



1T12A_3U Series

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

DC-DC Converter

1 Watt

- ⊕ Small footprint
- ⊕ 12Pin SMD package
- ⊕ 3kVDC isolation
- ⊕ High efficiency up to 80%
- ⊕ RoHS Compliance

- ⊕ Operating temperature range: -40°C ~ +85°C
- ⊕ International standard pinout
- ⊕ No external component required

The 1T12A_3U Series are specially designed for applications where an isolated voltage is required in a distributed power supply system.

They are suitable for

- 1) Where the voltage of the input power supply is stable (voltage variation: $\pm 10\%V_{in}$);
- 2) Where isolation between input and output is necessary (isolation voltage $\leq 3000VDC$);
- 3) Where the output voltage regulation is not strictly required;
- 4) Typical application: preceding-stage interference isolation condition; ground-interference canceled condition; digit circuit condition; Voltage-isolation converting condition; normal low-frequency artificial circuit condition; relay drive circuit condition, etc.



Common specifications

| | |
|--------------------------------|---|
| Short circuit protection: | short term, 1 sec. |
| Temperature rise at full load: | 25°C TYP |
| Cooling: | Free air convection |
| Operation temperature range: | -40°C~+85°C |
| Storage temperature range: | -40°C ~+100°C |
| Storage humidity range: | < 95% |
| Case material: | Epoxy resin [UL94-V0] |
| MTBF: | >3,500,000 hours |
| Weight: | 1.36g (15V: 1.5g) |
| Dimensions: | 15.24x8.0x7.30mm (15V: 15.24x8.0x8.50mm) |

Output specifications

| Item | Test condition | Min | Typ | Max | Units |
|---------------------------------|---|-----|---------|------------|---------|
| Output voltage accuracy | | | ± 5 | | % |
| Line regulation | For V_{in} change of $\pm 1\%$ | | 1.2 | | % |
| Load regulation | 10% to 100% load • 3.3V output • 5V/9V output • 12V/15V output | | 15 | | % |
| | | | | 12/8 | % |
| | | | | 8.5/7 | % |
| Temperature drift | 100% full load | | | ± 0.03 | %/°C |
| Ripple & Noise* | 20MHz Bandwidth | | | 75 | mVp-p |
| Transient response setting time | 50% load step change | | 350 | | μs |
| Switching frequency | Full load, nominal input | | 100 | | KHz |

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at application notes.

Input specifications

| Item | Test condition | Min | Typ | Max | Units |
|---------------------|----------------|-----|----------|-----|-------|
| Input voltage range | | | ± 10 | | % |
| Input Filter | Capacitor | | | | |

Isolation specifications

| Item | Test condition | Min | Typ | Max | Units |
|----------------------|---|------|-----|-----|-------|
| Isolation voltage | Input-output (2sec/0.5mA) | 3000 | | | VDC |
| Isolation resistance | Input-output, insulation voltage 500VDC | 1000 | | | MΩ |

Example:

1T12A_0515S3U

1 = 1Watt; T12 = SMT12; A = Series; 5Vin; 15Vout; S = Single output;
3 = 3kVDC isolation; U = Unregulated output

Note:

1. If the product is operated under the min. required load, the product performance cannot be guaranteed to comply with all performance indexes in this datasheet;
2. The max. capacitive load should be tested within the input voltage range and under full load conditions;
3. Unless otherwise specified, data in this data sheet should be tested under the conditions of $T_a = 25^\circ C$, humidity <75% when inputting nominal voltage and outputting rated load;
4. All index testing methods in this datasheet are based on our Company's corporate standards;

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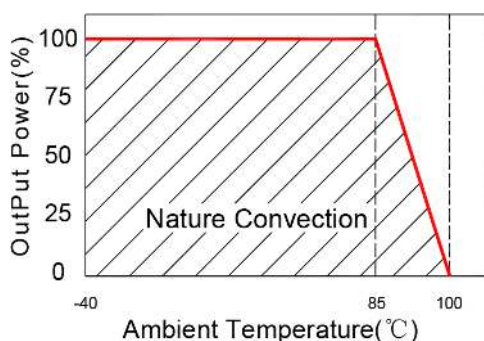
| Part Number | Input Voltage [V] | Output Voltage [VDC] | Output current [mA; typ] | Efficiency [%; Typ] @ full load |
|---------------|-------------------|----------------------|--------------------------|---------------------------------|
| 1T12A_xx03S3U | 3.3, 5, 9, 12, 15 | 3.3 | 303 | 65 |
| 1T12A_xx05S3U | 3.3, 5, 9, 12, 15 | 5 | 200 | 70 |
| 1T12A_xx09S3U | 3.3, 5, 9, 12, 15 | 9 | 112 | 75 |
| 1T12A_xx12S3U | 3.3, 5, 9, 12, 15 | 12 | 84 | 78 |
| 1T12A_xx15S3U | 3.3, 5, 9, 12, 15 | 15 | 67 | 80 |
| 1T12A_xx03D3U | 3.3, 5, 9, 12, 15 | ±3.3 | ±150 | 65 |
| 1T12A_xx05D3U | 3.3, 5, 9, 12, 15 | ±5 | ±100 | 70 |
| 1T12A_xx09D3U | 3.3, 5, 9, 12, 15 | ±9 | ±56 | 75 |
| 1T12A_xx12D3U | 3.3, 5, 9, 12, 15 | ±12 | ±42 | 78 |
| 1T12A_xx15D3U | 3.3, 5, 9, 12, 15 | ±15 | ±34 | 80 |

