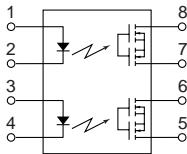


mm inch



### 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	Tape and reel	
				Tube packing style	Tape and reel packing style			
				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 <sub>F</sub>	50 mA				
	LED reverse voltage	V <sub>R</sub>	3 V				
	Peak forward current	I <sub>FP</sub>	1 A				f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P <sub>in</sub>	75 mW				
Output	Load voltage (peak AC)	V <sub>L</sub>	60 V	100 V	200 V	400 V	
	Continuous load current (Peak AC)	I <sub>L</sub>	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 <sub>peak</sub>	6.0 A	4.0 A	2.0 A	1.0 A	100ms (1 shot), V <sub>L</sub> = DC
	Power dissipation	P <sub>out</sub>	1,100 mW				
Total power dissipation		P <sub>T</sub>	1,100 mW				
I/O isolation voltage		V <sub>iso</sub>	2,500 V AC				
Temperature limits	Operating	T <sub>opr</sub>	-40°C to +85°C -40°F to +185°F				Non-condensing at low temperatures
	Storage	T <sub>stg</sub>	-40°C to +100°C -40°F to +212°F				

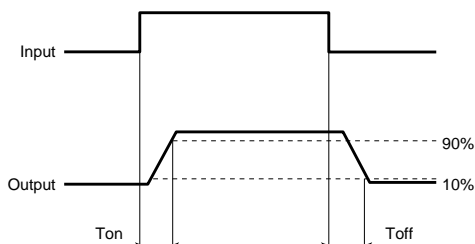
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item		Symbol	AQW272(A)	AQW275(A)	AQW277(A)	AQW274(A)	Condition
Input	LED operate current	Typical	1.0 mA				$I_L = 100 \text{ mA}$ $V_L = 10 \text{ V}$
		Maximum	3.0 mA				
	LED turn off current	Minimum	0.4 mA				$I_L = 100 \text{ mA}$ $V_L = 10 \text{ V}$
		Typical	0.9 mA				
LED dropout voltage	Typical	1.16 V (1.25 V at $I_F = 50 \text{ mA}$ )				$I_F = 10 \text{ mA}$	
	Maximum	1.5 V					
Output	On resistance	Typical	0.11 $\Omega$	0.23 $\Omega$	0.7 $\Omega$	2.1 $\Omega$	$I_F = 10 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time
		Maximum	0.18 $\Omega$	0.34 $\Omega$	1.1 $\Omega$	3.2 $\Omega$	
	Off state leakage current	Maximum	10 $\mu\text{A}$				$I_F = 0$ $V_L = \text{Max.}$
Transfer characteristics	Turn on time*	Typical	2.46 ms	2.40 ms	1.12 ms	1.65 ms	$I_F = 10 \text{ mA}$ $I_L = 100 \text{ mA}$ $V_L = 10 \text{ V}$
		Maximum	5.0 ms				
		Typical	5.64 ms	5.65 ms	2.57 ms	3.88 ms	$I_F = 5 \text{ mA}$ $I_L = 100 \text{ mA}$ $V_L = 10 \text{ V}$
		Maximum	10.0 ms				
	Turn off time*	Typical	0.22 ms	0.21 ms	0.10 ms	0.08 ms	$I_F = 5 \text{ mA or } 10 \text{ mA}$ $I_L = 100 \text{ mA}$ $V_L = 10 \text{ V}$
		Maximum	3.0 ms				
	I/O capacitance	Typical	0.8 pF				$f = 1 \text{ MHz}$ $V_B = 0$
		Maximum	1.5 pF				
Initial I/O isolation resistance	Minimum	1,000 M $\Omega$				500 V DC	
Maximum operating speed	Maximum	—				0.5 cps $I_F = 10 \text{ mA}$ Duty factor = 50% $I_L = \text{Max.}, V_L = \text{Max.}$	

Note: Recommendable LED forward current  $I_F = 5$  to  $10 \text{ mA}$ .

