1S7A2_3RP series

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

DC-DC Converter 1 Watt

- 1W regulated output
- Up to 79% efficiency
- Operating temperature: -40°C to +85°C
- Compact SIP7 housing
- No external components required
- 3000VDC isolation
- Plastic case meets the UL94 V-0 standard

Introducing our new compact and efficient 1S7A2_3RP series, designed to meet the highest performance standards! With a 1 Watt regulated output and an impressive efficiency of up to 79%, this power module ensures reliable operation while minimizing energy loss. Its compact SIP7 housing offers space-saving integration for a wide range of applications. Engineered to perform across extreme conditions, it operates seamlessly in a temperature range of -40°C to +85°C, providing robust performance even in challenging environments. The module features 3000VDC isolation, ensuring safety and reliability. With no external components required, it simplifies design processes, while the durable plastic case meets the UL94 V-0 standard, offering flame resistance for enhanced safety. Compact, efficient, and easy to implement—this power module is the perfect solution for your next project.

SHORT CIRCUIT PROTECTED

100% RoHS compliant

Common specifications

Short circuit protection:	Continuous, self-recovery
Operation temperature:	-40°C up to +105°C (with derating)
Storage temperature:	-55°C up to +125°C
Case temperature rise (Ta = 25°C):	25°C, typ. (within temperature derating curve)
Storage humidity:	5 ~ 95% RH (non-condensing)
Pin soldering resistance temp:	300°C MAX, 1.5mm from case for 10 sec
MTBF (MIL-HDBK-217F@25°C):	>3,500,000 hours
Case material:	Black flame-retardant heat-resistant Plastic (UL94 V-0)
Weight:	2.1g typ.
Dimensions	19.50 × 6.00 × 10.00mm

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output Power		0.1		1	W
Output Voltage Accuracy	Nominal input, Full load		±2	±3	%
Line regulation	10% ~ 100% nominal load			1.0	%
Load regulation	Input Voltage Change±1%			±0.25	%
Ripple & Noise*	Nominal input,full load, 20MHZ bandwidth		75	100	mVp-p
Temperature coefficient	100% full load			±0.03	%/°C
Switching frequency	• 5V input, full load • 12/24V input, full load		260 450		KHz KHz

Note:* Ripple & Noise tested by twisted-pair method.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Surge voltage (1 sec. max.)	• 5V input • 12V input • 24V input	-0.7 -0.7 -0.7		9 18 30	VDC VDC VDC
Input filter	Capacitance filter				

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Test 1 minute, leakage current <0.5mA	3000			VAC
Isolation capacitance	Input/Output, 100kHz/0.1V		20		pF

Example:
1S7A2_1205S3RP
1 = 1Watt; S7 = SIP7; A2 = Pinning; 12 = 12Vin; 05 = 5Vout;
S = Single Output; 3= 3kVDC isolation; R = Regulated Output;
P = Short circuit protection

Note:
1. This product cannot be used in parallel, and does not support hot-plugging;
2. If the product works below the minimum required load, it cannot be guaranteed that the product performance meets all performance indicators in this datasheet;
3. All index testing methods in this datasheet are based on our company's corporate standards
4. The product specification may be changed at any time without prior notice.

GAPTEC-Electronic GmbH & Co. KG
sales@gaptec-electronic.com – www.gaptec-electronic.com

