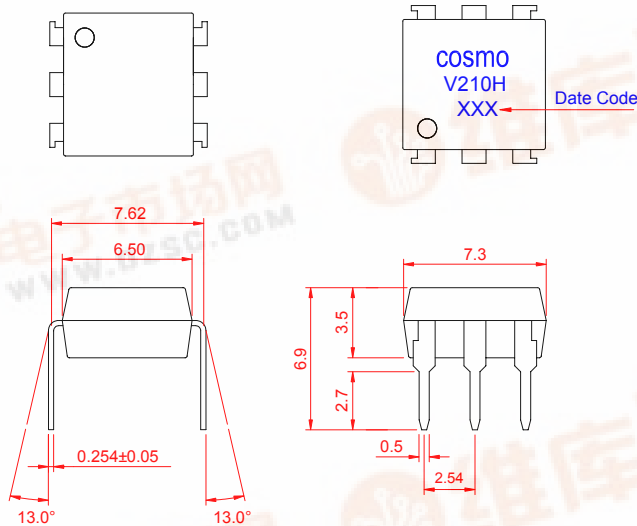


PRODUCT SPECIFICATION

DATE : 03/01/2005

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQV210H	Preliminary	REV.
		SHEET 1 OF 7	0

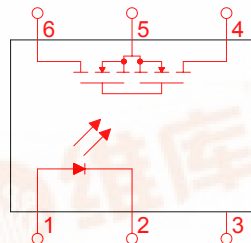
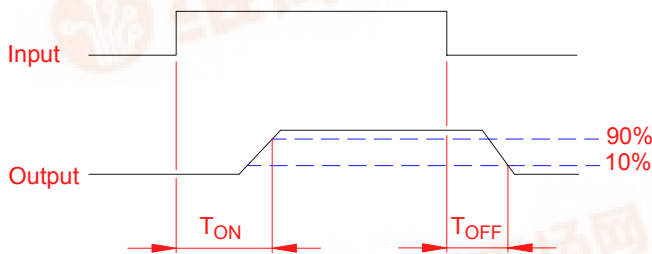
● OUTSIDE DIMENSION :



Unit : mm

Tolerance : ±0.2mm

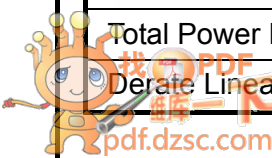
● Turn On / Turn Off time



● Absolute Maximum Ratings

(Ta=25°C)

Emitter (Input)	Detector (Output)
Reverse Voltage 5.0V	Output Breakdown Voltage ± 350V
Continuous Forward Current 50mA	Continuous Load Current ± 130mA
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 ≥ 10 ¹⁰ Ω	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



PRODUCT SPECIFICATION

DATE : 03/01/2005

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQV210H	Preliminary	REV.
		SHEET 2 OF 7	0

● 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	$I_{T\text{OFF}}$	$V_T=100\text{V}$, $I_F=0\text{mA}$		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}	$I_F=10\text{mA}$, $V_L=\pm 20\text{V}$		0.3	1.0	ms	
Turn-Off Time	T_{OFF}	$t=10\text{ms}$, $I_L=\pm 100\text{mA}$		0.7	1.5	ms	

● Schematic and Wiring Diagrams

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

PRODUCT SPECIFICATION

DATE : 03/01/2005

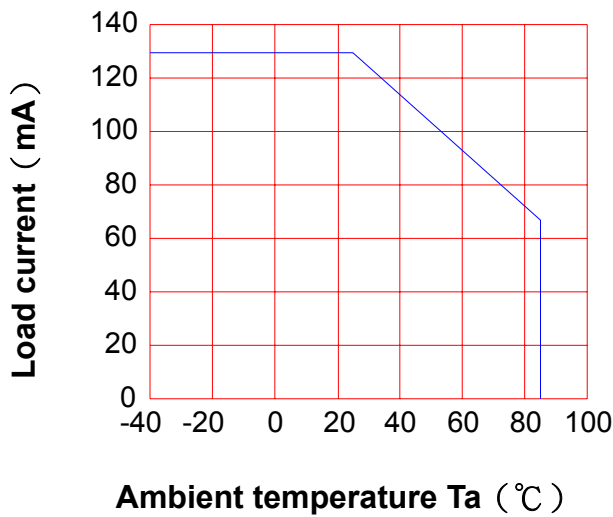
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		SHEET 3 OF 7	0

