

**DESCRIPTION**

AD-AxxxxS-2WR3 (Dual) 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 $\leq \pm 10\%$)

FEATURES

- A 2W isolated DC/DC converter with fixed input voltage and unregulated output
- High efficiency up to 86%
- I/O Isolation test voltage 1500VDC
- -40°C to $+85^{\circ}\text{C}$ Working Temperature Range
- No-load power consumption bottom 0.09W
- MTBF $\geq 3500\text{KHrs}$
- Low ripple and noise: 30 mV_{P-P} (typ.,20 MHz bandwidth)
- Output short-circuits, over-current protection
- Compact SIP with 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-2WR3	3.3 (2.97~3.63)	± 3.3	$\pm 303/ \pm 3$	72/76	100
AD-A0305S-2WR3		± 5	$\pm 200/ \pm 2$	76/80	100
AD-A0309S-2WR3		± 9	$\pm 112/ \pm 1$	82/86	100
AD-A0312S-2WR3		± 12	$\pm 83/ \pm 8$	82/86	100
AD-A0315S-2WR3		± 15	$\pm 67/ \pm 7$	82/86	100
AD-A0324S-2WR3		± 24	$\pm 42/ \pm 4$	82/86	100
AD-A0503S-2WR3	5 (4.5~5.5)	± 3.3	$\pm 303/ \pm 3$	72/76	100
AD-A0505S-2WR3		± 5	$\pm 200/ \pm 2$	76/80	100
AD-A0509S-2WR3		± 9	$\pm 112/ \pm 1$	82/86	100
AD-A0512S-2WR3		± 12	$\pm 83/ \pm 8$	82/86	100
AD-A0515S-2WR3		± 15	$\pm 67/ \pm 7$	82/86	100
AD-A0524S-2WR3		± 24	$\pm 42/ \pm 4$	82/86	100
AD-A0903S-2WR3	9 (8.1~9.9)	± 3.3	$\pm 303/ \pm 3$	78/82	100
AD-A0905S-2WR3		± 5	$\pm 200/ \pm 2$	82/86	100
AD-A0909S-2WR3		± 9	$\pm 112/ \pm 1$	82/86	100
AD-A0912S-2WR3		± 12	$\pm 83/ \pm 8$	82/86	100
AD-A0915S-2WR3		± 15	$\pm 67/ \pm 7$	82/86	100
AD-A0924S-2WR3		± 24	$\pm 42/ \pm 4$	82/86	100



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-2WR3	12 (10.8~13.2)	±3.3	±303/ ±3	72/82	100
AD-A1205S-2WR3		±5	±200/ ±2	82/86	100
AD-A1209S-2WR3		±9	±112/±1	82/86	100
AD-A1212S-2WR3		±12	±83/ ±8	82/86	100
AD-A1215S-2WR3		±15	±67/ ±7	82/86	100
AD-A1224S-2WR3		±24	±42/ ±4	82/86	100
AD-A1503S-2WR3	15 (13.5~16.5)	±3	±303/ ±3	82/86	100
AD-A1505S-2WR3		±5	±200/ ±2	82/86	100
AD-A1509S-2WR3		±9	±112/±1	82/86	100
AD-A1512S-2WR3		±12	±83/ ±8	82/86	100
AD-A1515S-2WR3		±15	±67/ ±7	82/86	100
AD-A1524S-2WR3		±24	±42/ ±4	82/86	100
AD-A2403S-2WR3	24 (21.6~26.4)	±3	±303/ ±3	72/82	100
AD-A2405S-2WR3		±5	±200/ ±2	82/86	100
AD-A2409S-2WR3		±9	±112/±1	82/86	100
AD-A2412S-2WR3		±12	±83/ ±8	82/86	100
AD-A2415S-2WR3		±15	±67/ ±7	82/86	100
AD-A2424S-2WR3		±24	±42/ ±4	82/87	100

