DC/DC Converter
A03_XT-1WR3 Series

MORNSUN®

1W isolated DC-DC converter
Fixed input voltage, unregulated dual output

Continuous Short Circuit Protection

Patent Protection

CE Report EN 62368-1

UKCA Report BS EN 62368-1

RoHS

FEATURES

- Continuous short-circuit protection
- Operating ambient temperature range: -40℃ to +105℃
- High efficiency up to 84%
- Compact SMD package
- I/O isolation test voltage 1.5k VDC
- Industry standard pin-out

A03_XT-1WR3 series are specially designed for applications where two isolated voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF)* Max.
		Nominal (Range)	Voltage (VDC)	Current(mA) Max./Min.		
EN/BS EN	A0303XT-1WR3	3.3 (2.97-3.63)	±3.3	±152/±15	73/77	1200
	A0305XT-1WR3		±5	±100/±10	78/82	1200
	A0309XT-1WR3		±9	±56/±5	78/82	470
	A0312XT-1WR3		±12	±42/±5	78/82	220
	A0315XT-1WR3		±15	±34/±4	78/82	220
	A0324XT-1WR3		±24	±21/±2	80/84	100

Note: * The specified maximum capacitive load for positive and negative output is identical.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3VDC input	3.3VDC output	--	394/12	416/--	mA
		5VDC/9VDC/12VDC/15VDC output	--	370/12	389/--	
		24VDC output	--	361/12	379/--	
Reflected Ripple Current*			--	30	--	
Surge Voltage (1sec. max.)			-0.7	--	5	VDC
Input Filter			Capacitance filter			
Hot Plug			Unavailable			

Note: *Reflected ripple current testing method please refer to *DC-DC Converter Application Note* for specific operation.

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy			See output regulation curve (Fig. 1)			
Linear Regulation	Input voltage change: ±1%	3.3VDC output	--	--	±1.5	--
		5VDC/9VDC/12VDC/15VDC/24VDC output	--	--	±1.2	
Load Regulation	10%-100% load	3.3VDC output	--	15	20	%
		5VDC/9VDC/12VDC/15VDC/24VDC output	--	10	15	
Ripple & Noise*	20MHz bandwidth		--	50	100	mVp-p
Temperature Coefficient	Full load		--	±0.02	--	%/℃
Short-circuit Protection			Continuous, self-recovery			

Note:* The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output electric strength test for 1 minute with a leakage current of 1mA max.	1500	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	20	--	pF
Operating Temperature	Derating when operating temperature≥85℃, (see Fig. 2)	-40	--	105	℃
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25℃	--	25	--	
Storage Humidity	Non-condensing	5	--	95	%RH
Reflow Soldering Temperature*		Peak temp. Tc≤245℃, maximum duration time≤60s over 217℃			
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	Full load, nominal input voltage	--	220	--	kHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	k hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1			

Note: * See also IPC/JEDEC J-STD-020D.1.

Mechanical Specifications

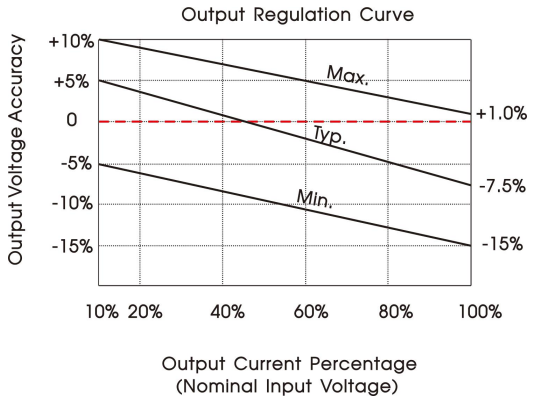
Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	15.24 x 11.40 x 7.25 mm
Weight	1.4g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B

