

Technical Data Sheet Photocoupler-RoHS Compliant

Features:

- 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
EL817*:1-channel type
- Pb free
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved (No. 608400)
- NEMKO approved (No. PO6206474/A1)
- DEMKO approved (No. 313924-01)
- FIMKO approved (No. FI 22807)
- 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 and S1 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.

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EL817 Series



EL817



EL817M



EL817S

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

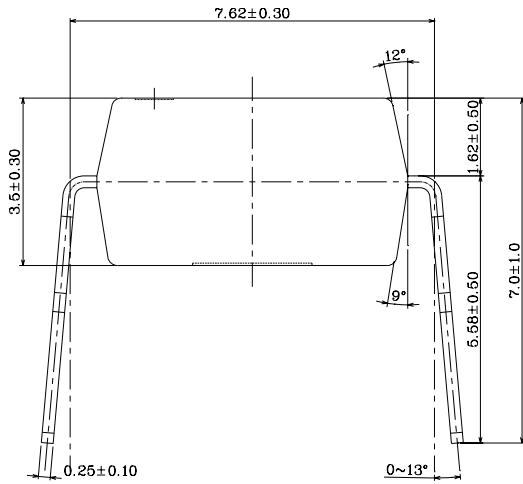
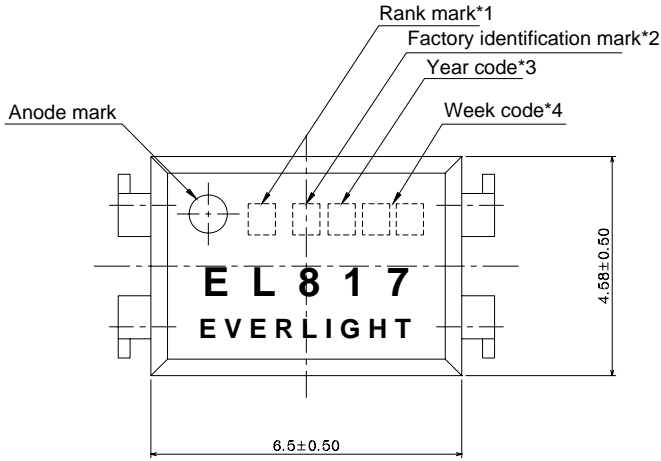
- Computer terminals
- System appliances, measuring instruments
- Registers, copiers, automatic vending machines
- Signal transmission between circuits of different potentials and impedances

Device Selection Guide

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

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Package Dimensions



EL817 Series

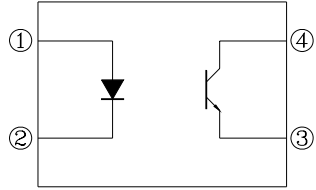
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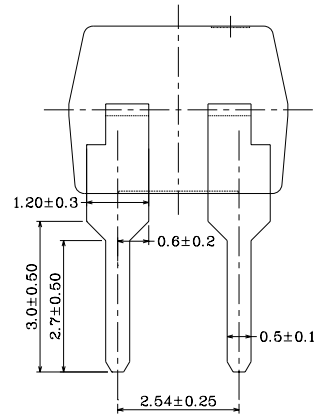
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PIN NO. AND INTERNAL CONNECTION DIAGRAM



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

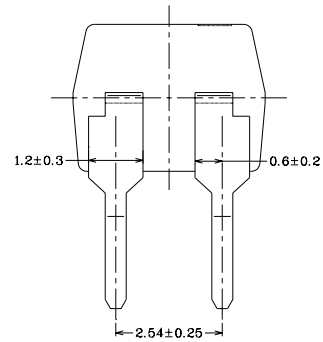
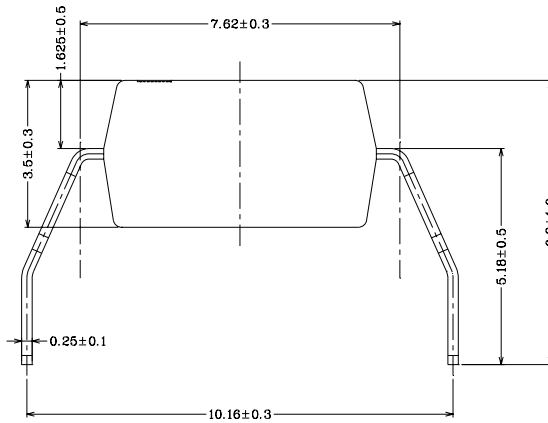
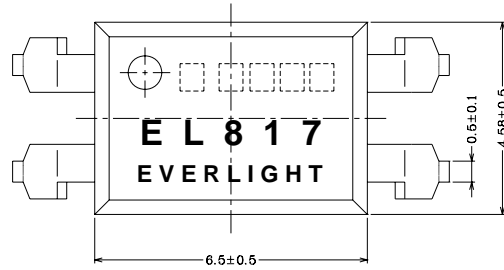


