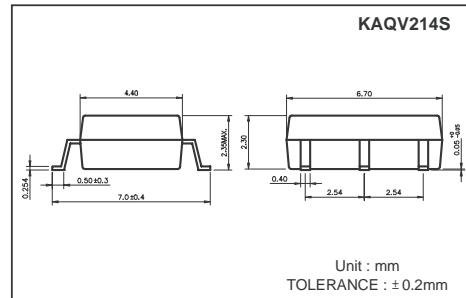


COSMO High Voltage, Solid State Relay-MOSFET Output KAQV214S

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

Features

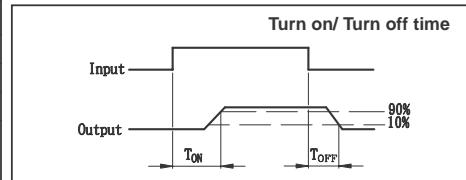
1. Normally Open, Single Pole Single Throw
2. Control 400VAC or DC Voltage
3. Switch 130mA Loads
4. LED control Current, 5mA
5. Low ON-Resistance
6. dv/dt, >500V/ms
7. Isolation Test Voltage, 1500VACrms



Absolute Maximum Ratings

(Ta=25°C)

Emitter (Input)	Detector (Output)
Reverse Voltage.....	5.0V
Continuous Forward Current	50mA
Peak Forward Current	1A
Power Dissipation	100mW
Derate Linearly from 25°C	1.3mW/°C
General Characteristics	
Isolation Test Voltage	1500VACrms
Isolation Resistance	Operating Temperature Range ...-40°C to +125°C
Vio=500V, Ta=25°C	≥10 ¹⁰ Ω
Total Power Dissipation	550mW
Derate Linearly from 25°C	2.5mW/°C
Storage Temperature Range ...-40°C to +125°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	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	<p>The schematic diagram shows the internal circuit of the KAQV214S. It consists of a driver stage with two N-channel MOSFETs (M1 and M2) and a load stage with an N-channel MOSFET (M3). The driver stage is controlled by an optoisolator (with photo-diode D1 and transistor Q1) and a resistor R1. The load stage is controlled by a resistor R2 and a diode D2. The output terminal is labeled 6.</p>	1a	AC/DC	A	<p>Wiring Diagram A shows the connection for an AC/DC load. The load is connected between terminals 6 and 5. The common terminal 4 is connected to ground. The power supply E1 is connected to terminals 1 and 2. The control signal is connected to terminal 3.</p>	
					<p>Wiring Diagram B shows the connection for an AC/DC load. The load is connected between terminals 6 and 5. The common terminal 4 is connected to ground. The power supply E1 is connected to terminals 1 and 2. The control signal is connected to terminal 3.</p>	
					<p>Wiring Diagram C shows the connection for an AC/DC load. The load is connected between terminals 6 and 5. The common terminal 4 is connected to ground. The power supply E1 is connected to terminals 1 and 2. The control signal is connected to terminal 3.</p>	
		DC	B		<p>Wiring Diagram A shows the connection for a DC load. The load is connected between terminals 6 and 5. The common terminal 4 is connected to ground. The power supply E1 is connected to terminals 1 and 2. The control signal is connected to terminal 3.</p>	
					<p>Wiring Diagram B shows the connection for a DC load. The load is connected between terminals 6 and 5. The common terminal 4 is connected to ground. The power supply E1 is connected to terminals 1 and 2. The control signal is connected to terminal 3.</p>	
					<p>Wiring Diagram C shows the connection for a DC load. The load is connected between terminals 6 and 5. The common terminal 4 is connected to ground. The power supply E1 is connected to terminals 1 and 2. The control signal is connected to terminal 3.</p>	

Data Curve

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

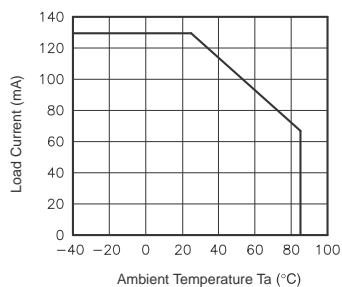


Fig.2 On resistance vs. ambient temperature
Across terminals 4 and 6 pin
LED current: 5mA
Continuous load current: 130mA(DC)

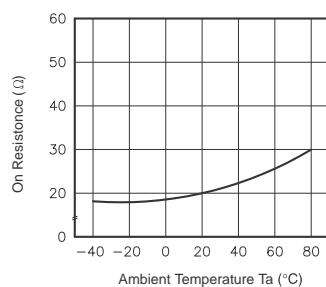


Fig.3 Turn on time vs. ambient temperature
Load voltage 400V(DC)
LED current: 5mA
Continuous load current: 130mA(DC)

