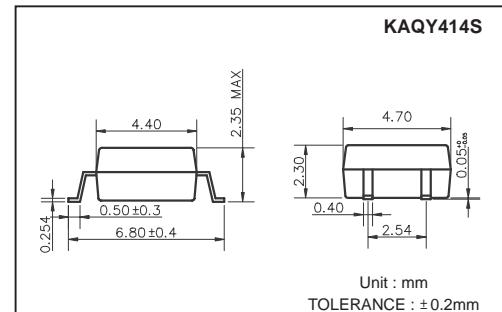


## Features

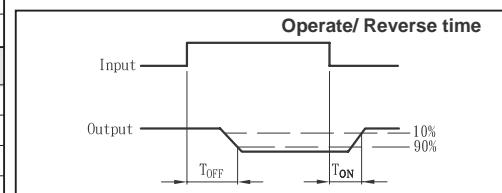
1. Normally Close, Single Pole Single Throw
2. Control 400VAC or DC Voltage
3. Switch 130mA Loads
4. LED control Current, 5mA
5. Low ON-Resistance
6. dv/dt, >500V/ms
7. Isolation Test Voltage, 1500VACrms



## Absolute Maximum Ratings

(Ta=25°C)

Emitter ( Input )	Detector ( Output )
Reverse Voltage	5.0V
Continuous Forward Current	50mA
Peak Forward Current	1A
Power Dissipation	100mW
Derate Linearly from 25°C	1.3mW/°C
General Characteristics	
Isolation Test Voltage	1500VACrms
Isolation Resistance	$\geq 10^{10}\Omega$
Vio=500V, Ta=25°C	
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

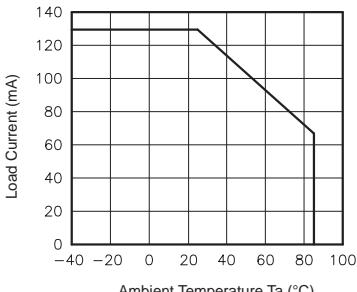
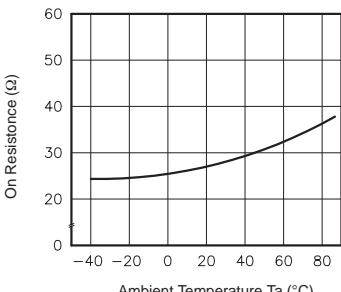
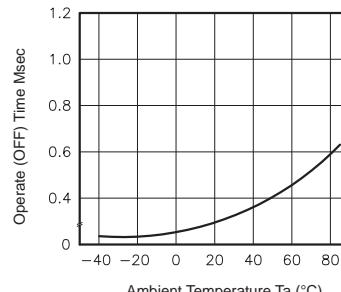
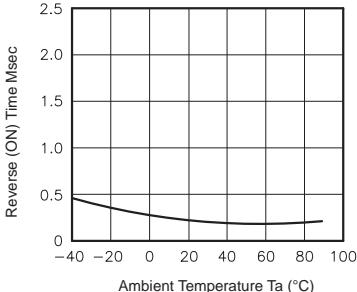
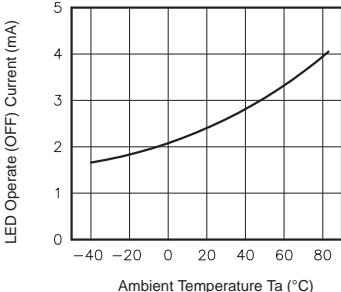
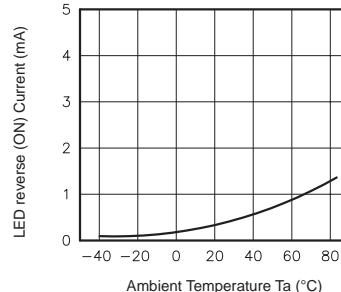
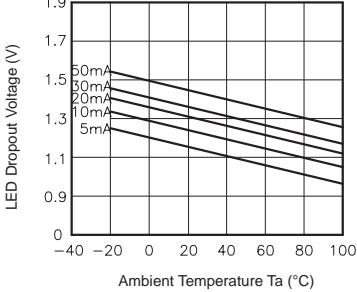
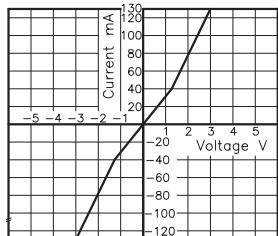
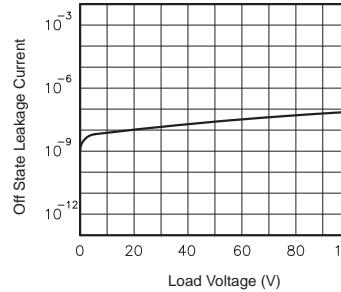
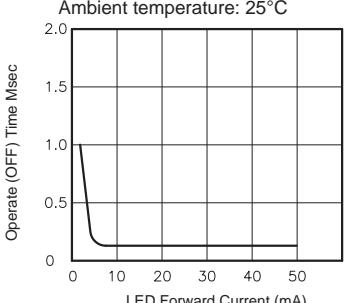
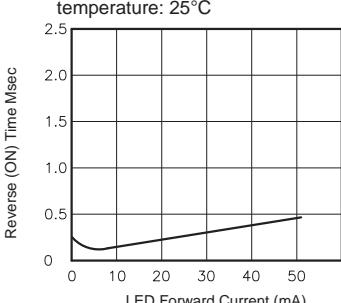
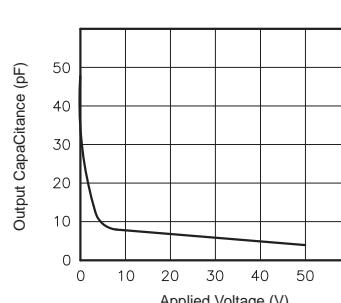
(Ta=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Emitter (Input)						
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =10mA		1.2	1.5	V
Operation Input Current	I <sub>FOFF</sub>	V <sub>L</sub> =±20V, I <sub>L</sub> ≤5uA			5	mA
Recovery Input Current	I <sub>FOR</sub>	V <sub>L</sub> =±20V, I <sub>L</sub> =100mA, t=10mS	0.2			mA
Detector (Output)						
Output Breakdown Voltage	V <sub>B</sub>	I <sub>B</sub> =50uA	400			V
Output Off-State Leakage	I <sub>TOFF</sub>	V <sub>T</sub> =100V, I <sub>F</sub> =10mA		0.2	2	uA
I/O Capacitance	C <sub>ISO</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
KAQY414S		1b	AC/DC	—	

