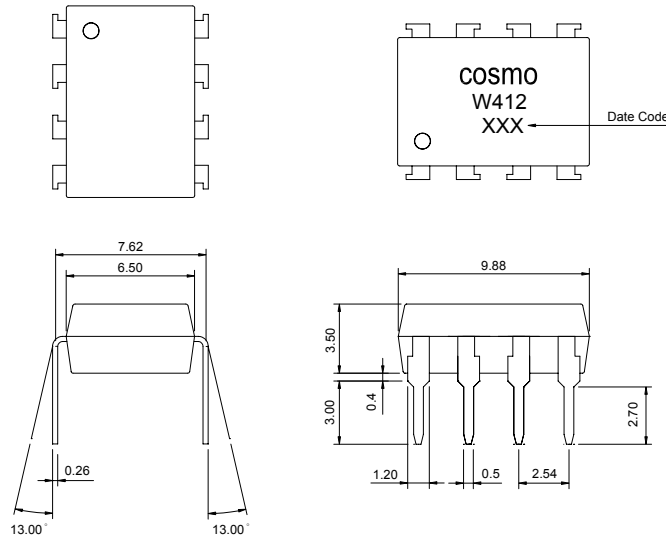


PRODUCT SPECIFICATION

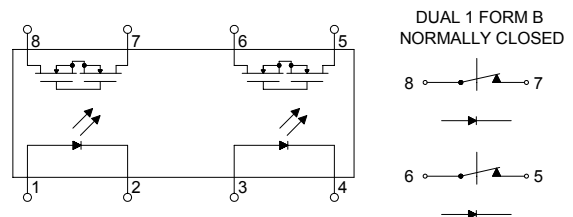
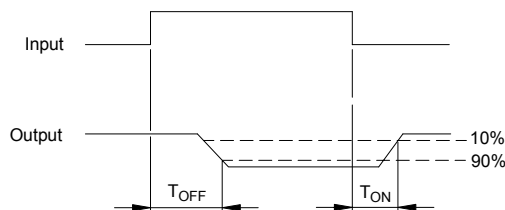
DATE : 09/01/2006

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW412	NO.60M21005	VER. 1
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● OUTSIDE DIMENSION :



● Operate / Reverse time



● Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Emitter (Input)		Detector (Output)	
Reverse Voltage	5.0V	Output Breakdown Voltage	$\pm 60\text{V}$
Continuous Forward Current	50mA	Continuous Load Current	$\pm 200\text{mA}$
Peak Forward Current	1A	Power Dissipation	500mW
Power Dissipation	100mW		
Derate Linearly from 25°C	1.3mW/ $^\circ\text{C}$		
General Characteristics			
Isolation Test Voltage	5000VACrms	Storage Temperature Range	-40°C to $+125^\circ\text{C}$
Isolation Resistance		Operating Temperature Range ...	-40°C to $+85^\circ\text{C}$
Viso=500V , $T_a=25^\circ\text{C}$	$\geq 10^{10}\Omega$	Junction Temperature	100 $^\circ\text{C}$
Total Power Dissipation	550mW	Soldering Temperature ,	
Derate Linearly from 25°C	2.5mW/ $^\circ\text{C}$	2mm from case , 10 sec	260 $^\circ\text{C}$

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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 _{F OFF}	V _L =±20V，I _L ≤5μA			5	mA
Recovery Input Current			I _{F ON}	V _L =±20V，I _L =100mA，t=10mS	0.2			mA
Detector（Output）								
Output Breakdown Voltage			V _B	I _B =50μA	60			V
Output Off-State Leakage			I _{T OFF}	V _T =100V，I _F =10mA		0.2	2	μ A
I/O Capacitance			C _{ISO}	I _F =0，f=1MHz		6		pF
ON Resistance	Connection	A	R _{ON}	I _L =100mA，I _F =0mA		2.5	5	Ω
		B				1.25	2.5	
		C				0.63	1.25	
Operate Time			T _{OFF}	I _F =10mA，V _L =±20V t=10ms，I _L =±100mA		0.6	1.5	ms
Reverse Time			T _{ON}			0.3	1.5	ms

● MOS Relay Schematic and Wiring Diagrams

Schematic	Output configuration	Load	Connection	Wiring Diagrams
	2b	AC/DC	-	<p>(1) Two independent 1 Form B use</p> <p>(2) 2 Form B use</p>

