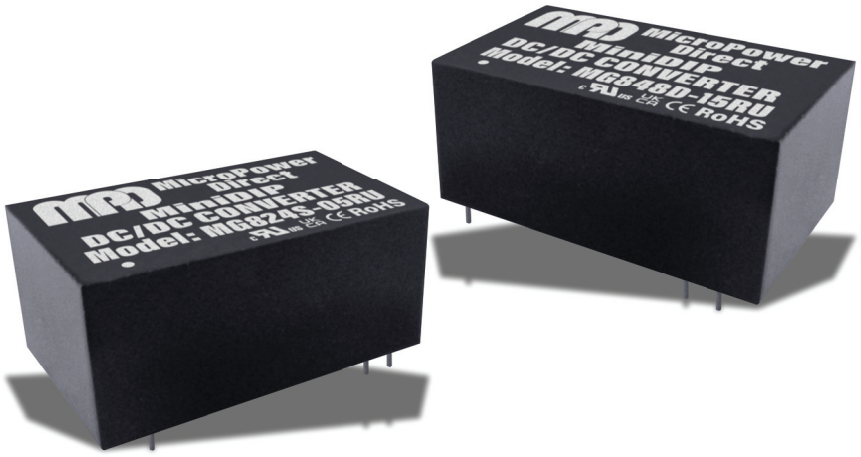
MG800RU

Compact 8W MiniDIP Ultra Wide 4:1 Input DC/DC Converters



Key Features:

- 8W Output Power
- Compact MiniDIP Case
- EN 62368 Approved
- Ultra-Wide 4:1 Input Range
- High Efficiency
- 1,500 VDC Isolation
- Single and Dual Outputs
- >2.95 MHour MTBF
- -40°C to +90°C Operation
- ***LOW COST***

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	24 VDC Input	9.0	24.0	36.0	VDC
	48 VDC Input	18.0	48.0	75.0	
Input Start-up Threshold	24 VDC Input			9.0	VDC
	48 VDC Input			18.0	
Under Voltage Shutdown	24 VDC Input		8.0		VDC
	48 VDC Input		16.0		
Input Filter	π (Pi) Filter				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy				±2.0	%
Output Voltage Balance	Dual Output, Balanced Loads		±1.0	±2.0	%
Line Regulation	V_{IN} = Min To Max		±0.2	±0.8	%
Load Regulation	I_{OUT} = 0% To 100%		±0.5	±1.0	%
Ripple & Noise (20 MHz)	See Note 2			55	mV P - P
Transient Recovery Time	See Note 3			500	µSec
Transient Response Deviation			±3.0	±5.0	%
Overload Protection	See Note 4		150		%
Temperature Coefficient			±0.01	±0.02	%/°C
Output Short Circuit	See Note 5		Continuous (Autorecovery)		

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,500			VDC
	1 Second	1,800			
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		500		pF
Switching Frequency			370		kHz

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+90	°C
Max Case Temperature				+105	°C
Storage Temperature Range		-50		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size & Weight	See Mechanical Diagram (Page 6)
Case Material	Aluminum Alloy, Black Anodized Coating (UL-94V0)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	2.35			MHours
Safety Standards	UL/cUL 62368-1 recognition (UL certificate)				

