

NAIS

POWER PhotoMOS RELAYS 1-channel (Form B) Type

PhotoMOS RELAYS

FEATURES

1. High capacity

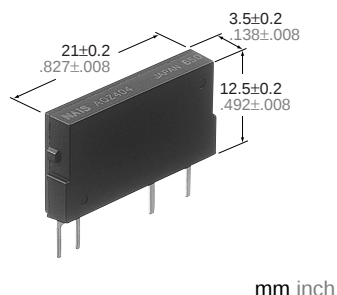
A maximum 0.5A load can be controlled with a 5 mA input current. The ON resistance is low at 2.8Ω (typ.)

2. 1 Form B

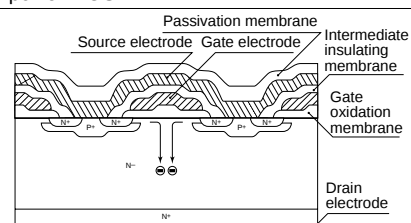
This has been realized thanks to the built-in MOSFET processed by our proprietary method, DSD (Double-diffused and Selective Doping) method.

3. Compact slim-type 4-pin SIL

(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.



Cross section of the normally-closed type of power MOS



TYPICAL APPLICATIONS

- Railroad, traffic signals
- Measurement instruments
- Testing equipment

TYPES

AC/DC type

Output rating*		Part No.	Packing quantity	
Load voltage	Load current		Inner carton	Outer carton
400 V	0.5 A	AQZ404	25 pcs	500 pcs

RATING

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

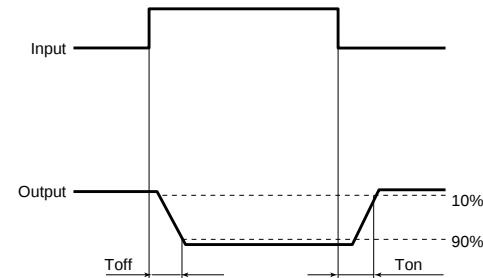
Item		Symbol	AQZ104	Remarks
Input	LED forward current	I_F	50 mA	
	LED reverse voltage	V_R	3 V	
	Peak forward current	I_{FP}	1 A	$f = 100 \text{ Hz}$, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW	
Output	Load voltage (Peak AC)	V_L	400 V	
	Continuous load current (Peak AC)	I_L	0.5 A	
	Peak load current	I_{peak}	1.5 A	100 ms (1 shot), $V_L = \text{DC}$
	Power dissipation	P_{out}	1.6 W	
Total power dissipation		P_T	1.6 W	
I/O isolation voltage		V_{iso}	2,500 V AC	
Temperature limits	Operating	T_{opr}	−40°C to +85°C −40°F to +185°F	Non-condensing at low temperatures
	Storage	T_{stg}	−40°C to +100°C −40°F to +212°F	

AQZ404

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

Item			Symbol	AQZ404	Condition	
Input	LED operate (OFF) current	Typical	I _{Off}	1.0 mA	I _L = 100 mA	
		Maximum		3.0 mA	V _L = 10 V	
	LED reverse (ON) current	Minimum	I _{Fon}	0.4 mA	I _L = 100 mA	
		Typical		0.9 mA	V _L = 10 V	
	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 _{on}	2.8 Ω	I _F = 0	
		Maximum		4.0 Ω	I _L = Max. Within 1 s on time	
	Off state leakage current	Maximum	I _{Leak}	10 μA	I _F = 10mA V _L = Max.	
Transfer characteristics	Switching speed	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	
	Initial I/O isolation resistance		Minimum	R _{iso}	1,000 MΩ	500 V DC
	Maximum operating frequency		Maximum	—	0.5 cps	I _F = 10 mA Duty factor = 50% I _L =Max., V _L =Max.

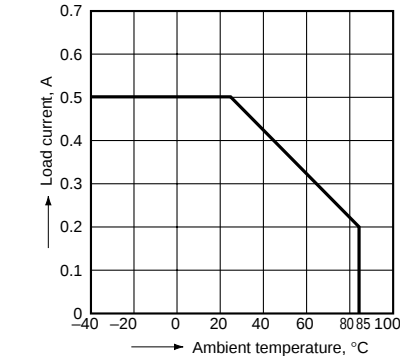
Note: Recommendable LED forward current $I_F = 5$ to 10 mA.
*Operate/Reverse time



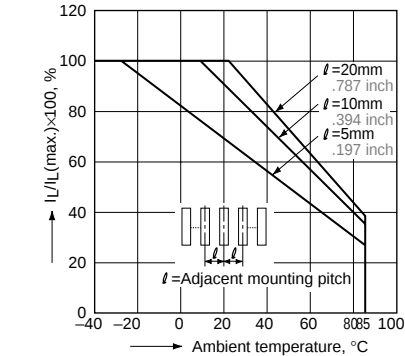
- For Dimensions, see Page 442.
- For Schematic and Wiring Diagrams, see Page 448.
- For Cautions for Use, see Page 453.

