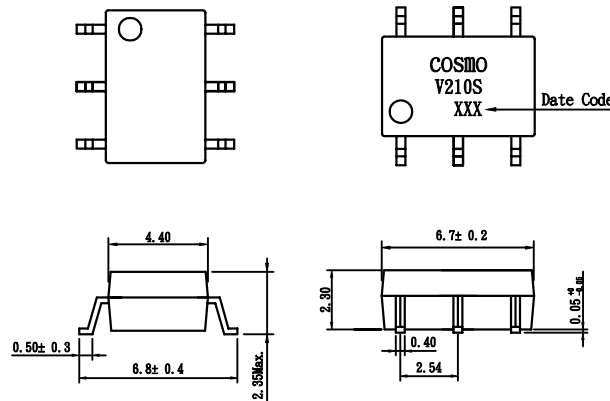


# PRODUCT SPECIFICATION

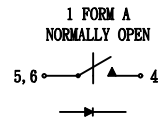
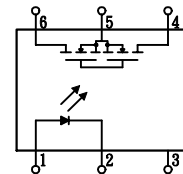
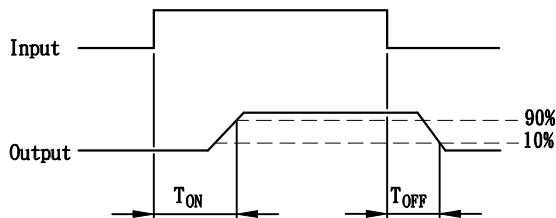
<b>COSMO</b> ELECTRONICS CO., LTD.	PHOTO MOS RELAYS: <b>KAQV210S</b>	SHEET 1 OF 7
---------------------------------------	--------------------------------------	--------------

## • OUTSIDE DIMENSION :



Unit:mm  
Tolerance:± 0.2 mm

## • Turn on/Turn off time



### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ )

#### Emitter (Input)

Reverse Voltage . . . . .	5.0V
Continuous Forward Current . . . . .	50mA
Peak Forward Current (1s) . . . . .	1A
Power Dissipation. . . . .	100mW
Derate Linearly from $25^\circ\text{C}$ . . . . .	$1.3\text{mW}/^\circ\text{C}$

#### Detector (Output)

Output Breakdown Voltage . . . . .	$\pm 350\text{V}$
Continuous Load Current . . . . .	$\pm 130\text{mA}$
Power Dissipation . . . . .	500mW

#### General Characteristics

Isolation Test Voltage. . . . .	1500VAC <sub>RMS</sub>
Isolation Resistance	
$V_{10}=500\text{V}, T_A=25^\circ\text{C}$ . . . . .	$\geq 10^{10}\Omega$
Total Power Dissipation . . . . .	550mW

Derate Linearly from $25^\circ\text{C}$ . . . . .	$2.5\text{mW}/^\circ\text{C}$
Storage Temperature Range . . . . .	$-40$ to $+150^\circ\text{C}$
Operating Temperature Range. . . . .	$-40$ to $+85^\circ\text{C}$
Junction Temperature . . . . .	$100^\circ\text{C}$
Soldering Temperature, 2mm from case, 10 sec. . . . .	$260^\circ\text{C}$

# PRODUCT SPECIFICATION

<b>COSMO</b> ELECTRONICS CO., LTD.	PHOTO MOS RELAYS: <b>KAQV210S</b>	SHEET 2 OF 7
---------------------------------------	--------------------------------------	--------------

## Characteristics

(T<sub>A</sub> = 25° C)