## Data Curve

<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>20</td><td>130</td></tr> <tr><td>40</td><td>110</td></tr> <tr><td>60</td><td>90</td></tr> <tr><td>80</td><td>70</td></tr> <tr><td>85</td><td>68</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	Load Current (mA)	-40	130	0	130	20	130	40	110	60	90	80	70	85	68	<p><b>Fig.2</b> On resistance vs. ambient temperature Across terminals 3 and 4 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>28</td></tr> <tr><td>40</td><td>32</td></tr> <tr><td>60</td><td>36</td></tr> <tr><td>80</td><td>40</td></tr> <tr><td>85</td><td>42</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	On Resistance (Ω)	-40	25	0	25	20	28	40	32	60	36	80	40	85	42	<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>0.05</td></tr> <tr><td>0</td><td>0.05</td></tr> <tr><td>20</td><td>0.1</td></tr> <tr><td>40</td><td>0.2</td></tr> <tr><td>60</td><td>0.3</td></tr> <tr><td>80</td><td>0.5</td></tr> <tr><td>85</td><td>0.6</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	Operate (OFF) Time Msec	-40	0.05	0	0.05	20	0.1	40	0.2	60	0.3	80	0.5	85	0.6																																																																										
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<p><b>Fig.7</b> LED dropout voltage vs. ambient temperature LED current: 5 to 50mA</p>  <table border="1"> <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>1.55</td><td>1.45</td><td>1.35</td><td>1.25</td><td>1.15</td></tr> <tr><td>0</td><td>1.45</td><td>1.35</td><td>1.25</td><td>1.15</td><td>1.05</td></tr> <tr><td>20</td><td>1.35</td><td>1.25</td><td>1.15</td><td>1.05</td><td>0.95</td></tr> <tr><td>40</td><td>1.25</td><td>1.15</td><td>1.05</td><td>0.95</td><td>0.85</td></tr> <tr><td>60</td><td>1.15</td><td>1.05</td><td>0.95</td><td>0.85</td><td>0.75</td></tr> <tr><td>80</td><td>1.05</td><td>0.95</td><td>0.85</td><td>0.75</td><td>0.65</td></tr> <tr><td>85</td><td>1.02</td><td>0.92</td><td>0.82</td><td>0.72</td><td>0.62</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	5mA	10mA	20mA	30mA	50mA	-40	1.55	1.45	1.35	1.25	1.15	0	1.45	1.35	1.25	1.15	1.05	20	1.35	1.25	1.15	1.05	0.95	40	1.25	1.15	1.05	0.95	0.85	60	1.15	1.05	0.95	0.85	0.75	80	1.05	0.95	0.85	0.75	0.65	85	1.02	0.92	0.82	0.72	0.62	<p><b>Fig.8</b> Voltage vs. current characteristics of output at MOS FET portion Measured portion: across terminals 3 and 4 pin Ambient temperature: 25°C</p>  <table border="1"> <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>-8</td></tr> <tr><td>-3</td><td>-5</td></tr> <tr><td>-2</td><td>-2</td></tr> <tr><td>-1</td><td>0</td></tr> <tr><td>0</td><td>10</td></tr> <tr><td>1</td><td>20</td></tr> <tr><td>2</td><td>40</td></tr> <tr><td>3</td><td>60</td></tr> <tr><td>4</td><td>80</td></tr> <tr><td>5</td><td>100</td></tr> </tbody> </table>	Voltage (V)	Current (mA)	-5	-10	-4	-8	-3	-5	-2	-2	-1	0	0	10	1	20	2	40	3	60	4	80	5	100	<p><b>Fig.9</b> Off state leakage current Across terminals 3 and 4 pin Ambient temperature: 25°C</p>  <table border="1"> <thead> <tr> <th>Load Voltage (V)</th> <th>Off State Leakage Current (A)</th> </tr> </thead> <tbody> <tr><td>0</td><td>10^-9</td></tr> <tr><td>20</td><td>10^-8.5</td></tr> <tr><td>40</td><td>10^-8.2</td></tr> <tr><td>60</td><td>10^-8.0</td></tr> <tr><td>80</td><td>10^-7.8</td></tr> <tr><td>85</td><td>10^-7.7</td></tr> </tbody> </table>	Load Voltage (V)	Off State Leakage Current (A)	0	10^-9	20	10^-8.5	40	10^-8.2	60	10^-8.0	80	10^-7.8	85	10^-7.7																																				
