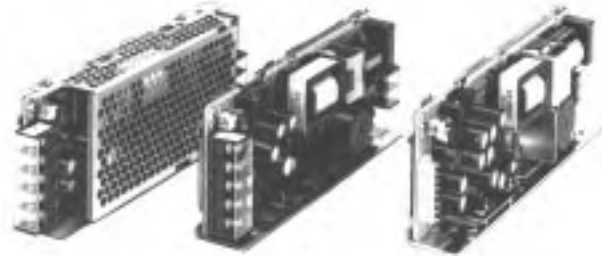


Economical Built-in 3-point Switching Power Supply

- Emission level conforms to FCC class B, VCCI2, EN55011 Gr1 class B: EN50081-2.
- Leakage current of 0.3 mA max.
- UL and CSA approval.
- Front terminal-, top terminal-, and connector-type available.
- Open-frame and covered types available.
- Easy to mount to a structure with chassis.



Ordering Information

Configuration	Input voltage	Power ratings	Output voltage/Current			Front terminals	Top terminals	Connector
			V1	V2	V3			
Open-frame type	100 VAC	30 W	5 V/3 A	12 V/1.2 A	-12 V/0.3 A	S8E3-03031A	S8E3-03031B	S8E3-03031C
			5 V/3 A	15 V/1 A	-15 V/0.3 A	S8E3-03032A	S8E3-03032B	S8E3-03032C
		50 W	5 V/5 A	12 V/1.5 A	-12 V/0.5 A	S8E3-05031A	S8E3-05031B	S8E3-05031C
			5 V/5 A	15 V/1.2 A	-15 V/0.5 A	S8E3-05032A	S8E3-05032B	S8E3-05032C
Covered-type	100 VAC	30 W	5 V/3 A	12 V/1.2 A	-12 V/0.3 A	S8E3-03031D	S8E3-03031E	S8E3-03031F
			5 V/3 A	15 V/1 A	-15 V/0.3 A	S8E3-03032D	S8E3-03032E	S8E3-03032F
		50 W	5 V/5 A	12 V/1.5 A	-12 V/0.5 A	S8E3-05031D	S8E3-05031E	S8E3-05031F
			5 V/5 A	15 V/1.2 A	-15 V/0.5 A	S8E3-05032D	S8E3-05032E	S8E3-05032F

Model Number Legend:

S8E3-

1 2 3

1. Power Ratings

030: 30 W
050: 50 W

2. Output Voltage

31: 5 V, 12 V, -12 V
32: 5 V, 15 V, -15 V

3. Configuration

A: Open-frame type, front terminals
B: Open-frame type, top terminals
C: Open-frame type, connector
D: Covered-type, front terminals
E: Covered-type, top terminals
F: Covered-type, connector

Specifications

■ Ratings/Characteristics

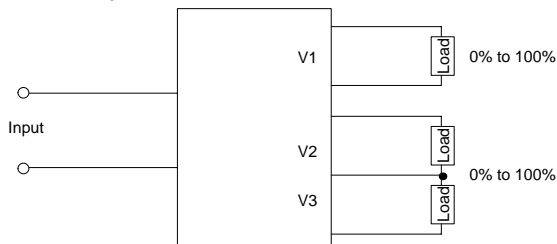
Item		30 W	50 W
Efficiency (typical)		73%	
Input	Voltage	100 VAC (85 to 132 VAC)	
	Frequency	47 to 450 Hz	
	Current (see note 2)	1.2 A max.	1.6 A max.
	Leakage current	0.3 mA max. (at 100 VAC)	
	Inrush current (see note 2)	25 A max. (25°C, cold start, at 100 VAC)	
	Noise filter	Yes	
Output	Voltage adjustment range	0% to 5% (V1 only)	
	Ripple (see note 2)	2% (p-p) max.	
	Input variation influence	0.4% max. (at 85 to 132-VAC input, 100% load)	
	Load variation influence	V1: 0.8% max.; V2, V3: 2.5% max. (0% to 100% load)	
	Temperature variation influence	0.05%/°C max. (with rated input and output)	
	Startup time	100 ms max.	
	Hold time (see note 2)	20 ms min. (at 100 VAC)	
Additional function	Overload protection	V1: inverted drop type, automatic reset; V2, V3: short-circuit protection	
	Overvoltage protection	Yes (V1 only)	
Other	Ambient temperature	Operating: See the derating curve in the "Engineering Data" section. Storage: -25°C to 65°C (with no condensation and icing)	
	Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between all inputs and all outputs/GR terminals)	
	Insulation resistance	100 MΩ min. (between all outputs and all inputs/GR terminals at 500 VDC)	
	Vibration resistance	10 to 55 Hz, 0.75-mm double amplitude (44.1 m/s ² (4.5G)) for 2 hrs each in X, Y, and Z directions	
	Shock resistance	294 m/s ² (30G), 3 times each in ±X, ±Y, and ±Z directions	
	Electromagnetic interference	Conforms to FCC class B, VCCI 2nd category, EN55011 Gr1 class B: EN50081-2	
	Approved standards	UL1950, CSA C22.2 No. 234	
	Output indicator	Yes (green)	
	Life expectancy	8 yrs min. (used at 40°C at the rated input with a 50% load)	
	Weight (covered-type)	450 g max.	570 g max.