Description	Symbol	Min.	Typ.	Max.	Unit	Test Condition
<b>Emitter (Input)</b>						
Forward Voltage	V <sub>F</sub>		1.8	2.0	V	I <sub>F</sub> = 10mA
Operation Input Current	I <sub>FON</sub>			5	mA	V <sub>L</sub> = ± 20V, I <sub>L</sub> = 100mA, t = 10 ms
Recovery Input Current	I <sub>FOFF</sub>	0.2			mA	V <sub>L</sub> = ± 20V, I <sub>L</sub> = <5uA
<b>Detector (Output)</b>						
Output Breakdown Voltage	V <sub>B</sub>	350			V	I <sub>B</sub> = 50uA
Output Off-State Leakage	I <sub>T(OFF)</sub>		0.2	1	uA	V <sub>T</sub> = 100V, I <sub>F</sub> = 0mA
I/O Capacitance	C <sub>ISO</sub>		6		pF	I <sub>F</sub> = 0, f = 1MHz
ON Resistance	Connection	A	20	30	Ω	I <sub>L</sub> = 100mA, I <sub>F</sub> = 10mA
		B	10	15		
		C	5	7.5		
Turn-on Time	T <sub>ON</sub>		0.3	1.0	ms	I <sub>F</sub> = 10mA, V <sub>L</sub> = ± 20V
Turn-off Time	T <sub>OFF</sub>		0.7	1.5	ms	t = 10ms, I <sub>L</sub> = ± 100mA

## Mos Relay Schematic and Wiring Diagrams

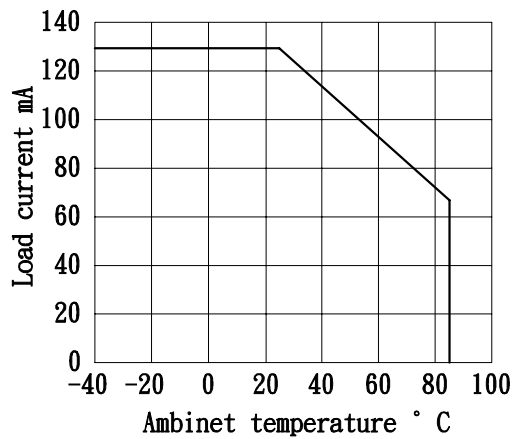
Type	Schematic	Output configuration	Load	Con-nection	Wiring diagram
KAQV210S		1a	AC/DC	A	
			DC	B	
DC	C				

# PRODUCT SPECIFICATION

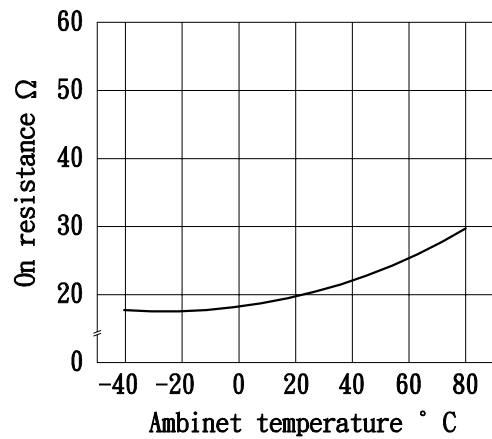
<b>COSMO</b> ELECTRONICS CO., LTD.	PHOTO MOS RELAYS: <b>KAQV210S</b>	SHEET 3 OF 7
---------------------------------------	--------------------------------------	--------------

## DATA CURVE

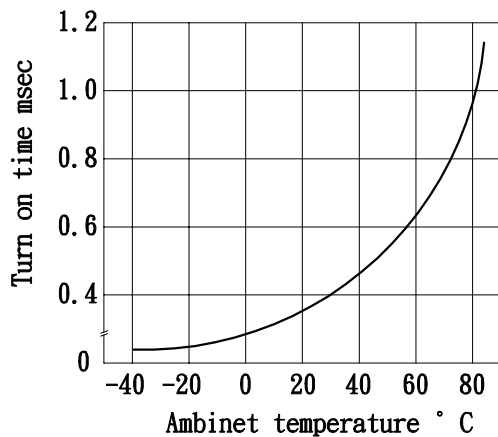
Load current vs. ambient temperature  
Allowable ambient temperature:  
-40° C+85° C



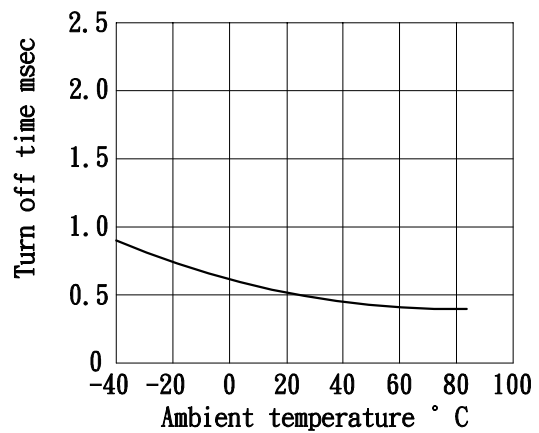
On resistance vs. ambient temperature  
Across terminals 4 and 6 pin  
LED current: 5mA  
Continuous load current: 130 mA(DC)



