DESCRIPTION

The AD-URBxxxxYMD-20WR3 (Single) and AD-URAxxxxYMD-20WR3 (Dual) series are isolated 20W DC-DC converter products a 4:1 input voltage range. They feature efficiencies of up to 91%, 1500VDC input to output isolation, operating ambient temperature of -40℃ to +85℃, 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 91%
- I/O isolation test voltage 1.5K VDC
- No-load power consumption bottom 0.012W
- 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
- DIP 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-URA2405YMD-20WR3	24.0 (9.0~36.0) Max:40	±5	±2000/0	85/87	2000
AD-URA2409YMD-20WR3		±9	±1111/0	86/88	2000
AD-URA2412YMD-20WR3		±12	±833/0	88/90	800
AD-URA2415YMD-20WR3		±15	±666/0	88/90	600
AD-URA2424YMD-20WR3		±24	±416/0	88/90	470
AD-URB2403YMD-20WR3		3.3	5000/0	86/88	10000
AD-URB2405YMD-20WR3		5	4000/0	88/90	10000
AD-URB2409YMD-20WR3		9	2222/0	86/88	10000
AD-URB2412YMD-20WR3		12	1666/0	88/90	1600
AD-URB2415YMD-20WR3		15	1333/0	89/91	1000
AD-URB2424YMD-20WR3		24	833/0	89/91	500
AD-URA4805YMD-20WR3	48 (18.0~75) Max:80	±5	±2000/0	85/87	2000
AD-URA4809YMD-20WR3		±9	±1111/0	86/88	2000
AD-URA4812YMD-20WR3		±12	±833/0	88/90	800
AD-URA4815YMD-20WR3		±15	±666/0	88/90	600
AD-URA4824YMD-20WR3		±24	±416/0	88/90	470
AD-URB4803YMD-20WR3		3.3	5000/0	86/88	10000
AD-URB4805YMD-20WR3		5	4000/0	88/90	10000
AD-URB4809YMD-20WR3		9	2222/0	86/88	10000
AD-URB4812YMD-20WR3		12	1666/0	88/90	1600
AD-URB4815YMD-20WR3		15	1333/0	89/91	1000
AD-URB4824YMD-20WR3		24	833/0	89/91	500

INPUT SPECIFICATIONS

Item	Operating Conditions	Min	Typ	Max	Unit
Input Current (Full Load/No-Load)	24VDC input, 3.3VDC output		782/20	800/30	mA
	24VDC input, 5VDC output		926/25	947/35	
	24VDC input, 9VDC output		926/25	947/35	
	24VDC input, 12VDC output		926/1	947/2	
	24VDC input, 15VDC output		916/1	937/2	
	24VDC input, 24VDC output t		916/1	937/2	
	24VDC input, ±5VDC output		957/25	980/35	
	24VDC input, ±9VDC output		957/25	980/35	
	24VDC input, ±12VDC output		926/1	947/2	
	24VDC input, ±15VDC output		926/1	937/2	
	24VDC input, ±24VDC output		926/1	937/2	
	48VDC input, 3.3VDC output		391/10	400/15	
	48VDC input, 5VDC output		463/12	474/18	
	48VDC input, 9VDC output		463/12	474/18	
	48VDC input, 12VDC output		458/1	469/1.5	
	48VDC input, 15VDC output		458/1	469/1.5	
	48VDC input, 24VDC output t		458/1	469/1.5	
	48VDC input, ±5VDC output		484/1	469/1.5	
	48VDC input, ±9VDC output		484/1	469/1.5	
	48VDC input, ±12VDC output		458/1	469/1.5	
	48VDC input, ±15VDC output		458/1	469/1.5	
	48VDC input, ±24VDC output		458/2	469/1.5	
Reflect Ripple Current	24V series input		40		mA
	48V series input		40		
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 under-voltage protection	24VDC input	5.5	6.5		VDC
	48VDC input	12	15.5		
Input Filter		PI Filter			
Hot Plug		Unavailable			
Start-up Time	Standard input with Constant Resistance load	1 ms			
CTRl *	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

