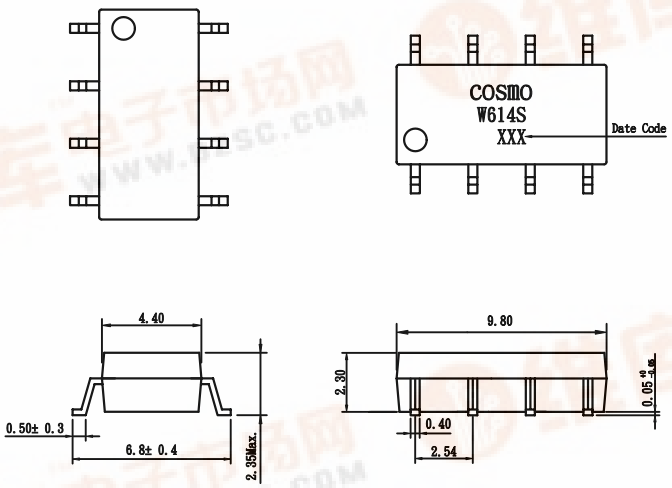
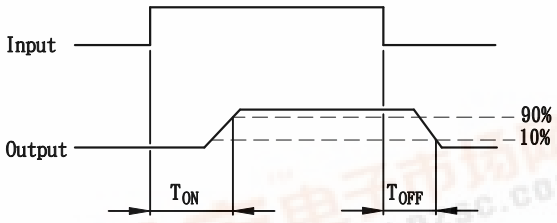
PRODUCT SPECIFICATION

COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 1 OF 10

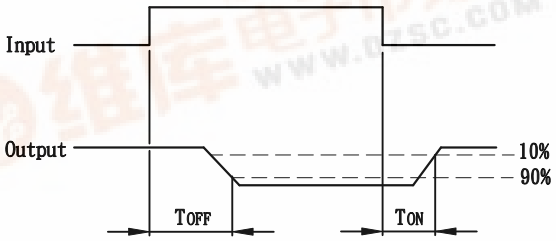
- OUTSIDE DIMENSION :



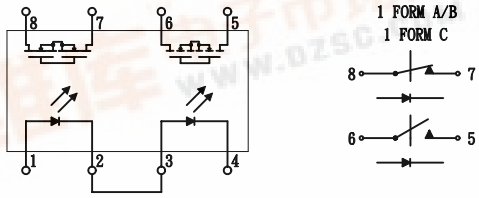
- Turn on/Turn off time



- Operate/Reverse time



Absolute Maximum Ratings (T_A=25° C)
Emitter (Inpute)
Reverse Voltage 5.0V
Continuous Forward Current 50mA
Peak Forward Current (1s) 1A
Power Dissipation. 100mW
Derate Linearly from 25° C . . . . . 1.3mW/° C
Detector (Output)
Output Breakdown Voltage . . . . . .± 400V
Continous Load Current . . . . . ± 130mA
Power Dissipation 500mW
General Characteristics
Isolation Test Voltage. . . . . .1500VAC$_{RMS}$
Isolation Resistance
V_{IO} =500V, T_A=25° C. . . . . .≥$10^{10}\Omega$
Total Power Dissipation 550mW



Derate Linearly form 25° C. . . . . .2.5mW/° C
Storage Temperature Range . . . . -40 to +150° C
Operating Temperature Range. . . . -40 to +85° C
Junction Temperature . . . . . .100° C
Soldering Temperature, 2mm from case, 10 sec. 260° C

PRODUCT SPECIFICATION

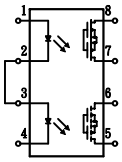
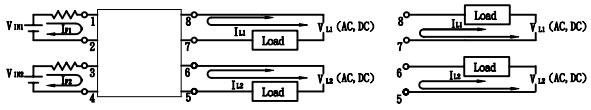
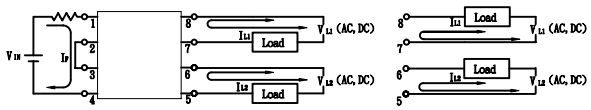
COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 2 OF 10