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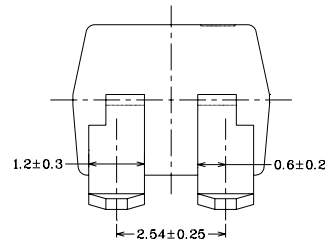
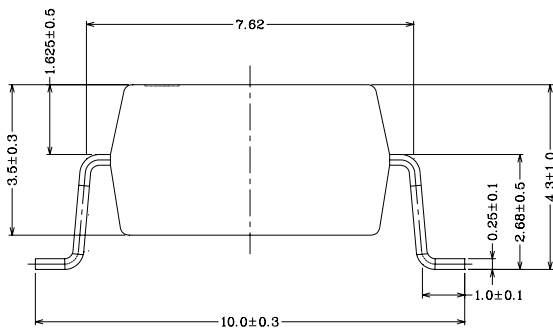
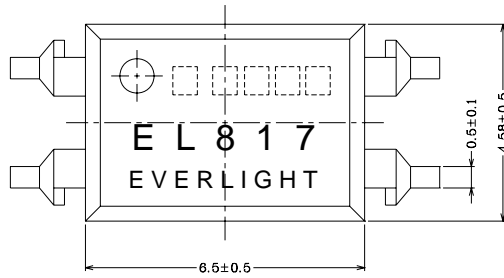
Package Dimensions

EL817 Series

M Type



S Type

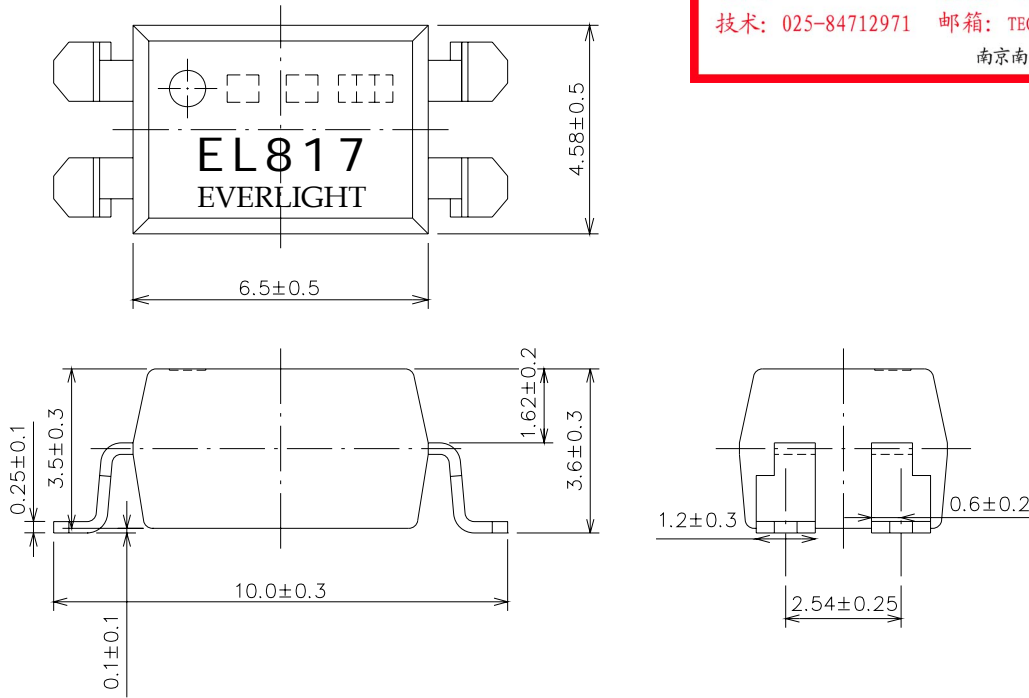


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Technical Data Sheet
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S1 Type

