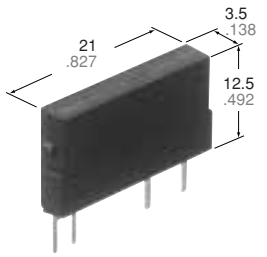
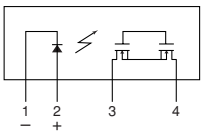
Panasonic
ideas for life

High capacity PhotoMOS Relay. (Load current Max. 0.5A) 1 Form B.

Power PhotoMOS (AQZ404)



mm inch

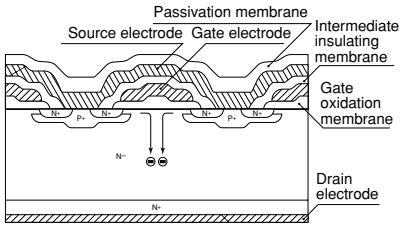


FEATURES

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.

Cross section of the normally-closed type of power MOS



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.

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)

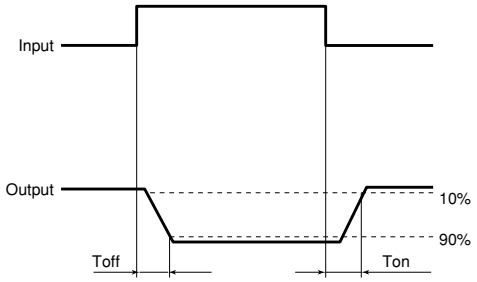
Item		Symbol	AQZ404	Remarks
Input	LED forward current	I_F	50 mA	
	LED reverse voltage	V_R	5 V	
	Peak forward current	I_{FP}	1 A	f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW	
Output	Load voltage (Peak AC)	V_L	400 V	
	Continuous load current (Peak AC)	I_L	0.5 A	
	Peak load current	I_{peak}	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 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	

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)	I_F = 50 mA
			Maximum		1.5 V	
Output	On resistance		Typical	R_{on}	2.8 Ω	I_F = 0 mA I_L = Max. Within 1 s on time
			Maximum		4.0 Ω	
	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 I_L = 100 mA V_L = 10 V
			Maximum		7.5 ms	
			Typical		9.4 ms	I_F = 0 → 5 mA I_L = 100 mA V_L = 10 V
			Maximum		15 ms	
		Reverse (ON) time*	Typical	T_{on}	0.8 ms	I_F = 5 mA → 0 or 10 mA → 0 I_L = 100 mA V_L = 10 V
			Maximum		3.0 ms	
	I/O capacitance		Typical	C_{iso}	0.8 pF	f = 1 MHz V_B = 0 V
			Maximum		1.5 pF	
	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.

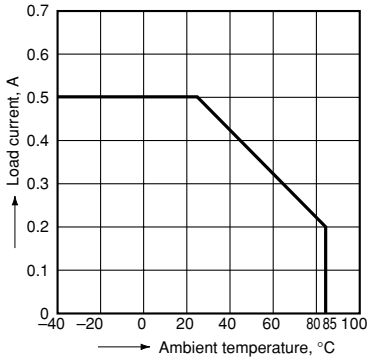
*Operate/Reverse time



REFERENCE DATA

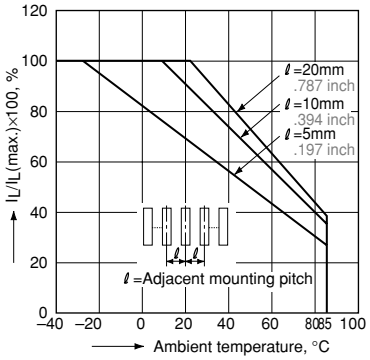
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature: –40°C to +85°C
–40°F to +185°F



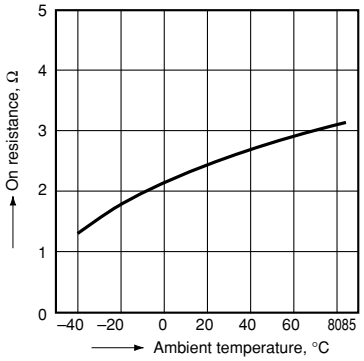
2. Load current vs. ambient temperature characteristics in adjacent mounting

