

1T10A2_3UP series

1W - Dual Output DC-DC Converter - Isolated & Unregulated

DC-DC Converter

1 Watt

- ⊕ 10-Pin SMD Package
- ⊕ No-load input current as low as 5mA
- ⊕ Continuous short-circuit protection
- ⊕ High efficiency up to 87%
- ⊕ Unregulated output types
- ⊕ 3kVDC Isolation
- ⊕ Operating temperature: -40°C to +105°C
- ⊕ Industry standard pinout
- ⊕ Design meets IEC62368, UL62368, EN62368

Introducing our latest 1T10A2_3UP series, designed in a compact SMD package with a no-load input current as low as 5mA. It offers continuous short-circuit protection and achieves high efficiency of up to 87%. Featuring unregulated output types and isolation of 3kVDC, this unit is capable of operating in extreme temperatures from -40°C to +105°C.



| 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 |
| Case material | Epoxy Resin (UL94V-0) |
| Switching frequency | Full load, nominal input @3.3V, 5V Vin 215/370 KHz Full load, nominal input @other Vin 250 KHz |
| Dimensions | 15.24 x 8.0 x 7.3 mm |
| Weight | 1.36 g |
| Cooling | Free air Convection |

| 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 | 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 • BW = DC to 20MHz @ Vo: 24V | | 30 | 75 | mVp-p |
| | | | 50 | 100 | |

| Input specifications | | | | | |
|----------------------|-----------------------------|-----|-----|-----|-------|
| Item | Test condition | Min | Typ | Max | Units |
| Voltage Range | • Vo,Io Nom @Vin:3.3V,5V,9V | | ±10 | | |
| | • Vo,Io Nom Vin:12V,15V,24V | | ±20 | | |
| Input filter | Capacitor | | | | |

| Isolation specifications | | | | | |
|--------------------------|---------------------------|------|-----|-----|-------|
| Item | Test condition | Min | Typ | Max | Units |
| Insulation resistance | 500Vdc | 3000 | | | MΩ |
| Isolation capacitance | Input-output, 100KHz/0.1V | | 20 | | pF |

Example:
1T10A2_0509D3UP
 1 = 1Watt; T10 = SMT10; A = Pinning; 05 = 5Vin; 09 = 9Vout; D = Dual Output;
 3 = 3kVDC; U = Unregulated Output; P = Short Circuit Protection

| 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 | | | |

1T10A2_3UP series

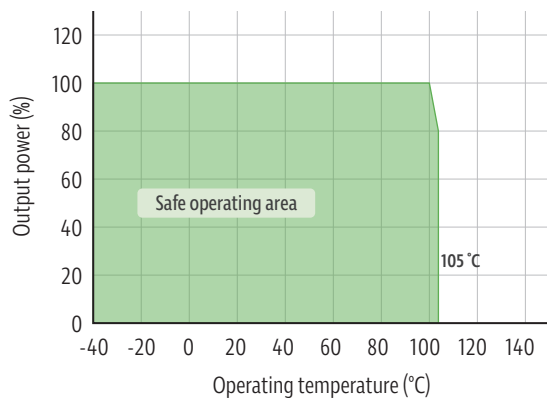
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Product Selection Guide - Dual output

