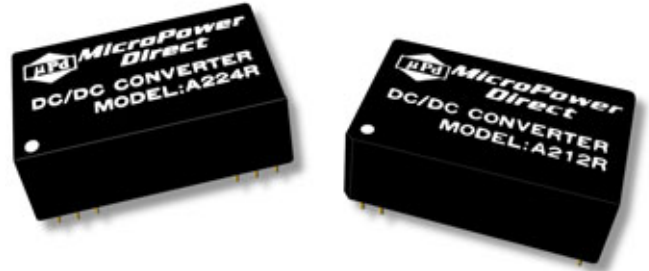


# A200R Series

## Compact, Regulated, 2W Single & Dual Output DC/DC Converters



### Key Features:

- 2W Output Power
- Compact DIP Case
- 500 VDC Isolation
- Tight Line/Load Regulation
- Single & Dual Outputs
- 20 Standard Models
- 1.0 MH MTBF
- Industry Standard Pin-Out

### 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	10.8	12.0	13.2	
	24 VDC Input	21.6	24.0	26.4	
	48 VDC Input	43.2	48.0	52.8	
Input Filter	π (Pi) Filter				
Reverse Polarity Input Current				0.5	A
Short Circuit Input Power				2,000	mW

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±2.0	±4.0	%
Output Voltage Balance	Dual Output , Balanced Loads		±1.0	±3.0	%
Line Regulation	V <sub>in</sub> = Min to Max		±0.2	±0.3	%
Load Regulation	I <sub>out</sub> = 10% to 100%		±0.2	±0.5	%
Ripple & Noise (20 MHz) (Note 1)			40	50	mV P - P
Ripple & Noise (20 MHz)	Over Line, Load & Temp.			75	mV P - P
Ripple & Noise (20 MHz)				5	mV rms
Output Power Protection		120			%
Transient Recovery Time (Note 2)	50% Load Step Change			50	µSec
Transient Response Deviation				±6.0	%
Temperature Coefficient			±0.01	±0.02	%/°C
Output Short Circuit	Continuous				

#### General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	500			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		100	150	pF
Switching Frequency		40	80		kHz

#### Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range		-25		+71	°C
		-25		+90	°C
Storage Temperature Range		-40		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

#### Physical

Case Size	1.25 x 0.80 x 0.40 Inches (31.8 x 20.3 x 10.2 mm)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.42 Oz (12g)

#### Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign		800		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		15.0	
	24 VDC Input	-0.7		30.0	
	48 VDC Input	-0.7		55.0	
Lead Temperature	1.5 mm From Case For 10 Sec.			260	°C
Internal Power Dissipation	All Models			3,000	mW

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

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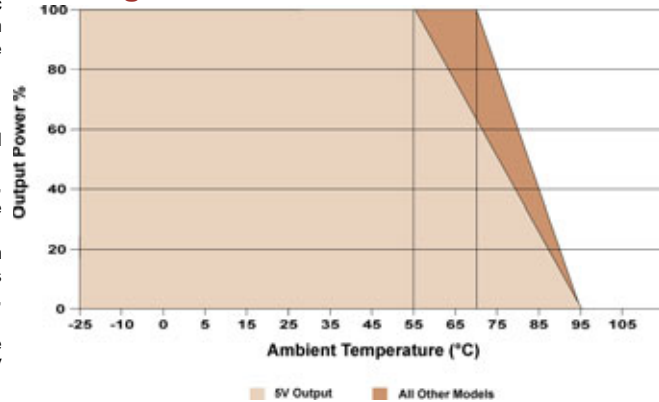
## Model Selection Guide

