

AB357NT  
Photocoupler

FEATURES

- Opaque type, mini-flat package
- Subminiature type (The volume is smaller than that of our conventional DIP type by as far as 30%)
- Maximum working isolation voltage  $V_{IOWM} = 450 V_{RMS}$
- Maximum repetitive peak isolation voltage  $V_{IORM} = 630 V_{peak}$
- Maximum transient isolation voltage  $V_{IOTM} = 6 kV_{peak}$
- Maximum withstanding isolation voltage  $V_{ISO} = 3750 V_{RMS}$
- Employs double transfer mold technology
- Recognized by UL and CUL, file NO.E225308
- Package: 1000 pcs/reel
- Moisture sensitivity level: 4
- RoHS compliant

APPLICATIONS

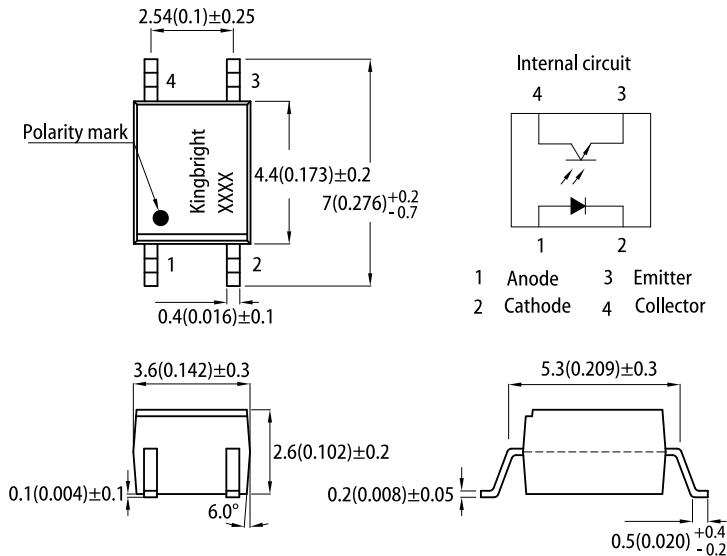
- Hybrid substrates that require high density mounting
- Programmable controllers

NOTES ON HANDLING

Cautions regarding electrical noise

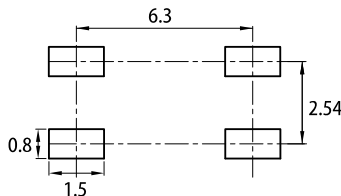
Please ensure the power supply is stable at all times. Even if the designed operating voltage is within specification limits, sudden voltage spikes at startup may damage the component.

PACKAGE DIMENSIONS



RECOMMENDED SOLDERING PATTERN

(units : mm; tolerance : ± 0.15)



- 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.
  4. The device has a single mounting surface. The device must be mounted according to the specifications.

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       | $I_F=20mA$                               |
|                          | Peak Forward Voltage                 |           | $V_{FM}$      | -     | -    | 3.0       | V       | $I_{FM}=0.5A$                            |
|                          | Reverse Current                      |           | $I_R$         | -     | -    | 10        | $\mu A$ | $V_R=4V$                                 |
| Output                   | Collector Dark Current               |           | $I_{CEO}$     | -     | -    | $10^{-7}$ | A       | $I_F=0mA, V_{CE}=20V$                    |
| Transfer Characteristics | Current Transfer Ratio               |           | CTR           | 50    | -    | 600       | %       | $I_F=5mA, V_{CE}=5V$                     |
|                          | Collector-Emitter Saturation Voltage |           | $V_{CE(sat)}$ | -     | -    | 0.2       | V       | $I_F=20mA, I_C=1mA$                      |
|                          | Response Time                        | Rise Time | $t_r$         | -     | 4    | 18        | $\mu s$ | $V_{CE}=2V, I_C=2mA$<br>$R_L=100 \Omega$ |
|                          |                                      | Fall Time | $t_f$         | -     | 3    | 18        | $\mu s$ |  |

