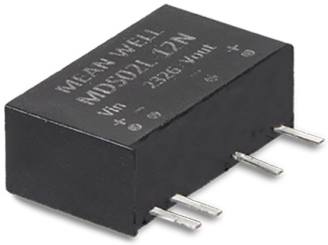
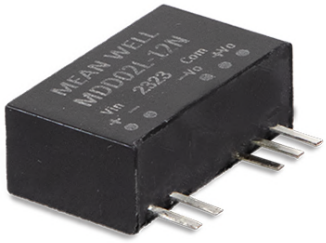
2W SIP Package DC-DC Medical Grade Unregulated Converter MDS02-N & MDD02-N series





UL62368-1 IEC62368-1 TPTC004

Medical Automate Industrial Security Network Telecom

Features

- SIP7 package with international standard pinout
- Operating temperature range -40 ~ +95℃
- Comply with IEC/UL62368-1 and LVD IEC60601-1
- Medical safety approved (1xMOPP/2xMOOP) according to IEC60601-1
- Low patient leakage current <2μA
- Protections: Short circuit (Continuous)
- 6KVDC hight I/O isolation (Reinforced insulation)
- Low cost
- 3 years warranty

Applications

- Medical devices
- Medical oxygen monitor
- CT scanning
- Medical carts
- Oral care equipment
- Telecom / datacom system
- Wireless network
- Industrial control facility

GTIN CODE

MW Search: https://www.meanwell.com/serviceGTIN.aspx

Description

MDS02-N and MDD02-N series are 2W isolated and unregulated module type medical grade DC-DC converter with SIP7 package. It features international standard pins, a high efficiency up to 86%, wide working temperature range -40~+95℃, 6KVDC I/P-O/P hight isolation voltage, short circuit protection, etc. The models account for different input voltage 5V/12V/24V±10%, and various output voltage, 3.3V/5V/12V/15V for single output and ±5V/±12V/±15V for dual outputs, which are suitable for medical systems, ultra low leakage current or industrial control, telecommunication field, distributed power architecture, and so on.

Model Encoding

MD S 02 L – 12 N

- N: NEW Series
- 12: Output voltage (3.3/5/12/15Vdc；±5/±12/±15Vdc)
- L: Input voltage (L: 4.5 ~ 5.5Vdc，M: 10.8 ~ 13.2Vdc，N: 21.6 ~ 26.4Vdc)
- 02: Rated wattage
- S: Series name { S:Single output / D:Dual output

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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				
MDS02L-03N	Normal 5V (4.5 ~ 5.5V)	40mA	505mA	3.3V	61 ~ 606mA	77%	1000μF
MDS02L-05N		40mA	490mA	5V	40 ~ 400mA	80%	1000μF
MDS02L-12N		40mA	470mA	12V	17 ~ 167mA	83%	330μF
MDS02L-15N		40mA	460mA	15V	13 ~ 134mA	86%	330μF
MDD02L-05N		37mA	490mA	±5V	±20 ~ 200mA	82%	*680μF
MDD02L-12N		43mA	473mA	±12V	±9 ~ 84mA	84%	*150μF
MDD02L-15N		46mA	455mA	±15V	±7 ~ 67mA	86%	*150μF
MDS02M-03N	Normal 12V (10.8 ~ 13.2V)	28mA	215mA	3.3V	61 ~ 606mA	75%	1000μF
MDS02M-05N		28mA	210mA	5V	40 ~ 400mA	77%	1000μF
MDS02M-12N		23mA	200mA	12V	17 ~ 167mA	84%	330μF
MDS02M-15N		23mA	200mA	15V	13 ~ 134mA	83%	330μF
MDD02M-05N		25mA	205mA	±5V	±20 ~ 200mA	80%	*680μF
MDD02M-12N		25mA	203mA	±12V	±9 ~ 84mA	83%	*150μF
MDD02M-15N		25mA	194mA	±15V	±7 ~ 67mA	84%	*150μF
MDS02N-03N	Normal 24V (21.6 ~ 26.4V)	10mA	108mA	3.3V	61 ~ 606mA	78%	1000μF
MDS02N-05N		12mA	103mA	5V	40 ~ 400mA	81%	1000μF
MDS02N-12N		12mA	100mA	12V	17 ~ 167mA	84%	330μF
MDS02N-15N		12mA	98mA	15V	13 ~ 134mA	85%	330μF
MDD02N-05N		11mA	102mA	±5V	±20 ~ 200mA	83%	*680μF
MDD02N-12N		10mA	102mA	±12V	±9 ~ 84mA	83%	*150μF
MDD02N-15N		10mA	100mA	±15V	±7 ~ 67mA	84%	*150μF

