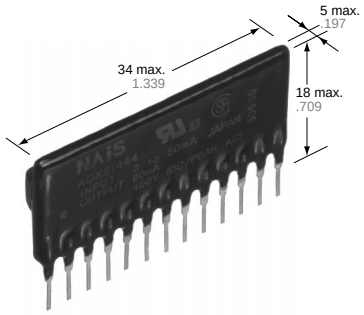
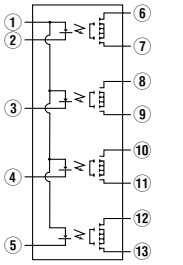
NAiS

GU (General Use) Type [Multi-Channel (4-Channel) Type]

PhotoMOS RELAYS



mm inch



① Input Common: DC+
② Input 1: DC–
③ Input 2: DC–
④ Input 3: DC–
⑤ Input 4: DC–
⑥ Output 1 (N.O.): DC or AC
⑦ Output 1 (N.O.): DC or AC
⑧ Output 2 (N.O.): DC or AC
⑨ Output 2 (N.O.): DC or AC
⑩ Output 3 (N.O.): DC or AC
⑪ Output 3 (N.O.): DC or AC
⑫ Output 4 (N.O.): DC or AC
⑬ Output 4 (N.O.): DC or AC

FEATURES

1. 4-circuit (4-Form A) of GU
PhotoMOS Relay in a compact and slim 13 pin SIL

2. Applicable for 4 Form A use, as well as 4 independent 1 Form A

3. Controls low-level analog signals
PhotoMOS relays feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.

4. Low-level off state leakage current (Typical 100 pA at 100 V load voltage)

5. Optical coupling for extremely high isolation

6. Eliminates the need for a counter electromotive protection diode in the drive circuit on the input side

7. PC board layout is simplified

8. Eliminates the need for a separate power supply to drive the power MOS-FET

9. Low thermal electromotive force (Approx. 1 μV)

10. No restriction on mounting direction

11. No arc, no bounce, no noise

TYPICAL APPLICATIONS

• Telecommunication equipment
• High speed inspection machine, Scanner, IC checker
• Robots

TYPES

	Output rating*		Part No.	Packing quantity	
	Load voltage	Load current		Inner case	Outer carton
AC/DC type	400 V	80 mA	AQX21444	20 pcs.	200 pcs.

*Indicate the peak AC and DC values.

RATINGS

1. AC/DC type

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

Item		Symbol	AQX21444	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 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	80 mA (100 mA)	( ): in case of using only 1 channel Peak AC, DC
	Peak load current	I_{peak}	0.3 A	100 ms (1 shot), V_L = DC
	Power dissipation	P_{out}	1,450 mW	
Total power dissipation		P_T	1,500 mW	
I/O isolation voltage		V_{iso}	1,500 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	

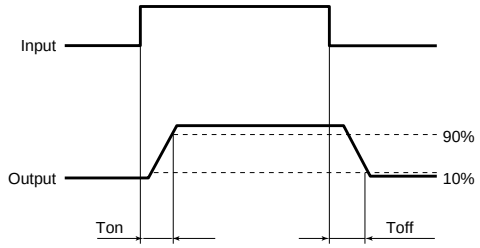
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item				Symbol	AQX21444	Condition
Input	LED operate current		Typical	I_{Fon}	1.1 mA	I_L = 80 mA
			Maximum		3 mA	
	LED turn off current		Minimum	I_{Foff}	0.4 mA	I_L = 80 mA
			Typical		1.0 mA	
	LED dropout voltage		Typical	V_F	1.14 V (1.25 V at I_F = 50 mA)	I_F = 5 mA
			Maximum		1.5 V	
Output	On resistance		Typical	R_{on}	30 Ω	I_F = 5 mA I_L = 80 mA Within 1 s on time
			Maximum		50 Ω	
	Off state leakage current		Maximum	I_{Leak}	1 μA	I_F = 0 mA V_L = 400 V
Transfer characteristics	Switching speed	Turn on time*	Typical	T_{on}	0.52 ms	I_F = 5 mA I_L = 80 mA
			Maximum		2 ms	
			Typical		0.29 ms	I_F = 10 mA I_L = 80 mA
			Maximum		1 ms	
		Turn off time*	Typical	T_{off}	0.19 ms	I_F = 5 mA or 10 mA I_L = 80 mA
			Maximum		0.5 ms	
	I/O capacitance		Typical	C_{iso}	4.0 pF	f = 1 MHz V_B = 0
			Maximum		8.0 pF	
	Initial I/O isolation resistance		Minimum	R_{iso}	1,000 MΩ	500 V DC
Vibration resistance			Minimum	—	10 to 55 Hz at double amplitude of 3 mm	2 hours for 3 axes
Shock resistance			Minimum	—	4,900 m/s² {500 G} 1 ms	3 times for 3 axes

