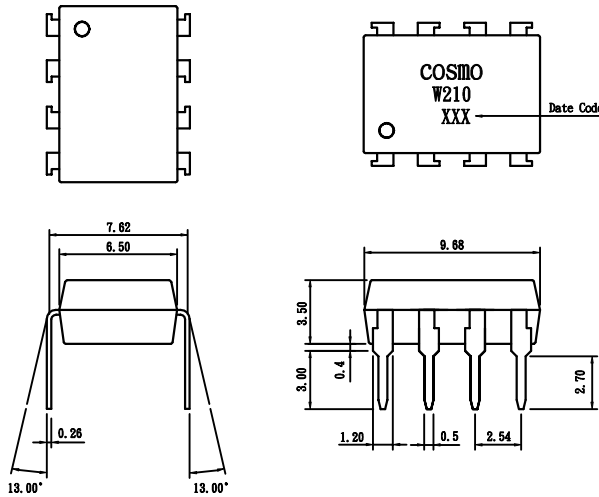


PRODUCT SPECIFICATION

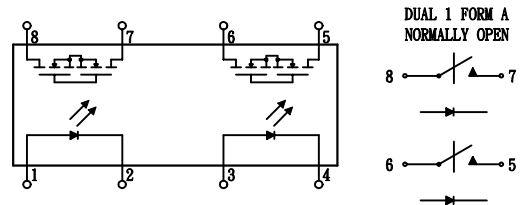
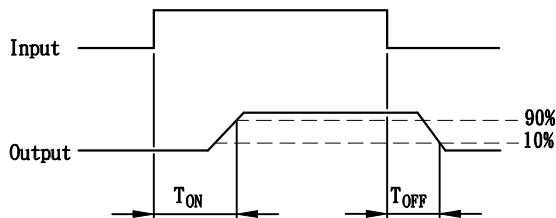
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| COSMO ELECTRONICS CO., LTD. | PHOTO MOS RELAYS: KAQW210 | SHEET 1 OF 7 |
|---------------------------------------|-------------------------------------|--------------|

• **OUTSIDE DIMENSION :**



Unit:mm
Tolerance:± 0.2 mm

• **Turn on/Turn off time**



Absolute Maximum Ratings ($T_A=25^\circ\text{C}$)

Emitter (Input)

| | |
|---|-------------------------|
| Reverse Voltage | 5.0V |
| Continuous Forward Current | 50mA |
| Peak Forward Current (1s) | 1A |
| Power Dissipation. | 100mW |
| Derate Linearly from 25°C | 1.3mW/ $^\circ\text{C}$ |

| | |
|---|-------------------------------|
| Derate Linearly from 25°C | 2.5mW/ $^\circ\text{C}$ |
| Storage Temperature Range | -40 to $+150^\circ\text{C}$ |
| Operating Temperature Range. | -40 to $+85^\circ\text{C}$ |
| Junction Temperature | 100°C |
| Soldering Temperature, 2mm from case, 10 sec. | 260°C |

Detector (Output)

| | |
|------------------------------------|---------|
| Output Breakdown Voltage | ± 350V |
| Continuous Load Current | ± 130mA |
| Power Dissipation | 500mW |

General Characteristics

| | |
|--|------------------------|
| Isolation Test Voltage. | 3750VAC _{RMS} |
| Isolation Resistance | |
| $V_{10}=500\text{V}, T_A=25^\circ\text{C}$ | $\geq 10^{10}\Omega$ |
| Total Power Dissipation | 550mW |

PRODUCT SPECIFICATION

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|---------------------------------------|-------------------------------------|--------------|

Characteristics

(T_A=25° C)

| Description | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------|---------------------|------|------|------|------|---|
| Emitter (Input) | | | | | | |
| Forward Voltage | V _F | | 1.8 | 2.0 | V | I _F = 10mA |
| Operation Input Current | I _{FON} | | | 5 | mA | V _L = ± 20V, I _L = 100mA t = 10 ms |
| Recovery Input Current | I _{FOFF} | 0.2 | | | mA | V _L = ± 20V, I _L < 5μA |
| Detector (Output) | | | | | | |
| Output Breakdown Voltage | V _B | 350 | | | V | I _B = 50μA |
| Output Off-State Leakage | I _{T(OFF)} | | 0.2 | 1 | μA | V _T = 100V, I _F = 0mA |
| I/O Capacitance | C _{ISO} | | 6 | | pF | I _F = 0, f = 1MHz |
| ON Resistance | R _{ON} | | 20 | 30 | Ω | I _L = 100mA, I _F = 10mA |
| Turn-on Time | T _{ON} | | 0.3 | 1.0 | ms | I _F = 10mA, V _L = ± 20V |
| Turn-off Time | T _{OFF} | | 0.7 | 1.5 | ms | t = 10ms, I _L = ± 100mA |

