MORNSUN®

1W, Fixed input voltage, isolated & unregulated dual output

Continuous Short Circuit Protection

Patent Protection **RoHS**

FEATURES

- Efficiency up to 82%
- Isolation voltage: 1.5K VDC
- Operating temperature range: -40℃to +105℃
- Miniature SMD package
- Internal surface mounted design
- No external component required
- International standard pin-out

A_XT-1WR2 series is specially designed for applications where an isolated voltage is required in a distributed power supply system. It is suitable for
1.Where the voltage of the input power supply is stable (voltage variation: ±10%Vin);
2.Where isolation is necessary between input and output (isolation voltage ≤1500VDC);
3.Where do not has high requirement of line regulation , load regulation and the ripple & noise of the output voltage;
Such as: pure digital circuits, low frequency analog circuits, and relay-driven circuits.

Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load (μF)
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
A0305XT-1WR2	3.3 (2.97-3.63)	±5	±100/±10	74/78	100
A0312XT-1WR2		±12	±42/±5	74/78	
A0315XT-1WR2		±15	±33/±3	74/78	
A0505XT-1WR2	5 (4.5-5.5)	±5	±100/±10	76/80	
A0509XT-1WR2		±9	±56/±6	76/80	
A0512XT-1WR2		±12	±42/±5	77/81	
A0515XT-1WR2		±15	±33/±3	77/81	
A0524XT-1WR2		±24	±21/±2	77/81	
A1205XT-1WR2	12 (10.8-13.2)	±5	±100/±10	76/80	
A1209XT-1WR2		±9	±56/±6	76/80	
A1212XT-1WR2		±12	±42/±5	77/81	
A1215XT-1WR2		±15	±33/±3	77/81	
A1224XT-1WR2		±24	±21/±2	77/81	
A1515XT-1WR2	15 (13.5-16.5)	±15	±33/±3	77/81	
A2405XT-1WR2	24 (21.6-26.4)	±5	±100/±10	76/80	
A2409XT-1WR2		±9	±56/±6	76/80	
A2412XT-1WR2		±12	±42/±5	77/81	
A2415XT-1WR2		±15	±33/±3	78/82	
A2424XT-1WR2		±24	±21/±2	78/82	

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3VDC input	--	389/25	--	mA
	5VDC input	--	250/20	--	
Input Current (full load / no-load)	12VDC input	--	104/15	--	mA
	15VDC input	--	83/12	--	
	24VDC input	--	52/10	--	

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Surge Voltage (1sec. max.)	3.3VDC input	-0.7	--	5	VDC
	5VDC input	-0.7	--	9	
	12VDC input	-0.7	--	18	
	15VDC input	-0.7	--	21	
	24VDC input	-0.7	--	30	
Reflected Ripple Current		--	15	--	mA
Input Filter		Capacitor filter			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope graph (Fig. 1)			
Line Regulation	Input voltage change: ±1%		--	--	±1.2	--
Load Regulation	10%-100% load	5VDC output	--	12	--	%
		9VDC output	--	9	--	
		12VDC output	--	8	--	
		15VDC output	--	7	--	
		24VDC output	--	6	--	
Ripple & Noise*	20MHz bandwidth		--	60	--	mVp-p
Temperature Drift Coefficient	100% load		--	--	±0.03	%/℃
Output Short Circuit Protection	3.3/5/12/15VDC input		Continuous, self-recovery			
	24VDC input		--	--	1	s

Notes: * Ripple and noise tested with “parallel cable” method, please see *DC-DC Converter Application Notes* for specific operation methods.
**Supply voltage must be discontinued at the end of short circuit duration for 24V input.

