Kingbright

KB817 Series

GENERAL PURPOSE
HIGH ISOLATION VOLTAGE
SINGLE TRANSISTOR TYPE
PHOTOCOUPLER SERIES

FEATURES

1.High isolation voltage between input and output (Viso=5000 Vrms)

2.Compact dual-in-line package

KB817:1-channel type

KB827:2-channel type

KB837:3-channel type

KB847:4-channel type

3.Recognized by UL and CUL, file NO. E225308

4.Approved by VDE 0884 Teil2(NO:40006364)
(Creepage distance between input and output:7mm or more)

DESCRIPTION

1.The KB817 series are optically coupled isolators containing a 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

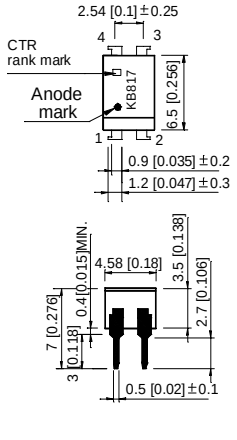
* PACKAGE DIMENSIONS (UNIT: mm)

DIP Type

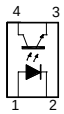
TOLERANCE : ± 0.5[± 0.02] UNLESS OTHERWISE NOTED.

KB817

Top View



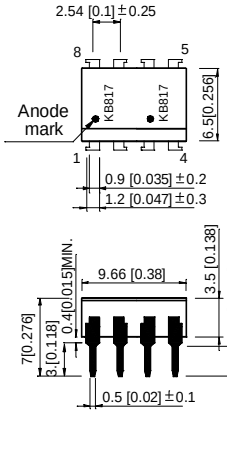
Internal connection diagram



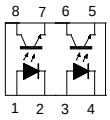
1. Anode 2. Cathode 3. Emitter 4. Collector

KB827

Top View



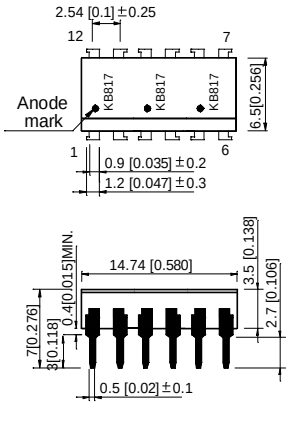
Internal connection diagram



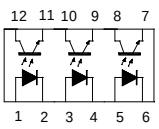
1, 3. Anode 2, 4. Cathode 5, 7. Emitter 6, 8. Collector

KB837

Top View



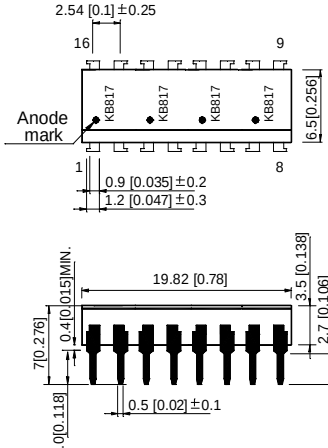
Internal connection diagram



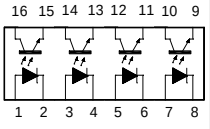
1, 3, 5. Anode
2, 4, 6. Cathode
7, 9, 11. Emitter
8, 10, 12. Collector

KB847

Top View



Internal connection diagram



1, 3, 5, 7. Anode
2, 4, 6, 8. Cathode
9, 11, 13, 15. Emitter
10, 12, 14, 16. Collector

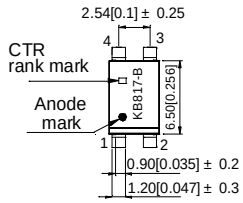
* PACKAGE DIMENSIONS (UNIT: mm)

Lead Bending Type

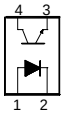
TOLERANCE : ± 0.5[± 0.02] UNLESS OTHERWISE NOTED.

