MEK2T Series

2W, Unregulated Output, 3KV Isolation, SMD DC/DC Converters

Features

- Rated power: 2W max
- Input voltage range ±10%
- Unregulated output
- High efficiency up to 85%
- Isolation voltage 3KVDC
- Small no load input current
- Operating temperature range: -40 ~ +105°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 MEK2T series are unregulated DC/DC converters offered in compact SMD package with 3KVDC isolation. These converters feature high efficiency, low ripple and noise, continuous short circuit protection, and wide operating temperature range -40 ~ +105°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] ±10%	Output Voltage [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [uF] Max.
			Max.	Min.		
MEK2T-0505	5	5	400	40	83	2400
MEK2T-0507	5	7	286	29	83	1000
MEK2T-0509	5	9	222	22	84	1000
MEK2T-0512	5	12	167	17	84	560
MEK2T-0515	5	15	133	13	84	560
MEK2T-0524	5	24	83	8	84	220
MEK2T-1205	12	5	400	40	83	2400
MEK2T-1209	12	9	222	22	84	1200
MEK2T-1212	12	12	167	17	84	1000
MEK2T-1215	12	15	133	13	84	560
MEK2T-1224	12	24	83	8	84	220
MEK2T-1505	15	5	400	40	83	2400
MEK2T-1509	15	9	222	22	84	1200
MEK2T-1512	15	12	167	17	84	560
MEK2T-1515	15	15	133	13	84	560
MEK2T-1524	15	24	83	8	84	220
MEK2T-2405	24	5	400	40	83	2400
MEK2T-2409	24	9	222	22	83	1200

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			Max.	Min.		
MEK2T-2412	24	12	167	17	84	560
MEK2T-2415	24	15	133	13	85	560
MEK2T-2424	24	24	83	8	85	220

* 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.

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	Note
Input current Full load	V_{IN}=5V V_{IN}=12V V_{IN}=15V V_{IN}=24V	-	477 196 161 98	-	mA	
Input current No load		-	8	-	mA	
Reflected Ripple Current		-	30	-	mA	
Surge voltage 1 second max	V_{IN}=5V V_{IN}=12V V_{IN}=15V V_{IN}=24V	-0.7 -0.7 -0.7 -0.7	-	9 18 21 30	VDC	
Output voltage accuracy	All models	Refer to graphic in "Characteristic Curves" section				
Line regulation For V_{IN} change of ±1%		-	-	±1.2	%	
Load regulation I_{OUT}=10% to 100% of $I_{OUT, rated}$	V_{OUT}=5V V_{OUT}=7V V_{OUT}=9V V_{OUT}=12V V_{OUT}=15V V_{OUT}=24V	-	10 8 8 7 6 6	15 12 10 10 10 10	%	
Temperature coefficiency	Full load	-	±0.02	-	%/°C	
Output ripple and noise	20MHz bandwidth	-	50	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

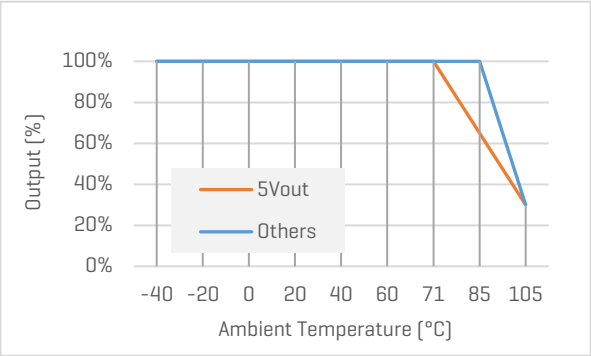
Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Isolation voltage 1 minute, leakage current <1mA	Input to Output	3000	-	-	VDC	
Isolation resistance Tested at 500VDC	Input to Output	1000	-	-	M ohm	
Isolation capacitance 100KHz, 0.1V	Input to Output	-	20	-	pF	
Operating temperature	See "Derating Curve"	-40	-	+105	°C	
Storage temperature		-55	-	+125	°C	
Temperature rise at case	Full load	-	25	-	°C	
Storage humidity	Non-condensing	5	-	95	%RH	
Switching frequency	Full load	-	260	-	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		IEC/EN/UL 62368-1				
Safety certifications		IEC/EN 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		13.5 x 11 x 7.25 mm				
Weight		1.6g Typ.				