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



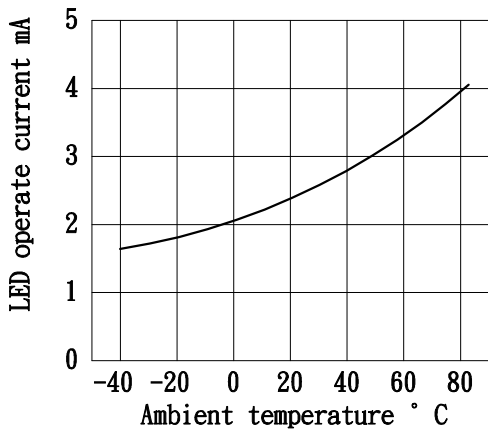
Turn off time vs. ambient temperature  
LED current: 5mA; Load voltage: 350V(DC)  
Continuous load current: 130mA(DC)



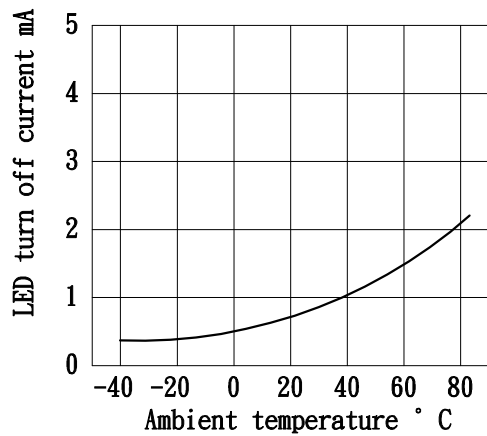
# PRODUCT SPECIFICATION

<p><b>COSMO</b> ELECTRONICS CO., LTD.</p>	<p>PHOTO MOS RELAYS: <b>KAQV210S</b></p>	<p>SHEET 4 OF 7</p>
---	--	---------------------

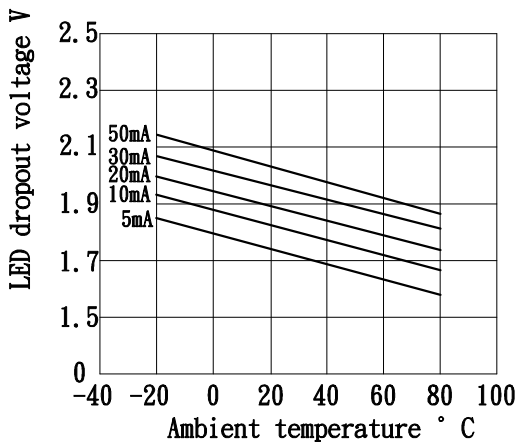
LED operate vs. ambient temperature  
Load voltage: 350V(DC)  
Continuous load current: 130mA(DC)



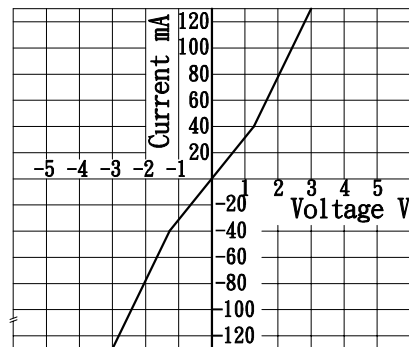
LED turn off current vs. ambient temperature  
Load voltage: 350V(DC)  
Continuons load current: 130mA(DC)



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 4 and 6 pin  
Ambient temperature: 25° C



# PRODUCT SPECIFICATION

**COSMO**

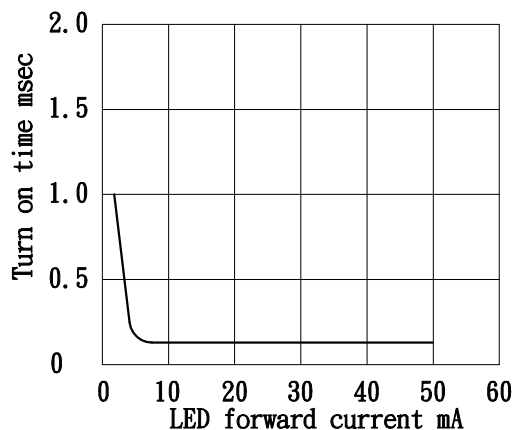
ELECTRONICS CO., LTD.

