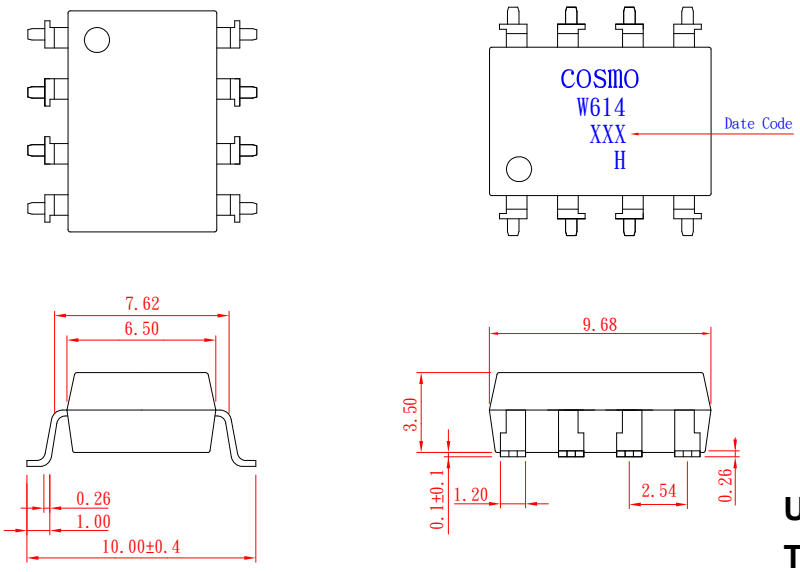
PRODUCT SPECIFICATION

DATE：02/22/2011

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT **KAQW614HA**	NO.61M22004 SHEET 1 OF 10	REV. 2

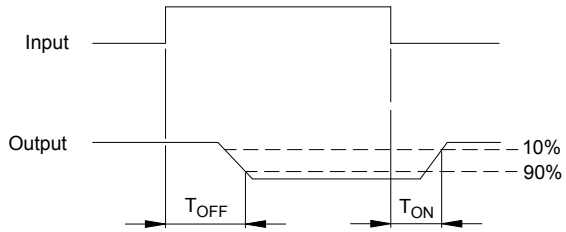
● OUTSIDE DIMENSION：



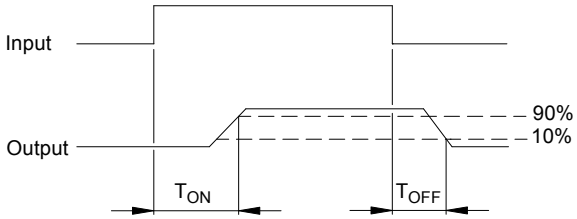
Unit：mm

Tolerance：±0.2mm

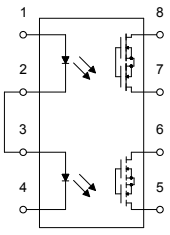
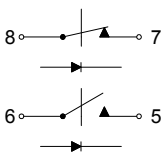
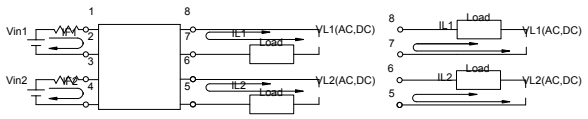
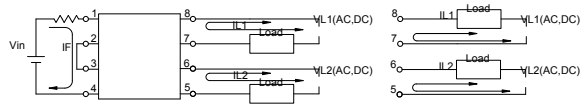
● Operate / Reverse time (N.C)



● Turn on / Turn off time (N.O)



● Schematic and Wiring Diagrams

Schematic	Output Configuration	Load	Connection	Wiring Diagrams
	1a1b 	AC/DC	-	(1)Two independent 1 Form A & 1 Form B use  (2) 1 Form A 1 Form B use 

PRODUCT SPECIFICATION

DATE：02/22/2011

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW614HA	NO.61M22004 SHEET 2 OF 10	REV. 2

● Absolute Maximum Ratings

（Ta=25℃）

Emitter（Input）		Detector（Output）	
Reverse Voltage	5.0V	Output Breakdown Voltage	± 400V
Continuous Forward Current	50mA	Continuous Load Current	± 130mA
Peak Forward Current	1A	Power Dissipation	500mW
Power Dissipation	100mW		
Derate Linearly from 25℃	1.3mW/℃		
General Characteristics			
Isolation Test Voltage	5000VACrms	Storage Temperature Range	-40℃ to +125℃
Isolation Resistance		Operating Temperature Range	-40℃ to +85℃
Viso=500V，Ta=25℃	$\geqq 10^{10}\Omega$	Junction Temperature	100℃
Total Power Dissipation	550mW	Soldering Temperature，	
Derate Linearly from 25℃	2.5mW/℃	2mm from case，10 sec	260℃

