



## 2S7WA\_3RPR series

2W - Single Output DC-DC Converter - Isolated & Regulated

# DC-DC Converter 2 Watt

- ⊕ SIP7 package
- ⊕ 2:1 input voltage range
- ⊕ Operating temperature range: -40°C to +100°C
- ⊕ 3000VDC isolation voltage
- ⊕ Up to 83% efficiency
- ⊕ Input under voltage protection
- ⊕ Short circuit protection (SCP)
- ⊕ Over current protection
- ⊕ MTBF: 1,000,000 hours

Introducing our new 2S7WA\_3RPR series, a compact and robust isolated DC-DC converter platform engineered for dependable performance in industrial and distributed power applications. Designed in a space-efficient SIP7 package, the series features a wide 2:1 input voltage range, ensuring stable operation even under fluctuating supply conditions. With reinforced 3000 VDC isolation and efficiencies of up to 83%, the 2S7WA\_3RPR series delivers reliable and efficient power conversion in demanding environments. It operates across an extended temperature range from -40°C to +100°C, supporting industrial-grade applications. Integrated input under-voltage protection, short circuit protection (SCP), and overcurrent protection provide comprehensive system-level safety and enhance overall operational reliability. An MTBF of 1,000,000 hours further underlines its suitability for long-life applications requiring stable and secure isolated power in a compact through-hole format.



Common specifications	
Short circuit protection	Continuous, self recovery
Switching frequency	300 kHz (PWM)
Operation temperature	-40°C ~+100°C (with derating)
Storage temperature	-55°C ~+125°C
Soldering Profile	Wave-soldering, 260°C (±5°C); time: 5-10s Manual-welding, 360°C (±10°C); time: 3-5s
Storage humidity	5-95% 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	19.60 x 7.05 x 10.10mm
Weight	2.7g (typ.)
Cooling method	Free air convection

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, resistance at 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		1000		pF

**Example:**  
**2S7WA\_2405S3RPR**  
**2 = 2Watt; S7 = SIP; WA = Series; 24 = 24Vin; 05 = 5Vout; S = Single Output;**  
**3 = 3000VDC isolation; R = Regulated Output; P = Short circuit protection;**  
**R = Revised**

- 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;
- The maximum capacitive load is tested within the input voltage range and under full load conditions;
- Unless otherwise specified, all indicators in this datasheet are measured at Ta = 25°C, humidity <75% RH, nominal input voltage, and output rated load;
- All testing methods in this datasheet are based on our company's standards;
- For specific requirements please contact our technical team directly;
- Product specifications are subject to change without prior notice.

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	0% - 100% load		±3.0	±5.0	%
Linear regulation	Vin = min. to max. @full Load		±1.0	±3.0	%
Load regulation	0% - 100% load		±3.0	±5.0	%
Transient recovery time	25% load step change, nominal input voltage		0.5	2	ms
Transient response deviation	25% load step change, nominal input voltage		±3.0	±5.0	%
Temperature coefficient	Full load			±0.03	%/°C
Ripple & noise*	20MHz bandwidth, 5% - 100% load, parallel line test method		60	100	mVp-p
Over-current protection	Input voltage range	110	160		%Io

Note: \*Under 0% - 5% load conditions, ripple & noise does not exceed 5%Vo.

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input current (full load/ no load)	<b>5VDC Nominal input</b>				
	• 3.3V output		388/15	400/25	
	• 5V output		571/15	588/25	
	• 9V output		556/15	571/25	
	• 12V output		533/15	548/25	
	• 15V output		513/20	526/40	
	• 24V output		500/20	513/40	
	<b>12VDC Nominal input</b>				
	• 3.3V output		151/10	155/20	
	• 5V output		222/10	228/20	
	• 9V output		214/10	219/20	
	• 12/15V output		208/15	214/30	
• 24V output		201/15	206/30		
<b>24VDC Nominal input</b>					
• 3.3V output		74/5	76/15		
• 5V output		110/5	113/15		
• 9V output		107/10	110/20		
• 12/15V output		104/10	107/20		
• 24V output		100/15	103/25		
Reflected ripple current	5VDC nominal input series		20		
	12VDC nominal input series		30		
	24VDC nominal input series		45		mA
Impulse voltage (1 sec.max)	5VDC nominal input series	-0.7		12	
	12VDC nominal input series	-0.7		25	VDC
	24VDC nominal input series	-0.7		50	
Starting voltage	5VDC nominal input series			4.5	
	12VDC nominal input series			9	VDC
	24VDC nominal input series			18	
Input under voltage protection	5VDC nominal input series	3.5	4		
	12VDC nominal input series	5.5	6.5		VDC
	24VDC nominal input series	12	15.5		

