

1S7AE_1RP series

1W - Single Output DC-DC Converter - Isolated & Regulated



DC-DC Converter

1 Watt

- ⊕ SIP7 package type
- ⊕ 1500VDC isolation voltage:
- ⊕ Operating temperature range: -40°C to +85°C
- ⊕ Up to 75% efficiency
- ⊕ International standard pinning
- ⊕ MTBF: 3,500,000 hours

Introducing our new 1S7AE_1RP series, a compact SIP7 power module engineered for demanding industrial and electronic applications. Designed with a robust 1500 VDC isolation voltage, it delivers reliable performance even in electrically challenging environments. The module operates effortlessly across a wide temperature range from -40°C to +85°C, ensuring stability in both extreme cold and high-heat conditions.

With efficiency levels reaching up to 75%, the 1S7AE_1RP series supports energy-aware system designs while maintaining consistent output. Built on international standard pinning, integration is straightforward and compatible with established layouts. Additionally, an impressive MTBF of 3.5 million hours underscores the long-term durability and confidence expected from a high-reliability power component.



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 ~+125°C
Pin welding can withstand the highest temperature	+300°C (non-condensing)
Case temperature rise	25°C (Ta = 25°C, nominal input, output load)
Storage humidity	95% RH (non-condensing)
MTBF: (MIL-HDBK-217F@25°C)	>3,500,000 hours
Input filter	Capacitance filter
Hot plug	Unavailable
Case material	Black plastic; flame-retardant and heat-resistant (UL94V-0 rated)
Package dimensions	19.60 x 6.00 x 10.10 mm
Weight	2.1g (typ.)
Cooling method	Free air convection

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	3.3VDC Input		373/15	438/-	mA
	5VDC Input		286/15	305/-	
	9VDC Input		153/12	170/-	
	12VDC Input		115/8	121/-	
Reflected ripple current	24VDC Input		59/4	65/-	mA
			15		

Example:

1S7AE_2405S1RP

1 = 1Watt; S7 = SIP; AE = Series; 24 = 24Vin; 05 = 5Vout; S = Single Output; 1 = 1000VDC isolation; R = Regulated Output; P = Short circuit protection

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy				±3	%
Linear regulation	Input voltage variation ±1%			±0.25	%
Load regulation (10% - 100% load)	3.3VDC output Others output			±3 ±2	%
Ripple noise 20mhz bandwidth (peak-peak)	15VDC output Others output		50 30	120 100	mV
Temperature drift coefficient	100% load		±0.02		%/°C

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		20		pF

- 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 indicator testing methods in this datasheet are based on our company's corporate standards;
- For specific requirements please contact directly our technical personnel;
- Product specifications are subject to change without prior notice.

EMC specifications

EMI	CE	CISPR32/EN55032	CLASS B (The recommended circuitis shown in Figure 3)		
EMI	RE	CISPR32/EN55032	CLASS B (The recommended circuitis shown in Figure 3)		
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV	Air ±8KV	perf. Criteria B

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Product Selection Guide

Approval	Part number	Input Voltage Nominal (Range) (VDC)	Output Voltage (VDC)	Output Current min. (mA)	Output Current max. (mA)	Full Load Efficiency (%) typ.	Capacitive Load max. (μF)
	1S7AE_0303S1RP	3.3	3.3	0	250	67	2400
	1S7AE_0305S1RP	3.3	5	0	200	69	2400
	1S7AE_0503S1RP	5	3.3	0	250	67	2400
	1S7AE_0505S1RP	5	5	0	200	70	2400
	1S7AE_0512S1RP	5	12	0	84	71	560
	1S7AE_0515S1RP	5	15	0	67	72	560
	1S7AE_0909S1RP	9	9	0	111	72	1000
	1S7AE_1203S1RP	12	3.3	0	250	67	2400
	1S7AE_1205S1RP	12	5	0	200	70	2400
	1S7AE_1212S1RP	12	12	0	84	73	560
	1S7AE_2403S1RP	24	3.3	0	250	67	2400
	1S7AE_2405S1RP	24	5	0	200	72	2400
	1S7AE_2412S1RP	24	12	0	83	73	560
	1S7AE_2415S1RP	24	15	0	67	75	560

