ME1T8 Series

1W, Unregulated Single Output, 1.5KV Isolation, SMD8 Package DC/DC Converters

Features

- Input voltage range ±10%
- Unregulated single output
- High efficiency up to 80%
- Isolation voltage 1.5KVdc
- Full SMT structure inside
- Operating temperature range: -40 ~ +105°C ambient
- No external components required for operating
- RoHS compliant
- Industrial standard SMD8 package
- Continuous short circuit protection for a majority of models, 1 sec for others
- Certified to UL60950-1, IEC/EN60950-1
- 3 year warranty

Overview

The ME1T8 series are unregulated SMD8 package DC/DC converters with single output, and 1.5KVdc isolation. These converters feature high efficiency, low ripple and noise, short circuit protection, and wide operating temperature range. They are widely used in distributed power system in industrial applications where isolation and voltage converting is needed.

Model Numbers

Model Number	Input Voltage [VDC] ±10%	Output Voltage [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [uF] Max.
			Min.	Max.		
ME1T8-S0303	3.3	3.3	30	303	69	220
ME1T8-S0305	3.3	5	20	200	74	220
ME1T8-S0312	3.3	12	9	84	80	220
ME1T8-S0315	3.3	15	7	67	80	220
ME1T8-S0324	3.3	24	4	42	80	220
ME1T8-S0503	5	3.3	30	303	72	220
ME1T8-S0505	5	5	20	200	80	220
ME1T8-S0509	5	9	12	111	80	220
ME1T8-S0512	5	12	9	84	80	220
ME1T8-S0515	5	15	7	67	80	220
ME1T8-S0524	5	24	4	42	80	220
ME1T8-S1203	12	3.3	30	303	72	220
ME1T8-S1205	12	5	20	200	80	220
ME1T8-S1209	12	9	12	111	80	220
ME1T8-S1212	12	12	9	84	80	220
ME1T8-S1215	12	15	7	67	80	220
ME1T8-S1224	12	24	4	42	80	220

Model Numbers (continued)

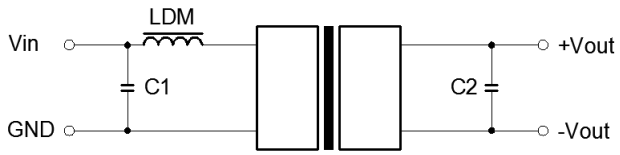
Model Number	Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [uF] Max.
			Min.	Max.		
ME1T8-S1505	15	5	20	200	80	220
ME1T8-S1515	15	15	7	67	80	220
ME1T8-S2405	24	5	20	200	80	220
ME1T8-S2409	24	9	12	111	80	220
ME1T8-S2412	24	12	9	84	80	220
ME1T8-S2415	24	15	7	67	80	220
ME1T8-S2424	24	24	4	42	80	220

* Only typical models are listed. Other models may be available upon request.

* Standard models in this series are 1.5KVDC isolation single output models. See ME1T8-K3 series for 3KVDC isolation models, ME1T10 for dual output 1.5KVDC isolation models, ME1T10-K3 for dual output 3KVDC isolation models.

Recommended External Circuit

External Circuit for EMC Improvement



Recommended input capacitor specifications [Table 1]

Input voltage	3.3V	5V	12V	15V	24V
C1	4.7uF	4.7uF	2.2uF	2.2uF	1uF

Recommended output capacitor specifications [Table 2]

Output voltage	3.3V	5V	9V	12V	15V	24V
C2	10uF	10uF	4.7uF	2.2uF	1uF	0.47uF

* The above external circuit is only to further lower the ripple and noise, and improve EMC performance. No external circuit is needed for general operating. Recommended component specifications are typical values. Excessive external capacitive load may cause startup problem. Recommended LDM value is 6.8uH.

* It is not recommended to use any external capacitor if output power is less than 0.5Watt.

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect the device reliability.

Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Operating temperature	See "Derating Curve"	-40	-	+105	°C	
Storage temperature		-55	-	+125	°C	
Input surge voltage For 1 second max.	V_{IN}=3.3V V_{IN}=5V V_{IN}=9V V_{IN}=12V V_{IN}=15V V_{IN}=24V	-0.7 -0.7 -0.7 -0.7 -0.7 -0.7	-	5 9 12 18 21 30	Vdc	

Electrical Specifications

Unless otherwise indicated, specifications are measured at T_A=25°C, nominal input voltage, full load after warm up.

Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Output voltage accuracy	All models	Refer to graphic in "Characteristic Curves" section				
Line regulation For V_{IN} change of ±1%	V_{OUT}=3.3V All others	-	-	±1.5 ±1.2	%	
Load regulation I_{OUT}=10% to 100% of $I_{OUT, rated}$	V_{OUT}=3.3V V_{OUT}=5V V_{OUT}=9V V_{OUT}=12V V_{OUT}=15V V_{OUT}=24V	-	18 12 8 7 6 5	-	%	
Temperature coefficiency	Full load	-	-	0.03	%/°C	
Output ripple and noise 20MHz bandwidth, peak to peak	All models	-	60	150	mV	
Output short circuit protection	V_{IN}=24V ME1T8-S0524 All others	Protected for 1 second max Protected for 1 second max Continuous, automatic recovery				

* Operating with less than 10% of rated load will not cause permanent damage to the converters, but the performances data may not fall into the specifications, and reliable operating is not assured.

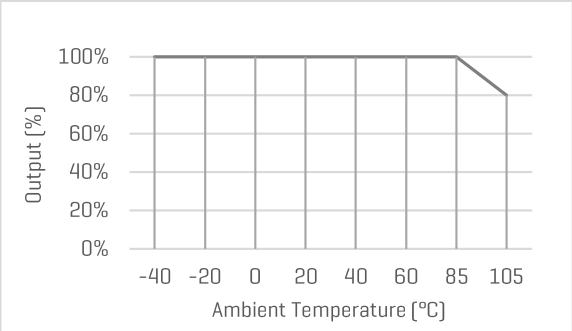
General Specifications

Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Isolation voltage Tested between input and output for 1 minute, leakage current less than 1mA		1500	-	-	VDC	
Isolation resistance Tested at 500VDC		1000	-	-	M ohm	
Isolation capacitance Tested between input and output, test condition 100KHz, 1V		-	20	-	pF	
Operating temperature	See "Derating Curve"	-40	-	+105	°C	
Storage temperature		-55	-	+125	°C	
Temperature rise at full load		-	25	-	°C	
Storage humidity		-	-	95	%RH	
Switching frequency Full load		-	100	-	KHz	
Molding material		Black plastic UL94-V0				
Soldering temperature	Reflow soldering	Recommended peak temp. 245°C, duration at 217°C 60s maximum. Refer to IPC / JEDEC J-STD-020D.1				
Design based on standards		RoHS5 compliant, all materials meet UL94V-0, product designed to meet UL60950-1, IEC/EN60950-1, FCC, EN55022				
Safety certifications		UL60950-1, IEC/EN60950-1				
EMC		CISPR22, EN55022 Class B with external circuit IEC/EN61000-4-2				
MTBF	MIL-HDBK-217F	>3,500,000 Hours, T_A=25°C				
Size		12.7 x 11.2 x 7.25 mm				
Weight		1.6g				

