

FEATURES

1. Continuous short-circuit protection
2. No-load input current as low as 8mA
3. Operating ambient temperature range: -40°C to +105°C
4. High efficiency up to 85%
5. Compact SMD package
6. I/O isolation test voltage: 1.5k VDC
7. Industry standard pin-out



3 years
Warranty

Selection Guide

Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF) Max.*
	Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
A1205XT-1WR3	12 (10.8-13.2)	±5	±100/±10	78/82	1200
A12Y7XT-1WR3		±7.5	±67/±7	78/82	470
A1209XT-1WR3		±9	±56/±6	79/83	470
A1212XT-1WR3		±12	±42/±5	79/83	220
A1215XT-1WR3		±15	±34/±4	79/83	220
A1224XT-1WR3		±24	±21/±3	81/85	100
A1515XT-1WR3	15 (13.5-16.5)	±15	±34/±4	79/83	220
A2405XT-1WR3	24 (21.6-26.4)	±5	±100/±10	76/82	1200
A2409XT-1WR3		±9	±56/±6	77/83	470
A2412XT-1WR3		±12	±42/±5	77/83	220
A2415XT-1WR3		±15	±34/±4	77/83	220
A2424XT-1WR3		±24	±21/±3	79/85	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)	12V input	±5VDC/±7.5VDC output	-	102/8	107/--	mA
		±9VDC/±12VDC/±15VDC output	-	101/8	106/--	
		±24VDC output	-	99/8	103/--	
	24V input	±5VDC/±9VDC/±12VDC/±15VDC output	-	51/8	55/--	
		±24VDC output	-	50/8	53/--	
Reflected Ripple Current*			-	15	-	
Surge Voltage(1sec. max.)	12VDC input		-0.7	-	18	VDC
	15VDC input		-0.7	-	21	
	24VDC input		-0.7	-	30	
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 curves (Fig. 1)				
Linear Regulation	Input voltage change: $\pm 1\%$	-	-	1.2	-	
Load Regulation	10%-100% load	$\pm 5\text{VDC}$ output	-	5	15	%
		$\pm 7.5\text{VDC}$ output	-	5	15	
		$\pm 9\text{VDC}$ output	-	3	10	
		$\pm 12\text{VDC}$ output	-	3	10	
		$\pm 15\text{VDC}$ output	-	3	10	
		$\pm 24\text{VDC}$ output	-	2	10	
Ripple & Noise*	20MHz bandwidth	$\pm 5\text{VDC}/\pm 7.5\text{VDC}/\pm 9\text{VDC}/\pm 12\text{VDC}/\pm 15\text{VDC}$ output	-	30	75	mVp-p
		$\pm 24\text{VDC}$ output	-	50	100	
			-	± 0.02	-	
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	-	25	-	
Storage Humidity	Non-condensing	5	--	95	%RH
Reflow Soldering Temperature*		Peak temp. $\leq 245^\circ\text{C}$, maximum duration time $\leq 60\text{s}$ over 217°C			
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	Full load, nominal input voltage	-	260	-	kHz
MTBF	MIL-HDBK-217F@25°C	3500	--	-	khours
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 Method	Free air convection

EMC Specifications

Emissions	CE	CISPR32/EN55032 CLASS B
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Immunity	ESD	IEC/EN61000-4-2 Air $\pm 8\text{kV}$, Contact $\pm 6\text{kV}$ perf. Criteria B
Note: Refer to Fig.4 for recommended circuit test.		

