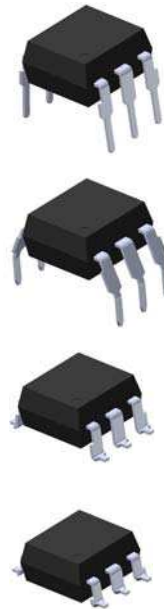


6 PIN DIP ZERO CROSS TRIAC DRIVER PHOTOCOUPLER

EL303X Series
EL304X Series
EL306X Series
EL308X Series

Features:

- Peak breakdown voltage
 - 250V: EL303X
 - 400V: EL304X
 - 600V: EL306X
 - 800V: EL308X
- High isolation voltage between input and output (Viso=5000 V rms)
- Zero voltage crossing
- Pb free and RoHS compliant.
- UL approved (No.E214129)
- VDE approved (No.132249)
- SEMKO approval (pending)
- NEMKO approval (pending)
- DEMKO approval (pending)
- FIMKO approval (pending)
- CSA approved (No. 2007798)



Description

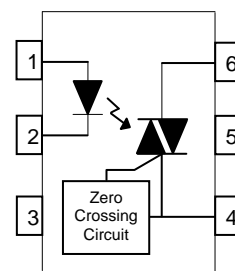
The EL303X, EL304X, EL306X and EL308X series of devices each consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon zero voltage crossing photo triac.

They are designed for use with a discrete power triac in the interface of logic systems to equipment powered from 110 to 380 VAC lines, such as solid-state relays, industrial controls, motors, solenoids and consumer appliances.

Applications

- Solenoid/valve controls
- Light controls
- Static power switch
- AC motor drivers
- E.M. contactors
- Temperature controls
- AC Motor starters

Schematic



Pin Configuration

1. Anode
2. Cathode
3. No Connection
4. Terminal
5. Substrate
(do not connect)
6. Terminal



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6 PIN DIP ZERO CROSS TRIAC DRIVER PHOTOCOUPLER

EL303X Series
EL304X Series
EL306X Series
EL308X Series

Absolute Maximum Ratings (T_a=25°C)

| Parameter | | Symbol | Rating | Unit | |
|-------------------------------------|--------------------------------------|------------------|----------|--------|---|
| Input | Forward current | I _F | 60 | mA | |
| | Reverse voltage | V _R | 6 | V | |
| | Power dissipation | P _D | 100 | mW | |
| | Derating factor (above 85°C) | | 3.8 | mW /°C | |
| Output | Off-state Output Terminal Voltage | V _{DRM} | EL303X | 250 | V |
| | | | EL304X | 400 | |
| | | | EL306X | 600 | |
| | | | EL308X | 800 | |
| | Peak Repetitive Surge Current | I _{TSM} | 1 | A | |
| | Power dissipation | P _D | 300 | mW | |
| Derating factor (above 85°C) | 7.6 | | mW /°C | | |
| Isolation voltage ^{*1} | | V _{iso} | 5000 | V rms | |
| Total power dissipation | | P _D | 330 | mW | |
| Operating temperature | | T _{opr} | -55~+100 | °C | |
| Storage temperature | | T _{stg} | -55~+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 & 3 are shorted together, and pins 4, 5 & 6 are shorted together.

*2 For 10 seconds.

6 PIN DIP ZERO CROSS TRIAC DRIVER PHOTOCOUPLER

**EL303X Series
EL304X Series
EL306X Series
EL308X Series**

Electrical Characteristics (T_a=25°C unless specified otherwise)

Input

| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|-------------------------|----------------|------|-------|------|------|-----------------------|
| Forward voltage | V _F | - | - | 1.5 | V | I _F = 30mA |
| Reverse Leakage current | I _R | - | - | 10 | μA | V _R = 6V |