I_L: Load current;
I_L (max.): Maximum continuous load current



3. On resistance vs. ambient temperature characteristics

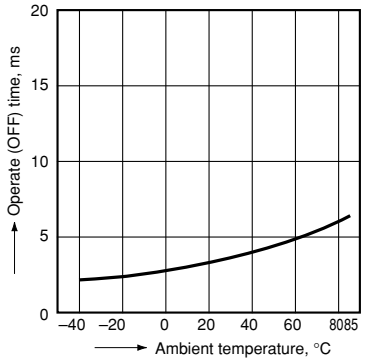
LED current: 0 mA; Load voltage: Max. (DC)
Continuous load current: Max. (DC)



Power PhotoMOS (AQZ404)

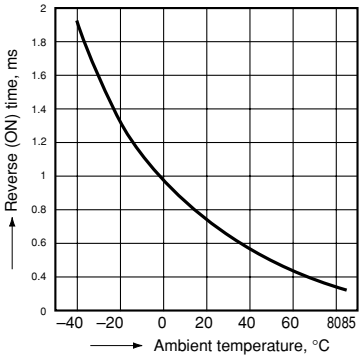
4. Operate (OFF) time vs. ambient temperature characteristics

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



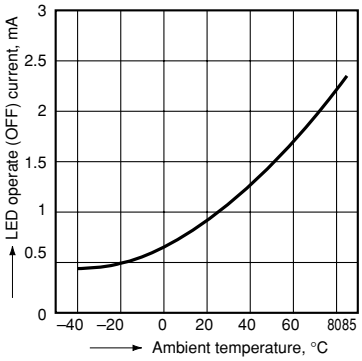
5. Reverse (ON) time vs. ambient temperature characteristics

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



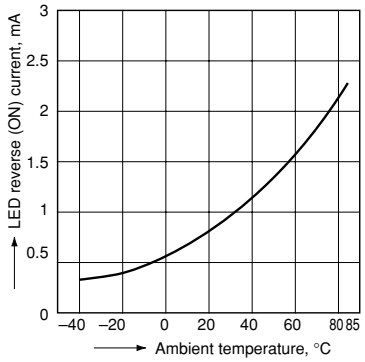
6. LED operate (OFF) current vs. ambient temperature characteristics

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



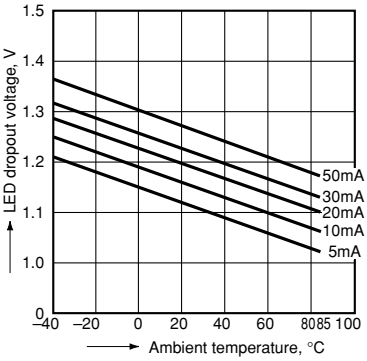
7. LED reverse (ON) current vs. ambient temperature characteristics

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



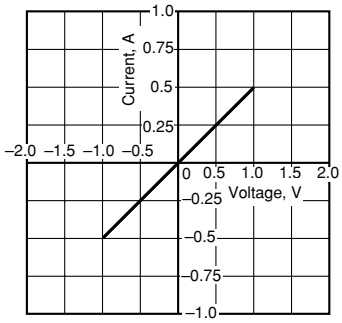
8. LED dropout voltage vs. ambient temperature characteristics

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



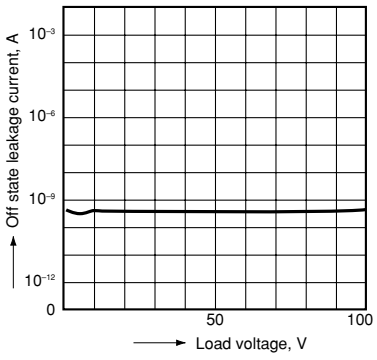
9. Current vs. voltage characteristics of output at MOS portion

