1S7A1_1.5UP 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
- High efficiency up to 87%
- Unregulated output types
- 1.5kVDC isolation
- Operating temperature: -40°C to +105°C
- Industry standard pinout
- UL/cUL/IEC/EN 62368-1 approved

Introducing our advanced 7-Pin SIP 1S7A1_1.5UP series, featuring remarkable efficiency and performance. With a no-load input current as low as 5mA and high efficiency up to 87%, this package ensures optimal power usage.

It provides continuous short-circuit protection and offers unregulated output types with 1.5kVDC isolation. Designed to operate in extreme temperatures ranging from -40°C to +105°C, it adheres to industry-standard pinouts. Moreover, it is UL/cUL/IEC/EN 62368-1 approved, ensuring compliance with global safety standards.

UL-62368-1 (E347551)

Common specifications

Short circuit protection	Continuous
Operation temperature	-40°C ~+105°C
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:
1S7A1_0509D1.5UP
1 = 1Watt; S7 = SIP7; A1 = Series; 05 = 5Vin; 09 = 9Vout; D = Dual Output;
1.5 = 1.5kVDC isolation; 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	3.3V (10% to 100% F.L.) 5V (10% to 100% F.L.) 9V (10% to 100% F.L.) 12V (10% to 100% F.L.) 15V (10% to 100% F.L.) 24V (10% to 100% F.L.)		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
Insulation resistance	500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		20		pF
Isolation voltage		1500			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

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Product Selection Guide - Single output

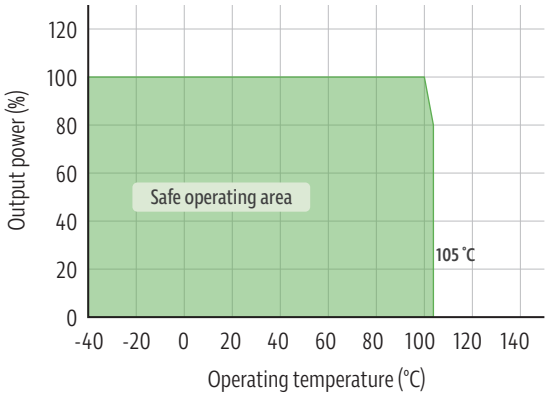
Approval	Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA) Max./Min.	Full Load Efficiency (%) Min./Typ.	Capacitive Load (µF)Max.
	1S7A1_0303S1.5UP	3.3	3.3	303	76	2400
	1S7A1_0305S1.5UP	3.3	5	200	82	2400
	1S7A1_0309S1.5UP	3.3	9	112	83	1000
	1S7A1_0312S1.5UP	3.3	12	84	84	470
	1S7A1_0315S1.5UP	3.3	15	67	84	330
	1S7A1_0324S1.5UP	3.3	24	42	85	100
	1S7A1_0503S1.5UP	5	3.3	303	76	2400
	1S7A1_0505S1.5UP	5	5	200	82	2400
	1S7A1_0509S1.5UP	5	9	112	83	1000
	1S7A1_0512S1.5UP	5	12	84	84	470
	1S7A1_0515S1.5UP	5	15	67	84	330
	1S7A1_0524S1.5UP	5	24	42	85	100
	1S7A1_0903S1.5UP	9	3.3	303	76	2400
	1S7A1_0905S1.5UP	9	5	200	82	2400
	1S7A1_0909S1.5UP	9	9	112	83	1000
	1S7A1_0912S1.5UP	9	12	84	84	470
	1S7A1_0915S1.5UP	9	15	67	84	330
	1S7A1_0924S1.5UP	9	24	42	85	100
	1S7A1_1203S1.5UP	12	3.3	303	78	2400
	1S7A1_1205S1.5UP	12	5	200	82	2400
	1S7A1_1209S1.5UP	12	9	112	85	1000
	1S7A1_1212S1.5UP	12	12	84	85	680
	1S7A1_1215S1.5UP	12	15	67	87	330
	1S7A1_1224S1.5UP	12	24	42	85	220
	1S7A1_1503S1.5UP	15	3.3	303	78	2400
	1S7A1_1505S1.5UP	15	5	200	82	2400
	1S7A1_1509S1.5UP	15	9	112	85	1000
	1S7A1_1512S1.5UP	15	12	84	85	680
	1S7A1_1515S1.5UP	15	15	67	87	330
	1S7A1_1524S1.5UP	15	24	42	85	220
	1S7A1_2403S1.5UP	24	3.3	303	78	2400
	1S7A1_2405S1.5UP	24	5	200	82	2400
	1S7A1_2409S1.5UP	24	9	112	85	1000
	1S7A1_2412S1.5UP	24	12	84	85	680
	1S7A1_2415S1.5UP	24	15	67	87	330
	1S7A1_2424S1.5UP	24	24	42	85	220

