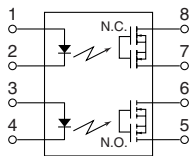
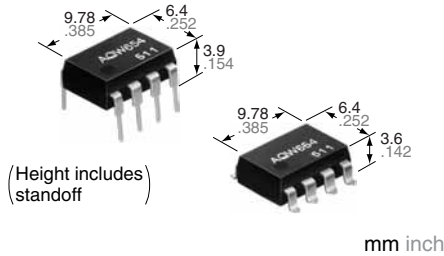


# Panasonic

ideas for life

Both 1 Form A and 1 Form B contacts incorporated in a compact DIP8-pin with low on-resistance

PhotoMOS<sup>®</sup>  
HE Form A & B  
(AQW654)



RoHS compliant

## FEATURES

- Applicable for 1 Form A 1 Form B use as well as two independent 1 Form A and 1 Form B use**
- Controls low-level analog signals**  
PhotoMOS feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.
- High sensitivity and low on-resistance**  
Can control max. 0.16 A load current with 5 mA input current. Low on-resistance of max. 11  $\Omega$ .
- Low-level off state leakage current of max. 1  $\mu$ A**

## TYPICAL APPLICATIONS

- High-speed inspection machines
- Data communication equipment
- Telephone equipment
- Sensing equipment

## TYPES

	Output rating*		Package	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 1/2/3/4-pin side	Picked from the 5/6/7/8-pin side			
AC/DC dual use	400 V	120 mA	DIP8-pin	AQW654	AQW654A	AQW654AX	AQW654AZ	1 tube contains: 50 pcs. 1 batch contains: 500 pcs.	1,000 pcs

\*Indicate the peak AC and DC values.

Note: The surface mount terminal indicator "A" and the packing style indicator "X" or "Z" are not marked on the device.

## RATING

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

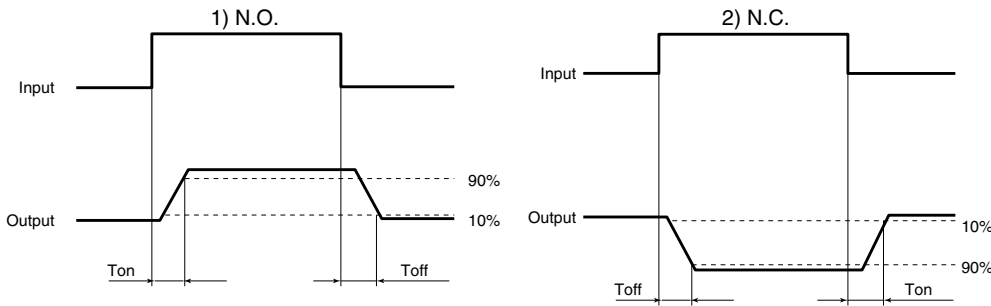
	Item	Symbol	AQW654(A)	Remarks
Input	LED forward current	$I_F$	50 mA	
	LED reverse voltage	$V_R$	5 V	
	Peak forward current	$I_{FP}$	1 A	$f = 100$ Hz, Duty factor = 0.1%
	Power dissipation	$P_{in}$	75 mW	
Output	Load voltage (peak AC)	$V_L$	400 V	
	Continuous load current	$I_L$	0.12A (0.16 A)	Peak AC, 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	

# HE Form A & B (AQW654)

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

Item		Symbol	AQW654(A)	Remarks
Input	LED operate current	Typical	$I_{Fon}$ (N.O.)	0.9 mA
		Maximum	$I_{Foff}$ (N.C.)	3 mA
	LED reverse current	Minimum	$I_{Foff}$ (N.O.)	0.4 mA
		Typical	$I_{Fon}$ (N.C.)	0.8 mA
LED dropout voltage	Typical	$V_F$	1.25 V (1.14 V at $I_F = 5$ mA)	
	Maximum		1.5 V	$I_F = 50$ mA
Output	On resistance	Typical	$R_{on}$	11 $\Omega$
		Maximum		16 $\Omega$
	Off state leakage current	Maximum	$I_{Leak}$	1 $\mu$ A
Transfer characteristics	Operate time*	Typical	$T_{on}$ (N.O.)	0.8 ms (N.O.) 1.2 ms (N.C.)
		Maximum	$T_{off}$ (N.C.)	2 ms
	Reverse time*	Typical	$T_{off}$ (N.O.)	0.04 ms (N.O.) 0.36 ms (N.C.)
		Maximum	$T_{on}$ (N.C.)	1 ms
	I/O capacitance	Typical	$C_{iso}$	0.8 pF
Maximum		1.5 pF		
Initial I/O isolation resistance	Minimum	$R_{iso}$	1,000 M $\Omega$	500 V DC

\*Operate/Reverse time



## RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper device operation and resetting.

Item	Symbol	Recommended value	Unit
Input LED current	$I_F$	5	mA

- For Dimensions.
- For Schematic and Wiring Diagrams.
- For Cautions for Use.

■ These products are not designed for automotive use.

