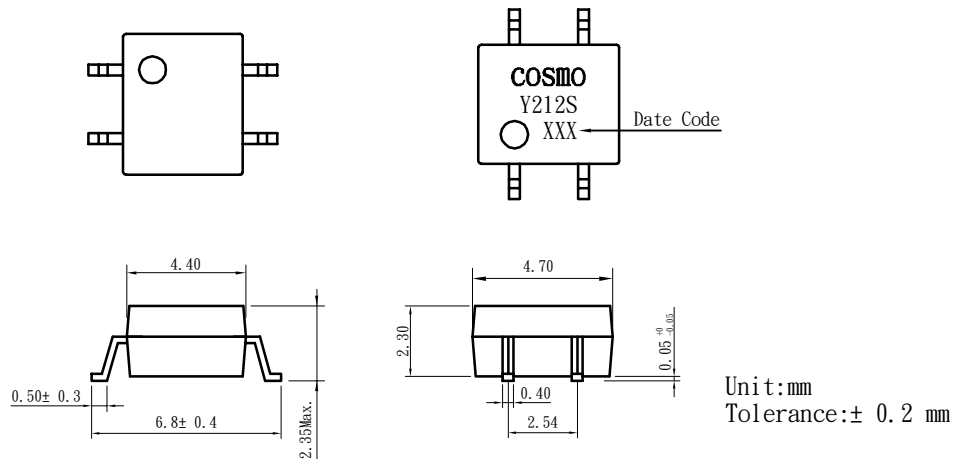


# PRODUCT SPECIFICATION

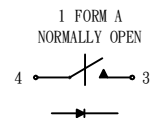
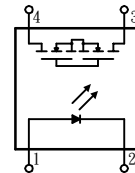
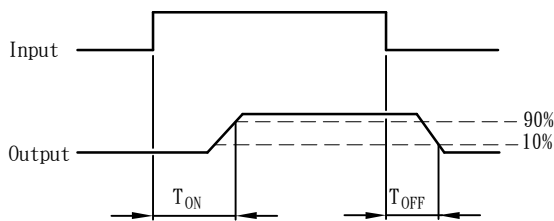
DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT	NO. 62M00012	REV.
	<b>KAQY212S</b>	SHEET 1 OF 7	2

• OUTSIDE DIMENSION :



• 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 (1us) . . . . .	1A
Power Dissipation. . . . .	100mW
Derate Linearly from $25^\circ\text{C}$ . . . . .	1.3mW/ $^\circ\text{C}$
Detector (Output)	
Output Breakdown Voltage . . . . .	$\pm 60\text{V}$
Continuous Load Current . . . . .	$\pm 400\text{mA}$
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 form $25^\circ\text{C}$ . . . . .	2.5mW/ $^\circ\text{C}$
Storage Temperature Range . . . . .	-40 to +150 $^\circ\text{C}$
Operating Temperature Range. . . . .	-40 to +85 $^\circ\text{C}$
Junction Temperature . . . . .	100 $^\circ\text{C}$
<b>Soldering Temperature, 2mm from case, 10 sec. 260<math>^\circ\text{C}</math></b>	

# PRODUCT SPECIFICATION

DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQY212S</b>	NO. 62M00012	REV.
		SHEET 2 OF 7	2

## Characteristics

(T<sub>A</sub> = 25° C)

Description	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Emitter (Input)						
Forward Voltage	V <sub>F</sub>		1.2	1.5	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
Detector (Output)						
Output Breakdown Voltage	V <sub>B</sub>	60			V	I <sub>B</sub> = 50uA
Output Off-State Leakage	I <sub>T(OFF)</sub>		0.2	1	uA	V <sub>T</sub> = 60V, I <sub>F</sub> = 0mA
I/O Capacitance	C <sub>ISO</sub>		6		pF	I <sub>F</sub> = 0, f = 1MHz
ON Resistance	R <sub>ON</sub>		0.83	2.5	Ω	I <sub>L</sub> = 100mA, I <sub>F</sub> = 10mA
Turn-on Time	T <sub>ON</sub>		0.2	1.5	ms	I <sub>F</sub> = 10mA, V <sub>L</sub> = ± 20V
Turn-off Time	T <sub>OFF</sub>		0.3	1.5	ms	t = 10ms, I <sub>L</sub> = ± 100mA

## Schematic and Wiring Diagrams

Type	Schematic	Output configuration	Load	Con-nection	Wiring diagram
KAQY212S		1a	AC/DC	-	

