

AB814B
Photocoupler

DESCRIPTIONS

- The AB814B (1-channel) is optically coupled isolators containing two GaAs Light Emitting Diode and an NPN silicon phototransistor
- The lead pitch is 2.54mm

FEATURES

- AC input
- Maximum working isolation voltage $V_{IOWM} = 630 V_{RMS}$
- Maximum repetitive peak isolation voltage $V_{IORM} = 890 V_{peak}$
- Maximum transient isolation voltage $V_{IOTM} = 7 kV_{peak}$
- Maximum withstanding isolation voltage $V_{ISO} = 5000 V_{RMS}$
- Compact dual-in-line package AB814B:1-channel type
- Recognized by UL and CUL, file NO.E225308
- RoHS compliant

APPLICATIONS

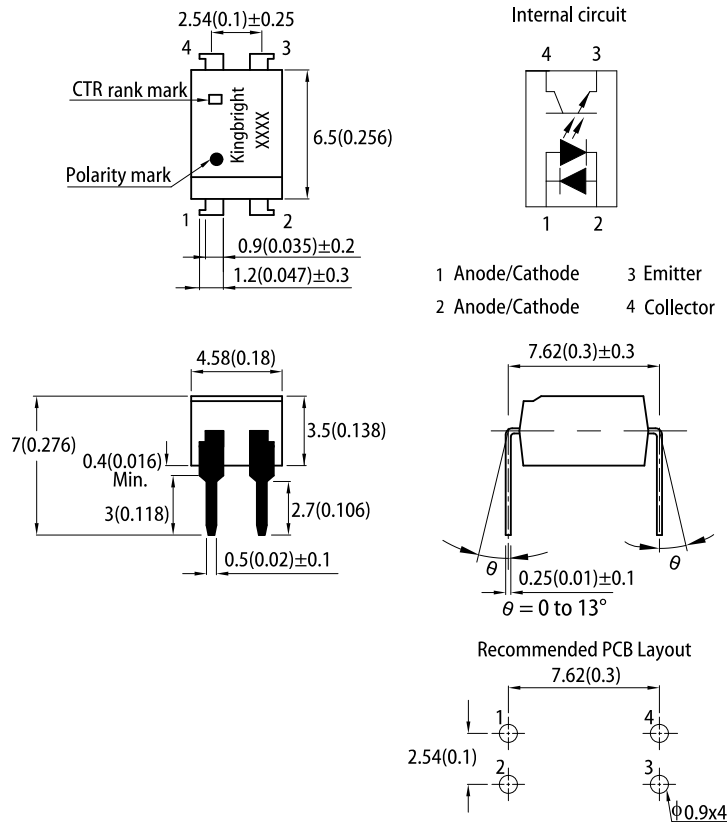
- Computer terminals
- Registers, copiers, automatic vending machines
- System appliances, measuring instruments
- Programmable logic controller
- Signal transmission between circuits of different potentials and impedances

NOTES ON HANDLING

Cautions regarding electrical noise

Please ensure the power supply is stable at all times. Even if the designed operating voltage is within specification limits, sudden voltage spikes at startup may damage the component.

PACKAGE DIMENSIONS



Notes:
1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.5(0.02") unless otherwise noted.
3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.

ELECTRICAL / OPTICAL CHARACTERISTICS at $T_A=25^{\circ}C$

Parameter		Symbol	Value			Unit	Test Conditions
			Min.	Typ.	Max.		
Input	Forward Voltage	V_F	-	1.2	1.4	V	$I_F=\pm 20mA$
	Peak Forward Voltage	V_{FM}	-	-	3.0	V	$I_{FM}=\pm 0.5A$
Output	Collector Dark Current	I_{CEO}	-	-	10^{-7}	A	$I_F=0mA, V_{CE}=20V$
Transfer Characteristics	Current Transfer Ratio ^[1]		CTR	120	-	300	% $I_F=\pm 1mA, V_{CE}=5V$
	Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	-	0.1	0.2	V $I_F=\pm 20mA, I_C=1mA$
	Response Time	Rise Time	t_r	-	4	18	μs $V_{CE}=2V, I_C=2mA$
		Fall Time	t_f	-	3	18	μs $R_L=100 \Omega$