Ambient temperature: 25°C 77°F



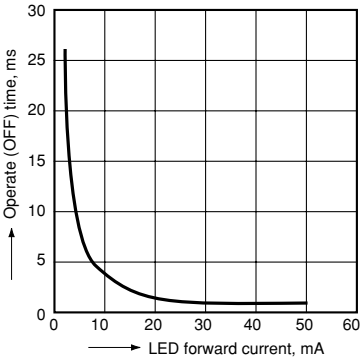
10. Off state leakage current vs. load voltage characteristics

Ambient temperature: 25°C 77°F



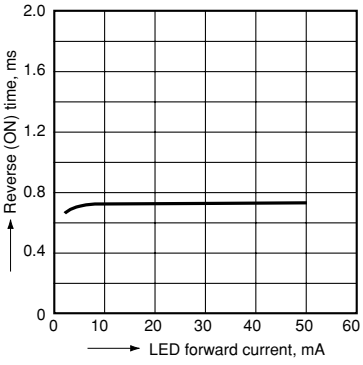
11. Operate (OFF) time vs. LED forward current characteristics

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



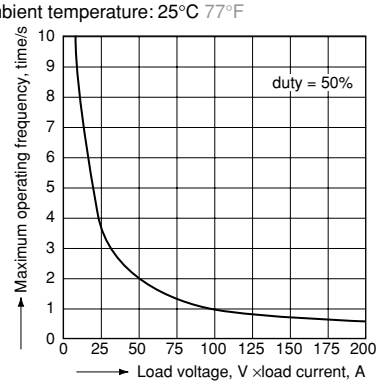
12. Reverse (ON) time vs. LED forward current characteristics

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



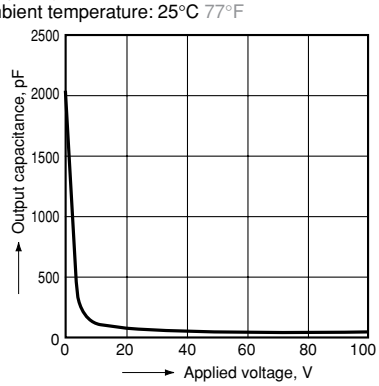
13. Maximum operating frequency vs. load voltage/current characteristics

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

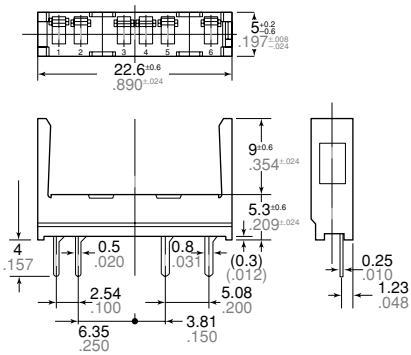


ACCESSORY

mm inch

Socket

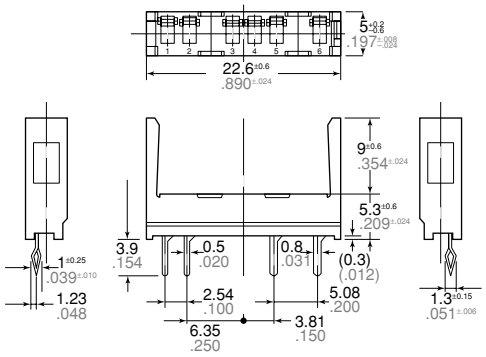
Standard type



PA1a-PS

General Tolerance: ±0.3 ±.012

Self clinching type

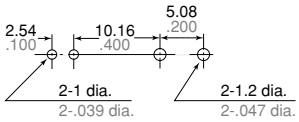


PA1a-PS-H

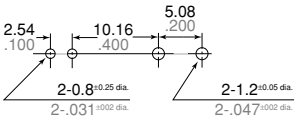
General Tolerance: ±0.3 ±.012

PC board pattern
(BOTTOM VIEW)

Standard type



Self clinching type



Tolerance: ±0.1 ±.004