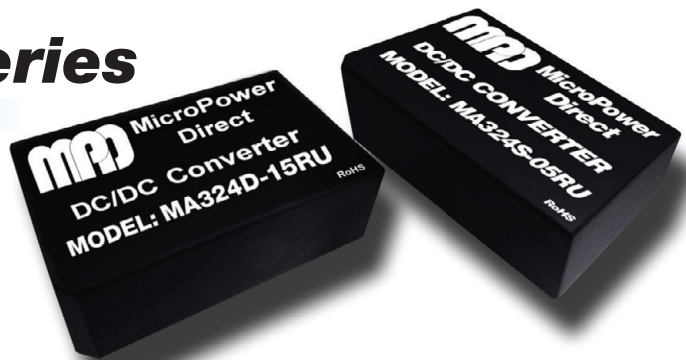


MA300RU Series

Wide 4:1 Input, 3W, Single & Dual Output DC/DC Converters



Key Features:

- 3W Output Power
- 4:1 Input Voltage Range
- 1,500 VDC Isolation
- 16 Standard Models
- Single & Dual Outputs
- Compact DIP Case
- -40°C to +85°C Operation
- Industry Standard Pin-Out

3.0 kV Isolation Models Available

2:1 Input Range Models Available

RoHS



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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 Start Voltage	24 VDC Input			9.0	VDC	
	48 VDC Input			18.0		
Under Voltage Shutdown	24 VDC Input			8.5	VDC	
	48 VDC Input			17.5		
Input Filter	π (Pi) Filter					

Output						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Output Voltage Accuracy				±2.0	%	
Output Voltage Balance	Dual Output, Balanced Loads		±0.5	±2.0	%	
Line Regulation	V _{IN} = Min to Max		±0.3	±1.0	%	
Load Regulation	I _{OUT} = 0% to 100%		±0.3	±1.0	%	
Ripple & Noise (20 MHz)	See Note 1			70	mV P - P	
Transient Recovery Time, See Note 2	25% Load Step Change		200	500	μSec	
Transient Response Deviation			±3.0	±5.0	%	
Temperature Coefficient			±0.01	±0.02	%/°C	
Output Overload Protection	Foldback	120			%	
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			MΩ	
Isolation Capacitance	100 kHz/1.0V		500		pF	
Switching Frequency		90			kHz	

EMI Characteristics						
Parameter	Standard	Level				
Radiated Emissions	EN 55022	Class A				
Conducted Emissions	EN 55022	Class A				
ESD	EN 61000-4-2	Criteria A; ±8 kV Air ±6 kV Contact				
RS	EN 61000-4-3	Criteria A; 10V/m				
EFT	See Note 3 EN 61000-4-4	Criteria A; ±2 kV				
Surge	See Note 3 EN 61000-4-5	Criteria A; ±1 kV				
CS	EN 61000-4-6	Criteria A; 10V/m				

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

Physical						
Case Size	1.25 x 0.80 x 0.40 Inches (31.75 x 20.32 x 10.16 mm)					
Case Material	Non-Conductive Black Plastic (UL94-V0)					
Weight	0.45 Oz (12.8g)					

Reliability Specifications						
Parameter	Conditions	Min.	Typ.	Max.	Units	
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1.0			MHours	

Absolute Maximum Ratings						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Input Voltage Surge (1 Sec)	24 VDC Input	-0.7		50.0	VDC	
	48 VDC Input	-0.7		100.0		
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.

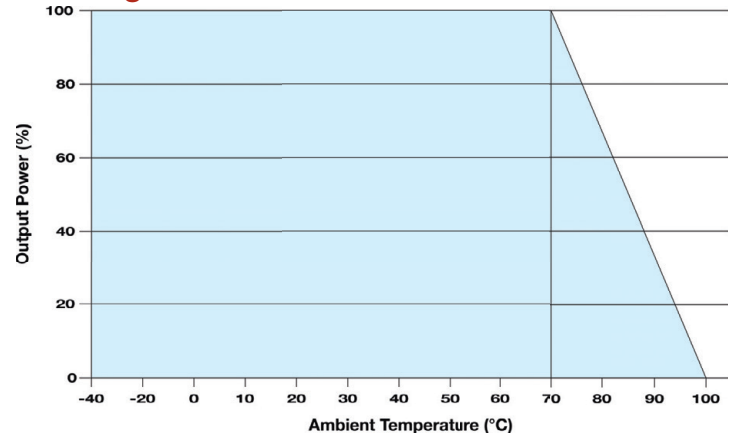
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Model Number	Input				Output			Efficiency (% Typ)	Reflected Ripple Current (mA Typ)	Capacitive Load (µF Max)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range	Full-Load	No-Load							
MA324S-05RU	24	9.0 - 36.0	134	30	3.3	750.0	0.0	77	15.0	680	1,000
MA324S-05RU	24	9.0 - 36.0	158	30	5.0	600.0	0.0	79	15.0	470	1,000
MA324S-12RU	24	9.0 - 36.0	152	30	12.0	250.0	0.0	82	15.0	330	1,000
MA324S-15RU	24	9.0 - 36.0	151	30	15.0	200.0	0.0	83	15.0	220	1,000
MA324S-24RU	24	9.0 - 36.0	154	30	24.0	125.0	0.0	81	15.0	100	1,000
MA324D-05RU	24	9.0 - 36.0	130	30	±5.0	±250.0	±0.0	80	15.0	±220	1,000
MA324D-12RU	24	9.0 - 36.0	152	30	±12.0	±125.0	±0.0	82	15.0	±150	1,000
MA324D-15RU	24	9.0 - 36.0	152	30	±15.0	±100.0	±0.0	82	15.0	±100	1,000
MA348S-03RU	48	18.0 - 75.0	67	20	3.3	750.0	0.0	77	10.0	680	500
MA348S-05RU	48	18.0 - 75.0	78	20	5.0	600.0	0.0	80	10.0	470	500
MA348S-12RU	48	18.0 - 75.0	75	20	12.0	250.0	0.0	83	10.0	330	500
MA348S-15RU	48	18.0 - 75.0	74	20	15.0	200.0	0.0	84	10.0	220	500
MA348S-24RU	48	18.0 - 75.0	76	20	24.0	125.0	0.0	82	10.0	100	500
MA348D-05RU	48	18.0 - 75.0	65	20	±5.0	±250.0	±0.0	80	10.0	±220	500
MA348D-12RU	48	18.0 - 75.0	76	20	±12.0	±125.0	±0.0	82	10.0	±150	500
MA348D-15RU	48	18.0 - 75.0	76	20	±15.0	±100.0	±0.0	82	10.0	±100	500