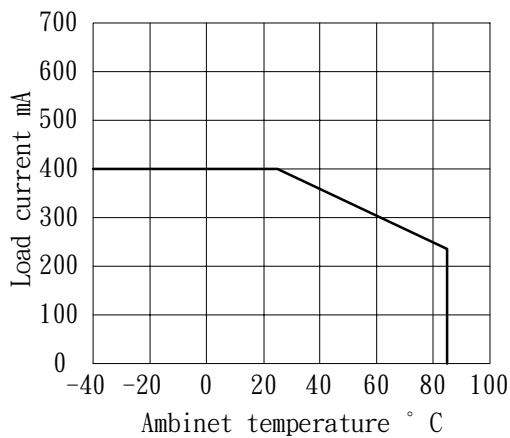
# PRODUCT SPECIFICATION

DATE: 11/18/2003

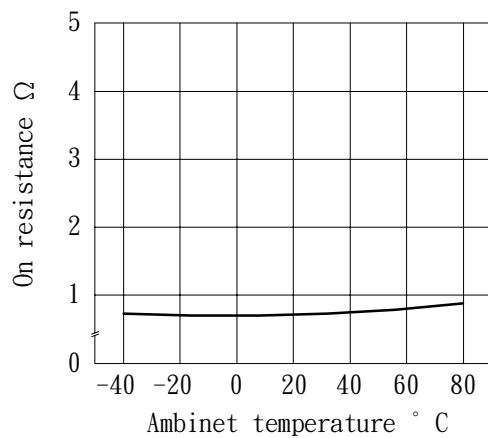
<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQY212S</b>	NO. 62M00012	REV.
		SHEET 3 OF 7	2

## DATA CURVE

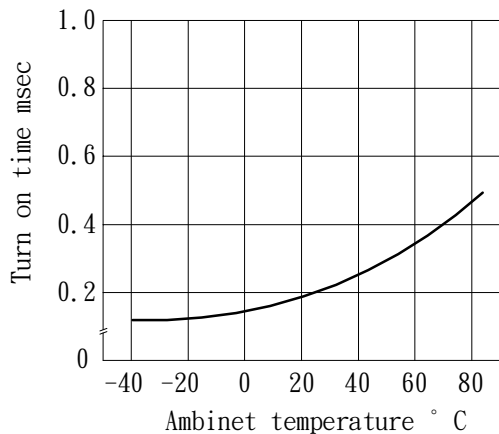
Load current vs. ambient temperature  
 Allowable ambient temperature:  
 -40°C to +85°C



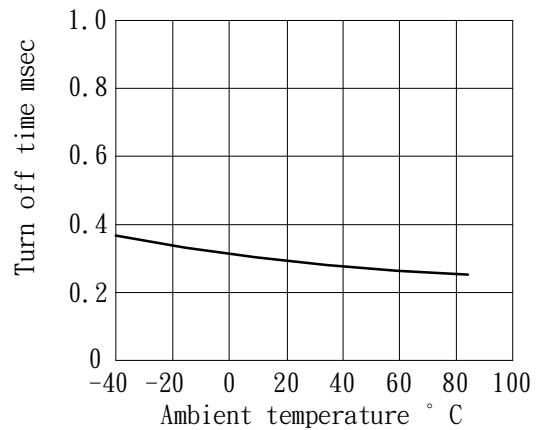
On resistance vs. ambient temperature  
 Across terminals 3 and 4 pin  
 LED current: 5mA  
 Continuous load current: 130 mA(DC)



Turn on time vs. ambient temperature  
 Load voltage 60 V(DC)  
 LED current :5mA  
 Continuous load current: 130mA(DC)



Turn off time vs. ambient temperature  
 LED current: 5mA; Load voltage: 60V(DC)  
 Continuous load current: 130mA(DC)

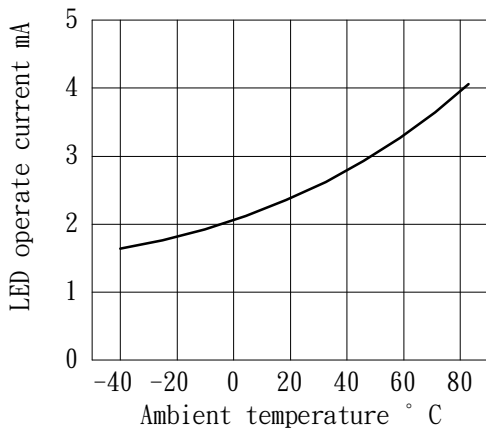


# PRODUCT SPECIFICATION

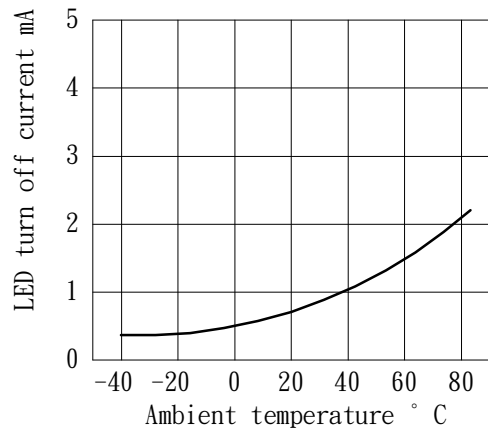
DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQY212S</b>	NO. 62M00012	REV.
		SHEET 4 OF 7	2