* For each output

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SPECIFICATION

INPUT	VOLTAGE RANGE	L: 4.5 ~ 5.5Vdc M: 10.8 ~ 13.2Vdc N: 21.6 ~ 26.4Vdc		
	FILTER	Internal capacitor		
	PROTECTION	Fuse recommended. 500mA Slow-Blow Type for all models		
OUTPUT	VOLTAGE ACCURACY	±5.0%		
	RATED POWER	2W		
	RIPPLE & NOISE Note.2	100mVp-p		
	LINE REGULATION Note.3	1.2% for 1% input variation		
	LOAD REGULATION Note.4	±15% for 3.3Vo, 5Vo ; ±10% for others		
	SWITCHING FREQUENCY (Typ.)	20KHz		
PROTECTION	SHORT CIRCUIT	Protection type : Continuous, automatic recovery		
ENVIRONMENT	COOLING	Free-air convection		
	WORKING TEMP.	-40 ~ +95℃ (Refer to "Derating Curve")		
	CASE TEMPERATURE	+105℃		
	WORKING HUMIDITY	20% ~ 90% RH non-condensing		
	STORAGE TEMP., HUMIDITY	-55 ~ +125℃, 10 ~ 95% RH non-condensing		
	TEMP. COEFFICIENT	0.02% / ℃ (0 ~ 90℃)		
	SOLDERING TEMPERATURE	1.5mm from case of 1 ~ 3sec./260℃ max.		
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes		
SAFETY & EMC (Note.6)	SAFETY STANDARDS	IEC62368-1 / UL62368-1, LVD IEC60601-1, EAC TP TC 020/2011 approved		
	WITHSTAND VOLTAGE	I/P-O/P:6KVDC		
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25℃/ 70% RH		
	ISOLATION LEVEL	Primary-secondary: 1xMOPP / 2xMOOP when system input voltage is with 250VAC		
	ISOLATION CAPACITANCE (Typ.)	25pF		
	EMC EMISSION	**Parameter**	**Standard**	**Test Level / Note**
		Conducted	BS EN/EN55032, BS EN/EN55011	Class A/B with external components
		Radiated	BS EN/EN55032, BS EN/EN55011	Class A/B with external components
	EMC IMMUNITY	**Parameter**	**Standard**	**Test Level / Note**
		ESD	BS EN/EN61000-4-2	Level 2, ±4KV contact, Level 3, ±8KV air
		Radiated Susceptibility	BS EN/EN61000-4-3	Level 2, 3V/m
		EFT/Bursts	BS EN/EN61000-4-4	Level 1, 0.5KV / 5KHz
		Surge	BS EN/EN61000-4-5	Level 1, 0.5KV Line to Ground
		Conducted	BS EN/EN61000-4-6	Level 2, 3V(e.m.f.)
		Magnetic Field	BS EN/EN61000-4-8	Level 1, 1A/m
OTHERS	MTBF	12900Khrs MIL-HDBK-217F(25℃)		
	DIMENSION (L*W*H)	19.7*7.1*11.5mm (0.775*0.279*0.452 inch)		
	CASE MATERIAL	Non-Conductive black plastic (UL 94V-0 rated)		
	PACKING	2.8g ; 24pcs/per tube, 2160pcs/90 tube/per carton		

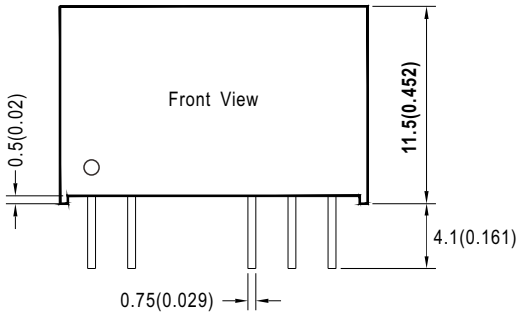
NOTE

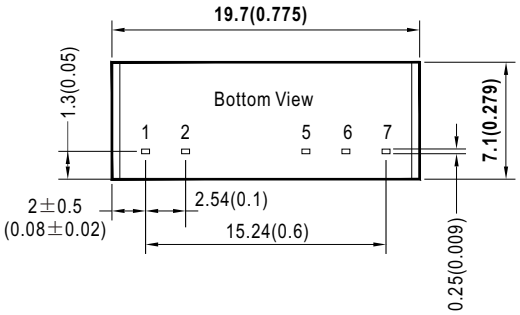
1.All parameters are specified at normal input(L:5Vdc, M:12Vdc, N:24Vdc), rated load, 25℃ 70% RH ambient.
2.Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1μf & 47μf capacitor.
3.Line regulation is measured from low line to high line at rated load.
4.Load regulation 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

