## DESCRIPTION

AD-AxxxxS-1WR3 (Dual) & AD-BxxxxLS-1WR3 (Single) series are specially designed for applications where an(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. Where the voltage of the input power supply is fixed (voltage variation ≤±10%)

## FEATURES

- High efficiency up to 90%
- I/O Isolation test voltage 1500VDC
- -40°C to +85°C Working Temperature Range
- No-load power consumption bottom 0.25W
- MTBF ≥3500KHrs
- Output short-circuit, over-current protection
- Industry standard pin-out

## ORDERING INFORMATION

| Part Number | Input Voltage (VDC) | Output | | Full Load Efficiency(%) Min/Typ | Capacitive Load (uF) Max. |
|---|---|---|---|---|---|
| | Nominal (Range) | Voltage (VDC) | Current (mA) Max/Min | | |
| AD-A0303S-1WR3 | 3.3 (2.97~3.63) | ±3.3 | ±152/±15 | 76/80 | 1200 |
| AD-A0305S-1WR3 | | ±5 | ±100/±10 | 86/88 | 1200 |
| AD-A0309S-1WR3 | | ±9 | ±56/±6 | 87/89 | 560 |
| AD-A0312S-1WR3 | | ±12 | ±42/±5 | 87/89 | 330 |
| AD-A0315S-1WR3 | | ±15 | ±34/±4 | 87/89 | 330 |
| AD-A0324S-1WR3 | | ±24 | ±21/±3 | 87/89 | 100 |
| AD-B0303LS-1WR3 | | 3.3 | 303/30 | 76/80 | 2400 |
| AD-B0305LS-1WR3 | | 5 | 200/20 | 80/84 | 2400 |
| AD-B0312LS-1WR3 | | 12 | 84/9 | 84/86 | 560 |
| AD-A0503S-1WR3 | 5 (4.5~5.5) | ±3.3 | ±152/±15 | 76/80 | 1200 |
| AD-A0505S-1WR3 | | ±5 | ±100/±10 | 86/88 | 1200 |
| AD-A0509S-1WR3 | | ±9 | ±56/±6 | 87/89 | 560 |
| AD-A0512S-1WR3 | | ±12 | ±42/±5 | 87/89 | 330 |
| AD-A0515S-1WR3 | | ±15 | ±34/±4 | 87/89 | 330 |
| AD-A0524S-1WR3 | | ±24 | ±21/±3 | 87/89 | 100 |
| AD-B0503LS-1WR3 | | 3.3 | 303/30 | 76/80 | 2400 |
| AD-B0505LS-1WR3 | | 5 | 200/20 | 86/88 | 2400 |
| AD-B0509LS-1WR3 | | 9 | 111/12 | 87/89 | 1000 |
| AD-B0512LS-1WR3 | | 12 | 84/9 | 87/89 | 560 |
| AD-B0515LS-1WR3 | | 15 | 67/7 | 87/89 | 560 |
| AD-B0524LS-1WR3 | | 24 | 42/4 | 87/89 | 220 |