● Electro-optical Characteristics

（Ta=25℃）

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Emitter (Input)						
Forward Voltage	V_F	I_F=10mA		1.2	1.5	V
Operation Input Current	IF_{ON} (N.O) IF_{OFF} (N.C)	V_L=±20V, I_L=100mA (N.O) V_L=±20V, $I_L \leqq$5μA (N.C) t=10ms			5	mA
Recovery Input Current	IF_{OFF} (N.O) IF_{ON} (N.C)	V_L=±20V, $I_L \leqq$5μA (N.O) V_L=±20V, I_L=100mA (N.C) t=10ms	0.2			mA
Detector (Output) normally open						
Output Breakdown Voltage	V_B	I_B=50μA	400			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	R_{ON}	I_L=100mA, I_F=10mA		20	30	Ω
Turn-On Time	T_{ON}	I_F=10mA, V_L=±20V		0.3	1.0	ms
Turn-Off Time	T_{OFF}	t=10mS, I_L=±100mA		0.7	1.5	ms
Detector (Output) normally close						
Output Breakdown Voltage	V_B	I_B=50μA, I_F=10mA	400			V
Output Off-State Leakage	I_{TOFF}	V_T=100V, I_F=10mA		0.2	2	μA
I/O Capacitance	C_{ISO}	I_F=0, f=1MHz		6		pF
ON Resistance	R_{ON}	I_L=100mA, I_F=0mA		25	50	Ω
Operate (OFF) Time	T_{OFF}	I_F=10mA, V_L=±20V		0.6	1.5	ms
Reverse (ON) Time	T_{ON}	t=10ms, I_L=±100mA		0.3	1.0	ms

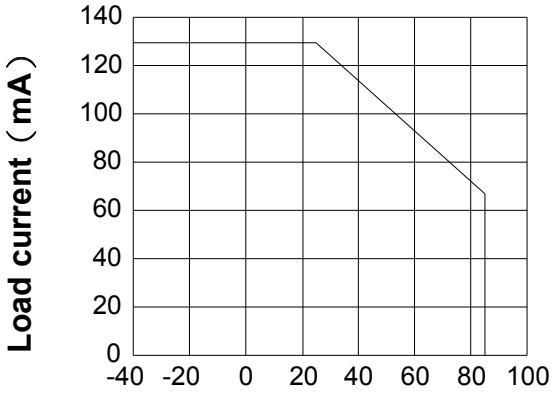
PRODUCT SPECIFICATION

DATE：02/22/2011

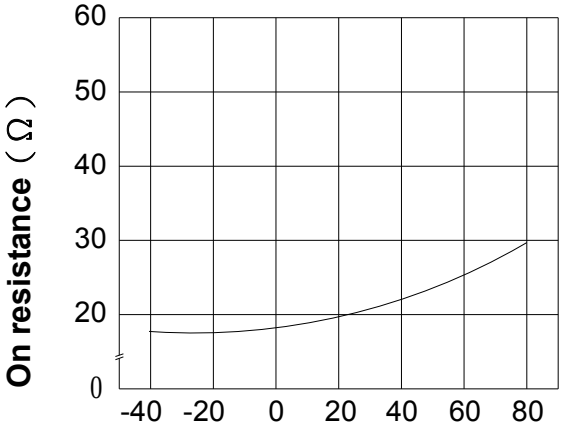
cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW614HA	NO.61M22004 SHEET 3 OF 10	REV. 2

● Data Curve (Normally Open Characteristics)

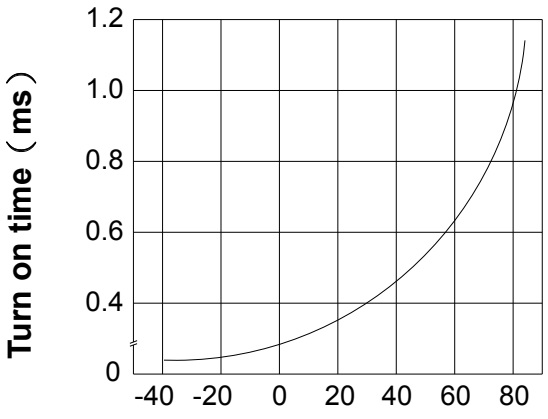
Load current vs. ambient temperature
Allowable ambient Temperature：
-40℃ to +85℃



