

## 2T8A2\_1.5UP series

2W - Single Output DC-DC Converter - Isolated & Unregulated

### DC-DC Converter

2 Watt

- ⊕ 8-Pin SMD package
- ⊕ No-load input current as low as 5mA
- ⊕ Continuous short-circuit protection
- ⊕ High Efficiency up to 89%
- ⊕ Unregulated output types
- ⊕ 1.5kVDC isolation
- ⊕ Operating temperature: -40°C to +105°C
- ⊕ Industry standard pinout
- ⊕ Design adheres to IEC62368, UL62368, EN62368

Introducing our latest 2T8A2\_1.5UP series in a 8-Pin SMD package, designed for high efficiency up to 89% and featuring a no-load input current as low as 5mA. This unit offers continuous short-circuit protection, unregulated output types, and 1.5kVDC isolation. It operates reliably within a temperature range of -40°C to +105°C and follows industry-standard pinout.

Additionally, the design adheres to IEC62368, UL62368, and EN62368 standards, ensuring top-notch safety and performance.



| Common specifications      |   |
|----------------------------|---|
| Short circuit protection   | Continuous  |
| Operation temperature      | -40°C ~+105°C   |
| Storage temperature        | -55°C ~+125°C   |
| Humidity                   | 95 %RH (Non Condensing)   |
| MTBF: (MIL-HDBK-217F@25°C) | 3,500,000 Hours   |
| Hot plug                   |   |
| Case material              | DAP   |
| Switching frequency        | Full load, nominal input @5V Vin 215 KHz<br>Full load, nominal input @other Vin 250 KHz |
| Dimensions                 | 12.7 x 7.6 x 6.25 mm (Others)   |
| Weight                     | 1.2g  |
| Cooling                    | Free air Convection   |

| Input specifications |                |     |     |     |       |  |
|----------------------|----------------|-----|-----|-----|-------|--|
| Item                 | Test condition | Min | Typ | Max | Units |  |
| Voltage Range        | Vo,Io Nom      |     | ±10 |     | %     |  |
| Input filter         | Capacitor      |     |     |     |       |  |

#### Example:

#### 2T8A2\_0509S1.5UP

2 = 2Watt; T8 = SMT8; A2 = Pinning; 05 = 5Vin; 09 = 9Vout; S = Single Output; 1.5 = 1.5kVDC; U = Unregulated Output; P = Short Circuit Protection

| Output specifications |                       |     |     |     |       |  |
|-----------------------|-----------------------|-----|-----|-----|-------|--|
| Item                  | Test condition        | Min | Typ | Max | Units |  |
| Voltage Tolerance     | 100% full load        |     |     | ±5  | %     |  |
| Line regulation       | For 1.0% of Vin       |     |     | 1.2 | %     |  |
| Load regulation       | 5V (10% To 100% F.L)  |     | 8   | 15  | %     |  |
|                       | 9V (10% To 100% F.L)  |     | 6   | 10  |       |  |
|                       | 12V (10% To 100% F.L) |     | 5   | 10  |       |  |
|                       | 15V (10% To 100% F.L) |     | 4   | 10  |       |  |
| Ripple & Noise*       | BW = DC To 20MHz      |     | 75  | 150 | mVp-p |  |

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

| EMC specifications |     |  |  |  |  |  |
|--------------------|-----|--|--|--|--|--|
| EMI                | CE  | CISPR32/EN55032 CLASS B (see Fig. 1 for recommended circuit) |  |  |  |  |
| EMI                | RE  | CISPR32/EN55032 CLASS B (see Fig. 1 for recommended circuit) |  |  |  |  |
| EMS                | ESD | IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B      |  |  |  |  |

