

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



UL us CE CB Patent Protection RoHS



FEATURES

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature range: -40°C to +105°C
- High efficiency up to 85%
- Compact SMD package
- I/O isolation test voltage 3k VDC
- Industry standard pin-out
- IEC62368, UL62368, EN62368 approved

E05_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*(μ F) Max.
		Nominal (Range)	Voltage (VDC)	Current(mA) Max./Min.		
UL/CE/CB	E0505XT-1WR3	5 (4.5-5.5)	± 5	$\pm 100/\pm 10$	78/82	1200
	E0509XT-1WR3		± 9	$\pm 56/\pm 6$	79/83	470
	E0512XT-1WR3		± 12	$\pm 42/\pm 5$	79/83	220
	E0515XT-1WR3		± 15	$\pm 34/\pm 4$	79/83	220
	E0524XT-1WR3		± 24	$\pm 21/\pm 3$	81/85	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)	5VDC input	5VDC output	--	244/5	257/10	mA
		9VDC/12VDC output	--	241/12	254/20	
		15VDC/24VDC output	--	241/18	254/30	
Reflected Ripple Current*		--	15	--	mA	
Surge Voltage (1sec. max.)	5VDC input	-0.7	--	9	VDC	
Input Filter		Capacitance filters				
Hot Plug		Unavailable				

Note: * Reflected ripple current testing method please see DC-DC Converter Application Notes 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: $\pm 1\%$	--	--	1.2	%/%	
Load Regulation	10%-100% load	5VDC output	--	10	15	%
		9VDC output	--	8	10	
		12VDC output	--	7	10	
		15VDC output	--	6	10	
		24VDC output	--	5	10	
Ripple & Noise*	20MHz bandwidth	Other output	--	30	75	mVp-p
		24VDC output	--	50	100	
Temperature Coefficient	Full load	--	± 0.02	--	%/°C	
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.	3000	--	--	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 $\geq 100^{\circ}\text{C}$ (see Fig. 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Case Temperature Rise	$T_{\alpha}=25^{\circ}\text{C}$	--	15	--	
Storage Humidity	Non-condensing	--	--	95	%RH
Reflow Soldering Temperature*		Peak temp. $\leq 245^{\circ}\text{C}$, maximum duration time $\leq 60\text{s}$ over 217°C			
Switching Frequency	Full load, nominal input voltage	--	270	--	KHz
MTBF	MIL-HDBK-217F@ 25°C	3500	--	--	K hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1			

Note: * For actual application, please refer to IPC/JEDEC J-STD-020D.1.

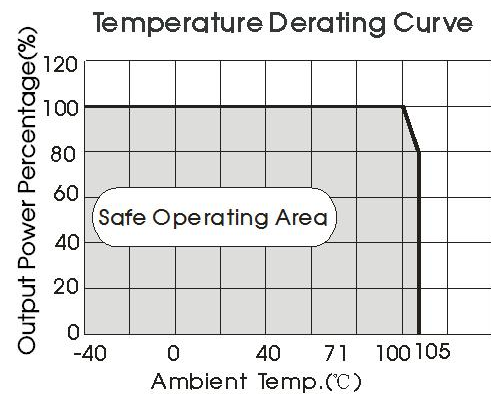
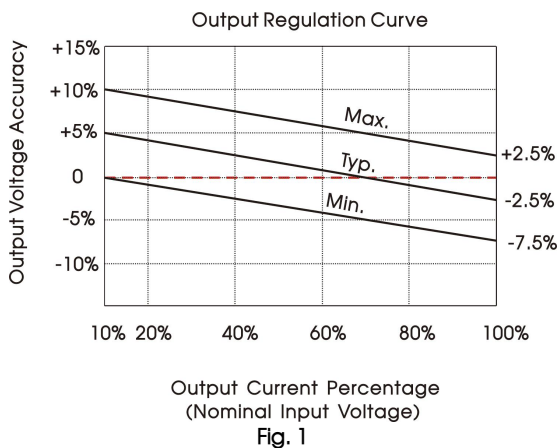
Mechanical Specifications

