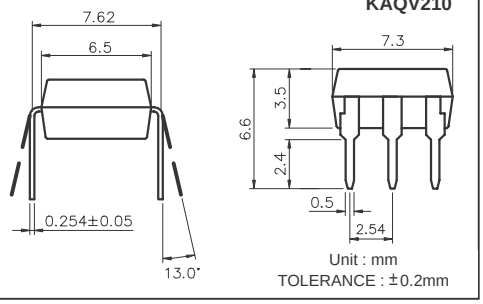
Solid State Relay-MOSFET Output KAQV210/210A

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

Features

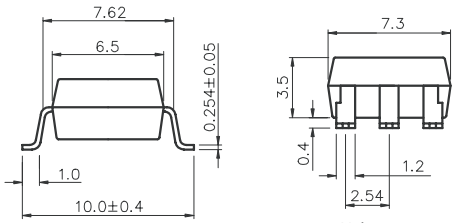
1. Normally Open, Single Pole Single Throw
2. Control 350VAC or DC Voltage
3. Switch 130mA Loads
4. LED control Current, 5mA
5. Low ON-Resistance
6. dv/dt, >500V/ms
7. Isolation Test Voltage, 3750VACrms

KAQV210



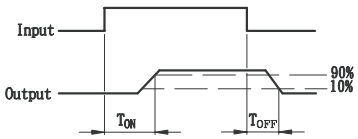
Unit : mm
TOLERANCE : ±0.2mm

KAQV210A



Unit : mm
TOLERANCE : ±0.2mm

Turn on/ Turn off time



Absolute Maximum Ratings

(Ta=25°C)

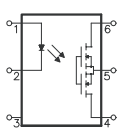
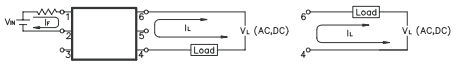
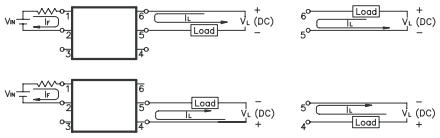
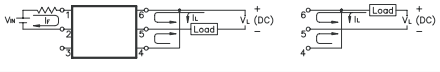
Emitter (Input)	Detector (Output)
Reverse Voltage……5.0V	Output Breakdown Voltage ……±350V
Continuous Forward Current ……50mA	Continuous Load Current ……±130mA
Peak Forward Current ……1A	Power Dissipation ……500mW
Power Dissipation ……100mW	
Derate Linearly from 25°C ……1.3mW/°C	
General Characteristics	
Isolation Test Voltage……3750VACrms	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 Dissipation ……550mW	Soldering Temperature,
Derate Linearly from 25°C ……2.5mW/°C	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		1.2	1.5	V
Operation Input Current			I_{FON}	V_L =±20V, I_L =100mA, t =10mS			5	mA
Recovery Input Current			I_{FOFF}	V_L =±20V, I_L ≤5uA	0.2			mA
Detector (Output)								
Output Breakdown Voltage			V_B	I_B=50uA	350			V
Output Off-State Leakage			I_{TOFF}	V_T =100V, I_F =10mA		0.2	1	uA
I/O Capacitance			C_{ISO}	I_F =0, f =1MHz		6		p F
ON Resistance	Connection	A	R_{ON}	I_L =100mA, I_F =10mA		20	30	Ω
		B				10	15	
		C				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
KAQV210 & KAQV210A		1a	AC/DC	A	
			DC	B	
			DC	C	

Data Curve

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

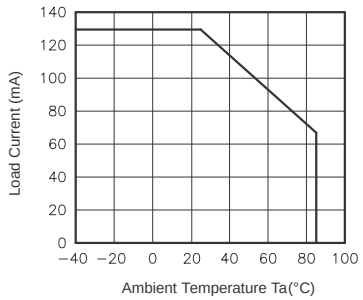


Fig.2 On resistance vs. ambient temperature
Across terminals 4 and 6 pin
LED current: 5mA
Continuous load current: 130mA(DC)

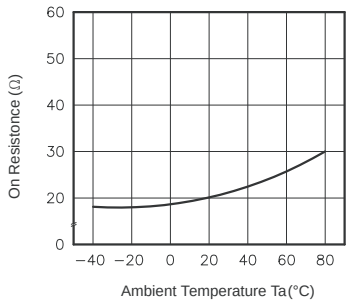


Fig.3 Turn on time vs. ambient temperature
Load voltage 350V(DC)
LED current: 5mA
Continuous load current: 130mA(DC)