Mos Relay Schematic and Wiring Diagrams

| Type | Schematic | Output configuration | Load | Con-nection | Wiring diagram |
|---------|-----------|----------------------|-------|-------------|---|
| KAQW210 | | 2a | AC/DC | - | <p>(1) Two independent 1 Form A use</p> <p>(2) 2 Form A use</p> |

PRODUCT SPECIFICATION

COSMO

ELECTRONICS CO., LTD.

PHOTO MOS RELAYS:

KAQW210

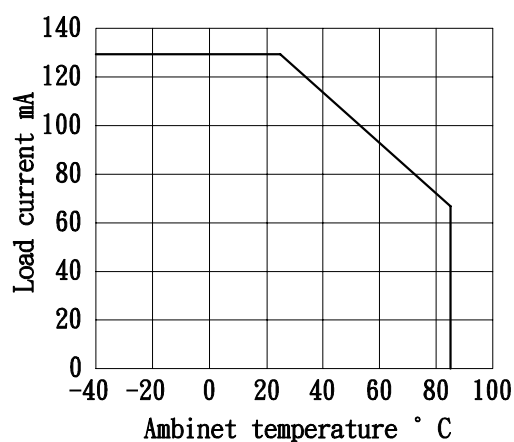
SHEET 3 OF 7

DATA CURVE

Load current vs. ambient temperature

Allowable ambient temperature:

-40° C+85° C

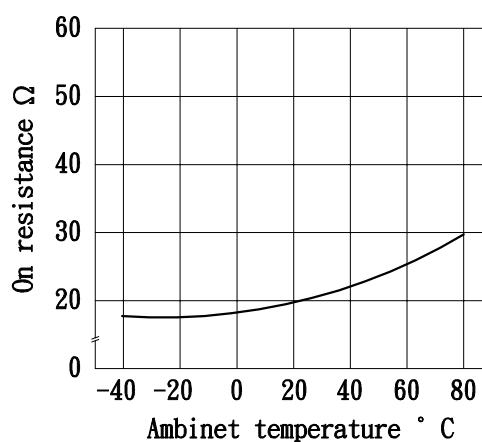


On resistance vs. ambient temperature

Across terminals 5,7 and 6,8 pin

LED current: 5mA

Continuous load current: 130 mA(DC)

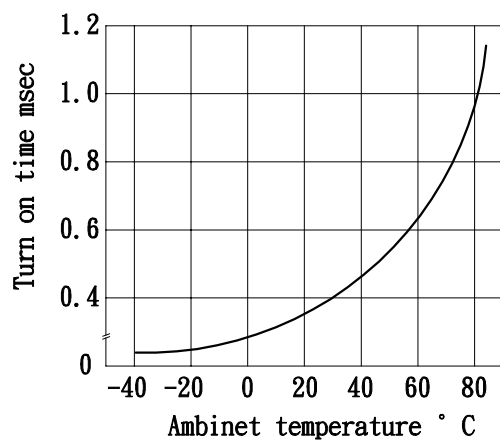


Turn on time vs. ambient temperature

Load voltage 350 V(DC)

LED current :5mA

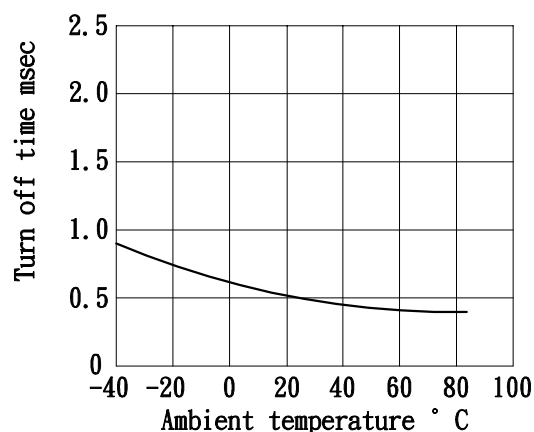
Continuous load current: 130mA(DC)



