

- All models feature the same compact dimensions to provide a uniform mounting pitch
- Built-in varistor effectively absorbs external surges
- Operation indicator (red LED) enables monitoring operation
- Protective cover for greater safety
- All models approved by UL/CSA; TUV approved models available
- Wide range of outputs: 5 to 40 A, up to 480 VAC/200 VDC
- Optional Y92B heat sinks allow relays to reach maximum rated loads
- 25-amp version ideal for many industrial control applications



## Ordering Information

Isolation	Applicable output load	Zero cross function	Rated input voltage	Part number
				With indicator
Phototriac	5 A at 24 to 240 VAC (see note 1)	Yes	5 to 24 VDC	<b>G3NA-205B-DC5-24</b>
			100 to 120 VAC	<b>G3NA-205B-AC100-120</b>
			200 to 240 VAC	<b>G3NA-205B-AC200-240</b>
	10 A at 24 to 240 VAC (see note 1)		5 to 24 VDC	<b>G3NA-210B-DC5-24</b>
			100 to 120 VAC	<b>G3NA-210B-AC100-120</b>
			200 to 240 VAC	<b>G3NA-210B-AC200-240</b>
Photocoupler	10 A at 200 to 480 VAC (see note 1)	No	5 to 24 VDC	<b>G3NA-410B-DC5-24</b>
			100 to 240 VAC	<b>G3NA-410B-AC100-240</b>
	10 A at 5 to 200 VDC		5 to 24 VDC	<b>G3NA-D210B-DC5-24</b>
			100 to 240 VAC	<b>G3NA-D210B-AC100-240</b>
Phototriac	20 A at 24 to 240 VAC (see note 1)	Yes	5 to 24 VDC	<b>G3NA-220B-DC5-24</b>
			100 to 120 VAC	<b>G3NA-220B-AC100-120</b>
			200 to 240 VAC	<b>G3NA-220B-AC200-240</b>
Photocoupler	20 A at 200 to 480 VAC (see note 1)		5 to 24 VDC	<b>G3NA-420B-DC5-24</b>
			100 to 240 VAC	<b>G3NA-420B-AC100-240</b>
Phototriac	25 A at 24 to 240 VAC (see note 1)		5 to 24 VDC	<b>G3NA-225B-DC5-24</b>
			100 to 120 VAC	<b>G3NA-225B-AC100-120</b>
			200 to 240 VAC	<b>G3NA-225B-AC200-240</b>
Photocoupler	25 A at 200 to 480 VAC (see note 1)		5 to 24 VDC	<b>G3NA-425B-DC5-24</b>
		100 to 240 VAC	<b>G3NA-425B-AC100-240</b>	
Phototriac	40 A at 24 to 240 VAC	5 to 24 VDC	<b>G3NA-240B-DC5-24</b>	
		100 to 120 VAC	<b>G3NA-240B-AC100-120</b>	
		200 to 240 VAC	<b>G3NA-240B-AC200-240</b>	
Photocoupler	40 A at 200 to 480 VAC (see note 1)	5 to 24 VDC	<b>G3NA-440B-DC5-24</b>	
		100 to 240 VAC	<b>G3NA-440B-AC100-240</b>	

NOTE: 1. Loss time increases under 75 VAC (Refer to "Precautions Section").

2. To order TUV approved versions, contact your local OMRON representative.

## ■ ACCESSORIES

### Heat Sinks

Types	Applicable solid-state relays	Part number
Standard mount	G3NA-205B, G3NA-210B, G3NA-D210B, G3NA-220B, G3NA-410B, G3NA-420B	<b>Y92B-A100</b>
	G3NA-225B, G3NA-240B, G3NA-425B, G3NA-440B	<b>Y92B-A150N</b>
	G3NA-440B	<b>Y92B-A250</b>
Track mount	G3NA-205B, G3NA-210B, G3NA-D210B, G3NA-410B	<b>Y92B-N50</b>
	G3NA-220B, G3NA-420B	<b>Y92B-N100</b>
	G3NA-225B, G3NA-240B, G3NA-425B, G3NA-440B	<b>Y92B-N150</b>

### Mounting Track and Accessories

Description	Part number
Mounting bracket for G3NA-240B. Changes pitch to 56 mm (2.21 in.) from 47.5 mm (1.73 in.), the same pitch as G3N-240B.	<b>R99-11</b>
DIN Rail Track, 50 cm (1.64 feet) length; use with Y92B-N□□□ heat sinks	<b>PFP-50M</b>
DIN Rail Track, 1 m (3.28 feet) length; use with Y92B-N□□□ heat sinks	<b>PFP-100M</b>
Spacer	<b>PFP-S</b>
End cap	<b>PFP-M</b>

## Specifications

### ■ INPUT RATINGS

(Ambient temperature: 25°C [77°F])

