

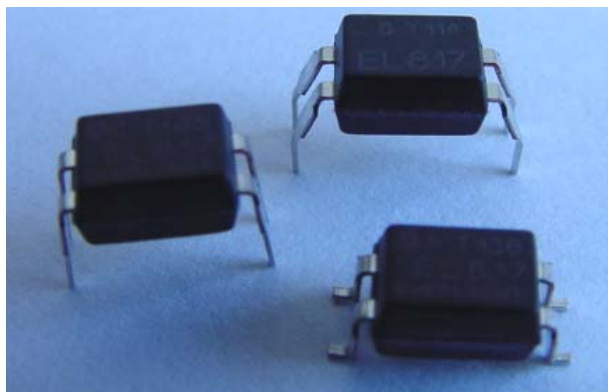
## Technical Data Sheet Photocoupler

*Preliminary*

### Features:

### EL817L Series

- Current transfer ratio  
(CTR:MIN.50% at IF =5mA ,VCE =5V)
- High isolation voltage between input and output (Viso=5000 V rms )
- Compact dual-in-line package  
EL817L\*:1-channel type
- Pb free
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved (No. 0143133/01-03)
- NEMKO approved (No. P00102385)
- DEMKO approved (No. 310352-04)
- FIMKO approved (No. FI 16763A2)
- CSA approved (No. 1143601)
- BSI approved (No. 8592 / 8593)
- Options available:
  - Leads with 0.4"(10.16mm) spacing (M Type)
  - Leads bends for surface mounting (S Type)
  - Tape and Reel of Type I for SMD(Add"-TA" Suffix)
  - Tape and Reel of Type II for SMD(Add"-TB" Suffix)
  - The tape is 16mm and is wound on a 33cm reel
- The product itself will remain within RoHS compliant version.



### Description

The EL817 series contains a infrared emitting diode optically coupled to a phototransistor. It is packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option.

### Applications

- Computer terminals
- System appliances, measuring instruments
- Registers, copiers, automatic vending machines
- Cassette type recorder
- Electric home appliances, such as fan heaters, etc.
- Signal transmission between circuits of different potentials

# Technical Data Sheet

## Photocoupler

*Preliminary*

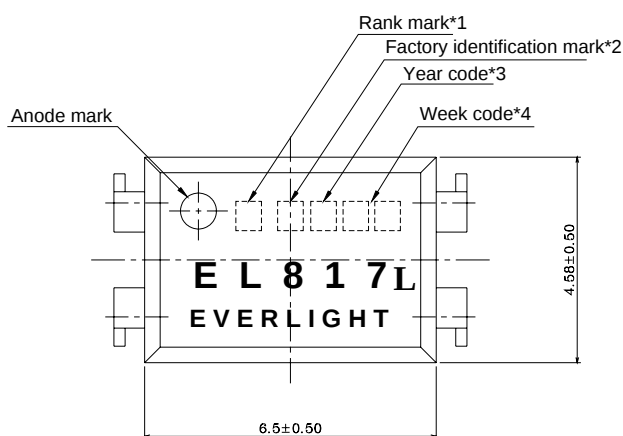
and impedances

### EL817L Series

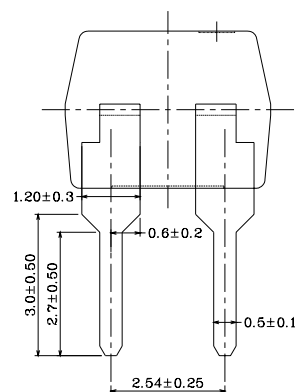
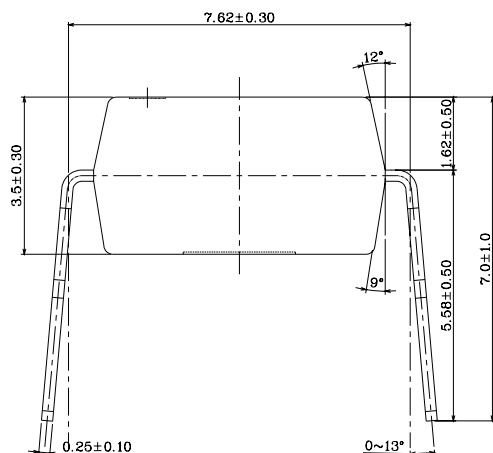
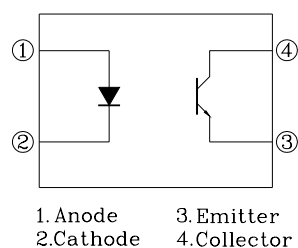
### Device Selection Guide

| Part. No. | Chip Material |         |
|-----------|---------------|---------|
|           | IR            | PT      |
| EL817*    | GaAs          | Silicon |