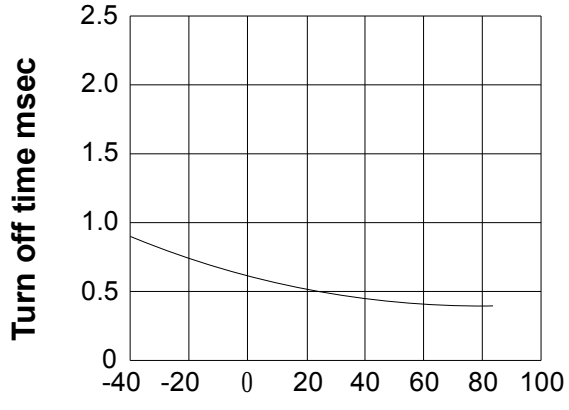
On resistance vs. ambient temperature across terminals 5 and 6 pin
LED current：5mA
Continuous load current：130mA（DC）



Turn on time vs. ambient temperature
Load voltage 400V（DC）
LED current：5mA
Continuous load current：130mA（DC）



Turn off time vs. ambient temperature
Load voltage 400V（DC）
LED current：5mA
Continuous load current：130mA（DC）

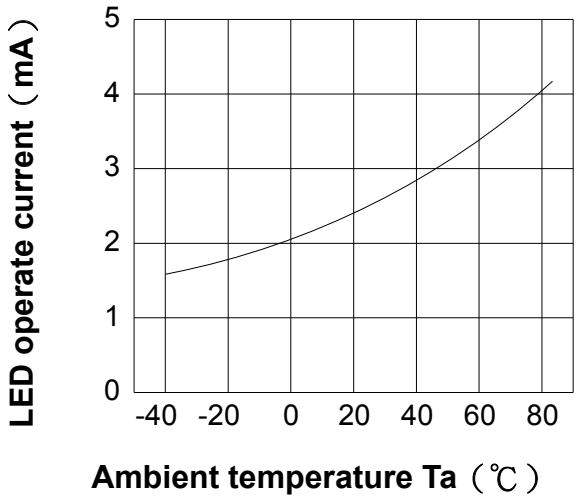


PRODUCT SPECIFICATION

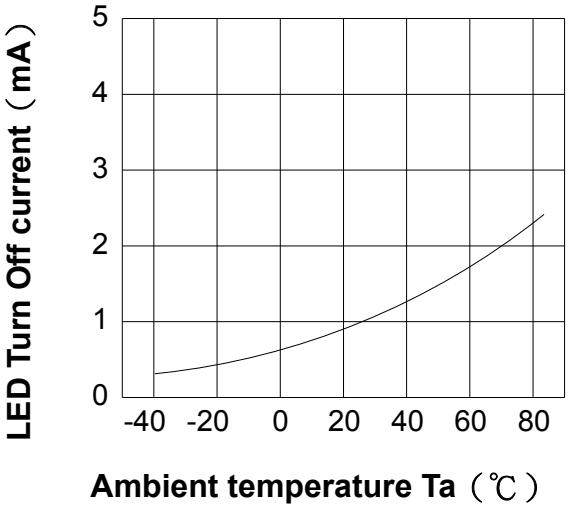
DATE：02/22/2011

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW614HA	NO.61M22004 SHEET 4 OF 10	REV. 2

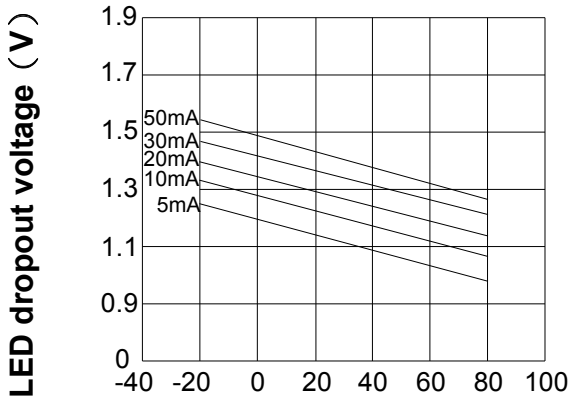
LED operate current vs.
ambient temperature
Load Voltage：400V（DC）
Continuous load current：130mA（DC）



