1W isolated DC-DC converter
Fixed input voltage, unregulated dual output


Continuous Short Circuit Protection

3 years Warranty

UL 62368-1 EN 62368-1 BS EN 62368-1 IEC 62368-1 CB Report RoHS Patent Protection

## FEATURES

- Continuous short-circuit protection
- No-load input current as low as 8mA
- Operating ambient temperature range: -40℃ to +105℃
- High efficiency up to 85%
- Compact SMD package
- I/O isolation test voltage: 1.5k VDC
- Industry standard pin-out

*A_XT-1WR3 series are specially designed for applications where two isolated voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.*

## Selection Guide

| Certification | Part No. | Input Voltage (VDC) | Output | | Full Load Efficiency (%) Min./Typ. | Capacitive Load(μF) Max.* |
|---|---|---|---|---|---|---|
| | | Nominal (Range) | Voltage (VDC) | Current (mA) Max./Min. | | |
| UL/EN/BS EN/IEC | A1205XT-1WR3 | 12 (10.8-13.2) | ±5 | ±100/±10 | 78/82 | 1200 |
| -- | A12Y7XT-1WR3 | | ±7.5 | ±67/±7 | 78/82 | 470 |
| UL/EN/BS EN/IEC | A1209XT-1WR3 | | ±9 | ±56/±6 | 79/83 | 470 |
| | A1212XT-1WR3 | | ±12 | ±42/±5 | 79/83 | 220 |
| | A1215XT-1WR3 | | ±15 | ±34/±4 | 79/83 | 220 |
| | A1224XT-1WR3 | | ±24 | ±21/±3 | 81/85 | 100 |
| | A1515XT-1WR3 | 15 (13.5-16.5) | ±15 | ±34/±4 | 79/83 | 220 |
| | A2405XT-1WR3 | 24 (21.6-26.4) | ±5 | ±100/±10 | 76/82 | 1200 |
| | A2409XT-1WR3 | | ±9 | ±56/±6 | 77/83 | 470 |
| | A2412XT-1WR3 | | ±12 | ±42/±5 | 77/83 | 220 |
| | A2415XT-1WR3 | | ±15 | ±34/±4 | 77/83 | 220 |
| | A2424XT-1WR3 | | ±24 | ±21/±3 | 79/85 | 100 |

Note: * The specified maximum capacitive load for positive and negative output is identical.

## Input Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input Current (full load / no-load) | 12V input | ±5VDC/±7.5VDC output | -- | 102/8 | 107/-- | mA |
| | | ±9VDC/±12VDC/±15VDC output | -- | 101/8 | 106/-- | |
| | | ±24VDC output | -- | 99/8 | 103/-- | |
| | 15V input | | -- | 81/8 | 85/-- | |
| | 24V input | ±5VDC/±9VDC/±12VDC/±15VDC output | -- | 51/8 | 55/-- | |
| | | ±24VDC output | -- | 50/8 | 53/-- | |
| Reflected Ripple Current* | | | -- | 15 | -- | |
| Surge Voltage(1sec. max.) | 12VDC input | | -0.7 | -- | 18 | VDC |
| | 15VDC input | | -0.7 | -- | 21 | |
| | 24VDC input | | -0.7 | -- | 30 | |
| Input Filter | | | Capacitance filter | | | |

| | | |
|---|---|---|
| Hot Plug | | Unavailable |
| Note: * Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method. | | |

## Output Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Voltage Accuracy | | | See output regulation curves (Fig. 1) | | | |
| Linear Regulation | Input voltage change: ±1% | | -- | -- | 1.2 | -- |
| Load Regulation | 10%-100% load | ±5VDC output | -- | 5 | 15 | % |
| | | ±7.5VDC output | -- | 5 | 15 | |
| | | ±9VDC output | -- | 3 | 10 | |
| | | ±12VDC output | -- | 3 | 10 | |
| | | ±15VDC output | -- | 3 | 10 | |
| | | ±24VDC output | -- | 2 | 10 | |
| Ripple & Noise* | 20MHz bandwidth | ±5VDC/±7.5VDC/±9VDC/ ±12VDC/±15VDC output | -- | 30 | 75 | mVp-p |
| | | ±24VDC output | -- | 50 | 100 | |
| Temperature Coefficient | Full load | | -- | ±0.02 | -- | %/℃ |
| Short-circuit Protection | | | Continuous, self-recovery | | | |
| Note: * The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information. | | | | | | |

