

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



CB Report

RoHS

Patent Protection

UL 62368-1 EN 62368-1 BS EN 62368-1 IEC 62368-1

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 1.5k VDC
- Industry standard pin-out

A05_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) Nominal (Range)	Output		Full Load Efficiency(%) Min./Typ.	Capacitive Load(μF)* Max.
			Voltage (VDC)	Current(mA) Max./Min.		
UL/EN/BS EN/IEC	A0505XT-1WR3	5 (4.5-5.5)	±5	±100/±10	78/82	1200
	A0509XT-1WR3		±9	±56/±6	79/83	470
	A0512XT-1WR3		±12	±42/±5	79/83	220
	A0515XT-1WR3		±15	±34/±4	79/83	220
	A0524XT-1WR3		±24	±21/±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	--		
Surge Voltage (1sec. max.)	5VDC input	-0.7	--	9	VDC	
Input Filter		Capacitance filter				
Hot Plug		Unavailable				

Note: * Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Voltage Accuracy		See output regulation curve(Fig. 1)				
Linear Regulation	Input voltage change: ±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.	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 $\geq 100^{\circ}\text{C}$, (see Fig. 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25°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.

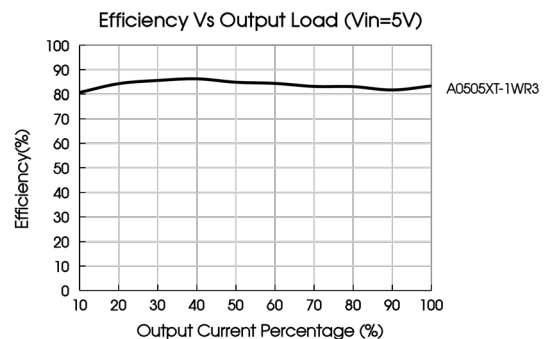
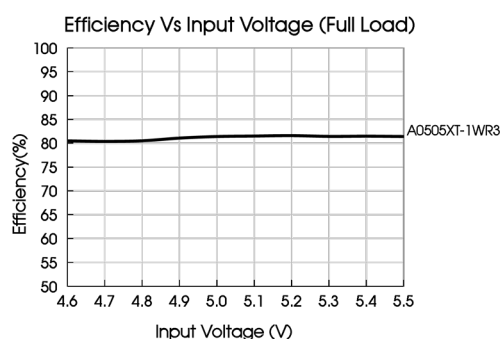
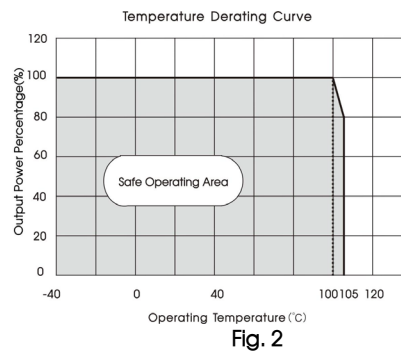
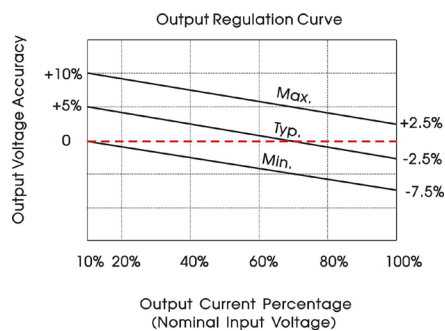
Mechanical Specifications

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

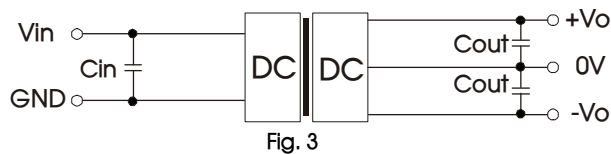


Fig. 3

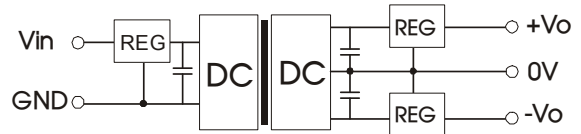


Fig. 4

Recommended capacitive load value table (Table 1)

Vin	Cin	Vo	Cout
5VDC	4.7μF/16V	±5VDC	4.7μF/16V
		±9VDC	2.2μF/16V
		±12VDC	1μF/25V
		±15/±24VDC	1μF/50V