Absolute Maximum Ratings

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

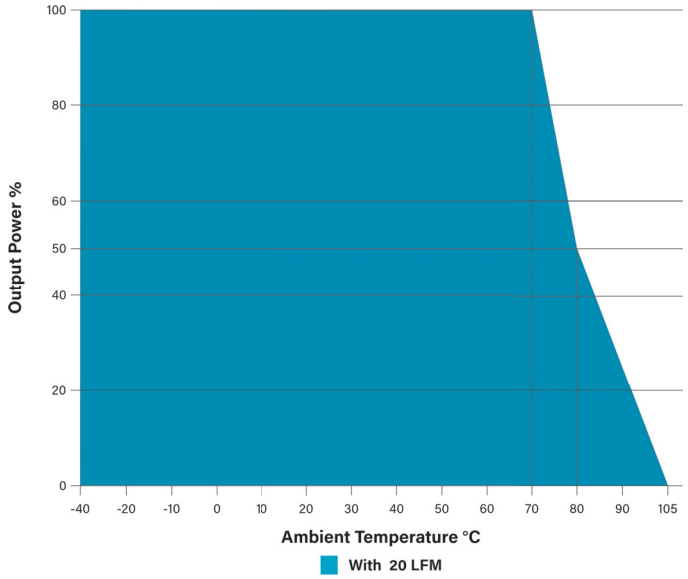
Model Selection Guide

Model Number	Input				Output			Output Capacitive Load (µF Max)	Efficiency (%, Typ)	Fuse Rating Slow-Blow (A)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)			
	Nominal	Range	Full-Load	No-Load						
MG824S-03RU	24	9.0 - 36.0	353	10	3.3	2,000	0.0	680	78	2.00
MG824S-05RU	24	9.0 - 36.0	407	10	5.0	1,600	0.0	680	82	2.00
MG824S-12RU	24	9.0 - 36.0	391	10	12.0	665	0.0	330	85	2.00
MG824S-15RU	24	9.0 - 36.0	393	10	15.0	535	0.0	330	85	2.00
MG824S-24RU	24	9.0 - 36.0	390	10	24.0	335	0.0	150	86	2.00
MG824D-12RU	24	9.0 - 36.0	394	10	±12.0	±335	±0.0	150	85	2.00
MG824D-15RU	24	9.0 - 36.0	385	10	±15.0	±265	±0.0	150	86	2.00
MG848S-03RU	48	18.0 - 75.0	176	8	3.3	2,000	0.0	680	78	1.00
MG848S-05RU	48	18.0 - 75.0	206	8	5.0	1,600	0.0	680	81	1.00
MG848S-12RU	48	18.0 - 75.0	196	8	12.0	665	0.0	330	85	1.00
MG848S-15RU	48	18.0 - 75.0	197	8	15.0	535	0.0	330	85	1.00
MG848S-24RU	48	18.0 - 75.0	195	8	24.0	335	0.0	150	86	1.00
MG848D-12RU	48	18.0 - 75.0	195	8	±12.0	±335	±0.0	150	86	1.00
MG848D-15RU	48	18.0 - 75.0	193	8	±15.0	±265	±0.0	150	86	1.00

Notes:

1. The specified maximum capacitive load is for each output.
2. When measuring output ripple, it is recommended that an external 0.47 µF ceramic capacitor be placed in parallel from the +VOUT pin to the -VOUT pin for single output models, or from each output to common for dual output models.
3. Transient recovery is measured to within a 1% error band for a load step change of 25%.
4. Output overload protection is provided by a Hiccup circuit with auto-recovery.
5. Output short circuit protection is provided by a Hiccup circuit with auto-recovery.
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 Model Selection table above for the correct rating.

Temperature Derating Curve

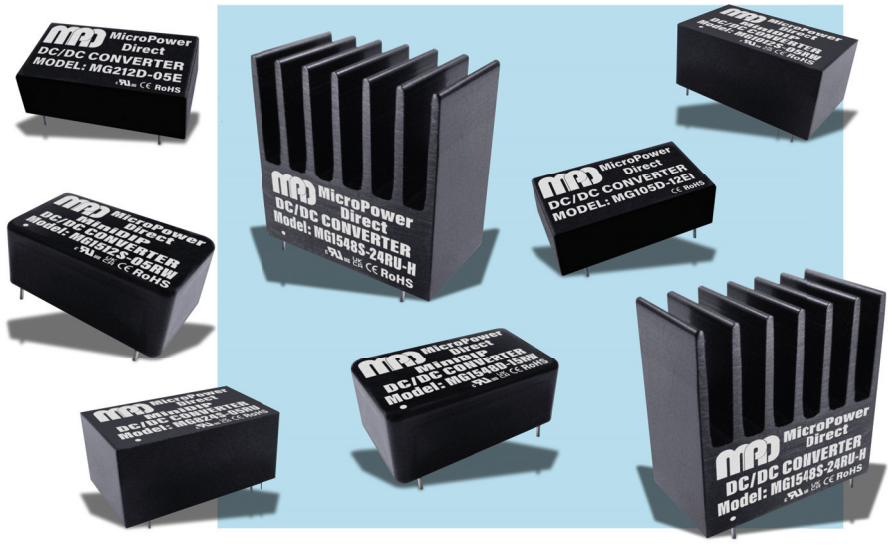


MPD offers a very wide range of DC/DC converters in the compact MiniDIP package. Ranging from 1W to 15W, these units offer

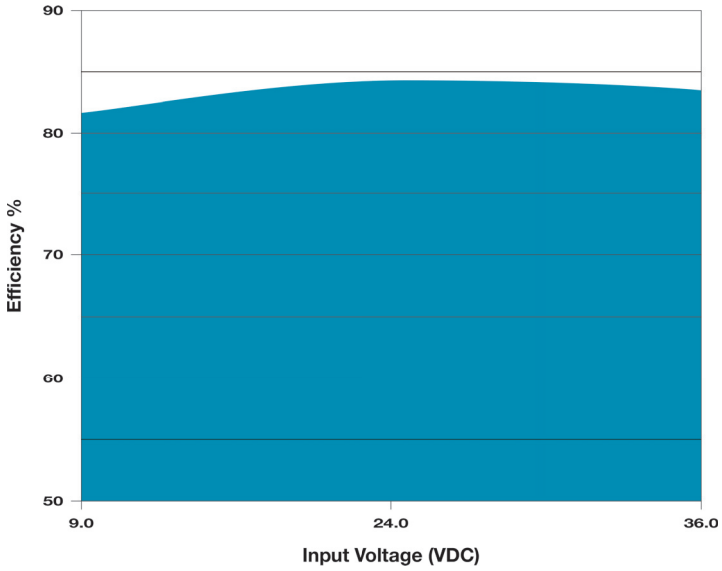
- Compact "MiniDip Packaging
- 1W to 15W Output Power
- Wide 2:1 or 4:1 Inputs
- UL 62368 Recognition (Most Models)
- Single & Dual Outputs
- Wide Temperature Operation
- Tight Regulation
- Low Cost

Call today, or go to our website to find the right, miniature DC/DC power module for your application.