Output

| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|---|--------------------|------|-------|------|------|--|
| Peak Blocking Current | EL303X/304X | - | - | 100 | nA | V _{DRM} = Rated V _{DRM} I _F = 0mA |
| | EL306X/308X | | | 500 | | |
| Peak On-state Voltage | V _{TM} | - | - | 3 | V | I _{TM} =100mA peak, I _F =Rated I _{FT} |
| Critical Rate of Rise of off-state Voltage | EL303X /304X /306X | 1000 | - | - | V/μs | V _{PEAK} =Rated V _{DRM} , I _F =0 (Fig. 10) |
| | EL308X | 600 | - | - | | |
| Inhibit Voltage (MT1-MT2 voltage above which device will not trigger) | V _{INH} | - | - | 20 | V | I _F = Rated I _{FT} |
| Leakage in Inhibited State | I _{DRM2} | - | - | 500 | μA | I _F = Rated I _{FT} , V _{DRM} =Rated V _{DRM} , off state |

Transfer Characteristics

| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|---------------------|-----------------|------|-------|------|------|--------------------------|
| LED Trigger Current | I _{FT} | - | - | 15 | mA | Main terminal Voltage=3V |
| | | | | 10 | | |
| | | | | 5 | | |
| Holding Current | I _H | - | 280 | - | μA | |

* Typical values at T_a = 25°C

**6 PIN DIP ZERO CROSS TRIAC DRIVER
PHOTOCOUPLER**

**EL303X Series
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EL308X Series**

Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

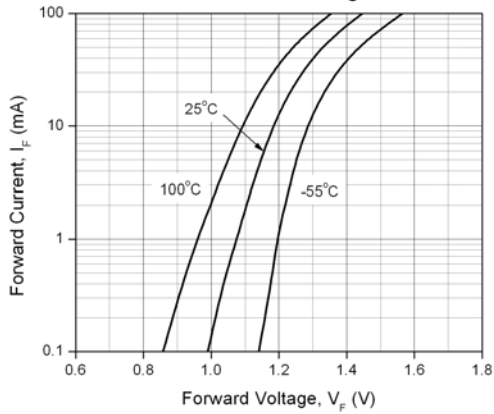


Figure 2. On-State Characteristics



Figure 3. Holding Current vs. Ambient Temperature

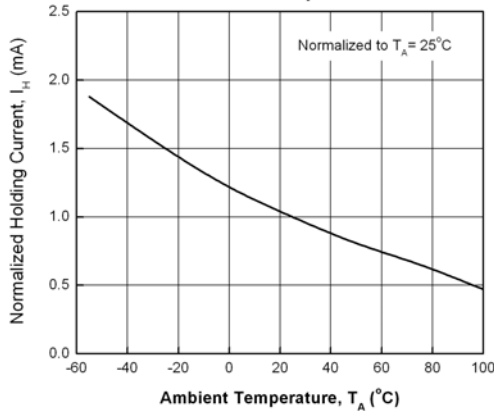


Figure 4. LED Current Required to Trigger vs. LED Pulse Width

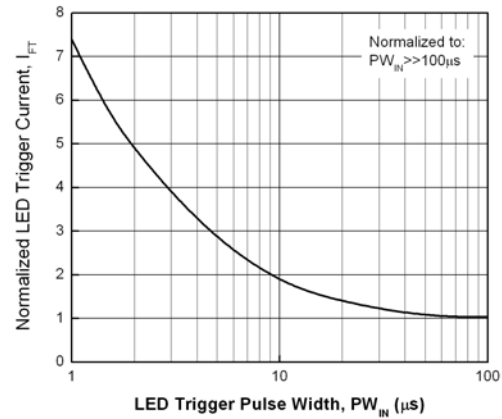


Figure 5. Leakage Current vs. Ambient Temperature

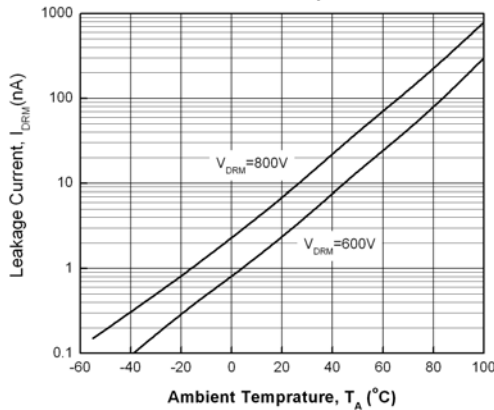
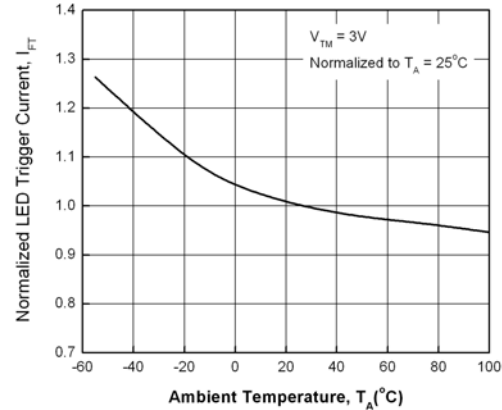


