MA800RW Series

2:1 Input Range, 8W Single & Dual Output DC/DC Converters

Key Features:

- 8W Output Power
- EN 60950 Approved
- 2:1 Input Voltage Range
- Compact DIP Case
- 1,500 VDC I/O Isolation
- Meets EN 55032 “A”
- Single & Dual Outputs
- Wide Temperature Operation
- 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	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	
Input Filter	π (Pi) Filter				
Input Reflected Ripple Current			35.0		mA P - P

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±1.0		%
Line Regulation	VIN = Min to Max			±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			75	mV P - P
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	1,500			VDC
	Case/Input, Output, 60 Seconds	1,000			
Isolation Resistance	500 VDC		1,000		MΩ
Isolation Capacitance	100 kHz/1V		1,000		pF
Switching Frequency			330		kHz

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	0.60 Oz (17g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	910			kHours
Safety Standards	UL 60950, EN 62368, EN 60950				

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	12 VDC Input			25.0	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.

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Model Selection Guide

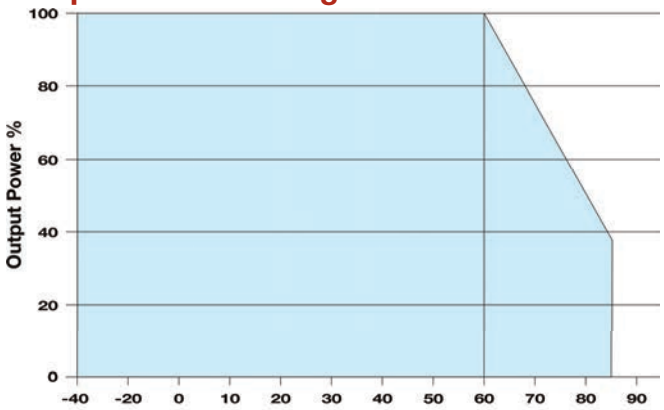
Model Number	Input				Output			Max Capacitive Load (µF Max)	Efficiency (%, Typ)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)			
	Nominal	Range	Full-Load	No-Load						
MA812S-03RW	12	9.0 - 18.0	687	20	3.3	2,000	0.0	3,300	80	2,000
MA812S-05RW	12	9.0 - 18.0	762	20	5.0	1,500	0.0	2,200	82	2,000
MA812S-09RW	12	9.0 - 18.0	794	20	9.0	888	0.0	470	84	2,000
MA812S-12RW	12	9.0 - 18.0	784	20	12.0	665	0.0	470	85	2,000
MA812S-15RW	12	9.0 - 18.0	803	20	15.0	535	0.0	220	83	2,000
MA812D-05RW	12	9.0 - 18.0	813	20	±5.0	±800	±0.0	1,000	82	2,000
MA812D-09RW	12	9.0 - 18.0	794	20	±9.0	±444	±0.0	330	84	2,000
MA812D-12RW	12	9.0 - 18.0	794	20	±12.0	±335	±0.0	220	84	2,000
MA812D-15RW	12	9.0 - 18.0	794	20	±15.0	±265	±0.0	100	84	2,000
MA824S-03RW	24	18.0 - 36.0	344	15	3.3	2,000	0.0	3,300	80	1,000
MA824S-05RW	24	18.0 - 36.0	381	15	5.0	1,500	0.0	2,200	82	1,000
MA824S-09RW	24	18.0 - 36.0	387	15	9.0	888	0.0	470	86	1,000
MA824S-12RW	24	18.0 - 36.0	392	15	12.0	665	0.0	470	85	1,000
MA824S-15RW	24	18.0 - 36.0	397	15	15.0	535	0.0	220	84	1,000
MA824D-05RW	24	18.0 - 36.0	407	15	±5.0	±800	±0.0	1,000	82	1,000
MA824D-09RW	24	18.0 - 36.0	392	15	±9.0	±444	±0.0	330	85	1,000
MA824D-12RW	24	18.0 - 36.0	402	15	±12.0	±335	±0.0	220	83	1,000
MA824D-15RW	24	18.0 - 36.0	392	15	±15.0	±265	±0.0	100	85	1,000
MA848S-03RW	48	36.0 - 72.0	172	15	3.3	2,000	0.0	3,300	80	500
MA848S-05RW	48	36.0 - 72.0	191	15	5.0	1,500	0.0	2,200	82	500
MA848S-09RW	48	36.0 - 72.0	198	15	9.0	888	0.0	470	84	500
MA848S-12RW	48	36.0 - 72.0	198	15	12.0	665	0.0	470	84	500
MA848S-15RW	48	36.0 - 72.0	198	15	15.0	535	0.0	220	84	500
MA848D-05RW	48	36.0 - 72.0	203	15	±5.0	±800	±0.0	1,000	82	500
MA848D-09RW	48	36.0 - 72.0	198	15	±9.0	±444	±0.0	330	84	500
MA848D-12RW	48	36.0 - 72.0	196	15	±12.0	±335	±0.0	220	85	500
MA848D-15RW	48	36.0 - 72.0	196	15	±15.0	±265	±0.0	100	85	500

