



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

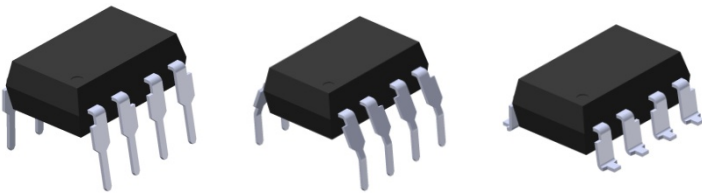
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

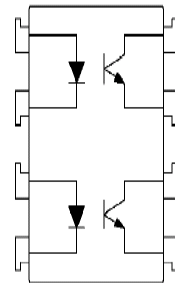
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



### 8 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER EL827 Series



Schematic



Pin Configuration

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

#### Features:

- Current transfer ratio (CTR: 50~600% at  $I_F = 5\text{mA}$ ,  $V_{CE} = 5\text{V}$ )
- High isolation voltage between input and output ( $V_{iso} = 5000\text{ V rms}$ )
- Compact small outline package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved
- CQC approved

#### Description

The EL827series devices each of consist of an infrared emitting diodes, optically coupled to a phototransistor detector. They are packaged in a 8-pin DIP package and available in wide-lead spacing and SMD option.

#### Applications

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as fan heaters, etc.
- Signal transmission between circuits of different potentials and impedances

8

7

6

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

|        | Parameter                           | Symbol    | Rating     | Unit  |
|--------|-------------------------------------|-----------|------------|-------|
| Input  | Forward current                     | $I_F$     | 60         | mA    |
|        | Peak forward current (1us, pulse)   | $I_{FP}$  | 1          | A     |
|        | Reverse voltage                     | $V_R$     | 6          | V     |
|        | Power dissipation                   | $P_D$     | 100        | mW    |
| Output | Power dissipation                   | $P_C$     | 150        | mW    |
|        | Collector current                   | $I_C$     | 50         | mA    |
|        | Collector-Emitter voltage           | $V_{CEO}$ | 80         | V     |
|        | Emitter-Collector voltage           | $V_{ECO}$ | 7          | V     |
|        | Total power dissipation             | $P_{TOT}$ | 200        | mW    |
|        | Isolation voltage <sup>*1</sup>     | $V_{ISO}$ | 5000       | V rms |
|        | Operating temperature               | $T_{OPR}$ | -55 to 110 | °C    |
|        | Storage temperature                 | $T_{STG}$ | -55 to 125 | °C    |
|        | Soldering temperature <sup>*2</sup> | $T_{SOL}$ | 260        | °C    |

Notes:

\*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 & 3, 4 are shorted together, and pins 5, 6 & 7, 8 are shorted together.

\*2 For 10 seconds

**Electro-Optical Characteristics (Ta=25°C unless specified otherwise)**

**Input**

| Parameter         | Symbol   | Min. | Typ.* | Max. | Unit          | Condition                |
|-------------------|----------|------|-------|------|---------------|--------------------------|
| Forward Voltage   | $V_F$    | -    | 1.2   | 1.4  | V             | $I_F = 20\text{mA}$      |
| Reverse Current   | $I_R$    | -    | -     | 10   | $\mu\text{A}$ | $V_R = 4\text{V}$        |
| Input capacitance | $C_{in}$ | -    | 30    | 250  | pF            | $V = 0, f = 1\text{kHz}$ |

**Output**

| Parameter                           | Symbol     | Min. | Typ.* | Max. | Unit | Condition                               |
|-------------------------------------|------------|------|-------|------|------|---|
| Collector-Emitter dark current      | $I_{CEO}$  | -    | -     | 100  | nA   | $V_{CE} = 20\text{V}, I_F = 0\text{mA}$ |
| Collector-Emitter breakdown voltage | $BV_{CEO}$ | 80   | -     | -    | V    | $I_C = 0.1\text{mA}$                    |
| Emitter-Collector breakdown voltage | $BV_{ECO}$ | 7    | -     | -    | V    | $I_E = 0.1\text{mA}$                    |