Note:
 „xx“ is input voltage:
 03 = 3.3VDC
 05 = 5VDC
 09 = 9VDC
 12 = 12VDC
 15 = 15VDC

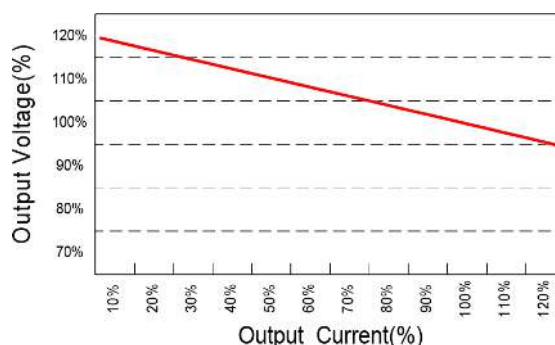
Recognized by UL 60950-1: 1T12A_0503S3U, 1T12A_0505S3U, 1T12A_0509S3U, 1T12A_0512S3U, 1T12A_0515S3U and 1T12A_1205S3U

Typical characteristics

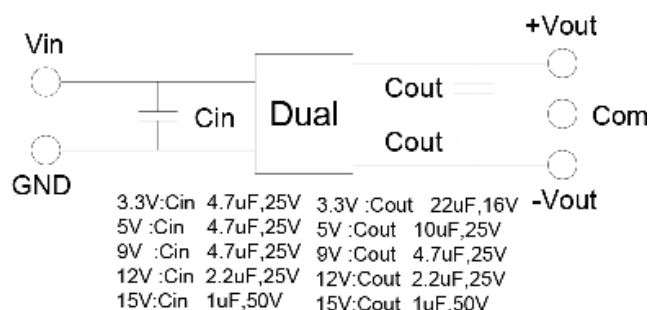
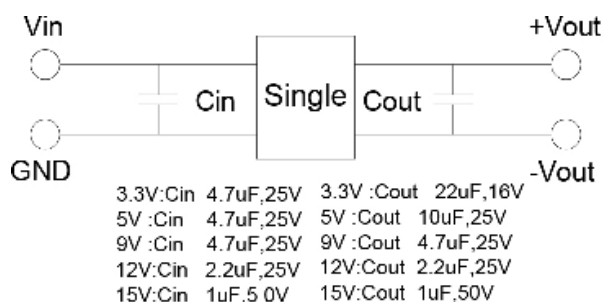
Temperature derating graph



Tolerance envelope graph



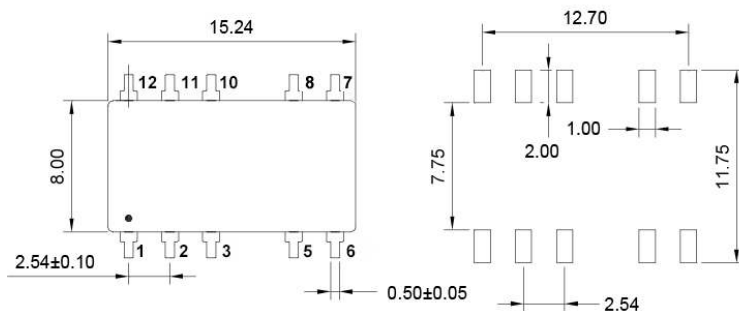
Recommended test circuit



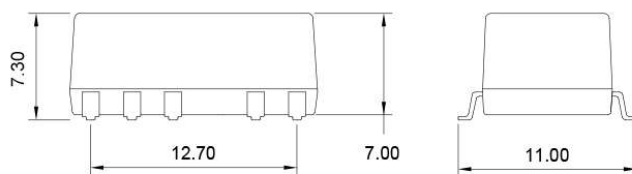
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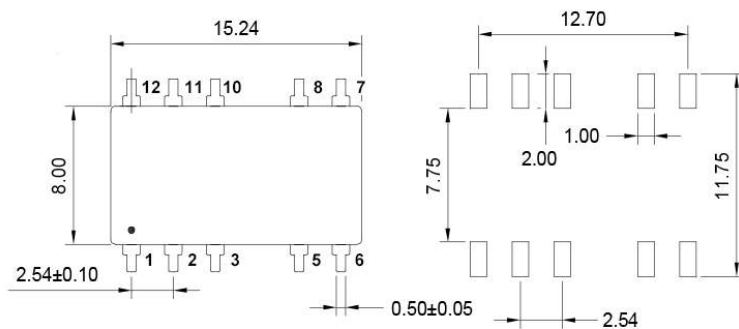
Mechanical dimensions



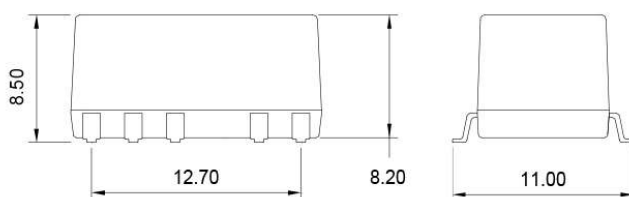
SUGGESTED PAD LAYOUT



Output 15V



SUGGESTED PAD LAYOUT



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

| PIN | 1 | 2 | 3 | 5 | 6 | 7 | 8 | 10 | 11 | 12 |
|--------|------|------|----|-------|-------|----|-------|----|----|----|
| SINGLE | -Vin | +Vin | NC | -Vout | NC | NC | +Vout | NC | NC | NC |
| DUAL | -Vin | +Vin | NC | Com | -Vout | NC | +Vout | NC | NC | NC |