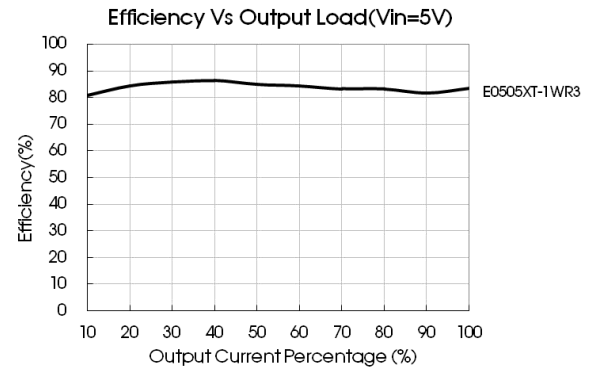
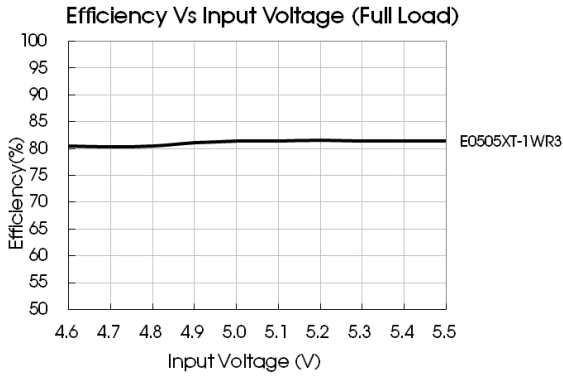
Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)
Dimensions	15.24 x 11.40 x 7.25 mm
Weight	1.4g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 5 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 5 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Air $\pm 8\text{kV}$, Contact $\pm 4\text{kV}$ perf. Criteria B

Typical Characteristic Curves





Design Reference

1. Typical application circuit

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.

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).

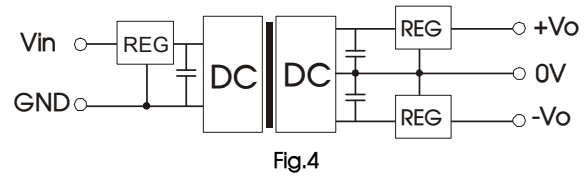
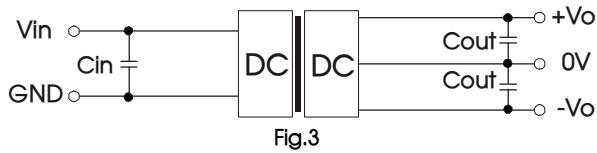


Table 1: Recommended capacitive load value table

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

2. EMC (CLASS B) compliance circuit

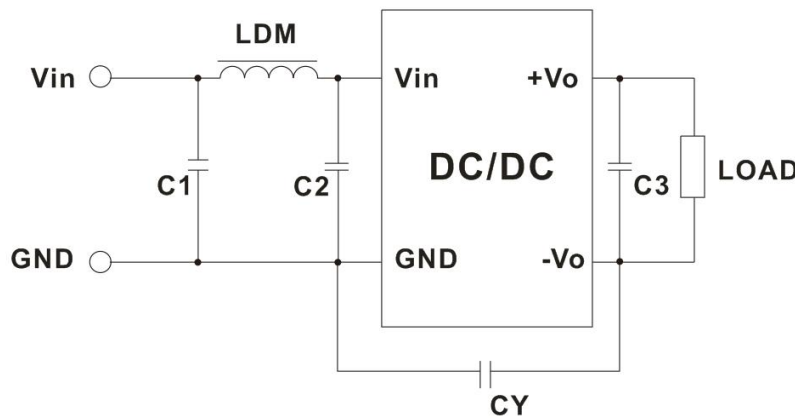


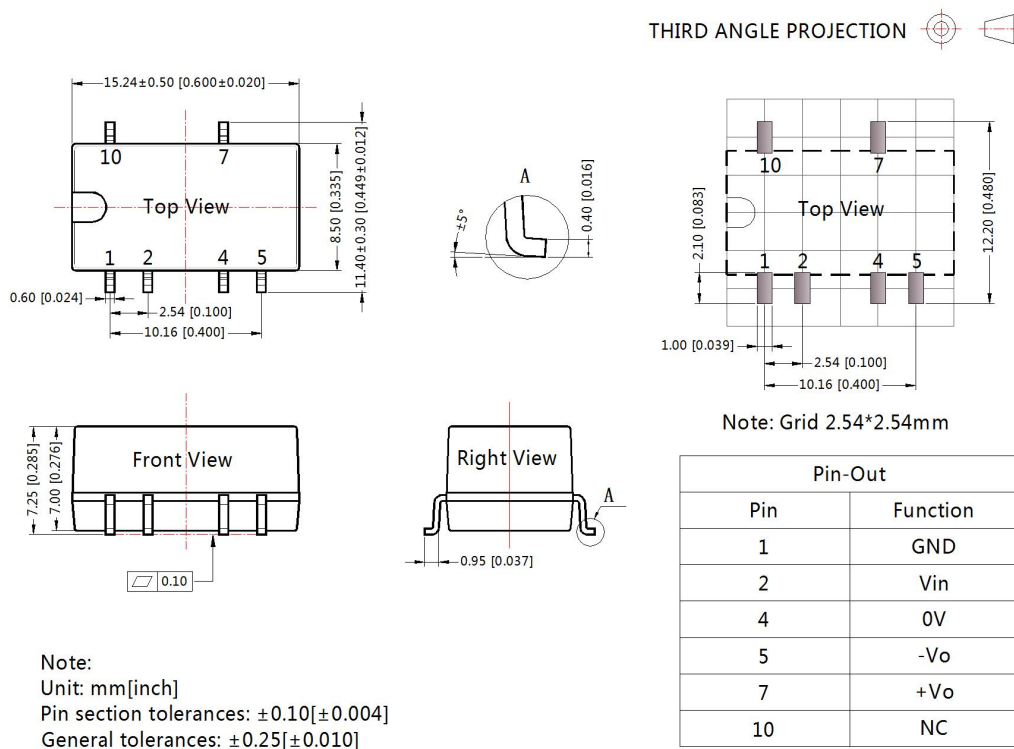
Table 2: EMC recommended circuit value table

