SWB Series

50W, 100W

SINGLE OUTPUT

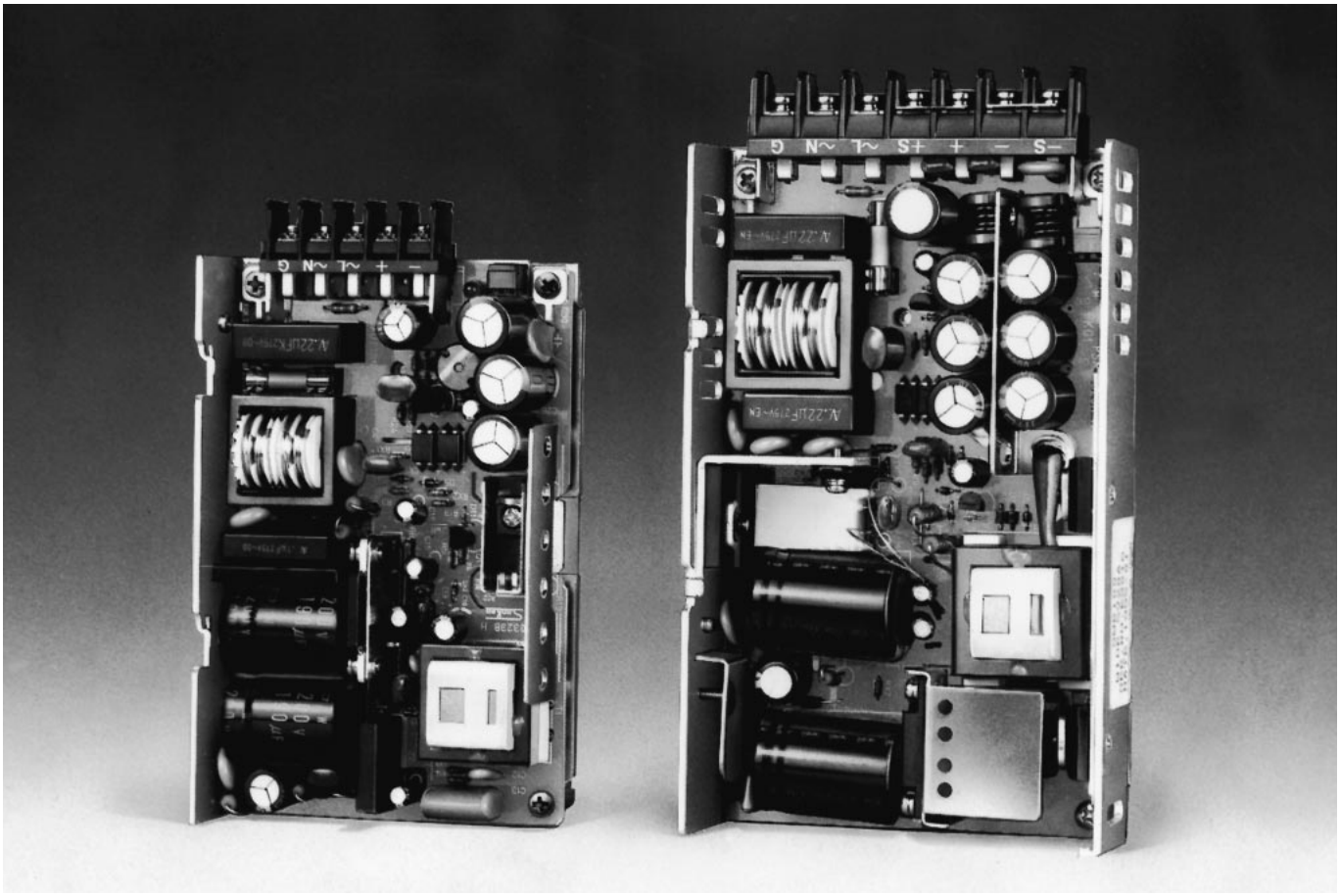
Open Frame with Optional Cover

Designed to meet UL, CSA, and TUV safety standards

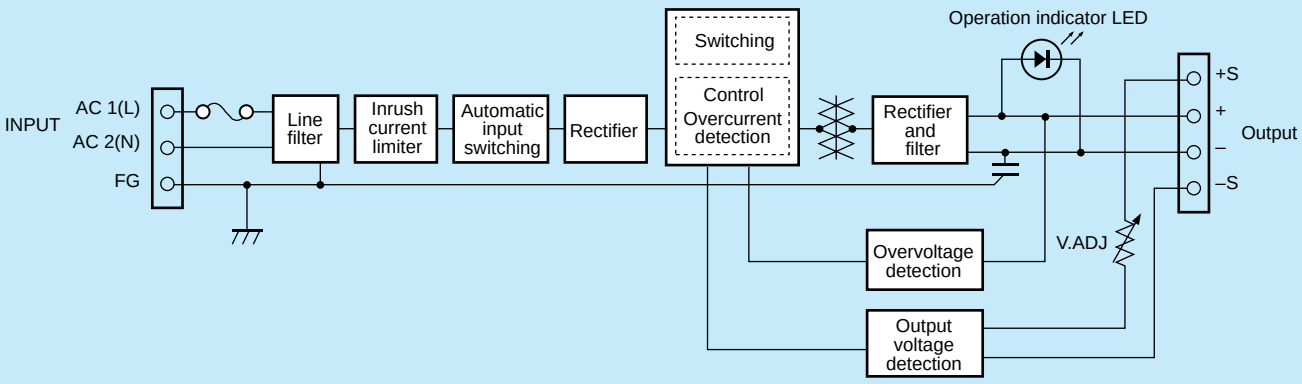
The SWB Series features Sanken' s proprietary resonant-mode power hybrid IC and transformer. These models provide the high efficiency and low noise that can only be realized with a resonant-mode supply. These supplies can accept an input voltage range of 85 to 264 V, and feature continuous input operation