

### Features

- ▶ Rated power: 1W max
- ▶ Input voltage range  $\pm 10\%$
- ▶ Unregulated single output
- ▶ High efficiency up to 88%
- ▶ Isolation voltage 1.5KVDC
- ▶ Small no load input current
- ▶ Operating temperature range:  $-40 \sim +105^{\circ}\text{C}$  ambient
- ▶ RoHS compliant
- ▶ Industrial standard SMD package
- ▶ Continuous short circuit protection
- ▶ Designed to meet UL/EN/IEC 62368-1
- ▶ 3 year warranty



### Overview

The ME1T series are unregulated DC/DC converters offered in compact SMD package with 1.5KVDC isolation. These converters feature high efficiency, low ripple and noise, continuous short circuit protection, and wide operating temperature range  $-40 \sim +105^{\circ}\text{C}$ . 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] $\pm 10\%$	Output Voltage [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [ $\mu\text{F}$ ] Max.
			Max.	Min.		
ME1T-0303	3.3	3.3	303	0	80	3000
ME1T-0305	3.3	5	200	0	82	3000
ME1T-0309	3.3	9	111	0	83	1200
ME1T-0312	3.3	12	84	0	84	820
ME1T-0503	5	3.3	303	0	82	3000
ME1T-0505	5	5	200	0	85	3000
ME1T-0509	5	9	111	0	86	1200
ME1T-0512	5	12	84	0	86	820
ME1T-0515	5	15	67	0	86	680
ME1T-0524	5	24	42	0	87	330
ME1T-1203	12	3.3	303	0	82	3000
ME1T-1205	12	5	200	0	85	3000
ME1T-1209	12	9	111	0	86	1200
ME1T-1212	12	12	84	0	86	820
ME1T-1215	12	15	67	0	86	680
ME1T-1224	12	24	42	0	88	330

## Model Numbers [continued]

Model Number	Input Voltage [VDC] ±10%	Output Voltage [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [uF] Max.
			Max.	Min.		
ME1T-1505	15	5	200	0	86	3000
ME1T-1512	15	12	84	0	87	820
ME1T-1515	15	15	67	0	88	680
ME1T-2403	24	3.3	303	0	82	3000
ME1T-2405	24	5	200	0	85	3000
ME1T-2409	24	9	111	0	86	1200
ME1T-2412	24	12	84	0	87	820
ME1T-2415	24	15	67	0	87	680
ME1T-2424	24	24	42	0	88	330

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

\* 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.

\* Standard models in this series are 1.5KVDC isolation single output models. See ME1T-D for dual output, and MEK1T series for 3KVDC isolation models.

### Electrical Specifications

Unless otherwise indicated, specifications are measured at  $T_A=25^{\circ}\text{C}$ , nominal input voltage, full load after warm up.

Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Input current Full load	$V_{IN}=3.3\text{V}$		370		mA	
	$V_{IN}=5\text{V}$	-	230	-		
	$V_{IN}=12, 15\text{V}$		99			
	$V_{IN}=24\text{V}$		51			
Input current No load		-	3	-	mA	
Reflected Ripple Current		-	15	-	mA	
Surge voltage 1 second max	$V_{IN}=3.3\text{V}$	-0.7		9	VDC	
	$V_{IN}=5\text{V}$	-0.7		15		
	$V_{IN}=12\text{V}$	-0.7	-	18		
	$V_{IN}=15\text{V}$	-0.7		21		
	$V_{IN}=24\text{V}$	-0.7		30		
Output voltage accuracy	All models	Refer to graphic in "Characteristic Curves" section				
Line regulation For $V_{IN}$ change of $\pm 1\%$	$V_{OUT}=3.3\text{V}$	-	-	$\pm 1.5$	%	
	All others			$\pm 1.2$		
Load regulation $I_{OUT}=10\%$ to $100\%$ of $I_{OUT, rated}$ $V_{IN}=3.3\text{V}$	$V_{OUT}=3.3\text{V}$		14		%	
	$V_{OUT}=5\text{V}$		10			
	$V_{OUT}=9\text{V}$	-	9	-		
	$V_{OUT}=12\text{V}$		8			
	$V_{OUT}=15\text{V}$		7			
	$V_{OUT}=24\text{V}$		6			
Temperature coefficient	Full load	-	$\pm 0.02$	-	$\%/^{\circ}\text{C}$	
Output ripple and noise	20MHz bandwidth	-	60	150	mVp-p	
Output short circuit protection		Continuous, automatic recovery				
Input filter		Capacitor				
Hot plug		None				

