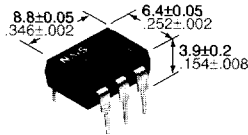


NAIS

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

PhotoMOS RELAYS

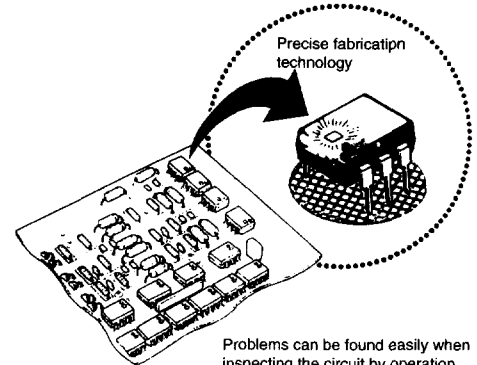
**UL File No.: E43149
CSA File No.: LR26550**



mm inch

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				
	Load voltage	Load current	Tube packing style	Tape and reel packing		Tube	Tape and reel	
AC/DC type	400 V	150 mA	AQV254R	AQV254RA	Picked from the 1/2/3-pin side AQV254RAX			Picked from the 4/5/6-pin side AQV454RAZ

* Indicate the peak AC and DC values.
Note: For space reasons, the package type indicator "X" and "Z" are omitted from the seal.

12 RATING

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

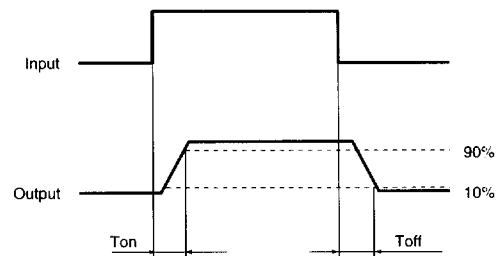
Item		Symbol	Type of connection	AQV254R(A)	Remarks
Input	LED forward current	I _F	A B C	25 mA	
	LED reverse voltage	V _R		3 V	
	Peak forward current	I _{FP}		60 mA	f = 100 Hz, Duty factor = 0.1 %
	Power dissipation	P _{in}		90 mW	
Output	Load voltage (peak AC)	V _L	A B C	400 V	
	Continuous load current	I _L		0.15 A 0.18 A 0.25 A	A connection: Peak AC, DC B, C connection: DC
	Peak load current	I _{peak}		0.5 A	A connection: 100 ms (1 shot), V _L = DC
	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}		-20°C to +80°C -4°F to +176°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	Type of connection	AQV254R(A)	Condition		
Input	LED operate current	Minimum Typical Maximum	I _{Fon}	—	1.0 mA 3.0 mA	I _L = Max.	
	LED turn off current	Minimum Typical Maximum	I _{Foff}	—	0.4 mA 0.9 mA	I _L = Max.	
	LED dropout voltage	Minimum Typical Maximum	V _F	—	2.8 V 3.5 V	I _F = 5 mA	
Output	On resistance	Minimum Typical Maximum	R _{on}	A	12.4 Ω 16 Ω	I _F = 5 mA I _L = Max. Within 1 s on time	
		Minimum Typical Maximum	R _{on}	B	6.2 Ω 8 Ω	I _F = 5 mA I _L = Max. Within 1 s on time	
		Minimum Typical Maximum	R _{on}	C	3.1 Ω 4 Ω	I _F = 5 mA I _L = Max. Within 1 s on time	
	Off state leakage current	Minimum Typical Maximum	I _{Leak}	—	1 μA	I _F = 0 V _L = Max.	
Transfer characteristics	Switching speed	Turn on time*	Minimum Typical Maximum	T _{on}	—	0.8 ms 2 ms	I _F = 5 mA I _L = Max.
		Turn off time*	Minimum Typical Maximum	T _{off}	—	0.05 ms 0.2 ms	I _F = 5 mA I _L = Max.
	I/O capacitance	Minimum Typical Maximum	C _{iso}	—	1.3 pF 3 pF	f = 1 MHz V _B = 0	
	Initial I/O isolation resistance	Minimum Typical Maximum	R _{iso}	—	1,000 MΩ	500 V DC	

For type of connection, see Page 317.

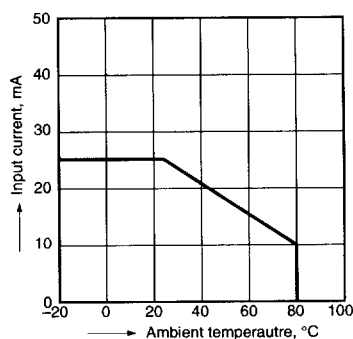
*Turn on/Turn off time



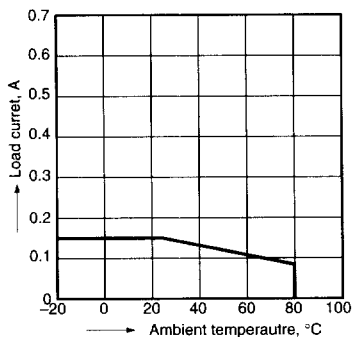
- For Dimensions, see Page 314.
- For Schematic and Wiring Diagrams, see Page 317.
- For Cautions for Use, see Page 321.