● Data Curve

Load current vs. ambient temperature

Allowable ambient Temperature :

-40°C to +85°C

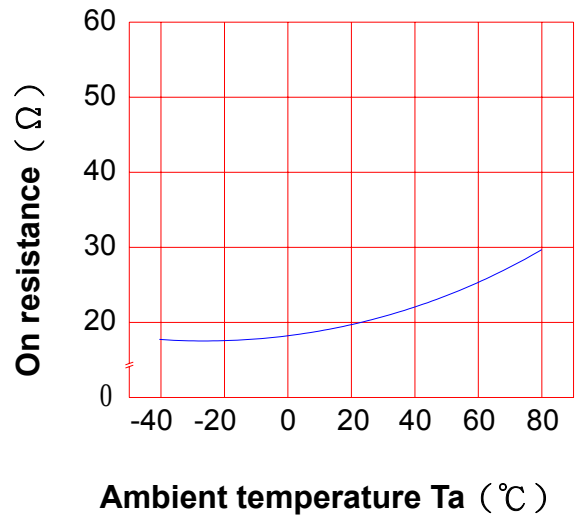


On resistance vs. ambient temperature

across terminals 4 and 6 pin

LED current : 5mA

Continuous load current : 130mA (DC)

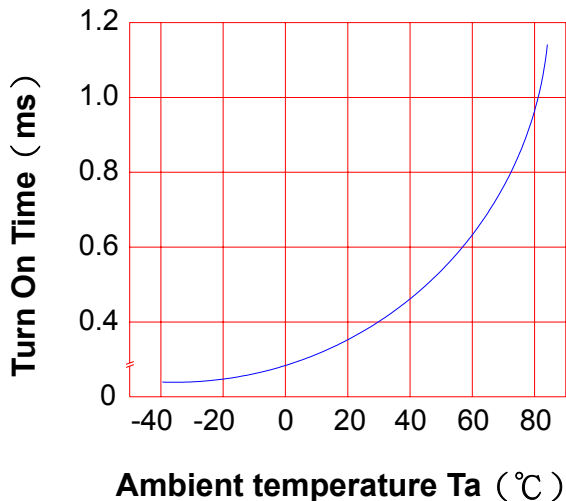


Turn On Time vs. ambient temperature

Load voltage 350V (DC)

LED current : 5mA

Continuous load current : 130mA (DC)

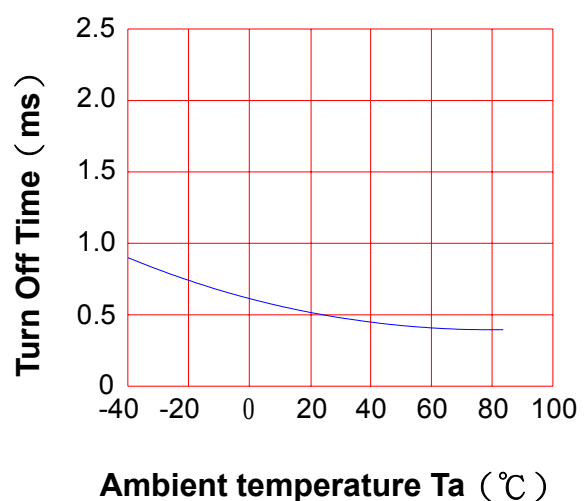


Turn Off Time vs. ambient temperature

Load voltage 350V (DC)

LED current : 5mA

Continuous load current : 130mA (DC)



PRODUCT SPECIFICATION

DATE : 03/01/2005

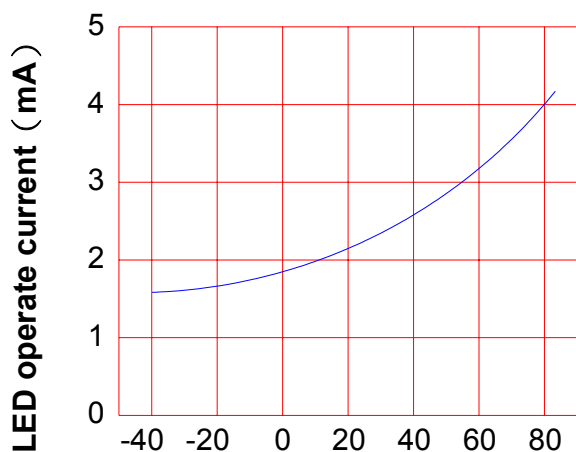
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		SHEET 4 OF 7	0

