1T8A4_1.5UP series

1W - Single Output DC-DC converter - Isolated & Unregulated

DC-DC Converter 1 Watt

- SMD8 package type
- Operating temperature range: -40°C to +105°C
- 1500VDC isolation voltage
- Up to 88% efficiency
- No-load input current as low as 5mA
- MTBF: 3,500,000 hours

Introducing our new 1T8A4_1.5UP series — a compact, high-performance DC-DC converter line in a space-saving SMD8 package, engineered for demanding, thermally challenging applications. Operating reliably across a wide temperature range from –40°C to +105°C and featuring a reinforced 1500 VDC isolation voltage, this series delivers robust electrical protection and excellent long-term stability. With efficiency levels of up to 88% and a no-load input current as low as 5 mA, the converters offer highly efficient power usage even in low-load or standby conditions. An impressive MTBF of 3,500,000 hours underscores the durability and reliability of the design, making the 1T8A4_1.5UP series an ideal choice for modern high-density, high-efficiency system architectures.

SHORT CIRCUIT PROTECTED

100% RoHS compliant 6/6

c UL us
UL62368 - E347551

Common specifications

Short circuit protection	Continuous, self recovery
Switching frequency	220KHz (typ.) full load, nominal input voltage
Operating temperature	-40°C - +105°C (with derating)
Storage temperature	-55°C - +125°C
Case temperature rise	+25°C (Ta = 25°C nominal input, output load)
Reflow temperature	Peak temp. ≤245°C, maximum duration time ≤60s over 217°C
Storage humidity	95% RH (non-condensing)
Input filter	Capacitance filter
Hot plug	Unavailable
MTBF (MIL-HDBK-217F@25°C)	> 3,500,000 Hours
Case material	Black plastic; flame-retardant and heat-resistant (UL94V-0 rated)
Package dimensions	13.50 x 11.10 x 7.25 mm
Weight	1.7g (typ.)
Cooling method	Free air convection

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input Current (full load/no load)	3.3VDC Input 5VDC Input 12VDC Input 15VDC Input 24VDC Input		370/6 230/5 99/4 78/3 51/3	--/17 --/15 --/15 --/15 --/15	mA
Reflected Ripple Current			15		mA
Impulse Voltage	3.3VDC Input 5VDC Input 12VDC Input 15VDC Input 24VDC Input	-0.7 -0.7 -0.7 -0.7 -0.7		9 15 18 21 21	VDC

Example:
1T8A4_0512S1.5UP
1 = 1Watt; T8 = SMT8; A4 = Series; 05 = 5Vin; 12 = 12Vout; S = Single Output; 1.5 = 1.5kVDC isolation; U = Unregulated Output; P = Short circuit protection.

EMC specifications

EMI	CE	CISPR32/EN55032 CLASS B	
EMI	RE	CISPR32/EN55032 CLASS B	
EMS	ESD	IEC/EN61000-4-2 Air ±8kV, contact ±4kV	perf. criteria B

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Output voltage accuracy	See Envelope Curve Figure 1				
Linear regulation (Input voltage variation ±1%)	3.3VDC output Others output			±1.5 ±1.2	%
Load regulation (10% - 100% load)	3.3VDC output 5VDC output 9VDC output 12VDC output 15VDC output 24VDC output		15 10 9 8 7 6		%
Ripple & noise	20MHz Bandwidth(peak-peak)		60	120	mV
Temperature coeffcient	Full Load		±0.03	--	%/°C

Isolation specifications

Item	Operating Conditions	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 datasheet 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.