Figure 6. LED Trigger Current vs. Ambient Temperature



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EL308X Series**

Figure 7. Off-State Output Terminal Voltage vs. Ambient Temperature

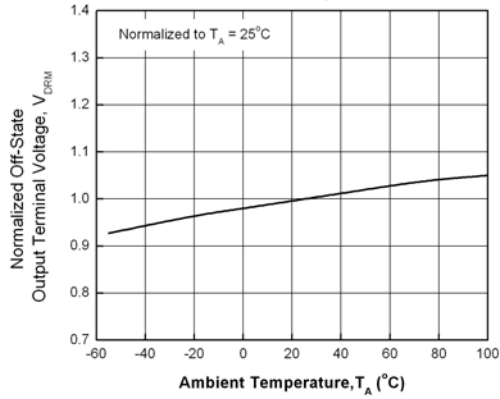


Figure 8. Leakage in Inhibit State vs. Ambient Temperature

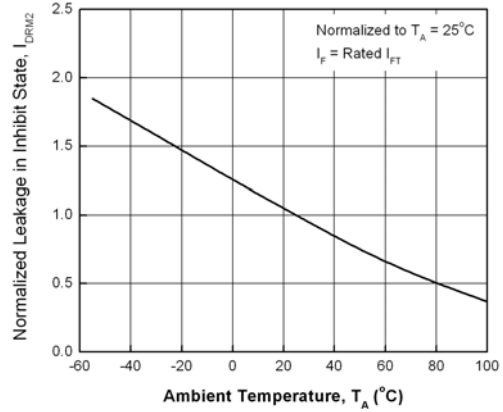


Figure 9. Inhibit Voltage vs. Ambient Temperature

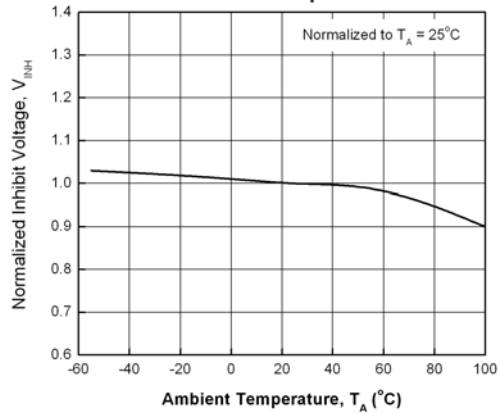
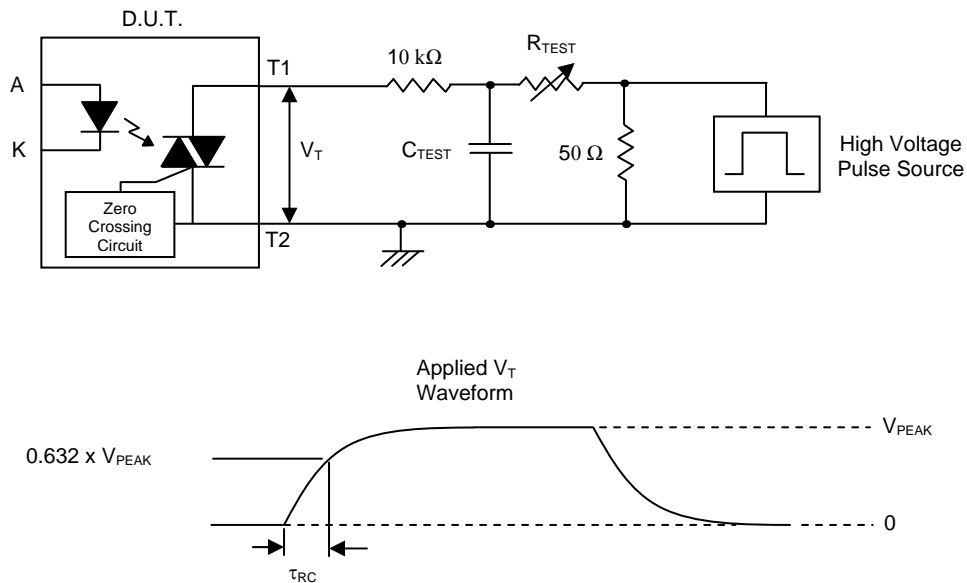


