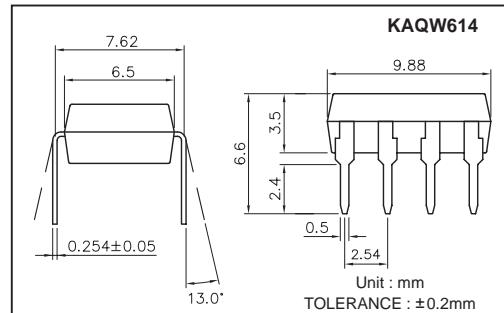


## Features

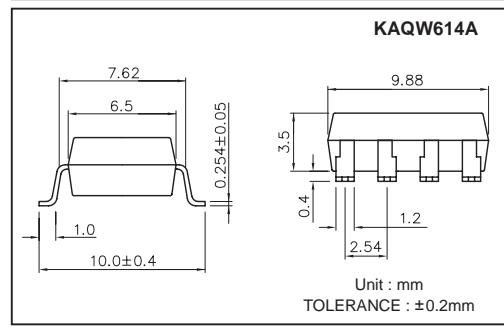
1. Normally Open and Close, Single Pole Single Throw
2. Control 400VAC or DC Voltage
3. Switch 130mA Loads
4. LED control Current, 5mA
5. Low ON-Resistance
6. dv/dt, >500V/ms
7. Isolation Test Voltage, 3750VACrms



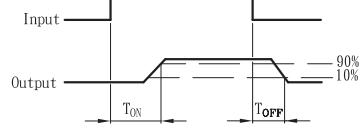
## Absolute Maximum Ratings

(Ta=25°C)

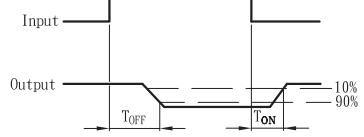
Emitter ( Input )	
Reverse Voltage	5.0V
Continuous Forward Current	50mA
Peak Forward Current	1A
Power Dissipation	100mW
Derate Linearly from 25°C	1.3mW/°C
Detector ( Output )	
Output Breakdown Voltage	±400V
Continuous Load Current	±130mA
Power Dissipation	500mW
General Characteristics	
Isolation Test Voltage	3750VACrms
Isolation Resistance Vio=500V, Ta=25°C	$\geq 10^{10} \Omega$
Total Power Dissipation	550mW
Derate Linearly from 25°C	2.5mW/°C
Storage Temperature Range	-40°C to +125°C
Operating Temperature Range	-30°C to +85°C
Junction Temperature	100°C
Soldering Temperature, 2mm from case, 10 sec	260°C



### Turn on/ Turn off time Normally Open



### Operate/ Reverse time Normally Close



## Electro-optical Characteristics

(Ta=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Emitter (Input)						
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10mA		1.2	1.5	V
Operation Input Current	I <sub>FOR(N.O)</sub> I <sub>FOR(N.C)</sub>	V <sub>L</sub> = ±20V, I <sub>L</sub> = 100mA (N.O) V <sub>L</sub> = ±20V, I <sub>L</sub> ≤ 5μA (N.C) t = 10mS			5	mA
Recovery Input Current	I <sub>FOR(N.O)</sub> I <sub>FOR(N.C)</sub>	V <sub>L</sub> = ±20V, I <sub>L</sub> ≤ 5μA (N.O) V <sub>L</sub> = ±20V, I <sub>L</sub> = 100mA (N.C) t = 10mS	0.2			mA

Detector (Output) normally open						
Output Breakdown Voltage	V <sub>B</sub>	I <sub>B</sub> = 50μA	400			V
Output Off-State Leakage	I <sub>TOFF</sub>	V <sub>T</sub> = 100V, I <sub>F</sub> = 0mA		0.2	1	uA
I/O Capacitance	C <sub>I/O</sub>	I <sub>F</sub> = 0, f = 1MHz		6		pF
ON Resistance	R <sub>ON</sub>	I <sub>L</sub> = 100mA, I <sub>F</sub> = 10mA		20	30	Ω
Turn-On Time	T <sub>ON</sub>	I <sub>F</sub> = 10mA, V <sub>L</sub> = ±20V		0.3	1.0	ms
Turn-Off Time	T <sub>OFF</sub>	t = 10ms, I <sub>L</sub> = ±100mA		0.7	1.5	ms