- Note:**
1. The specification is defined at the power supply output terminals.
 2. At 100% load for rated input voltage (100 VAC).

Engineering Data

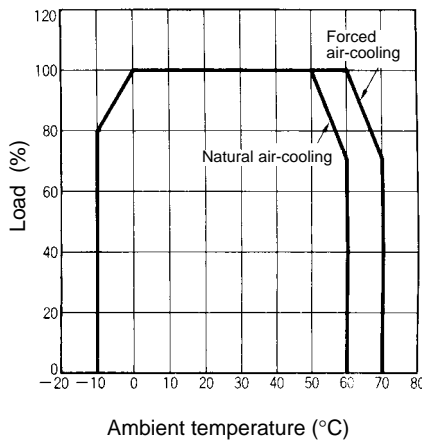
■ Minimum Currents for V₁, V₂, and V₃

V₁, V₂, and V₃ can be used at 0% to 100% loads.

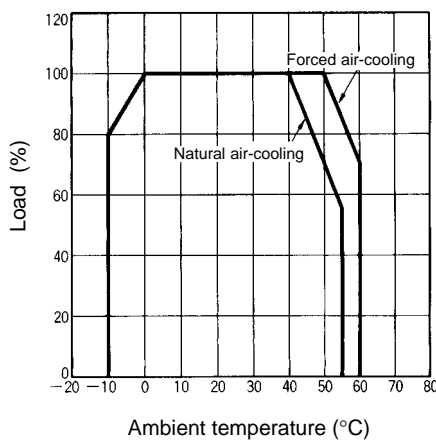


Derating Curve (Standard Installation)

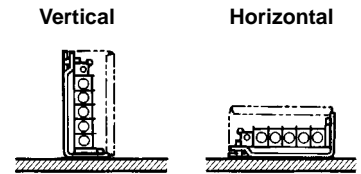
Open-frame Type



Covered-type



Standard Installation

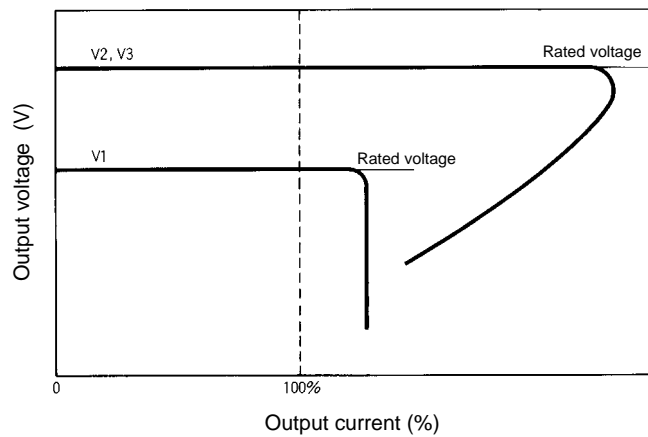


Note: The derating curve depends on the mounting direction of the Power Supply.

Note: The above ambient temperature curves for forced air-cooling were obtained with an air capacity of 1 m³ per minute.

Overload Protection

The S8E3 is provided with an overload protection function that protects the load and the S8E3 from possible damage by overcurrent. The following graph shows the overload detection and reset operation of the S8E3.

