

Kingbright

PHOTOCOUPLER

KB837-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
KB837-B: 3-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).
6. RoHS compliant.

DESCRIPTION

1. The KB837-B (3-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.

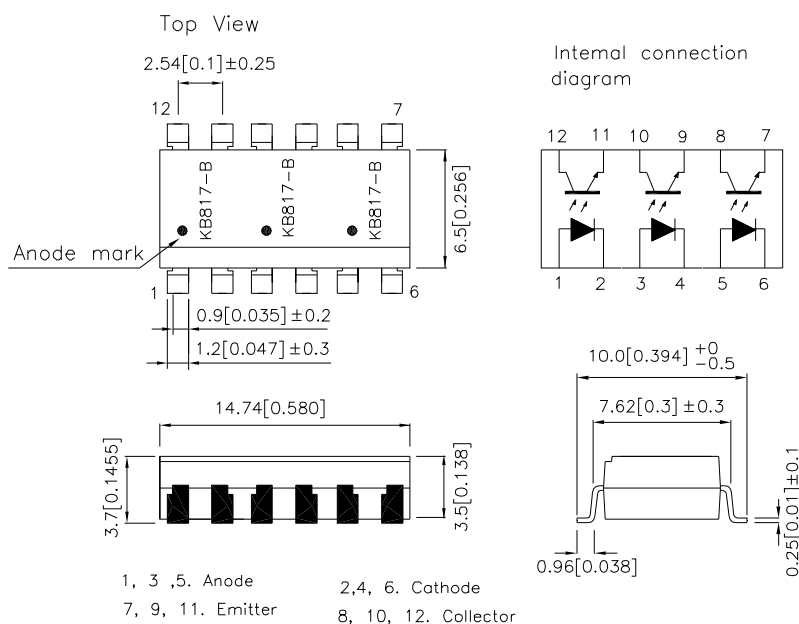


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*PACKAGE DIMENSIONS (UNIT:mm)

Lead Bending Type

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



*Absolute Maximum Ratings (Ta=25°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
*1 Isolation voltage		V_{iso}	5000	Vrms
Operating temperature		T_{opr}	-30~+100	°C
Storage temperature		T_{stg}	-55~+125	°C
*2 Soldering temperature		T_{sol}	260	°C

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

*2 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	μA
Output	Collector dark current		I_{CEO}	$V_{CE}=20\text{V}, I_F=0\text{mA}$	—	—	10^{-7}	A
Transfer characteristics	*1Current 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	μs
		Fall time	t_f		—	3	18	μs

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

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

Model No.	Rank mark	CTR(%)
KB837L-B	L	50 to 100
KB837A-B	A	80 to 160
KB837B-B	B	130 to 260
KB837C-B	C	200 to 400
KB837D-B	D	300 to 600
KB837AB-B	A or B	80 to 260
KB837BC-B	B or C	130 to 400
KB837CD-B	C or D	200 to 600
KB837AC-B	A,B or C	80 to 400
KB837BD-B	B,C or D	130 to 600
KB837AD-B	A,B,C or D	80 to 600
KB837-B	L,A,B,C,D or No mark	50 to 600

