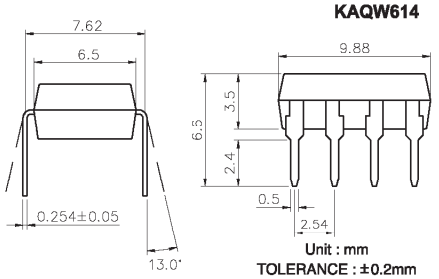
cosmo High Voltage, Solid State Relay-MOSFET Output KAQW614/614A

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

Features

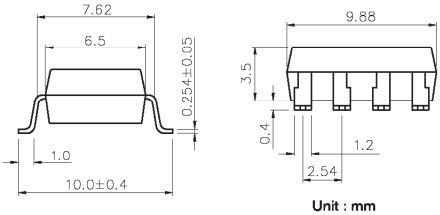
1. Normally Open and Close, Single Pole Single Throw
2. Control 400VAC or DC Voltage
3. Switch 130mA Loads
4. LED control Current, 5mA
5. Low ON-Resistance
6. dv/dt, >500V/ms
7. Isolation Test Voltage, 3750VACrms

KAQW614



Unit : mm
TOLERANCE : ±0.2mm

KAQW614A

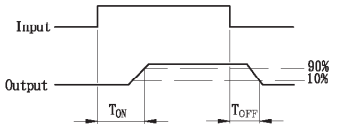


Unit : mm
TOLERANCE : ±0.2mm

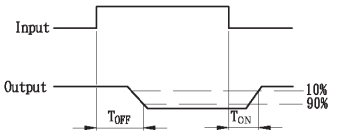
Absolute Maximum Ratings (Ta=25°C)

Emitter (Input)	
Reverse Voltage	5.0V
Continuous Forward Current	50mA
Peak Forward Current	1A
Power Dissipation	100mW
Derate Linearly from 25°C	1.3mW/°C
Detector (Output)	
Output Breakdown Voltage	±400V
Continuous Load Current	±130mA
Power Dissipation	500mW
General Characteristics	
Isolation Test Voltage	3750VACrms
Isolation Resistance 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

Turn on/ Turn off time Normally Open



Operate/ Reverse time Normally Close



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Electro-optical Characteristics

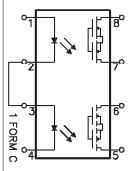
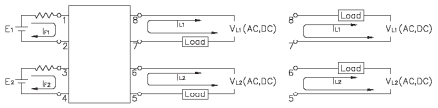
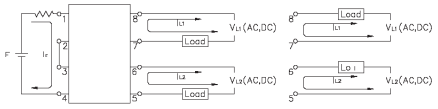
(Ta=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Emitter (Input)						
Forward Voltage	V_F	I_F =10mA		1.2	1.5	V
Operation Input Current	$I_{FON(N.O)}$ $I_{FOFF(N.C)}$	V_L =±20V, I_L =100mA (N.O) V_L =±20V, I_L≤5uA (N.C) t = 10mS			5	mA
Recovery Input Current	$I_{FOFF(N.O)}$ $I_{FON(N.C)}$	V_L =±20V, I_L≤5uA (N.O) V_L =±20V, I_L =100mA (N.C) t = 10mS	0.2			mA

Detector (Output) normally open						
Output Breakdown Voltage	V_B	I_B=50uA	400			V
Output Off-State Leakage	I_{TOFF}	V_T =100V, I_F =0mA		0.2	1	uA
I/O Capacitance	C_{ISO}	I_F =0, f =1MHz		6		pF
ON Resistance	R_{ON}	I_L =100mA, I_F =10mA		20	30	Ω
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

