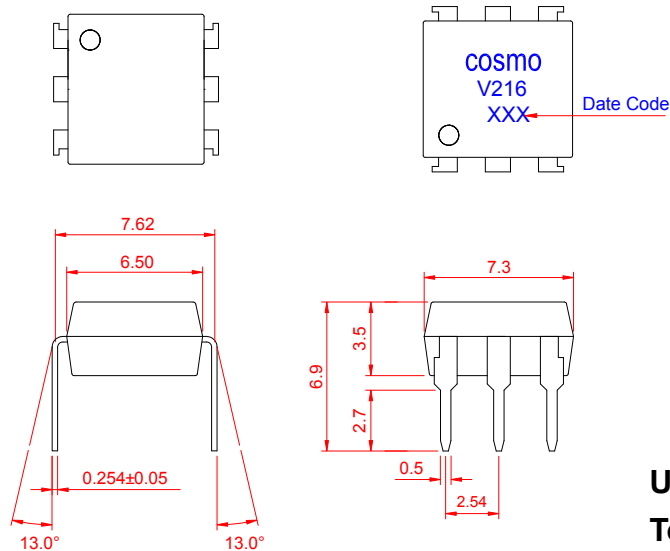


# PRODUCT SPECIFICATION

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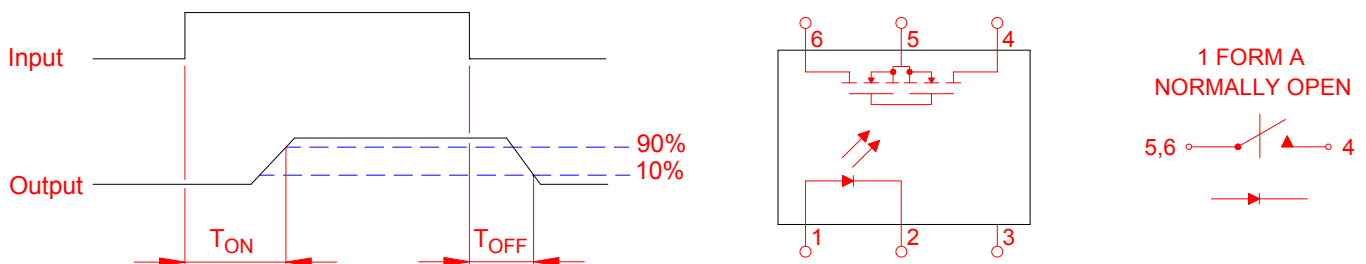
|   |   |              |        |
|---|---|--------------|--------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | SOLID STATE RELAY - MOSFET OUTPUT<br><b>KAQV216</b> | NO.60M10028  | VER. 3 |
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## ● OUTSIDE DIMENSION :



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 .....  | ± 600V          |
| Continuous Forward Current ..... | 50mA                 | Continuous Load Current .....   | ± 120mA         |
| 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 <sup>10</sup> 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           |

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|   |                                   |              |      |
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|   | <b>KAQV216</b>                    | SHEET 2 OF 7 | 3    |

## ● 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 | $V_B$             | $I_B=50\mu\text{A}$  | 600                                    |      |      | V             |          |
| Output Off-State Leakage | $I_{T\text{OFF}}$ | $V_T=100\text{V}$ , $I_F=0\text{mA}$   |  | 0.2  | 1    | $\mu\text{A}$ |          |
| I/O Capacitance          | $C_{\text{ISO}}$  | $I_F=0$ , $f=1\text{MHz}$  |  | 6    |      | pF            |          |
| ON Resistance            | Connection        | A  | $I_L=100\text{mA}$ , $I_F=10\text{mA}$ |      | 35   | 80            | $\Omega$ |
|                          |                   | B  |  |      | 27   | 40            |          |
|                          |                   | C  |  |      | 15   | 20            |          |
| Turn-On Time             | $T_{\text{ON}}$   | $I_F=10\text{mA}$ , $V_L=\pm 20\text{V}$<br>$t=10\text{ms}$ , $I_L=\pm 100\text{mA}$ |  | 0.3  | 1.0  | ms            |          |
| Turn-Off Time            | $T_{\text{OFF}}$  |  |  | 0.5  | 1.5  | ms            |          |

