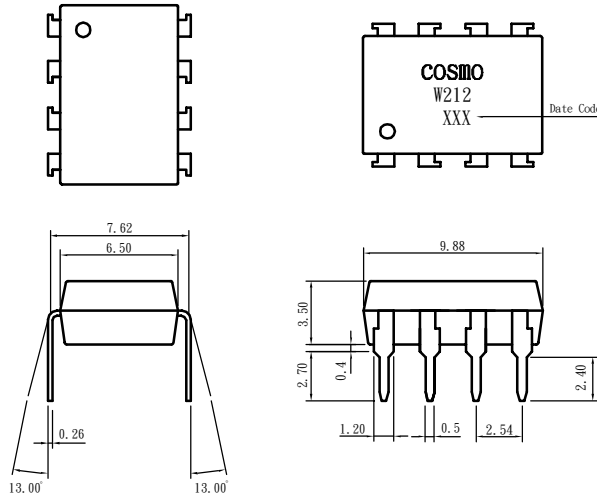


# PRODUCT SPECIFICATION

DATE: 11/18/2003

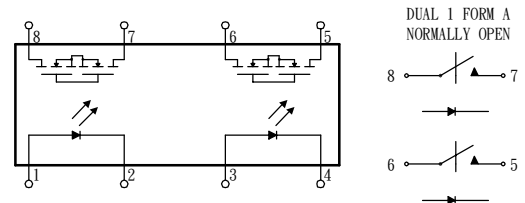
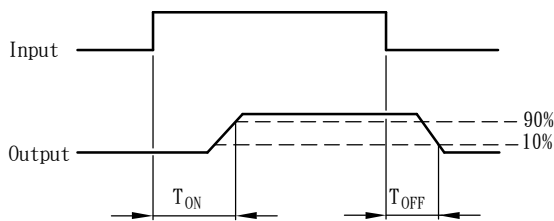
<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQW212</b>	NO. 60M20014	REV.
		SHEET 1 OF 7	2

• 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 (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 . . . . . 3750VAC<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  $25^\circ\text{C}$  . . . . . 2.5mW/ $^\circ\text{C}$   
 Storage Temperature Range . . . . .  $-40$  to  $+150^\circ\text{C}$   
 Operating Temperature Range . . . . .  $-40$  to  $+85^\circ\text{C}$   
 Junction Temperature . . . . .  $100^\circ\text{C}$   
**Soldering Temperature, 2mm from case, 10 sec.  $260^\circ\text{C}$**

# PRODUCT SPECIFICATION

DATE: 11/18/2003

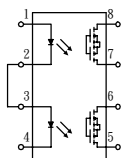
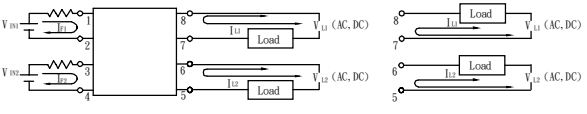
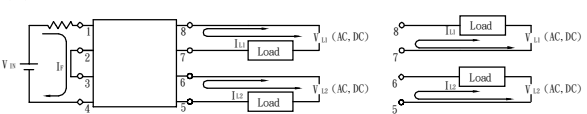
<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT	NO. 60M20014	REV.
	<b>KAQW212</b>	SHEET 2 OF 7	2

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>		1.2	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
<b>Detector (Output)</b>						
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	2.50	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
KAQW212		2a	AC/DC	-	<p>(1) Two independent 1 Form A use</p>  <p>(2) 2 Form A use</p> 

