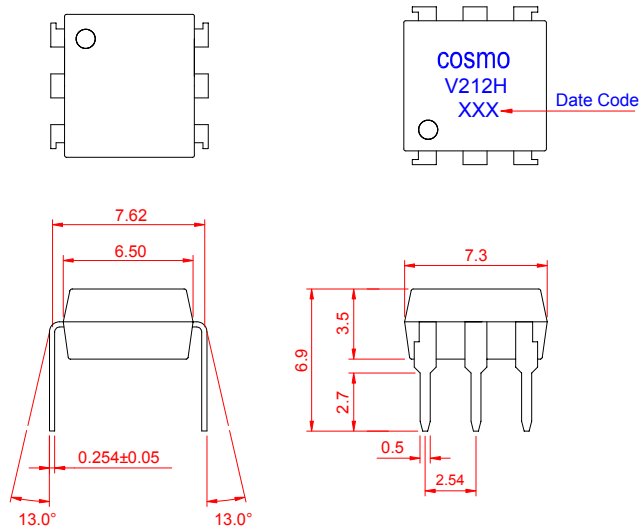


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DATE : 03/01/2005

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQV212H	Preliminary	REV. 0
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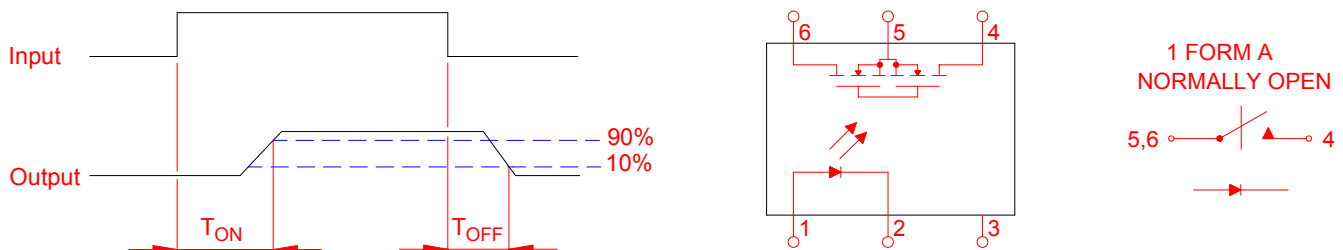
● OUTSIDE DIMENSION :



Unit : mm

Tolerance : $\pm 0.2\text{mm}$

● Turn On / Turn Off time



● Absolute Maximum Ratings

(Ta=25°C)

Emitter (Input)		Detector (Output)	
Reverse Voltage	5.0V	Output Breakdown Voltage	$\pm 60\text{V}$
Continuous Forward Current	50mA	Continuous Load Current	$\pm 400\text{mA}$
Peak Forward Current	1A	Power Dissipation	500mW
Power Dissipation	100mW		
Derate Linearly from 25°C	1.3mW/°C		
General Characteristics			
Isolation Test Voltage	5000VACrms	Storage Temperature Range	-40°C to +125°C
Isolation Resistance		Operating Temperature Range ...	-40°C to +85°C
Vio=500V , Ta=25°C	$\geq 10^{10}\Omega$	Junction Temperature	100°C
Total Power Dissipation	550mW	Soldering Temperature ,	
Derate Linearly from 25°C	2.5mW/°C	2mm from case , 10 sec	260°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 _{FON}	V _L =±20V，I _L =100mA，t=10ms			5.0	mA
Recovery Input Current			I _{FOFF}	V _L =±20V，I _L ≤5μA	0.2			mA
Detector（Output）								
Output Breakdown Voltage			V _B	I _B =50μA	60			V
Output Off-State Leakage			I _{TOFF}	V _T =100V，I _F =0mA		0.2	1	μA
I/O Capacitance			C _{ISO}	I _F =0，f=1MHz		6		pF
ON Resistance	Connection	A	R _{ON}	I _L =100mA，I _F =10mA		0.83	2.50	Ω
		B				0.44	1.25	
		C				0.25	0.63	
Turn-On Time			T _{ON}	I _F =10mA，V _L =±20V t=10ms，I _L =±100mA		0.2	1.5	ms
Turn-Off Time			T _{OFF}			0.3	1.5	ms

● Schematic and Wiring Diagrams

Schematic	Output Configuration	Load	Connection	Wiring Diagrams
	1a	AC/DC	A	
		DC	B	
		DC	C	