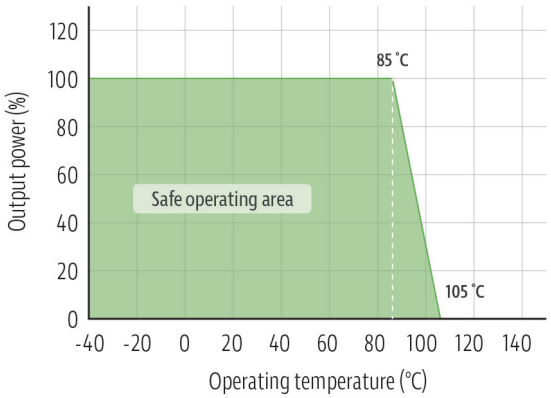
Product Selection Guide

Part Number	Input Voltage [Nominal, V]	Output current full load,	[mA, typ.] no load,	Output Voltage [VDC]	Output current [mA]	Max. capacitive load [µF]	Efficiency [%, typ]
1S7A2_0503S3RP	5	290	30	3.3	303	2200	69
1S7A2_0505S3RP	5	279	29	5	200	2200	71
1S7A2_0512S3RP	5	256	23	12	83	470	78
1S7A2_0515S3RP	5	256	30	15	67	470	77
1S7A2_0524S3RP	5	276	40	24	42	470	73
1S7A2_1205S3RP	12	109	10	5	200	2200	77
1S7A2_1212S3RP	12	104	10	12	83	470	79
1S7A2_1215S3RP	12	103	11	15	67	470	74
1S7A2_2405S3RP	24	57	7	5	200	2200	74
1S7A2_2412S3RP	24	60	11	12	83	470	76
1S7A2_2415S3RP	24	53	8	15	67	470	77
1S7A2_2424S3RP	24	63	13	24	42	220	67

Note:
In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor at the output side, the resistance recommended equal to 10% nominal power.

Typical characteristics

Temperature derating graph



Recommended circuit

In order to ensure the input/output ripple and noise decreased, capacitor filter net could be connected to input and output terminal, application circuit as below photo 1; choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure the modules running safely and reliably, the recommended capacitive load values as shown in Table 1. (But for the actual output power of application circuit is less than 0.5W, suggest not to connect external capacitor)

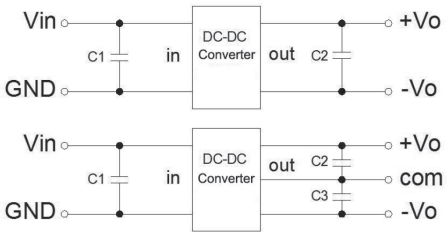


Table 1: Recommended capacitor load values

Vin	C1	Vout	C2	Vout	C3/C4
3.3/5VDC	4.7µF	3.3/5VDC	10µF	±3.3/+5VDC	4.7µF
12VDC	2.2µF	9VDC	4.7µF	±9VDC	2.2µF
15VDC	1µF	12VDC	2.2µF	±12VDC	1µF
24VDC	1µF	15VDC	1µF	±15VDC	0.47µF
		24VDC	0.47µF	±24VDC	0.22µF

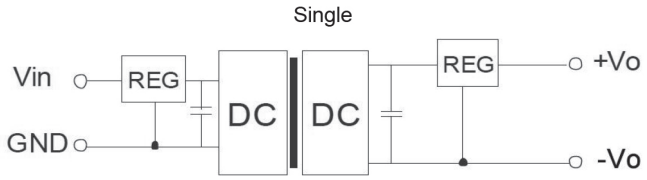
Output load requirements

a. In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor at the output side, the resistance equal to 10% nominal load.

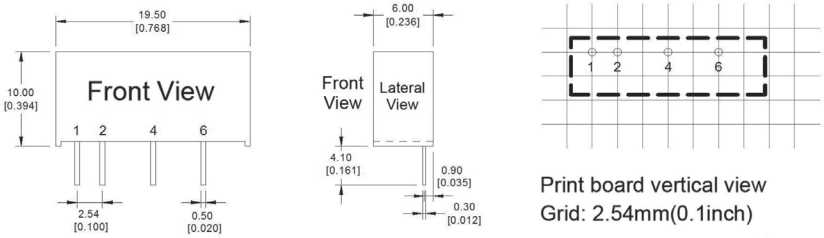
b. The maximum capacitive load is tested under nominal input full load, and cannot exceed the maximum capacitive load of output terminal under operation, otherwise it will cause it difficult to start up and damage the product.

Output regulated voltage and over voltage protection circuit

The simplest device to protect output regulated voltage, over voltage and over current is to cascade a linear regulator with overheat protection at input or output terminal, and connect a capacitor filter net (see below picture), filter capacitive value recommended see table 1. Linear regulator is chosen according to the actual voltage, current needed in working.



Mechanical dimensions



Note:
Unit: mm (inch),
General tolerance 0.XX ±0.1 (0.XX ±0.004)
0.XX ±0.25 (0.XX ±0.001)

Pin Function	1	2	3	4	5	6
Single (S)	+Vin	GND	NP	-Vo	NP	+Vo

Note: if the definition of pin is not in accordance with the model selection guide, please refer to the label on actual part.