**Transfer Characteristics**

| Parameter                            | Symbol        | Min                | Typ. | Max. | Unit          | Condition  |
|--------------------------------------|---------------|--------------------|------|------|---------------|--|
| 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                 | $R_{IO}$      | $5 \times 10^{10}$ | -    | -    | $\Omega$      | $V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{ R.H.}$                       |
| Floating capacitance                 | $C_{IO}$      | -                  | 0.6  | 1.0  | pF            | $V_{IO} = 0, f = 1\text{MHz}$  |
| 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                            | $t_r$         | -                  | 3    | 18   | $\mu\text{s}$ | $V_{CE} = 2\text{V}, I_C = 2\text{mA},$<br>$R_L = 100\Omega$             |
| Fall time                            | $t_f$         | -                  | 4    | 18   | $\mu\text{s}$ |  |

\* Typical values at  $T_a = 25^\circ\text{C}$

Typical Electro-Optical Characteristics Curves

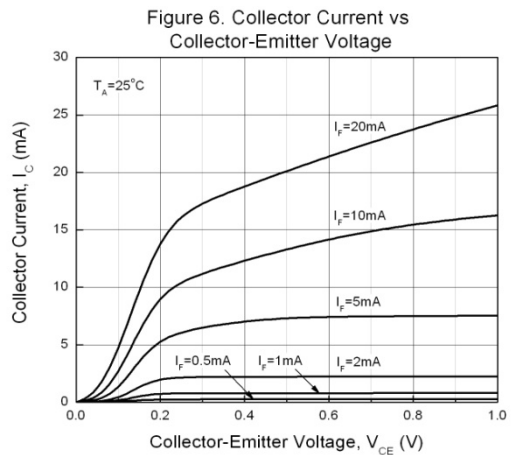
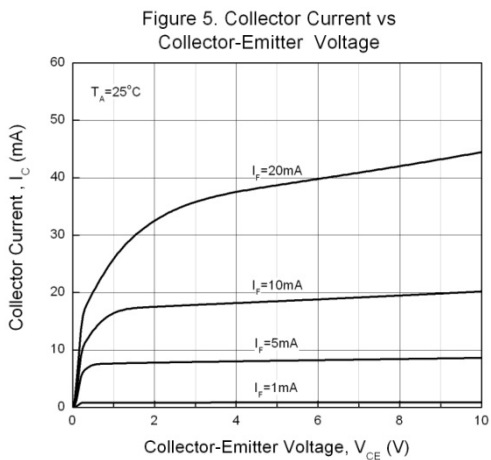
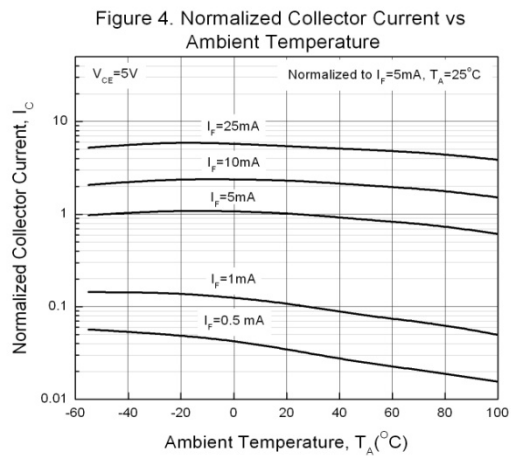
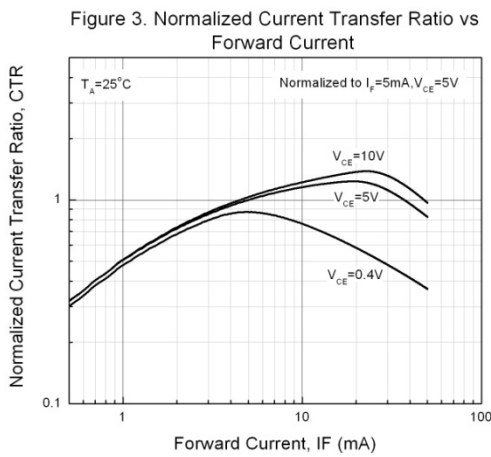
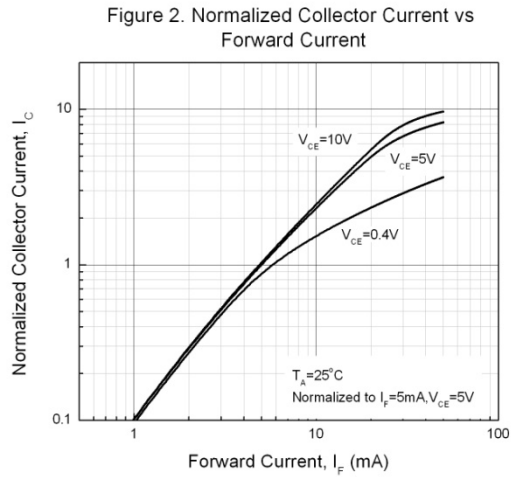
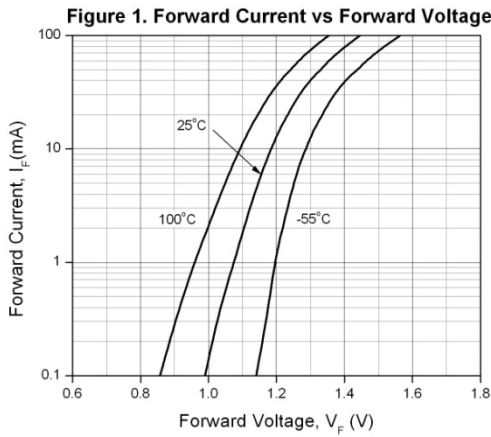