If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

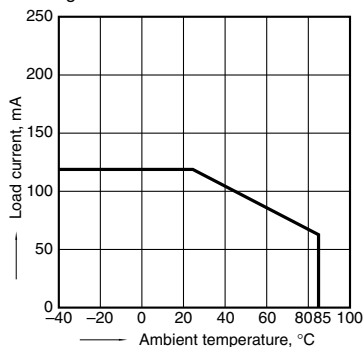
For more information.

## REFERENCE DATA

1. Load current vs. ambient temperature characteristics

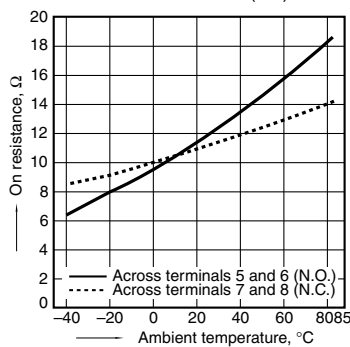
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F

When using 2 channels



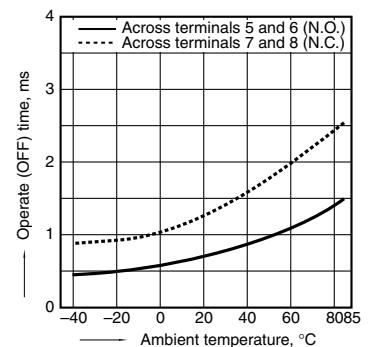
2. On resistance vs. ambient temperature characteristics

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)



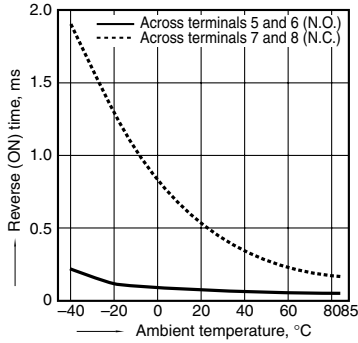
3. Operate time vs. ambient temperature characteristics

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



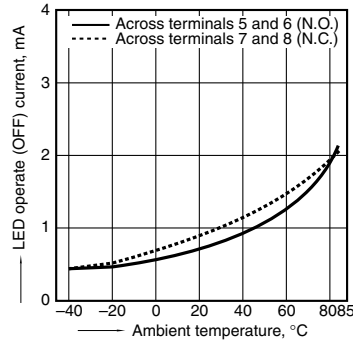
## 4. Reverse time vs. ambient temperature characteristics

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



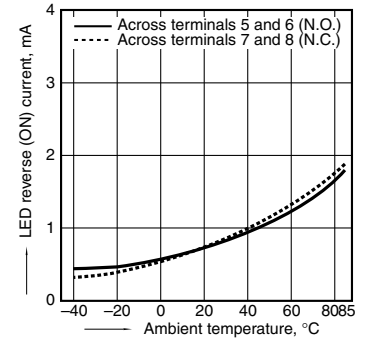
## 5. LED operate current vs. ambient temperature characteristics

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



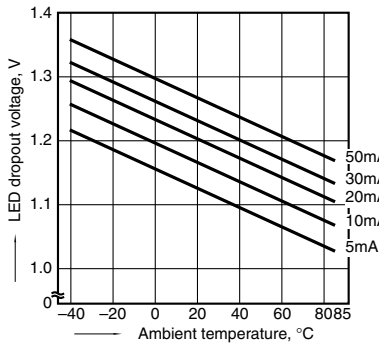
## 6. LED reverse current vs. ambient temperature characteristics

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



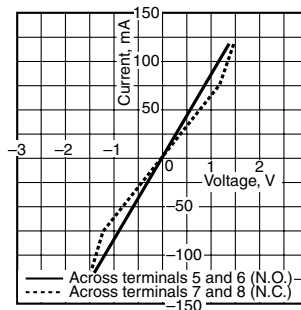
## 7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



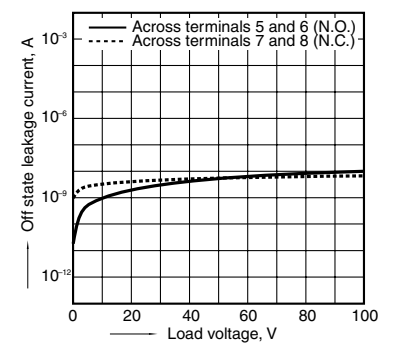
## 8. Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F



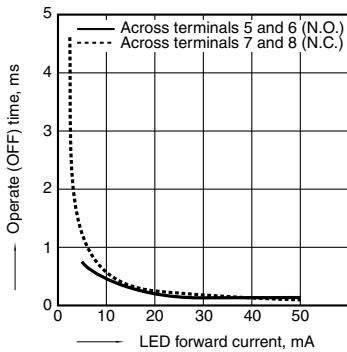
## 9. Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F



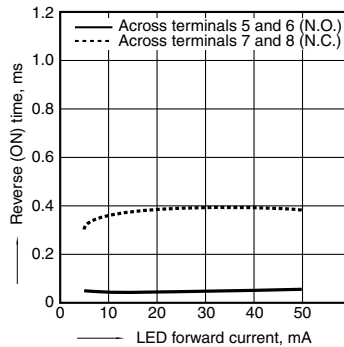
## 10. Operate time vs. LED forward current characteristics

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 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

