

MD300S Series

Miniature 3W Single Output SIP DC/DC Converters



Key Features:

- 3W Output Power
- Miniature SIP Case
- 1,000 VDC Isolation
- Single Outputs
- > 2 MHour MTBF
- -40°C to +85°C Operation
- Industry Standard Pin-Out

RoHS



Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range	5 VDC Input	4.50	5.00	5.50	VDC
	12 VDC Input	10.8	12.0	13.2	
	24 VDC Input	21.6	24.0	26.4	
Reverse Polarity Input Current				0.5	A
Internal Power Dissipation			700		mW
Input Filter	Internal Capacitor				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy,			±3.0		%
Line Regulation	For V _{IN} Change of 1%		±1.01	±1.2	%
Load Regulation, See Note 1	See Model Selection Guide				
Ripple & Noise (20 MHz)	See Note 2		60	100	mV P - P
Temperature Coefficient			±0.01	±0.02	%/°C
Output Short Circuit	Momentary (0.5 Sec)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,000			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz/1.0V		60	120	pF
Switching Frequency			60		kHz

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
	Case			+100	
Storage Temperature Range		-50		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size	See Mechanical Drawing (Page 2)				
Case Material	Non-Conductive Black Plastic (UL94-V0)				
Weight	0.07 Oz (2.2g)				

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	2.0			MHours

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	5 VDC Input	-0.7		9.0	VDC
	12 VDC Input	-0.7		18.0	
	24 VDC Input	-0.7		30.0	
Lead Temperature	1.5 mm From Case for 10 Sec			260	°C

Caution: Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

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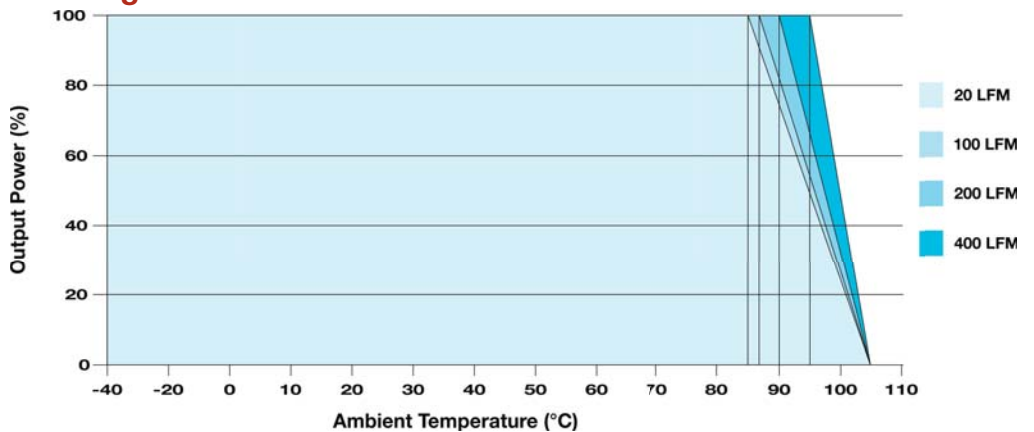
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Model Number	Input				Output			Load Regulation (%/Typ)	Efficiency (% Typ)	Capacitive Load (µF, Max)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range	Full-Load	No-Load							
MD305S-05	5	4.50 - 5.50	723	50	5.0	600	12.0	8.0	83	220	2,000
MD305S-09	5	4.50 - 5.50	689	50	9.0	333	6.0	7.0	87	220	2,000
MD305S-12	5	4.50 - 5.50	701	50	12.0	250	4.5	7.0	85	220	2,000
MD305S-15	5	4.50 - 5.50	686	50	15.0	200	3.0	6.0	87	220	2,000
MD312S-05	12	10.8 - 13.2	298	40	5.0	600	12.0	6.0	84	220	1,000
MD312S-09	12	10.8 - 13.2	285	40	9.0	333	6.0	5.0	87	220	1,000
MD312S-12	12	10.8 - 13.2	284	40	12.0	250	4.5	4.5	88	220	1,000
MD312S-15	12	10.8 - 13.2	281	40	15.0	200	3.0	4.0	89	220	1,000
MD324S-05	24	21.6 - 26.4	152	30	5.0	600	12.0	5.8	82	220	500
MD324S-09	24	21.6 - 26.4	147	30	9.0	333	6.0	4.8	85	220	500
MD324S-12	24	21.6 - 26.4	146	30	12.0	250	4.5	4.3	85	220	500
MD324S-15	24	21.6 - 26.4	147	30	15.0	200	3.0	3.5	85	220	500

