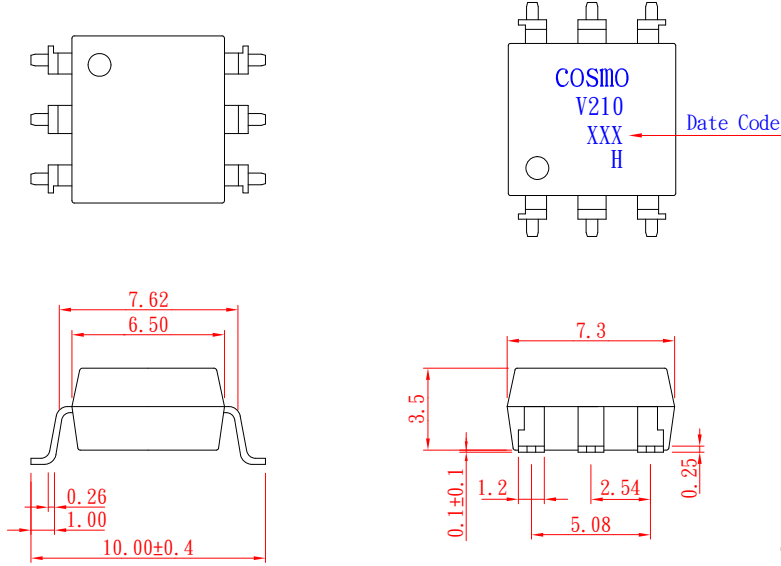


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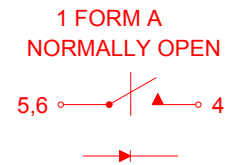
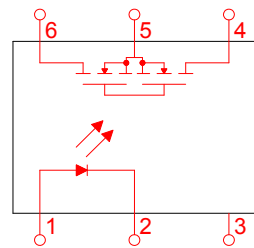
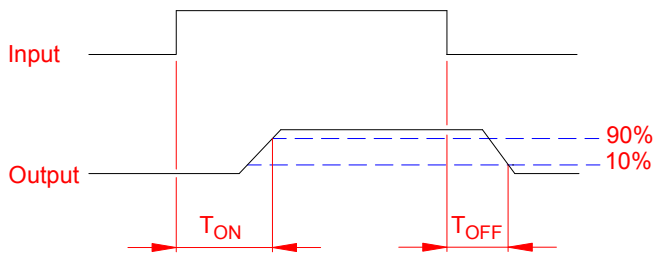
cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQV210HA	NO.61M10018	REV. 3
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● OUTSIDE DIMENSION :



Unit : mm
Tolerance : ± 0.2 mm

● Turn On / Turn Off time



● Absolute Maximum Ratings

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

Emitter (Input)		Detector (Output)	
Reverse Voltage	5.0V	Output Breakdown Voltage	± 350 V
Continuous Forward Current	50mA	Continuous Load Current	± 130 mA
Peak Forward Current	1A	Power Dissipation	500mW
Power Dissipation	100mW		
Derate Linearly from 25°C	$1.3\text{mW}/^\circ\text{C}$		
General Characteristics			
Isolation Test Voltage	5000VACrms	Storage Temperature Range	-40°C to $+125^\circ\text{C}$
Isolation Resistance		Operating Temperature Range ...	-40°C to $+85^\circ\text{C}$
$V_{io}=500\text{V}$, $T_a=25^\circ\text{C}$	$\geq 10^{10}\Omega$	Junction Temperature	100°C
Total Power Dissipation	550mW	Soldering Temperature ,	
Derate Linearly from 25°C	$2.5\text{mW}/^\circ\text{C}$	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	$I_F=10\text{mA}$		1.2	1.5	V	
Operation Input Current	$I_{F\text{ON}}$	$V_L=\pm 20\text{V}$, $I_L=100\text{mA}$, $t=10\text{ms}$			5.0	mA	
Recovery Input Current	$I_{F\text{OFF}}$	$V_L=\pm 20\text{V}$, $I_L \leq 5\mu\text{A}$	0.2			mA	
Detector (Output)							
Output Breakdown Voltage	V_B	$I_B=50\mu\text{A}$	350			V	
Output Off-State Leakage	$I_{T\text{OFF}}$	$V_T=350\text{V}$, $I_F=0\text{mA}$		0.2	1	μA	
I/O Capacitance	C_{ISO}	$I_F=0$, $f=1\text{MHz}$		6		pF	
ON Resistance	Connection	A	$I_L=100\text{mA}$, $I_F=10\text{mA}$		20	30	Ω
		B			10	15	
		C			5	7.5	
Turn-On Time	T_{ON}	$I_F=10\text{mA}$, $V_L=\pm 20\text{V}$ $t=10\text{ms}$, $I_L=\pm 100\text{mA}$		0.3	1.0	ms	
Turn-Off Time	T_{OFF}			0.7	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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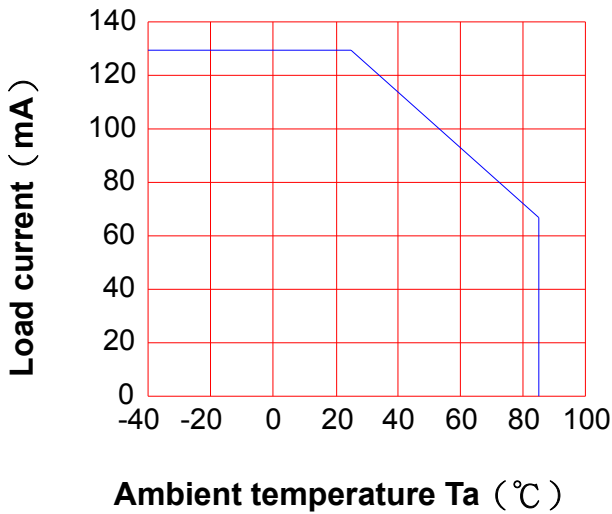
SOLID STATE RELAY - MOSFET OUTPUT
KAQV210HA