## ● Schematic and Wiring Diagrams

| Schematic | Output configuration | Load  | Connection | Wiring Diagrams |
|-----------|----------------------|-------|------------|-----------------|
|           | 1a                   | AC/DC | A          |                 |
|           |                      | DC    | B          |                 |
|           |                      | DC    | C          |                 |

# PRODUCT SPECIFICATION

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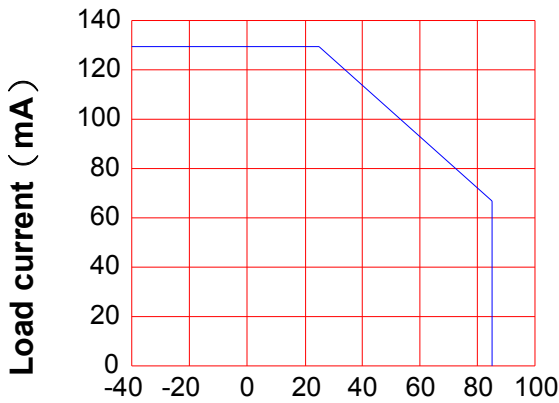
SOLID STATE RELAY - MOSFET OUTPUT  
**KAQV216**

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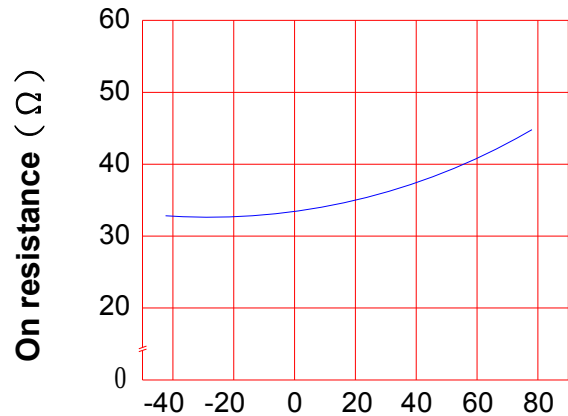
## ● Data Curve

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



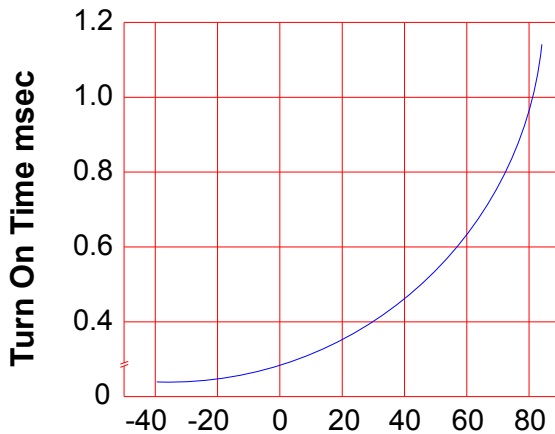
Ambient temperature Ta (°C)

On resistance vs. ambient temperature  
across terminals 4 and 6 pin  
LED current : 5mA  
Continuous load current : 120mA (DC)



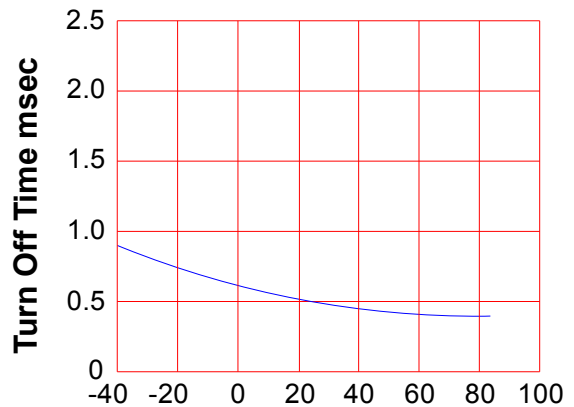
Ambient temperature Ta (°C)

