

ME1S-B Series

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

Features

- ▶ Rated power: 1W max
- ▶ Input voltage range $\pm 10\%$
- ▶ Unregulated bipolar output
- ▶ High efficiency up to 85%
- ▶ Isolation voltage 1.5KVDC
- ▶ Operating temp. range: -40 ~ +105°C ambient
- ▶ RoHS compliant
- ▶ Compact SIP7 package
- ▶ Continuous short circuit protection
- ▶ Meet UL/EN/IEC 62368-1 EN 55032 Class B
- ▶ 5 year warranty



Overview

The ME1S-B series are unregulated SIP7 package DC/DC converters with bipolar (dual positive) outputs and 1.5KVdc isolation. These converters feature high efficiency, low ripple and noise, continuous short circuit protection, and wide operating temperature range. They are widely used in distributed power system in industrial applications where two isolated output is needed.

Model Numbers

Model Number	Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA] Max.	Efficiency [%] Typ.	Capacitive Load [μ F] Max.
ME1S-0505B	5 [4.5~5.5]	+5, +5	100, 100	85	680, 680
ME1S-0512B		+12, +12	42, 42	82	330, 330
ME1S-1205B	12 [10.8~13.2]	+5, +5	100, 100	82	680, 680
ME1S-1212B		+12, +12	42, 42	82	330, 330
ME1S-2405B	24 [21.6~26.4]	+5, +5	100, 100	82	680, 680
ME1S-2415B		+15, +15	33, 33	82	220, 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
Input current Full load, $V_{IN}=5\text{V}$	$V_{OUT}=+5, +5\text{V}$ $V_{OUT}=+12, +12\text{V}$	-	235 260	-	mA
Input current Full load, $V_{IN}=12\text{V}$		-	107	-	mA
Input current Full load, $V_{IN}=24\text{V}$		-	54	-	mA
Input current No load	ME1S-0505B All others	-	10 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 $\pm 1\%$		-	-	± 1.2	%
Load regulation $I_{OUT}=10\%$ to 100% of $I_{OUT, rated}$	$V_{OUT}=+5, +5\text{V}$ $V_{OUT}=+12, +12\text{V}$ $V_{OUT}=+15, +15\text{V}$	-	8 3 2	15 10 10	%
Temperature coefficient	Full load	-	± 0.02	-	%/ $^{\circ}\text{C}$
Output ripple and noise 20MHz bandwidth		-	50	100	mVp-p
Output short circuit protection		Continuous, automatic recovery			
Input filter		Capacitor			
Hot plug		None			

Note [2]: 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. Need to operate with balanced load. The load difference between two outputs over 10% may cause unstable operating of the converter.

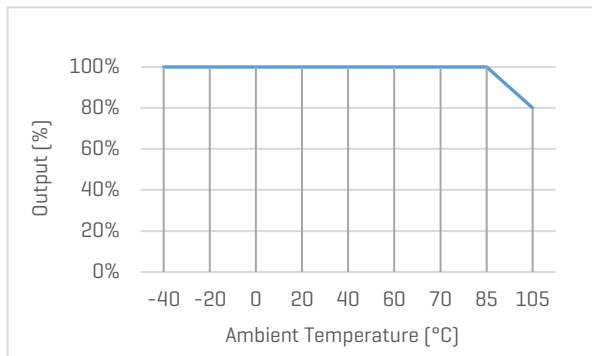
General Specifications

Parameters	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage 1 minute, leakage current <1mA	Input to Output	1500	-	-	VDC
	V _{OUT 1} to V _{OUT 2}	1000	-	-	VDC
Isolation resistance Tested at 500VDC	Input to Output	1000	-	-	M ohm
Isolation capacitance 100KHz, 0.1V	Input to Output	-	20	-	pF
Switching frequency	Full load	-	220	-	KHz
Temperature rise at case	Full load	-	15	-	°C
Operating temperature	See "Derating Curve"	-40	-	+105	°C
Storage temperature		-55	-	+125	°C
Storage humidity	Non-condensing	5	-	95	%RH
Pin soldering resistance 1.5mm away from case for 10 sec		-	-	300	°C
Case material		Black plastic UL94-V0			
Cooling method		Free air convection			
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z			
MTBF	MIL-HDBK-217F	>3,500,000 Hours, T _A =25°C			
Safety standards		UL/EN/IEC 62368-1			
EMC standards	CISPR32, EN55032	Class B with "External Circuit"			
ESD	IEC/EN61000-4-2	Contact ±4kV, Air ±8kV, perf. Criteria B			
Size & Weight		19.65x6x10.16mm, 2.1g Typ.			

