

1S7B_3UP series

1W - Single/Dual Output DC-DC Converter - Isolated & Unregulated



DC-DC Converter

1 Watt

- ⊕ SIP7 package type
- ⊕ Operating temperature range: -40°C to +105°C
- ⊕ 3000VDC isolation voltage
- ⊕ Up to 89% high efficiency
- ⊕ Input undervoltage protection
- ⊕ Short circuit protection (SCP)
- ⊕ Overcurrent protection
- ⊕ MTBF: 3,500,000 hours

Introducing our new 1S7B_3UP series, a compact and reliable SIP7 DC-DC converter designed for demanding industrial applications. Engineered to operate across a wide temperature range from -40 °C to +105 °C, it delivers dependable performance even in harsh environments. With reinforced 3000 VDC isolation and up to 89 % efficiency, the series combines high electrical safety with excellent power density. Integrated protection features—including input undervoltage protection, short-circuit protection, and overcurrent protection — ensure stable and secure operation under all conditions.

An MTBF of 3,500,000 hours underlines the long-term reliability of the 1S7B_3UP series, making it an ideal choice for applications where durability, efficiency, and compact design are essential.



Common specifications

Short circuit protection	Continuous, self recovery
Switching frequency	220 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)
Package dimensions	19.60 x 6.00 x 10.10mm
Weight	1.35g (typ.)
Cooling method	Free air convection

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	3.3VDC Input		370/3	-/-15	mA
	5VDC Input		235/3	-/-15	
	12VDC Input		99/3	-/-15	
	15VDC Input		71/3	-/-15	
	24VDC Input		51/3	-/-15	
Reflected ripple current			15		mA
Impulse voltage	3.3VDC Input	-0.7		5	VDC
	5VDC Input	-0.7		9	
	12VDC Input	-0.7		18	
	15VDC Input	-0.7		21	
	24VDC Input	-0.7		30	

Example:

1S7B_2405S3UP

1 = 1Watt; S7 = SIP; B = Series; 24 = 24Vin; 05 = 5Vout; S = Single Output; 3 = 3000VDC isolation; U = Unregulated Output; P = Short circuit protection

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	See envelope curve figure 1				
Linear regulation (input voltage variation ±1%)	3.3VDC output	±1.5			%
	Other output	±1.2			
Load regulation (10% - 100% load)	3.3VDC output		10		%
	5VDC output		10		
	12VDC output		8		
	15VDC output		6		
	24VDC output		6		
Ripple & noise	20MHz Bandwidth (peak to peak)		45	100	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	3000			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;
- Suggested dual output module load imbalance: $\leq \pm 5\%$. If it exceeds $\pm 5\%$, it cannot be guaranteed that the product performance meets all performance indicators in this datasheet;
- 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, Test circuit parameters according to the recommended circuit for application;
- All indicator 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.

1S7B_3UP series

1W - Single/Dual Output DC-DC Converter - Isolated & Unregulated

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	IEC/EN61000-4-2 Contact $\pm 6\text{kV}$		perf. criteria B	

Product Selection Guide

Approval	Part number	Input Voltage Nominal (VDC)	Output Voltage (VDC)	Output Current max.(mA)	Full Load Efficiency (%) typ.	Capacitive Load max. (μF)
	1S7B_0303S3UP	3.3	3.3	303	82	4000
	1S7B_0305S3UP	3.3	5	200	83	4000
	1S7B_0309S3UP	3.3	9	111	84	2000
	1S7B_0312S3UP	3.3	12	84	85	1000
	1S7B_0503S3UP	5	3.3	303	83	4000
	1S7B_0505S3UP	5	5	200	86	4000
	1S7B_0509S3UP	5	9	111	86	2000
	1S7B_0512S3UP	5	12	84	88	1000
	1S7B_0515S3UP	5	15	67	88	680
	1S7B_0524S3UP	5	24	42	89	560
	1S7B_1203S3UP	12	3.3	303	84	4000
	1S7B_1205S3UP	12	5	200	86	4000
	1S7B_1209S3UP	12	9	111	87	2000
	1S7B_1212S3UP	12	12	84	87	1000
	1S7B_1215S3UP	12	15	67	88	680
	1S7B_1224S3UP	12	24	42	89	560
	1S7B_1505S3UP	15	5	200	86	2400
	1S7B_1509S3UP	15	9	111	87	1000
	1S7B_1512S3UP	15	12	84	87	560
	1S7B_1515S3UP	15	15	67	88	560
	1S7B_2403S3UP	24	3.3	303	84	2400
	1S7B_2405S3UP	24	5	200	87	2400
	1S7B_2409S3UP	24	9	111	88	1000
	1S7B_2412S3UP	24	12	84	88	560
	1S7B_2415S3UP	24	15	67	88	560
	1S7B_2424S3UP	24	24	42	89	220

