

1S7B1_3UP series

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



DC-DC Converter

1 Watt

- 7-Pin SIP package
- No-load input current as low as 5mA
- Continuous short-circuit protection
- Up to 87% efficiency
- Unregulated output types
- 3000VDC isolation
- Operating temperature: -40°C to +105°C (derating)
- Industry standard pinout
- UL/cUL/IEC/EN 62368-1 approved

Introducing our new 7-Pin SIP package 1S7B1_3UP series, designed to meet the highest standards in electronic components. This innovative product boasts a no-load input current as low as 5mA, ensuring efficient energy usage even in idle states. With continuous short-circuit protection, your devices are safeguarded against unexpected surges, maintaining longevity and reliability. Our package offers high efficiency, reaching up to 87%, making it a top choice for those looking to optimize performance. The unregulated output types provide flexibility for various applications, and with a robust 3kVDC isolation, your circuits are well-protected from voltage spikes.

Built to withstand extreme conditions, this product operates seamlessly in temperatures ranging from -40°C to +105°C. Its industry-standard pinout ensures compatibility with a wide range of systems, facilitating easy integration. The series is UL/cUL/IEC/EN 62368-1 approved, adhering to international standards. Choose our 7-Pin SIP package for superior performance and reliability in your electronic projects.



Common specifications	
Short circuit protection	Continuous
Operation temperature	-40°C ~+105°C (with derating)
Storage temperature	-55°C ~+125°C
Humidity	95 %RH (non condensing)
MTBF: (MIL-HDBK-217F@25°C)	3,500,000 Hours
Case material	DAP
Switching frequency	Full load, nominal input @ 3.3V, 5V Vin 215/370kHz Full load, nominal input @ other Vin 250kHz
Dimensions	19.5 x 6.0 x 10.0 mm
Weight	2.1 g
Cooling	Free air Convection

Output specifications						
Item	Test condition	Min	Typ	Max	Units	
Voltage tolerance	100% full load			±5	%	
Line regulation	For 1.0% of Vin			1.2	%	
Load regulation (10% to 100%)	3.3V		15	20	%	
	5V		10	15	%	
	9V		8	10	%	
	12V		7	10	%	
	15V		6	10	%	
Ripple & noise*	24V		5	10	%	
	• BW = DC to 20MHz @Vo: 3.3V, 5V, 9V, 12V, 15V • BW = DC to 20MHz @ Vo: 24V		30	75	mVp-p	
			50	100		

Isolation specifications						
Item	Test condition	Min	Typ	Max	Units	
Isolation voltage	Tested for 1 minute and 1mA max	3000			VDC	
Isolation resistance	Test at 500VDC	1000			MΩ	
Isolation capacitance	Input/Output, 100KHz/0.1V		20		pF	

Input specifications						
Item	Test condition	Min	Typ	Max	Units	
Voltage range	• Vo, Io Nom@Vin: 3.3V, 5V, 9V		±10		%	
	• Vo, Io Nom@Vin: 12V, 15V, 24V		±20		%	
Input filter	Capacitor					

Example:
1S7B1_0509D3UP
1 = 1Watt; S7 = SIP7; B1 = Pinning; 05 = 5Vin; 09 = 9Vout; D = Dual Output;
3 = 3kVDC; U = Unregulated Output; P = Short Circuit Protection

EMC specifications		
EMI	CE	CISPR32/EN55032 CLASS B (see Fig. 1 for recommended circuit)
EMI	RE	CISPR32/EN55032 CLASS B (see Fig. 1 for recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B

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Product Selection Guide - Single output

