

## Absolute Maximum Ratings (Ta=25°C)

|                         | Parameter                                      | Symbol           | Rating     | Unit  |
|-------------------------|------------------------------------------------|------------------|------------|-------|
| Input                   | Forward current                                | I <sub>F</sub>   | 60         | mA    |
|                         | Peak forward current (1us, pulse)              | I <sub>FP</sub>  | 1          | A     |
|                         | Reverse voltage                                | V <sub>R</sub>   | 6          | V     |
|                         | Power dissipation                              | P <sub>D</sub>   | 100        | mW    |
|                         | Derating factor (above T <sub>a</sub> = 100°C) |                  | 2.9        | mW/°C |
| Output                  | Power dissipation                              | P <sub>C</sub>   | 150        | mW    |
|                         | Derating factor (above T <sub>a</sub> = 100°C) |                  | 5.8        | mW/°C |
|                         | Collector current                              | I <sub>C</sub>   | 50         | mA    |
|                         | Collector-Emitter voltage                      | V <sub>CEO</sub> | 80         | V     |
|                         | Emitter-Collector voltage                      | V <sub>ECO</sub> | 7          | V     |
| Total Power Dissipation |                                                | P <sub>TOT</sub> | 200        | mW    |
| Isolation Voltage*1     |                                                | V <sub>ISO</sub> | 5000       | V rms |
| Operating Temperature   |                                                | T <sub>OPR</sub> | -55 to 110 | °C    |
| Storage Temperature     |                                                | T <sub>STG</sub> | -55 to 125 | °C    |
| Soldering Temperature*2 |                                                | T <sub>SOL</sub> | 260        | °C    |

