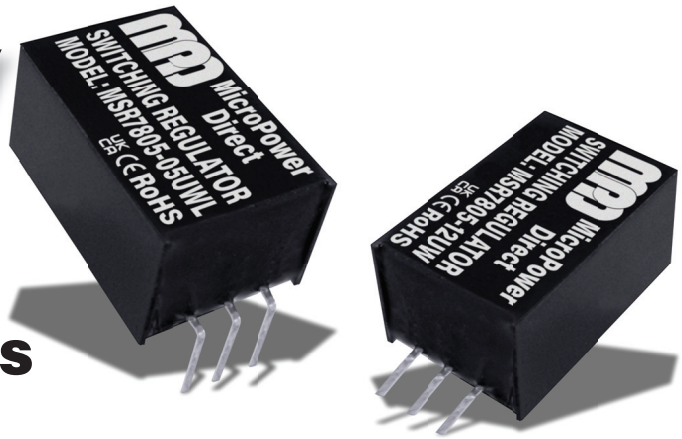
MSR7805UW

Low Cost, Non-Isolated UltraWide 10-1 Input, POL Switching Regulators



Key Features:

- 10:1 Input Voltage Range
- Efficiency to 93%
- 0.5A Output Current
- Short Circuit Protected
- Right Angle Pins Available
- Pin Compatible to LM78xx
- No Load Input I to 1.5 mA
- -40°C to +85°C Operation
- Industry Standard Pin-Out

CE
UK CA
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
No-Load Input Current	Positive Output			1.5	mA
Input Filter	Capacitor Filter				
Reverse Polarity Input	Not Allowed, Could Damage the Unit				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy	3.3 VOUT Model		±3.5	±4.5	%
	All Other Models		±2.0	±3.0	
Line Regulation, See Note 2	3.3, 5.0 and 6.5 VOUT Models		±0.6	±1.5	%
	9.0, 12 and 15 VOUT Models		±0.6	±2.0	
	24 VOUT Model		±1.2	±2.5	
Load Regulation	Nom Input, IOUT = 10% to 100%		±1.0	±2.0	%
Ripple & Noise (20 MHz)	See Note 3		40	80	mV P - P
Temperature Coefficient	Operating Temperature = -40° to +85°			0.03	%/°C
Transient Recovery Time, See Note 3	Nominal Input, 25% Load Step Change		0.2	1.0	mS
Transient Response Deviation			±0.4	±1.5	%
Output Short Circuit	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Not Isolated				
Switching Frequency			300		kHz

EMI Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions, See Note 4	EN 55032		B
Conducted Emissions, See Note 4	EN 55032		B
ESD	EN 61000-4-2	B	±4 kV Contact
RS	EN 61000-4-3	B	10V/m
EFT, See Note 5	EN 61000-4-4	B	±1 kV
Surge, See Note 5	EN 61000-4-5	B	±1 kV
CS	EN61000-4-6	B	3V rms

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Storage Temperature Range		-55		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size	See Mechanical Diagram (Page 4)
Case Material	Non-Conductive Black Plastic (UL-94V0)
Weight	0.133 Oz (3.8g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	2.0			MHours
Lead Temperature	See Note 6			300	°C

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 Voltage (VDC)		Output		Efficiency (%, Typ)		Capacitive Load (µF, Max)
	Nom.	Range	Voltage (VDC)	Current (mA, Max)	Min VIN	Max VIN	
MSR7805-03UW(L)	48	9.00 - 90.0	3.3	500.0	82	69	100
MSR7805-05UW(L)	48	9.00 - 90.0	5.0	500.0	87	75	100
MSR7805-06UW(L)	48	9.00 - 90.0	6.5	500.0	91	78	100
MSR7805-09UW(L)	48	14.0 - 90.0	9.0	500.0	91	80	100
MSR7805-12UW(L)	48	18.0 - 90.0	12.0	500.0	91	83	100
MSR7805-15UW(L)	48	20.0 - 90.0	15.0	500.0	93	84	100
MSR7805-24UW(L)	48	36.0 - 90.0	24.0	500.0	93	85	100