Product Selection Guide - Dual output

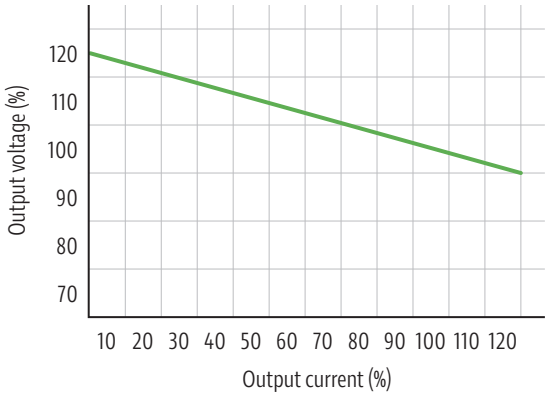
Approval	Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA) Max./Min.	Full Load Efficiency (%) Min./Typ.	Capacitive Load (µF)Max.
	1S7A1_0303D1.5UP	3.3	±3.3	±151	76	±1200
	1S7A1_0305D1.5UP	3.3	±5	±100	82	±1200
	1S7A1_0309D1.5UP	3.3	±9	±56	83	±470
	1S7A1_0312D1.5UP	3.3	±12	±42	84	±220
	1S7A1_0315D1.5UP	3.3	±15	±34	84	±220
	1S7A1_0324D1.5UP	3.3	±24	±21	85	±47
	1S7A1_0503D1.5UP	5	±3.3	±151	76	±1200
	1S7A1_0505D1.5UP	5	±5	±100	82	±1200
	1S7A1_0509D1.5UP	5	±9	±56	83	±470
	1S7A1_0512D1.5UP	5	±12	±42	84	±220
	1S7A1_0515D1.5UP	5	±15	±34	84	±220
	1S7A1_0524D1.5UP	5	±24	±21	85	±47
	1S7A1_0903D1.5UP	9	±3.3	±151	76	±1200
	1S7A1_0905D1.5UP	9	±5	±100	82	±1200
	1S7A1_0909D1.5UP	9	±9	±56	83	±470
	1S7A1_0912D1.5UP	9	±12	±42	84	±220
	1S7A1_0915D1.5UP	9	±15	±34	84	±220
	1S7A1_0924D1.5UP	9	±24	±21	85	±47
	1S7A1_1203D1.5UP	12	±3.3	±151	78	±1200
	1S7A1_1205D1.5UP	12	±5	±100	82	±1200
	1S7A1_1209D1.5UP	12	±9	±56	85	±680
	1S7A1_1212D1.5UP	12	±12	±42	85	±330
	1S7A1_1215D1.5UP	12	±15	±34	87	±220
	1S7A1_1224D1.5UP	12	±24	±21	85	±100
	1S7A1_1503D1.5UP	15	±3.3	±151	78	±1200
	1S7A1_1505D1.5UP	15	±5	±100	82	±1200
	1S7A1_1509D1.5UP	15	±9	±56	85	±680
	1S7A1_1512D1.5UP	15	±12	±42	85	±330
	1S7A1_1515D1.5UP	15	±15	±34	87	±220
	1S7A1_1524D1.5UP	15	±24	±21	85	±100
	1S7A1_2403D1.5UP	24	±3.3	±151	78	±1200
	1S7A1_2405D1.5UP	24	±5	±100	82	±1200
	1S7A1_2409D1.5UP	24	±9	±56	85	±680
	1S7A1_2412D1.5UP	24	±12	±42	85	±330
	1S7A1_2415D1.5UP	24	±15	±34	87	±220
	1S7A1_2424D1.5UP	24	±24	±21	85	±100