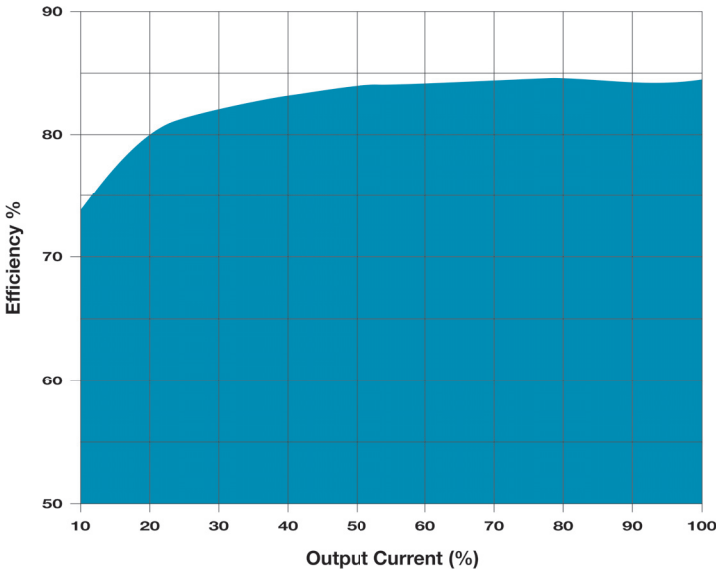
MICROPOWERDIRECT.COM



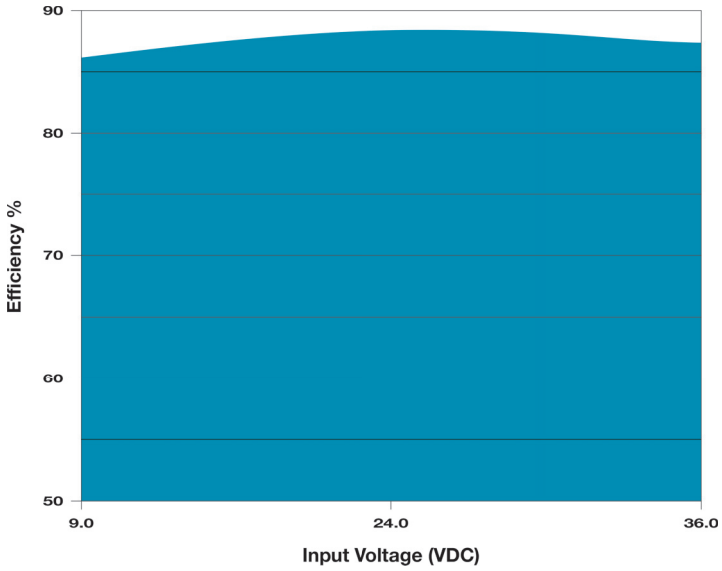
Efficiency vs Input: MG824S-05RU



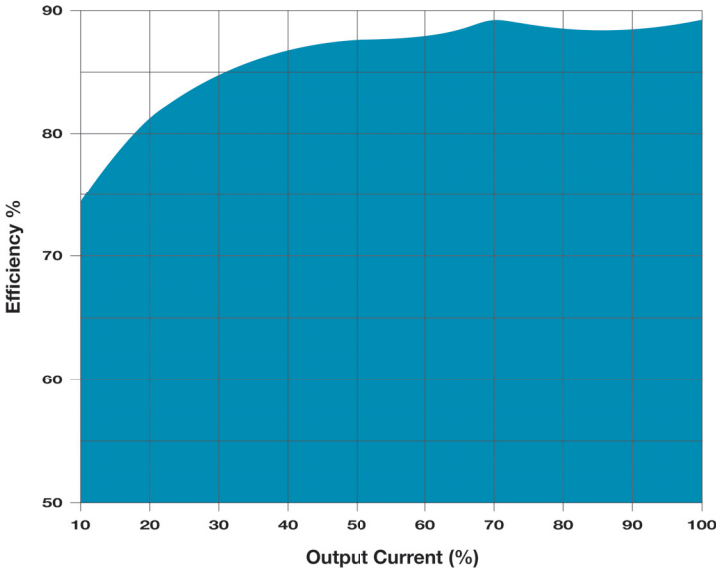
Efficiency vs Output Load: MG824S-05RU



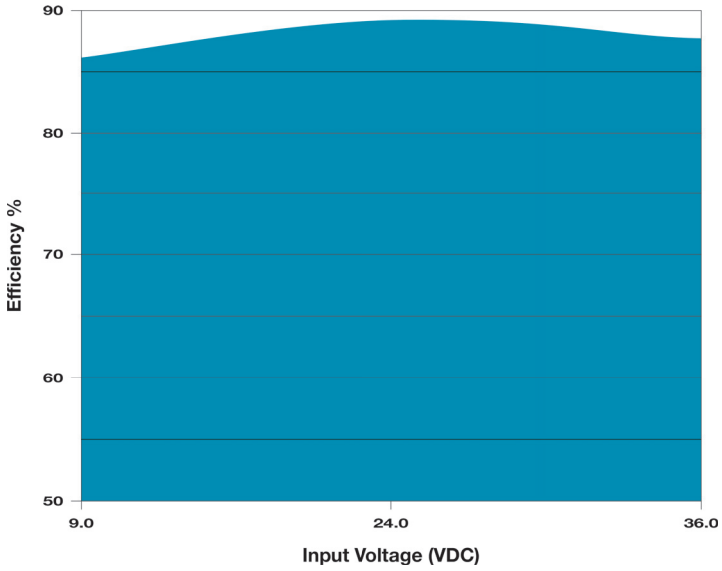
Efficiency vs Input: MG824S-12RU



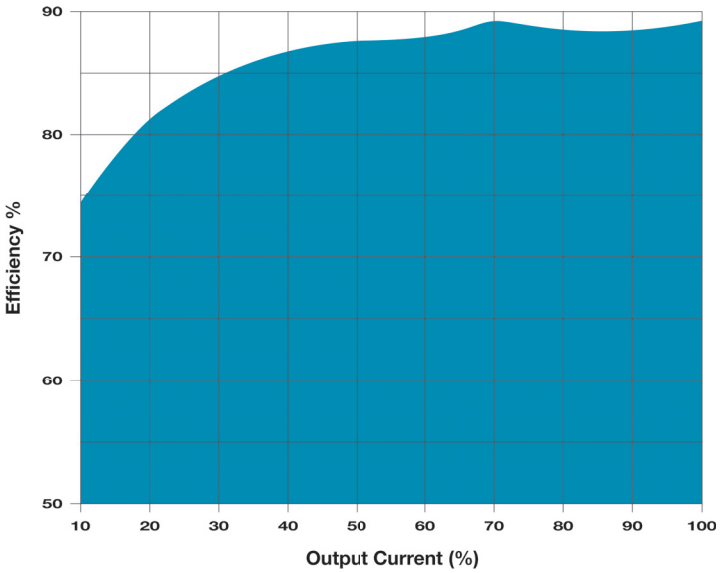
Efficiency vs Output Load: MG824S-12RU



