1S7B1_4UP 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
- 4000VDC 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_4UP 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 4kVDC 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.

SHORT CIRCUIT PROTECTED

100% RoHS compliant

c UL us
UL62368 - E347551

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

Input specifications

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

Example:
1S7B1_0509D4UP
1 = 1Watt; S7 = SIP7; B1 = Pinning; 05 = 5Vin; 09 = 9Vout; D = Dual Output; 4 = 4kVDC; U = Unregulated Output; P = Short Circuit Protection

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 5V 9V 12V 15V 24V		15 10 8 7 6 5	20 15 10 10 10 10	% % % % % %
Ripple & noise*	• BW = DC to 20MHz @Vo: 3.3V, 5V,9V, 12V, 15V • BW = DC to 20MHz @ Vo: 24V		30 50	75 100	mVp-p

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation resistance	500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		20		pF
Isolation voltage	Tested for 1 minute		4000		VDC

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

GAPTEC-Electronic GmbH & Co. KG
sales@gaptec-electronic.com – www.gaptec-electronic.com
Specifications subject to change without notice.

Product Selection Guide - Single output

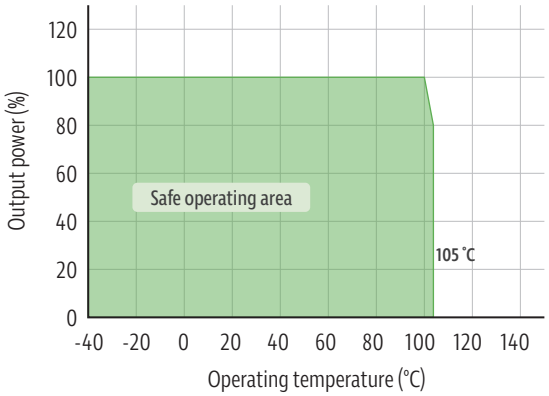
Approval	Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA) Max./Min.	Full Load Efficiency (%) Typ.	Capacitive Load (µF)Max.
UL	1S7B1_0303S4UP	3.3	3.3	303	76	2400
UL	1S7B1_0305S4UP	3.3	5	200	82	2400
UL	1S7B1_0309S4UP	3.3	9	112	83	1000
UL	1S7B1_0312S4UP	3.3	12	84	84	470
UL	1S7B1_0315S4UP	3.3	15	67	84	330
UL	1S7B1_0324S4UP	3.3	24	42	85	100
UL	1S7B1_0503S4UP	5	3.3	303	76	2400
UL	1S7B1_0505S4UP	5	5	200	82	2400
UL	1S7B1_0509S4UP	5	9	112	83	1000
UL	1S7B1_0512S4UP	5	12	84	84	470
UL	1S7B1_0515S4UP	5	15	67	84	330
UL	1S7B1_0524S4UP	5	24	42	85	100
UL	1S7B1_0903S4UP	5	3.3	303	76	2400
UL	1S7B1_0905S4UP	9	5	200	82	2400
UL	1S7B1_0909S4UP	9	9	112	83	1000
UL	1S7B1_0912S4UP	9	12	84	84	470
UL	1S7B1_0915S4UP	9	15	67	84	330
UL	1S7B1_0924S4UP	9	24	42	85	100
UL	1S7B1_1203S4UP	12	3.3	303	78	2400
UL	1S7B1_1205S4UP	12	5	200	82	2400
UL	1S7B1_1209S4UP	12	9	112	85	1000
UL	1S7B1_1212S4UP	12	12	84	85	680
UL	1S7B1_1215S4UP	12	15	67	87	330
UL	1S7B1_1224S4UP	12	24	42	85	220
UL	1S7B1_1503S4UP	15	3.3	303	78	2400
UL	1S7B1_1505S4UP	15	5	200	82	2400
UL	1S7B1_1509S4UP	15	9	112	85	1000
UL	1S7B1_1512S4UP	15	12	84	85	680
UL	1S7B1_1515S4UP	15	15	67	87	330
UL	1S7B1_1524S4UP	15	24	42	85	220
UL	1S7B1_2403S4UP	24	3.3	303	78	2400
UL	1S7B1_2405S4UP	24	5	200	82	2400
UL	1S7B1_2409S4UP	24	9	112	85	1000
UL	1S7B1_2412S4UP	24	12	84	85	680
UL	1S7B1_2415S4UP	24	15	67	87	330
UL	1S7B1_2424S4UP	24	24	42	85	220

