



## 2T8A1\_1.5UP series

2W - Single Output DC-DC Converter - Fixed Input - Isolated & Unregulated  
Compact SMD Package

### DC-DC Converter 2 Watt

- ⊕ Continuous short-circuit protection
- ⊕ No-load input current as low as 8mA
- ⊕ Operating ambient temperature range: -40°C to +105°C
- ⊕ High efficiency up to 85%
- ⊕ Compact SMD package
- ⊕ I/O isolation test voltage 1.5kVDC
- ⊕ Industry standard pin-out
- ⊕ EN62368 approved

The 2T8A1\_1.5UP series are designed for use in distributed power supply systems and especially suitable in applications such as pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.



Common specifications	
Short circuit protection:	Continuous, self-recovery
Operation temperature:	-40 ~ +105°C ( See Fig. 2)
Storage temperature:	-55°C ~+125°C
Case Temperature Rise	25°C TYP (Ta = 25°C, nominal input voltage, full load)
Storage humidity:	5~95%RH (Non-condensing)
Reflow soldering temperature:*	Peak temp. ≤245°C, maximum duration time ≤60s over 217°C
MTBF (MIL-HDBK-217F@25°C):	>3,500,000 hours
Moisture Sensitivity Level(MSL):	Level 1; IPC/JEDEC J-STD-020D.1
Case Material:	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions:	13.20 x 11.40 x 7.25 mm
Weight:	1.4g TYP.
Cooling:	Free air convection

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

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input current (full load / no load)	• 12V input		196/8		mA
	• 15V input		161/8		mA
	• 24V input		98/8		mA
Reflected ripple current*			30		mA
Surge Voltage (1sec. max.)	• 12V input	0.7		18	VDC
	• 15V input	0.7		21	VDC
	• 24V input	0.7		30	VDC
Input Filter	Capacitor Filter				
Hot plug	Unavailable				

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

EMC specifications					
Emissions	CE	CISPR32/EN55032 CLASS B (see recommended circuit)			
Emissions	RE	CISPR32/EN55032 CLASS B (see recommended circuit)			
Immunity	ESD	IEC/EN61000-4-2	Contact ±6kV	perf. Criteria B	

Output specifications					
Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	See output regulation curve (Fig. 1)				
Line regulation	Input voltage change:±1%			±1.2	%%
Load regulation	10% to 100% load				
	• 5VDC output		7	15	%
	• 9VDC output		6	10	%
	• 12VDC output		5	10	%
	• 15VDC output		4	10	%
	• 24VDC output		3	10	%
Ripple & Noise*	20MHz Bandwidth		50	150	mVp-p
Temperature Coefficient	Full load			±0.02	%/°C
Switching frequency	Full load, nominal input		260		KHz

\* The "parallel cable" method is used for Ripple and noise test, please refer to DC-DC Converter Application Notes for specific information;

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 min., leak current lower than 1mA	1500			VDC
Isolation resistance	Input-output, insulation voltage 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V		20		pF

#### Example:

**2T8A1\_1205S1.5UP**

**2 = 2Watt; T8 = SMT8; A1 = Series; 12 = 12Vin; 05 = 5Vout; S = Single output; 1.5 = 1.5kVDC isolation; U=Unregulated output**

#### Note:

- 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;
- The maximum capacitive load offered were tested at input voltage range and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- 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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### Product Selection Guide

Part Number	Input Voltage [V] [Nominal (Range) ]	Output Voltage [VDC]	Output current [mA; max/min]	Efficiency [%; Min. / Typ] @ full load	Capacitive Load (µF)
2T8A1_1205S1.5UP	12 (10.8-13.2)	5	400/40	79/83	2400
2T8A1_1209S1.5UP	12 (10.8-13.2)	9	222/22	79/83	1000
2T8A1_1212S1.5UP	12 (10.8-13.2)	12	167/17	80/84	560
2T8A1_1215S1.5UP	12 (10.8-13.2)	15	133/13	80/84	560
2T8A1_1224S1.5UP	12 (10.8-13.2)	24	83/8	81/85	220
2T8A1_1505S1.5UP	15 (13.5-16.5)	5	400/40	79/83	2400
2T8A1_1515S1.5UP	15 (13.5-16.5)	15	133/13	80/84	560
2T8A1_2405S1.5UP	24 (21.6-26.4)	5	400/40	77/83	2400
2T8A1_2409S1.5UP	24 (21.6-26.4)	9	222/22	77/83	1000
2T8A1_2412S1.5UP	24 (21.6-26.4)	12	167/17	78/84	560
2T8A1_2415S1.5UP	24 (21.6-26.4)	15	133/13	78/84	560
2T8A1_2424S1.5UP	24 (21.6-26.4)	24	83/8	79/85	220

