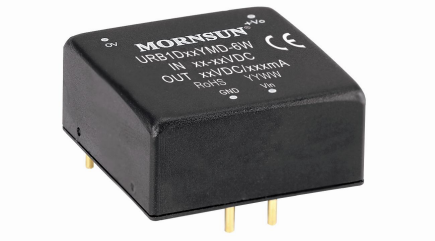
MORNSUN®

URB1D_YMD-6W SERIES

6W，ULTRA WIDE INPUT, ISOLATED & REGULATED SINGLE OUTPUT DIP PACKAGING DC-DC CONVERTER



Patent Protection RoHS

FEATURES

- Efficiency up to 85%
- 4:1 wide input voltage range
- 1.5KVDC isolation
- Operating temperature range: -40°C ~ +85°C
- Output over voltage protection,short circuit protection
- Industry standard pinout
- Low ripple & noise
- Meet EN60950

PART NUMBER SYSTEM

URB1D15YMD-6W

- Rated Power
- Package Style
- Output Voltage
- Input Voltage
- Product Series

APPLICATION

The URB1D_YMD-6W series offer 6W of output, with 4:1 wide input voltage of 40-160VDC .It is suitable for 72 V, 96 V, 110 V standard input of the bus voltage,single output and 1500VDC isolation, over voltage and short-circuit protection.It offers good EMC performance,meet EN60950 standards.All models are particularly suited to railway etc.c

SELECTION GUIDE

Approval	Model	Input Voltage(VDC)		Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(typ.)		Reflected Ripple Current (mA,typ.)	Max. Capacitive Load (μF)	Efficiency (%, typ.) @Max. Load
		Nominal (Range)	Max.*		Max.	Min.	@Max. Load	@No Load			
CE	URB1D05YMD-6W	110 (40-160)	170	5	1200	60	67	2	20	1000	81
	URB1D12YMD-6W			12	500	25	65			100	83
	URB1D15YMD-6W			15	400	20	64			100	85
	URB1D24YMD-6W			24	250	13	64			47	85

Note: *Input voltage can't exceed this value, or will cause the permanent damage.

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec.max.)		-0.7	--	180	VDC
Start-up Voltage		--	--	40	
Input Filter		Pi Filter			

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±1	±2	%
Line Regulation	Full load, Input voltage from low to high	--	±0.2	±0.5	
Load Regulation	5% to 100% load	--	±0.5	±1	
Transient Recovery Time	25% load step change	--	300	1000	μs
Transient Response Deviation		_	±3	±5	%
Temperature Drift	100% load	--	--	±0.03	%/°C
Ripple*	20MHz bandwidth	--	10	25	mVp-p
Noise*			70	100	
Output Over Voltage Protection	Input voltage range	110-140			%Vo
Output Short Circuit Protection		Continuous, automatic recovery			

Note: * Ripple and noise tested by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Tested for 1 minute and leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input/Output,100KHz/0.1V	--	1000	--	pF
Switching Frequency	PWM mode	--	300	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Safety approvals		EN60950			
Case Material		Aluminum Alloy			
Size		25.40×25.40×11.70			mm
Weight		--	14	--	g

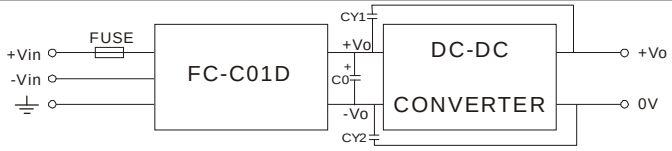
ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	5	--	95	%
Operating Temperature	Power derating (above 71℃,see Figure 3)	-40	--	85	℃
Storage Temperature		-55	--	125	
Temp. rise at full load	Ta=25°C	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			
Shake		5-150Hz, shift range: 7.5mm, acceleration: 2G			