Note: Recommendable LED forward current I_F = 5 mA.

For type of connection, see page 34.

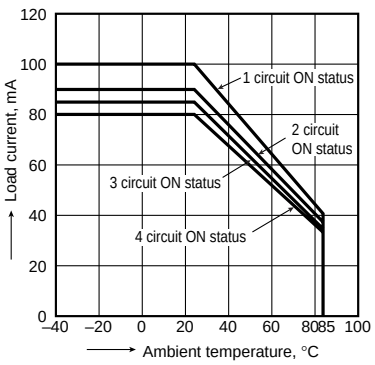
*Turn on/Turn off time



REFERENCE DATA

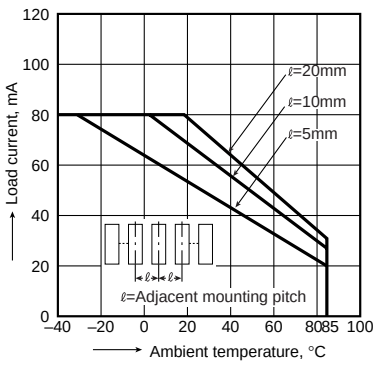
1. Load current vs. ambient temperature characteristics

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



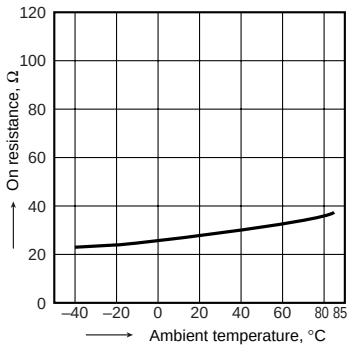
2. Load current in adjacent mounting vs. ambient temperature

Condition: 4 circuits ON status



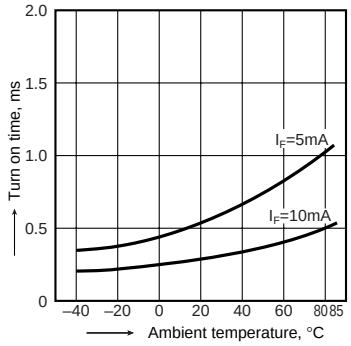
3. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 6 and 7, 8 and 9, 10 and 11, 12 and 13; LED current: 5 mA;
Continuous load current: 80 mA (DC)



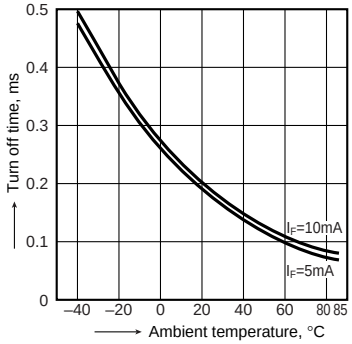
4. Turn on time vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 80 mA (DC)



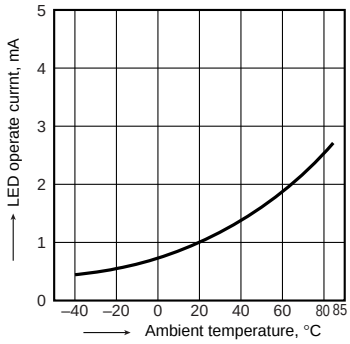
5. Turn off time vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 80 mA (DC)



