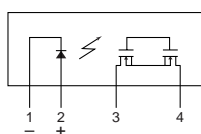
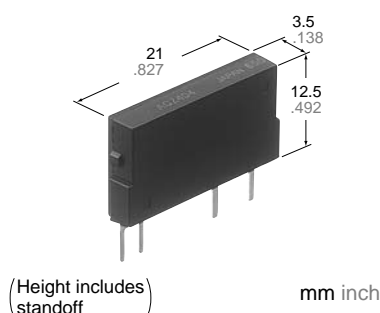


**Normally closed type  
in a slim SIL package  
Load voltage 400V**

**PhotoMOS Relays  
Power 1 Form B  
(AQZ404)**



## FEATURES

### 1. High sensitivity and low on-resistance

Max. 0.5A load can be controlled with 5 mA input current. The on-resistance is low at typ. 2.8Ω.

### 2. Normally closed (1 Form B) contact

This has been realized thanks to the built-in MOSFET processed by our proprietary method, DSD (Double-diffused and Selective Doping) method.

### 3. Slim SIL4-pin package

(W) 3.5 × (D) 21.0 × (H) 12.5 mm  
(W) .138 × (D) .827 × (H) .492 inch

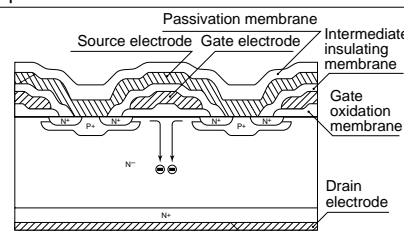
The compact size of the 4-pin SIL package allows high density mounting.

### 4. Sockets are also available

(PA1a-PS, PA1a-PS-H)

### 5. Can be installed on the RT-3 relay terminal (Power PhotoMOS relay type)

Cross section of the normally-closed type of power MOS



## TYPICAL APPLICATIONS

- Railroad system, traffic signals
- Measuring instruments
- Industrial machines

## TYPES

	Output rating*		Package	Part No.	Packing quantity	
	Load voltage	Load current			Inner carton	Outer carton
AC/DC dual use	400 V	0.5 A	SIL4-pin	AQZ404	25 pcs	500 pcs

\*Indicate the peak AC and DC values.

## RATING

### 1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

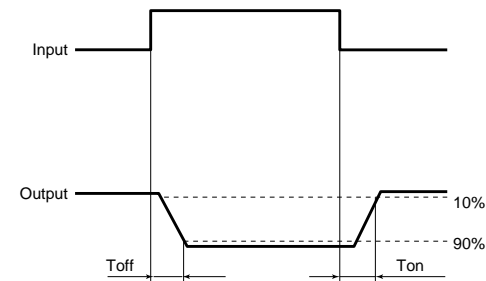
Item		Symbol	AQZ404	Remarks
Input	LED forward current	I <sub>F</sub>	50 mA	
	LED reverse voltage	V <sub>R</sub>	5 V	
	Peak forward current	I <sub>FP</sub>	1 A	f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P <sub>in</sub>	75 mW	
Output	Load voltage (peak AC)	V <sub>L</sub>	400 V	
	Continuous load current	I <sub>L</sub>	0.5 A	Peak AC, DC
	Peak load current	I <sub>peak</sub>	1.5 A	100 ms (1 shot), V <sub>L</sub> = DC
	Power dissipation	P <sub>out</sub>	1.6 W	
Total power dissipation		P <sub>T</sub>	1.6 W	
I/O isolation voltage		V <sub>iso</sub>	2,500 V AC	
Temperature limits	Operating	T <sub>opr</sub>	−40°C to +85°C −40°F to +185°F	Non-condensing at low temperatures
	Storage	T <sub>stg</sub>	−40°C to +100°C −40°F to +212°F	

