

ME2A Series

2W, Unregulated, 1.5KV Isolation, SIP4 Package DC/DC Converters



Features

- Rated power: 2W Max
- Input voltage range $\pm 10\%$
- Unregulated single output
- High efficiency, up to 86%
- Small no load input current
- Isolation voltage 1.5KVDC
- Operating temperature range: $-40 \sim +105^{\circ}\text{C}$ ambient
- RoHS compliant
- Compact SIP4 package
- Continuous short circuit protection
- Designed to meet UL/EN/IEC 62368-1
- 3 year warranty



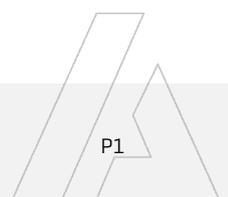
Overview

The ME2A series are unregulated SIP4 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] $\pm 10\%$	Output Voltage [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [μF] Max.
			Max.	Min.		
ME2A-0505	5	5	400	40	80	2400
ME2A-0509	5	9	222	22	80	1000
ME2A-0512	5	12	167	17	80	560
ME2A-0515	5	15	133	13	80	560
ME2A-0524	5	24	83	8	80	220
ME2A-1203	12	3.3	400	40	79	2400
ME2A-1205	12	5	400	40	82	2400
ME2A-1209	12	9	222	22	82	1000
ME2A-1212	12	12	167	17	84	560
ME2A-2405	24	5	400	40	80	2400
ME2A-2415	24	15	133	13	84	560
ME2A-2424	24	24	83	8	86	220

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



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	$V_{IN}=5\text{V}$ $V_{IN}=12\text{V}$ $V_{IN}=24\text{V}$	-	500 200 100	-	mA	
Input current No load		-	8	-	mA	
Reflected Ripple Current		-	15	-	mA	
Surge voltage 1 second max	$V_{IN}=5\text{V}$ $V_{IN}=12\text{V}$ $V_{IN}=24\text{V}$	-0.7 -0.7 -0.7	-	9 18 30	VDC	
Output voltage accuracy	All models	Refer to graphic in "Characteristic Curves" section				
Line regulation For V_{IN} change of $\pm 1\%$	$V_{OUT}=3.3\text{V}$ All others	-	-	± 1.5 ± 1.2	%	
Load regulation $I_{OUT}=10\%$ to 100% of $I_{OUT, rated}$	$V_{OUT}=3.3\text{V}$ $V_{OUT}=5\text{V}$ Others	-	12 10 8	25 20 15	%	
Temperature coefficient	Full load	-	± 0.03	-	$\%/^{\circ}\text{C}$	
Output ripple and noise 20MHz bandwidth		-	75	200	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.

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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, 0.1V		-	20	-	pF	
Operating temperature	See "Derating Curve"	-40	-	+105	°C	
Storage temperature		-55	-	+125	°C	
Temperature rise at case	Full load	-	15	-	°C	
Storage humidity	Non-condensing	-	-	95	%RH	
Switching frequency	Full load	-	220	-	KHz	
Pin soldering resistance 1.5mm away from case for 10 sec		-	-	300	°C	
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z				
Case material		Black plastic UL94-V0				
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 with External Circuit IEC/EN61000-4-2, air ±8kV, contact ±6kV, Criteria B				
MTBF	MIL-HDBK-217F	>3,500,000 Hours, T _A =25°C				
Size		11.6 x 6.00 x 10.20 mm				
Weight		1.6g Typ.				



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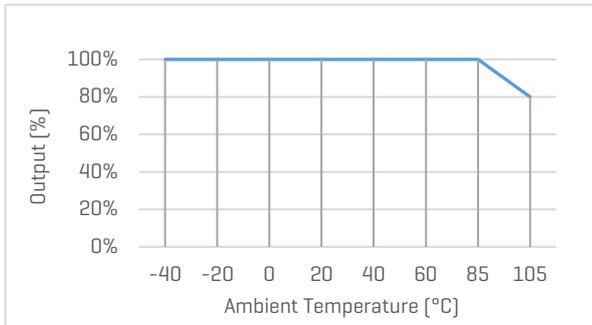
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Characteristic Curves