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

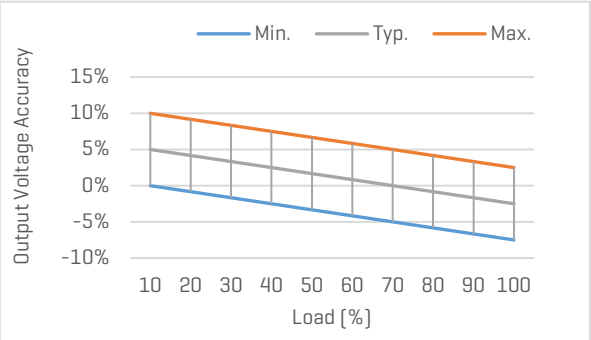
Characteristic Curves

Derating Curve

Output vs Ambient Temperature



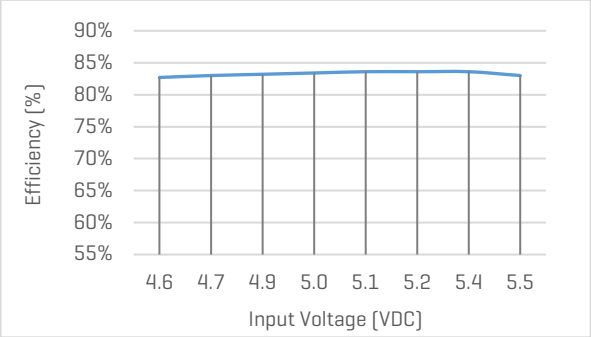
Output Voltage Accuracy vs Load



Efficiency Curves

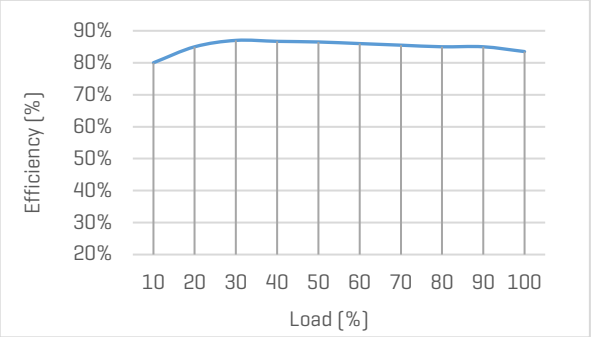
Efficiency vs Input Voltage

MEK2T-0505, with full Load



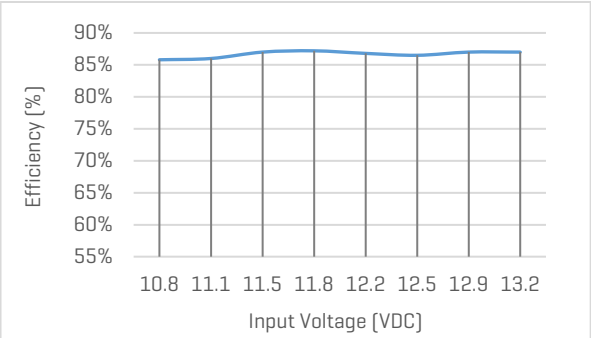
Efficiency vs Load

MEK2T-0505, with nominal input voltage



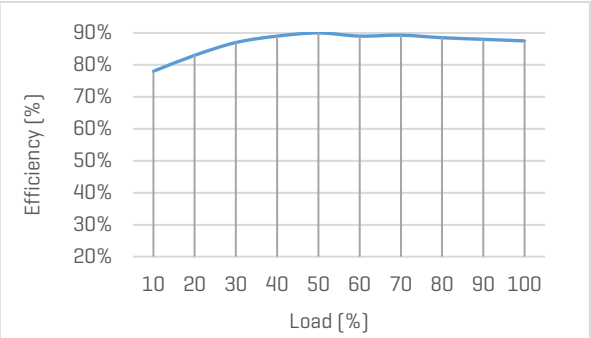
Efficiency vs Input Voltage

MEK2T-1205, with full Load



Efficiency vs Load

MEK2T-1205, 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.

