

**DESCRIPTION**

The AD-URBxxxxS-6WR3 and AD-URAxxxxS-6WR3 (1500VDC Isolation) series are isolated 6W DC-DC converter products a 4:1 input voltage range. They feature efficiencies of up to 87%, 1600VDC input to output isolation, operating ambient temperature of -40°C to +85°C, input under-voltage protection, output over-current, short-circuit protection, which is widely used in medical, industrial controls, electricity, instrumentation, communications and other fields.

**FEATURES**

- Wide 4:1 input voltage range
- High efficiency up to 87%
- I/O isolation test voltage 1.5K VDC (URA)
- No-load power consumption bottom 0.12W
- Input under-voltage protection, output short-circuit, over-current protection
- Continuous short-circuit protection
- Operating temperature range:-40°C to +85°C
- International Standard Pin out
- Small SIP8 Package

**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-URB2403S-6WR3	24.0 (9.0~36.0)	3.3	1350	50/130	2200	
AD-URB2405S-6WR3		5	1200	50/130	2200	
AD-URB2409S-6WR3		9	667	50/130	680	
AD-URB2412S-6WR3		12	500	50/130	680	
AD-URB2415S-6WR3		15	400	50/130	470	
AD-URB2424S-6WR3		24	250	50/130	330	
AD-URA2403S-6WR3		±3.3	±625	50/130	1000	
AD-URA2405S-6WR3		±5	±600	50/130	1000	
AD-URA2409S-6WR3		±9	±333	50/130	1000	
AD-URA2412S-6WR3		±12	±250	50/130	470	
AD-URA2415S-6WR3		±15	±200	50/130	220	
AD-URA2424S-6WR3		±24	±125	50/130	100	
AD-URB4803S-6WR3		48 (18.0~75)	3.3	1350	50/130	2200
AD-URB4805S-6WR3			5	1200	50/130	2200
AD-URB4809S-6WR3	9		667	50/130	680	
AD-URB4812S-6WR3	12		500	50/130	680	
AD-URB4815S-6WR3	15		400	50/130	470	
AD-URB4824S-6WR3	24		250	50/130	330	
AD-URA4803S-6WR3	±3.3		±625	50/130	1000	
AD-URA4805S-6WR3	±5		±600	50/130	1000	
AD-URA4809S-6WR3	±9		±333	50/130	1000	
AD-URA4812S-6WR3	±12		±250	50/130	470	
AD-URA4815S-6WR3	±15		±200	50/130	220	
AD-URA4824S-6WR3	±24		±125	50/130	100	

**INPUT SPECIFICATIONS**

Item	Operating Conditions	Min	Typ	Max	Unit
Input Current (Full Load/No-Load)	24VDC input, 3.3VDC output	--	228/5	245/12	mA
	24VDC input, 5.0VDC output	--	305/5	313/12	
	24VDC input, Others	--	305/5	313/12	
	48VDC input, 3.3VDC output	--	119/3	123/6	
	48VDC input, 5.0VDC output	--	152/3	162/6	
	48VDC input, Others	--	152/3	162/6	
Reflect Ripple Current		--	50	--	mA
Surge Voltage (1sec. max)	24VDC input	-0.7	--	50	VDC
	48VDC input	-0.7	--	100	
Start-up Voltage	24VDC input	--	--	9	VDC
	48VDC input	--	--	18	
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			
CTRI *	Module on	Ctrl pin open or pulled high (>0.8VDC)			
	Module off	Ctrl pin pull low to GND (<0.6VDC)			

\*The Ctrl pin voltage is referenced to input GND.