| Part Number | Input Voltage (VDC) | Output | | Full Load Efficiency(%) Min/Typ | Capacitive Load (uF) Max. |
|---|---|---|---|---|---|
| | Nominal (Range) | Voltage (VDC) | Current (mA) Max/Min | | |
| AD-A1203S-1WR3 | 12 (10/8~13.2) | ±3.3 | ±152/±15 | 76/80 | 1200 |
| AD-A1205S-1WR3 | | ±5 | ±100/±10 | 86/88 | 1200 |
| AD-A1209S-1WR3 | | ±9 | ±56/±6 | 87/89 | 560 |
| AD-A1212S-1WR3 | | ±12 | ±42/±5 | 87/89 | 330 |
| AD-A1215S-1WR3 | | ±15 | ±34/±4 | 87/89 | 330 |
| AD-A1224S-1WR3 | | ±24 | ±21/±3 | 87/89 | 100 |
| AD-B1203LS-1WR3 | | 3.3 | 303/30 | 76/80 | 2400 |
| AD-B1205LS-1WR3 | | 5 | 200/20 | 87/89 | 2400 |
| AD-B1209LS-1WR3 | | 9 | 111/12 | 87/89 | 1000 |
| AD-B1212LS-1WR3 | | 12 | 84/9 | 87/89 | 560 |
| AD-B1215LS-1WR3 | | 15 | 67/7 | 87/89 | 560 |
| AD-B1224LS-1WR3 | | 24 | 42/4 | 87/89 | 220 |
| AD-A1503S-1WR3 | 15 (13.5~16.5) | ±3 | ±152/±15 | 76/80 | 1200 |
| AD-A1505S-1WR3 | | ±5 | ±100/±10 | 86/88 | 1200 |
| AD-A1509S-1WR3 | | ±9 | ±56/±5 | 87/89 | 560 |
| AD-A1512S-1WR3 | | ±12 | ±42/±5 | 87/89 | 330 |
| AD-A1515S-1WR3 | | ±15 | ±34/±4 | 87/89 | 330 |
| AD-A1524S-1WR3 | | ±24 | ±21/±2 | 87/89 | 100 |
| AD-B1503LS-1WR3 | | 3 | 300/30 | 76/80 | 2400 |
| AD-B1505LS-1WR3 | | 5 | 200/20 | 87/89 | 2400 |
| AD-B1509LS-1WR3 | | 9 | 111/12 | 87/89 | 1000 |
| AD-B1512LS-1WR3 | | 12 | 84/9 | 87/89 | 560 |
| AD-B1515LS-1WR3 | | 15 | 67/7 | 87/89 | 560 |
| AD-B1524LS-1WR3 | | 24 | 42/4 | 87/89 | 220 |
| AD-A2403S-1WR3 | 24 (21.6~26.4) | ±3 | ±152/±15 | 76/80 | 1200 |
| AD-A2405S-1WR3 | | ±5 | ±100/±10 | 86/88 | 1200 |
| AD-A2409S-1WR3 | | ±9 | ±56/±5 | 87/89 | 560 |
| AD-A2412S-1WR3 | | ±12 | ±42/±5 | 87/89 | 330 |
| AD-A2415S-1WR3 | | ±15 | ±34/±4 | 87/89 | 330 |
| AD-A2424S-1WR3 | | ±24 | ±21/±3 | 87/89 | 100 |
| AD-B1503LS-1WR3 | | 3 | 303/30 | 76/80 | 2400 |
| AD-B1505LS-1WR3 | | 5 | 200/20 | 86/88 | 2400 |
| AD-B1509LS-1WR3 | | 9 | 111/12 | 87/89 | 1000 |
| AD-B1512LS-1WR3 | | 12 | 83/9 | 87/89 | 560 |
| AD-B1515LS-1WR3 | | 15 | 67/7 | 87/90 | 560 |
| AD-B1524LS-1WR3 | | 24 | 42/4 | 87/90 | 220 |

## INPUT SPECIFICATIONS

| Item | Operating Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Input Current (Full Load/No-Load) | 3.3VDC input | -- | 387/6 | --/12 | mA |
| | 5VDC input | -- | 224/5 | --/10 | |
| | 12VDC input | -- | 93/3 | --/5 | |
| | 15VDC input | -- | 74/2 | --/4 | |
| | 24VDC input | -- | 47/1 | --/2 | |
| Reflect Ripple Current | | -- | 15 | -- | mA |
| Surge Voltage (1sec. max) | 3.3VDC input | -0.7 | -- | 5 | VDC |
| | 5VDC input | -0.7 | -- | 9 | |
| | 12VDC input | -0.7 | -- | 18 | |
| | 15VDC input | -0.7 | -- | 21 | |
| | 24VDC input | -0.7 | -- | 30 | |
| Input Filter | | Capacitance Filter | | | |
| Hot Plug | | Unavailable | | | |

## OUTPUT SPECIFICATIONS

| Item | Operating Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Output Load | Load Percentage | | 10 | -- | 100 | % |
| Load Regulation | 10~100% Load | 3.3VDC output | -- | 18 | -- | % |
| | | 5VDC output | -- | 12 | -- | |
| | | 9VDC output | -- | 8 | -- | |
| | | 12VDC output | -- | 7 | -- | |
| | | 15VDC output | -- | 6 | -- | |
| | | 24VDC output | -- | 5 | -- | |
| Linear Regulation | Input voltage change: ±0.1% | 3.3VDC output | -- | -- | ±1.5 | % |
| | | Others | | -- | ±1.2 | |
| Linear Regulation | Input voltage variation from low to high at full load | | -- | ±0.5 | ±1 | % |
| Output Voltage Accuracy | See Fig 1. Output Regulation Curve | | -- | ±0.5 | ±1.5 | % |
| Ripple & Noise | Pure resistance load, 20MHz bandwidth peak-to-peak value | | -- | 30 | 80 | mVp-p |
| Temperature Drift Coefficient (Full Load) | | | -- | -- | ±0.03 | %/°C |
| Output Short Circuit Protection | | | Continuous, self-recovery | | | |

