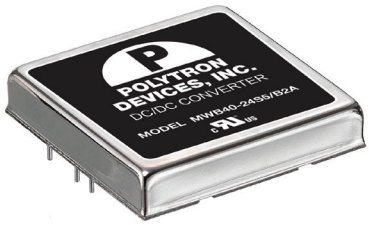
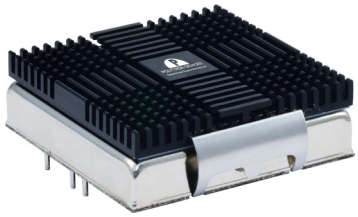
Polytron Power Supplies

DABURN





DC-DC CONVERTERS

SINGLE AND DUAL OUTPUT, UP TO 40 WATT

ISOLATED, 4:1 WIDE INPUT RANGE

MWB40/B2A SERIES

c UL us CE

FEATURES

- 4:1 Wide Input Range
- Miniature Package: 2" × 2" × 0.4"
- 1600Vdc Isolation Voltage
- Efficiency to 89%
- Six-Sided Shielding
- Remote ON/OFF Control
- Over Current Protection
- Over Temperature Protection
- Over Voltage Protection
- Under Voltage Protection
- Short Circuit Protection
- Safety Meets: IEC/UL/EN60950-1
- RoHS Compliant
- REACH Compliant
- CE Mark

SELECTION GUIDE All specifications are typical at 230Vac input, full load and 25°C, unless otherwise noted.

Input Range Vdc	Output Voltage Vdc	Output Current at Full Load		Input Current at No Load mA	Efficiency %	Model Number*	Maximum Capacitor Load µF
		Min. Load mA	Full Load A				
9 - 36	3.3	0	10	75	87	MWB40-24S33/B2A	25750
9 - 36	5	0	8	95	88	MWB40-24S5/B2A	13600
9 - 36	12	50	3.33	50	87	MWB40-24S12/B2A	2360
9 - 36	15	50	2.67	50	87	MWB40-24S15/B2A	1510
18 - 75	3.3	0	10	55	87	MWB40-48S33/B2A	25750
18 - 75	5	0	8	60	89	MWB40-48S5/B2A	13600
18 - 75	12	50	3.33	30	87	MWB40-48S12/B2A	2360
18 - 75	15	50	2.67	25	88	MWB40-48S15/B2A	1510
9 - 36	±12	±65	±1.67	60	86	MWB40-24-12/B2A	±1200
9 - 36	±15	±50	±1.33	70	86	MWB40-24-15/B2A	±750
18 - 75	±12	±65	±1.67	30	87	MWB40-48-12/B2A	±1200
18 - 75	±15	±60	±1.33	30	86	MWB40-48-15/B2A	±750

* Heat Sink with Clamp: **Suffix "HC"**
Negative Logic: **Suffix "N"**
Positive Logic is standard: **No Suffix** needed

DABURN

DABURN ELECTRONICS & CABLE

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Tel: (973)328-3200 Fax: (973)328-3130 - Email: daburn@daburn.com - Website: www.daburn.com

MWB40 SERIES

Input Specifications

Operating input voltage range, Vdc	9 Min., 24 Typ., 36 Max.	24Vin(nom)
	18 Min., 48 Typ., 75 Max.	48Vin(nom)
Start up voltage, Vdc	9 Max.	24Vin(nom)
	18 Max.	48Vin(nom)
Shutdown voltage, Vdc	7 Min., 8 Typ., 8.8 Max.	24Vin(nom)
	15 Min., 16 Typ., 17.5 Max.	48Vin(nom)
Start up time, ms	20 Max.	Constant resistive load, Power up
	20 Max.	Remote ON/OFF
Input surge voltage, Vdc	50 Max.	24Vin(nom), 100 ms, Max.
	100 Max.	48Vin(nom)
Input filter	Pi type	
Remote ON/OFF Control, Vdc		Referred to -Vin pin
	Open or 3 - 12	Positive logic DC-DC ON
	Short or 0 - 1.2	(Standard) DC-DC OFF
	Short or 0 - 1.2	Negative logic DC-DC ON
	Open or 3 - 12	(Option) DC-DC OFF
	-0.5 Min., 0.5 Max.	Input current of Ctrl pin
	10 Typ.	Remote OFF 24Vin(nom)
	5 Typ.	Input current 48Vin(nom)