Type	Rated voltage	Operating voltage range	Impedance	Voltage Level	
				Must operate voltage	Must release voltage
G3NA-2□□B	5 to 24 VDC	4 to 32 VDC	7 mA max. (see note 2)	4 VDC max.	1 VDC min.
	100 to 120 VAC	75 to 132 VAC	36 kΩ ±20%	75 VAC, max. (see note 3)	20 VAC min. (see note 3)
	200 to 240 VAC	150 to 264 VAC	72 kΩ ±20%	150 VAC max. (see note 3)	40 VAC min. (see note 3)
G3NA-4□□B	5 to 24 VDC	4 to 32 VDC	5 mA max. (see note 2)	4 VDC max.	1 VDC min.
	100 to 240 VAC	75 to 132 VAC	72 kΩ ±20%	75 VAC max.	20 VAC min.
G3NA-D210B	5 to 24 VDC	4 to 32 VDC	5 mA max. (see note 2)	4 VDC max.	1 VDC min.
	100 to 240 VAC	75 to 132 VAC	72 kΩ ±20%	75 VAC max.	20 VAC min.

Note: 1. The input impedance is measured at the maximum value of the rated supply voltage (for example, with the model rated at 100 to 120 VAC, the input impedance is measured at 120 VAC).

2. With constant current input circuit system.
3. Refer to the "Characteristic Data" for further details.

### ■ OUTPUT RATINGS

Type	Applicable load				
	Rated load voltage	Load voltage range	Load current		Surge current
			With heat sink*	Without heat sink	
G3NA-205B	24 to 240 VAC	19 to 264 VAC	0.1 to 5 A	0.1 to 3 A	60 A (60 Hz, 1 cycle)
G3NA-210B	24 to 240 VAC	19 to 264 VAC	0.1 to 10 A	0.1 to 4 A	150 A (60 Hz, 1 cycle)
G3NA-410B	200 to 480 VAC	180 to 528 VAC	0.2 to 10 A	0.2 to 4 A	150 A (60 Hz, 1 cycle)
G3NA-220B	24 to 240 VAC	19 to 264 VAC	0.1 to 20 A	0.1 to 4 A	220 A (60 Hz, 1 cycle)
G3NA-420B	200 to 480 VAC	180 to 528 VAC	0.2 to 20 A	0.2 to 4 A	220 A (60 Hz, 1 cycle)
G3NA-225B	24 to 240 VAC	19 to 264 VAC	0.1 to 25 A	0.1 to 4 A	220 A (60 Hz, 1 cycle)
G3NA-425B	200 to 480 VAC	180 to 528 VAC	0.1 to 25 A	0.1 to 4 A	220 A (60 Hz, 1 cycle)
G3NA-240B	24 to 240 VAC	19 to 264 VAC	0.1 to 40 A	0.1 to 6 A	440 A (60 Hz, 1 cycle)
G3NA-440B	200 to 480 VAC	180 to 528 VAC	0.2 to 40 A	0.2 to 6 A	440 A (60 Hz, 1 cycle)
G3NA-D210B	5 to 200 VDC	4 to 220 VDC	0.1 to 10 A	0.1 to 4 A	20 A (10 ms)

\*When the appropriate size OMRON heat sink is used.

■ CHARACTERISTICS

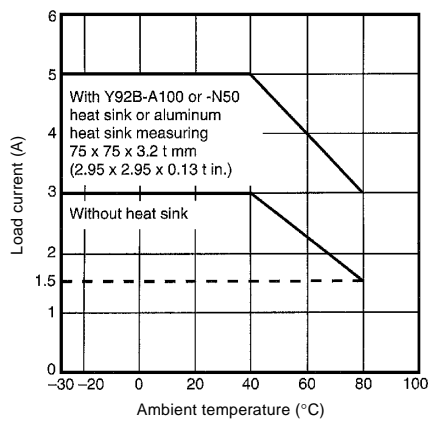
Type		G3NA-205B, -210B, -220B, -225B	G3NA-240B	G3NA-410B, -420B, -425B, -440B	G3NA-D210B
Operate time	DC input	1/2 of load power source cycle + 1 ms max.			1 ms max.
	AC input	1 1/2 of load power source cycle + 1 ms max.			30 ms max.
Release time	DC input	1/2 of load power source cycle + 1 ms max.			5 ms max.
	AC input	1 1/2 of load power source cycle + 1 ms max.			30 ms max.
Output ON voltage drop		1.6 V (RMS) max.	1.6 V (RMS) max.	1.8 V (RMS max.)	1.5 V max.
Leakage current		5 mA max. at 100 VAC		10 mA max. at 200 VAC	5 mA max. at 200 VDC
		10 mA max. at 200 VAC		20 mA max. at 400 VAC	
Insulation resistance		100 MΩ min at 500 VDC			
Dielectric strength		2,500 VAC, 50/60 Hz for 1 minute			
Vibration	Malfunction	10 to 55 Hz, 1.5 mm double amplitude			
Shock	Malfunction	1,000 m/s <sup>2</sup> (approx. 100G)			
Ambient temperature	Operating	-30° to 80°C (-22° to 176°F) with no icing			
	Storage	-30° to 100°C (-22° to 212°F) with no icing			
Humidity		45% to 85% RH			
Weight		Approx. 60 g (2.1 oz.)	Approx. 70 g (2.5 oz.)	Approx. 80 g (2.8 oz.)	Approx. 70 g (2.5 oz.)

