



## 1T8A2\_1.5UP series

1W - Single Output DC-DC Converter - Fixed Input - Isolated & Unregulated

### DC-DC Converter 1 Watt

- ⊕ 8PIN SMD Package
- ⊕ No load input current as low as 5 mA
- ⊕ 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
- ⊕ IEC62368, UL62368, EN62368

The 1T8A2\_1.5UP series is specially designed for applications where a group of polar power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is fixed (voltage variation  $\leq \pm 10\%$ )
- 2) Where isolation is necessary between input and output (isolation voltage  $\leq 1500\text{VDC}$ )
- 3) Where the regulation of the output voltage and the output ripple noise are not demanding. Such as: digit circuit condition; normal low-frequency artificial circuit condition; relay drive circuit condition, etc.



Common specifications	
Short circuit protection:	continuous
Operation temperature range:	-40°C ~ +105°C
Storage temperature range:	-55°C ~ +125°C
Storage humidity range:	< 95% (Non Condensing)
MTBF (MIL-HDBK-217F@25°C):	>3,500,000 hours
Case material:	DAP
Cooling:	Free air convection
Dimensions:	12.7 x 7.6 x 6.25 mm
Weight:	1.2 g

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Voltage range (Vo,Io Nom)	Vin: 3.3V, 5V			$\pm 10$	%
	Vin: 9V, 12V, 15V, 24V			$\pm 20$	%
Filter	Capacitor				

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input to output	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100KHz/0.1V		20		pF

EMC specifications		
Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 1 for recommended circuit)
Emissions	RE	CISPR32/EN55032 CLASS B (see Fig. 1 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Air $\pm 8\text{kV}$ , Contact $\pm 4\text{kV}$ perf. Criteria B

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Voltage tolerance	100% full load			$\pm 5$	%
Line regulation	For Vin change of 1%		$\pm 1.2$		%
Load regulation	• 3.3V (10% To 100% F.L)		15	20	%
	• 5V (10% To 100% F.L)		10	15	%
	• 9V (10% To 100% F.L)		8	10	%
	• 12V (10% To 100% F.L)		7	10	%
	• 15V (10% To 100% F.L)		6	10	%
Ripple & Noise* (BW = DC To 20MHz)	• Vo: 3.3V, 5V, 9V, 12V, 15V		30	75	mVp-p
Switching frequency (Full load, nominal input)	• 3.3V,5V Vin		215/370		KHz
	• Other Vin		250		KHz

\* Ripple and noise tested with "parallel cable" method. See detailed operation instructions at DC-DC Application Notes.

#### Example:

#### 1T8A2\_1205S1.5UP

1 = 1Watt; T8 = SMT8; A2 = Series; 12 = 12Vin; 05 = 5Vout;  
 S = Single output; 1.5 = 1.5kVDC isolation; U = Unregulated output;  
 P = Short circuit protection (SCP)

#### Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed.
2. Max. Capacitive Load tested at input voltage range and full load.
3. All specifications measured at Ta = 25°C, humidity < 75%, nominal input voltage and rated output load unless otherwise specified.
4. In this datasheet, all the test methods of indications are based on our corporate standards.

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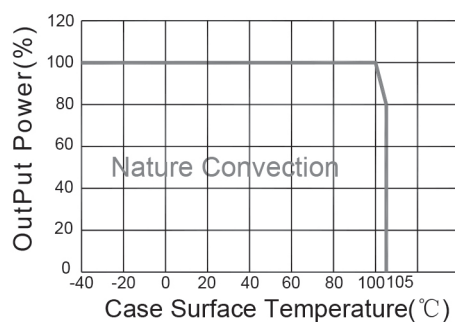
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### Product Selection Guide