Typical Characteristic Curves

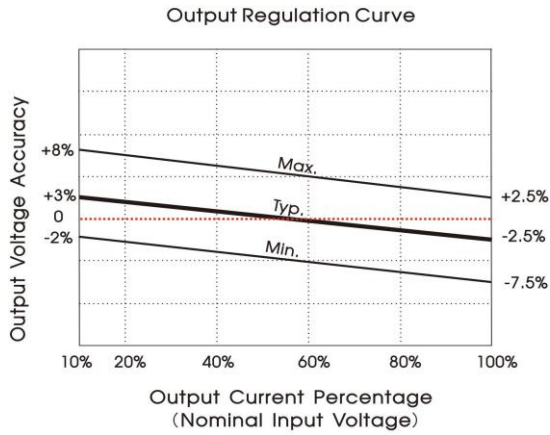


Fig. 1

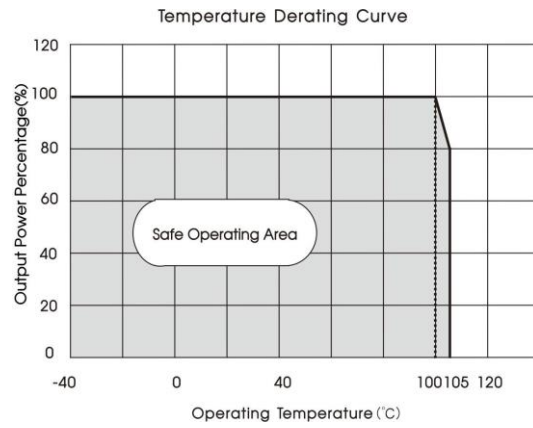
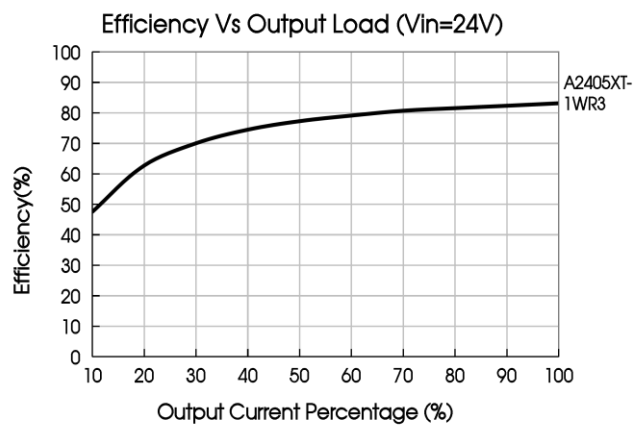
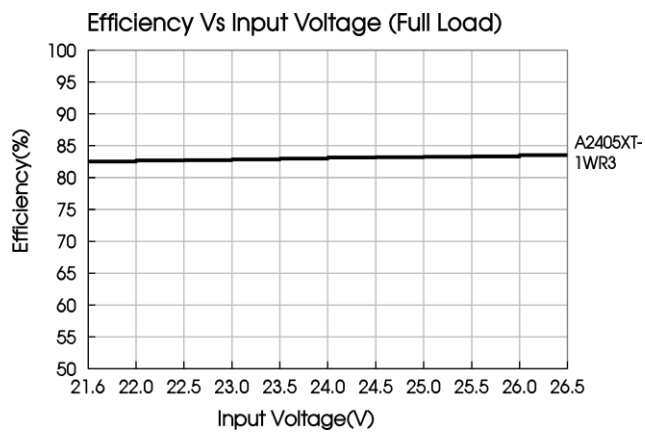
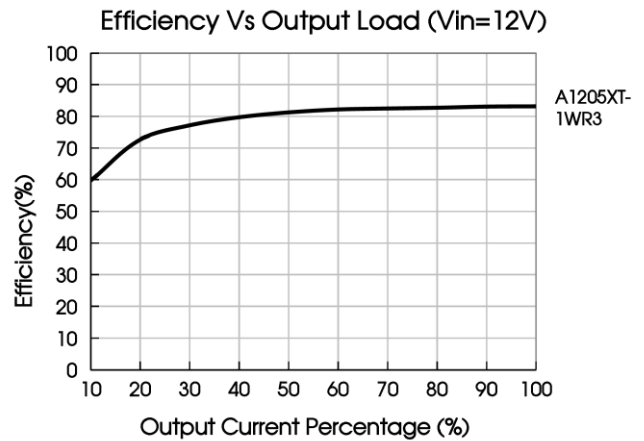
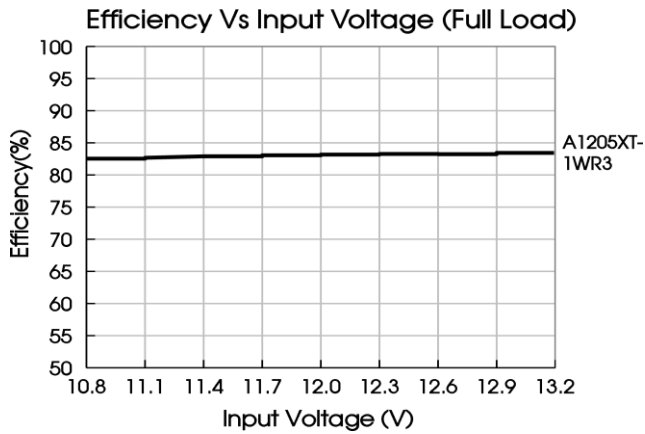


