1T8E_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 70%
- 1000VDC isolation
- Temperature range: -40°C ~ +85°C
- Industry standard pinout
- Low temperature rise
- Internal SMD construction
- No external component required
- RoHS compliance

The 1T8E_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 ≤ ±10%)
2) Where isolation is necessary between input and output (isolation voltage ≤1000VDC)
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
Weight:	1g
MSL (Moisture sensitivity level):	J-STD-020D standard - Level 2

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input voltage			5		VDC
Input voltage range			±10		%
Filter	Capacitor				

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			MΩ

Output specifications

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

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

Example:
1T8E_0505S1U
1 = 1Watt; T8 = SMT8; E = Series; 05 = 5Vin; 05 = 5Vout;
S = Single output; 1 = 1kVDC; U = Unregulated output

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 [µF, Max.]	Efficiency [%, typ]
1T8E_xx03S1U	3.3; 5; 9; 12; 15	3.3	303	220	65
1T8E_xx05S1U	3.3; 5; 9; 12; 15	5	200	220	70
1T8E_xx09S1U	3.3; 5; 9; 12; 15	9	110	220	75
1T8E_xx12S1U	3.3; 5; 9; 12; 15	12	84	220	78
1T8E_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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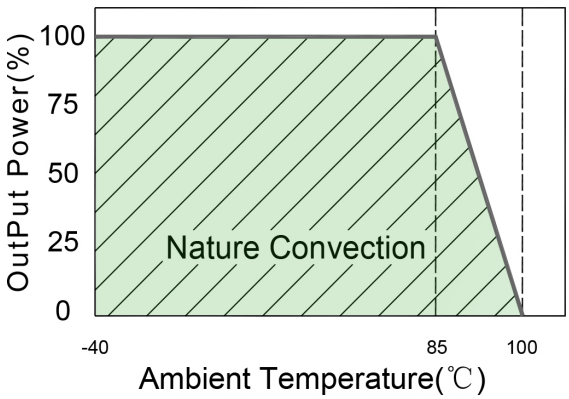
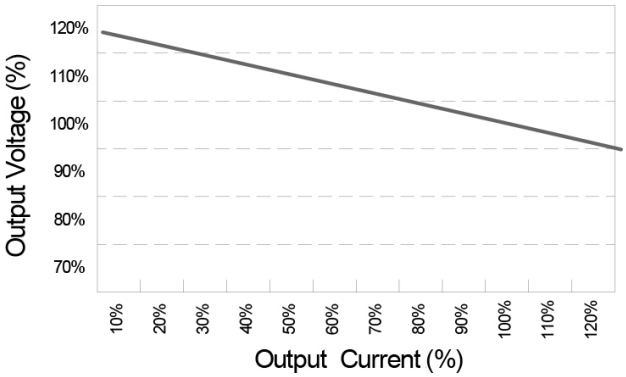
Specifications subject to change without notice.

Typical characteristics

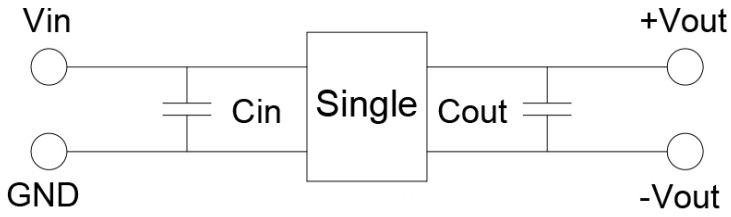
Temperature derating graph



Tolerance envelope graph



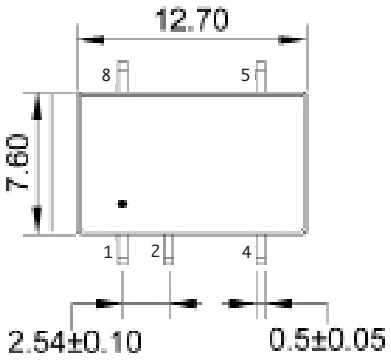
Recommended test circuit

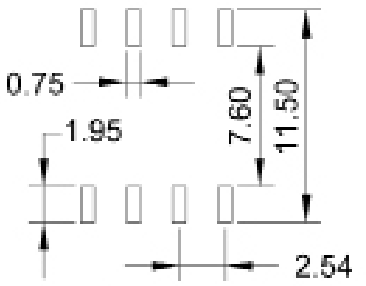


3.3V: Cin 4.7uF, 25V
5V: Cin 4.7uF, 25V
9V: Cin 4.7uF, 25V
12V: Cin 2.2uF, 25V
15V: Cin 1uF, 50V

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

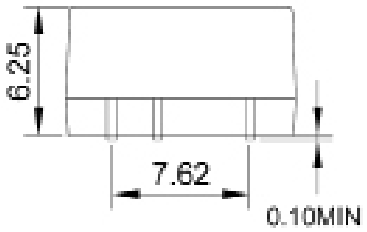
Mechanical dimensions

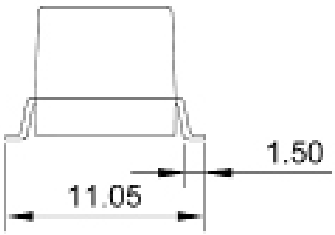




SUGGESTED PAD LAYOUT

PIN	Single
1	-Vin
2	+Vin
4	-Vout
5	+Vout
8	NC





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

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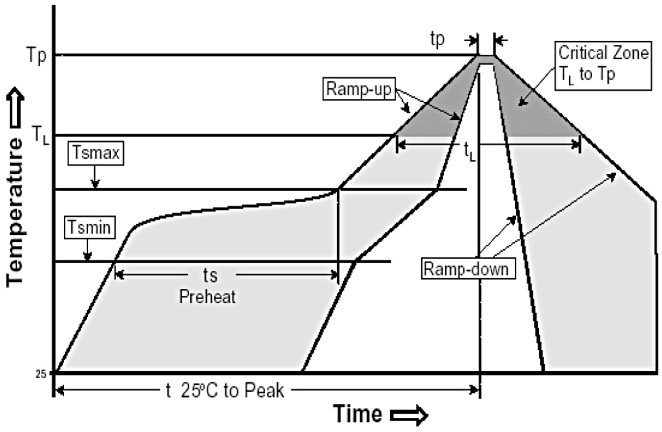
RoHS compliant type

Our RoHS parts just can withstand IR Reflow peak temperature: 240°C MAX as the following profile:

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Ts max to Tp)	3°C /second max.
Preheat -Temperature Min (Ts min) -Temperature Max (Ts max) -Time (ts min to ts max)	 150°C 200°C 60-180 seconds
Time maintained above -Temperature (TL) -Time (tL)	 217°C 60-150 seconds
Peak/Classification Temperature (Tp)	240°C max.
Time within 5°C of actual Peak Temperature (tp)	20-40 seconds
Ramp-Down Rate	6°C/seconds max.
Time 25°C to Peak Temperature	6 minutes max.



Packing informations