Approval	Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA) Max./Min.	Full Load Efficiency (%) Typ.	Capacitive Load (μF)Max.
UL	1S7B1_0303S3UP	3.3	3.3	303	76	2400
UL	1S7B1_0305S3UP	3.3	5	200	82	2400
UL	1S7B1_0309S3UP	3.3	9	112	83	1000
UL	1S7B1_0312S3UP	3.3	12	84	84	470
UL	1S7B1_0315S3UP	3.3	15	67	84	330
UL	1S7B1_0324S3UP	3.3	24	42	85	100
UL	1S7B1_0503S3UP	5	3.3	303	76	2400
UL	1S7B1_0505S3UP	5	5	200	82	2400
UL	1S7B1_0509S3UP	5	9	112	83	1000
UL	1S7B1_0512S3UP	5	12	84	84	470
UL	1S7B1_0515S3UP	5	15	67	84	330
UL	1S7B1_0524S3UP	5	24	42	85	100
UL	1S7B1_0903S3UP	5	3.3	303	76	2400
UL	1S7B1_0905S3UP	9	5	200	82	2400
UL	1S7B1_0909S3UP	9	9	112	83	1000
UL	1S7B1_0912S3UP	9	12	84	84	470
UL	1S7B1_0915S3UP	9	15	67	84	330
UL	1S7B1_0924S3UP	9	24	42	85	100
UL	1S7B1_1203S3UP	12	3.3	303	78	2400
UL	1S7B1_1205S3UP	12	5	200	82	2400
UL	1S7B1_1209S3UP	12	9	112	85	1000
UL	1S7B1_1212S3UP	12	12	84	85	680
UL	1S7B1_1215S3UP	12	15	67	87	330
UL	1S7B1_1224S3UP	12	24	42	85	220
UL	1S7B1_1503S3UP	15	3.3	303	78	2400
UL	1S7B1_1505S3UP	15	5	200	82	2400
UL	1S7B1_1509S3UP	15	9	112	85	1000
UL	1S7B1_1512S3UP	15	12	84	85	680
UL	1S7B1_1515S3UP	15	15	67	87	330
UL	1S7B1_1524S3UP	15	24	42	85	220
UL	1S7B1_2403S3UP	24	3.3	303	78	2400
UL	1S7B1_2405S3UP	24	5	200	82	2400
UL	1S7B1_2409S3UP	24	9	112	85	1000
UL	1S7B1_2412S3UP	24	12	84	85	680
UL	1S7B1_2415S3UP	24	15	67	87	330
UL	1S7B1_2424S3UP	24	24	42	85	220

1S7B1_3UP series

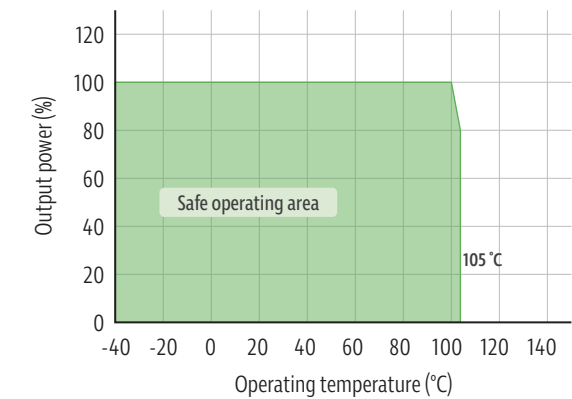
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Product Selection Guide - Dual output