Note: Data shown are of initial value.

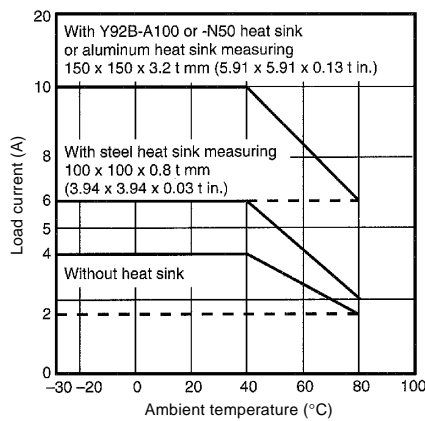
■ CHARACTERISTIC DATA

Load Current vs. Ambient Temperature Characteristics

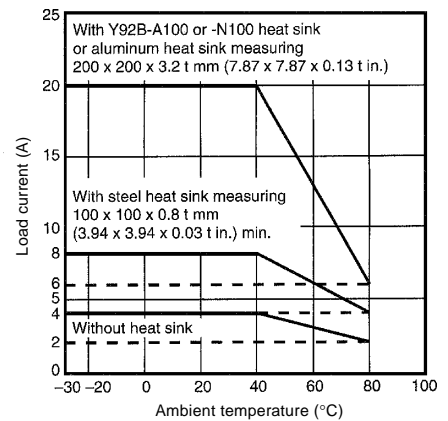
G3NA-205B



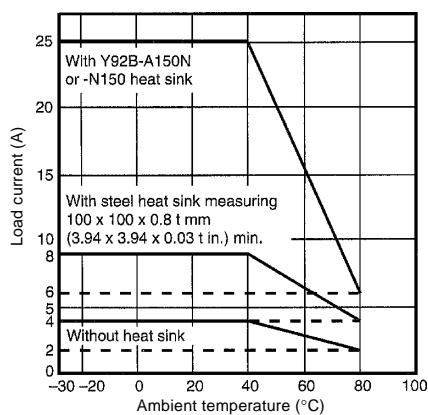
G3NA-210B  
G3NA-410B



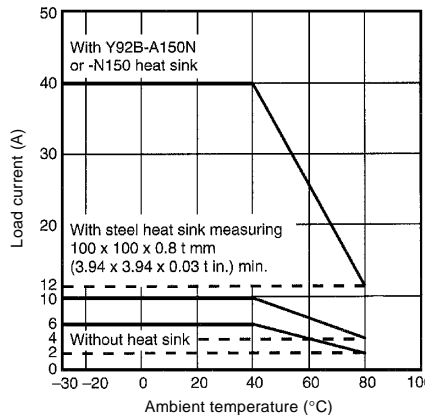
G3NA-220B  
G3NA-420B



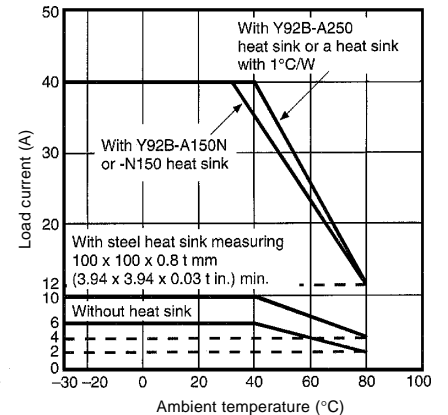
G3NA-225B  
G3NA-425B



G3NA-240B



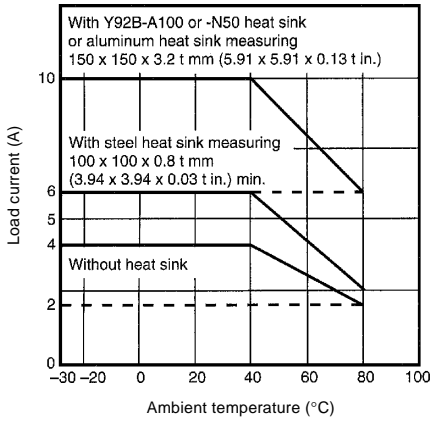
G3NA-440B



■ CHARACTERISTIC DATA (continued)