### Package Dimensions



PIN NO. AND INTERNAL CONNECTION DIAGRAM



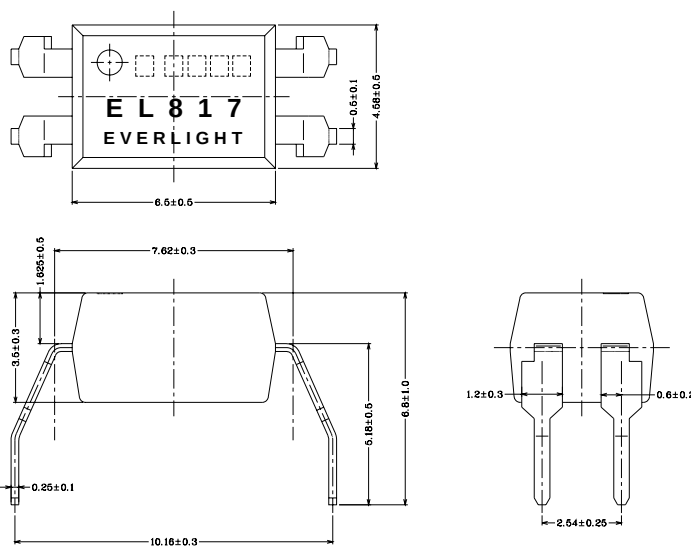
# Technical Data Sheet Photocoupler

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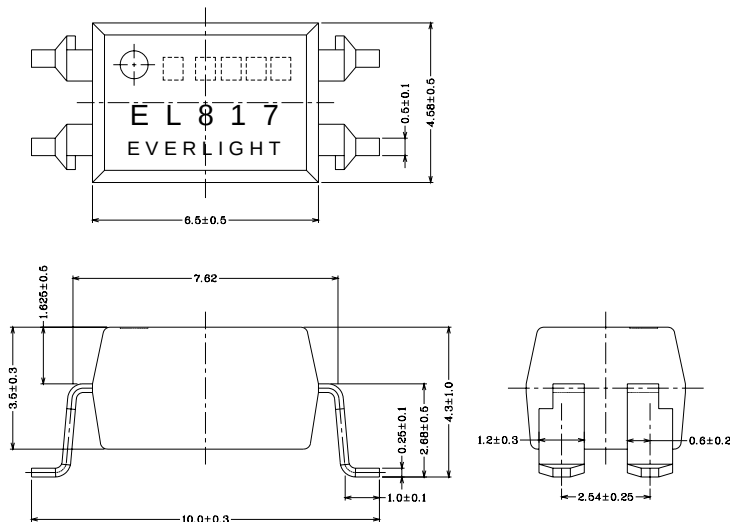
## EL817L Series

### Package Dimensions

#### M Type



#### S Type



#### Notes:

1. Rank shall be or shall not be marked
2. Factory code shall be marked (T: Taiwan / C: China)
3. Year date code
4. 2-digit work week
5. All dimensions are in millimeters
6. Specifications are subject to change without notice

**Technical Data Sheet**  
**Photocoupler**
**Preliminary**
**EL817L Series**
**Absolute Maximum Ratings**
**( Ta=25°C )**

