

ME1T-D Series

1W, Unregulated, 1.5KV Isolation, SMD DC/DC Converters



Features

- Rated power: 1W max
- Input voltage range $\pm 10\%$
- Unregulated output
- High efficiency up to 85%
- Isolation voltage 1.5KVDC
- Small no load input current, only about 3mA
- Operating temperature range: $-40 \sim +105^{\circ}\text{C}$ ambient
- RoHS compliant
- Compact SMD package
- Continuous short circuit protection
- Designed to meet UL/EN/IEC 62368-1
- 3 year warranty



Overview

The ME1T-D 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 [μF] Max.
			Max.	Min.		
ME1T-0303D	3.3	± 3.3	± 152	± 15	77	1200
ME1T-0305D	3.3	± 5	± 100	± 10	82	1200
ME1T-0309D	3.3	± 9	± 56	± 5	82	470
ME1T-0312D	3.3	± 12	± 42	± 5	82	220
ME1T-0315D	3.3	± 15	± 34	± 4	82	220
ME1T-0324D	3.3	± 24	± 21	± 2	84	100
ME1T-0503D	5	± 3.3	± 152	± 15	74	1200
ME1T-0505D	5	± 5	± 100	± 10	82	1200
ME1T-0509D	5	± 9	± 56	± 6	83	470
ME1T-0512D	5	± 12	± 42	± 5	83	220
ME1T-0515D	5	± 15	± 34	± 4	83	220
ME1T-0524D	5	± 24	± 21	± 3	85	100
ME1T-1203D	12	± 3.3	± 152	± 15	77	1200
ME1T-1205D	12	± 5	± 100	± 10	82	1200
ME1T-1207D	12	± 7.5	± 67	± 7	82	470
ME1T-1209D	12	± 9	± 56	± 6	83	470
ME1T-1212D	12	± 12	± 42	± 5	83	220

ME1T-D Series

1W, Unregulated, 1.5KV Isolation, SMD DC/DC Converters



Model Numbers [continued]

Model Number	Input Voltage [VDC] $\pm 10\%$	Output Voltage [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [uF] Max.
			Max.	Min.		
ME1T-1215D	12	± 15	± 34	± 4	83	220
ME1T-1224D	12	± 24	± 21	± 3	85	100
ME1T-1515D	15	± 15	± 34	± 4	83	220
ME1T-2405D	24	± 5	± 100	± 10	82	1200
ME1T-2409D	24	± 9	± 56	± 6	83	470
ME1T-2412D	24	± 12	± 42	± 5	83	220
ME1T-2415D	24	± 15	± 34	± 4	83	220
ME1T-2424D	24	± 24	± 21	± 3	85	100

* 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.

ME1T-D Series

1W, Unregulated, 1.5KV Isolation, SMD DC/DC Converters



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			
	$V_{IN}=5\text{V}$		240			
	$V_{IN}=12\text{V}$	-	108	-	mA	
	$V_{IN}=15\text{V}$		99			
	$V_{IN}=24\text{V}$		51			
Input current No load		-	10	-	mA	
Reflected ripple current		-	15	-	mA	
Surge voltage 1 second max	$V_{IN}=3.3\text{V}$	-0.7		5		
	$V_{IN}=5\text{V}$	-0.7		9		
	$V_{IN}=12\text{V}$	-0.7	-	18	VDC	
	$V_{IN}=15\text{V}$	-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 $\pm 1\%$	$V_{OUT}=\pm 3.3\text{V}$	-	-	± 1.5	%	
	All others			± 1.2		
Load regulation $I_{OUT}=10\%$ to 100% of $I_{OUT, rated}$	$V_{OUT}=\pm 3.3\text{V}$		15	20		
	$V_{OUT}=\pm 5\text{V}$	-	10	15	%	
	All others		8	10		
Temperature coefficient	Full load	-	± 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				

* Dual output models need to operate with balanced load. The load difference between two outputs over 10% may cause unstable operating of the converter.