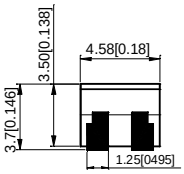
KB817-B

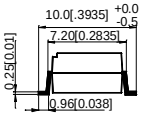
Top View



Internal connection diagram



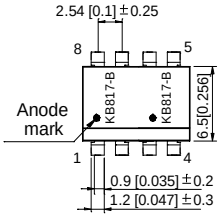




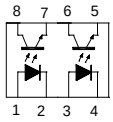
1. Anode 2. Cathode 3. Emitter 4. Collector

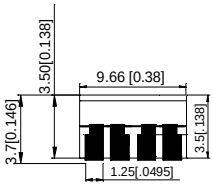
KB827-B

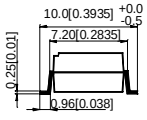
Top View



Internal connection diagram



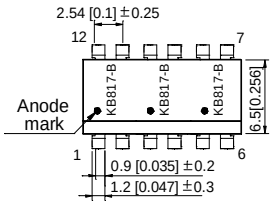




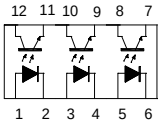
1, 3. Anode 2, 4. Cathode 5, 7. Emitter 6, 8. Collector

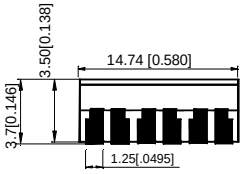
KB837-B

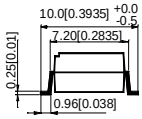
Top View



Internal connection diagram





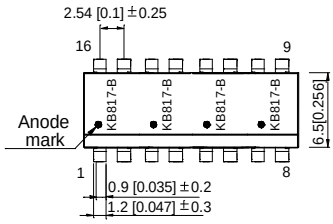


1, 3, 5. Anode
2, 4, 6. Cathode

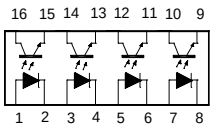
7, 9, 11. Emitter
8, 10, 12. Collector

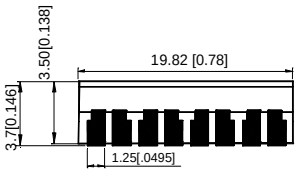
KB847-B

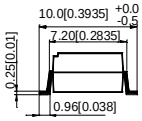
Top View



Internal connection diagram







1, 3, 5, 7. Anode
2, 4, 6, 8. Cathode

9, 11, 13, 15. Emitter
10, 12, 14, 16. Collector

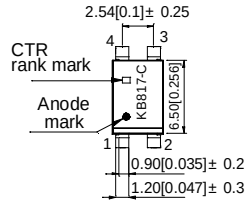
* PACKAGE DIMENSIONS (UNIT: mm)

Lead Bending Type

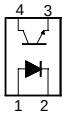
TOLERANCE : ± 0.5[± 0.02] UNLESS OTHERWISE NOTED.

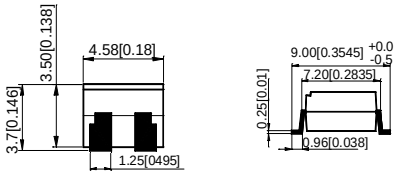
KB817-C

Top View



Internal connection diagram

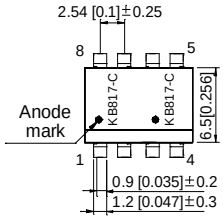




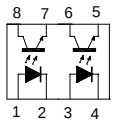
1. Anode 2. Cathode 3. Emitter 4. Collector

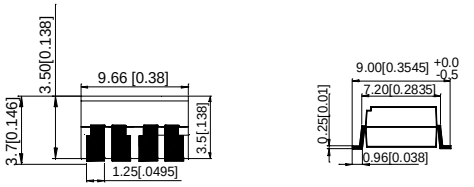
KB827-C

Top View



Internal connection diagram

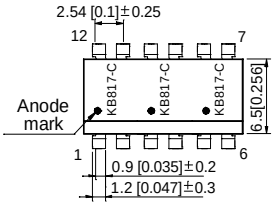




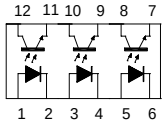
1, 3. Anode 2, 4. Cathode 5, 7. Emitter 6, 8. Collector