### Notes:

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

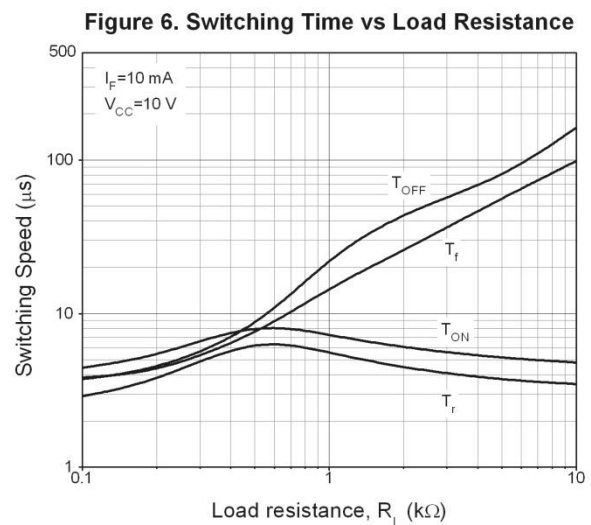
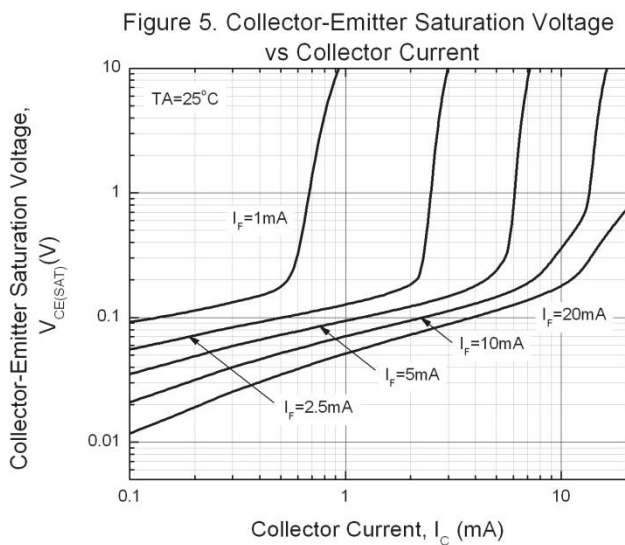
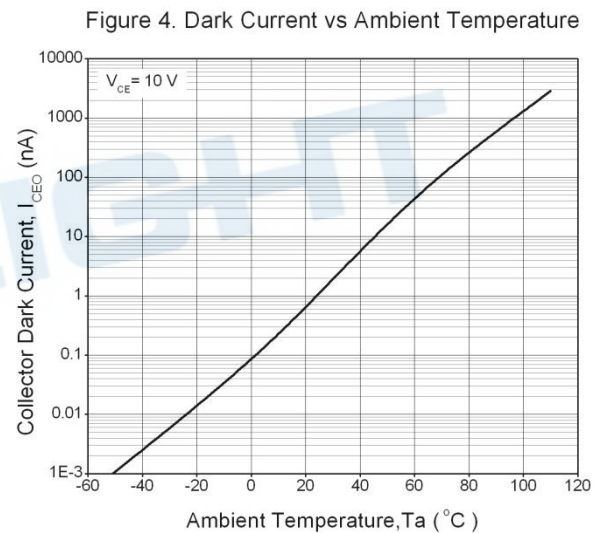
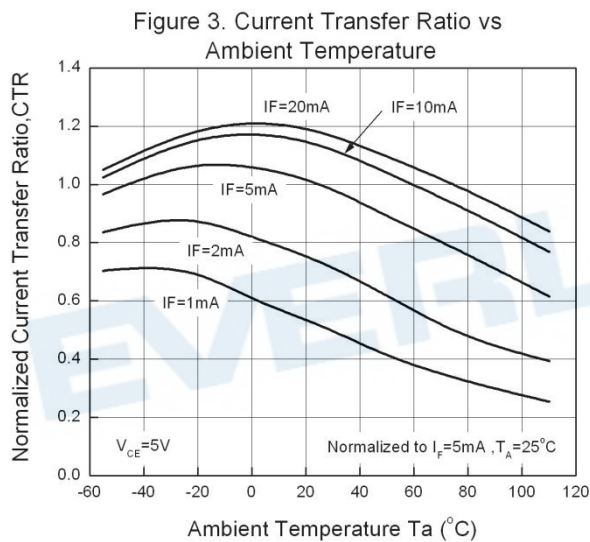
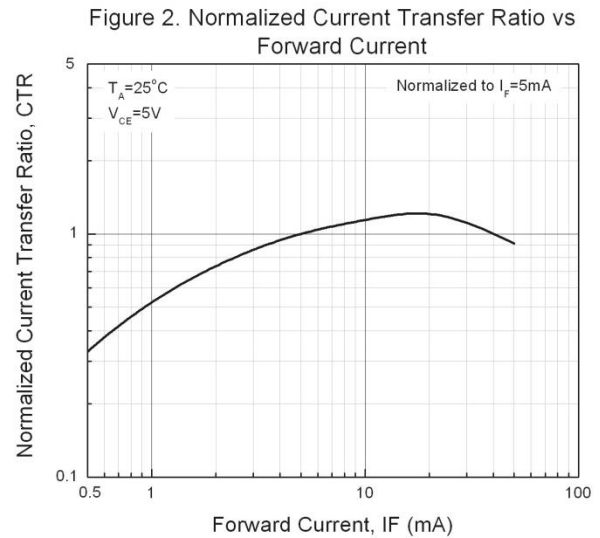
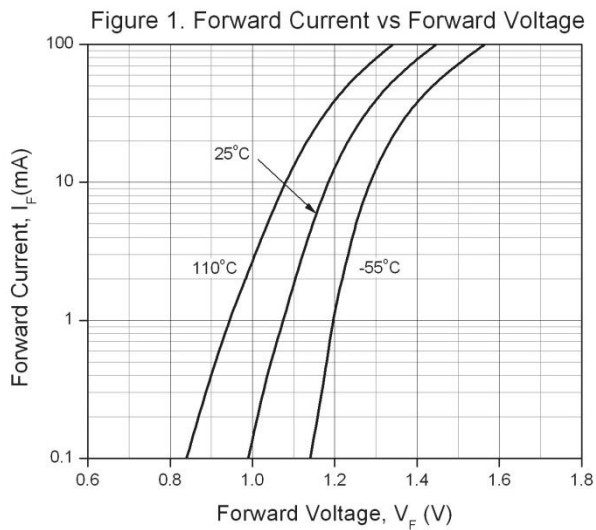
| Parameter                           | Symbol     | Min | Typ. | Max. | Unit | Condition                               |
|-------------------------------------|------------|-----|------|------|------|-----------------------------------------|
| Collector-Emitter dark current      | $I_{CEO}$  | -   | -    | 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               | EL817         | 50                 | -    | 600  | %             | $I_F = 5\text{mA}, V_{CE} = 5\text{V}$                               |
|                                      | EL817A        | 80                 | -    | 160  |               |                                                                      |
|                                      | EL817B        | 130                | -    | 260  |               |                                                                      |
|                                      | EL817C        | 200                | -    | 400  |               |                                                                      |
|                                      | EL817D        | 300                | -    | 600  |               |                                                                      |
|                                      | EL817X        | 100                | -    | 200  |               |                                                                      |
|                                      | EL817Y        | 150                | -    | 300  |               |                                                                      |
| 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           | $V_{CE} = 5\text{V}, I_C = 2\text{mA}, R_L = 100\Omega, -3\text{dB}$ |
| Rise time                            | $t_r$         | -                  | 6    | 18   | $\mu\text{s}$ | $V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$              |
| Fall time                            | $t_f$         | -                  | 8    | 18   | $\mu\text{s}$ |                                                                      |