Fig. 1 Current Transfer Ratio vs. Forward Current

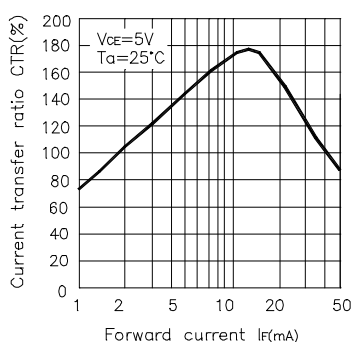


Fig. 2 Forward Current vs. Forward voltage

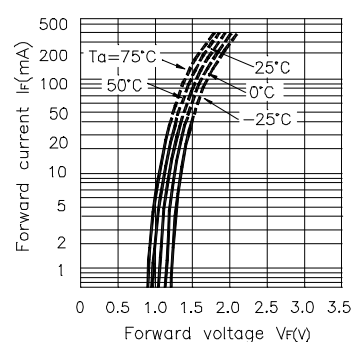


Fig. 3 Collector Current vs. Collector-emitter Voltage

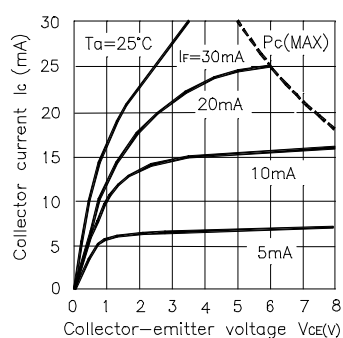


Fig. 4 Relative Current Transfer Ratio vs. Ambient Temperature

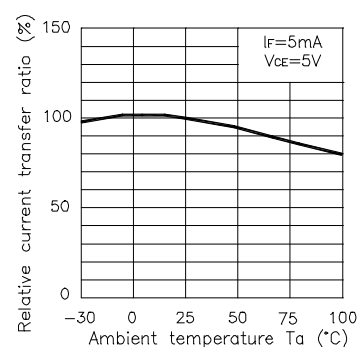


Fig. 5 Collector-emitter Saturation Voltage vs. Ambient Temperature

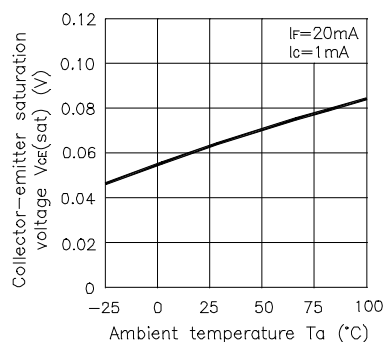


Fig. 6 Collector Dark Current vs. Ambient Temperature

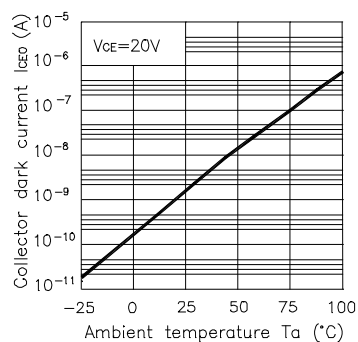


Fig. 7 Forward Current vs. Ambient Temperature

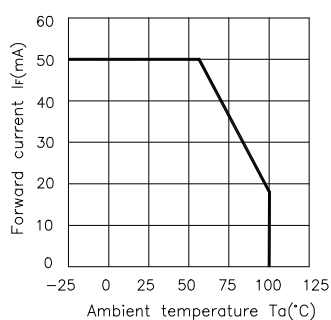


Fig. 8 Collector Power Dissipation vs. Ambient Temperature

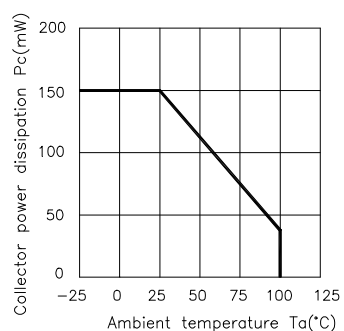
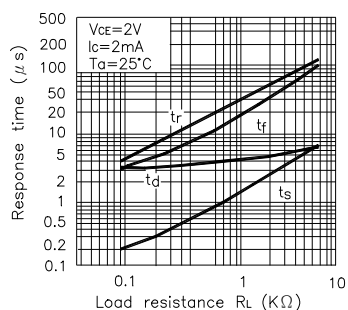


Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

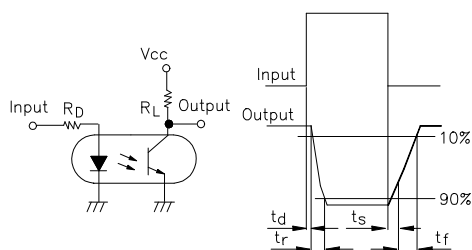
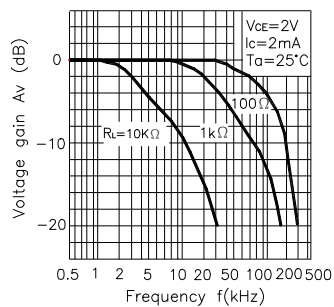


Fig. 10 Frequency Response



Test Circuit for Frequency Response

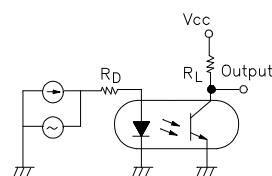
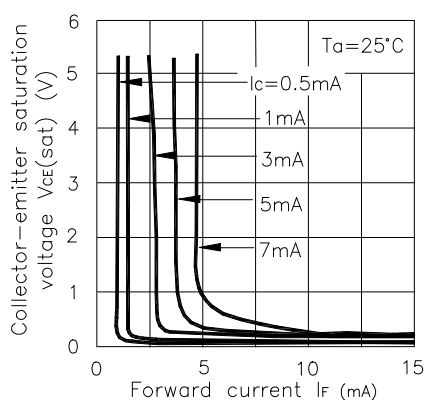