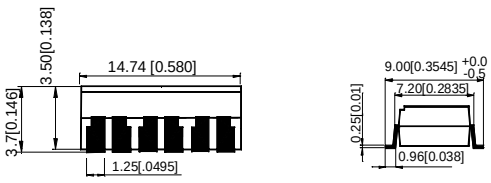
KB837-C

Top View



Internal connection diagram



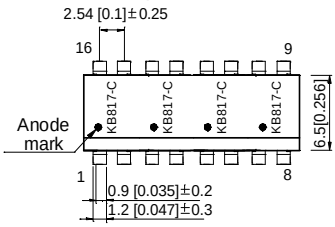


1, 3, 5. Anode
2, 4, 6. Cathode

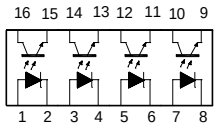
7, 9, 11. Emitter
8, 10, 12. Collector

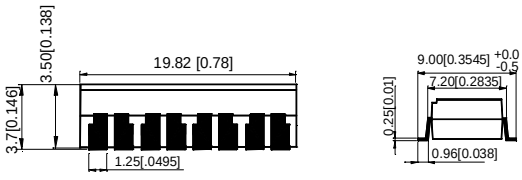
KB847-C

Top View



Internal connection diagram





1, 3, 5, 7. Anode
2, 4, 6, 8. Cathode

9, 11, 13, 15. Emitter
10, 12, 14, 16. Collector

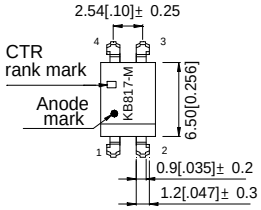
* PACKAGE DIMENSIONS (UNIT: mm)

Lead Bending Type for long creepage distance

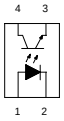
TOLERANCE : ± 0.5[± 0.02] UNLESS OTHERWISE NOTED.

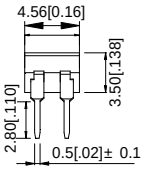
KB817-M

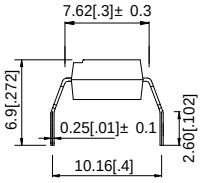
Top View



Internal connection diagram



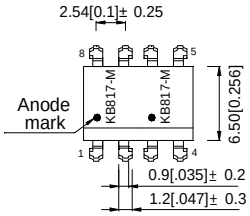




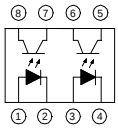
1.Anode 2. Cathode 3. Emitter 4. Collector

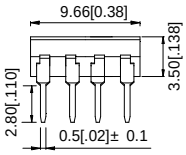
KB827-M

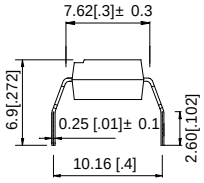
Top View



Internal connection diagram



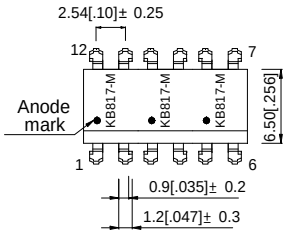




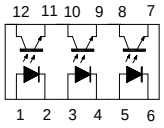
1, 3. Anode 2, 4. Cathode 5, 7. Emitter 6, 8. Collector