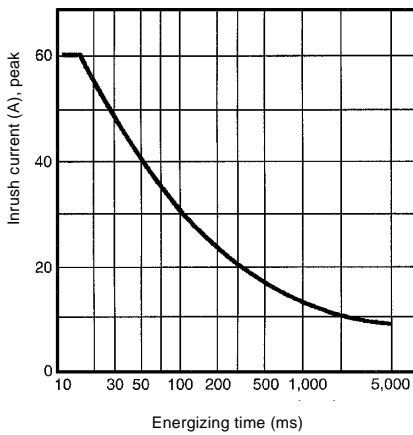
Load Current vs. Ambient Temperature Characteristics

G3NA-D210B

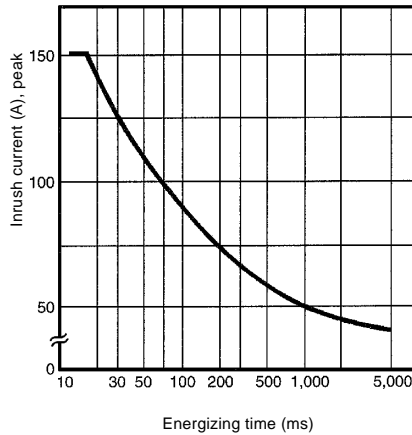


Surge Current Resistivity

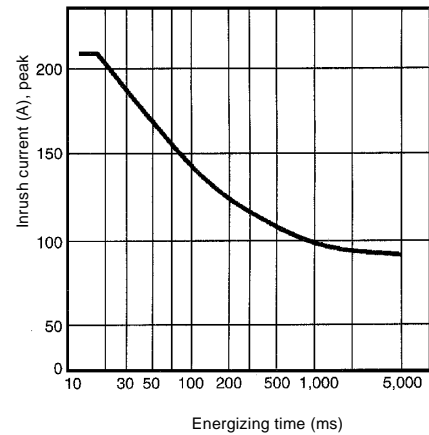
G3NA-205B



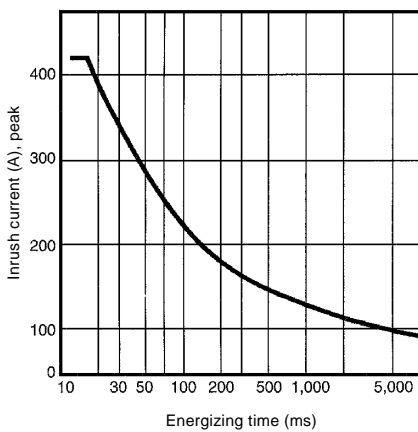
G3NA-210B  
G3NA-410B



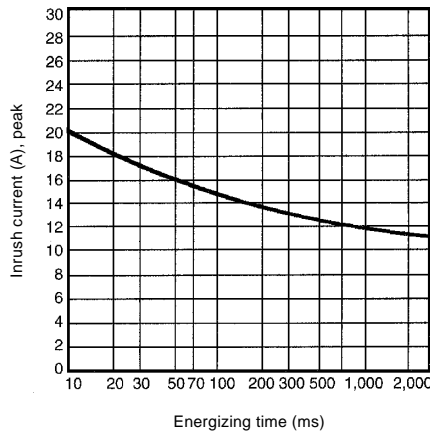
G3NA-220B, G3NA-225B,  
G3NA-420B, G3NA-425B