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

## Typical Electro-Optical Characteristics Curves



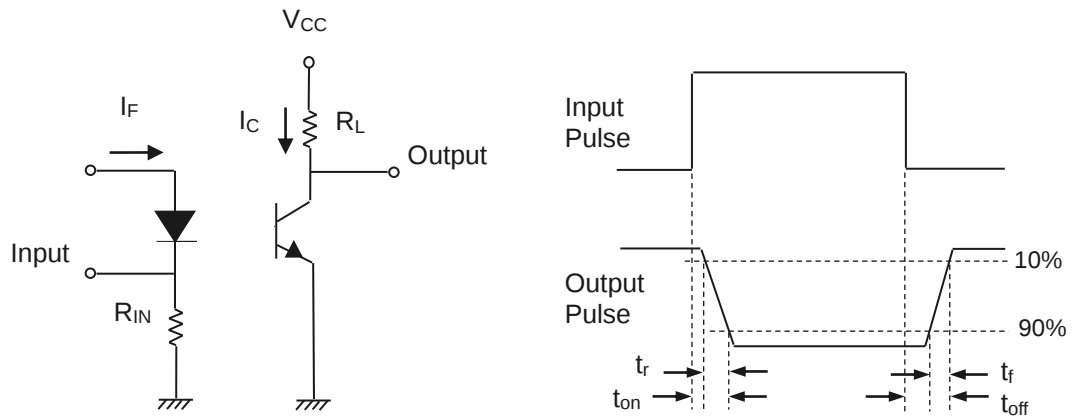


Figure 7. Switching Time Test Circuit & Waveforms

EVERLIGHT

## Order Information

### Part Number

**EL817X(Y)(Z)-FVG**

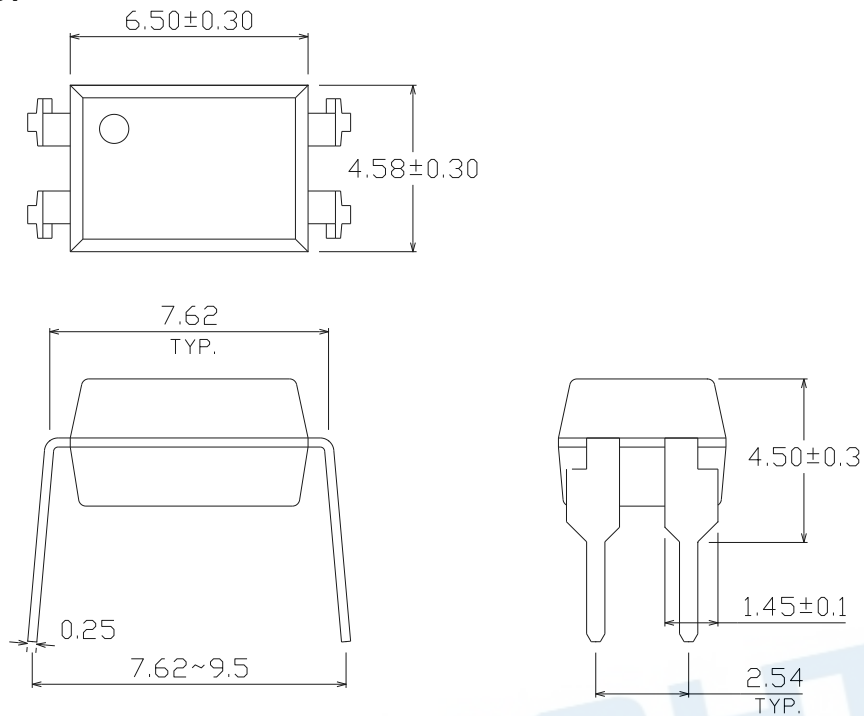
### Note

- X = Lead form option (S1, S2, M or none)  
Y = CTR Rank (A, B, C, D, X, Y or none)  
Z = Tape and reel option (TU, TD or none)  
F = Lead frame option (F: Iron, None: copper)  
V = VDE safety (optional)  
G = Halogens free

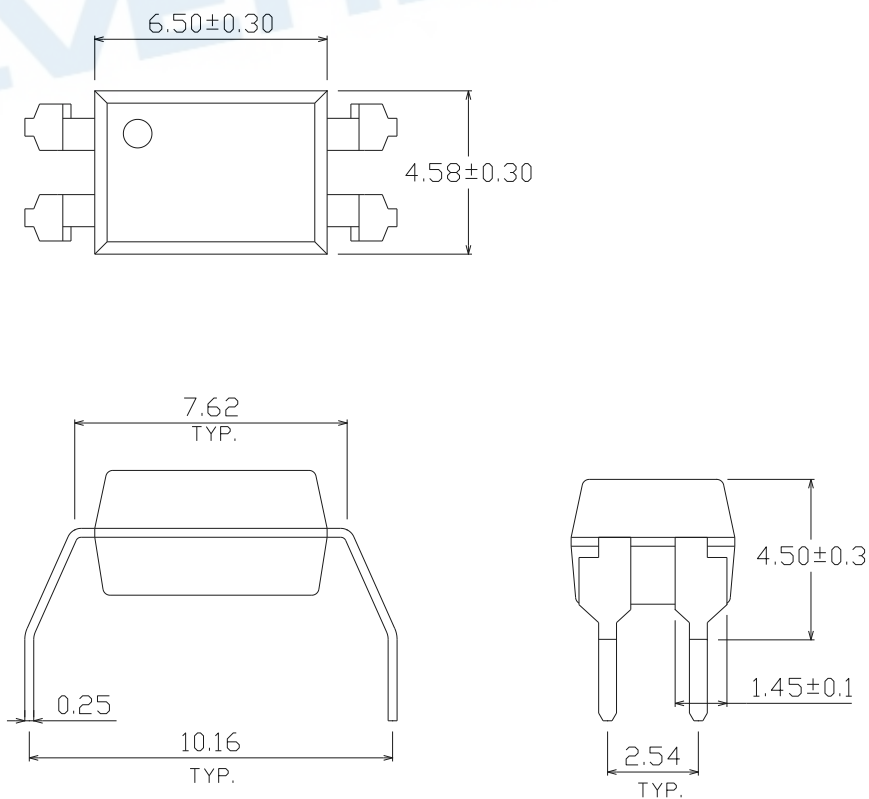
| Option  | Description                                                   | Packing quantity    |
|---------|---------------------------------------------------------------|---------------------|
| None    | Standard DIP-4                                                | 100 units per tube  |
| M       | Wide lead bend (0.4 inch spacing)                             | 100 units per tube  |
| S1 (TU) | Surface mount lead form (low profile) + TU tape & reel option | 1500 units per reel |
| S1 (TD) | Surface mount lead form (low profile) + TD tape & reel option | 1500 units per reel |
| S2 (TU) | Surface mount lead form (low profile) + TU tape & reel option | 2000 units per reel |
| S2 (TD) | Surface mount lead form (low profile) + TD tape & reel option | 2000 units per reel |