# Power 1 Form B (AQZ404)

## 2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item			Symbol	AQZ404	Condition
Input	LED operate (OFF) current	Typical	I <sub>Foff</sub>	1.0 mA	I <sub>L</sub> = 100 mA
		Maximum		3.0 mA	V <sub>L</sub> = 10 V
	LED reverse (ON) current	Minimum	I <sub>Fon</sub>	0.4 mA	I <sub>L</sub> = 100 mA
		Typical		0.9 mA	V <sub>L</sub> = 10 V
	LED dropout voltage	Typical	V <sub>F</sub>	1.25 V (1.16 V at I <sub>F</sub> = 10 mA)	
		Maximum		1.5 V	I <sub>F</sub> = 50 mA
Output	On resistance	Typical	R <sub>on</sub>	2.8 Ω	I <sub>F</sub> = 0 mA, I <sub>L</sub> = Max.
		Maximum		4.0 Ω	Within 1 s on time
	Off state leakage current	Maximum	I <sub>LLeak</sub>	10 μA	I <sub>F</sub> = 10mA, V <sub>L</sub> = Max.
Transfer characteristics	Operating (OFF) time*	Typical	T <sub>off</sub>	3.9 ms	I <sub>F</sub> = 0 → 10 mA
		Maximum		7.5 ms	I <sub>L</sub> = 100 mA, V <sub>L</sub> = 10 V
		Typical		9.4 ms	I <sub>F</sub> = 0 → 5 mA
		Maximum		15 ms	I <sub>L</sub> = 100 mA, V <sub>L</sub> = 10 V
	Reverse (ON) time*	Typical	T <sub>on</sub>	0.8 ms	I <sub>F</sub> = 5 mA → 0 or 10 mA → 0
		Maximum		3.0 ms	I <sub>L</sub> = 100 mA, V <sub>L</sub> = 10 V
	I/O capacitance	Typical	C <sub>iso</sub>	0.8 pF	f = 1 MHz
		Maximum		1.5 pF	V <sub>B</sub> = 0 V
	Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	1,000 MΩ	500 V DC
Maximum operating frequency	Maximum	—	0.5 cps	I <sub>F</sub> = 10 mA, Duty factor = 50% I <sub>L</sub> =Max., V <sub>L</sub> =Max.	

\*Operate/Reverse time



## RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper relay operation and resetting.

Item	Symbol	Recommended value	Unit
Input LED current	$I_{\text{F}}$	5 to 10	mA

- Dimensions
- Schematic and Wiring Diagrams
- Cautions for Use

■ These products are not designed for automotive use.

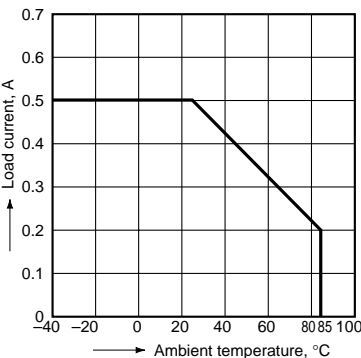
If you are considering to use these products for automotive applications, please contact your local Panasonic Electric Works technical representative.

Please refer to our information on [PhotoMOS Relays for Automotive Applications](#).

## REFERENCE DATA

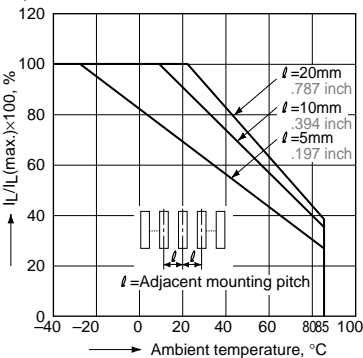
### 1. Load current vs. ambient temperature characteristics

Allowable ambient temperature:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$   
 $-40^{\circ}\text{F}$  to  $+185^{\circ}\text{F}$



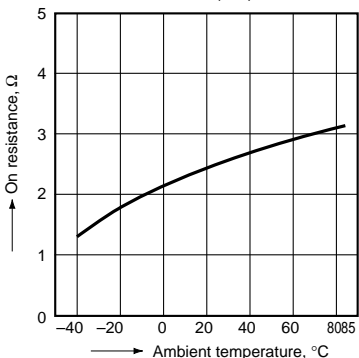
### 2. Load current vs. ambient temperature characteristics in adjacent mounting

$I_{\text{L}}$ : Load current;  
 $I_{\text{L}}(\text{max.})$ : Maximum continuous load current



