



## 2T8A4\_1.5UP series

2W - Single Output DC-DC converter - Isolated & Unregulated

### DC-DC Converter

2 Watt

- ⊕ SMD8 package type
- ⊕ Operating temperature range: -40°C to +105°C
- ⊕ 1500VDC isolation voltage
- ⊕ Up to 84% efficiency
- ⊕ No-load input current as low as 5mA
- ⊕ MTBF: 3,500,000 hours

Introducing our new 2T8A4\_1.5UP series, a compact and high-reliability isolated DC-DC converter platform designed for modern surface-mount applications. Housed in a space-saving SMD8 package, the series combines efficient power conversion with robust electrical isolation of 1500 VDC. Engineered for demanding environments, it operates reliably across an extended temperature range from -40°C to +105°C. With efficiencies of up to 84% and a no-load input current as low as 5 mA, the 2T8A4\_1.5UP series supports energy-efficient designs while minimizing standby power consumption. An MTBF of 3,500,000 hours further ensures long-term operational stability, making it an ideal solution for industrial, control, and embedded systems requiring dependable isolated power in a compact SMT form factor.



Common specifications	
Short circuit protection	Continuous, self recovery
Switching frequency	220kHz (typ.) full load, nominal input voltage
Operating temperature	-40°C - +105°C (with derating)
Storage temperature	-55°C - +125°C
Case temperature rise	+25°C (typ.) (Ta = 25°C, nominal input, output load)
Reflow soldering temperature	Peak temp. ≤245°C, maximum duration time ≤60s over 217°C
Storage humidity	95% RH (non-condensing)
Input filter	Capacitance filter
Hot plug	Unavailable
MTBF (MIL-HDBK-217F@25°C)	> 3,500,000 Hours
Case material	Black plastic; flame-retardant and heat-resistant (UL94V-0 rated)
Package dimensions	13.50 x 11.10 x 7.25 mm
Weight	1.7g (typ.)
Cooling method	Free air convection

Input specifications					
Item	Operating condition	Min	Typ	Max	Units
Input current (full load/no load)	5VDC Input		482/6		mA
	12VDC Input		208/4		
	15VDC Input		167/3		
	24VDC Input		104/3		
Reflected ripple current			15		mA
Impulse voltage	5VDC Input	-0.7		9	VDC
	12VDC Input	-0.7		18	
	15VDC Input	-0.7		20	
	24VDC Input	-0.7		30	

**Example:**  
**2T8A4\_1205S1.5UP**  
 2 = 2Watt; T8 = SMT8; A4 = Series; 12 = 12Vin; 05 = 05Vout; S = Single Output;  
 1.5 = 1.5kVDC isolation; U = Unregulated Output; P = Short circuit protection.

Output specifications					
Item	Operating condition	Min	Typ	Max	Units
Output voltage accuracy	See envelope curve figure 1				
Linear regulation (Input voltage variation ±1%)	3.3VDC output		± 1.5		%
	Others output		± 1.2		
Load regulation (10% - 100% load)	3.3/5VDC output		8	15	%
	12VDC output		5	10	
	15VDC output		4	10	
	24VDC output		4	10	
Ripple & noise	20MHz bandwidth (peak to peak)	--	60	150	mV
Temperature coefficient	Full load		±0.03	--	%/°C

Isolation specifications					
Item	Operating conditions	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500			VDC
Isolation resistance	Input-output, isolated voltage 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		20		pF

EMC specifications					
EMI	CE	CISPR32/EN55032 CLASS B (the recommended circuit is shown in figure 4)			
EMI	RE	CISPR32/EN55032 CLASS B (the recommended circuit is shown in figure 4)			
EMS	ESD	IEC/EN61000-4-2 Air± 8kV, Contact ± 4kV			perf. criteria B

- The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
- The maximum capacitive load is tested within the input voltage range and under full load conditions;
- Unless otherwise specified, all indicators in this datasheet are measured at Ta = 25°C, humidity <75% RH, nominal input voltage, and output rated load;
- All testing methods in this datasheet are based on our company's standards;
- For any specific requirement please contact our technical team directly;
- Product specifications are subject to change without prior notice.

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### Product Selection Guide

Approval	Part number	Input Voltage (VDC) Nominal	Output Voltage (VDC)	Output Current min. (mA)	Output Current max. (mA)	Full Load Efficiency % (typ.)	Capacitive Load ( $\mu$ F) max.
	2T8A4_0503S1.5UP	5	3.3	40	400	82	2400
	2T8A4_0505S1.5UP	5	5	40	400	83	2400
	2T8A4_0512S1.5UP	5	12	17	167	84	560
	2T8A4_0515S1.5UP	5	15	13	133	84	560
	2T8A4_0524S1.5UP	5	24	8	84	84	220
	2T8A4_1203S1.5UP	12	3.3	40	400	80	2400
	2T8A4_1205S1.5UP	12	5	40	400	83	2400
	2T8A4_1212S1.5UP	12	12	17	167	84	560
	2T8A4_1215S1.5UP	12	15	13	133	84	560
	2T8A4_1224S1.5UP	12	24	8	84	84	220
	2T8A4_1503S1.5UP	15	3.3	40	400	82	2400
	2T8A4_1505S1.5UP	15	5	40	400	83	2400
	2T8A4_1512S1.5UP	15	12	17	167	84	560
	2T8A4_1515S1.5UP	15	15	13	133	84	560
	2T8A4_1524S1.5UP	15	24	8	84	84	220
	2T8A4_2403S1.5UP	24	3.3	40	400	82	2400
	2T8A4_2405S1.5UP	24	5	40	400	83	2400
	2T8A4_2412S1.5UP	24	12	17	167	84	560
	2T8A4_2415S1.5UP	24	15	13	133	84	560
	2T8A4_2424S1.5UP	24	24	8	84	84	220