Figure 7. Collector Dark Current vs Ambient Temperature

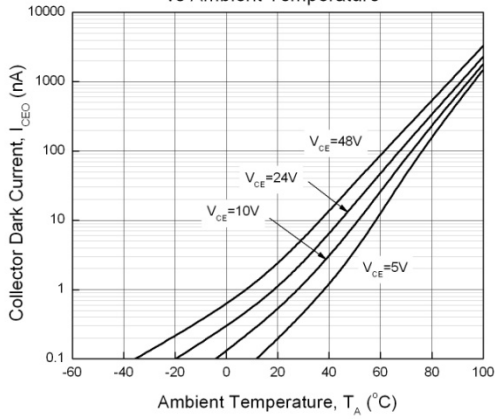


Figure 8. Switching Time vs Load Resistance

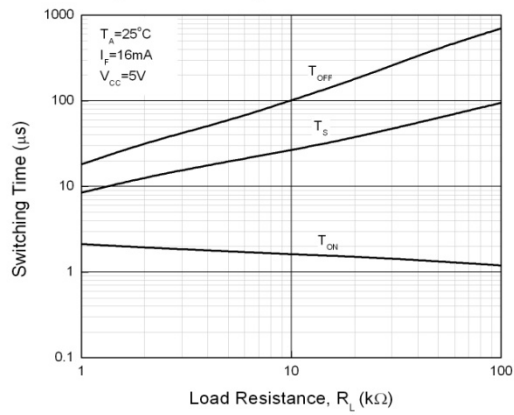


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

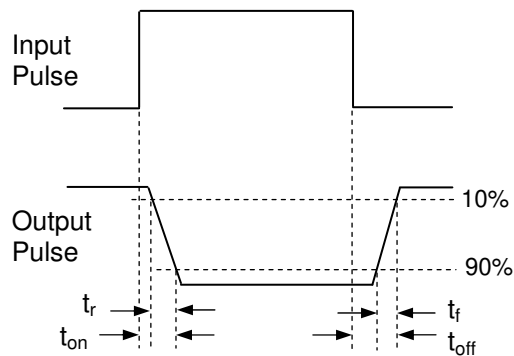
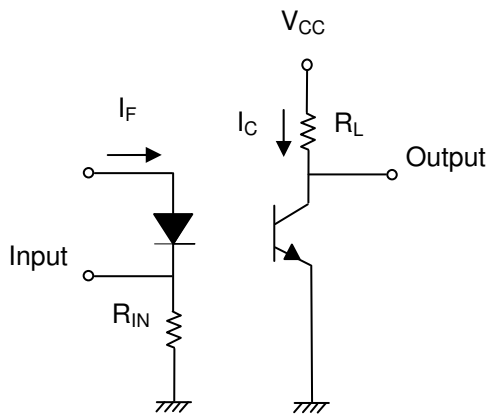
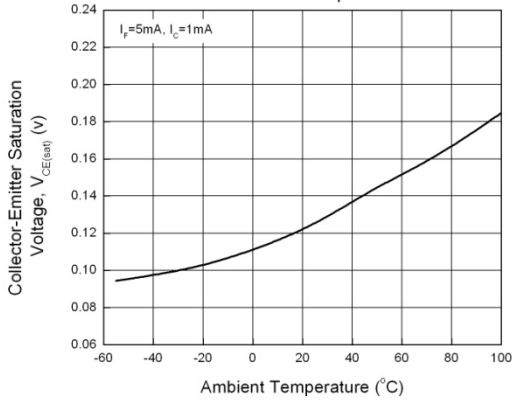


