



1T8A3_1.5UP series

1W - Single Output DC-DC Converter - Fixed Input - Isolated & Unregulated

DC-DC Converter

1 Watt

- Continuous short-circuit protection
- No-load input current as low as 3mA
- Operating ambient temp. range: -40°C to +105°C
- High efficiency up to 88%
- Small SMD package
- I/O isolation test voltage: 1,500VDC isolation
- International standard pinout
- ESD satisfy 8kV contact discharge
- Input voltage change range is $V_{in} \pm 10\%$

Introducing our power module 1T8A3_1.5UP series with continuous short-circuit protection and a no-load input current as low as 3mA. It operates within an ambient temperature range of -40°C to +105°C and offers high efficiency of up to 88%. The input voltage change range is $\pm 10\% V_{in}$. The small SMD package features an I/O isolation test voltage of 1.5kVDC and conforms to the international standard pinout. Additionally, it satisfies ESD requirements with an 8kV contact discharge rating.



Common specifications

Short circuit protection	Continuous, self-recovery
Operation temperature	-40°C ~ +105°C (with derating)
Storage temperature	-55°C ~ +135°C
Case temperature rise	15°C Ambient temperature 25°C (Ta = 25°C)
Storage humidity	95% RH (non-condensing)
Reflow temperature	Peak temp. $\leq 245^\circ\text{C}$, maximum duration time $\leq 60\text{s}$ over 217°C
MTBF	>3,000 k hours (MIL-HDBK-217F@25°C)
Casing material	Black flame-retardant, heat-resistant plastic [UL94-V0]
Cooling	Natural air cooling
Dimensions:	12.7 x 11.20 x 7.25 mm
Weight:	1.4g typ.

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage accuracy	See output regulation curves				
Line regulation (Input voltage change 1%)	• 3.3VDC/5VDC output • Other input			1.5 1.2	% %
Load regulation (10% to 100% load)	• 3.3VDC/5VDC output • Other input	10 8	15 10		% %
Ripple & Noise* (20MHz Bandwidth)	3VDC input Other input • 5/9VDC output • 12/15/24VDC output	75 30 50	100 75 100		mVp-p mVp-p mVp-p
Temperature coefficient	full load			± 0.03	%/°C
Switching Frequency (Full load)	Single • 3VDC/5VDC input • Other input		260 450		kHz kHz

Example:

1T8A3_0505S1.5UP

1 = 1Watt; T8 = SMT8; A3 = Series; 05 = 5Vin; 05 = 5Vout; S = Single output; 1.5 = 1.5kVDC isolation; U = Unregulated output; P = Short circuit protection

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/ no load)	3VDC input				
	• 3.3/5VDC output		370/5	380/10	mA
	• 9VDC output		357/5	365/10	mA
	• 12/15VDC output		348/10	357/20	mA
	• 24VDC output		357/20	365/30	mA
	5VDC input				
	• 3.3/5VDC output		244/5	250/10	mA
	• 5/9VDC output		233/6	238/15	mA
	• 12/15VDC output		225/15	230/25	mA
	• 24VDC output		244/30	250/40	mA
	12VDC input				
	• 3.3VDC output		96/ 6	104/9	mA
	• 5VDC output		96/ 6	98/9	mA
	• 9/12VDC output		89/6	91/9	mA
	• 15VDC output		93/7	95/9	mA
	• 24VDC output		-	-	
	15VDC input				
	• 5VDC output		78/5	82/10	mA
	24VDC input				
	• 3.3VDC output		47/3	50/8	mA
• 5VDC output		47/3	50/8	mA	
• 9/12VDC output		48/5	50/8	mA	
• 15VDC output		48/6	50/8	mA	
Reflected ripple current			15		mA
Overshoot Voltage	• 3VDC input • 5VDC input • 12VDC input • 15VDC input • 24VDC input	-0.7 -0.7 -0.7 -0.7 -0.7		9 9 18 21 30	VDC VDC VDC VDC VDC
Overshoot current			0.8		A
Input filter	Capacitance filter				
Hot plug	Unavailable				

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	I/O, Tested for 1min and leakage current $\leq 0.5\text{mA}$	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output 100kHz/0.1V		20		pF

EMC specifications

Emissions	CE	CISPR32/EN55032 CLASS B (See EMC recommended circuit)
Emissions	RE	CISPR32/EN55032 CLASS B (See EMC recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Air $\pm 8\text{kV}$, Contact $\pm 8\text{kV}$ perf. Criteria B

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 data-sheet
- The max. 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's 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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Products Selection Guide

Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA, max./min]	Capacitive load [μF, max.]	Ripple & Noise, 20MHz [mVp-p, typ./max]	Efficiency [% , typ.]
1T8A3_0303S1.5UP	3.3	3.3	303/30	10000	50/100	76
1T8A3_0305S1.5UP	3.3	5	200/20	10000	50/100	82
1T8A3_0309S1.5UP	3.3	9	111/11	10000	50/100	85
1T8A3_0312S1.5UP	3.3	12	83/8	10000	100/150	87
1T8A3_0315S1.5UP	3.3	15	67/7	10000	100/150	87
1T8A3_0324S1.5UP	3.3	24	42/4	10000	100/150	80

Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA, max./min]	Capacitive load [μF, max.]	Ripple & Noise, 20MHz [mVp-p, typ./max]	Efficiency [% , typ.]
1T8A3_0503S1.5UP	5	3.3	303/30	10000	50/100	80
1T8A3_0505S1.5UP	5	5	200/20	10000	50/100	85
1T8A3_0509S1.5UP	5	9	111/11	10000	50/100	86
1T8A3_0512S1.5UP	5	12	83/8	10000	100/150	87
1T8A3_0515S1.5UP	5	15	67/7	10000	100/150	87
1T8A3_0524S1.5UP	5	24	42/4	10000	100/150	88

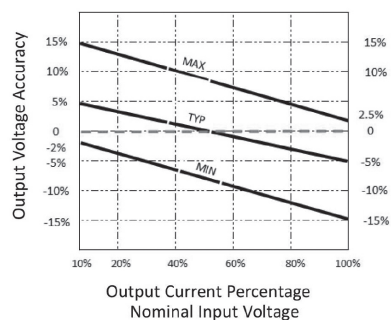
Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA, max./min]	Capacitive load [μF, max.]	Ripple & Noise, 20MHz [mVp-p, typ./max]	Efficiency [% , typ.]
1T8A3_1203S1.5UP	12	3.3	303/30	3000	50/100	82
1T8A3_1205S1.5UP	12	5	200/20	3000	50/100	86
1T8A3_1209S1.5UP	12	9	111/11	3000	50/100	86
1T8A3_1212S1.5UP	12	12	83/8	2200	50/100	86
1T8A3_1215S1.5UP	12	15	67/6	1000	50/100	86
1T8A3_1224S1.5UP	12	24	42/4	560	50/100	86

Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA, max./min]	Capacitive load [μF, max.]	Ripple & Noise, 20MHz [mVp-p, typ./max]	Efficiency [% , typ.]
1T8A3_1505S1.5UP	15	5	200/20	2200	50/100	85

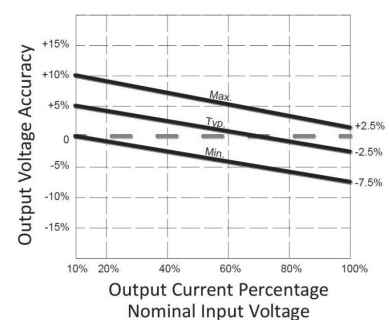
Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA, max./min]	Capacitive load [μF, max.]	Ripple & Noise, 20MHz [mVp-p, typ./max]	Efficiency [% , typ.]
1T8A3_2403S1.5UP	24	3.3	303/30	3000	50/100	82
1T8A3_2405S1.5UP	24	5	200/20	3000	50/100	86
1T8A3_2409S1.5UP	24	9	111/11	3000	50/100	86
1T8A3_2412S1.5UP	24	12	83/8	2200	50/100	86
1T8A3_2415S1.5UP	24	15	67/6	1000	50/100	86
1T8A3_2424S1.5UP	24	24	42/4	560	50/100	86

Products Characteristic Curve

3.3VDC 5VDC output regulation curve



Other voltage output regulation curve

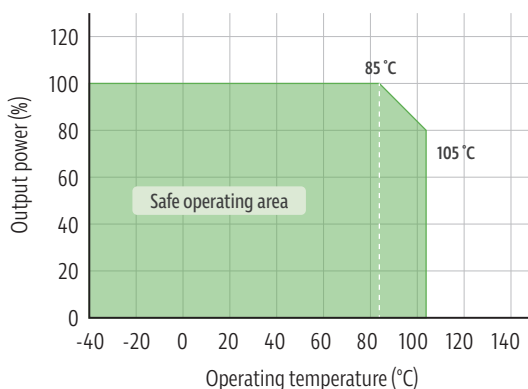


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Products characteristic curve

Temperature derating graph



Typical application



Fig.3

Note: C_{in} is 4.7uF/50V C_{out} is 10uF/50V

In order to ensure the input/output ripple and noise decreased, capacitor filter net could be connected to input and output side, application circuit as in fig. 3; choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance.

