MA1500RW Series

2:1 Input Range, 15W Single & Dual Output DC/DC Converters

Key Features:

- 15W Output Power
- 2:1 Input Voltage Range
- Compact DIP Case
- 1,600 VDC I/O Isolation
- Meets EN 55032 "A"
- Single & Dual Outputs
- Remote On/Off Control
- Wide Temperature 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	12 VDC Input	9.0	12.0	18.0	VDC
	24 VDC Input	18.0	24.0	36.0	
	48 VDC Input	36.0	48.0	72.0	
Start Up Time	Nominal VIN & Constant Resistive Load		20		mS
Input Filter	π (Pi) Filter				
Input Reflected Ripple Current				20.0	mA P - P

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±1.0		%
Line Regulation, VIN = Min to Max	Single Output			±0.2	%
	Dual Output			±0.5	
Load Regulation, See Note 2	Single Output			±0.5	%
	Dual Output			±1.0	
Cross Regulation, Dual Output	See Note 3			±5.0	%
Ripple & Noise (20 MHz)	See Note 4			60	mV P - P
Transient Recovery Time, See Note 5	25% Load Step Change		250		μSec
Transient Response Deviation				±3.0	%
Output Power Protection			150		% I_{OUT}
Temperature Coefficient			±0.02		%/°C
Output Short Circuit Protection	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Input/Output, 60 Seconds	1,600			VDC
	Case/Input, Output, 60 Seconds	1,600			
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz/1V		2,000		pF
Switching Frequency			330		kHz

Remote On/Off (See Page 3)

Parameter	Conditions	Min.	Typ.	Max.	Units
Supply On	See Note On Page 3	3.0		12	VDC
Supply Off		0.0		1.2	VDC
Standby Input Current			5.0		mA
Control Common	Referenced to -Input (Pins 2, 3)				

Environmental

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

Physical

Case Size	See Mechanical Diagram (Page 3)
Case Material	Copper With Nickel Coating (UL94V-0)
Weight	0.705 Oz (20g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	460			kHours

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	12 VDC Input			36.0	VDC
	24 VDC Input			50.0	
	48 VDC Input			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.

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

T: (781) 344-8226
F: (781) 344-8481
E: sales@micropowerdirect.com
W: www.micropowerdirect.com

