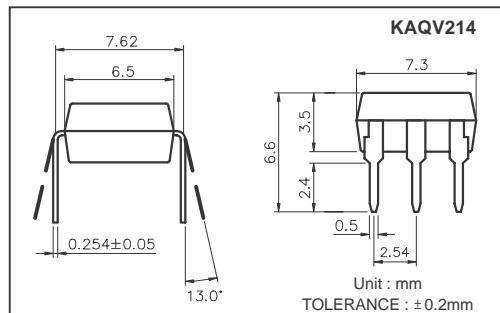


COSMO High Voltage, Solid State Relay-MOSFET Output KAQV214/214A

UL 1577/ UL 508 (File No.E108430), FI EN60950 (File No.FI13698)

Features

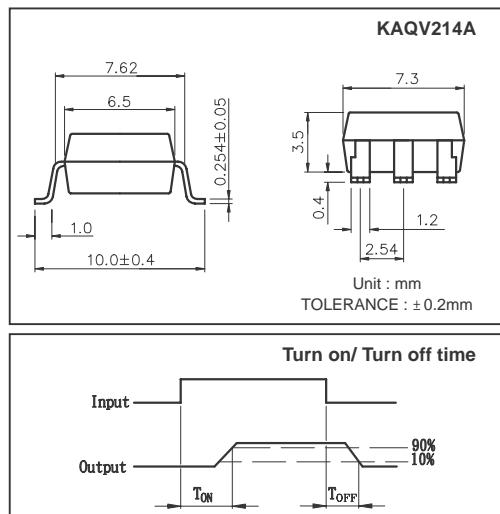
1. Normally Open, Single Pole Single Throw
2. Control 400VAC or DC Voltage
3. Switch 130mA Loads
4. LED control Current, 5mA
5. Low ON-Resistance
6. dv/dt, >500V/ms
7. Isolation Test Voltage, 3750VACrms



Absolute Maximum Ratings

(Ta=25°C)

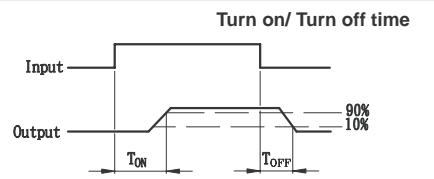
Emitter (Input)	Detector (Output)
Reverse Voltage.....5.0V	Output Breakdown Voltage±400V
Continuous Forward Current50mA	Continuous Load Current±130mA
Peak Forward Current1A	Power Dissipation500mW
Power Dissipation100mW	
Derate Linearly from 25°C1.3mW/°C	
General Characteristics	
Isolation Test Voltage3750VACrms	Storage Temperature Range ...-40°C to +125°C
Isolation Resistance	Operating Temperature Range...-30°C to +85°C
Vio=500V, Ta=25°C>10 ¹⁰ Ω	Junction Temperature.....100°C
Total Power Dissipation550mW	Soldering Temperature,
Derate Linearly from 25°C2.5mW/°C	2mm from case, 10 sec260°C



Electro-optical Characteristics

(Ta=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Emitter (Input)						
Forward Voltage	V _F	I _F =10mA		1.2	1.5	V
Operation Input Current	I _{IFON}	V _L =±20V, I _L =100mA, t=10mS			5	mA
Recovery Input Current	I _{IOFF}	V _L =±20V, I _L ≤5μA	0.2			mA
Detector (Output)						
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	μA
I/O Capacitance	C _{ISO}	I _F =0, f=1MHz	6			p F
ON Resistance	Connection	R _{ON}	I _L =100mA, I _F =10mA	20	30	Ω
				10	15	
				5	7.5	
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



Schematic and Wiring Diagrams

Type	Schematic	Output configuration	Load	Connection	Wiring Diagrams
KAQV214 & KAQV214A		1a	AC/DC	A	

Data Curve

<p>Fig.1 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>100</td></tr> <tr><td>60</td><td>80</td></tr> <tr><td>80</td><td>70</td></tr> <tr><td>85</td><td>65</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	Load Current (mA)	-40	130	0	130	20	130	40	100	60	80	80	70	85	65	<p>Fig.2 On resistance vs. ambient temperature Across terminals 4 and 6 pin LED current: 5mA 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>15</td></tr> <tr><td>0</td><td>15</td></tr> <tr><td>20</td><td>18</td></tr> <tr><td>40</td><td>22</td></tr> <tr><td>60</td><td>26</td></tr> <tr><td>80</td><td>30</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	On Resistance (Ω)	-40	15	0	15	20	18	40	22	60	26	80	30	<p>Fig.3 Turn on 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>Turn on 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)	Turn on 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.7 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>1.5</td><td>1.4</td><td>1.3</td><td>1.2</td><td>1.1</td></tr> <tr><td>0</td><td>1.4</td><td>1.3</td><td>1.2</td><td>1.1</td><td>1.0</td></tr> <tr><td>20</td><td>1.3</td><td>1.2</td><td>1.1</td><td>1.0</td><td>0.9</td></tr> <tr><td>40</td><td>1.2</td><td>1.1</td><td>1.0</td><td>0.9</td><td>0.8</td></tr> <tr><td>60</td><td>1.1</td><td>1.0</td><td>0.9</td><td>0.8</td><td>0.7</td></tr> <tr><td>80</td><td>1.0</td><td>0.9</td><td>0.8</td><td>0.7</td><td>0.6</td></tr> <tr><td>100</td><td>0.9</td><td>0.8</td><td>0.7</td><td>0.6</td><td>0.5</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	5mA	10mA	20mA	30mA	50mA	-40	1.5	1.4	1.3	1.2	1.1	0	1.4	1.3	1.2	1.1	1.0	20	1.3	1.2	1.1	1.0	0.9	40	1.2	1.1	1.0	0.9	0.8	60	1.1	1.0	0.9	0.8	0.7	80	1.0	0.9	0.8	0.7	0.6	100	0.9	0.8	0.7	0.6	0.5	<p>Fig.8 Voltage vs. current characteristics of output at MOS FET portion Measured portion: across terminals 4 and 6 pin Ambient temperature: 25°C</p> <table border="1"> <thead> <tr> <th>Voltage (V)</th> <th>Current (mA)</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>20</td></tr> <tr><td>2</td><td>60</td></tr> <tr><td>3</td><td>100</td></tr> <tr><td>4</td><td>130</td></tr> </tbody> </table>	Voltage (V)	Current (mA)	0	0	1	20	2	60	3	100	4	130	<p>Fig.9 Off state leakage current Across terminals 4 and 6 pin Ambient temperature: 25°C</p> <table border="1"> <thead> <tr> <th>Load Voltage (V)</th> <th>Off State Leakage Current (mA)</th> </tr> </thead> <tbody> <tr><td>0</td><td>1.5e-12</td></tr> <tr><td>10</td><td>1.5e-12</td></tr> <tr><td>100</td><td>1e-11</td></tr> </tbody> </table>	Load Voltage (V)	Off State Leakage Current (mA)	0	1.5e-12	10	1.5e-12	100	1e-11
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