Turn On Time vs. ambient temperature  
Load voltage 600V (DC)  
LED current : 5mA  
Continuous load current : 120mA (DC)



Ambient temperature Ta (°C)

Turn Off Time vs. ambient temperature  
Load voltage 600V (DC)  
LED current : 5mA  
Continuous load current : 120mA (DC)



Ambient temperature Ta (°C)

# PRODUCT SPECIFICATION

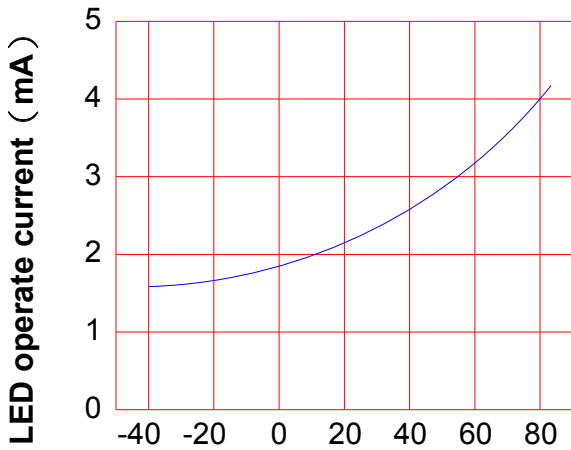
DATE : 08/14/2007

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|---|-----------------------------------|--------------|-----------|
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**LED operate current vs. ambient temperature**

**Load Voltage : 600V (DC)**

**Continuous load current : 120mA (DC)**

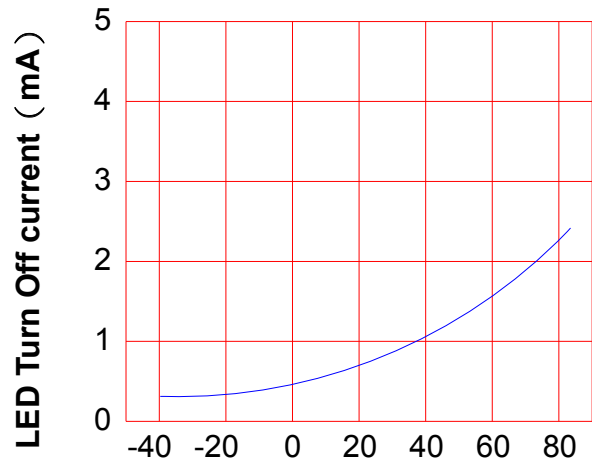


Ambient temperature Ta (°C)

**LED Turn Off current vs. ambient temperature**

**Load Voltage : 600V (DC)**

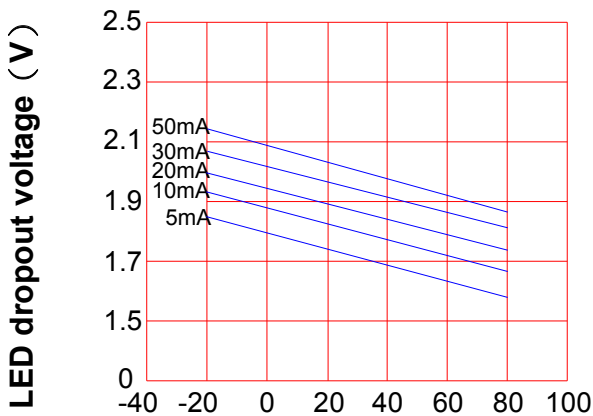
**Continuous load current : 120mA (DC)**



Ambient temperature Ta (°C)