ME1T-D Series

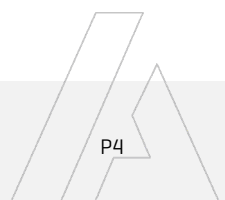
1W, Unregulated, 1.5KV Isolation, SMD DC/DC Converters



General Specifications

Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Isolation voltage 1 minute, leakage current <1mA	Input to Output	1500	-	-	VDC	
Isolation resistance Tested at 500VDC	Input to Output	1000	-	-	M ohm	
Isolation capacitance 100KHz, 0.1V	Input to Output	-	20	-	pF	
Operating temperature	See "Derating Curve"	-40	-	+105	°C	
Storage temperature		-55	-	+125	°C	
Case temperature rise		-	25	-	°C	
Storage humidity	Non-condensing	5	-	95	%RH	
Switching frequency	Full load	-	220	-	KHz	
Reflow soldering temperature		Peak temp. 217 - 245°C, maximum duration 60s				
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z				
Cooling method		Free air convection				
Design based on standards		UL/EN/IEC 62368-1				
Safety certifications		EN/IEC 62368-1				
EMC	Emissions Immunity	CISPR32, EN55032 Class B* IEC/EN61000-4-2, air ±8kV, contact ±4kV				
MTBF	MIL-HDBK-217F	>3,500,000 Hours, T _A =25°C				
Moisture sensitivity level [MSL]		IPC/JEDEC J-STD-020D.1 Level 1				
Size		15.24 x 11.4 x 7.25 mm				
Weight		1.7g Typ.				

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



ME1T-D Series

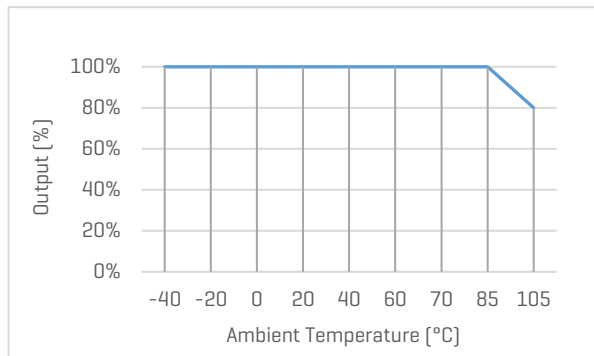
1W, Unregulated, 1.5KV Isolation, SMD DC/DC Converters



Characteristic Curves

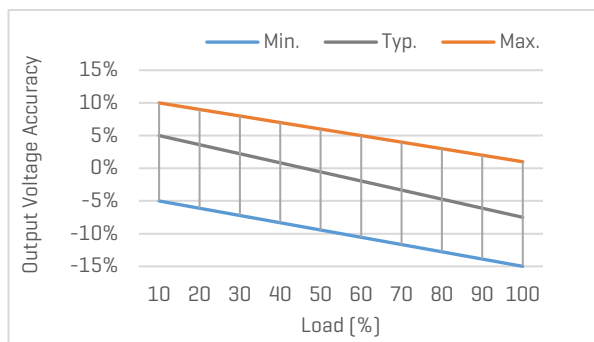
Derating Curve

Output vs Ambient Temperature

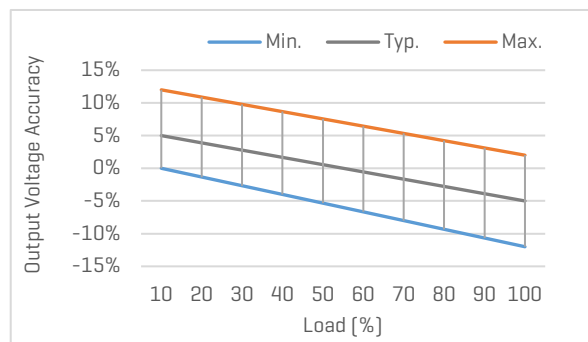


Output Voltage Accuracy vs Load

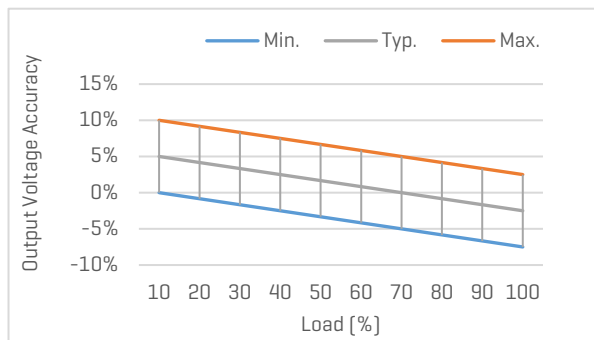
3.3V input models, and $V_{OUT}=3.3V$



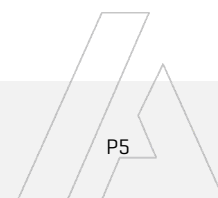
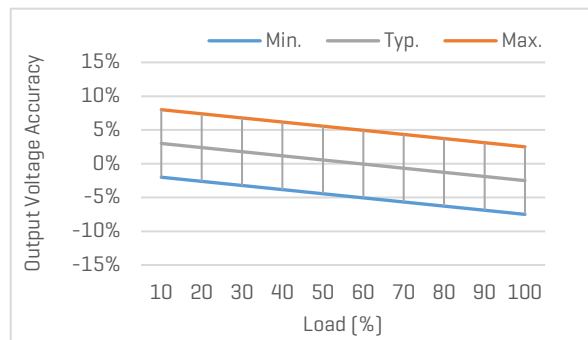
5V input models, and $V_{OUT}=3.3V$



