



2T8A_3 Series

2W - Single Output DC-DC Converter - Fixed Input - Isolated & Unregulated
ULTRAMINIATURE SMD PACKAGE

DC-DC Converter

2 Watt

- ⊕ Miniature SMD package
- ⊕ Isolation voltage: 3000 VDC
- ⊕ Operating temperature range: -40°C to +105°C
- ⊕ Efficiency up to 84%
- ⊕ Internal SMD construction
- ⊕ No external component required
- ⊕ International standard pin-out
- ⊕ RoHS compliance
- ⊕ Short circuit protection (SCP)
- ⊕ Safety Meets UL60950-1, EN60950-1, IEC60950-1

The 2T8A_3 series is specially designed for applications where an isolated voltage is required in a distributed power supply system. It is suitable for

- 1) Where the voltage of the input power supply is stable (voltage variation: $\pm 10\%V_{in}$);
- 2) Where isolation is necessary between input and output (isolation voltage $\approx 3000VDC$); design meets IEC60950-1
- 3) Where the output voltage regulation and the ripple & noise of the output voltage is not strictly required;

Typical application: preceding-stage interference isolation condition; ground-interference canceled condition; digit circuit condition; Voltage-isolation converting condition; normal low-frequency artificial circuit condition; relay drive circuit condition, etc.



Common specifications	
Short circuit protection*:	continuous
Temperature rise at full load:	25°C TYP
Cooling:	Free air convection
Operation temperature range:	-40°C~+105°C • 5V: Derating (above 71°C) • Others: Derating (above 85°C)
Storage temperature range:	-55°C ~+125°C
Lead temperature:	300°C MAX, 1.5mm from case for 10 sec
Casing temperature rise:	25°C (Ta=25°C)
Storage humidity range:	< 95%
Reflow soldering temperature:	Peak temp. $\leq 245^\circ C$, maximum duration time $\leq 60s$ at 217°C. For actual application, please refer to IPC/JEDEC J-STD-020D.1.
Case material:	Epoxy resin [UL94-V0]
MTBF:	>3,500,000 hours
Weight:	1.6g

* Supply voltage must be discontinued at the end of short circuit duration.

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 min., leak current lower than 1mA	3000			VDC
Isolation resistance	Input-output, insulation voltage 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V		20		pF

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input current (full load / no load)	• 5VDC Input • 12VDC Input • 15VDC Input • 24VDC Input		506/30 212/25 169/18 105/15	-/60 -/50 -/35 -/30	mA
Input surge voltage (1 sec. max.)	• 5VDC Input • 12VDC Input • 15VDC Input • 24VDC Input	-0.7		9 18 21 30	VDC
Reflected ripple current			15		mA
Input Filter	Capacitor Filter				
Hot plug	Unavailable				

Output specifications						
Item	Test condition	Min	Typ	Max	Units	
Output voltage accuracy	See tolerance envelope graph					
Line regulation	For V_{in} change of $\pm 1\%$			± 1.2	%	
Load regulation	10% to 100% load				%	
	• 5V output		12		%	
	• 9V output		9		%	
	• 12V output		8		%	
	• 15V output		7		%	
	• 24V output		6		%	
Temperature coefficient	100% full load			± 0.03	%/°C	
Ripple & Noise*	20MHz Bandwidth		100	200	mVp-p	
Switching frequency	Full load, nominal input		100		KHz	

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at application notes.

Model selection:

WCTP_xxyyN##O**

W= Watt; **C**= Case; **T**= Type; **P**= Pinning; ******= Voltage variation (omitted $\pm 10\%$); **xx**= V_{in} ; **yy**= V_{out} ; **N**= Numbers of output; **##**= Isolation (kVDC); **O**= output regulation

Example:

2T8A_0505S3UP

2=2Watt; T8= SMT8; A=Series; 5Vin; 5Vout; S=Single output; 3=3kVDC; U=Unregulated output; P= Short circuit protection

Note:

1. If the product is operated under the min. required load, the product performance cannot be guaranteed to comply with all performance indexes in this datasheet;
2. The max. capacitive load should be tested within the input voltage range and under full load conditions;
3. Unless otherwise specified, data in this data sheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
4. All index testing methods in this datasheet are based on our Company's corporate standards;

