# 1S4A1_3UP series

1W - Single output DC-DC converter - Fixed input - Isolated & unregulated


## DC-DC Converter 1 Watt

- SIP4 package
- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temp. range: -40°C to +105°C
- High efficiency up to 87%
- I/O isolation test voltage 3000kVDC
- Unregulated output types
- Industry standard pin-out
- UL/cUL/IEC/EN 62368-1 approved

Introducing our cutting-edge 1S4A1_3UP series with a SIP4 Package, designed to meet the demanding needs of modern electronic applications. This package offers continuous short-circuit protection, ensuring your devices remain safe and operational under any circumstances. With a no-load input current as low as 5mA, it maximizes efficiency even in standby mode. Our SIP Package operates within a wide ambient temperature range from -40°C to +105°C, making it suitable for various environments and conditions. It boasts an impressive high efficiency of up to 87%, ensuring optimal performance and energy savings.

The I/O isolation test voltage stands at a robust 3kVDC, providing reliable insulation and safety. Adhering to an industry-standard pin-out, our SIP Package integrates seamlessly into your existing designs. It is built to comply with international standards IEC62368, UL62368, and EN62368, ensuring high quality and safety.

UL62368 - E347551

### Common specifications

| | |
|---|---|
| Short circuit protection | Continuous |
| Operation temperature | -40°C ~ +105°C (with derating) |
| Storage temperature | -55°C ~ +125°C |
| Storage humidity | 95% RH (non-condensing) |
| MTBF: (MIL-HDBK-217F@25°C) | >3,500,000 hours |
| Case Material | DAP |
| Cooling | Free air Convection |
| Dimensions | 11.5 x 6.0 x 10.0 mm |
| Weight | 1.1g typ. |

### Input specifications

| Item | Test condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Voltage range<br>(Vo, Io Nom) | 3.3V,5V,9V<br>12V, 15V, 24V | | ±10<br>±20 | | %<br>% |
| Filter | Capacitor | | | | |

**Example:**
**1S4A1_1205S3UP**
**1 = 1 Watt; S4 = SIP4; A1 = Series; 12 = 12Vin; 05 = 5Vout;**
**S = Single output; 3 = 3kVDC; U = Unregulated output;**
**P = Short circuit protection**

### Electromagnetic compatibility (EMC)

| | | |
|---|---|---|
| EMI | CE | CISPR32/EN55032 CLASS B<br>(see fig. 1 for recommended circuit) |
| | RE | CISPR32/EN55032 CLASS B<br>(see fig. 1 for recommended circuit) |
| EMS | ESD | IEC/EN61000-4-2 air ±8kV ,<br>Contact ±6kV perf. criteria B |

### Output specifications

| Item | Test condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Output voltage accuracy | 100% load | | | ±5 | % |
| Line regulation | For 1.0% of Vin | | 1.2 | | % |
| Load regulation<br>(10% to 100% fullload) | 3.3V<br>5V<br>9V<br>12V<br>15V<br>24V | | 15<br>10<br>8<br>7<br>6<br>5 | 20<br>15<br>10<br>10<br>10<br>10 | %<br>%<br>%<br>%<br>%<br>% |
| Ripple & noise<br>BW = DC to 20MHz | @Vo: 3.3V, 5V, 9V, 12V,15V<br>@ Vo: 24V | | 30<br>50 | 75<br>100 | mVp-p<br>mVp-p |
| Switching frequency | Full load, nominal input @3.3V, 5V Vin | | 215/370 | | kHz |
| Switching frequency | Full load, nominal input @other Vin | | 250 | | kHz |

### Isolation specifications

| Item | Test condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Isolation voltage | | 3000 | | | VDC |
| Isolation resistance | Test at 500VDC | 1000 | | | MΩ |
| Isolation capacitance | Input/output capacitance 100kHz/0.1V | | 20 | | pF |

**Note:**

1. If the product is not operated within the specified load range, its performance cannot be guaranteed to meet all the parameters listed in the datasheet.
2. The maximum capacitive load was tested under the full input voltage range and load conditions.
3. Unless otherwise stated, the parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75%RH, with nominal input voltage and rated output load.
4. All testing methods referenced in this datasheet are based on our company's corporate standards.
5. We offer product customization services; please contact our technicians directly for more detailed information.
6. Products are subject to laws and regulations; refer to the "Features" and "EMC" sections for more information.
7. Our products are classified according to ISO14001 and relevant environmental


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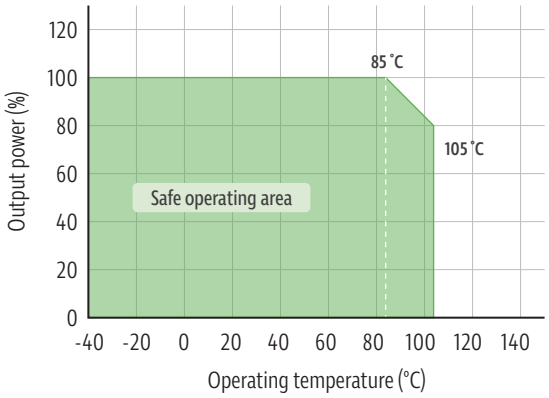
# Product Selection Guide