**OUTPUT SPECIFICATIONS**

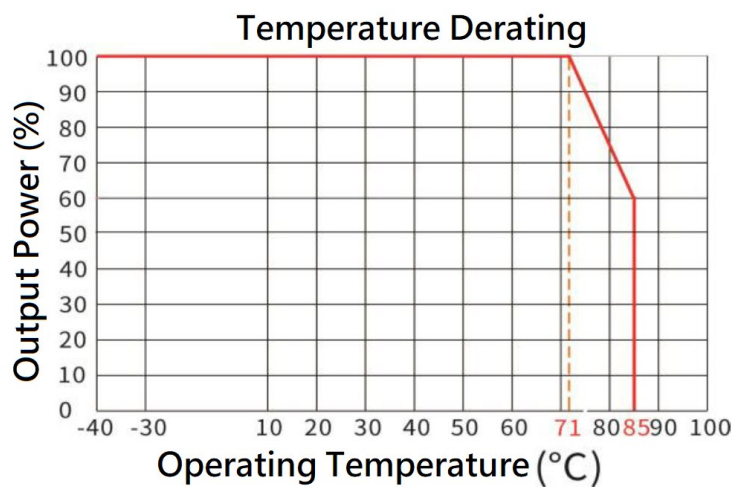
Item	Operating Conditions	Min	Typ	Max	Unit	
Output Voltage Accuracy	5%~100% Load	3.3V/5V output	--	±3	±5	%
		Others	--	±1	±2	
Linear Regulation	Input voltage variation from low to high at full load	--	±0.5	±1	%	
Load Regulation	10~100% Load	--	±0.5	±1.5	%	
Ripple & Noise	Pure resistance load, 20MHz bandwidth peak-to-peak value	--	50	130	mVp-p	
Temperature Drift Coefficient	Full Load	--	±0.02	±0.03	%/°C	
Output Short Circuit Protection		Continuous, self-recovery				
Transient Recovery Time	25% load step change	--	±5	±8	ms	
Transient Response Deviation		--	±3	±5		



**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	--	120	--	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	--	300	--	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	1000			KHrs

**TYPICAL CHARACTERISTIC CURVES Fig 1.**



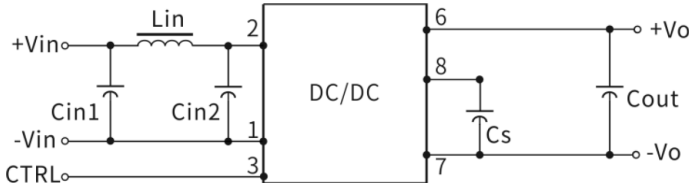


**DESIGN REFERENCE**

**Typical Application**

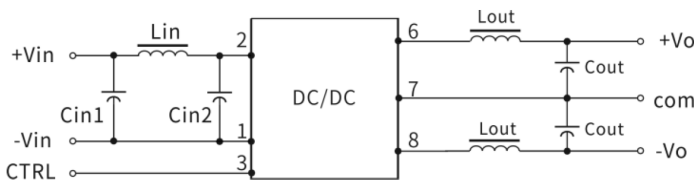
If the input and output ripples are required to be further reduced, the input and output external capacitors  $C_{in1}$ ,  $C_s$  and  $C_{out}$  can be appropriately increased or capacitors with small equivalent impedance values can be selected in series.  $C_s$  is used to reduce the ripples. If the ripples have met the requirements, there is no need to add  $C_s$ . However, a suitable filter capacitor value should be selected. If the capacitor is too large, it is likely to cause startup problems. For each output, the maximum capacitance of its filter capacitor must be less than the maximum capacitive load while ensuring safe and reliable operation.

Fig 2. Single Output



Input Voltage	24VDC	48VDC
$C_{in1}$	100uF	48uF
$C_{in2}$	47uF	22uF
$L_{in}$	4.7uH-12uH	4.7uH-12uH
$C_s$	10uF-22uF	10uF-22uF
$C_{out}$	100uF (Typ.)	100uF (Typ.)
$L_{out}$	2.2uH-10uH	2.2uH-10uH