LED operate current vs.

ambient temperature

Load Voltage : 350V (DC)

Continuous load current : 130mA (DC)



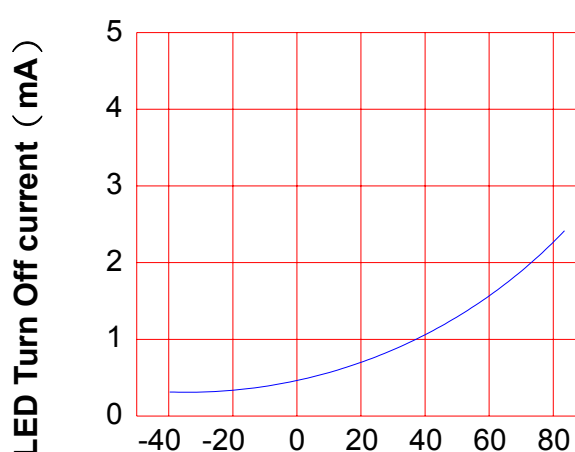
Ambient temperature Ta (°C)

LED Turn Off current vs.

ambient temperature

Load Voltage : 350V (DC)

Continuous load current : 130mA (DC)

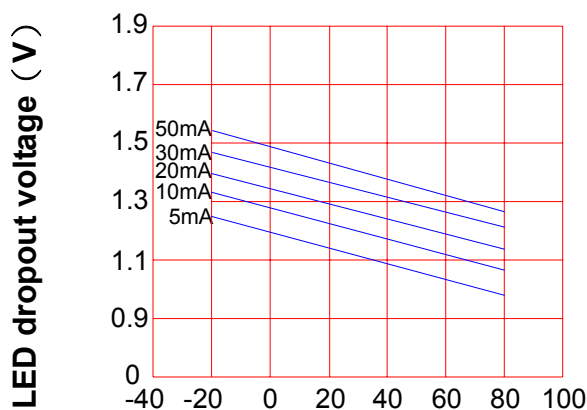


Ambient temperature Ta (°C)

LED dropout voltage vs.

ambient temperature

LED current : 5 to 50mA



Ambient temperature Ta (°C)

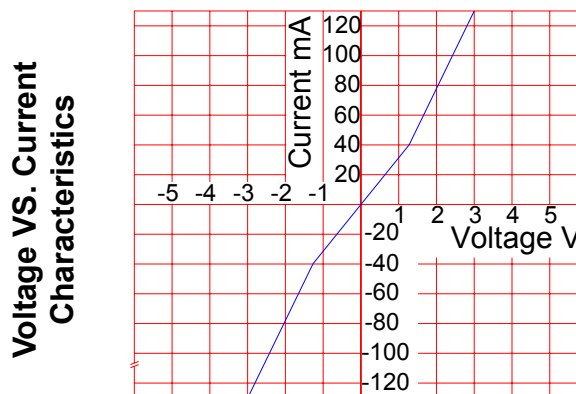
Voltage vs. current characteristics

of output at MOSFET portion

Measured portion : across terminals

4 and 6 pin

Ambient temperature : 25°C



Ambient temperature : 25°C

PRODUCT SPECIFICATION

DATE : 03/01/2005

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQV210H	Preliminary	REV.
		SHEET 5 OF 7	0

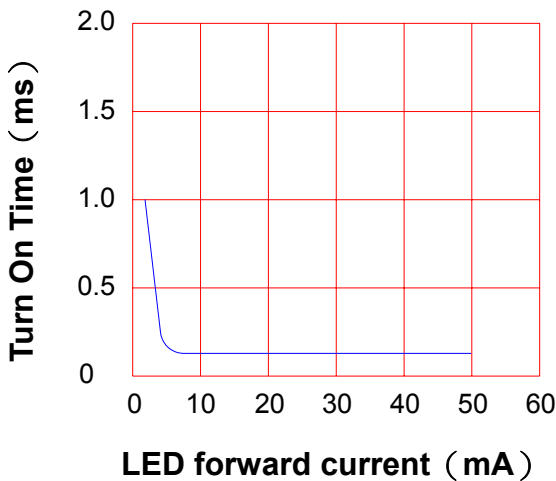
LED forward current vs. Turn On Time

Across terminals 4 and 6pin

Load voltage : 350V (DC)