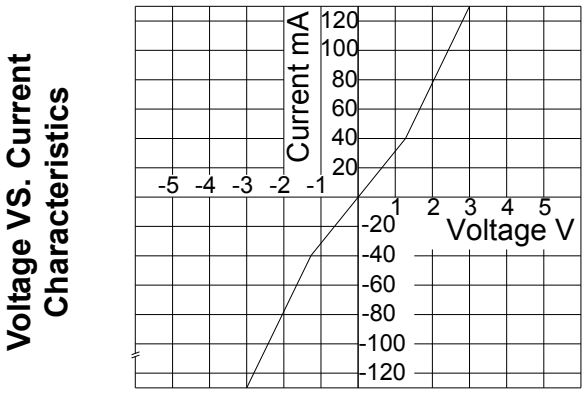
LED Turn Off current vs.
ambient temperature
Load Voltage：400V（DC）
Continuous load current：130mA（DC）



LED dropout voltage vs.
ambient temperature
LED current：5 to 50mA



Voltage vs. current characteristics
of output at MOSFET portion
Measured portion：across terminals
5 and 6 pin
Ambient temperature：25℃

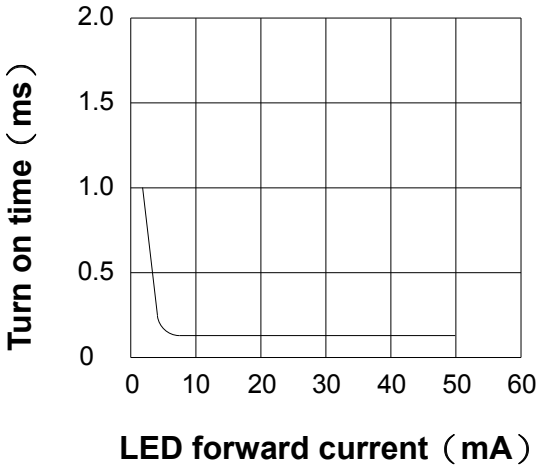


PRODUCT SPECIFICATION

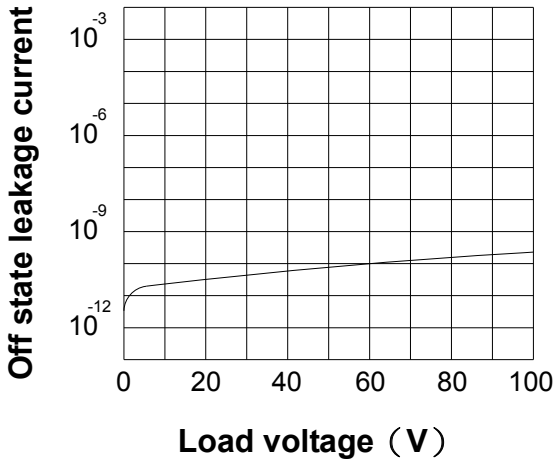
DATE：02/22/2011

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW614HA	NO.61M22004	REV. 2
		SHEET 5 OF 10	

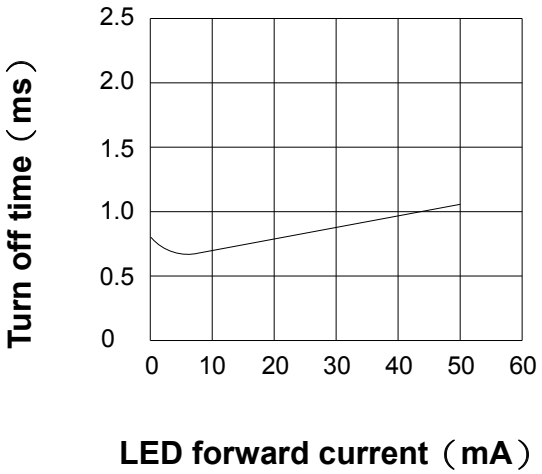
LED forward current vs. turn on time
Across terminals 5 and 6 pin
Load voltage：400V（DC）
Continuous load current：130mA（DC）
Ambient temperature：25℃



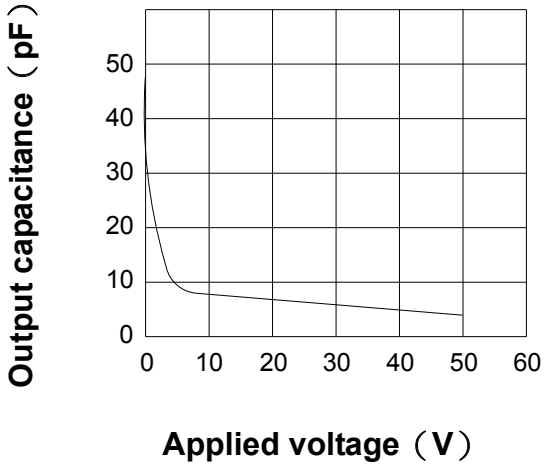
Off state leakage current
Across terminals 5 and 6 pin
Ambient temperature：25℃