**LED dropout voltage vs. ambient temperature**

**LED current : 5 to 50mA**

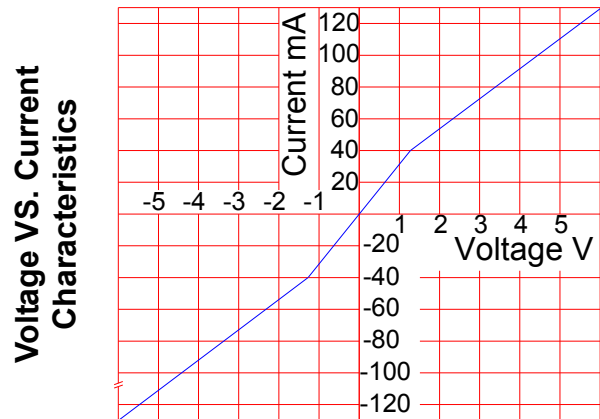


Ambient temperature Ta (°C)

**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

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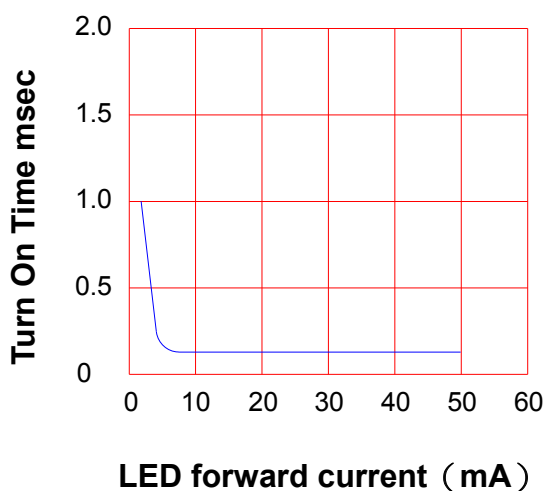
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SOLID STATE RELAY - MOSFET OUTPUT  
**KAQV216**

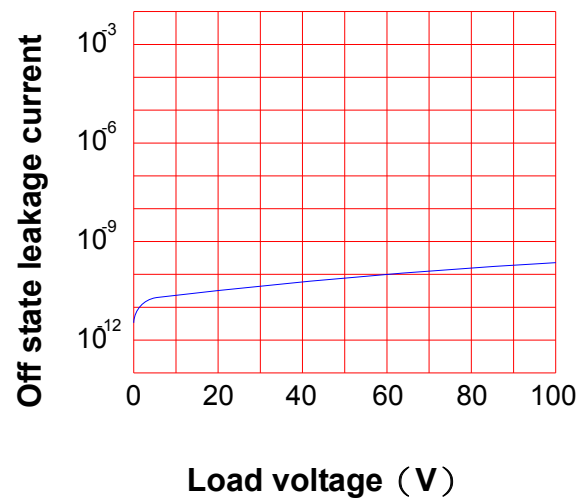
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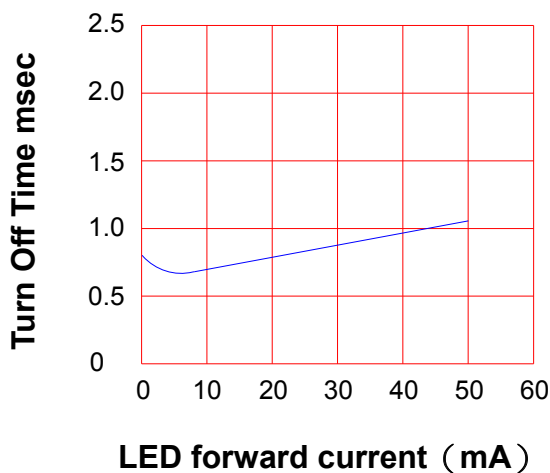
**LED forward current vs. Turn On Time**  
Across terminals 4 and 6 pin  
Load voltage : 600V (DC)  
Continuous load current : 120mA (DC)  
Ambient temperature : 25°C



