1T8A3_3UP series

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

DC-DC Converter 1 Watt

- Fixed input voltage, isolated & unregulated output
- Continuous short circuit protection
- Operating temperature: -40°C to +105°C
- Small SMD8 package
- Isolation Voltage 3000VDC
- Up to 88% efficiency
- No load input current as low as 5mA
- 8kV contact discharge
- 1W output power

Introducing our latest 1T8A3_3UP series, engineered to deliver exceptional performance and reliability in compact designs. With a fixed input voltage and an isolated, unregulated output, this module offers versatile power solutions for a wide range of applications. It is equipped with continuous short circuit protection, ensuring long-term safety and resilience under stress. This high-performance module operates within a wide temperature range of -40°C to +105°C, making it ideal for use in harsh environments. Housed in a small SMD package, it is perfect for applications where space is limited, while maintaining excellent durability and performance. With an impressive 3000VDC isolation voltage, the module ensures robust protection and electrical isolation. Achieving up to 88% efficiency, it minimizes power loss, reducing overall system energy consumption. Additionally, the module has an extremely low no-load input current of just 5mA, making it energy-efficient even when idle. For environments prone to electrostatic discharge, this module is designed to handle 8kV contact discharge, providing added safety and protection for sensitive components. Delivering 1W of output power.

SHORT CIRCUIT PROTECTED · 100% RoHS compliant · c UL us UL62368 - E347551

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. ≤250°C, maximum duration time ≤60s 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.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/ no load)	**3VDC input**				
	• 3.3/5VDC output		370/5	380/20	mA
	• 9VDC output		357/5	365/20	mA
	• 12/15VDC output		348/10	357/20	mA
	• 24VDC output		357/20	365/30	mA
	5VDC input				
	• 3.3/5VDC output		244/5	250/20	mA
	• 5/9VDC output		233/6	238/20	mA
	• 12/15VDC output		225/15	230/25	mA
	• 24VDC output		244/30	250/40	mA
	12VDC input				
	• 3.3VDC output		96/3	104/15	mA
	• 5VDC output		196/2	198/15	mA
	• 12VDC output		89/3	91/15	mA
	• 15VDC output		93/7	95/15	mA
	15VDC input				
	• 5VDC output		98/7	103/15	mA
	24VDC input				
	• 5VDC output		78/5	82/20	mA
	• 12VDC output		47/3	50/8	mA
	• 15VDC output		48/5	50/8	mA
Reflected ripple current			15		mA
Overshoot Voltage	• 3VDC input	-0.7		9	VDC
	• 5VDC input	-0.7		11	VDC
	• 12VDC input	-0.7		18	VDC
	• 15VDC input	-0.7		21	VDC
	• 24VDC input	-0.7		30	VDC
Overshoot current			0.8		A
Input filter	Capacitance filter				
Hot plug	Unavailable				

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			±1.5	%
	• Other input			±1.2	%
Load regulation (10% to 100% load)	• 3.3VDC/5VDC output		10	15	%
	• Other input		8	10	%
Temperature coefficient	full load			±0.03	%/°C
Switching Frequency (Full load)	• 3VDC/5VDC input		260		kHz
	• Other input		450		kHz

Example:
1T8A3_0505S3UP
1 = 1Watt; T8 = SMT8; A3 = Series; 05 = 5Vin; 05 = 5Vout; S = Single output; 3 = 3kVDC isolation; U = Unregulated output; P = Short circuit protection

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	I/O, Tested for 1min and leakage current ≤0.5mA .	3000			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 ±8kV, Contact ±8kV perf. Criteria B

Note:

1. 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
2. The max. capacitive load offered were tested at input voltage range and full load;
3. 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;
4. All index testing methods in this datasheet are based on our company's corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see „Features" and „EMC";
7. 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_0303S3UP	3.3	3.3	303/30	2400	50/100	76
1T8A3_0305S3UP	3.3	5	200/20	2400	50/100	82
1T8A3_0309S3UP	3.3	9	111/11	1000	50/100	85
1T8A3_0312S3UP	3.3	12	83/8	560	100/150	87
1T8A3_0315S3UP	3.3	15	67/7	560	100/150	87
1T8A3_0324S3UP	3.3	24	42/4	220	100/150	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_0503S3UP	5	3.3	303/30	2400	50/100	80
1T8A3_0505S3UP	5	5	200/20	2400	50/100	85
1T8A3_0509S3UP	5	9	111/11	1000	50/100	86
1T8A3_0512S3UP	5	12	83/8	1000	100/150	87
1T8A3_0515S3UP	5	15	67/7	560	100/150	87
1T8A3_0524S3UP	5	24	42/4	220	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_1203S3UP	12	3.3	303/30	2400	50/100	82
1T8A3_1205S3UP	12	5	200/20	2400	50/100	86
1T8A3_1212S3UP	12	12	83/8	1000	50/100	86
1T8A3_1215S3UP	12	15	67/6	560	50/100	86
1T8A3_1224S3UP	12	24	42/4	220	50/100	86

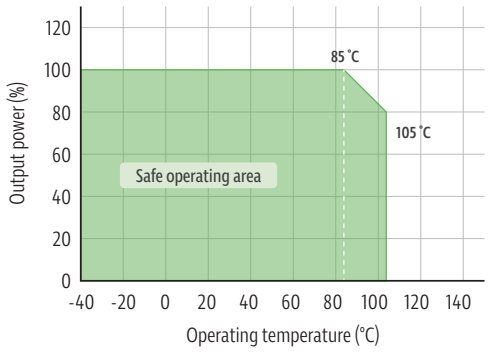
Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA, max./min]	Capacitive load [µF, max.]	Ripple & Noise, 20MHz [mVp-p, typ./max]	Efficiency [%, typ.]
1T8A3_1505S3UP	15	5	200/20	2400	50/100	86