### Typical characteristics

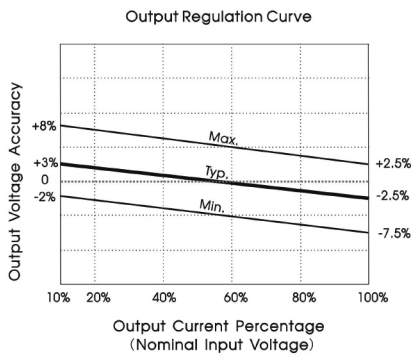


Fig. 1

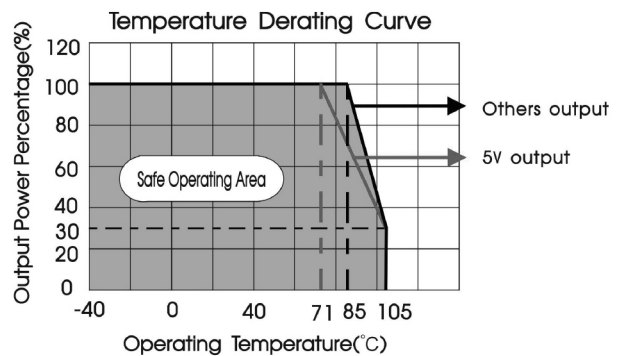
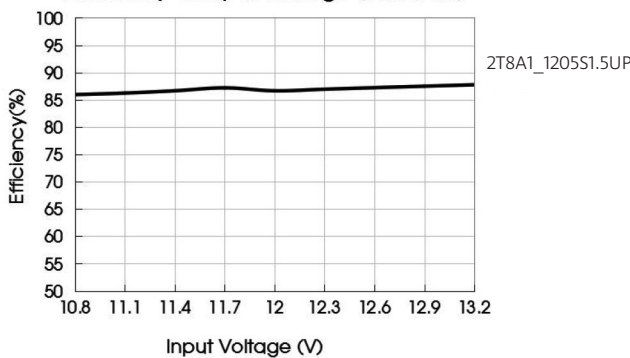


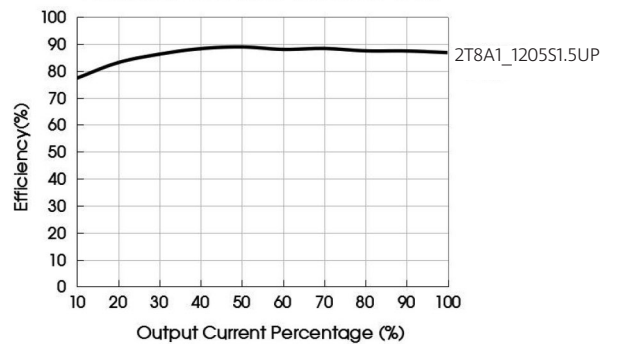
Fig. 2

### Efficiency

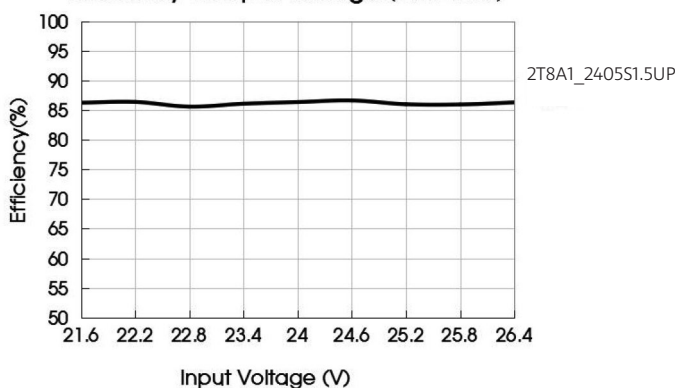
Efficiency Vs Input Voltage (Full Load)



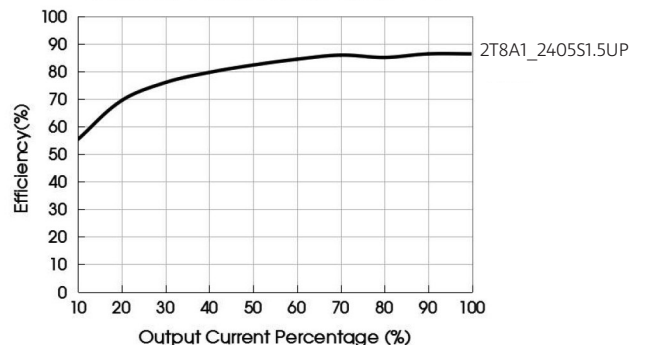
Efficiency Vs Output Load (Vin=12V)



Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=24V)



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### 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.