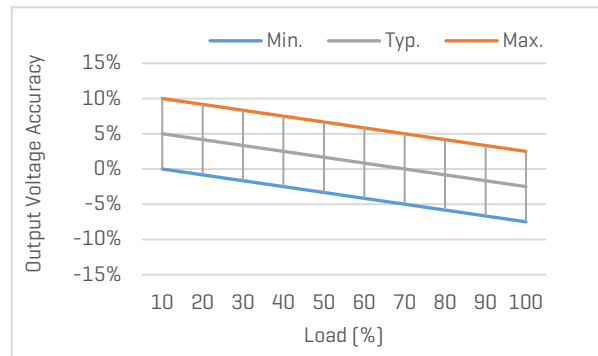
Characteristic Curves

Output vs Ambient Temperature

All models



Output Voltage Accuracy vs Load



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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 mandatory.

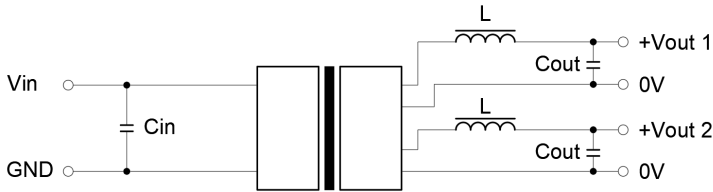


Figure 1. Typical external circuit

[Table 1] Recommended component spec

Input voltage	5V	12V	24V
C_{IN}	4.7uF, 50V	2.2uF, 50V	2.2uF, 50V

[Table 2] Recommended component spec

Output voltage	5V	12V	15V
C_{OUT}	4.7uF, 50V	2.2uF, 50V	2.2uF, 50V

EMC Enhancement for EN55032 Class B

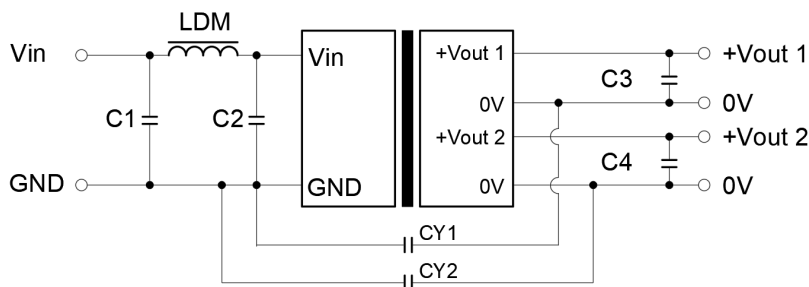


Figure 2. Circuit for EMC enhancement

[Table 3] Recommended component spec

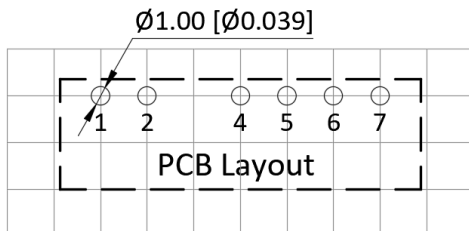
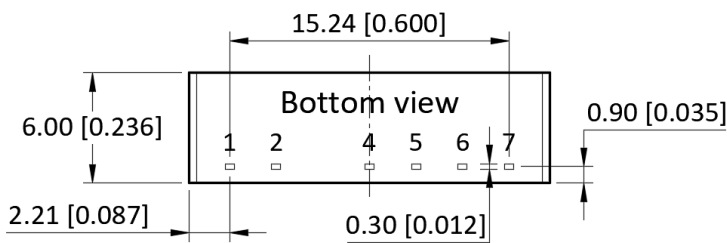
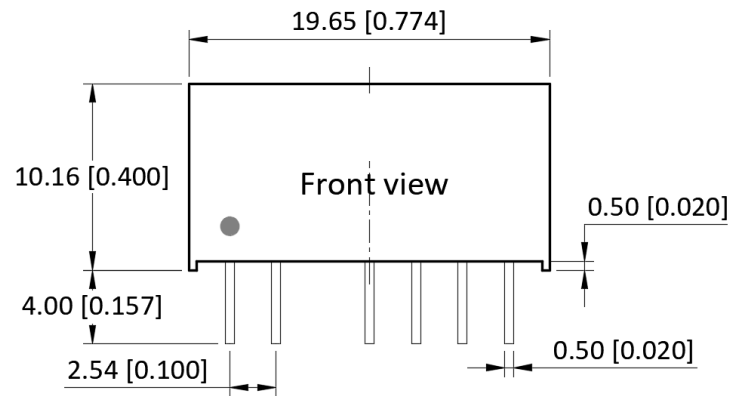
Component	LDM	C1, C2	CY
C_{OUT}	6.8uH	4.7uF, 50V	1nF, 2KV

*"C3 and C4" refer to C_{OUT} in [Table 2]

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Mechanical Specifications



Pin Definition

Pin #	Bipolar Out
1	+V _{IN}
2	-V _{IN}
4	-V _{OUT1}
5	+V _{OUT1}
6	-V _{OUT2}
7	+V _{OUT2}

* 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