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, Isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating if the temperature ≥100℃ (see Fig. 2)	-40	--	105	℃
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25℃	--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Reflow Soldering Temperature		Peak temp.≤245℃, maximum duration time≤60s at 217℃. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
Storage Humidity	Non-condensing	--	--	95	%
Switching Frequency	100% load, nominal input voltage	--	100	300	KHz
MTBF	MIL-HDFK-217F@25℃	3500	--	--	K hours

Physical Specifications

Casing Material	Black flame-retardant heat-proof epoxy resin (UL94-V0)
Package Dimensions	15.24*11.20*7.25 mm
Weight	1.8g (Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	Conducted disturbance	CISPR22/EN55022 CLASS B (see Fig. 5 for recommended circuit)
	Radiated emission	CISPR22/EN55022 CLASS B (see Fig. 5 for recommended circuit)
EMS	Electrostatic discharge	IEC/EN61000-4-2 Contact ±6KV perf. Criteria B

Product Characteristic Curve

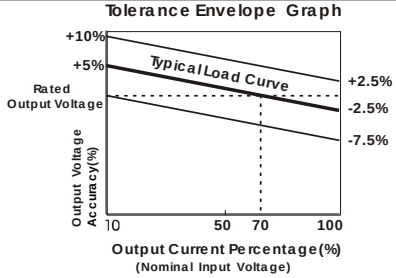


Fig. 1

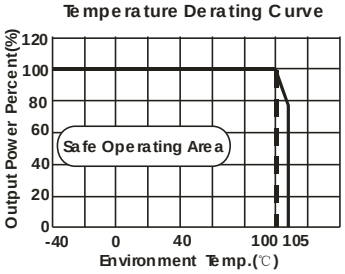
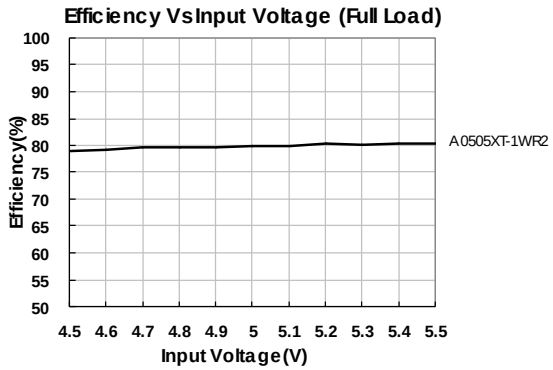
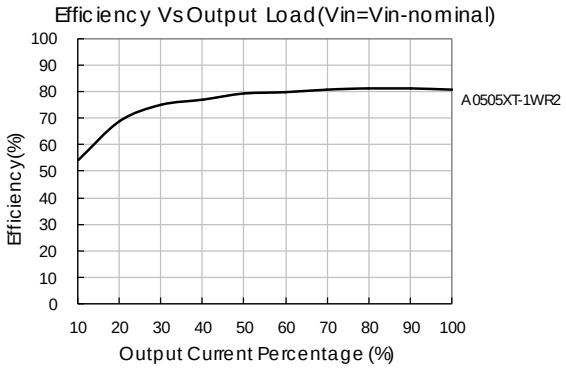
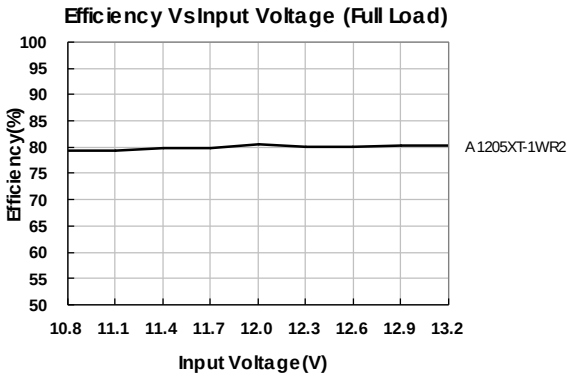
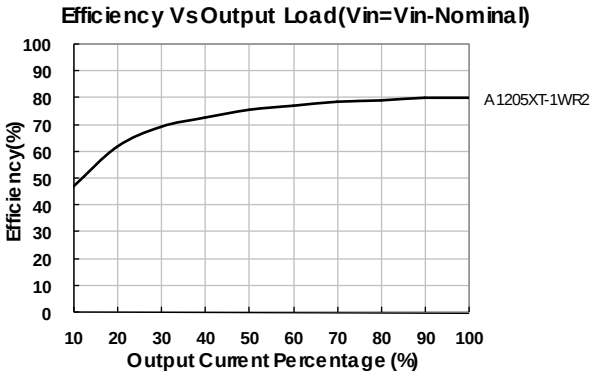


Fig. 2









Design Reference

1. Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig.3.