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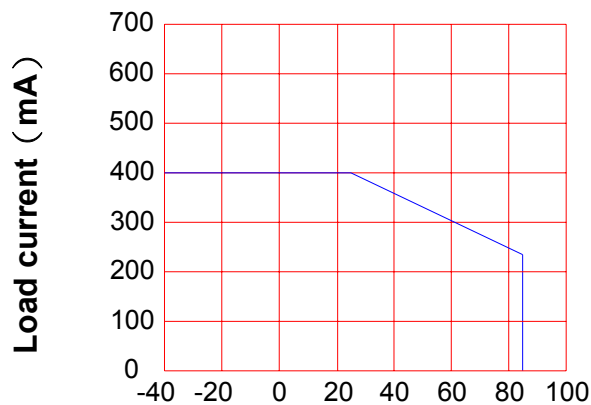
SOLID STATE RELAY - MOSFET OUTPUT
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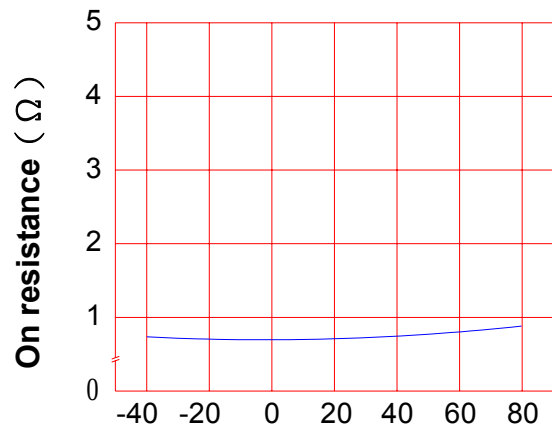
● Data Curve

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



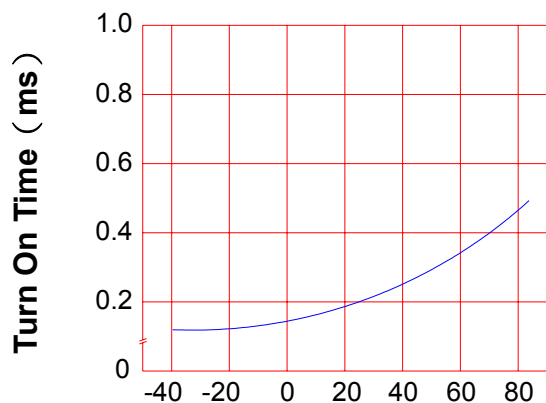
Ambient temperature Ta (°C)

On resistance vs. ambient temperature
across terminals 4 and 6 pin
LED current : 5mA
Continuous load current : 400mA (DC)



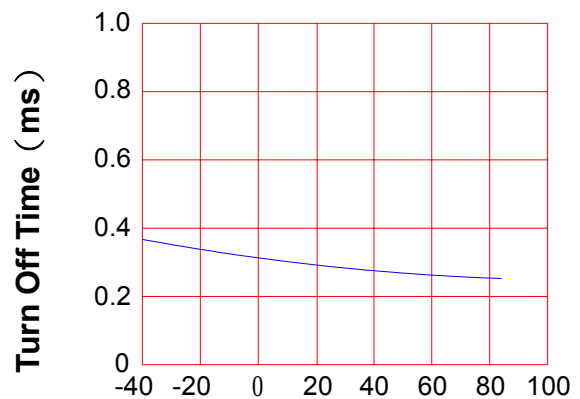
Ambient temperature Ta (°C)

Turn On Time vs. ambient temperature
Load voltage 60V (DC)
LED current : 5mA
Continuous load current : 400mA (DC)



Ambient temperature Ta (°C)

Turn Off Time vs. ambient temperature
Load voltage 60V (DC)
LED current : 5mA
Continuous load current : 400mA (DC)



Ambient temperature Ta (°C)

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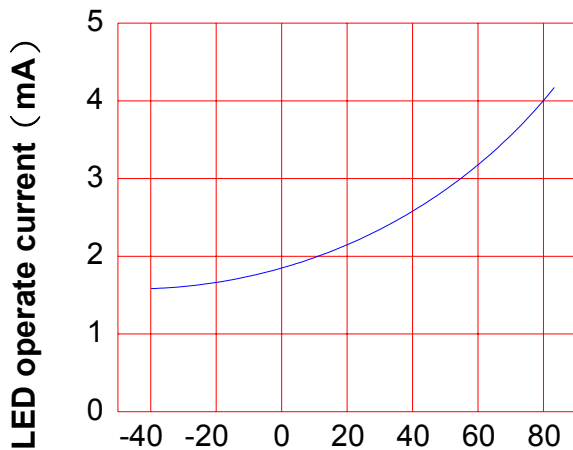
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LED operate current vs.
ambient temperature