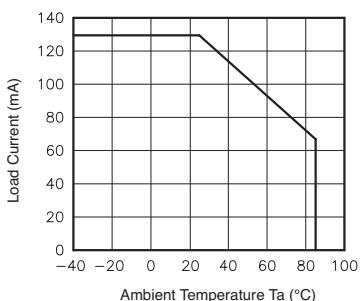
Detector (Output) normally close						
Output Breakdown Voltage	V <sub>B</sub>	I <sub>B</sub> = 50μA	400			V
Output Off-State Leakage	I <sub>TOFF</sub>	V <sub>T</sub> = 100V, I <sub>F</sub> = 0mA		0.2	2	uA
I/O Capacitance	C <sub>I/O</sub>	I <sub>F</sub> = 0, f = 1MHz		6		pF
ON Resistance	R <sub>ON</sub>	I <sub>L</sub> = 100mA, I <sub>F</sub> = 10mA		40	50	Ω
Reverse (ON) Time	T <sub>ON</sub>	I <sub>F</sub> = 10mA, V <sub>L</sub> = ±20V		0.6	1.5	ms
Operate (OFF) Time	T <sub>OFF</sub>	t = 10ms, I <sub>L</sub> = ±100mA		0.3	1.0	ms

## Mos Relay Schematic and Wiring Diagrams

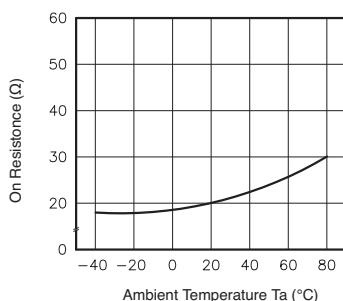
Type	Schematic	Output configuration	Load	Connection	Wiring Diagrams
KAQW614 & KAQW614A		1a1b	AC/DC	-	<p>(1) Two independent 1 Form A &amp; 1 Form B use</p> <p>(2) 1 Form A &amp; 1 Form B use</p>

## Data Curve (KAQW614/614A Normally Open Characteristics)

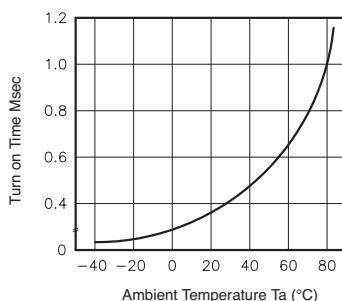
**Fig.1** Load current vs. ambient temperature  
Allowable ambient temperature:  
-40°C to +85°C



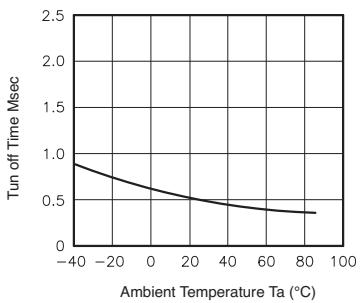
**Fig.2** On resistance vs. ambient temperature  
Across terminals 5 and 6 pinLED  
current: 5mA Continuous load  
current: 130mA(DC)



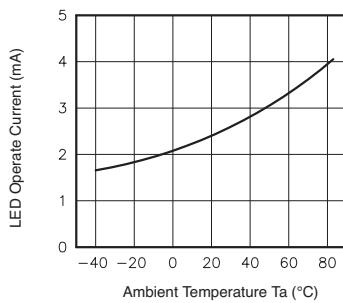
**Fig.3** Turn on time vs. ambient temperature  
Load voltage 400V(DC)  
LED current: 5mA  
Continuous load current: 130mA(DC)



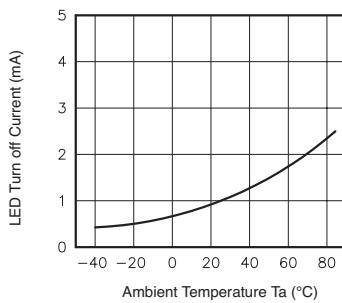
**Fig.4** Turn off time vs. ambient temperature  
LED current: 5mA; Load voltage:  
400V(DC)  
Continuous load current: 130mA(DC)