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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

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EL817 Series**Absolute Maximum Ratings****(Ta=25°C)**

| Parameter | | Symbol | Rating | Unit |
|--------------------------|-----------------------------|-----------|----------|-------|
| Input | Forward Current | I_F | 50 | mA |
| | Peak Forward Current*1 | I_{FM} | 1 | A |
| | Reverse Voltage | V_R | 6 | V |
| | Power Dissipation | P | 70 | 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 |
| *2 Isolation Voltage | | Viso | 5000 | V rms |
| Operating Temperature | | Topr | -55~+110 | °C |
| Storage Temperature | | Tstg | -55~+125 | °C |
| *3 Soldering Temperature | | Tsol | 260 | °C |

*1 Frequency=100 HZ ,10uS Duty

*2 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

*3 For 10 seconds



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EL817 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 =20mA |
| | Peak Forward Current | V _{FM} | | | 3.0 | V | I _{FM} =0.5A |
| | Reverse Current | I _R | - | - | 10 | uA | V _R =4V |
| | Terminal | C _t | - | 30 | 250 | pF | V=0,f=1kHz |
| Output | Collector Dark current | I _{CEO} | - | - | 100 | nA | V _{CE} =20V |
| | Collector-Emitter breakdown voltage | BV _{CEO} | 35 | - | - | V | I _c =0.1mA |
| Transfer Characteristics | Current Transfer ratio | CTR | 50 | - | 600 | % | I _F =5mA, V _{CE} =5V |
| | Collector-Emitter saturation voltage | V _{CE(sat)} | - | 0.1 | 0.2 | V | I _F =20mA, I _c =1 mA |
| | Isolation resistance | R _{ISO} | 5×10 ¹⁰ | 10 ¹¹ | - | Ω | DC500V,40~60%R.H |
| | Flotation capacitance | C _f | - | 0.6 | 1.0 | pF | V=0, f=1MHz |
| | Cut-off frequency | f _c | - | 80 | - | kHz | V _{CE} =5V, I _c =2 mA R _L =100Ω, -3dB |
| | Rise time | t _r | - | 4 | 18 | us | V _{CE} =2V I _c =2mA,R _L =100Ω |
| | Fall time | t _f | - | 3 | 18 | us | |



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Supplement

EL817 Series

Current Transfer Ratio CTR

| Sub-Model No. | Rank mark | CTR (%) | Condition |
|-----------------------------|-----------|------------|--|
| EL817* ^{note 1} | | 50 to 600 | $I_F = 5 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $T_a = 25^\circ\text{C}$ |
| EL817* (L) ^{note2} | L | 50 to 100 | |
| EL817* (A) | A | 80 to 160 | |
| EL817* (B) | B | 130 to 260 | |
| EL817* (C) | C | 200 to 400 | |
| EL817* (D) | D | 300 to 600 | |
| EL817* (AB) | A or B | 80 to 260 | |
| EL817* (BC) | B or C | 130 to 400 | |
| EL817* (CD) | C or D | 200 to 600 | |

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

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

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**Technical Data Sheet
Photocoupler-RoHS Compliant**
EL817 Series

