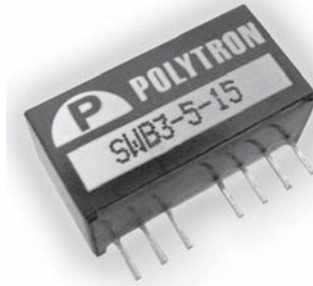




# 3 WATT SINGLE & DUAL OUTPUT

## 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 <sub>p-p</sub> max
48V input	200mA <sub>p-p</sub> 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 <sub>p-p</sub>
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 <sup>9</sup> 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 <sup>6</sup> hrs.
	MIL-HDBK-217F ..... 1.707 x 10 <sup>6</sup> 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 1.6kVdc**
- **Continuous Short Circuit Protection**
- **External On/Off Control**
- **RoHS Compliant**

SWB3 Series

Selection Guide

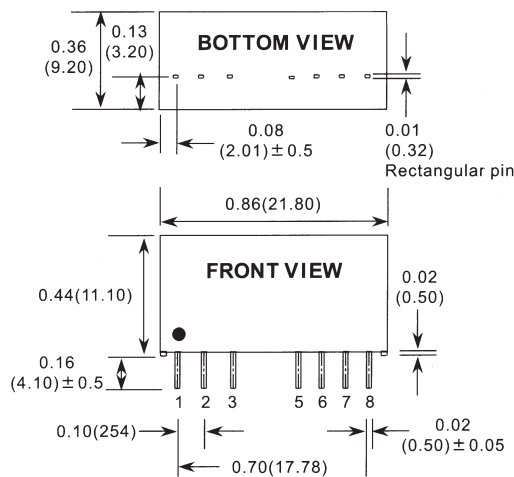
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	Input Range (Vdc)	Output Voltage (Vdc)	Output Current		Input Current		Efficiency <sup>④</sup> %	Model Number	Capacitor Load Max
			Min. Load <sup>③</sup> (mA)	Full Load (mA)	No Load (mA)	Full Load (mA)			
SINGLE OUTPUT VOLTAGE	9 – 36	3.3	0	700	20	140	75	SWB3-24S33	1760 $\mu$ F
	9 – 36	5	0	600	20	165	80	SWB3-24S5	1000 $\mu$ F
	9 – 36	9	0	333	19	166	79	SWB3-24S9	470 $\mu$ F
	9 – 36	12	0	250	20	167	79	SWB3-24S12	170 $\mu$ F
	9 – 36	15	0	200	19	166	79	SWB3-24S15	110 $\mu$ F
	18 – 72	3.3	0	700	12	71	74	SWB3-48S33	1760 $\mu$ F
	18 – 72	5	0	700	12	85	78	SWB3-48S5	1000 $\mu$ F
	18 – 72	9	0	700	13	85	78	SWB3-48S9	470 $\mu$ F
	18 – 72	12	0	700	14	85	78	SWB3-48S12	170 $\mu$ F
	18 – 72	15	0	700	14	84	79	SWB3-48S15	110 $\mu$ F
DUAL OUTPUT VOLTAGE	9 – 36	$\pm$ 5	0	$\pm$ 300	25	169	78	SWB3-24-5	$\pm$ 470 $\mu$ F
	9 – 36	$\pm$ 23	0	$\pm$ 125	25	165	80	SWB3-24-12	$\pm$ 100 $\mu$ F
	9 – 36	$\pm$ 15	0	$\pm$ 100	25	160	82	SWB3-24-15	$\pm$ 47 $\mu$ F
	18 – 72	$\pm$ 5	0	$\pm$ 300	14	85	78	SWB3-48-5	$\pm$ 470 $\mu$ F
	18 – 72	$\pm$ 12	0	$\pm$ 125	14	84	79	SWB3-48-12	$\pm$ 100 $\mu$ F
	18 – 72	$\pm$ 15	0	$\pm$ 100	14	82	80	SWB3-48-15	$\pm$ 47 $\mu$ 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 $\mu$ F/50V 1210 MLCC. L1=10 $\mu$ H0504 SMD Inductor P/N:PMT-47.  
 48 Vin : C1=2.2 $\mu$ F/100V 1210 MLCC. L1=10 $\mu$ 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.

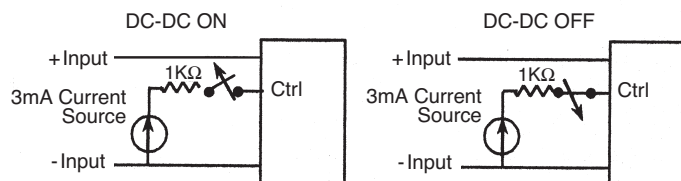
Mechanical Specifications

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



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