which requires no manual voltage selection. Their design makes it easy to meet the power supply needs of world-wide applications.

FEATURES

- 80 to 87% efficiency (SWB Series 50 W),
  81 to 88% efficiency (SWB Series 100 W)
- Low noise
- Small and lightweight, occupying only about 2/3 the volume of Sanken' s equivalent FCC power supplies



SWB Series circuit diagram



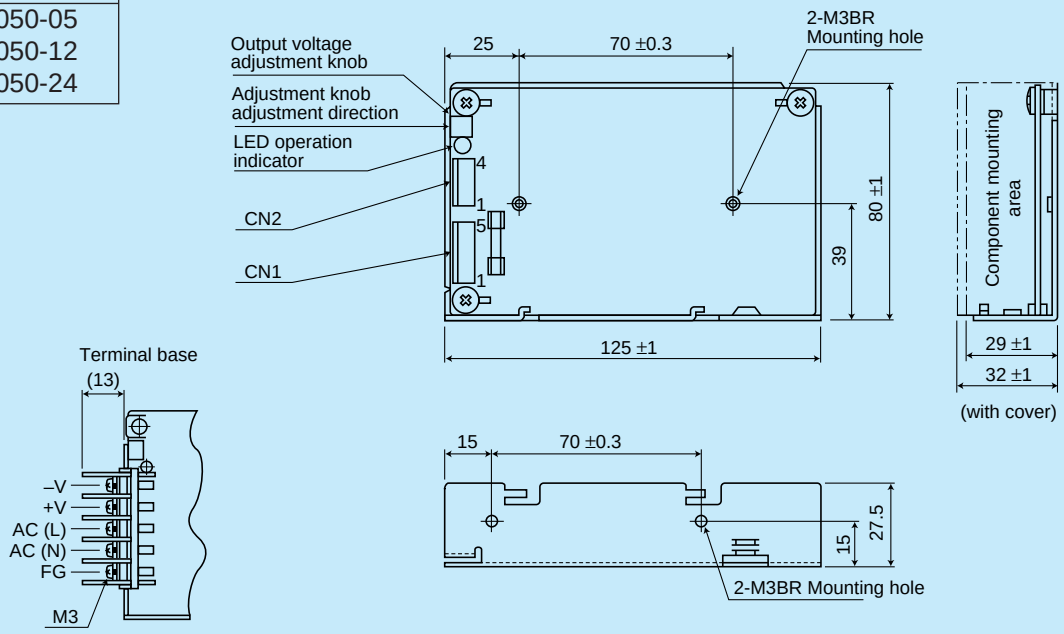
* +S and + are connected with a short bar, as are -S and -.
+S and -S are provided on 100 W model.