Fig. 1 Forward Current vs. Ambient Temperature

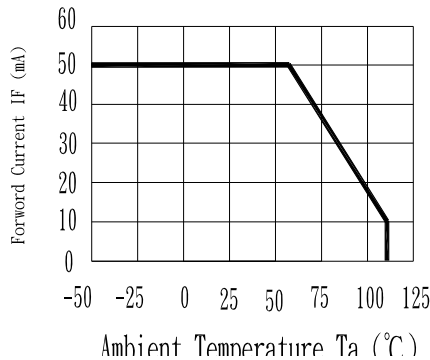


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

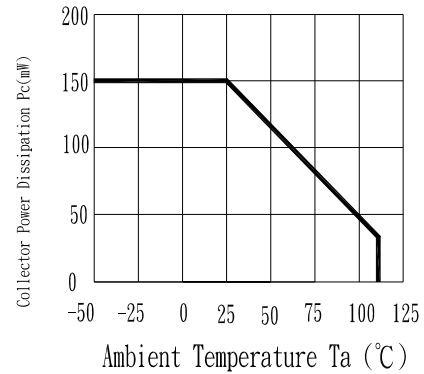
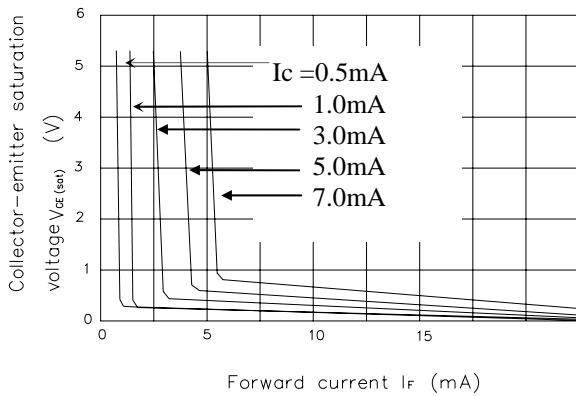

 Fig. 3 Collector-emitter Saturation Voltage vs. Forward Current ($T_a=25^\circ\text{C}$)


Fig. 4 Current transfer Ratio vs. Forward Current

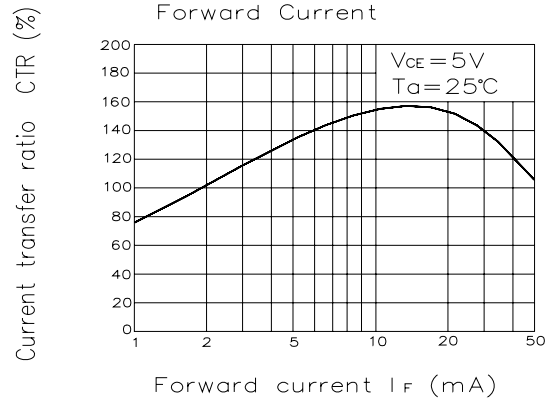
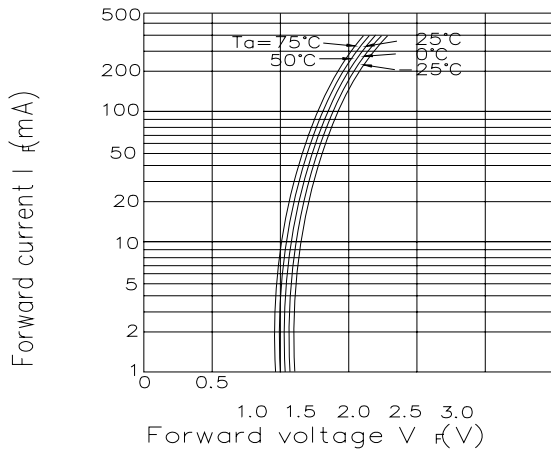
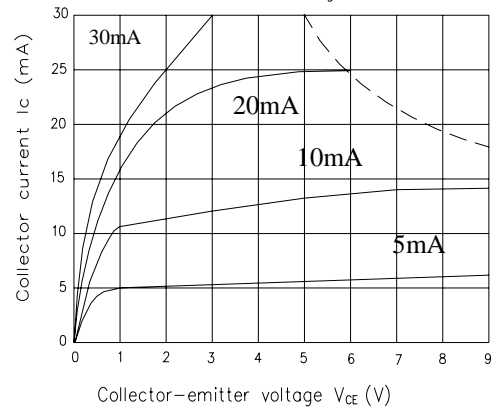