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Product Selection Guide

Approval	Part number	Input Voltage (VDC) Nominal	Output Voltage (VDC)	Output Current min. (mA)	Output Current max. (mA)	Full Load Efficiency % (typ.)	Capacitive Load (µF) max.
	1T8A4_0303S1.5UP	3.3	3.3	30	303	80	2400
	1T8A4_0305S1.5UP	3.3	5	20	200	82	2400
	1T8A4_0309S1.5UP	3.3	9	11	111	83	1200
	1T8A4_0312S1.5UP	3.3	12	8	84	84	820
	1T8A4_0503S1.5UP	5	3.3	30	303	82	3000
UL	1T8A4_0505S1.5UP	5	5	20	200	85	3000
	1T8A4_0509S1.5UP	5	9	11	111	86	1200
UL	1T8A4_0512S1.5UP	5	12	8	84	86	820
	1T8A4_0515S1.5UP	5	15	7	67	86	680
	1T8A4_0524S1.5UP	5	24	4	42	87	330
	1T8A4_1203S1.5UP	12	3.3	30	303	82	3000
	1T8A4_1205S1.5UP	12	5	20	200	85	3000
	1T8A4_1209S1.5UP	12	9	11	111	86	1200
	1T8A4_1212S1.5UP	12	12	8	84	86	820
	1T8A4_1215S1.5UP	12	15	7	67	86	680
	1T8A4_1224S1.5UP	12	24	4	42	88	330
	1T8A4_1505S1.5UP	15	5	20	200	86	3000
	1T8A4_1512S1.5UP	15	12	8	84	87	820
	1T8A4_1515S1.5UP	15	15	7	67	88	680
	1T8A4_2403S1.5UP	24	3.3	30	303	82	3000
	1T8A4_2405S1.5UP	24	5	20	200	85	3000
	1T8A4_2409S1.5UP	24	9	11	111	86	1200
	1T8A4_2412S1.5UP	24	12	8	84	87	820
	1T8A4_2415S1.5UP	24	15	7	67	87	680
	1T8A4_2424S1.5UP	24	24	4	42	88	330

Product characteristic curve

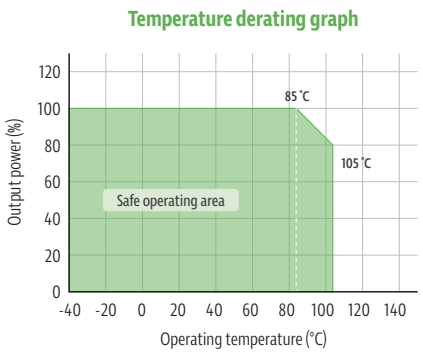


Figure 2

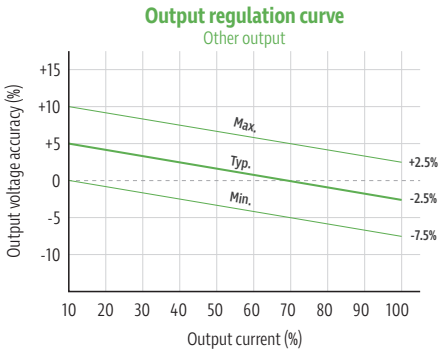


Figure 1-1

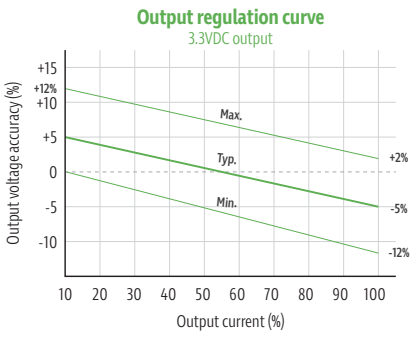
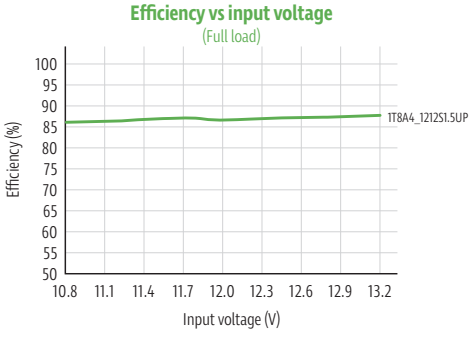
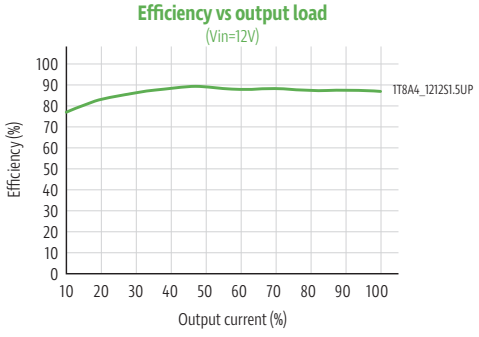
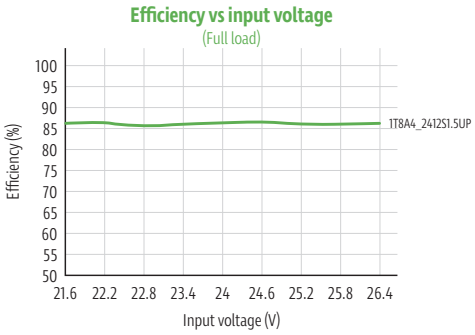


