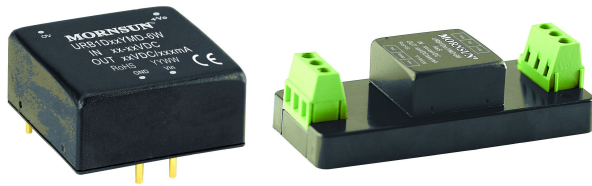


6W, ultra wide input isolated & regulated single output DC-DC converter



CE RoHS Patent Protection

URB1D\_YMD-6W series are isolated 6W DC-DC products with 4:1 input voltage. They feature efficiency up to 85%, 1500VDC isolation, operating temperature of -40°C ~ +85°C, output over-voltage protection, short-circuit protection. It offers good EMC performance, meet EN60950 standards. All models are particularly suited to railway etc.c.

### FEATURES

- Wide range of input voltage (4:1)
- Efficiency up to 85%
- Isolation voltage : 1.5K VDC
- Operating temperature range: -40°C to +85°C
- Output over-voltage protection, Short circuit protection
- Low ripple & noise
- Meet EN60950
- International standard pin-out

### Selection Guide

certification	Part No.	Input Voltage (VDC)		Output		Efficiency (%Min./Typ.) @ Full Load	Max. Capacitive Load(μF)
		Nominal (Range)	Max. <sup>②</sup>	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
CE	URB1D05YMD-6W	110 (40-160)	170	5	1200/60	79/81	1000
	URB1D12YMD-6W			12	500/25	81/83	100
	URB1D15YMD-6W			15	400/20	83/85	100
	URB1D24YMD-6W			24	250/13	83/85	47

Note:

- ①series with suffix "A2S" are chassis mounting, for example URB1D05YMD-6WA2S is chassis mounting,
- ②Absolute maximum rating without damage on the converter, but it isn't recommended;
- ③The efficiency of A2S (wiring type) products is 2% lower than the above-mentioned value due to the reverse connection protection for input;

### Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)		--	67/2	70/5	mA
Reflected Ripple Current		--	20	--	
Input Impulse Voltage (1sec. max.)		-0.7	--	180	VDC
Starting Voltage		--	--	40	
Input Filter		PI filter			
Hot Plug		Unavailable			

### Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±1	±2	%
Line Regulation	Full load, the input voltage is from low voltage to high voltage	--	±0.2	±0.5	
Load Regulation	5%-100% load	--	±0.5	±1	
Transient Recovery Time	25% load step change	--	300	1000	μs
Transient Response Deviation		--	±3	±5	%
Temperature Coefficient	Full load	--	--	±0.03	%/°C
Ripple & Noise*	20MHz bandwidth	--	70	100	mV p-p
Over-voltage Protection	Input voltage range	110	--	140	%Vo
Short circuit Protection		Continuous			

Note: \* Ripple and noise tested with "parallel cable" method, please see DC-DC Converter Application Notes for specific operation methods.

### General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA.	1500	--	--	VDC

Isolation Resistance	Input-output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	1000	--	pF
Operating Temperature	Derating when operating temperature up to 71°C., (see Fig.1)	-40	--	85	°C
Storage Temperature		-55	--	125	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds.	--	--	300	
Storage Humidity	Non-condensing	5	--	95	%
Vibration		5-150Hz, Displacement Acceleration: 2G			range: 7.5mm,
Switching Frequency	PWM Mode	--	300	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours

Physical Specifications

Casing Material	Aluminum alloy				
Dimensions	Horizontal package	25.40*25.40*11.70 mm			
	A2S wiring package	76.00*31.50*21.20mm			
Weight	Horizontal package/A2S wiring package	14g/36g (Typ.)			
Cooling Methods	Free air convection				

EMC Specifications

EMI	CE	CISPR22/EN55022	CLASS B (see Fig.3 for recommended circuit)		
	RE	CISPR22/EN55022	CLASS B (see Fig.3 for recommended circuit)		
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV		perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m		perf. Criteria A
	EFT	IEC/EN61000-4-4	±4KV		perf. Criteria B
	Surge	IEC/EN61000-4-5	±2KV/±4KV (see Fig.3 for recommended circuit)		perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s		perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-29	0-70%		perf. Criteria B