| Parameter                            |                             | Symbol    | Rating   | Unit  |
|--------------------------------------|-----------------------------|-----------|----------|-------|
| Input                                | Forward Current             | $I_F$     | 80       | mA    |
|                                      | Reverse Voltage             | $V_R$     | 6        | V     |
|                                      | Power Dissipation           | P         | 150      | mW    |
| Output                               | Collector Power Dissipation | $P_C$     | 150      | mW    |
|                                      | Collector Current           | $I_C$     | 50       | mA    |
|                                      | Collector-Emitter Voltage   | $V_{CEO}$ | 35       | V     |
|                                      | Emitter-Collector Voltage   | $V_{ECO}$ | 6        | V     |
| Total Power Dissipation              |                             | $P_{tot}$ | 200      | mW    |
| * <sup>1</sup> Isolation Voltage     |                             | $V_{iso}$ | 5000     | V rms |
| Operating Temperature                |                             | $T_{opr}$ | -55~+110 | °C    |
| Storage Temperature                  |                             | $T_{stg}$ | -55~+125 | °C    |
| * <sup>2</sup> Soldering Temperature |                             | $T_{sol}$ | 260      | °C    |

\*<sup>1</sup> AC for 1 minute, R.H= 40~ 60%RH

-Isolation voltage shall be measured using the following method.

- (1) Short between anode and cathode on the primary side and between collector, emitter and base on the secondary side.
- (2) The isolation voltage tester with zero-cross circuit shall be used.
- (3) The waveform of applied voltage shall be a sine wave

\*<sup>2</sup> For 10 seconds

**Technical Data Sheet**  
**Photocoupler**
**Preliminary**
**EL817L Series**
**Electro-Optical Characteristics**

(Ta=25°C)

| Parameter                |                                      | Symbol        | Min.               | Typ.      | Max. | Unit          | Condition                                                          |
|--------------------------|--------------------------------------|---------------|--------------------|-----------|------|---------------|--------------------------------------------------------------------|
| Input                    | Forward                              | $V_F$         | -                  | 1.2       | 1.4  | V             | $I_F=20\text{mA}$                                                  |
|                          | Reverse Current                      | $I_R$         | -                  | -         | 10   | $\mu\text{A}$ | $V_R=4\text{V}$                                                    |
|                          | Terminal                             | $C_t$         | -                  | 30        | 250  | pF            | $V=0, f=1\text{kHz}$                                               |
| Output                   | Collector Dark current               | $I_{CEO}$     | -                  | -         | 100  | nA            | $V_{CE}=20\text{V}$                                                |
|                          | Collector-Emitter breakdown voltage  | $BV_{CEO}$    | 80                 | -         | -    | V             | $I_C=0.1\text{mA}$                                                 |
| Transfer Characteristics | Current Transfer ratio               | CTR           | 50                 | -         | 600  | %             | $I_F=5\text{mA}, V_{CE}=5\text{V}$                                 |
|                          | Collector-Emitter saturation voltage | $V_{CE(sat)}$ | -                  | 0.1       | 0.2  | V             | $I_F=20\text{mA}, I_C=1\text{mA}$                                  |
|                          | Isolation resistance                 | $R_{ISO}$     | $5 \times 10^{10}$ | $10^{11}$ | -    | $\Omega$      | DC500V, 40~60%R.H                                                  |
|                          | Floating capacitance                 | $C_f$         | -                  | 0.6       | 1.0  | pF            | $V=0, f=1\text{MHz}$                                               |
|                          | Cut-off frequency                    | $f_c$         | -                  | 80        | -    | kHz           | $V_{CE}=5\text{V}, I_C=2\text{mA}$<br>$R_L=100\Omega, -3\text{dB}$ |
|                          | Rise time                            | $t_r$         | -                  | 4         | 18   | $\mu\text{s}$ | $V_{CE}=2\text{V}$<br>$I_C=2\text{mA}, R_L=100\Omega$              |

**Technical Data Sheet**  
**Photocoupler**
**Preliminary**

|  |           |       |   |   |    |                            |  |
|--|-----------|-------|---|---|----|----------------------------|--|
|  | Fall time | $t_f$ | - | 3 | 18 | <b>EL817L Series</b><br>US |  |
|--|-----------|-------|---|---|----|----------------------------|--|

**Supplement**
**Current Transfer Ratio CTR**

| Sub-Model No.            | Rank mark | CTR (%)    | Condition                                                                  |
|--------------------------|-----------|------------|----------------------------------------------------------------------------|
| EL817* <sup>note 1</sup> |           | 50 to 600  | $I_F = 5 \text{ mA}$<br>$V_{CE} = 5 \text{ V}$<br>$T_a = 25^\circ\text{C}$ |
| EL817* (A)               | A         | 80 to 160  |                                                                            |
| EL817* (B)               | B         | 130 to 260 |                                                                            |
| EL817* (C)               | C         | 200 to 400 |                                                                            |
| EL817* (D)               | D         | 300 to 600 |                                                                            |

