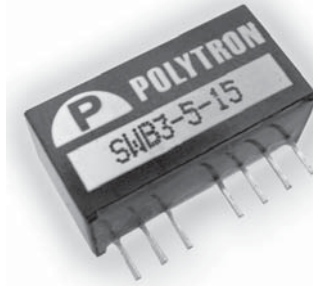




3 WATT SINGLE & DUAL OUTPUT

**Regulated,
Wide Input (4:1)
DC/DC Converters**



Specifications

All specifications are typical at nominal input, full load and 25°C, unless otherwise noted.

INPUT

Input Voltage Range	
24V nominal input	9 - 36 Vdc
48V nominal input	18 - 72 Vdc
Input Filter	Capacitor type
Input Surge Voltage	100mS max.
24V input	50 Vdc
48V input	100 Vdc
Input Reflected Ripple Current	
24V input	380mA _{p-p} max
48V input	200mA _{p-p} max
Start up time	Nominal Vin and constant resistor load
Power Up	30mS typ
Remote ON/OFF	30mS typ
Remote ON/OFF	DC-DC ON Open or high impedance
	DC-DC OFF Control pin applied current 2 ~ 4mA max. (via 1KΩ)
Remote OFF state Input current	Nominal Vin 2.5mA max.

OUTPUT

Output Power	3 Watts max.
Voltage Accuracy	Full load and nominal Vin ±1%
Minimum Load	0%
Line Regulation	LL to HL at Full load ±0.2%
Load Regulation	No load to full load Single ±1%
	5% load to 100% load Single ±0.5%
	No load to full load Dual ±1%
Cross Regulation (Dual)	Asymmetrical load 25%/100% FL ±5%
Ripple and Noise	20MHz bandwidth 30mV _{p-p}
Temperature Coefficient	±0.1%/°C, max.
Transient Response Recovery Time	25% load step change 500μS, typ
Short Circuit Protection	Continuous, automatic recovery

GENERAL

Efficiency	See table
Isolation Voltage	1600 Vdc, min.
Isolation Resistance	10 ⁹ Ohms, min.
Isolation Capacitance	200pF, max.
Switching Frequency	Full load to minimum load 1000 KHz, min.

ENVIRONMENTAL

Operating Ambient Temperature	-40°C ~ +71°C (without derating)
	+71°C ~ +100°C (with derating)
Storage Temperature Range	-55°C to +125°C
Cooling	Free Air Convection
Thermal Shock	MIL-STD-810F
Vibration	MIL-STD-810F
Relative Humidity	5% to 95% RH

PHYSICAL

Design Meets Safety Standard	IEC60950-1, UL60950-1, EN60950-1
Case Material	Non-conductive black plastic
Base Material	None
Potting Material	Silicon (UL94-V0)
Dimensions	0.86" x 0.36" x 0.44" (21.8 x 9.2 x 11.1 mm)
Weight	4.8 g. (0.17 oz.)
MTBF (note①)	Bellcore TR-NWT-000332 3.963 x 10 ⁶ hrs.
	MIL-HDBK-217F 1.707 x 10 ⁶ hrs.

EMC CHARACTERISTICS

EMI (note⑤⑥)	EN55022			Class A
ESD	EN61000-4-3	Air ±8KV	Contact ±6KV	Perf. Criteria A
Radiated Immunity	EN61000-4-3	10V/m		Perf. Criteria A
Fast Transient (note⑥)	EN61000-4-4	± 2KV		Perf. Criteria A
Surge (note⑥)	EN61000-4-5	± 1KV		Perf. Criteria A
Conducted Immunity	EN61000-4-6	10 Vr.m.s.		Perf. Criteria A

FEATURES

- **4:1 Wide Input Voltage Range**
- **SIP Package**
0.86" x 0.36" x 0.44"
- **High Efficiency**
up to 82%
- **Low Ripple and Noise**
- **Input to Output Isolation up to 3,000 Vdc**
- **Continuous Short Circuit Protection**
- **External On/Off Control**
- **RoHS Compliant**

