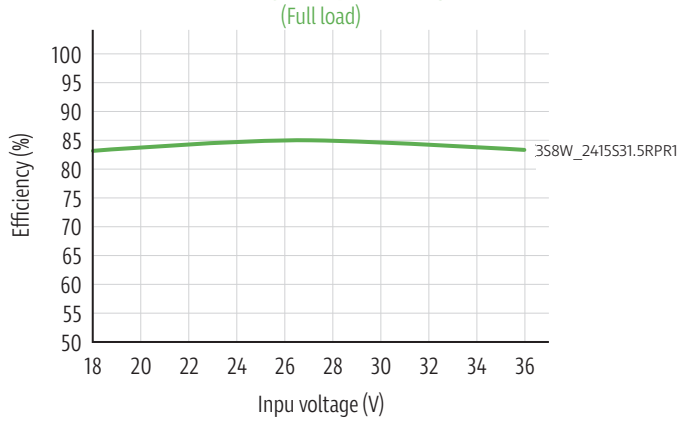
Efficiency vs input voltage
(Full load)



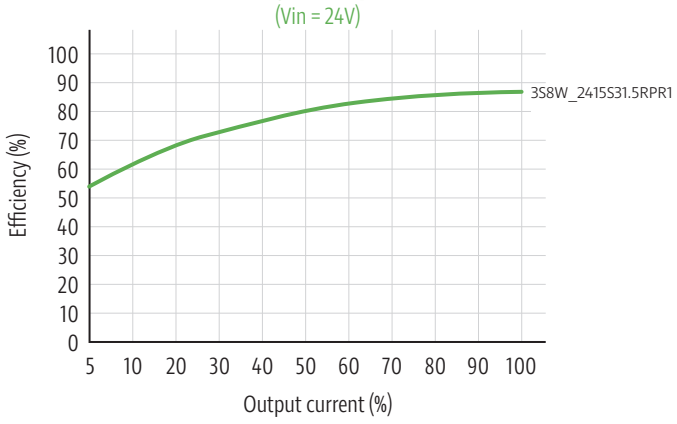
Efficiency vs output load
(Vin = 12V)



Efficiency vs input voltage
(Full load)



Efficiency vs output load
(Vin = 24V)



Typical circuit design and application

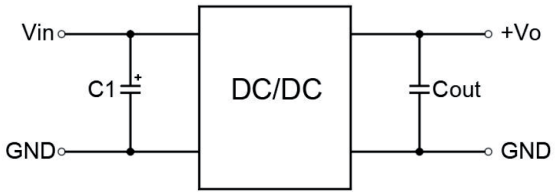


Figure2

Recommended Capacitive Load Value Table

Cin (μF)	Cout (μF)
100	22

EMI recommended component parameters

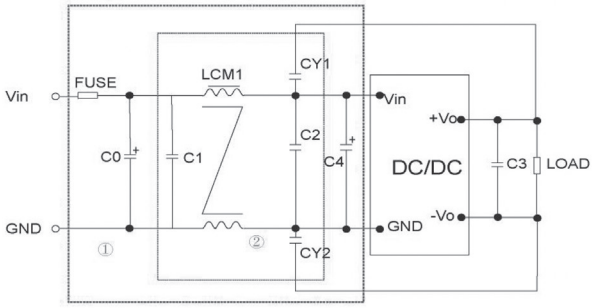


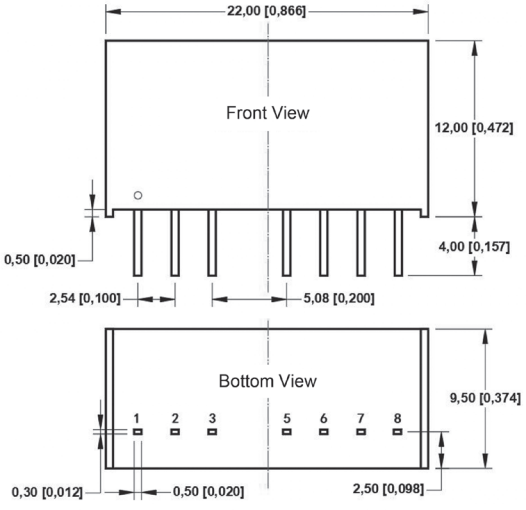
Fig 3

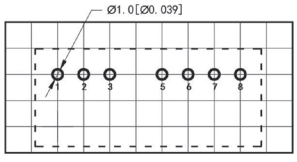
EMI recommended component parameters

Vin	Vin: 12V	Vin: 24V
FUSE	Select according to the actual input current of the customer	
C0, C4	330uF/35V	330uF/50V
C1, C2	10μF/50V	10μF/50V
LCM1	1.4-1.7mH	1.4-1.7mH
C3	22μF/50V	22μF/50V
CY1, CY2	1nF/400VAC	1nF/400VAC

Note: Part 1 in Figure 3 is for EMC testing; The second part is used for EMI filtering, which can be selected according to the demand.

Mechanical dimensions





Note: The grid distance is 2.54mm*2.54mm

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

NC: Pin to be isolated from circuity

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