Note1. The symbol “\*” can be none or S or M by different leads form request

Note2. The symbol “( )” can be CTR rank

Fig. 1 Forward Current vs.  
Ambient Temperature

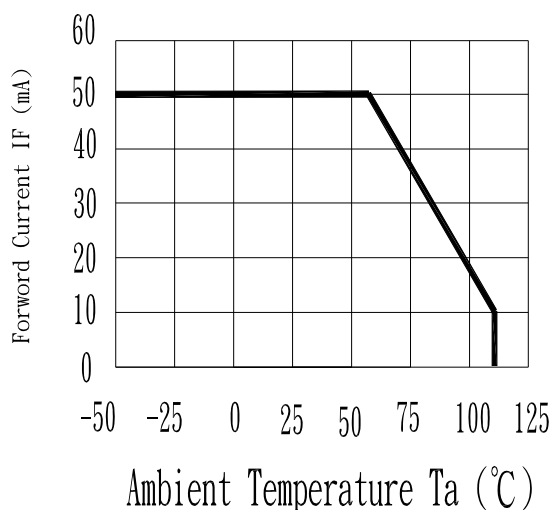
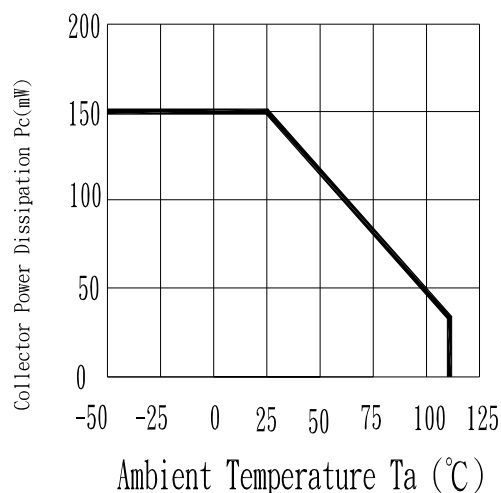


Fig.2 Collector Power Dissipation vs.  
Ambient Temperature



# Technical Data Sheet

## Photocoupler

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### EL817L Series

Fig. 3 Collector-emitter Saturation Voltage vs. Forward Current ( $T_a=25^\circ\text{C}$ )

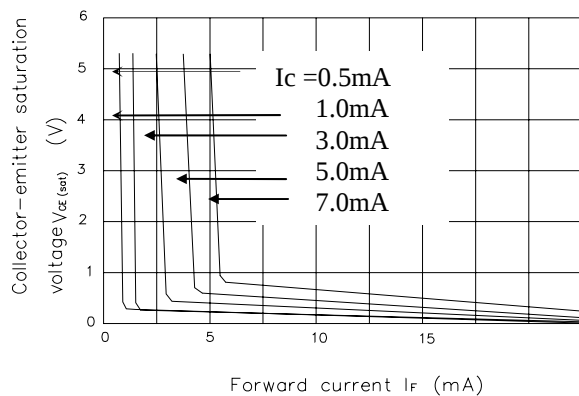


Fig.4 Current transfer Ratio vs. Forward Current

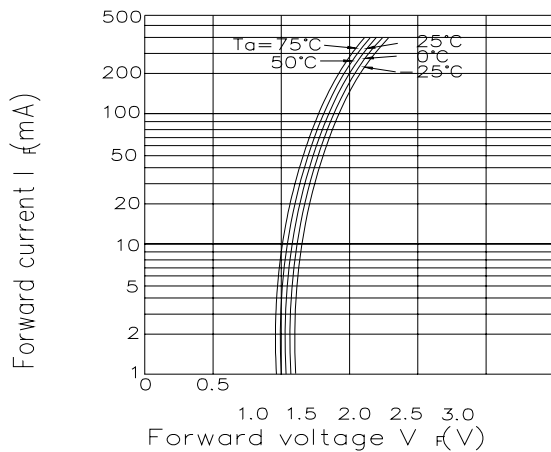
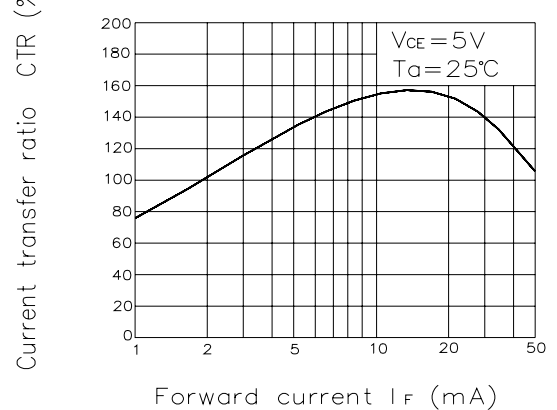


