



6 WATT

Single & Dual Output

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



FEATURES

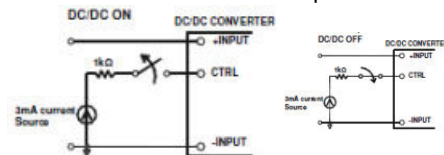
- Extra Wide (4:1) Input Voltage Range
- Output Current up to 1500 mA
- SIP Package 0.86" X 0.36" X 0.44"
- Fixed Switching Frequency
- Input/Output Isolation up to 3000 Vdc
- Continuous Short Circuit Protection
- External On/Off Control
- UL60950-1, EN60950-1, IEC60950-1 CE Mark
- RoHS Compliant to EU Directive 2011/65/EU

SWB6 Series

Specifications

INPUT

Voltage Range	24VDC nominal input.....9-36VDC 48VDC nominal input.....18 -75VDC
Input Filter	Capacitor type
Input Surge Voltage	24VDC Input.....50VDC 1sec, max. 48VDC input.....100VDC 1sec, max.
Input Reflected Ripple Current	24VDC nominal input.....20mA _{p-p} 48VDC nominal input.....20mA _{p-p}
Start up Time	constant resistive load..... Power Up .....30mS Remote On/Off
Remote On/Off	Referenced to -INPUT pin and CTRL pin applied current ...DC-DC On.....Open or high impedance ...DC-DC Off..... 2.0min., 3.0typ., 4.0max. Remote off input current .....1.0mA



OUTPUT

Output Power	6 Watts max.
Voltage Accuracy	±1%
Line Regulation	LL to HL at Full Load..... ±0.2%
Load Regulation	Single.....No Load to Full Load..... ±0.5% Dual.....No Load to Full Load..... ±1%
Ripple and Noise 20MHz band width.....	See table
Temperature Coefficient	±0.2% / °C, max.
Transient Response recovery Time	25% load step change.....250µS
Overload Protection.....	% of I _{out} rated, hiccup mode .....180%
Short Circuit Protection.....	Continuous, automatic recovery

GENERAL

Efficiency.....	See table
.....Standard 1600Vdc, min. 1 minute	
.....Input to Output.....	Suffix "H" 3000Vdc, min. 1 minute
Isolation Voltage	.....Suffix "M" 1600Vdc, min. 1 minute
.....Input (Output) to Case.....	Suffix "M" 1000Vdc, min. 1 minute
Isolation Resistance	.....500Vdc, GΩ
.....Standard.....	50pF, max.
Isolation Capacitance	.....Suffix "H".....
.....Suffix "M".....	50pF, max.
Switching Frequency	.....522kHz, min., 580kHz typ., 638kHz max.
Safety Approvals	.....IE60950-1, UL60950-1, EN60950-1
.....Standard.....	Non-conductive black plastic
Case Material	.....Suffix "H".....
.....Suffix "M".....	Copper
Base Material	.....None
Potting Material	.....Silicon (UL94-V0)
Dimensions	.....0.86 x 0.36 x 0.44 inches
.....(21.8 x 9.1 x 11.2 mm)	
.....Standard.....	4.8g (0.17 oz.)
Weight	.....Suffix "H".....
.....Suffix "M".....	5.9g (0.21 oz.)
MTBF	BELLCORE TW-NWT-000332 Case 1:50% Stress, Ta=40°C..... 3.381 x 10 ⁵ hrs
	MIL-HDBK-217F Ta=25°C, Full load (GB controlled environment).... 8.408 x 10 ⁵ hrs

ENVIRONMENTAL

Operating Ambient Temperature.....	-40°C - +85°C
Storage Temperature Range.....	-55°C - +125°C
Thermal Shock.....	MIL-STD-810
Vibration.....	MIL-STD-810
Relative Humidity.....	5% to 95% R

EMC CHARACTERISTICS

EMI (Note 1).....	EN55022.....	Class
ESD.....	EN61000-4-2	Air Contact..
		±8KV
		±6KV
Radiated Immunity.....	EN61000-4-3	20 V/m
Fast Transient (Note 2).....	EN61000-4-4	±2KV.....
Surge (Note 2).....	EN61000-4-5	±2KV.....
Conducted Immunity	EN61000-4-6	10Vr.m.s.....