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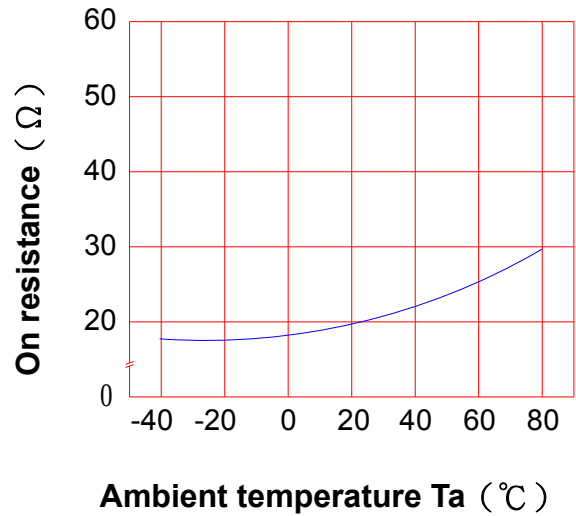
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● Data Curve

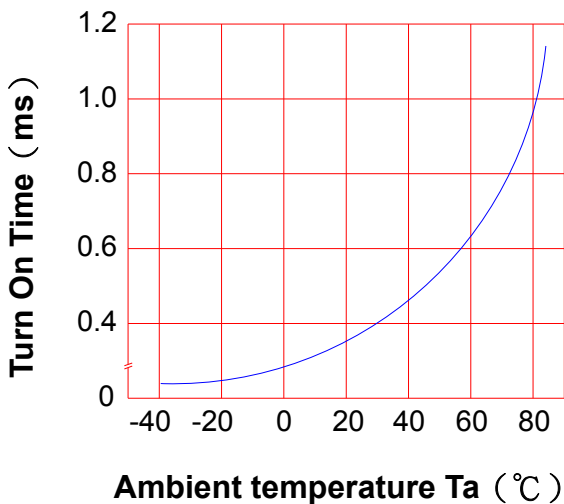
Load current vs. ambient temperature
Allowable ambient Temperature :
-40°C to +85°C



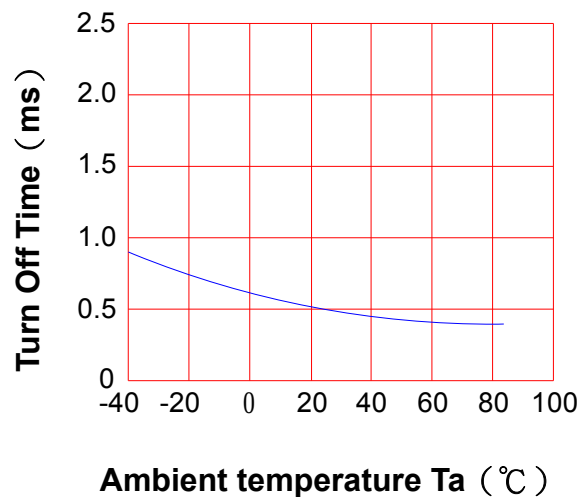
On resistance vs. ambient temperature
across terminals 4 and 6 pin
LED current : 5mA
Continuous load current : 130mA (DC)