Characteristic Curves

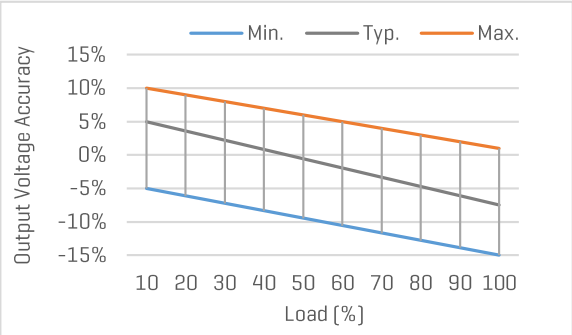
Derating Curve

Output vs Ambient Temperature

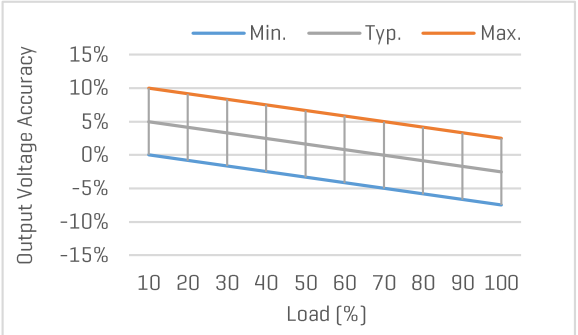


Output Voltage Accuracy vs Load

3.3V output models

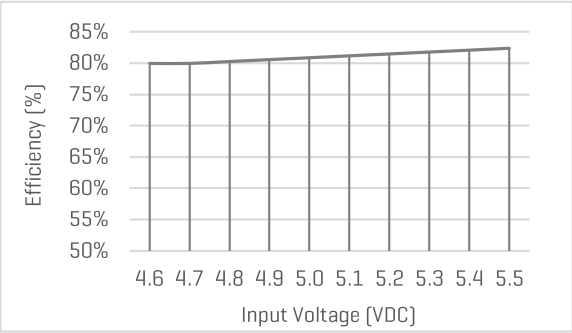


All other output models



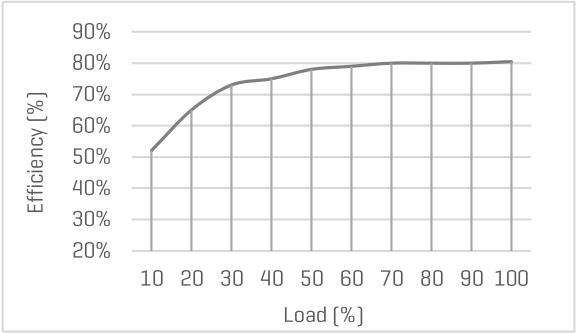
Efficiency vs Input Voltage

ME1T8-S0505, with full Load



Efficiency vs Load

ME1T8-S0505, with nominal input voltage



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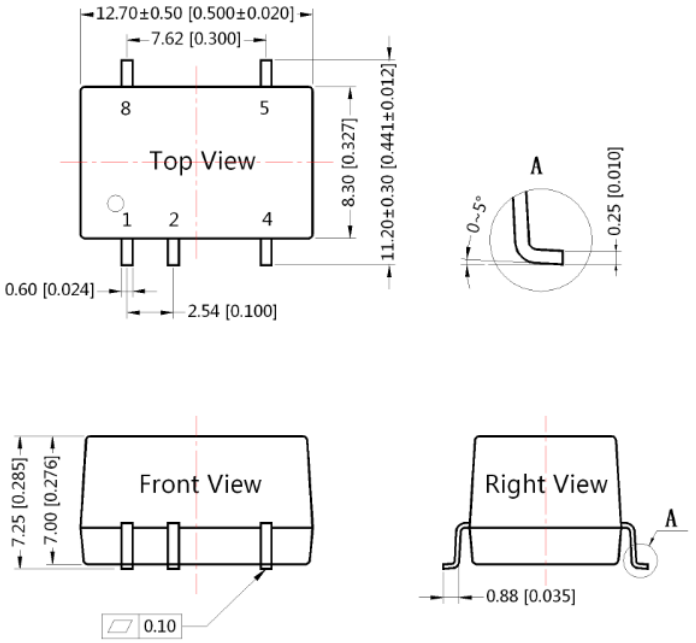
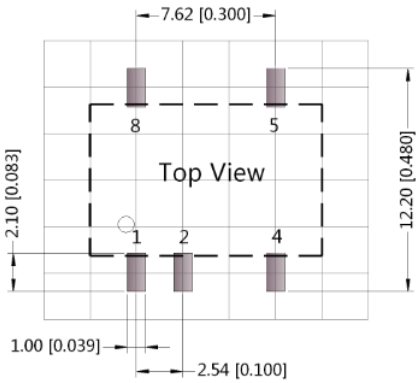
Mechanical Specifications

THIRD ANGLE PROJECTION



Recommended Footprint



Grid: 2.54 x 2.54 mm

* Unless otherwise specified unit: mm [inch]
* General tolerance: ±0.25 [±0.010]
* Pin thickness: ±0.10 [±0.004]

Pin Definition

Pin #	Single Out
1	GND
2	V_{IN}
4	0V
5	$+V_{OUT}$
8	NC

NC = No connection

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