

# K5630 • K5631

These Photocouplers consist of two Gallium Arsenide Infrared Emitting Diodes and a Silicon NPN Phototransistor in a 6-pin package.

## FEATURES

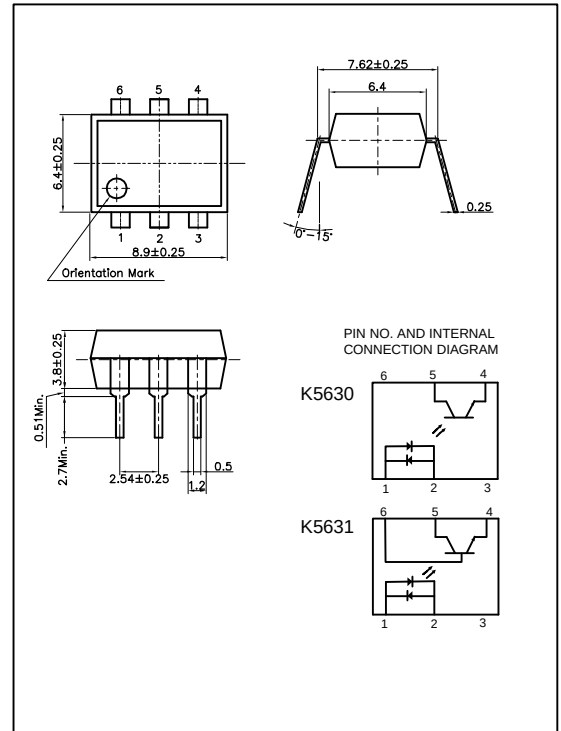
- Switching Time - Type 3 $\mu$ s
- Collector-Emitter Voltage : Min.35V
- Current Transfer Ratio : Typ.10% (at  $I_F = \pm 10\text{mA}$ ,  $V_{CE} = 10\text{V}$ )
- Electrical Isolation Voltage : AC5000V<sub>rms</sub>
- Without Base Connection - K5630
- With Base Connection - K5631
- UL Recognized File No. E107486

## APPLICATIONS

- Interface between two circuits of different potential
- AC signal input
- Telephone set & line interface
- I/O compatible with integrated circuits

## DIMENSION

(Unit : mm)



## MAXIMUM RATINGS

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

| Parameter                                       |                                     | Symbol     | Rating   | Unit             |
|-------------------------------------------------|-------------------------------------|------------|----------|------------------|
| Input                                           | Forward Current                     | $I_F$      | $\pm 60$ | mA               |
|                                                 | Peak Forward Current <sup>*1</sup>  | $I_{FP}$   | $\pm 1$  | A                |
|                                                 | Power Dissipation                   | $P_D$      | 70       | mW               |
| Output                                          | Collector-Emitter Breakdown Voltage | $BV_{CEO}$ | 35       | V                |
|                                                 | Emitter-Collector Breakdown Voltage | $BV_{ECO}$ | 6        | V                |
|                                                 | Collector-Base Breakdown Voltage**  | $BV_{CBO}$ | 70       | V                |
|                                                 | Emitter-Base Breakdown Voltage**    | $BV_{EBO}$ | 6        | V                |
|                                                 | Collector Current                   | $I_C$      | 50       | mA               |
|                                                 | Collector Power Dissipation         | $P_C$      | 150      | mW               |
| Input to Output Isolation Voltage <sup>*2</sup> |                                     | $V_{iso}$  | AC5000   | V <sub>rms</sub> |
| Storage Temperature                             |                                     | $T_{stg}$  | -55~+125 | $^\circ\text{C}$ |
| Operating Temperature                           |                                     | $T_{opr}$  | -30~+100 | $^\circ\text{C}$ |
| Lead Soldering Temperature <sup>*3</sup>        |                                     | $T_{sol}$  | 260      | $^\circ\text{C}$ |
| Total Power Dissipation                         |                                     | $P_{tot}$  | 200      | mW               |

\*\* Except for K5630

\*1. Input current with 100 $\mu$ s pulse width, 1% duty cycle

\*2. Measured at RH=40~60% for 1min

\*3. 1/16 inch form case for 10sec

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## ELECTRO-OPTICAL CHARACTERISTICS