Fig.6 Collector Current vs. Collector-emitter Voltage ( $T_a=25^\circ\text{C}$ )

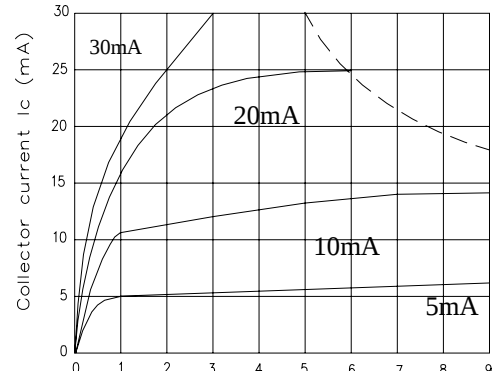


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

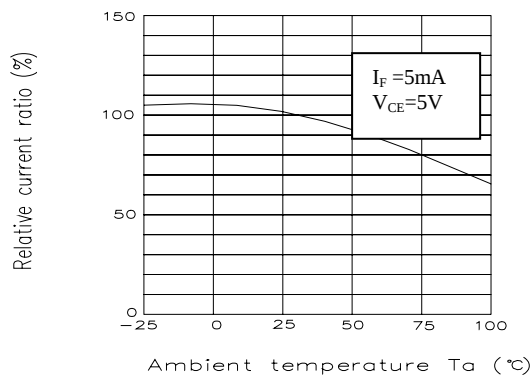
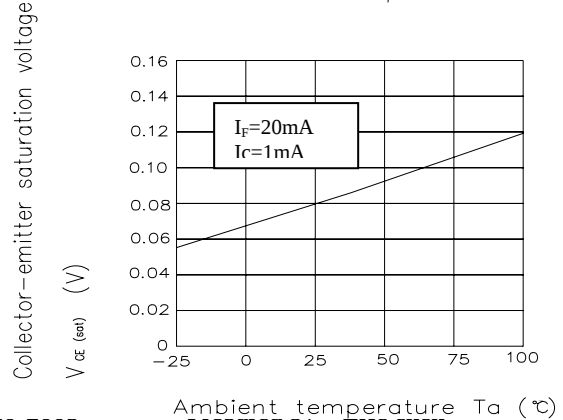


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature



En

Device No :

Prepared date : . . . . .

Ambient temperature  $T_a$  ( $^\circ\text{C}$ )