Characteristics (T_A=25° C)

Description	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Emitter (Input)						
Forward Voltage	V_F		1.8	2.0	V	I_F=10mA
Operation Input Current	$I_{FON(N.O)}$ $I_{FOFF(N.C)}$			5	mA	V_L=± 20V, I_L=100mA(N.O) V_L=± 20V, I_L=< 5uA(N.C) t=10 ms
Recovery Input Current	$I_{FOFF(N.O)}$ $I_{FON(N.C)}$	0.2			mA	V_L=± 20V, I_L=< 5uA(N.O) V_L=± 20V, I_L=100mA(N.C) t=10 ms
Deterctor (Output) normally open						
Output Breakdown Voltage	V_B	400			V	I_B=50uA
Output Off-State Leakage	$I_{T(OFF)}$		0.2	1	uA	V_T=100V, I_F=0mA
I/O Capacitance	C_{ISO}		6		pF	I_F=0, f=1MHz
ON Resistance	R_{ON}		20	30	Ω	I_L=100mA, I_F=10mA
Turn-on Time	T_{ON}		0.3	1.0	ms	I_F=10mA, V_L=± 20V
Turn-off Time	T_{OFF}		0.7	1.5	ms	t=10ms, I_L=± 100mA

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

Mos Relay Schematic and Wiring Diagrams

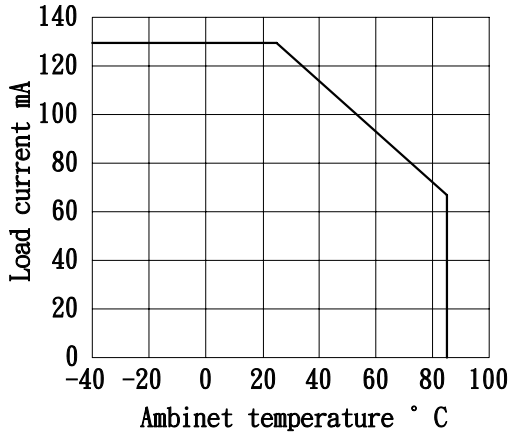
Type	Schematic	Output configur-ation	Load	Con-nection	Wiring diagram
KAQW614S		1a1b	AC/DC	-	(1)Two independent 1 Form A & 1 Form B use  (2) 1 Form A 1 Form B use 

PRODUCT SPECIFICATION

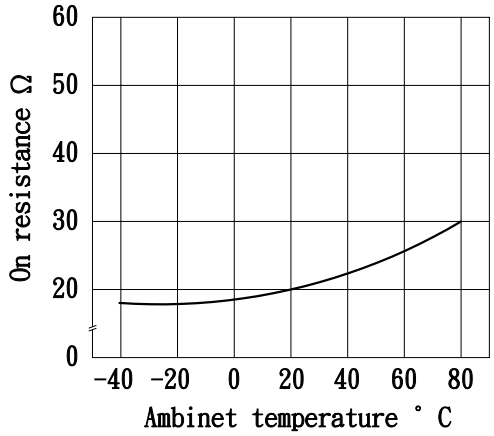
COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 3 OF 10

Normally Open Characteristics
DATA CURVE

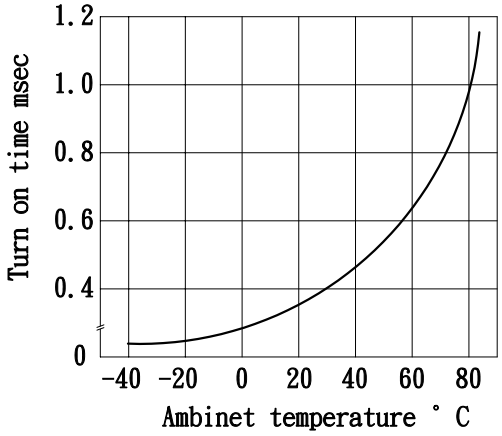
Load current vs. ambient temperature
Allowable ambient temperature:
-40° C+85° C



