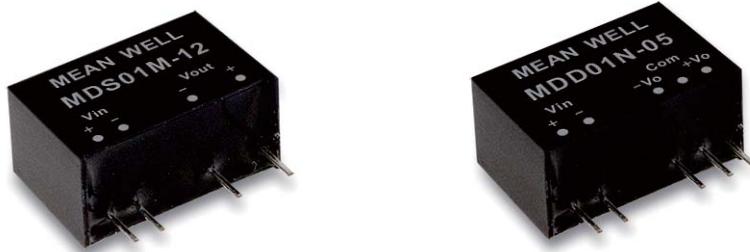




1W SIP Package DC-DC Medical Grade Unregulated Converter

MDS01 & MDD01 series



■ Features

- SIP7 package with international standard pinout
- Operating temperature range $-40 \sim +85^\circ\text{C}$
- Medical safety approved (1xMOPP/2xMOOP) according to ANSI/AAMI ES60601-1
- Low patient leakage current $<2\mu\text{A}$
- Protection: Short circuit(3 second max.)
- 6KVDC or 4.2KVAC hight I/O isolation (Reinforced isolation)
- Low cost
- 3 years warranty

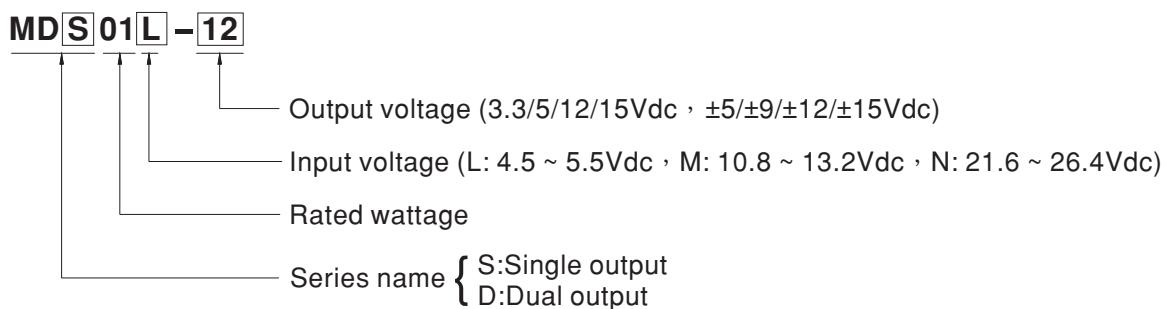
■ Applications

- Medical devices
- Medical oxygen monitor
- CT scanning
- Medical carts
- Oral care equipment

■ Description

MDS01 and MDD01 series are 1W isolated and unregulated module type medical grade DC-DC converter with SIP7 package. It features international standard pins, a high efficiency up to 83%, wide working temperature range $-40\sim+85^\circ\text{C}$, 6KVDC or 4.2KVAC I/P-O/P hight isolation voltage, short circuit protection, etc. The models account for different input voltage 5V/12V/24V $\pm 10\%$, and various output voltage, 3.3V/5V/12V/15V for single output and $\pm 5V/\pm 9V/\pm 12V/\pm 15V$ for dual outputs, which are suitable for medical systems, ultra low leakage current.