### Product characteristic curve

#### Temperature derating graph

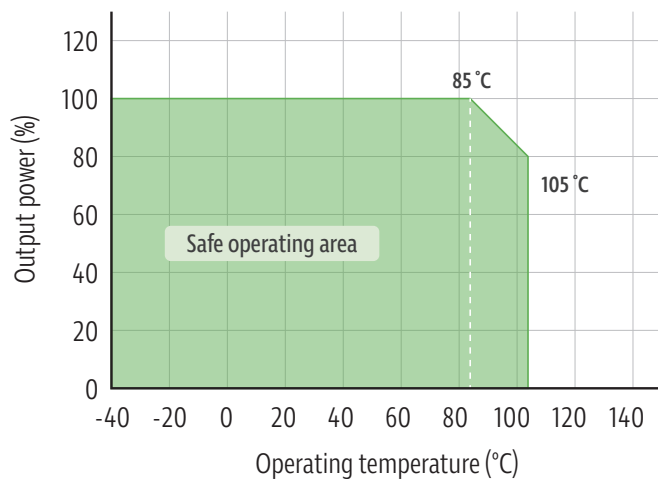


Figure 2

# 2T8A4\_1.5UP series

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## Product characteristic curve

**Output regulation curve**

Other output

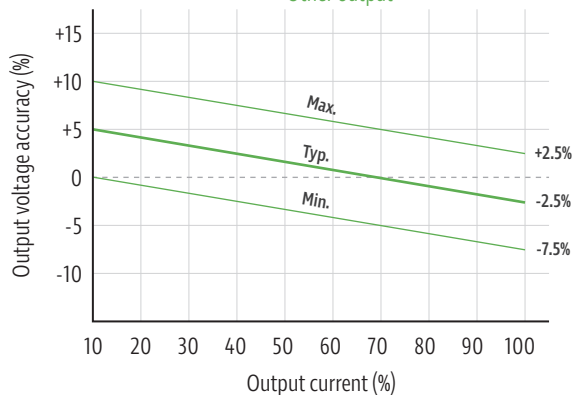


Figure 1-1

**Output regulation curve**

3.3VDC output

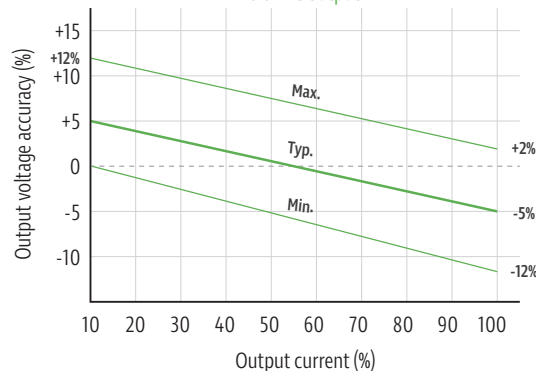
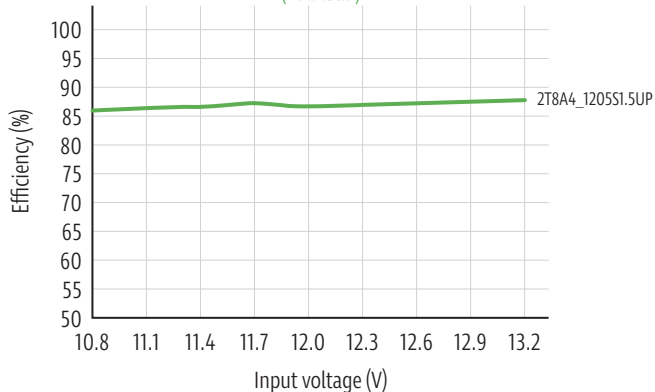


Figure 1-2

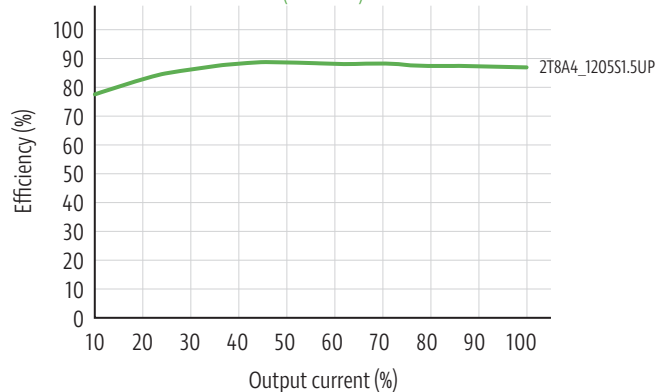
**Efficiency vs input voltage**

(Full load)



