

#### **HIGH LOAD RELAY** FOR SMART J/B

# TG RELAYS (ACTG)

#### FEATURES

 Large capacity switching despite small size. Can replace micro ISO terminal type relays.

• Low operating power type

Sealed type

## **TYPICAL APPLICATIONS**

Head lamp, Fog lamp, Fan motor, EPS, Defogger, Seat heater, etc.

**RoHS compliant** 

## **ORDERING INFORMATION**



## **TYPES**

Contact arrangement	Nominal coil voltage	Coil resistance	Part No.
Contact analigement			Heat resistance: High heat-resistant type
1 Form A	12V DC	225Ω	ACTG1H3
		320Ω	ACTG1H4
1 Farm C		225Ω	ACTG2H3
I Form C		320Ω	ACTG2H4

Standard packing; Carton (tube): 40 pcs.; Case: 800 pcs. Note: Please contact us for details about products other than those above.

## TG (ACTG)

## RATING

#### 1. Coil data

Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power (at 20°C 68°F)	Usable voltage range
12V DC -	Max. 6.5V DC (Initial)	Min. 0.8V DC (Initial)	53.3 mA	225Ω	640 mW	10 to 16V/DC
	Max. 7.0V DC (Initial)	Min. 0.8V DC (Initial)	37.5 mA	320Ω	450 mW	101018700

Note: Other pick-up voltage types are also available. Please contact us for details.

#### 2. Specifications

Characteristics		Item	Specifications	
Contact	Arrangement		1 Form A, 1 Form C	
	Contact resistance (Initial)		N.O.: Typ3m $\Omega$ , N.C.: Typ4m $\Omega$ (By voltage drop 6V DC 1A)	
	Contact material		Ag alloy (Cadmium free)	
Rating	Nominal switching capacity (resistive load)		N.O.: 30A 14V DC, N.C.: 15A 14V DC	
	Max. carrying current (12V DC initial)*3		35A for 1 hour (at 20°C 68°F)	
	Nominal operating power		640 mW (Pick-up voltage 6.5V DC type)	
			450 mW (Pick-up voltage 7.0V DC type)	
	Min. switching capacity (resistive load)*1		1A 14V DC	
	Insulation resistance (Initial)		Min. 100 M $\Omega$ (at 500V DC, Measurement at same location as "Breakdown voltage" section.)	
Electrical characteristics	Breakdown voltage	Between open contacts	500 Vrms for 1 min. (Detection current: 10mA)	
	(Initial)	Between contacts and coil	500 Vrms for 1 min. (Detection current: 10mA)	
	Operate time (at nor	ninal voltage)	Max. 10ms (at 20°C 68°F, excluding contact bounce time) (Initial)	
	Release time (at non	ninal voltage)	Max. 10ms (at 20°C 68°F, excluding contact bounce time) (Initial) (without protective element)	
	Charle registeres	Functional	Min. 100 m/s <sup>2</sup> {10G} (Half-wave pulse of sine wave: 11ms; detection time: 10µs)	
Machanical	Shock resistance	Destructive	Min. 1,000 m/s <sup>2</sup> {100G} (Half-wave pulse of sine wave: 6ms)	
characteristics		Functional	10 Hz to 100 Hz, Min. 44.1 m/s <sup>2</sup> {4.5G} (Detection time: 10µs)	
onaraotonolioo	Vibration resistance	Destructive	10 Hz to 500 Hz, Min. 44.1 m/s <sup>2</sup> {4.5G}, Time of vibration for each direction; X, Y direction: 2 hours, Z direction: 4 hours	
	Mechanical		Min. 107 (at 120 cpm)	
Expected life	Electrical		<resistive load=""> Min. 10<sup>5</sup> (at nominal switching capacity, operating frequency: 1s ON, 9s OFF)</resistive>	
			<motor load=""> Min. 10<sup>5</sup> (30 A 14V DC at motor lock condition), operating frequency: 0.5s ON, 9.5s OFF</motor>	
			<lamp load=""> Min. 2 × 10<sup>5</sup> (at 84 A (inrush), 12 A (steady), 14 V DC), Operating frequency: 1s ON, 14s OFF</lamp>	
Conditions	Conditions for operation, transport and storage*2		High heat-resistant type Ambient temperature: -40°C to +110°C -40°F to +230°F, Humidity: 2% R.H. to 85% R.H. (Not freezing and condensing at low temperature)	
Mass			Approx. 12 g .42 oz	

Notes: \*1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

\*2. The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Please refer to "Usage ambient condition" in CAUTIONS FOR USE OF AUTOMOTIVE RELAYS. Please inquire if you will be using the relay in a high temperature atmosphere (110°C 230°F).
 \*3. Depends on connection conditions. Also, this does not guarantee repeated switching. We recommend that you confirm operation under actual conditions.

## **REFERENCE DATA**

1.-(1) Coil temperature rise (at room temperature) Sample: ACTG1H4, 3pcs. Contact carrying current: 10A, 20A, 30A Ambient temperature: Room temperature



3. Distribution of pick-up and drop-out voltage

Sample: ACTG1H4, 40pcs.

1.-(2) Coil temperature rise (at 110°C 230°F) Sample: ACTG1H4, 3pcs. Contact carrying current: 10A, 20A Ambient temperature: 110°C 230°F



2. Ambient temperature and operating voltage range Sample: ACTG1H4





40

30

\* Without diode

Operate time

Release time

8



5.-(1) Electrical life test (Motor lock) Sample: ACTG1H4, 6pcs.

Load: 30A 14V DC Power window motor actual load (lock condition) Operating frequency: ON 0.5s, OFF 9.5s Ambient temperature: Room temperature Circuit:



5.-(2) Electrical life test (Lamp load) Sample: ACTG1H4, 6pcs. Load: inrush: 84A/steady: 12A 14V DC Operating frequency: ON 1s, OFF 14s Ambient temperature: Room temperature Circuit:





Change of pick-up and drop-out voltage

3 4 5 6

Time, ms

2

1



#### Change of pick-up and drop-out voltage











## TG (ACTG)

#### DIMENSIONS (mm inch)

1 Form A type







Dimension:	<u>Tolerance</u>
Less than 1mm .039inch:	$\pm 0.1 \pm .004$
Min. 1mm .039inch less than 3mm .118 inch:	$\pm 0.2 \pm .008$
Min. 3mm .118 inch:	±0.3 ±.012

PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

#### Schematic (Bottom view)



\* Dimensions (thickness and width) of terminal is measured before pre-soldering. Intervals between terminals is measured at A surface level.

#### 1 Form C type



#### External dimensions





Tolerance: ±0.1 ±.004

#### Schematic (Bottom view)



\* Dimensions (thickness and width) of terminal is measured before pre-soldering. Intervals between terminals is measured at A surface level.

## NOTES

## Usage, transport and storage conditions

 Ambient temperature, humidity, and atmospheric pressure during usage, transport, and storage of the relay:
 Temperature: -40 to +110°C -40 to +230°F (High heat-resistant type)
 Humidity: 2 to 85% RH (Avoid freezing and condensation.) (3) Atmospheric pressure: 86 to 106 kPa
The humidity range varies with the temperature. Use within the range indicated in the graph below.
(Temperature and humidity range for usage, transport, and storage)



For general cautions for use, please refer to the "CAUTIONS FOR USE OF AUTOMOTIVE RELAYS"