

2T8A_1.5 Series

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

DC-DC Converter

2 Watt

- ⊕ Miniature SMD package
- ⊕ Isolation voltage: 1.5K VDC
- ⊕ Operating temperature range: -40°C to +105°C
- ⊕ Efficiency up to 86%
- ⊕ Internal SMD construction
- ⊕ No external component required
- ⊕ International standard pin-out
- ⊕ RoHS compliance
- ⊕ Short circuit protection (SCP)

The 2T8A_1.5 Series is specially designed for applications where an isolated voltage is required in a distributed power supply system. It is suitable for

These products apply to:

- 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 $\leq 1500VDC$);
- 3) Where do not has high requirement of line regulation and load regulation;

Such as: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.



Common specifications	
Short circuit protection*:	continuous, auto-recovery (24V: 1s)
Temperature rise at full load:	25°C TYP
Cooling:	Free air convection
Operation temperature range:	-40°C~+105°C • 3.3V/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%
Case material:	Epoxy resin [UL94-V0]
MTBF:	>3,500,000 hours
Weight:	1.5g

* For the products of 24V Input voltage, supply voltage must be discontinued at the end of short circuit duration.

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	See tolerance envelope graph				
Line regulation	For V_{in} change of $\pm 1\%$ • 3.3V output • other output			± 1.5 ± 1.2	% %
Load regulation	10% to 100% load • 3.3V output • 5V output • 9V output • 12V output • 15V output • 24V output		18 12 9 8 7 6		% % % % % %
Temperature drift	100% full load			± 0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		100		mVp-p
Switching frequency	Full load, nominal input		100	300	KHz

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

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

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_0505S1.5UP

2=2Watt; T8= SMT8; A=Series; 5Vin; 5Vout; S=Single output; 1.5=1.5kVDC; U=Unregulated output; P= Short circuit protection

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		mA mA mA mA
Input surge voltage (1 sec. max.)	• 5VDC Input • 12VDC Input • 15VDC Input • 24VDC Input	-0.7 -0.7 -0.7 -0.7		9 18 21 30	VDC VDC VDC VDC
Reflected ripple current*			15		mA
Input Filter	Capacitor Filter				

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 $T_a=25^\circ C$, 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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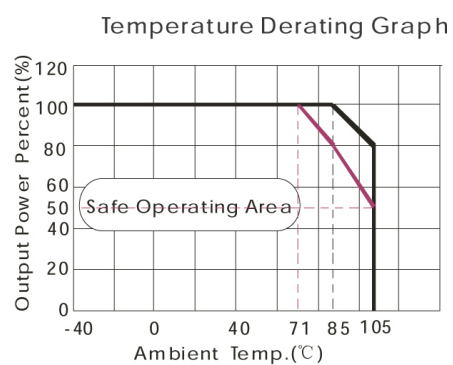
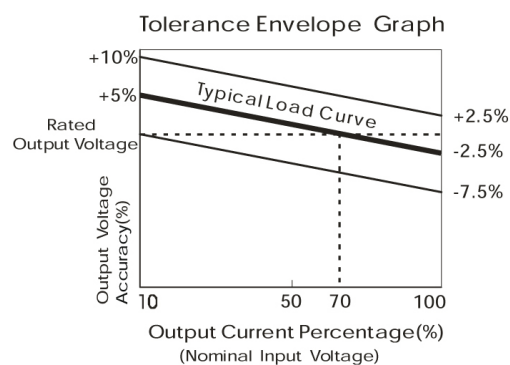
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EMC specifications

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 ± 6 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_0503S1.5UP	5	3.3	400/40	68	220
2T8A_0505S1.5UP	5	5	400/40	75	220
2T8A_0509S1.5UP	5	9	222/22	78	220
2T8A_0512S1.5UP	5	12	167/17	78	220
2T8A_0515S1.5UP	5	15	133/13	79	220
2T8A_1205S1.5UP	12	5	400/40	75	220
2T8A_1209S1.5UP	12	9	222/22	78	220
2T8A_1212S1.5UP	12	12	167/17	78	220
2T8A_1215S1.5UP	12	15	133/13	79	220
2T8A_1224S1.5UP	12	24	83/8	80	220
2T8A_1515S1.5UP	15	15	133/13	79	220
2T8A_2405S1.5UP	24	5	400/40	75	220
2T8A_2412S1.5UP	24	12	167/17	78	220
2T8A_2415S1.5UP	24	15	133/13	79	220
2T8A_2424S1.5UP	24	24	83/8	82	220