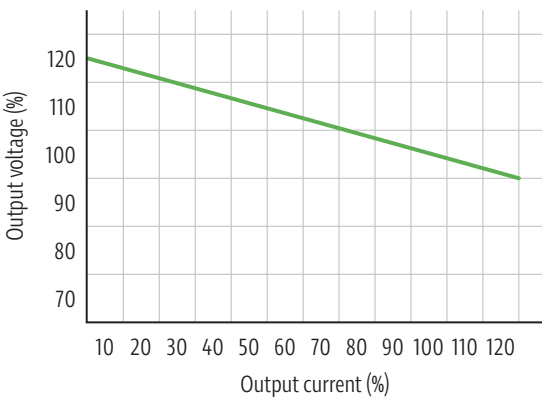
Approval	Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA) Max./Min.	Full Load Efficiency (%) Typ.	Capacitive Load (μF)Max.
UL	1S7B1_0303D3UP	3.3	±3.3	±151	76	±1200
UL	1S7B1_0305D3UP	3.3	±5	±100	82	±1200
UL	1S7B1_0309D3UP	3.3	±9	±56	83	±470
UL	1S7B1_0312D3UP	3.3	±12	±42	84	±220
UL	1S7B1_0315D3UP	3.3	±15	±34	84	±220
UL	1S7B1_0324D3UP	3.3	±24	±21	85	±47
UL	1S7B1_0503D3UP	5	±3.3	±151	76	±1200
UL	1S7B1_0505D3UP	5	±5	±100	82	±1200
UL	1S7B1_0509D3UP	5	±9	±56	83	±470
UL	1S7B1_0512D3UP	5	±12	±42	84	±220
UL	1S7B1_0515D3UP	5	±15	±34	84	±220
UL	1S7B1_0524D3UP	5	±24	±21	85	±47
UL	1S7B1_0903D3UP	5	±3.3	±151	76	±1200
UL	1S7B1_0905D3UP	9	±5	±100	82	±1200
UL	1S7B1_0909D3UP	9	±9	±56	83	±470
UL	1S7B1_0912D3UP	9	±12	±42	84	±220
UL	1S7B1_0915D3UP	9	±15	±34	84	±220
UL	1S7B1_0924D3UP	9	±24	±21	85	±47
UL	1S7B1_1203D3UP	12	±3.3	±151	78	±1200
UL	1S7B1_1205D3UP	12	±5	±100	82	±1200
UL	1S7B1_1209D3UP	12	±9	±56	85	±680
UL	1S7B1_1212D3UP	12	±12	±42	85	±330
UL	1S7B1_1215D3UP	12	±15	±34	87	±220
UL	1S7B1_1224D3UP	12	±24	±21	85	±100
UL	1S7B1_1503D3UP	15	±3.3	±151	78	±1200
UL	1S7B1_1505D3UP	15	±5	±100	82	±1200
UL	1S7B1_1509D3UP	15	±9	±56	85	±680
UL	1S7B1_1512D3UP	15	±12	±42	85	±330
UL	1S7B1_1515D3UP	15	±15	±34	87	±220
UL	1S7B1_1524D3UP	15	±24	±21	85	±100
UL	1S7B1_2403D3UP	24	±3.3	±151	78	±1200
UL	1S7B1_2405D3UP	24	±5	±100	82	±1200
UL	1S7B1_2409D3UP	24	±9	±56	85	±680
UL	1S7B1_2412D3UP	24	±12	±42	85	±330
UL	1S7B1_2415D3UP	24	±15	±34	87	±220
UL	1S7B1_2424D3UP	24	±24	±21	85	±100