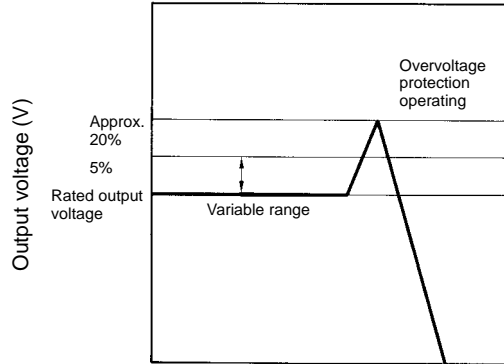


Type	Operating method	Detection	Reset
V1	Inverted drop	105% min. of rated load current	Automatically resets when the output current returns to normal
V2, V3	Short-circuit protection	---	

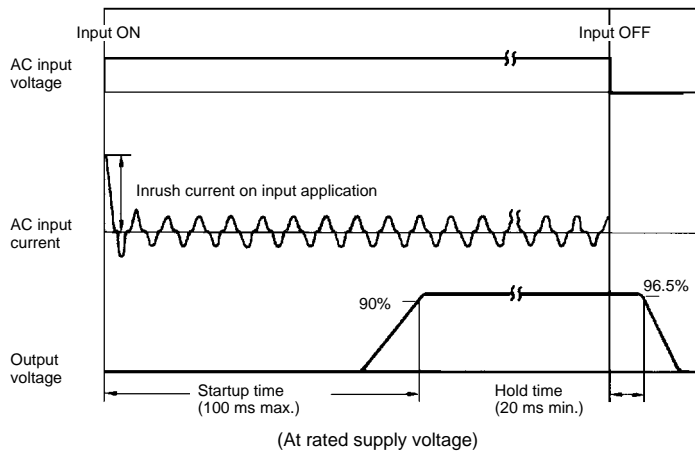
- Note:**
1. The overload protection function of output V₁ is triggered when the total output of V₁, V₂, and V₃ exceeds the permissible output capacity of the S8E3 (total overcurrent protection). If outputs V₂ and V₃ are within their rated currents, overload protection for V₁ operates with its output current is 105% or more of the rated output current. Caution is required, however, because operation depends on the output status of outputs V₂ and V₃.
 2. V₂ and V₃ have an independent short-circuit protection function.
 3. Do not continue operating the S8E3 if an output terminal is short-circuited or overloaded, otherwise the S8E3 may incur output voltage fluctuation, internal element deterioration, or damage.

■ Overvoltage Protection (V1 Output Only)

The Power Supply is provided with an overvoltage protection function that protects the load and the Power Supply from possible damage by overvoltage. When the output voltage rises above a set value (120% of the rated output voltage), the protection function is triggered, shutting off all of the output voltage. If this occurs, reset the Power Supply by turning it off for 1 minute min. and then turning it on again.



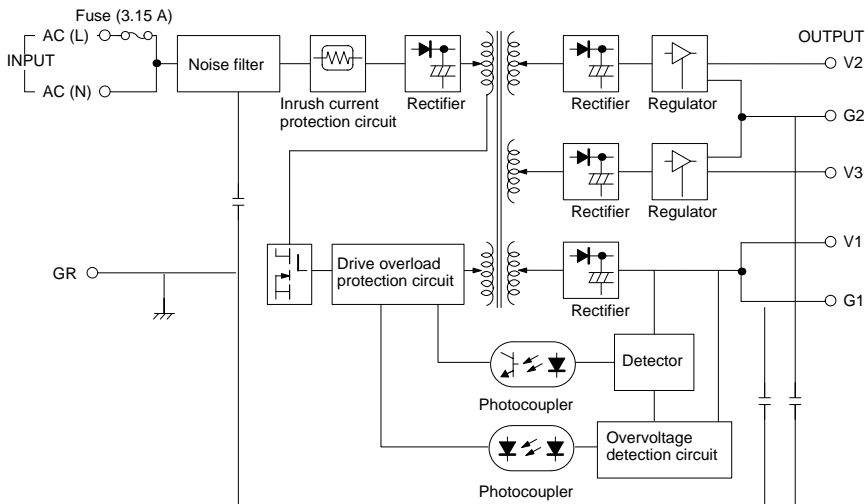
■ Inrush Current, Startup Time, Hold Time



