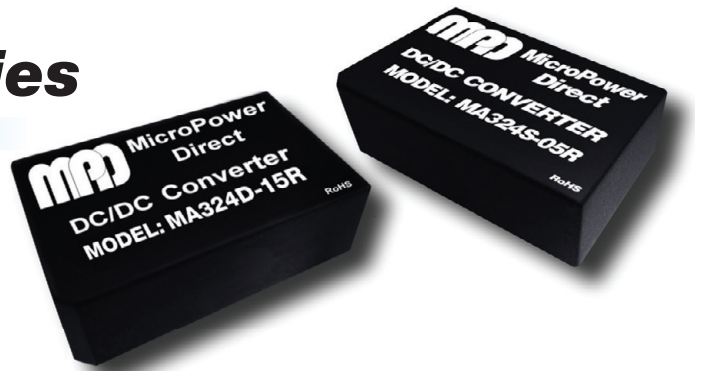


# MA300R Series

## Regulated, 3W DIP Single & Dual Output DC/DC Converters



### Key Features:

- 3W Output Power
- Compact DIP Case
- Tight Regulation
- Single & Dual Outputs
- 1,500 VDC Isolation
- >700 kHour MTBF
- 15 Standard Models
- 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	4.5	5.0	5.5	VDC
	12 VDC Input	10.80	12.0	13.20	
	24 VDC Input	21.60	24.0	26.40	
Short Circuit Input Power				2,000	mW
Input Filter	Pi ( $\pi$ ) Filter				
Conducted EMI	EN 55022 Class A				

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy				$\pm 2.0$	%
Output Voltage Balance			$\pm 1.0$	$\pm 3.0$	%
Line Regulation	$V_{IN} = \text{Min to Max}$		$\pm 0.2$	$\pm 0.5$	%
Load Regulation	$I_{OUT} = 0\% \text{ to } 100\%$		$\pm 0.2$	$\pm 0.5$	%
Ripple & Noise (20 MHz)	See Note 1			60	mV P - P
Temperature Coefficient			$\pm 0.02$		%/°C
Output Short Circuit	Continuous (Autorecovery)				

#### General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,500			VDC
Isolation Resistance	500 VDC	1,000			M $\Omega$
Isolation Capacitance	100 kHz, 1V		300		pF
Switching Frequency			300		kHz

#### Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Operating Temperature Range	Case			+95	°C
Storage Temperature Range		-55		+125	°C
Cooling, See Note 2	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	0.43 Oz (12.4g)				

#### Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	700			kHours

#### Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	5 VDC Input	-0.7		7.5	VDC
	12 VDC Input	-0.7		15	
	24 VDC Input	-0.7		30	
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.

### MicroPower Direct

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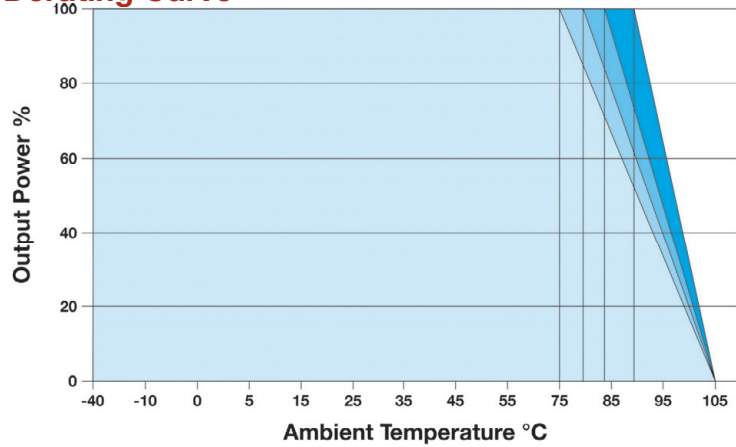
[www.micropowerdirect.com](http://www.micropowerdirect.com)