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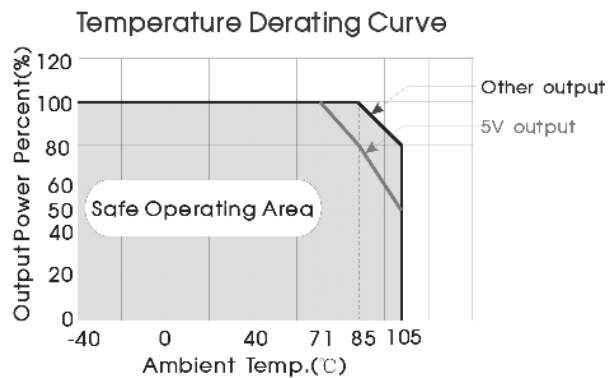
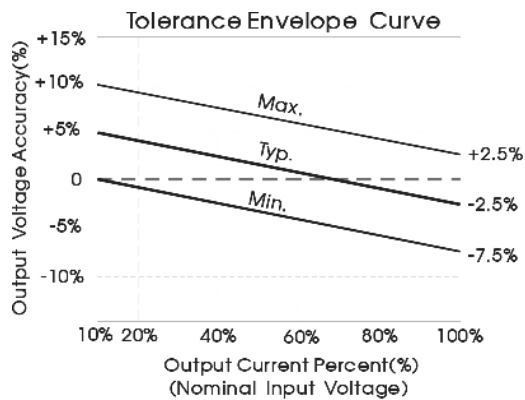
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EMC specifications

EMI	CE	CISPR22/EN55022 CLASS B (refer to EMC recommended circuit)
EMI	RE	CISPR22/EN55022 CLASS B (refer to EMC recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Contact ± 8 KV perf. Criteria B

Part Number	Input Voltage [V]	Output Voltage [VDC]	Output current [mA; max/min]	Efficiency [%; Typ] @ full load	Max. Capacitive Load (μ F)
2T8A_0505S3UP	5	5	400/40	79	220
2T8A_0509S3UP	5	9	222/22	82	220
2T8A_0512S3UP	5	12	167/17	82	220
2T8A_0515S3UP	5	15	133/13	83	220
2T8A_1205S3UP	12	5	400/40	79	220
2T8A_1212S3UP	12	12	167/17	82	220
2T8A_1215S3UP	12	15	133/13	83	220
2T8A_1224S3UP	12	24	83/8	84	220
2T8A_1515S3UP	15	15	133/13	83	220
2T8A_2405S3UP	24	5	400/40	79	220
2T8A_2412S3UP	24	12	167/17	82	220
2T8A_2415S3UP	24	15	133/13	83	220
2T8A_2424S3UP	24	24	83/8	84	220