Figure 10. Switching Time Test Circuit & Waveforms

## Order Information

### Part Number

**EL827X(Z)-V**

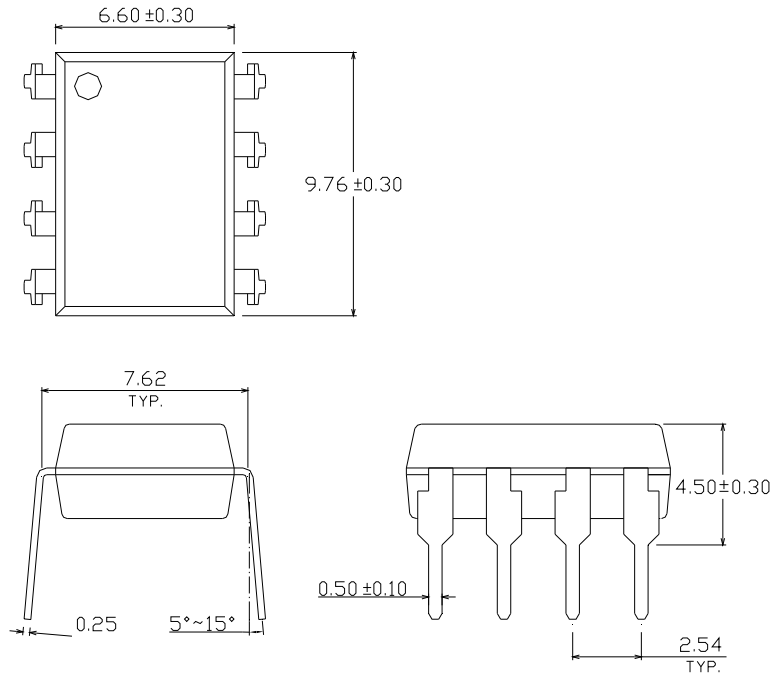
### Note

- X = Lead form option (S, S1, M or none)
- Z = Tape and reel option (TA, TB or none)
- V = VDE safety (optional)

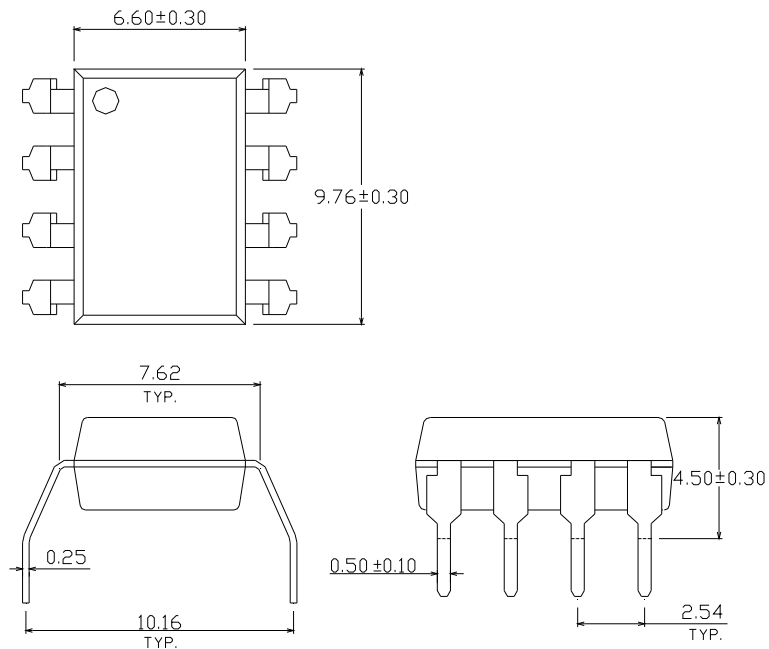
| Option  | Description   | Packing quantity    |
|---------|---|---------------------|
| None    | Standard DIP-8  | 45 units per tube   |
| M       | Wide lead bend (0.4 inch spacing)                             | 45 units per tube   |
| S (TA)  | Surface mount lead form + TA tape & reel option               | 1000 units per reel |
| S (TB)  | Surface mount lead form + TB tape & reel option               | 1000 units per reel |
| S1 (TA) | Surface mount lead form (low profile) + TA tape & reel option | 1000 units per reel |
| S1 (TB) | Surface mount lead form (low profile) + TB tape & reel option | 1000 units per reel |