Figure 10. Static dv/dt Test Circuit & Waveform



Measurement Method

The high voltage pulse is set to the required V_{PEAK} value and applied to the D.U.T. output side through the RC circuit above. LED current is not applied. The waveform V_T is monitored using a x100 scope probe. By varying R_{TEST} , the dv/dt (slope) is increased, until the D.U.T. is observed to trigger (waveform collapses). The dv/dt is then decreased until the D.U.T. stops triggering. At this point, τ_{RC} is recorded and the dv/dt calculated.

$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

For example, $V_{PEAK} = 600V$ for EL306X series. The dv/dt value is calculated as follows:

$$dv/dt = \frac{0.63 \times 600}{\tau_{RC}} = \frac{378}{\tau_{RC}}$$



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6 PIN DIP ZERO CROSS TRIAC DRIVER PHOTOCOUPLER

EL303X Series
EL304X Series
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EL308X Series

Order Information

Part Number

EL303XY(Z)-V
or **EL304XY(Z)-V**
or **EL306XY(Z)-V**
or **EL308XY(Z)-V**

Note

X = Part No. (1, 2 or 3)

Y = Lead form option (S, S1, M or none)

Z = Tape and reel option (TA, TB or none).

V = VDE safety approved option

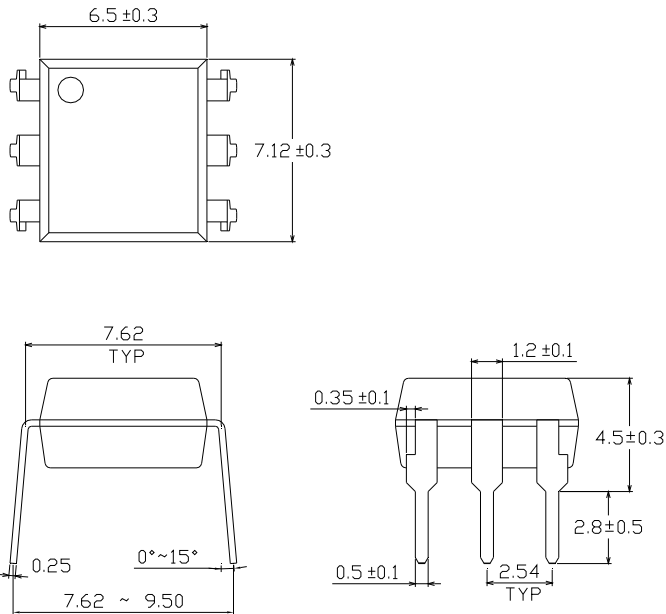
| Option | Description | Packing quantity |
|---------|---|---------------------|
| None | Standard DIP-6 | 65 units per tube |
| M | Wide lead bend (0.4 inch spacing) | 65 units per tube |
| S (TA) | Surface mount lead form + TA tape & reel option | 1000 units per reel |
| S (TB) | Surface mount lead 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 |