Product Selection Guide - Dual output

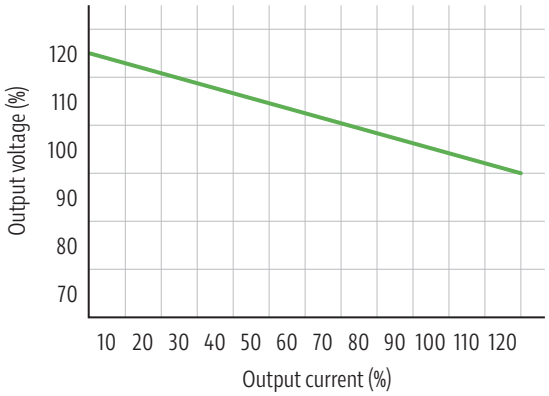
Approval	Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA) Max./Min.	Full Load Efficiency (%) Typ.	Capacitive Load (µF)Max.
UL	1S7B1_0303D4UP	3.3	±3.3	±151	76	±1200
UL	1S7B1_0305D4UP	3.3	±5	±100	82	±1200
UL	1S7B1_0309D4UP	3.3	±9	±56	83	±470
UL	1S7B1_0312D4UP	3.3	±12	±42	84	±220
UL	1S7B1_0315D4UP	3.3	±15	±34	84	±220
UL	1S7B1_0324D4UP	3.3	±24	±21	85	±47
UL	1S7B1_0503D4UP	5	±3.3	±151	76	±1200
UL	1S7B1_0505D4UP	5	±5	±100	82	±1200
UL	1S7B1_0509D4UP	5	±9	±56	83	±470
UL	1S7B1_0512D4UP	5	±12	±42	84	±220
UL	1S7B1_0515D4UP	5	±15	±34	84	±220
UL	1S7B1_0524D4UP	5	±24	±21	85	±47
UL	1S7B1_0903D4UP	5	±3.3	±151	76	±1200
UL	1S7B1_0905D4UP	9	±5	±100	82	±1200
UL	1S7B1_0909D4UP	9	±9	±56	83	±470
UL	1S7B1_0912D4UP	9	±12	±42	84	±220
UL	1S7B1_0915D4UP	9	±15	±34	84	±220
UL	1S7B1_0924D4UP	9	±24	±21	85	±47
UL	1S7B1_1203D4UP	12	±3.3	±151	78	±1200
UL	1S7B1_1205D4UP	12	±5	±100	82	±1200
UL	1S7B1_1209D4UP	12	±9	±56	85	±680
UL	1S7B1_1212D4UP	12	±12	±42	85	±330
UL	1S7B1_1215D4UP	12	±15	±34	87	±220
UL	1S7B1_1224D4UP	12	±24	±21	85	±100
UL	1S7B1_1503D4UP	15	±3.3	±151	78	±1200
UL	1S7B1_1505D4UP	15	±5	±100	82	±1200
UL	1S7B1_1509D4UP	15	±9	±56	85	±680
UL	1S7B1_1512D4UP	15	±12	±42	85	±330
UL	1S7B1_1515D4UP	15	±15	±34	87	±220
UL	1S7B1_1524D4UP	15	±24	±21	85	±100
UL	1S7B1_2403D4UP	24	±3.3	±151	78	±1200
UL	1S7B1_2405D4UP	24	±5	±100	82	±1200
UL	1S7B1_2409D4UP	24	±9	±56	85	±680
UL	1S7B1_2412D4UP	24	±12	±42	85	±330
UL	1S7B1_2415D4UP	24	±15	±34	87	±220
UL	1S7B1_2424D4UP	24	±24	±21	85	±100