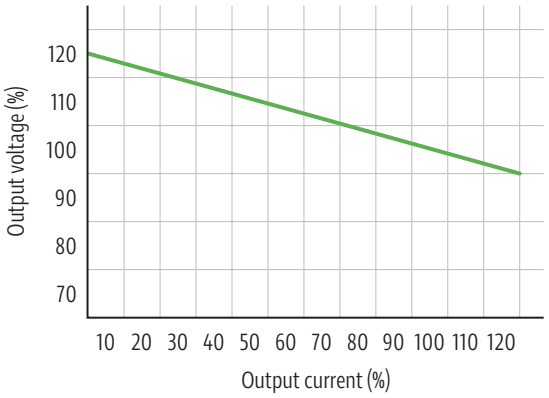
| Part Number | Input Voltage [VDC, Nom] | Output Voltage [VDC] | Output Current [mA] | Full Load Efficiency [%, Typ.] | Capacitive Load [µF, Max.] |
|---|---|---|---|---|---|
| 1S4A1_0303S3UP | 3.3 | 3.3 | 303 | 76 | 2400 |
| 1S4A1_0305S3UP | 3.3 | 5 | 200 | 82 | 2400 |
| 1S4A1_0309S3UP | 3.3 | 9 | 112 | 83 | 1000 |
| 1S4A1_0312S3UP | 3.3 | 12 | 84 | 84 | 470 |
| 1S4A1_0315S3UP | 3.3 | 15 | 67 | 84 | 330 |
| 1S4A1_0324S3UP | 3.3 | 24 | 42 | 85 | 100 |
| 1S4A1_0503S3UP | 05 | 3.3 | 303 | 76 | 2400 |
| 1S4A1_0505S3UP | 05 | 5 | 200 | 82 | 2400 |
| 1S4A1_0509S3UP | 05 | 9 | 112 | 83 | 1000 |
| 1S4A1_0512S3UP | 05 | 12 | 84 | 84 | 470 |
| 1S4A1_0515S3UP | 05 | 15 | 67 | 84 | 330 |
| 1S4A1_0524S3UP | 05 | 24 | 42 | 85 | 100 |
| 1S4A1_0903S3UP | 09 | 3.3 | 303 | 76 | 2400 |
| 1S4A1_0905S3UP | 09 | 5 | 200 | 82 | 2400 |
| 1S4A1_0909S3UP | 09 | 9 | 112 | 83 | 1000 |
| 1S4A1_0912S3UP | 09 | 12 | 84 | 84 | 470 |
| 1S4A1_0915S3UP | 09 | 15 | 67 | 84 | 330 |
| 1S4A1_0924S3UP | 09 | 24 | 42 | 85 | 100 |
| 1S4A1_1203S3UP | 12 | 3.3 | 303 | 78 | 2400 |
| 1S4A1_1205S3UP | 12 | 5 | 200 | 82 | 2400 |
| 1S4A1_1209S3UP | 12 | 9 | 112 | 85 | 1000 |
| 1S4A1_1212S3UP | 12 | 12 | 84 | 85 | 680 |
| 1S4A1_1215S3UP | 12 | 15 | 67 | 87 | 330 |
| 1S4A1_1224S3UP | 12 | 24 | 42 | 85 | 220 |
| 1S4A1_1503S3UP | 15 | 3.3 | 303 | 78 | 2400 |
| 1S4A1_1505S3UP | 15 | 5 | 200 | 82 | 2400 |
| 1S4A1_1509S3UP | 15 | 9 | 112 | 85 | 1000 |
| 1S4A1_1512S3UP | 15 | 12 | 84 | 85 | 680 |
| 1S4A1_1515S3UP | 15 | 15 | 67 | 87 | 330 |
| 1S4A1_1524S3UP | 15 | 24 | 42 | 85 | 220 |
| 1S4A1_2403S3UP | 24 | 3.3 | 303 | 78 | 2400 |
| 1S4A1_2405S3UP | 24 | 5 | 200 | 82 | 2400 |
| 1S4A1_2409S3UP | 24 | 9 | 112 | 85 | 1000 |
| 1S4A1_2412S3UP | 24 | 12 | 84 | 85 | 680 |
| 1S4A1_2415S3UP | 24 | 15 | 67 | 87 | 330 |
| 1S4A1_2424S3UP | 24 | 24 | 42 | 85 | 220 |

# Typical characteristics

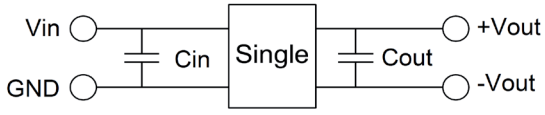
### Temperature derating graph




### Tolerance envelope graph




# Recommended test circuit




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

# EMC (CLASS B) compliance circuit

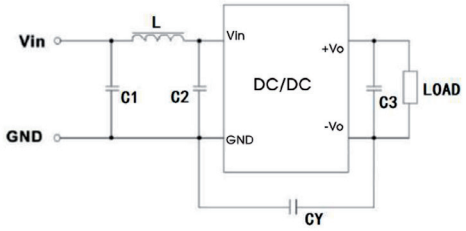
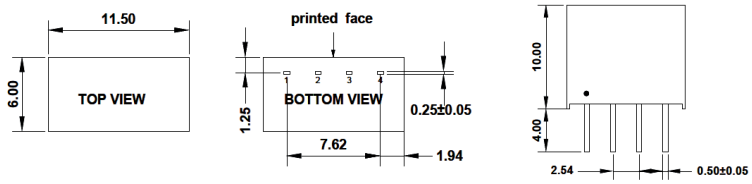



Fig. 1

EMC recommended circuit value table

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

# Mechanical dimensions




| Pin-Out | |
|---|---|
| Pin | Function |
| 1 | -Vin |
| 2 | +Vin |
| 3 | -Vout |
| 4 | +Vout |

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