EMC recommended circuit

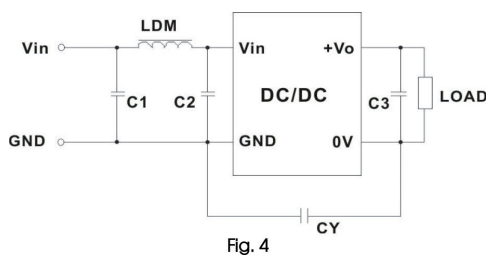


Fig. 4

Note: C_1 , C_2 are 4.7uF/50V, LDM is 6.8uH, CY is 1nF/250VAC, for C_3 , please refer to the typical circuit.

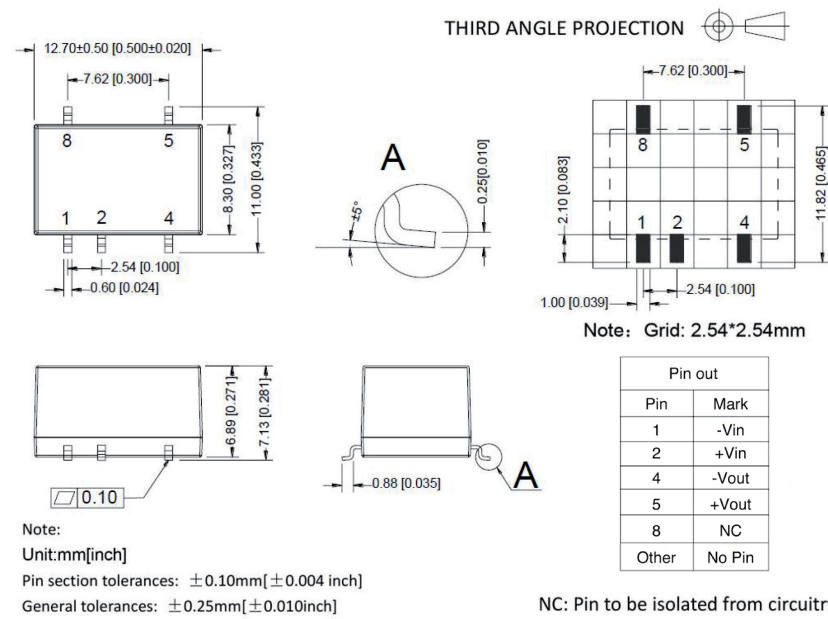
Output load requirement

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor at the output side. (The actual using power and the power of the resistor should be more than 10% rated power)

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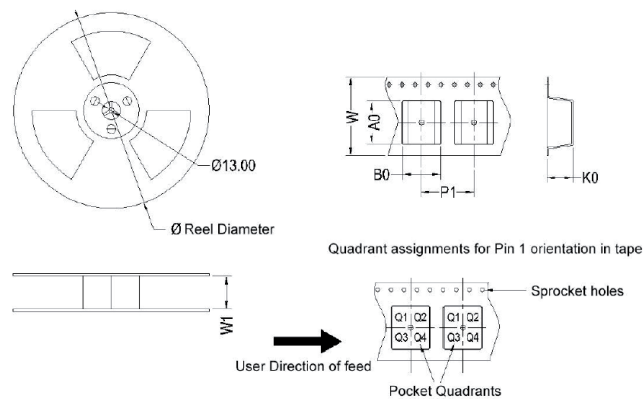
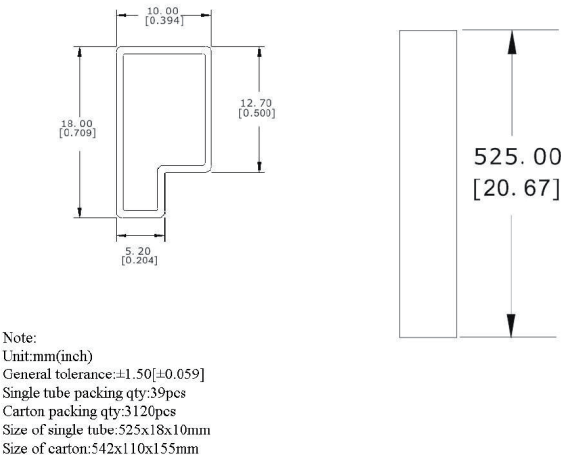
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Mechanical dimensions



Note: if the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

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	24.5	13.1	11.7	7.5	18.0	24	Q1