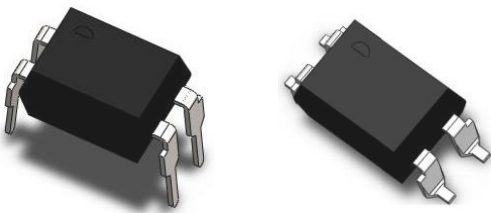
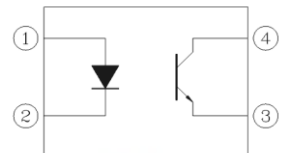


4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER EL617-G Series



Schematic



Pin Configuration

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

Features:

- Halogens free.
(Br <900 ppm , Cl <900 ppm , Br+Cl < 1500 ppm).
- Current transfer ratio
(CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output ($V_{iso} = 5000\text{ V rms}$)
- Operating temperature up to $+110^\circ\text{C}$
- Compact small outline package
- Compliance with EU REACH.
- Pb free and RoHS compliant.
- UL and cUL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC approved

Description

The EL617 series of devices each consist of an infrared emitting diodes, optically coupled to a phototransistor detector encapsulated with green compound. They are packaged in a 4-pin DIP package.

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

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 |
| 2.9 | | | | mW/°C |
| Output | Break Down Voltage | P_C | 150 | mW |
| | | | 5.8 | mW/°C |
| | Collector current | I_C | 50 | mA |
| | Collector-Emitter voltage | V_{CEO} | 80 | V |
| | Emitter-Collector voltage | V_{ECO} | 6 | V |
| Total Power Dissipation | P_{TOT} | 200 | mW | |
| Isolation Voltage*1 | V_{ISO} | 5000 | V rms | |
| Operating Temperature | T_{OPR} | -55 to 110 | °C | |
| Storage Temperature | T_{STG} | -55 to 125 | °C | |
| Soldering Temperature*2 | T_{SOL} | 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 | μA | $V_R = 4\text{V}$ |
| 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} | 6 | - | - | V | $I_E = 0.1\text{mA}$ |

Transfer Characteristics

| Parameter | Symbol | Min | Typ. | Max. | Unit | Condition |
|--------------------------------------|---------------|--------------------|------|------|---------------|--|
| Current Transfer ratio | EL617 | 50 | - | 600 | % | $I_F = 5\text{mA}, V_{CE} = 5\text{V}$ |
| | EL617A | 80 | - | 160 | | |
| | EL617B | 130 | - | 260 | | |
| | EL617C | 200 | - | 400 | | |
| | EL617D | 300 | - | 600 | | |
| | EL617X | 100 | - | 200 | | |
| | EL617Y | 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} | 5×10^{10} | - | - | Ω | $V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{ R.H.}$ |
| 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 | - | - | 18 | μs | $V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$ |
| Fall time | t_f | - | - | 18 | μs | $R_L = 100\Omega$ |