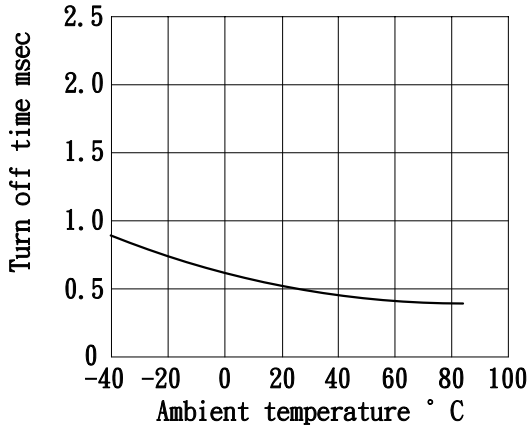
On resistance vs. ambient temperature
Across terminals 5 and 6 pin
LED current: 5mA
Continuous load current: 130 mA(DC)



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



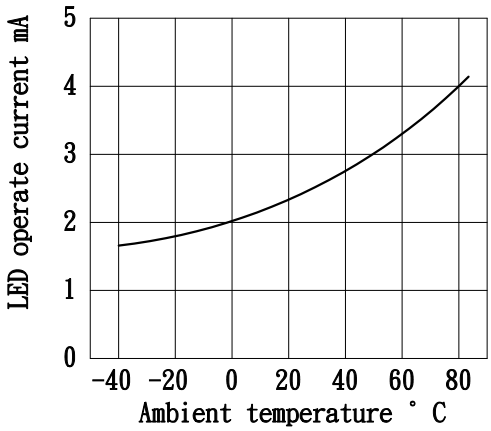
Turn off time vs. ambient temperature
LED current: 5mA;Load voltage: 400V(DC)
Continuous load current: 130mA(DC)



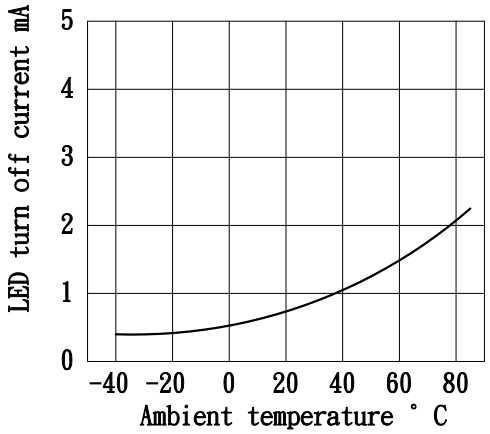
PRODUCT SPECIFICATION

COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 4 OF 10

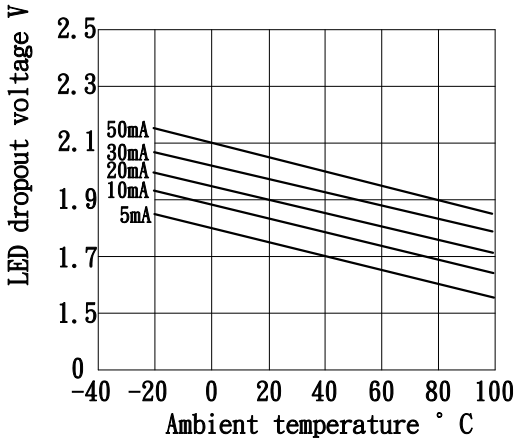
LED operate vs. ambient temperature
Load voltage: 400V(DC)
Continuous load current: 130mA(DC)