For type of connection, see page 32.

\*Turn on/Turn off time

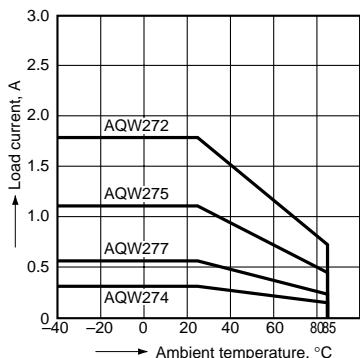


- For Dimensions, see Page 29.
- For Schematic and Wiring Diagrams, see Page 32.
- For Cautions for Use, see Page 36.

REFERENCE DATA

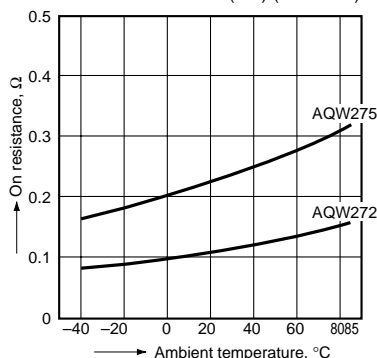
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature:  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$   
 $-40^\circ\text{F}$  to  $+185^\circ\text{F}$



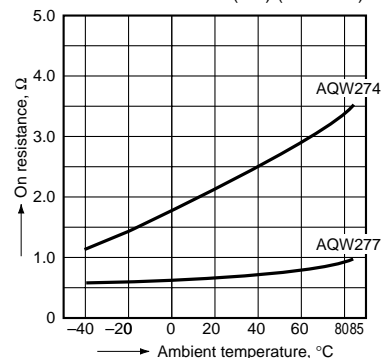
2.-(1) On resistance vs. ambient temperature characteristics

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

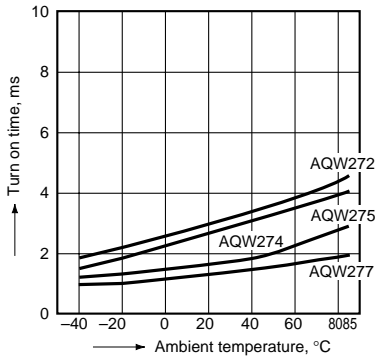
LED current: 10 mA;  
Continuous load current: 0.55 A (DC) (AQW277),  
0.3 A (DC) (AQW274)



# AQW270

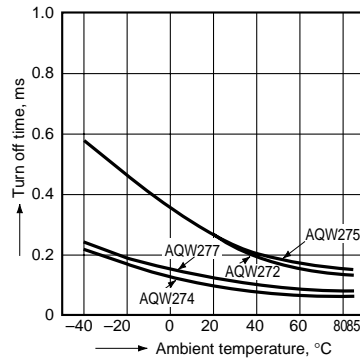
## 3. Turn on time vs. ambient temperature characteristics

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



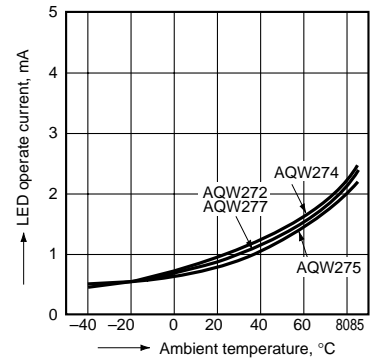
## 4. Turn off time vs. ambient temperature characteristics

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



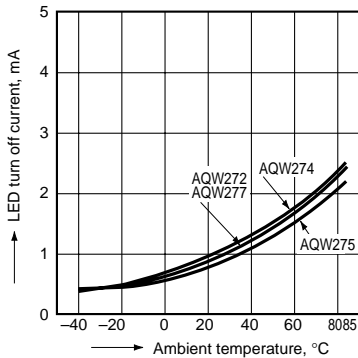
## 5. LED operate current vs. ambient temperature characteristics

