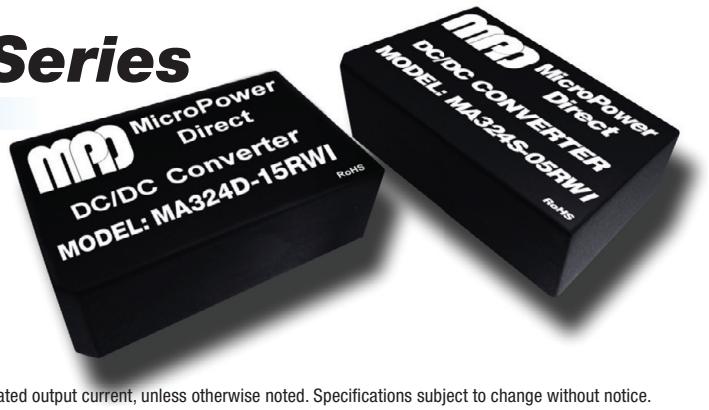
MA300RWI Series

Wide 2:1 Input, 3W, High 3 kVDC Isolation DC/DC Converters



Key Features:

- 3W Output Power
- 2:1 Input Voltage Range
- 3,000 VDC Isolation
- 32 Standard Models
- Single & Dual Outputs
- Compact DIP Case
- -40°C to +85°C Operation
- Industry Standard Pin-Out

1.5 kV Isolation Models Available

4:1 Input Range Models Available

RoHS

MicroPower Direct
292 Page Street
Suite D
Stoughton, MA 02072
USA

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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	5 VDC Input			4.5	VDC
	12 VDC Input			9.0	
	24 VDC Input			18.0	
	48 VDC Input			36.0	
Under Voltage Shutdown	5 VDC Input			4.0	VDC
	12 VDC Input			8.5	
	24 VDC Input			17.5	
	48 VDC Input			35.5	
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		300	500	µSec
Transient Response Deviation			±3.0	±5.0	%
Temperature Coefficient			±0.01	±0.02	%/°C
Output Overload Protection	Foldback	120	150		%
Output Short Circuit	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	3,000			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz/1.0V			300	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)	5 VDC Input	-0.7		11.0	VDC
	12 VDC Input	-0.7		25.0	
	24 VDC Input	-0.7		50.0	
	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.

Model Selection Guide

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							
MA305S-03RWI	5	4.5 - 9.0	514	65	3.3	600.0	0.0	77	100.0	680	1,500
MA305S-05RWI	5	4.5 - 9.0	641	65	5.0	500.0	0.0	78	100.0	470	1,500
MA305S-12RWI	5	4.5 - 9.0	732	65	12.0	250.0	0.0	82	100.0	330	1,500
MA305S-15RWI	5	4.5 - 9.0	732	65	15.0	200.0	0.0	82	100.0	220	1,500
MA305S-24RWI	5	4.5 - 9.0	741	65	24.0	125.0	0.0	81	100.0	100	1,500
MA305D-05RWI	5	4.5 - 9.0	649	65	±5.0	±250.0	±0.0	77	100.0	±220	1,500
MA305D-12RWI	5	4.5 - 9.0	741	65	±12.0	±125.0	±0.0	81	100.0	±150	1,500
MA305D-15RWI	5	4.5 - 9.0	741	65	±15.0	±100.0	±0.0	81	100.0	±100	1,500
MA312S-03RWI	12	9.0 - 18.0	209	35	3.3	600.0	0.0	79	30.0	680	600
MA312S-05RWI	12	9.0 - 18.0	257	35	5.0	500.0	0.0	81	30.0	470	600
MA312S-12RWI	12	9.0 - 18.0	294	35	12.0	250.0	0.0	85	30.0	330	600
MA312S-15RWI	12	9.0 - 18.0	294	35	15.0	200.0	0.0	85	30.0	220	600
MA312S-24RWI	12	9.0 - 18.0	298	35	24.0	125.0	0.0	84	30.0	100	600
MA312D-05RWI	12	9.0 - 18.0	260	35	±5.0	±250.0	±0.0	80	30.0	±220	600
MA312D-12RWI	12	9.0 - 18.0	298	35	±12.0	±125.0	±0.0	84	30.0	±150	600
MA312D-15RWI	12	9.0 - 18.0	298	35	±15.0	±100.0	±0.0	84	30.0	±100	600
MA324S-05RWI	24	18.0 - 36.0	104	20	3.3	600.0	0.0	79	15.0	680	300
MA324S-05RWI	24	18.0 - 36.0	129	20	5.0	500.0	0.0	81	15.0	470	300
MA324S-12RWI	24	18.0 - 36.0	147	20	12.0	250.0	0.0	85	15.0	330	300
MA324S-15RWI	24	18.0 - 36.0	147	20	15.0	200.0	0.0	85	15.0	220	300
MA324S-24RWI	24	18.0 - 36.0	149	20	24.0	125.0	0.0	84	15.0	100	300
MA324D-05RWI	24	18.0 - 36.0	130	20	±5.0	±250.0	±0.0	80	15.0	±220	300
MA324D-12RWI	24	18.0 - 36.0	149	20	±12.0	±125.0	±0.0	84	15.0	±150	300
MA324D-15RWI	24	18.0 - 36.0	149	20	±15.0	±100.0	±0.0	84	15.0	±100	300
MA348S-03RWI	48	36.0 - 72.0	52	15	3.3	600.0	0.0	79	10.0	680	150
MA348S-05RWI	48	36.0 - 72.0	64	15	5.0	500.0	0.0	81	10.0	470	150
MA348S-12RWI	48	36.0 - 72.0	74	15	12.0	250.0	0.0	85	10.0	330	150
MA348S-15RWI	48	36.0 - 72.0	74	15	15.0	200.0	0.0	85	10.0	220	150
MA348S-24RWI	48	36.0 - 72.0	74	15	24.0	125.0	0.0	84	10.0	100	150
MA348D-05RWI	48	36.0 - 72.0	65	15	±5.0	±250.0	±0.0	80	10.0	±220	150
MA348D-12RWI	48	36.0 - 72.0	74	15	±12.0	±125.0	±0.0	84	10.0	±150	150
MA348D-15RWI	48	36.0 - 72.0	74	15	±15.0	±100.0	±0.0	84	10.0	±100	150