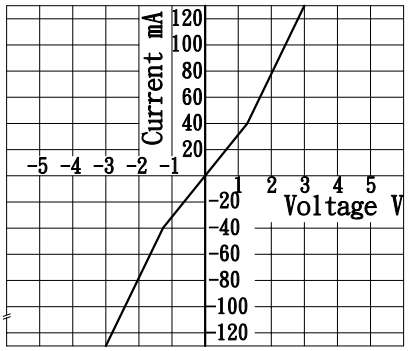
LED turn off current vs. ambient temperature
Load voltage: 400V(DC)
Continuons load current: 130mA(DC)



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



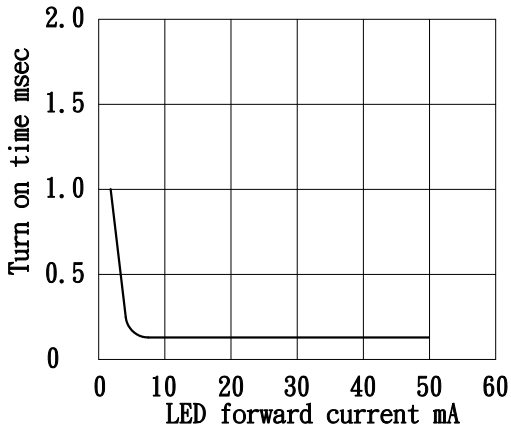
Voltage vs. current characteristics of output at MOS FET portion
Measured portion: across terminals 5 and 6 pin
Ambient temperature: 25° C



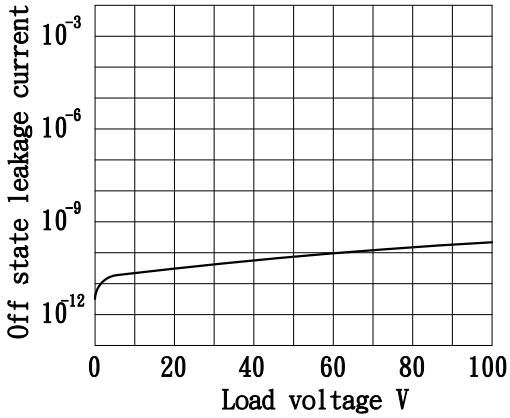
PRODUCT SPECIFICATION

COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 5 OF 10

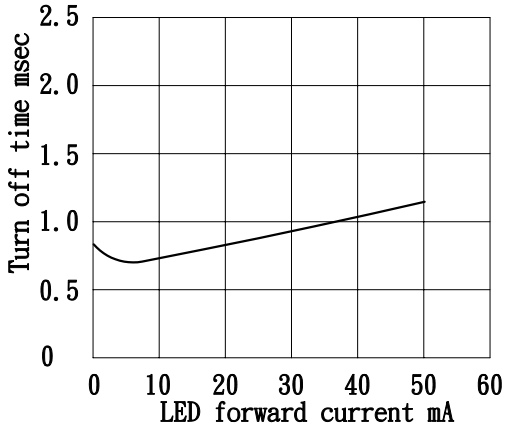
LED forward current vs. turn on time
Across terminals 5 and 6pin;Load voltage: 400V(DC);Continuous load current: 130mA(DC);Ambient temperature: 25° C



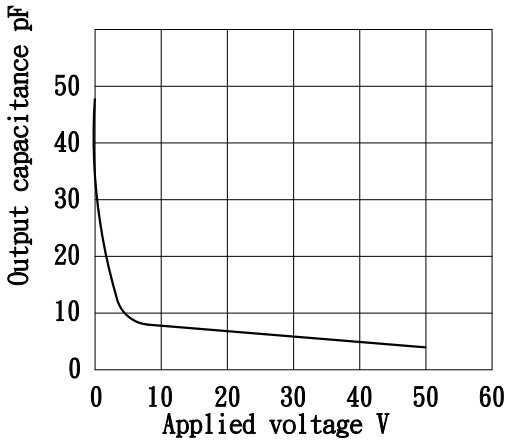
Off state leakage current
Across terminals 5 and 6pin
Ambient temperature: 25° C