Model Selection Guide

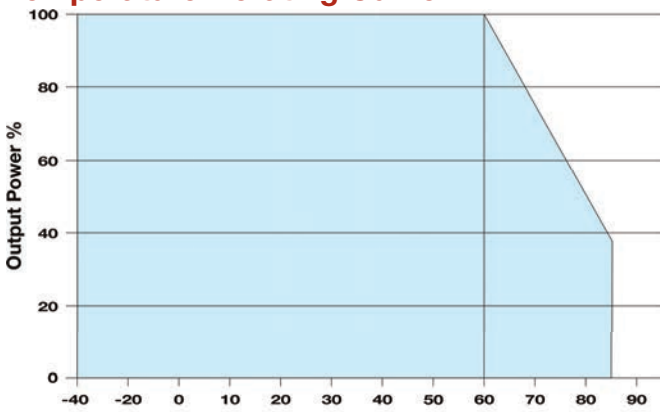
Model Number	Input				Output			Over Voltage Protection (VDC)	Max Capacitive Load (µF Max)	Efficiency (%, Typ)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range	Full-Load	No-Load							
MA1512S-03RW	12	9.0 - 18.0	1,309	15	3.3	4,000	0.0	3.9	4,700	86	3,000
MA1512S-051RW	12	9.0 - 18.0	1,465	15	5.1	3,000	0.0	6.2	3,300	89	3,000
MA1512S-12RW	12	9.0 - 18.0	1,436	15	12.0	1,250	0.0	15.0	600	89	3,000
MA1512S-15RW	12	9.0 - 18.0	1,420	15	15.0	1,000	0.0	18.0	400	90	3,000
MA1512D-05RW	12	9.0 - 18.0	1,488	15	±5.0	±1,500	±0.0	±6.2	±1,500	86	3,000
MA1512D-12RW	12	9.0 - 18.0	1,420	15	±12.0	±625	±0.0	±15.0	±288	90	3,000
MA1512D-15RW	12	9.0 - 18.0	1,420	15	±15.0	±500	±0.0	±18.0	±200	90	3,000
MA1524S-03RW	24	18.0 - 36.0	647	10	3.3	4,000	0.0	3.9	4,700	87	1,500
MA1524S-051RW	24	18.0 - 36.0	732	10	5.1	3,000	0.0	6.2	3,300	89	1,500
MA1524S-12RW	24	18.0 - 36.0	710	10	12.0	1,250	0.0	15.0	600	90	1,500
MA1524S-15RW	24	18.0 - 36.0	702	10	15.0	1,000	0.0	18.0	400	91	1,500
MA1524D-05RW	24	18.0 - 36.0	744	10	±5.0	±1,500	±0.0	±6.2	±1,500	86	1,500
MA1524D-12RW	24	18.0 - 36.0	710	10	±12.0	±625	±0.0	±15.0	±288	90	1,500
MA1524D-15RW	24	18.0 - 36.0	710	10	±15.0	±500	±0.0	±18.0	±200	90	1,500
MA1548S-03RW	48	36.0 - 75.0	327	5	3.3	4,000	0.0	3.9	4,700	86	1,000
MA1548S-051RW	48	36.0 - 75.0	370	5	5.1	3,000	0.0	6.2	3,300	88	1,000
MA1548S-12RW	48	36.0 - 75.0	359	5	12.0	1,250	0.0	15.0	600	89	1,000
MA1548S-15RW	48	36.0 - 75.0	359	5	15.0	1,000	0.0	18.0	400	89	1,000
MA1548D-05RW	48	36.0 - 75.0	372	5	±5.0	±1,500	±0.0	±6.2	±1,500	86	1,000
MA1548D-12RW	48	36.0 - 75.0	359	5	±12.0	±625	±0.0	±15.0	±288	89	1,000
MA1548D-15RW	48	36.0 - 75.0	355	5	±15.0	±500	±0.0	±18.0	±200	90	1,000

Notes:

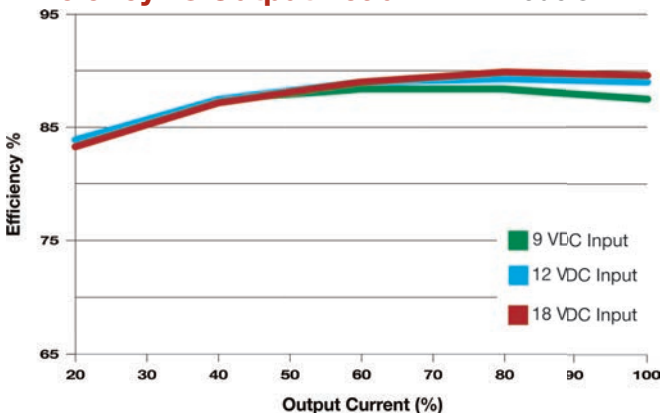
1. The specified maximum capacitive load is for each output.
2. Load regulation is specified for a load change of 0% to 100%.
3. When measuring cross regulation, the load on one output is varied from 25% to 100% while the other output is held at 100%.
4. Output ripple is measured with a 1.0 µF capacitor connected from the +Vout to the -Vout pins for single output units and from each output to common for dual output models. See the typical connection diagram & notes on page 3.
5. Transient recovery is measured to within a 1% error band for a load step change of 75% to 50% to 25%.
6. Operation at no-load will not damage these units. However, they may not meet all specifications.
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.