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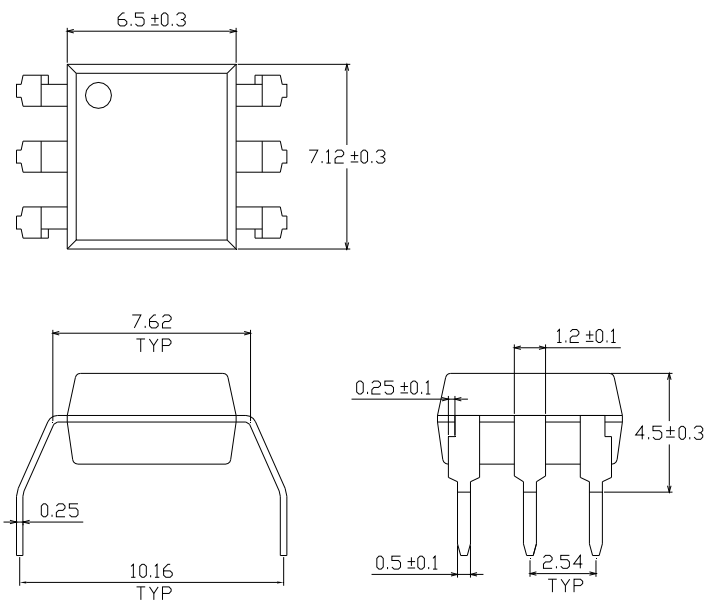
**EL303X Series
EL304X Series
EL306X Series
EL308X Series**

**Package Drawings
(Dimensions in mm)**

Standard DIP Type



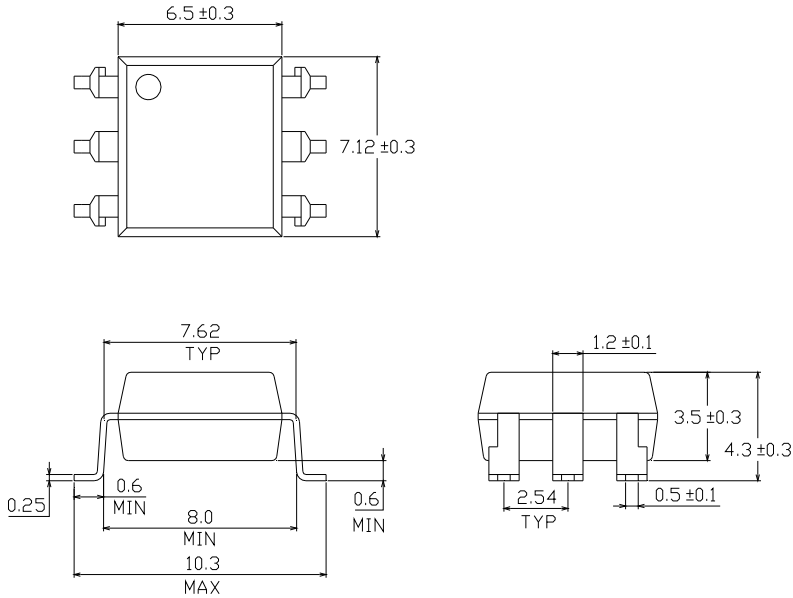
Option M Type



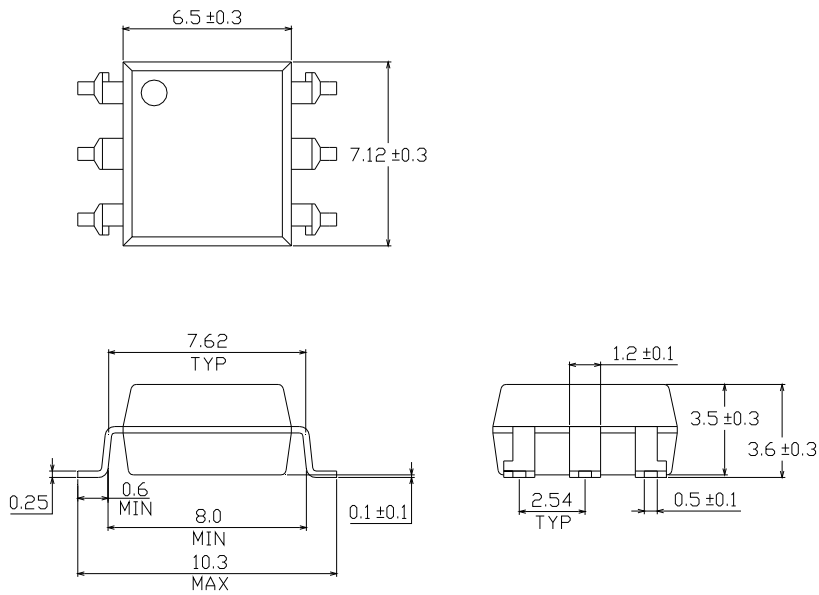
**6 PIN DIP ZERO CROSS TRIAC DRIVER
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Option S Type



