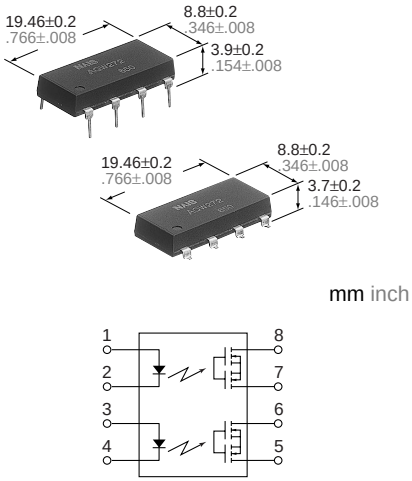
NAiS

PD Type
2- channel (Form A) Type

PhotoMOS RELAYS



mm inch

FEATURES

1. Flat-Packaged Type (W) 8.8× (D) 19.46× (H) 3.9mm (W) .346× (D) .766× (H) .154inch

2. High capacity

Supports the various types of load control, from very small loads to a maximum 1.8A at the rated load voltage 60V (AQW272)

3. High sensitivity

• Low ON resistance

A maximum 1.8A load can be controlled with a 5mA input current. The ON resistance is low at 0.11Ω (typ.) (AQW272)

TYPICAL APPLICATIONS

- Measuring and Testing equipment
- IC Testers and Board Testers
- High speed inspection machines
- Railroad, traffic signals

TYPES

Type	Output rating*		Part No.				Packing quantity	
	Load voltage	Load current	Through hole terminal	Surface-mount terminal				
			Tube packing style		Tape and reel packing style		Tube	Tape and reel
					Picked from the 1/2/3/4-pin side	Picked from the 5/6/7/8-pin side		
AC/DC	60V	1.8A	AQW272	AQW272A	AQW272AX	AQW272AZ	1 tube contains 25 pcs. 1 batch contains 250 pcs.	1,000 pcs.
	100V	1.1A	AQW275	AQW275A	AQW275AX	AQW275AZ		
	200V	0.55A	AQW277	AQW277A	AQW277AX	AQW277AZ		
	400V	0.3A	AQW274	AQW274A	AQW274AX	AQW274AZ		

* Indicate the peak AC and DC values.

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

RATING

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

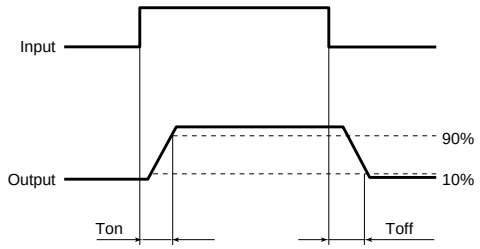
Item		Symbol	AQW272(A)	AQW275(A)	AQW277(A)	AQW274(A)	Remarks
Input	LED forward current	I_F	50 mA				
	LED reverse voltage	V_R	3 V				
	Peak forward current	I_{FP}	1 A				f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW				
Output	Load voltage (peak AC)	V_L	60 V	100 V	200 V	400 V	
	Continuous load current (Peak AC)	I_L	1.8 A (2.5 A)	1.1 A (1.5 A)	0.55 A (0.7 A)	0.3 A (0.4 A)	Peak AC, DC ( ): in case of using only 1 channel
	Peak load current	I_{peak}	6.0 A	4.0 A	2.0 A	1.0 A	100ms (1 shot), V_L = DC
	Power dissipation	P_{out}	1,100 mW				
Total power dissipation		P_T	1,100 mW				
I/O isolation voltage		V_{iso}	2,500 V AC				
Temperture limits	Operating	T_{opr}	–40°C to +85°C –40°F to +185°F				Non-condensing at low temperatures
	Storage	Tstg	–40°C to +100°C –40°F to +212°F				