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



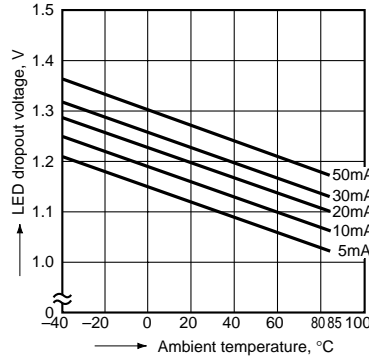
## 6. LED turn off current vs. ambient temperature characteristics

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



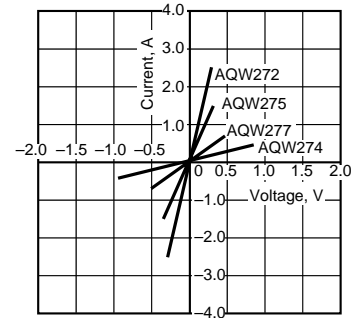
## 7. LED dropout voltage vs. ambient temperature characteristics

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



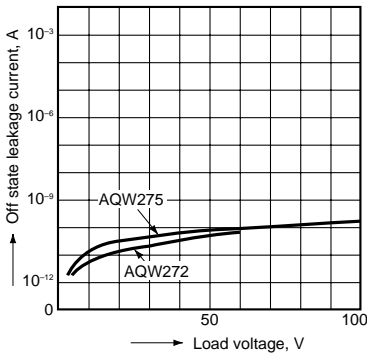
## 8. Voltage vs. current characteristics of output at MOS portion

Ambient temperature: 25°C 77°F



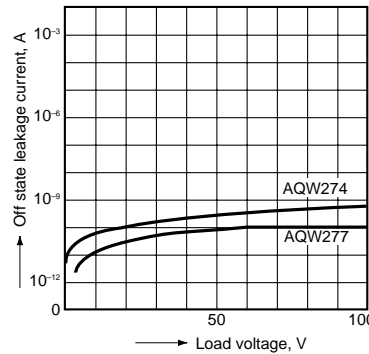
## 9.-(1) Off state leakage current

Ambient temperature: 25°C 77°F



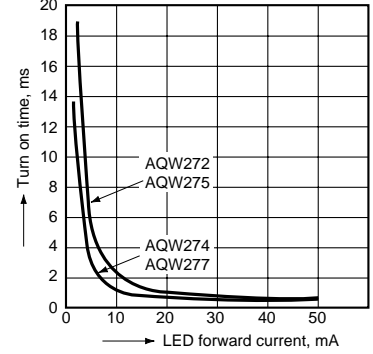
## 9.-(2) Off state leakage current

Ambient temperature: 25°C 77°F



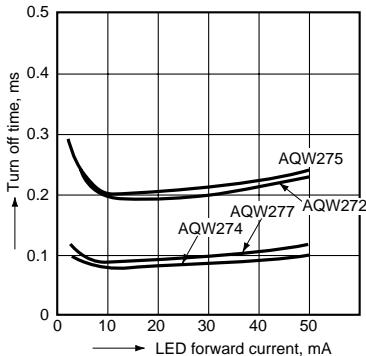
## 10. LED forward current vs. turn on time characteristics

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



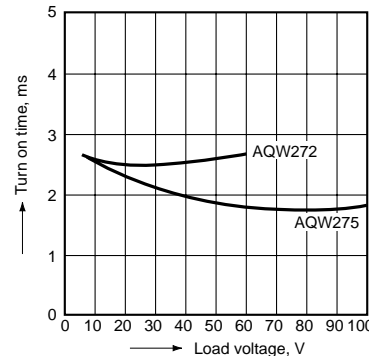
## 11. LED forward current vs. turn off time characteristics

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



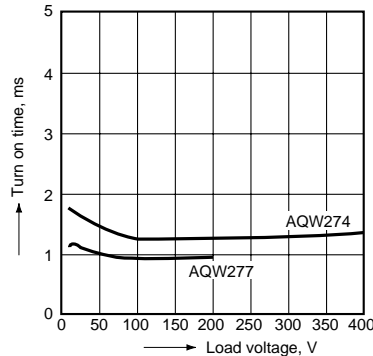
## 12.-(1) Load voltage vs. turn on time characteristics