Note:  
1. 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<sub>A</sub>=25°C

| Parameter                        |                             | Symbol           | Rating   | Unit             |
|----------------------------------|-----------------------------|------------------|----------|------------------|
| Input                            | Forward Current             | I <sub>F</sub>   | 50       | mA               |
|                                  | Reverse Voltage             | V <sub>R</sub>   | 6        | V                |
|                                  | Power Dissipation           | P <sub>D</sub>   | 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> | 170      | mW               |
| Isolation Voltage <sup>[1]</sup> |                             | V <sub>iso</sub> | 3750     | V <sub>rms</sub> |
| Operating Temperature            |                             | T <sub>opr</sub> | -30~+100 | °C               |
| Storage Temperature              |                             | T <sub>stg</sub> | -40~+125 | °C               |

Notes:  
1. 40 to 60% RH, AC for 1 minute.  
2. 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.

| Rank Mark            | CTR(%)    |
|----------------------|-----------|
| L                    | 50 ~ 100  |
| A                    | 80 ~ 160  |
| B                    | 130 ~ 260 |
| C                    | 200 ~ 400 |
| D                    | 300 ~ 600 |
| A or B               | 80 ~ 260  |
| B or C               | 130 ~ 400 |
| C or D               | 200 ~ 600 |
| A,B or C             | 80 ~ 400  |
| B,C or D             | 130 ~ 600 |
| A,B,C or D           | 80 ~ 600  |
| L,A,B,C,D or No mark | 50 ~ 600  |

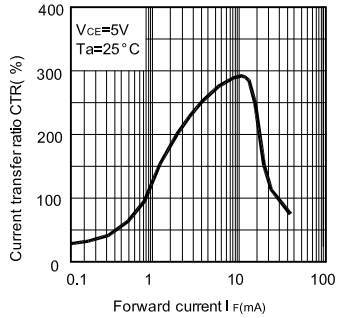
MAXIMUM SAFETY RATINGS

| Parameter                  | Symbol          | Value |      |      | Unit | Test Condition |
|----------------------------|-----------------|-------|------|------|------|----------------|
|                            |                 | Min.  | Typ. | Max. |      |                |
| Input Current              | I <sub>SI</sub> | -     | -    | 200  | mA   | -              |
| Output Power Dissipation   | P <sub>SO</sub> | -     | -    | 300  | mW   | -              |
| Ambient Safety Temperature | T <sub>S</sub>  | -     | -    | 150  | °C   | -              |

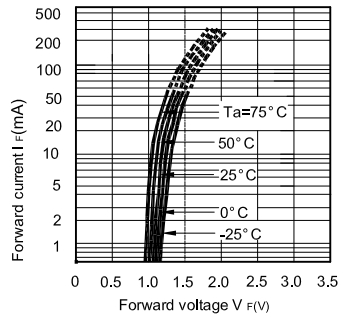
Note:  
1. This optocoupler is designed for electrical isolation only when operating within its specified safety ratings.  
Compliance with these ratings must be guaranteed by implementing appropriate protective circuits.

## TECHNICAL DATA

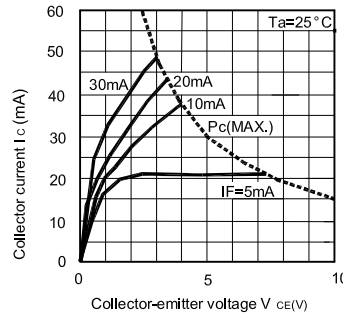
**Fig. 1 Current Transfer Ratio vs. Forward Current**



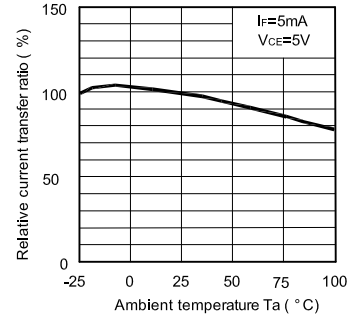
**Fig. 2 Forward Current vs. Forward Voltage**



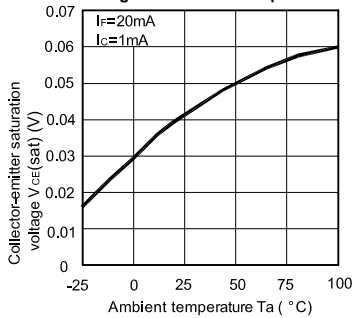
**Fig. 3 Collector Current vs. Collector-Emitter Voltage**