■ Model Encoding





1W SIP Package DC-DC Medical Grade Unregulated Converter

MDS01 & MDD01 series**MODEL SELECTION TABLE**

ORDER NO.	INPUT			OUTPUT		EFFICIENCY (TYP.)	CAPACITOR LOAD (MAX.)		
	INPUT VOLTAGE (RANGE)	INPUT CURRENT		OUTPUT VOLTAGE	OUTPUT CURRENT				
		NO LOAD	FULL LOAD						
MDS01L-03	Normal 5V (4.5 ~ 5.5V)	25mA	260mA	3.3V	31 ~ 303mA	73%	1000µF		
MDS01L-05		25mA	260mA	5V	20 ~ 200mA	78%	1000µF		
MDS01L-12		40mA	260mA	12V	9 ~ 84mA	77%	470µF		
MDS01L-15		45mA	265mA	15V	7 ~ 67mA	75%	470µF		
MDD01L-05		25mA	260mA	±5V	±10 ~ 100mA	79%	*470µF		
MDD01L-09		35mA	260mA	±9V	±6 ~ 56mA	81%	*470µF		
MDD01L-12		40mA	265mA	±12V	±5 ~ 42mA	77%	*220µF		
MDD01L-15		45mA	275mA	±15V	±4 ~ 34mA	77%	*220µF		
MDS01M-05	Normal 12V (10.8 ~ 13.2V)	15mA	105mA	5V	20 ~ 200mA	78%	1000µF		
MDS01M-12		15mA	105mA	12V	9 ~ 84mA	82%	470µF		
MDS01M-15		15mA	105mA	15V	7 ~ 67mA	83%	470µF		
MDD01M-05		14mA	105mA	±5V	±10 ~ 100mA	78%	*470µF		
MDD01M-09		14mA	105mA	±9V	±6 ~ 56mA	82%	*470µF		
MDD01M-12		22mA	114mA	±12V	±5 ~ 42mA	75%	*220µF		
MDD01M-15		22mA	114mA	±15V	±4 ~ 34mA	76%	*220µF		
MDS01N-05	Normal 24V (21.6 ~ 26.4V)	9mA	55mA	5V	20 ~ 200mA	77%	1000µF		
MDS01N-12		9mA	55mA	12V	9 ~ 84mA	79%	470µF		
MDS01N-15		9mA	55mA	15V	7 ~ 67mA	79%	470µF		
MDD01N-05		9mA	55mA	±5V	±10 ~ 100mA	77%	*470µF		
MDD01N-09		9mA	55mA	±9V	±6 ~ 56mA	79%	*470µF		
MDD01N-12		10mA	56mA	±12V	±5 ~ 42mA	77%	*220µF		
MDD01N-15		11mA	57mA	±15V	±4 ~ 34mA	77%	*220µF		

* For each output



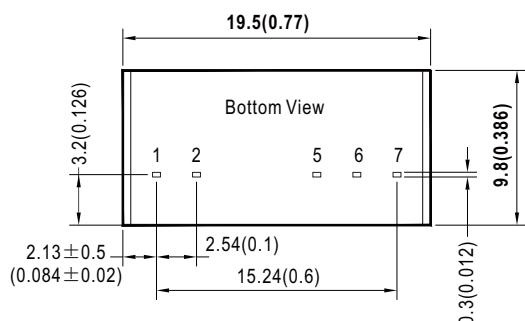
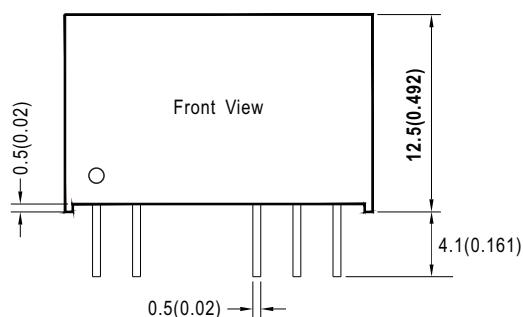
1W SIP Package DC-DC Medical Grade Unregulated Converter