Turn off time vs. ambient temperature

LED current: 5mA;Load voltage: 350V(DC)

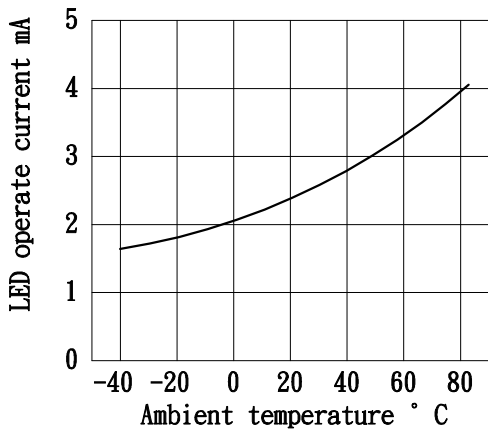
Continuous load current: 130mA(DC)



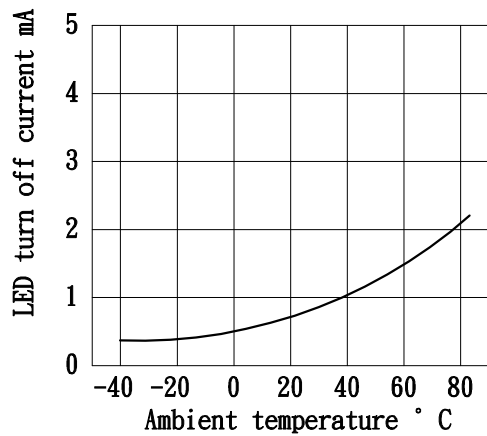
PRODUCT SPECIFICATION

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| <p>COSMO ELECTRONICS CO., LTD.</p> | <p>PHOTO MOS RELAYS: KAQW210</p> | <p>SHEET 4 OF 7</p> |
|---|---|---------------------|

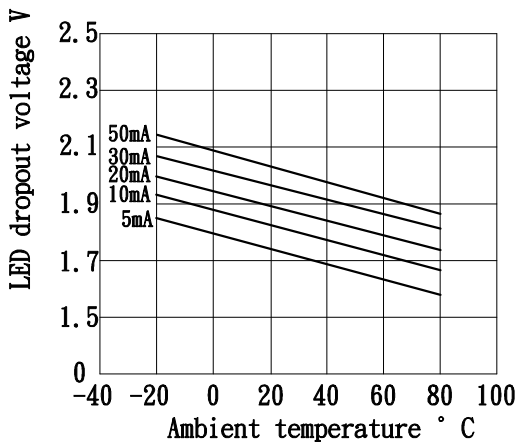
LED operate vs. ambient temperature
Load voltage: 350V(DC)
Continuous load current: 130mA(DC)



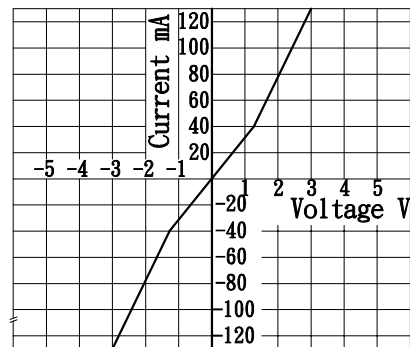
LED turn off current vs. ambient temperature
Load voltage: 350V(DC)
Continuons load current: 130mA(DC)



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



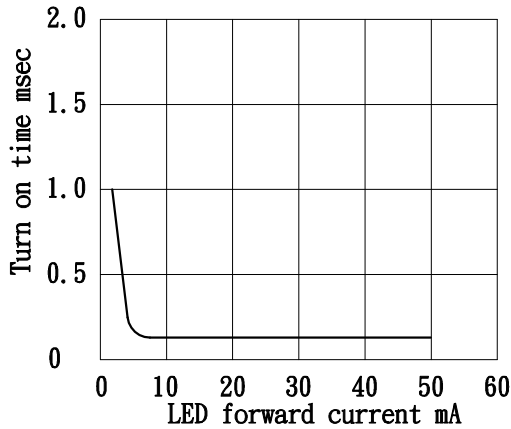
Voltage vs. current characteristics of output at MOS FET portion
Measured portion: across terminals 5, 7 and 6, 8 pin
Ambient temperature: 25° C