Load Voltage : 60V (DC)

Continuous load current : 400mA (DC)

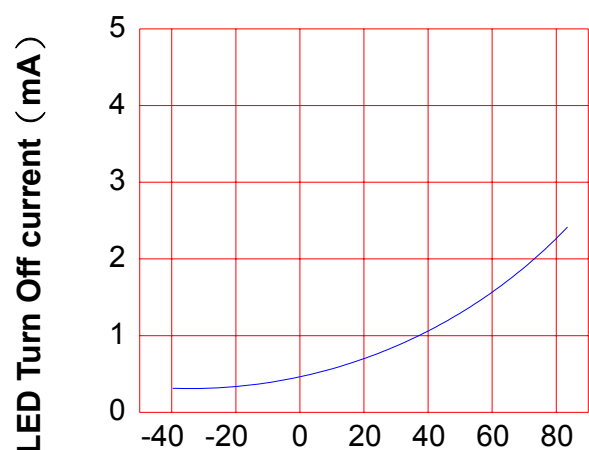


Ambient temperature Ta (°C)

LED Turn Off current vs.
ambient temperature

Load Voltage : 60V (DC)

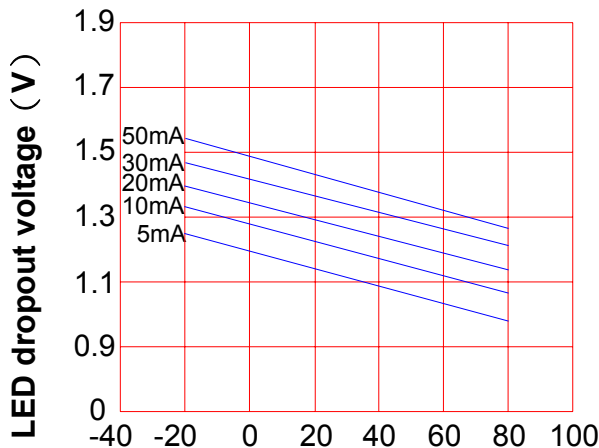
Continuous load current : 400mA (DC)



Ambient temperature Ta (°C)

LED dropout voltage vs.
ambient temperature

LED current : 5 to 50mA

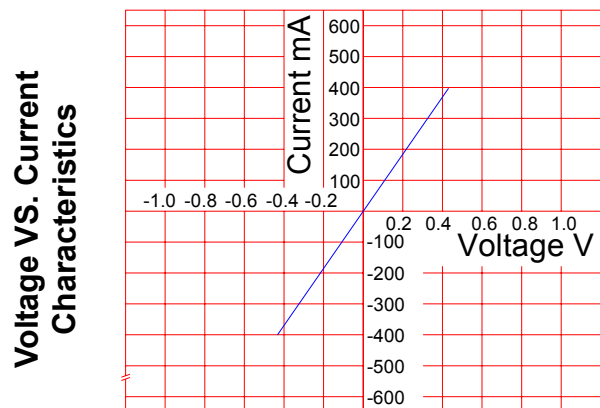


Ambient temperature Ta (°C)

Voltage vs. current characteristics
of output at MOSFET portion

Measured portion : across terminals
4 and 6 pin

Ambient temperature : 25°C



Ambient temperature : 25°C

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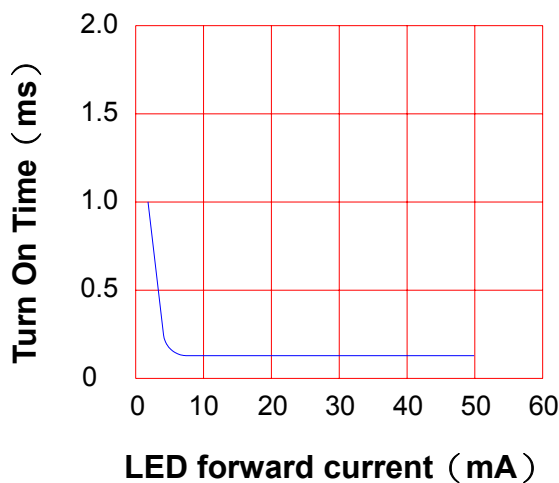
LED forward current vs. Turn On Time