### Package Dimension (Dimensions in mm)

#### Standard DIP Type

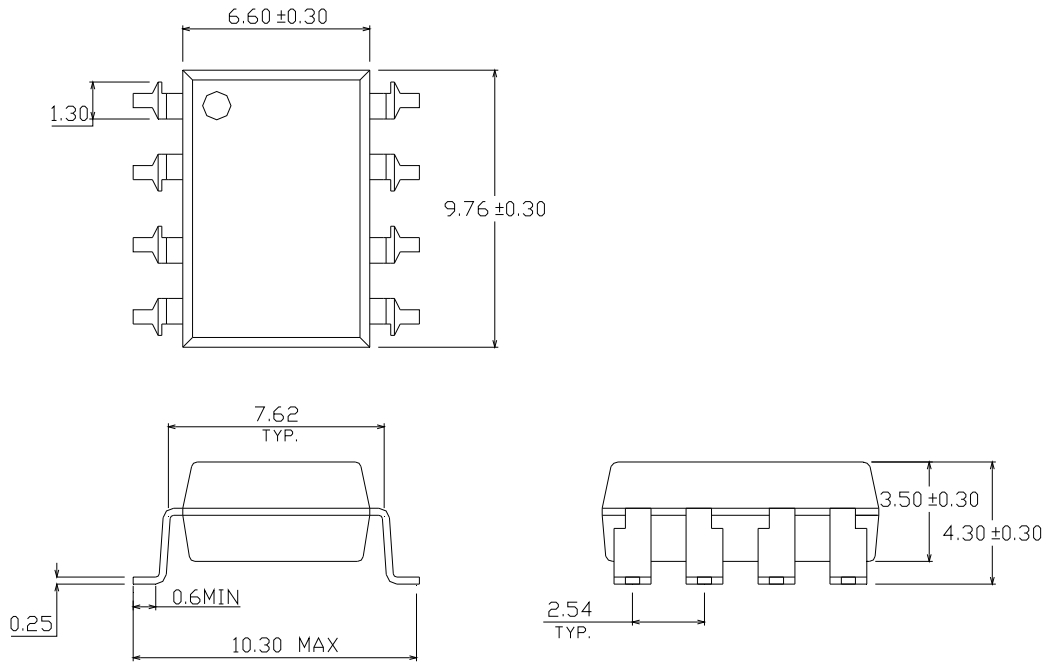


#### Option M Type

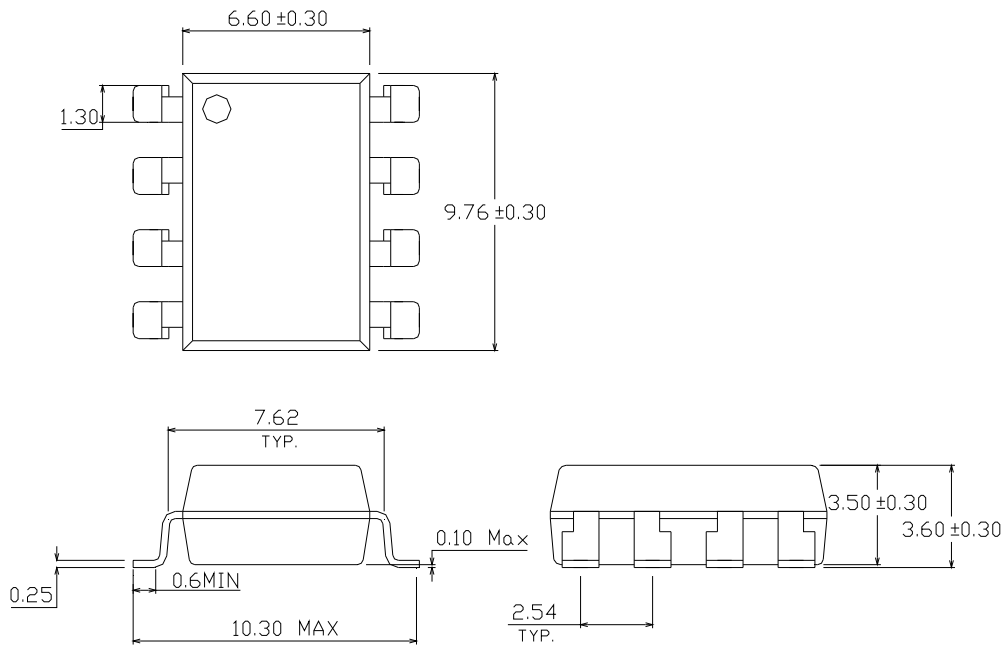




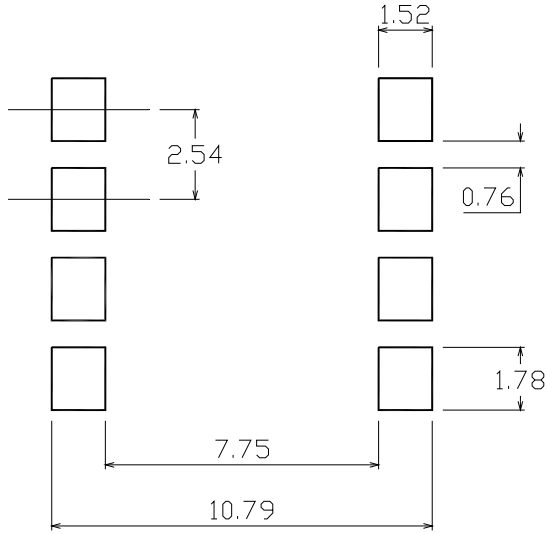
Option S Type



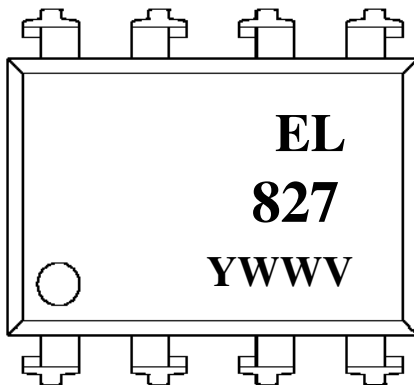
Option S1 Type



**Recommended pad layout for surface mount leadform**



**Device Marking**

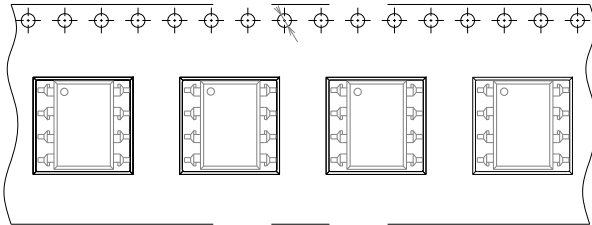


**Notes**

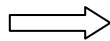
- EL827 denotes Device Number
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE (optional)