PRODUCT SPECIFICATION

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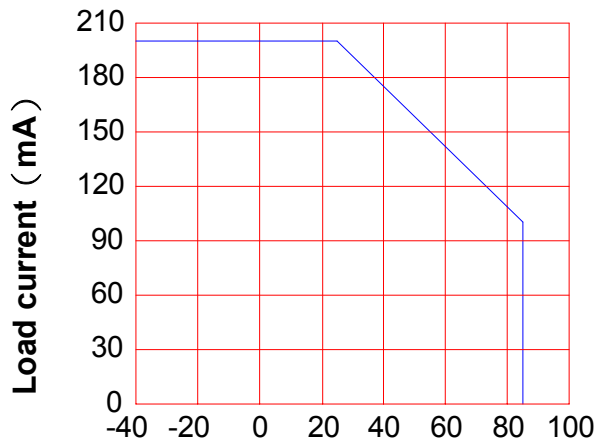
SOLID STATE RELAY - MOSFET OUTPUT
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SHEET 3 OF 7

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1

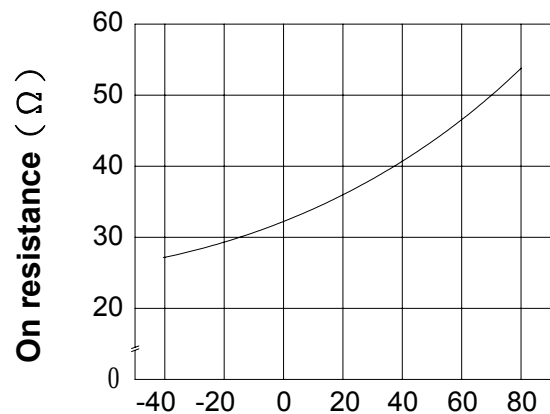
● Data Curve

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



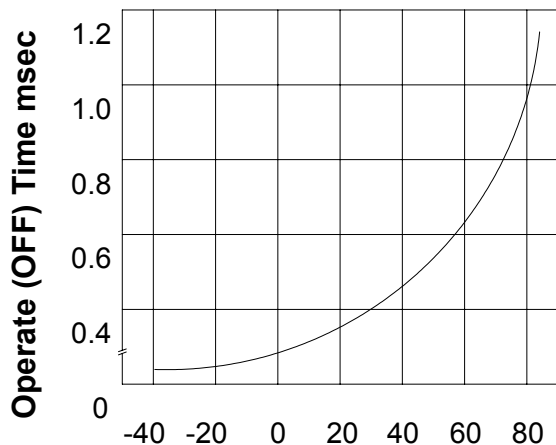
Ambient temperature Ta (°C)

On resistance vs. ambient temperature
across terminals 5 , 7 and 6 , 8 pin
LED current : 5mA
Continuous load current : 200mA (DC)



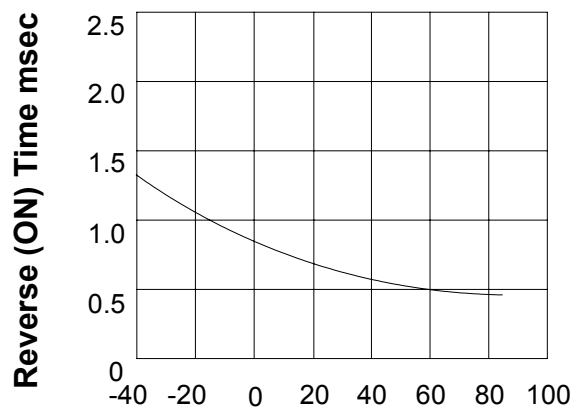
Ambient temperature Ta (°C)

Operate (OFF) time vs. ambient temperature
Load voltage 60V (DC)
LED current : 5mA
Continuous load current : 200mA (DC)



Ambient temperature Ta (°C)

Reverse (ON) time vs. ambient temperature
Load voltage 60V (DC)
LED current : 5mA
Continuous load current : 200mA (DC)



Ambient temperature Ta (°C)

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SOLID STATE RELAY - MOSFET OUTPUT
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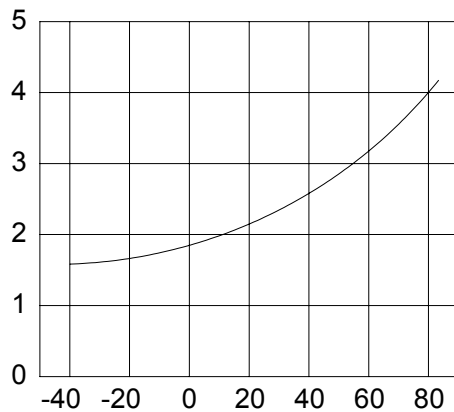
VER.
1