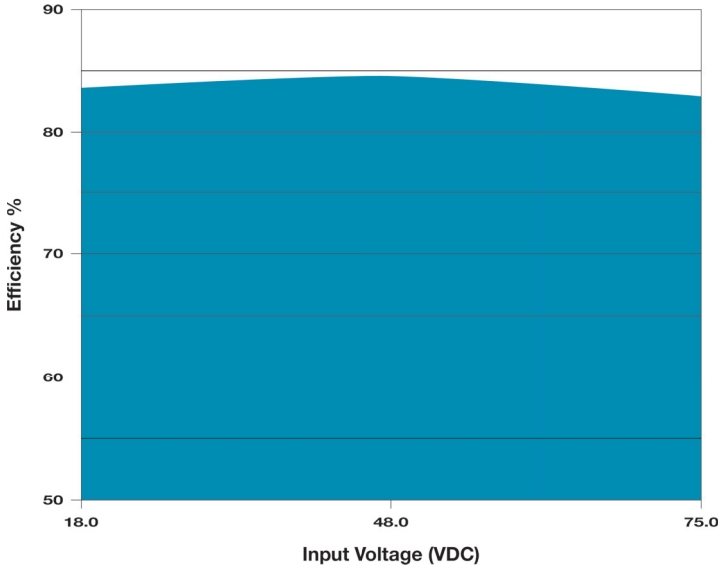
Efficiency vs Input: MG824S-24RU



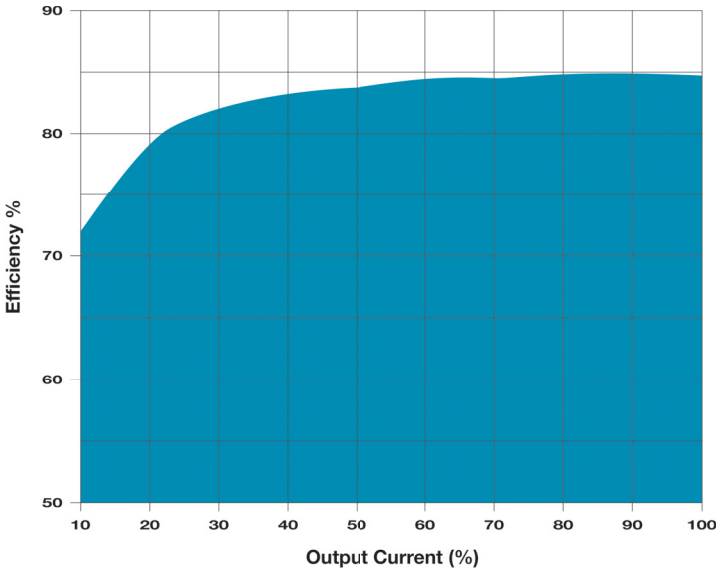
Efficiency vs Output Load: MG824S-24RU



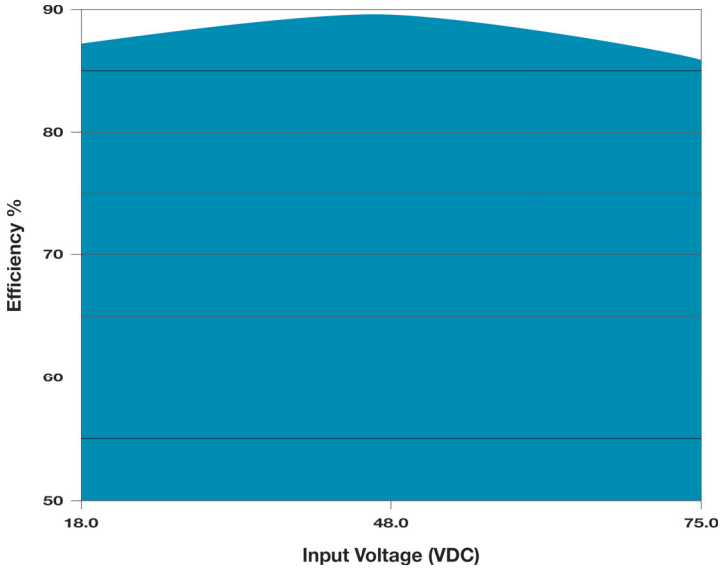
Efficiency vs Input: MG848S-05RU



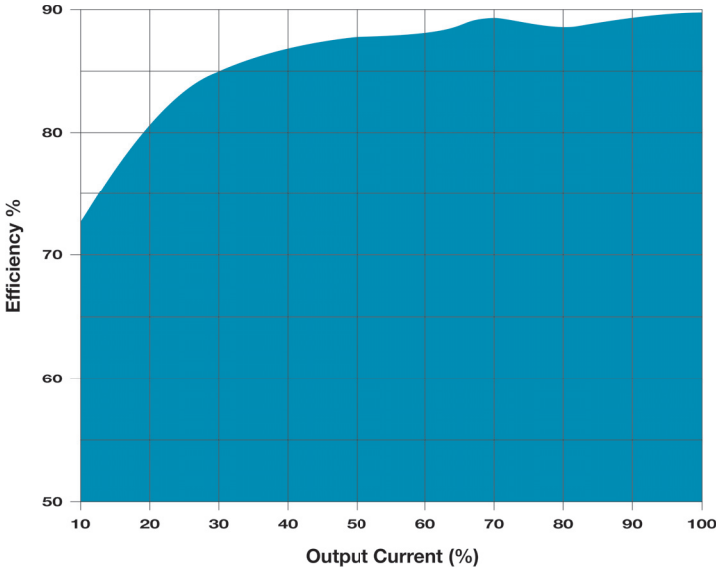
Efficiency vs Output Load: MG848S-05RU



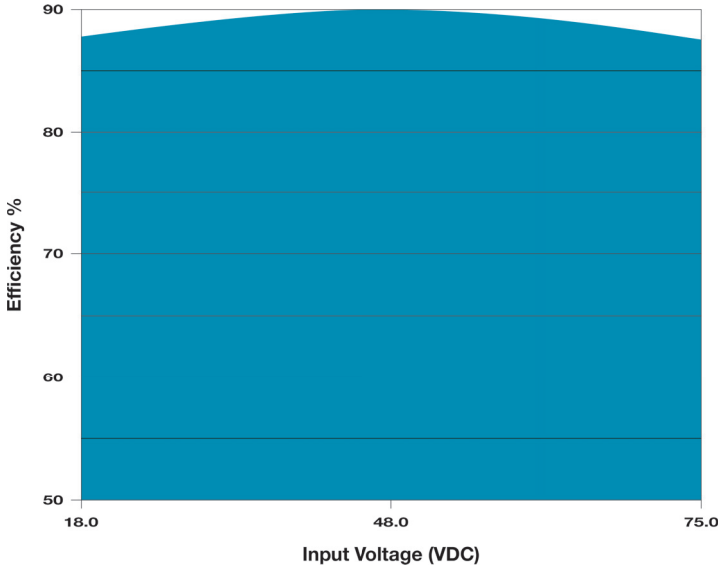
Efficiency vs Input: MG848S-12RU