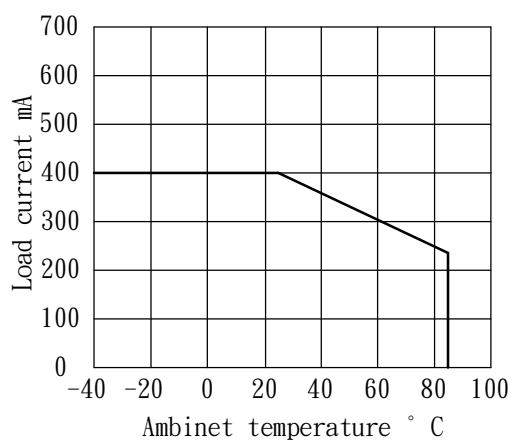
# PRODUCT SPECIFICATION

DATE: 11/18/2003

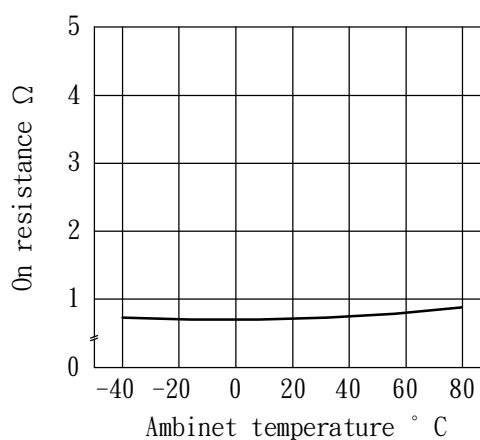
<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQW212</b>	NO. 60M20014	REV.
		SHEET 3 OF 7	2

## DATA CURVE

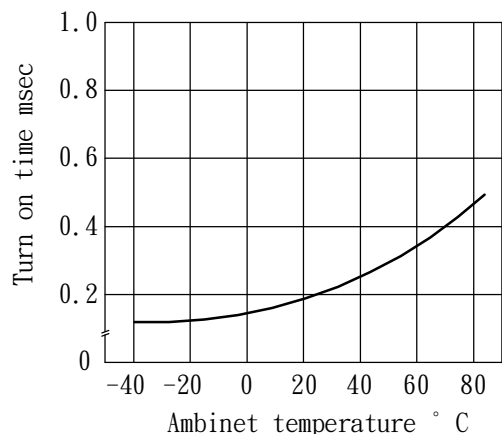
Load current vs. ambient temperature  
 Allowable ambient temperature:  
 -40°C to +85°C



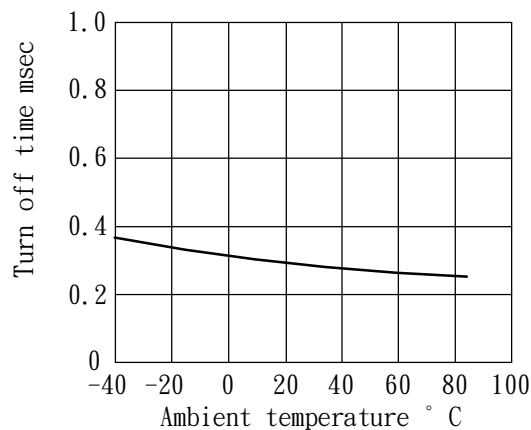
On resistance vs. ambient temperature  
 Across terminals 5,7 and 6,8 pin  
 LED current: 5mA  
 Continuous load current: 130 mA(DC)



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)

