3S7A2_1.5UP series

3W - Single/Dual Output DC-DC Converter - Isolated & Unregulated

DC-DC Converter 3 Watt

- SIP6 package style
- Operating temperature range: -40°C to +105°C
- 1500VDC isolation
- Up to 86% efficiency
- International standard pin
- MTBF: 3,500,00 hours

Introducing our new 3S7A2_1.5UP series. Engineered for performance and reliability, the new 3S7A2_1.5UP DC-DC converter series delivers outstanding efficiency in a compact SIP6 package. Designed to meet demanding industrial and instrumentation requirements, it operates reliably across a wide temperature range from –40°C to +105°C and provides 1500 VDC isolation.

With efficiency levels of up to 86 percent and a standard international pin configuration, integration is simple and effective. An impressive MTBF of 3,500,000 hours ensures long-term dependability. Compact, efficient, and robust – the 3S7A2_1.5UP series is performance built to last.

SHORT CIRCUIT PROTECTED

100% RoHS compliant

Common specifications

Short circuit protection	Continuous, self recovery
Switching frequency	250 kHz (full load, nominal input voltage)
Operation temperature	-40°C ~+105°C (with derating)
Storage temperature	-55°C ~+125°C
Pin welding can withstand the highest temperature	+300°C (soldering spot is 1.5mm away from case for 10 seconds)
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 7.05 x 10.10 mm
Weight	2.02 g (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 15VDC input		750/6 312/4 240/4	--/15 --/15 --/20	mA
Reflected ripple current			15		mA
Impulse voltage	5VDC input 12VDC input 15VDC input	-0.7 -0.7 -0.7		9 18 21	VDC

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	See envelope curve figure 2				
Linear regulation	Input voltage variation		±1.2		%
Load regulation (10% - 100% load)	5VDC output Other output		12 10		%
Ripple & noise	20MHz bandwidth (peak-peak)	--	75	150	mV
Temperature coefficient	Full load		±0.03		%/°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

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

Example:
3S7A2_1205S1.5UP
3 = 3Watt; S7 = SIP; A2 = Series; 12 = 12Vin; 05 = 5Vout; S = Single Output;
1.5 = 1500VDC isolation; U = Unregulated Output; P = Short circuit protection

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EMC specifications			
EMI	CE	CISPR32/EN55032 CLASS B (the recommended circuit is shown in Figure 4)	
EMI	RE	CISPR32/EN55032 CLASS B (the recommended circuit is shown in Figure 4)	
EMS	ESD	(Single) IEC/EN61000-4-2 Contact ±8kV	perf. criteria B

Product Selection Guide

Approval	Part number	Input Voltage Nominal (Range) (VDC)	Output Voltage (VDC)	Output Current max./min.(mA)	Full Load Efficiency (%) min./typ.	Capacitive Load Max. (µF)
	3S7A2_0505S1.5UP	5	5	600/60	83	1200
	3S7A2_0509S1.5UP	5	9	333/33	83	1200
	3S7A2_0524S1.5UP	5	24	100/10	88	220
	3S7A2_1205S1.5UP	12	5	600/60	85	1200
	3S7A2_1212S1.5UP	12	12	250/25	86	220
	3S7A2_1215S1.5UP	15	15	200/20	83	220

Approval	Part number	Input Voltage Nominal (Range) (VDC)	Output Voltage (VDC)	Output Current max./min.(mA)	Full Load Efficiency (%) min./typ.	Capacitive Load Max. (µF)
	3S7A2_0506D1.5UP	5	±6	±250/±25	83	#5600505