Operation

■ Block Diagram

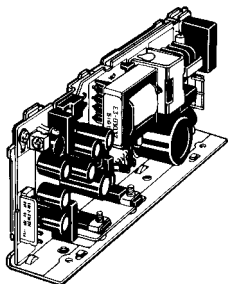
30-W, 50-W Models



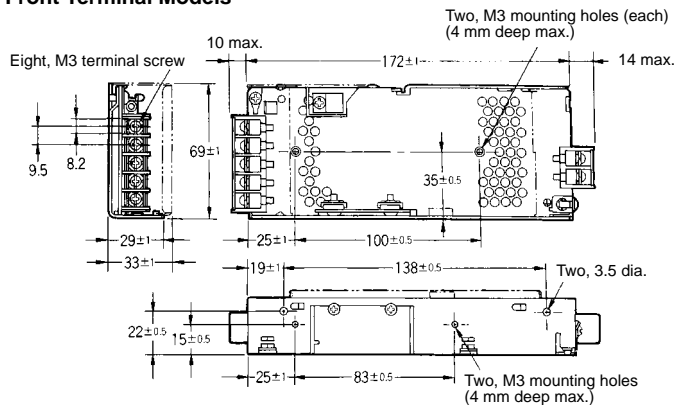
Dimensions

Note: All units are in millimeters unless otherwise indicated.

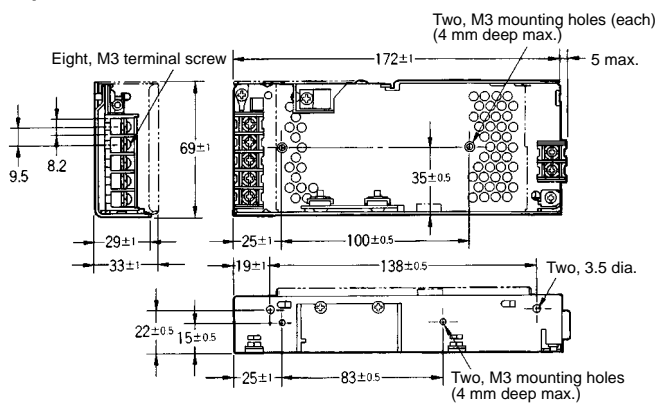
30-W Models



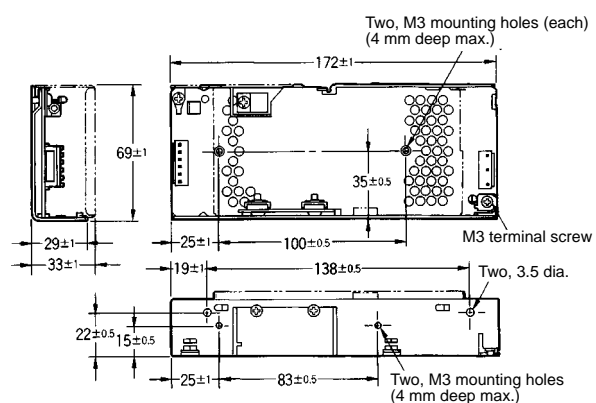
Front Terminal Models



Top Terminal Models

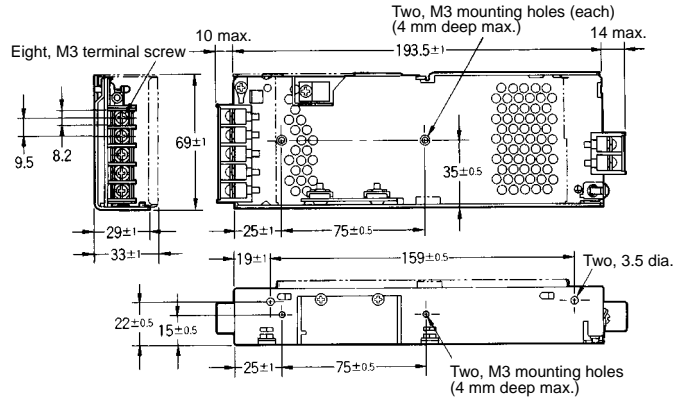
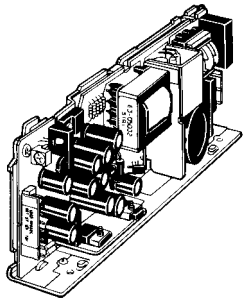