Model Number	Input				Output			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						
MA305S-05R	5.0	4.5 - 5.5	857	90	5.0	600	0.0	70	470	1,500
MA305S-12R	5.0	4.5 - 5.5	769	90	12.0	250	0.0	78	100	1,500
MA305S-15R	5.0	4.5 - 5.5	769	90	15.0	200	0.0	78	100	1,500
MA305D-12R	5.0	4.5 - 5.5	769	90	±12.0	±125	0.0	78	±100	1,500
MA305D-15R	5.0	4.5 - 5.5	769	90	±15.0	±100	0.0	78	±100	1,500
MA312S-05R	12	10.8 - 13.2	338	45	5.0	600	0.0	74	470	750
MA312S-12R	12	10.8 - 13.2	313	45	12.0	250	0.0	80	100	750
MA312S-15R	12	10.8 - 13.2	313	45	15.0	200	0.0	80	100	750
MA312D-12R	12	10.8 - 13.2	309	45	±12.0	±125	0.0	81	±100	750
MA312D-15R	12	10.8 - 13.2	305	45	±15.0	±100	0.0	82	±100	750
MA324S-05R	24	21.6 - 26.4	167	22	5.0	600	0.0	75	470	350
MA324S-12R	24	21.6 - 26.4	156	22	12.0	250	0.0	80	100	350
MA324S-15R	24	21.6 - 26.4	156	22	15.0	200	0.0	80	100	350
MA324D-12R	24	21.6 - 26.4	154	22	±12.0	±125	0.0	81	±100	350
MA324D-15R	48	21.6 - 26.4	152	22	±15.0	±100	0.0	82	±100	350

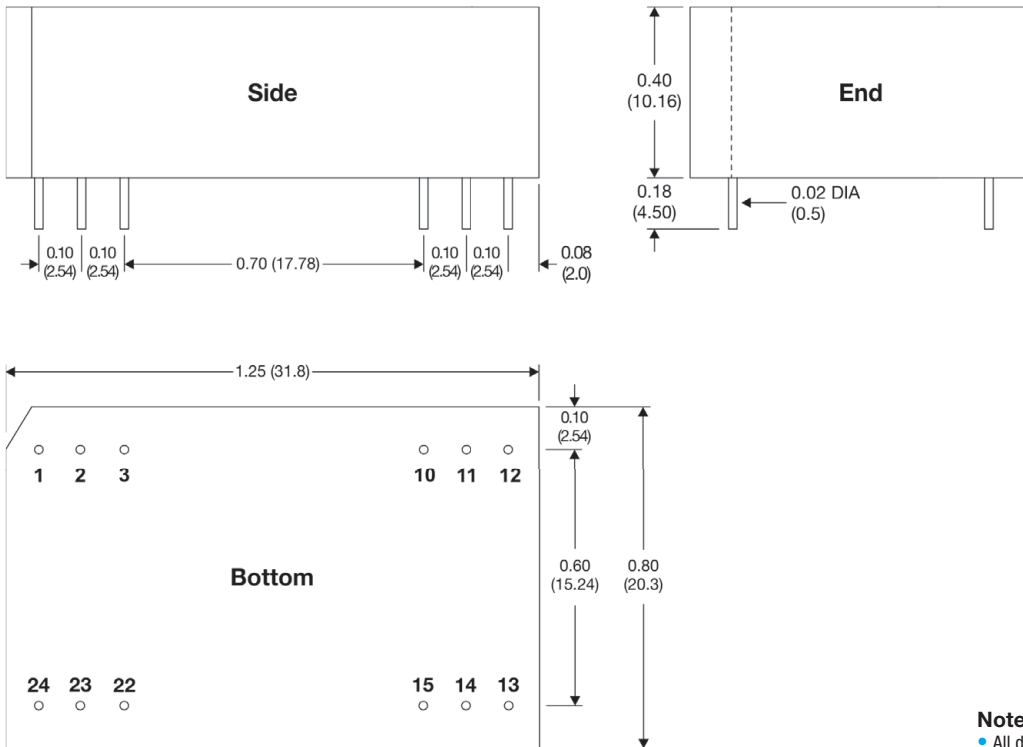
Notes:

- 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 for single output units and from each output to common for dual output models.
- Free air convection is typically 20 LFM. The units should not be operated in still air (0 LFM).
- Exceeding the absolute ratings could damage the unit.
- 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	Single	Dual
1	+VIN	+VIN
2	NC	-VOUT
3	NC	Common
10	-VOUT	Common
11	+VOUT	+VOUT
12	-VIN	-VIN
13	-VIN	-VIN
14	+VOUT	+VOUT
15	-VOUT	Common
22	NC	Common
23	NC	-VOUT
24	+VIN	+VIN

NC: No Connection

Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.02 (±0.50)
- Pin 1 is marked by a "dot" or indentation on the side of the unit



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