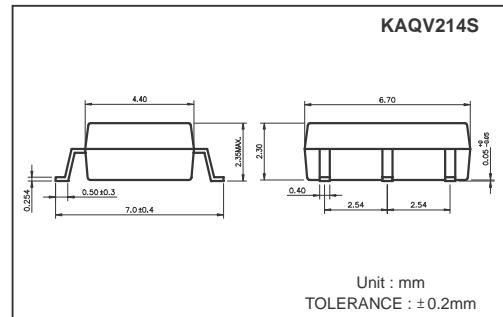


COSMO High Voltage, Solid State Relay-MOSFET Output KAQV214S

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

Features

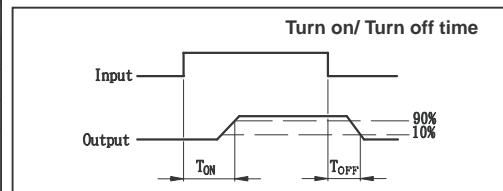
1. Normally Open, Single Pole Single Throw
2. Control 400VAC or DC Voltage
3. Switch 130mA Loads
4. LED control Current, 5mA
5. Low ON-Resistance
6. dv/dt, >500V/ms
7. Isolation Test Voltage, 1500VACrms



Absolute Maximum Ratings

(Ta=25°C)

Emitter (Input)	Detector (Output)
Reverse Voltage.....	5.0V
Continuous Forward Current	50mA
Peak Forward Current	1A
Power Dissipation	500mW
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	$\geq 10^{10} \Omega$
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	VF	IF=10mA		1.2	1.5	V		
Operation Input Current	IFON	VL =±20V, IL =100mA, t =10mS			5	mA		
Recovery Input Current	IFOFF	VL =±20V, IL ≤ 5μA	0.2			mA		
Detector (Output)								
Output Breakdown Voltage	VB	IB=50μA	400			V		
Output Off-State Leakage	IOFF	VT =100V, IF =0mA		0.2	1	uA		
I/O Capacitance	CISO	IF =0, f =1MHz		6		pF		
ON Resistance	Connection	RON	IL =100mA, IF =10mA	20	30	Ω		
				10	15			
				5	7.5			
Turn-On Time		TON	IF =10mA, VL =±20V		0.3	1.0	ms	
Turn-Off Time		TOFF	t =10ms, IL =±100mA		0.7	1.5	ms	

Schematic and Wiring Diagrams

Type	Schematic	Output configuration	Load	Connection	Wiring Diagrams
KAQV214S	 	1a	AC/DC	A	
			DC	B	
			DC	C	

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>18</td></tr> <tr><td>0</td><td>18</td></tr> <tr><td>20</td><td>20</td></tr> <tr><td>40</td><td>22</td></tr> <tr><td>60</td><td>25</td></tr> <tr><td>80</td><td>30</td></tr> </tbody> </table>	Ambient Temperature Ta (°C)	On Resistance (Ω)	-40	18	0	18	20	20	40	22	60	25	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>-1</td><td>-10</td></tr> <tr><td>-0.5</td><td>-5</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>0.5</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> <tr><td>6</td><td>120</td></tr> </tbody> </table>	Voltage (V)	Current (mA)	-1	-10	-0.5	-5	0	0	0.5	10	1	20	2	40	3	60	4	80	5	100	6	120	<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 (A)</th> </tr> </thead> <tbody> <tr><td>0</td><td>10^{-12}</td></tr> <tr><td>20</td><td>10^{-9}</td></tr> <tr><td>40</td><td>10^{-9}</td></tr> <tr><td>60</td><td>10^{-9}</td></tr> <tr><td>80</td><td>10^{-9}</td></tr> <tr><td>100</td><td>10^{-9}</td></tr> </tbody> </table>	Load Voltage (V)	Off State Leakage Current (A)	0	10^{-12}	20	10^{-9}	40	10^{-9}	60	10^{-9}	80	10^{-9}	100	10^{-9}
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