



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

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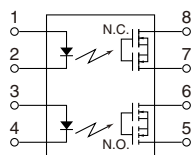
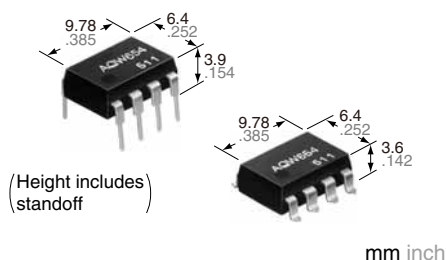
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**Both 1 Form A and 1 Form B contacts incorporated in a compact DIP8-pin with low on-resistance**

**PhotoMOS<sup>®</sup>  
HE 1 Form A & 1 Form B  
(AQW654)**



**RoHS compliant**

### FEATURES

- 1. Applicable for 1 Form A and 1 Form B use as well as two independent 1 Form A and 1 Form B use**
- 2. Controls low-level analog signals**  
PhotoMOS feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.
- 3. 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  $\Omega$ .
- 4. 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				
	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 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)

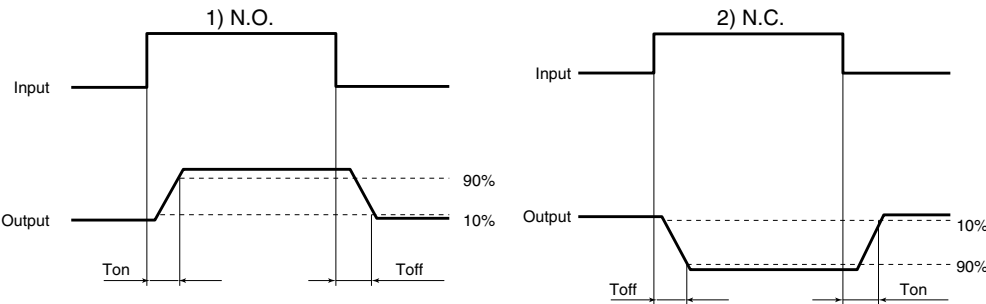
Item		Symbol	AQW654(A)	Remarks
Input	LED forward current	$I_F$	50 mA	
	LED reverse voltage	$V_R$	5 V	
	Peak forward current	$I_{FP}$	1 A	$f = 100$ Hz, Duty factor = 0.1%
	Power dissipation	$P_{in}$	75 mW	
Output	Load voltage (peak AC)	$V_L$	400 V	
	Continuous load current	$I_L$	0.12A (0.16 A)	Peak AC,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

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

Item			Symbol	AQW654(A)	Remarks
Input	LED operate current	Typical	I <sub>Fon</sub> (N.O.)	0.9 mA	I <sub>L</sub> = Max.
		Maximum	I <sub>Foff</sub> (N.C.)	3 mA	
	LED reverse current	Minimum	I <sub>Foff</sub> (N.O.)	0.4 mA	I <sub>L</sub> = Max.
		Typical	I <sub>Fon</sub> (N.C.)	0.8 mA	
	LED dropout voltage	Typical	V <sub>F</sub>	1.25 V (1.14 V at I <sub>F</sub> = 5 mA)	I <sub>F</sub> = 50 mA
		Maximum		1.5 V	
Output	On resistance	Typical	R <sub>on</sub>	11 Ω	I <sub>F</sub> = 5 mA (N.O.) I <sub>F</sub> = 0 mA (N.C.) I <sub>L</sub> = Max. Within 1 s on time
		Maximum		16 Ω	
	Off state leakage current	Maximum	I <sub>Leak</sub>	1 μA	I <sub>F</sub> = 0 mA (N.O.) I <sub>F</sub> = 5 mA (N.C.) V <sub>L</sub> = Max.
	Transfer characteristics	Operate time*	Typical	T <sub>on</sub> (N.O.)	0.8 ms (N.O.) 1.2 ms (N.C.)
Maximum			T <sub>off</sub> (N.C.)	2 ms	
Reverse time*		Typical	T <sub>off</sub> (N.O.)	0.04 ms (N.O.) 0.36 ms (N.C.)	I <sub>F</sub> = 5 mA → 0 mA I <sub>L</sub> = Max.
		Maximum	T <sub>on</sub> (N.C.)	1 ms	
I/O capacitance		Typical	C <sub>iso</sub>	0.8 pF	f = 1 MHz
		Maximum		1.5 pF	V <sub>B</sub> = 0 V
Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	1,000 MΩ	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 <sub>F</sub>	5	mA

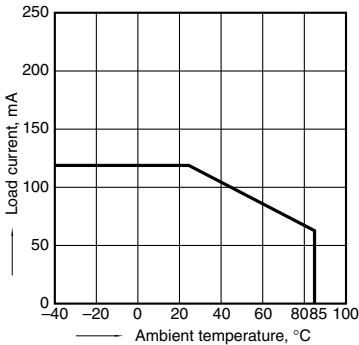
■ These products are not designed for automotive use.  
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

