

MEG1S Series

1W, Unregulated, 6KV Isolation, SIP7 Package DC/DC Converters



Features

- Rated power: 1W Max
- Input voltage range $\pm 10\%$
- Unregulated output
- Creepage & clearance $> 5\text{mm}$
- Isolation capacitance 4pF typ
- High efficiency, up to 81%
- Isolation 4.2KVAC or 6KVDC
- Operating temperature range: $-40 \sim +105^\circ\text{C}$ ambient
- RoHS compliant
- Compact SIP7 package
- Patient leakage current 2uA max
- Continuous short circuit protection
- Meet EN 60601-1 EN/IEC 62368-1
- 3 year warranty



Overview

The MEG1S series are unregulated SIP7 package DC/DC converters with single or dual outputs, and 6KVDC isolation. These converters feature reinforced insulation, low leakage current, high efficiency, low ripple and noise, continuous short circuit protection, and wide operating temperature range. They are widely used in industrial and medical applications where high isolation 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.		
MEG1S-0505	5	5	200	4	79	220
MEG1S-0509	5	9	111	4	79	220
MEG1S-0512	5	12	84	2	80	220
MEG1S-0515	5	15	67	2	81	220
MEG1S-0505D	5	± 5	± 100	± 2	79	100
MEG1S-0509D	5	± 9	± 55	± 1	79	100
MEG1S-0512D	5	± 12	± 40	± 1	81	100
MEG1S-0515D	5	± 15	± 35	± 1	81	100
MEG1S-1205	12	5	200	4	79	220
MEG1S-1212	12	12	84	2	81	220
MEG1S-1215	12	15	67	2	79	220
MEG1S-1205D	12	± 5	± 100	± 2	79	100
MEG1S-1212D	12	± 12	± 40	± 1	81	100
MEG1S-1215D	12	± 15	± 35	± 1	81	100
MEG1S-1505	15	5	200	20	79	220
MEG1S-1505D	15	± 5	± 100	± 10	77	100
MEG1S-1515D	15	± 15	± 33	± 4	79	100

MEG1S Series

1W, Unregulated, 6KV Isolation, SIP7 Package DC/DC Converters



Model Numbers [continued]

Model Number	Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [uF] Max.
			Max.	Min.		
MEG1S-2405	24	5	200	4	76	220
MEG1S-2412	24	12	84	2	79	220
MEG1S-2415	24	15	67	2	79	220
MEG1S-2424	24	24	42	4	76	220
MEG1S-2405D	24	±5	±100	±2	75	100
MEG1S-2412D	24	±12	±40	±1	76	100
MEG1S-2415D	24	±15	±35	±1	76	100

* 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} =5V	-	274	-	mA	
	V _{IN} =12V		114			
	V _{IN} =15V		93			
	V _{IN} =24V		56			
Input current No load	V _{IN} =5V	-	35	-	mA	
	V _{IN} =12V		15			
	V _{IN} =15V		18			
	V _{IN} =24V		10			
Reflected ripple current		-	15	-	mA	
Surge voltage 1 second max	V _{IN} =5V	-0.7	-	9	VDC	
	V _{IN} =12V	-0.7		18		
	V _{IN} =15V	-0.7		21		
	V _{IN} =24V	-0.7		30		
Output voltage accuracy	All models	Refer to graphic in “Characteristic Curves” section				
Line regulation For V _{IN} change of ±1%		-	-	±1.5	%	
Load regulation I _{OUT} =10% to 100% of I _{OUT, rated}	V _{OUT} =3.3, 5V	-	-	20	%	
	Others			15		
Temperature coefficiency	Full load	-	±0.02	-	%/°C	
Output ripple and noise	20MHz bandwidth	-	100	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.

MEG1S Series

1W, Unregulated, 6KV Isolation, SIP7 Package DC/DC Converters



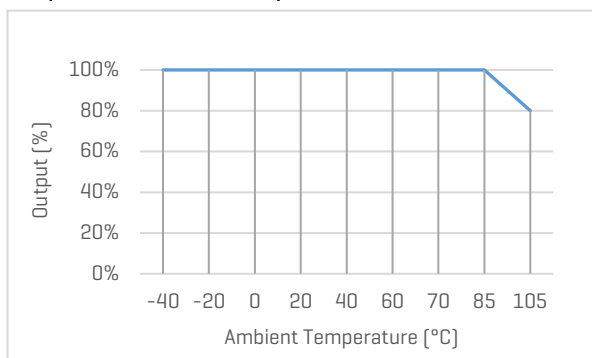
General Specifications

Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Isolation voltage 1 minute, leakage current 1mA Max	I/P to O/P	4200	-	-	VAC	
	I/P to O/P	6000	-	-	VDC	
Patient leakage current	250VAC, 50/60Hz	-	-	2	uA	
Isolation resistance 500VDC	I/P to O/P	1000	-	-	M ohm	
Isolation capacitance 100KHz, 0.1V	I/P to O/P	-	4	-	pF	
Creepage & Clearance distance		5	-	-	mm	
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	-	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		EN/IEC 62368-1, EN/ES 60601-1				
EMC	Emissions Immunity	CISPR32, EN55032 Class B with External Circuit EN 60601-1-2, CISPR 11 Class B with External Circuit				
MTBF	MIL-HDBK-217F	>19,360,000 Hours, T _A =25°C				
Size & Weight		19.50 x 9.80 x 12.50 mm, 4.2g Typ.				