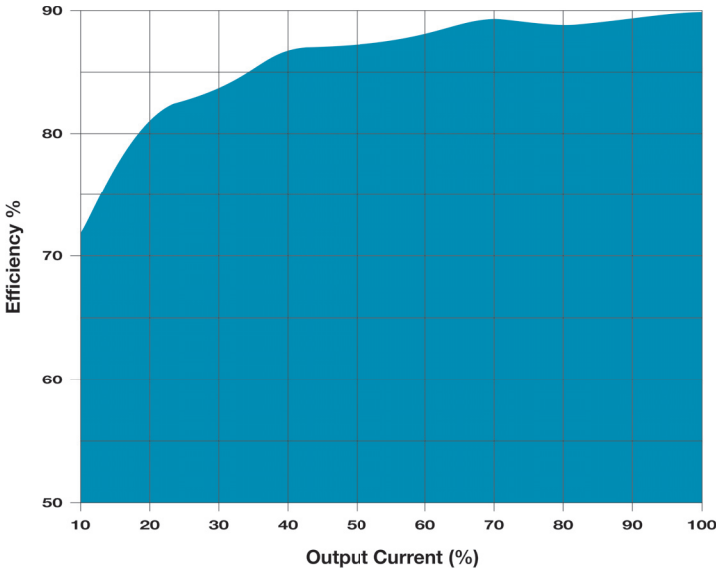
Efficiency vs Output Load: MG848S-12RU



Efficiency vs Input: MG848S-24RU



Efficiency vs Output Load: MG848S-24RU

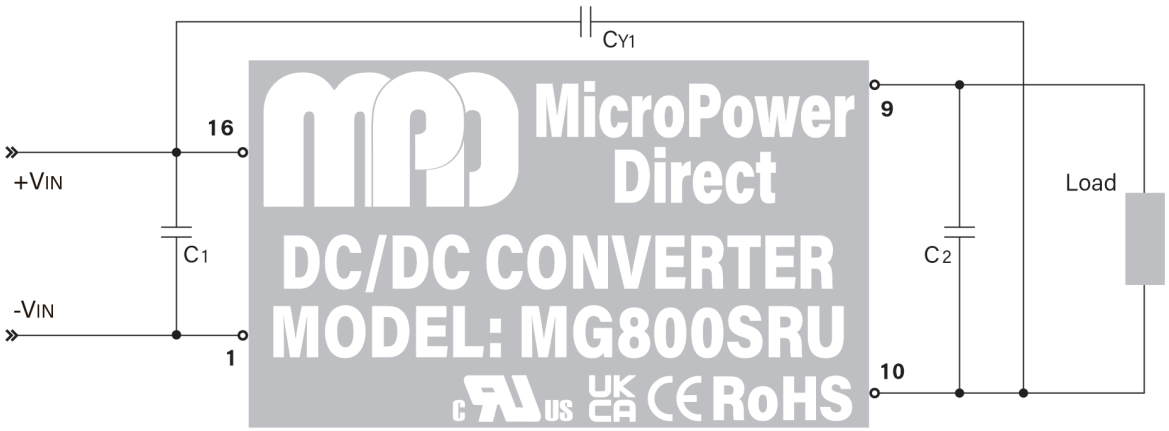


EMI/EMC Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions	EN 55032		Class A
Conducted Emissions	EN 55032		Class A
ESD	EN 61000-4-2	A	±6 kV Contact
			±8kV Air
RS	EN 61000-4-3	A	10V/m
EFT, See note at left	EN 61000-4-4	A	±2 kV
Surge, See note at left	EN 61000-4-5	A	±1 kV
CS	EN 61000-4-6	A	10 Vrms
PFMF	EN 61000-4-8	A	1,000 A/m (1s)

These converters meet the requirements of EN 55032 class A conducted emissions without external components. To meet the requirements of class A radiated emissions, see the Typical EMI Connection diagram below.