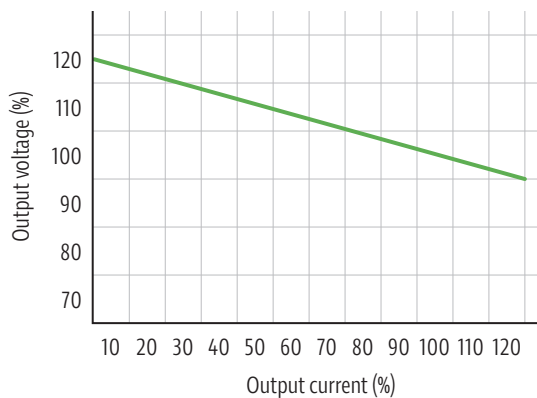
| Approval | Model | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) Max./Min. | Full Load Efficiency (%) Min./Typ. | Capacitive Load (μF)Max. |
|----------|-----------------|---------------------|----------------------|-------------------------------|------------------------------------|--------------------------|
| | 1T10A2_0303D3UP | 3.3 | ±3.3 | ±151 | 76 | ±1200 |
| | 1T10A2_0503D3UP | 5 | ±3.3 | ±151 | 76 | ±1200 |
| | 1T10A2_0903D3UP | 9 | ±3.3 | ±151 | 76 | ±1200 |
| | 1T10A2_1203D3UP | 12 | ±3.3 | ±151 | 78 | ±1200 |
| | 1T10A2_1503D3UP | 15 | ±3.3 | ±151 | 78 | ±1200 |
| | 1T10A2_2403D3UP | 24 | ±3.3 | ±151 | 78 | ±1200 |
| | 1T10A2_0305D3UP | 3.3 | ±5 | ±100 | 82 | ±1200 |
| | 1T10A2_0505D3UP | 5 | ±5 | ±100 | 82 | ±1200 |
| | 1T10A2_0905D3UP | 9 | ±5 | ±100 | 82 | ±1200 |
| | 1T10A2_1205D3UP | 12 | ±5 | ±100 | 82 | ±1200 |
| | 1T10A2_1505D3UP | 15 | ±5 | ±100 | 82 | ±1200 |
| | 1T10A2_2405D3UP | 24 | ±5 | ±100 | 82 | ±1200 |
| | 1T10A2_0309D3UP | 3.3 | ±9 | ±56 | 83 | ±470 |
| | 1T10A2_0509D3UP | 5 | ±9 | ±56 | 83 | ±470 |
| | 1T10A2_0909D3UP | 9 | ±9 | ±56 | 83 | ±470 |
| | 1T10A2_1209D3UP | 12 | ±9 | ±56 | 85 | ±680 |
| | 1T10A2_1509D3UP | 15 | ±9 | ±56 | 85 | ±680 |
| | 1T10A2_2409D3UP | 24 | ±9 | ±56 | 85 | ±680 |
| | 1T10A2_0312D3UP | 3.3 | ±12 | ±42 | 84 | ±220 |
| | 1T10A2_0512D3UP | 5 | ±12 | ±42 | 84 | ±220 |
| | 1T10A2_0912D3UP | 9 | ±12 | ±42 | 84 | ±220 |
| | 1T10A2_1212D3UP | 12 | ±12 | ±42 | 85 | ±330 |
| | 1T10A2_1512D3UP | 15 | ±12 | ±42 | 85 | ±330 |
| | 1T10A2_2412D3UP | 24 | ±12 | ±42 | 85 | ±330 |
| | 1T10A2_0315D3UP | 3.3 | ±15 | ±34 | 84 | ±1000 |
| | 1T10A2_0515D3UP | 5 | ±15 | ±34 | 84 | ±1000 |
| | 1T10A2_0915D3UP | 9 | ±15 | ±34 | 84 | ±1000 |
| | 1T10A2_1215D3UP | 12 | ±15 | ±34 | 87 | ±220 |
| | 1T10A2_1515D3UP | 15 | ±15 | ±34 | 87 | ±220 |
| | 1T10A2_2415D3UP | 24 | ±15 | ±34 | 87 | ±220 |
| | 1T10A2_0324D3UP | 3.3 | ±24 | ±21 | 85 | ±47 |
| | 1T10A2_0524D3UP | 5 | ±24 | ±21 | 85 | ±47 |
| | 1T10A2_0924D3UP | 9 | ±24 | ±21 | 85 | ±47 |
| | 1T10A2_1224D3UP | 12 | ±24 | ±21 | 85 | ±100 |
| | 1T10A2_1524D3UP | 15 | ±24 | ±21 | 85 | ±100 |
| | 1T10A2_2424D3UP | 24 | ±24 | ±21 | 85 | ±100 |