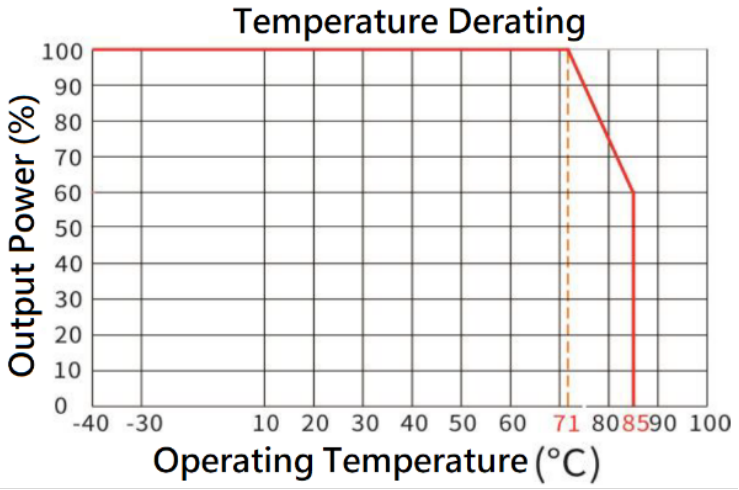
Item	Operating Conditions	+Vo1 / -Vo2			
		Min	Typ	Max	Unit
Output Voltage Accuracy		--	±1.0/2.0	±2.0/3.0	%
Linear Regulation	Input voltage variation from low to high at full load	--	±0.2/1.5	±0.5/2.0	%
Load Regulation	20~100% Load	--	±0.5/4.0	±1.0/5.0	%
Ripple & Noise	Pure resistance load, 20MHz bandwidth peak-to-peak value	--	50	80	mVp-p
Start Delay time		--	1	--	ms
Output Over Current Protection	Full Voltage input range	110% Io	150% Io	200% Io	
Output Over Voltage Protection	Full Voltage input range	110% Vo		160% Vo	
Output Short Circuit Protection	Full Voltage input range	sustainable, self-healing			
Transient Recovery Time	25% load step change	--	0.3	0.5	ms
Transient Response Deviation		--	±3.0/3.0	±5.0/5.0	%

GENERAL SPECIFICATIONS

Item	Test Condition	Min	Typ	Max	Unit
Insulation Voltage	Input-output, test time 1minute, leakage current less than 1mA	1500	--	--	VDC
Insulation Resistance	Input-output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitor	Input-output, 100KHz/0.1V	--	1000	--	pF
Operating Temperature	Refer to Fig1. Temperature Derating	-40	--	+85	°C
Storage Temperature		-40	--	+125	°C
Max Operation Case Temperature		--	--	100	°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	--	250	--	KHz
Vibrations	10-55Hz, 10G, 30Min along X,Y & Z				
Housing Material	Aluminum shell				
MTBF	MIL-HDBK-217F@25℃		$2x10^5$		Hrs

TYPICAL CHARACTERISTIC CURVES

Fig 1.



DESIGN REFERENCE

Typical Application

If need to further reduce the input and output ripple, you can increase the input and output external capacitors C1, C2, C3 or use capacitors with a small series equivalent impedance value, but the capacitance value cannot be greater than the maximum capacitive load of the product.

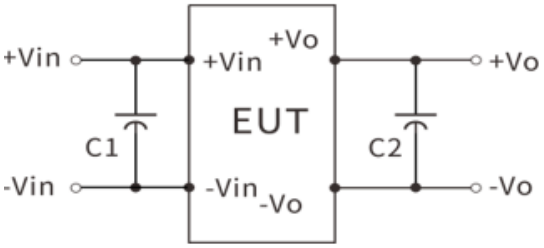


Fig 2.

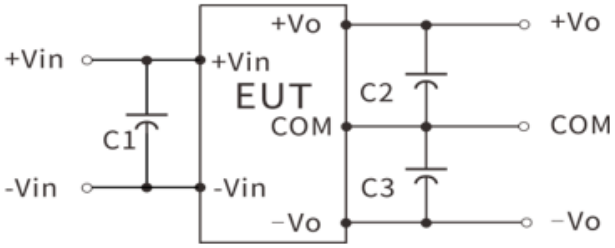
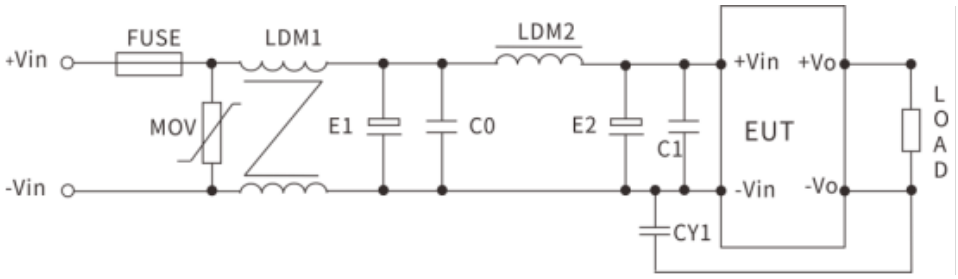


Fig 3.

EMC Compliance Circuit

Fig 4.



Components	24V input	48V Input
Fuse	Choose according to actual input current	
MOV Varistor	14D560K	14D101K
LDM1 inductor	10mH	15mH
E1,E2 Electrolytic Cap	100uF/50V	100uF/50V
C0, C1 Ceramic Cap	1uF/50V	1uF/50V
CY1 Safety Cap Y2	1nF/250Vac	

Table 1. Recommanded Components Parameter Description.