Typical Characteristic Curves

3.3VDC output



5VDC/9VDC/12VDC/15VDC/24VDC output

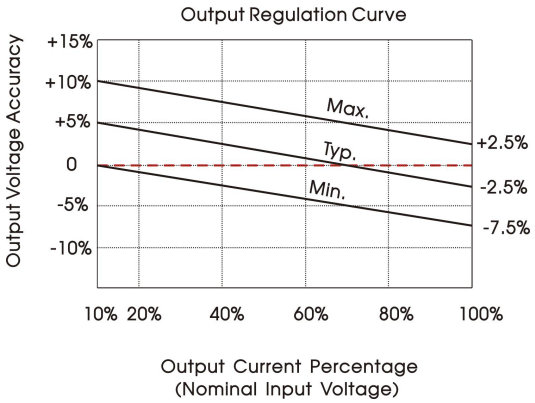


Fig. 1

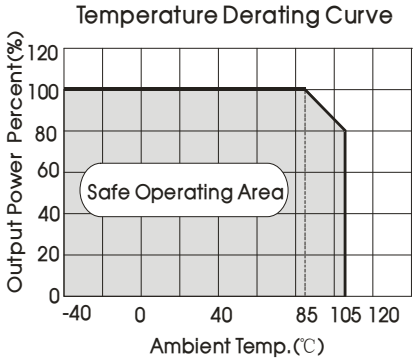
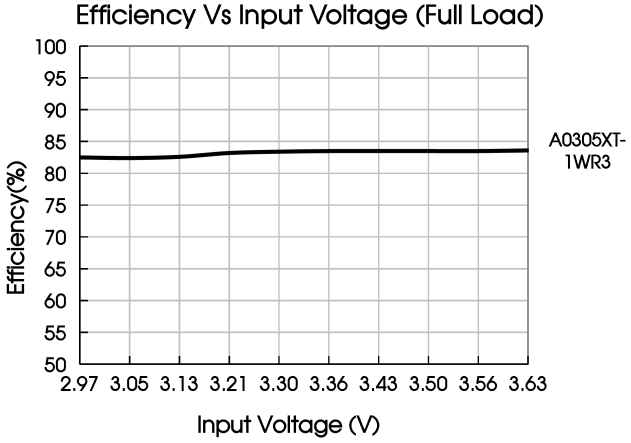
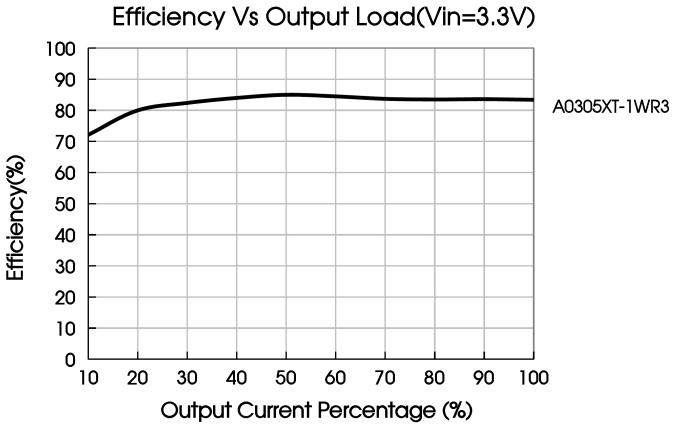


Fig. 2





Design Reference

1. Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.3.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

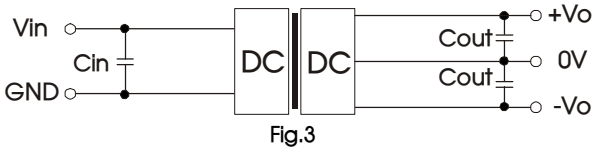


Fig.3

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
3.3VDC	10μF/16V	±3.3VDC	10μF/16V
--	--	±5VDC	10μF/16V
--	--	±9VDC	2.2μF/16V
--	--	±12VDC	2.2μF/25V
--	--	±15VDC	1μF/25V
--	--	±24VDC	1μF/50V

