

## Photocoupler

**KODENSHI**

### KPC614 • KPC624 • KPC644

These Photocouplers consist of two Gallium Arsenide Infrared Emitting Diodes and a Silicon NPN Photo Darlington transistor per channel.

The KPC614 has one channel in a 4-pin package.

The KPC624 has two channels in a 8-pin package.

The KPC644 has four channels in a 16-pin package.

#### FEATURES

- Small Package Size
- Collector-Emitter Voltage : Min.30V
- Current Transfer Ratio : Type 1000% (at  $I_F = \pm 1\text{mA}$ ,  $V_{CE} = 2\text{V}$ )
- Electrical Isolation Voltage : AC5000V<sub>rms</sub>
- UL Recognized File No. E107486

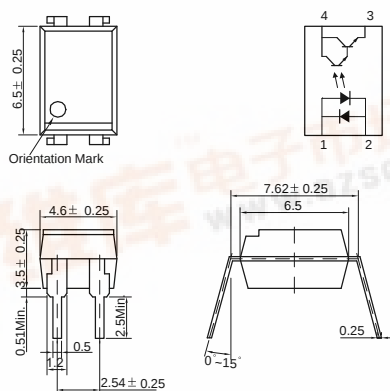
#### APPLICATIONS

- AC Signal Input
- Interface between two circuits of different potential
- Automatic Vending Machine
- Copiers, Industrial Robots

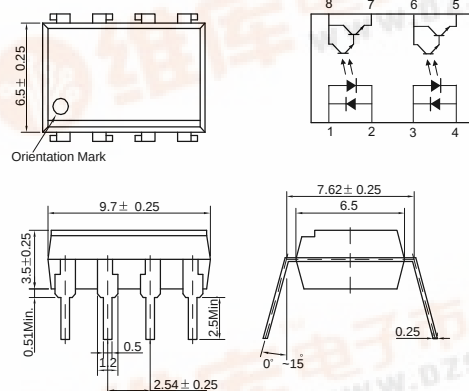
#### DIMENSION

(Unit : mm)

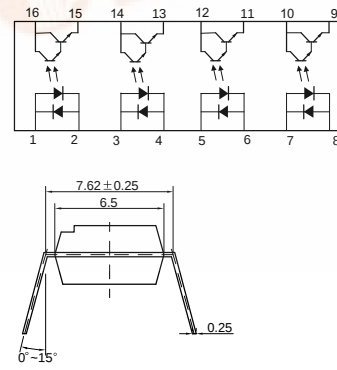
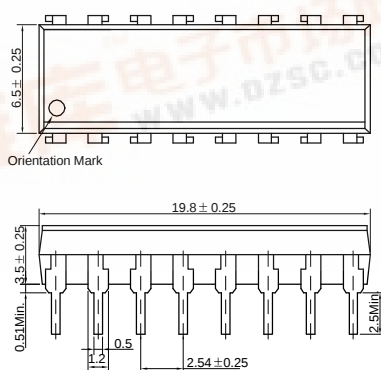
##### KPC614



##### KPC624



##### KPC644



## Photocoupler



# KPC614 • KPC624 • KPC644

## MAXIMUM RATINGS

(Ta=25 )

| Parameter                                       |                                     | Symbol | Rating   | Unit |
|-------------------------------------------------|-------------------------------------|--------|----------|------|
| Input                                           | Forward Current                     | IF     | ± 60     | mA   |
|                                                 | Peak Forward Current <sup>*1</sup>  | IFP    | ± 1      | A    |
|                                                 | Power Dissipation                   | PD     | 150      | mW   |
|                                                 | Junction Temperature                | TJ     | 125      |      |
| Output                                          | Collector-Emitter Breakdown Voltage | BVCEO  | 30       | V    |
|                                                 | Emitter-Collector Breakdown Voltage | BVECO  | 5        | V    |
|                                                 | Collector Current                   | IC     | 50       | mA   |
|                                                 | Collector Power Dissipation         | PC     | 150      | mW   |
| Input to Output Isolation Voltage <sup>*2</sup> |                                     | Viso   | AC5000   | Vrms |
| Storage Temperature                             |                                     | Tstg   | -55~+125 |      |
| Operating Temperature                           |                                     | Topr   | -30~+85  |      |
| Lead Soldering Temperature <sup>*3</sup>        |                                     | Tsol   | 260      |      |
| Total Power Dissipation                         |                                     | Ptot   | 250      | mW   |