**Tape & Reel Packing Specifications**

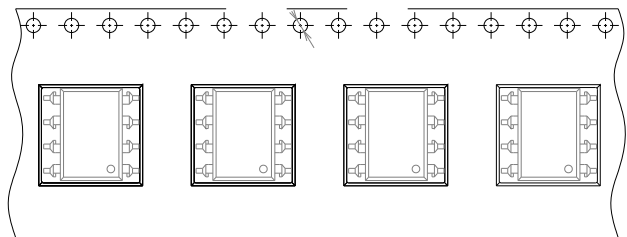
**Option TA**



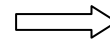
Direction of feed from reel



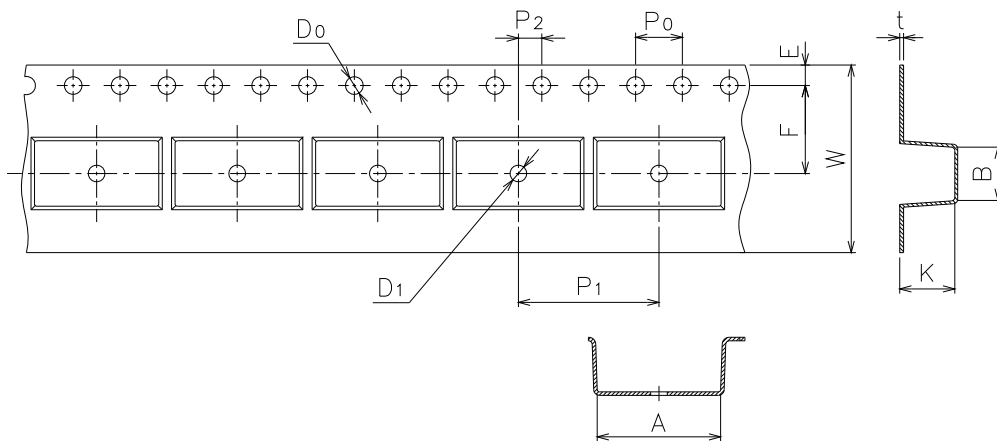
**Option TB**



Direction of feed from reel



**Tape dimensions**

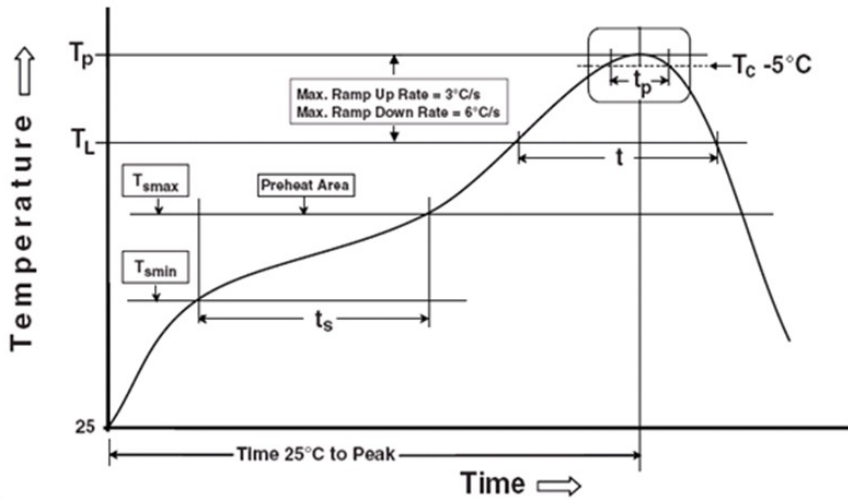


|               |           |           |           |                  |          |          |
|---------------|-----------|-----------|-----------|------------------|----------|----------|
| Dimension No. | <b>A</b>  | <b>B</b>  | <b>Do</b> | <b>D1</b>        | <b>E</b> | <b>F</b> |
| Dimension(mm) | 10.4±0.1  | 10.0±0.1  | 1.5±0.1   | 1.5+0.25<br>-0.1 | 1.75±0.1 | 7.5±0.1  |
| Dimension No. | <b>Po</b> | <b>P1</b> | <b>P2</b> | <b>t</b>         | <b>W</b> | <b>K</b> |
| Dimension(mm) | 4.0±0.1   | 12.0±0.1  | 2.0±0.1   | 0.4±0.1          | 16.0±0.3 | 4.5±0.1  |

## Precautions for Use

### 1. Soldering Condition

#### 1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



Note:

Reference: IPC/JEDEC J-STD-020D

#### Preheat

|  |                 |
|--|-----------------|
| Temperature min ( $T_{smin}$ )               | 150 °C          |
| Temperature max ( $T_{smax}$ )               | 200°C           |
| Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )  | 60-120 seconds  |
| Average ramp-up rate ( $T_{smax}$ to $T_p$ ) | 3 °C/second max |

#### Other

|  |                  |
|--|------------------|
| Liquidus Temperature ( $T_L$ )                                       | 217 °C           |
| Time above Liquidus Temperature ( $t_L$ )                            | 60-100 sec       |
| Peak Temperature ( $T_p$ )   | 260°C            |
| Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$ | 30 s             |
| Ramp- Down Rate from Peak Temperature                                | 6°C /second max. |
| Time 25°C to peak temperature  | 8 minutes max.   |
| Reflow times   | 3 times          |

## **DISCLAIMER**

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
3. These specification sheets include materials protected under copyright of EVERLIGHT corporation. Please don't reproduce or cause anyone to reproduce them without EVERLIGHT's consent.