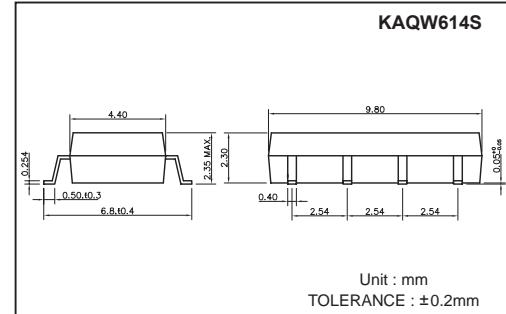


Features

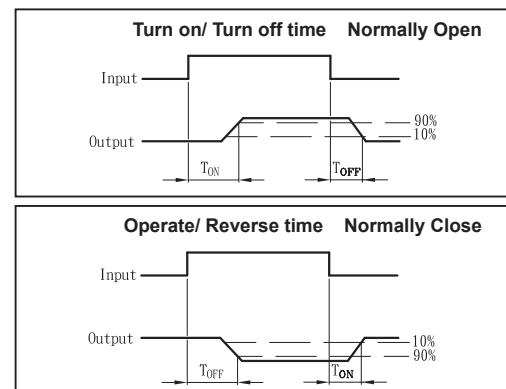
1. Normally Open and Close, Single Pole Single Throw
2. Control 400VAC or DC Voltage
3. Switch 130mA Loads
4. LED control Current, 5mA
5. Low ON-Resistance
6. dv/dt, >500V/ms
7. Isolation Test Voltage, 1500VACrms



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	1500VACrms
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



Electro-optical Characteristics

(Ta=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Emitter (Input)						
Forward Voltage	V _F	I _F =10mA		1.8	2.0	V
Operation Input Current	I _{FOR(N.O)} I _{FOR(N.C)}	V _L =±20V, I _L =100mA (N.O) V _L =±20V, I _L ≤5μA (N.C) t=10mS			5	mA
Recovery Input Current	I _{FOR(N.O)} I _{FOR(N.C)}	V _L =±20V, I _L ≤5μA (N.O) V _L =±20V, I _L =100mA (N.C) t=10mS	0.2			mA

Detector (Output) normally open						
Output Breakdown Voltage	V _B	I _B =50μA	400			V
Output Off-State Leakage	I _{TOFF}	V _T =100V, I _F =0mA		0.2	1	uA
I/O Capacitance	C _{IISO}	I _F =0, f=1MHz		6		pF
ON Resistance	R _{ON}	I _L =100mA, I _F =10mA		20	30	Ω
Turn-On Time	T _{ON}	I _F =10mA, V _L =±20V		0.3	1.0	ms
Turn-Off Time	T _{OFF}	t=10ms, I _L =±100mA		0.7	1.5	ms

Detector (Output) normally close						
Output Breakdown Voltage	V _B	I _B =50μA	400			V
Output Off-State Leakage	I _{TOFF}	V _T =100V, I _F =0mA		0.2	2	uA
I/O Capacitance	C _{IISO}	I _F =0, f=1MHz		6		pF
ON Resistance	R _{ON}	I _L =100mA, I _F =10mA		40	50	Ω
Reverse (ON) Time	T _{ON}	I _F =10mA, V _L =±20V		0.6	1.5	ms
Operate (OFF) Time	T _{OFF}	t=10ms, I _L =±100mA		0.3	1.0	ms

Mos Relay Schematic and Wiring Diagrams

Type	Schematic	Output configuration	Load	Connection	Wiring Diagrams
KAQW614S		1a1b	AC/DC	-	<p>(1) Two independent 1 Form A & 1 Form B use</p> <p>(2) 1 Form A & 1 Form B use</p>

Data Curve (KAQW614S Normally Open Characteristics)

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

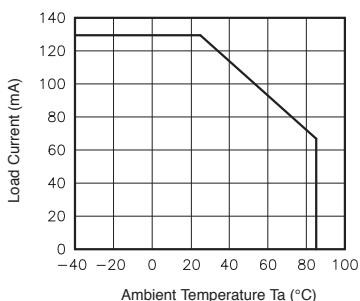


Fig.2 On resistance vs. ambient temperature
Across terminals 5 and 6 pin
LED current: 5mA
Continuous load current: 130mA(DC)

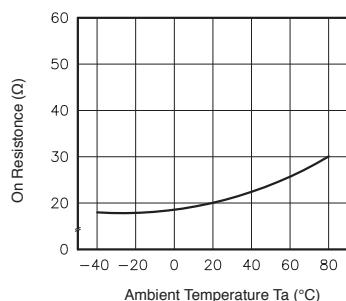


Fig.3 Turn on time vs. ambient temperature
Load voltage 400V(DC)
LED current: 5mA
Continuous load current: 130mA(DC)