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



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

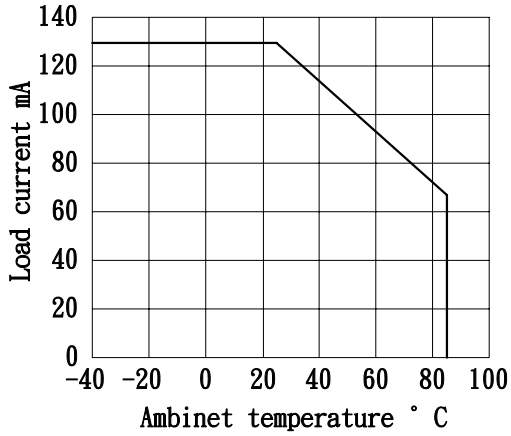


PRODUCT SPECIFICATION

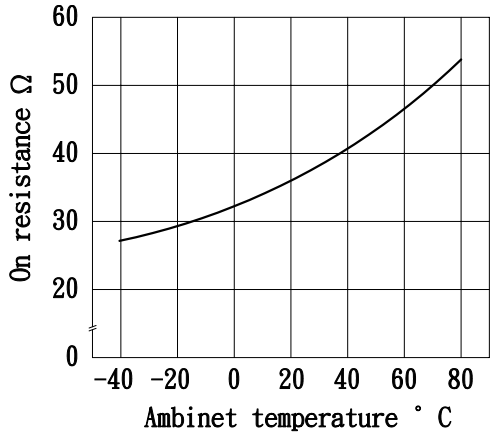
COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 6 OF 10

Normally Close Characteristics
DATA CURVE

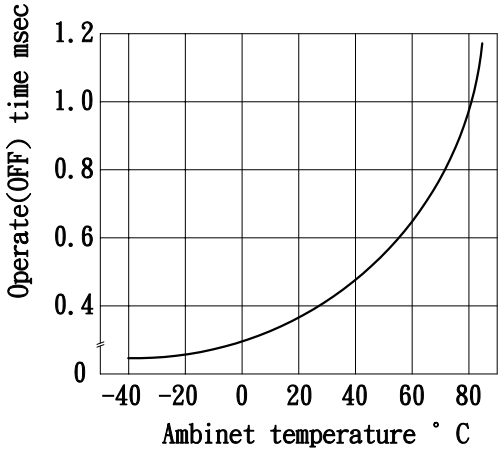
Load current vs. ambient temperature
Allowable ambient temperature:
-40° C+85° C



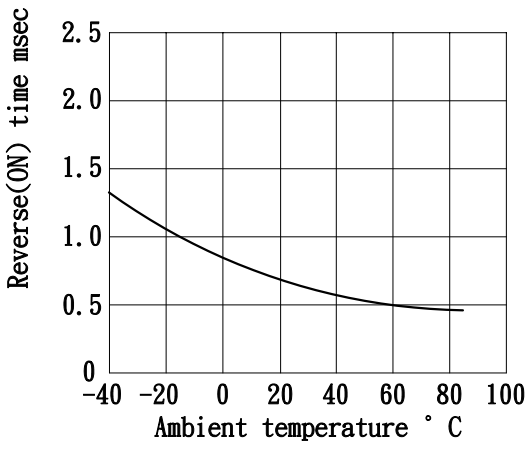
On resistance vs. ambient temperature
Across terminals 7 and 8 pin
LED current: 0mA
Continuous load current: 130 mA(DC)



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



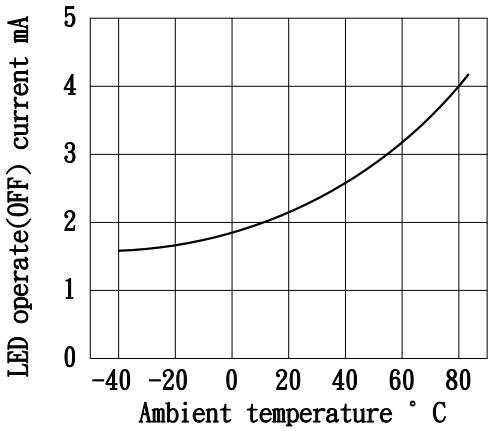
Reverse(ON) time vs. ambient temperature
LED current: 5mA;Load voltage: 400V(DC)
Continuous load current: 130mA(DC)