Input voltage 5VDC	Output voltage(VDC)		5/9	12/15/24
	Emissions	C1/C2		4.7μF /25V
CY			--	1nF/4KVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA
C3			Refer to the Cout in table 1	
LDM			6.8μH	6.8μH

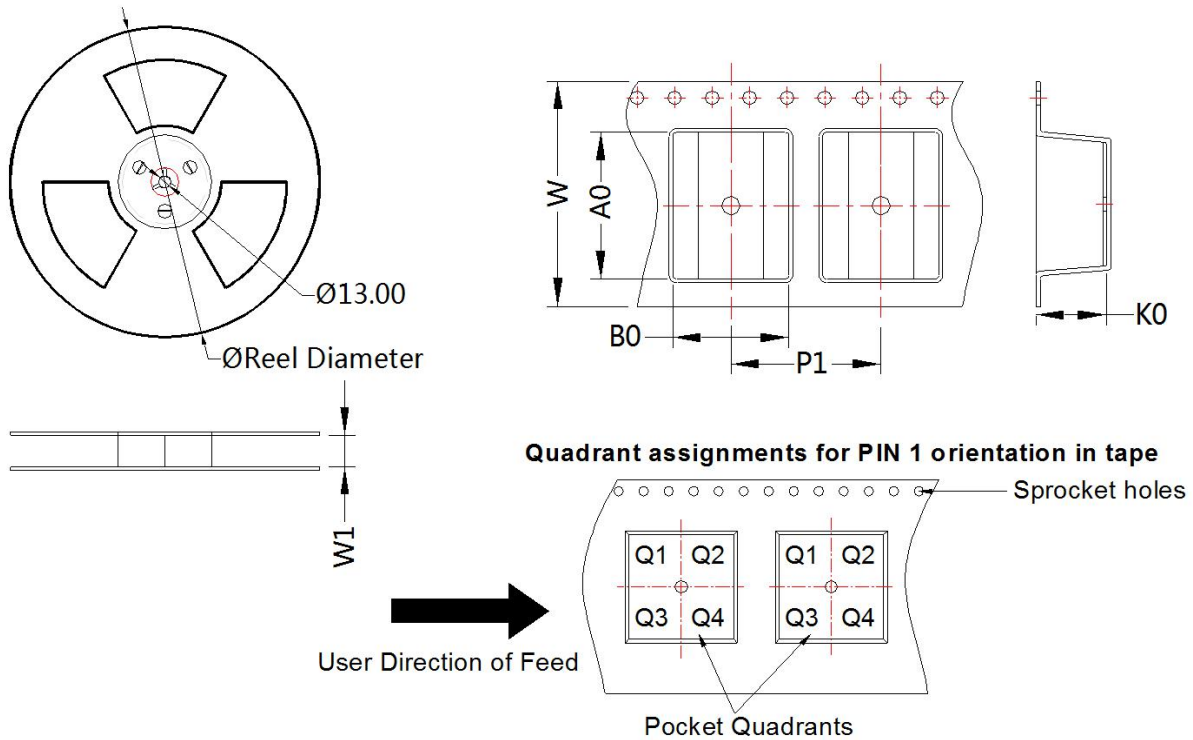
Note: In the case of actual use, the requirements for emissions are high, it is subject to CY.

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

Dimensions and Recommended Layout



NC: Pin to be isolated from circuitry



Device	Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
E05_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 $T_a=25^\circ\text{C}$, 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.

MORNSUN Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com