

# K3620 • K3621

These Photocouplers consist of a Gallium Arsenide Infrared Emitting Diode and a Silicon NPN PhotoDarlington transistor in a 6-pin package.

## FEATURES

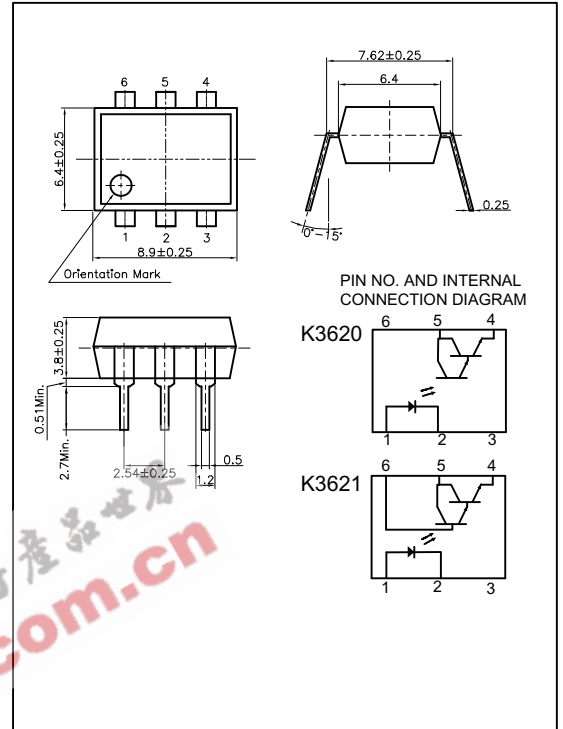
- Collector-Emitter Voltage : Min.35V
- Current Transfer Ratio : Typ.500% (at  $I_F=1\text{mA}$ ,  $V_{CE}=2\text{V}$ )
- Electrical Isolation Voltage : AC2500V<sub>rms</sub>
- UL Recognized File No. E107486

## APPLICATIONS

- Interface between two circuits of different potential
- Telephone Line Receiver
- Automatic Vending Machine
- Power Supply Regulators

## DIMENSION

(Unit : mm)



## MAXIMUM RATINGS

( Ta=25 )

| Parameter                                       |                                     | Symbol     | Rating   | Unit             |
|---|-------------------------------------|------------|----------|------------------|
| Input   | Forward Current                     | $I_F$      | 60       | mA               |
|   | Reverse Voltage                     | $V_R$      | 5        | V                |
|   | Peak Forward Current <sup>*1</sup>  | $I_{FP}$   | 1        | A                |
|   | Power Dissipation                   | $P_D$      | 150      | mW               |
|   | Junction Temperature                | $T_J$      | 125      |                  |
| Output  | Collector-Emitter Breakdown Voltage | $BV_{CEO}$ | 35       | V                |
|   | Emitter-Collector Breakdown Voltage | $BV_{ECO}$ | 6        | V                |
|   | Collector-Base Breakdown Voltage**  | $BV_{CBO}$ | 35       | V                |
|   | Collector Current                   | $I_C$      | 50       | mA               |
|   | Collector Power Dissipation         | $P_C$      | 150      | mW               |
| Input to Output Isolation Voltage <sup>*2</sup> |                                     | $V_{iso}$  | AC2500   | V <sub>rms</sub> |
| Storage Temperature                             |                                     | $T_{stg}$  | -55~+125 |                  |
| Operating Temperature                           |                                     | $T_{opr}$  | -30~+100 |                  |
| Lead Soldering Temperature <sup>*3</sup>        |                                     | $T_{sol}$  | 260      |                  |
| Total Power Dissipation                         |                                     | $P_{tot}$  | 200      | mW               |

\*\* Except for K3620

\*1. Input current with 100μs 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

( $T_a=25$  , unless otherwise noted)