Fig. 5 Forward Current vs. Forward Voltage


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


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EL817 Series

Fig.7 Relative Current Transfer Ratio vs Ambient Temperature

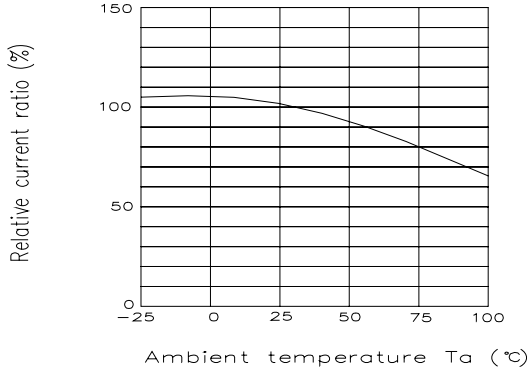


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

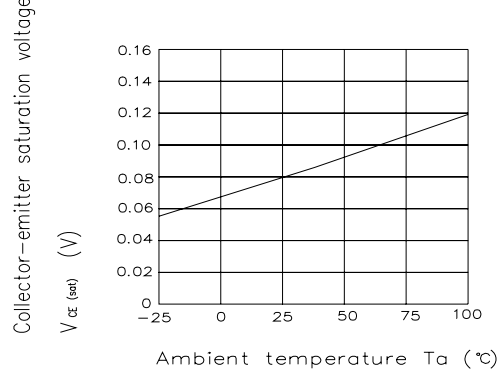


Fig.9 Collector Dark Current vs. Ambient Temperature

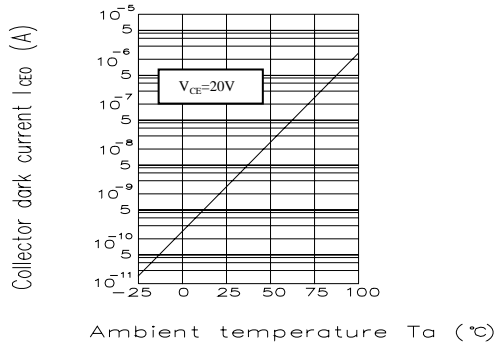


Fig.10 Response Time vs. Load Resistance

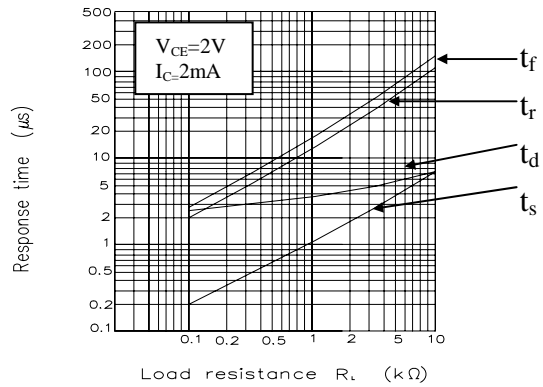


Fig.11 Frequency Response

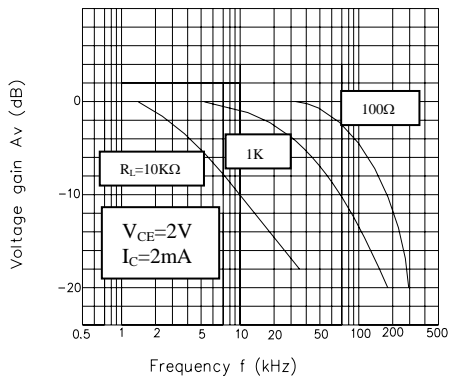
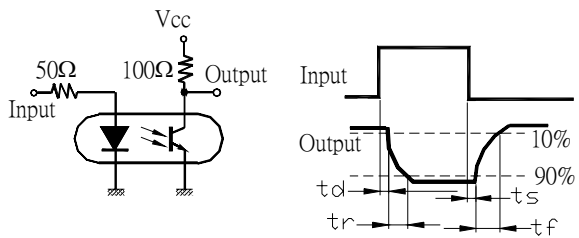


Fig. 12





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RELIABILITY PLAN

EL817 Series

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

Confidence level : 90 % , LTPD : 10 %

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

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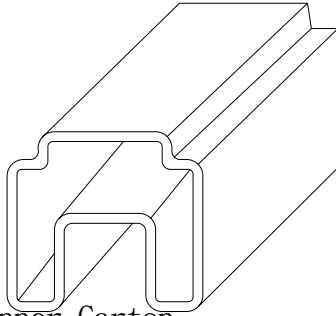
Technical Data Sheet Photocoupler-RoHS Compliant

Tube Packing Specifications (For Dip & M Type)