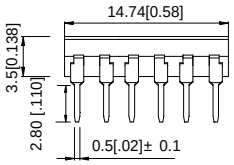
KB837-M

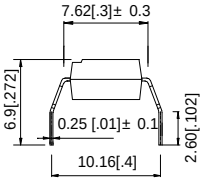
Top View



Internal connection diagram





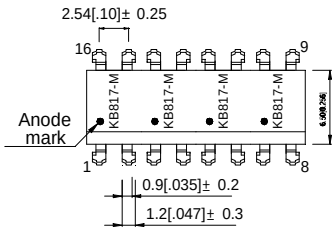


1, 3, 5. Anode
2, 4, 6. Cathode

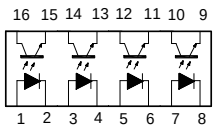
7, 9, 11. Emitter
8, 10, 12. Collector

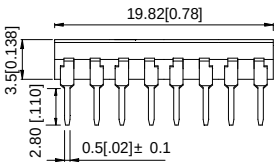
KB847-M

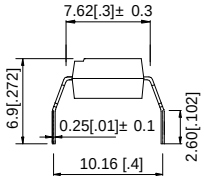
Top View



Internal connection diagram







1, 3, 5, 7. Anode
2, 4, 6, 8. Cathode

9, 11, 13, 15. Emitter
10, 12, 14, 16. Collector

***ORDERING INFORMATION**

Part Number	Package	Package Style
KB817	4-pin DIP	100pcs/each tube
KB827	8-pin DIP	50pcs/each tube
KB837	12-pin DIP	30pcs/each tube
KB847	16-pin DIP	25pcs/each tube
KB817-B, KB817-C	4-pin LEAD BENDING	1000pcs/each reel

*Absolute Maximum Ratings (T_a=25C)

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		Ptot	200	mW
*1 Isolation voltage		Viso	5000	Vrms
Operating temperature		Topr	-30~+100	°C
Storage temperature		Tstg	-55~+125	°C
*2 Soldering temperature		Tsol	260	°C

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

*2 For 10 seconds.

* Electro-optical Characteristics

Parameter			Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage		V_F	I_F=20mA	–	1.2	1.4	V
	Peak forward voltage		V_{FM}	I_{FM}=0.5A	–	–	3.0	V
	Reverse current		I_R	V_R=4V	–	–	10	μA
Output	Collector dark current		I_{CEO}	V_{CE}=20V,I_F=0mA	–	–	10^{-7}	A
Transfer charact-eristics	*1 Current transfer ratio		CTR	I_F=5mA, V_{CE}=5V	50	–	600	%
	Collector-emitter saturation voltage		$V_{CE(sat)}$	I_F=20mA, I_C=1mA	–	0.1	0.2	V
	Cut-off frequency		f_c	V_{CE}=5V, I_C=2mA R_L=100Ω , -3dB	–	80	–	kHz
	Response time	Rise time	t_r	V_{CE}=2V, I_C=2mA R_L=100Ω	–	4	18	μS
		Fall time	t_f		–	3	18	μS

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

$$CTR=\frac{Ic}{I_F}\ X\ 100\%$$

Model No.	Rank mark	CTR(%)
KB817L	L	50 to 100
KB817A	A	80 to 160
KB817B	B	130 to 260
KB817C	C	200 to 400
KB817D	D	300 to 600
KB8X7AB	A or B	80 to 260
KB8X7BC	B or C	130 to 400
KB8X7CD	C or D	200 to 600
KB8X7AC	A,B or C	80 to 400
KB8X7BD	B,C or D	130 to 600
KB8X7AD	A,B,C or D	80 to 600
KB8X7	L,A,B,C,D or No mark	50 to 600

