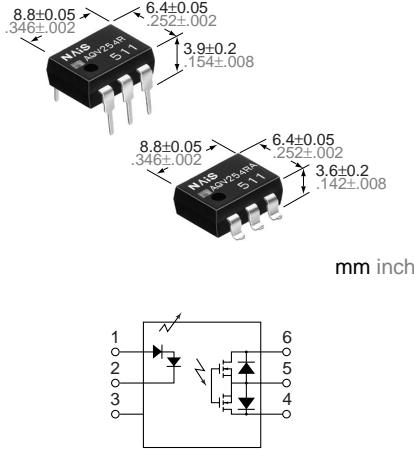


NAIS

HE (High-function Economy) Type [1-Channel (Form A) Type] —With LED Display—

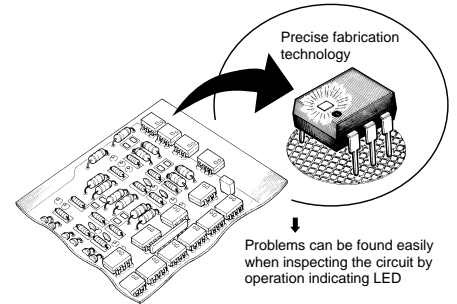
PhotoMOS RELAYS



FEATURES

- **Low on resistance and LED display**
- **Same compact size of our conventional relays without LED display** (W) 6.4×(D) 8.8×(H) 3.9 mm (W) 0.252×(D) 0.346×(H) 0.154 inch.
- **Controls low-level analog signals**
PhotoMOS relays feature extremely low closed-circuit offset voltage to enable control of low level voltage signals or analog signals without distortion.
- **High sensitivity and low on resistance**
A stable relay that has a low on resistance of 16 Ω, no metal contacts, and the ability to control a maximum load current of 0.25 A with an input current of 5 mA.

- **Low-level off state leakage current**
In contrast to the SSR with its off state leakage current of several milliamps, the PhotoMOS relay features a very small off state leakage current of only 100 pA even at a high load voltage of 400 V.



TYPICAL APPLICATIONS

- Telephones
- Measuring instruments
- Game machines
- High-speed inspection machines
- Industrial equipment

TYPES

Type	Output rating*		Part No.				Packing quantity	
			Through hole terminal	Surface-mount terminal			Tube	Tape and reel
	Load voltage	Load current	Tube packing style	Tape and reel packing style				
				Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side			
AC/DC type	400 V	150 mA	AQV254R	AQV254RA	AQV254RAX	AQV254RAZ	1 tube contains 50 pcs. 1 batch contains 500 pcs.	1,000 pcs

*Indicate the peak AC and DC values.

Note: For space reasons, the package type indicator "X" and "Z" are omitted from the seal.

RATING

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

Item	Symbol	Type of connection	AQV254R(A)	Remarks
Input	LED forward current	I_F	25 mA	
	LED reverse voltage	V_R	3 V	
	Peak forward current	I_{FP}	60 mA	f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	90 mW	
Load voltage (peak AC)	V_L		400 V	
Output	Continuous load current	A	0.15 A	A connection: Peak AC, DC B, C connection: DC
		B	0.18 A	
		C	0.25 A	
	Peak load current	I_{peak}		0.5 A
Power dissipation	P_{out}		360 mW	
Total power dissipation	P_T		410 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	