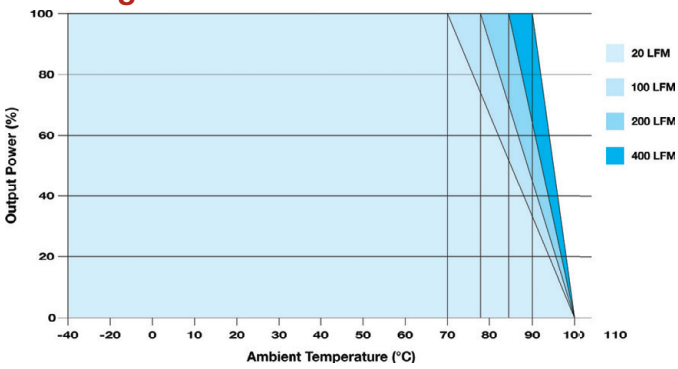
Notes:

1. 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.
2. Transient recovery is measured to within a 1% error band for a load step change of 75% to 100%.
3. Operation at no-load will not damage these units.
4. An external 220 µF/100V capacitor connected across the input pins is required to meet EN61000-4-4 and EN61000-4-5.
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.
6. 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 5V input units a 8.2 µF is recommended, for 12V input units, a 3.3 µF; and for 24V & 48V units a 1.5 µF.
7. 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.

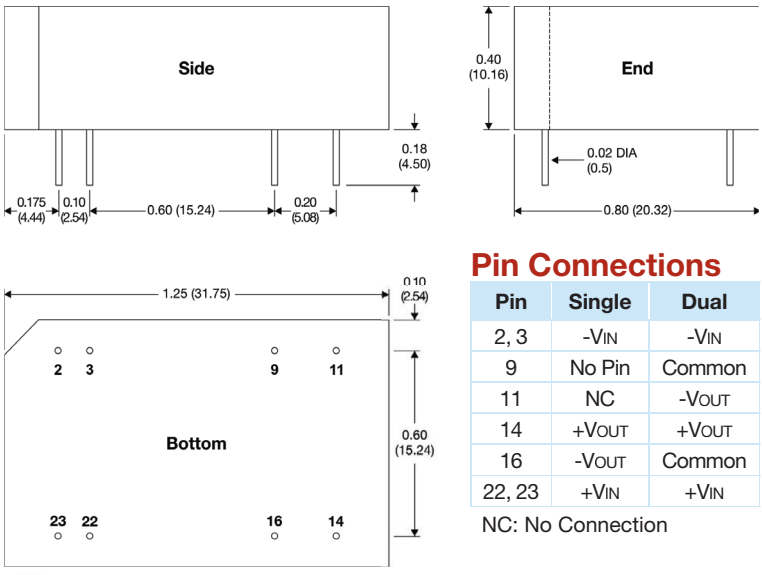
For 1.5 kV Isolation, See **MA300-xxRW** Series Datasheet

For 4:1 Inputs, See **MA300-xxRU** Series Datasheet

Derating Curve



Mechanical Dimensions



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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