Fig. 2



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.

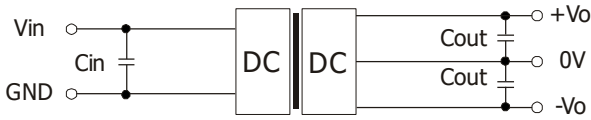


Fig. 3

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
12VDC	2.2µF/25V	±5VDC	4.7µF/16V
15VDC	2.2µF/25V	±7.5VDC	1µF/16V
24VDC	1µF/50V	±9VDC	1µF/16V
-	-	±12VDC	1µF/25V
-	-	±15VDC	0.47µF/25V
-	-	±24VDC	0.47µF/50V

2. EMC compliance circuit

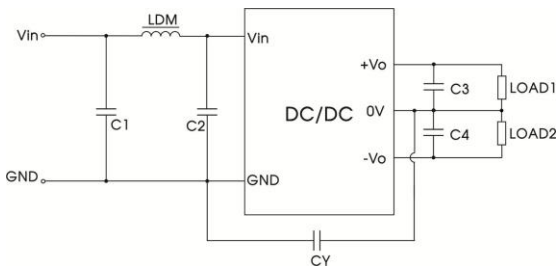
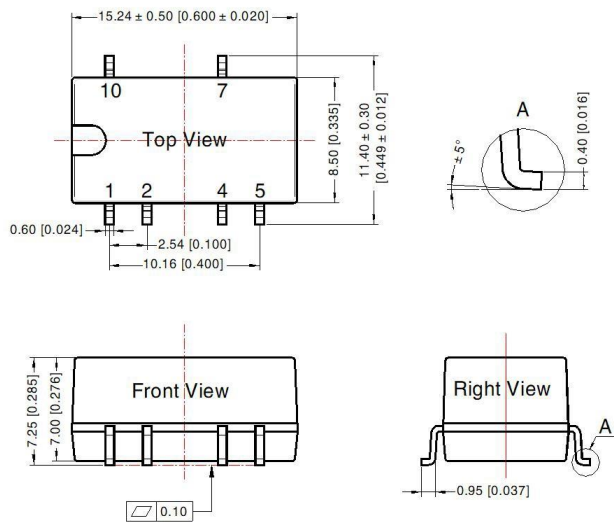


Fig. 4

Table 2: EMC recommended circuit value table

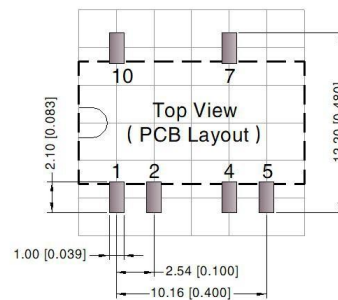
Emissions	C1/C2	4.7µF /50V
	CY	270pF /2kV
	C3/C4	Refer to the Cout in table 1
	LDM	6.8µH

Dimensions and Recommended Layout



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

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

NC: Pin to be isolated from circuitry

Notes & Instructions

1. If the product works under the minimum required load, it cannot guarantee that the performance of the product complies with all the performance indicators in this manual;
2. The maximum capacitive load is tested under the input voltage range and full load condition;
3. Unless otherwise stated, all indexes in this manual are measured at $T_a=25^{\circ}\text{C}$, humidity $<75\%RH$, nominal input voltage and rated output load;
4. All index testing methods in this manual are based on the enterprise standards of the company;
5. Our company can provide product customization, specific needs can directly contact our technical staff;

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Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.norpas-power.com

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