## General Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Isolation | Input-output electric strength test for 1 minute with a leakage current of 1mA max. | 1500 | -- | -- | VDC |
| Insulation Resistance | Input-output resistance at 500VDC | 1000 | -- | -- | MΩ |
| Isolation Capacitance | Input-output capacitance at 100kHz/0.1V | -- | 20 | -- | pF |
| Operating Temperature | Derating when operating temperature≥100℃, (see Fig. 2) | -40 | -- | 105 | ℃ |
| Storage Temperature | | -55 | -- | 125 | |
| Case Temperature Rise | Ta=25℃ | -- | 25 | -- | |
| Storage Humidity | Non-condensing | 5 | -- | 95 | %RH |
| Reflow Soldering Temperature* | | Peak temp.≤245℃, maximum duration time≤60s over 217℃ | | | |
| Vibration | | 10-150Hz, 5G, 0.75mm. along X, Y and Z | | | |
| Switching Frequency | Full load, nominal input voltage | -- | 260 | -- | kHz |
| MTBF | MIL-HDBK-217F@25℃ | 3500 | -- | -- | k hours |
| Moisture Sensitivity Level (MSL) | IPC/JEDEC J-STD-020D.1 | Level 1 | | | |
| Note: * For actual application, please refer to IPC/JEDEC J-STD-020D.1. | | | | | |

## Mechanical Specifications

| | |
|---|---|
| Case Material | Black plastic; flame-retardant and heat-resistant (UL94V-0) |
| Dimensions | 15.24 x 11.40 x 7.25 mm |
| Weight | 1.4g(Typ.) |
| Cooling Method | Free air convection |

## Electromagnetic Compatibility (EMC)

| | | |
|---|---|---|
| Emissions | CE | CISPR32/EN55032 CLASS B |
| Emissions | RE | CISPR32/EN55032 CLASS B |
| Immunity | ESD | IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B |
| Note: Refer to Fig.4 for recommended circuit test. | | |

## Typical Performance Curves

Output Regulation Curve

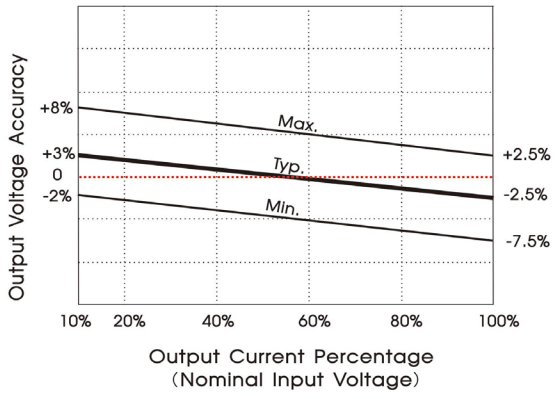



Fig. 1

Temperature Derating Curve

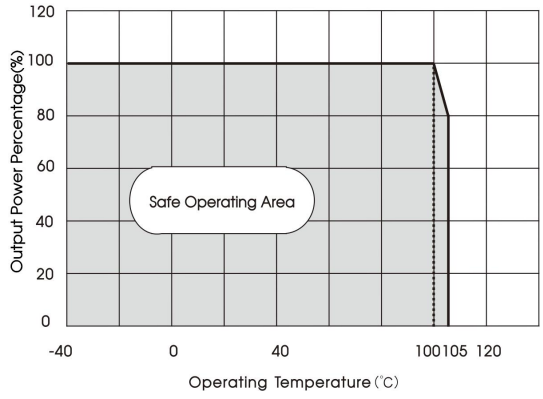
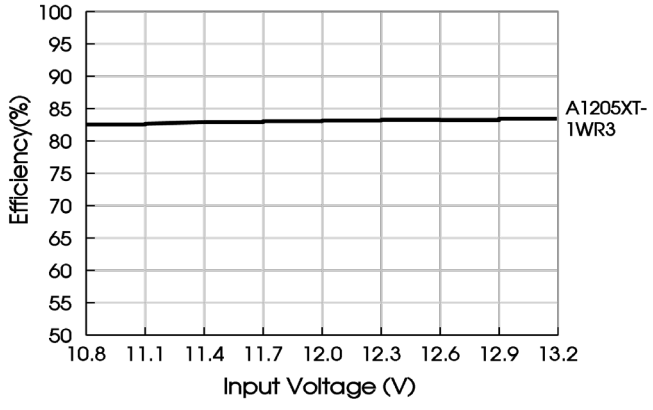
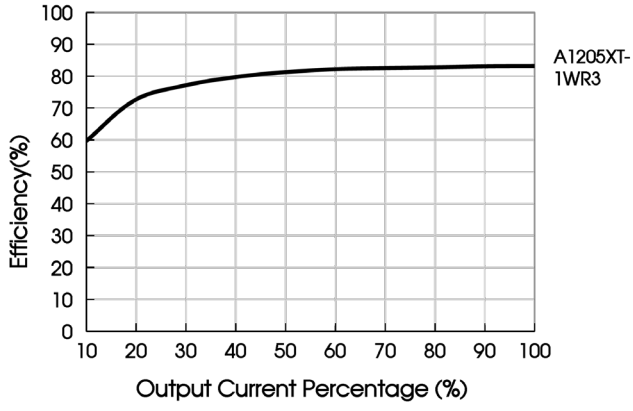