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

Typical Electro-Optical Characteristics Curves

Figure 1. Forward Current vs Forward Voltage

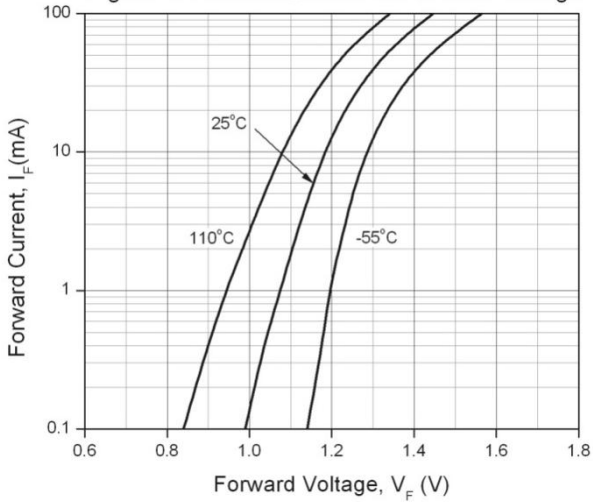


Figure 2. Normalized Current Transfer Ratio vs Forward Current

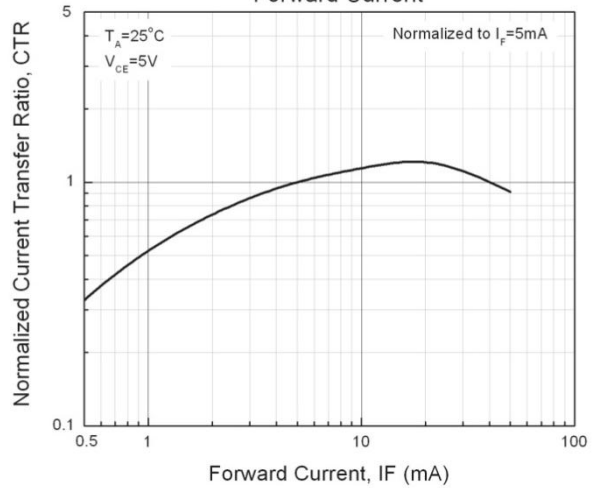


Figure 3. Current Transfer Ratio vs Ambient Temperature

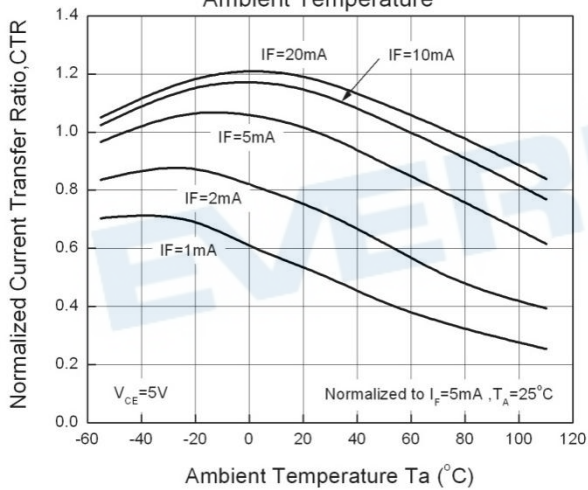


Figure 4. Dark Current vs Ambient Temperature

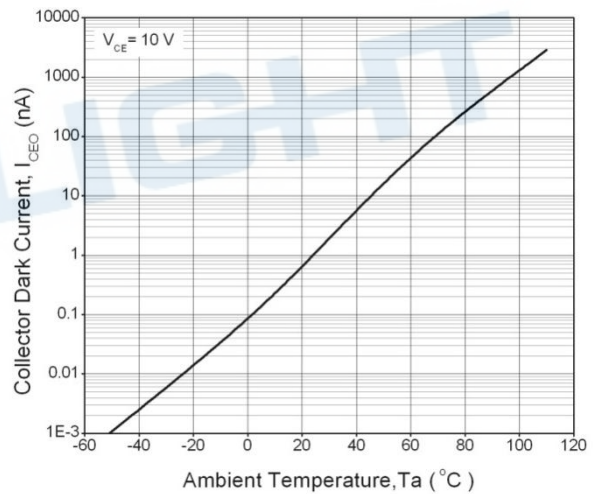


Figure 5. Collector-Emitter Saturation Voltage vs Collector Current

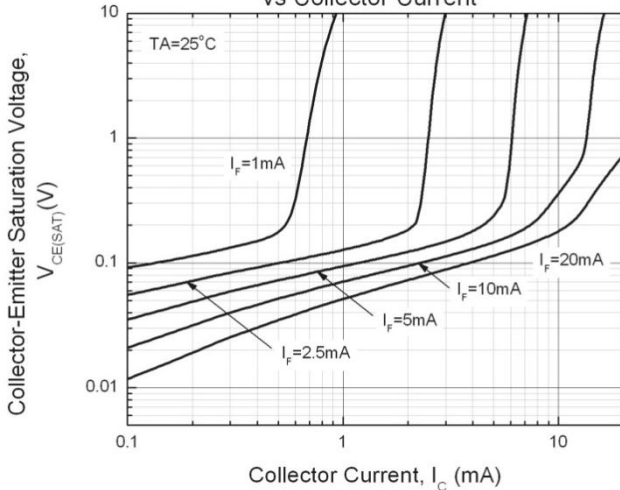
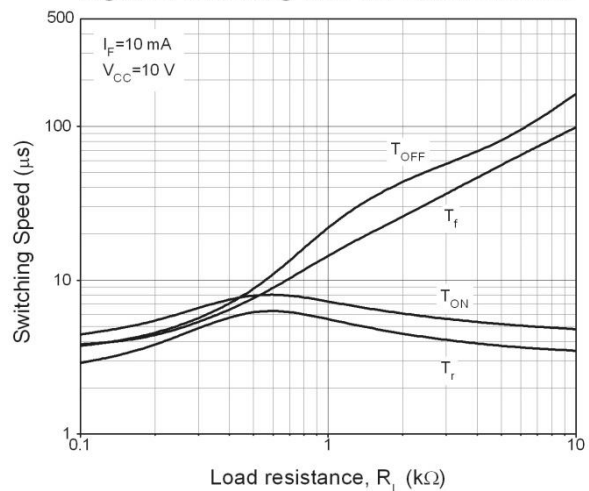