G3NA-240B  
G3NA-440B

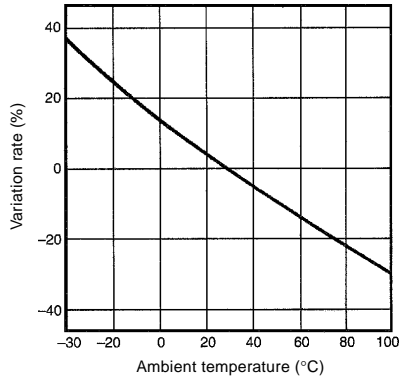


G3NA-D210B

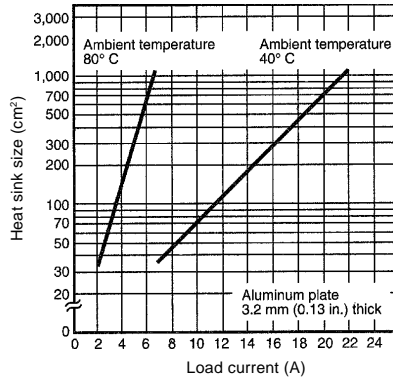


**Temperature Characteristics**  
(with must operate voltage and must release voltage)

G3NA-2□□B AC input



**Heat Sink Size vs. Load Current**  
G3NA-220B



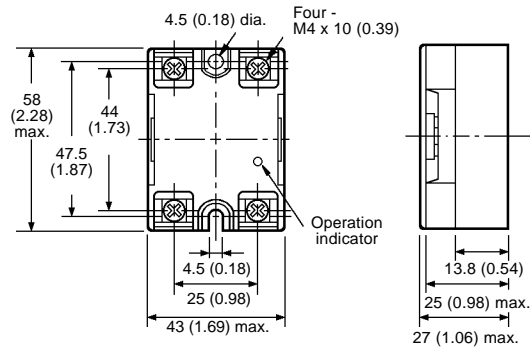
Note: The heat sink size refers to the combined area of the sides of the heat sink that radiate heat. For example, when a current of 18 A is allowed to flow through the SSR at 40°C, the graph shows that the heat sink size is about 450 cm<sup>2</sup>. Therefore, if the heat sink is square, one side of the heat sink must be 15 cm (15<sup>2</sup> x 2 = 450) or longer.

**Dimensions**

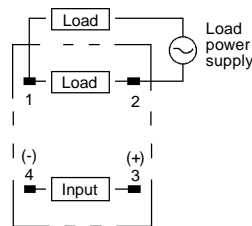
Unit: mm (inch)

■ **SOLID-STATE RELAYS**

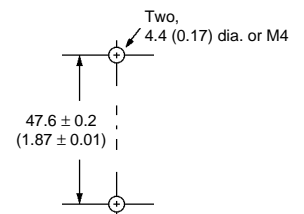
G3NA-205B, G3NA-210B, G3NA-220B,  
G3NA-225B, G3NA-410B,  
G3NA-420B, G3NA-425B



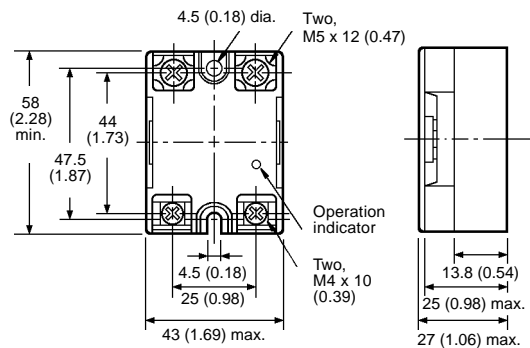
**Terminal arrangement/  
Internal connections**  
(Top view)



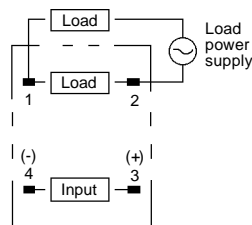
**Mounting holes**  
(Bottom view)



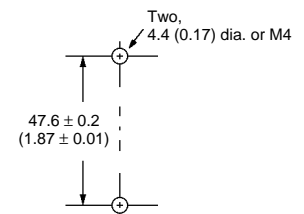
G3NA-240B, G3NA-440B



**Terminal arrangement/  
Internal connections**  
(Top view)



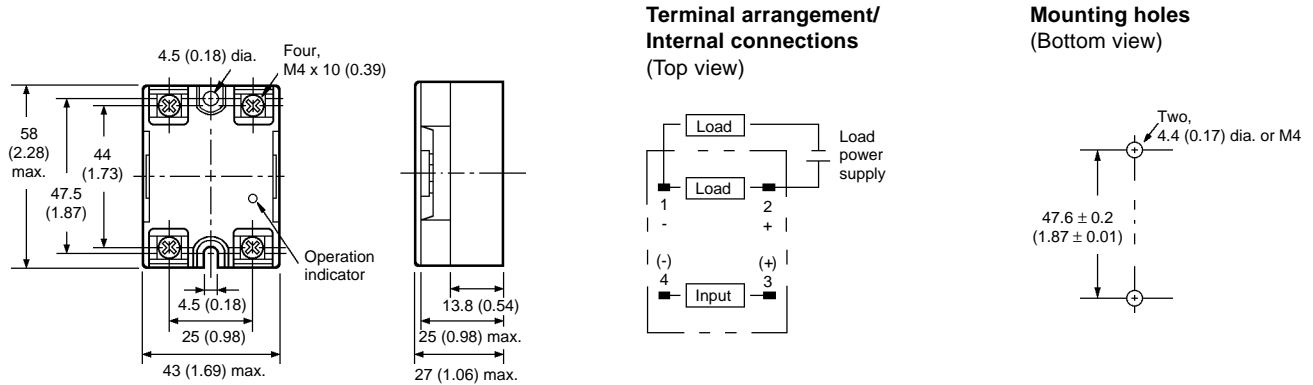
**Mounting holes**  
(Bottom view)



Unit: mm (inch)