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■ Mechanical Specification

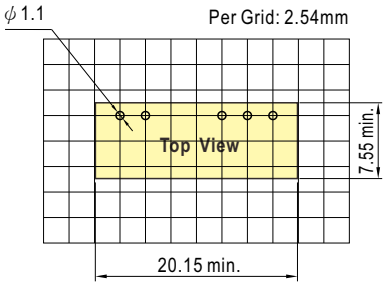
- All dimensions in mm(inch)
- Tolerance:x.x±0.5mm(x.xx±0.02")
  x.xx±0.10mm(x.xxx±0.004")
- Pin pitch tolerance:±0.05mm (±0.002")





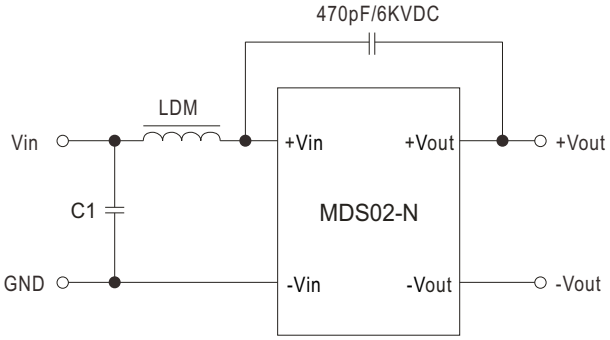
■ Plug Assignment

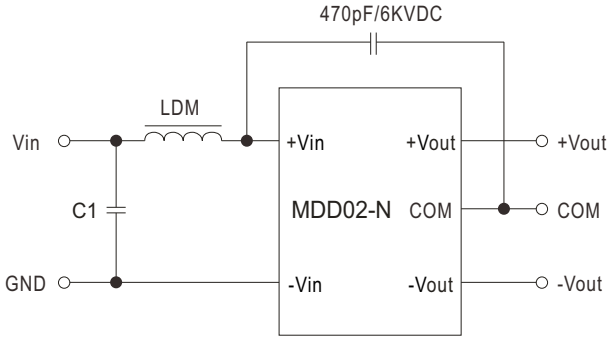
Pin-Out		
Pin No.	MDS02-N (Single output)	MDD02-N (Dual output)
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No pin	Common
7	+Vout	+Vout



■ EMC Suggestion

EMC typical recommended circuit (Class A/B)



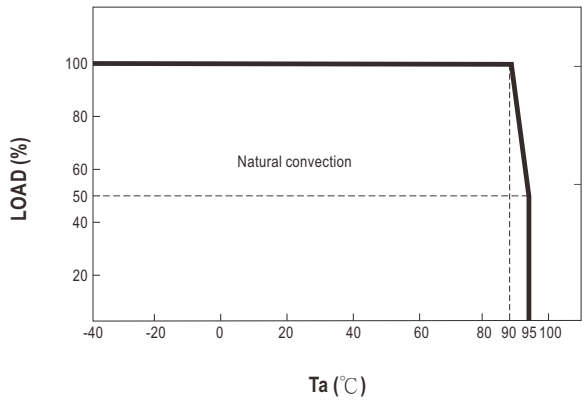


Recommended typical circuit parameters:

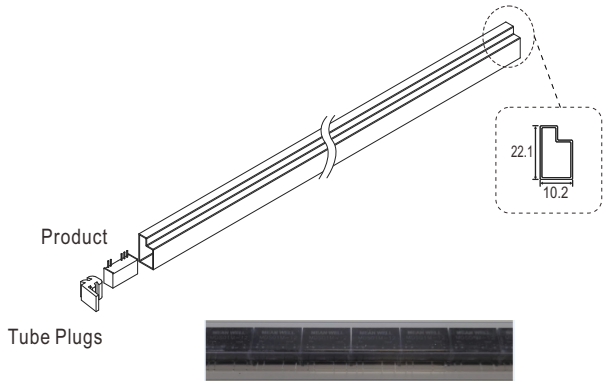
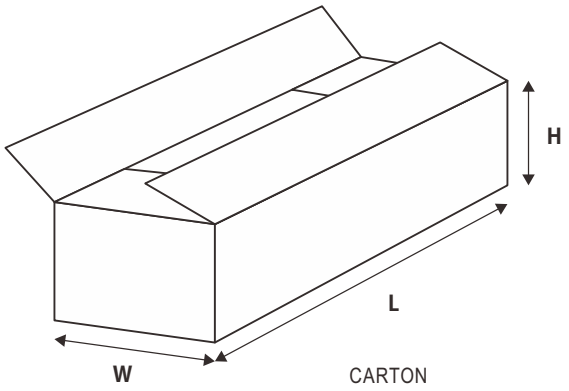
Input	LDM	C1
5V	47μH	22μF
12V	47μH	10μF
24V	100μH	22μF

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■ Derating Curve



■ Packing

Standard Tube Packing	MPQ Per Tube (PCS)	One Tube G.W.	Max. Q'TY/ Carton(PCS)	One Carton G.W.
Unit : mm  Tube pattern  CARTON L545 x W145 x H220	24	105.5g	2160	9.5Kg

■ Installation Manual

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

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