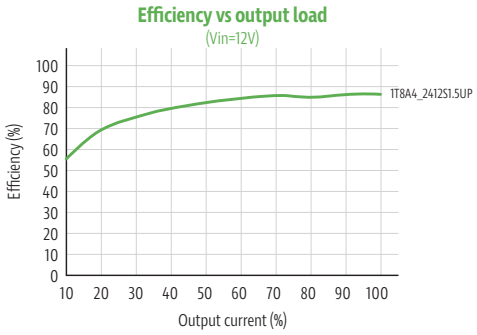
Figure 1-2





Product characteristic curve





Recommended Circuits for Application

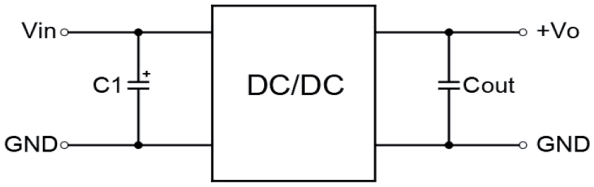


Figure 3

Recommended Capacitive Load Value Table

Vin (VDC)	Cin (μF)	Vo (VDC)	Cout (μF)
3.3/5	10	3.3/5	10
12	4.7	9	4.7
15	2.2	12	2.2
24	1	15	1
		24	0.47

Recommended EMC Circuit

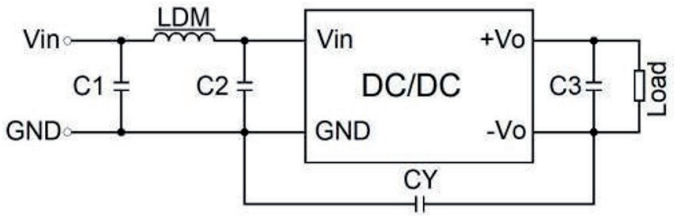


Figure 4

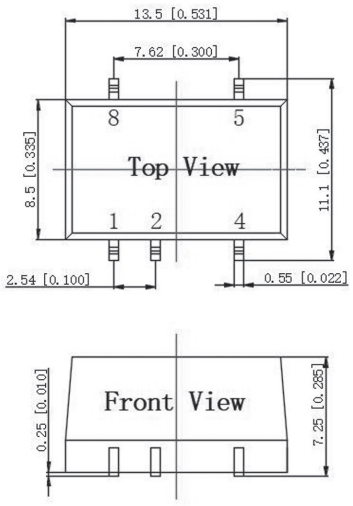
EMI recommended parameter table		
EMI	C1, C2	4.7μF / 50μF
	C3	Refer to the Cout parameter in Figure 3
	CY	270pF / 2kV
	LDM	6.8μH

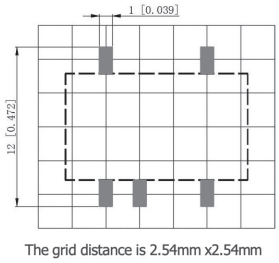
1.Typical applications
To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals.The application circuit is shown in Figure 3. However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is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





The grid distance is 2.54mm x2.54mm

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

Pin definition table

Pin	Function
1	GND
2	Vin
4	-Vo
5	+Vo
8	NC

NC: cannot be connected to any external circui