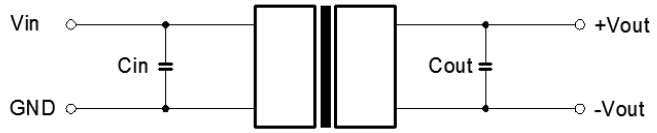


Figure 1. Typical external circuit

[Table 1] Recommended component spec

Input voltage	5V	12V	15V	24V
C_{IN}	4.7uF, 16V	2.2uF, 25V	1uF, 25V	1uF, 50V

[Table 2] Recommended component spec

Output voltage	5V	9V	12V	15V	24V
C_{OUT}	10uF, 16V	2.2uF, 25V	2.2uF, 25V	1uF, 25V	0.47uF, 50V

EMC Enhancement for EN55032 Class B

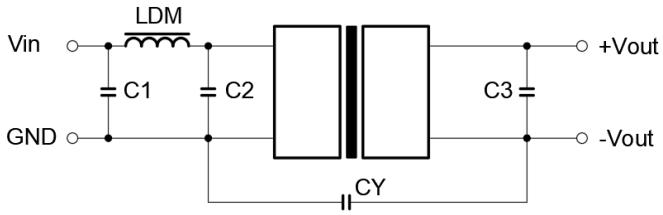
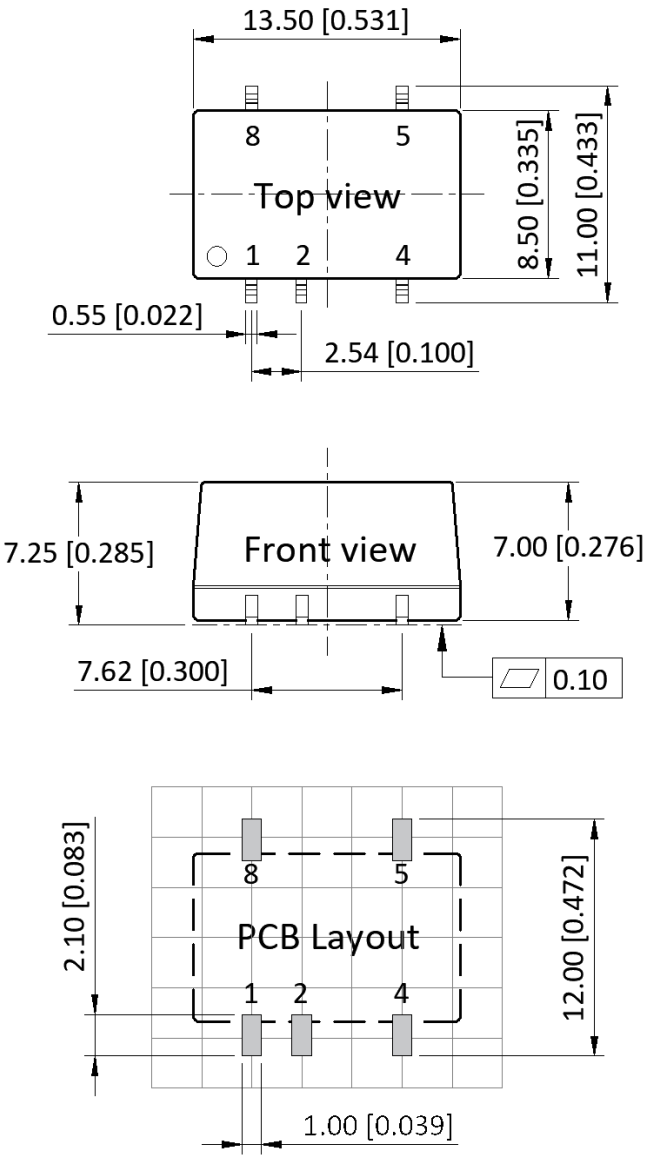


Figure 2. Circuit for EMC enhancement

[Table 3] Recommended component spec

Component	LDM	C1, C2	CY	C3
C_{OUT}	6.8uH	4.7uF, 50V	270pF, 4KV	Refer to C_{OUT} in [Table 2]

Mechanical Specifications



Pin Definition

Pin #	Single Out
1	GND
2	V_{IN}
4	0V
5	$+V_{OUT}$
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