Fig 3. Dual Output



**EMC Compliance Circuit**

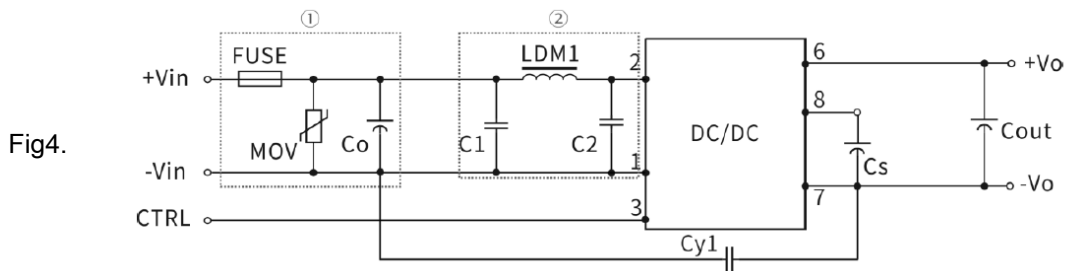


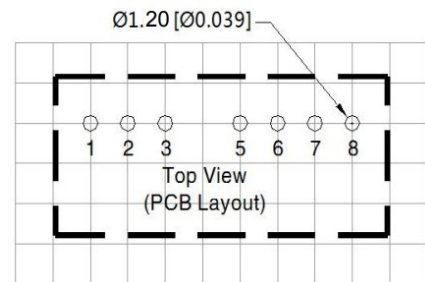
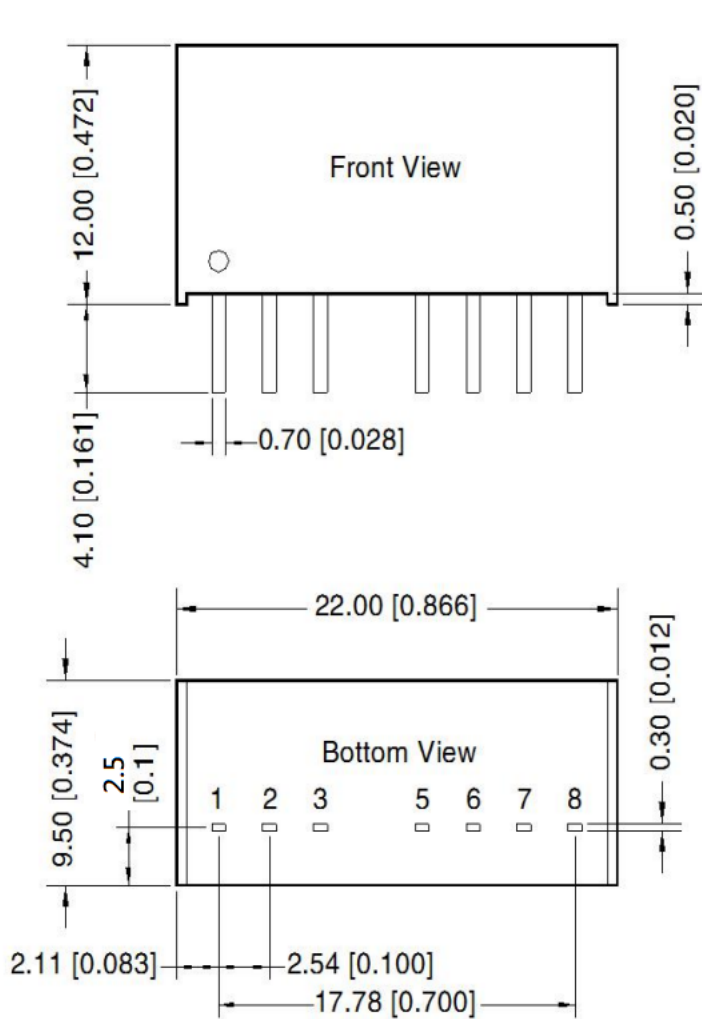
Table 2. Parameter Description

Components	24V input	Components	24V input
Fuse	Choose according to actual input current	C1	4.7uF/50V
MOV	14D560K	C2	4.7uF/50V
LDM1	12uH	$C_{out}$	See Fig 3. $C_{out}$
$C_o$	330uH/50V	CY1	1nF/2KV



**PACKAGE INFORMATION**

SIP8 Package



Note: Grid 2.54 \* 2.54mm  
 Unit: mm(inch)  
 Pin section tolerances:  $\pm 0.10 (\pm 0.004)$   
 General tolerances:  $\pm 0.25 (\pm 0.010)$

Pin	Mark
1	GND
2	Vin
3	Ctrl
5	NC
6	+Vo
7	0V
8	NC