Notes:

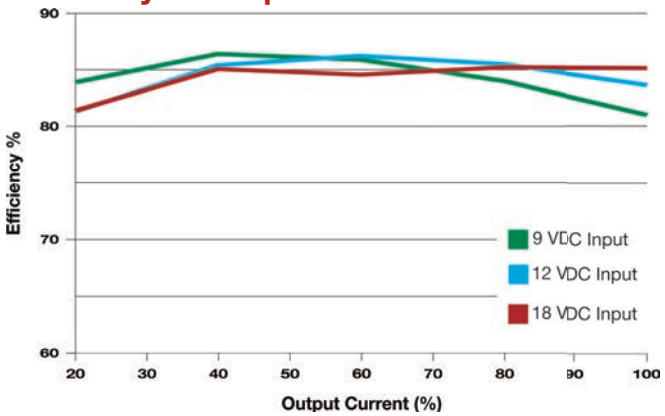
1. The specified maximum capacitive load is for each output.
2. Load regulation is specified for a load change of 0% to 100%. Load regulation for 3.3V output models is ±1.5% max for a load change of 0% to 100%.
3. When measuring cross regulation, the load on one output is varied from 25% to 100% while 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. Operation at no-load will not damage these units. However, they may not meet all specifications.
6. 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.

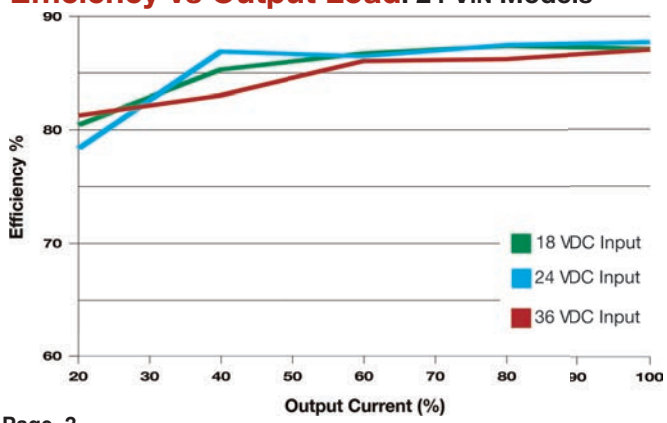
Temperature Derating Curve



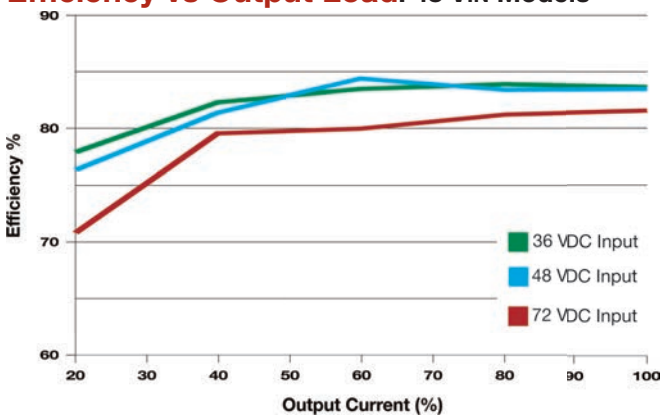
Efficiency vs Output Load: 12 VIN Models