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

Item			Symbol	AQW272(A)	AQW275(A)	AQW277(A)	AQW274(A)	Condition
Input	LED operate current	Typical	I_{Fon}	1.0 mA				I_L = 100 mA V_L = 10 V
		Maximum		3.0 mA				
	LED turn off current	Minimum	I_{Foff}	0.4 mA				I_L = 100 mA V_L = 10 V
		Typical		0.9 mA				
	LED dropout voltage	Typical	V_F	1.16 V (1.25 V at I_F = 50 mA)				I_F = 10 mA
		Maximum		1.5 V				
Output	On resistance	Typical	R_{on}	0.11 Ω	0.23 Ω	0.7 Ω	2.1 Ω	I_F = 10 mA I_L = Max. Within 1 s on time
		Maximum		0.18 Ω	0.34 Ω	1.1 Ω	3.2 Ω	
	Off state leakage current	Maximum	I_{Leak}	10 μA				I_F = 0 V_L = Max.
Transfer characteristics	Turn on time*	Typical	T_{on}	2.46 ms	2.40 ms	1.12 ms	1.65 ms	I_F = 10 mA I_L = 100 mA V_L = 10 V
		Maximum		5.0 ms				
		Typical		5.64 ms	5.65 ms	2.57 ms	3.88 ms	I_F = 5 mA I_L = 100 mA V_L = 10 V
		Maximum		10.0 ms				
	Turn off time*	Typical	T_{off}	0.22 ms	0.21 ms	0.10 ms	0.08 ms	I_F = 5 mA or 10 mA 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
		Maximum		1.5 pF				
	Initial I/O isolation resistance	Minimum	R_{iso}	1,000 MΩ				500 V DC
	Maximum operating speed	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. For type of connection, see page 32.

*Turn on/Turn off time

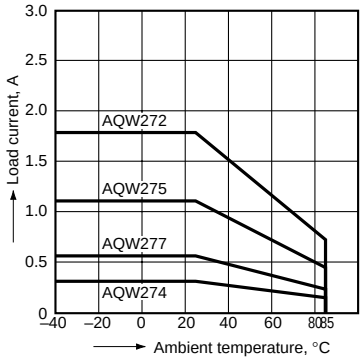


■ **For Dimensions, see Page 29.**
■ **For Schematic and Wiring Diagrams, see Page 32.**
■ **For Cautions for Use, see Page 36.**

REFERENCE DATA

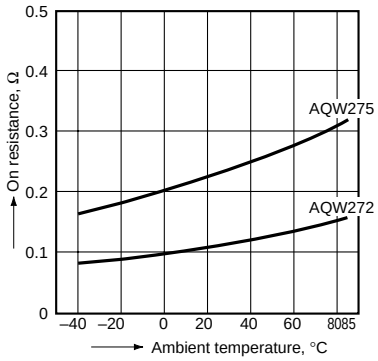
1. Load current vs. ambient temperature characteristics

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



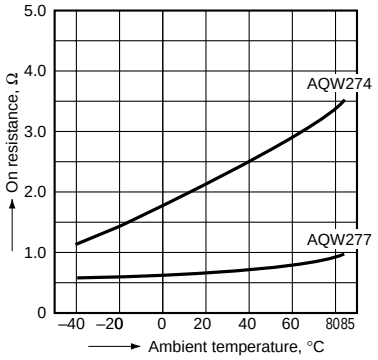
2.-(1) On resistance vs. ambient temperature characteristics

LED current: 10 mA;
Continuous load current: 1.8 A (DC) (AQW272),
1.1 A (DC) (AQW275)



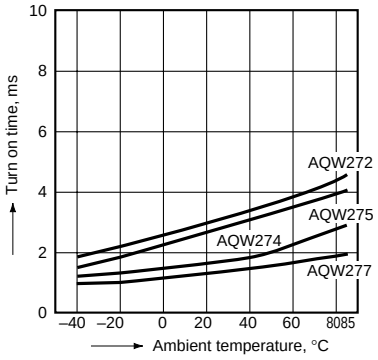
2.-(2) On resistance vs. ambient temperature characteristics

LED current: 10 mA;
Continuous load current: 0.55 A (DC) (AQW277),
0.3 A (DC) (AQW274)



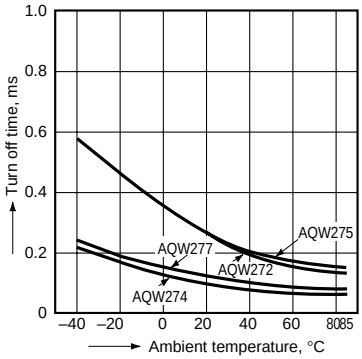
3. Turn on time vs. ambient temperature characteristics

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



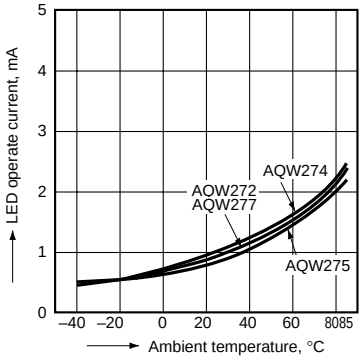
4. Turn off time vs. ambient temperature characteristics