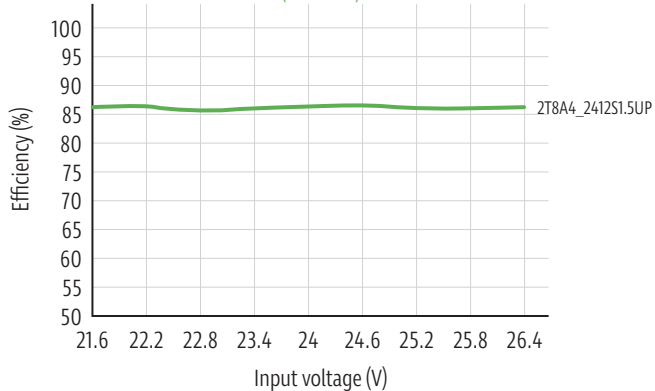
**Efficiency vs output load**

(Vin = 12V)



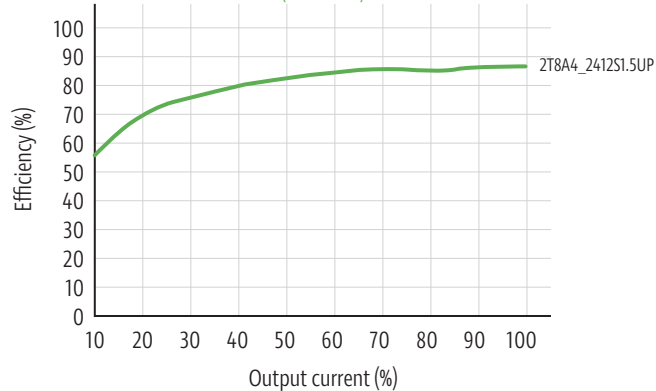
**Efficiency vs input voltage**

(Full load)



**Efficiency vs output load**

(Vin = 24V)



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### Recommended circuits for application

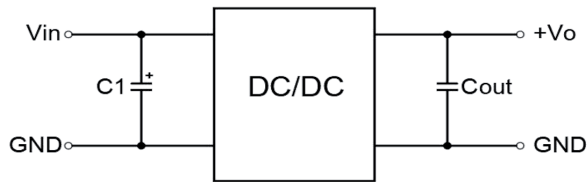


Figure 3

Recommended capacitive load value table

Vin (VDC)	Cin (μF)	Vo (VDC)	Cout (μF)
5VDC	10μF/10V	3.3/5VDC	10μF/10V
12VDC	4.7μF/25V	12VDC	2.2μF/25V
15VDC	2.2μF/25V	15VDC	1μF/50V
24VDC	1μF/50V		

### Recommended EMC circuit

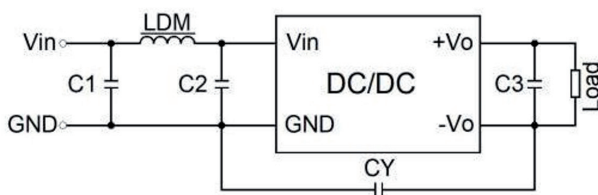


Figure 4

EMI recommended parameter table

EMI	EMI recommended parameter table	
	C1, C2	4.7μF / 50μF
C3	Refer to the Cout parameter in figure 3	
CY	270pF / 2kV	
LDM	6.8μH	

#### 1. Typical applications

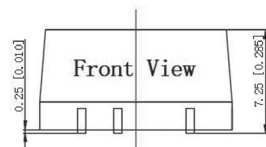
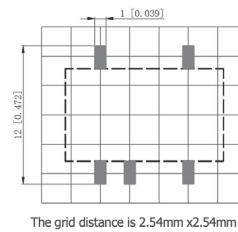
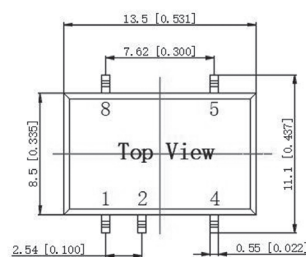
To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals. The application circuit is shown in figure 3. However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is likely to cause start-up problems. For each output, the recommended capacitive load values are shown in "recommended capacitive load value table" for safe and reliable operation.

#### 2. EMC typical recommended circuit see figure 4

#### 3. Output load requirements

In order to ensure that the module can work efficiently and reliably, the minimum output load should not be less than 10% of the rated load when used. If the power required is really small, connect a resistor in parallel to the output end (the sum of the power consumed by the resistance and the power actually used is greater than or equal to 10% of the rated power).

### Mechanical Dimensions



Note:  
Unit: mm [inch]  
Pin section tolerances: ±0.10 [±0.004]  
General tolerances: ±0.50 [±0.020]

Pin definition table

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

NC: cannot be connected to any external circuit