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



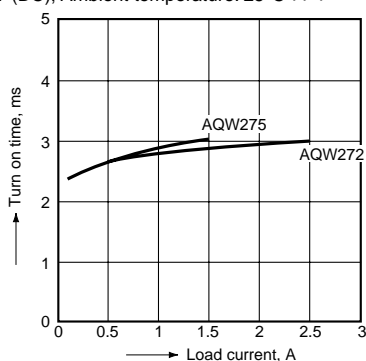
## 12.-(2) Load voltage vs. turn on time characteristics

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



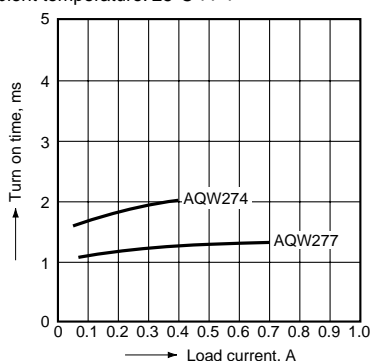
13.-(1) Load current vs. turn on time characteristics

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



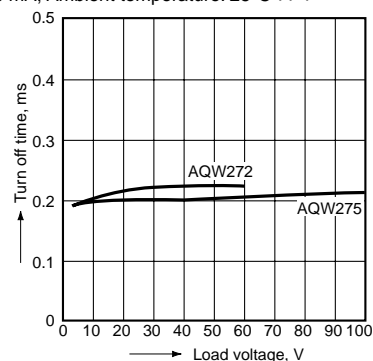
13.-(2) Load current vs. turn on time characteristics

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



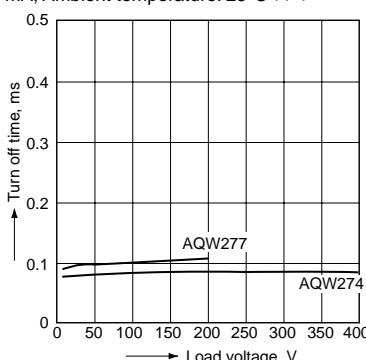
14.-(1) Load voltage vs. turn off time characteristics

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



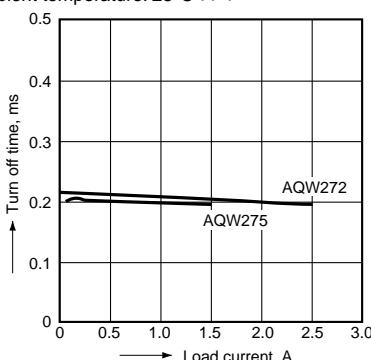
14.-(2) Load voltage vs. turn off time characteristics

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



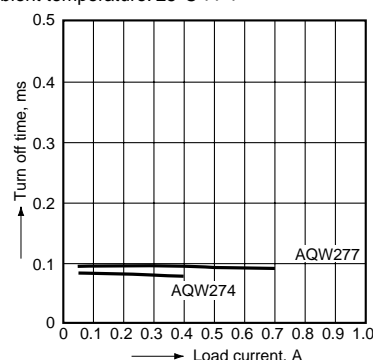
15.-(1) Load current vs. turn off time characteristics

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



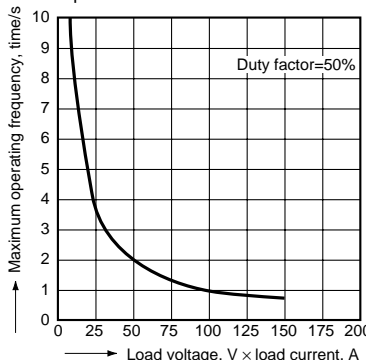
15.-(2) Load current vs. turn off time characteristics

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