Typical characteristics

Temperature derating graph

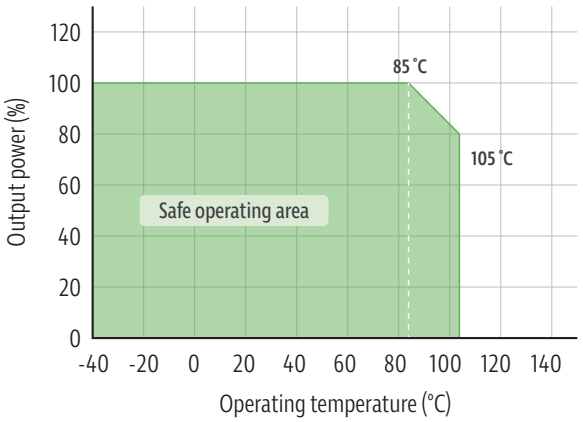


Figure 1

Output regulation curve

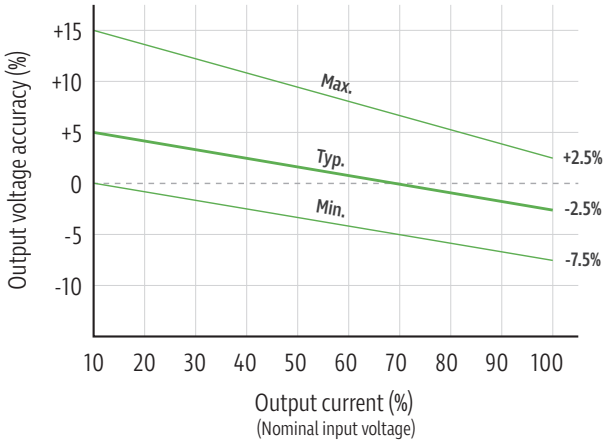


Figure 2

Typical Circuit design and application

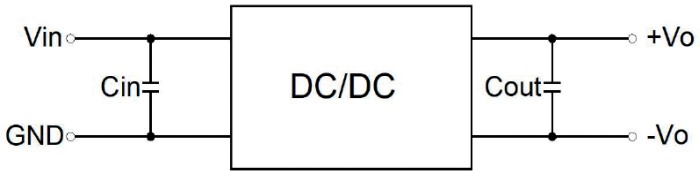


Figure 3

Recommended capacitive load value table

Vin	Cin	Vo	Cout
5VDC	10uF/16V	5/6VDC	10uF/16V
12VDC	4.7uF/25V	9/12/15VDC	2.2uF/25V
15VDC	2.2uF/25V	24VDC	1.0uF/50V

Recommended EMC circuit diagram

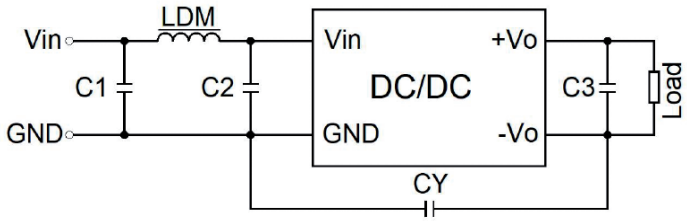


Figure 4

EMI recommended parameter table

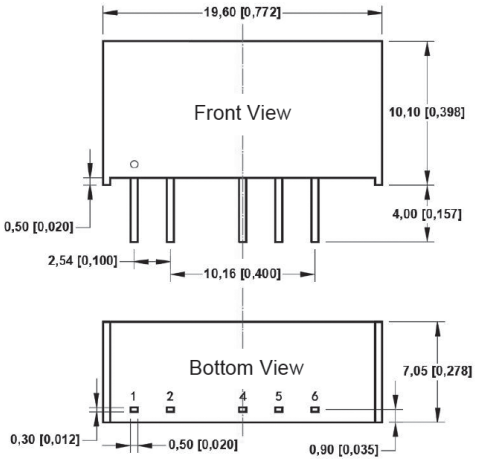
EMI	Input Voltage (VDC)	5/12/15
	C1/C2	4.7μF /50V
	C3	Refer to the Cout parameter in Fig.3
	CY	1nF/4kV
	LDM	6.8μH

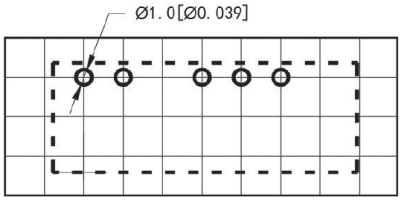
1. Typical applications
To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals.The application circuit is shown in Fig.3. However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is likely 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 Fig.4

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	Single	Dual
1	Vin	Vin
2	GND	GND
4	-Vo	-Vo
5	No Pin	COM
6	+Vo	+Vo

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