LED forward current vs. turn off time
Across terminals 5 and 6 pin
Load voltage：400V（DC）
Continuous load current：130mA（DC）
Ambient temperature：25℃



Applied voltage vs. output capacitance
Across terminals 5 and 6 pin
Frequency：1MHz
Ambient temperature：25℃



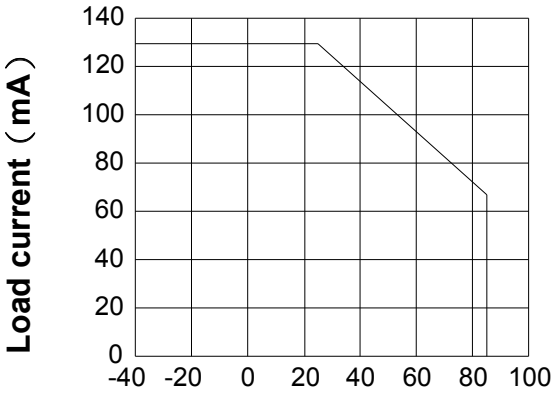
PRODUCT SPECIFICATION

DATE：02/22/2011

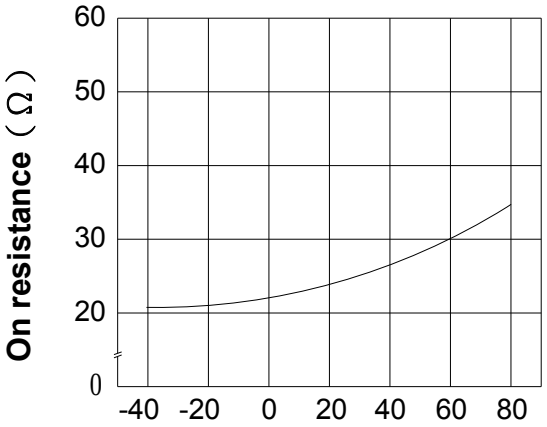
cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW614HA	NO.61M22004 SHEET 6 OF 10	REV. 2

● Data Curve (Normally Close Characteristics)

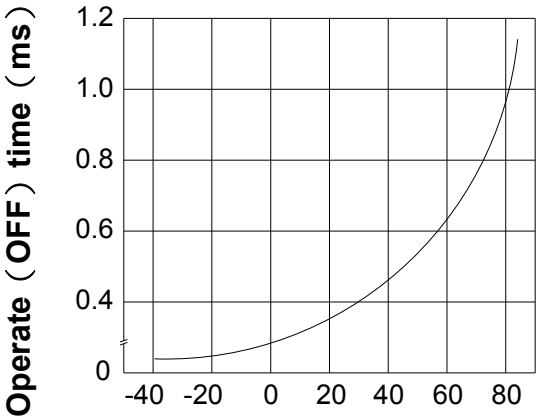
Load current vs. ambient temperature
Allowable ambient Temperature：
-40℃ to +85℃



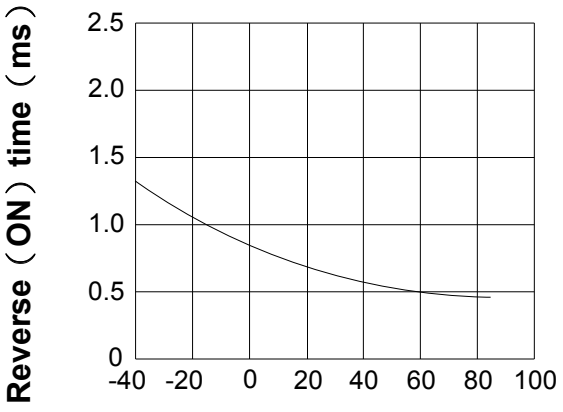
On resistance vs. ambient temperature across terminals 7 and 8 pin
LED current：0mA
Continuous load current：130mA（DC）



Operate（OFF）time vs. ambient temperature
Load voltage 400V（DC）
LED current：5mA
Continuous load current：130mA（DC）



Reverse（ON）time vs. ambient temperature
Load voltage 400V（DC）
LED current：5mA
Continuous load current：130mA（DC）