Output Specifications

Voltage accuracy, %	-1 Min., 1 Max.	
Line regulation, %	-0.2 Min., 0.2 Max.	
Load regulation, %		Min. load to full load
	-0.5 Min., 0.5 Max.	Single
	-1 Min., 1 Max.	Dual
Cross regulation, %	-5 Min., 5 Max	Asymmetrical load 25%/100% FL, Dual
Voltage adjustability, %	-10 Min., 10 Max.	
Ripple and noise, mVp-p		20MHz bandwidth
	50 Typ.	Single 3.3Vout, 5Vout
	75 Typ.	Single, 12Vout, 15Vout
	120 Typ.	Dual, 12Vout
	150 Typ.	Dual, 15Vout
Temperature coefficient, %/ºC	-0.2 Min., 0.2 Max.	
Transient response recovery time, µs	250 Typ.	25% load step change
Over voltage protection, Vdc		Zener doide clamp
	3.9 Typ.	3.3Vout
	6.2 Typ.	5Vout
	15 Typ.	12Vout
	18 Typ.	15Vout
Over load protection, %	150 Max.	% of Iout rated
Short circuit protection		Continuous, automatics recovery

General Specifications

Isolation voltage, Vdc	1 minute	Input to output	1600 Min.		
		Input (output) to case	1600 Min.		
Case grounding	Connect case to -Vin with decoupling Y cap				
Isolation resistance, GΩ	500Vdc		1 Min.		
Isolation capacitance, pF					2500 Max.
Switching frequency, kHz			270 Min.	300 Typ.	330 Max.

Environmental Specifications

Operating ambient temperature, ºC		Without derating	-40 Min.		50 Max.
		With derating	50 Min.		105 Max.
Case temperature, ºC					105 Max.
Over temperature protection, ºC				110 Typ.	
Storage temperature range, ºC			-55 Min.		125 Max.
Thermal impedance, ºC/W		Without heat-sink		9.2 Typ.	
		With heat-sink		7.6 Typ.	
Thermal shock			MIL-STD-810F		
Vibration			MIL-STD-810F		
Relative humidity			5% to 95% RH		

MWB40 SERIES

Physical Specifications

Design meet safety standard	IEC/UL/EN60950-1, UL:E193009, CB:UL(Demko)
Case material	Nickel-coated copper
Base material	FR4 PCB
Potting material	Epoxy (UL94 V-0)
Weight, g	60g (2.11oz)
Dimensions	2" × 2" × 0.4" (50.8mm × 50.8mm × 10.2mm)
MTBF	6.617 × 10^5 hrs , MIL-HDBK-217F, Full load

EMC Specifications

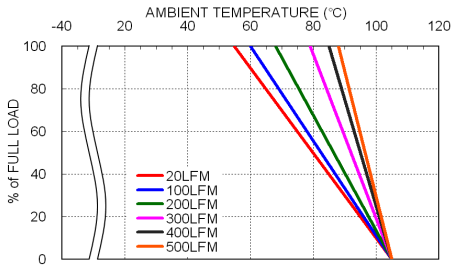
Specifications	Conditions		Level
EMI	EN55032	With external components	Class A Class B
ESD	EN61000-4-2	Air ±8kV and Contact ±6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10V/m	Perf. Criteria A
Fast transient	EN61000-4-4	±2KV, With an external input filter capacitor (Nippon chemi-con KY series, 220 μF/100V)	Perf. Criteria B
Surge	EN61000-4-5	±1KV, With an external input filter capacitor (Nippon chemi-con KY series, 220 μF/100V)	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8	100 A/m continuous; 1000 A/m 1 second	Perf. Criteria A

Note:

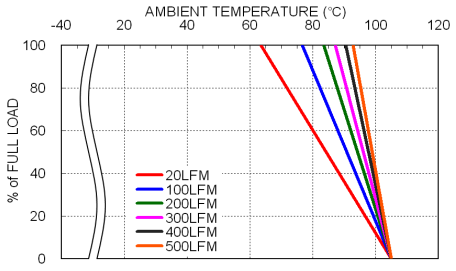
1. For further information, please contact Polytron Devices.

CAUTION: This power module is not internally fused. An input line fuse must always be used.