SELECTION GUIDE

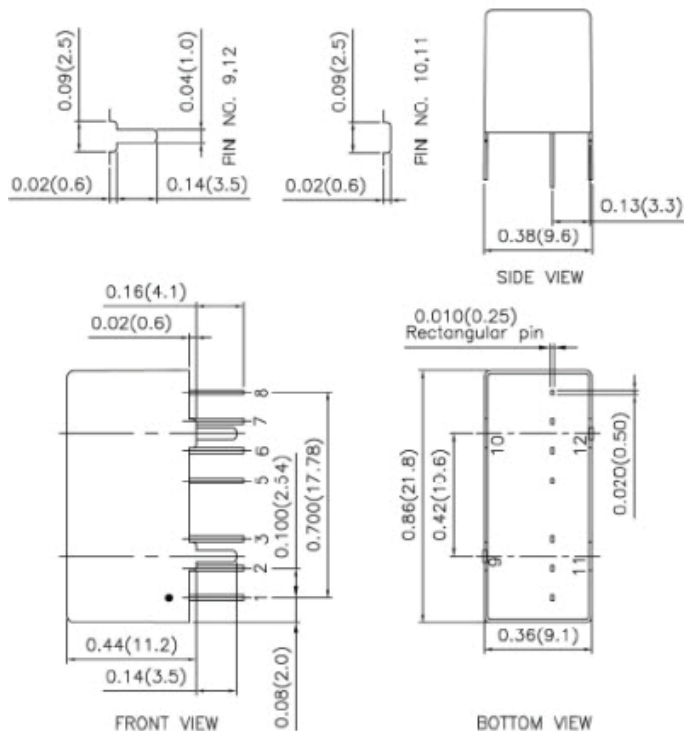
Input Voltage Range	Output Voltage	Output Current		Output Ripple & Noise	Input Current No load ⁽²⁾	Efficiency (%)	Model Number	Capacitor Load max.
		Min. load	Full load					
9-36 Vdc	3.3 Vdc	0mA	1500mA	50mVp-p	4mA	81	SWB6-24S33	4700µF
9-36 Vdc	5 Vdc	0mA	1200mA	75mVp-p	4mA	84	SWB6-24S5	2200µF
9-36 Vdc	9 Vdc	0mA	666mA	75mVp-p	4mA	86	SWB6-24S9	1400µF
9-36 Vdc	12 Vdc	0mA	500mA	100mVp-p	4mA	87	SWB6-24S12	1100µF
9-36 Vdc	15 Vdc	0mA	400mA	100mVp-p	4mA	88	SWB6-24S15	1000µF
9-36 Vdc	24 Vdc	0mA	250mA	100mVp-p	4mA	87	SWB6-24S24	470µF
18-75 Vdc	3.3 Vdc	0mA	1500mA	50mVp-p	4mA	81	SWB6-48S33	4700µF
18-75 Vdc	5 Vdc	0mA	1200mA	75mVp-p	4mA	84	SWB6-48S5	2200µF
18-75 Vdc	9 Vdc	0mA	666mA	75mVp-p	4mA	85	SWB6-48S9	1400µF
18-75 Vdc	12 Vdc	0mA	500mA	100mVp-p	4mA	87	SWB6-48S12	1100µF
18-75 Vdc	15 Vdc	0mA	400mA	100mVp-p	4mA	87	SWB6-48S15	1000µF
18-75 Vdc	24 Vdc	0mA	250mA	100mVp-p	4mA	87	SWB6-48S24	470µF
9-36 Vdc	+/-5 Vdc	0mA	+/-600mA	75mVp-p	6mA	84	SWB6-24-5	+/-1400µF
9-36 Vdc	+/-12 Vdc	0mA	+/-250mA	100mVp-p	6mA	87	SWB6-48-12	+/-660µF
9-36 Vdc	+/-15 Vdc	0mA	+/-200mA	100mVp-p	8mA	87	SWB6-24-15	+/-470µF
18-75 Vdc	+/-5 Vdc	0mA	+/-600mA	75mVp-p	6mA	84	SWB6-48-5	+/-1400µF
18-75 Vdc	+/-12 Vdc	0mA	+/-250mA	100mVp-p	6mA	87	SWB6-48-12	+/-660µF
18-75 Vdc	+/-15 Vdc	0mA	+/-200mA	100mVp-p	8mA	87	SWB6-48-15	+/-470µF