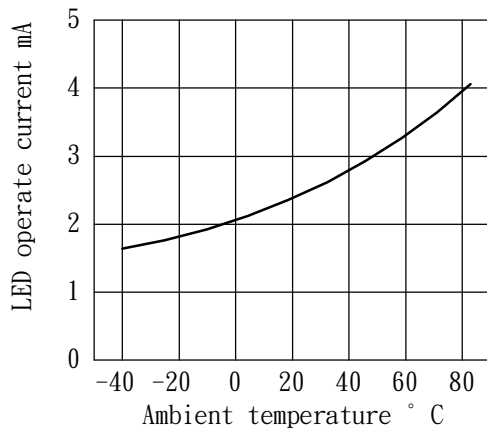


# PRODUCT SPECIFICATION

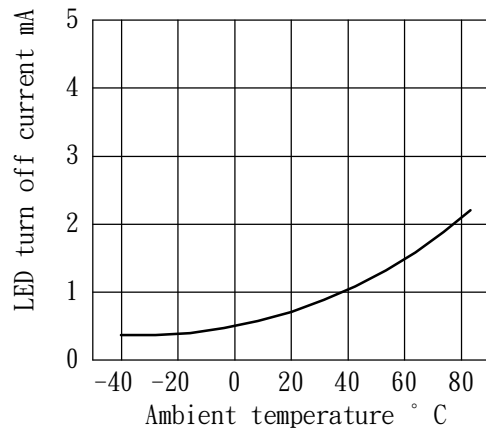
DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQW212</b>	NO. 60M20014	REV.
		SHEET 4 OF 7	2

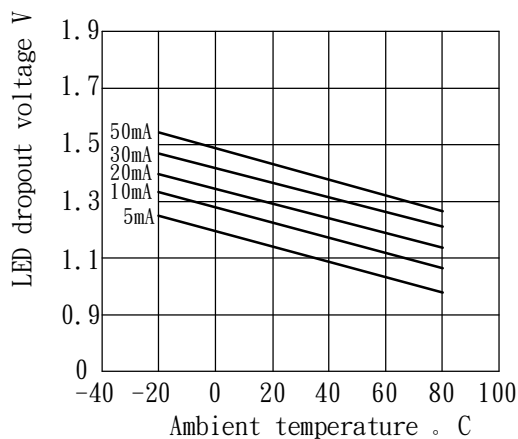
LED operate vs. ambient temperature  
 Load voltage: 60V(DC)  
 Continuous load current: 130mA(DC)



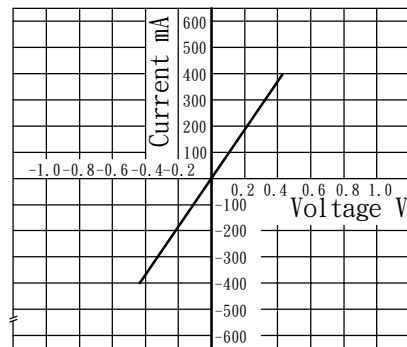
LED turn off current vs. ambient temperature  
 Load voltage: 60V(DC)  
 Continuous load current: 130mA(DC)



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 5,7 and 6,8 pin  
 Ambient temperature: 25° C

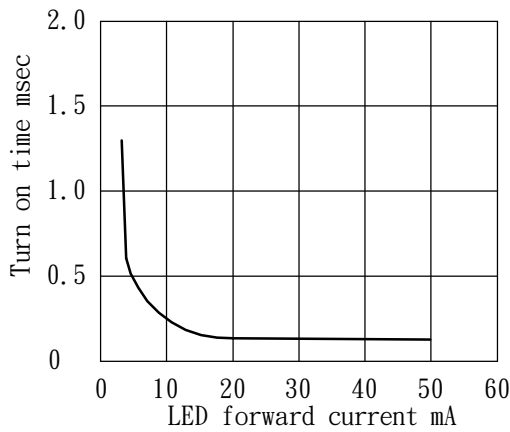


# PRODUCT SPECIFICATION

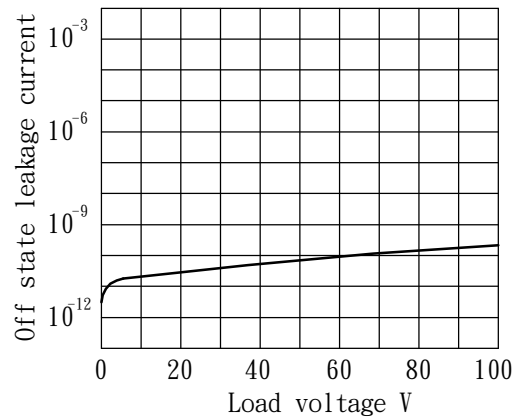
DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQW212</b>	NO. 60M20014	REV.
		SHEET 5 OF 7	2