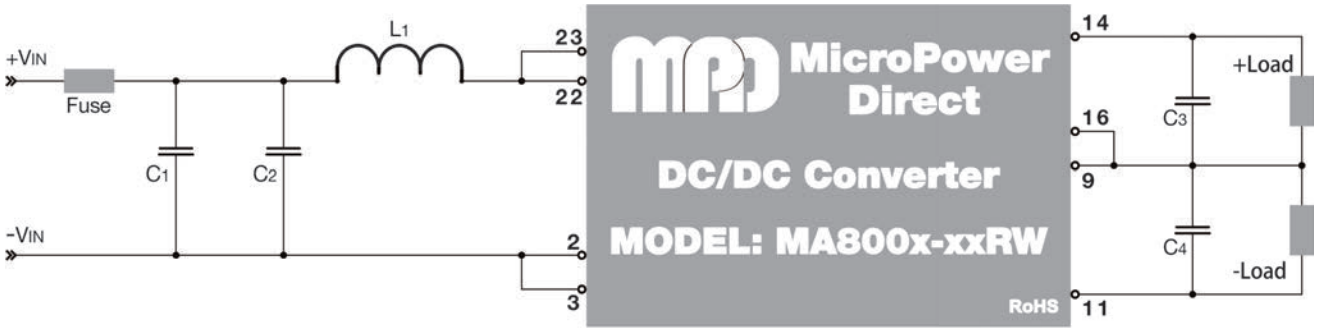
Efficiency vs Output Load: 24 VIN Models



Efficiency vs Output Load: 48 VIN Models



Typical Connection



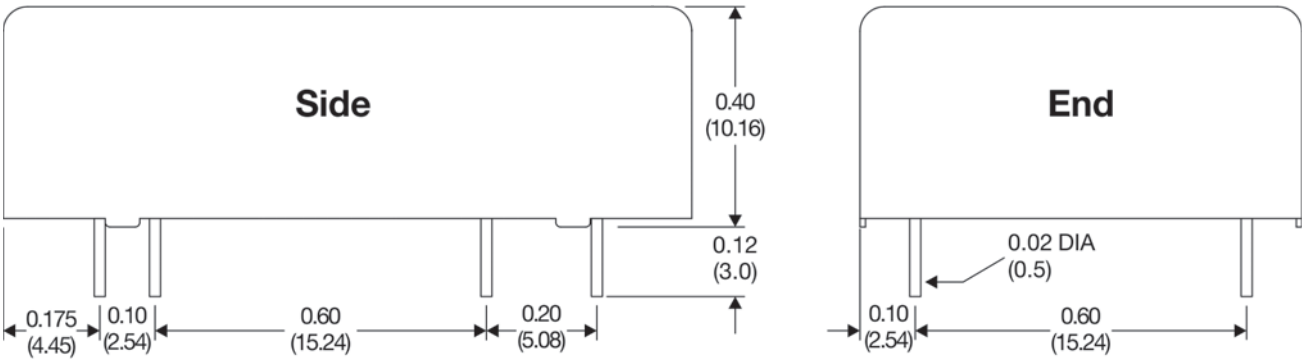
To help meet conducted emissions requirements, the filter components (C_2, & L_1) in the diagram above should be used. The recommended values are 100 μF/100V for C_2 and 12 μH for L_1. These components should be mounted as close to the module as possible. To meet the requirements of EN 61000-4-4 and EN 61000-4-5, an external filter capacitor (C_1 in the diagram above) is required. The recommended value for C_1 is 220 μF/100V.

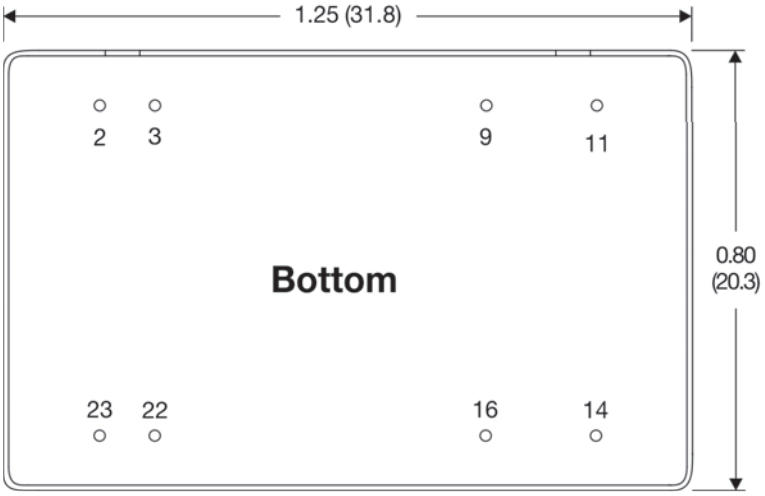
When measuring output ripple, it is recommended that an external 1.0 μF ceramic capacitor be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units. For noise sensitive applications, the use of 3.3 μF capacitors will reduce the output ripple.

EMI Characteristics

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

Mechanical Dimensions





Pin Connections

Pin	Single	Dual
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)