Detector (Output) normally close						
Output Breakdown Voltage	V_B	I_B=50uA	400			V
Output Off-State Leakage	I_{TOFF}	V_T =100V, I_F =10mA		0.2	2	uA
I/O Capacitance	C_{ISO}	I_F =0, f =1MHz		6		pF
ON Resistance	R_{ON}	I_L =100mA, I_F =0mA		40	50	Ω
Reverse (ON) Time	T_{ON}	I_F =10mA, V_L =±20V		0.6	1.5	ms
Operate (OFF) Time	T_{OFF}	t =10ms, I_L =±100mA		0.3	1.0	ms

Schematic and Wiring Diagrams

Type	Schematic	Output configuration	Load	Connection	Wiring Diagrams
KAQW614 & KAQW614A		1a1b	AC/DC	–	(1) Two independent 1 Form A & 1 Form B use  (2) 1 Form A & 1 Form B use 

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Data Curve (KAQW614/614A Normally Open Characteristics)

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

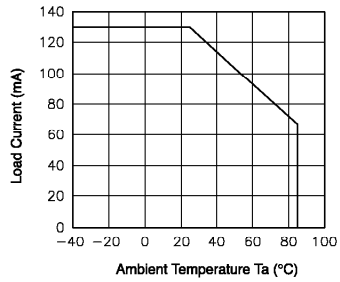


Fig.2 On resistance vs. ambient temperature
Across terminals 5 and 6 pin
LED current: 5mA
Continuous load current: 130mA(DC)

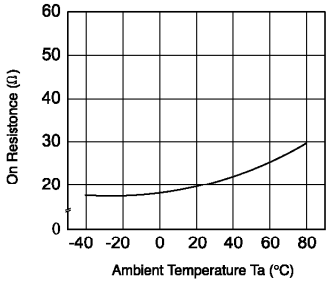


Fig.3 Turn (ON) time vs. ambient temperature Load voltage 400V(DC)
LED current: 5mA
Continuous load current: 130mA(DC)

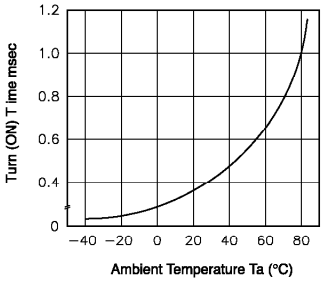


Fig.4 Tutn (OFF) time vs. ambient temperature LED current: 5mA;
Load voltage: 400V(DC)
Continuous load current: 130mA(DC)

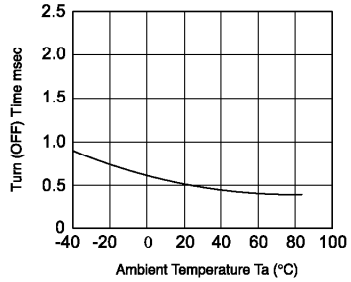


Fig.5 LED operate current vs. ambient temperature
Load voltage 400V(DC)
Continuous load current: 130mA(DC)

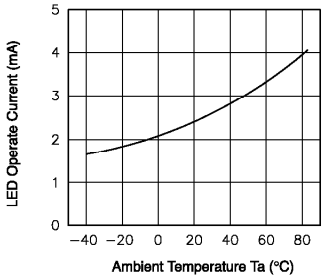


Fig.6 LED Turn (OFF) current. ambient temperature
Load voltage 400V(DC)
Continuous load current: 130mA(DC)

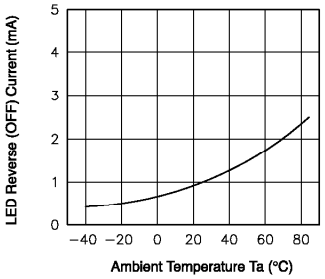


Fig.7 LED dropout voltage vs. ambient temperature
LED current: 5 to 50mA

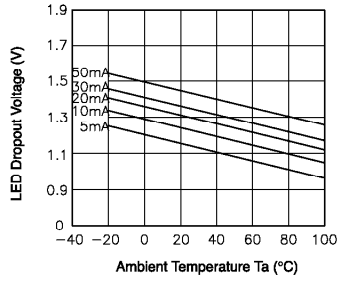


Fig.8 Voltage vs. current characteristics of output at MOS FET portion
Measured portion: across terminals 5 and 6 pin
Ambient temperature: 25°C