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



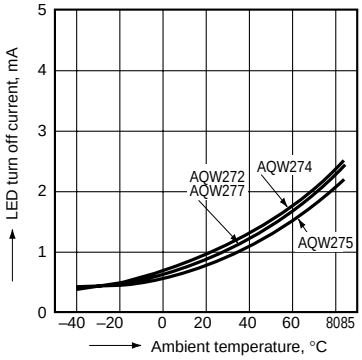
5. LED operate current vs. ambient temperature characteristics

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



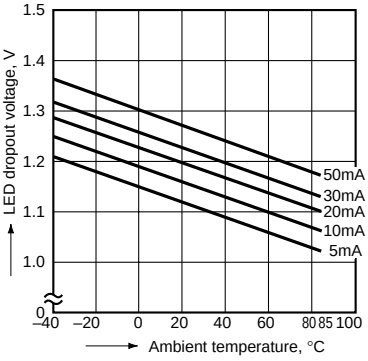
6. LED turn off current vs. ambient temperature characteristics

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



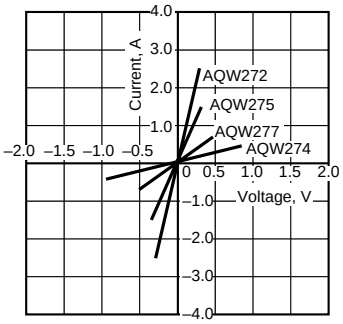
7. LED dropout voltage vs. ambient temperature characteristics

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



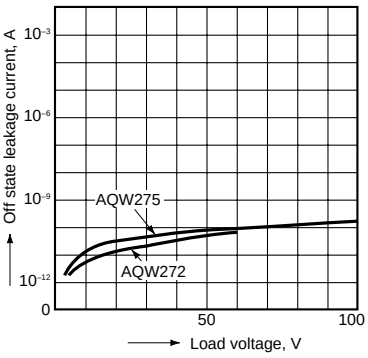
8. Voltage vs. current characteristics of output at MOS portion

Ambient temperature: 25°C 77°F



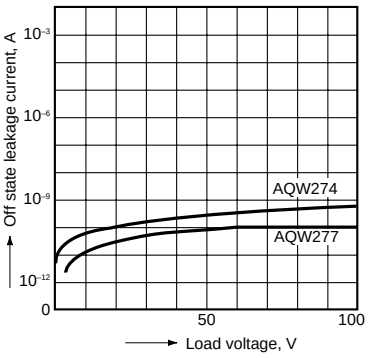
9.-(1) Off state leakage current

Ambient temperature: 25°C 77°F



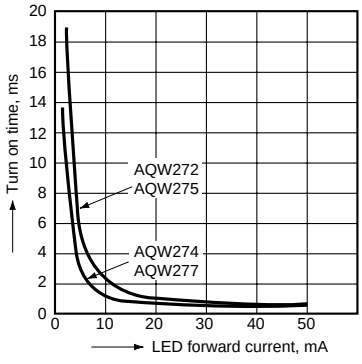
9.-(2) Off state leakage current

Ambient temperature: 25°C 77°F



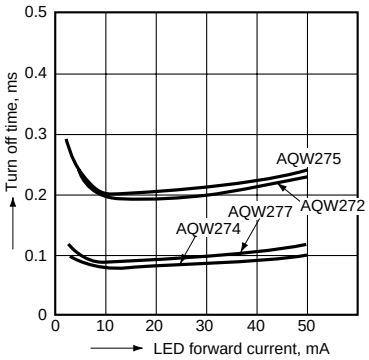
10. LED forward current vs. turn on time characteristics

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



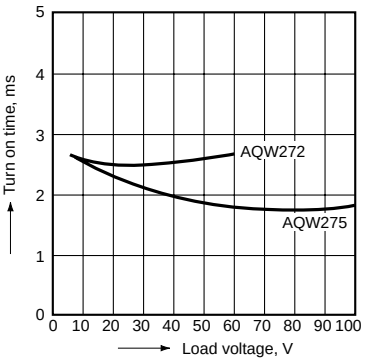
11. LED forward current vs. turn off time characteristics