2. EMC (CLASS B) compliance circuit

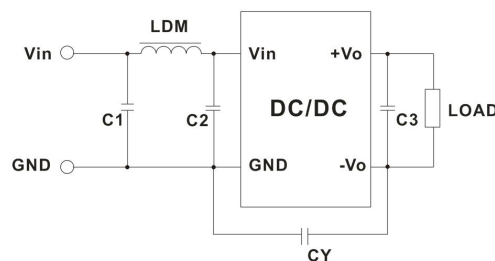


Fig. 5

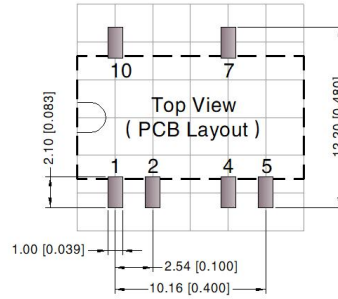
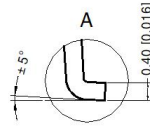
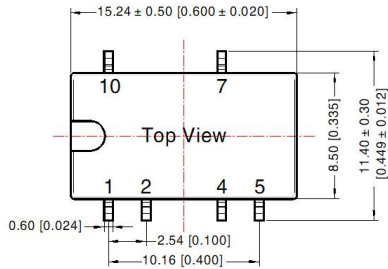
EMC recommended circuit value table (Table 2)

Input voltage 5VDC	Output voltage		5/9VDC	12/15/24VDC
	Emissions	C1/C2	4.7μF /25V	4.7μF /25V
CY		--		
C3		Refer to the Cout in table 1		
LDM		6.8μH	6.8μH	

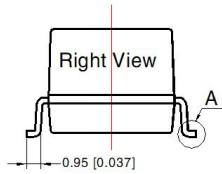
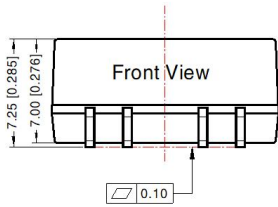
Note: In the case of actual use, the requirements for EMI are high, it is subject to CY.

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

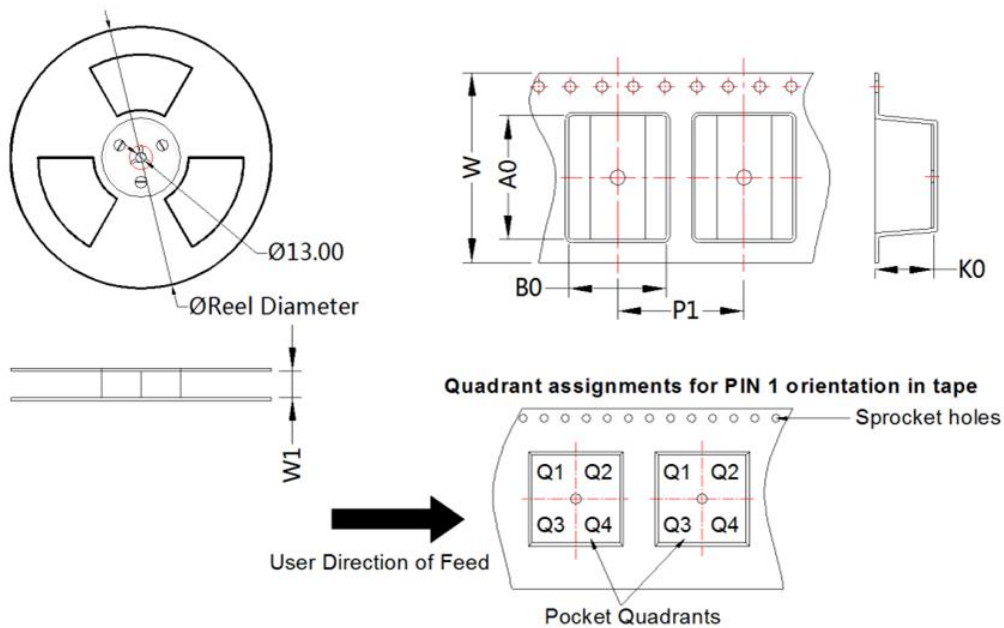


Pin-Out	
Pin	Mark
1	GND
2	Vin
4	0V
5	-Vo
7	+Vo
10	NC

Note:
Unit: mm[inch]
Pin section tolerances: $\pm 0.10[\pm 0.004]$
General tolerances: $\pm 0.25[\pm 0.010]$

NC: Pin to be isolated from circuitry

Tape and Reel Info



Device	Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
A05_XT-1WR3	SMD	6	500	330.0	24.5	15.64	12.4	7.45	16.0	24.0	Q1