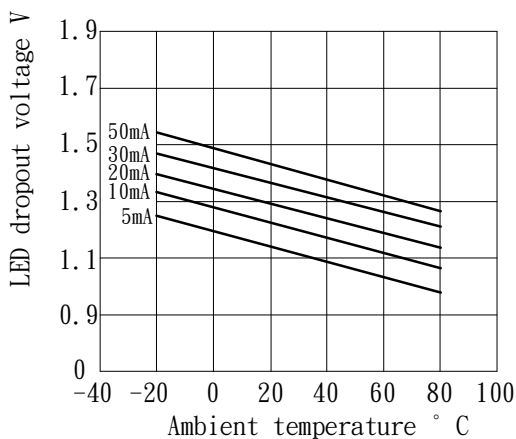
LED operate vs. ambient temperature  
 Load voltage: 60V(DC)  
 Continuous load current: 130mA(DC)



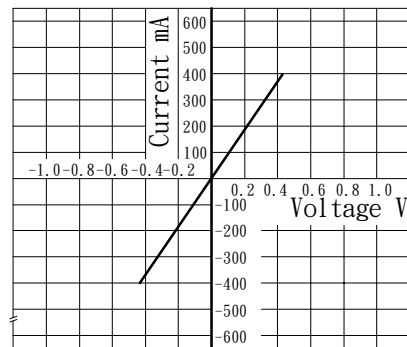
LED turn off current vs. ambient temperature  
 Load voltage: 60V(DC)  
 Continuous load current: 130mA(DC)



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 3 and 4 pin  
 Ambient temperature: 25°C

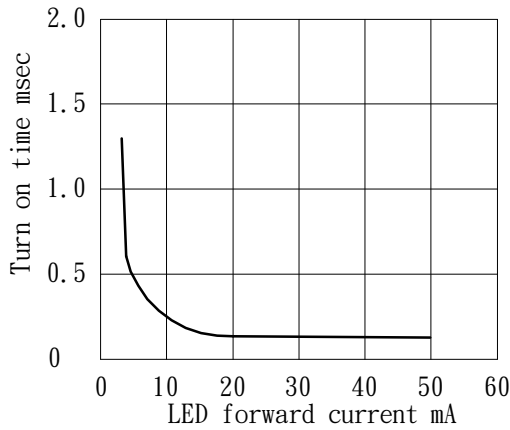


# PRODUCT SPECIFICATION

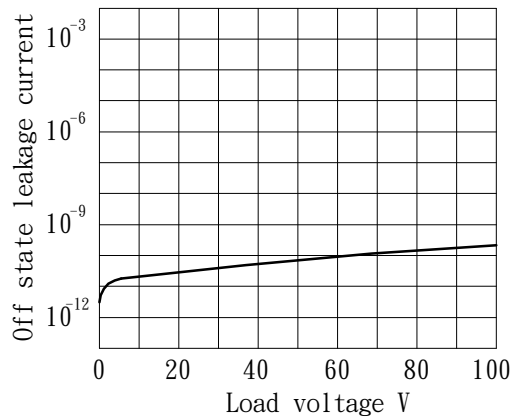
DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT	NO. 62M00012	REV.
	<b>KAQY212S</b>	SHEET 5 OF 7	2

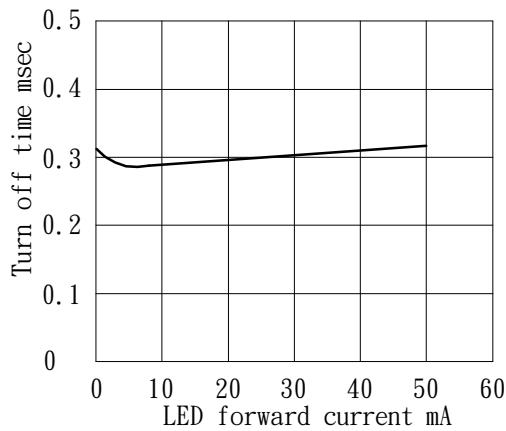
LED forward current vs. turn on time  
 Across terminals 3 and 4pin; Load voltage: 60V(DC); Continuous load current: 130mA(DC); Ambient temperature: 25° C