MDS01 & MDD01 series

SPECIFICATION			
INPUT	VOLTAGE RANGE	L: 4.5 ~ 5.5Vdc M: 10.8 ~ 13.2Vdc N: 21.6 ~ 26.4Vdc	
	SURGE VOLTAGE (100ms max.)	5Vin models : 9Vdc 12Vin models : 18Vdc 24Vin models : 30Vdc	
	FILTER	Internal capacitor	
	PROTECTION	Fuse recommended. 500mA Slow-Blow Type for all models	
OUTPUT	VOLTAGE ACCURACY	±5.0%	
	RATED POWER	1W	
	RIPPLE & NOISE Note.2	75mVp-p	
	LINE REGULATION Note.3	1.2% for 1% input variation	
	LOAD REGULATION Note.4	±10%	
	SWITCHING FREQUENCY (Typ.)	100KHz	
PROTECTION	SHORT CIRCUIT	3 second max.	
ENVIRONMENT	COOLING	Free-air convection	
	WORKING TEMP.	-40 ~ +85°C (Refer to "Derating Curve")	
	WORKING HUMIDITY	20% ~ 90% RH non-condensing	
	STORAGE TEMP., HUMIDITY	-55 ~ +125°C, 10 ~ 95% RH non-condensing	
	TEMP. COEFFICIENT	0.02% / °C (0 ~ 85°C)	
	SOLDERING TEMPERATURE	1.5mm from case of 1 ~ 3sec./260°C max.	
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes	
SAFETY & EMC (Note.6)	SAFETY STANDARDS	UL60601-1, EAC TP TC 020/2011 approved	
	WITHSTAND VOLTAGE	I/P-O/P:6KVDC or 4.2KVAC	
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25°C / 70% RH	
	ISOLATION LEVEL	Primary-secondary: 1xMOPP / 2xMOOP when system input voltage is with 250VAC, 50/60Hz	
	ISOLATION CAPACITANCE (Typ.)	5pF	
	EMC EMISSION	Parameter	Standard
		Conducted	BS EN/EN55011(CISPR11)
	EMC IMMUNITY	Radiated	BS EN/EN55011(CISPR11)
		Parameter	Standard
		ESD	BS EN/EN61000-4-2
OTHERS	MTBF	3500Khrs MIL-HDBK-217F(25°C)	
	DIMENSION (L*W*H)	19.5*9.8*12.5mm (0.77*0.386*0.492 inch)	
	CASE MATERIAL	Non-Conductive black plastic (UL 94V-0 rated)	
	PACKING	4.2g	
NOTE	1. All parameters are specified at normal input(L:5Vdc, M:12Vdc, N:24Vdc), rated load, 25°C 70% RH ambient. 2. Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1µF & 47µF capacitor. 3. Line regulation is measured from low line to high line at rated load. 4. Load regulation is measured from 10% to 100% rated load. 5. Patient leakage current(2µA max.) and reinforced isolation is based on a 250VAC, 50/60Hz system input voltage. 6. The final equipment must be re-confirm that it still meet EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com)		
	※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx		

■ Mechanical Specification

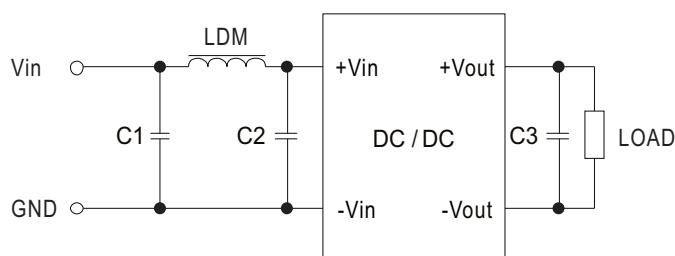
- All dimensions in mm(inch)
- Tolerance: $x.x \pm 0.25\text{mm}(x.xx \pm 0.01")$
 $x.xx \pm 0.10\text{mm}(x.xxx \pm 0.004")$
- Pin pitch tolerance: $\pm 0.05\text{mm} (\pm 0.002")$


■ Plug Assignment

Pin-Out		
Pin No.	MDS01 (Single output)	MDD01 (Dual output)
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No pin	Common
7	+Vout	+Vout

■ EMC Suggestion

EMC typical recommended circuit (Class B)



Recommended typical circuit parameters:

Input voltage (V)	3.3/5/12/15/24
EMI	C1,C2
	4.7μF/50V
	See table 2
	LDM
	6.8μH

Table 1

Single Vout	C3(μF)	Dual Vout	C3(μF)
3.3/5V	10μF	±5V	4.7μF
12V	2.2μF	±9V	2.2μF
15V	1μF	±12V/15V	1μF

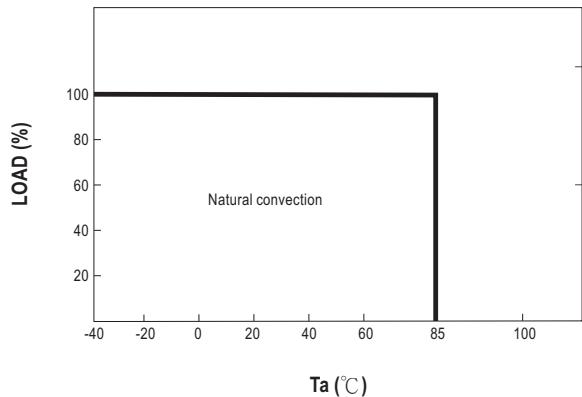
Table 2



1W SIP Package DC-DC Medical Grade Unregulated Converter

MDS01 & MDD01 series

■ Derating Curve



■ Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>