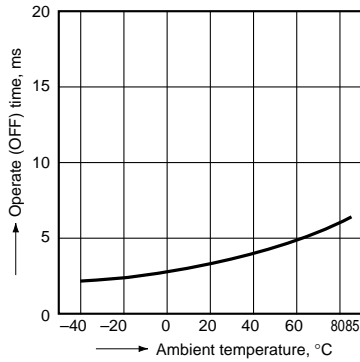
### 3. On resistance vs. ambient temperature characteristics

LED current: 0 mA; Load voltage: Max. (DC)  
Continuous load current: Max. (DC)



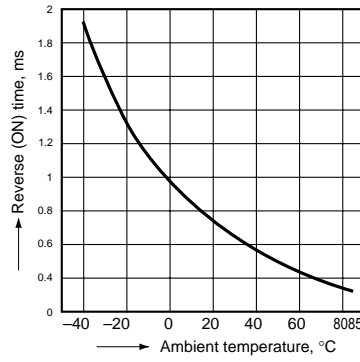
## 4. Operate (OFF) time vs. ambient temperature characteristics

LED current: 10 mA; Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



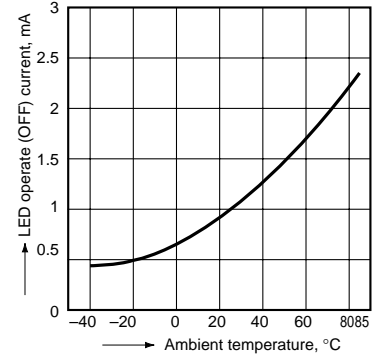
## 5. Reverse (ON) time vs. ambient temperature characteristics

LED current: 10 mA; Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



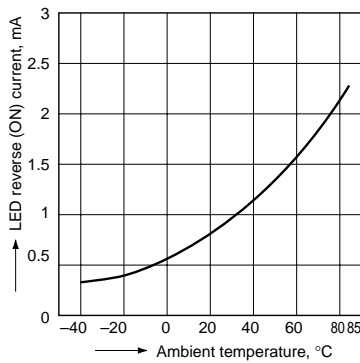
## 6. LED operate (OFF) current vs. ambient temperature characteristics

Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



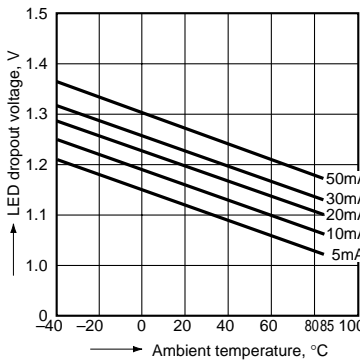
## 7. LED reverse (ON) current vs. ambient temperature characteristics

Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



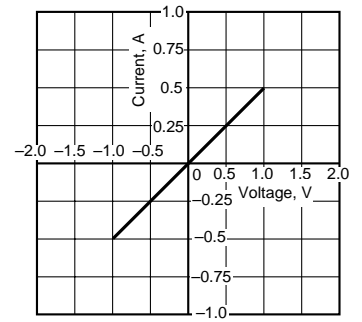
## 8. LED dropout voltage vs. ambient temperature characteristics

Sample: all types; LED current: 5 to 50 mA



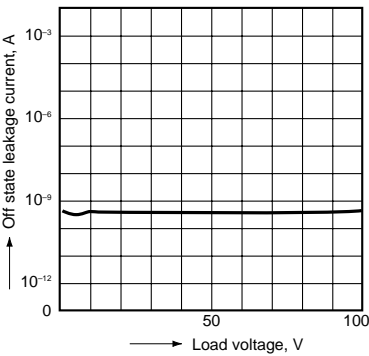
## 9. Current vs. voltage characteristics of output at MOS portion

Ambient temperature: 25°C 77°F



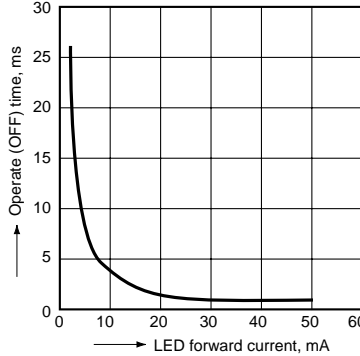
## 10. Off state leakage current vs. load voltage characteristics