Typical characteristics

Temperature derating graph

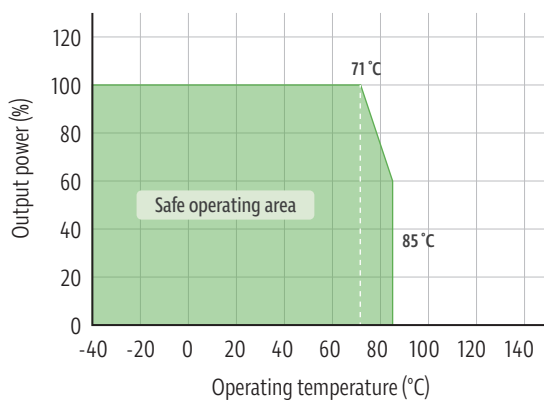
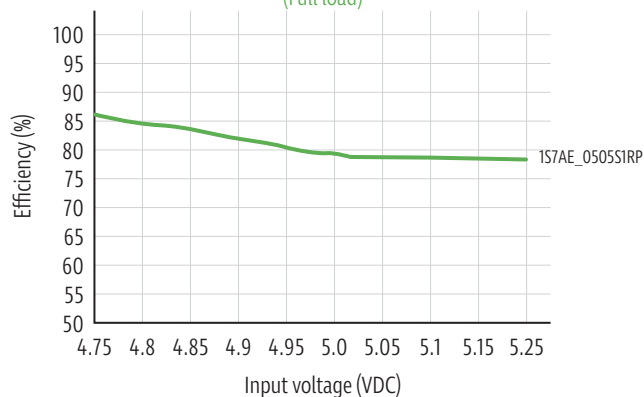
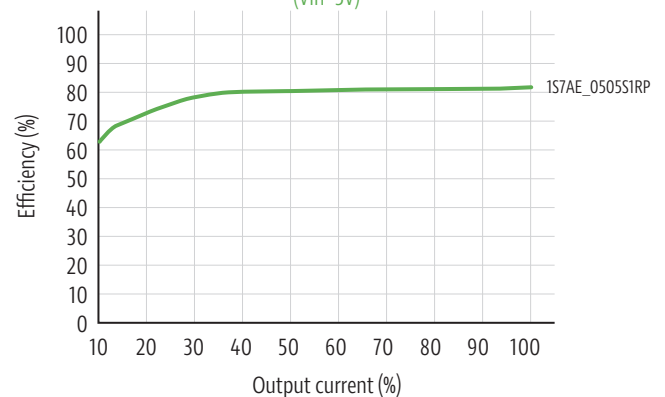


Figure 1

Efficiency vs input voltage
(Full load)



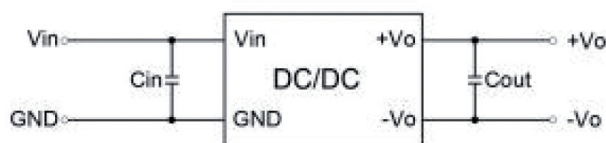
Efficiency vs output load
(Vin=5V)



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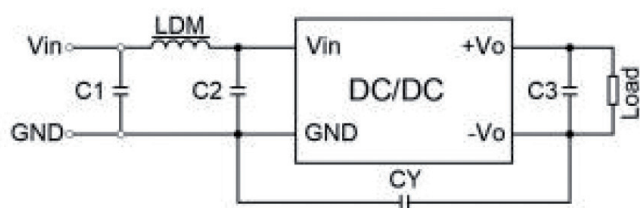
Typical circuit design and application



Recommended capacitive load value table

Vin	Cin	Vo	Cout (μF)
3.3/5VDC	4.7uF/16V	3.3/5VDC	10/16V
9/12/15VDC	2.2uF/25V	9VDC	4.7/16V
24VDC	1.0uF/50V	12VDC	2.2/25V
--	--	15VDC	1.0/25V

Recommended EMC circuit diagram



EMI Recommended Parameter Table

EMI	C1	4.7μF /50V
EMI	C2	4.7μF /50V
EMI	C3	Refer to the Cout parameter in figure 3
EMI	CY	1000pF/2kV
EMI	LDM	6.8μH

1. Typical applications

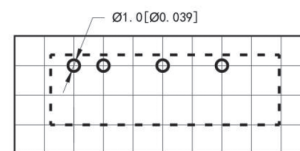
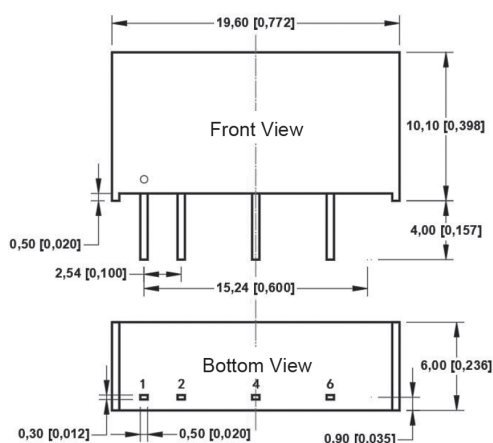
To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals. The application circuit is shown in figure 2. However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is likely to cause start-up problems. For each output, the recommended capacitive load values are shown in "Recommended Capacitive Load Value Table" for safe and reliable operation.

2. EMC typical recommended circuit See figure 3

3. Output load requirements

In order to ensure that the module can work efficiently and reliably, the minimum output load should not be less than 10% of the rated load when used. If the power required is really small, connect a resistor in parallel to the output end (the sum of the power consumed by the resistance and the power actually used is greater than or equal to 10% of the rated power).

Mechanical dimensions



Note: The grid distance is 2,54*2,54 mm

Pin definition table

Pin	Function
1	Vin
2	GND
4	-Vo
6	+Vo

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