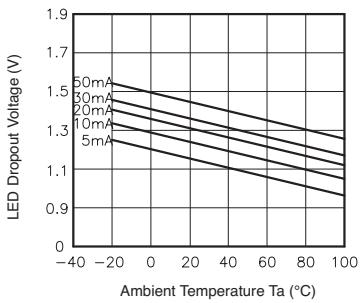
**Fig.5** LED operate vs. ambient temperature  
Load voltage 400V(DC)  
Continuous load current: 130mA(DC)



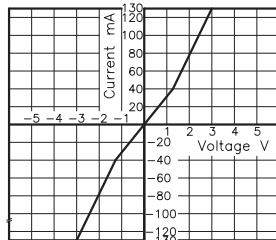
**Fig.6** LED turn off current vs. ambient temperature  
Load voltage 400V(DC)  
Continuous load current: 130mA(DC)



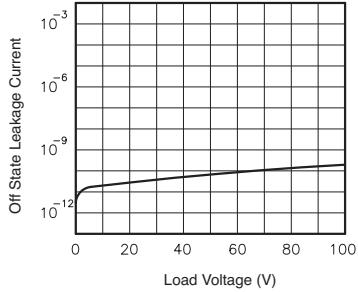
**Fig.7** LED dropout voltage vs. ambient temperature  
LED current: 5 to 50mA



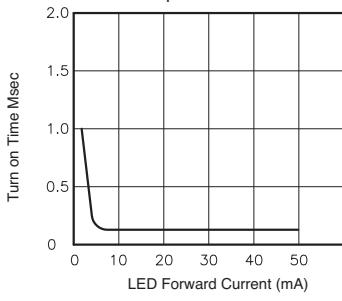
**Fig.8** Voltage vs. current characteristics of output at MOS FET portion  
Measured portion: across terminals 5  
and 6 pin  
Ambient temperature: 25°C



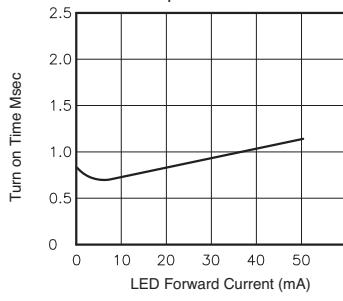
**Fig.9** Off state leakage current  
Across terminals 5 and 6 pin  
Ambient temperature: 25°C



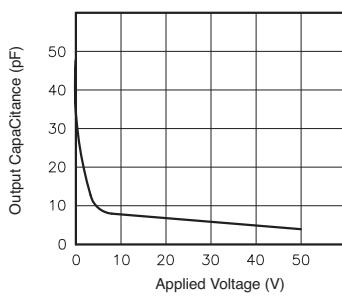
**Fig.10** LED forward current vs. turn on time  
Across terminals 5 and 6 pin;  
Load voltage: 400V (DC);  
Continuous load current: 130mA (DC);  
Ambient temperature: 25°C



**Fig.11** LED forward current vs. turn off time  
Across terminals 5 and 6 pin;  
Load voltage: 400V (DC);  
Continuous load current: 130mA (DC);  
Ambient temperature: 25°C



**Fig.12** Applied voltage vs. output capacitance  
Across terminals 5 and 6 pin  
Frequency: 1MHz  
Ambient temperature: 25°C