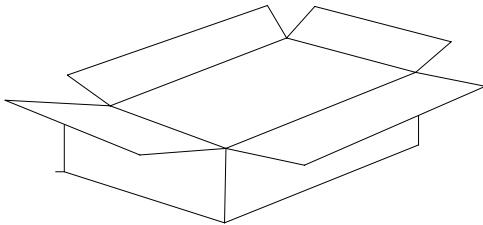
EL817 Series

1. Tube

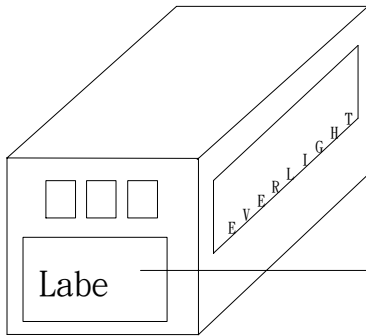
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2. Inner Carton



3. Outside Carton



EVERLIGHT

CPN:

P/N:



RoHS

EL817

QTY:



CAT:

HUE:

REF:

LOT NO:

MADE IN TAIWAN



● Packing Quantity

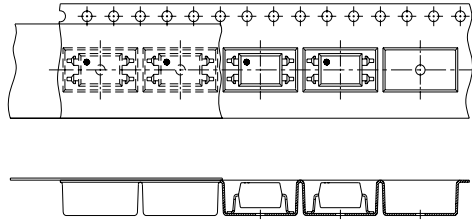
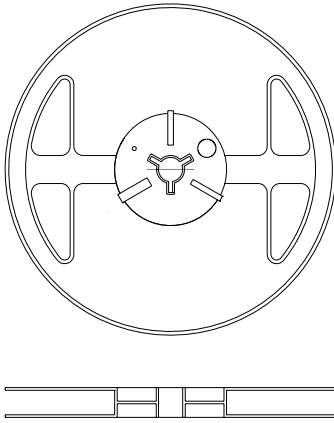
- 1. 100 Pcs/ Per Tube
- 2. 25 Tubes / Inner Carton
- 3. 12 Inner Cartons / Outside Carton

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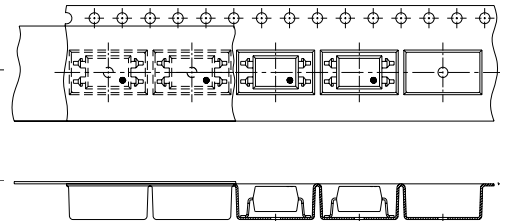
Tape & Reel Packing Specifications

EL817 Series

1. Tape & Reel (For S & S1 Type only)

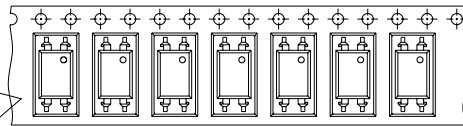
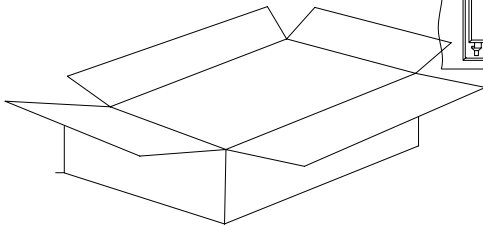


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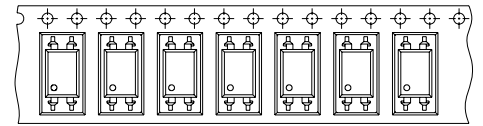


TB

2. Inner Carton

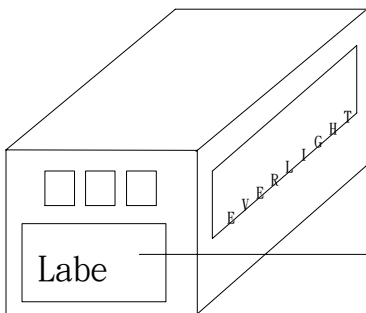


TU



TD

3. Outside Carton



EVERLIGHT

CPN:

P/N:

EL817

QTY:

LOT NO:



RoHS

CAT:

HUE:

REF:

MADE IN TAIWAN



● **Packing Quantity**

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