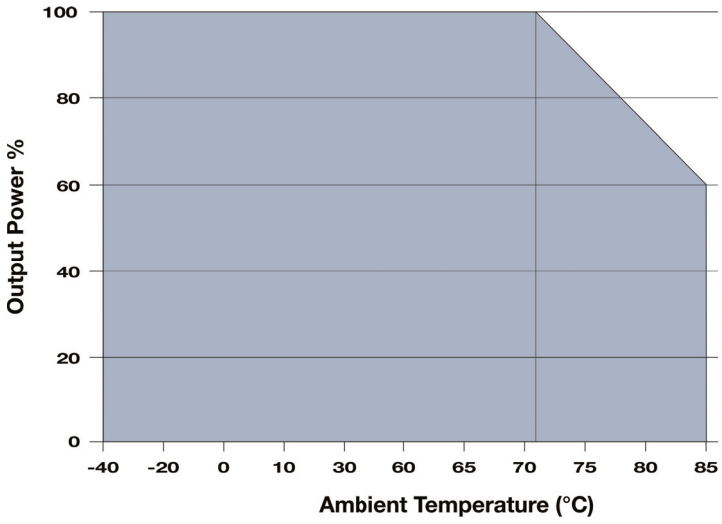
Notes:

1. For many applications, a minimum of external components are required. If the input is over 80V, a 22 µF/100V input capacitor (C_1) is required. See the typical application note on page 3.
2. Measured at full load over the unit input voltage range.
3. Output ripple is measured with a nominal input and is specified for a load range of 10% to 100%. When measuring output ripple, two external capacitors (1 µF and 10 µF) must be placed from the VOUT to the Gnd pins.
3. Transient recovery is measured to within a 1% error band for a load step change of 25%.
4. The unit may not meet emissions to class B without the addition of external components as shown in the EMI circuit diagram on page 3.
5. The unit meets EFT & surge EMS specifications with the addition of external components as shown in the EMC circuit diagram on page 3.
6. Soldering temperature is measured 1.5 mm from the pins. Soldering time should not exceed 10S.

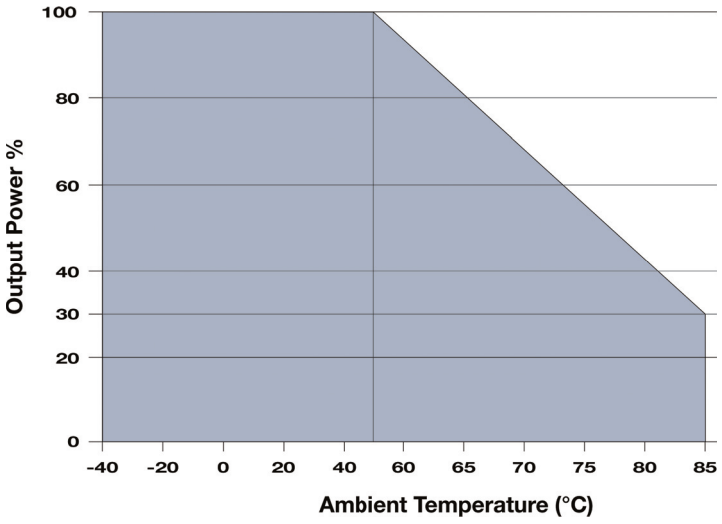
For "Right Angle" pins add the L to the part number: **MSR7805-xxUWL**

7. This regulator is not designed to be used in parallel with another unit to increase output power.
8. A reverse polarity connection on the input could damage the unit.
9. The input should not exceed the range given in the model selection chart. Exceeding this limit could damage the unit.
10. It is recommended that an external fuse be used. The fuse should be selected based upon the actual input current of the application. For more information please call the factory.
11. The temperature derating for all models except the MSR7805-24UW is shown in derating curve A below. For the MSR7805-24UW over a VIN range of 36V to 60V use Curve A. For an input voltage > 60V use curve B

Temperature Derating Curve A: See Note 11



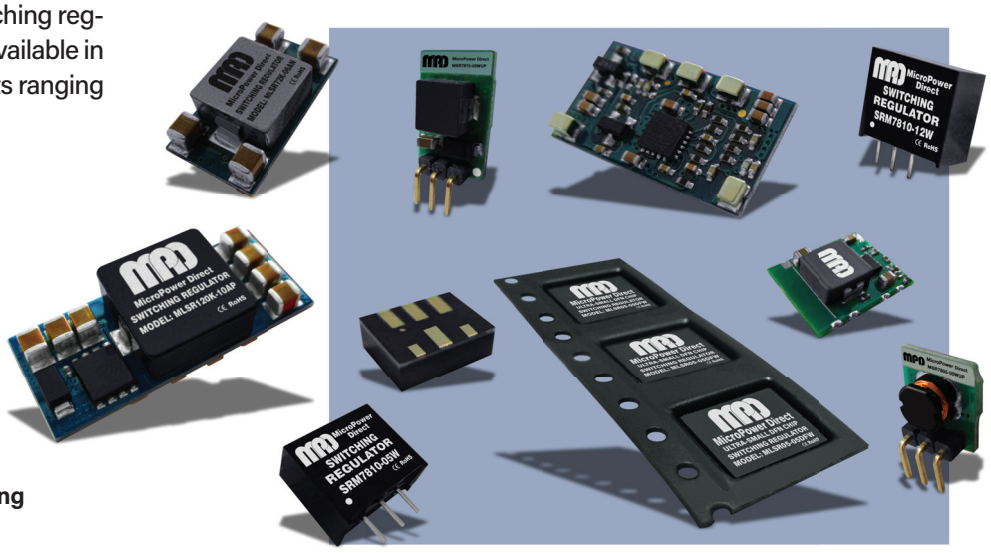
Temperature Derating Curve B: See Note 11