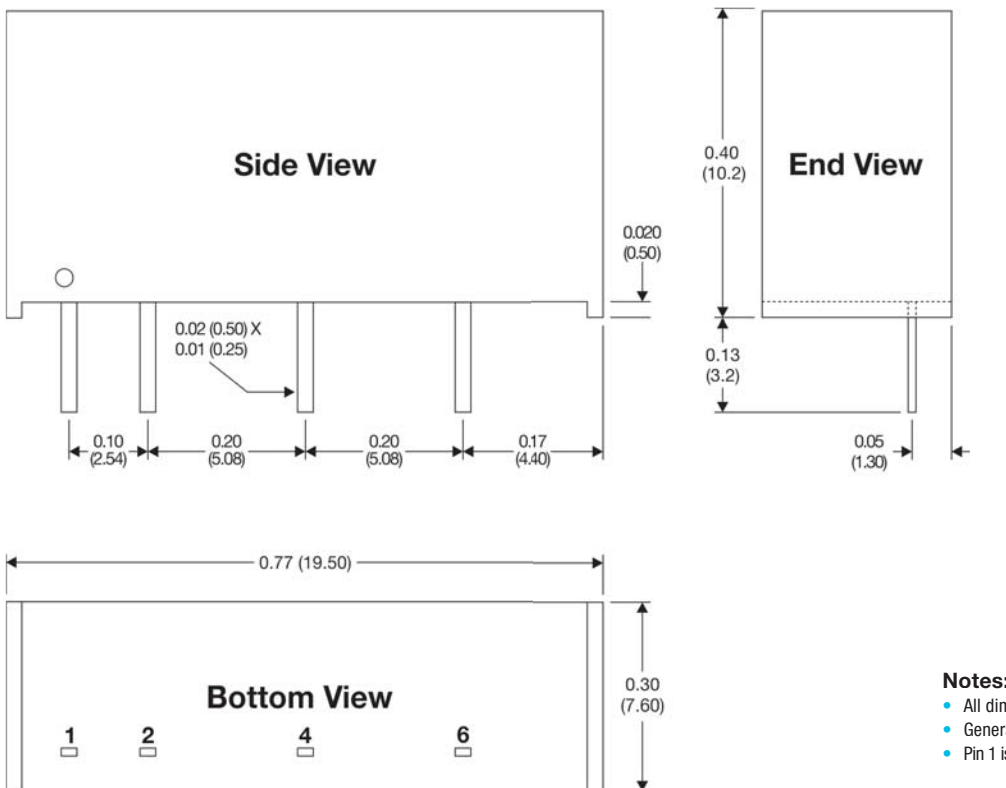
Notes:

1. Output load regulation is specified for a load change of 20% to 100%.
2. When measuring output ripple & noise, it is recommended that an external ceramic capacitor (0.33 µF typ.) be placed from the +Vout to the -Vout pins.
3. Free air convection is typically 20 LFM. The units should not be operated in still air (0 LFM).
4. Operation at no-load will not damage the unit, but they may not meet all specifications.
5. It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection table above for the correct rating.

Derating Curve



Mechanical Dimensions



Pin Connections

Pin	Function
1	+VIN
2	-VIN
4	-VOUT
6	+VOUT

Notes:

- All dimensions are typical in inches (mm)
- General Tolerance x.xx = ±0.01 (±0.25)
- Pin 1 is marked by a "dot" or indentation on the top of the unit