

### KB817-B

**GENERAL PURPOSE  
HIGH ISOLATION VOLTAGE  
SINGLE TRANSISTOR TYPE  
PHOTOCOUPLER SERIES**

#### FEATURES

1. Lead forming (gull wing) type, for surface mounting.
2. High isolation voltage between input and output (Viso=5000 Vrms).
3. Compact dual-in-line package  
KB817-B: 1-channel type
4. Recognized by UL and CUL, file NO. E225308.

#### DESCRIPTION

1. The KB817-B (1-channel) is optically coupled isolators containing a GaAs light emitting diode and an NPN silicon phototransistor.
2. The lead pitch is 2.54mm.
3. Solid insulation thickness between emitting diode and output phototransistor:  $\geq 0.6\text{mm}$ .

#### 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.

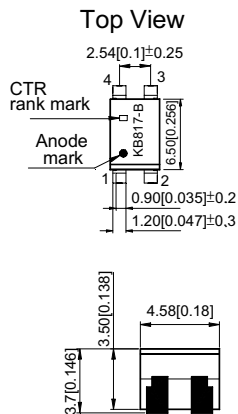
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#### \*PACKAGE DIMENSIONS (UNIT:mm)

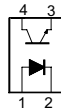
#### Lead Bending Type

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

#### KB817-B



#### Internal connection diagram



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

#### \*Absolute Maximum Ratings ( $T_a=25^\circ\text{C}$ )

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	Reverse voltage	$V_R$	6	V
	Power dissipation	P	70	mW
Output	Collector-emitter voltage	$V_{CEO}$	35	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	50	mA
	Collector power dissipation	$P_C$	150	mW
Total power dissipation		$P_{tot}$	200	mW
<sup>1</sup> Isolation voltage		$V_{iso}$	5000	$V_{rms}$
Operating temperature		$T_{opr}$	-30~+100	$^\circ\text{C}$
Storage temperature		$T_{stg}$	-55~+125	$^\circ\text{C}$
<sup>2</sup> Soldering temperature		$T_{sol}$	260	$^\circ\text{C}$

<sup>1</sup> 40 to 60% RH, AC for 1 minute.

<sup>2</sup> For 10 seconds.

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#### \*Electro-optical Characteristics

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit	
Input	Forward voltage	$V_F$	$I_F=20\text{mA}$	—	1.2	1.4	V	
	Peak forward voltage	$V_{FM}$	$I_{FM}=0.5\text{A}$	—	—	3.0	V	
	Reverse current	$I_R$	$V_R=4\text{V}$	—	—	10	$\mu\text{A}$	
Output	Collector dark current	$I_{CEO}$	$V_{CE}=20\text{V}, I_F=0\text{mA}$	—	—	$10^{-7}$	nA	
Transfer characteristics	*1 Current transfer ratio		CTR	$I_F=5\text{mA}, V_{CE}=5\text{V}$	50	—	600	%
	Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_F=20\text{mA}, I_C=1\text{mA}$	—	0.1	0.2	V
	Cut-off frequency		$f_c$	$V_{CE}=5\text{V}, I_C=2\text{mA}$ $R_L=100\Omega, -3\text{dB}$	—	80	—	KHz
	Response time	Rise time	$t_r$	$V_{CE}=2\text{V}, I_C=2\text{mA}$ $R_L=100\Omega$	—	4	18	$\mu\text{s}$
Fall time		$t_f$	—		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(%)
KB817L-B	L	50 to 100
KB817A-B	A	80 to 160
KB817B-B	B	130 to 260
KB817C-B	C	200 to 400
KB817D-B	D	300 to 600
KB817AB-B	A or B	80 to 260
KB817BC-B	B or C	130 to 400
KB817CD-B	C or D	200 to 600
KB817AC-B	A,B or C	80 to 400
KB817BD-B	B,C or D	130 to 600
KB817AD-B	A,B,C or D	80 to 600
KB817-B	L,A,B,C,D or No mark	50 to 600

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Fig. 1 Current Transfer Ratio vs. Forward Current