\* 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
<b>Isolation voltage</b> 1 minute, leakage current <1mA	Input to Output	1500	-	-	VDC	
<b>Isolation resistance</b> Tested at 500VDC	Input to Output	1000	-	-	M ohm	
<b>Isolation capacitance</b> 100KHz, 0.1V	Input to Output	-	20	-	pF	
<b>Operating temperature</b>	See "Derating Curve"	-40	-	+105	°C	
<b>Storage temperature</b>		-55	-	+125	°C	
<b>Temperature rise at case</b>	Full load	-	25	-	°C	
<b>Storage humidity</b>	Non-condensing	5	-	95	%RH	
<b>Switching frequency</b>	Full load	-	220	-	KHz	
<b>Reflow soldering temperature</b>		Peak temp. 217 - 245°C, maximum duration 60s				
<b>Vibration</b>		10-150Hz, 5G, 0.75mm along X, Y and Z				
<b>Cooling method</b>		Free air convection				
<b>Design based on standards</b>		UL/EN/IEC 62368-1				
<b>Safety certifications</b>		EN/IEC 62368-1				
<b>EMC</b>	Emissions Immunity	CISPR32, EN55032 Class B* IEC/EN61000-4-2				
<b>MTBF</b>	MIL-HDBK-217F	>3,500,000 Hours, T <sub>A</sub> =25°C				
<b>Moisture sensitivity level [MSL]</b>		IPC/JEDEC J-STD-020D.1 Level 1				
<b>Size</b>		13.5 x 11 x 6.05 mm				
<b>Weight</b>		1.5g Typ.				

\*External circuit is required in order to meet Class B, refer to Figure 2 in Recommended External Circuit