AQV254R

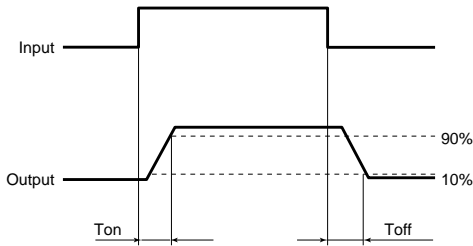
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item		Symbol	Type of connection	AQV254R(A)	Remarks			
Input	LED operate current	Typical	I _{Fon}	—	1.0 mA	I _L = Max.		
		Maximum					3.0 mA	
	LED turn off current	Minimum	I _{Foff}	—	0.4 mA		I _L = Max.	
		Typical						0.9 mA
	LED dropout voltage	Typical	V _F	—	2.8 V			I _F = 5 mA
		Maximum						
Output	On resistance	Typical	R _{on}	A	12.4 Ω	I _F = 5 mA I _L = Max. Within 1 s on time		
		Maximum						
		Typical	R _{on}	B	6.2 Ω		I _F = 5 mA I _L = Max. Within 1 s on time	
		Maximum						
	Typical	R _{on}	C	3.1 Ω	I _F = 5 mA I _L = Max. Within 1 s on time			
	Maximum							4 Ω
Off state leakage current		Maximum	I _{Leak}	—		1 μA		I _F = 0 V _L = Max.
Transfer characteristics	Switching speed	Turn on time*	T _{on}	—		0.8 ms		I _F = 5 mA
						2 ms	I _L = Max.	
		Turn off time*	T _{off}	—		0.05 ms	I _F = 5 mA	
					0.2 ms	I _L = Max.		
	I/O capacitance		Typical	C _{iso}	—	1.3 pF	f = 1 MHz V _B = 0	
			Maximum			3 pF		
Initial I/O isolation resistance		Minimum	R _{iso}	—	1,000 MΩ	500 V DC		

Note: Recommendable LED forward current I_F = 5 mA.

For type of connection, see Page 31.

*Turn on/Turn off time



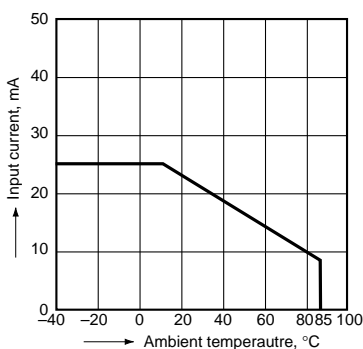
- For Dimensions, see Page 27.
- For Schematic and Wiring Diagrams, see Page 31.
- For Cautions for Use, see Page 36.

REFERENCE DATA

1. Input current vs. ambient temperature characteristics

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

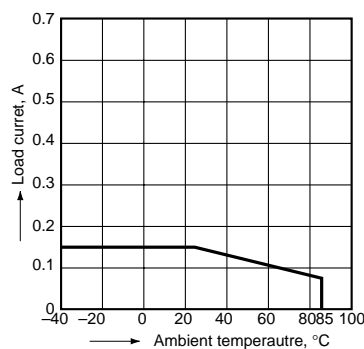
Type of connection: A



2. Load current vs. ambient temperature characteristics

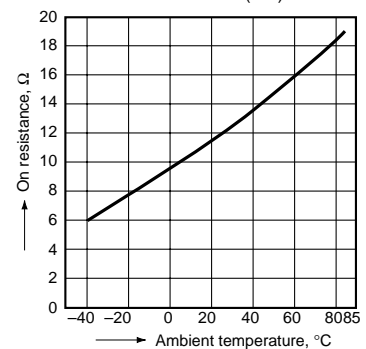
Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F;

Type of connection: A



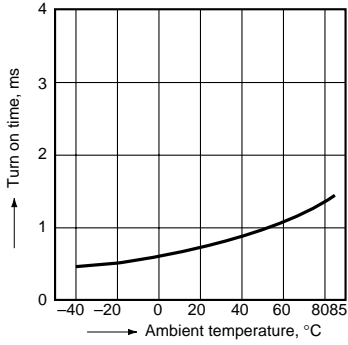
3. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
LED current: 5 mA;
Load voltage: 400 V (DC);
Continuous load current: 150 mA (DC)



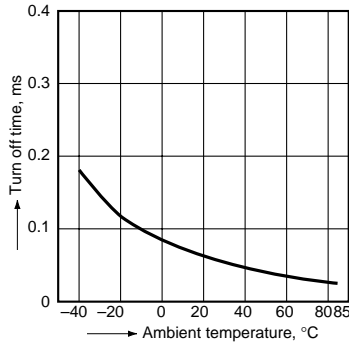
4. Turn on time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 400 V (DC);
Continuous load current: 150 mA (DC)