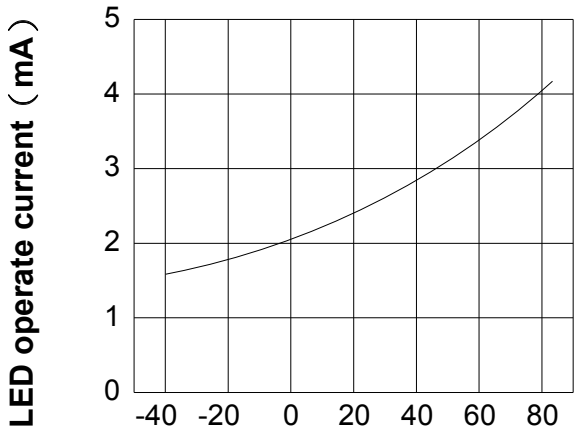


PRODUCT SPECIFICATION

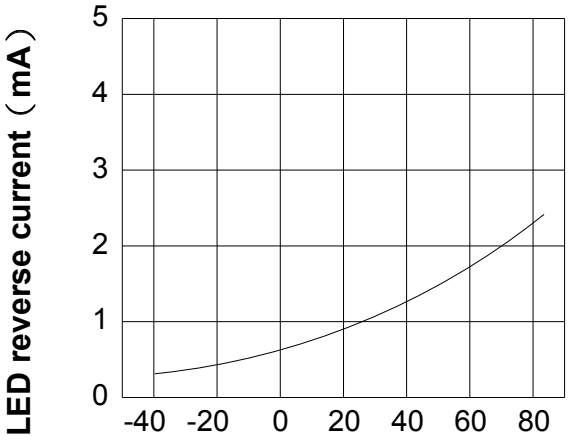
DATE：02/22/2011

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW614HA	NO.61M22004 SHEET 7 OF 10	REV. 2

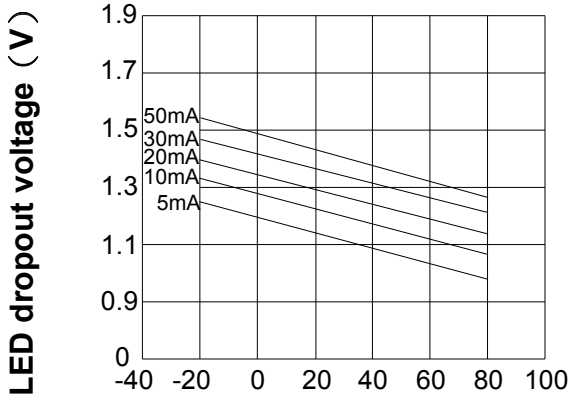
LED Operate (OFF) current vs. ambient temperature
Load Voltage：400V（DC）
Continuous load current：130mA（DC）



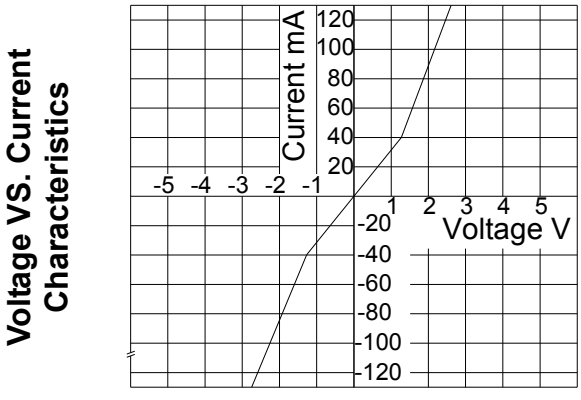
LED Reverse (ON) current vs. ambient temperature
Load Voltage：400V（DC）
Continuous load current：130mA（DC）



LED dropout voltage vs. ambient temperature
LED current：5 to 50mA



Voltage vs. current characteristics of output at MOSFET portion
Measured portion：across terminals 7 and 8 pin
Ambient temperature：25℃