Fig. 1 Current Transfer Ratio vs. Forward Current

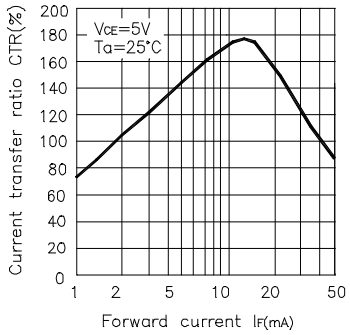


Fig. 2 Forward Current vs. Forward voltage

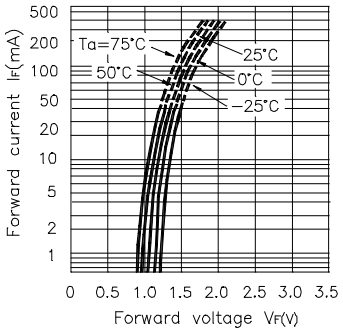


Fig. 3 Collector Current vs. Collector-emitter Voltage

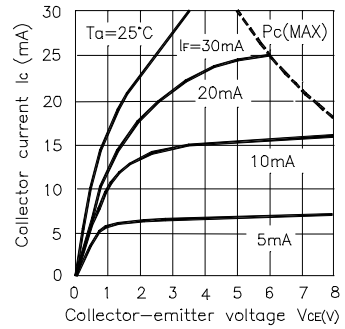


Fig. 4 Relative Current Transfer Ratio vs. Ambient Temperature

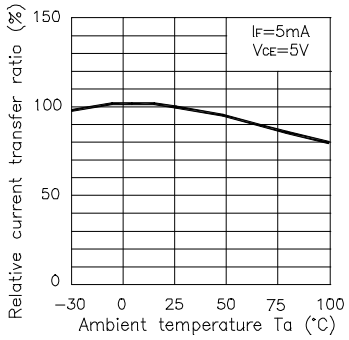


Fig. 5 Collector-emitter Saturation Voltage vs. Ambient Temperature

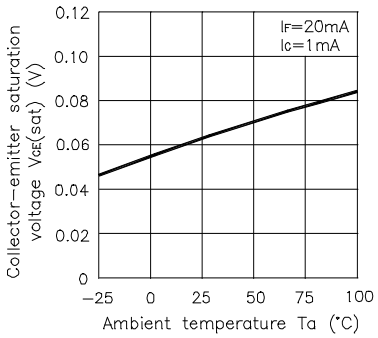


Fig. 6 Collector Dark Current vs. Ambient Temperature

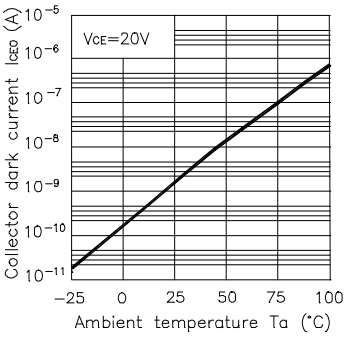


Fig. 7 Forward Current vs. Ambient Temperature

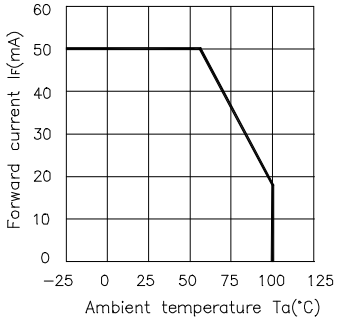


Fig. 8 Collector Power Dissipation vs. Ambient Temperature

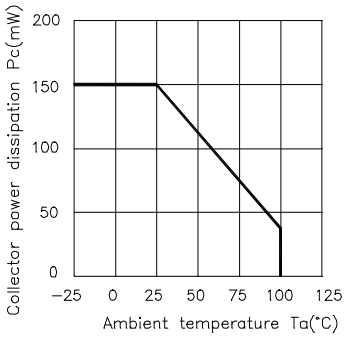
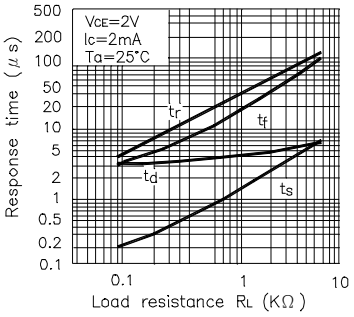


Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

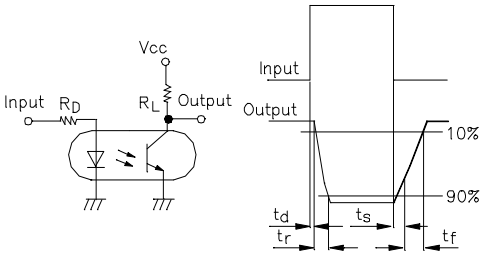
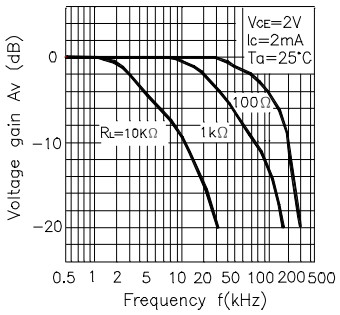