Fig. 2

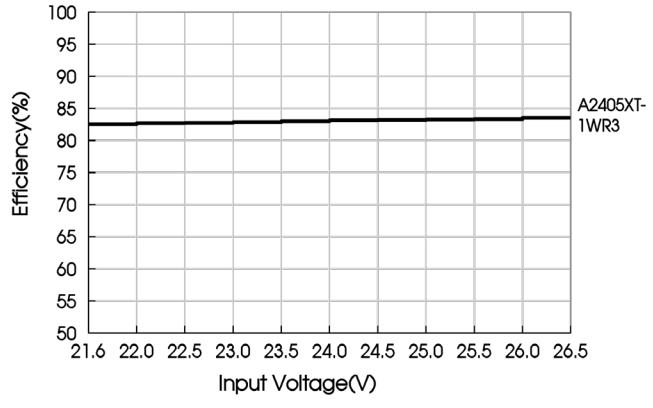
Efficiency Vs Input Voltage (Full Load)



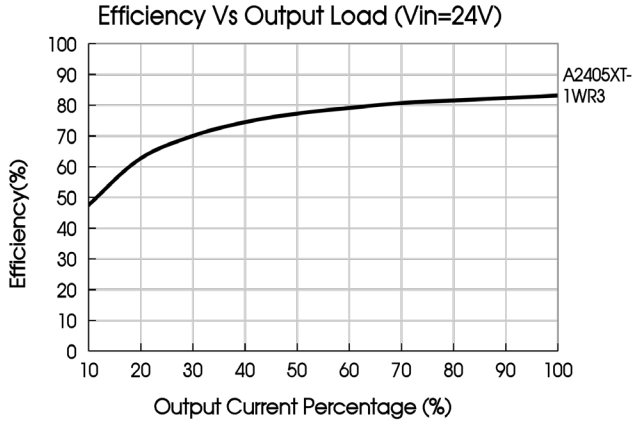

Efficiency Vs Output Load (Vin=12V)




Efficiency Vs Input Voltage (Full Load)




Efficiency Vs Output Load (Vin=24V)



## Design Reference

### 1. Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig. 3.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

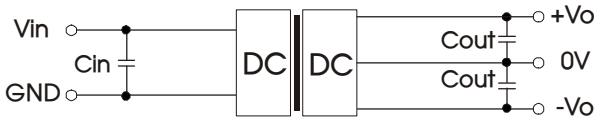



Fig. 3

Table 1: Recommended input and output capacitor values

| Vin | Cin | Vo | Cout |
|---|---|---|---|
| 12VDC | 2.2μF/25V | ±5VDC | 4.7μF/16V |
| 15VDC | 2.2μF/25V | ±7.5VDC | 1μF/16V |
| 24VDC | 1μF/50V | ±9VDC | 1μF/16V |
| -- | -- | ±12VDC | 1μF/25V |
| -- | -- | ±15VDC | 0.47μF/25V |
| -- | -- | ±24VDC | 0.47μF/50V |