Typical EMI Connection: Class A, Single Output

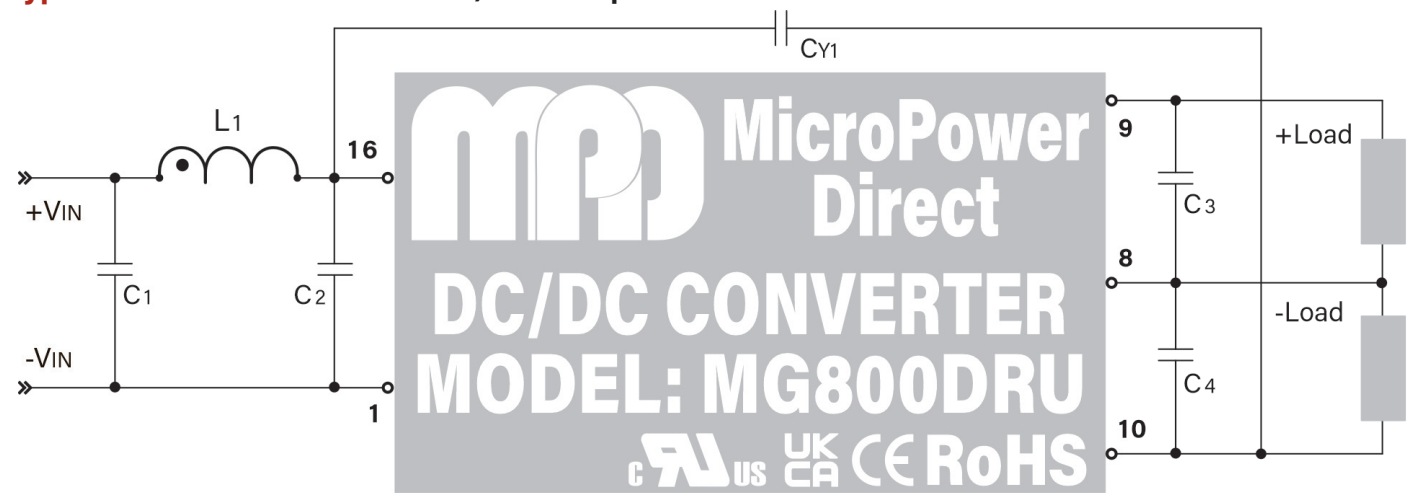


In some applications the addition of input/output capacitors, as shown in the typical connection diagram above, will enhance stability and reduce output ripple. This simple connection includes low ESR (<1Ω at 100 kHz) capacitors C1, C2 and C3 (for dual output units) connected close to the module.

For single output units, to meet the requirements of EN 55032 radiated emissions class A, the addition of capacitor CY1 is required. Recommended component values are given in the table at right.

Model	C1	CY1	C2	C3
MG824SRU	2.2 µF/50V	220 pF/2 kV 1808 X7R	3.3 µF/50V	---
MG824DRU	2.2 µF/50V	470 pF/2 kV 1808 X7R	3.3 µF/50V	3.3 µF/50V
MG848SRU	2.2 µF/100V	220 pF/2 kV 1808 X7R	3.3 µF/50V	---
MG848DRU	2.2 µF/100V	470 pF/2 kV 1808 X7R	3.3 µF/50V	3.3 µF/50V

Typical EMI Connection: Class B, Dual Output

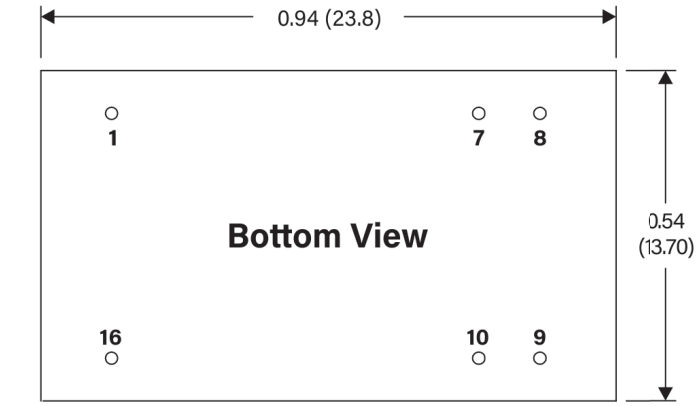


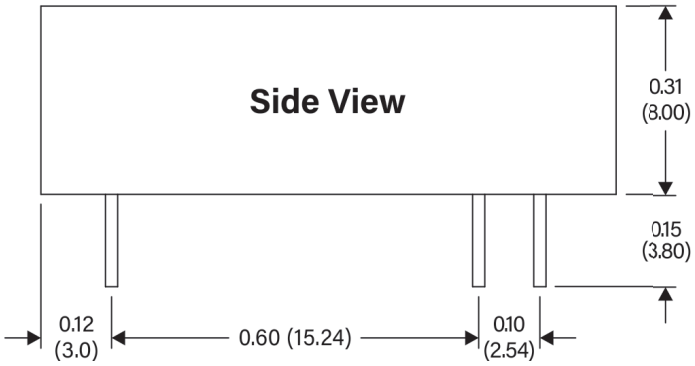
The typical connection diagram shown above again shows the addition of input/output capacitors, as shown to enhance stability and reduce output ripple. This simple connection includes low ESR (<1Ω at 100 kHz) capacitors (C2, C3 & C4) connected close to the module.