Notes:
1. Classification table of current transfer ratio is shown below.
 $CTR = \frac{I_C}{I_F} \times 100\%$
2. Excess driving current and / or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

ABSOLUTE MAXIMUM RATINGS at T_A=25°C

Parameter		Symbol	Rating	Unit
Input	Forward Current	I _F	±50	mA
	Power Dissipation	P _D	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
Isolation Voltage ^[1]		V _{iso}	5000	V _{rms}
Operating Temperature		T _{opr}	-30~+100	°C
Storage Temperature		T _{stg}	-55~+125	°C
Soldering Temperature ^[2]		T _{sol}	260	°C

Notes:
1. 40 to 60% RH, AC for 1 minute.
2. For 10 seconds.
3. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.

MAXIMUM SAFETY RATINGS

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Input Current	I _{SI}	-	-	300	mA	-
Output Power Dissipation	P _{SO}	-	-	500	mW	-
Ambient Safety Temperature	T _S	-	-	150	°C	-

Note:
1. This optocoupler is designed for electrical isolation only when operating within its specified safety ratings.
Compliance with these ratings must be guaranteed by implementing appropriate protective circuits.

TECHNICAL DATA

Fig. 1 Current Transfer Ratio vs. Forward Current

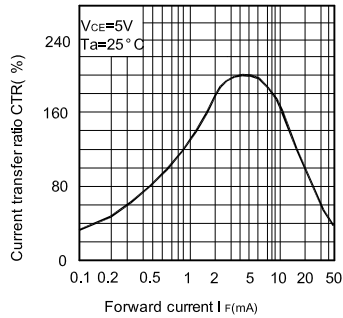


Fig. 2 Forward Current vs. Forward Voltage

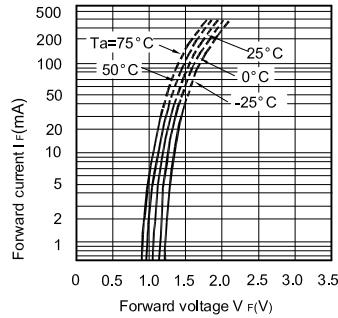


Fig. 3 Collector Current vs. Collector-Emitter Voltage

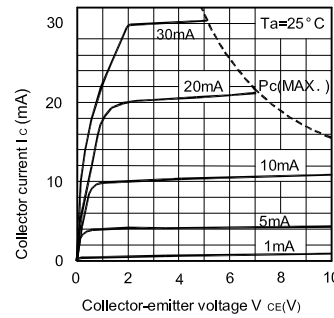


Fig. 4 Relative Current Transfer Ratio vs. Ambient Temperature

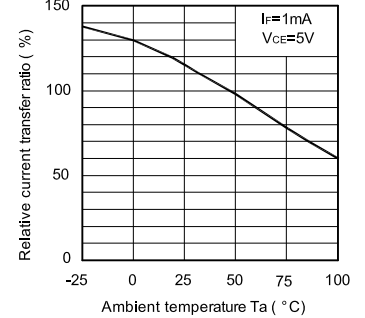


Fig. 5 Collector-Emitter Saturation Voltage vs. Ambient Temperature

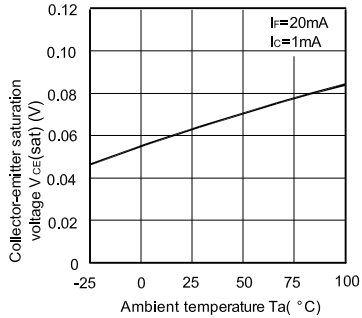


Fig. 6 Collector Dark Current vs. Ambient Temperature

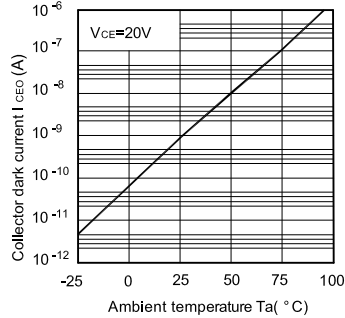


Fig. 7 Forward Current vs. Ambient Temperature

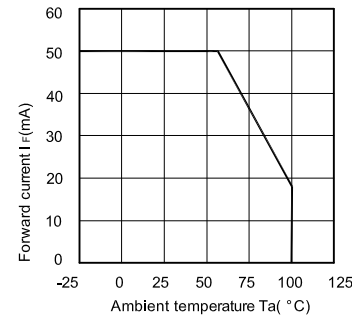


Fig. 8 Collector Power Dissipation vs. Ambient Temperature

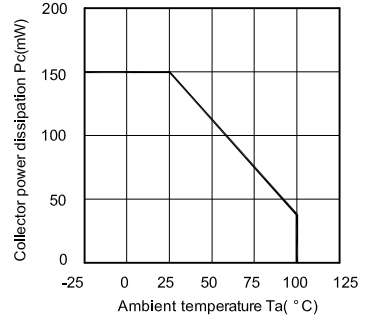


Fig. 9 Response Time vs. Load Resistance

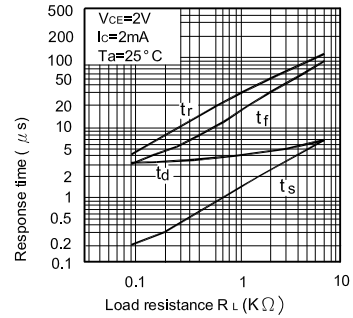


Fig.10 Frequency Response

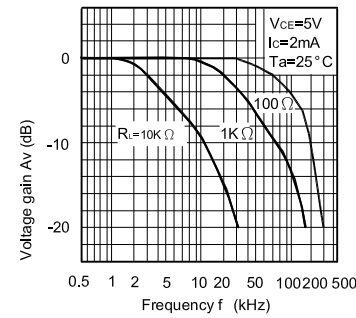
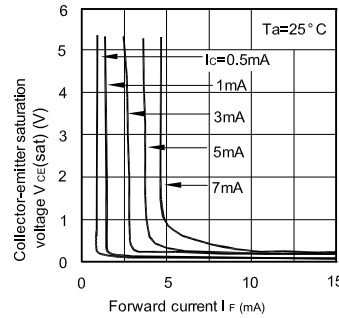
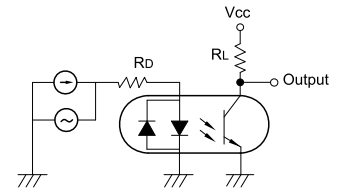


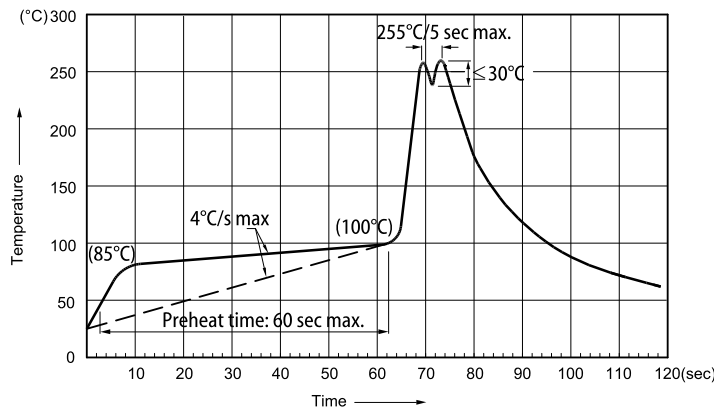
Fig.11 Collector-Emitter Saturation Voltage vs. Forward Current