Ambient temperature: 25°C 77°F



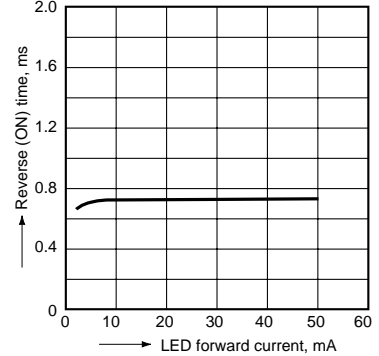
## 11. Operate (OFF) time vs. LED forward current characteristics

Load voltage: 10 V (DC); Continuous load current: 100 mA (DC); Ambient temperature: 25°C 77°F



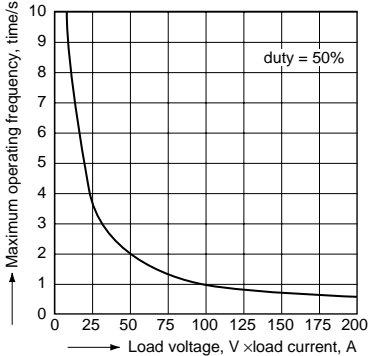
## 12. Reverse (ON) time vs. LED forward current characteristics

Load voltage: 10 V (DC); Continuous load current: 100 mA (DC); Ambient temperature: 25°C 77°F



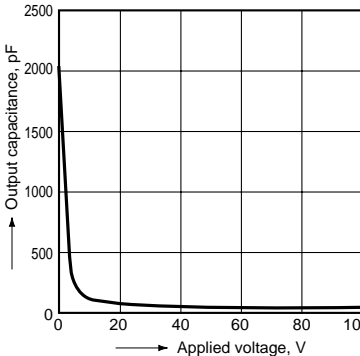
## 13. Maximum operating frequency vs. load voltage/current characteristics

LED current: 10 mA;  
Ambient temperature: 25°C 77°F



## 14. Output capacitance vs. applied voltage characteristics

Frequency: 1 MHz;  
Ambient temperature: 25°C 77°F



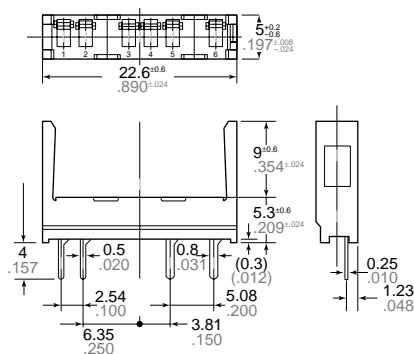
Power 1 Form B (AQZ404)

ACCESSORY (mm inch)

Socket



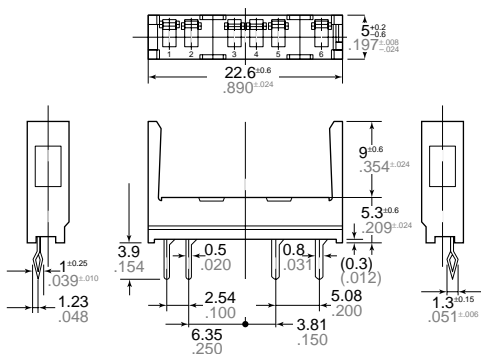
Standard type



PA1a-PS

General Tolerance:  $\pm 0.3 \pm .012$

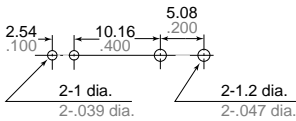
Self clinching type



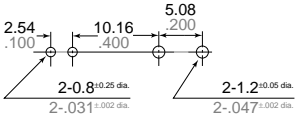
PA1a-PS-H

General Tolerance:  $\pm 0.3 \pm .012$

PC board pattern  
(BOTTOM VIEW)  
Standard type



Self clinching type



Tolerance:  $\pm 0.1 \pm .004$