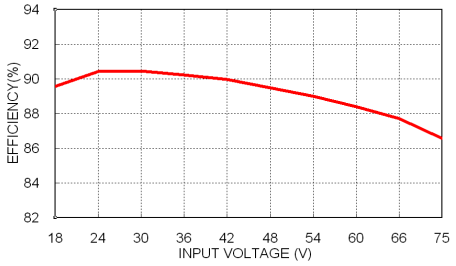
Characteristic Curve



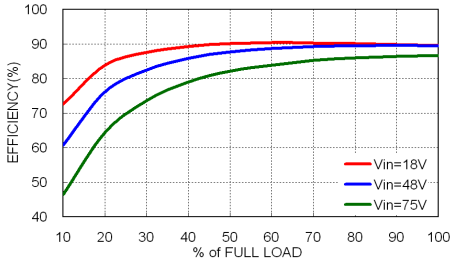
MWB40-48S5 Derating Curve



MWB40-48S5 Derating Curve With Heat Sink



MWB40-48S5 Efficiency vs. Input Voltage



MWB40-48S5 Efficiency vs. Output Load

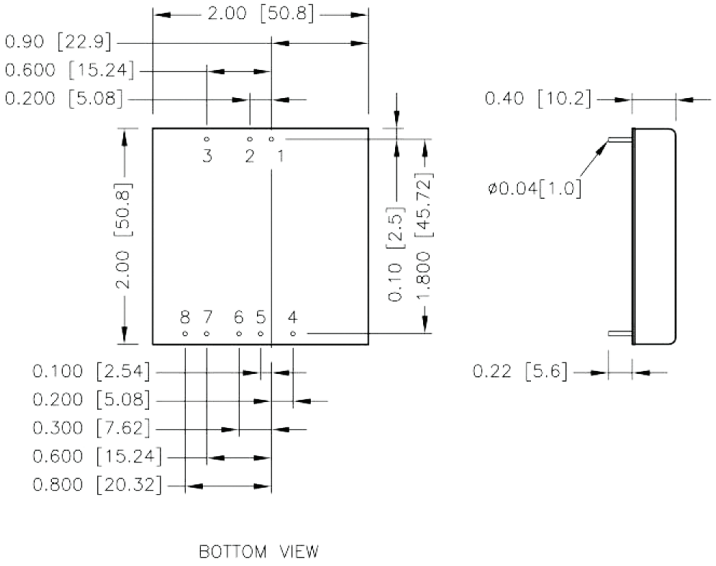
Fuse Consideration

Modules	Fuse Rating (A)	Fuse Type
MWB40-24SXX	8	Fast-Acting
MWB40-48SXX	4	Slow-Blow

Note:

1. This power module is not internally fused. An input line fuse must always be used.
2. This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.
3. To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.
4. The table is based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

Mechanical Drawing



BOTTOM VIEW

PIN CONNECTION

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	Ctrl	Ctrl
4	-Sense	+Vout
5	+Sense	Common
6	+Vout	Common
7	-Vout	-Vout
8	Trim	Trim

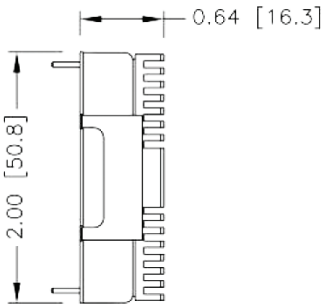
1. All dimensions in inches (mm)

2. Tolerance: x.xx±0.02 (x.x±0.5)x.xxx±0.01 (x.xx±0.25)

3. Pin pitch tolerance ±0.01 (0.25)

4. Pin dimension tolerance ±0.004(0.1)

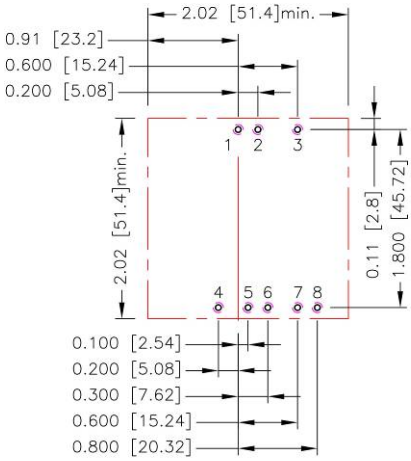
Heat-Sink Options



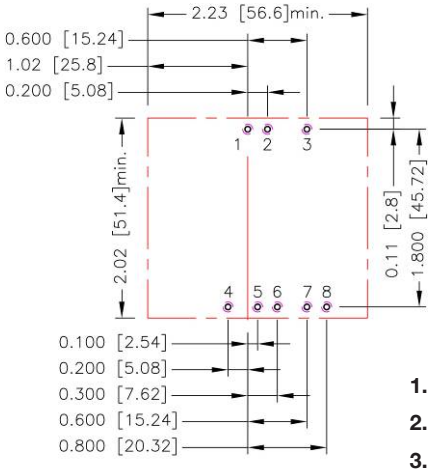
1. All dimensions in inches (mm)

Recommended Pad Layout

Standard



-HC (Heat Sink)



1. All dimensions in inches (mm)

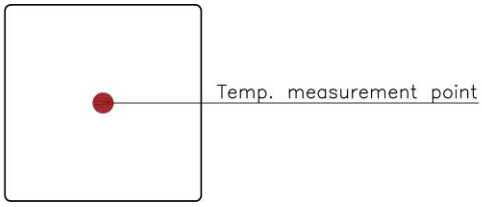
2. Pad size (lead free recommended)

3. Through hole 1, 2, 3, 4, 5, 6, 7, 8: 0.051 (1.30)

4. Top view pad 1, 2, 3, 4, 5, 6, 7, 8: 0.064 (1.63)

5. Bottom view pad 1, 2, 3, 4, 5, 6, 7, 8: 0.102 (2.60)

Thermal Considerations



1. The power module operates in a variety of thermal environments.
2. Sufficient cooling should be provided to help ensure reliable operation of the unit.
3. Heat is removed by conduction, convection and radiation to the surrounding environment.
4. Proper cooling can be verified by measuring the point.
5. The temperature at this location should not exceed 105°C.
6. When operating, adequate cooling must be provided to maintain the test point temperature at or below 105°C.
7. Although the maximum point temperature of the power modules is 105°C, you can limit this temperature to a lower value for extremely high reliability.