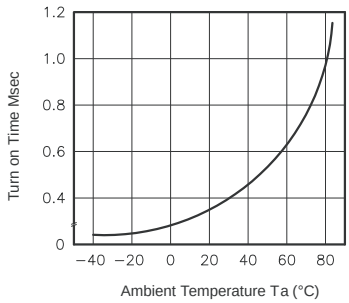


Fig.4 Turn off time vs. ambient temperature
LED current: 5mA; Load voltage: 350V(DC)
Continuous load current: 130mA(DC)

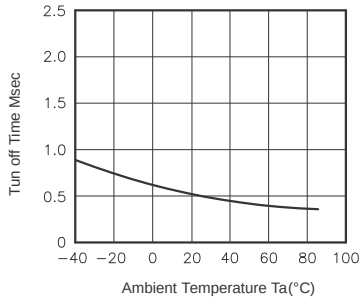


Fig.5 LED operate vs. ambient temperature
Load voltage 350V(DC)
Continuous load current: 130mA(DC)

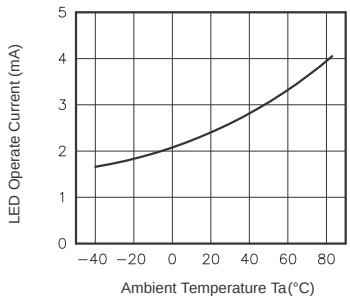


Fig.6 LED turn off current vs. ambient temperature
Load voltage 350V(DC)
Continuous load current: 130mA(DC)

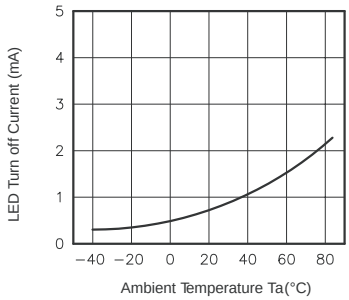


Fig.7 LED dropout voltage vs. ambient temperature
LED current: 5 to 50mA

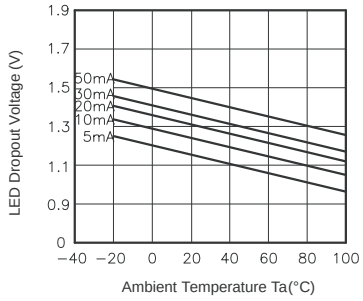


Fig.8 Voltage vs. current characteristics of output at MOS FET portion
Measured portion: across terminals 4 and 6 pin
Ambient temperature: 25°C

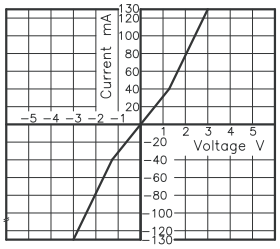


Fig.9 Off state leakage current
Across terminals 4 and 6 pin Ambient temperature: 25°C

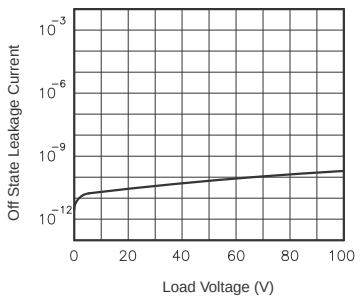


Fig.10 LED forward current vs. turn on time
Across terminals 4 and 6 pin;
Load voltage: 350V (DC);
Continuous load current: 130mA (DC);
Ambient temperature: 25°C

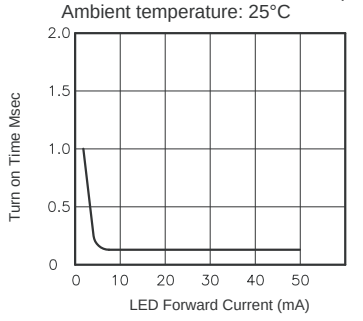


Fig.11 LED forward current vs. turn off time
Across terminals 4 and 6 pin;
Load voltage: 350V (DC);
Continuous load current: 130mA (DC);
Ambient temperature: 25°C

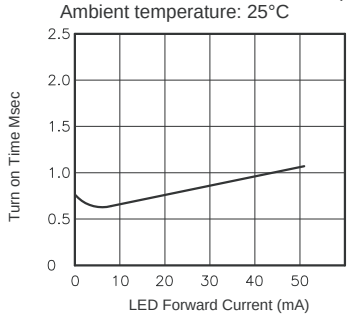


Fig.12 Applied voltage vs. output capacitance
Across terminals 4 and 6 pin
Frequency: 1MHz
Ambient temperature: 25°C