Connector Models

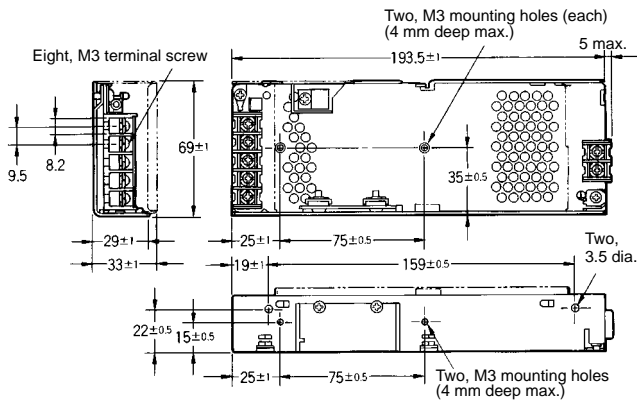


50-W Models

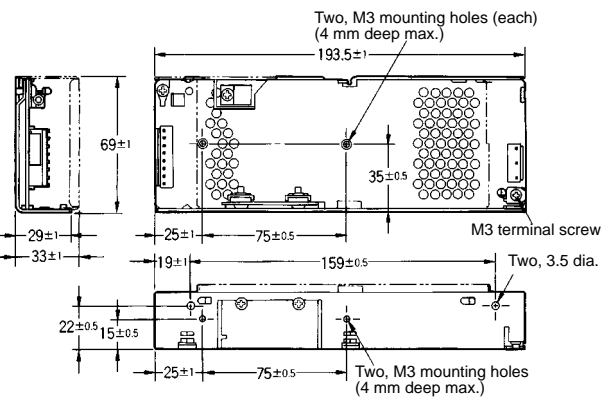
Front Terminal Models



Top Terminal Models

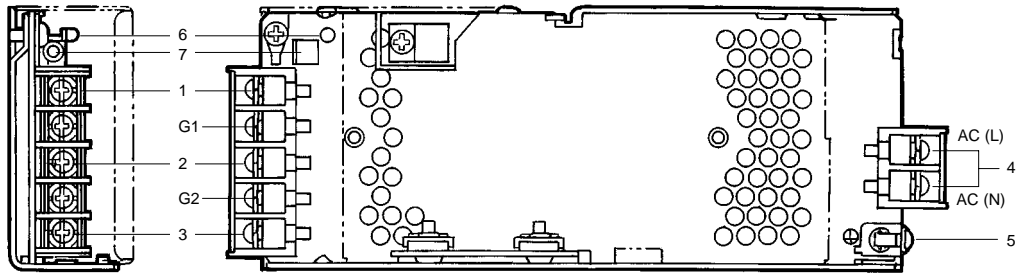


Connector Models

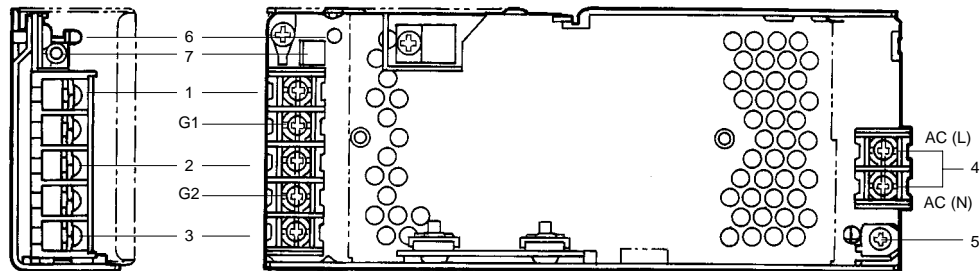


Installation

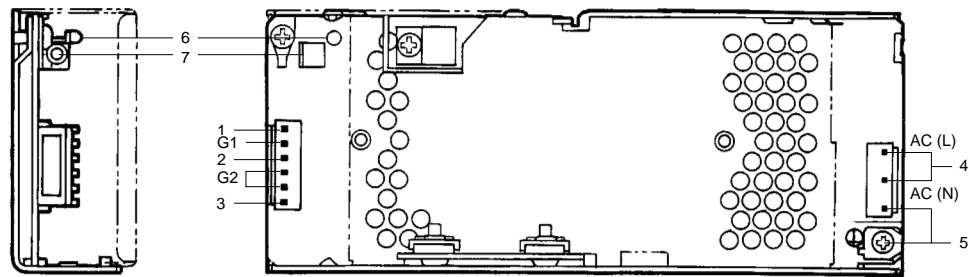
Front Terminal Models (30-/50-W)