Product Characteristic Curve

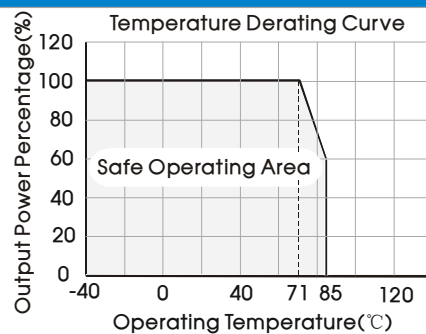
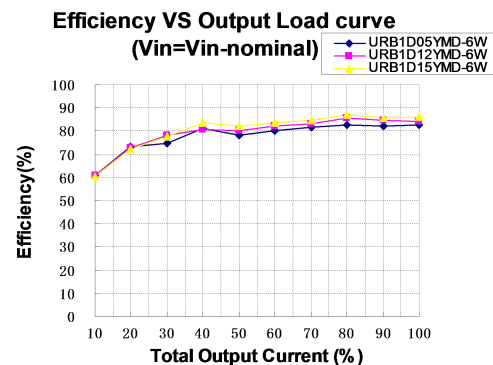
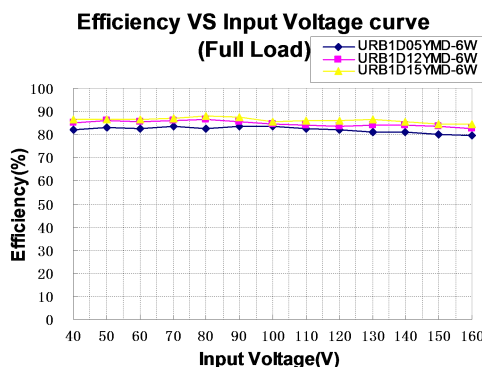


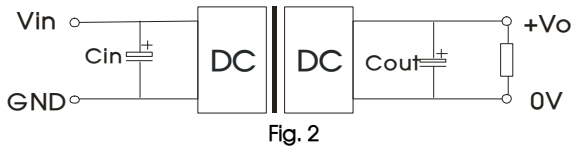
Fig. 1



Design Reference

1. Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery. If a further decrease of the input and output ripple is required, properly increase the input & output of additional capacitors  $C_{in}$  and  $C_{out}$  or select capacitors of low equivalent impedance, and ensure the capacitance should be lower than the max. capacitive load of the product.



$C_{in}$	$C_{out}$
10 $\mu$ F -47 $\mu$ F	10 $\mu$ F

2. EMC solution-recommended circuit

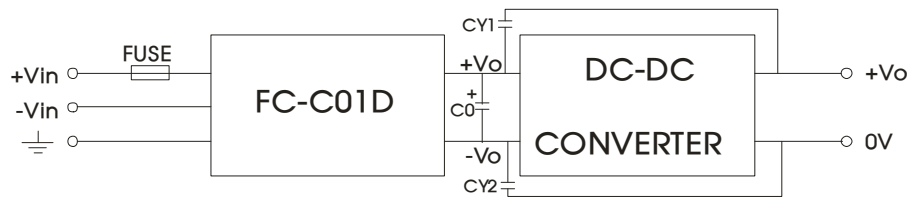


Fig. 3

FC-C01D is the EMC auxiliary component of our company. Input voltage range: 40V-160V;  
 FUSE: Choose according to customer actual input current;  
 C0: Recommend to use 100 $\mu$ F/200V electrolytic capacitor;  
 CY1\CY2: 1nF /2KV.

EMC solution-recommended circuit PCB layout

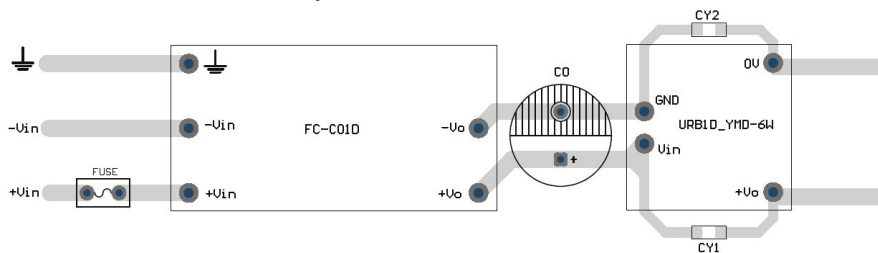
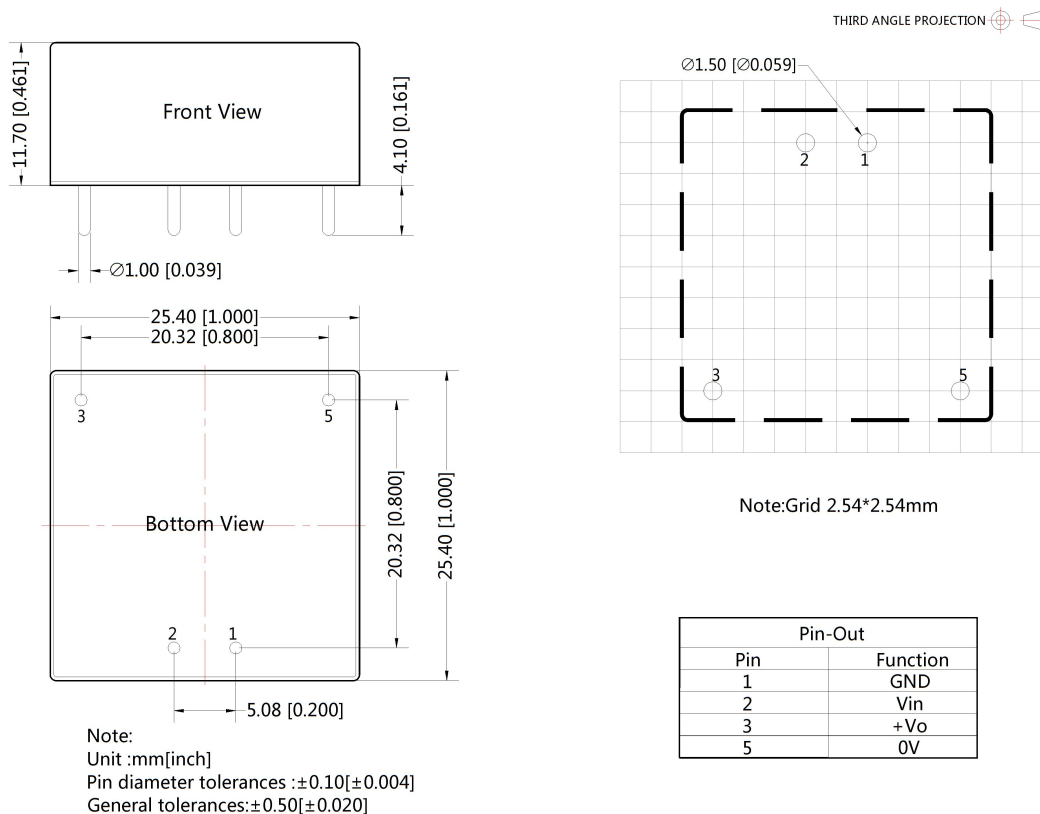