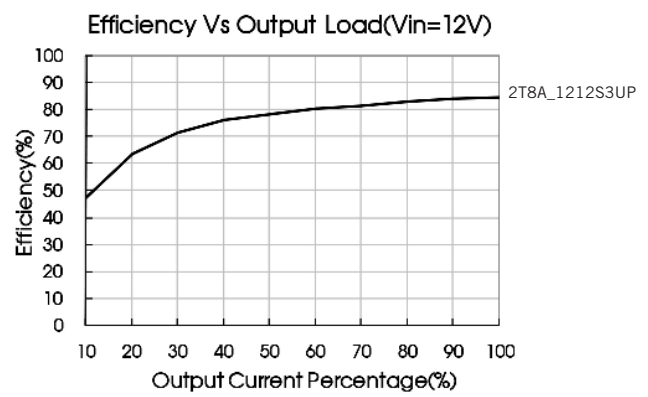
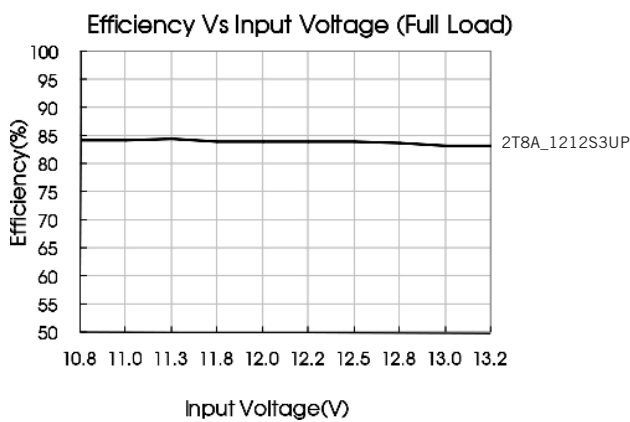
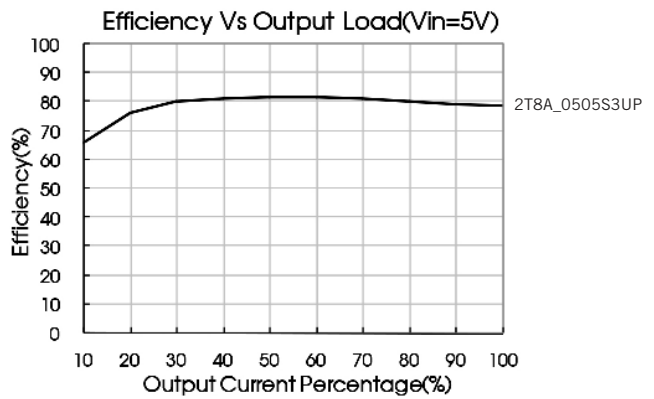
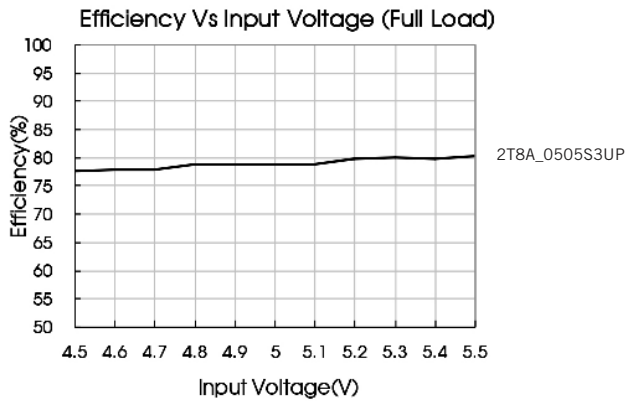
Typical characteristics



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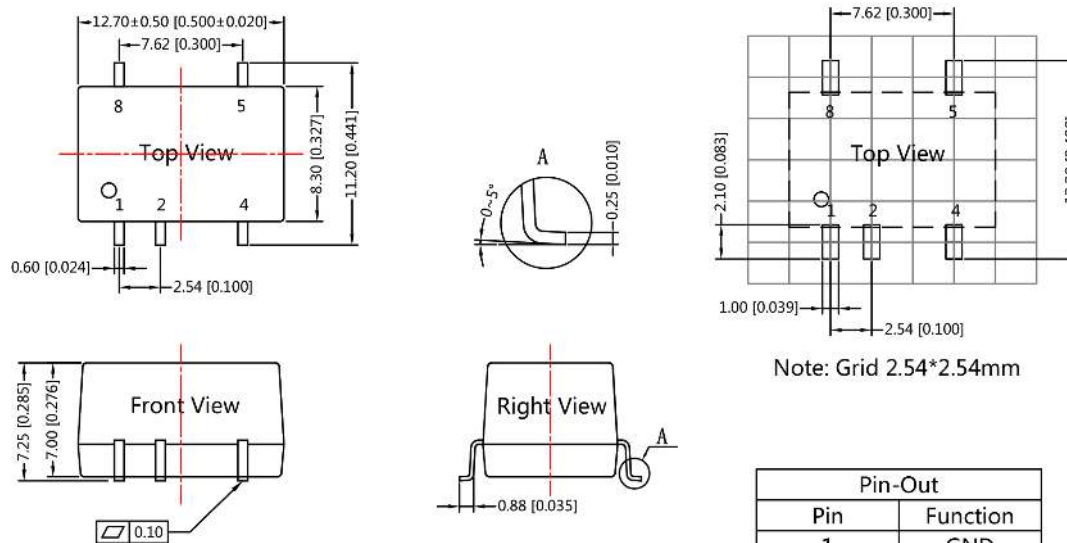
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Efficiency



