

### KB814

GENERAL PURPOSE  
HIGH ISOLATION VOLTAGE  
SINGLE TRANSISTOR TYPE  
PHOTOCOUPLER SERIES

#### FEATURES

- 1.AC Input
- 2.High isolation voltage between input and output (Viso=5000 Vrms)
- 3.Compact dual-in-line package  
KB814:1-channel type
- 4.Recognized by UL and CUL, file NO. E225308
5. Approved by VDE 0884 Teil2(NO:40006364)  
(Creepage distance between input and output:7mm or more)

#### DESCRIPTION

- 1.The KB814(1-channel) is optically coupled isolators containing two GaAs light emitting diode and an NPN silicon phototransistor.
- 2.The lead pitch is 2.54mm.

#### APPLICATIONS

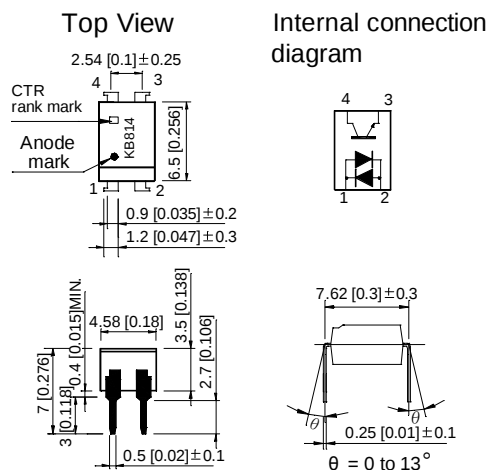
- 1.Computer terminals.
- 2.Registers, copiers, automatic vending machines.
- 3.System appliances, measuring instruments.
- 4.Programmable logic controller.
- 5.Signal transmission between circuits of different potentials and impedances.

### KB814

#### \*PACKAGE DIMENSIONS (UNIT:mm)

##### DIP Type

#### KB814



1. Anode,Cathode
2. Anode,Cathode
3. Emitter
4. Collector

TOLERANCE :  $\pm 0.5[\pm 0.02]$  UNLESS OTHERWISE NOTED.

#### \* Absolute Maximum Ratings (Ta=25°C)

| Parameter                |                             | Symbol           | Rating   | Unit             |
|--------------------------|-----------------------------|------------------|----------|------------------|
| Input                    | Forward current             | IF               | ± 50     | mA               |
|                          | Power dissipation           | P                | 70       | mW               |
| Output                   | Collector-emitter voltage   | V <sub>CEO</sub> | 35       | V                |
|                          | Emitter-collector voltage   | V <sub>ECO</sub> | 6        | V                |
|                          | Collector current           | I <sub>C</sub>   | 50       | mA               |
|                          | Collector power dissipation | P <sub>C</sub>   | 150      | mW               |
| Total power dissipation  |                             | P <sub>tot</sub> | 200      | mW               |
| *1 Isolation voltage     |                             | Viso             | 5000     | V <sub>rms</sub> |
| Operating temperature    |                             | T <sub>opr</sub> | -30~+100 | ° C              |
| Storage temperature      |                             | T <sub>stg</sub> | -55~+125 | ° C              |
| *2 Soldering temperature |                             | T <sub>sol</sub> | 260      | ° C              |

\*1 40 to 60%RH, AC for 1 minute

\*2 For 10 seconds

## \* Electro-optical Characteristics (Ta=25°C)

| Parameter                |                                      | Symbol        | Conditions                                                  | Min. | Typ. | Max.      | Unit          |
|--------------------------|--------------------------------------|---------------|-------------------------------------------------------------|------|------|-----------|---------------|
| Input                    | Forward voltage                      | $V_F$         | $I_F = \pm 20\text{mA}$                                     | —    | 1.2  | 1.4       | V             |
|                          | Peak forward voltage                 | $V_{FM}$      | $I_{FM} = \pm 0.5\text{A}$                                  | —    | —    | 3.0       | V             |
| Output                   | Collector dark current               | $I_{CEO}$     | $V_{CE} = 20\text{V}, I_F = 0\text{mA}$                     | —    | —    | $10^{-7}$ | A             |
| Transfer characteristics | *1 Current transfer ratio            | CTR           | $I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$                  | 20   | —    | 300       | %             |
|                          | Collector-emitter saturation voltage | $V_{CE(Sat)}$ | $I_F = \pm 20\text{mA}, I_C = 1\text{mA}$                   | —    | 0.1  | 0.2       | V             |
|                          | Response time                        | Rise time     | $V_{CE} = 2\text{V}, I_C = 2\text{mA}$<br>$R_L = 100\Omega$ | —    | 4    | 18        | $\mu\text{S}$ |
|                          |                                      | Fall time     |                                                             | —    | 3    | 18        | $\mu\text{S}$ |

\*1 Classification table of current transfer ratio is shown below.