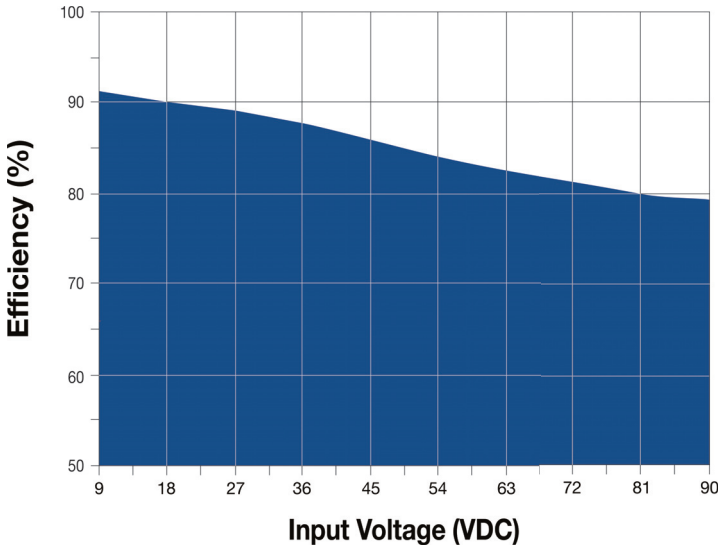
MPD offers a very wide variety of switching regulators. Full product families are now available in a wide variety of packages with outputs ranging from 0.5A to 16A.

Features Include:

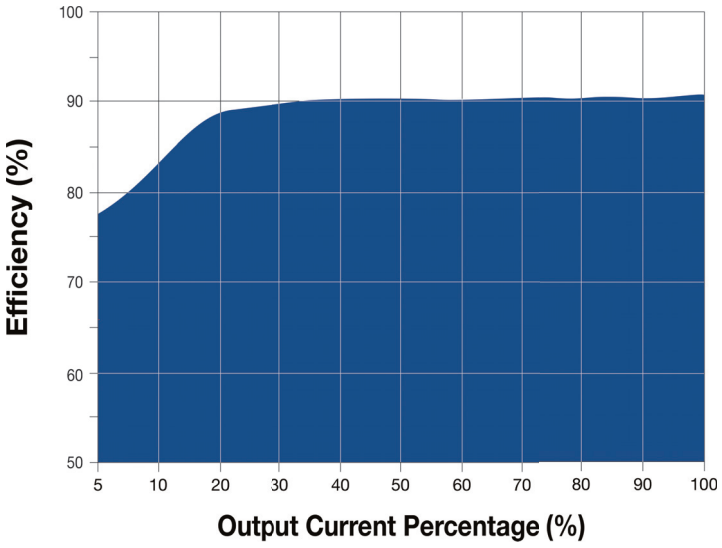
- **Up to 15W Output Power**
- **Very High Efficiency**
- **EN 62368 Safety Approvals**
- **Very Wide Input Ranges (to 10:1)**
- **Industry Standard Pin-Outs**
- **1,500 VDC I/O Isolation**
- **Single and Dual Outputs**
- **Through-Hole, DFN and SMT Packaging**
- **LOW COST**



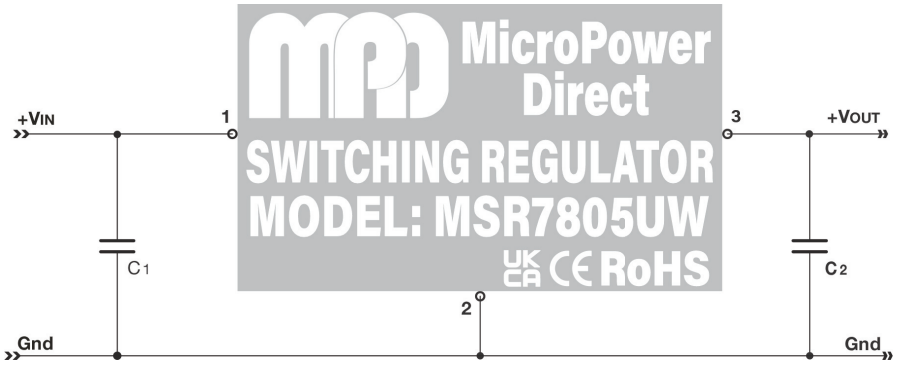
Efficiency vs Input Voltage: 5VOUT, Full Load