Dimensions and recommended layout

THIRD ANGLE PROJECTION



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

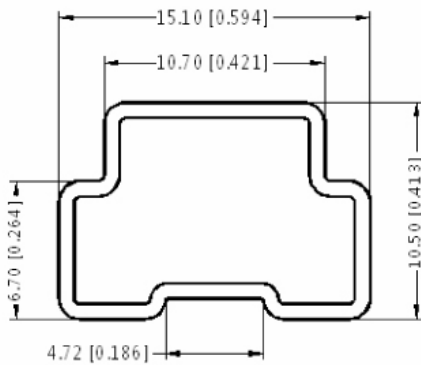
NC: No Connection

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

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Tube outline dimensions



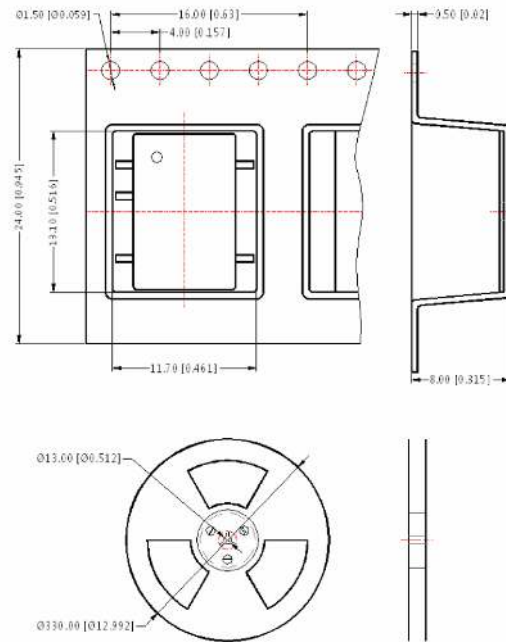
Note:

Unit: mm[inch]
General tolerances: 0.5mm[0.020inch]

L=530mm[20.866inch]
Devices per tube quantity: 40pcs

L=220mm[8.661inch]
Devices per tube quantity: 15pcs

Reel packing outline dimensions



Note:

Unit: mm[inch]
General tolerances: 0.5mm[0.020inch]
Devices per reel quantity: 500pcs

Application note

1) Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig.1. Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in Table 1.



Figure 1

Vin (VDC)	Cin (μF)	Vo (VDC)	Cout (μF)
5	4.7	5	10
12	2.2	9	4.7
15	2.2	12	2.2
24	1	15	1
--	--	24	0.47

Table 1

It's not recommended to connect any external capacitor in the application field with less than 0.5 watt output.

2) EMC solution- recommended circuit (CLASS B)

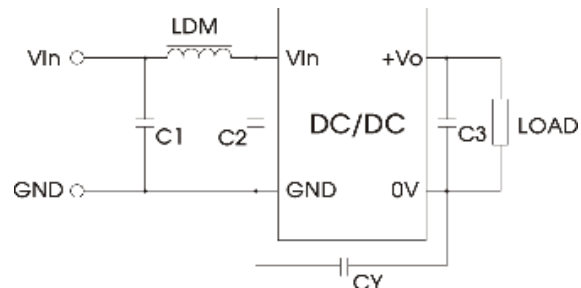


Figure 2

Input voltage (VDC)		5/12/15	24
EMI	C1	4.7μF /50V	
EMI	C2	4.7μF /50V	
EMI	C3	Refer to the Cout in Fig.1	
EMI	CY	--	1nF/3KV
EMI	LDM	6.8μH	

Note:

- 24V input series, 24V output series is subject to CY (CY : 1nF/3KV).
- It is not needed to add the component in the peripheral circuit when parameter with the symbol of "--".

3) Output load requirements

When using, the minimum load of the module output should not be less than 10% of the nominal load. In order to meet the performance parameters of this datasheet, please connect a 10% dummy load in parallel at the output end, the dummy load is generally a resistor. Please note that the resistor needs to be used in derating.