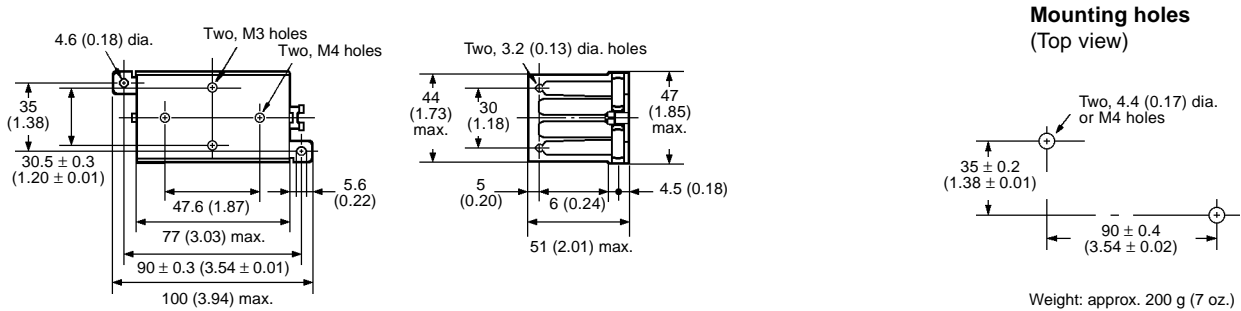
■ SOLID-STATE RELAYS (continued)

G3NA-D210B

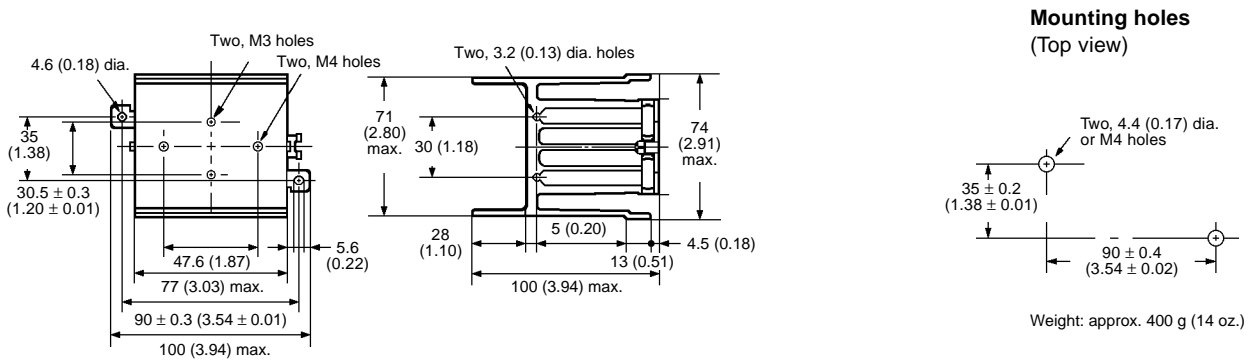


■ HEAT SINKS

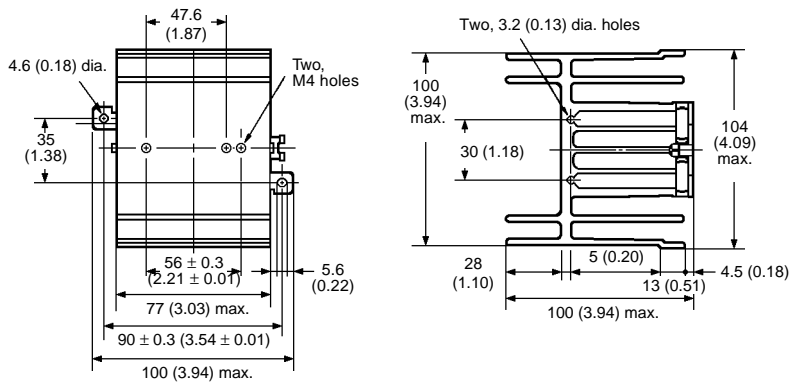
Track Mount Heat Sink – Y92B-N50



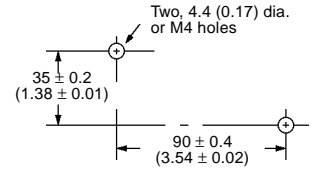
Track Mount Heat Sink – Y92B-N100



Track Mount Heat Sink – Y92B-N150



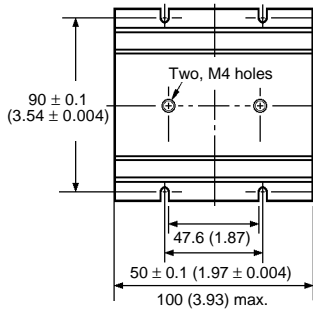
Mounting holes  
(Top view)



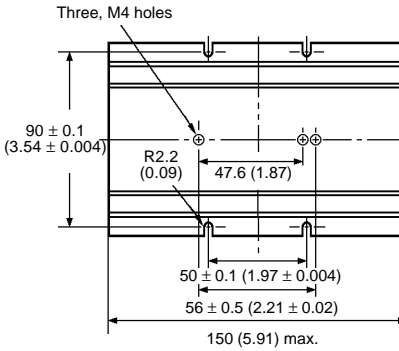
Weight: approx. 560 g (20 oz.)