Notes:

- The SWB6 Series meets EN55022 with external filter.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The suggested Polytron filter: TBD.

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

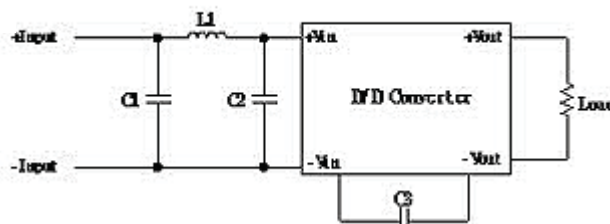
Mechanical Drawing (Metal Case):



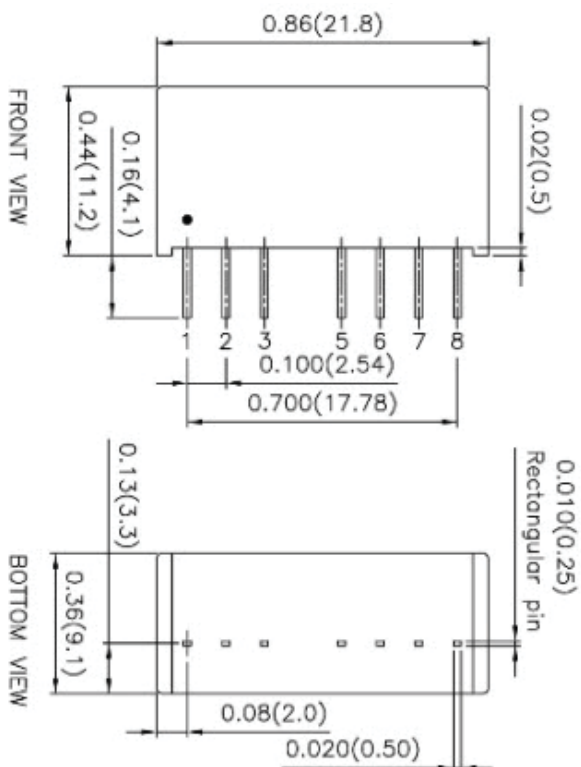
PIN CONNECTION		
PIN	SINGLE	DUAL
1	-INPUT	-INPUT
2	+INPUT	+INPUT
3	CTRL	CTRL
5	NC	NC
6	+OUTPUT	+OUTPUT
7	-OUTPUT	COMMON
8	NC	-OUTPUT
9	CASE	CASE
10	STAND OFF	STAND OFF
11	STAND OFF	STAND OFF
12	CASE	CASE

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)

Recommended EMI Filter:



Mechanical Drawing (Plastic Case):



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)

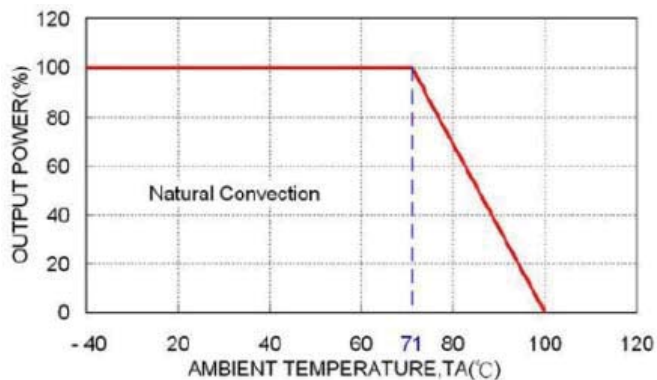
Recommended Filter for EN55022 Class A Compliance