Fig. 4

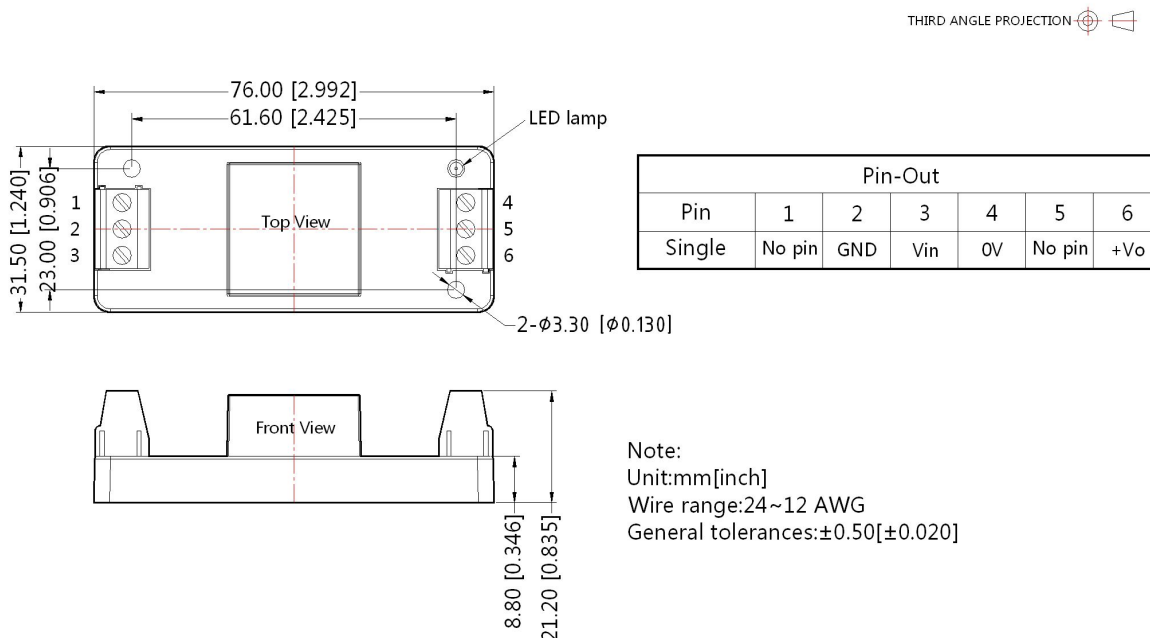
Note: the min. distance of the bonding pads between input & output isolation capacitors (CY1/CY2) shall be  $\geq 2$ mm.

- It is not allowed to connect modules output in parallel to enlarge the power
- For more information about Mornsun EMC Filter products, please visit [www.mornsun-power.com](http://www.mornsun-power.com) to download the Selection Guide of EMC Filter

Dimensions and Recommended Layout



A2S Wiring Package Dimensions



Note:

1. Packing Information please refer to 'Product Packing Information'. The Packing bag number of Horizontal package : 58210003; The Packing bag number of A2S wiring package: 58220022;
2. Recommend to use module with more than 5% load, if not, the ripple of the product may exceeds the specification, but does not affect the reliability of the product;
3. The max. capacitive load should be tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, data in this datasheet should be tested under the conditions of  $T_a=25^{\circ}\text{C}$ , humidity<75% when inputting nominal voltage and outputting rated load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. The performance indexes of the product models listed in this datasheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
7. We can provide product customization service;
8. Specifications of this product are subject to changes without prior notice.

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