Typical characteristics

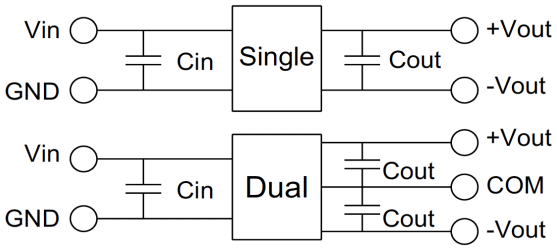
Temperature derating graph



Tolerance envelope graph



Recommended test circuit



Vin	Cin	Single Vout	Cout	Dual Vout	Cout
3.3VDC	4.7μF/25V	3.3VDC	10μF/16V	±3.3VDC	±4.7μF/16V
5VDC	4.7μF/25V	5VDC	10μF/16V	±5VDC	±4.7μF/16V
9VDC	4.7μF/25V	9VDC	2.2μF/16V	±9VDC	±1μF/16V
12VDC	2.2μF/25V	12VDC	2.2μF/25V	±12VDC	±1μF/25V
15VDC	2.2μF/25V	15VDC	1μF/25V	±15VDC	±1μF/25V
24VDC	1μF/50V	24VDC	1μF/50V	±24VDC	±1μF/50V

EMC (CLASS B) compliance circuit

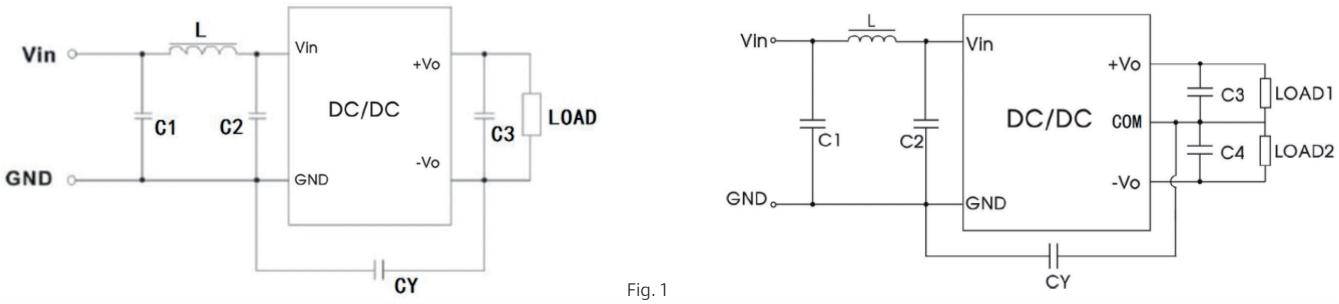
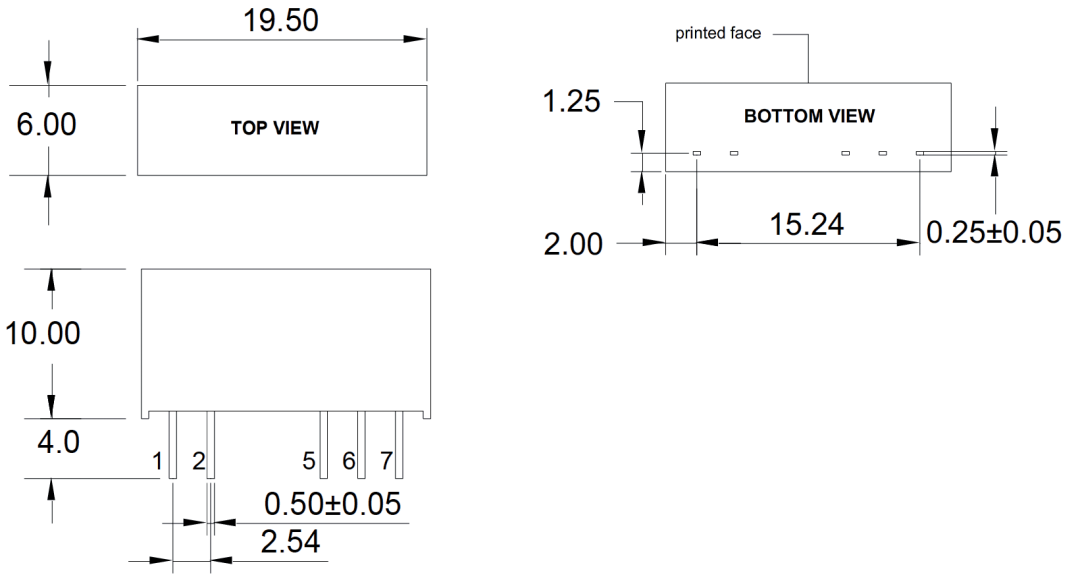


Fig. 1

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