MPD offers a wide range of DC/DC converters in the standard 24 pin DIP package. Models range from 1W to 15W and offer wide input ranges, high isolation & tight regulation. Many are approved to EN 60950. For full information, go to our website or contact the factory.

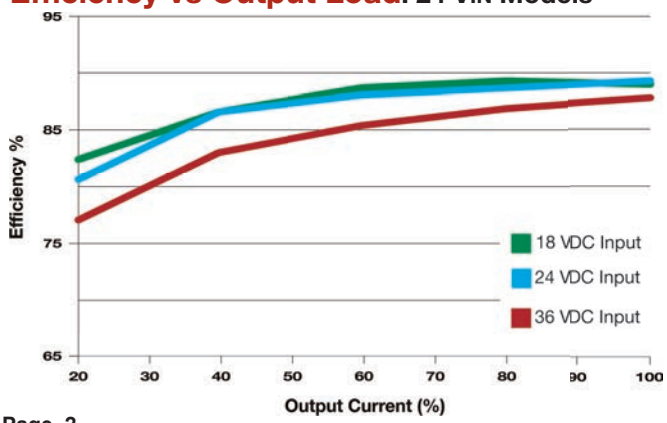
Temperature Derating Curve



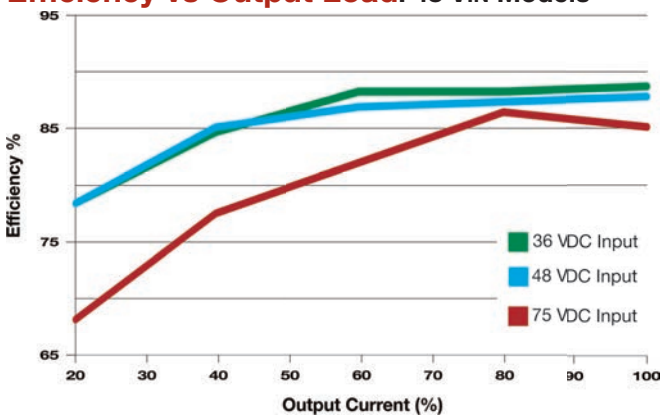
Efficiency vs Output Load: 12 VIN Models



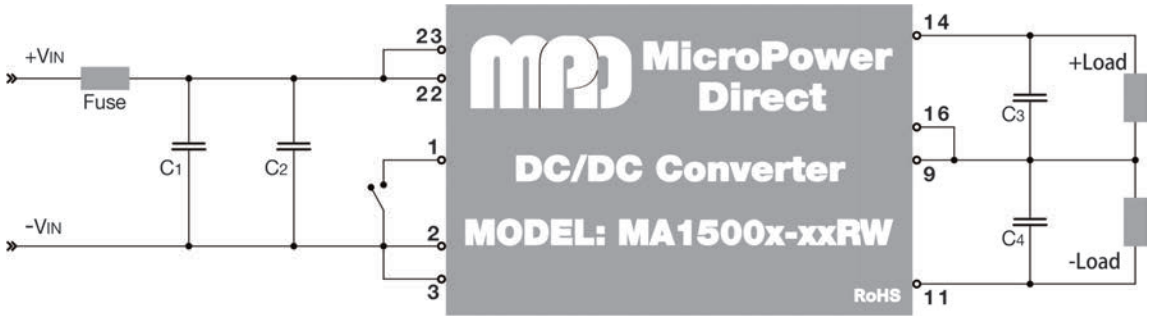
Efficiency vs Output Load: 24 VIN Models



Efficiency vs Output Load: 48 VIN Models



Typical Connection



To meet the requirements of EN 61000-4-4 & EN 61000-4-5, the external filter capacitors (C_1 & C_2) in the diagram above) are required. The recommended value for C_1 & C_2 is 330 µF/100V. A single 680 µF/100V capacitor may also be used.