Figure 6. Switching Time vs Load Resistance



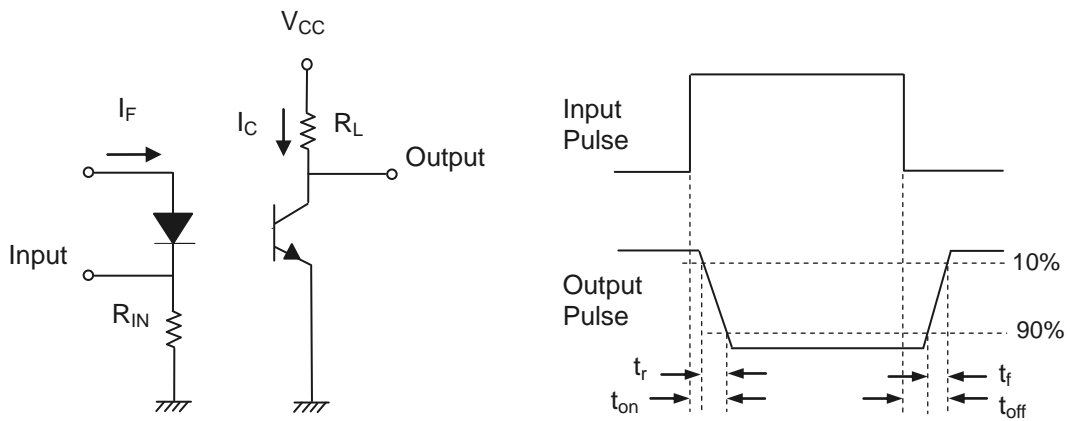


Figure 7. Switching Time Test Circuit & Waveforms

EVERLIGHT

Order Information

Part Number

EL617X(Y)(Z) -VG

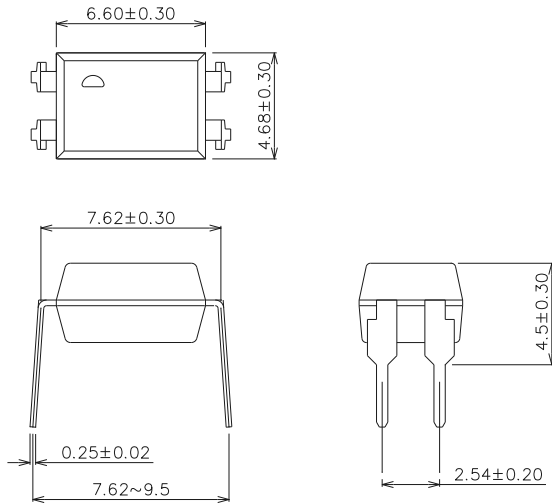
Note

- X = Lead form option (S or none)
- Y = CTR Rank (A, B, C, D, X, Y or none)
- Z = Tape and reel option (TA, TB, TU, TD or none).
- V = VDE safety
- G = Halogens free

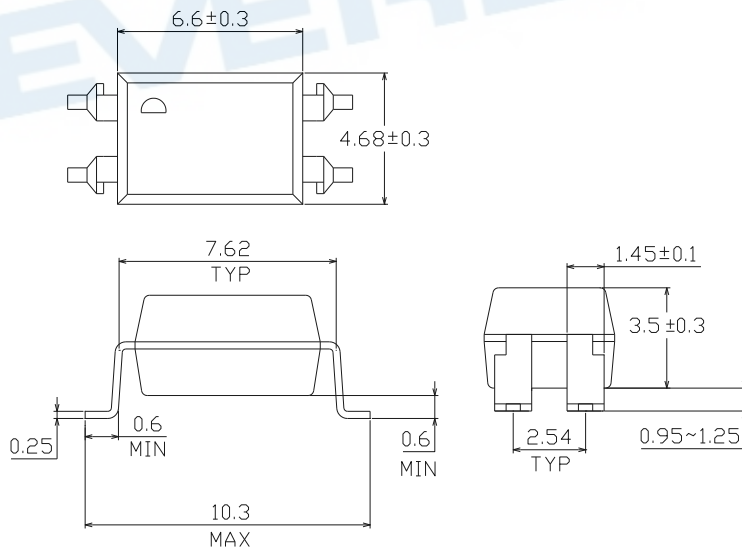
| Option | Description | Packing quantity |
|--------|---|---------------------|
| None | Standard DIP-4 | 100 units per tube |
| S (TA) | Surface mount lead form + TA tape & reel option | 1000 units per reel |
| S (TB) | Surface mount lead form + TB tape & reel option | 1000 units per reel |
| S (TU) | Surface mount lead form + TU tape & reel option | 1500 units per reel |
| S (TD) | Surface mount lead form + TD tape & reel option | 1500 units per reel |