Package Dimension (Dimensions in mm)

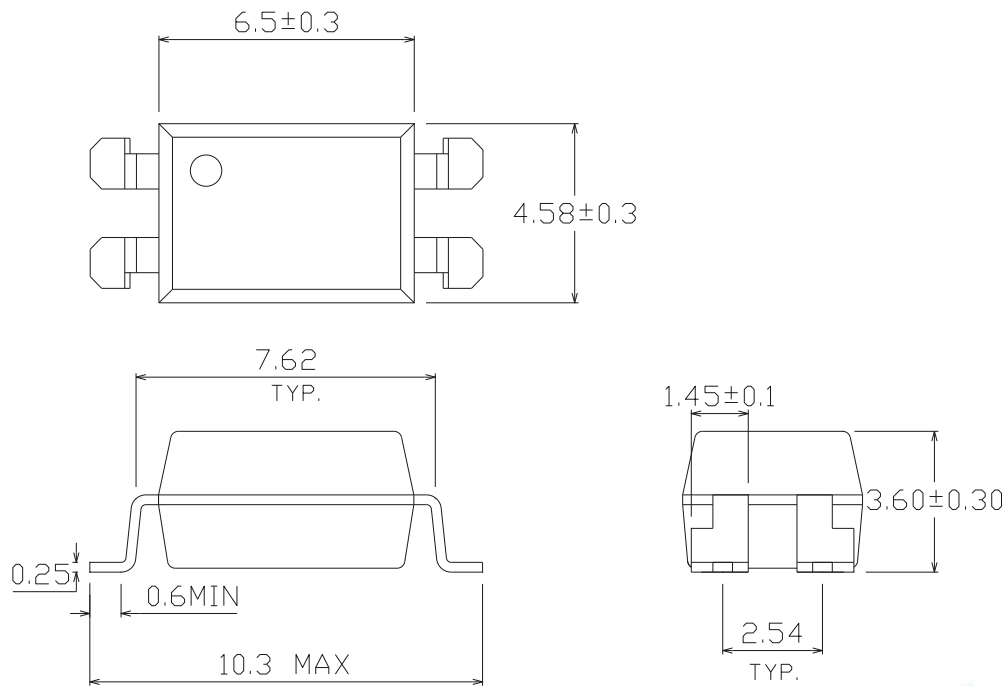
Standard DIP Type



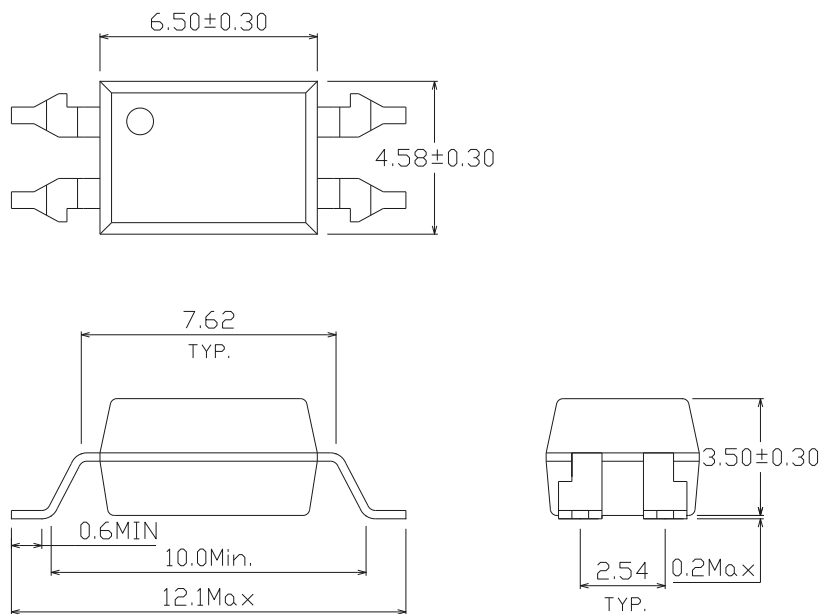
Option M Type



Option S1 Type

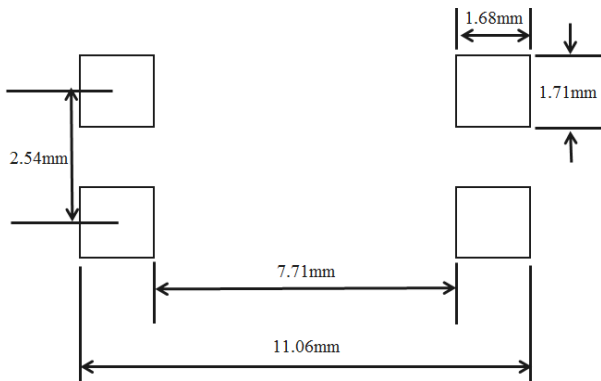


Option S2 Type

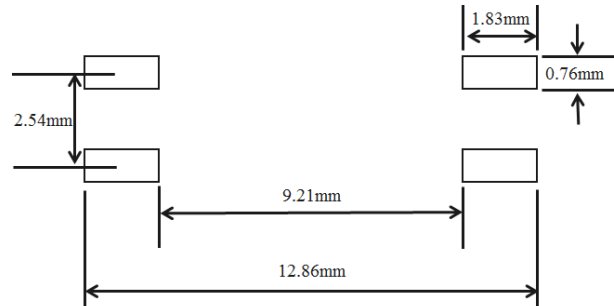


## Recommended pad layout for surface mount leadform

For S1 option



For S2 option



### Notes

Suggested pad dimension is just for reference only.  
Please modify the pad dimension based on individual need.