The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

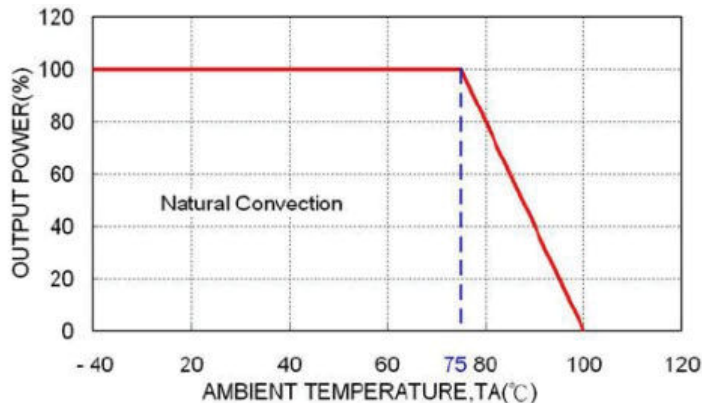
	C1 & C2	C3 & C4	L1
24 Vdc In	10µF/50V 1210 MLCC	331pF/3KV 1808 MLCC	10µH 0504 SMD Inductor PMD-047
48 Vdc In	2.2µF/100V 1812 MLCC	331pF/3KV 1808 MLCC	15µH 0504 SMD Inductor PMD-089

PIN CONNECTION		
PIN	SINGLE	DUAL
1	-INPUT	-INPUT
2	+INPUT	+INPUT
3	CTRL	CTRL
5	NC*/NO PIN**	NC*/NO PIN**
6	+OUTPUT	+OUTPUT
7	-OUTPUT	COMMON
8	NC	-OUTPUT

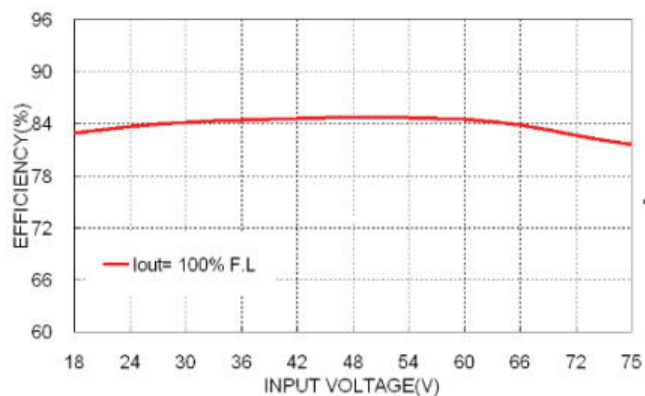
*NC pin for standard.
**NO pin for 3KV isolation. (P/N suffix "H")



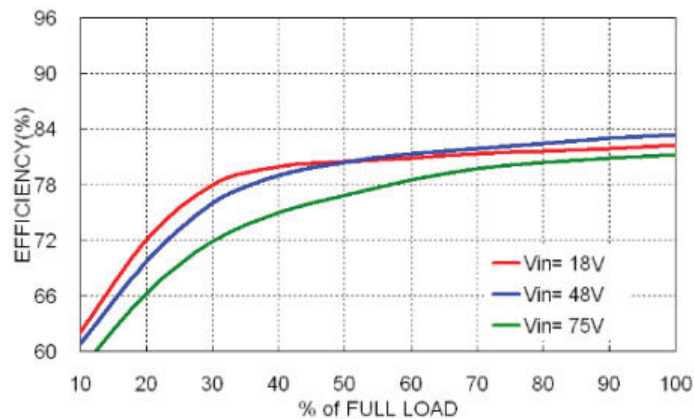
SWB6-48S5 Derating Curve



SWB6-48S5-M Derating Curve



SWB6-48S5 Efficiency VS Input Voltage



SWB6-48S5 Efficiency VS Output Load