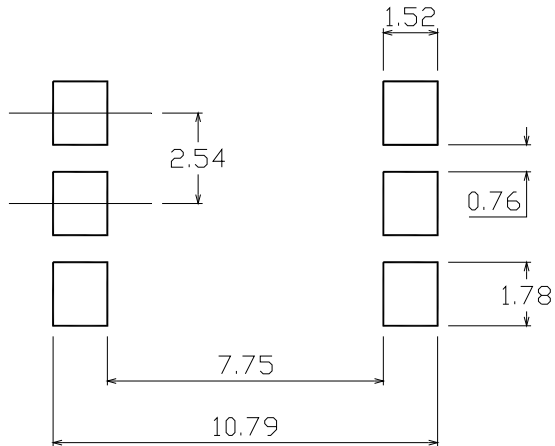
Option S1 Type



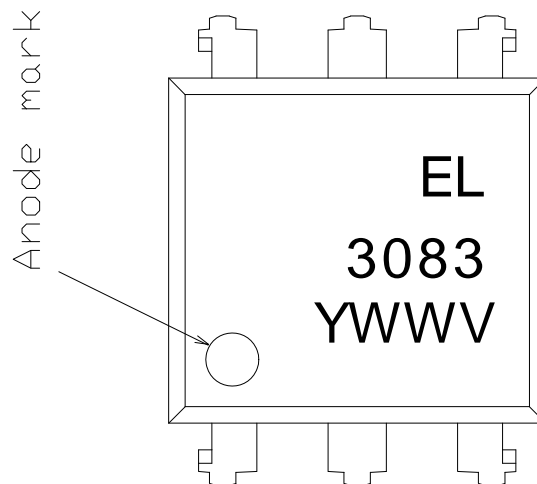
**6 PIN DIP ZERO CROSS TRIAC DRIVER
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**EL303X Series
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EL308X Series**

Recommended pad layout for surface mount leadform



Device Marking



Notes

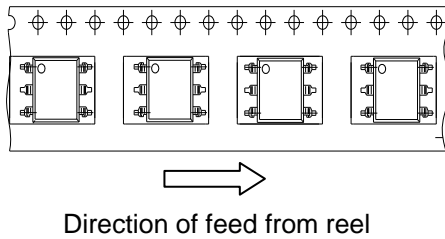
- EL denotes Everlight
- 3083 denotes Device Number
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE option

6 PIN DIP ZERO CROSS TRIAC DRIVER PHOTOCOUPLER

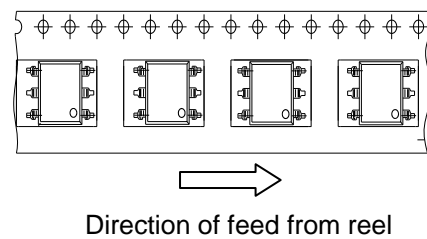
EL303X Series
EL304X Series
EL306X Series
EL308X Series