# Technical Data Sheet

## Photocoupler

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### EL817L Series

Fig.9

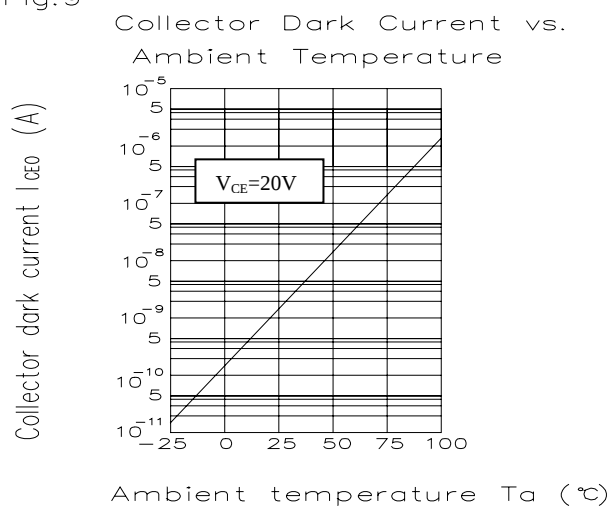


Fig.10

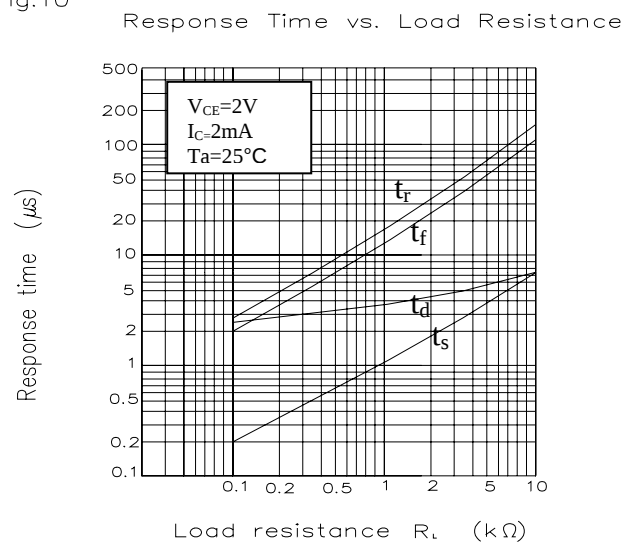
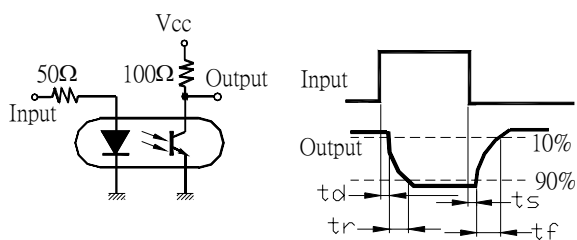
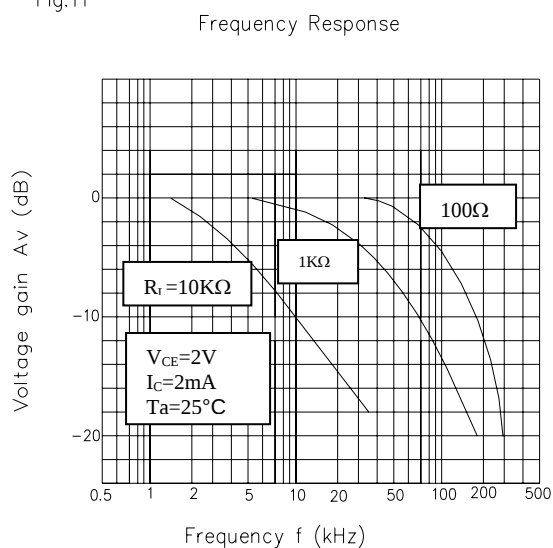


Fig.11





Technical Data Sheet  
Photocoupler

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**EL817L Series**

**RELIABILITY PLAN**

- The reliability of products shall be satisfied with items listed below.