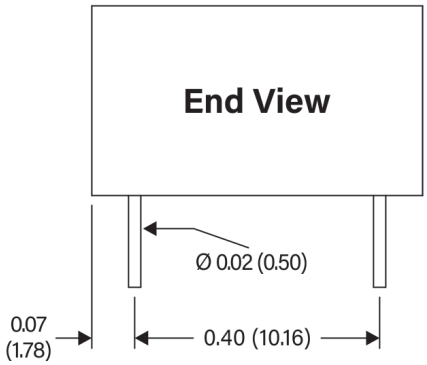
For dual output units, to meet the requirements of EN 55032 radiated emissions class B, C1, L1 and CY1 are required. Recommended component values are given in the table at right.

Model	C1	L1	C2	CY1	C3	C4
MG824SRU	10 µF/50V 1206 X5R	4.7 µH/1.4A 744 774 047	2.2 µF/50V	680 pF/2 kV 1808 X7R	3.3 µF/50V	3.3 µF/50V
MG824DRU	10 µF/50V 1206 X7R	4.7 µH/1.4A 744 774 122	2.2 µF/50V	680 pF/2 kV 1808 X7R	3.3 µF/50V	3.3 µF/50V
MG848SRU	2.2 µF/100V 1206 X7R	22 µH/1.4A 744 774 122	2.2 µF/100V	680 pF/2 kV 1808 X7R	3.3 µF/50V	3.3 µF/50V
MG848DRU	2.2 µF/100V 1206 X7R	22 µH/1.4A 744 774 122	2.2 µF/100V	680 pF/2 kV 1808 X7R	3.3 µF/50V	3.3 µF/50V

Mechanical Dimensions







Pin Connections

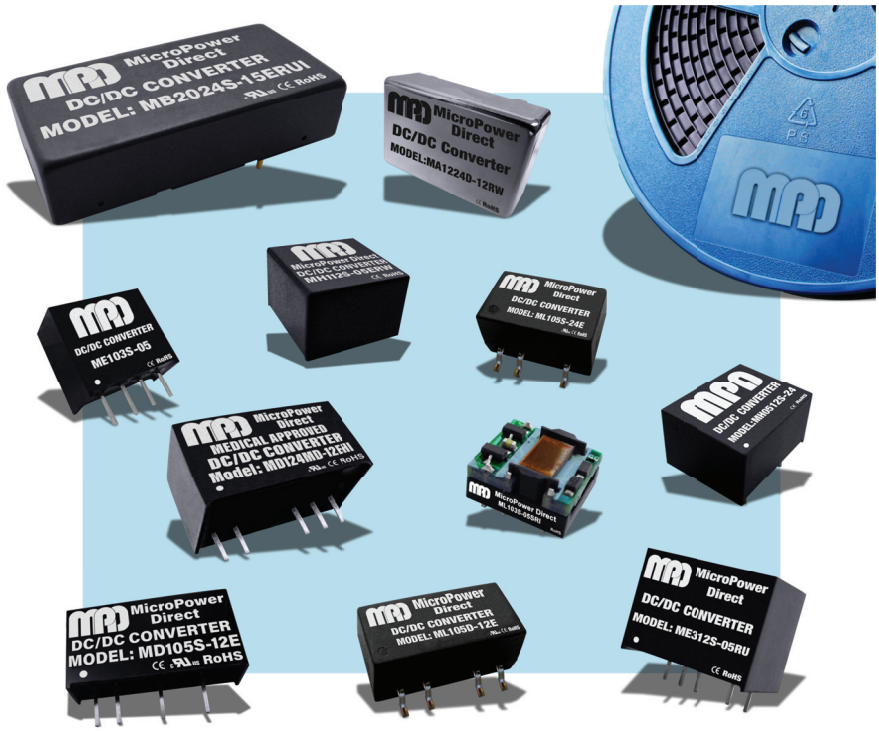
Pin	Single	Dual
1	-VIN	-VIN
7	NC	NC
8	NC	Common
9	+VOUT	+VOUT
10	-VOUT	-VOUT
16	+VIN	+VIN

NC = No Connection

Notes:

- All dimensions are typical in inches (mm)
- Pin 1 is marked by a "dot" or indentation on the unit
- General Tolerance = ±0.01 (±0.25)
- Pin Tolerance = ±0.02 (±0.05)
- Recommended pin hole size (on the application PC Board) is Ø 0.03 (Ø 0.80)
- Weight (Typ) = 0.215 Oz (6.1g)

MPD offers a very wide variety of DC/DC converters. Our standard product line includes SMT, SIP, and DIP potted modules, industry standard 1 x 1" & 1 x 2" modules, as well as new models in an ultra miniature DFN package. Our units are used in applications ranging from high speed gate drive circuits to instrumentation to industrial equipment and medical equipment/instrumentation. Units are available over a power range of 0.25 to 60W. Most models meet international EMC/EMI standards and many are fully approved to EN 62368. Call today, or go to our website to find the right DC/DC power module for your application.



MicroPower Direct
We Power Your Success - For Less!
292 Page Street Ste D Stoughton, MA 02072 ▪ TEL: (781) 344-8226 ▪ FAX: (781) 344-8481 ▪ E-Mail: sales@micropowerdirect.com