LED operate (OFF) current vs.
ambient temperature

Load Voltage : 60V (DC)

Continuous load current : 200mA (DC)

LED operate (OFF) current (mA)



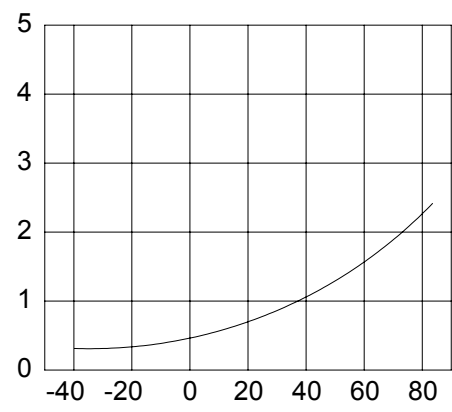
Ambient temperature Ta (°C)

LED Reverse (ON) current vs.
ambient temperature

Load Voltage : 60V (DC)

Continuous load current : 200mA (DC)

LED Reverse (ON) current (mA)

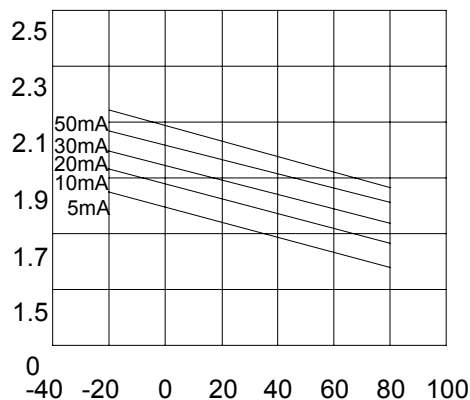


Ambient temperature Ta (°C)

LED dropout voltage vs.
ambient temperature

LED current : 5 to 50mA

LED dropout voltage (V)



Ambient temperature Ta (°C)

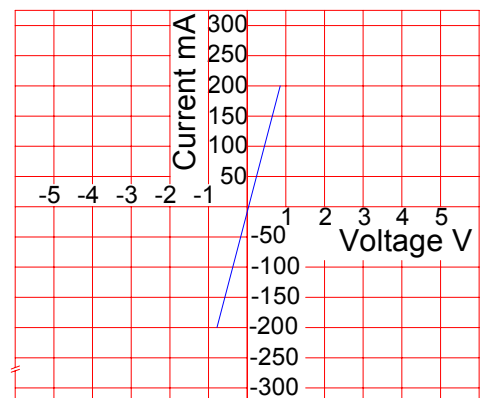
Voltage vs. current characteristics of
output at MOSFET portion

Measured portion : across terminals

5 , 7 and 6 , 8 pin

Ambient temperature : 25°C

Voltage VS. Current
Characteristics



PRODUCT SPECIFICATION

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SOLID STATE RELAY - MOSFET OUTPUT

KAQW412

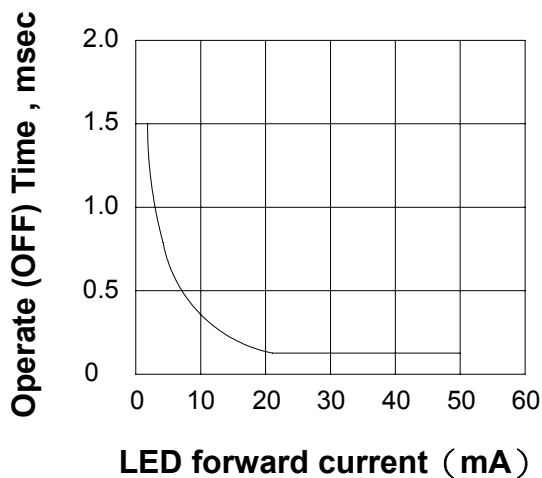
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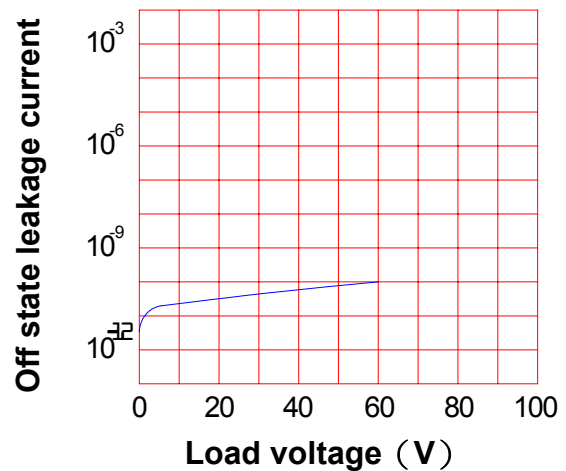
VER.