Approval	Part number	Input Voltage Nominal (VDC)	Output Voltage (VDC)	Output Current max.(mA)	Full Load Efficiency (%) typ.	Capacitive Load max. (μF)
	1S7B_0312D3UP	3.3	± 12	± 42	84	560
	1S7B_0315D3UP	3.3	± 15	± 34	84	220
	1S7B_0503D3UP	5	± 3.3	± 152	84	2000
	1S7B_0505D3UP	5	± 5	± 100	86	2000
	1S7B_0509D3UP	5	± 9	± 56	86	1000
	1S7B_0512D3UP	5	± 12	± 42	88	560
	1S7B_0515D3UP	5	± 15	± 34	88	220
	1S7B_0524D3UP	5	± 24	± 21	88	100
	1S7B_1203D3UP	12	± 3.3	± 152	84	2000
	1S7B_1205D3UP	12	± 5	± 100	86	2000
	1S7B_1209D3UP	12	± 9	± 56	87	560
	1S7B_1212D3UP	12	± 12	± 42	87	220
	1S7B_1215D3UP	12	± 15	± 34	88	220
	1S7B_1505D3UP	15	± 5	± 100	86	1000
	1S7B_1512D3UP	15	± 12	± 42	87	220
	1S7B_1515D3UP	15	± 15	± 34	88	220
	1S7B_2405D3UP	24	± 5	± 100	87	1000
	1S7B_2409D3UP	24	± 9	± 56	88	560
	1S7B_2412D3UP	24	± 12	± 42	88	220
	1S7B_2415D3UP	24	± 15	± 34	88	220