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



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



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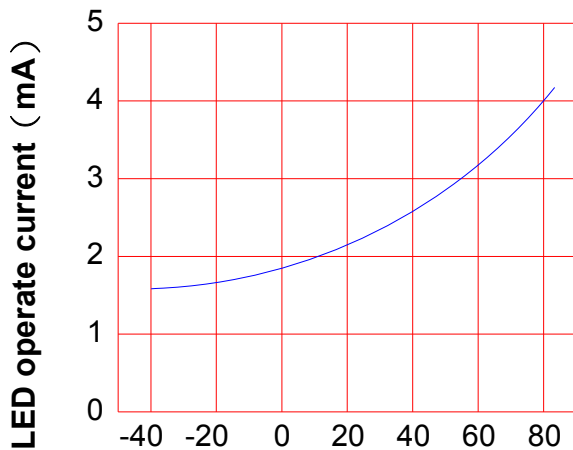
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KAQV210HA

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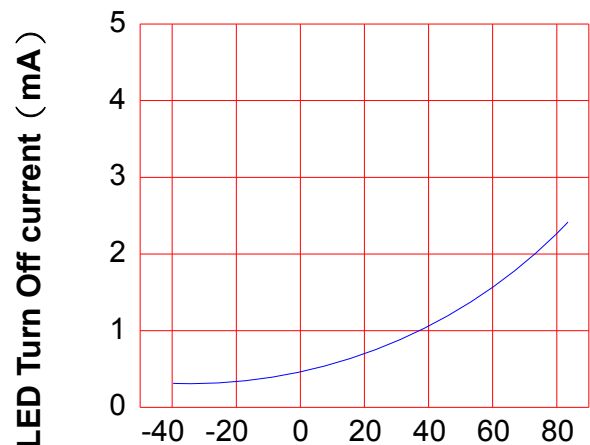
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LED operate current vs.
ambient temperature
Load Voltage : 350V (DC)
Continuous load current : 130mA (DC)



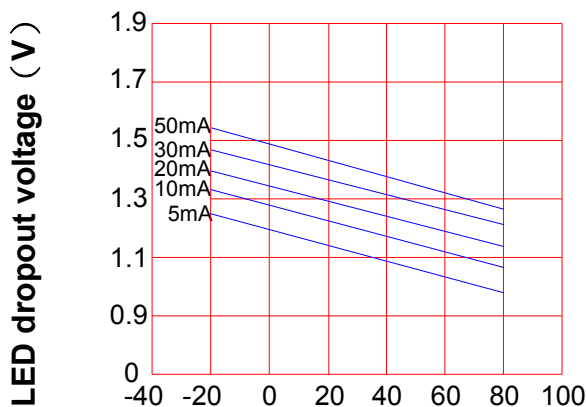
Ambient temperature Ta (°C)

LED Turn Off current vs.
ambient temperature
Load Voltage : 350V (DC)
Continuous load current : 130mA (DC)



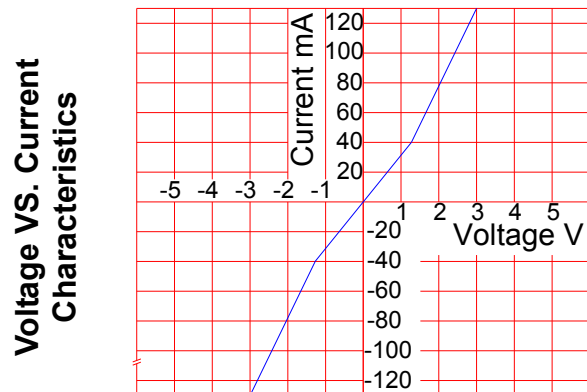
Ambient temperature Ta (°C)

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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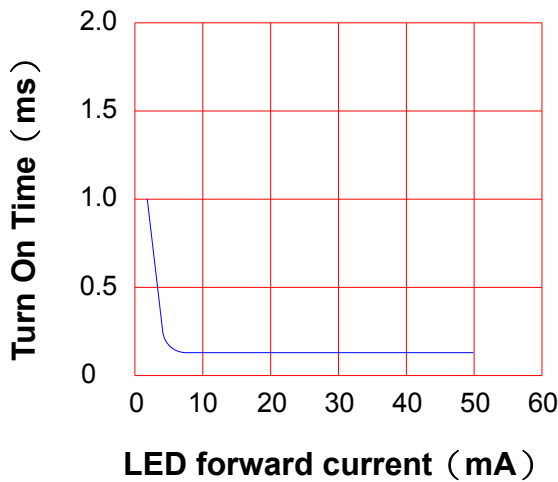
LED forward current vs. Turn On Time