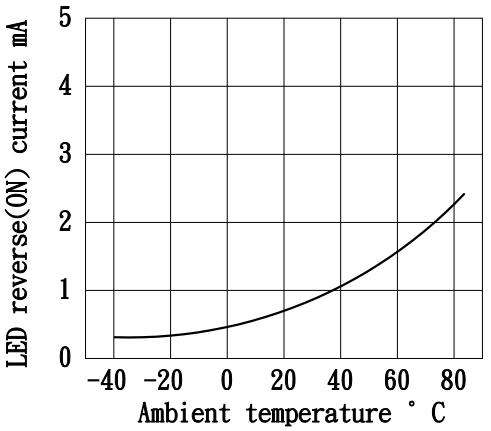
PRODUCT SPECIFICATION

COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 7 OF 10

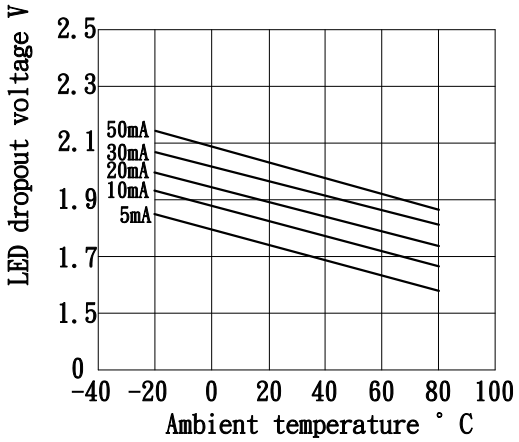
LED operate(OFF) vs. ambient temperature
Load voltage: 400V(DC)
Continuous load current: 130mA(DC)



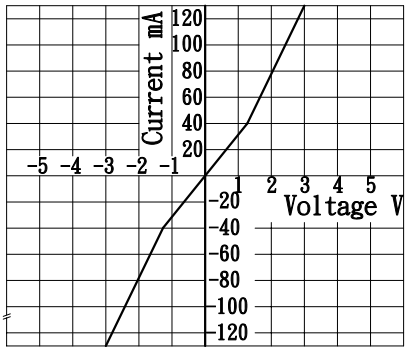
LED reverse(ON) current vs. ambient temperature
Load voltage: 400V(DC)
Continuons load current: 130mA(DC)



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



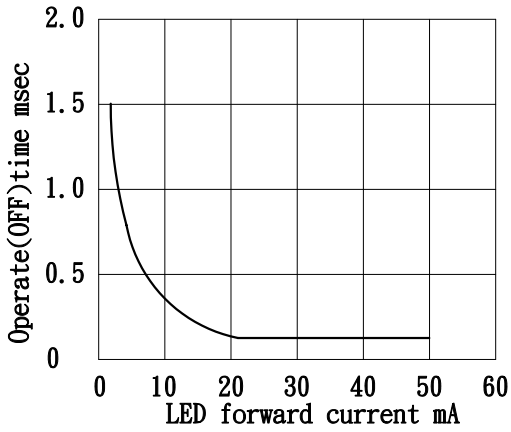
Voltage vs. current characteristics of output at MOS FET portion
Measured portion: across terminals 7 and 8 pin
Ambient temperature: 25° C