## GENERAL SPECIFICATIONS

| Item | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Insolation Voltage | Input-output, test time 1minute, leakage current less than 1mA | 1500 | -- | -- | VDC |
| Insolation Resistance | Input-output, insulation voltage 500VDC | 1000 | -- | -- | MΩ |
| Isolation Capacitor | Input-output, 100KHz/0.1V | -- | 20 | -- | pF |
| Operating Temperature | Refer to Fig1. Temperature Derating | -40 | -- | +85 | °C |
| Storage Temperature | | -40 | -- | +125 | °C |
| Case Temperature Rise During Operation | | -- | 25 | -- | %RH |
| Storage Humidity | No Condensation | 5 | -- | 95 | %RH |
| Pin Soldering Temperature Resistance | Solder joint distance from housing 1.5mm, 10s | -- | -- | +300 | °C |
| Switching Frequency | Full load, nominal voltage input | -- | 100 | -- | KHz |
| Vibrations | | 10-55Hz, 10G, 30Min along X,Y & Z | | | |
| Housing Material | | Black flame retardant & heat resistant plastic (UL94V-0) | | | |
| MTBF | MIL-HDBK-217F@25℃ | $3.5X10^6$ | | | KHrs |

## TYPICAL CHARACTERISTIC CURVES

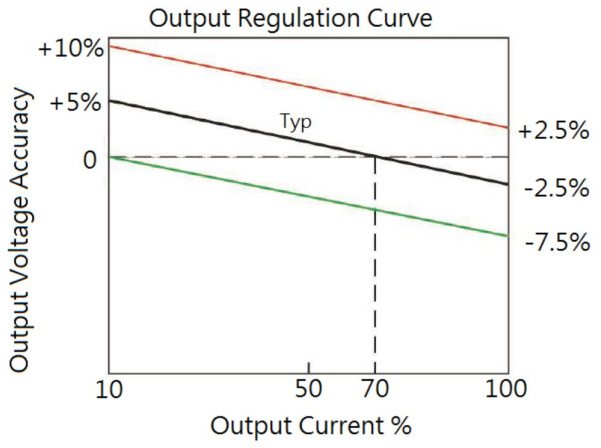



Fig 1.

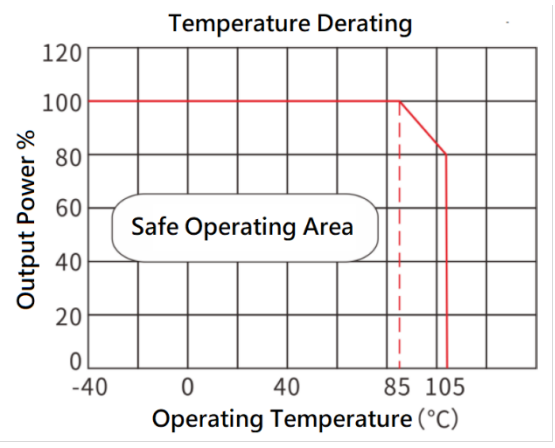



Fig 2.

## DESIGN REFERENCE

### Typical Application

If want to reduce the input and output ripples, can connect a capacitor filter circuit to the input and output. The application circuit is shown in Fig 3 & 4. However, be careful to select the appropriate filter capacitor. If the capacitance is too large, it might cause startup problems.

**Fig 3. Single Output**

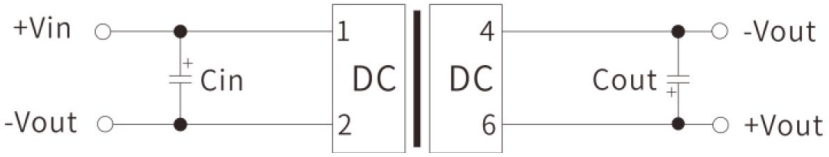



**Fig 4. Dual Output**


| Vin (VDC) | Cin (uF) | Vo (VDC) | Cout (uF) |
|---|---|---|---|
| 3.3/5 | 4.7 | 3.3/5 | 20 |
| 12 | 2.2 | 9 | 4.7 |
| 15 | 2.2 | 12 | 2.2 |
| 24 | 1 | 15 | 1 |
| -- | -- | 24 | 0.47 |

Table1. Recommend Input and output Capacitor Values

### EMC Compliance Circuit

**Fig 5. Single Output**

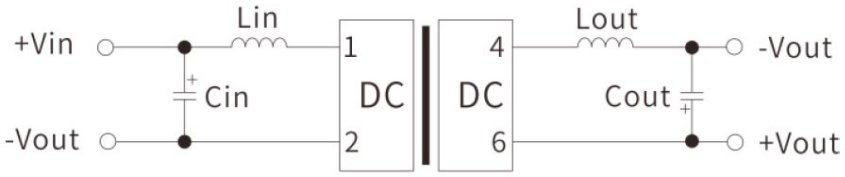
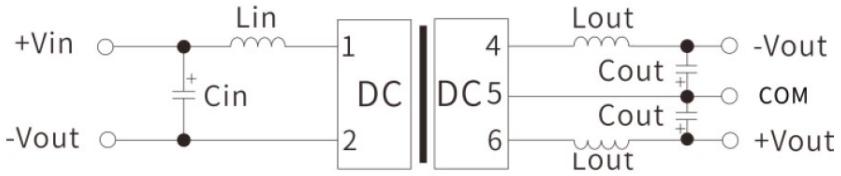