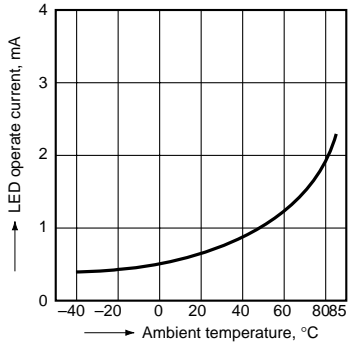
5. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 400 V (DC);
Continuous load current: 150 mA (DC)



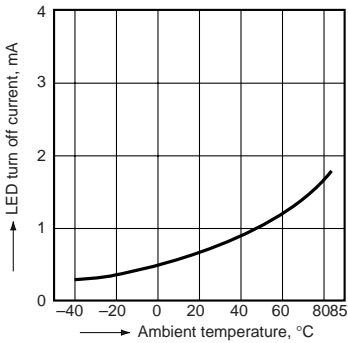
6. LED operate vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 150 mA (DC)



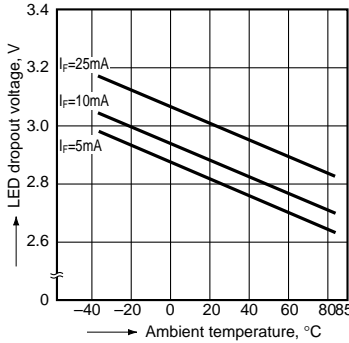
7. LED turn off current vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 150 mA (DC)



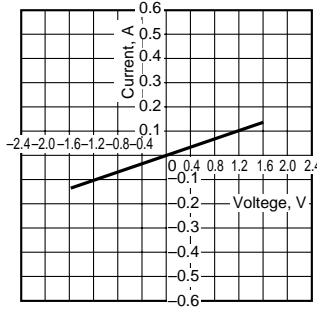
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 25 mA



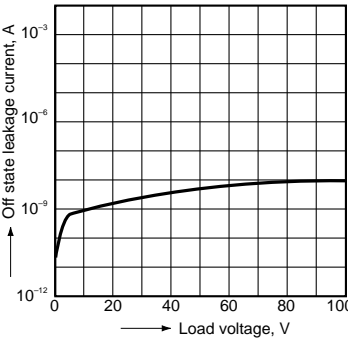
9. Voltage vs. current characteristics of output at MOS portion

Measured portion: between terminals 4 and 6;
Ambient temperature: 25°C 77°F



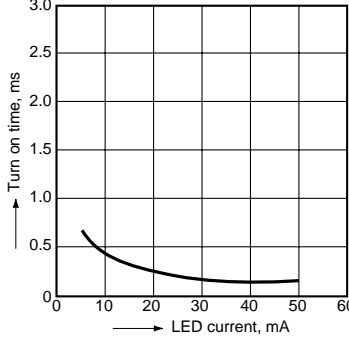
10. Off state leakage current

Measured portion: between terminals 4 and 6;
Ambient temperature: 25°C 77°F



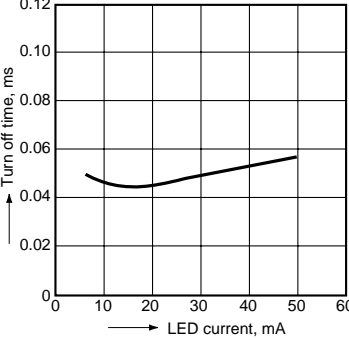
11. LED forward current vs. turn on time characteristics

Measured portion: between terminals 4 and 6;
Load voltage: 400 V (DC);
Continuous load current: 150 mA (DC);
Ambient temperature: 25°C 77°F



12. LED forward current vs. turn off time characteristics

Measured portion: between terminals 4 and 6;
Load voltage: 400 V (DC);
Continuous load current: 150 mA (DC);
Ambient temperature: 25°C 77°F



13. Applied voltage vs. output capacitance characteristics

Measured portion: between terminals 4 and 6;
Frequency: 1 MHz;
Ambient temperature: 25°C 77°F