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### Product Selection Guide - Single output

| Approval | Model            | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) Max./Min. | Full Load Efficiency (%) Min./Typ. | Capacitive Load (μF)Max. |
|----------|------------------|---------------------|----------------------|-------------------------------|------------------------------------|--------------------------|
|          | 2T8A2_0305S1.5UP | 3.3                 | 5                    | 400                           | 85                                 | 2400                     |
|          | 2T8A2_0309S1.5UP | 3.3                 | 9                    | 223                           | 87                                 | 820                      |
|          | 2T8A2_0312S1.5UP | 3.3                 | 12                   | 167                           | 87                                 | 470                      |
|          | 2T8A2_0315S1.5UP | 3.3                 | 15                   | 133                           | 88                                 | 220                      |

| Approval | Model            | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) Max./Min. | Full Load Efficiency (%) Min./Typ. | Capacitive Load (μF)Max. |
|----------|------------------|---------------------|----------------------|-------------------------------|------------------------------------|--------------------------|
|          | 2T8A2_0505S1.5UP | 5                   | 5                    | 400                           | 85                                 | 2400                     |
|          | 2T8A2_0509S1.5UP | 5                   | 9                    | 223                           | 87                                 | 820                      |
|          | 2T8A2_0512S1.5UP | 5                   | 12                   | 167                           | 87                                 | 470                      |
|          | 2T8A2_0515S1.5UP | 5                   | 15                   | 133                           | 88                                 | 220                      |

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|----------|------------------|---------------------|----------------------|-------------------------------|------------------------------------|--------------------------|
|          | 2T8A2_0905S1.5UP | 9                   | 5                    | 400                           | 85                                 | 2400                     |
|          | 2T8A2_0909S1.5UP | 9                   | 9                    | 223                           | 87                                 | 820                      |
|          | 2T8A2_0912S1.5UP | 9                   | 12                   | 167                           | 87                                 | 470                      |
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|----------|------------------|---------------------|----------------------|-------------------------------|------------------------------------|--------------------------|
|          | 2T8A2_1205S1.5UP | 12                  | 5                    | 400                           | 85                                 | 2400                     |
|          | 2T8A2_1209S1.5UP | 12                  | 9                    | 223                           | 87                                 | 820                      |
|          | 2T8A2_1212S1.5UP | 12                  | 12                   | 167                           | 87                                 | 470                      |
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|----------|------------------|---------------------|----------------------|-------------------------------|------------------------------------|--------------------------|
|          | 2T8A2_1505S1.5UP | 15                  | 5                    | 400                           | 85                                 | 2400                     |
|          | 2T8A2_1509S1.5UP | 15                  | 9                    | 223                           | 87                                 | 820                      |
|          | 2T8A2_1512S1.5UP | 15                  | 12                   | 167                           | 87                                 | 470                      |
|          | 2T8A2_1515S1.5UP | 15                  | 15                   | 133                           | 88                                 | 220                      |

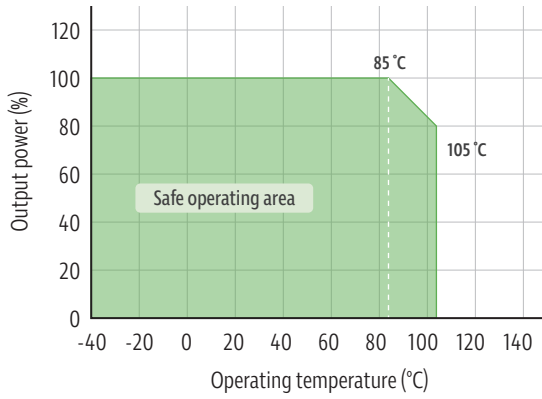
| Approval | Model            | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) Max./Min. | Full Load Efficiency (%) Min./Typ. | Capacitive Load (μF)Max. |
|----------|------------------|---------------------|----------------------|-------------------------------|------------------------------------|--------------------------|
|          | 2T8A2_2405S1.5UP | 24                  | 5                    | 400                           | 85                                 | 2400                     |
|          | 2T8A2_2409S1.5UP | 24                  | 9                    | 223                           | 87                                 | 820                      |
|          | 2T8A2_2412S1.5UP | 24                  | 12                   | 167                           | 87                                 | 470                      |
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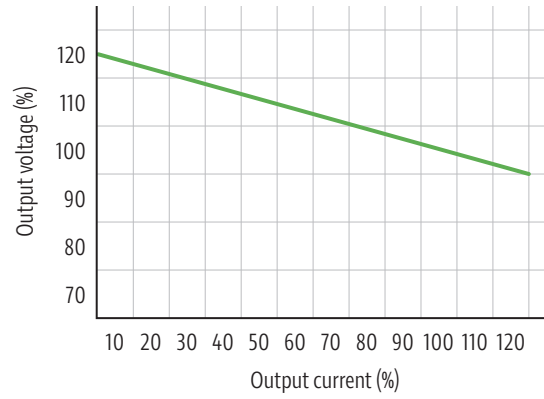
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### Typical characteristics