Continuous load current : 130mA (DC)

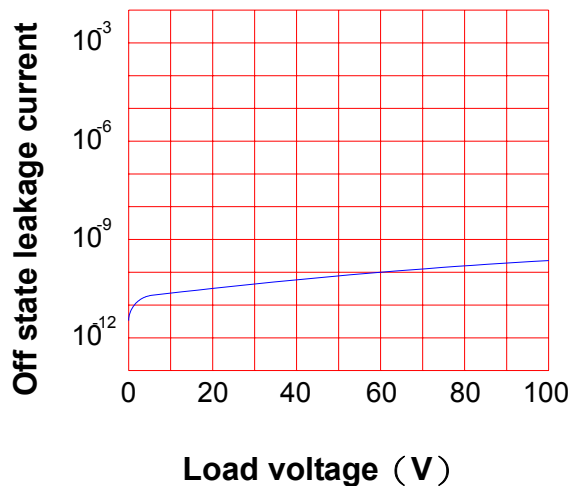
Ambient temperature : 25°C



Off state leakage current

Across terminals 4 and 6 pin

Ambient temperature : 25°C



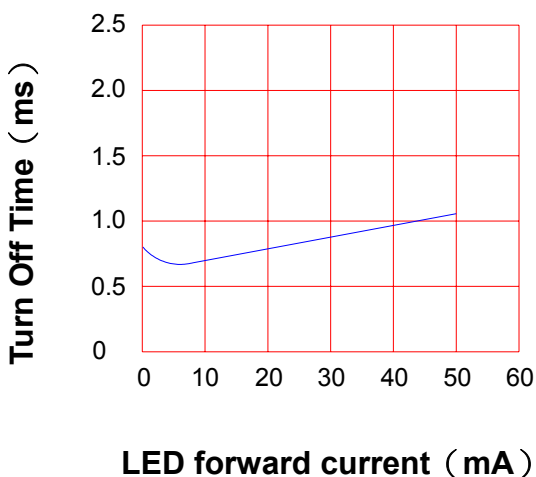
LED forward current vs. reverse(ON) time

Across terminals 4 and 6 pin

Load voltage : 350V (DC)

Continuous load current : 130mA (DC)

Ambient temperature : 25°C

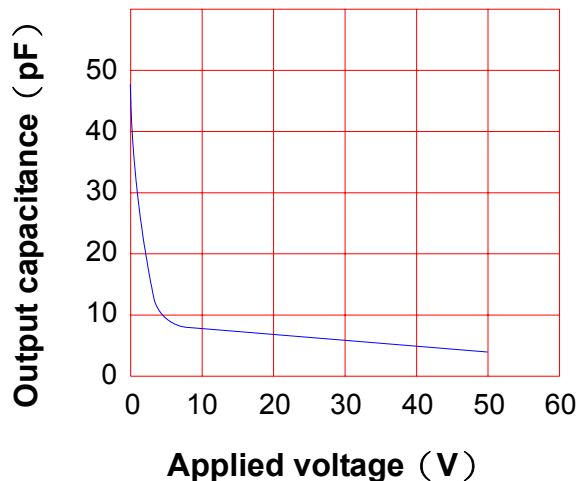


Applied voltage vs. output capacitance

Across terminals 4 and 6 pin

Frequency : 1MHz

Ambient temperature : 25°C



PRODUCT SPECIFICATION

DATE : 03/01/2005

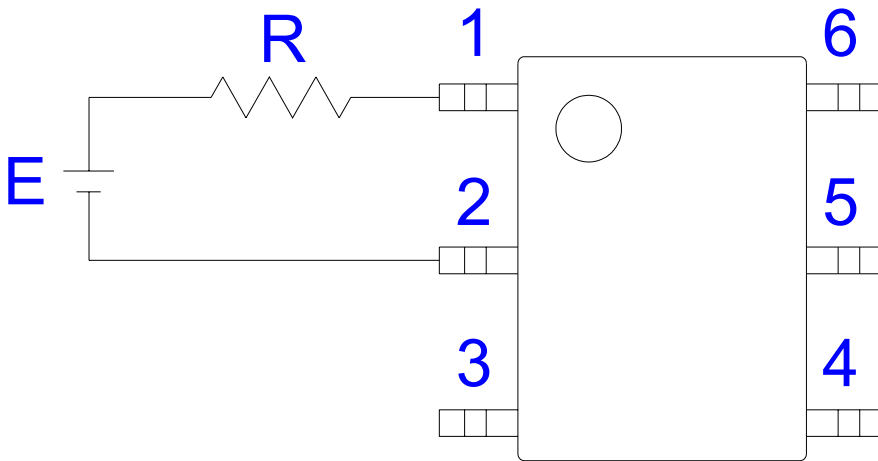
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		SHEET 6 OF 7	0