3.3V or 5V input models, and $V_{OUT}=None$ 3.3V



All models with 12, 15, 24V input



ME1T-D Series

1W, Unregulated, 1.5KV Isolation, SMD DC/DC Converters

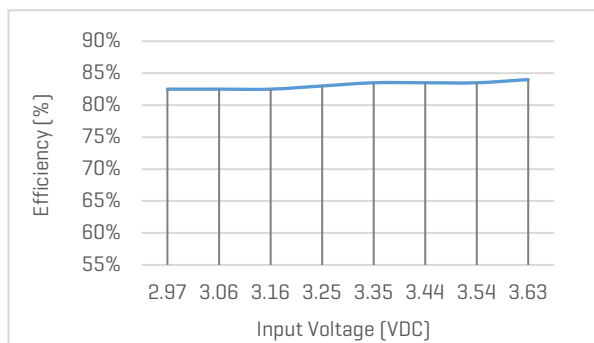


Characteristic Curves [continued]

Efficiency Curves

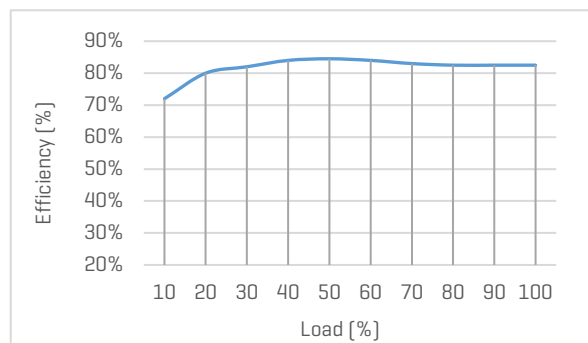
Efficiency vs Input Voltage

ME1T-0303D, with full Load



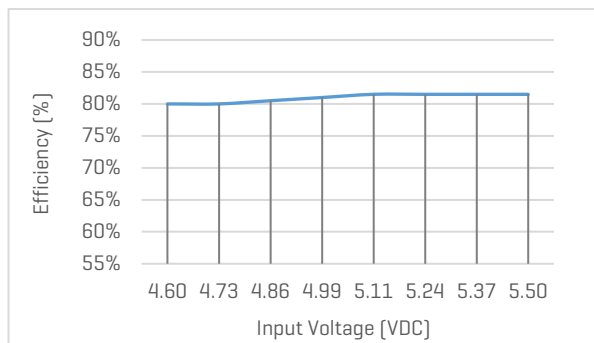
Efficiency vs Load

ME1T-0303D, with nominal input voltage



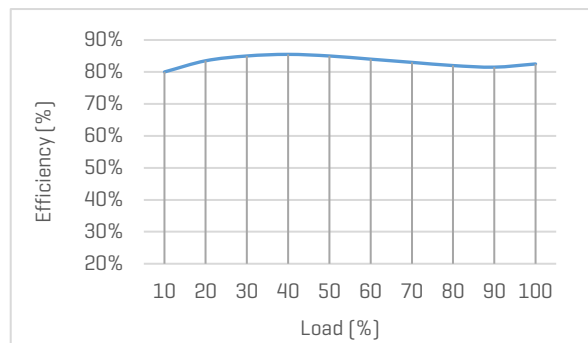
Efficiency vs Input Voltage

ME1T-0503D, with full Load



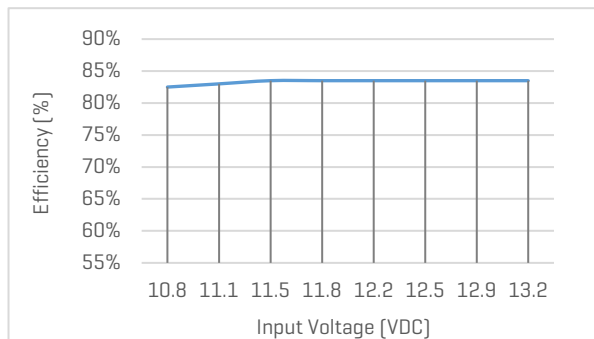
Efficiency vs Load

ME1T-0503D, with nominal input voltage



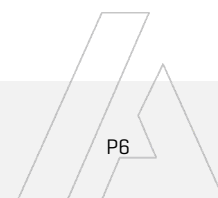
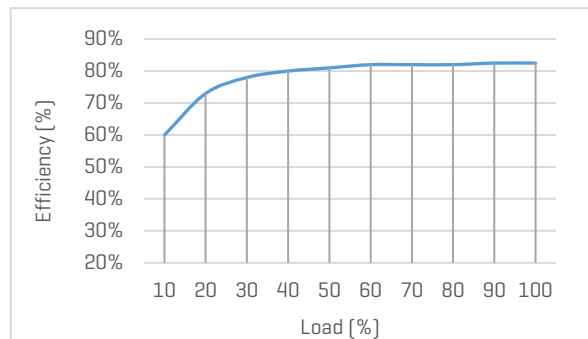
Efficiency vs Input Voltage

ME1T-1205D, with full Load



Efficiency vs Load

ME1T-1205D, with nominal input voltage



ME1T-D Series

1W, Unregulated, 1.5KV Isolation, SMD DC/DC Converters



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	3.3V	5V	12V	15V	24V