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



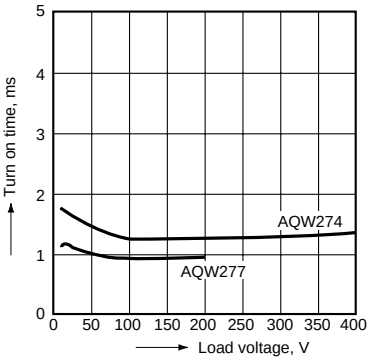
12.-(1) Load voltage vs. turn on time characteristics

LED current: 10 mA; Continuous load current: 100 mA; Ambient temperature: 25°C 77°F



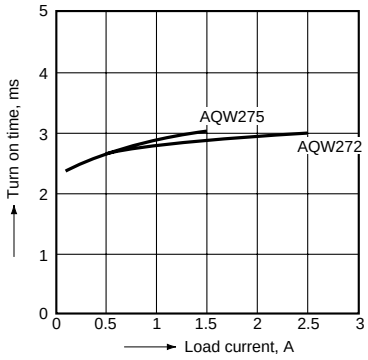
12.-(2) Load voltage vs. turn on time characteristics

LED current: 10 mA; Continuous load current: 100 mA; Ambient temperature: 25°C 77°F



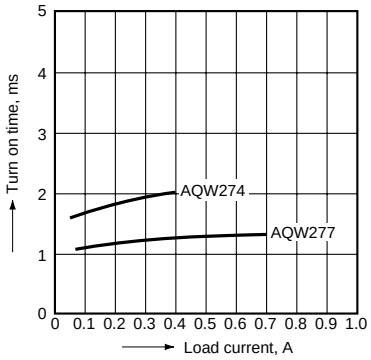
13.-(1) Load current vs. turn on time characteristics

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



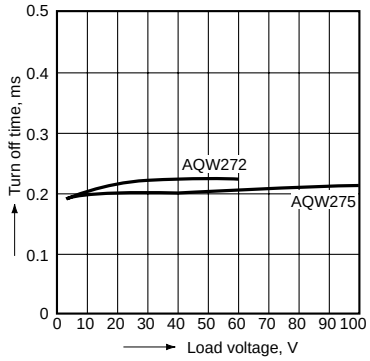
13.-(2) Load current vs. turn on time characteristics

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



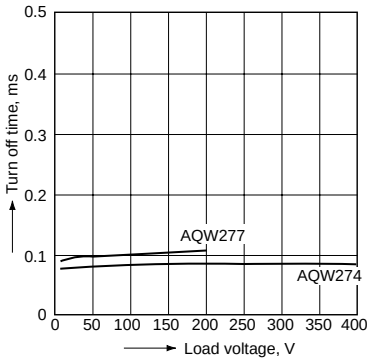
14.-(1) Load voltage vs. turn off time characteristics

LED current: 10 mA; Continuous load current: 100 mA; Ambient temperature: 25°C 77°F



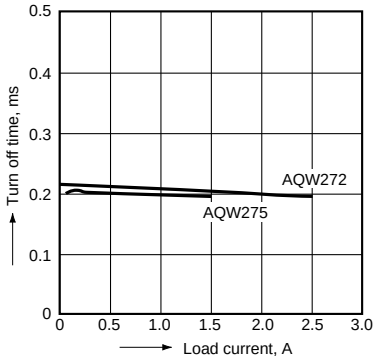
14.-(2) Load voltage vs. turn off time characteristics

LED current: 10 mA; Continuous load current: 100 mA; Ambient temperature: 25°C 77°F



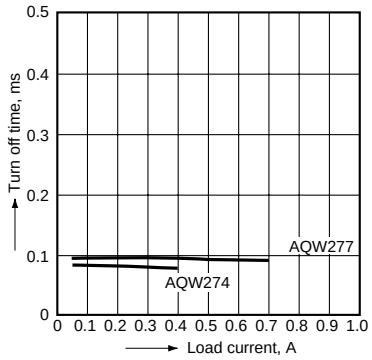
15.-(1) Load current vs. turn off time characteristics

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



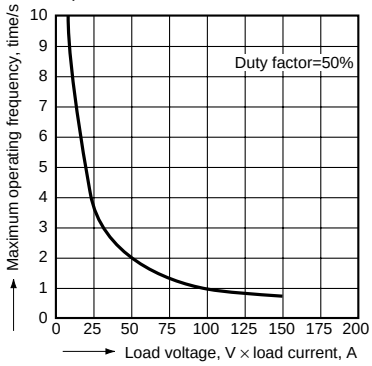
15.-(2) Load current vs. turn off time characteristics

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



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

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



17. Applied voltage vs. output capacitance characteristics

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