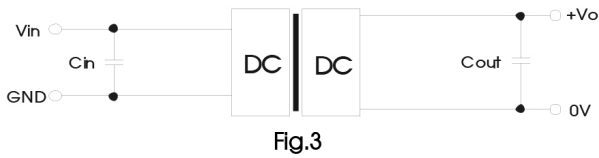


Fig.3

Vin (VDC)	Cin (μF)	Vo (VDC)	Cout (μF)
12	2.2μF/25V	5	10/10V
15	1μF/25V	9	2.2/25V
24	1μF/50V	12	2.2/25V
-	-	15	1/25V
-	-	24	0.47/50V

Table 1: Recommended input and output capacitor values

### EMC solution-recommended circuit

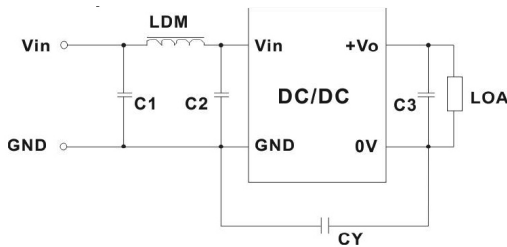
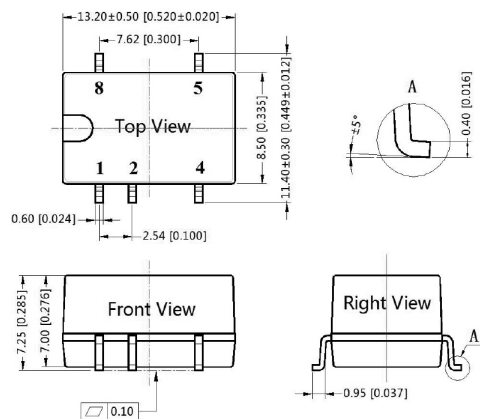


Fig. 4

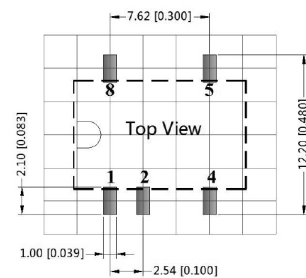
Emissions	C1/C2	4.7μF /50V
Emissions	C3	Refer to the Cout in Fig. 3
Emissions	CY	270pF/2kV
Emissions	LDM	6.8μH

### Mechanical dimensions



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

THIRD ANGLE PROJECTION



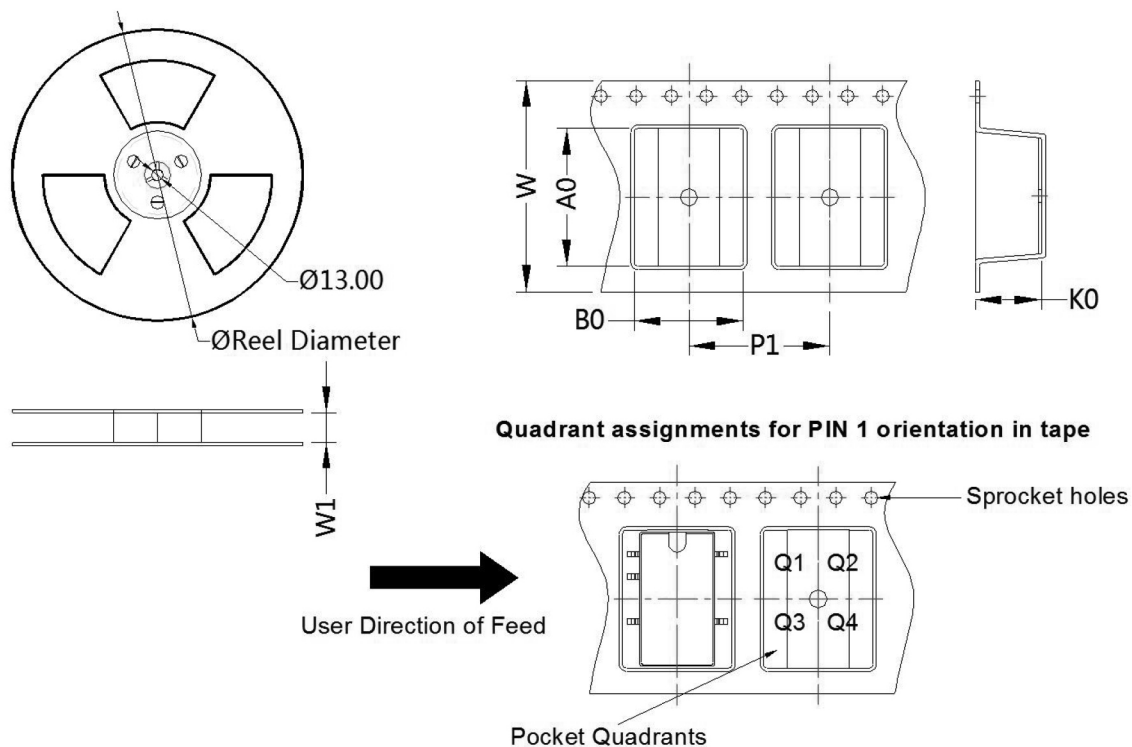
Note:  
Grid 2.54\*2.54 mm

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

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### Tape and Reel Info



Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SMD	5	500	330.0	24.5	13.4	11.7	7.5	16.0	24.0	Q1