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<p><b>Fig.10</b> LED forward current vs. operate (OFF) time Across terminals 3 and 4 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>1.0</td></tr> <tr><td>5</td><td>0.2</td></tr> <tr><td>10</td><td>0.1</td></tr> <tr><td>20</td><td>0.05</td></tr> <tr><td>30</td><td>0.03</td></tr> <tr><td>40</td><td>0.02</td></tr> <tr><td>50</td><td>0.01</td></tr> <tr><td>55</td><td>0.01</td></tr> <tr><td>60</td><td>0.01</td></tr> <tr><td>65</td><td>0.01</td></tr> <tr><td>70</td><td>0.01</td></tr> <tr><td>75</td><td>0.01</td></tr> <tr><td>80</td><td>0.01</td></tr> <tr><td>85</td><td>0.01</td></tr> <tr><td>88</td><td>0.01</td></tr> <tr><td>90</td><td>0.01</td></tr> <tr><td>92</td><td>0.01</td></tr> <tr><td>95</td><td>0.01</td></tr> <tr><td>98</td><td>0.01</td></tr> <tr><td>100</td><td>0.01</td></tr> </tbody> </table>	LED Forward Current (mA)	Operate (OFF) Time Msec	0	1.0	5	0.2	10	0.1	20	0.05	30	0.03	40	0.02	50	0.01	55	0.01	60	0.01	65	0.01	70	0.01	75	0.01	80	0.01	85	0.01	88	0.01	90	0.01	92	0.01	95	0.01	98	0.01	100	0.01	<p><b>Fig.11</b> LED forward current vs. reverse (ON) time Across terminals 3 and 4 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>0.1</td></tr> <tr><td>10</td><td>0.15</td></tr> <tr><td>20</td><td>0.2</td></tr> <tr><td>30</td><td>0.25</td></tr> <tr><td>40</td><td>0.3</td></tr> <tr><td>50</td><td>0.4</td></tr> <tr><td>55</td><td>0.45</td></tr> <tr><td>60</td><td>0.5</td></tr> <tr><td>65</td><td>0.55</td></tr> <tr><td>70</td><td>0.6</td></tr> <tr><td>75</td><td>0.65</td></tr> <tr><td>80</td><td>0.7</td></tr> <tr><td>85</td><td>0.75</td></tr> <tr><td>88</td><td>0.8</td></tr> <tr><td>90</td><td>0.85</td></tr> <tr><td>92</td><td>0.9</td></tr> <tr><td>95</td><td>0.95</td></tr> <tr><td>98</td><td>1.0</td></tr> <tr><td>100</td><td>1.0</td></tr> </tbody> </table>	LED Forward Current (mA)	Reverse (ON) Time Msec	0	0.1	10	0.15	20	0.2	30	0.25	40	0.3	50	0.4	55	0.45	60	0.5	65	0.55	70	0.6	75	0.65	80	0.7	85	0.75	88	0.8	90	0.85	92	0.9	95	0.95	98	1.0	100	1.0	<p><b>Fig.12</b> Applied voltage vs. output capacitance Across terminals 3 and 4 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>40</td></tr> <tr><td>10</td><td>30</td></tr> <tr><td>20</td><td>20</td></tr> <tr><td>30</td><td>15</td></tr> <tr><td>40</td><td>12</td></tr> <tr><td>50</td><td>10</td></tr> <tr><td>55</td><td>9</td></tr> <tr><td>60</td><td>8</td></tr> <tr><td>65</td><td>7</td></tr> <tr><td>70</td><td>6</td></tr> <tr><td>75</td><td>5.5</td></tr> <tr><td>80</td><td>5</td></tr> <tr><td>85</td><td>4.5</td></tr> <tr><td>90</td><td>4</td></tr> <tr><td>92</td><td>3.8</td></tr> <tr><td>95</td><td>3.5</td></tr> <tr><td>98</td><td>3.2</td></tr> <tr><td>100</td><td>3</td></tr> </tbody> </table>	Applied Voltage (V)	Output Capacitance (pF)	0	50	5	40	10	30	20	20	30	15	40	12	50	10	55	9	60	8	65	7	70	6	75	5.5	80	5	85	4.5	90	4	92	3.8	95	3.5	98	3.2	100	3
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