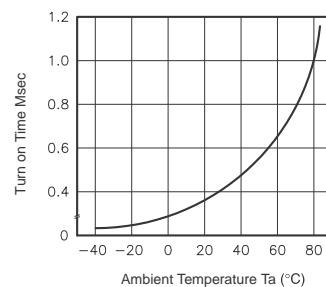


Fig.4 Turn off time vs. ambient temperature
LED current: 5mA; Load voltage:
400V(DC)
Continuous load current: 130mA(DC)

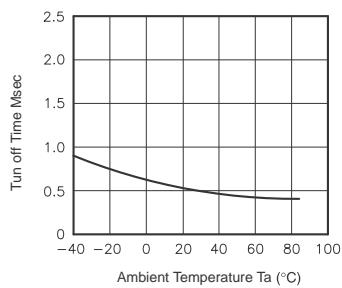


Fig.5 LED operate vs. ambient temperature
Load voltage 400V(DC)
Continuous load current: 130mA(DC)

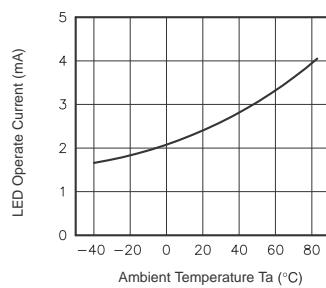


Fig.6 LED turn off current vs. ambient temperature
Load voltage 400V(DC)
Continuous load current: 130mA(DC)

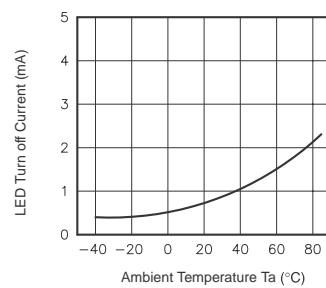


Fig.7 LED dropout voltage vs. ambient temperature
LED current: 5 to 50mA

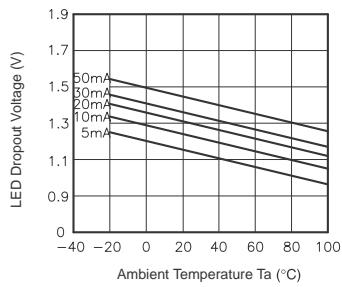


Fig.8 Voltage vs. current characteristics of output at MOS FET portion
Measured portion: across terminals 4 and 6 pin
Ambient temperature: 25°C

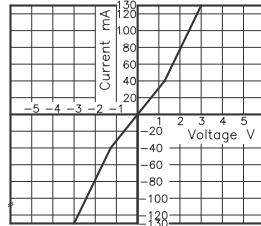


Fig.9 Off state leakage current
Across terminals 4 and 6 pin
Ambient temperature: 25°C

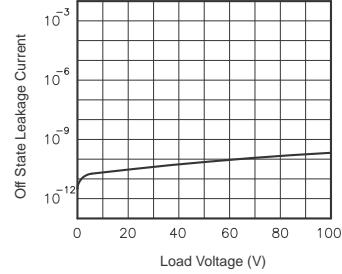


Fig.10 LED forward current vs. turn on time
Across terminals 4 and 6 pin;
Load voltage: 400V (DC);
Continuous load current: 130mA (DC);
Ambient temperature: 25°C

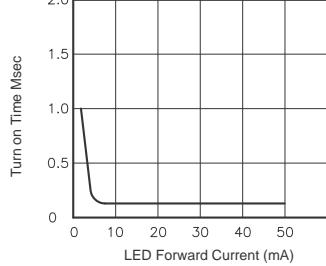


Fig.11 LED forward current vs. turn off time
Across terminals 4 and 6 pin;
Load voltage: 400V (DC);
Continuous load current: 130mA (DC);
Ambient temperature: 25°C

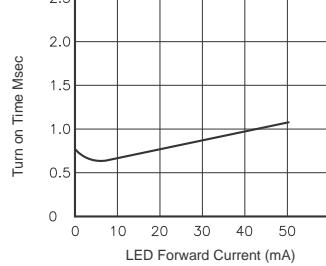


Fig.12 Applied voltage vs. output capacitance
Across terminals 4 and 6 pin
Frequency: 1MHz
Ambient temperature: 25°C