Recommended circuit for output filter

Fig 5.Single output

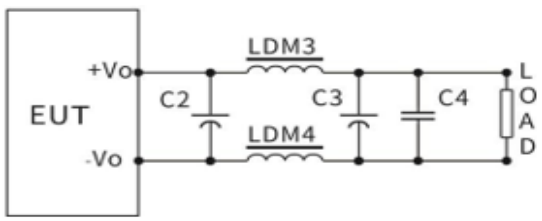
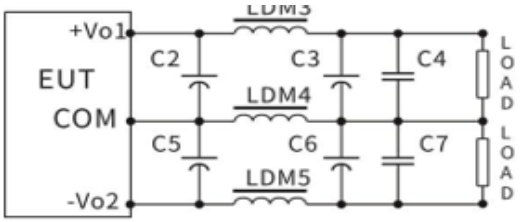


Fig 6. Positive and negative dual output

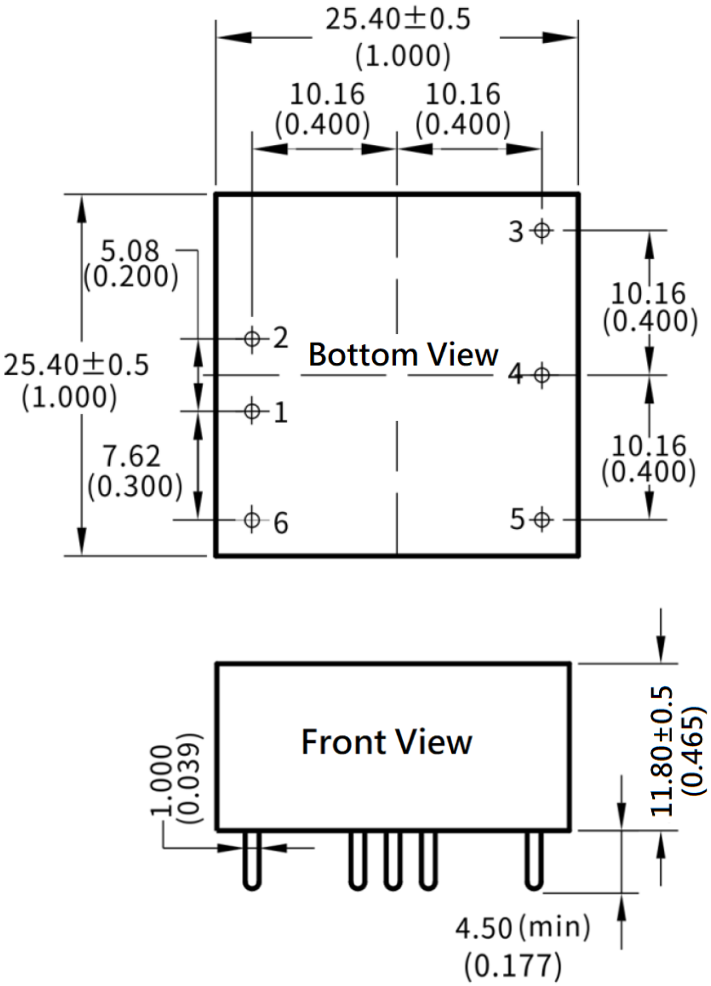


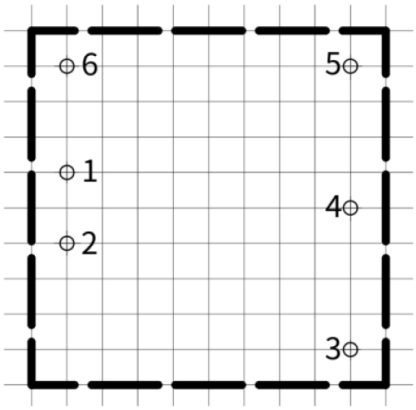
When the requirements for ripple and noise are average, just use C2 and C5. When the requirements for ripple and noise are strict, it is recommended to use the circuit in the figure above.

Item	3.3VDC	±5VDC	±9/12VDC	±15VDC	±24VDC
LDM3 Inductor	0.47uH	1uH	2.2uH	2.2uH	4.7uH
LDM4 Inductor	0.47uH	1uH	2.2uH	2.2uH	4.7uH
LDM5 Inductor		1uH	2.2uH	2.2uH	4.7uH
C2, C3 Electrolytic Cap	220uF	220uF	100uF	100uF	68uF
C5,C6 Electrolytic Cap	220uF	220uF	100uF	100uF	68uF
C4,C7 Electrolytic Cap	1uF/50V				

PACKAGE INFORMATION

Package Code: YMD Dimension: 25.4x25.4x11.0 mm (1.000x1.000x0.433 inch)





Note: Grid 2.54 * 2.54mm

Unit: mm(inch)

Pin section tolerances: ±0.10 (±0.004)

General tolerances: ±0.25 (±0.010)

Pin-Out		
Pin #	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	+Vo	+Vo1
4	NC	COM
5	-Vo	-Vo2
6	CTRL	CTRL