Typical characteristics

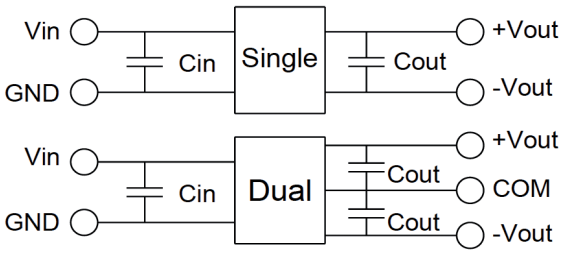
Temperature derating graph



Tolerance envelope graph

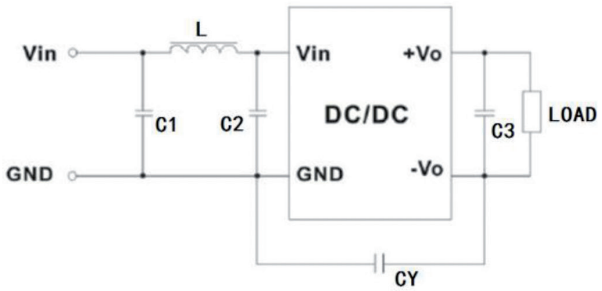


Recommended test circuit



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



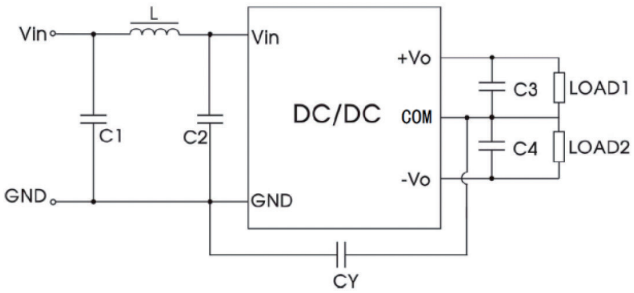
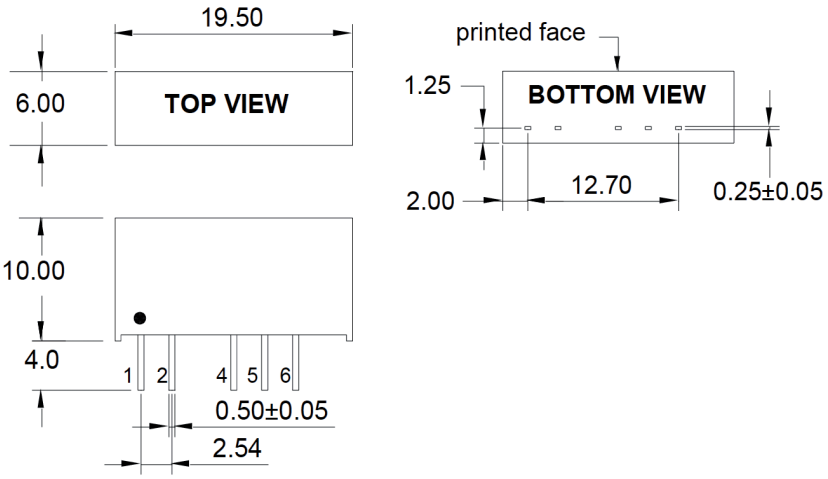


Fig. 1

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	4	5	6
(Single)	+Vin	-Vin	-Vout	No Pin	+Vout
(Dual)	+Vin	-Vin	-Vout	Com	+Vout