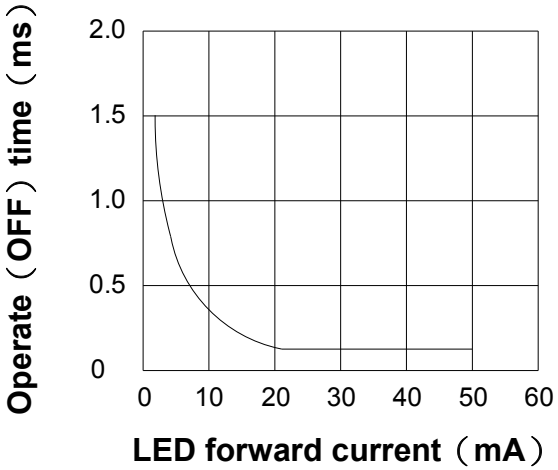


PRODUCT SPECIFICATION

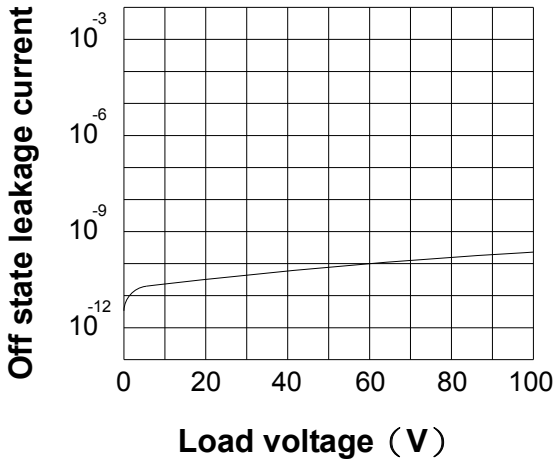
DATE：02/22/2011

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW614HA	NO.61M22004	REV. 2
		SHEET 8 OF 10	

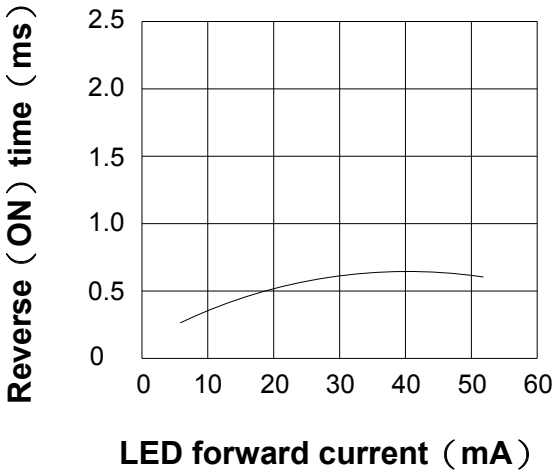
LED forward current vs. operate（OFF）time
Across terminals 7 and 8 pin
Load voltage：400V（DC）
Continuous load current：130mA（DC）
Ambient temperature：25℃



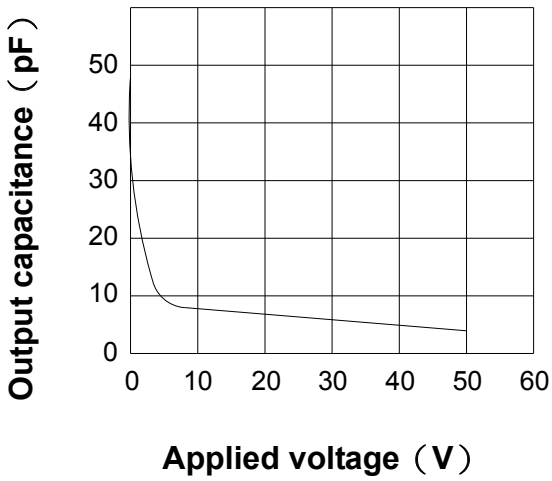
Off state leakage current
Across terminals 7 and 8 pin
Ambient temperature：25℃



LED forward current vs. reverse（ON）time
Across terminals 7 and 8 pin
Load voltage：400V（DC）
Continuous load current：130mA（DC）
Ambient temperature：25℃



Applied voltage vs. output capacitance
Across terminals 7 and 8 pin
Frequency：1MHz
Ambient temperature：25℃



PRODUCT SPECIFICATION

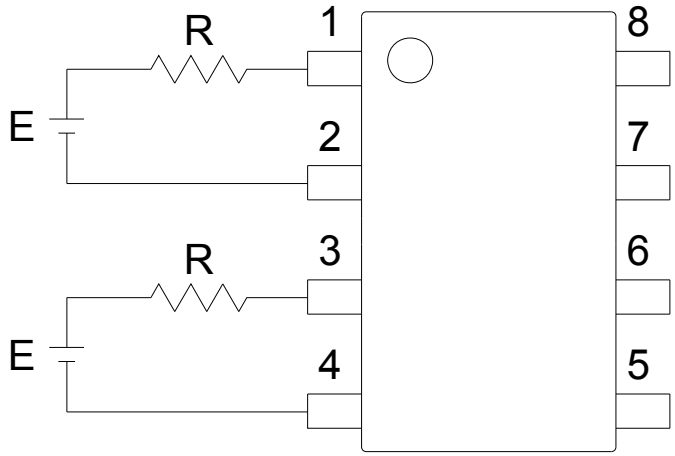
DATE：02/22/2011

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW614HA	NO.61M22004 SHEET 9 OF 10	REV. 2