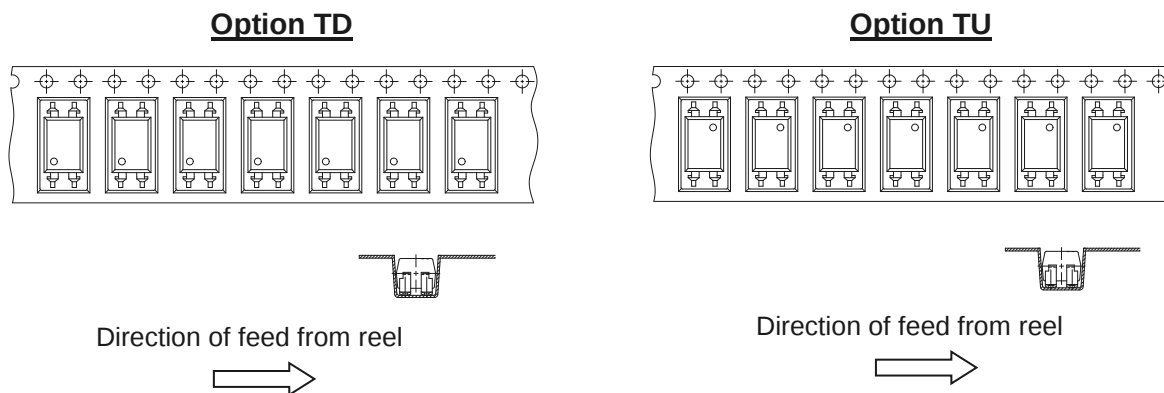
### Device Marking



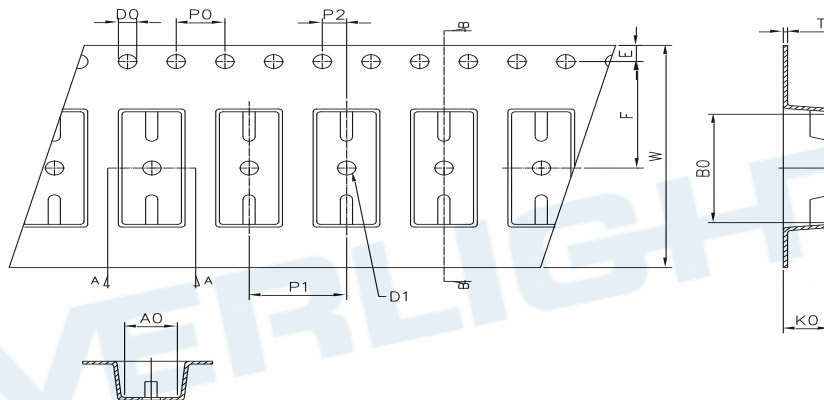
### Notes

EL denotes EVERLIGHT  
817 denotes Device Number  
G denotes Green part  
R denotes CTR Rank (A, B, C, D, X, Y or none)  
Y denotes 1 digit Year code  
WW denotes 2 digit Week code  
V denotes VDE (optional)

## Tape & Reel Packing Specifications



## Tape dimensions

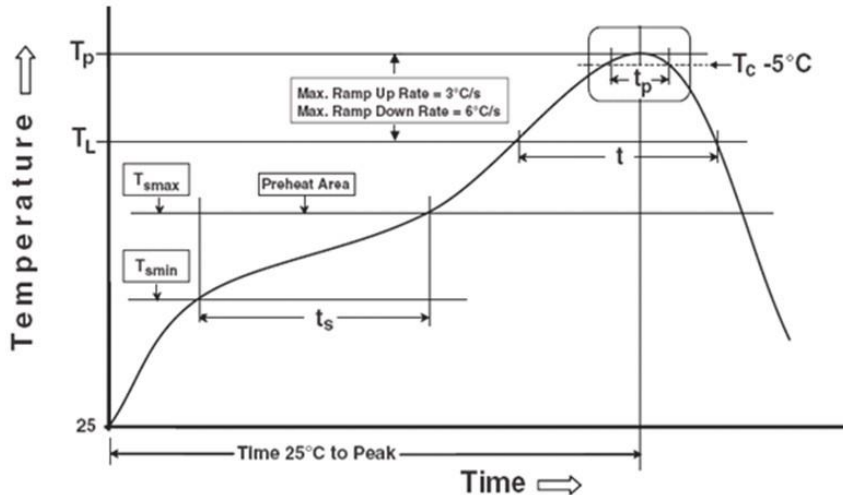


| Dimension No.        | Ao       | Bo        | Do       | D1       | E         | F        |
|----------------------|----------|-----------|----------|----------|-----------|----------|
| Dimension (mm)<br>S1 | 4.90±0.1 | 10.40±0.1 | 1.5±0.1  | 1.50±0.1 | 1.75±0.1  | 7.50±0.1 |
| Dimension (mm)<br>S2 | 4.88±0.1 | 12.55±0.1 | 1.5±0.1  | 1.50±0.1 | 1.75±0.1  | 11.5±0.1 |
| Dimension No.        | Po       | P1        | P2       | t        | W         | Ko       |
| Dimension (mm)<br>S1 | 4.00±0.1 | 8.00±0.1  | 2.00±0.1 | 0.40±0.1 | 16.00±0.3 | 4.60±0.1 |
| Dimension (mm)<br>S2 | 4.00±0.1 | 8.00±0.1  | 2.00±0.1 | 0.40±0.1 | 24.00±0.3 | 4.00±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 <sub>smin</sub> )                             | 150 °C          |
| Temperature max (T <sub>smax</sub> )                             | 200°C           |
| Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> ) | 60-120 seconds  |
| Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )      | 3 °C/second max |

#### Other

|                                                                   |                  |
|-------------------------------------------------------------------|------------------|
| Liquidus Temperature (T <sub>L</sub> )                            | 217 °C           |
| Time above Liquidus Temperature (t <sub>L</sub> )                 | 60-100 sec       |
| Peak Temperature (T <sub>p</sub> )                                | 260°C            |
| Time within 5 °C of Actual Peak Temperature: T <sub>p</sub> - 5°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

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