● USING METHODS

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

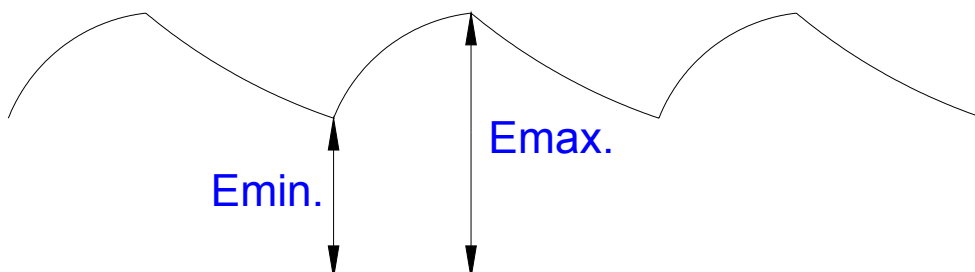
SSR-MOSFET OUTPUT

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



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.



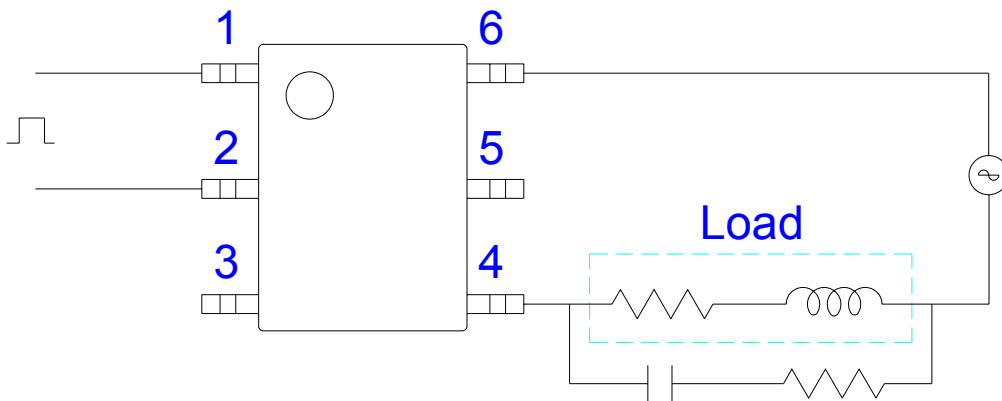
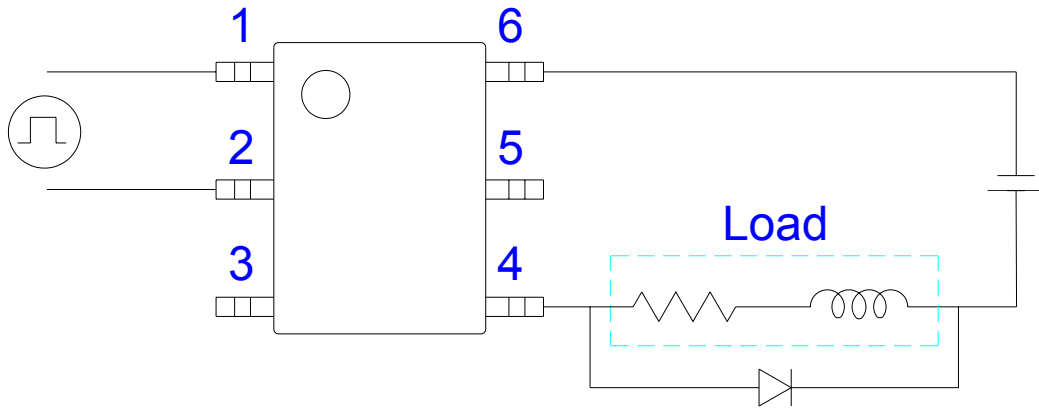
PRODUCT SPECIFICATION

DATE : 03/01/2005

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		SHEET 7 OF 7	

● USING METHODS

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



R-C Snubber