## Data Curve (KAQW614/614A Normally Close Characteristics)

<p><b>Fig.1</b> Load current vs. ambient temperature Allowable ambient temperature: -40°C to +85°C</p> <table border="1"> <thead> <tr> <th>Ambient Temperature Ta (°C)</th> <th>Load Current (mA)</th> </tr> </thead> <tbody> <tr><td>-40</td><td>130</td></tr> <tr><td>0</td><td>130</td></tr> <tr><td>25</td><td>130</td></tr> <tr><td>40</td><td>100</td></tr> <tr><td>60</td><td>70</td></tr> <tr><td>80</td><td>65</td></tr> <tr><td>85</td><td>65</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	Load Current (mA)	-40	130	0	130	25	130	40	100	60	70	80	65	85	65	<p><b>Fig.2</b> On resistance vs. ambient temperature Across terminals 7 and 8 pin LED current: 0mA      Continuous load current: 130mA(DC)</p> <table border="1"> <thead> <tr> <th>Ambient Temperature Ta (°C)</th> <th>On Resistance (Ω)</th> </tr> </thead> <tbody> <tr><td>-40</td><td>25</td></tr> <tr><td>0</td><td>25</td></tr> <tr><td>20</td><td>35</td></tr> <tr><td>40</td><td>45</td></tr> <tr><td>60</td><td>55</td></tr> <tr><td>80</td><td>55</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	On Resistance (Ω)	-40	25	0	25	20	35	40	45	60	55	80	55	<p><b>Fig.3</b> Operate (OFF) time vs. ambient temperature Load voltage 400V(DC) LED current: 5mA Continuous load current: 130mA(DC)</p> <table border="1"> <thead> <tr> <th>Ambient Temperature Ta (°C)</th> <th>Operate (OFF) Time Msec</th> </tr> </thead> <tbody> <tr><td>-40</td><td>0.1</td></tr> <tr><td>0</td><td>0.15</td></tr> <tr><td>20</td><td>0.25</td></tr> <tr><td>40</td><td>0.4</td></tr> <tr><td>60</td><td>0.7</td></tr> <tr><td>80</td><td>1.2</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	Operate (OFF) Time Msec	-40	0.1	0	0.15	20	0.25	40	0.4	60	0.7	80	1.2																																				
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<p><b>Fig.10</b> LED forward current vs. turn on time Across terminals 7 and 8 pin; Load voltage: 400V (DC); Continuous load current: 130mA (DC); Ambient temperature: 25°C</p> <table border="1"> <thead> <tr> <th>LED Forward Current (mA)</th> <th>Operate (OFF) Time Msec</th> </tr> </thead> <tbody> <tr><td>0</td><td>1.5</td></tr> <tr><td>2</td><td>0.8</td></tr> <tr><td>5</td><td>0.5</td></tr> <tr><td>10</td><td>0.2</td></tr> <tr><td>20</td><td>0.1</td></tr> <tr><td>30</td><td>0.05</td></tr> <tr><td>40</td><td>0.03</td></tr> <tr><td>50</td><td>0.02</td></tr> </tbody> </table>	LED Forward Current (mA)	Operate (OFF) Time Msec	0	1.5	2	0.8	5	0.5	10	0.2	20	0.1	30	0.05	40	0.03	50	0.02	<p><b>Fig.11</b> LED forward current vs. reverse (ON) time Across terminals 7 and 8 pin; Load voltage: 400V (DC); Continuous load current: 130mA (DC); Ambient temperature: 25°C</p> <table border="1"> <thead> <tr> <th>LED Forward Current (mA)</th> <th>Reverse (ON) Time Msec</th> </tr> </thead> <tbody> <tr><td>0</td><td>0.3</td></tr> <tr><td>10</td><td>0.4</td></tr> <tr><td>20</td><td>0.5</td></tr> <tr><td>30</td><td>0.55</td></tr> <tr><td>40</td><td>0.58</td></tr> <tr><td>50</td><td>0.6</td></tr> </tbody> </table>	LED Forward Current (mA)	Reverse (ON) Time Msec	0	0.3	10	0.4	20	0.5	30	0.55	40	0.58	50	0.6	<p><b>Fig.12</b> Applied voltage vs. output capacitance Across terminals 7 and 8 pin Frequency: 1MHz Ambient temperature: 25°C</p> <table border="1"> <thead> <tr> <th>Applied Voltage (V)</th> <th>Output Capacitance (pF)</th> </tr> </thead> <tbody> <tr><td>0</td><td>50</td></tr> <tr><td>5</td><td>30</td></tr> <tr><td>10</td><td>20</td></tr> <tr><td>20</td><td>15</td></tr> <tr><td>30</td><td>12</td></tr> <tr><td>40</td><td>10</td></tr> <tr><td>50</td><td>8</td></tr> </tbody> </table>	Applied Voltage (V)	Output Capacitance (pF)	0	50	5	30	10	20	20	15	30	12	40	10	50	8																																
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