

## Miniature Single-pole Relay with 80-A Surge Current and 20-A Switching Current

- ROHS compliant.
- Ideal for motor switching.
- Miniature, relay with high switching power and long endurance.
- Creepage distance conforms to UL, CSA and EN standards.
- Highly noise-resistive insulation materials employed.
- Standard model available with flux protection construction.



## Ordering Information

Classification	Contact Form	Model
#250 tab terminals/PCB coil terminals	SPST-NO	G4A-1A-E
PCB terminals/PCB coil terminals		G4A-1A-PE

**Note:** When ordering, add the rated coil voltage to the model number.

Example: G4A-1A-E 12 VDC

Rated coil voltage

### Model Number Legend

**G4A-**   -     **VDC**  
1 2 3 4 5

- 1. Number of Poles**  
1: 1 pole
- 2. Contact Form**  
A: SPST-NO
- 3. Terminals**  
None: #250 tab/PCB coil terminals  
P: Straight PCB/PCB terminals
- 4. Special Function**  
E: For long endurance
- 5. Rated Coil Voltage**  
5, 12, 24 VDC

## Specifications

### ■ Coil Rating

<b>Rated voltage</b>	5 VDC	12 VDC	24 VDC
<b>Rated current</b>	180 mA	75 mA	37.5 mA
<b>Coil resistance</b>	27.8Ω	160Ω	640Ω
<b>Coil inductance</b>	<b>Armature OFF</b> –	0.8 H	3.5 H
<b>(ref. value)</b>	<b>Armature ON</b> –	1.1 H	4.8 H
<b>Must operate voltage</b>	70% of rated voltage max.		
<b>Must release voltage</b>	10% of rated voltage min.		
<b>Max. permissible voltage</b>	160% of rated voltage at (23°)		
<b>Power consumption</b>	Approx. 0.9 W		

**Note:** 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.

2. Operating characteristics are measured at a coil temperature of 23°C.

3. Max. permissible voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

### ■ Contact Ratings

<b>Rated load</b>	20 A at 250 VAC
<b>Contact material</b>	AgSnO <sub>2</sub>
<b>Rated carry current</b>	20 A
<b>Max. switching voltage</b>	250 VAC
<b>Max. switching current</b>	20 A
<b>Max. switching power</b>	5,000 VA
<b>Failure rate (ref. value)</b>	100 mA at 5 VDC

**Note:** P level:  $\lambda_{60} = 0.1 \times 10^{-6}$ /operation (with an operating frequency of 120 operations/min).

### ■ Endurance

with Motor Load

Load conditions	Switching frequency	Electrical endurance
250 VAC: Inrush current: 80 A, 0.3 s ( $\cos\varphi = 0.7$ ) Break current: 20 A ( $\cos\varphi = 0.9$ )	ON: 1.5 s OFF: 1.5 s	200,000 operations

With Overload

Load conditions	Switching frequency	Electrical endurance
250 VAC: Inrush current: 80 A ( $\cos\varphi = 0.7$ ) Break current: 80 A ( $\cos\varphi = 0.7$ )	ON: 1.5 s OFF: 99 s	1,500 operations

With Inverter Load

Load conditions	Switching frequency	Electrical endurance
100 VAC: Inrush current: 200 A (0-P) Break current: 20 A	ON: 3 s OFF: 5 s	30,000 operations