PHOTO MOS RELAYS:

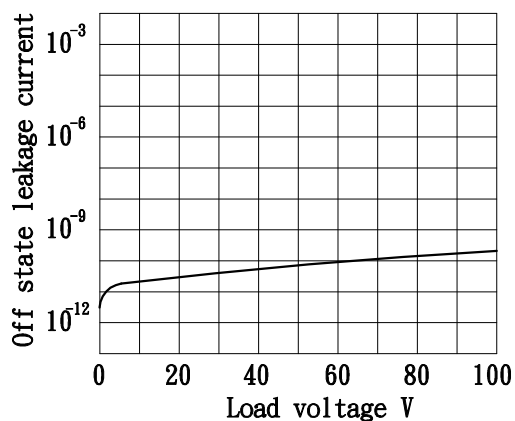
**KAQV210S**

SHEET 5 OF 7

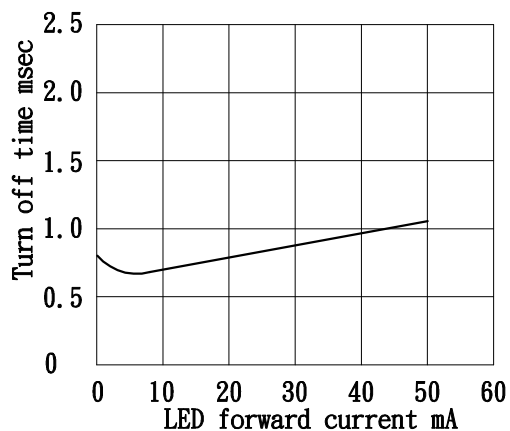
LED forward current vs. turn on time  
 Across terminals 4 and 6pin; Load voltage: 350V(DC); Continuous load current: 130mA(DC); Ambient temperature: 25° C



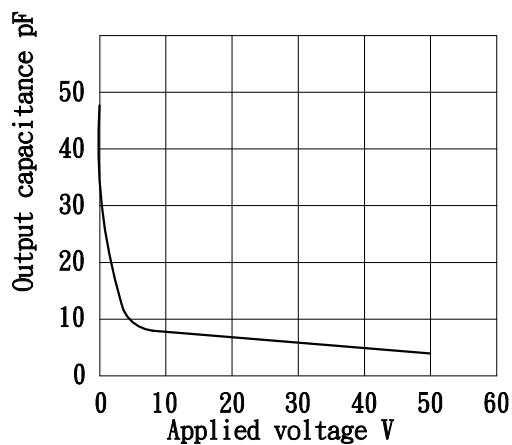
Off state leakage current  
 Across terminals 4 and 6pin  
 Ambient temperature: 25° C



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



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

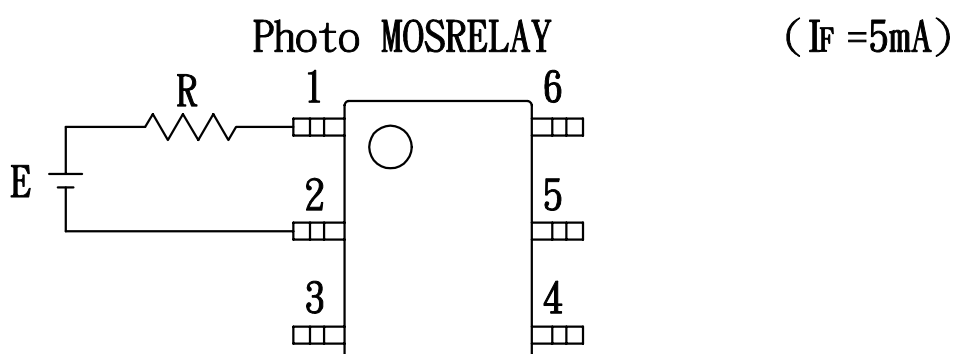


# PRODUCT SPECIFICATION

<b>COSMO</b> ELECTRONICS CO., LTD.	PHOTO MOS RELAYS: <b>KAQV210S</b>	SHEET 6 OF 7
---------------------------------------	--------------------------------------	--------------