	Item		Rating	50W			100W		
			Conditions	SWB 050-05	SWB 050-12	SWB 050-24	SWB 100-05	SWB 100-12	SWB 100-24
Input	Rated Input Voltage			100V AC/120V AC/200V AC/230V AC					
	Input Voltage Range			85 to 132 V AC, 170 to 264 V AC (automatic switching)					
	Frequency Range			47 to 440 Hz (rated frequency is 50/60 Hz)					
	Input Current		Rated input/output conditions	1.2A/0.9A/0.8A/0.7A (typ)			2.7A/2.3A/1.4A/1.2A (typ)		
	Inrush Current		Rated input/output conditions	30 A/60 A (max) (see Note 1)			30 A/60 A (max) (see Note 1)		
	Efficiency (typ)		Rated input/output conditions	80%	84%	87%	81%	85%	88%
Output (see Note 3)	Rated Output Voltage			+5V	+12V	+24V	+5V	+12V	+24V
	Adjustable Output Voltage Range			Rated voltage ±10%			Rated voltage ±10%		
	Rated Output Current			10A	4.2A	2.1A	20A	8.5A	4.5A
	Adjustable Output Current Range			0 to 100%			0 to 100%		
	Maximum Output Power			50W	50.4W	50.4W	100W	102W	108W
	Ripple Noise (mVp-p) (see Note 2)		Rated input/output conditions	80	100	100	80	100	100
	Constant Voltage Accuracy	Static Input Range	85 to 132V AC	±3%			±3%		
		Static Load Range	0 to 100%						
		Time Drifft	10min. to 8 hours						
		Ambient Temperature Range	0 to +60°C						
Other	Output Holdup Time		Rated input/output conditions	16ms (min)			16ms (min)		
	Startup Time		Rated input/output conditions	360ms/250ms (typ)			370ms/260ms (typ)		
	Leakage Current		Rated input/output conditions	0.3mA/0.6mA			0.3mA/0.6mA		
	Switching Method, Transformer Frequency			SMZ, approx. 70 kHz			SMZ, approx. 70 kHz		
Additional Functions	Over Current Protection			Detection above 105% of rated current (output cutoff)					
	Over Voltage Protection			Detection above 115% of rated voltage (output cutoff)					
	Remote Sensing			Not provided			Provided		
	Remote On/Off Control			Not provided			Not provided		
	Display			Red LED operation indicator			Red LED operation indicator		
Environmental	Operating Temperature			0 to 60°C (derating above 50°C)			0 to 60°C (derating above 50°C)		
	Storage Temperature			-25 to +85°C			-25 to +85°C		
	Operating Humidity			30 to 90% (no condensation)			30 to 90% (no condensation)		
	Storage Humidity			30 to 90% (no condensation)			30 to 90% (no condensation)		
Insulation	Insulation Withstand Voltage (at normal temperature and humidity)		Between Input and Output Between Input and Frame	2000 V AC for 1 minute			2000 V AC for 1 minute		
			Between Output and Frame	500 V AC for 1 minute			500 V AC for 1 minute		
	Insulation Resistance (at normal temperature and humidity)		Between Input and Output Between Input and Frame Between Output and Frame	100 MΩ (measured with 500 V DC Megger)					
Structural Specifications	Vibration Resistance			10 to 55 Hz, 2 G, 1 hour(in X, Y, and Z directions, with 3-minute vibration time)					
	Cooling Requirements			Natural air cooling					
	External Appearance			Open frame (with optional cover)					
	Size (dimensions in mm)			125 x 80 x 29 (W x D x H) (without cover)			150 x 93 x 33 (W x D x H) (without cover)		
	Weight			about 280 g (without cover)			about 450 g (without cover)		
Applicable Standards	Safety Standards			Designed to meet UL 1950, CSA C22.2 No. 234 Level 3, TUV (EN 60950) (120/230 V AC)					
	EMI Standards			Designed to meet FCC Class B (120 V AC), VDE 0871 Class A (230 V AC)					

Note 1: At cold start. (More current may flow at restart.)
Note 2: Ripple noise is measured with a 100 MHz oscilloscope, using a 1:1 probe.
Note 3: Output characteristics are measured at the output connector. Ripple noise is measured at a point 5 cm from the output connector, with a 63 V 47 µF electrolytic capacitor attached at that point.
* "Rated input/output conditions" means that the switching power supply is operated under the rated input voltage, rated output voltage, rated output current, rated frequency, and at an ambient temperature of 25°C and 60% humidity.