Typical characteristics

Temperature derating graph

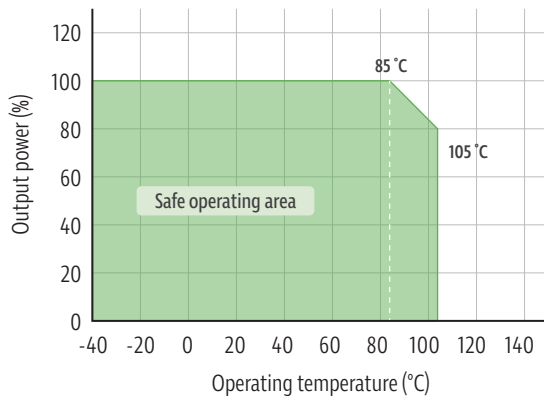


Figure 2

Output regulation curve

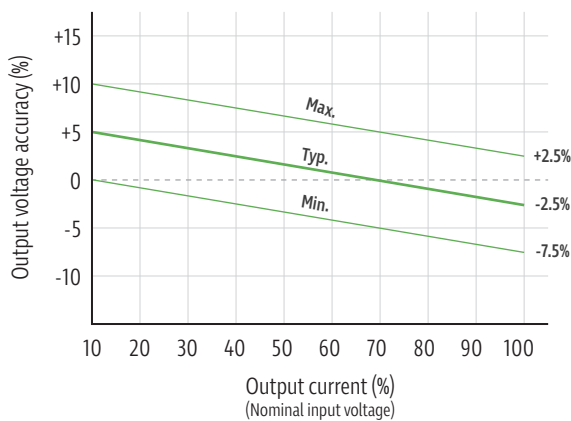


Figure 1-1

Output regulation curve

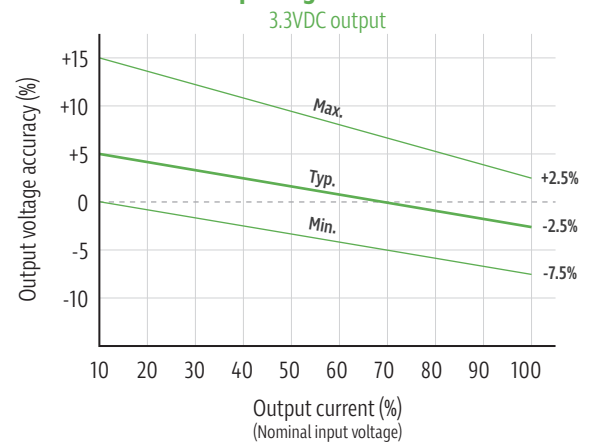
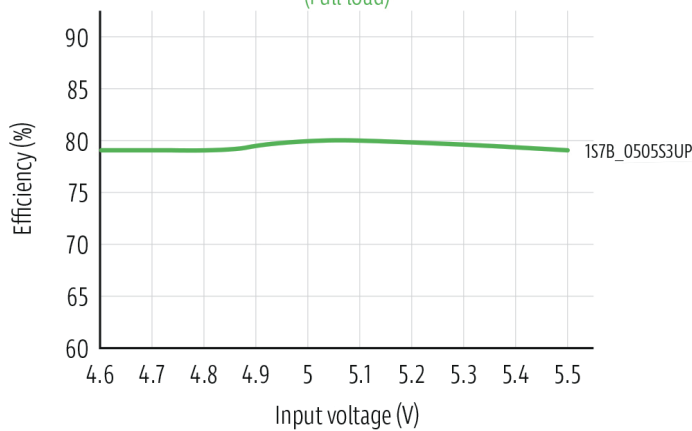
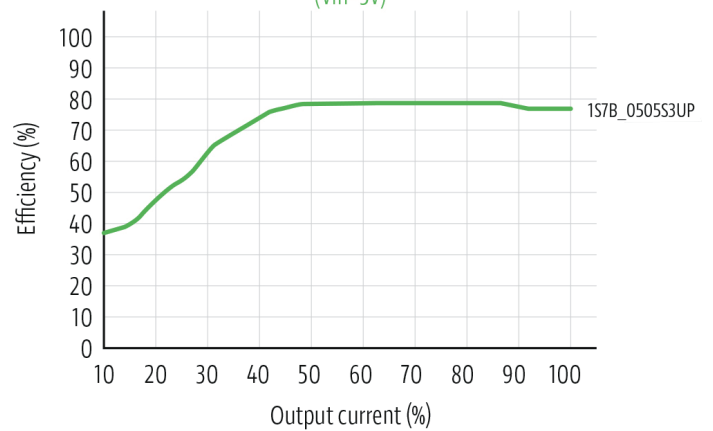


Figure 1-2

Efficiency vs input voltage
(Full load)



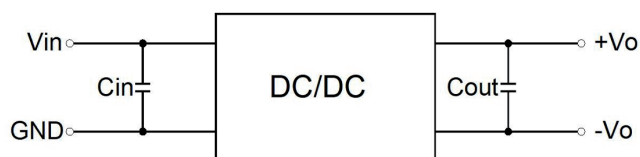
Efficiency vs output load
(Vin=5V)



157B_3UP series

1W - Single/Dual Output DC-DC Converter - Isolated & Unregulated

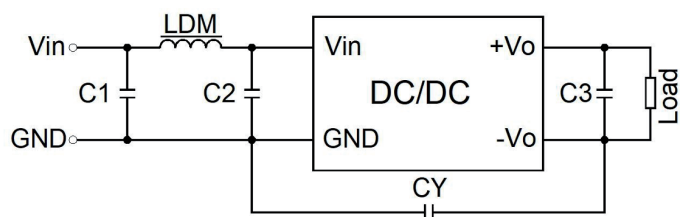
Typical circuit design and application



Recommended Capacitive Load Value Table

Vin	Cin	Vo	Cout (μF)
3.3/5VDC	4.7μF/16V	3.3/5VDC	10
12VDC	2.2μF/25V	12VDC	2.2
15VDC	2.2μF/25V	15VDC	1.0
24VDC	1.0μF/50V	24VDC	0.47

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

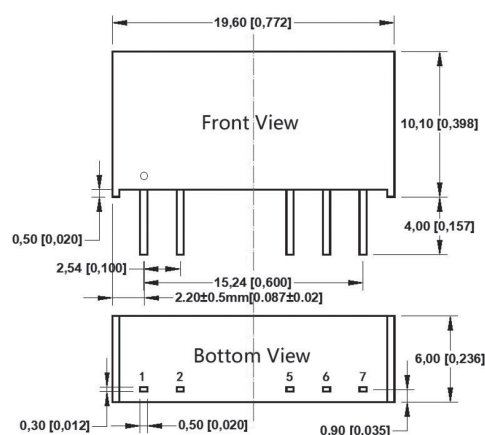
To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals. The application circuit is shown in figure 3. However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is likely to cause start-up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

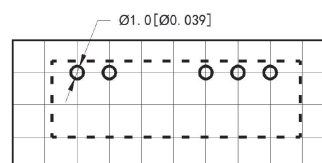
3. Output load requirements

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



Note: The grid distance is 2.54mm x 2.54mm

Pin definition table

Pin	Function (single)	Function (dual)
1	Vin	Vin
2	GND	GND
5	-Vo	-Vo
6	No Pin	COM
7	+Vo	+Vo