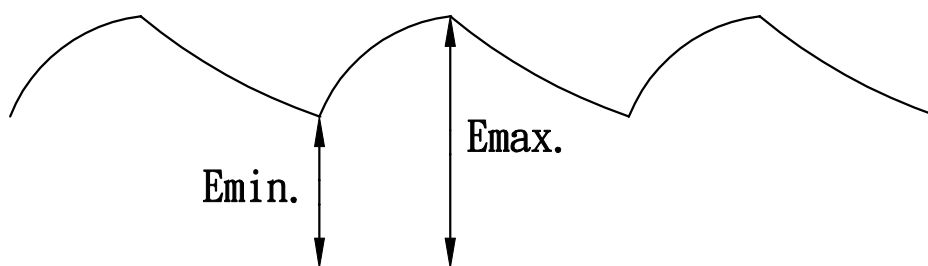
## USING METHODS

Examples of resistance value to control LED forward current  $I_F$



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.

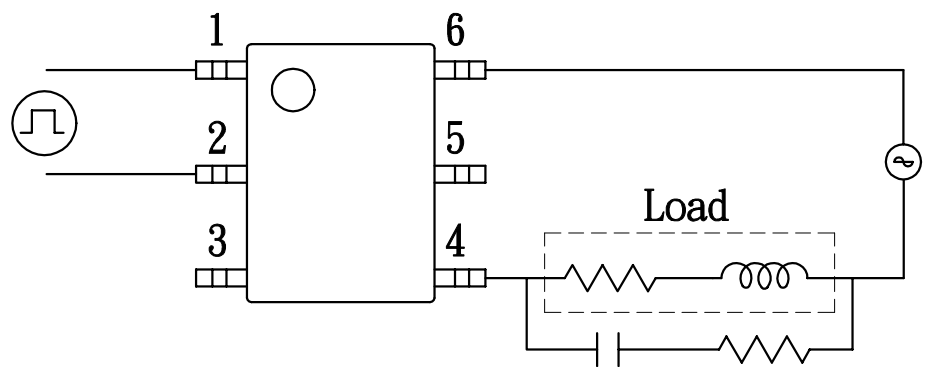
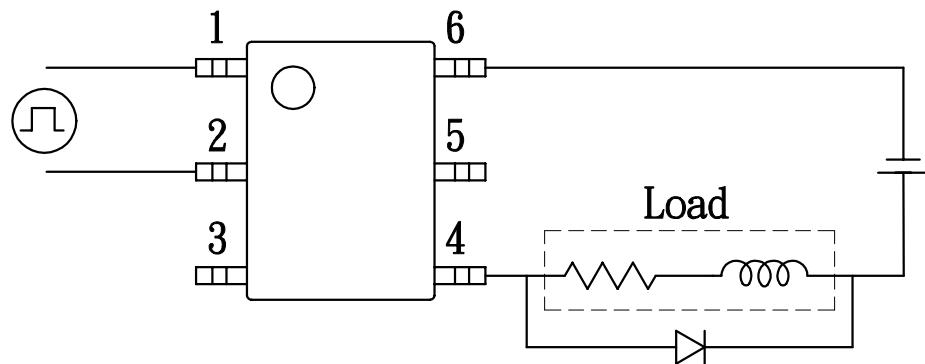


# PRODUCT SPECIFICATION

<b>COSMO</b> ELECTRONICS CO., LTD.	PHOTO MOS RELAYS: <b>KAQV210S</b>	SHEET 7 OF 7
---------------------------------------	--------------------------------------	--------------

## USING METHODS

Regulate the spike voltage generated on the inductive load as follows



R-C Snubber