Fig. 10 Frequency Response



Test Circuit for Frequency Response

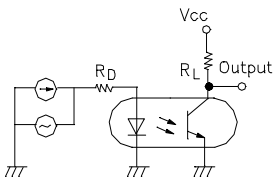
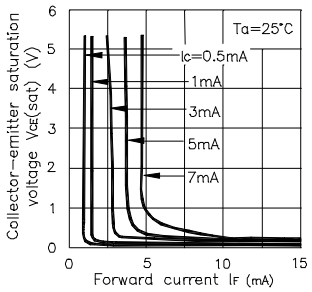


Fig. 11 Collector-emitter Saturation Voltage vs. Forward Current



* 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 chlorine (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.

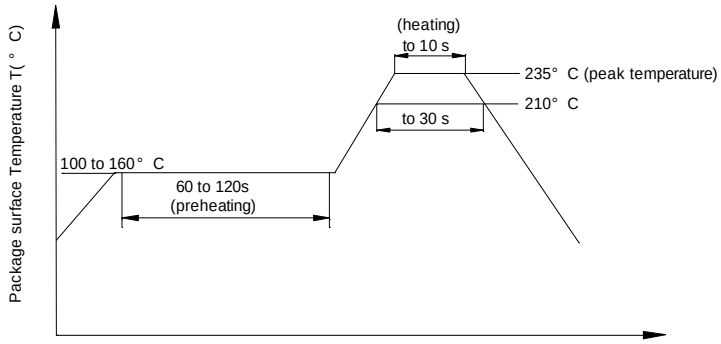
NOTES ON HANDLING

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 or reflows Three
- Flux Rosin flux containing small amount of chlorine(The flux with a maximum chlorine content of 0.2Wt % is recommended.)

Recommended Temperature Profile of infrared Reflow



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.

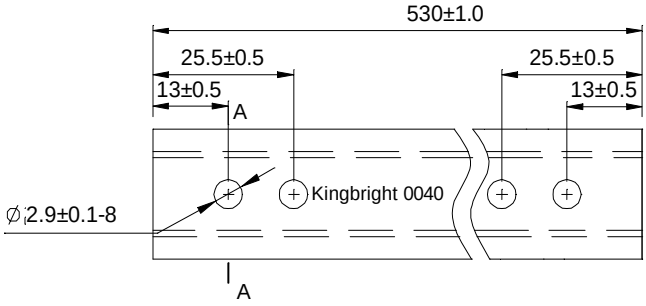
RESTRICTIONS ON PRODUCT USE

- The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version. Not all devices / types available in every country.
- We are mention about our product quality stablity, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing KINGBRIGHT products, to observe standards of safety, and to a avoid situations in which a malfunction or failure of a KINGBRIGHT product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that KINGBRIGHT products are used within specified operating ranges as set forth in the most recent products specifications.

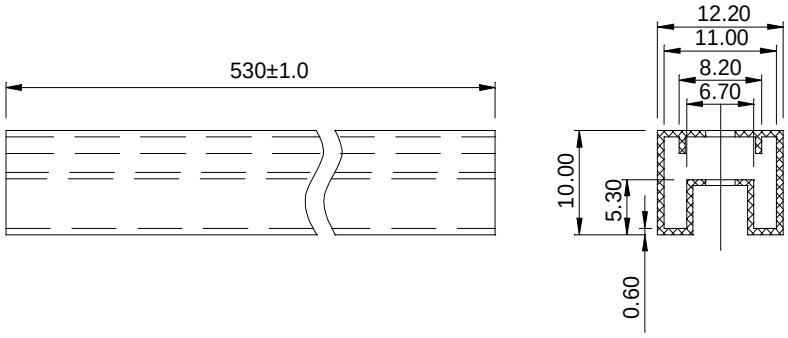
Dimension of Tube

TOLERANCE : ±0.4[±0.012] UNLESS OTHERWISE NOTED.