Fig. 11 Collector-emitter Saturation Voltage vs. Forward Current



*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 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.
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2.Cautions regarding noise

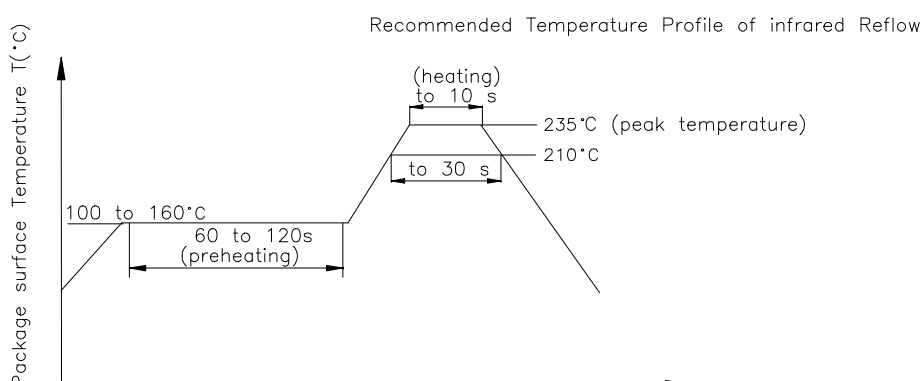
Be aware that power is suddenly into the component any surge current may cause damage happen, even if the voltage is within the absolute maximum ratings.

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

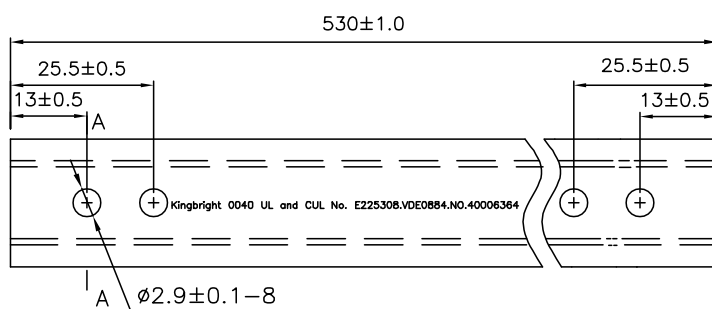
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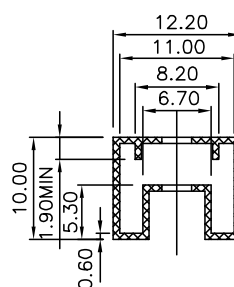
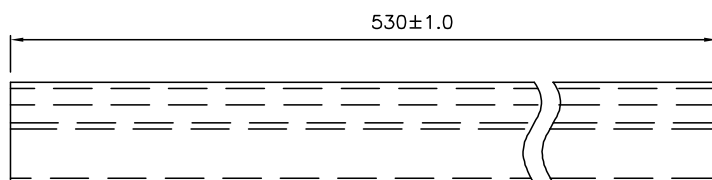
Dimension of Tube

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

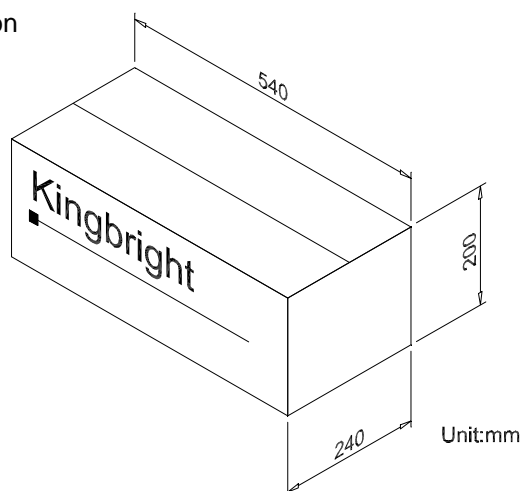
Unit:mm



A-A Side view



Dimension of Carton



Unit:mm

Part Number	Package	Packing Style
KB837-B	12-pin DIP	30pcs / each tube