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_2405S3UP	24	5	200/20	2400	50/100	86
1T8A3_2412S3UP	24	12	83/8	1000	50/100	86
1T8A3_2415S3UP	24	15	67/6	560	50/100	86

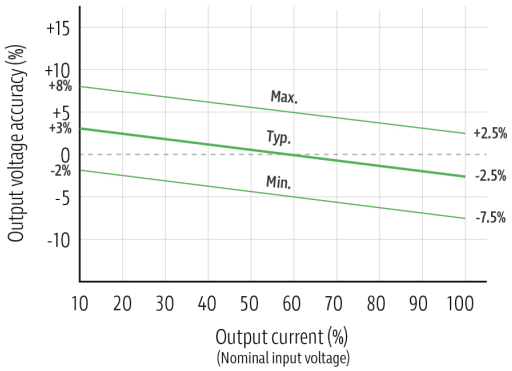
Note
1: The typical output efficiency is based on that product is full loaded and burned-in after half an hour.
2: The fluctuation range of full load efficiency (%, typ.) is ±2%, full load output efficiency = total output power/module's input power.
3: Ripple & noise tested by twisted-pair method, for details please check ripple & noise test method.

Products characteristic curve

Temperature derating graph



Output regulation curve



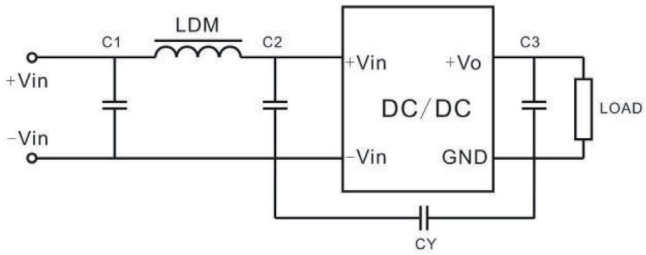
Typical application

Fig.3

Note: Cin is 4.7uF/50V; Cout 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 below photo 3; choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance.

EMC recommended circuit

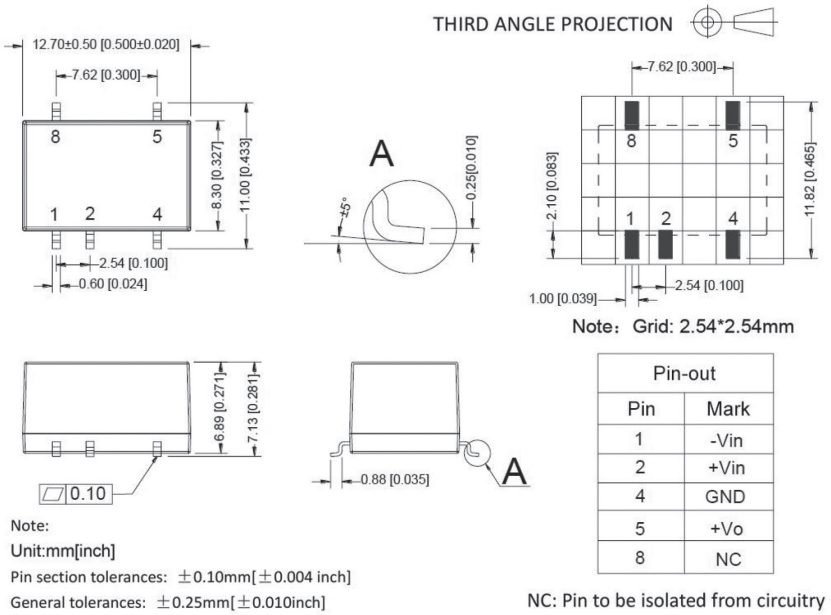


Note: C1, C2 are 4.7uF/50V, LDM is 6.8uH, CY is 1nF/250VAC, for C3, please refer to the typical circuit.

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.

Mechanical dimensions

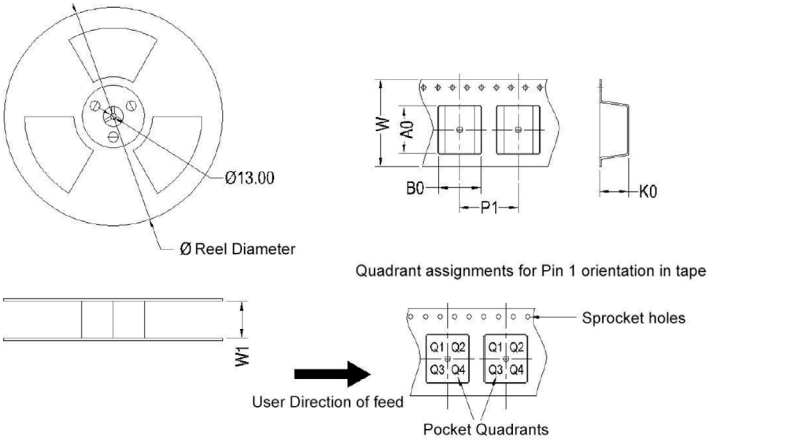


Pin-out	
Pin	Mark
1	-Vin
2	+Vin
4	GND
5	+Vo
8	NC

NC: Pin to be isolated from circuitry

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

Packing Information



Package	PIN	SPQ	Reel diameter(mm	Reel width(mm)	A0 (mm)	B0 (mm)	K0(mm)	P1(mm)	W (mm)	PIN Quadrant
SMD	5	500	330	24.5	13.1	11.7	7.5	16.0	24	Q1