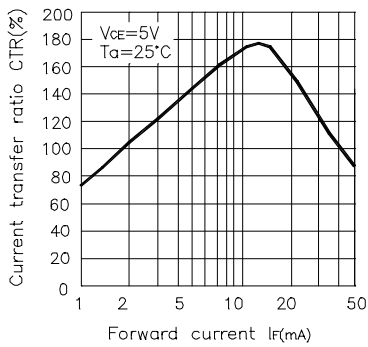


Fig. 2 Forward Current vs. Forward voltage

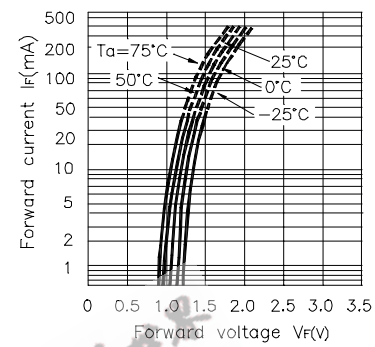


Fig. 3 Collector Current vs. Collector-emitter Voltage

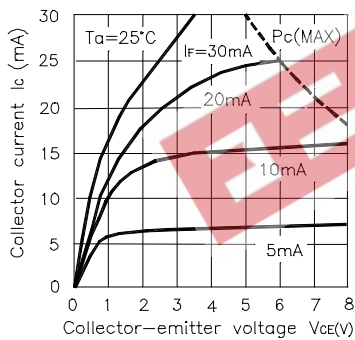


Fig. 4 Relative Current Transfer Ratio vs. Ambient Temperature

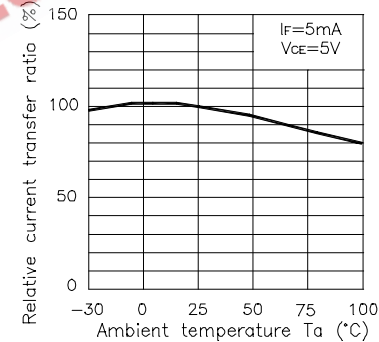


Fig. 5 Collector-emitter Saturation Voltage vs. Ambient Temperature

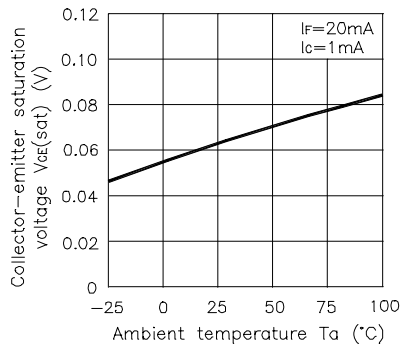
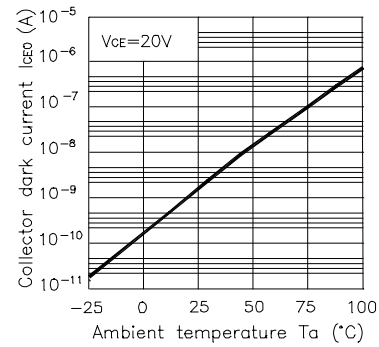
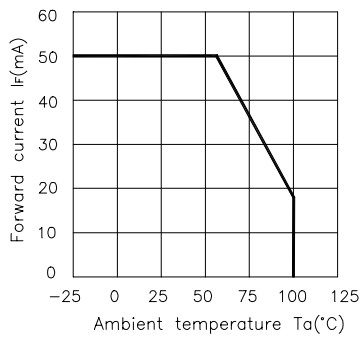


Fig. 6 Collector Dark Current vs. Ambient Temperature

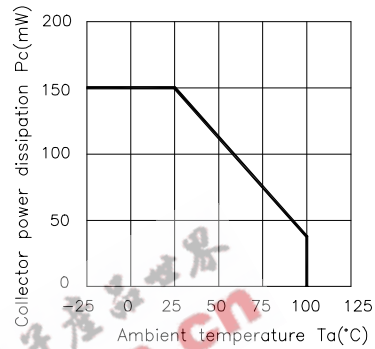


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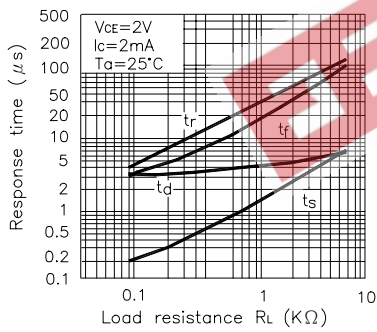
**Fig. 7 Forward Current vs. Ambient Temperature**



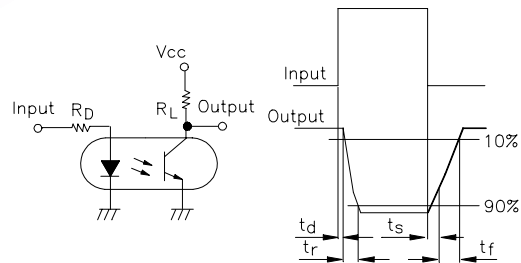
**Fig. 8 Collector Power Dissipation vs. Ambient Temperature**



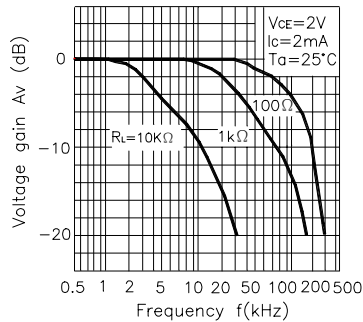
**Fig. 9 Response Time vs. Load Resistance**



