



2W SIP Package DC-DC Medical Grade Unregulated Converter

MDS02-N & MDD02-N series



Features

- SIP7 package with international standard pinout
- Operating temperature range $-40 \sim +95^{\circ}\text{C}$
- Comply with IEC/UL62368-1 and LVD IEC60601-1
- Medical safety approved (1xMOPP/2xMOOP) according to IEC60601-1
- Low patient leakage current $<2\mu\text{A}$
- Protections: Short circuit (Continuous)
- 6KVDC high 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 $-40 \sim +95^{\circ}\text{C}$, 6KVDC 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 $\pm 5\text{V}/\pm 12\text{V}/\pm 15\text{V}$ 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

NEW Series

Output voltage (3.3/5/12/15Vdc, $\pm 5/\pm 12/\pm 15\text{Vdc}$)

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



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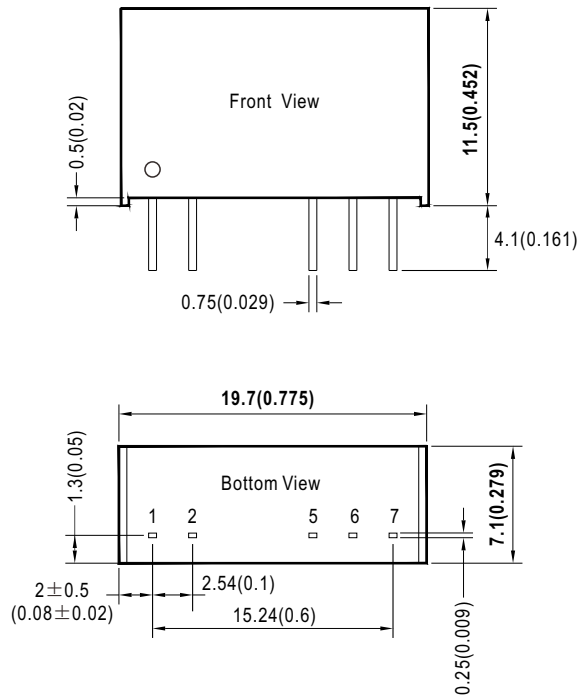
MODEL SELECTION TABLE							
ORDER NO.	INPUT			OUTPUT		EFFICIENCY (TYP.)	CAPACITOR LOAD (MAX.)
	INPUT VOLTAGE (RANGE)	INPUT CURRENT		OUTPUT VOLTAGE	OUTPUT CURRENT		
		NO LOAD	FULL LOAD				
MDS02L-03N	Normal 5V (4.5 ~ 5.5V)	40mA	505mA	3.3V	61 ~ 606mA	77%	1000μF
MDS02L-05N		40mA	490mA	5V	40 ~ 400mA	80%	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

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% / °C (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			

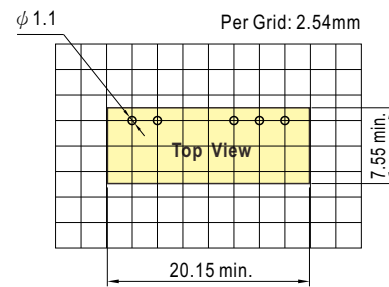
Mechanical Specification

- All dimensions in mm(inch)
- Tolerance: $x.x \pm 0.5\text{mm}$ ($x.xx \pm 0.02"$)
 $x.xx \pm 0.10\text{mm}$ ($x.xxx \pm 0.004"$)
- Pin pitch tolerance: $\pm 0.05\text{mm}$ ($\pm 0.002"$)



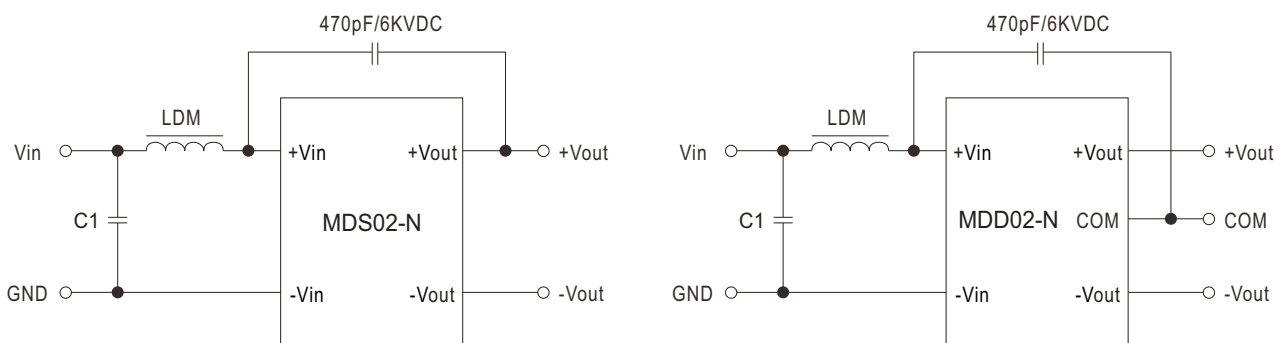
Plug Assignment

Pin-Out		
Pin No.	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

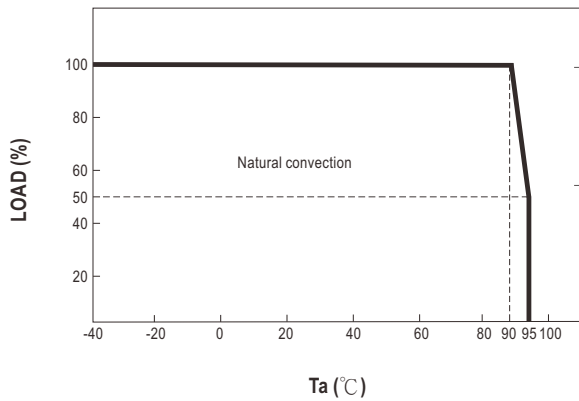
EMC typical recommended circuit (Class A/B)



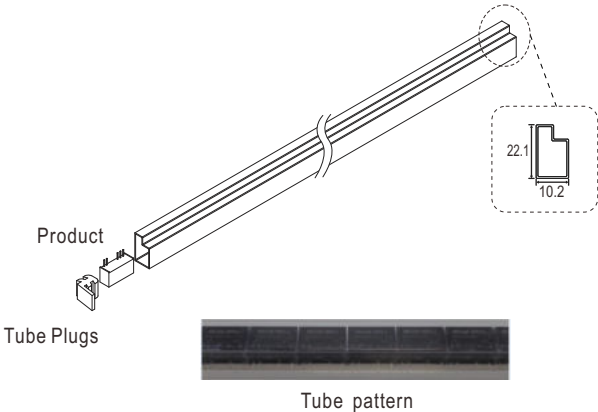
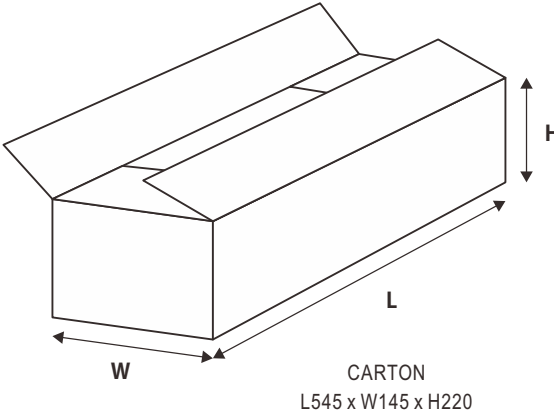
Recommended typical circuit parameters:

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

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  Product Tube Plugs 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>