MEK3S Series

3W, Unregulated, 3KV Isolation, DC/DC Converters

Features

- Rated power: 3W max
- Input voltage range ±10%
- Unregulated output
- High efficiency up to 85%
- Isolation voltage 3KVDC
- Small no load input current
- Operating temp. range: -40 ~ +85°C ambient
- RoHS compliant
- Compact SIP7 package
- Continuous short circuit protection
- Meet UL/EN/IEC 62368-1 EN 55032 Class B
- 5 year warranty

RoHS CE

Overview

The MEK3S series are unregulated SIP7 package DC/DC converters with single outputs, and 3KVDC 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 isolation and voltage converting is needed.

Model Numbers

Model Number	Input Voltage [VDC] ±10%	Output Voltage [VDC]	Output Current [mA] Max.	Efficiency [%] Typ.	Capacitive Load [uF] Max.
MEK3S-0503	5	3.3	600	80	220
MEK3S-0505	5	5	600	83	220
MEK3S-0509	5	9	333	83	220
MEK3S-1205	12	5	600	83	220
MEK3S-1212	12	12	250	83	220
MEK3S-1515	15	15	200	85	220

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
Input current Full load	V_{IN}=5V V_{IN}=12V V_{IN}=15V	-	714 284 230	-	mA
Input current No load	V_{IN}=5V V_{IN}=12V V_{IN}=15V	-	10 15 20	-	mA
Reflected Ripple Current		-	15	-	mA
Surge voltage 1 second max	V_{IN}=5V V_{IN}=12V V_{IN}=15V	-0.7 -0.7 -0.7	-	9 18 21	VDC
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 [2] I_{OUT}=10% to 100% of $I_{OUT, rated}$	V_{OUT}=3.3V Others	-	14 10	20 15	%
Temperature coefficiency	Full load	-	-	±0.03	%/°C
Output ripple and noise	20MHz bandwidth	-	60	150	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.

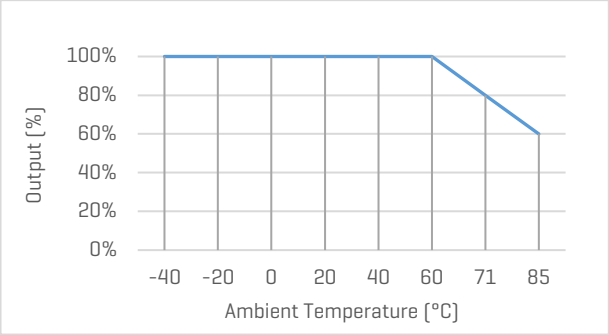
General Specifications

Parameters	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage 1 minute, leakage current <1mA	Input to Output	3000	-	-	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	-	25	-	°C
Operating temperature	See "Derating Curve"	-40	-	+85	°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		19.65x7.05x10.16mm, 2.4g Typ.			