Across terminals 4 and 6pin

Load voltage : 350V (DC)

Continuous load current : 130mA (DC)

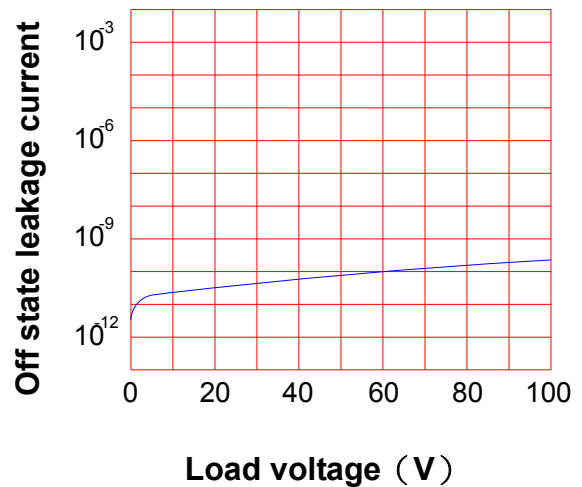
Ambient temperature : 25°C



Off state leakage current

Across terminals 4 and 6 pin

Ambient temperature : 25°C



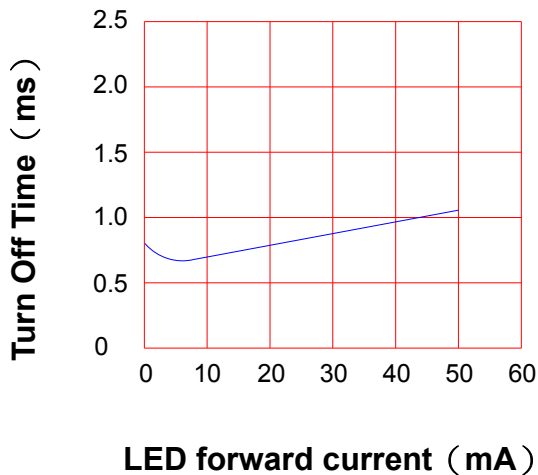
LED forward current vs. reverse(ON) time

Across terminals 4 and 6 pin

Load voltage : 350V (DC)

Continuous load current : 130mA (DC)

Ambient temperature : 25°C

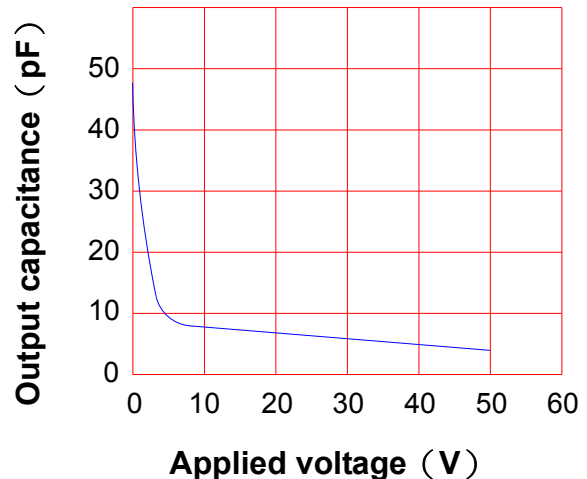


Applied voltage vs. output capacitance

Across terminals 4 and 6 pin

Frequency : 1MHz

Ambient temperature : 25°C



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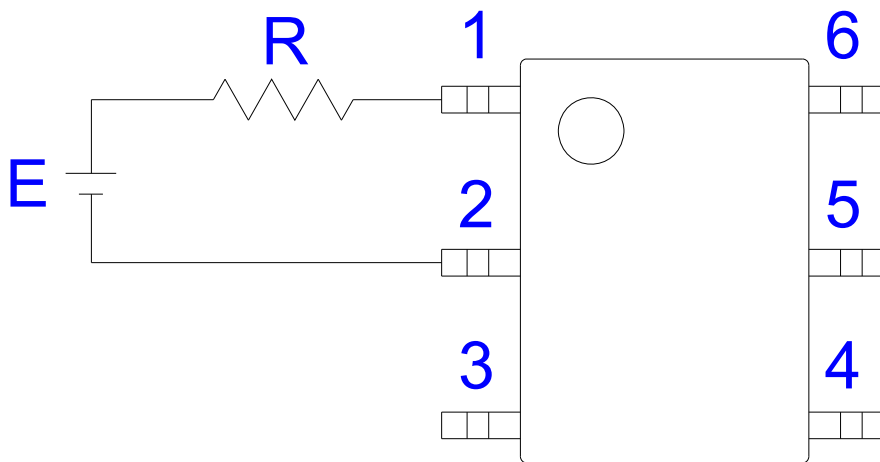
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● USING METHODS