SWB3 Series

Selection Guide

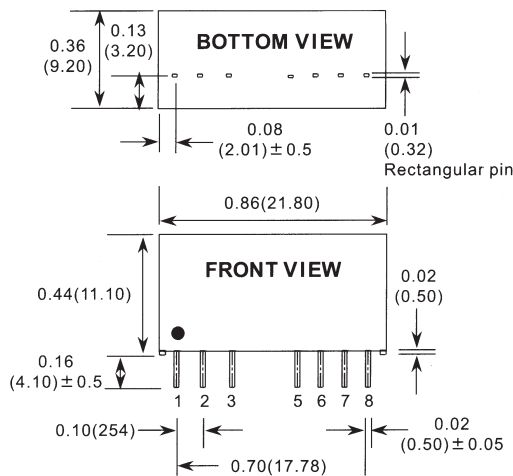
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	Input Range (Vdc)	Output Voltage (Vdc)	Output Current		Input Current		Efficiency ^④ %	Model Number*	Capacitor Load Max
			Min. Load ^③ (mA)	Full Load (mA)	No Load (mA)	Full Load (mA)			
SINGLE OUTPUT VOLTAGE	9 – 36	3.3	0	700	20	140	75	SWB3-24S33	1760 μ F
	9 – 36	5	0	600	20	165	80	SWB3-24S5	1000 μ F
	9 – 36	9	0	333	19	166	79	SWB3-24S9	470 μ F
	9 – 36	12	0	250	20	167	79	SWB3-24S12	170 μ F
	9 – 36	15	0	200	19	166	79	SWB3-24S15	110 μ F
	18 – 72	3.3	0	700	12	71	74	SWB3-48S33	1760 μ F
	18 – 72	5	0	600	12	85	78	SWB3-48S5	1000 μ F
	18 – 72	9	0	333	13	85	78	SWB3-48S9	470 μ F
	18 – 72	12	0	250	14	85	78	SWB3-48S12	170 μ F
	18 – 72	15	0	200	14	84	79	SWB3-48S15	110 μ F
DUAL OUTPUT VOLTAGE	9 – 36	\pm 5	0	\pm 300	25	169	78	SWB3-24-5	\pm 470 μ F
	9 – 36	\pm 23	0	\pm 125	25	165	80	SWB3-24-12	\pm 100 μ F
	9 – 36	\pm 15	0	\pm 100	25	160	82	SWB3-24-15	\pm 47 μ F
	18 – 72	\pm 5	0	\pm 300	14	85	78	SWB3-48-5	\pm 470 μ F
	18 – 72	\pm 12	0	\pm 125	14	84	79	SWB3-48-12	\pm 100 μ F
	18 – 72	\pm 15	0	\pm 100	14	82	80	SWB3-48-15	\pm 47 μ F

- NOTES:
- ① Bellcore TR-NWT-00032, Case: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment).MIL-STD-217F Notice 2 @ Ta = 25°C, Full Load (Ground, Benign, controlled environment).
 - ② The SWB3 Series requires external filter to meet EN55022 class B.
 - ③ The SWB3 series requires a minimum load at the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specifications.
 - ④ Typical value at nominal input voltage and full load.
 - ⑤ The SWB3 Series meet EN55022 Class A with external L-C filter before the input pins to the converter.
 Recommend: 24 Vin : C1=2.2 μ F/50V 1210 MLCC. L1=10 μ H0504 SMD Inductor P/N:PMT-47.
 48 Vin : C1=2.2 μ F/100V 1210 MLCC. L1=10 μ H0504 SMD Inductor P/N:PMT-47.
 - ⑥ An external input filter capacitor is required if the module has to meet EN61000-4-4. EN61000-4-5.
- * For 3000Vdc Isolation, Use Suffix "H" After the Model Number.