Package Dimension (Dimensions in mm)

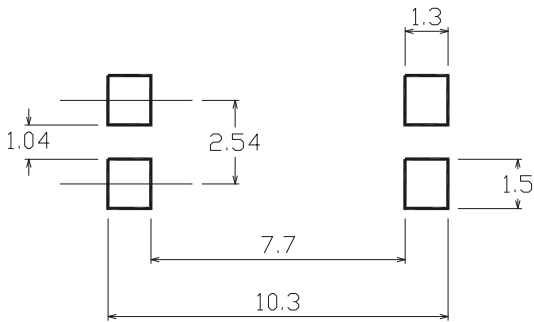
Standard DIP Type



Option S Type



Recommended pad layout for surface mount leadform



Device Marking

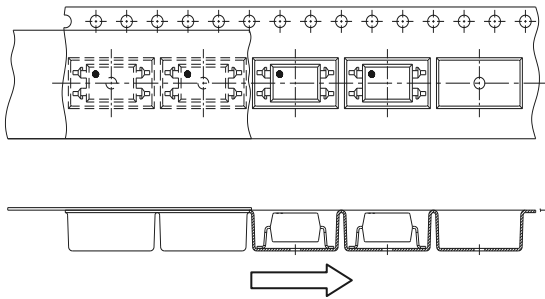


Notes

- EL denotes EVERLIGHT
- 617 denotes Device Number
- G denotes Halogens free
- R denotes CTR Rank (A, B, C, D or none)
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE

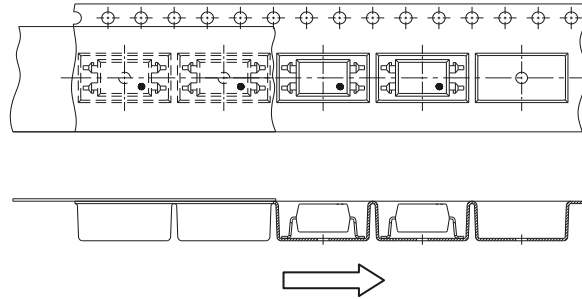
Tape & Reel Packing Specifications

Option TA



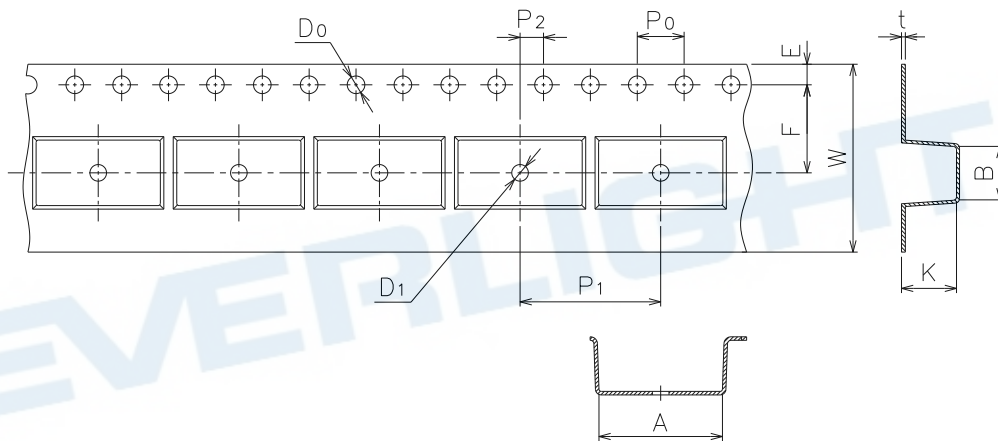
Direction of feed from reel

Option TB



Direction of feed from reel

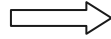
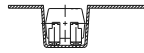
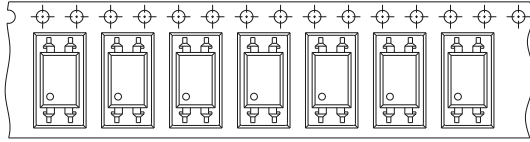
Tape dimensions