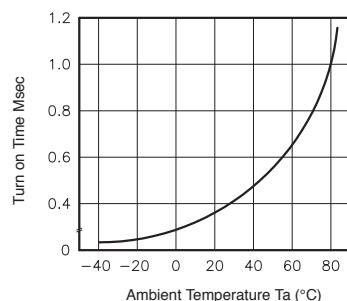


Fig.4 Turn off time vs. ambient temperature
LED current: 5mA; Load voltage:
400V(DC)
Continuous load current: 130mA(DC)

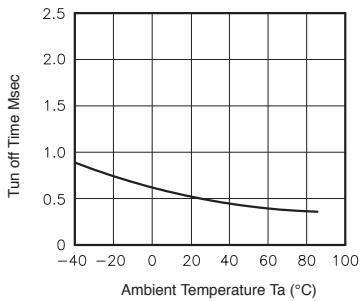


Fig.5 LED operate vs. ambient temperature
Load voltage 400V(DC)
Continuous load current: 130mA(DC)

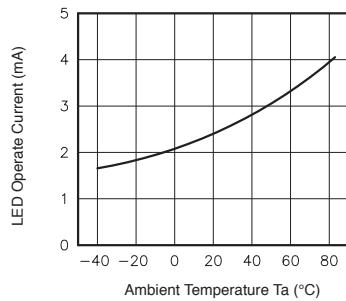


Fig.6 LED turn off current vs. ambient temperature
Load voltage 400V(DC)
Continuous load current: 130mA(DC)

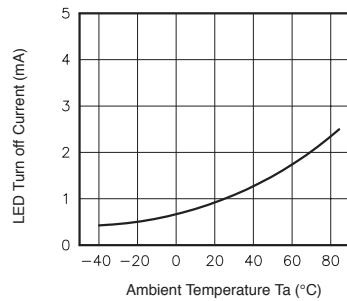


Fig.7 LED dropout voltage vs. ambient temperature
LED current: 5 to 50mA

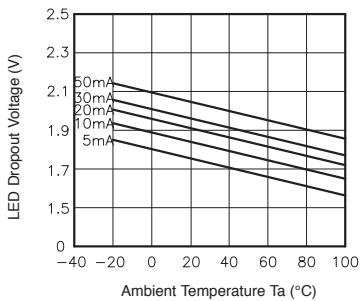


Fig.8 Voltage vs. current characteristics of output at MOS FET portion
Measured portion: across terminals 5 and 6 pin
Ambient temperature: 25°C

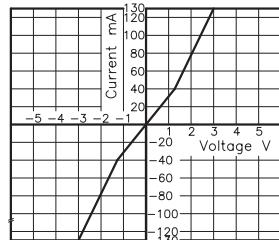


Fig.9 Off state leakage current
Across terminals 5 and 6 pin
Ambient temperature: 25°C

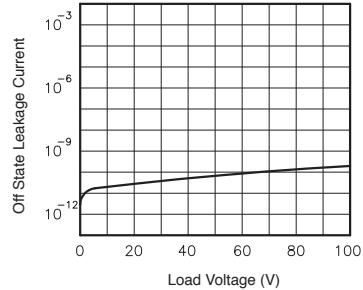


Fig.10 LED forward current vs. turn on time
Across terminals 5 and 6 pin;
Load voltage: 400V (DC);
Continuous load current: 130mA (DC);
Ambient temperature: 25°C

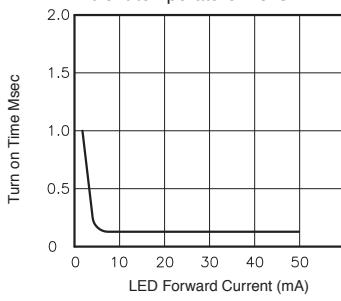


Fig.11 LED forward current vs. turn off time
Across terminals 5 and 6 pin;
Load voltage: 400V (DC);
Continuous load current: 130mA (DC);
Ambient temperature: 25°C