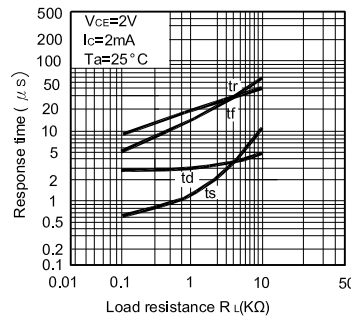
**Fig. 4 Relative Current Transfer Ratio vs. Ambient Temperature**



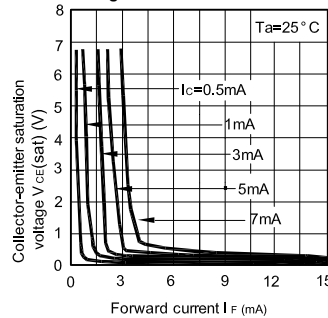
**Fig. 5 Collector-Emitter Saturation Voltage vs. Ambient Temperature**



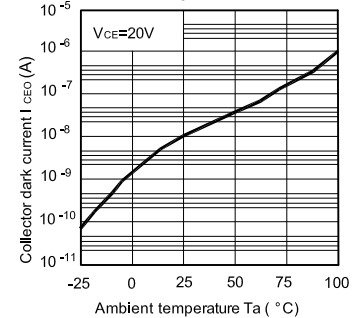
**Fig. 6 Response Time vs. Load Resistance**



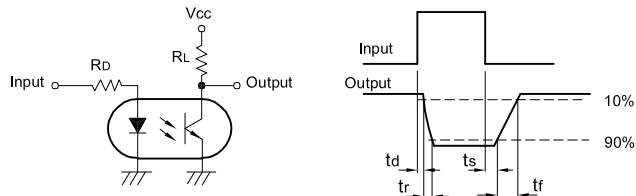
**Fig. 7 Collector-Emitter Saturation Voltage vs. Forward Current**



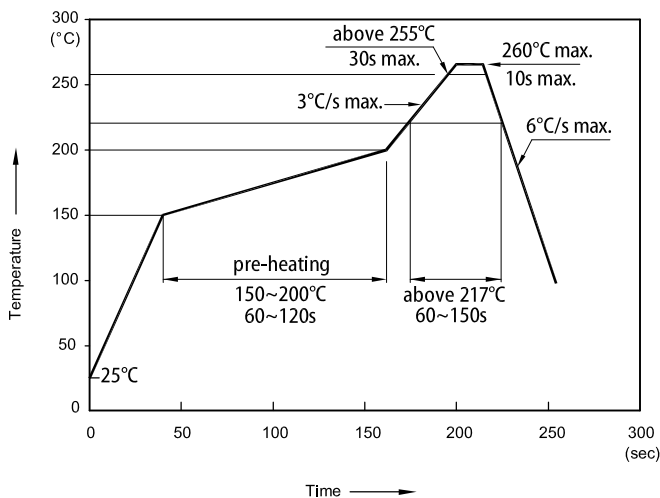
**Fig. 8 Collector Dark Current vs. Ambient Temperature**