Standard Mount Heat Sinks

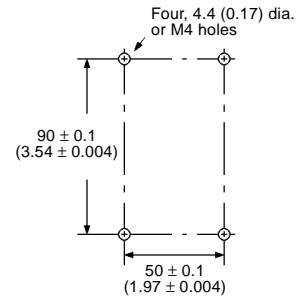
Y92B-A100



Y92B-A150

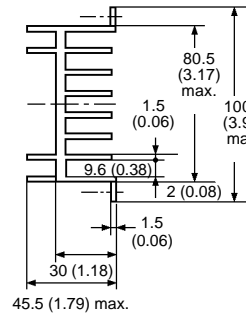
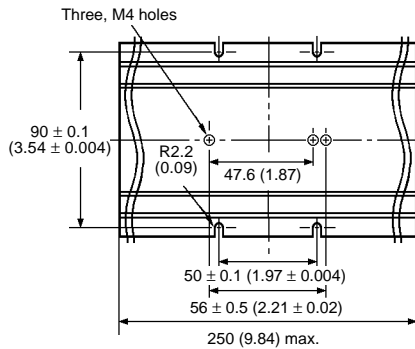


Mounting holes  
Y92B-A100, Y92B-A150N  
Y92B-A250

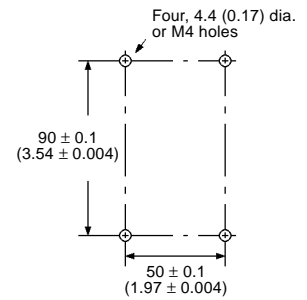


Standard Mount Heat Sinks

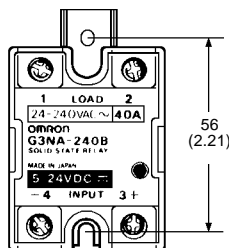
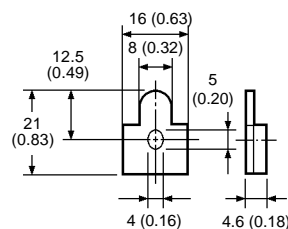
Y92B-A250



Mounting holes



R99-11 Mounting Bracket for G3NA-240B



Note: Use mounting bracket R99-11 to mount the G3NA-240B with a pitch of 56 mm (2.21 in) instead of 47.5 mm (1.87 in) to match the pitch of G3N-240B.

**■ APPROVALS**

UL (File No. E64562)/CSA (File No. LR35535)

SSR type	Input voltage	Load type	Contact ratings	
			Without heat sink	With heat sink (see note 1)
G3NA-205B	5 to 24 VDC 100 to 120 VAC	General use/Tungsten	3 A, 240 VAC	5 A, 240 VAC
		Motor	2.5 FLA, 15 LRA, 240 VAC	2.5 FLA, 15 LRA, 240 VAC
G3NA-210B	200 to 240 VAC	General use/Tungsten	4 A, 240 VAC	10 A, 240 VAC
		Motor	2.5 FLA, 15 LRA, 240 VAC	5 FLA, 30 LRA, 240 VAC
G3NA-220B		General use/Tungsten	4 A, 240 VAC	20 A, 240 VAC
		Motor	2.5 FLA, 15 LRA, 240 VAC	10 FLA, 60 LRA, 240 VAC
G3NA-225B		General use/Tungsten	4 A, 240 VAC	25 A, 240 VAC
		Motor	2.5 FLA, 15 LRA, 240 VAC	12 FLA, 72 LRA, 240 VAC
G3NA-240B		General use/Tungsten	6 A, 240 VAC	40 A, 240 VAC
		Motor	5 FLA, 30 LRA, 240 VAC	20 FLA, 120 LRA, 240 VAC
G3NA-410B	5 to 24 VDC 100 to 240 VAC	General use/Tungsten	4 A, 480 VAC	10 A, 480 VAC
		Motor	2.5 FLA, 15 LRA, 480 VAC	5 FLA, 30 LRA, 480 VAC
G3NA-420B		General use/Tungsten	4 A, 480 VAC	20 A, 480 VAC
		Motor	2.5 FLA, 15 LRA, 480 VAC	10 FLA, 60 LRA, 480 VAC
G3NA-425B		General use/Tungsten	4 A, 480 VAC	25 A, 480 VAC
		Motor	2.5 FLA, 15 LRA, 480 VAC	12 FLA, 72 LRA, 480 VAC
G3NA-440B		General use/Tungsten	6 A, 480 VAC	40 A, 480 VAC
		Motor	5 FLA, 30 LRA, 480 VAC	20 FLA, 120 LRA, 480 VAC
G3NA-D210B		General use	4 A, 200 VDC	10 A, 200 VDC

- Note:
1. When used with the proper OMRON heat sink part number or an appropriately dimensioned equivalent.
  2. The rated values approved by each of the safety standards (e.g., UL, CSA, and TUV) may be different from the performance characteristics individually defined in this catalog.
  3. In the interest of product improvement, specifications are subject to change.