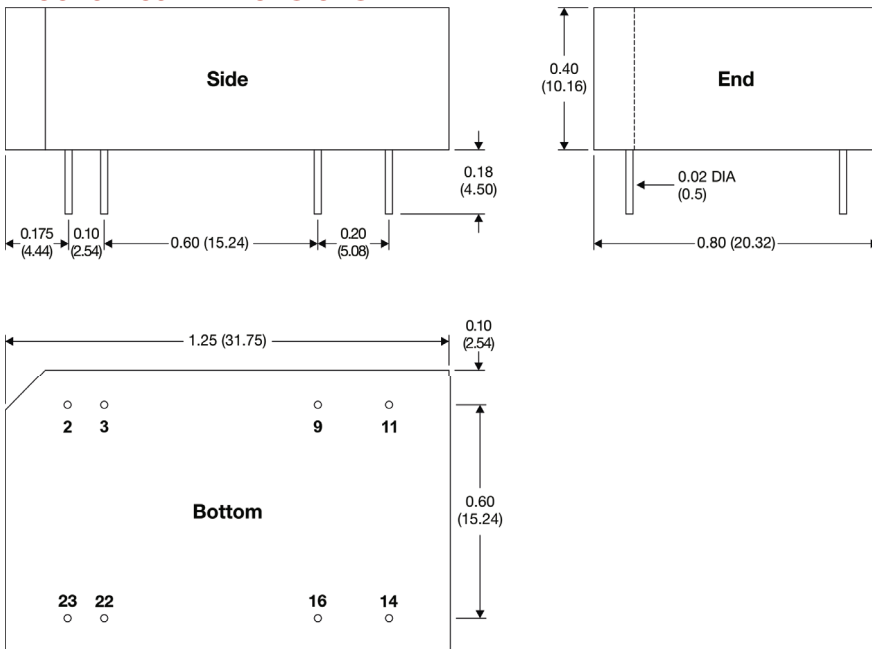
Notes:

- When measuring output ripple, it is recommended that an external 3.3 µF ceramic capacitor be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units.
- Transient recovery is measured to within a 1% error band for a load step change of 75% to 100%.
- Operation at no-load will not damage these units.
- An external 220 µF/100V capacitor connected across the input pins is required to meet EN61000-4-4 and EN61000-4-5.
- Dual output units may be connected to provide a 10, 24 or 30 VDC output. To do this, connect the load across the positive (+Vout) and negative (-Vout) outputs and float the output common.
- The converter should be connected to a low ac-impedance source. An input source with a highly inductive impedance may affect the stability of the converter. In applications where the converter output loading is high and input power is supplied over long lines, it may be necessary to use a capacitor on the input to insure start-up. In this case, it is recommended that a low ESR (ESR <1.0Ω at 100 kHz) capacitor be mounted close to the converter. For 24V input units a 4.7 µF is recommended; and for 48V units a 2.2 µF.
- It is recommended that a fuse be used on the input of a power supply for protection. See the table above for the correct rating.

Derating Curve



Mechanical Dimensions



For 3 kV Isolation, See MA300x-xxRUI Series Datasheet

For 2:1 Inputs, See MA300x-xxRW Series Datasheet

Pin Connections

Pin	Single	Dual
2, 3	-VIN	-VIN
9	No Pin	Common
11	NC	-VOUT
14	+VOUT	+VOUT
16	-VOUT	Common
22, 23	+VIN	+VIN

NC: No Connection

Mechanical Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.x = ±0.02 (±0.50)
- Tolerance x.xx = ±0.01 (±0.25)



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