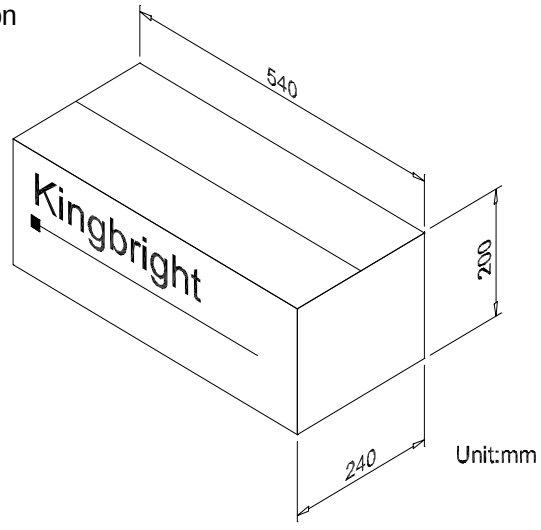
Unit:mm



A-A Side view



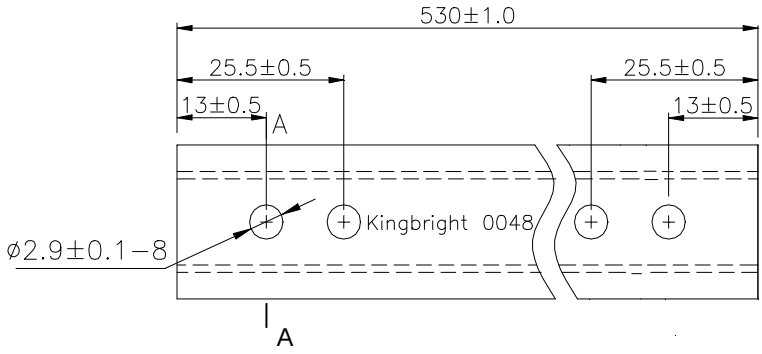
Dimension of Carton



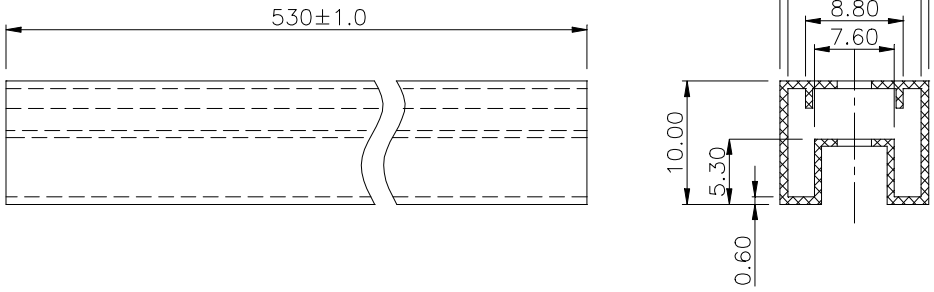
KB817-M

Dimension of Tube

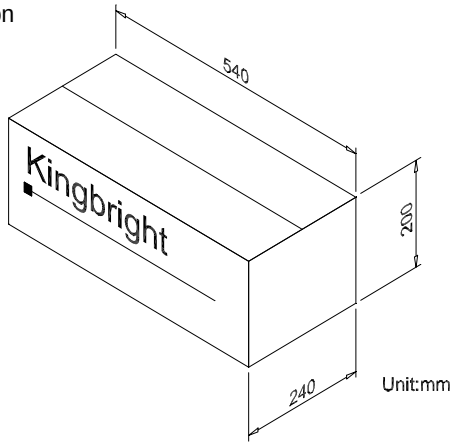
TOLERANCE : ± 0.4[± 0.012] UNLESS OTHERWISE NOTED.
Unit:mm