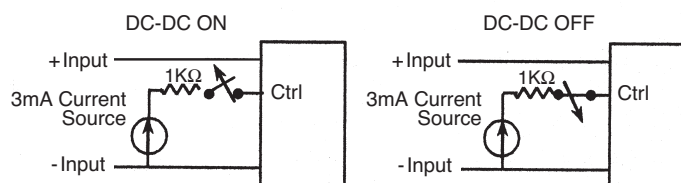
Mechanical Specifications

PIN CONNECTION		
PIN	SINGLE	DUAL
1	-INPUT	-INPUT
2	+INPUT	+INPUT
3	CTRL	CTRL
5	NC	NC
6	+OUTPUT	+OUTPUT
7	-OUTPUT	COM
8	NC	-OUTPUT



- 1. All Dimensions are in inches (mm)
- 2. Pin pitch tolerance \pm 0.02 (0.5)

Application Circuit



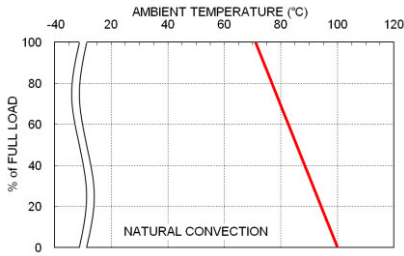
DABURN ELECTRONICS & CABLE

44 Richboynton Road, Dover, New Jersey 07801 U.S.A.

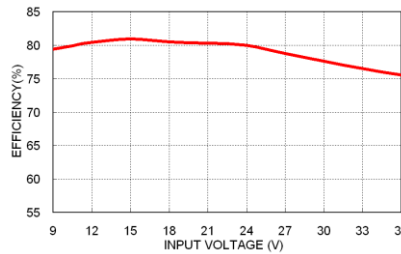
Tel: (973)328-3200 Fax: (973)328-3130 - Email: daburn@daburn.com - Website: www.daburn.com

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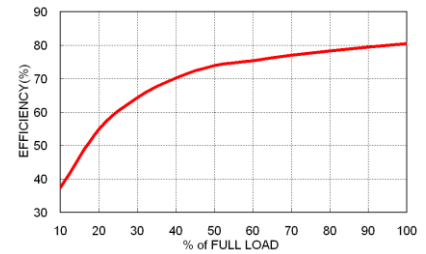
Characteristic Curve



SWB3-24S5 Derating Curve



SWB3-24S5 Efficiency vs. Input Voltage



SWB3-24S5 Efficiency vs. Output Load

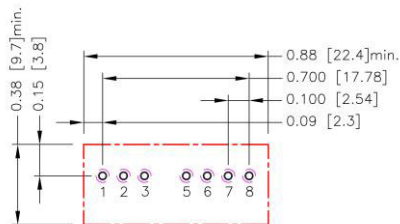
Fuse Consideration

This power module is not internally fused. An input line fuse must always be used. 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. To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse. The input line fuse suggest as below :

Model	Fuse Rating (A)	Fuse Type
SWB3-12S□□ · SWB3-12D□□	2	Slow-Blow
SWB3-24S□□ · SWB3-24D□□	1.6	Slow-Blow
SWB3-48S□□ · SWB3-48D□□	1	Slow-Blow

The table is based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

Recommended Pad Layout



All dimensions in inch[mm]
 Pad size(lead free recommended)
 Through hole 1.2.3.5.6.7.8: $\Phi 0.031[0.80]$
 Top view pad 1.2.3.5.6.7.8: $\Phi 0.039[1.00]$
 Bottom view pad 1.2.3.5.6.7.8: $\Phi 0.063[1.60]$

Thermal Considerations

The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point as the figure below. The temperature at this location should not exceed "Maximum case temperature". When operating, adequate cooling must be provided to maintain the test point temperature at or below "Maximum case temperature". You can limit this temperature to a lower value for extremely high reliability.

- Thermal test condition with vertical direction by natural convection (20LFM).

