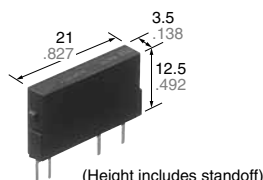


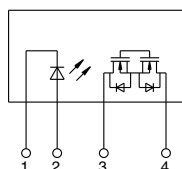


**Normally closed type
in a slim SIL package
Load voltage 400V**

**PhotoMOS®
Power 1 Form B
(AQZ404)**



mm inch



RoHS compliant

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

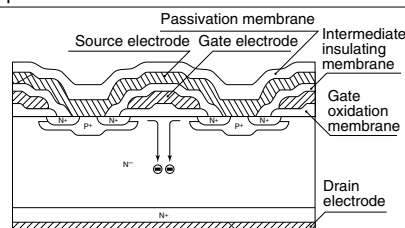
The compact size of the 4-pin SIL package allows high density mounting.

4. Sockets are also available

(PA1a-PS, PA1a-PS-H)

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

Cross section of the normally-closed type of power MOS



TYPICAL APPLICATIONS

- 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

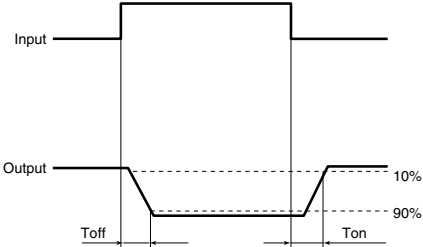
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

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

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

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

*Operate/Reverse time



3. Recommended operating conditions (Ambient temperature: 25°C 77°F)

Please use under recommended operating conditions to obtain expected characteristics.

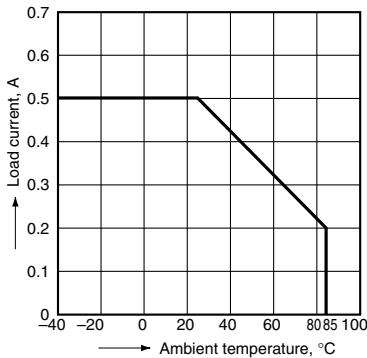
Item		Symbol	Min.	Max.	Unit
LED current		I _F	5	30	mA
AQZ404	Load voltage (Peak AC)	V _L	—	320	V
	Continuous load current	I _L	—	0.5	A

■ These products are not designed for automotive use.
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

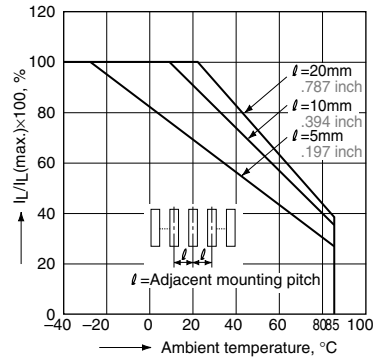
1. Load current vs. ambient temperature characteristics

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



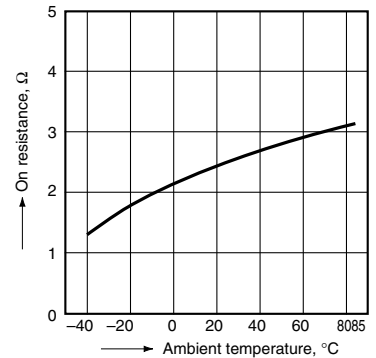
2. Load current vs. ambient temperature characteristics in adjacent mounting

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



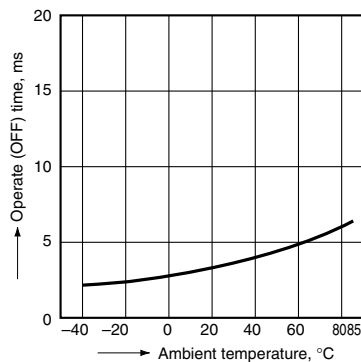
3. On resistance vs. ambient temperature characteristics

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



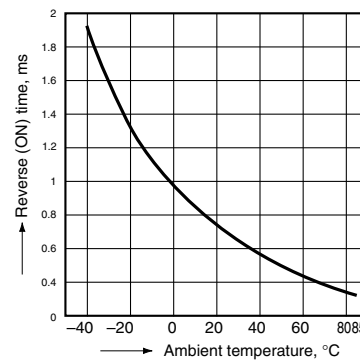
4. Operate (OFF) time vs. ambient temperature characteristics

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



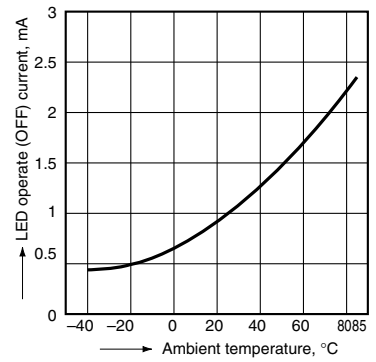
5. Reverse (ON) time vs. ambient temperature characteristics

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



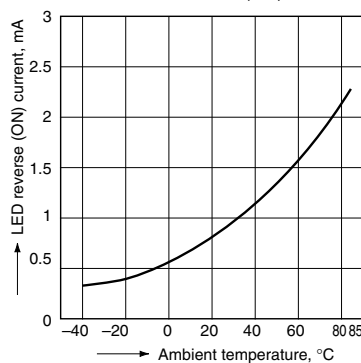
6. LED operate (OFF) current vs. ambient temperature characteristics

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



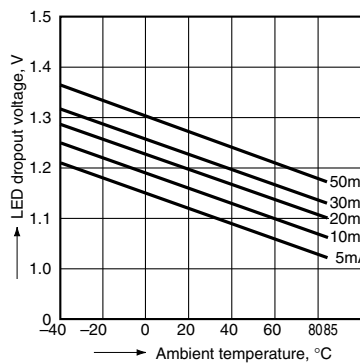
7. LED reverse (ON) current vs. ambient temperature characteristics