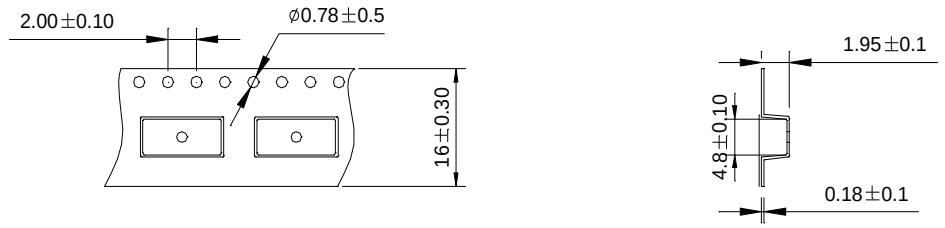
A-A Side view



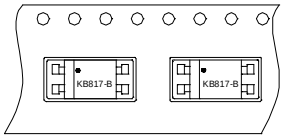
Dimension of Carton



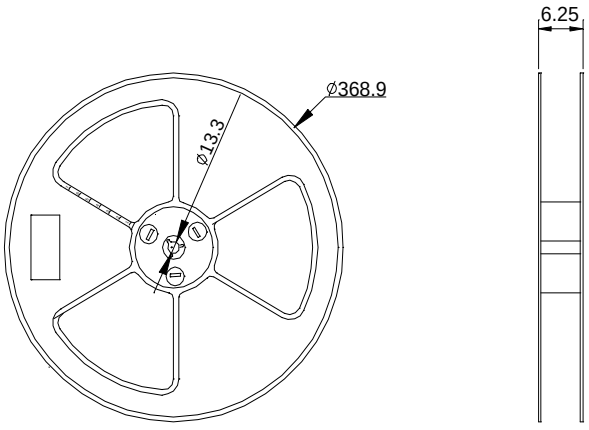
Outline and Dimension (Tape)
KB817-B



Tape Direction

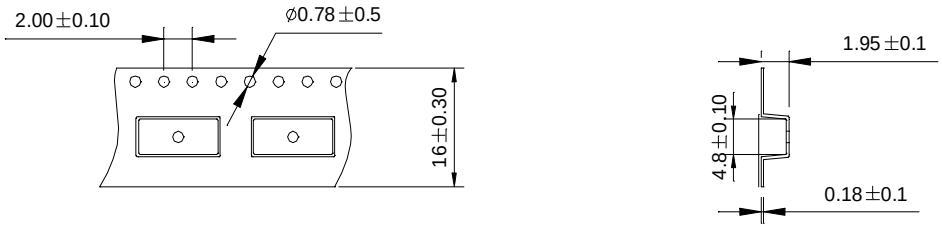


Outline and Dimension(Reel)

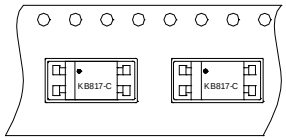


Packing:1000pcs/reel

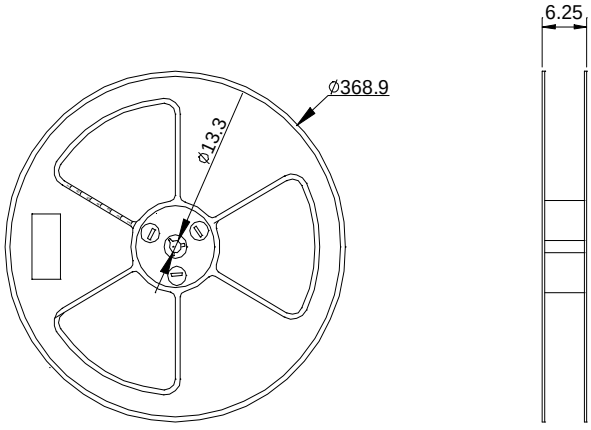
Outline and Dimension (Tape)
KB817-C



Tape Direction



Outline and Dimension(Reel)



Packing:1000pcs/reel