Output Voltage Adjustment Trim Up

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.

Output voltage set point adjustment allows the user to increase or decrease the output voltage set point of the module.

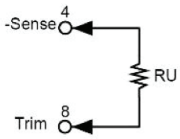
Single Output

1. This is accomplished by connecting an external resistor between the Trim pin and either the +Sense or -Sense pins.
2. With an external resistor between the Trim and -Sense pin, the output voltage set point increases.
3. With an external resistor between the Trim and +Sense pin, the output votlage set point decreases.
4. The external Trim resistor needs to be at least 0.16 W of rated power.

Dual Output

1. This is accomplished by connecting an external resistor between the Trim pin and either the +Output or -Output pins.
2. With an external resistor between the Trim and -Output pin, the output voltage set point increases.
3. With an external resistor between the Trim and +Output pin, the output votlage set point decreases.
4. The external Trim resistor needs to be at least 0.16 W resistors.

Single Output



□□S33

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.630
RU (kΩ)	57.930	26.165	15.577	10.283	7.106	4.988	3.476	2.341	1.459	0.753

□□S5

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	5.050	5.100	5.150	5.200	5.250	5.300	5.350	5.400	5.450	5.500
RU (kΩ)	36.570	16.580	9.917	6.585	4.586	3.253	2.302	1.588	1.032	0.588

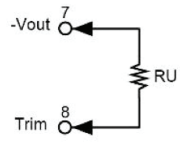
□□S12

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	12.120	12.240	12.360	12.480	12.600	12.720	12.840	12.960	13.080	13.200
RU (kΩ)	367.910	165.950	98.636	64.977	44.782	31.318	21.701	14.488	8.879	4.391

□□S15

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	15.150	15.300	15.450	15.600	15.750	15.900	16.050	16.200	16.350	16.500
RU (kΩ)	404.180	180.590	106.060	68.796	46.437	31.531	20.883	12.898	6.687	1.718

Dual Output



□□-12

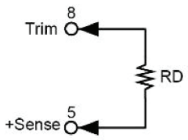
△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	±12.12	±12.24	±12.36	±12.48	±12.6	±12.72	±12.84	±12.96	±13.08	±13.2
RU (kΩ)	218.21	98.105	58.07	38.052	26.042	18.035	12.316	8.026	4.69	2.021

□□-15

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	±15.15	±15.3	±15.45	±15.6	±15.75	±15.9	±16.05	±16.2	±16.35	±16.5
RU (kΩ)	268.29	120.64	71.429	46.822	32.058	22.215	15.184	9.911	5.81	2.529

Output Voltage Adjustment Trim Down

Single Output



□□S33

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	3.267	3.234	3.201	3.168	3.135	3.102	3.069	3.036	3.003	2.970
RD (kΩ)	69.470	31.235	18.490	12.117	8.294	5.745	3.924	2.559	1.497	0.647

□□S5

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	4.950	4.900	4.850	4.800	4.750	4.700	4.650	4.600	4.550	4.500
RD (kΩ)	45.533	20.612	12.306	8.152	5.660	3.999	2.812	1.922	1.230	0.676

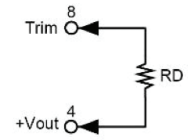
□□S12

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	11.880	11.760	11.640	11.520	11.400	11.280	11.160	11.040	10.920	10.800
RD (kΩ)	460.990	207.950	123.600	81.423	56.118	39.249	27.199	18.162	11.132	5.509

□□S15

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	14.850	14.700	14.550	14.400	14.250	14.100	13.950	13.800	13.650	13.500
RD (kΩ)	499.820	223.410	131.270	85.204	57.563	39.136	25.974	16.102	8.424	2.282

Dual Output



□□-12

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	±11.88	±11.76	±11.64	±11.52	±11.4	±11.28	±11.16	±11.04	±10.92	±10.8
RD (kΩ)	273.44	123.02	72.874	47.803	32.76	22.732	15.568	10.196	6.017	2.675

□□-15

△V (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	±14.85	±14.7	±14.55	±14.4	±14.25	±14.1	±13.95	±13.8	±13.65	±13.5
RD (kΩ)	337.71	152.02	90.126	59.178	40.609	28.23	19.387	12.756	7.598	3.471