\*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

## ELECTRO-OPTICAL CHARACTERISTICS

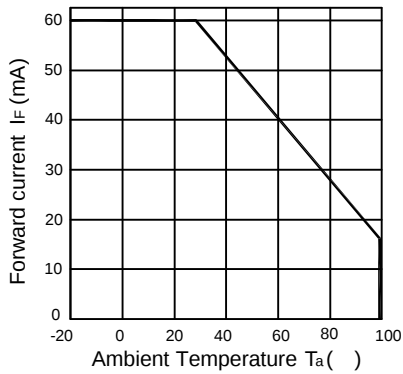
(Ta=25 , unless otherwise noted)

| Parameter |                                      | Symbol   | Condition         | Min. | Typ.             | Max. | Unit. |
|-----------|--------------------------------------|----------|-------------------|------|------------------|------|-------|
| Input     | Forward Voltage                      | VF       | IF= ± 10mA        | -    | 1.15             | 1.30 | V     |
|           | Capacitance                          | CT       | V=0, f=1kHz       | -    | 30               | -    | pF    |
| Output    | Collector-Emitter Breakdown Voltage  | BVCEO    | IC=0.5mA          | 30   | -                | -    | V     |
|           | Emitter-Collector Breakdown Voltage  | BVECO    | IE=0.1mA          | 5    | -                | -    | V     |
|           | Collector Dark Current               | ICEO     | IF=0, VCE=10V     | -    | -                | 100  | nA    |
|           | Capacitance                          | CCE      | VCE=0, f=1kHz     | -    | 10               | -    | pF    |
| Coupled   | Current Transfer Ratio <sup>*4</sup> | CTR      | IF= ± 1mA, VCE=2V | 300  | -                | -    | %     |
|           | Collector-Emitter Saturation Voltage | VCE(SAT) | IF= ± 1mA, IC=2mA | -    | 0.8              | 1.2  | V     |
|           | Input-Output Capacitance             | CIO      | V=0, f=1kHz       | -    | 5                | -    | pF    |
|           | Input-Output Isolation Resistance    | RIO      | RH=40~60%, V=500V | -    | 10 <sup>11</sup> | -    | Ω     |
|           | Rise Time                            | tr       | VCE=10V, RL=100 Ω | -    | 90               | -    | μs    |
|           | Fall Time                            | tf       | IC=10mA           | -    | 120              | -    | μs    |

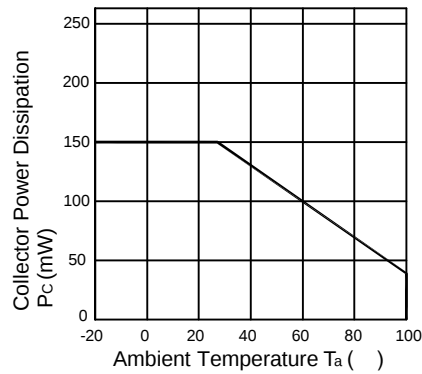
\*4. CTR=(IC/IF) X 100 (%)

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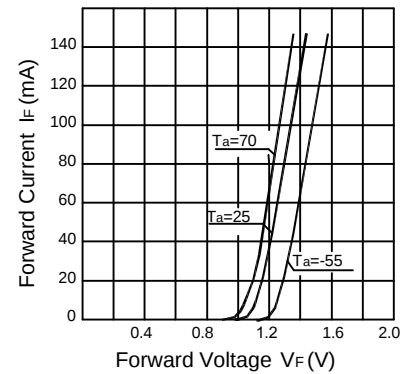
**Forward Current vs. Ambient Temperature**



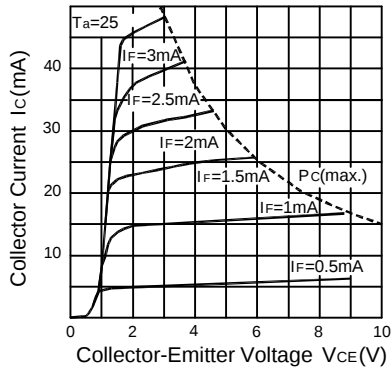
**Collector Power Dissipation vs. Ambient Temperature**



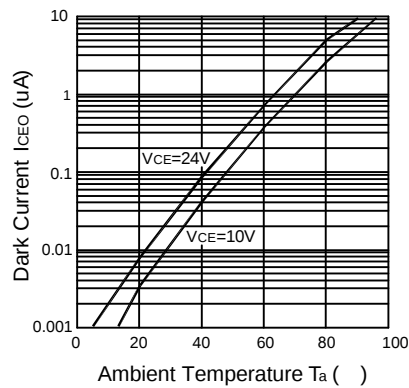
**Forward Current vs. Forward Voltage**



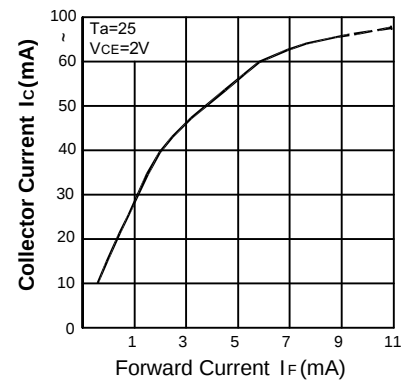
**Collector Current vs. Collector-Emitter Voltage**



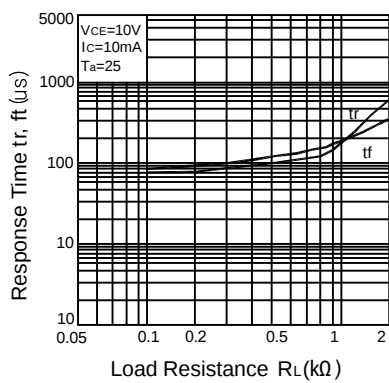
**Dark Current vs. Ambient Temperature**



**Collector Current vs. Forward Current**



**Response Time vs. Load Resistance**



**Switching Time Test Circuit**