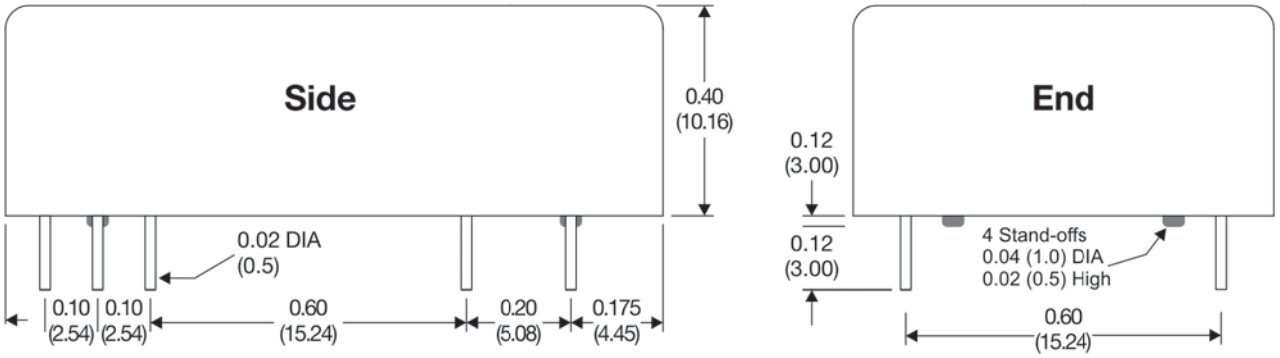
When measuring output ripple, it is recommended that an external 1.0 µF ceramic capacitor be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units. For noise sensitive applications, the use of 3.3 µF capacitors will reduce the output ripple.

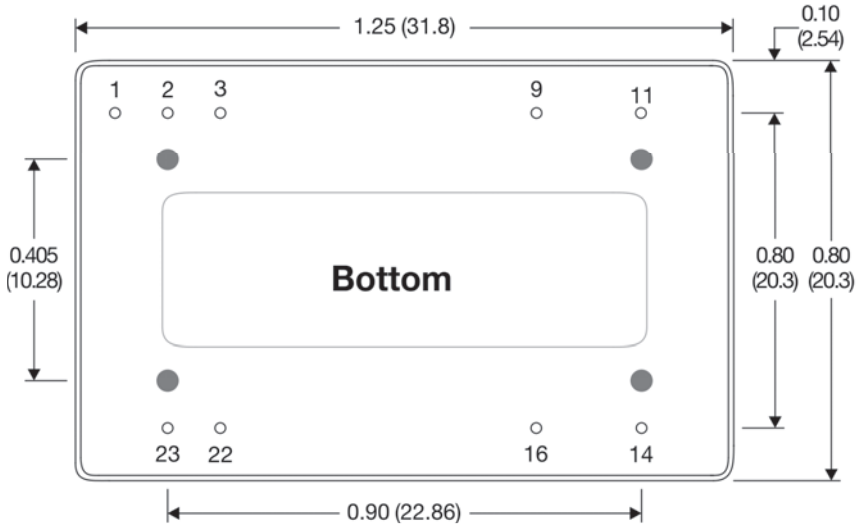
The Remote On/Off circuit is referenced to the minus input of the unit (pins 2 & 3). If the On/Off input (pin 1) is connected to the minus input, the unit is shut off. If pin 1 is left open, the unit operates normally.

EMI Characteristics

Parameter	Standard	Criteria/Level
Radiated Emissions	EN 55032	Class A
Conducted Emissions	EN 55032	Class A
ESD	EN 61000-4-2	B
RS	EN 61000-4-3	A
EFT	EN 61000-4-4	B
Surge	EN 61000-4-5	B
CS	EN 61000-4-6	A
PFM	EN 61000-4-8	A

Mechanical Dimensions





Pin Connections

Pin	Single	Dual
1	Remote On/Off	Remote On/Off
2	-Vin	-Vin
3	-Vin	-Vin
9	No Pin	Common
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

NC: No Connection

Mechanical Notes:

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