Tape dimensions

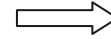
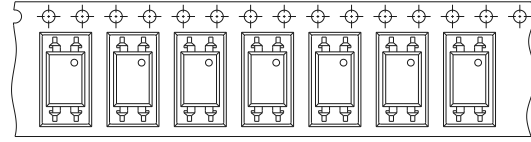
| | | | | | | |
|----------------|----------|----------|---------|----------|----------|----------|
| Dimension No. | A | B | Do | D1 | E | F |
| Dimension (mm) | 10.5±0.1 | 4.65±0.1 | 1.5±0.1 | 1.50±0.1 | 1.75±0.1 | 7.5±0.1 |
| Dimension No. | Po | P1 | P2 | t | W | K |
| Dimension (mm) | 4.0±0.1 | 12.0±0.1 | 2.0±0.1 | 0.4±0.1 | 16.0±0.3 | 5.05±0.1 |

Option TD



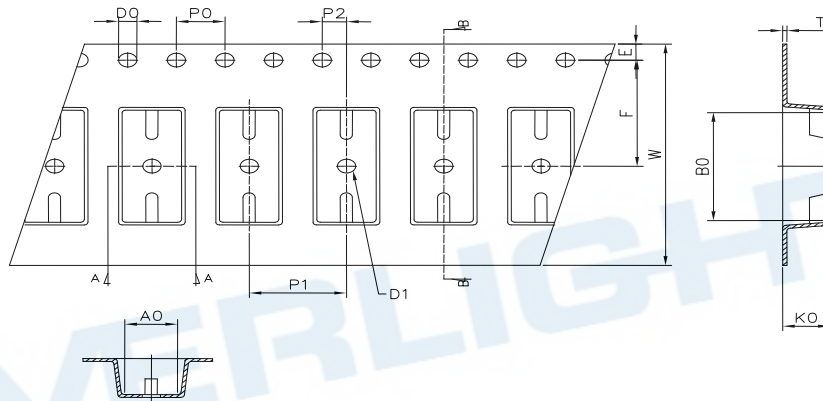
Direction of feed from reel

Option TU



Direction of feed from reel

Tape dimensions

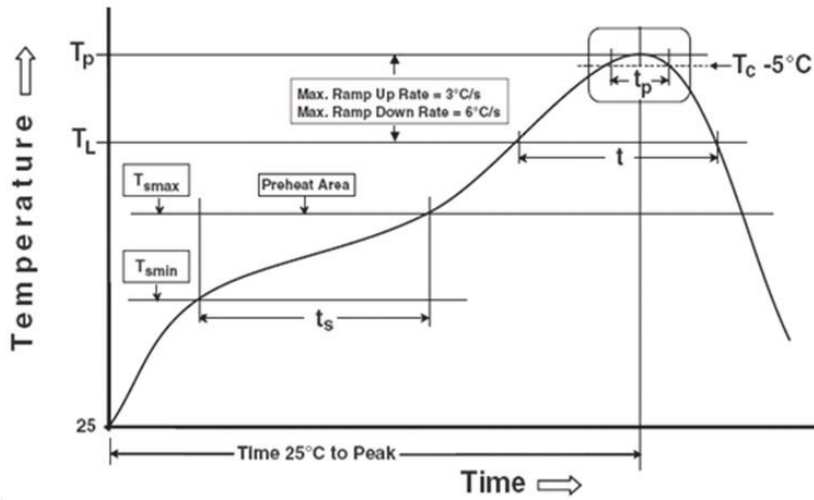


| | | | | | | |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Dimension No. | Ao | Bo | Do | D1 | E | F |
| Dimension(mm) | 4.90±0.1 | 10.40±0.1 | 1.5±0.1 | 1.50±0.1 | 1.75±0.1 | 7.50±0.1 |
| Dimension No. | Po | P1 | P2 | t | W | Ko |
| Dimension(mm) | 4.00±0.1 | 8.00±0. | 2.00±0.1 | 0.40±0.1 | 16.00±0.3 | 4.60±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.
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