



1T8A1_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 8mA
- ⊕ Operating ambient temp. range: -40°C to +105°C
- ⊕ Compact SMD package
- ⊕ I/O isolation test voltage: 1.5kVDC isolation
- ⊕ Industry standard pin-out
- ⊕ High efficiency up to 85%

The 1T8A1_1.5UP series series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.



Common specifications	
Short circuit protection	Continuous, self-recovery
Operation temperature	-40°C ~ +105°C (Derating when operating temperature ≥ 100°C, (see Fig. 2))
Storage temperature	-55°C ~ +125°C
Case temperature rise	25°C (Ta=25°C)
Storage Humidity	5%RH ~ 95%RH (Non-condensing)
Reflow Soldering Temperature*	Peak temp. ≤ 245°C, maximum duration time ≤ 60s over 217°C
MTBF	> 3,500,000 hours (MIL-HDBK-217F@25°C)
Moisture Sensitivity Level (MSL)	(Level 1) IPC/JEDEC J-STD-020D.1
Casing material	Black flame-retardant, heat-resistant plastic [UL94-V0]
Dimensions:	13.20*11.40*7.25 mm
Weight:	1.4g
Cooling	Free air convection
MSL (Moisture sensitivity level):	J-STD-020D standard - Level 1

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	See output regulation curves				
Line regulation	Input voltage change: ±1%			1.2	%
Load regulation	10% to 100% load				
	• 5V output		10	15	%
	• 9V output		8	10	%
	• 12V output		7	10	%
	• 15V output		6	10	%
	• 24V output		5	10	%
Ripple & Noise*	20MHz Bandwidth				
	• 5/9/12/15VDC DC output		30	75	mVp-p
	• 24VDC output		50	100	mVp-p
Temperature coefficient	full load		±0.02		%/°C
Switching frequency	Full load, nominal input		260		KHz

The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input current (full load / no load)	12VDC input				
	• 5VDC output		102/8	107/-	mA
	• 9/12/15VDC output		101/8	106/-	mA
	• 24VDC output		99/8	103/-	mA
	15VDC input				
	• 5VDC output		82/8	86/-	mA
	• 15VDC output		81/8	85/-	mA
	24VDC input				
	• 5/9/12/15VDC output		51/8	55/-	mA
	• 24VDC output		50/8	53/-	mA
Reflected ripple current			30		mA
Surge voltage (1 sec. max.)		-0.7		18	VDC
		-0.7		21	VDC
		-0.7		30	VDC
Input filter	Capacitance filter				
Hot plug	Unavailable				

EMC specifications		
EMI	CE	CISPR32/EN55032 CLASS B (see EMC recommended circuit)
EMI	RE	CISPR32/EN55032 CLASS B (see EMC recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Contact ±6kV perf. Criteria B

Example:

1T8A1_0505S1.5UP

1 = 1Watt; T8 = SMT8; A1 = Pinning; 05 = 5Vin; 05 = 5Vout; S = Single output; 1.5 = 1.5kVDC; U = Unregulated output; P = Short circuit

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 maximum 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.

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output 100KHz/0.1V		20		pF

1T8A1_1.5UP series

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

Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA]	Capacitive load [μ F, Max.]	Efficiency [%, min/typ]	Certification
1T8A1_0503S1.5UP	5	3.3	303	2400	70/74	UL/CE
1T8A1_0505S1.5UP	5	5	200	2400	78/82	UL/CE
1T8A1_0509S1.5UP	5	9	111	1000	79/83	UL/CE
1T8A1_0512S1.5UP	5	12	84	560	79/83	UL/CE
1T8A1_0515S1.5UP	5	15	67	560	79/83	UL/CE
1T8A1_0524S1.5UP	5	24	42	220	81/85	UL/CE

Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA]	Capacitive load [μ F, Max.]	Efficiency [%, min/typ]	Certification
1T8A1_1205S1.5UP	12	5	200	2400	78/82	UL/CE
1T8A1_1209S1.5UP	12	9	111	1000	79/83	UL/CE
1T8A1_1212S1.5UP	12	12	84	560	79/83	UL/CE
1T8A1_1215S1.5UP	12	15	67	560	79/83	UL/CE
1T8A1_1224S1.5UP	12	24	42	220	81/85	UL/CE

Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA]	Capacitive load [μ F, Max.]	Efficiency [%, min/typ]	Certification
1T8A1_1505S1.5UP	15	5	200	2400	78/82	UL/CE
1T8A1_1515S1.5UP	15	15	67	560	79/83	UL/CE

Part Number	Input Voltage [V, nom]	Output Voltage [VDC]	Output Current [mA]	Capacitive load [μ F, Max.]	Efficiency [%, min/typ]	Certification
1T8A1_2405S1.5UP	24	5	200	2400	76/82	UL/CE
1T8A1_2409S1.5UP	24	9	111	1000	77/83	UL/CE
1T8A1_2412S1.5UP	24	12	111	560	77/83	UL/CE
1T8A1_2415S1.5UP	24	15	67	560	77/83	UL/CE
1T8A1_2424S1.5UP	24	24	42	220	79/85	UL/CE

Design Reference

1. Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.3. Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.