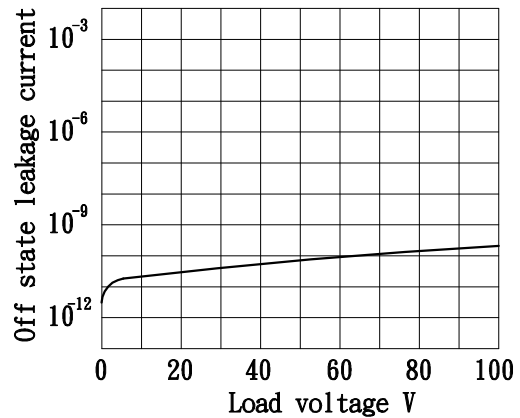
PRODUCT SPECIFICATION

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| <p>COSMO ELECTRONICS CO., LTD.</p> | <p>PHOTO MOS RELAYS: KAQW210</p> | <p>SHEET 5 OF 7</p> |
|---|---|---------------------|

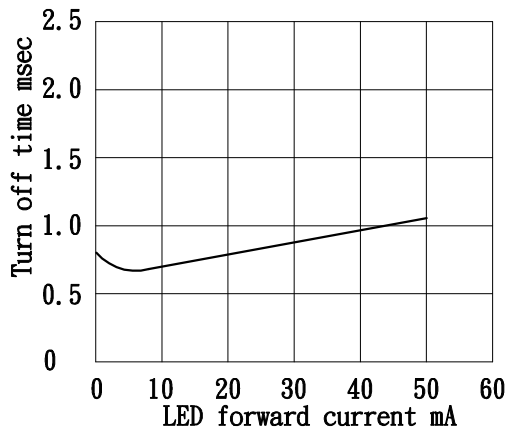
LED forward current vs. turn on time
Across terminals 5, 7 and 6, 8pin; Load voltage: 350V(DC); Continuous load current: 130mA(DC); Ambient temperature: 25° C



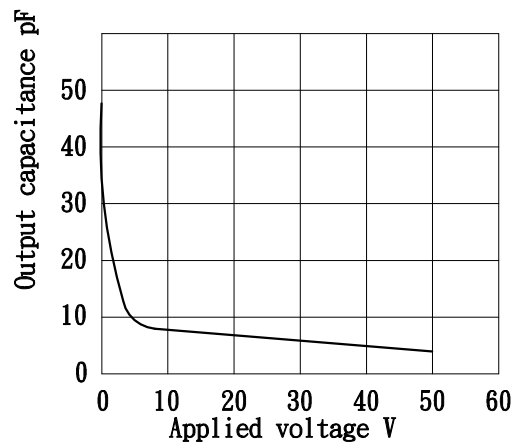
Off state leakage current
Across terminals 5, 7 and 6, 8pin
Ambient temperature: 25° C



LED forward current vs. turn off time
Across terminals 5, 7 and 6, 8pin; Load voltage: 350V(DC); Continuous load current: 130 mA(DC); Ambient temperature: 25° C



Applied voltage vs. output capacitance
Across terminals 5, 7 and 6, 8pin
Frequency: 1MHz; Ambient temperature: 25° C



PRODUCT SPECIFICATION

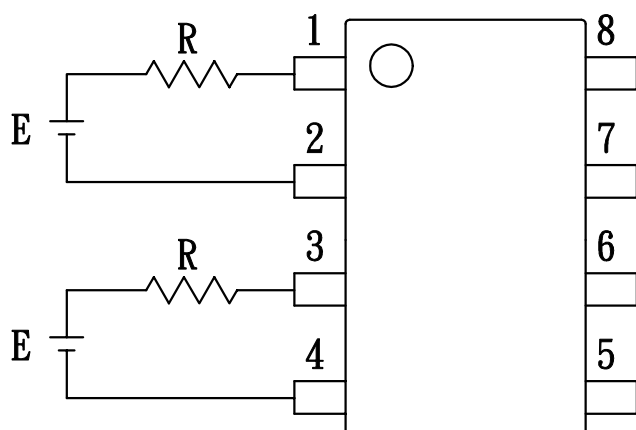
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|---------------------------------------|-------------------------------------|--------------|