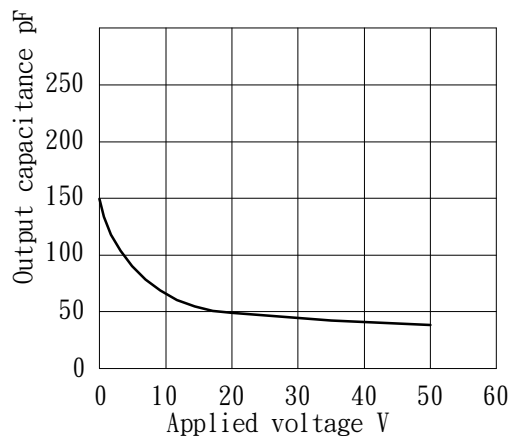
Off state leakage current  
 Across terminals 3 and 4pin  
 Ambient temperature: 25° C



LED forward current vs. turn off time  
 Across terminals 3 and 4pin; Load voltage: 60V(DC); Continuous load current: 130 mA(DC); Ambient temperature: 25° C



Applied voltage vs. output capacitance  
 Across terminals 3 and 4pin  
 Frequency: 1MHz; Ambient temperature: 25° C



# PRODUCT SPECIFICATION

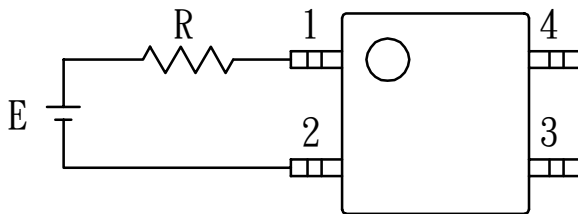
DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQY212S</b>	NO. 62M00012	REV.
		SHEET 6 OF 7	2

## USING METHODS

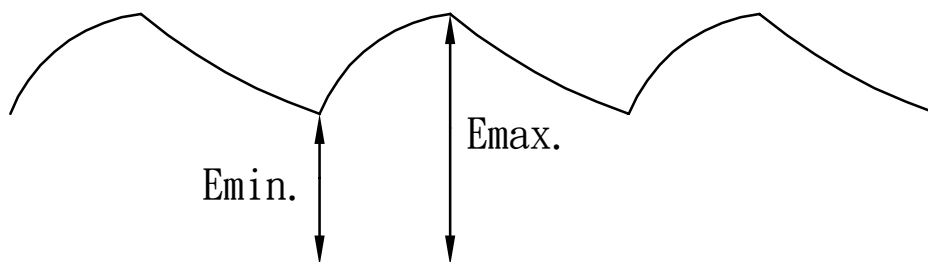
Examples of resistance value to control LED forward current  $I_F$

( $I_F = 5\text{mA}$ )



E	R
3.3V	Approx. 330 ohm
5V	Approx. 640 ohm
12V	Approx. 1.9K ohm
15V	Approx. 2.5K ohm
24V	Approx. 4.1K 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.



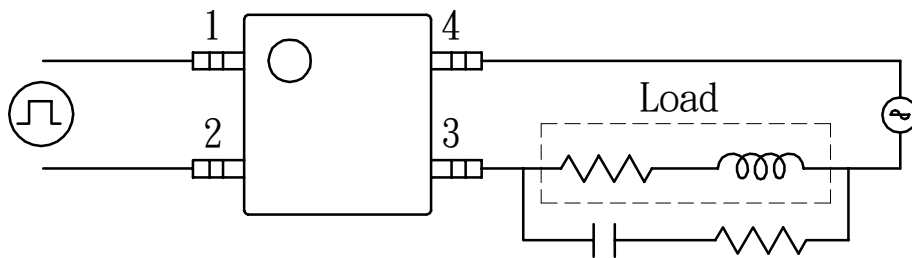
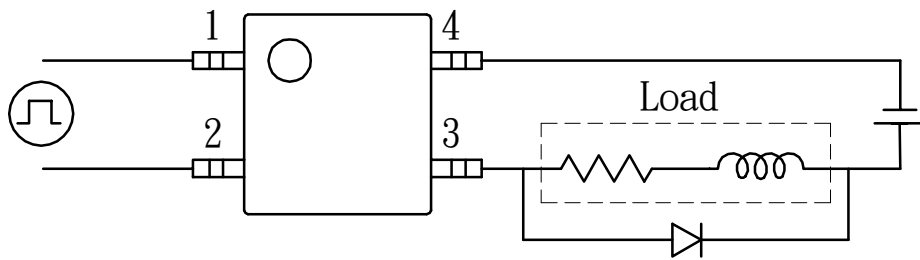
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DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQY212S</b>	NO. 62M00012	REV.
		SHEET 7 OF 7	2

## USING METHODS

Regulate the spike voltage generated on the inductive load as follows



R-C Snubber