## Installation

### Close Mounting

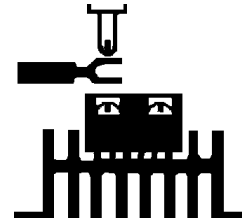
When mounting solid-state relays (SSRs) side by side, provide a space equivalent to the width of a single SSR between two adjacent SSRs. Otherwise, reduce the current flow to 1/2 to 1/3 of the rated current



### Heat Sink Mounting

To mount an SSR in a heat sink, first apply a heat conductive grease to the metal back surface of the SSR. Press the SSR firmly onto the heat sink to ensure a good seal. Screw the SSR down to the heat sink.

Next, wire the screw terminals and securely tighten the screws.





# Precautions

## ■ LOAD CONNECTION

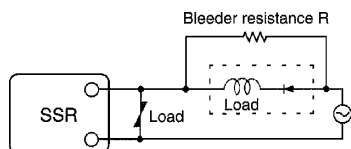
Before connecting a load that generates a high surge current, such as a lamp load, to the SSR, make sure that the SSR can withstand the surge current of the load.

OMRON's data sheet shows the non-repetitive peak value of the surge current that flows through the SSR. Normally, use 1/2 the non-repetitive peak surge current as the standard value. If a surge current exceeding that value is expected, connect a quick-blowing fuse to protect the SSR.

For an AC load, use a power supply rated at 50 or 60 Hz. The maximum operating frequency is 10 Hz. The G3NA has a built-in varistor for over-voltage protection.

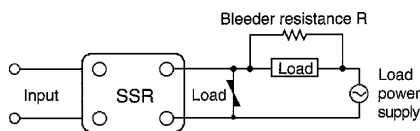
### Half-wave rectifier loads

If the SSR is not provided with a zero cross function, a half-wave rectifier load can be switched with no problem. If the SSR is equipped with a zero cross function, allow about 20% of the load current to flow through the SSR.



Note: Connect bleeder resistor R.

### Low-capacity loads



Note: Connect bleeder resistor R.

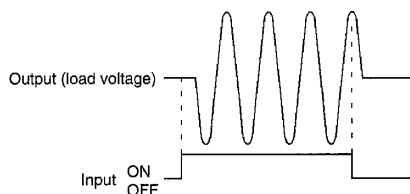
### Capacitive loads

The supply voltage plus the charge voltage of the capacitor is applied to both ends of the SSR when it is OFF. Therefore, use an SSR model with an input voltage rating twice the size of the supply voltage.

Limit the charge current of the capacitor to less than half the peak surge current value allowed for the SSR.

## ■ ZERO CROSS FUNCTION

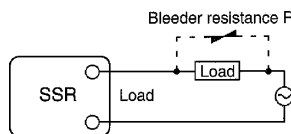
An SSR with a zero cross function operates when an AC load voltage reaches the zero point or its vicinity. This reduces clicking noises when the load is input, and minimizes the influence of an inductive load, such as a lamp, heater, or motor, on the power supply because the inrush current of the load is reduced. This can also minimize the scale of the surge current protection circuit.



## ■ LIFE EXPECTANCY (MTTF)

The mean time to failure (MTTF) for most SSRs is 100,000 hours. This, however, varies with the operating conditions. To ensure long life and stable operation of SSRs, plan for a constant operating environment, especially when the equipment incorporating SSRs is used under severe conditions such as high operating temperature, fluctuations in temperature, or continuous energizing.

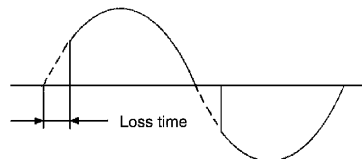
### Varistor



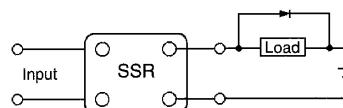
Use the following elements for surge absorption:

Operating voltage	Varistor voltage	Surge resistance
100 to 120 VAC	240 to 270 V	1,000 A min.
200 to 240 VAC	440 to 470 V	
380 to 480 VAC	820 to 1,000 V	

The applied voltage should be carefully determined before use, because the loss time for the output signal increases if the applied voltage and current are low.



For a DC or L load, a diode should be connected in parallel to the load to absorb the counter electromotive force of the load.



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