### Test Circuit for Response Time

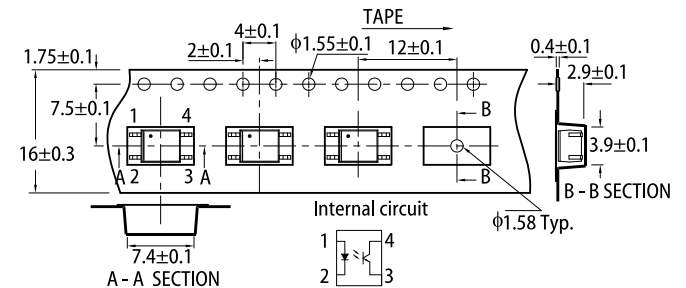


### REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS

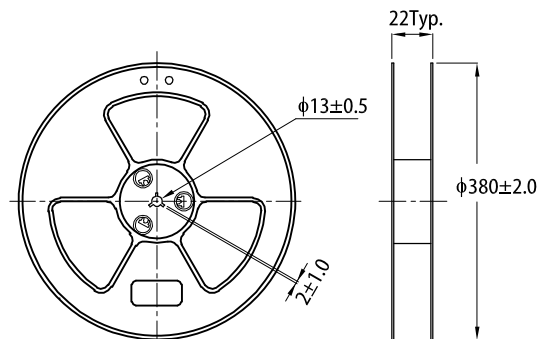


- Notes:
1. Don't cause stress to the LEDs while it is exposed to high temperature.
  2. The maximum number of reflow soldering passes is 2 times.
  3. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.

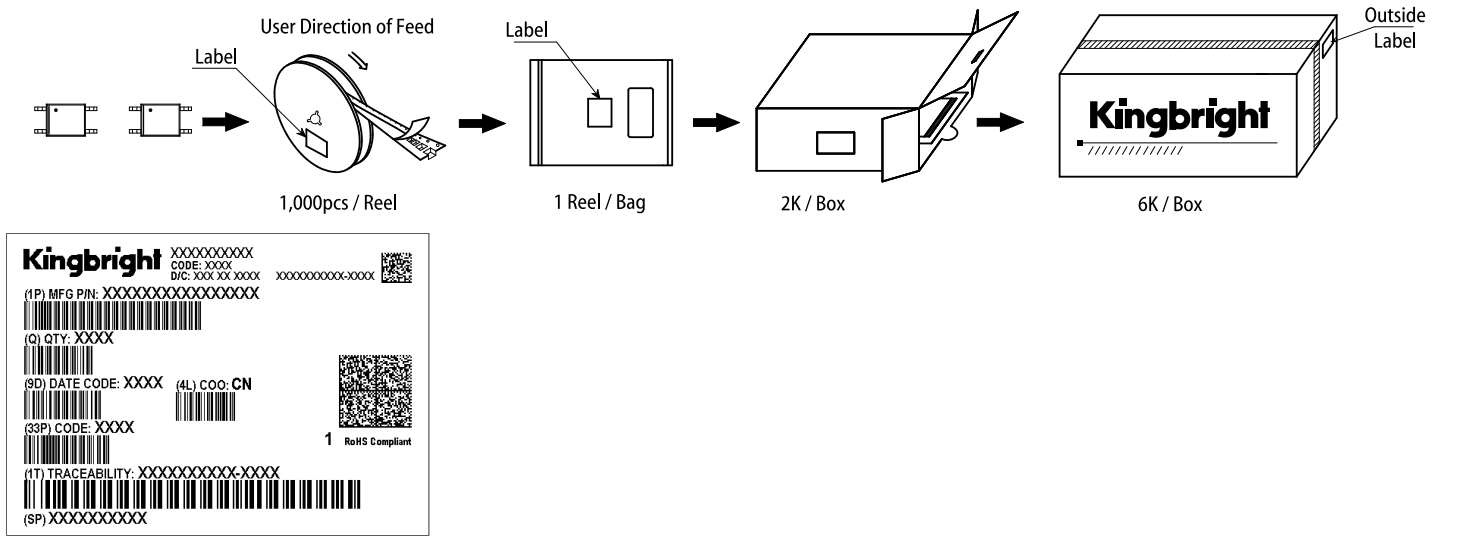
### TAPE SPECIFICATIONS (units : mm)



### REEL DIMENSION (units : mm)



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.
3. Please ensure this product is used in accordance with the electrical and environmental specifications and tolerances listed in this document. If the usage exceeds the specification range, Kingbright will not be responsible for any subsequent issues.
4. Semiconductor components may be damaged by electrical or physical stresses. The buyer of Kingbright products is responsible to use them in accordance with all safety regulations. During development and design, the user should insure Kingbright products are used within the latest specification tolerances, and avoid any situations when the failure of Kingbright products might cause physical harm, death, or property loss.
5. The information in this document may not be reproduced or retransmitted without Kingbright's permission.