Panasonic
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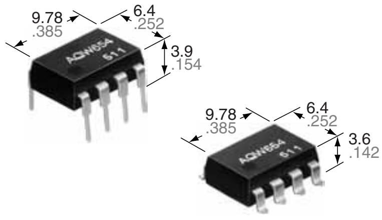
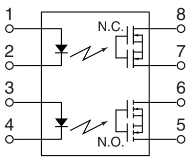
High sensitivity and low on-resistance. DIP (1 Form A/1 Form B) 8-pin type.

HE PhotoMOS (AQW654)



mm inch



RoHS Directive compatibility information
http://www.mew.co.jp/ac/e/environment/

FEATURES

1. Compact 8-pin DIP size
The device comes in a compact (W) 6.4×(L) 9.78×(H) 3.9 m (W) .252×(L) .385×(H) .154 inch, 8-pin DIP size (through hole terminal type).

2. Applicable for 1 Form A 1 Form B use as well as two independent 1 Form A and 1 Form B use

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. High sensitivity, low ON resistance
Can control a maximum 0.16 A (AQW654) load current with a 5 mA input current. Low ON resistance of 16 Ω (AQW654). Stable operation because there are no metallic contact parts.

5. Low-level off state leakage current
The SSR has an off state leakage current of several milliamperes, whereas the PhotoMOS relay has typ. 100 pA even with the rated load voltage of 400 V (AQW654).

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

TYPICAL APPLICATIONS

- High-speed inspection machines
- Data communication equipment
- Telephone 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 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	400 V	120 mA	AQW654	AQW654A	AQW654AX	AQW654AZ	1 tube contains 40 pcs. 1 batch contains 400 pcs.	1,000 pcs

*Indicate the peak AC and DC values.
Note: For space reasons, the SMD terminal shape indicator “A” and the package style indicator “X” or “Z” are not marked on the relay.

RATING

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

Item		Symbol	AQW654(A)	Remarks
Input	LED forward current	I_F	50 mA	
	LED reverse voltage	V_R	5 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	0.12A (0.16 A)	Peak AC, DC ( ): in case of using only 1 channel)
	Peak load current	I_{peak}	0.36 A	A connection: 100 ms (1 shot), V_L = DC
	Power dissipation	P_{out}	800 mW	
Total power dissipation		P_T	850 mW	
I/O isolation voltage		V_{iso}	1,500 V AC	Between input and output/between contact sets
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	

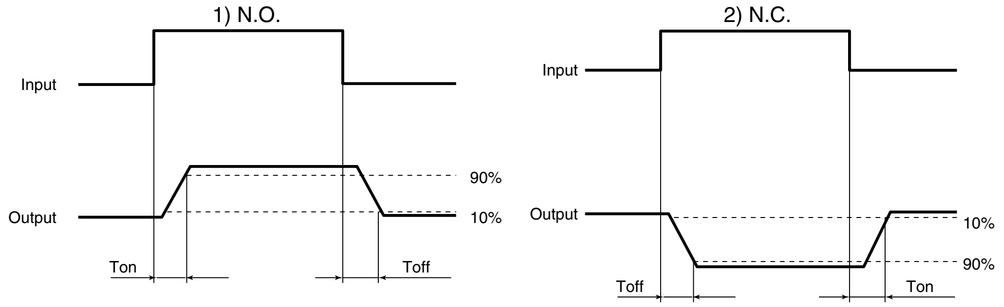
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item				Symbol	AQW654(A)	Remarks
Input	LED operate (OFF) current		Typical	I_{Fon} (N.O.) I_{Foff} (N.C.)	0.9 mA	I_L = Max.
			Maximum		3 mA	
	LED reverse (ON) current		Minimum	I_{Foff} (N.O.) I_{Fon} (N.C.)	0.4 mA	I_L = Max.
			Typical		0.8 mA	
	LED dropout voltage		Typical	V_F	1.25 V (1.14 V at I_F = 5 mA)	I_F = 50 mA
			Maximum		1.5 V	
Output	On resistance		Typical	R_{on}	11 Ω	I_F = 5 mA (N.O.) I_F = 0 mA (N.C.) I_L = Max. Within 1 s on time
			Maximum		16 Ω	
	Off state leakage current		Maximum	I_{Leak}	1 μA	I_F = 0 mA (N.O.) I_F = 5 mA (N.C.) V_L = Max.
Transfer characteristics	Switching speed	Operate (OFF) time*	Typical	T_{on} (N.O.) T_{off} (N.C.)	0.8 ms (N.O.) 1.2 ms (N.C.)	I_F = 0 mA → 5 mA I_L = Max.
			Maximum		2 ms	
		Reverse (ON) time*	Typical	T_{off} (N.O.) T_{on} (N.C.)	0.04 ms (N.O.) 0.36 ms (N.C.)	I_F = 5 mA → 0 mA I_L = Max.
			Maximum		1 ms	
	I/O capacitance		Typical	C_{iso}	0.8 pF	f = 1 MHz V_B = 0 V
			Maximum		1.5 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.