50 W
(weight: approx. 280 g)

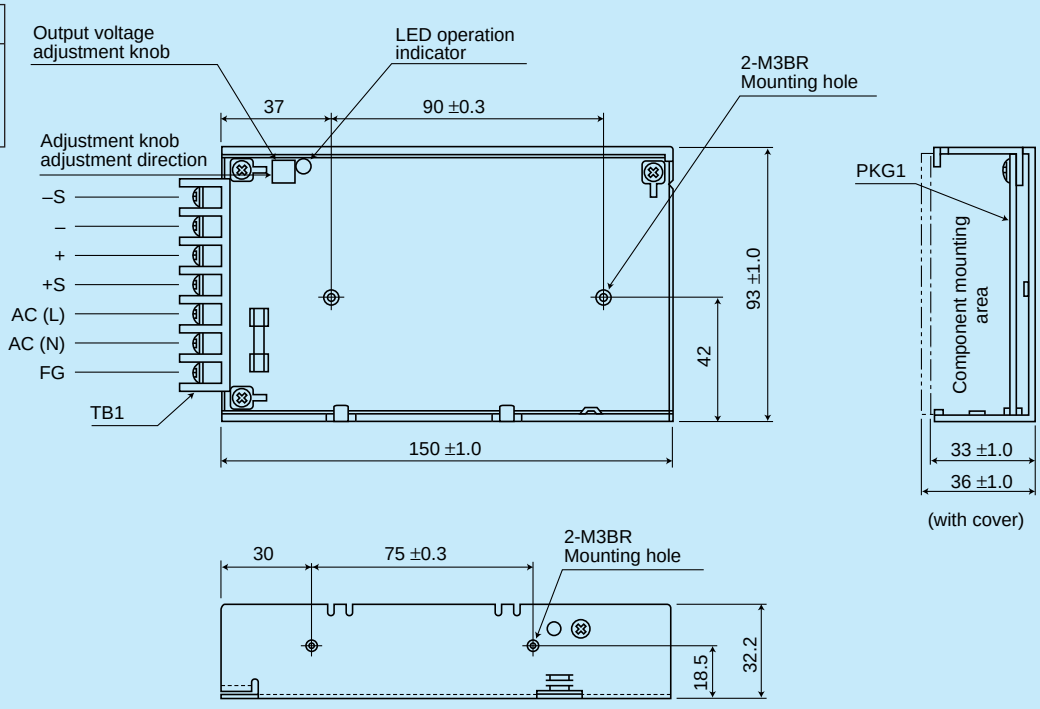
Model
SWB050-05
SWB050-12
SWB050-24



* Installation screws must be shorter than 5 mm.

100 W
(weight: approx. 450 g)

Model
SWB100-05
SWB100-12
SWB100-24



* Installation screws must be shorter than 5 mm.

Operating instruction (SWB Series)

SWB050 Connector type

	Pin number	Terminal name	Corresponding connector	Corresponding contact
CN1	1	FG	VHR-5N (JST)	SVH-21T-P1.1 (JST)
	2	NC		
	3	AC (N)		
	4	NC		
	5	AC (L)		
CN2	1 - 2	+	VHR-4N (JST)	SVH-21T-P1.1 (JST)
	3 - 4	–		

SWB050 Terminal base type

	Terminal label	Terminal name	Corresponding crimp terminal
TB1	–	–	V1.25-3 (JST) or equivalent
	+	+	
	~L	AC (L)	
	~N	AC (N)	
	G	FG	

SWB100 Terminal base (for terminal base types only)

	Terminal label	Terminal name	Corresponding crimp terminal
TB1	–S	–S	V2-4 (JST) or equivalent
	–	–	
	+	+	
	+S	+S	
	~L	AC (L)	
	~N	AC (N)	
	G	FG	

Terminal names and functions

	Terminal name	Function
Input	AC (L)	AC input terminal. Includes an input fuse.
	AC (N)	AC input terminal.
	FG	Frame ground (ground terminal).
Output	+	DC output terminal, + side.
	–	DC output terminal, - side.
	+S	Remote sensing terminal, + side. (100 W model only)
	–S	Remote sensing terminal, - side. (100 W model only)
	NC	No connect.

Options

Model number option code	Terminal name	Applicable models
none	Terminal base type, no cover	all models
-CN	Connector type, no cover	SWB050
-C	Terminal base type, with cover	all models
-CN -C	Connector type, with cover	SWB050

1 Setting the output current

Output current may be adjusted using the adjustment knob found near the connector or terminal base. Turning the knob clockwise increases output current, while turning it counterclockwise decreases output current. Use the power supply with the output within its adjustable range and with a load such that the supply's rated output power is not exceeded.

