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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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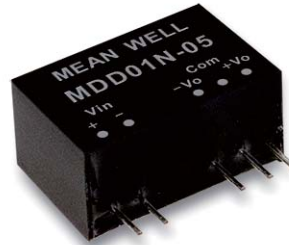
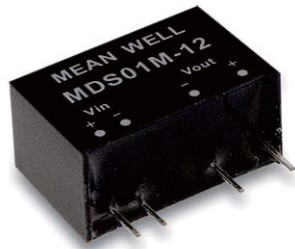
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## ■ Features

- 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 high 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 high 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  $\pm 5\text{V}/\pm 9\text{V}/\pm 12\text{V}/\pm 15\text{V}$  for dual outputs, which are suitable for medical systems, ultra low leakage current.

## ■ Model Encoding

**MD****S****01****L****-12**

- Output voltage (3.3/5/12/15Vdc ,  $\pm 5/\pm 9/\pm 12/\pm 15\text{Vdc}$ )
- Input voltage (L: 4.5 ~ 5.5Vdc , M: 10.8 ~ 13.2Vdc , N: 21.6 ~ 26.4Vdc)
- Rated wattage
- Series name { S:Single output  
D: Dual output



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

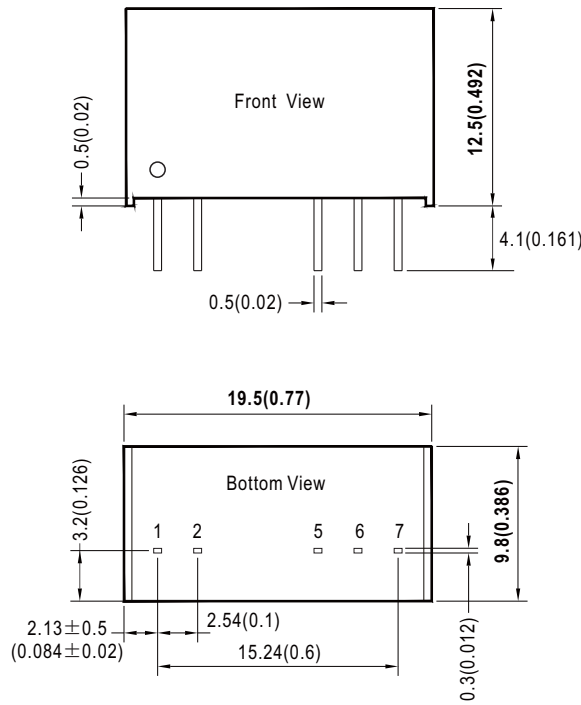
\* For each output



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)	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	Test Level / Note
		Conducted	EN55011(CISPR11)	Class B
	EMC IMMUNITY	Parameter	Standard	Test Level / Note
		ESD	EN61000-4-2	Level 2, ±8KV contact
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	<p>1.All parameters are specified at normal input(L:5Vdc, M:12Vdc, N:24Vdc), rated load, 25°C 70% RH ambient.</p> <p>2.Ripple &amp; noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1µf &amp; 47µf capacitor.</p> <p>3.Line regulation is measured from low line to high line at rated load.</p> <p>4.Load regulation is measured from 10% to 100% rated load.</p> <p>5.Patient leakage current(2µf max.) and reinforced isolation is based on a 250VAC, 50/60Hz system input voltage.</p> <p>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 <a href="http://www.meanwell.com">http://www.meanwell.com</a>)</p>			

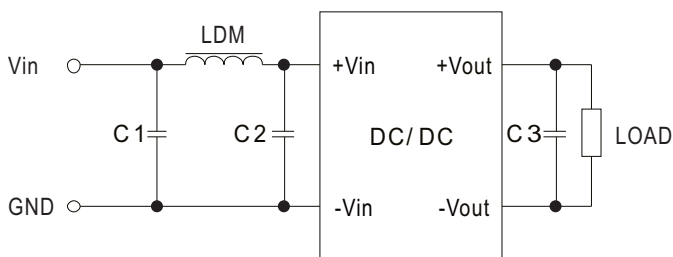
### Mechanical Specification

- 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:  $\pm 0.05\text{mm}$  ( $\pm 0.002"$ )



### EMC Suggestion

EMC typical recommended circuit (Class B)



Recommended typical circuit parameters:

Input voltage (V)		3.3/5/12/15/24
EMI	C1,C2	4.7 $\mu$ F/50V
	C3	See table 2
	LDM	6.8 $\mu$ F

Table 1

Single Vout	C3( $\mu$ F)	Dual Vout	C3( $\mu$ F)
3.3/5V	10	$\pm 5\text{V}$	4.7 $\mu$ F
12V	2.2	$\pm 9\text{V}$	2.2 $\mu$ F
15V	1	$\pm 12\text{V} / 15\text{V}$	1 $\mu$ F

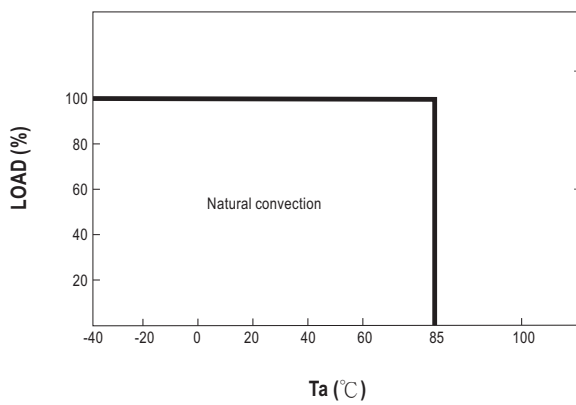
Table 2



## ■ Plug Assignment

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

## ■ Derating Curve



## ■ Installation Manual

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