*Operate/Reverse time

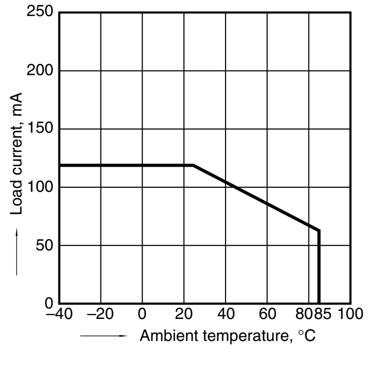


■ **For Dimensions.**
■ **For Schematic and Wiring Diagrams.**
■ **For Cautions for Use.**

REFERENCE DATA

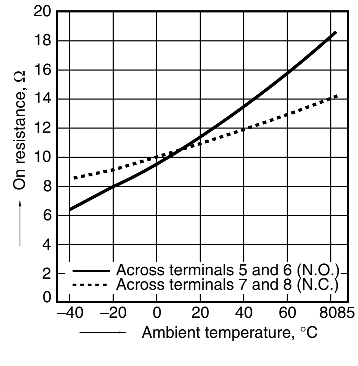
1. Load current vs. ambient temperature characteristics

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



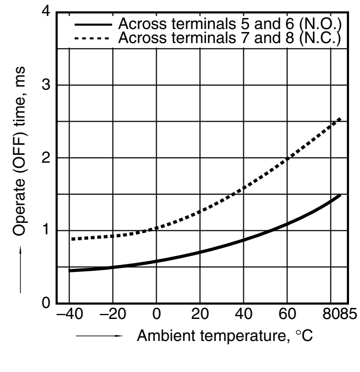
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8; LED current: 5 mA; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)

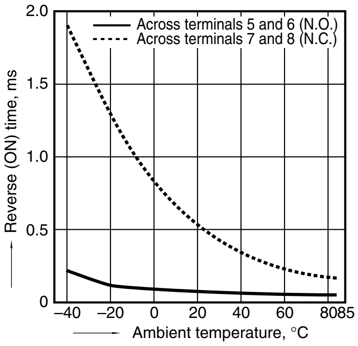


3. Operate (OFF) time vs. ambient temperature characteristics

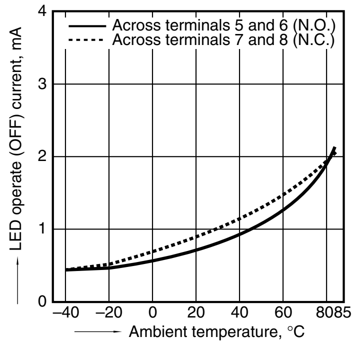
LED current: 5 mA; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



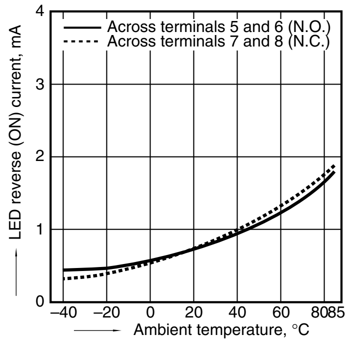
4. Reverse (ON) time vs. ambient temperature characteristics
LED current: 5 mA;
Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



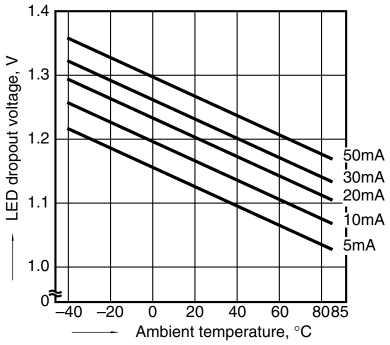
5. LED operate (OFF) current vs. ambient temperature characteristics
Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



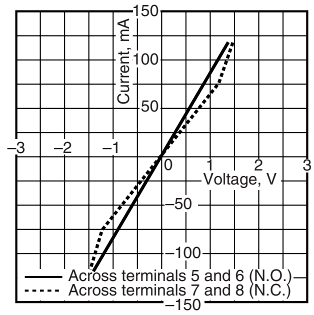
6. LED reverse (ON) current vs. ambient temperature characteristics
Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



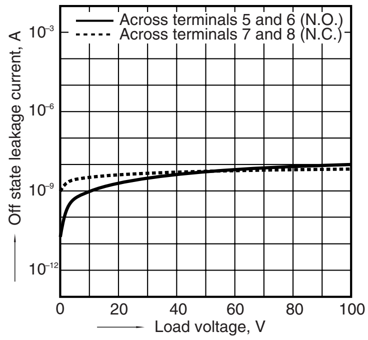
7. LED dropout voltage vs. ambient temperature characteristics
LED current: 5 to 50 mA



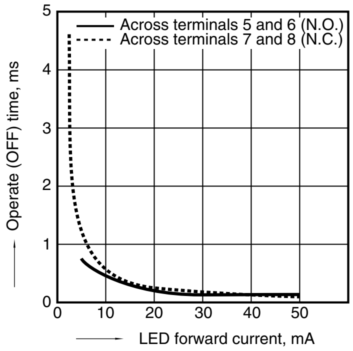
8. Current vs. voltage characteristics of output at MOS portion
Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F



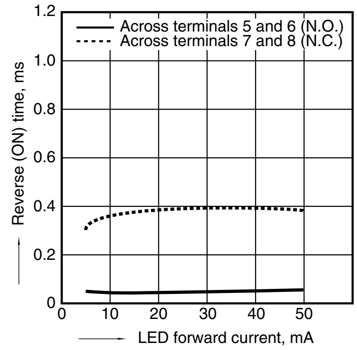
9. Off state leakage current vs. load voltage characteristics
Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F



10. Operate (OFF) time vs. LED forward current characteristics
Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC); Ambient temperature: 25°C 77°F



11. Reverse (ON) time vs. LED forward current characteristics
Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC); Ambient temperature: 25°C 77°F



12. Output capacitance vs. applied voltage characteristics
Measured portion: between terminals 5 and 6, 7 and 8; Frequency: 1 MHz;
Ambient temperature: 25°C 77°F