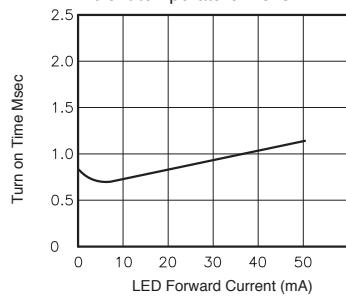
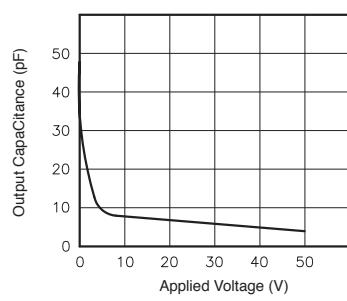


Fig.12 Applied voltage vs. output capacitance
Across terminals 5 and 6 pin
Frequency: 1MHz
Ambient temperature: 25°C



Data Curve (KAQW614S Normally Close Characteristics)

<p>Fig.1 Load current vs. ambient temperature Allowable ambient temperature: -40°C to +85°C</p> <table border="1"> <caption>Data for Fig.1: Load current vs. ambient temperature</caption> <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>20</td><td>130</td></tr> <tr><td>40</td><td>120</td></tr> <tr><td>60</td><td>100</td></tr> <tr><td>80</td><td>65</td></tr> <tr><td>85</td><td>60</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	Load Current (mA)	-40	130	0	130	20	130	40	120	60	100	80	65	85	60	<p>Fig.2 On resistance vs. ambient temperature Across terminals 7 and 8 pin LED current: 5mA Continuous load current: 130mA(DC)</p> <table border="1"> <caption>Data for Fig.2: On resistance vs. ambient temperature</caption> <thead> <tr> <th>Ambient Temperature Ta (°C)</th> <th>On Resistance (Ω)</th> </tr> </thead> <tbody> <tr><td>-40</td><td>28</td></tr> <tr><td>0</td><td>28</td></tr> <tr><td>20</td><td>32</td></tr> <tr><td>40</td><td>38</td></tr> <tr><td>60</td><td>45</td></tr> <tr><td>80</td><td>55</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	On Resistance (Ω)	-40	28	0	28	20	32	40	38	60	45	80	55	<p>Fig.3 Operate (OFF) time vs. ambient temperature Load voltage 400V(DC) LED current: 5mA Continuous load current: 130mA(DC)</p> <table border="1"> <caption>Data for Fig.3: Operate (OFF) time vs. ambient temperature</caption> <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>0.1</td></tr> <tr><td>20</td><td>0.2</td></tr> <tr><td>40</td><td>0.4</td></tr> <tr><td>60</td><td>0.8</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	0.1	20	0.2	40	0.4	60	0.8	80	1.2																																				
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<p>Fig.4 Reverse (ON) time vs. ambient temperature LED current: 5mA; Load voltage: 400V(DC) Continuous load current: 130mA(DC)</p> <table border="1"> <caption>Data for Fig.4: Reverse (ON) time vs. ambient temperature</caption> <thead> <tr> <th>Ambient Temperature Ta (°C)</th> <th>Reverse (ON) Time Msec</th> </tr> </thead> <tbody> <tr><td>-40</td><td>1.4</td></tr> <tr><td>0</td><td>0.8</td></tr> <tr><td>20</td><td>0.5</td></tr> <tr><td>40</td><td>0.3</td></tr> <tr><td>60</td><td>0.2</td></tr> <tr><td>80</td><td>0.1</td></tr> <tr><td>85</td><td>0.05</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	Reverse (ON) Time Msec	-40	1.4	0	0.8	20	0.5	40	0.3	60	0.2	80	0.1	85	0.05	<p>Fig.5 LED operate (ON) vs. ambient temperature Load voltage 400V(DC) Continuous load current: 130mA(DC)</p> <table border="1"> <caption>Data for Fig.5: LED operate (ON) vs. ambient temperature</caption> <thead> <tr> <th>Ambient Temperature Ta (°C)</th> <th>LED Operate Current (mA)</th> </tr> </thead> <tbody> <tr><td>-40</td><td>1.5</td></tr> <tr><td>0</td><td>1.8</td></tr> <tr><td>20</td><td>2.2</td></tr> <tr><td>40</td><td>2.6</td></tr> <tr><td>60</td><td>3.0</td></tr> <tr><td>80</td><td>3.5</td></tr> <tr><td>85</td><td>4.0</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	LED Operate Current (mA)	-40	1.5	0	1.8	20	2.2	40	2.6	60	3.0	80	3.5	85	4.0	<p>Fig.6 LED Reverse (ON) current vs. ambient temperature Load voltage 400V(DC) Continuous load current: 130mA(DC)</p> <table border="1"> <caption>Data for Fig.6: LED Reverse (ON) current vs. ambient temperature</caption> <thead> <tr> <th>Ambient Temperature Ta (°C)</th> <th>LED Reverse (ON) Current (mA)</th> </tr> </thead> <tbody> <tr><td>-40</td><td>0.5</td></tr> <tr><td>0</td><td>0.8</td></tr> <tr><td>20</td><td>1.2</td></tr> <tr><td>40</td><td>1.6</td></tr> <tr><td>60</td><td>2.0</td></tr> <tr><td>80</td><td>2.5</td></tr> <tr><td>85</td><td>3.0</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	LED Reverse (ON) Current (mA)	-40	0.5	0	0.8	20	1.2	40	1.6	60	2.0	80	2.5	85	3.0																																