$$\text{CTR} = \frac{I_C}{I_F} \times 100\%$$

| Model NO. | Rank mark          | CTR(%)  |
|-----------|--------------------|---------|
| KB814L    | L                  | 20~60   |
| KB814A    | A                  | 50~150  |
| KB814B    | B                  | 120~300 |
| KB814LA   | L or A             | 20~150  |
| KB814AB   | A or B             | 50~300  |
| KB814     | L, A, B or No mark | 20~300  |

Fig. 1 Current Transfer Ratio vs. Forward Current

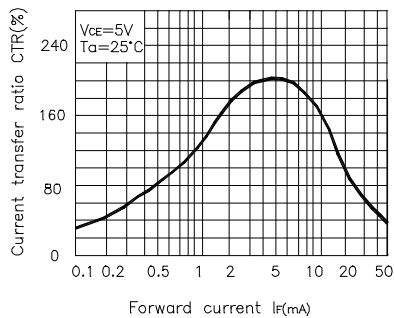


Fig. 2 Forward Current vs. Forward voltage

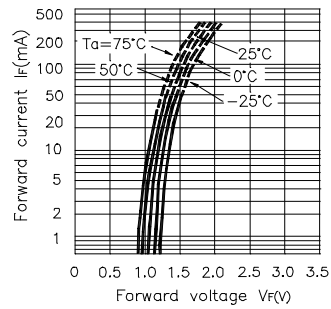


Fig. 3 Collector Current vs. Collector-emitter Voltage

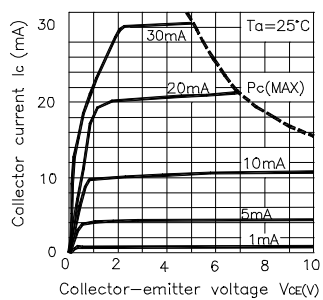


Fig. 4 Relative Current Transfer Ratio vs. Ambient Temperature

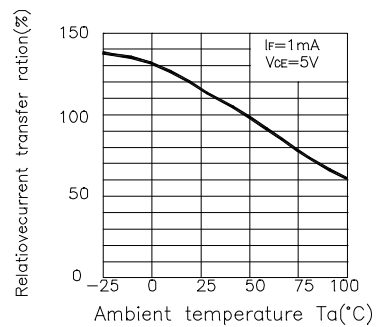


Fig. 5 Collector-emitter Saturation Voltage vs. Ambient Temperature

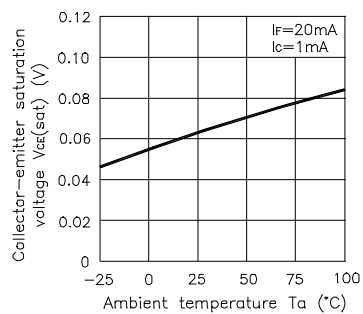


Fig. 6 Collector Dark Current vs. Ambient Temperature

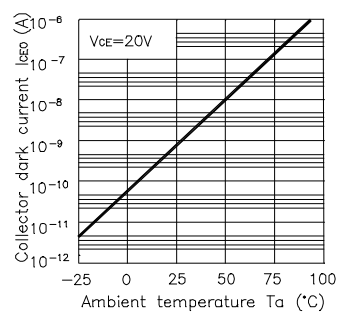


Fig. 7 Forward Current vs. Ambient Temperature

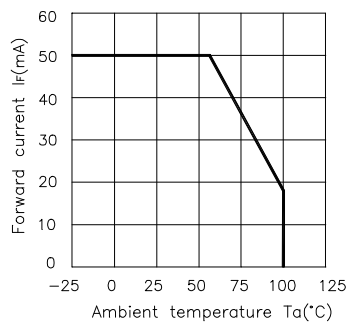


Fig. 8 Collector Power Dissipation vs. Ambient Temperature

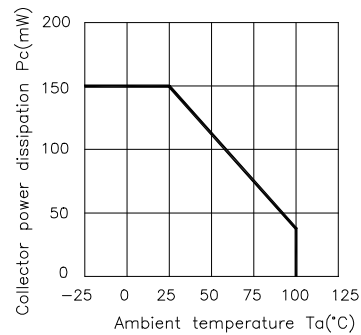
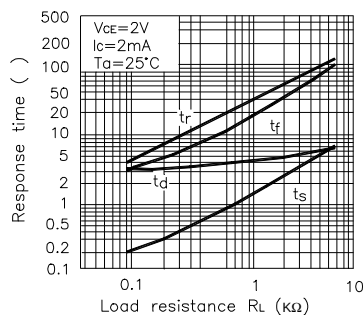


Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

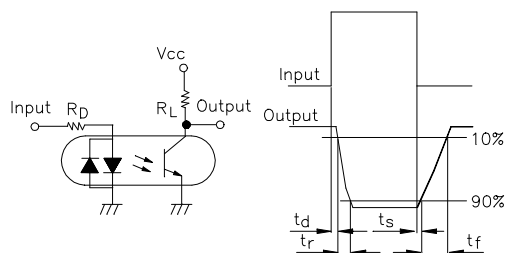
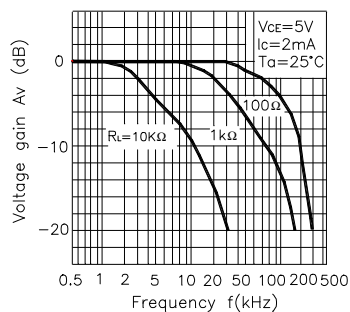


Fig. 10 Frequency Response



Test Circuit for Frequency Response

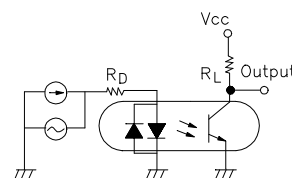
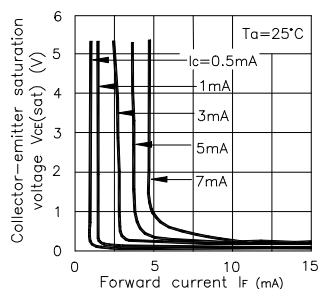


Fig. 11 Collector-emitter Saturation Voltage vs. Forward Current



#### \* NOTES ON HANDLING

##### 1.Recommended soldering conditions (Dip soldering)

###### (1) Dip soldering

|             |                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Temperature | 260 °C or below (molten solder temperature)                                                                              |
| Time        | Less than 10 seconds.                                                                                                    |
| Cycle       | One cycle allowed to be dipped in solder including plastic nold portion.                                                 |
| Flux        | Rosin flux containing small amount of chlorine<br>(The flux with a maximum chlorine content of 0.2 Wt % is recommended.) |

###### (2) Cautions

###### Fluxes

Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.

##### 2.Cautions regarding noise

Be aware that power is suddenly into the component any surge current may cause damage happen, even if the voltage is within the absolute maximum ratings.

#### CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested.

GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them.

#### RESTRICTIONS ON PRODUCT USE

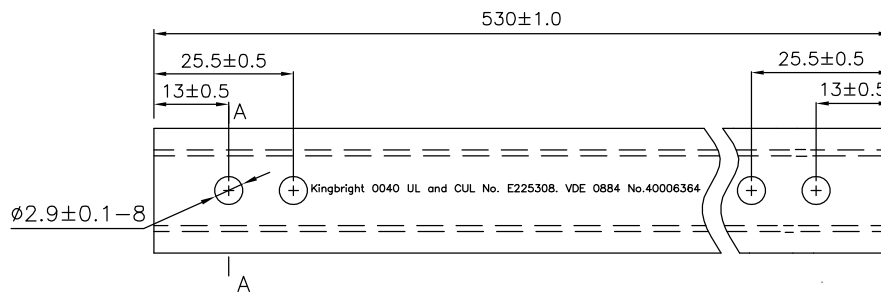
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### KB814

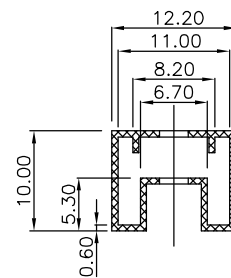
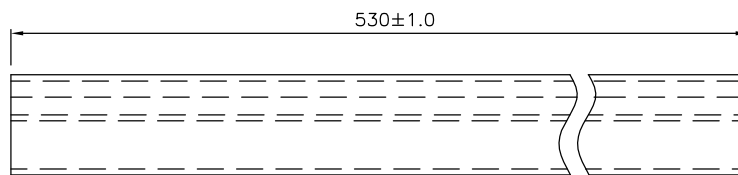
#### Dimension of Tube

TOLERANCE :  $\pm 0.4[\pm 0.012]$  UNLESS OTHERWISE NOTED.

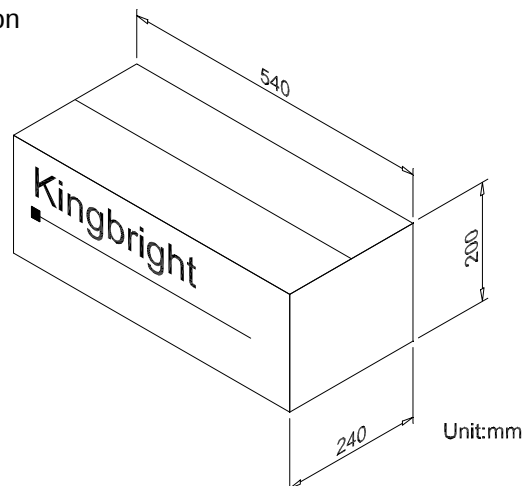
Unit:mm



A-A Side view



#### Dimension of Carton



Unit:mm

| Part Number | Package   | Packing Style      |
|-------------|-----------|--------------------|
| KB814       | 4-pin DIP | 100pcs / each tube |