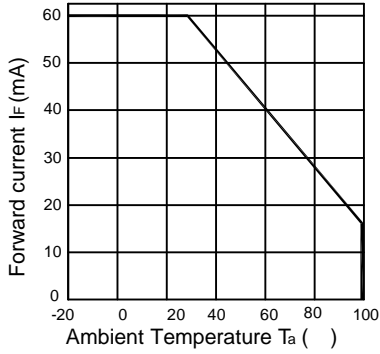
| Parameter |                                      | Symbol        | Condition                          | Min. | Typ.      | Max. | Unit.         |
|-----------|--------------------------------------|---------------|------------------------------------|------|-----------|------|---------------|
| Input     | Forward Voltage                      | $V_F$         | $I_F=10\text{mA}$                  | -    | 1.15      | 1.30 | V             |
|           | Reverse Current                      | $I_R$         | $V_R=5\text{V}$                    | -    | -         | 10   | $\mu\text{A}$ |
|           | Capacitance                          | $C_T$         | $V=0, f=1\text{MHz}$               | -    | 30        | -    | pF            |
| Output    | Collector-Emitter Breakdown Voltage  | $BV_{CEO}$    | $I_C=1\text{mA}$                   | 35   | -         | -    | V             |
|           | Emitter-Collector Breakdown Voltage  | $BV_{ECO}$    | $I_E=0.1\text{mA}$                 | 6    | -         | -    | V             |
|           | Collector-Base Breakdown Voltage **  | $BV_{CBO}$    | $I_C=0.1\text{mA}$                 | 35   | -         | -    | V             |
|           | Collector Dark Current               | $I_{CEO}$     | $I_F=0, V_{CE}=10\text{V}$         | -    | -         | 100  | nA            |
|           | Capacitance                          | $C_{CE}$      | $V_{CE}=0, f=1\text{MHz}$          | -    | 10        | -    | pF            |
| Coupled   | Current Transfer Ratio *4            | CTR           | $I_F=1\text{mA}, V_{CE}=2\text{V}$ | -    | 500       | -    | %             |
|           | Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_F=1\text{mA}, I_C=2\text{mA}$   | -    | 0.85      | 1.0  | V             |
|           | Input-Output Capacitance             | $C_{IO}$      | $V=0, f=1\text{MHz}$               | -    | 1         | -    | pF            |
|           | Input-Output Isolation Resistance    | $R_{IO}$      | $R_H=40\sim 60\%, V=500\text{V}$   | -    | $10^{11}$ | -    |               |
|           | Rise Time                            | $t_r$         | $V_{CE}=10\text{V}, R_L=100$       | -    | 100       | -    | $\mu\text{s}$ |
|           | Fall Time                            | $t_f$         | $I_C=2\text{mA}$                   | -    | 100       | -    | $\mu\text{s}$ |

\*\* Except for K3620

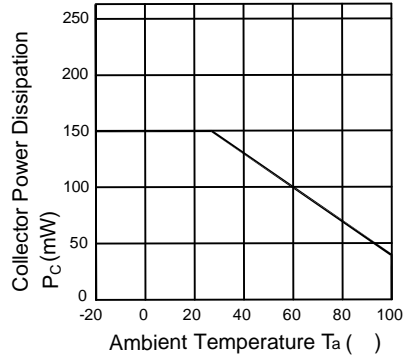
\*4.  $CTR=(I_C/I_F) \times 100$  (%)

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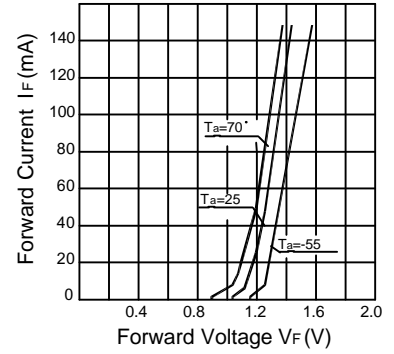
**Forward Current vs. Ambient Temperature**



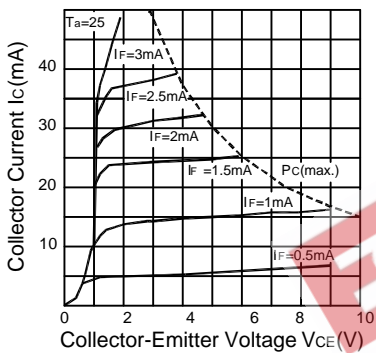
**Collector Power Dissipation vs. Ambient Temperature**



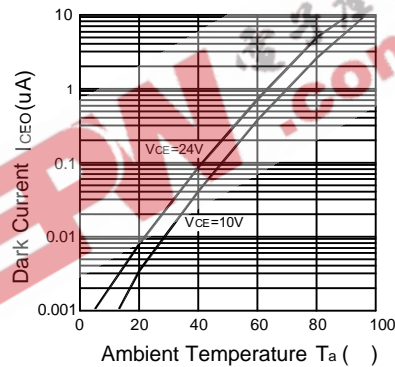
**Forward Current vs. Forward Voltage**



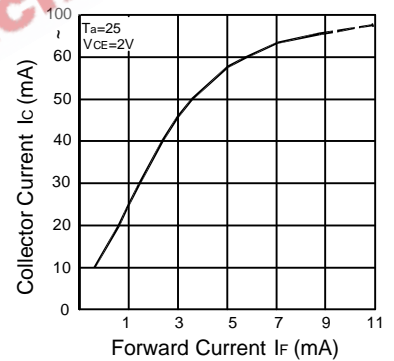
**Collector Current vs. Collector-Emitter Voltage**



**Dark Current vs. Ambient Temperature**



**Collector Current vs. Forward Current**



**Switching Time Test Circuit**