2 Overcurrent protection

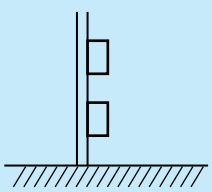
When the output is overloaded, the power supply's built-in overcurrent protection will shut off the output. The overcurrent protection is set to function when the output current exceeds 105% of the rated current value (about 130% of a standard output value).
To reset the overcurrent protection, remove the source of the overload, turn off the power, and wait about a minute before turning the power on again.

3 Overvoltage protection

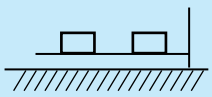
If the output voltage increases for some reason, the overvoltage condition is detected and the output shut off. Once the overvoltage protection is activated, the output will remain cut off as long as the input supply is energized. To reset the overvoltage protection, turn off the power and wait about a minute before turning the power on again.
Take care when applying power again, as there may still be a problem with the output voltage (if there is, the overvoltage protection will shut down the output again).

4 Mounting

To use the power supply with natural air cooling, mount the supply so that both sides and the top are open, and so that there is sufficient air current.
The power supply may be mounted either vertically or horizontally, as shown below. Use mounting screws that are 5 mm long or less.



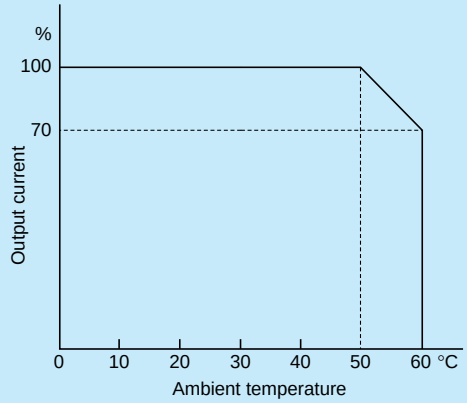
(A) Vertical mounting



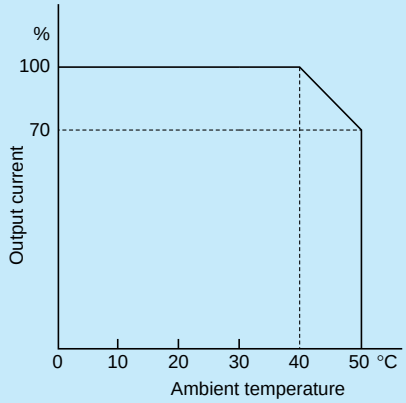
(B) Horizontal mounting

Output current derating

SWB Series (A), (B), without cover



SWB Series (A), (B), with cover



5 Leakage current

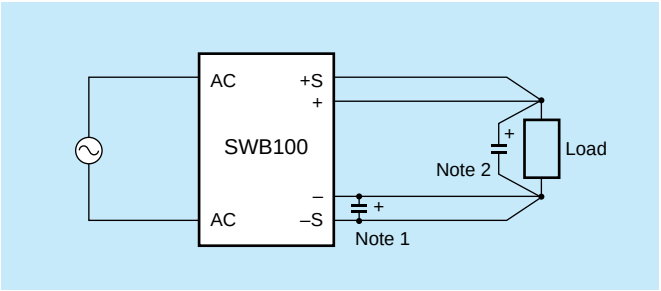
Leakage current for a single power supply is 0.6 mA or less. Take care when using multiple supplies together.

6 Inrush current limiting

The power supply is equipped with an inrush current limiting circuit to restrict the amount of current that flows when the power is turned on. The 50 W model uses a power thermistor; current greater than that listed in the specifications may flow when restarting the supply, or due to ambient temperature conditions. The 100 W model may also allow more current than listed in the specifications if restarting after a short period of time. Take adequate precautions.

7 Remote sensing

The SWB100 is equipped with a remote sensing feature to guard against output line drop. The guaranteed output voltage range, including line drop effects, is 5% of rated output voltage. Limit line drop on the minus side to 125 mV or less.



Note 1 Connect an electrolytic capacitor of about 10 µF.
Note 2 Connect an electrolytic capacitor of about 100 µF across the load.

8 Serial and parallel connection

These power supplies may not be connected in serial or parallel to increase output capacity.

9 When there is no output

- Check that all terminals are connected correctly.
- Output will be cut off when overvoltage protection is active. Check the supply as described in item (3). Overvoltage protection may be activated if the output voltage is set too high. Verify that the output voltage adjustment knob is set towards the middle of its range. Overvoltage protection may be activated if the remote sensing terminals are not properly connected. Check their connections.
- The overcurrent protection will be activated and the output cut off if there is an overload condition.