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<p>Fig.7 LED dropout voltage vs. ambient temperature LED current: 5 to 50mA</p> <table border="1"> <caption>Data for Fig.7: LED dropout voltage vs. ambient temperature</caption> <thead> <tr> <th>Ambient Temperature Ta (°C)</th> <th>5mA</th> <th>10mA</th> <th>20mA</th> <th>30mA</th> <th>50mA</th> </tr> </thead> <tbody> <tr><td>-40</td><td>2.1</td><td>2.1</td><td>2.1</td><td>2.1</td><td>2.1</td></tr> <tr><td>0</td><td>1.9</td><td>1.9</td><td>1.9</td><td>1.9</td><td>1.9</td></tr> <tr><td>20</td><td>1.7</td><td>1.7</td><td>1.7</td><td>1.7</td><td>1.7</td></tr> <tr><td>40</td><td>1.5</td><td>1.5</td><td>1.5</td><td>1.5</td><td>1.5</td></tr> <tr><td>60</td><td>1.4</td><td>1.4</td><td>1.4</td><td>1.4</td><td>1.4</td></tr> <tr><td>80</td><td>1.3</td><td>1.3</td><td>1.3</td><td>1.3</td><td>1.3</td></tr> <tr><td>85</td><td>1.2</td><td>1.2</td><td>1.2</td><td>1.2</td><td>1.2</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	5mA	10mA	20mA	30mA	50mA	-40	2.1	2.1	2.1	2.1	2.1	0	1.9	1.9	1.9	1.9	1.9	20	1.7	1.7	1.7	1.7	1.7	40	1.5	1.5	1.5	1.5	1.5	60	1.4	1.4	1.4	1.4	1.4	80	1.3	1.3	1.3	1.3	1.3	85	1.2	1.2	1.2	1.2	1.2	<p>Fig.8 Voltage vs. current characteristics of output at MOS FET portion Measured portion: across terminals 7 and 8 pin Ambient temperature: 25°C</p> <table border="1"> <caption>Data for Fig.8: Voltage vs. current characteristics</caption> <thead> <tr> <th>Voltage (V)</th> <th>Current (mA)</th> </tr> </thead> <tbody> <tr><td>-5</td><td>-10</td></tr> <tr><td>-4</td><td>-20</td></tr> <tr><td>-3</td><td>-30</td></tr> <tr><td>-2</td><td>-40</td></tr> <tr><td>-1</td><td>-50</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>50</td></tr> <tr><td>2</td><td>40</td></tr> <tr><td>3</td><td>30</td></tr> <tr><td>4</td><td>20</td></tr> <tr><td>5</td><td>10</td></tr> </tbody> </table>	Voltage (V)	Current (mA)	-5	-10	-4	-20	-3	-30	-2	-40	-1	-50	0	0	1	50	2	40	3	30	4	20	5	10	<p>Fig.9 Off state leakage current Across terminals 7 and 8 pin Ambient temperature: 25°C</p> <table border="1"> <caption>Data for Fig.9: Off state leakage current</caption> <thead> <tr> <th>Load Voltage (V)</th> <th>Off State Leakage Current (A)</th> </tr> </thead> <tbody> <tr><td>0</td><td>10^-12</td></tr> <tr><td>10</td><td>10^-12</td></tr> <tr><td>100</td><td>10^-11</td></tr> </tbody> </table>	Load Voltage (V)	Off State Leakage Current (A)	0	10^-12	10	10^-12	100	10^-11
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LED Forward Current (mA)	Reverse (ON) Time Msec																																																																																	
5	0.2																																																																																	
10	0.3																																																																																	
20	0.4																																																																																	
30	0.5																																																																																	
40	0.55																																																																																	
50	0.6																																																																																	
Applied Voltage (V)	Output Capacitance (pF)																																																																																	
0	30																																																																																	
10	10																																																																																	
20	8																																																																																	
30	7																																																																																	
40	6																																																																																	
50	5																																																																																	