Typical characteristics

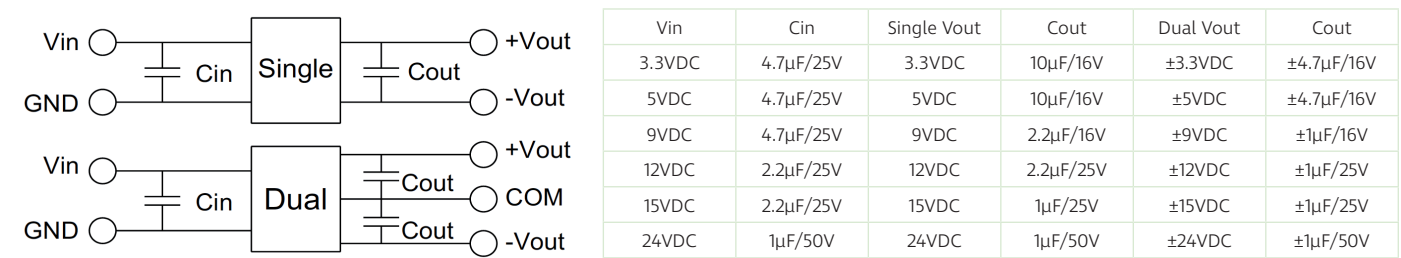
Temperature derating graph



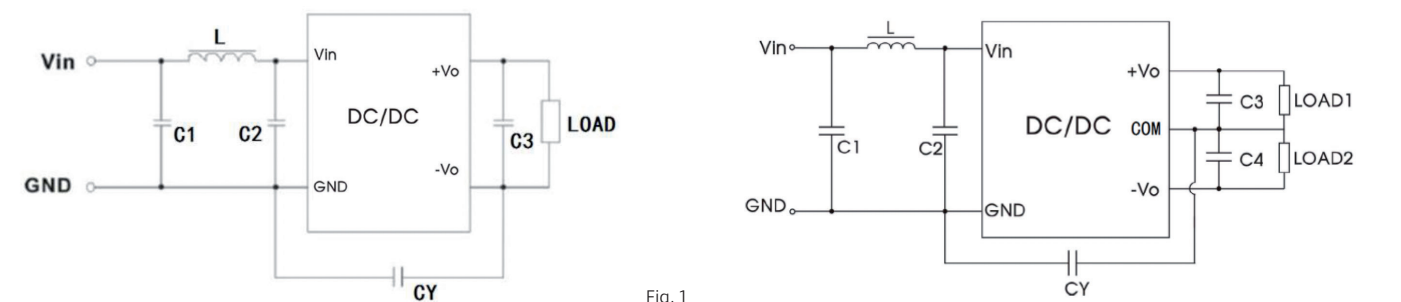
Tolerance envelope graph



Recommended test circuit



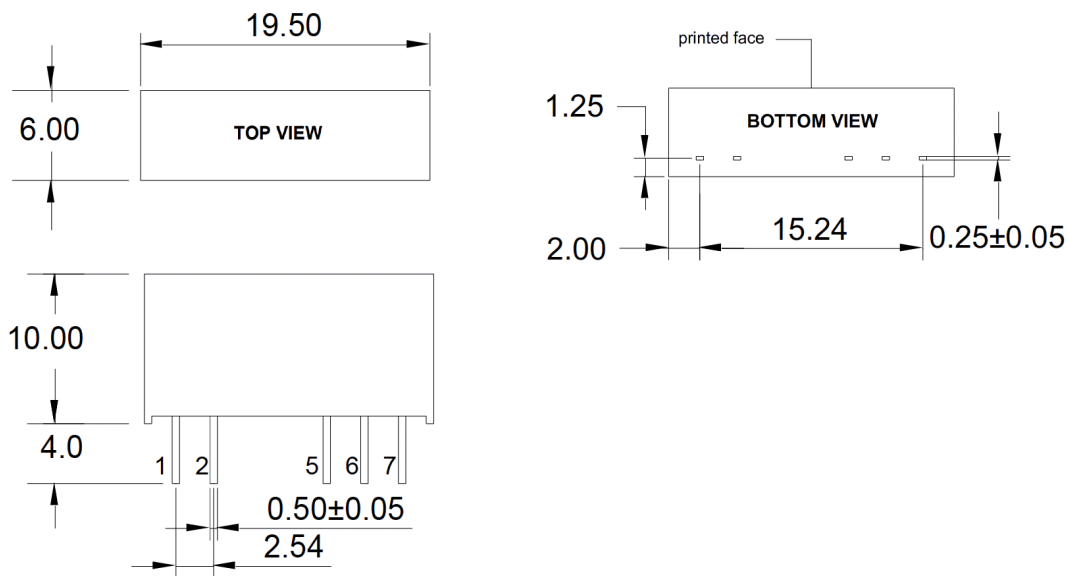
EMC (CLASS B) compliance circuit



EMC recommended circuit value table

EMI	C1	4.7μF /50V
EMI	C2	4.7μF /50V
EMI	CY	1nF/4kV
EMI	C3, C4	Recommended test circuit
EMI	L	6.8μH

Mechanical dimensions



UNIT: mm Unless otherwise specified, all tolerances are ±0.25

PIN Connection					
PIN	1	2	5	6	7
Single	+Vin	-Vin	-Vout	No pin	+Vout
Dual	+Vin	-Vin	-Vout	Com	+Vout