## 2S7WA\_3RPR series

2W - Single Output DC-DC Converter - Isolated & Regulated

### EMC specifications

EMI	CE	CISPR32/EN55032 CLASS B (see fig. 3-2 for recommended circuit)	
EMI	RE	CISPR32/EN55032 CLASS B (see fig. 3-2 for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2 Contact $\pm 4kV$	Perf. criteria B
EMS	RS	IEC/EN61000-4-3 10V/m	Perf. criteria A
EMS	EFT	IEC/EN61000-4-4 $\pm 2kV$ (see fig. 3-3 for recommended circuit)	Perf. criteria B
EMS	Surge	IEC/EN61000-4-5 line to line $\pm 2kV$ (see Fig. 3-4 for recommended circuit)	Perf. criteria B
EMS	CS	IEC/EN61000-4-6 3Vr.m.s	Perf. criteria A

## Product Selection Guide

Approval	Part number	Input Voltage Nominal (Range) (VDC)	Input Voltage max. (VDC)*	Output Voltage (VDC)	Output Current max. (mA)	Full Load Efficiency (%) typ.**	Capacitive Load max. ( $\mu F$ )
	2S7WA_0503S3RPR	5 (4.5-9)	11	3.3	400	68	1200
	2S7WA_0505S3RPR	5 (4.5-9)	11	5	400	70	1000
	2S7WA_0509S3RPR	5 (4.5-9)	11	9	222	72	680
	2S7WA_0512S3RPR	5 (4.5-9)	11	12	167	75	560
	2S7WA_0515S3RPR	5 (4.5-9)	11	15	133	78	470
	2S7WA_0524S3RPR	5 (4.5-9)	11	24	84	80	220
	2S7WA_1203S3RPR	12 (9-18)	20	3.3	400	73	1200
	2S7WA_1205S3RPR	12 (9-18)	20	5	400	75	1000
	2S7WA_1209S3RPR	12 (9-18)	20	9	222	78	680
	2S7WA_1212S3RPR	12 (9-18)	20	12	167	80	560
	2S7WA_1215S3RPR	12 (9-18)	20	15	133	80	470
	2S7WA_1224S3RPR	12 (9-18)	20	24	84	83	220
	2S7WA_2403S3RPR	24 (18-36)	40	3.3	400	74	1200
	2S7WA_2405S3RPR	24 (18-36)	40	5	400	76	1000
	2S7WA_2409S3RPR	24 (18-36)	40	9	222	78	680
	2S7WA_2412S3RPR	24 (18-36)	40	12	167	80	560
	2S7WA_2415S3RPR	24 (18-36)	40	15	133	80	470
	2S7WA_2424S3RPR	24 (18-36)	40	24	84	83	220

Note: \* Exceeding the maximum input voltage may cause permanent damage;

\*\* Efficiency is measured at nominal input voltage and rated output load.