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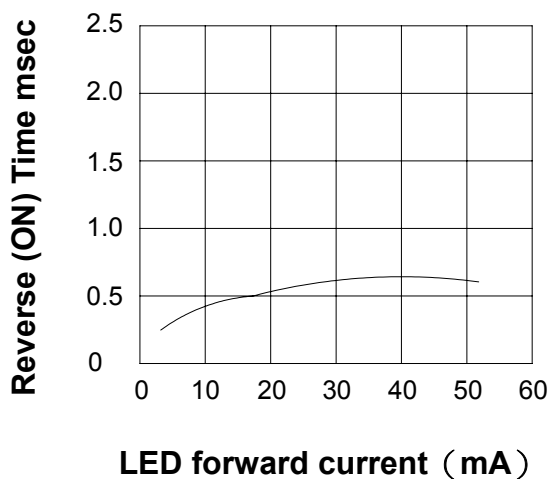
LED forward current vs. Operate (OFF) time across terminals 5 , 7 and 6 , 8 pin
Load voltage : 60V (DC)
Continuous load current : 200mA (DC)
Ambient temperature : 25°C



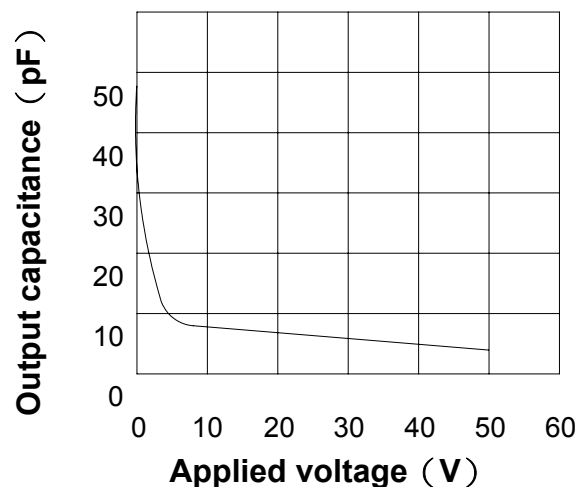
Off state leakage current
Across terminals 5 , 7 and 6 , 8 pin
Ambient temperature : 25°C



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



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



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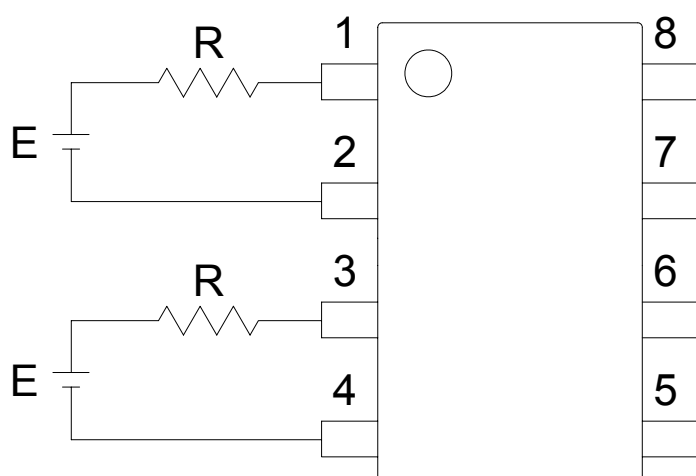
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● USING METHODS

Examples of resistance value to control LED forward current (I_F)

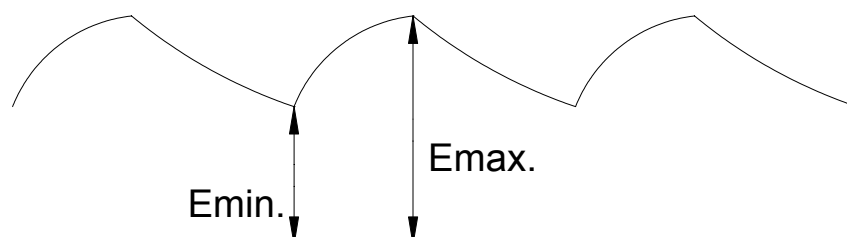
SSR-MOSFET OUTPUT

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



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

- (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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● USING METHODS

Regulate the spike voltage generated on the inductive load as follows :