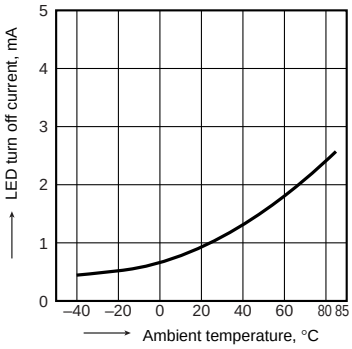
6. LED operate current vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 80 mA (DC)



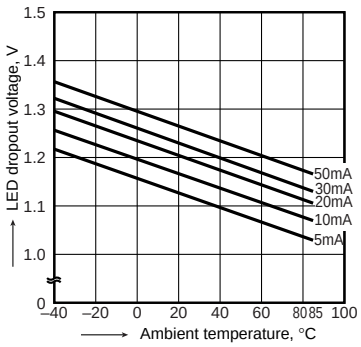
7. LED turn off current vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 80 mA (DC)



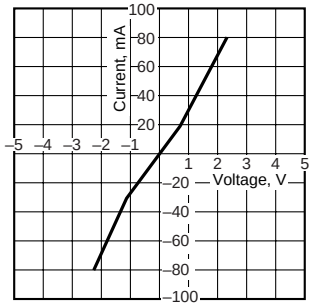
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



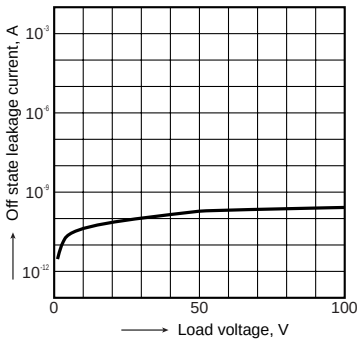
9. Voltage vs. current characteristics of output at MOS portion

Measured portion: between 6 and 7, 8 and 9, 10 and 11, 12 and 13; Ambient temperature: 25°C 77°F



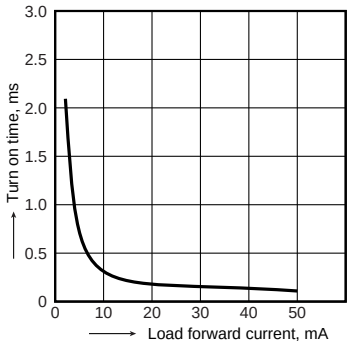
10. Off state leakage current

Measured portion: between terminals 6 and 7, 8 and 9, 10 and 11, 12 and 13;
Ambient temperature: 25°C 77°F



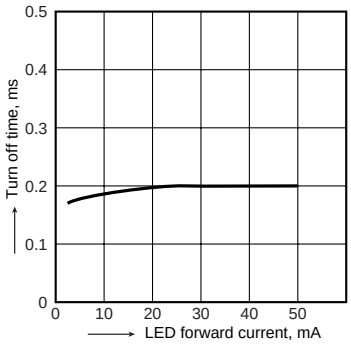
11. LED forward current vs. turn on time characteristics

Measured portion: between terminals 6 and 7, 8 and 9, 10 and 11, 12 and 13; Load voltage: 400 V (DC);
Continuous load current: 80 mA (DC);
Ambient temperature: 25°C 77°F



12. LED forward current vs. turn off time characteristics

Measured portion: between terminals 6 and 7, 8 and 9, 10 and 11, 12 and 13; Load voltage: 400 V (DC);
Continuous load current: 80 mA (DC);
Ambient temperature: 25°C 77°F



13. Applied voltage vs. output capacitance characteristics (AC/DC type)

Measured portion: between terminals 6 and 7, 8 and 9, 10 and 11, 12 and 13; Load voltage: 400 V (DC);
Frequency: 1 MHz; Ambient temperature: 25°C 77°F