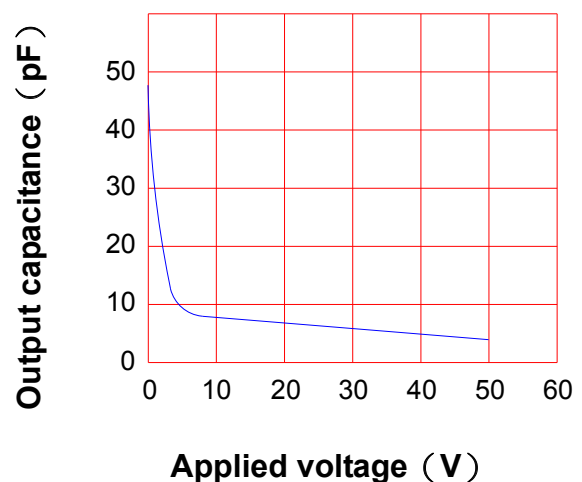
**Off state leakage current**  
Across terminals 4 and 6 pin  
Ambient temperature : 25°C



**LED forward current vs. reverse(ON) time**  
Across terminals 4 and 6 pin  
Load voltage : 600V (DC)  
Continuous load current : 120mA (DC)  
Ambient temperature : 25°C



**Applied voltage vs. output capacitance**  
Across terminals 4 and 6 pin  
Frequency : 1MHz  
Ambient temperature : 25°C



# PRODUCT SPECIFICATION

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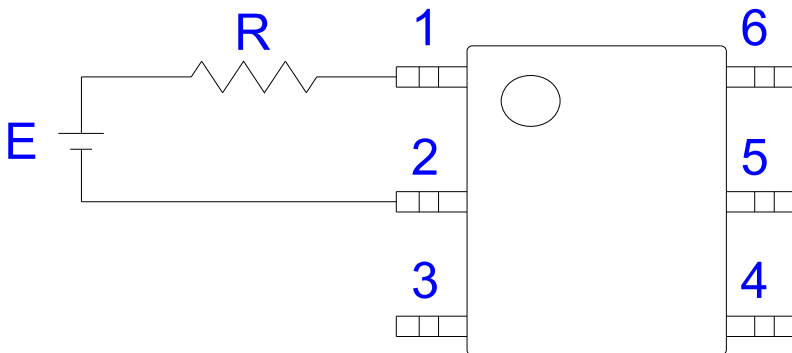
|   |   |              |           |
|---|---|--------------|-----------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | SOLID STATE RELAY - MOSFET OUTPUT<br><b>KAQV216</b> | NO.60M10028  | VER.<br>3 |
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## ● USING METHODS

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

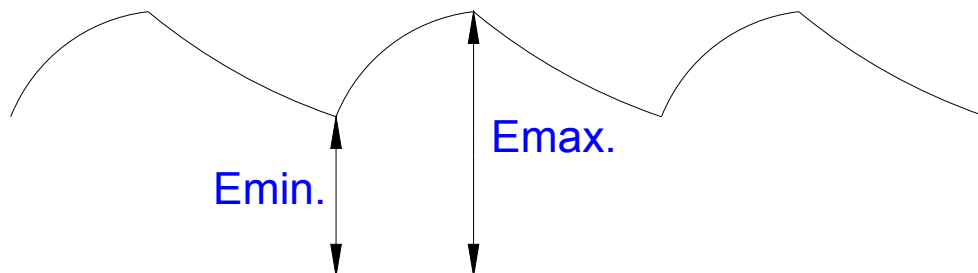
SSR-MOSFET OUTPUT

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



| E    | R                     |
|------|-----------------------|
| 3.3V | Approx. 330 $\Omega$  |
| 5V   | Approx. 640 $\Omega$  |
| 12V  | Approx. 1.9K $\Omega$ |
| 15V  | Approx. 2.5K $\Omega$ |
| 24V  | Approx. 4.1K $\Omega$ |

- (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  
**KAQV216**

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## ● USING METHODS

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