Across terminals 4 and 6pin

Load voltage : 60V (DC)

Continuous load current : 400mA (DC)

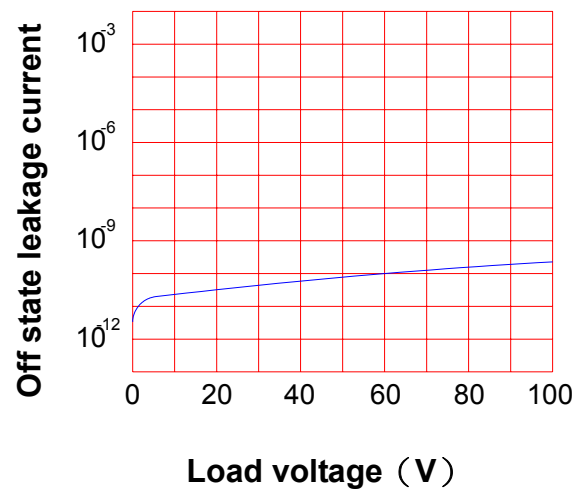
Ambient temperature : 25°C



Off state leakage current

Across terminals 4 and 6 pin

Ambient temperature : 25°C



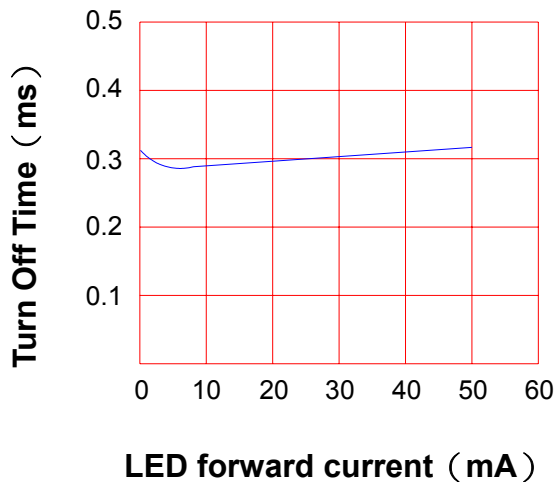
LED forward current vs. reverse(ON) time

Across terminals 4 and 6 pin

Load voltage : 60V (DC)

Continuous load current : 400mA (DC)

Ambient temperature : 25°C

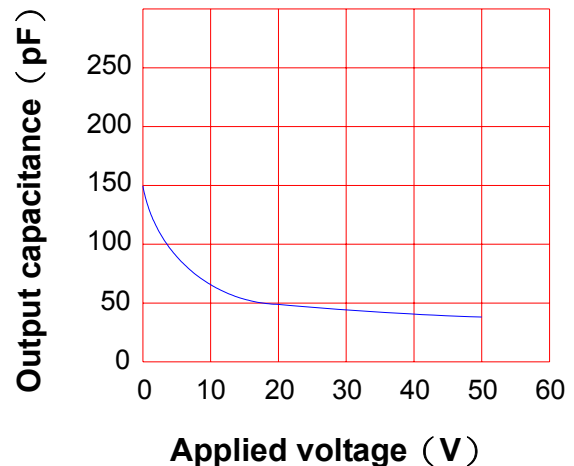


Applied voltage vs. output capacitance

Across terminals 4 and 6 pin

Frequency : 1MHz

Ambient temperature : 25°C



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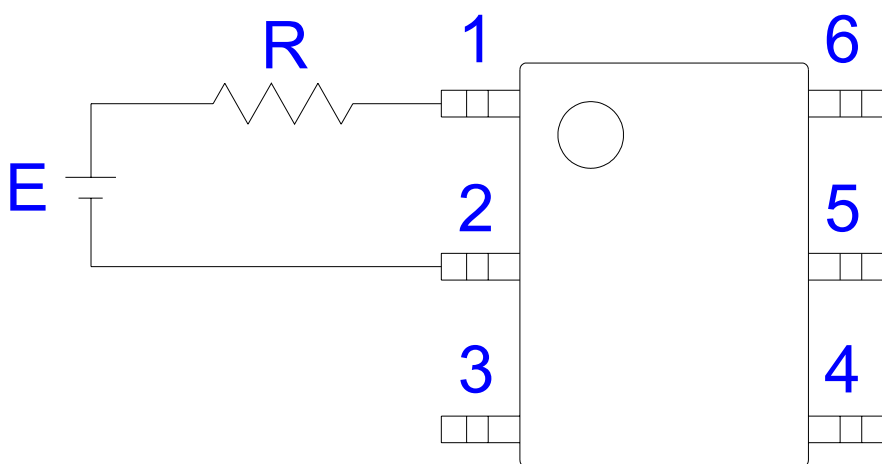
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● USING METHODS