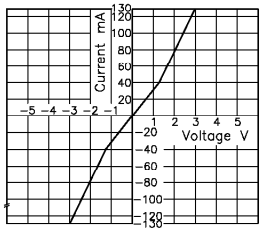


Fig.9 Off state leakage current
Across terminals 5 and 6 pinAmbient temperature: 25°C

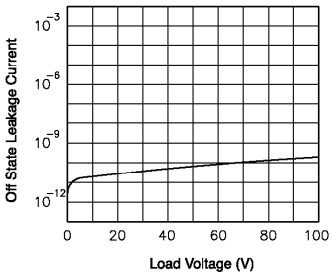


Fig.10 LED forward current vs. turn (ON) time
Across terminals 5 and 6 pin;
Load voltage: 400V (DC);
Continuous load current: 130mA (DC);
Ambient temperature: 25°C

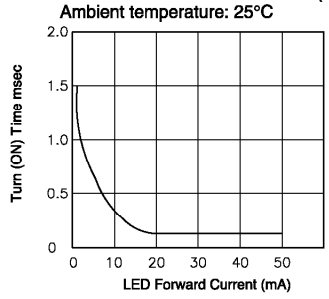


Fig.11 LED forward current vs. Turn (OFF) timeAcross terminals 5 and 6 pin;
Load voltage: 400V (DC); Continuous load current: 130mA (DC); Ambient temperature: 25°C

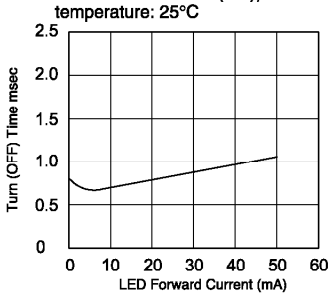
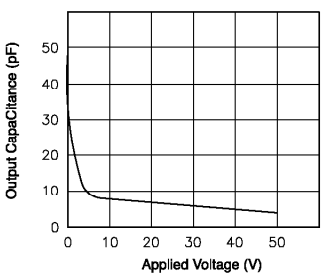


Fig.12 Applied voltage vs. output capacitance
Across terminals 5 and 6 pin
Frequency: 1MHz
Ambient temperature: 25°C



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Data Curve (KAQW614/614A Normally Close Characteristics)

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

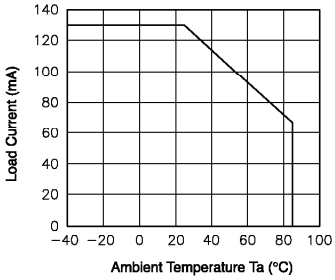

Fig.2 On resistance vs. ambient temperature
Across terminals 7 and 8 pin
LED current: 0mA
Continuous load current: 130mA(DC)

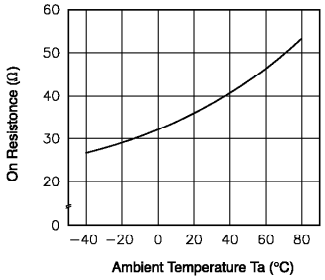

Fig.3 Operate (OFF) time vs. ambient temperature Load voltage 400V(DC)
LED current: 5mA
Continuous load current: 130mA(DC)

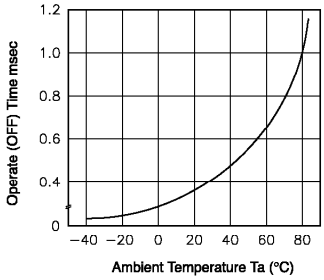

Fig.4 Turn (ON) time vs. ambient temperature LED current: 5mA;
Load voltage: 400V(DC)
Continuous load current: 130mA(DC)