Tape & Reel Packing Specifications

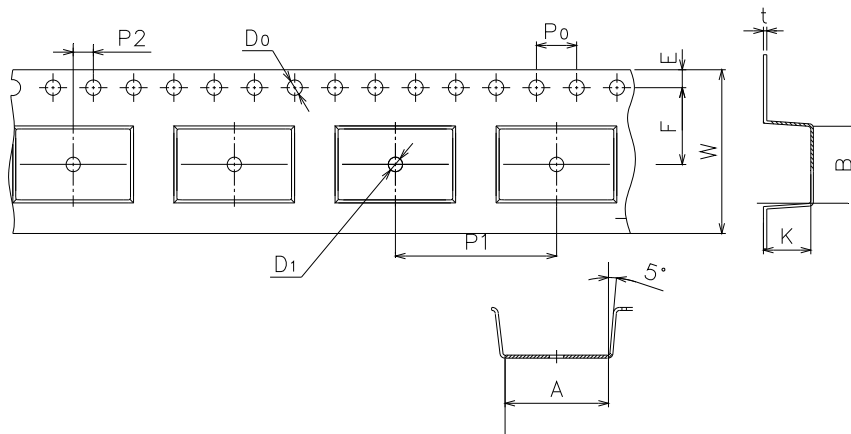
Option TA



Option TB



Tape dimensions



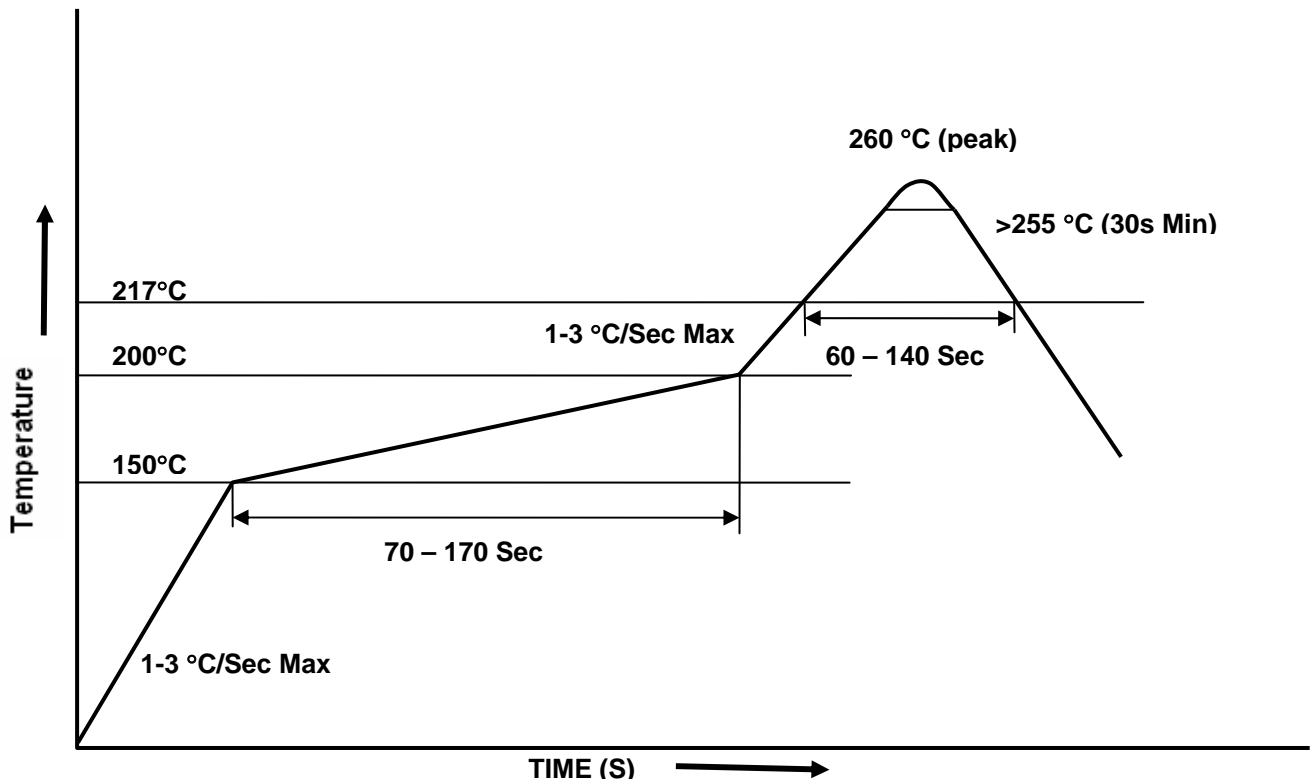
| Dimension No. | A | B | Do | D1 | E | F |
|----------------|----------|----------|------------|------------|----------|---------|
| Dimension (mm) | 10.4±0.1 | 7.52±0.1 | 1.5+0.1/-0 | 1.5+0.1/-0 | 1.75±0.1 | 7.5±0.1 |

| Dimension No. | Po | P1 | P2 | t | W | K |
|----------------|----------|---------|---------|-----------|----------|---------|
| Dimension (mm) | 4.0±0.15 | 1.6±0.1 | 2.0±0.1 | 0.35±0.03 | 16.0±0.2 | 4.5±0.1 |

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Solder Reflow Temperature Profile





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EL308X Series

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