**Test Circuit for Response Time**



**Fig. 10 Frequency Response**



**Test Circuit for Frequency Response**

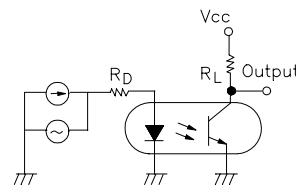
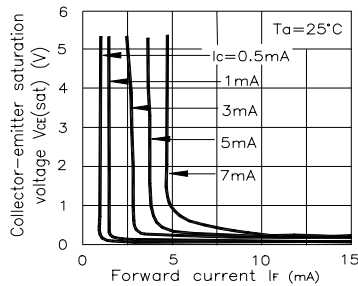


Fig. 11 Collector-emitter Saturation Voltage vs. Forward Current



**\*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 mold portion.
- Flux                                    Rosin flux containing small amount of chorine  
(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 componment any surge current may cause damage happen, even if the voltage is within the absolute maximum ratings.

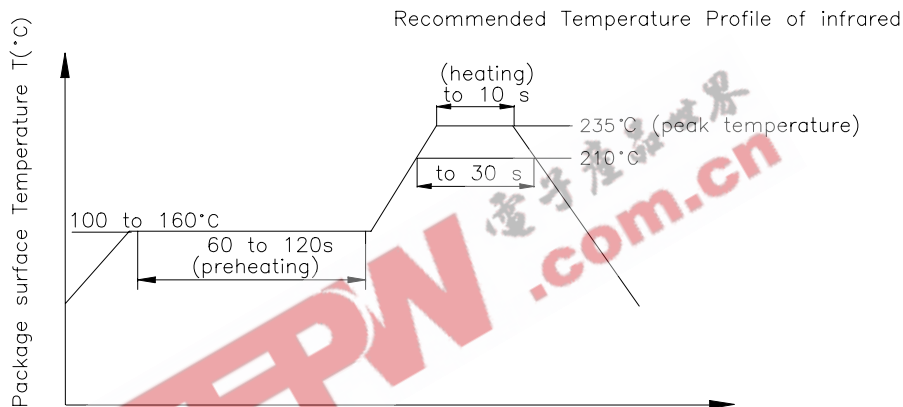
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#### NOTES ON HANDLING

##### 1.Recommended soldering conditions

##### (1).Infrared reflow soldering

- |  |  |
|--|--|
| ●Peak reflow temperature               | 235°C or below(package surface temperature)  |
| ●Time of temperature higher than 210°C | 30 seconds or less   |
| ●Number of reflows                     | Three  |
| ●Flux                                  | Rosin flux containing small amount of chlorine(The flux with a maximum chlorine content of 0.2Wt% is recommended.) |



#### CAUTION

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

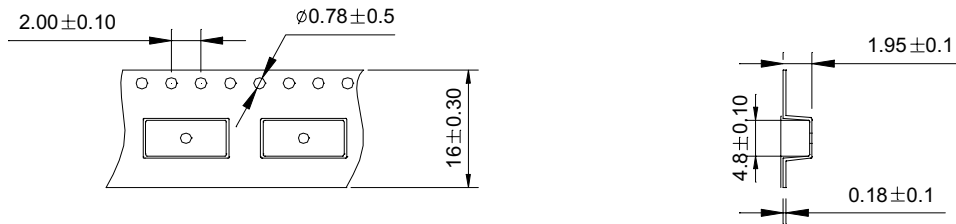
GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them.

#### RESTRICTIONS ON PRODUCT USE

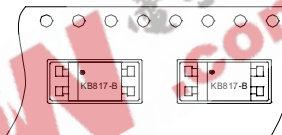
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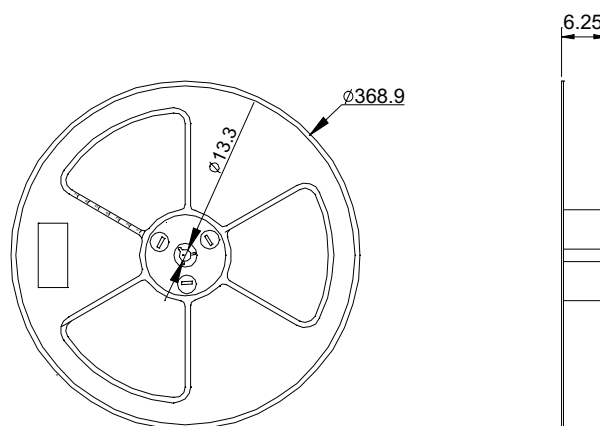
Outline and Dimension (Tape)  
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Tape Direction



Outline and Dimension(Reel)



Packing: 1000pcs/reel