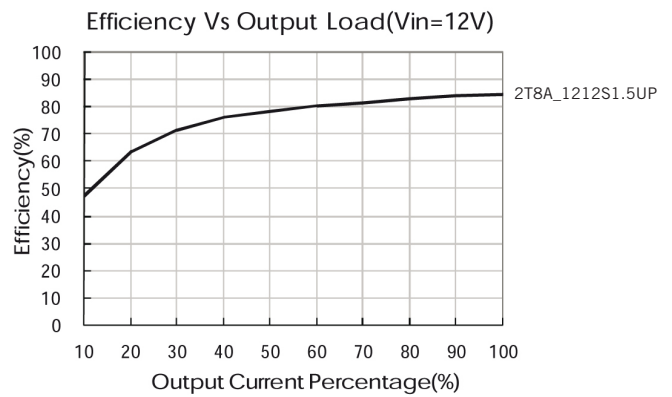
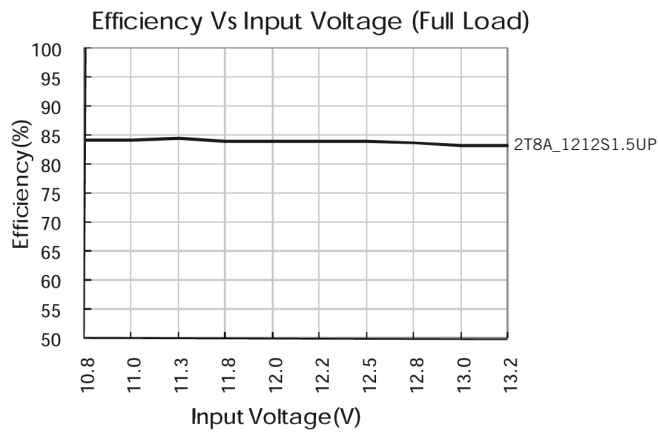
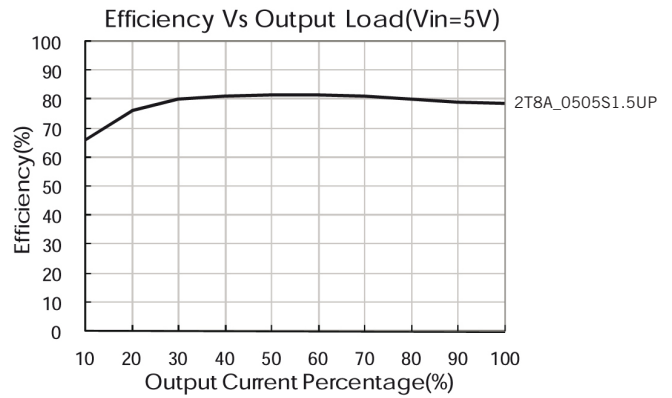
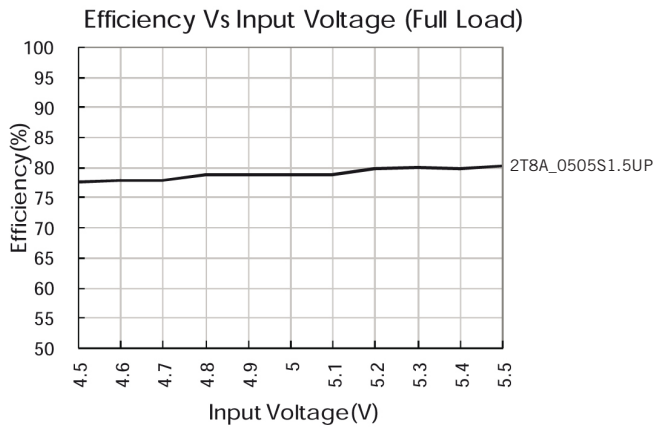
Typical characteristics



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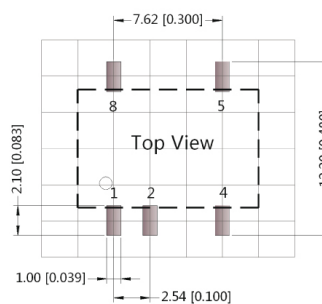
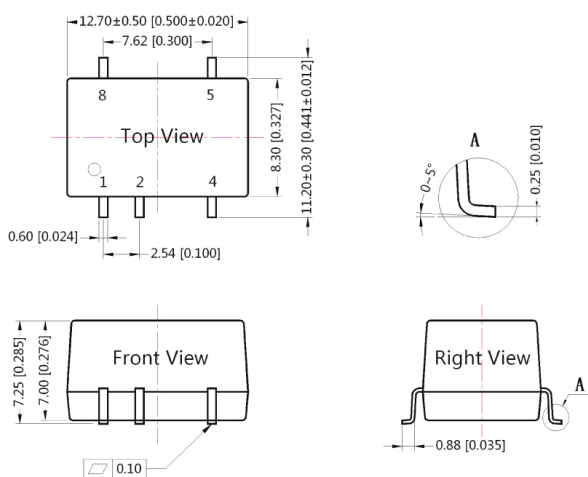
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Efficiency



Dimensions and recommended layout

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

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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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 suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure the modules are running well, the recommended capacitive load values as shown in Table 1.



Figure 1

V _{in} (VDC)	C _{in} (μF)	V _o (VDC)	C _{out} (μF)
5	4.7	3.3	10
12	2.2	5	10
15	2.2	9	4.7
24	1	12	2.2
--	--	15	1
--	--	24	0.47

It's not recommended to connect any external capacitor in the application field with less than 0.5 watt output. Table 1

2) EMC typical recommended circuit (CLASS B)

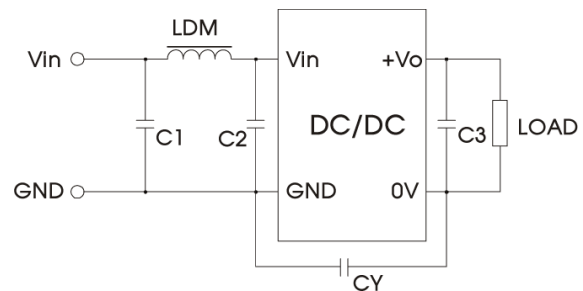


Figure 2

Input voltage (VDC)	5/12/15/24
EMI C1	4.7μF /50V
EMI C2	4.7μF /50V
EMI C3	Refer to the C _{out} in Fig.1
EMI CY	--
EMI LDM	6.8μH

Note:

- 2T8A_2424S1.5UP is subject to C2 (C2 : 470pF/2KV).
- It is not needed to add the component in the peripheral circuit when parameter with the symbol of „--“.

3) Output load requirements

To ensure the module work efficiently and reliably, during the operation, the min. output load should be no less than 10% of the full load. If the actual output power is low, please connect a resistor to the output terminal in parallel, with a recommended resistance which is 10% of the rated power, and derating is required during operation.