

## 1T8B\_1U Series

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

### DC-DC Converter

1 Watt

- ⊕ Small footprint
- ⊕ Miniature SMD package style
- ⊕ High efficiency up to 80%
- ⊕ 1000VDC isolation
- ⊕ Temperature range: -40°C ~ +85°C
- ⊕ Industry standard pinout
- ⊕ Low temperature rise
- ⊕ Internal SMD construction
- ⊕ No external component required
- ⊕ RoHS compliance

The 1T8B\_1U 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  $\leq 1000\text{VDC}$ )
- 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:	1 second
Temperature rise at full load:	25°C TYP (Ta = 25°C)
Cooling:	Free air convection
Operation temperature range:	-40°C ~ +85°C
Storage temperature range:	-40°C ~ +100°C
Lead temperature	300°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	< 95%
Package material:	Epoxy Resin [UL94-V0]
MTBF (MIL-HDBK-217F@25°C):	>3,500,000 hours
Dimensions:	12.7x7.6x6.25mm
Weight:	1g

Output specifications						
Item	Test condition	Min	Typ	Max	Units	
Voltage tolerance			$\pm 5$			%
Line regulation	For Vin change of 1%		1.2			%
Load regulation	10% to 100% load		15			%
	• 3.3V					
	• 5V			15	%	
	• 9V			9	%	
	• 12V			7.5	%	
• 15V		7	%			
Transient response setting time	50% load step change		350			$\mu\text{s}$
Temperature drift	100% full load			$\pm 0.03$		%/°C
Ripple & Noise*	20MHz Bandwidth			100		mVp-p
Switching frequency	Full load, nominal input		100			KHz

Input specifications						
Item	Test condition	Min	Typ	Max	Units	
Voltage tolerance				$\pm 10$		%
Filter	Capacitor					

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

#### Example:

**1T8B\_0505S1U**  
**1 = 1Watt; T8 = SMT8; E = Series; 05 = 5Vin; 05 = 5Vout;**  
**S = Single output; 1 = 1kVDC; U = Unregulated output**

Isolation specifications						
Item	Test condition	Min	Typ	Max	Units	
Isolation voltage	Input to Output (2sec/0.5mA)	1000				VDC
Isolation resistance	Test at 500VDC	1000				M $\Omega$

#### 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.

Part Number	Input Voltage [V]	Output Voltage [VDC]	Output Current [mA]	Capacitive load [ $\mu\text{F}$ , Max.]	Efficiency [%, typ]
1T8B_xx03S1U	3.3; 5; 9; 12; 15	3.3	303	220	65
1T8B_xx05S1U	3.3; 5; 9; 12; 15	5	200	220	70
1T8B_xx09S1U	3.3; 5; 9; 12; 15	9	111	220	75
1T8B_xx12S1U	3.3; 5; 9; 12; 15	12	84	220	78
1T8B_xx15S1U	3.3; 5; 9; 12; 15	15	67	220	80

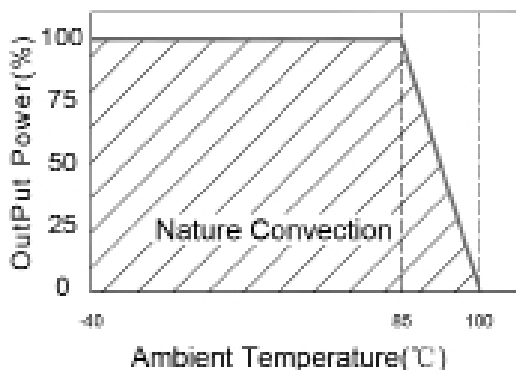
- xx = Input Voltage (possible for other input and output voltage combinations on request)
- Vin = 3.3VDC, xx = 03
- Vin = 5VDC, xx = 05
- Vin = 9VDC, xx = 09
- Vin = 12VDC, xx = 12
- Vin = 15VDC, xx = 15

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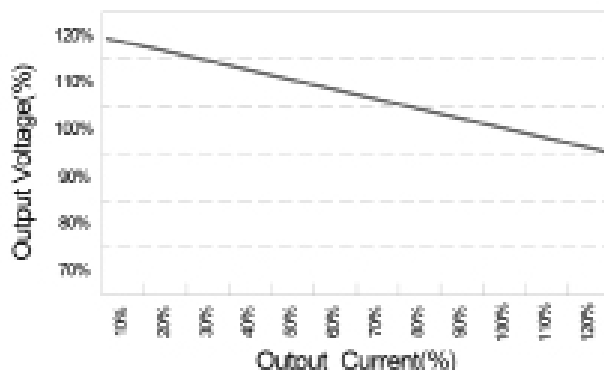
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## Typical characteristics

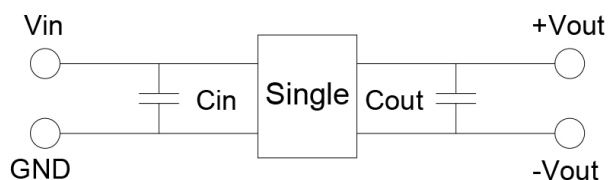
Temperature derating graph



Tolerance envelope graph



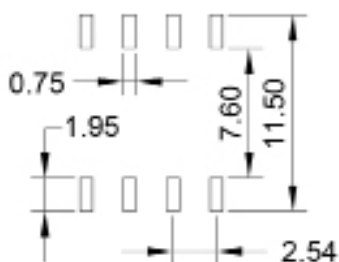
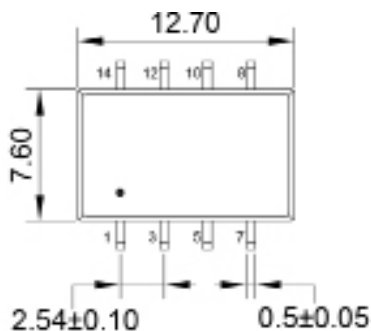
## Recommended test circuit



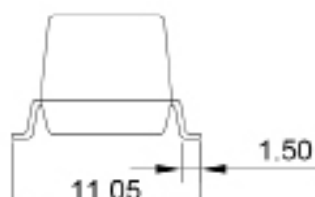
3.3V: Cin 4.7uF, 25V  
 5V: Cin 4.7uF, 25V  
 9V: Cin 4.7uF, 25V  
 12V: Cin 2.2uF, 25V  
 15V: Cin 1uF, 50V

3.3V: Cout 22uF, 16V  
 5V: Cout 10uF, 25V  
 9V: Cout 4.7uF, 25V  
 12V: Cout 2.2uF, 25V  
 15V: Cout 1uF, 50V

## Mechanical dimensions



SUGGESTED PAD LAYOUT



PIN	Single
1	-Vin
3	+Vin
7	-Vout
8	+Vout
Other	NC

**Note:**  
 Unit: mm[inch]  
 General tolerances: ±0.25mm[ ±0.010inch]