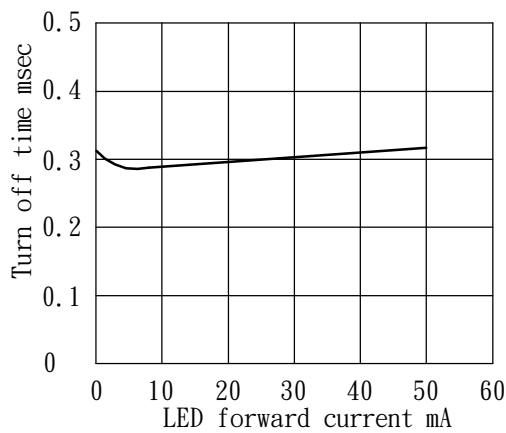
LED forward current vs. turn on time  
 Across terminals 5, 7 and 6, 8 pin; Load voltage: 60V(DC); Continuous load current: 130mA(DC); Ambient temperature: 25° C



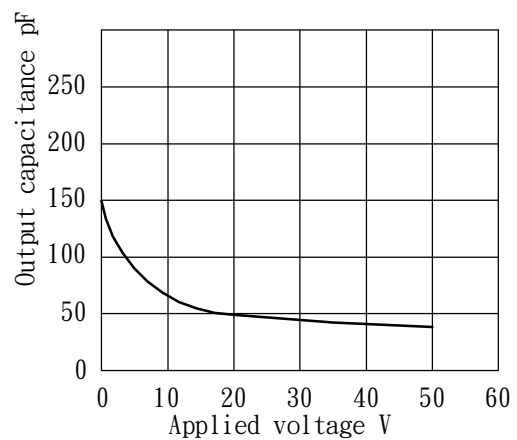
Off state leakage current  
 Across terminals 5, 7 and 6, 8 pin  
 Ambient temperature: 25° C



LED forward current vs. turn off time  
 Across terminals 5, 7 and 6, 8 pin; Load voltage: 60V(DC); Continuous load current: 130 mA(DC); Ambient temperature: 25° C



Applied voltage vs. output capacitance  
 Across terminals 5, 7 and 6, 8 pin  
 Frequency: 1MHz; Ambient temperature: 25° C



# PRODUCT SPECIFICATION

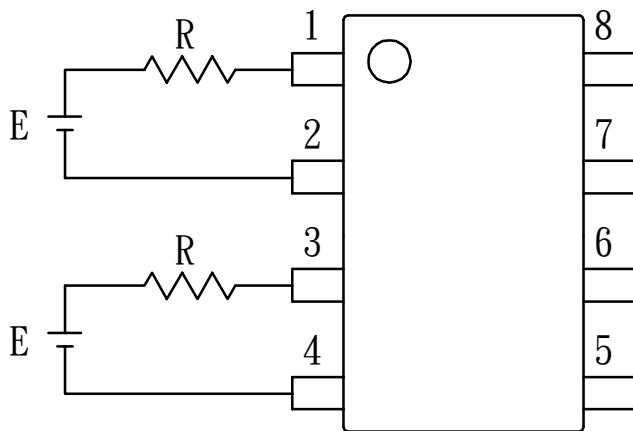
DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQW212</b>	NO. 60M20014	REV.
		SHEET 6 OF 7	2

## USING METHODS

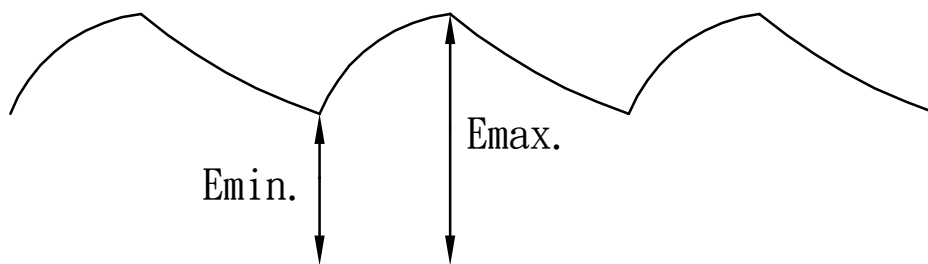
Examples of resistance value to control LED forward current  $I_F$

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



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.