2. EMC compliance circuit

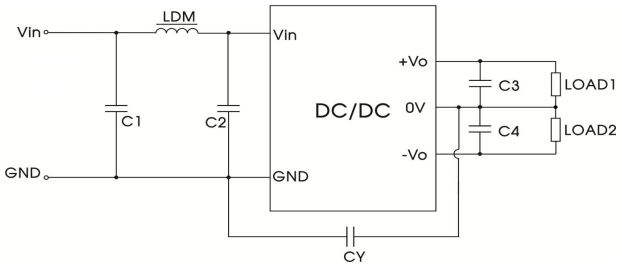


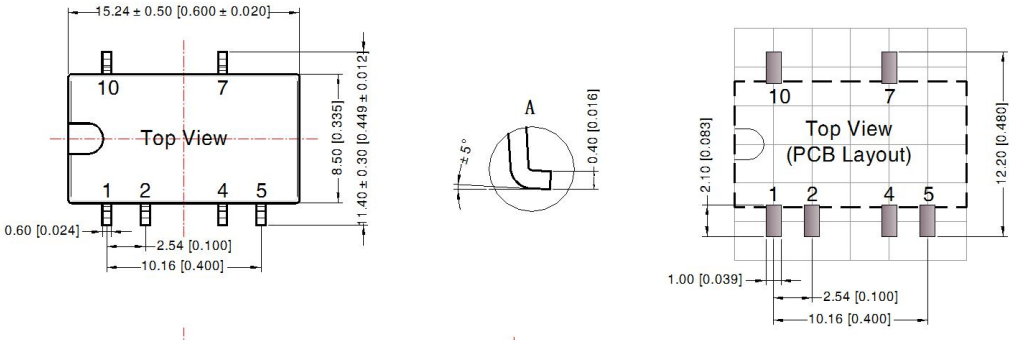
Fig. 4

Input voltage		3.3VDC
Emissions	C1, C2	4.7μF/16V
	CY	270pF/2kV
	C3, C4	Refer to the Cout in Fig.3
	LDM	6.8μH

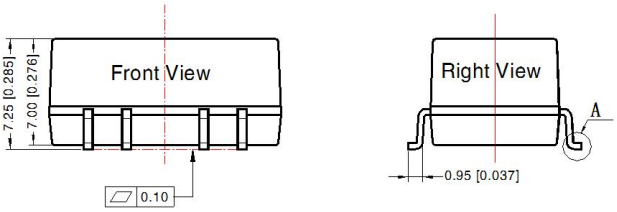
3. For additional information, please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

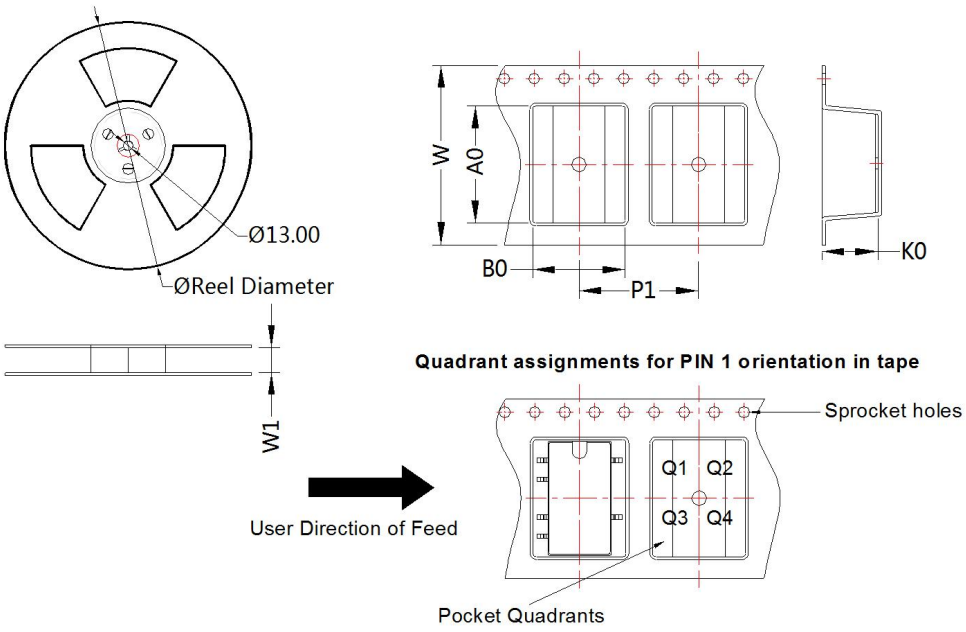


Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

Pin–Out	
Pin	Mark
1	GND
2	Vin
4	0V
5	–Vo
7	+Vo
10	NC

NC: Pin to be isolated from circuitry

Tape and Reel Info



Quadrant assignments for PIN 1 orientation in tape

Device	Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
A_XT-1WR3	SMD	6	500	330.0	24.5	15.64	12.4	7.45	16.0	24.0	Q1

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Tube Packaging bag number: 58210023, Roll Packaging bag number: 58210034;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our company corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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