Moreover, choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensured the modules running well, the recommended capacitive load values as shown in Table 1.

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (see Fig. 4).

Fig.3

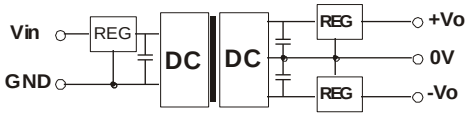


Fig.4

Recommended capacitive load value table (Table 1)

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

It is not recommended to connect any external capacitor when output power is less than 0.5W.

2. EMC typical recommended circuit

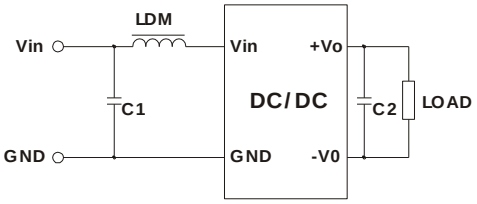


Fig. 5

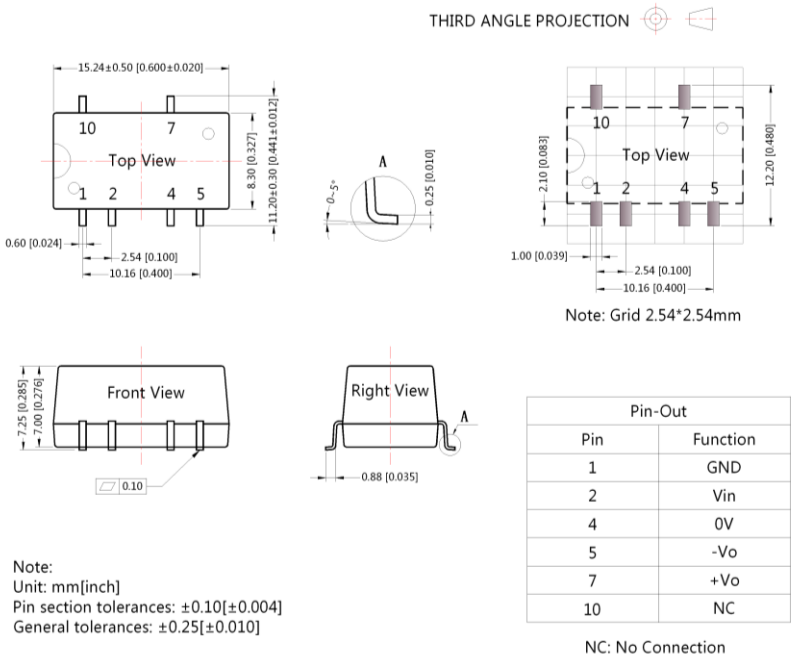
Input voltage (VDC)		3.3/5/15/12/24
EMI	C1	4.7μF /50V
	C2	Refer to the Cout in Fig.3
	LDM	6.8μH

3. Output load requirements

To ensure the module work efficiently and reliably, during the operation, the min. output load should be no less than 10% of the full load. If the actual output power is low, please connect a resister to the output terminal in parallel, with a recommenced resistance which is 10% of the rated power, and derating is required during operation.

4. For more information please find the application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	-Vo
7	+Vo
10	NC

NC: No Connection

Notes:

1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58210023;
2. If the product is operated under the min. required load, the product performance cannot be guaranteed to comply with all performance indexes in this datasheet;
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 Ta=25°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 manual 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.