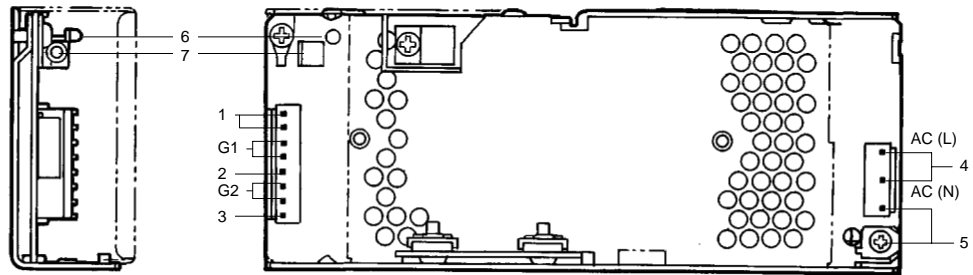
Top Terminal Models (30-/50-W)



Connector Models (30-W)



Connector Models (50-W)



Connectors

(Manufactured by Nippon Atchaku Tanshi)

Ratings	Connector	Connector on the circuit board side	Suitable housing	Terminal
30 W	Input	B3P-5-VH	VHR-5N	SVH-21T-P1.1
	Output	B6P-VH	VHR-6N	SVH-21T-P1.1
50 W	Input	B3P-5-VH	VHR-5N	SVH-21T-P1.1
	Output	B8P-VH	VHR-8N	SVH-21T-P1.1

Note: 30-W Models: The two Housings and ten Terminals are provided with the Unit.
The terminal press-fit tool are YC-160R and YC-16 (manufactured by Nippon Atchaku Tanshi).
50-W Models: The two Housings and twelve Terminals are provided with the Unit.
The terminal press-fit tool are YC-160R and YC-16 (manufactured by Nippon Atchaku Tanshi).

1. V_1
 2. V_2
 3. V_3
- } Connect the DC output terminals and load lines to these terminals.
4. **AC Input Terminals (L, N):** Connect the input lines to these terminals
 5. **Ground Terminal (GR):** Connect a ground line to this terminal.
 6. **Output Indicator (DC ON):** Lights while a Direct Current (DC) output is ON.
 7. **Output Voltage Adjuster:** The voltage of the 5-V output can be increased by 5% maximum.

Precautions

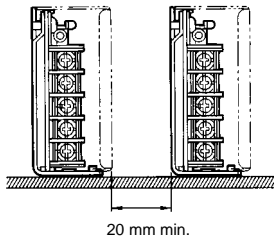
Mounting

To improve and maintain the reliability of the Power Supply over a long period of time, adequate consideration must be given to heat radiation.

The Power Supply is designed to radiate heat by means of natural air-flow. Therefore, mount the Power Supply so that air flow takes place around the Power Supply.

Forced air-cooling is recommended.

When mounting two or more Power Supplies side-by-side, allow at least 20 mm spacing between them, as shown in the following illustration.



Mounting Screws

When tightening the mounting screws into the power supply, do not allow them to penetrate more than 4 mm into the power supply.

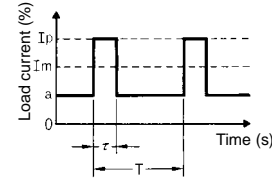
Penetration of Metal Filings and Cuttings

If drilling and other work is carried out over the power supply, metal filings, cuttings, and other materials may fall onto the printed circuit boards inside the power supply, leading to internal shorts and damage. If it is necessary to work over top of the power supply, cover the power supply with a sheet or other suitable material to prevent the entry of foreign matter into the power supply. This step is necessary regardless of whether or not the power supply is equipped with a cover. After completing the above work and before supplying power, remove the sheet so that proper cooling is not interfered with.

Peak Load Current (S8E3-05031□ Only)

The rated current of the S8E3-05031□ is 1.5 A at 12 V. The peak load current of the S8E3-05031□ is available at 12 V under the following conditions, in which case the waveform of the load current must satisfy the following formula.

$$I_{av} \cong I_m = \frac{(I_p - a)\tau}{T} + a \quad (\text{see note})$$



I_p :	Peak current (2 A max.)	(A)
I_{av} :	Rated output current (1.5 A)	(A)
I_m :	Mean load current	(A)
τ :	Pulse width of peak current (30 s max.)	(S)
T :	Frequency	(S)
a :	Continuous load current	(A)

Note: When the output current rises above the peak current, the overload protection function is triggered and the output voltage will decrease.

Series or Parallel Operation

No series or parallel operation is available.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. T009-E1-1A In the interest of product improvement, specifications are subject to change without notice.

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