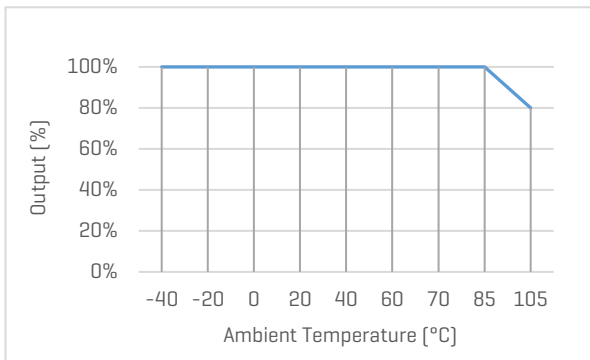
# ME1T Series

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

## Characteristic Curves

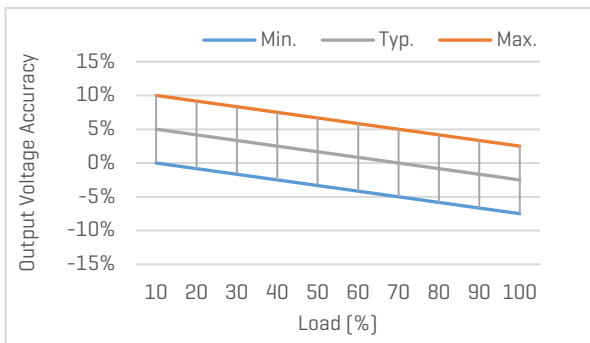
### Derating Curve

Output vs Ambient Temperature

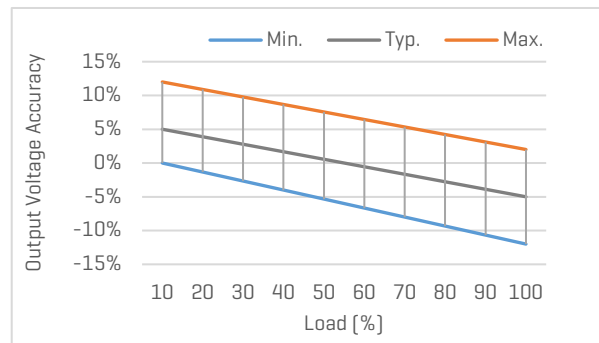


### Output Voltage Accuracy vs Load

None 3.3V output models



3.3V output models

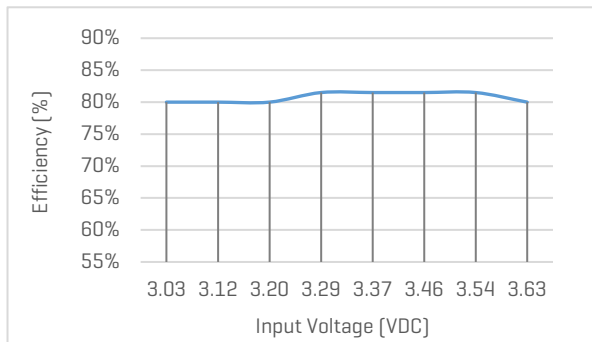


## Characteristic Curves [continued]

### Efficiency Curves

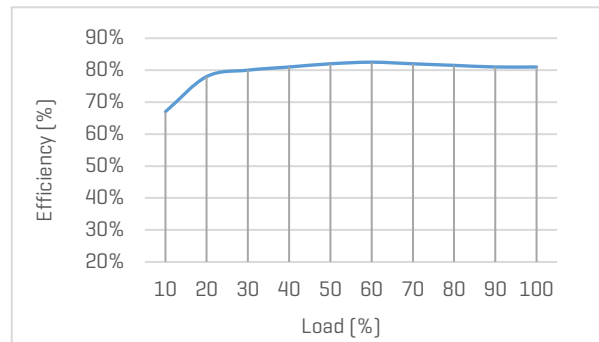
#### Efficiency vs Input Voltage

ME1T-0305, with full Load



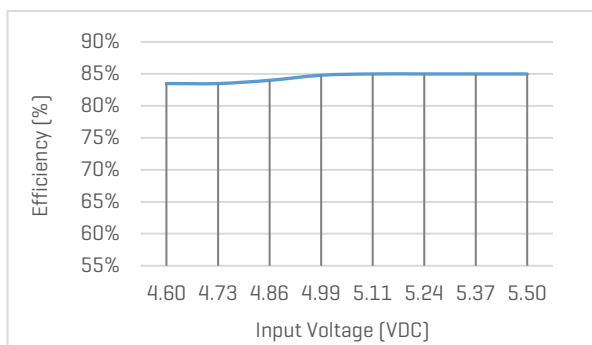
#### Efficiency vs Load

ME1T-0305, with nominal input voltage



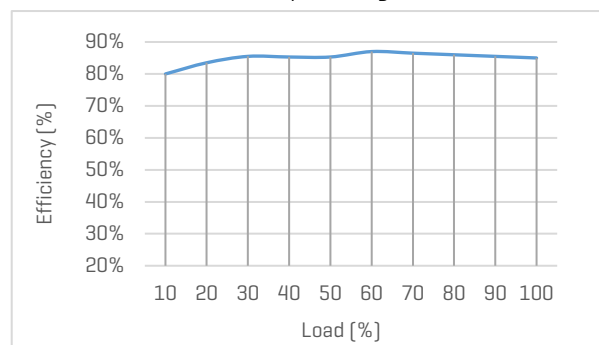
#### Efficiency vs Input Voltage

ME1T-0505, with full Load



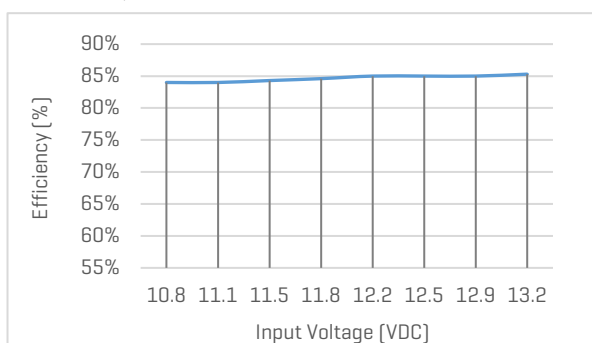
#### Efficiency vs Load

ME1T-0505, with nominal input voltage



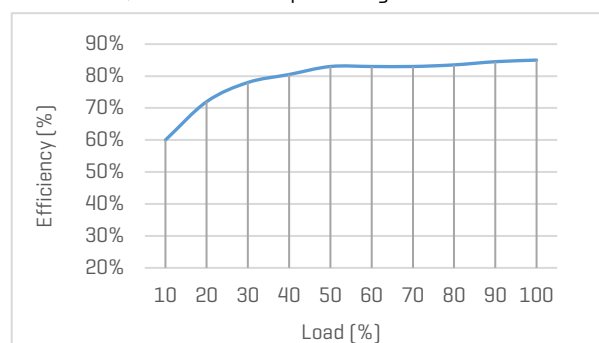
#### Efficiency vs Input Voltage

ME1T-1205, with full Load



#### Efficiency vs Load

ME1T-1205, with nominal input voltage



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## Recommended External Circuit

### Typical Application Circuit

\*Typical application circuit is to further lower the input and output ripple. It is not required for general use.