Fig.3

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
12VDC	2.2 μ F/25V	5VDC	10 μ F/16V
15VDC	2.2 μ F/25V	9VDC	2.2 μ F/16V
24VDC	1 μ F/50V	12VDC	2.2 μ F/25V
--	--	15VDC	1 μ F/25V
--	--	24VDC	1 μ F/50V

2. EMC (CLASS B) compliance circuit

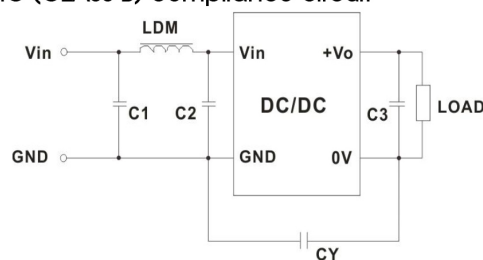


Fig.4

Table 2: EMC recommended circuit value table

EMI	Component	Value
	C1	4.7 μ F /50V
	C2	4.7 μ F /50V
	CY	270pF/2kV
	C3	Refer to the Cout in table 1
	LDM	6.8 μ H

3. Minimum Output Load Requirement

For a reliable and efficient operation of the converter, the minimum load should never be less than 1% of the rated output load. If the total required output power is below 1%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is always maintained at 1% minimum.

Typical characteristics

Output Regulation Curve

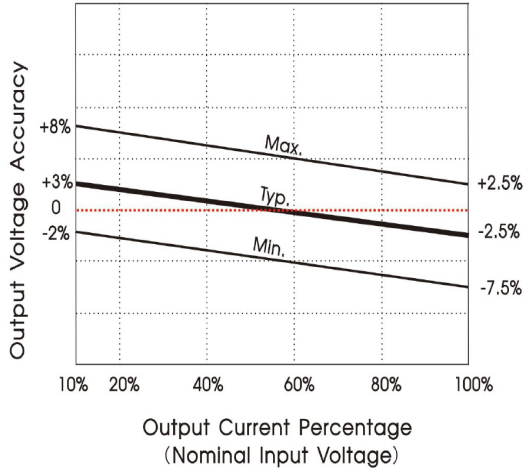


Fig. 1

Temperature Derating Curve

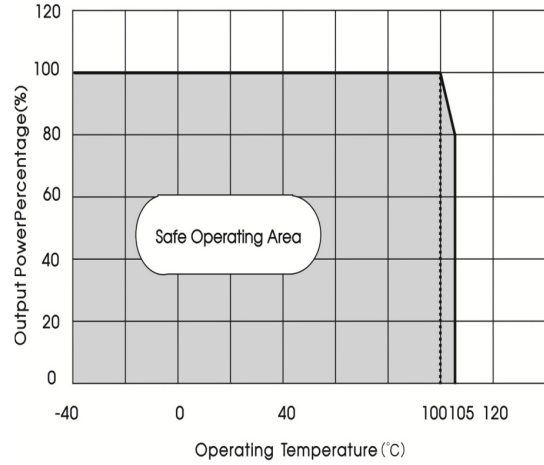
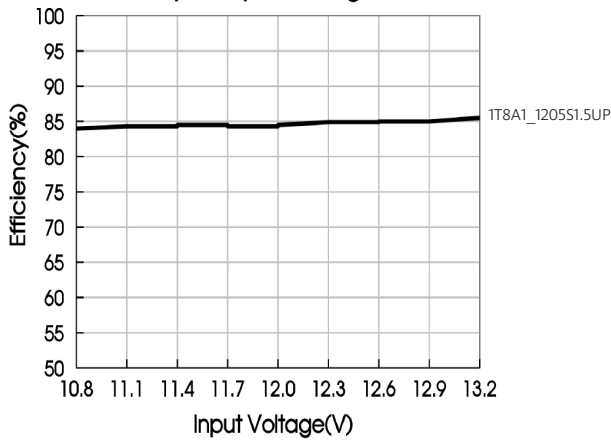
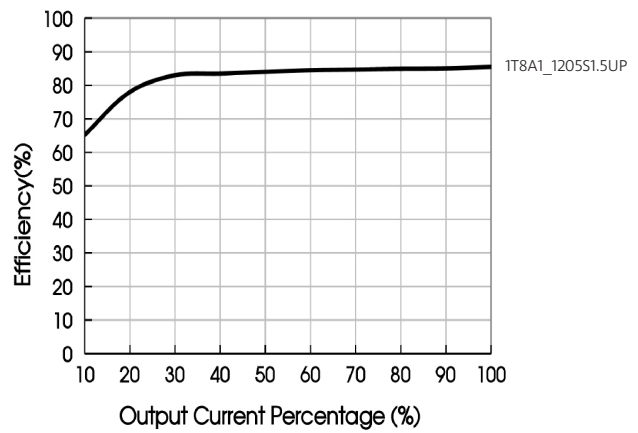