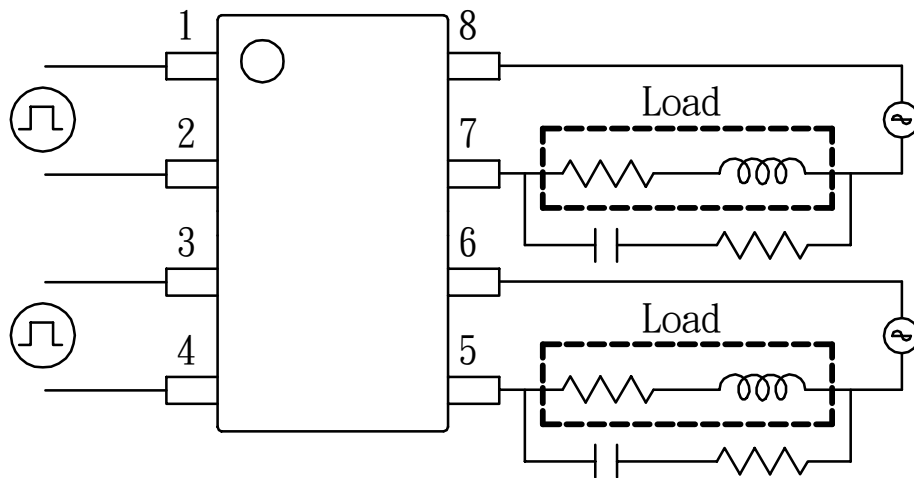
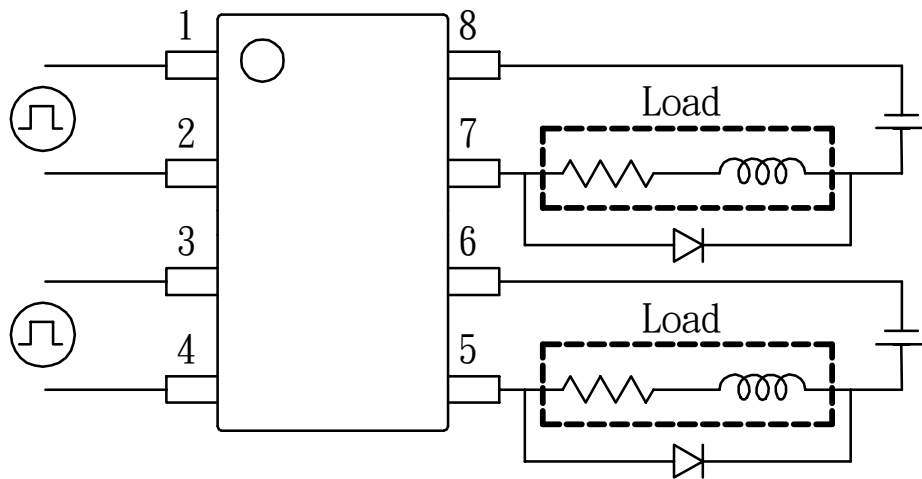
# PRODUCT SPECIFICATION

DATE: 11/18/2003

<b>COSMO</b> ELECTRONICS CORPORATION	SOLID STATE RELAY-MOSFET OUTPUT <b>KAQW212</b>	NO. 60M20014	REV.
		SHEET 7 OF 7	2

## USING METHODS

Regulate the spike voltage generated on the inductive load as follows



R-C Snubber