Model Number	Input					Output			Efficiency (% Typ)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Reflected Ripple Current (mA, Typ)	Voltage (VDC)	Current (mA, Max)	Current (mA, Min)		
	Nominal	Range	Full-Load	No-Load						
A201R	5	4.5 - 5.5	800	80	80	5.0	400	0.0	50	1,500
A202R	5	4.5 - 5.5	730	80	80	12.0	165	0.0	54	1,500
A203R	5	4.5 - 5.5	690	80	80	15.0	133	0.0	57	1,500
A204R	5	4.5 - 5.5	740	80	80	±12.0	±83	±0.0	53	1,500
A205R	5	4.5 - 5.5	740	80	80	±15.0	±66	±0.0	51	1,500
A211R	12	10.8 - 13.2	330	40	30	5.0	400	0.0	50	700
A212R	12	10.8 - 13.2	295	40	30	12.0	165	0.0	56	700
A213R	12	10.8 - 13.2	265	40	30	15.0	133	0.0	62	700
A214R	12	10.8 - 13.2	280	40	30	±12.0	±83	±0.0	59	700
A215R	12	10.8 - 13.2	280	40	30	±15.0	±66	±0.0	59	700
A221R	24	21.6 - 26.4	163	20	15	5.0	400	0.0	51	350
A222R	24	21.6 - 26.4	135	20	15	12.0	165	0.0	61	350
A223R	24	21.6 - 26.4	135	20	15	15.0	133	0.0	61	350
A224R	24	21.6 - 26.4	135	20	15	±12.0	±83	±0.0	61	350
A225R	24	21.6 - 26.4	135	20	15	±15.0	±66	±0.0	61	350
A231R	48	43.2 - 52.8	83	10	10	5.0	400	0.0	50	135
A232R	48	43.2 - 52.8	70	10	10	12.0	165	0.0	59	135
A233R	48	43.2 - 52.8	70	10	10	15.0	133	0.0	59	135
A234R	48	43.2 - 52.8	80	10	10	±12.0	±83	±0.0	51	135
A235R	48	43.2 - 52.8	80	10	10	±15.0	±66	±0.0	51	135

### Notes:

- When measuring output ripple, it is recommended that an external 0.33  $\mu\text{F}$  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. For noise sensitive applications, the use of 1.5  $\mu\text{F}$  capacitors will reduce the output ripple.
- Transient recovery is measured to within a 1% error band for a load step change of 50% to 100%.
- Operation at no-load will not damage these units. However, they may not meet all specifications.
- Dual output units may be connected to provide a 24 VDC 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 <1.0 $\Omega$  at 100 kHz) capacitor be mounted close to the converter. For 5V input units a 2.2  $\mu\text{F}$  is recommended, for 12V input units, a 1.0  $\mu\text{F}$ ; and for 24V & 48V units a 0.47  $\mu\text{F}$ .
- 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



### Pin Connections

Pin	Single	Dual
1, 24	+Vin	+Vin
2, 23	NC	-Vout
3, 22	NC	Common
10, 15	-Vout	Common
11, 14	+Vout	+Vout
12, 13	-Vin	-Vin

NC: No Connection

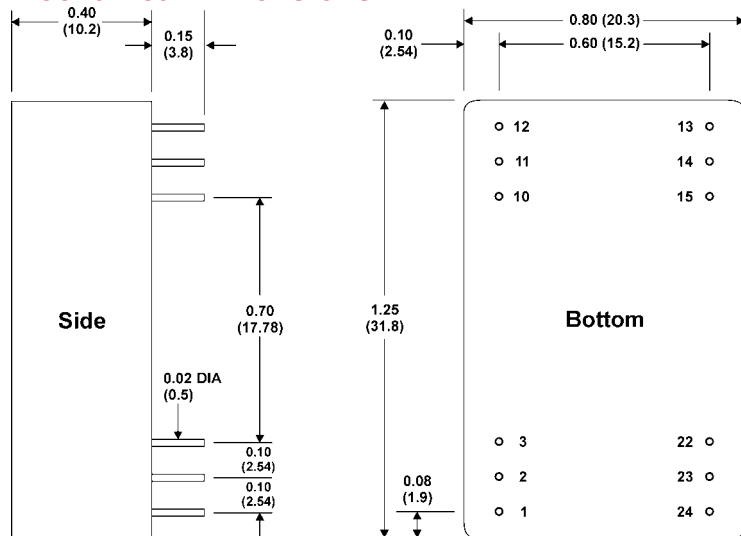
### Capacitive Load

Single Output	Dual Output
470 $\mu\text{F}$ Max	±220 $\mu\text{F}$ Max

### Mechanical Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx =  $\pm 0.01$  ( $\pm 0.25$ )
- Leads are tin plated for improved solderability.

### Mechanical Dimensions



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