Fig. 2

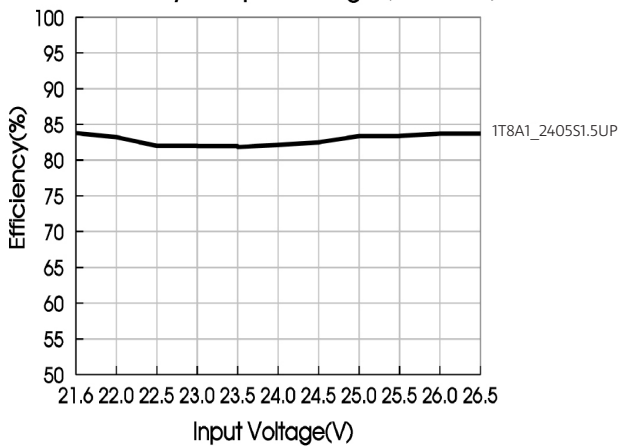
Efficiency Vs Input Voltage (Full Load)



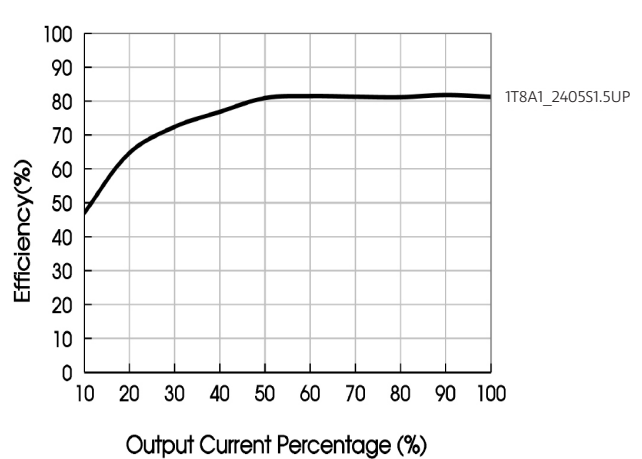
Efficiency Vs Output Load (Vin=12V)



Efficiency Vs Input Voltage (Full Load)



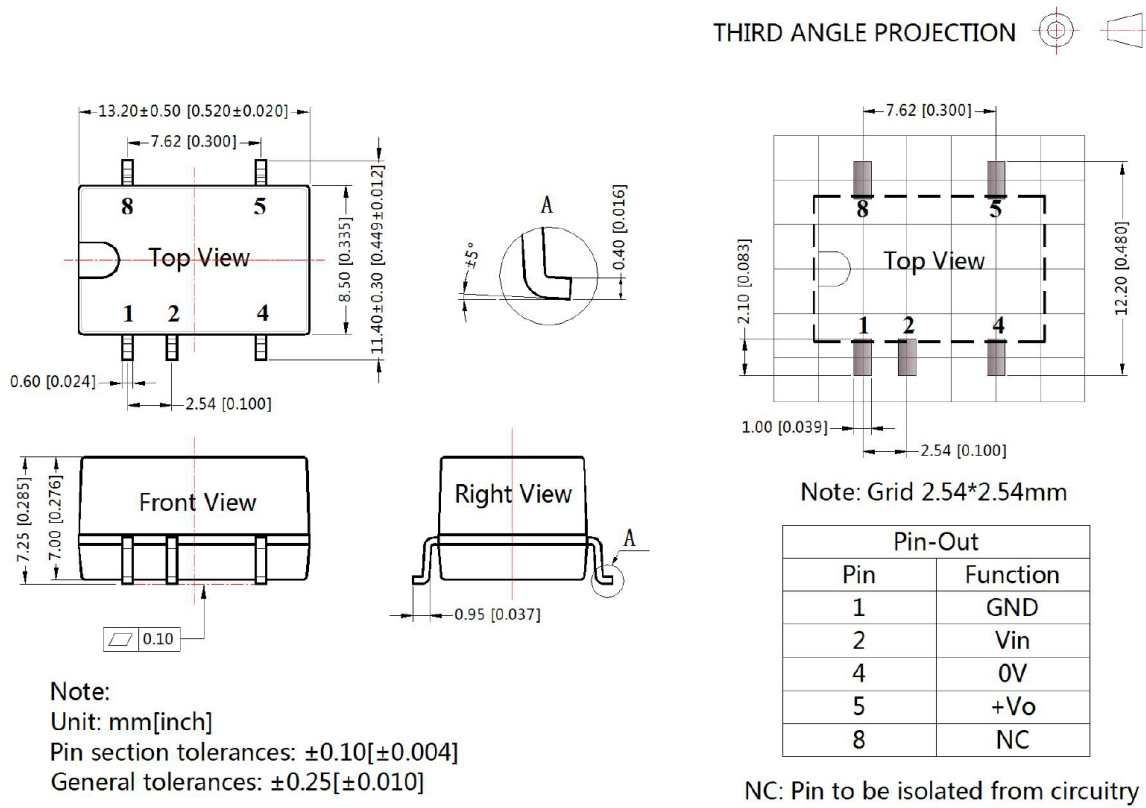
Efficiency Vs Output Load (Vin=24V)



1T8A1_1.5UP series

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

Mechanical dimensions



Tape and Reel Info