Characteristic Curves

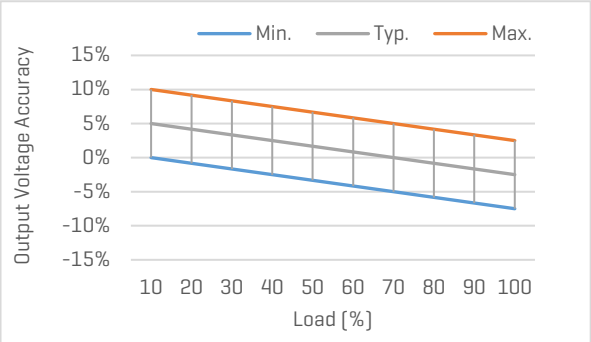
Derating Curve

Output vs Ambient Temperature



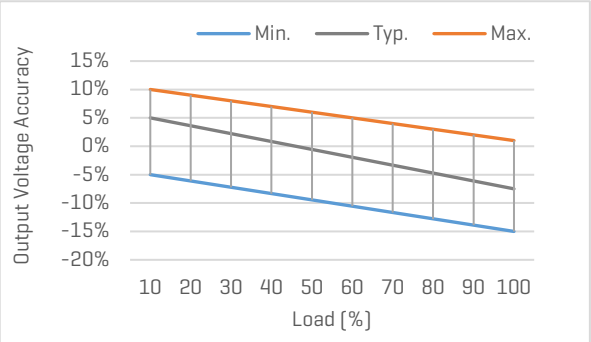
Output Voltage Accuracy vs Load

None 3.3V output models



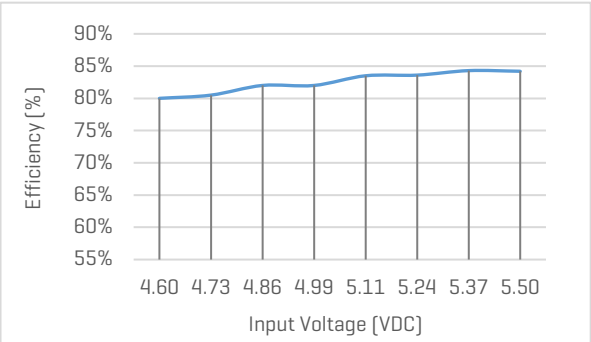
Output Voltage Accuracy vs Load

3.3V output models



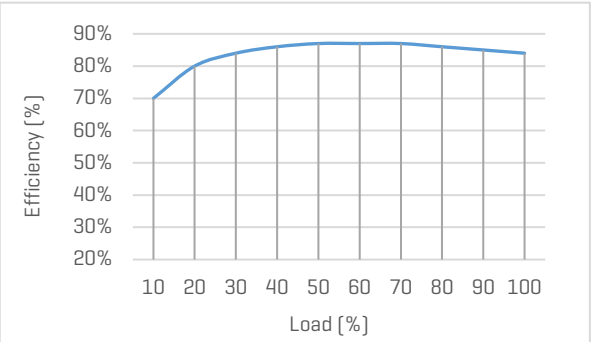
Efficiency vs Input Voltage

MEK3S-0505, with full Load



Efficiency vs Load

MEK3S-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 mandatory.

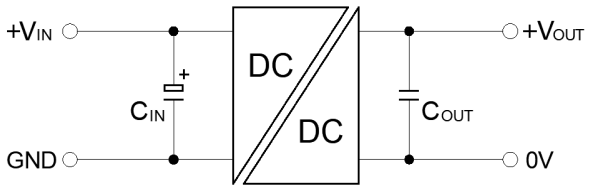


Figure 1. Typical external circuit

[Table 1] Recommended components

Input voltage	C_{IN}
5V	4.7uF, 16V
12, 15V	2.2uF, 25V

Output voltage	C_{OUT}
3.3, 5V	10uF, 16V
9, 12V	2.2uF, 25V
15V	1uF, 25V

EMC Enhancement for EN55032 Class B

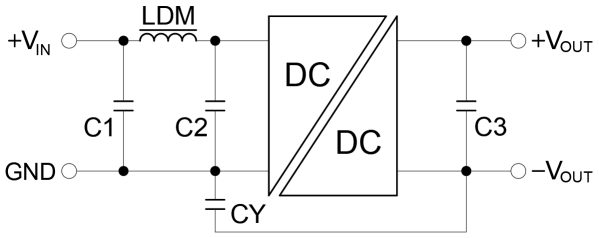
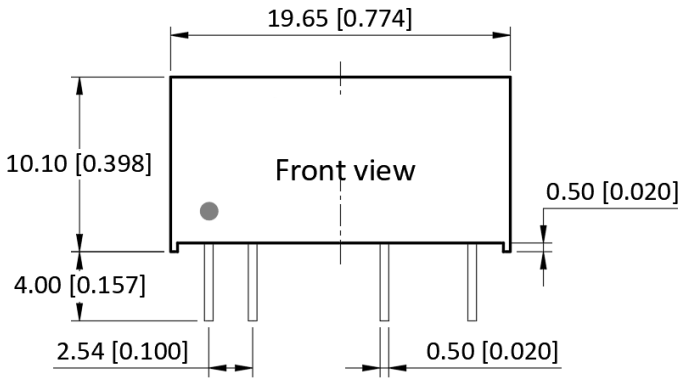


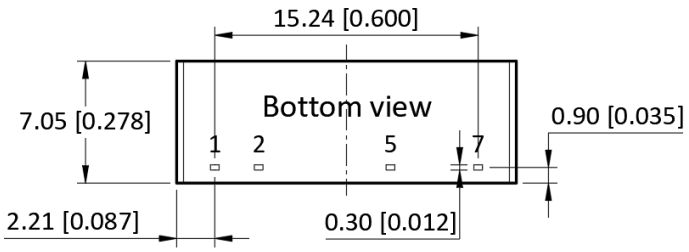
Figure 2. Circuit for EMC enhancement

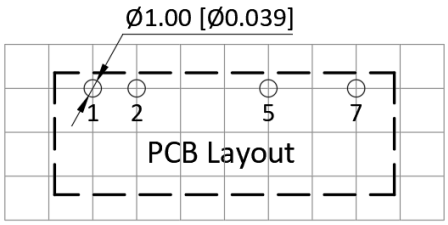
[Table 2] Recommended components

Item	Spec
LDM	6.8uH
C1, C2	4.7uF, 50V
CY	1nF, 4KV
C3	Refer to C_{OUT} in [Table 1]

Mechanical Specifications







Pin Definition

Pin #	Single Out
1	$+V_{IN}$
2	$-V_{IN}$
5	$-V_{OUT}$
7	$+V_{OUT}$

* 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