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



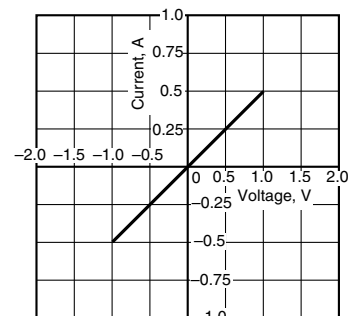
8. LED dropout voltage vs. ambient temperature characteristics

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



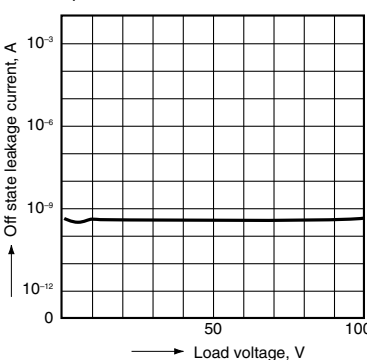
9. Current vs. voltage characteristics of output at MOS portion

Ambient temperature: 25°C 77°F



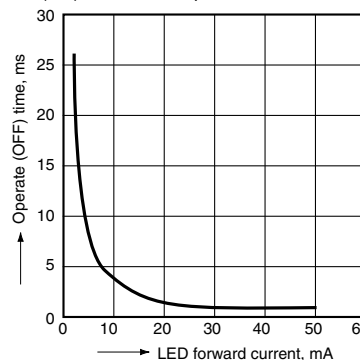
10. Off state leakage current vs. load voltage characteristics

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



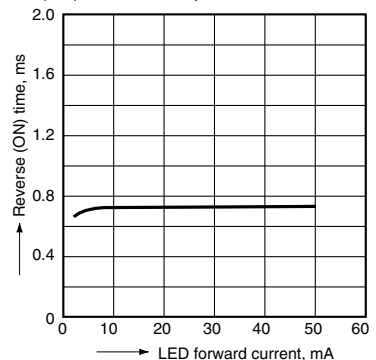
11. Operate (OFF) time vs. LED forward current characteristics

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

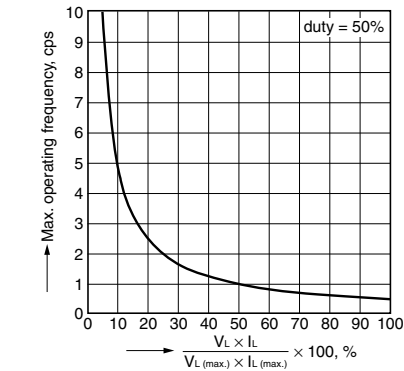


12. Reverse (ON) time vs. LED forward current characteristics

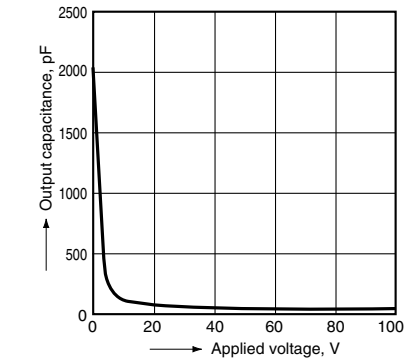
Load voltage: 10 V (DC); Continuous load current:
 100 mA (DC); Ambient temperature: 25°C 77°F



13. Max. operating frequency vs. load voltage/
current characteristics
LED current: 10 mA;
Ambient temperature: 25°C 77°F
V_L: Load voltage, V_L (Max.): Max. rated load voltage
I_L: Load current, I_L (Max.): Max. rated continuous load
current



14. Output capacitance vs. applied voltage
characteristics
LED current: 10 mA; Frequency: 1 MHz;
Ambient temperature: 25°C 77°F



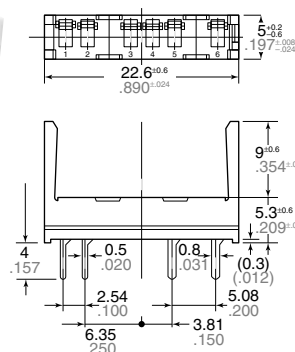
ACCESSORY (mm inch)

Socket

PA1a-PS

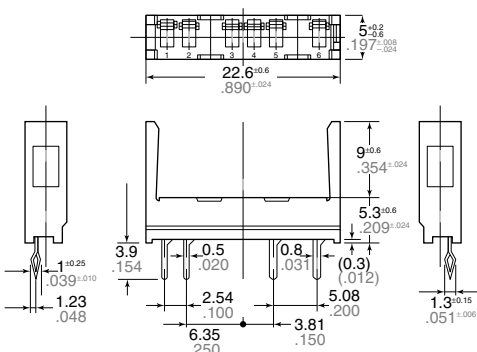
PA1a-PS-H

PC board pattern
(BOTTOM VIEW)
Standard type



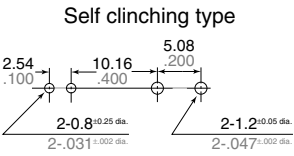
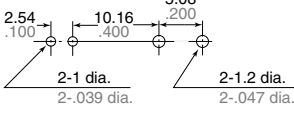
Standard type

General Tolerance: $\pm 0.3 \pm 0.12$



Self clinching type

General Tolerance: $\pm 0.3 \pm 0.12$



Tolerance: $\pm 0.1 \pm 0.04$

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Please contact

Panasonic Corporation

Electromechanical Control Business Division

■ 1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8506, Japan
industrial.panasonic.com/ac/e/

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