Confidence level : 90 % ,    LTPD : 10 %

# Technical Data Sheet

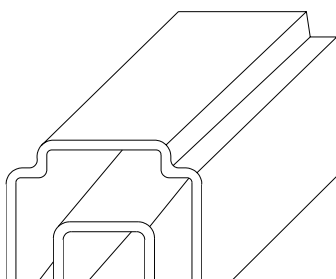
## Photocoupler

**Preliminary**

| <b>EL817L Series</b>      |                                                       |                                                                           |                  |                                                |                                                          |
|---------------------------|-------------------------------------------------------|---------------------------------------------------------------------------|------------------|------------------------------------------------|----------------------------------------------------------|
| Classification            | Test Item                                             | Description & Condition                                                   | (Acc.)<br>Sample | Failure<br>Criteria                            | Reference<br>Standard                                    |
| <b>Endurance test</b>     | Operation Life *                                      | Ta = 25 ± 3°C<br>IR: If = 50 mA<br>Pt: Pc = 130 mW ( Vf=1.4v ) , 1000 hrs | 0 / 22           | CTR shift > 1.2                                | MIL-S-750 : 1026<br>MIL-S-883 : 1005<br>JIS C 7021 : B-1 |
|                           | High Temperature / High Humidity Reverse Bias (H3TRB) | Ta = 85 ± 3°C , Humi. = 85 % rh<br>Pt: 80% * Vce (max rating) , 1000 hrs  | 0 / 22           | Vf > U* 1.0<br>Ir > U * 1.0<br>Vce(sat) >U*1.0 | JIS C 7021 : B-11                                        |
|                           | High Temperature Reverse Bias (HTRB)                  | Ta = 105 ± 3°C<br>Pt: 100% * Vce (Max rating) , 1000 hrs                  | 0 / 22           | Bvceo < L*1.0<br>Bveco < L*1.0                 | JIS C 7021 : B-8                                         |
|                           | Low Temperature Storage                               | Ta = -50 ± 3°C , 1000 hrs                                                 | 0 / 22           |                                                | JIS C 7021 : B-12                                        |
|                           | High Temperature Storage                              | Ta = 125 ± 3°C , 1000 hrs                                                 | 0 / 22           | L :Low Spec.Limit                              | JIS C 7021 : B-10<br>MIL-S-883 : 1008                    |
|                           | Auto clamp                                            | P = 15 PSIG , Ta = 121 °C , Humi. = 100 % rh , 48 hrs                     | 0 / 22           | U : Up Spec. Limit                             | JESD 22-A102-B                                           |
|                           |                                                       |                                                                           |                  |                                                |                                                          |
| <b>Environmental Test</b> | Temperature Cycling (Air to Air)                      | 125°C ~ - 55 °C<br>30 ~ 30 min , 100 cycles                               | 0 / 22           |                                                | MIL-S-883 :1010<br>JIS C 7021 : A-4                      |
|                           | Thermal Shock (Liquid to Liquid)                      | 125 ~ - 55°C<br>t (dwell) = 5 min<br>t (trans.) = 10 sec , 100 cycles     | 0 / 22           |                                                | MIL-S-202 : 107D<br>MIL-S-750 : 1051<br>MIL-S-883 :1011  |
|                           | Solder Resistance                                     | Ta = 260 ± 3°C<br>t (dwell) = 10 ± 1 sec                                  | 0 / 22           |                                                | MIL-S-750 : 2031<br>JIS C 7021 : A-1                     |
|                           | Solder Ability                                        | Ta = 230 ± 3 °C<br>t (dwell) = 5 ± 1 sec                                  | 0 / 22           |                                                | MIL-S-883 : 2003<br>JIS C 7021 : A-2                     |
|                           |                                                       |                                                                           |                  |                                                |                                                          |

## 1. Tube Packing Specifications ( For Dip & M Type)

### 1. Tube





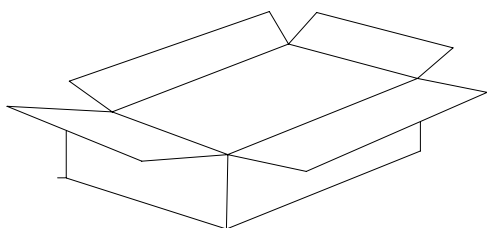
EVERLIGHT ELECTRONICS CO., LTD

## Technical Data Sheet Photocoupler

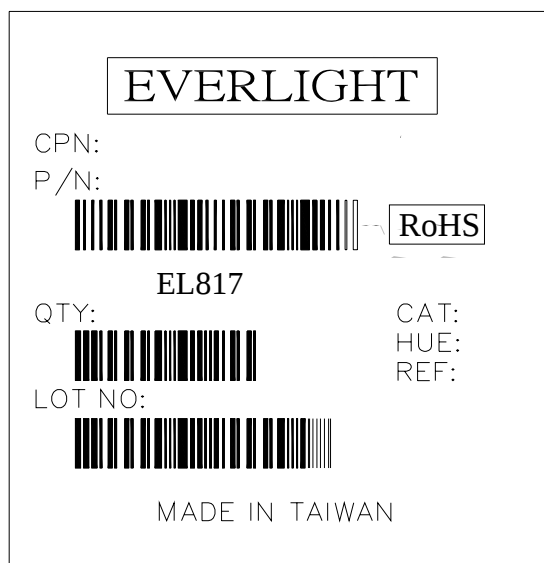
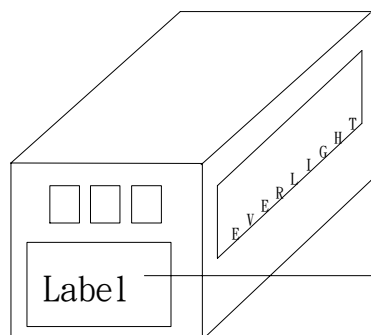
*Preliminary*