**Fig 5. Single Output**



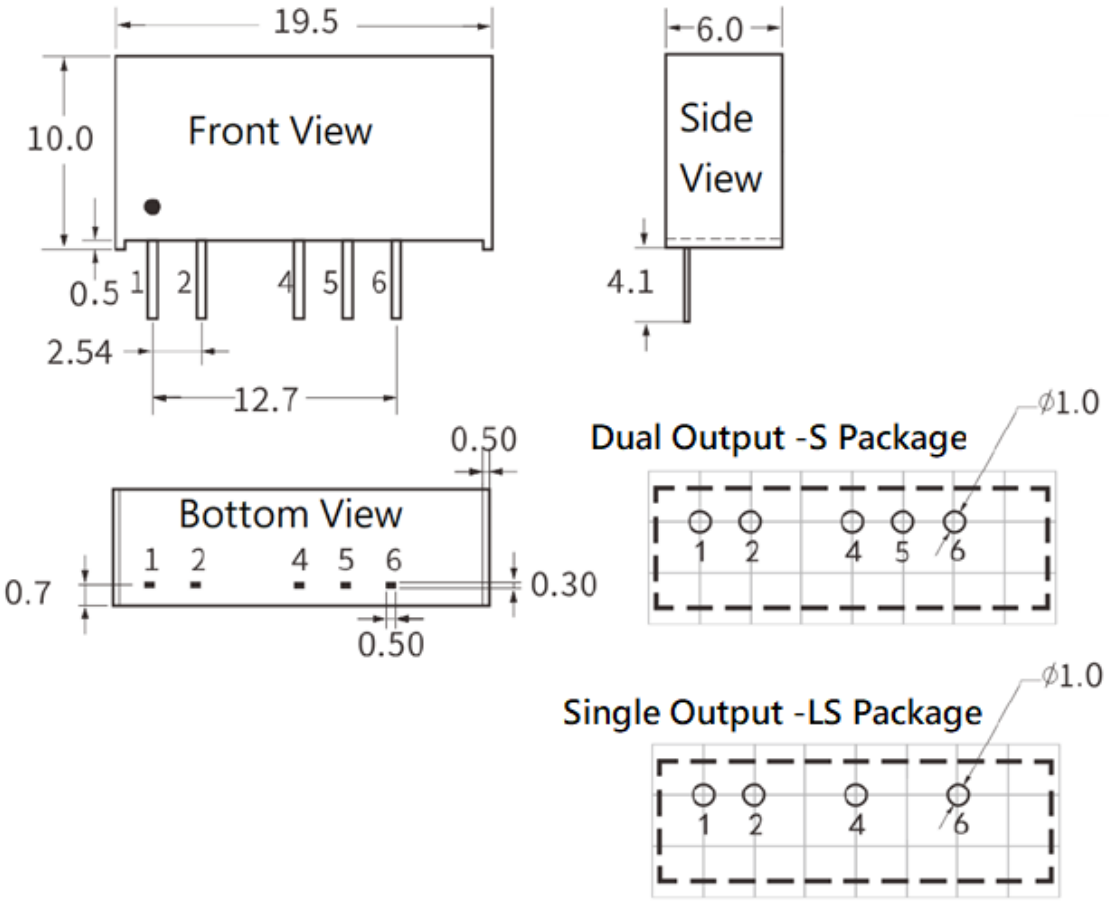

| Vin (VDC) | 3.3/5/12/15/24 |
|---|---|
| Cin | 4.7uF/50V |
| Cout | See Table 1 |
| Lin | 4.7uH |
| Lout | 4.7uH |

Table 2. Recommend EMC Reference Value

## PACKAGE INFORMATION

Package Code: S Dimension: 19.5x6.0x10.0 mm (0.768x0.236x0.394 inch)

Package Code: LS Dimension: 19.5x6.0x10.0 mm (0.768x0.236x0.394 inch)




| Pin-Out | | |
|---|---|---|
| Pin # | AD-AxxxS | AD-BxxxLS |
| | Dual | Single |
| 1 | Vin | Vin |
| 2 | GND | GND |
| 4 | -Vo | 0V |
| 5 | 0V | - |
| 6 | +Vo | +Vo |

Note: Grid 2.54 * 2.54mm

Unit: mm

General tolerances: ±0.25