### 2. EMC compliance circuit

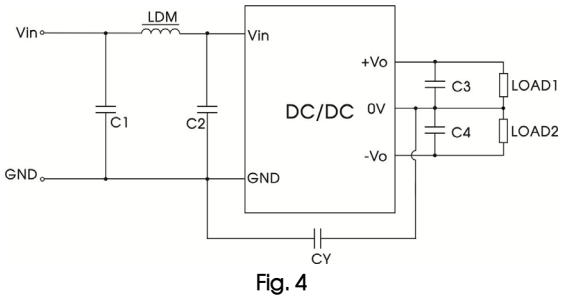


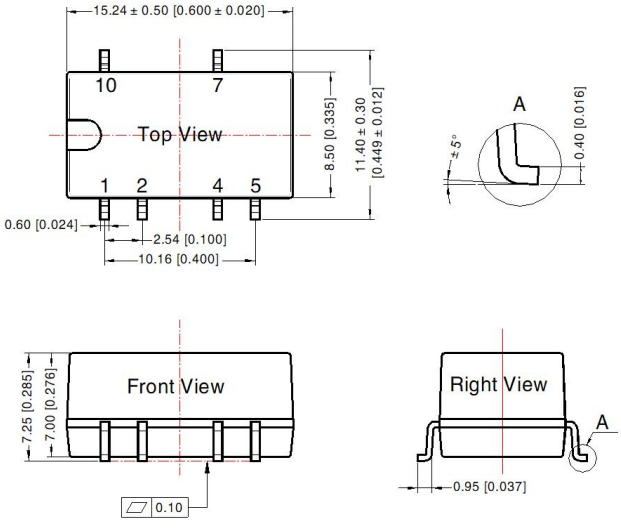

Fig. 4

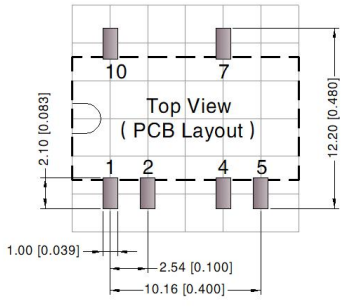
Table 2: EMC recommended circuit value table

| | | |
|---|---|---|
| Emissions | C1/C2 | 4.7μF /50V |
| | CY | 270pF /2kV |
| | C3/C4 | Refer to the Cout in table 1 |
| | LDM | 6.8μH |

## Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



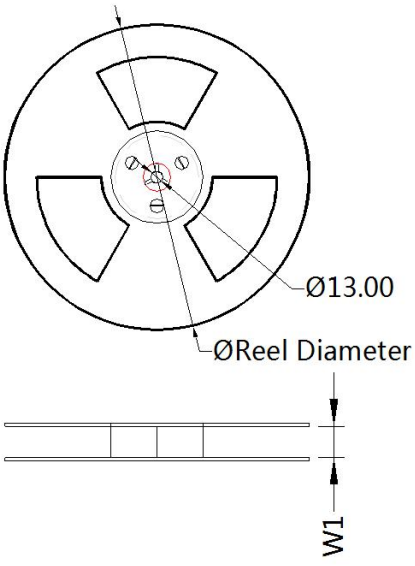

Note: Grid 2.54*2.54mm

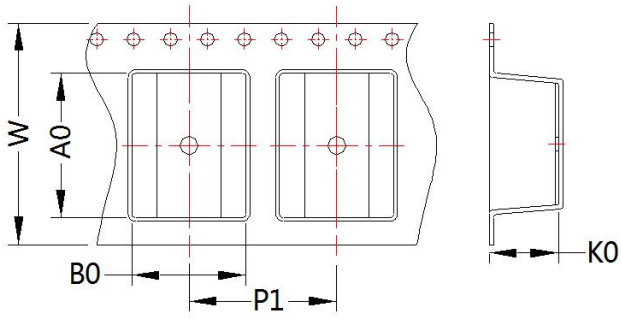
Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[ ± 0.004]
General tolerances: ± 0.25[ ± 0.010]

| Pin-Out | |
|---|---|
| Pin | Mark |
| 1 | GND |
| 2 | Vin |
| 4 | 0V |
| 5 | -Vo |
| 7 | +Vo |
| 10 | NC |

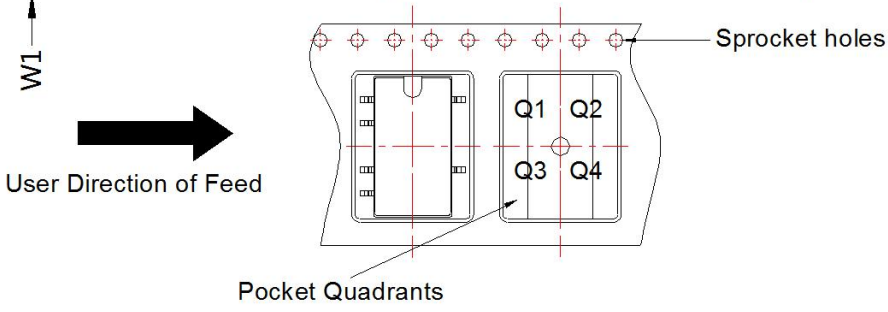
NC: Pin to be isolated from circuitry

## Tape and Reel Info




**Quadrant assignments for PIN 1 orientation in tape**




| Device | Package Type | Pin | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A_XT-1WR3 | SMD | 6 | 500 | 330.0 | 24.5 | 15.64 | 12.4 | 7.45 | 16.0 | 24.0 | Q1 |