Typical characteristics

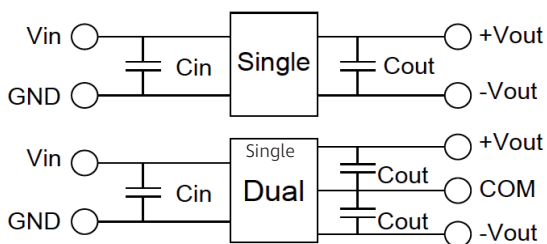
Temperature derating graph



Tolerance envelope graph



Recommended Test Circuit



| Vin | Cin | Single Vout | Cout | Dual Vout | Cout |
|--------|-----------|-------------|-----------|-----------|------------|
| 3.3VDC | 4.7μF/25V | 3.3VDC | 10μF/16V | ±3.3VDC | ±4.7μF/16V |
| 5VDC | 4.7μF/25V | 5VDC | 10μF/16V | ±5VDC | ±4.7μF/16V |
| 9VDC | 4.7μF/25V | 9VDC | 2.2μF/16V | ±9VDC | ±1μF/16V |
| 12VDC | 2.2μF/25V | 12VDC | 2.2μF/25V | ±12VDC | ±1μF/25V |
| 15VDC | 2.2μF/25V | 15VDC | 1μF/25V | ±15VDC | ±1μF/25V |
| 24VDC | 1μF/50V | 24VDC | 1μF/50V | ±24VDC | ±1μF/50V |

EMC (CLASS B) compliance circuit

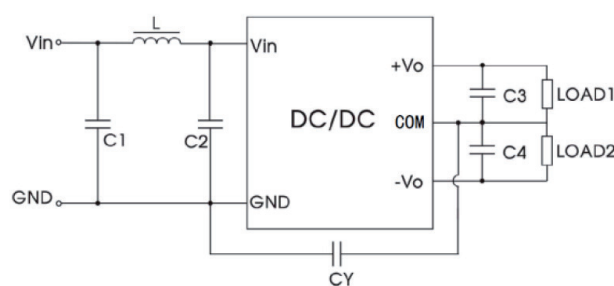
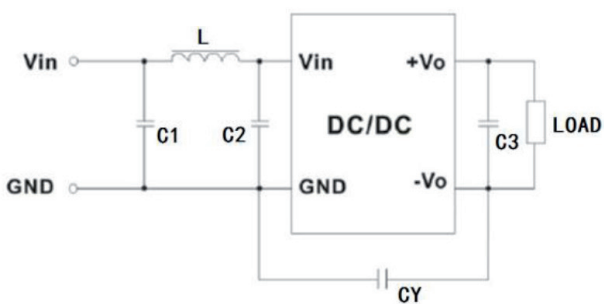


Fig. 1

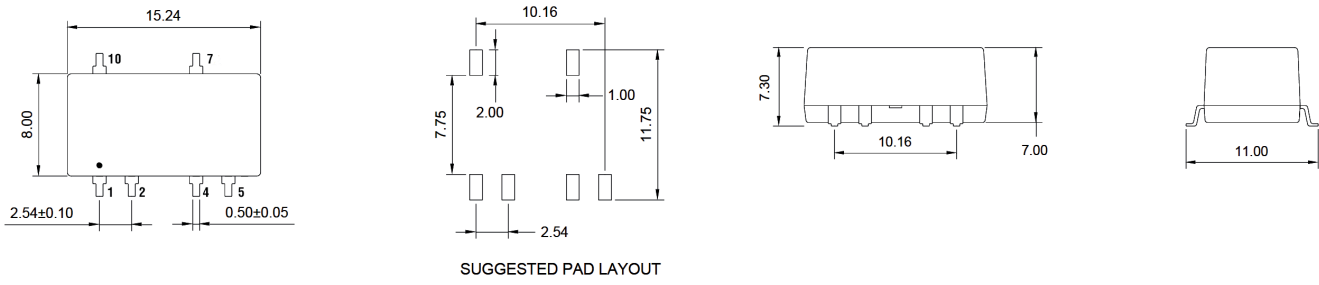
EMC recommended circuit value table

| | | |
|-----|--------|--------------------------|
| EMI | C1 | 4.7μF /50V |
| EMI | C2 | 4.7μF /50V |
| EMI | CY | 1nF/4kV |
| EMI | C3, C4 | Recommended Test Circuit |
| EMI | L | 6.8μH |

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Mechanical dimensions



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

| PIN Connection | | | | | | | | | | |
|----------------|------|------|-----|-----|-------|-----|-------|-----|-----|----|
| PIN | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| (Dual) | -Vin | +Vin | NC* | Com | -Vout | NC* | +Vout | NC* | NC* | NC |