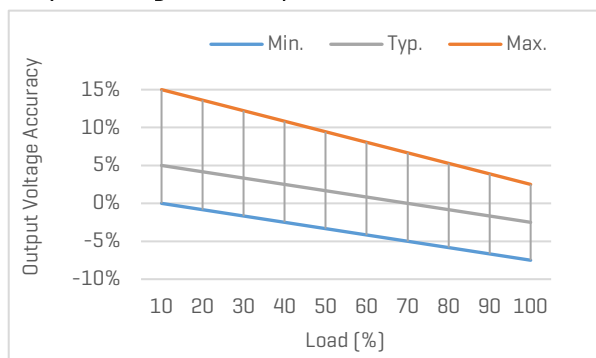
Characteristic Curves

Derating Curve

Output vs Ambient Temperature



Output Voltage Accuracy vs Load



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.

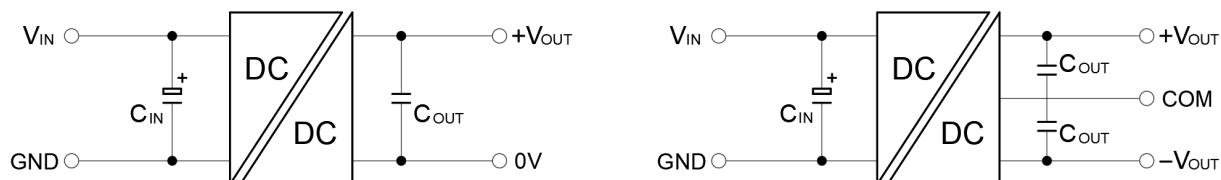


Figure 1. Typical Application Circuit

[Table 1] Recommended component spec

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

Output voltage	5V	9, 12V	15, 24V	$\pm 5, \pm 9V$	$\pm 12, \pm 15V$
C_{OUT}	10uF, 16V	2.2uF, 25V	1uF, 50V	4.7uF, 16V	1uF, 25V

Circuit for EMC Enhancement

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

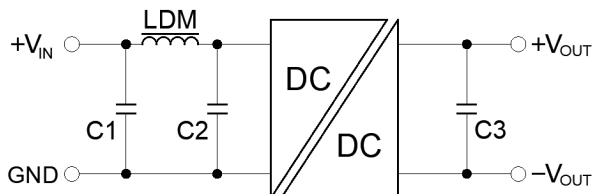
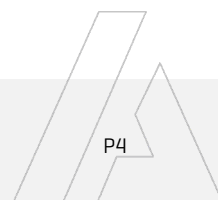


Figure 2. Circuit for EMC enhancement

[Table 2] Recommended component spec

Output voltage	C1, C2	LDM	C3
Spec	4.7uF, 50V	6.8uH	refer to C_{OUT} in [Table 1]

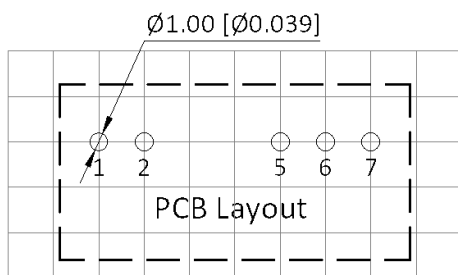
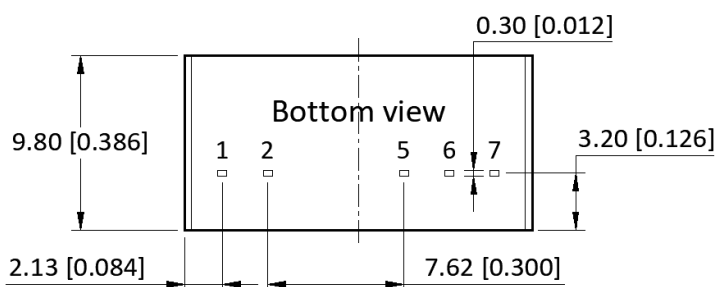
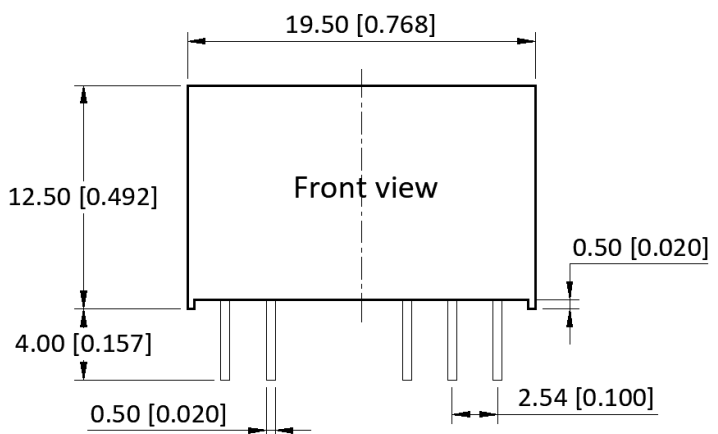


MEG1S Series

1W, Unregulated, 6KV Isolation, SIP7 Package DC/DC Converters



Mechanical Specifications



Pin Definition

Pin #	Single Out	Dual Out
1	V _{IN}	V _{IN}
2	GND	GND
5	OV	-V _{OUT}
6	No Pin	OV
7	+V _{OUT}	+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