Efficiency vs Output Load: VIN = 48V



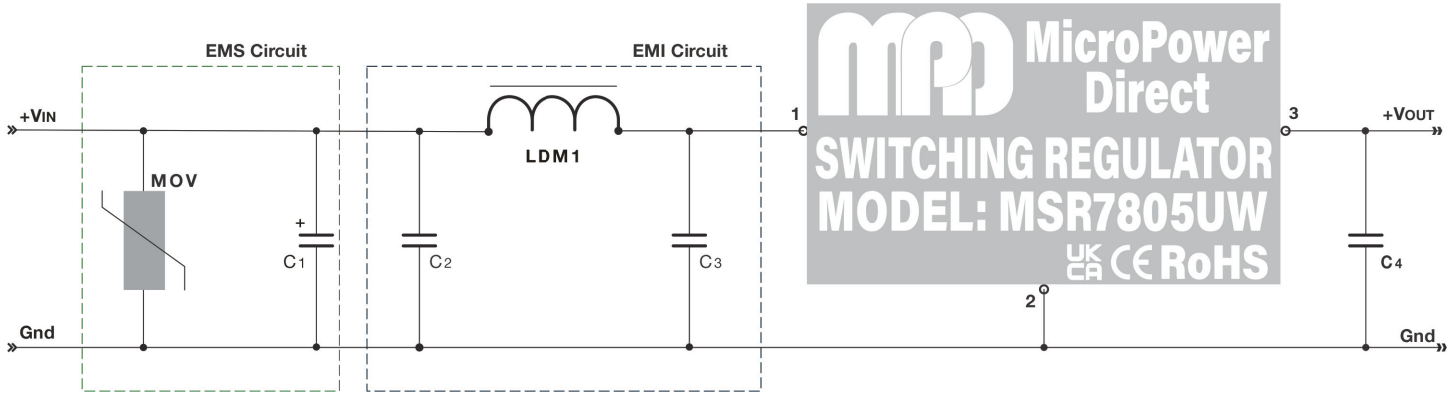
Typical Application Circuit



For many applications, the **MSR7805UW(L)** can be used with a minimum of external components. The circuit above illustrates a typical connection. The capacitors C1 and C2 are required, and should be mounted as close to the module as possible. The recommended values for all the external components are given in the table at right.

Model Number	C1	C2
MSR7805-03UW(L)	10 µF/100V	22 µF/10V
MSR7805-05UW(L)	10 µF/100V	22 µF/10V
MSR7805-06UW(L)	10 µF/100V	22 µF/10V
MSR7805-09UW(L)	10 µF/100V	22 µF/16V
MSR7805-12UW(L)	10 µF/100V	22 µF/25V
MSR7805-15UW(L)	10 µF/100V	22 µF/25V
MSR7805-24UW(L)	10 µF/100V	22 µF/50V