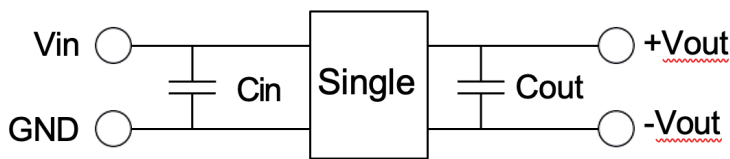
Temperature derating graph



Tolerance envelope graph



### Recommended Test Circuit



| Vin   | Cin       | Single Vout | Cout      |
|-------|-----------|-------------|-----------|
| 5VDC  | 4.7μF/25V | 5VDC        | 10μF/16V  |
| 12VDC | 2.2μF/25V | 9VDC        | 2.2μF/16V |
| 15VDC | 2.2μF/25V | 12VDC       | 2.2μF/25V |
| 24VDC | 1μF/50V   | 15VDC       | 1μF/25V   |

### EMC (CLASS B) compliance circuit

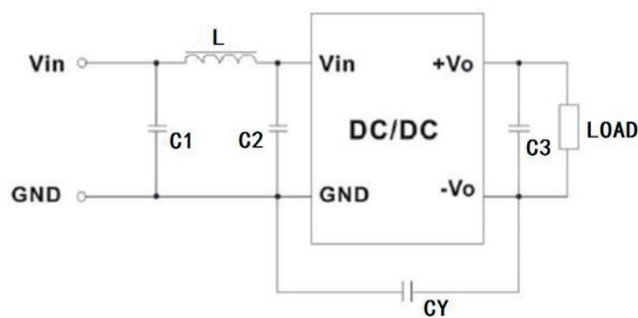


Fig. 1

EMC recommended circuit value table

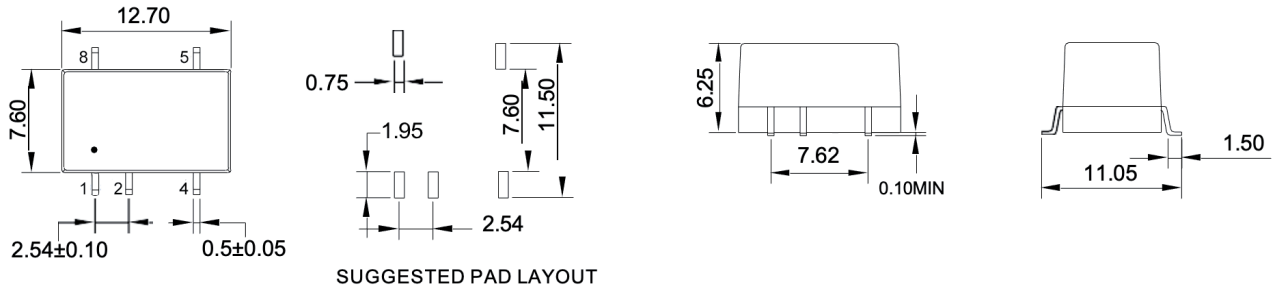
| EMI | C1 | 4.7μF /50V               |
|-----|----|--------------------------|
| EMI | C2 | 4.7μF /50V               |
| EMI | CY | 1nF/4kV                  |
| EMI | C3 | Recommended Test Circuit |
| EMI | L  | 6.8μH                    |

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### Mechanical dimensions

Others



UNIT: mm Unless otherwise specified, all tolerances are  $\pm 0.25$

| PIN Connection |      |      |       |       |    |        |
|----------------|------|------|-------|-------|----|--------|
| PIN            | 1    | 2    | 4     | 5     | 8  | Other  |
| (Single)       | -Vin | +Vin | -Vout | +Vout | NC | NO PIN |