C_{IN}	10uF, 16V	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_{OUT}	10uF, 16V	2.2uF, 16V	2.2uF, 25V	1uF, 25V	1uF, 50V

Circuit for EMC Enhancement

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

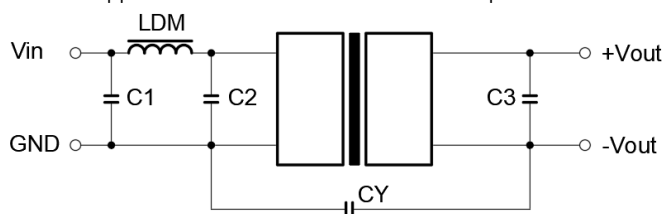


Figure 2. Circuit for EMC enhancement

[Table 3] Recommended component spec

Component	LDM	C1, C2	CY [3.3...9V _{OUT}]	CY [12...24V _{OUT}]
Spec	6.8uH	4.7uF, 50V	100pF, 2KV	1nF, 2KV

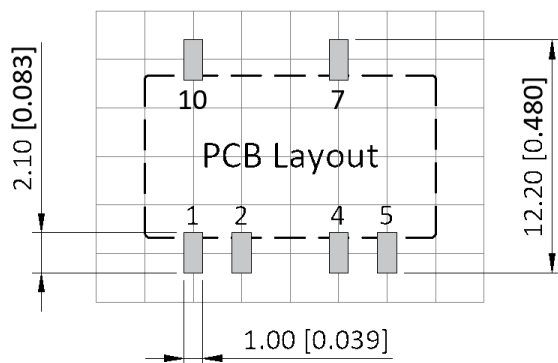
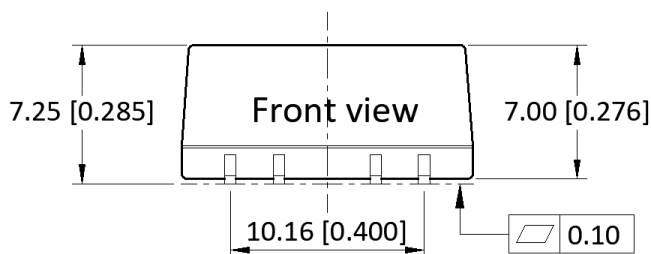
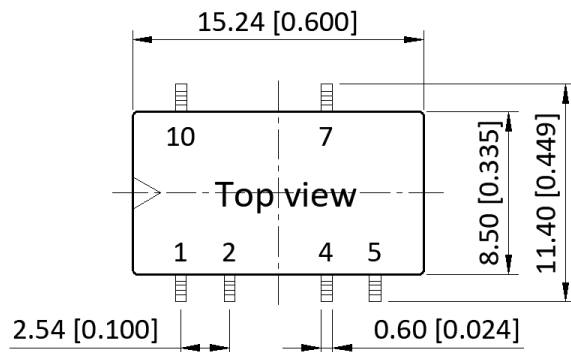
*C3 Refer to C_{OUT} in [Table 2]

ME1T-D Series

1W, Unregulated, 1.5KV Isolation, SMD DC/DC Converters



Mechanical Specifications



Pin Definition

Pin #	Single Out
1	GND
2	V_{IN}
4	OV
5	$-V_{OUT}$
7	$+V_{OUT}$
10	No connection

* Unless otherwise specified unit: mm [inch]

* General tolerance: ± 0.25 [± 0.010]

* Pin thickness: ± 0.10 [± 0.004]

* Footprint grid 2.54 x 2.54 mm