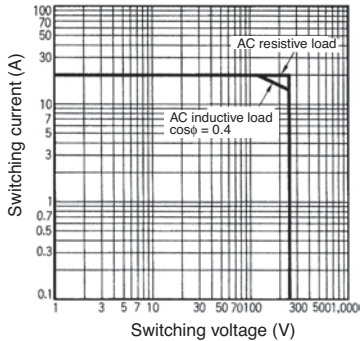
## ■ Characteristics

<b>Contact resistance</b>		100 mΩ max.
<b>Operate time</b>		20 ms max.
<b>Release time</b>		10 ms max.
<b>Max. Operating Frequency</b>		Mechanical: 18,000 operations/hr
<b>Insulation resistance</b>		1,000 MΩ max. (at 500 VDC)
<b>Dielectric strength</b>		4,500 VAC 50/60 Hz for 1 min between coil and contacts 1,000 VAC 50/60 Hz for 1 min between contacts of same polarity
<b>Impulse withstand voltage</b>		8,500V (1.2/50μs) between coil and contacts
<b>Insulation Distance</b>	<b>Creepage (Typ)</b>	6.4 mm
	<b>Clearance (Typ)</b>	3.2 mm
<b>Tracking Resistance (CTI)</b>		250 V
<b>Shock resistance</b>		Destruction: 1,000 m/s <sup>2</sup> Malfunction: 200 m/s <sup>2</sup>
<b>Vibration resistance</b>		Destruction: 10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude) Malfunction: 10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude)
<b>Endurance</b>		Mechanical: 2,000,000 operations min. (at 18,000 operations/hr) Motor load: 100,000 operations min. (ON/OFF: 1.5 s) Inverter load: 30,000 operations min. (ON: 3 s, OFF: 5 s)
<b>Ambient temperature</b>		Operating: -20°C to 60°C (with no icing)
<b>Ambient humidity</b>		Operating: 5% to 85%
<b>Weight</b>		Approx. 23 g

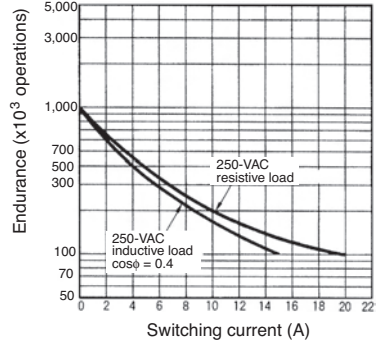
**Note:** The data shown above are initial values.

## Engineering Data

**Maximum Switching Power**



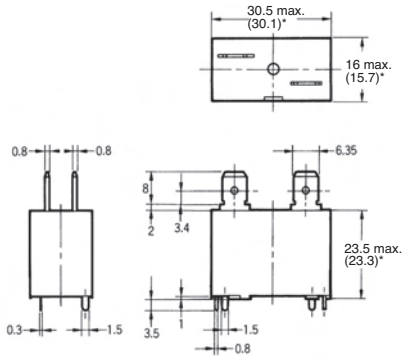
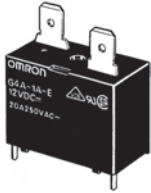
**Endurance**



## Dimensions

**Note:** All units are in millimetres unless otherwise indicated; dimensions shown in parentheses are in inches.

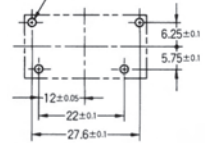
### G4A-1A-E



\*Average value

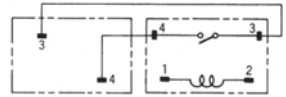
### Mounting Holes (Bottom View)

Four, 1.8 <sup>+0.1</sup> dia.



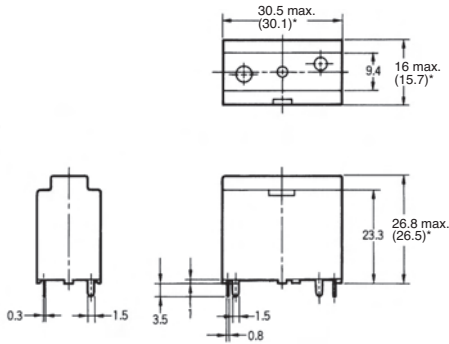
### Terminal Arrangement /Internal Connections

(Top View) (Bottom View)



Tab Terminal PCB Terminal

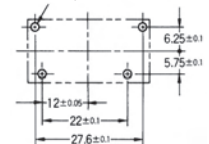
### G4A-1A-PE



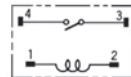
\*Average value

### Mounting Holes (Bottom View)

Four, 1.8 <sup>+0.1</sup> dia.



### Terminal Arrangement /Internal Connections (Bottom View)



## Precautions

### Mounting

When mounting two or more relays side by side, provide a minimum space of 3 mm between relays.

### Terminal Connection

The terminals fit FASTON receptacle 250 and are suitable for positive-lock mounting.

Do not apply excessive force on the terminals when mounting or dismounting the relay.

The following positive-lock connectors made by AMP are recommended.

Type	Receptacle terminals	Positive housing
#250 terminals (width: 6.35 mm)	AMP 170333-1 (170327-1) AMP 170334-1 (170328-1) AMP 170335-1 (170329-1)	AMP 172076-1 natural color AMP 172076-4 yellow AMP 172076-5 green AMP 172076-6 blue

**Note:** The numbers shown in parentheses are for air-feeding.