\*Recommended component specifications are typical values. Excessive external capacitive load may cause startup problem.



Figure 1. Typical external circuit

[Table 1] Recommended component spec

Input voltage	3.3, 5V	12V	15V	24V
C <sub>IN</sub>	4.7uF, 16V	2.2uF, 25V	2.2uF, 25V	1uF, 50V

[Table 2] Recommended component spec

Output voltage	3.3, 5V	9V	12V	15V	24V
C <sub>OUT</sub>	10uF, 16V	4.7uF, 16V	2.2uF, 25V	1uF, 25V	0.47uF, 50V

### Circuit for EMC Enhancement

\*Use this application circuit to meet Class B EMC performance.

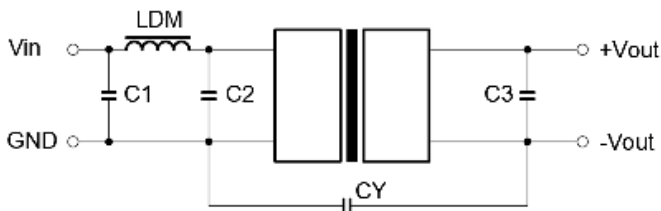


Figure 2. Circuit for EMC enhancement

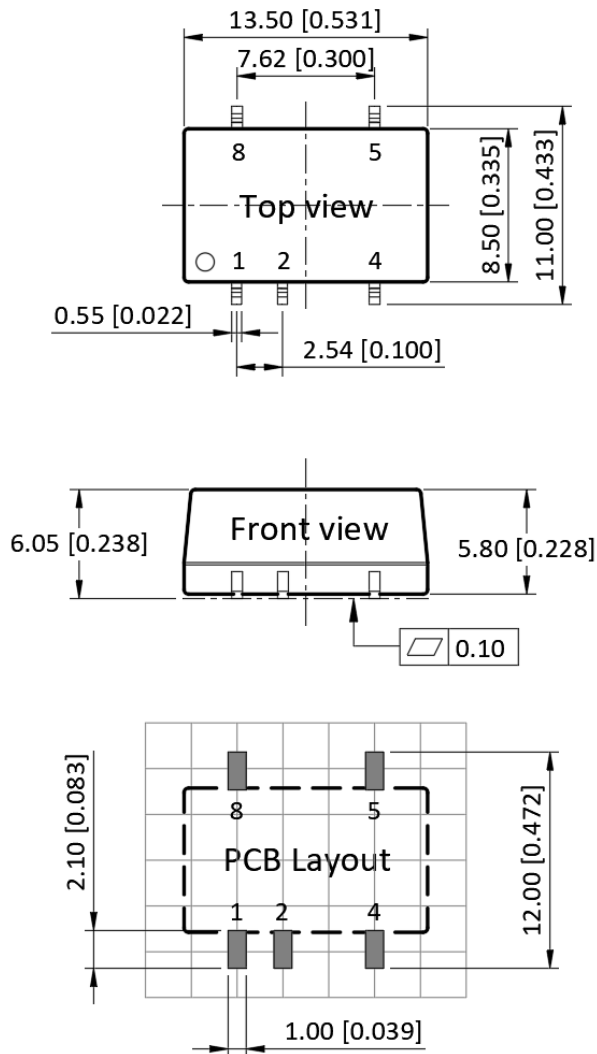
[Table 3] Recommended component spec

Component	LDM	C1, C2	CY	C3
C <sub>OUT</sub>	6.8uH	4.7uF, 50V	270pF, 2KV	Refer to C <sub>OUT</sub> in [Table 2]

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## Mechanical Specifications



### Pin Definition

Pin #	Single Out
1	GND
2	V <sub>IN</sub>
4	OV
5	+V <sub>OUT</sub>
8	No connection

\* Unless otherwise specified unit: mm [inch]

\* General tolerance: ±0.50 [±0.020]

\* Pin thickness: ±0.10 [±0.004]

\* Footprint grid 2.54 x 2.54 mm

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