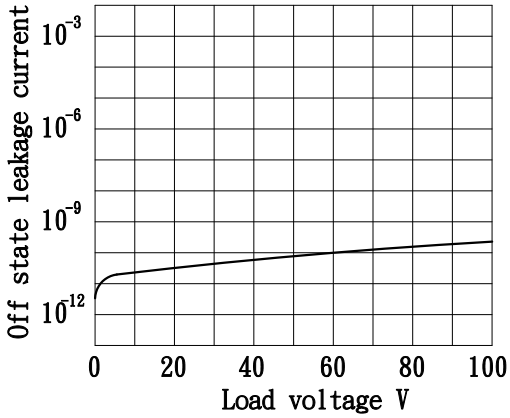
PRODUCT SPECIFICATION

COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 8 OF 10

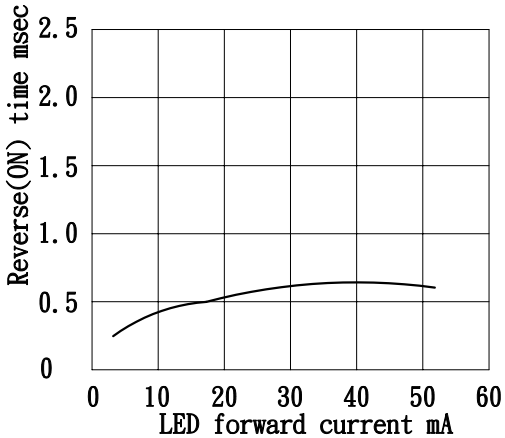
LED forward current vs. Operate(OFF) time
Across terminals 7 and 8pin;Load voltage: 400V(DC);Continuous load current:130mA(DC) ;Ambient temperature: 25° C



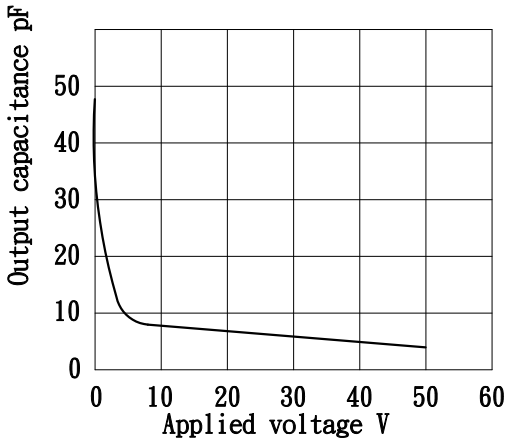
Off state leakage current
Across terminals 7 and 8pin
Ambient temperature: 25° C



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



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



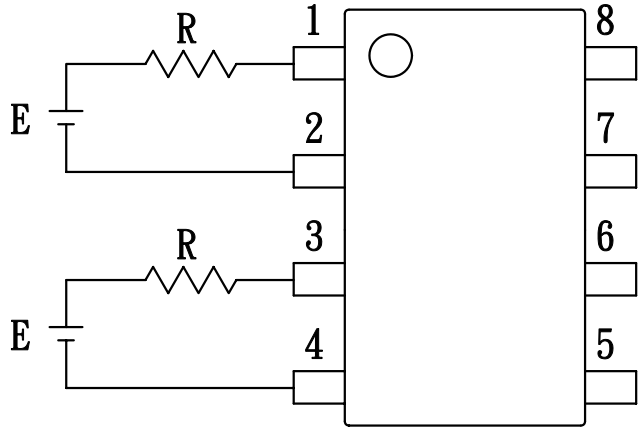
PRODUCT SPECIFICATION

COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 9 OF 10

USING METHODS

Examples of resistance value to control LED forward current I_F

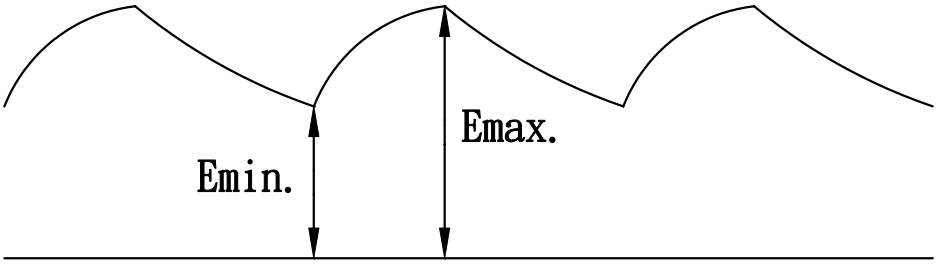
Photo MOSRELAY (I_F =5mA)



E	R
3.3V	Approx. 240 ohm
5V	Approx. 540 ohm
12V	Approx. 1.8K ohm
15V	Approx. 2.4K ohm
24V	Approx. 4K ohm

(1) LED forward current must be more than 5mA, at E min.