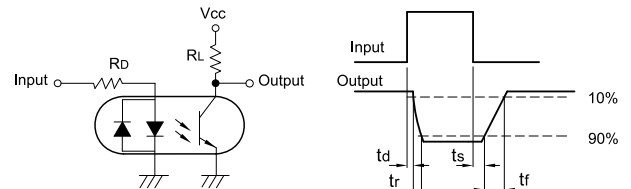
Test Circuit for Frequency Response



RECOMMENDED WAVE SOLDERING PROFILE

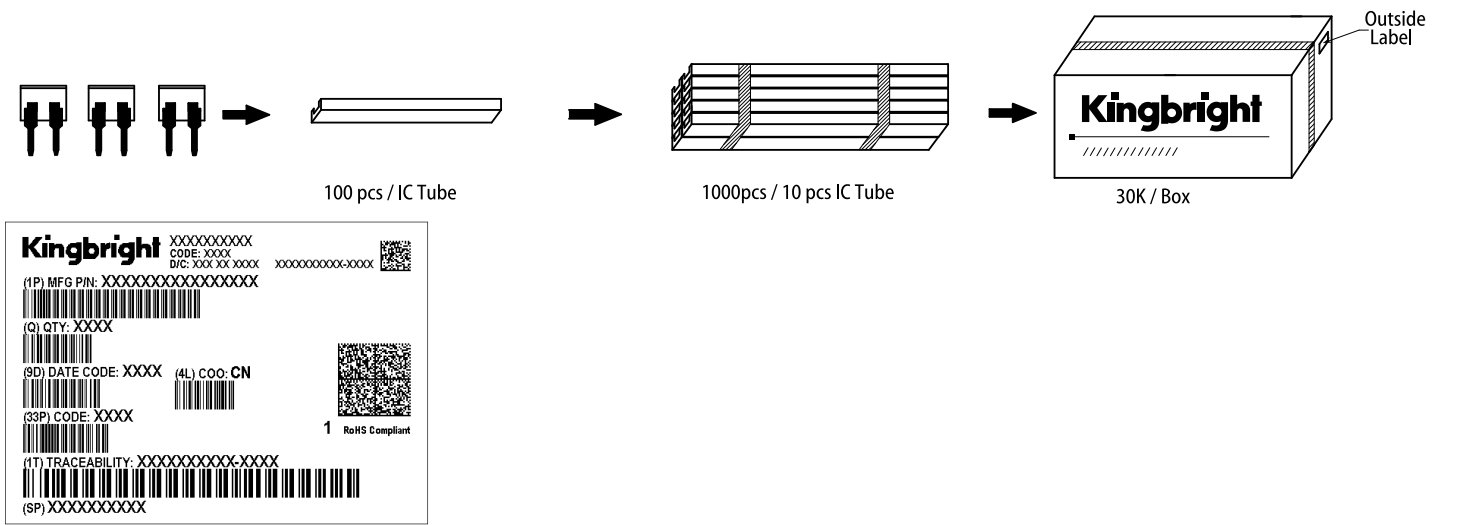


Test Circuit for Response Time



- Notes:
1. Recommend pre-heat temperature of 105°C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260°C
 2. Peak wave soldering temperature between 245°C ~ 255°C for 3 sec (5 sec max).
 3. Do not apply stress to the epoxy resin while the temperature is above 85°C.
 4. Fixtures should not incur stress on the component when mounting and during soldering process.
 5. SAC 305 solder alloy is recommended.
 6. No more than one wave soldering pass.

PACKING & LABEL SPECIFICATIONS



RESTRICTIONS ON PRODUCT USE

1. The information in this document represents typical usage and is provided for technical reference.
2. The information in this document is subject to change without notice. Please refer to the latest version of this document for the most updated information.
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