INPUT SPECIFICATIONS

Item	Operating Conditions	Min	Typ	Max	Unit
Input Current (Full Load/No-Load)	5.0VDC input	--	454/5	--/10	mA
	9.0VDC input	--	250/5	--/10	
	12VDC input	--	186/2	--/5	
	15VDC input	--	148/2	--/4	
	24VDC input	--	91/1	--/2	
Reflect Ripple Current		--	15	--	mA
Surge Voltage (1sec. max)	3.3VDC input	-0.7	--	5	VDC
	5.0VDC input	-0.7	--	9	
	9.0VDC input	-0.7	--	15	
	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	
Output Voltage Accuracy	See Fig 1. Output Regulation Curve		--	--	±15	%
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, insolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitor	Input-output, 100KHz/0.1V	--	40	--	pF
Operating Temperature	Refer to Fig1. Temperature Derating	-40	--	+85	°C
Storage Temperature		-40	--	+125	°C
Case Temperature Rise During Operation		--	25	--	°C
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°C	3.5X10 ⁶			Hrs



TYPICAL CHARACTERISTIC CURVES

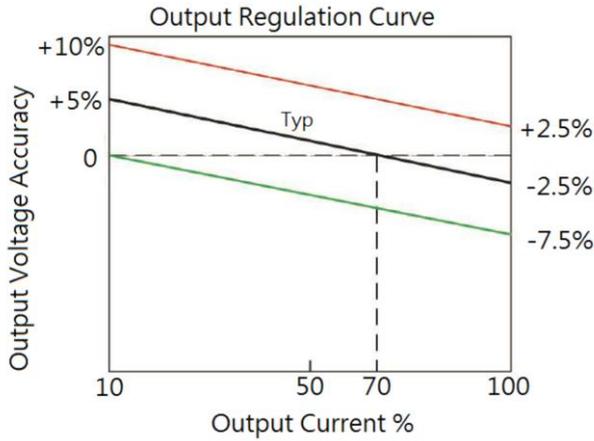


Fig 1.

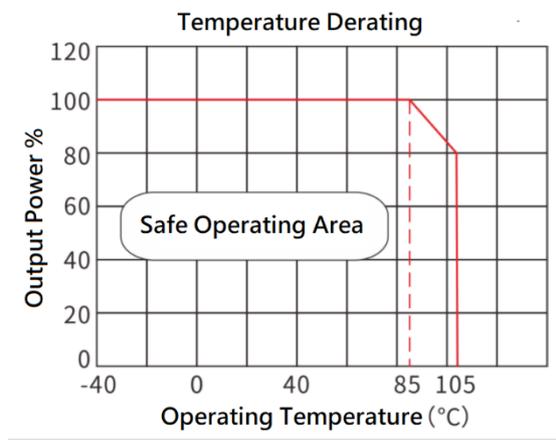


Fig 2.

DESIGN REFERENCE

Typical Application

If further reduction of input and output ripple is required, a capacitor filter network may be connected at the input and output terminals, as shown in Figure 3. Care should be taken to select appropriate filter capacitors. Excessively large capacitance may cause start-up issues. For each output, the recommended capacitive load values under safe and reliable operating conditions are listed in Table 1.

Fig 3. Dual Output



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

Table1. Recommend Input and output Capacitor Values



EMI Compliance Circuit

Fig 4. Dual Output



Vin (VDC)	3.3/5/12/15/24
Cin	See Table 1
Cout	See Table 1
Lin	4.7uH
Lout	4.7uH

Table 2. Recommend EMC Reference Value

OUTPUT LOAD REQUIREMENTS:

To ensure efficient and reliable operation of the module, the minimum output load shall not be less than 10% of the rated load.