REFERENCE DATA

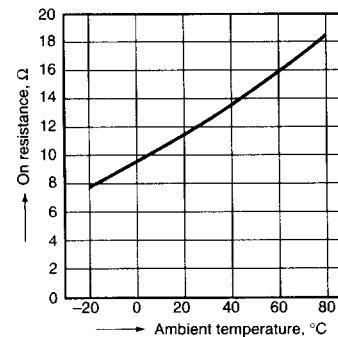
1. Input current vs. ambient temperature characteristics
 Allowable ambient temperature: -20°C to +80°C
 -4°F to +176°F; Type of connection: A



2. Load current vs. ambient temperature characteristics
 Allowable ambient temperature: -20°C to +80°C
 -4°F to +176°F; Type of connection: A



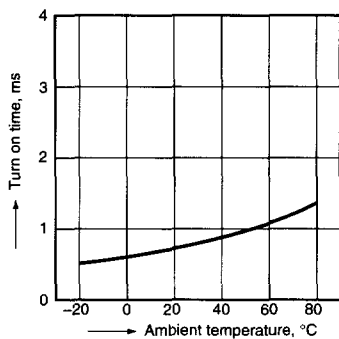
3. On resistance vs. ambient temperature characteristics
 Measured portion: between terminals 4 and 6;
 LED current: 5 mA; Load voltage: 400 V (DC);
 Continuous load current: 150 mA (DC)



AQV254R

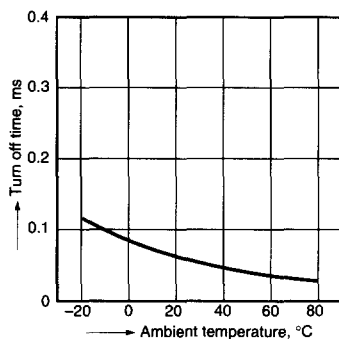
4. Turn on time vs. ambient temperature characteristics

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



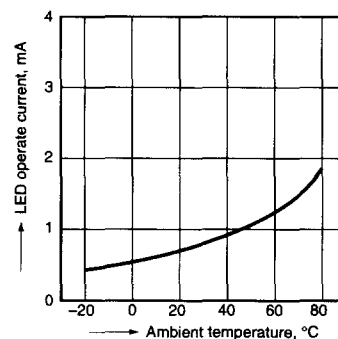
5. Turn off time vs. ambient temperature characteristics

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



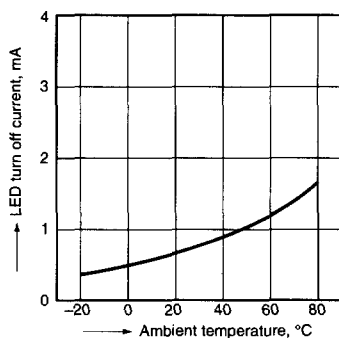
6. LED operate vs. ambient temperature characteristics

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



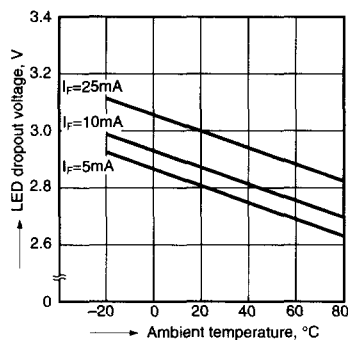
7. LED turn off current vs. ambient temperature characteristics

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



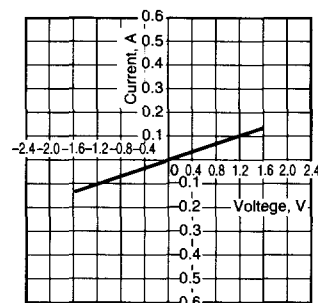
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 25 mA



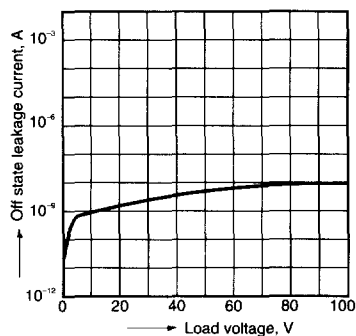
9. Voltage vs. current characteristics of output at MOS portion

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



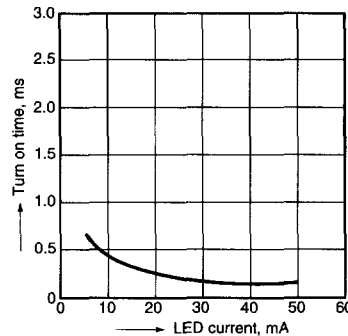
10. Off state leakage current

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



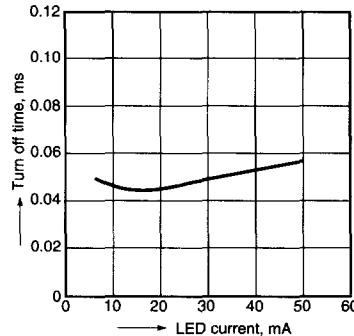
11. LED forward current vs. turn on time characteristics

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



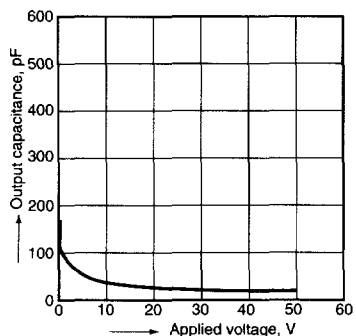
12. LED forward current vs. turn off time characteristics

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



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