● USING METHODS

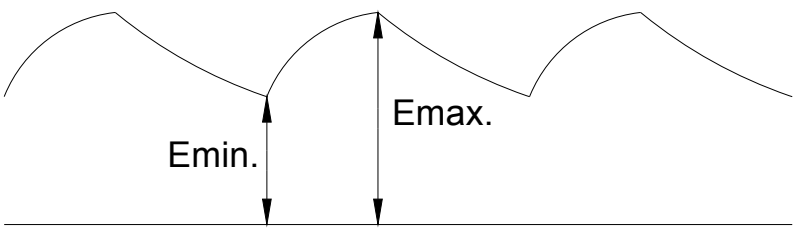
Examples of resistance value to control LED forward current（IF）

SSR-MOSFET OUTPUT **（IF=5mA）**



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.



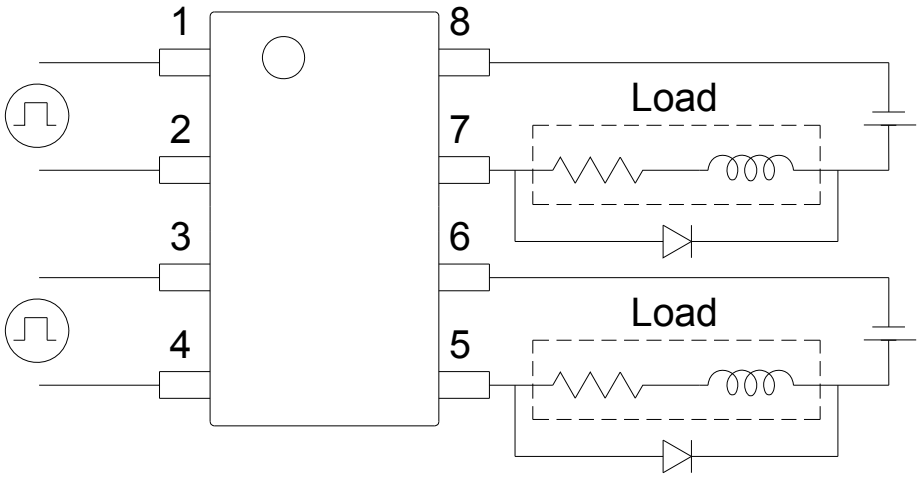
PRODUCT SPECIFICATION

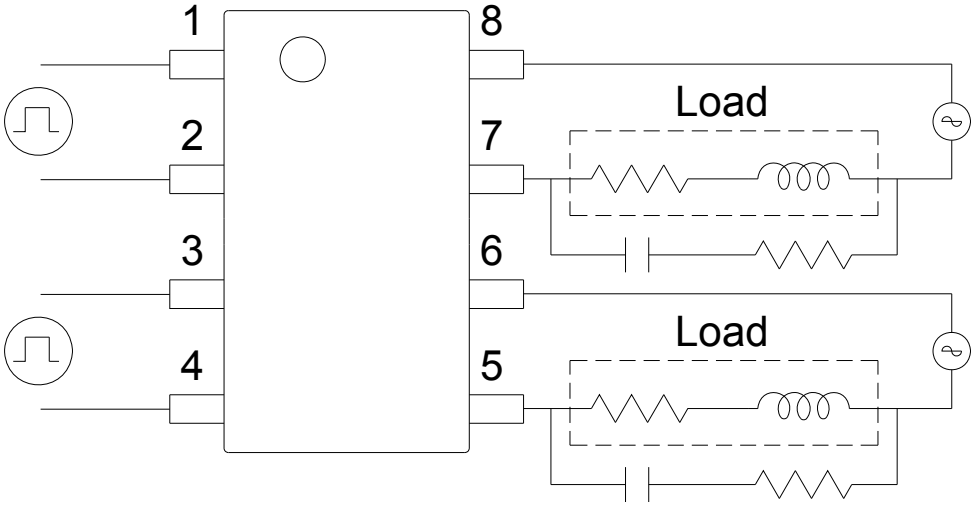
DATE：02/22/2011

cosmo ELECTRONICS CORPORATION	SOLID STATE RELAY - MOSFET OUTPUT KAQW614HA	NO.61M22004	REV. 2
		SHEET 10 OF 10	

● USING METHODS

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





R-C Snubber