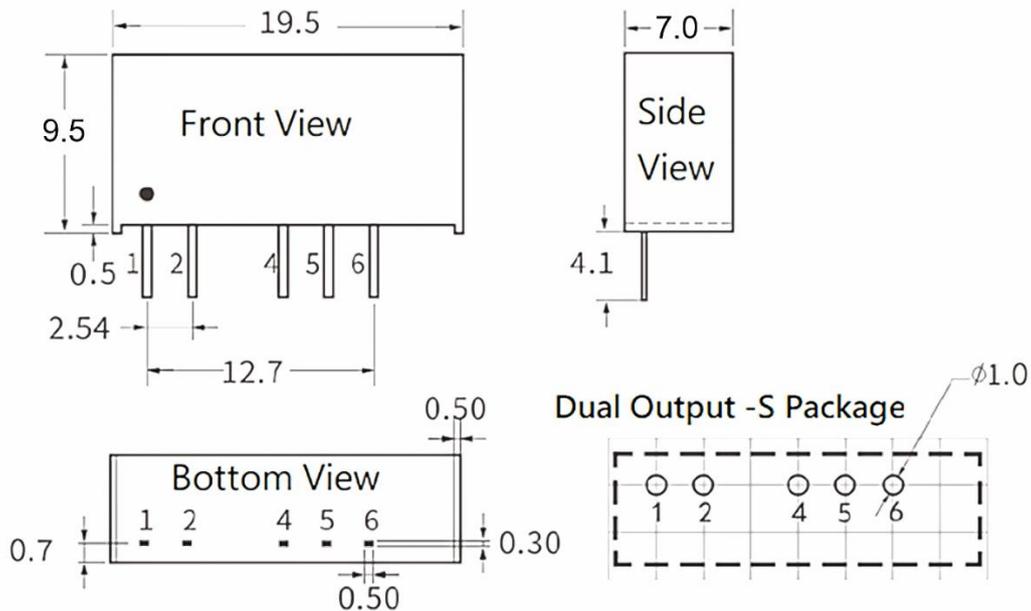
If the required output power is lower than this level, a resistor should be connected in parallel across the output terminals. The total actual power dissipation of the resistor(s) shall be no less than 10% of the rated output power, and the selected resistor(s) shall have a power rating at least five times greater than the actual dissipation; otherwise, excessive resistor temperature may occur.



PACKAGE INFORMATION

Package Code: S

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



Pin-Out	
Pin #	AD-AxxxxS
	Dual
1	Vin
2	-Vin
4	-Vo
5	COM
6	+Vo

Note: Grid 2.54 * 2.54mm

Unit: mm

General tolerances: ±0.25



PRECAUTIONS

Input Requirements

Ensure that the output voltage fluctuation of the power supply does not exceed the input voltage range specified for the DC/DC module. The output power capability of the input power source must be greater than the output power of the DC/DC module.

Recommended Circuit

For applications with general ripples and noise requirements, it is recommended to connect one filter capacitor in parallel at both the input and output terminals. The external circuit is shown in Figure 3, and the recommended capacitor values are listed in Table 1.

Output Load Requirement

Avoid no-load operation whenever possible. When the actual load power is less than 10% of the module's rated output power, or under no-load conditions, it is recommended to connect a dummy load at the output. The dummy load (resistor) can be calculated as 5–10% of the module's rated power, with the resistor value given by: $R = V_{out} / (2WR3 \times 10\%)$

Overload Protection

Under normal operating conditions, the output circuit does not provide dedicated overload protection. Prolonged overload may trigger thermal protection, causing the output to shut down.

Short-Circuit Protection

The output supports continuous short-circuit protection with automatic recovery.

Output Capacitor Requirement

The external output capacitor should not be excessively large; otherwise, it may cause inrush current at startup or result in start-up failure.

Minimum Load Limitation

If the product operates below the minimum required load, full compliance with all performance specifications in this manual cannot be guaranteed.



Capacitive Load Test Conditions

The maximum capacitive load values are tested under full-load conditions across the specified input voltage range.

Test Conditions

Unless otherwise specified, all parameters in this manual are measured at $T_a = 25\text{ }^\circ\text{C}$, humidity < 75% RH, with nominal input voltage and rated output load.

Notice

Product specifications are subject to change without prior notice.