REFERENCE DATA

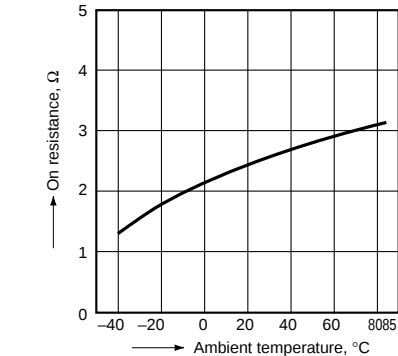
1. Load current vs. ambient temperature characteristics
Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F



2. Load current vs. ambient temperature characteristics in adjacent mounting
 I_L : Load current;
 $I_L(\text{max.})$: Maximum continuous load current

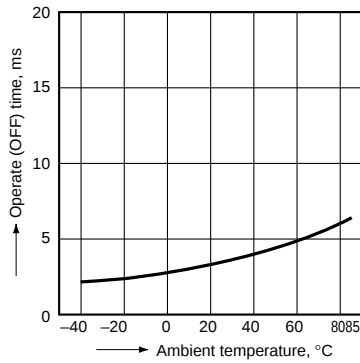


3. On resistance vs. ambient temperature characteristics
LED current: 0 mA; Load voltage: Max. (DC)
Continuous load current: Max. (DC)



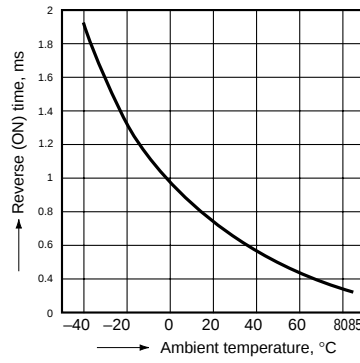
4. Operate (OFF) time vs. ambient temperature characteristics

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



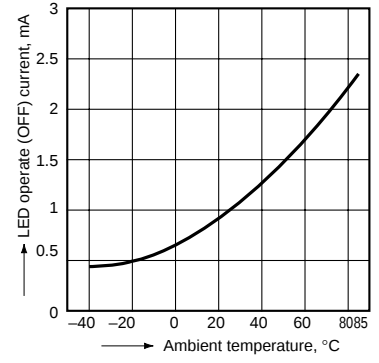
5. Reverse (ON) time vs. ambient temperature characteristics

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



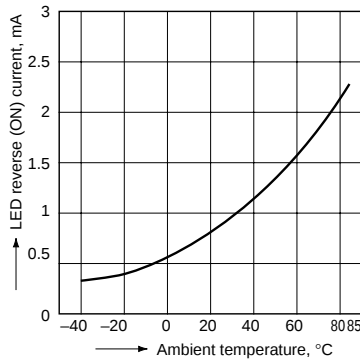
6. LED operate (OFF) current vs. ambient temperature characteristics

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



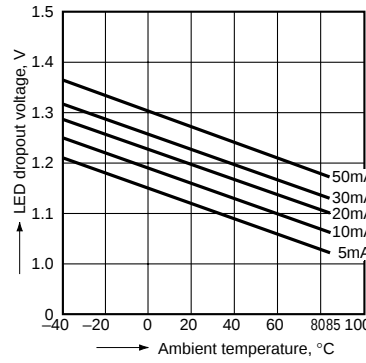
7. LED reverse (ON) current vs. ambient temperature characteristics

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



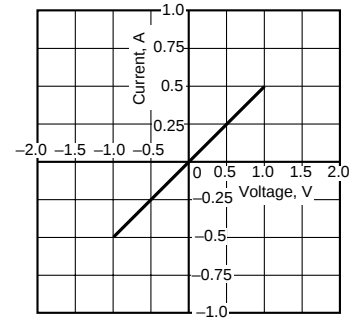
8. LED dropout voltage vs. ambient temperature characteristics