SAFE & EMC SPECIFICATIONS

Safe	Transient Input Voltage	RIA12	385V / 20ms perf. Criteria A（Pulse Interval > 60s） (With MORNSUN's FC-C01D Module, Refer to Figure 1)
	Maximum Input Voltage	EN50155	1800V（5/50μs, 5Ωor100Ω） perf. Criteria B（Pulse Interval > 60s） (With MORNSUN's FC-C01D Module, Refer to Figure 1)
		EN50155	8400V（(0.05/0.1μs, 100Ω） perf. Criteria B（Pulse Interval > 60s） (With MORNSUN's FC-C01D Module, Refer to Figure 1)
EMI	CE	CISPR22/EN55022	CLASS B(With MORNSUN's FC-C01D Module, Refer to Figure 1)
	RE	CISPR22/EN55022	CLASS B(With MORNSUN's FC-C01D Module, Refer to Figure 1)
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(With MORNSUN's FC-C01D Module, Refer to Figure 1)
	Surge	IEC/EN61000-4-5	±2KV/±4KV perf. Criteria B(With MORNSUN's FC-C01D Module, Refer to Figure 1)
	CS	IEC/EN61000-4-6	3Vr.m.s perf. Criteria A
	Voltage dips、short and interruptions immunity	IEC/EN61000-4-29	0%-70% perf. Criteria B

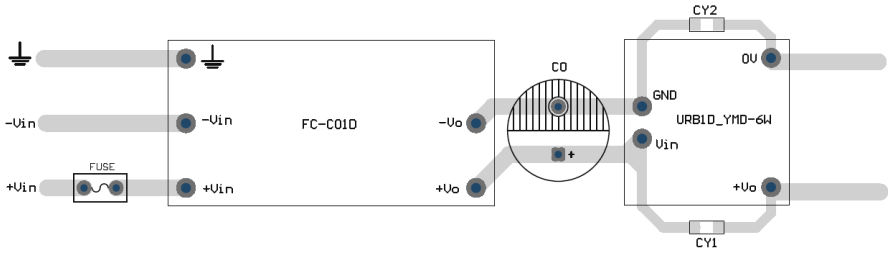
EMC MODULE APPLICATION CIRCUIT



FC-C01D's input voltage range: 40V-160V
(Figure 1)

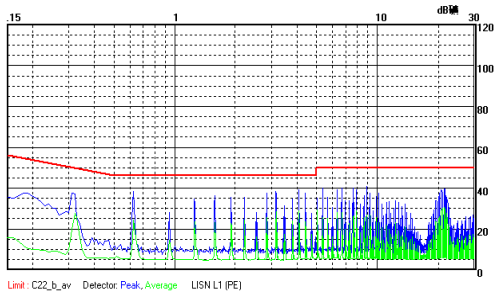
FUSE: Choose according to customer actual input current;
C0: Recommend to use 100uF/200V electrolytic capacitor; It is used to suppress voltage dips, is not designed without requirement of the application;
CY1\CY2:1nF /2KV.

EMC MODULE RECOMMENDED CIRCUIT PCB LAYOUT

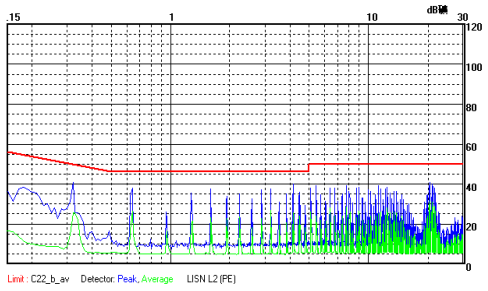


(Figure 2)

EMI TEST WAVEFORM (CLASS B APPLY CIRCUIT)

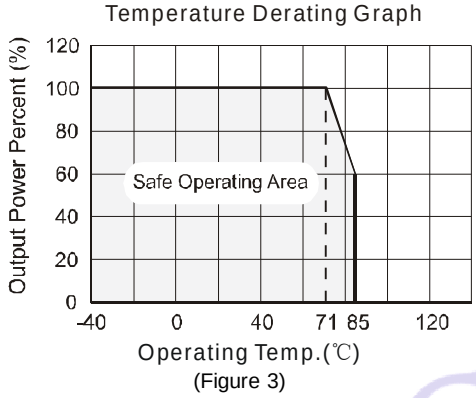


URB1D05YMD-6W CE (Positive line)