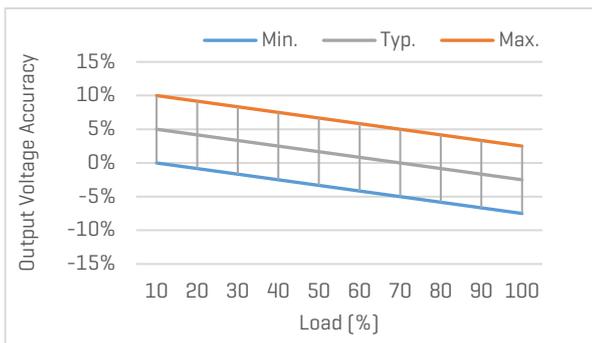
Derating Curve

Output vs Ambient Temperature

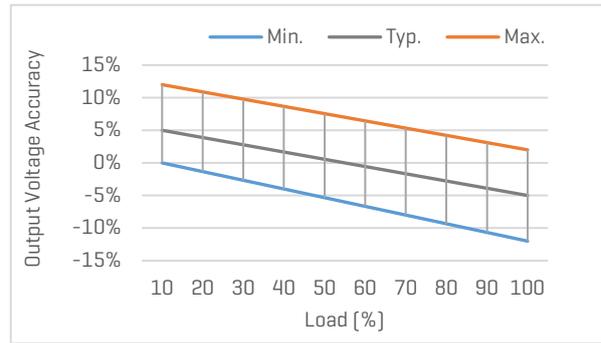


Output Voltage Accuracy vs Load

None 3.3V output models



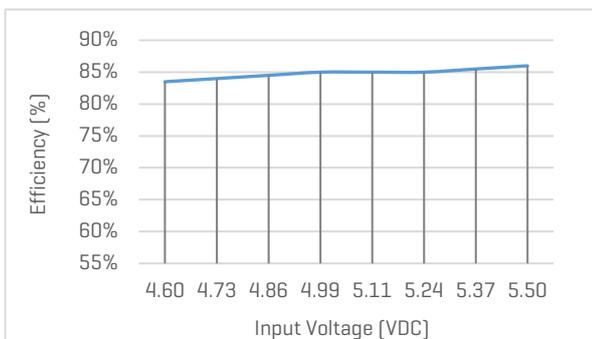
3.3V output models



Efficiency Curves

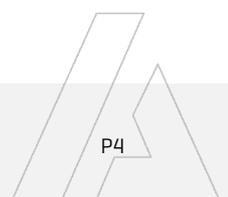
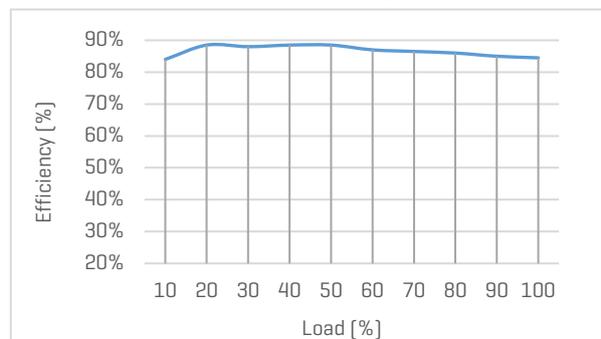
Efficiency vs Input Voltage

ME2A-0505, with full Load



Efficiency vs Load

ME2A-0505, with nominal input voltage



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	5V	12V	24V
C_{IN}	4.7uF, 16V	2.2uF, 25V	1.0uF, 50V

[Table 2] Recommended component spec

Output voltage	3.3, 5V	9V	12V	15V	24V
C_{OUT}	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.

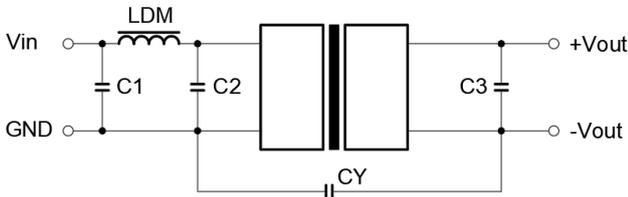


Figure 2. Circuit for EMC enhancement

[Table 3] Recommended component spec

Component	LDM	C1, C2	CY
Spec	6.8uH	4.7uF, 50V	1nF, 2KV

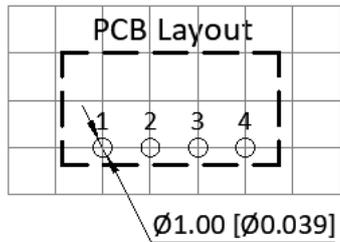
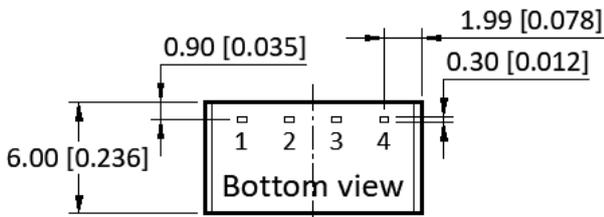
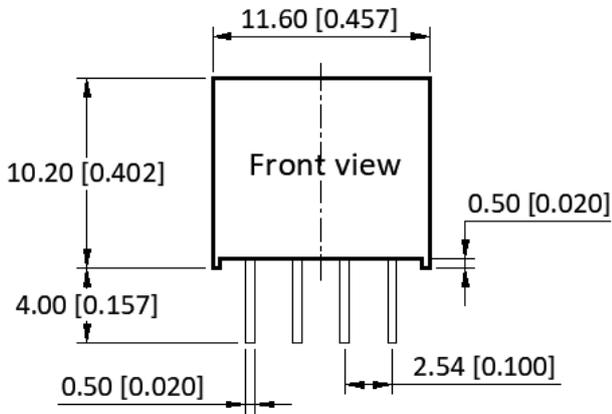
*C3 refer to C_{OUT} in [Table 2]

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Mechanical Specifications



Pin Definition

Pin #	Single Out
1	GND
2	V _{IN}
3	OV
4	+V _{OUT}

* 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