## Typical characteristics

### Temperature derating graph

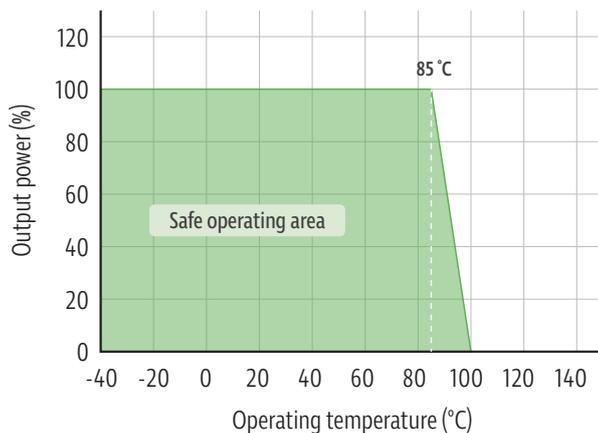


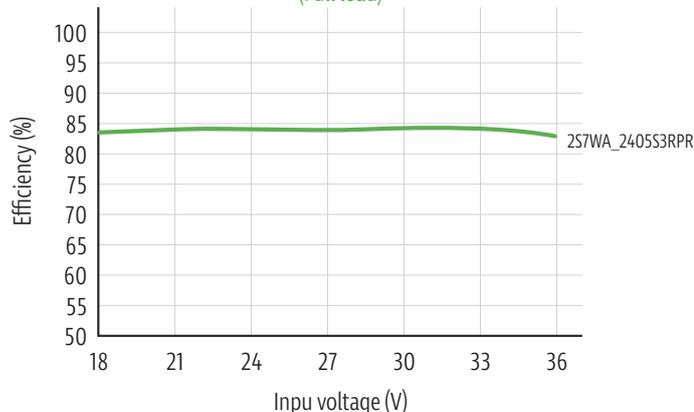
Figure 1

## 2S7WA\_3RPR series

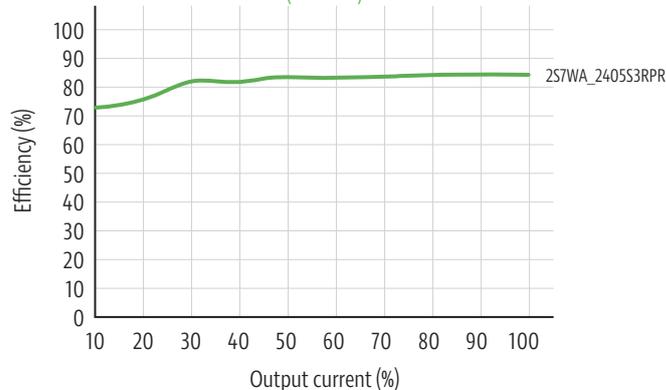
2W - Single Output DC-DC Converter - Isolated & Regulated

### Typical characteristics

**Efficiency vs input voltage**  
(Full load)



**Efficiency vs output load**  
(Vin=24V)



### Typical circuit design and application

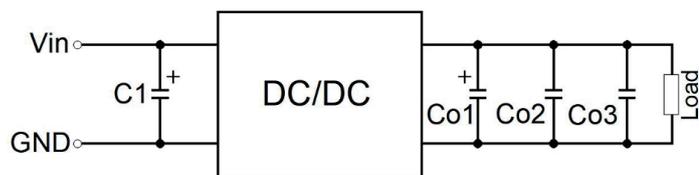


Figure 2

Recommended capacitive load value table

Vout	C1	Co1	Co2	Co3
3.3/5VDC	100µF/100V	47µF/16V	10µF/50V	0.1µF/16V
9/12/15VDC	100µF/100V	47µF/25V	10µF/50V	0.1µF/25V
24VDC	100µF/100V	47µF/50V	10µF/50V	0.1µF/50V

All the DC-DC converters of this series are tested before delivery using the recommended circuit shown in fig. 2. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C1 and Co1/Co2/Co3 and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.

### Recommended EMC circuit diagram

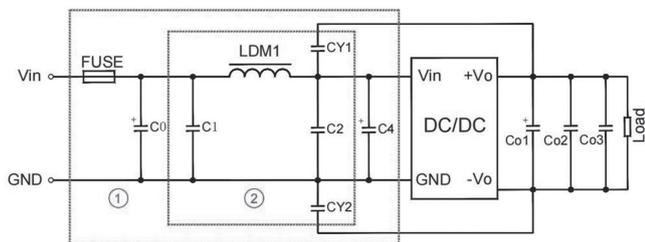


Figure 3

EMI recommended parameter table

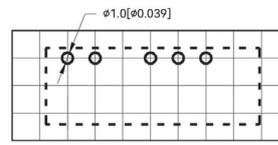
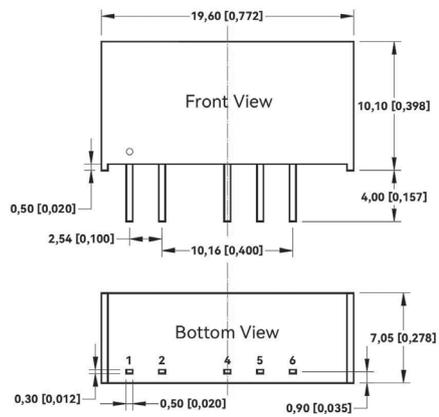
Model	Vin: 5VDC	Vin: 12VDC	Vin: 24VDC
FUSE	Select according to the actual input current of the customer		
C0/C4	680µF/25V	680µF/25V	330µF/50V
C1/C2	4.7µF/50V		
LDM1	12µH		
Co1/Co2/Co3	Refer fig. 2 capacitive load value table		
CY1/CY2	1nF/3kV		

Note: We use part ① in fig. 3 for immunity tests and part ② for emissions test. Selecting based on needs.

## 2S7WA\_3RPR series

2W - Single Output DC-DC Converter - Isolated & Regulated

# Mechanical dimensions



The grid distance is 2.54mm x2.54mm

Pin definition table

Pin	Function
1	Vin
2	GND
4	-Vo
5	No Pin
6	+Vo

No Pin: No physical pin

Note:  
Unit: mm [inch]  
Pin section tolerances:  $\pm 0.10$  [ $\pm 0.004$ ]  
General tolerances:  $\pm 0.50$  [ $\pm 0.020$ ]