### EL817L Series

2. Inner Carton



3. Outside Carton

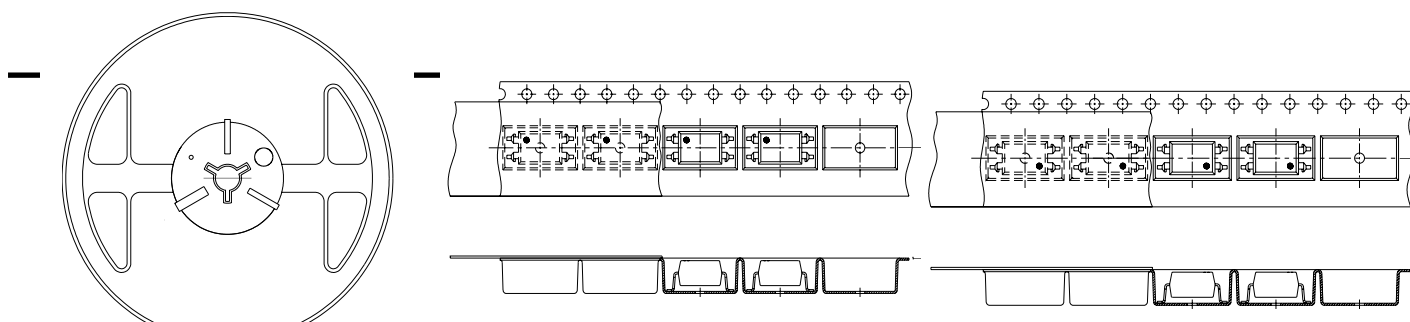


#### ● Packing Quantity

1. 100 Pcs/ Per Tube
2. 25 Tubes / Inner Carton
3. 12 Inner Cartons / Outside Carton

#### 1. Tape & Reel Packing Specifications

1. Tape & Reel (For S Type only)



# Technical Data Sheet

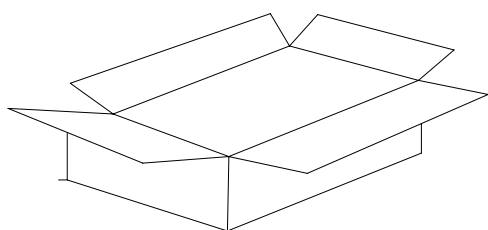
## Photocoupler

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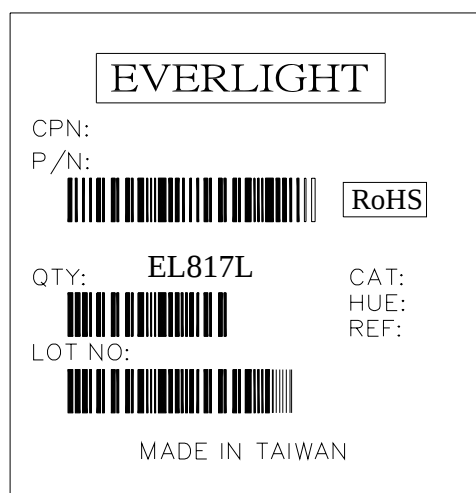
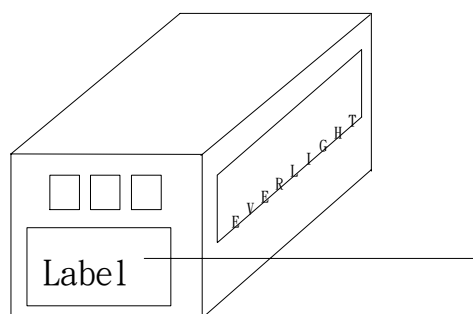
### EL817L Series

TATB

#### 2. Inner Carton



#### 3. Outside Carton



#### ● Packing Quantity

1. 1,000 Pcs / Per Reel
2. 3 Reels / Inner Carton
3. 10 Inner Cartons / Outside Carton