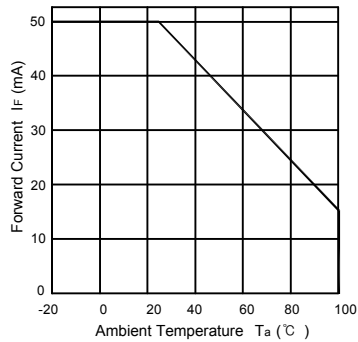
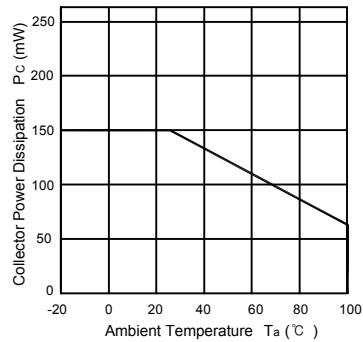
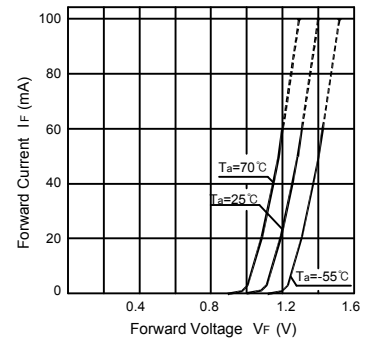
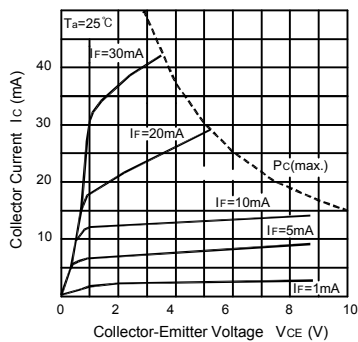
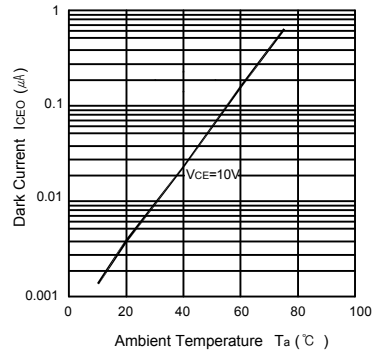
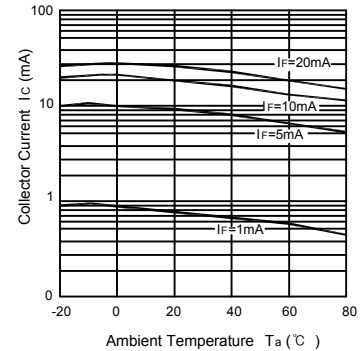
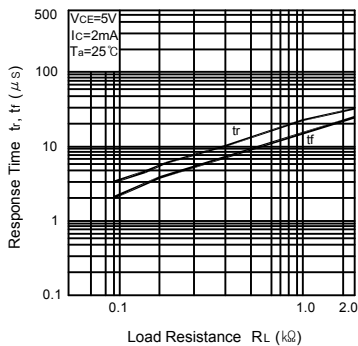
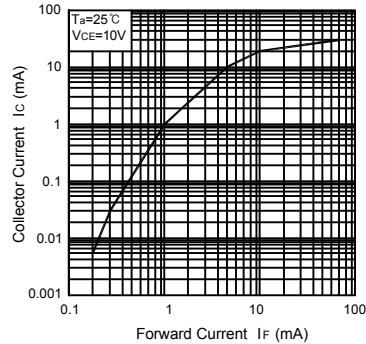
(Ta=25°C , unless otherwise noted)

| Parameter    |                                      | Symbol               | Condition                                                       | Min. | Typ.             | Max. | Unit. |
|--------------|--------------------------------------|----------------------|-----------------------------------------------------------------|------|------------------|------|-------|
| Input        | Forward Voltage                      | V <sub>F</sub>       | I <sub>F</sub> = ±10mA                                          | -    | 1.15             | 1.30 | V     |
|              | Capacitance                          | C <sub>T</sub>       | V=0, f=1MHz                                                     | -    | 30               | -    | pF    |
| Output       | Collector-Emitter Breakdown Voltage  | BV <sub>CEO</sub>    | I <sub>C</sub> =1mA                                             | 35   | -                | -    | V     |
|              | Emitter-Collector Breakdown Voltage  | BV <sub>ECO</sub>    | I <sub>E</sub> =0.1mA                                           | 6    | -                | -    | V     |
|              | Collector-Base Breakdown Voltage **  | BV <sub>CBO</sub>    | I <sub>C</sub> =0.1mA                                           | 70   | -                | -    | V     |
|              | Emitter-Base Breakdown Voltage **    | BV <sub>EBO</sub>    | I <sub>C</sub> =0.1mA                                           | 6    | -                | -    | V     |
|              | Collector Dark Current               | I <sub>CEO</sub>     | I <sub>F</sub> =0, V <sub>CE</sub> =10V                         | -    | -                | 100  | nA    |
|              | Capacitance                          | C <sub>CE</sub>      | V <sub>CE</sub> =0, f=10MHz                                     | -    | 10               | -    | pF    |
| Coupled      | Current Transfer Ratio *4            | CTR                  | I <sub>F</sub> = ±10mA, V <sub>CE</sub> =10V                    | 50   | -                | 200  | %     |
|              | Collector-Emitter Saturation Voltage | V <sub>CE(SAT)</sub> | I <sub>F</sub> = ±10mA, I <sub>C</sub> =0.5mA                   | -    | -                | 0.4  | V     |
|              | Input-Output Capacitance             | C <sub>IO</sub>      | V=0, f=1MHz                                                     | -    | 2                | -    | pF    |
|              | Input-Output Isolation Resistance    | R <sub>IO</sub>      | RH=40~60%, V=500V                                               | -    | 10 <sup>11</sup> | -    | Ω     |
|              | Rise Time                            | t <sub>r</sub>       | V <sub>CE</sub> =5V, R <sub>L</sub> =100<br>I <sub>C</sub> =2mA | -    | 3                | -    | μs    |
|              | Fall Time                            | t <sub>f</sub>       |                                                                 | -    | 3                | -    | μs    |
| CTR Symmetry |                                      | CTR1/CTR2            |                                                                 | 0.33 | -                | 3.0  |       |

\*\* Except for K5630

\*4. CTR=(I<sub>C</sub>/I<sub>F</sub>) X 100 (%)

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Forward Current vs.  
Ambient TemperatureCollector Power Dissipation vs.  
Ambient TemperatureForward Current vs.  
Forward VoltageCollector Current vs.  
Collector-Emitter VoltageDark Current vs.  
Ambient TemperatureCollector Current vs.  
Ambient TemperatureResponse Time vs.  
Load ResistanceCollector Current vs.  
Forward Current

Switching Time Test Circuit