USING METHODS

Examples of resistance value to control LED forward current I_F

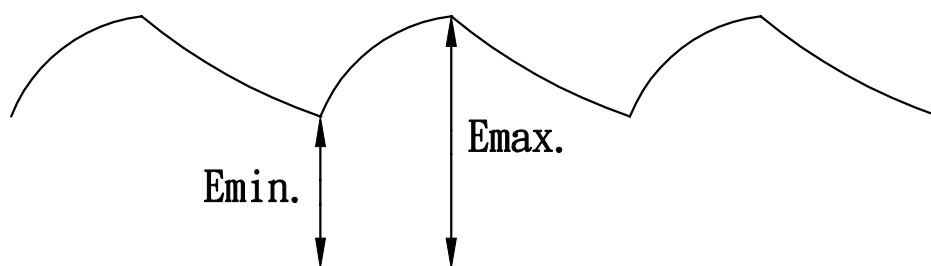
Photo MOSRELAY

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



| E | R |
|------|------------------|
| 3.3V | Approx. 240 ohm |
| 5V | Approx. 540 ohm |
| 12V | Approx. 1.8K ohm |
| 15V | Approx. 2.4K ohm |
| 24V | Approx. 4K ohm |

- (1) LED forward current must be more than 5mA, at E min.
- (2) LED forward current must be less than 50mA, at E max.

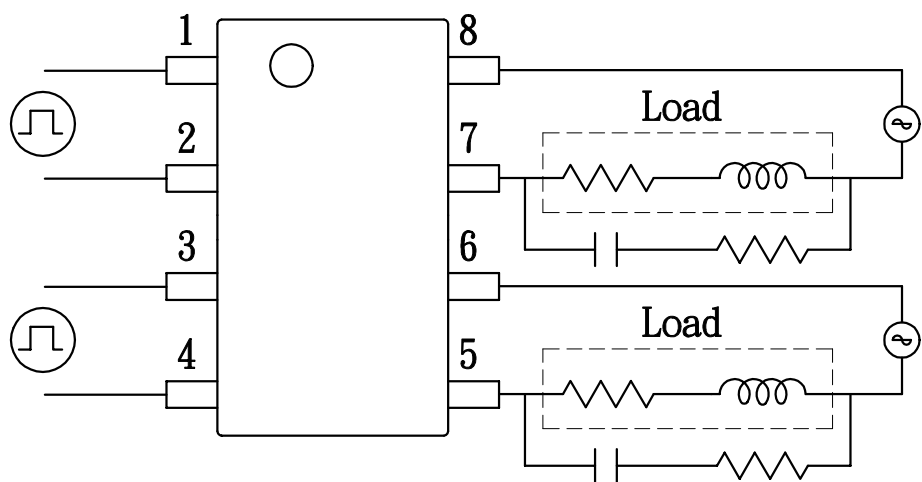
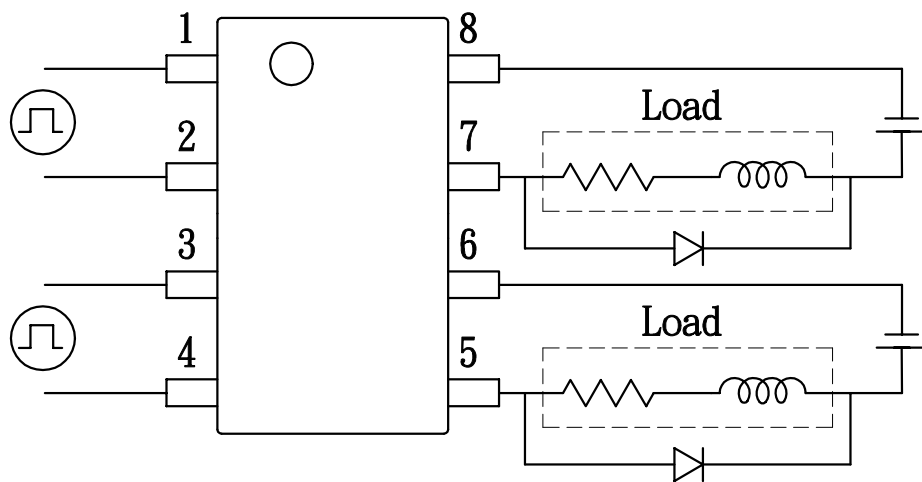


PRODUCT SPECIFICATION

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|---------------------------------------|-------------------------------------|--------------|
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|---------------------------------------|-------------------------------------|--------------|

USING METHODS

Regulate the spike voltage generated on the inductive load as follows



R-C Snubber