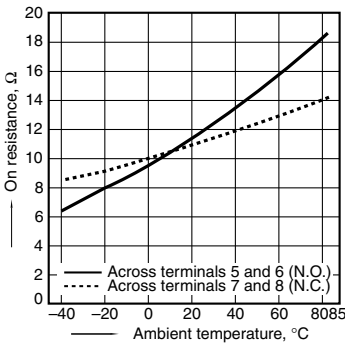
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F

When using 2 channels



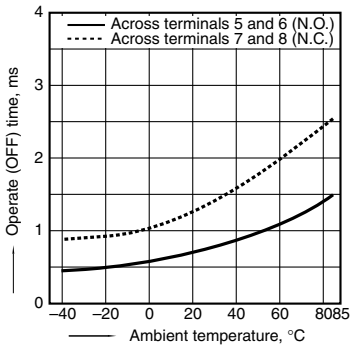
2. On resistance vs. ambient temperature characteristics

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

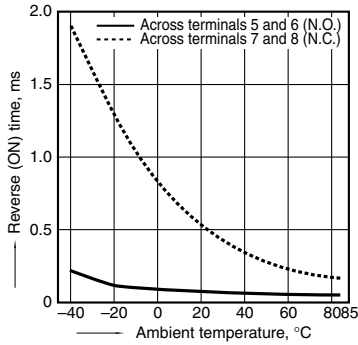
LED current: 5 mA; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)





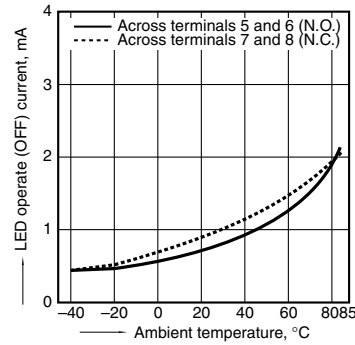
#### 4. Reverse time vs. ambient temperature characteristics

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



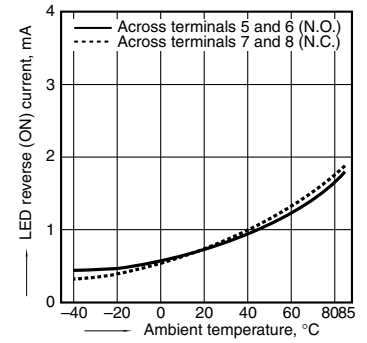
#### 5. LED operate current vs. ambient temperature characteristics

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



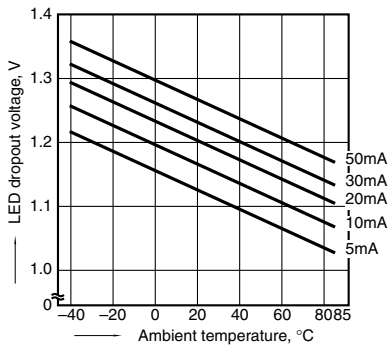
#### 6. LED reverse current vs. ambient temperature characteristics

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



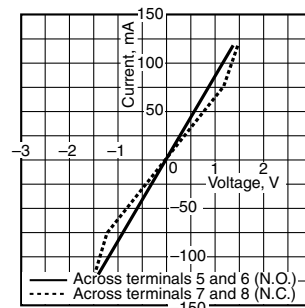
#### 7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



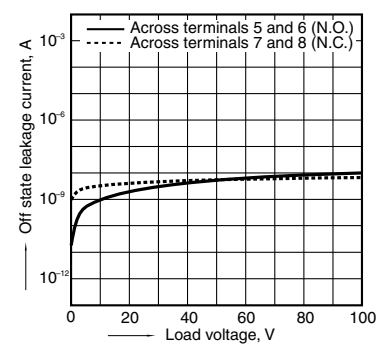
#### 8. Current vs. voltage characteristics of output at MOS portion

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



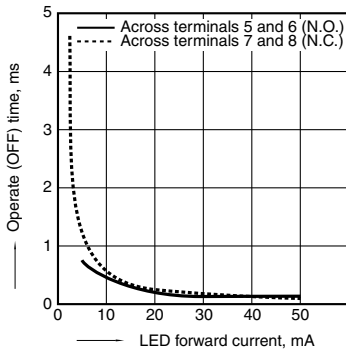
#### 9. Off state leakage current vs. load voltage characteristics

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



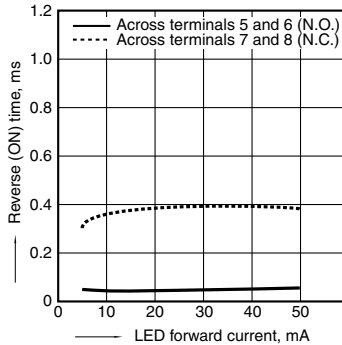
#### 10. Operate time vs. LED forward current characteristics

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