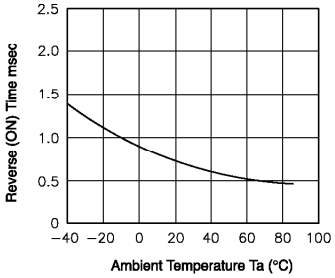

Fig.5 LED operate (OFF) vs. ambient temperature
Load voltage 400V(DC)
Continuous load current: 130mA(DC)

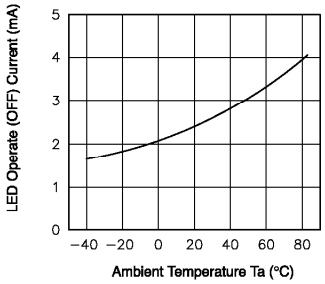

Fig.6 LED Reverse (ON) current vs. ambient temperature
Load voltage 400V(DC)
Continuous load current: 130mA(DC)

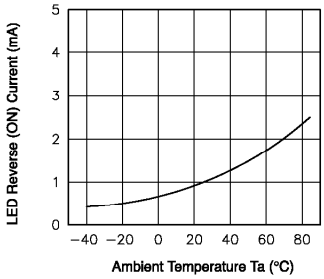

Fig.7 LED dropout voltage vs. ambient temperature
LED current: 5 to 50mA

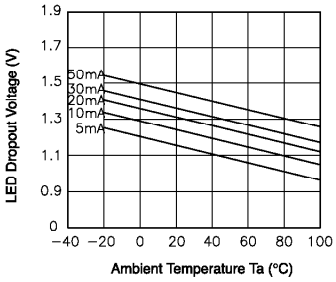

Fig.8 Voltage vs. current characteristics of output at MOS FET portion
Measured portion: across terminals 7 and 8 pin
Ambient temperature: 25°C

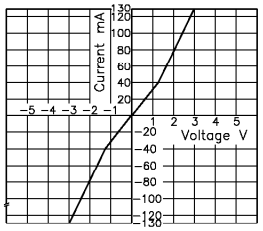

Fig.9 Off state leakage current
Across terminals 7 and 8 pinAmbient temperature: 25°C

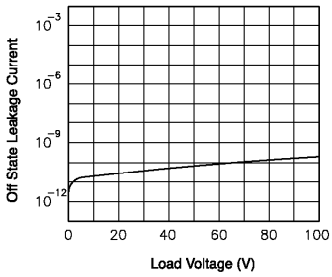

Fig.10 LED forward current vs. turn on time
Across terminals 7 and 8 pin;
Load voltage: 400V (DC);
Continuous load current: 130mA (DC);
Ambient temperature: 25°C

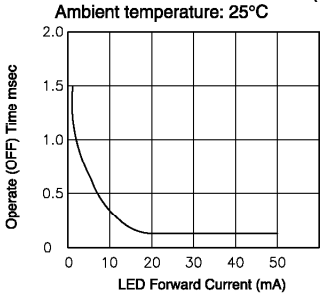

Fig.11 LED forward current vs. reverse (ON) timeAcross terminals 7 and 8 pin;
Load voltage: 400V (DC);
Continuous load current: 130mA (DC);
Ambient temperature: 25°C

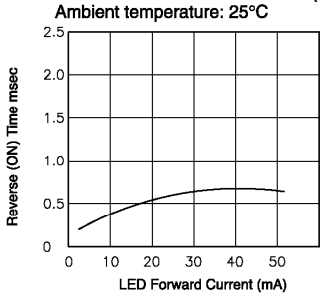
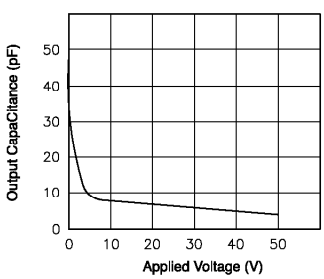
Fig.12 Applied voltage vs. output capacitance
Across terminals 7 and 8 pin
Frequency: 1MHz
Ambient temperature: 25°C