(2) LED forward current must be less than 50mA, at E max.

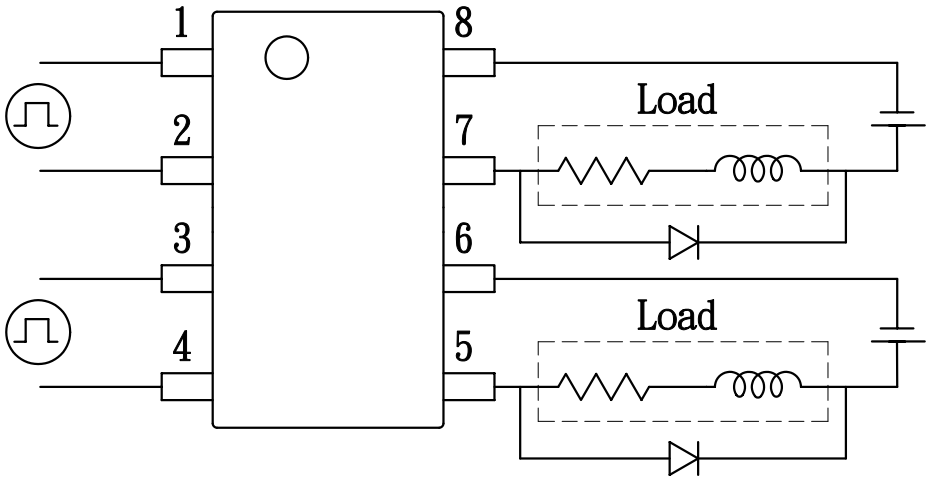


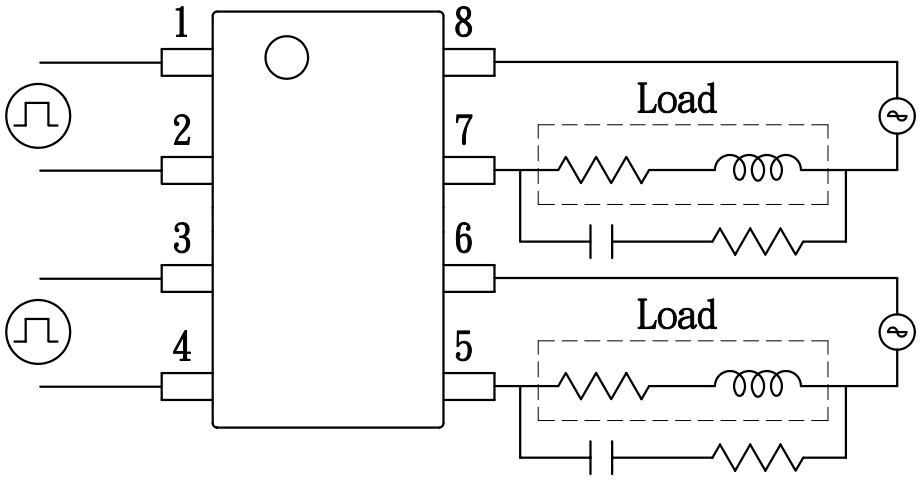
PRODUCT SPECIFICATION

COSMO ELECTRONICS CO.,LTD.	PHOTO MOS RELAYS: KAQW614S	SHEET 10 OF 10

USING METHODS

Regulate the spike voltage generated on the inductive load as follows





R-C Snubber