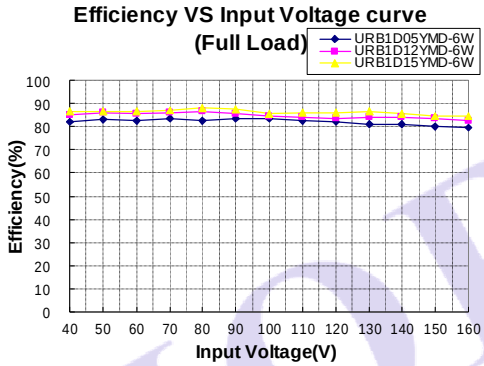


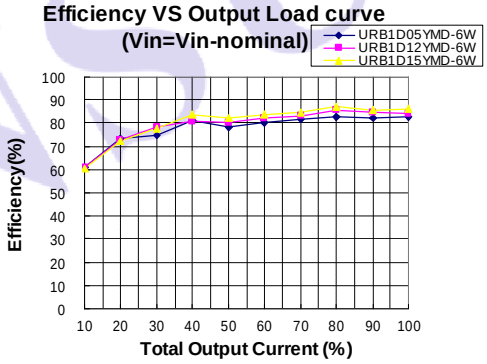
URB1D05YMD-6W CE (Negative line)

PRODUCT TYPICAL CURVE



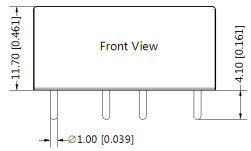
(Figure 3)

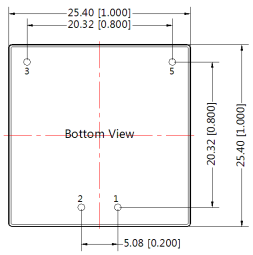




OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING

MECHANICAL DIMENSIONS



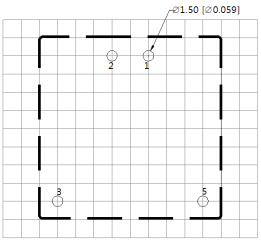


PIN CONNECTION	
Pin	Function
1	GND
2	Vin
3	+Vo
5	0V

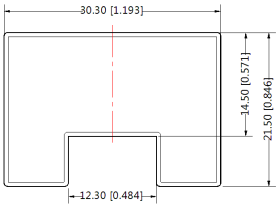
Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
Pin height tolerances :±0.50[±0.002]
General tolerances:±0.25[±0.010]

THIRD ANGLE PROJECTION

RECOMMENDED FOOTPRINT DETAILS



TUBE PACKAGING DIMENSIONS



Note:
Unit :mm[inch]
General tolerances :±0.50[±0.020]
L=530[20.866] Tube Quantity:19pcs
L=220[8.661] Tube Quantity:7pcs
Inner carton(S): L*W*H=255*170*80
Outer carton(S): L*W*H=375*280*270, 6 inner cartons(S)
Inner carton(L): L*W*H=580*200*100
Outer carton(L): L*W*H=600*215*220, 2 inner cartons(L)
Outer carton(L): L*W*H=600*215*325, 3 inner cartons(L)

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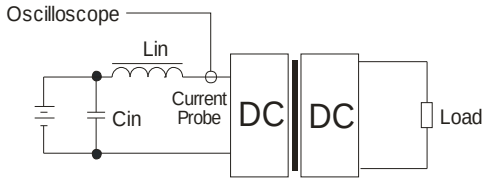
TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin and Capacitor Cin to simulate source impedance.



Lin(4.7μH) Cin(220μF, ESR < 1.0Ω at 100 KHz)

DESIGN CONSIDERATIONS

1) Recommended circuit

All the URB1D_YMD-6W Series have been tested according to the following recommended testing circuit before leaving factory (see Figure 4).

If you want to further decrease the input/output ripple, you can increase a capacitance properly or choose capacitors with low ESR, but the greatest capacitance of its filter capacitor must less than the Max. Capacitive Load.

General: Cin：10~47μF

Cout：10μF

(Figure 4)

2) It is not recommended to increase the output power capability by connecting two or more converters in parallel.The product is not hot-swappable

Note:

1. Min. load shouldn't be less than 5%, otherwise ripple maybe increase dramatically. Operation under minimum load will not damage the converter, however, they may not meet all specification listed.
2. Max. Capacitive Load tested at input voltage range and full load.
3. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
4. In this datasheet, all the test methods of indications are based on our corporate standards.
5. All characteristics are for listed model, non-standard models may perform differently, please contact our technical person for more detail.
6. Contact us for your specific requirement.
7. Specifications subject to change without prior notice.

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