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

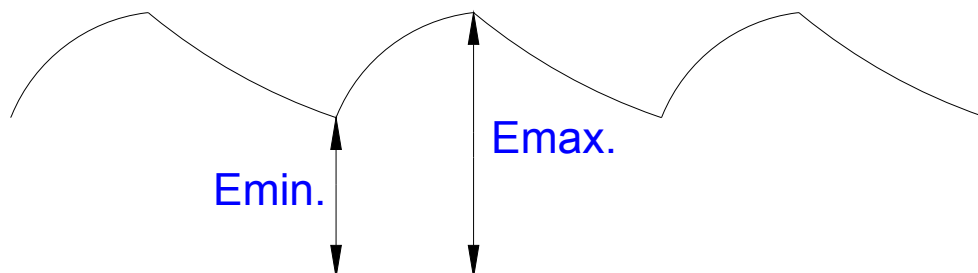
SSR-MOSFET OUTPUT

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



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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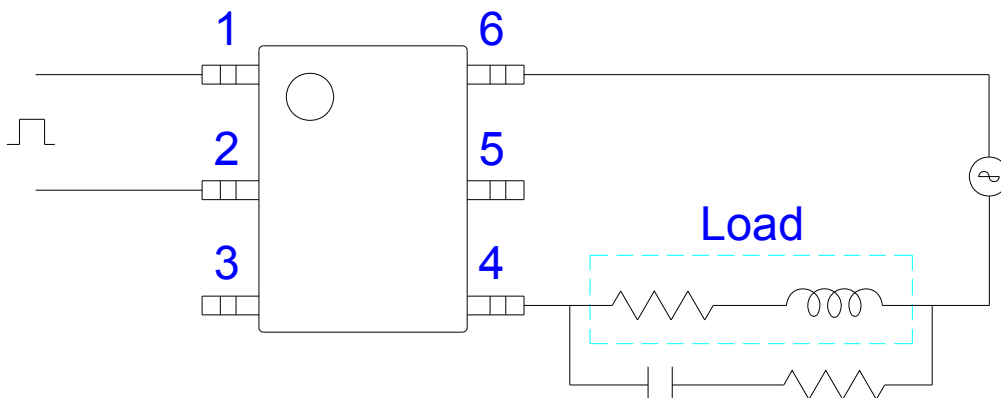
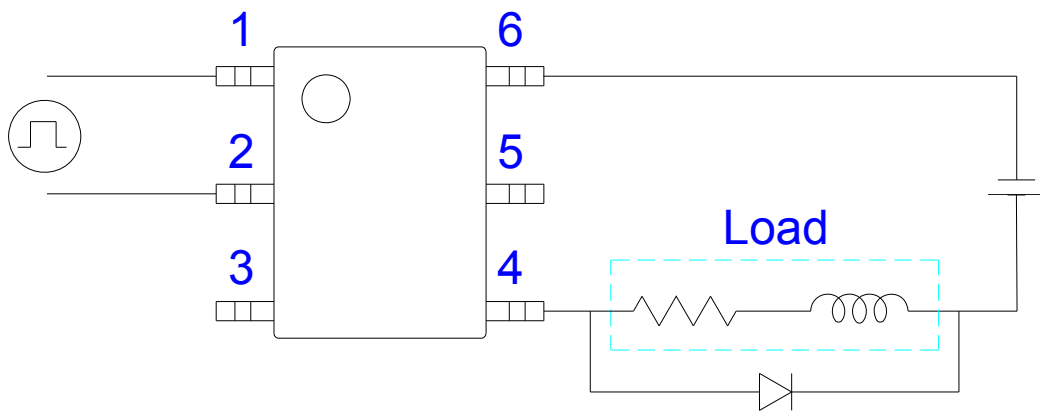
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● USING METHODS

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



R-C Snubber