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



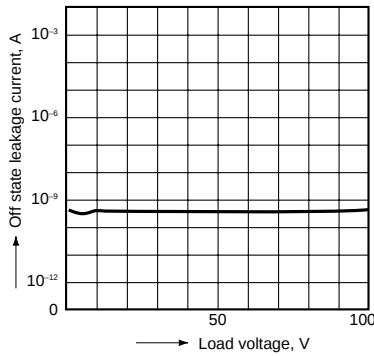
9. Voltage vs. current characteristics of output at MOS portion

Ambient temperature: 25°C 77°F



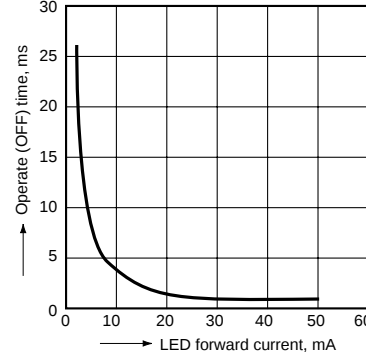
10. Off state leakage current

Ambient temperature: 25°C 77°F



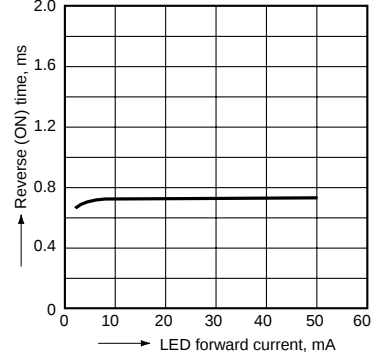
11. LED forward current vs. operate (OFF) time characteristics

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



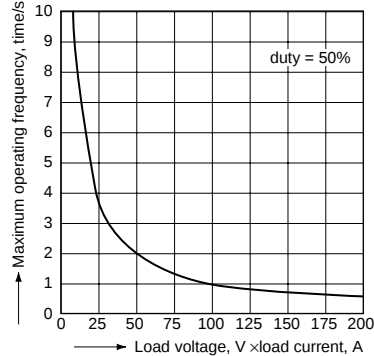
12. LED forward current vs. reverse (ON) time characteristics

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



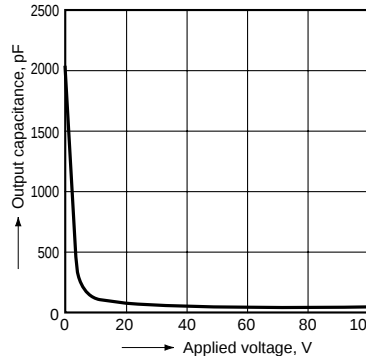
13. Maximum operating frequency vs. load voltage/current characteristics

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



14. Applied voltage vs. output capacitance characteristics

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



AQZ404

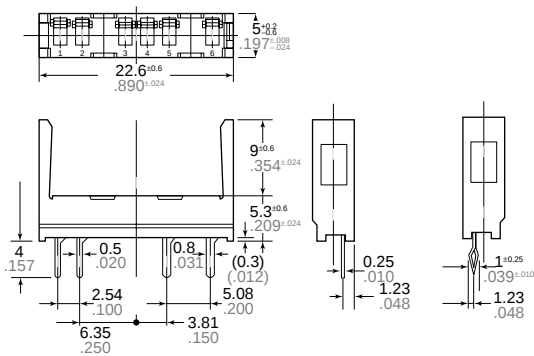
ACCESSORY

mm inch

Socket



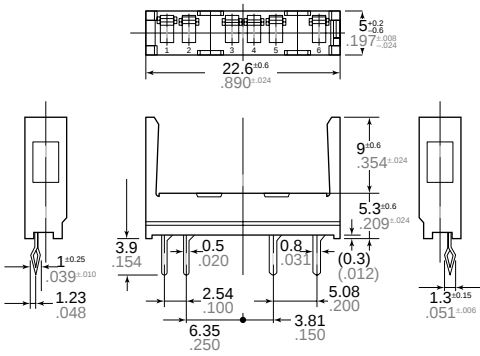
Standard type



PA1a-PS

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

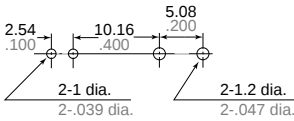
Self clinching type



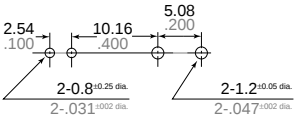
PA1a-PS-H

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

PC board pattern
(BOTTOM VIEW)
Standard type



Self clinching type



Tolerance: $\pm 0.1 \pm .004$