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

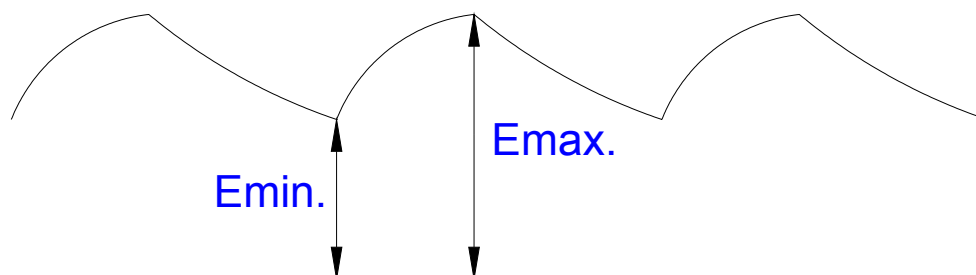
SSR-MOSFET OUTPUT

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



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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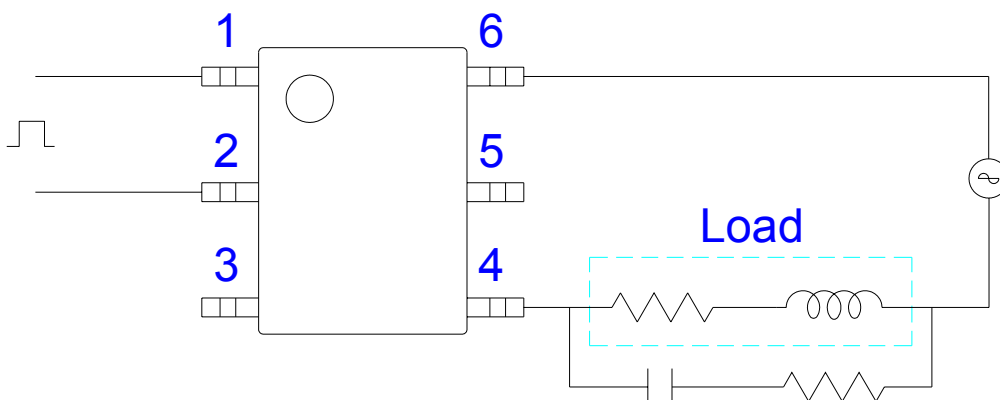
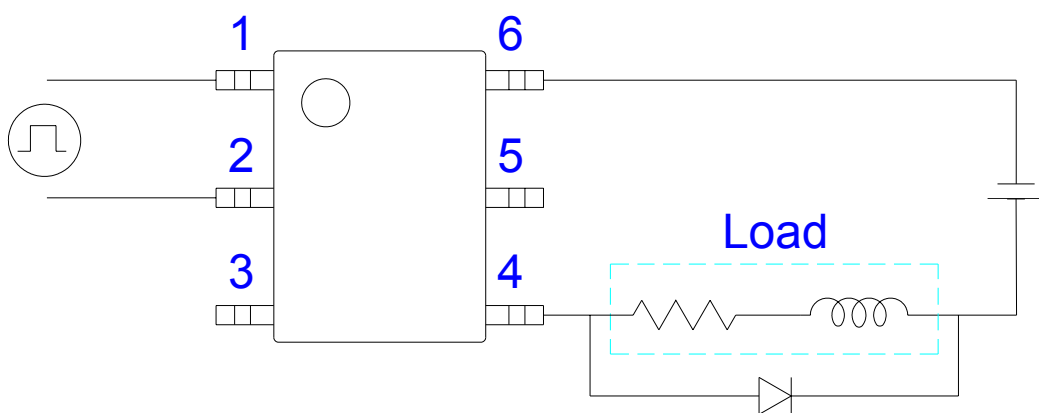
SOLID STATE RELAY - MOSFET OUTPUT
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● USING METHODS

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



R-C Snubber