EMC Application Circuit

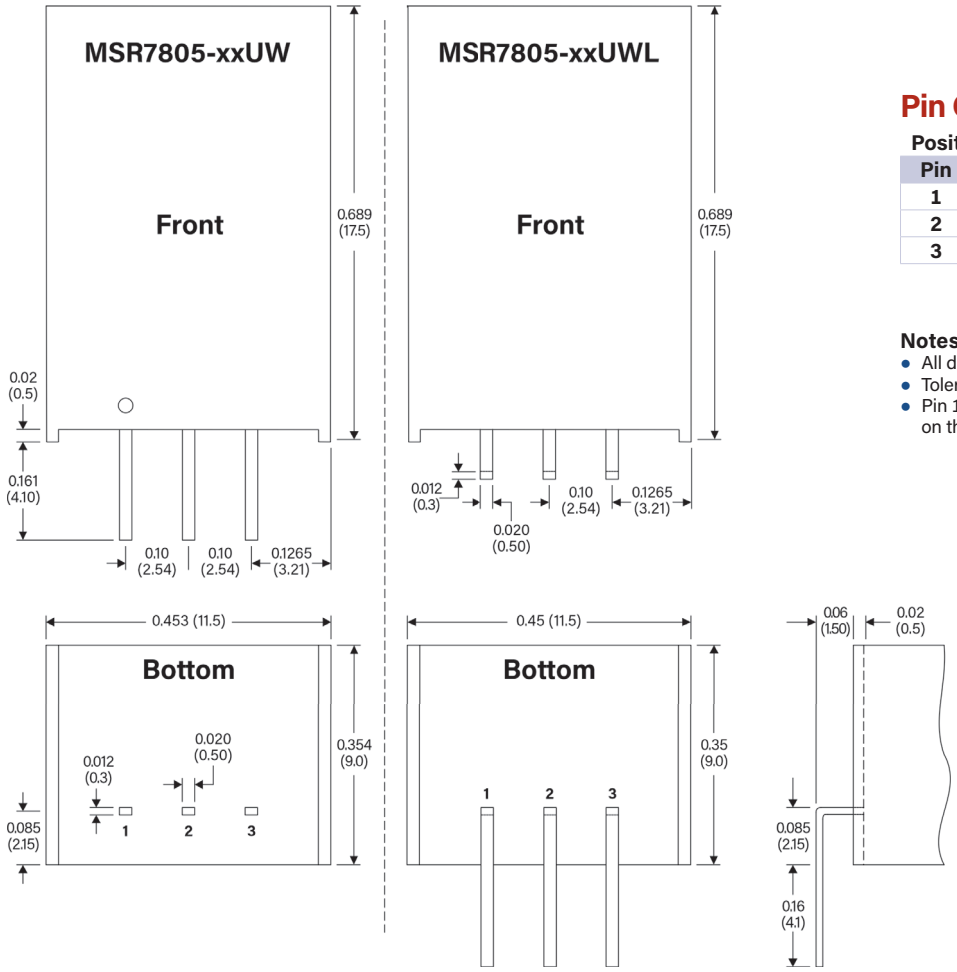


The diagram above illustrates a typical connection of the M**SR7805UW(L)** series for applications that require meeting EMC standards. An external MOV is recommended on the input to protect the unit in the event of a surge.

The recommended values for all components are given in the table at right.

Component	Value	Component	Value
MOV	S20K30	LDM1	120 µH
C1	680 µF/100V	C3	4.7 µF/100V
C2	4.7 µF/100V	C4	10 µF/50V

Mechanical Dimensions



Pin Connection

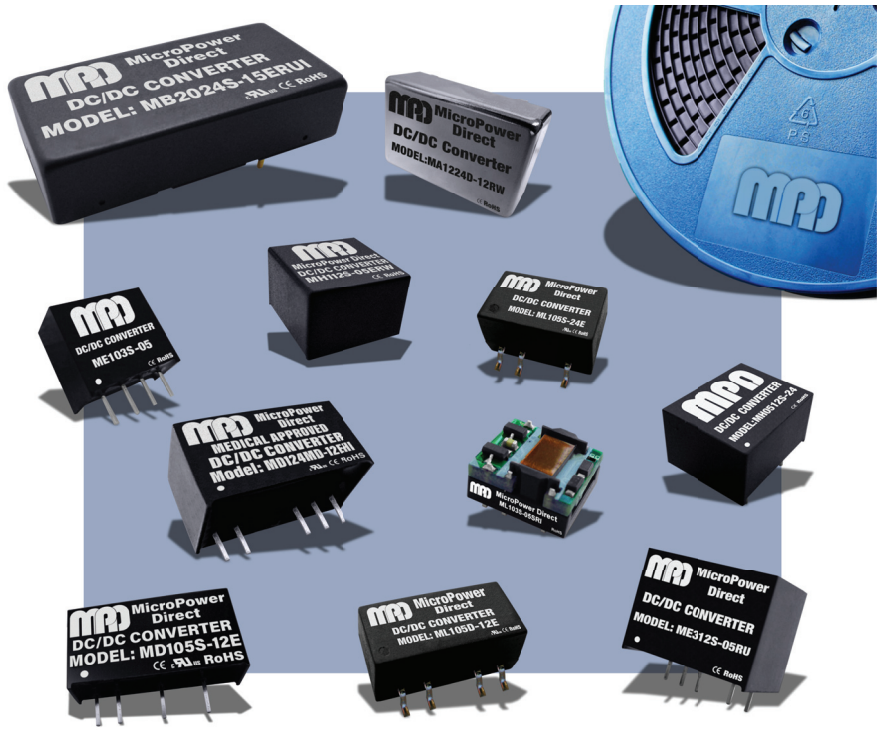
Positive Output

Pin	Function
1	+VIN
2	GND
3	VOUT

Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.02 (±0.50)
- Pin 1 is marked by a "dot" or indentation on the front of the unit

MPD also 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