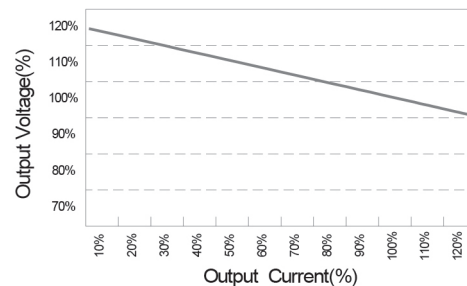
Part Number	Output Voltage [VDC]	Output Current [mA]	Efficiency [%, typ]	Capacitive Load [ $\mu$ F]
1T8A2_0303S1.5UP	3.3	303	76	2400
1T8A2_0305S1.5UP	5	200	82	2400
1T8A2_0309S1.5UP	9	112	83	1000
1T8A2_0312S1.5UP	12	84	84	470
1T8A2_0315S1.5UP	15	67	84	330
1T8A2_0503S1.5UP	3.3	303	76	2400
1T8A2_0505S1.5UP	5	200	82	2400
1T8A2_0509S1.5UP	9	112	83	1000
1T8A2_0512S1.5UP	12	84	84	470
1T8A2_0515S1.5UP	15	67	84	330
1T8A2_0903S1.5UP	3.3	303	76	2400
1T8A2_0905S1.5UP	5	200	82	2400
1T8A2_0909S1.5UP	9	112	83	1000
1T8A2_0912S1.5UP	12	84	84	470
1T8A2_0915S1.5UP	15	67	84	330
1T8A2_1203S1.5UP	3.3	303	78	2400
1T8A2_1205S1.5UP	5	200	82	2400
1T8A2_1209S1.5UP	9	112	85	1000
1T8A2_1212S1.5UP	12	84	85	680
1T8A2_1215S1.5UP	15	67	87	330
1T8A2_1503S1.5UP	3.3	303	78	2400
1T8A2_1505S1.5UP	5	200	82	2400
1T8A2_1509S1.5UP	9	112	85	1000
1T8A2_1512S1.5UP	12	84	85	680
1T8A2_1515S1.5UP	15	67	87	330
1T8A2_2403S1.5UP	3.3	303	78	2400
1T8A2_2405S1.5UP	5	200	82	2400
1T8A2_2409S1.5UP	9	112	85	1000
1T8A2_2412S1.5UP	12	84	85	680
1T8A2_2415S1.5UP	15	67	87	330

### Typical characteristics

Temperature derating graph



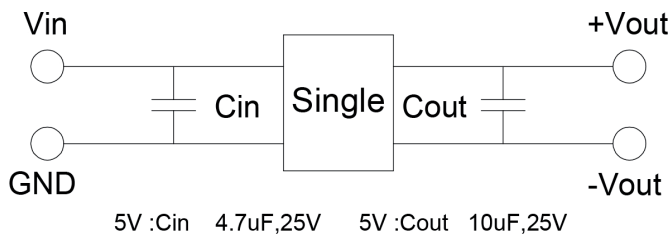
Tolerance envelope graph



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### Recommended test circuit



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

### Recommended test circuit

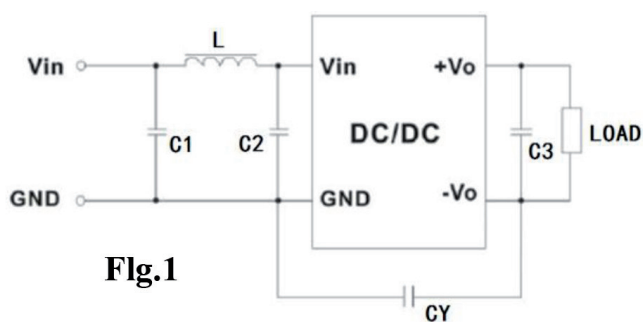
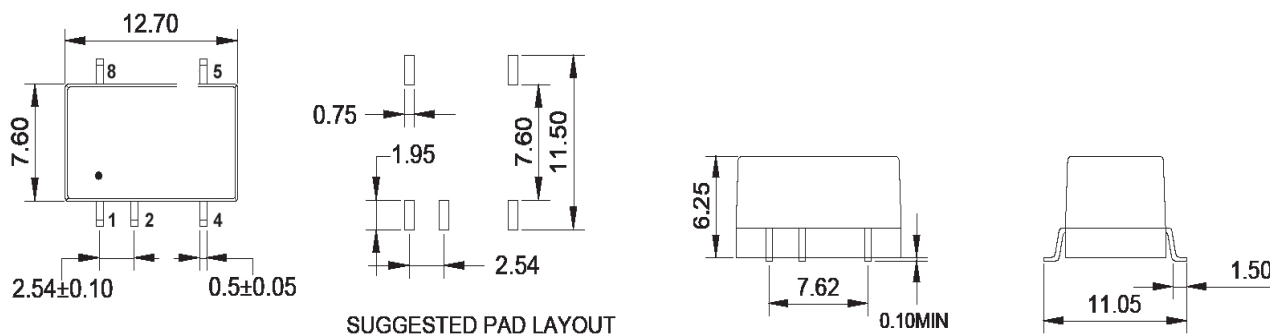


Fig.1

EMC recommended circuit value table		
Emissions	C1	4.7μF /50V
Emissions	C2	4.7μF /50V
Emissions	CY	1nF/4kV
Emissions	C3	Recommended Test Circuit
Emissions	L	6.8μH

### Mechanical dimensions



SUGGESTED PAD LAYOUT

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

PIN	Single
1	-Vin
2	+Vin
4	-Vout
5	+Vout
8	NC
Other	NO PIN