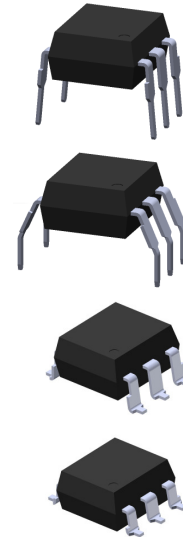


### Features:

- Peak breakdown voltage
  - 250V: EL303X(P5)
  - 400V: EL304X(P5)
  - 600V: EL306X(P5)
  - 800V: EL308X(P5)
- 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 approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved
- CQC approved



### Description

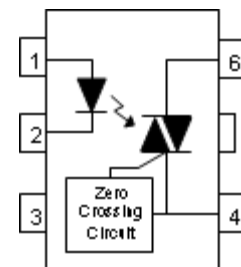
The EL303X(P5), EL304X(P5), EL306X(P5) and EL308X(P5) series of devices each consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon zero voltage crossing photo triac.

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. Pin Cut
6. Terminal

### Absolute Maximum Ratings ( $T_a=25^\circ\text{C}$ )

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	60	mA
	Reverse voltage	$V_R$	6	V
	Power dissipation Derating factor (above $85^\circ\text{C}$ )	$P_D$	100	mW
	3.8		mW / $^\circ\text{C}$	
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 Derating factor (above $85^\circ\text{C}$ )	$P_D$	300	mW
	7.6		mW / $^\circ\text{C}$	
Isolation voltage <sup>*1</sup>		$V_{iso}$	5000	V rms
Total power dissipation		$P_D$	330	mW
Operating temperature		$T_{opr}$	-55~+100	$^\circ\text{C}$
Storage temperature		$T_{stg}$	-55~+125	$^\circ\text{C}$
Soldering temperature <sup>*2</sup>		$T_{sol}$	260	$^\circ\text{C}$

#### 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.

### Electrical Characteristics ( $T_a=25^\circ\text{C}$ unless specified otherwise)

#### Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	$V_F$	-	-	1.5	V	$I_F = 30\text{mA}$
Reverse Leakage current	$I_R$	-	-	10	$\mu\text{A}$	$V_R = 6\text{V}$

#### Output

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

#### Transfer Characteristics

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
LED Trigger Current	EL3031 EL3041 EL3061 EL3081	-	-	15	mA	Main terminal Voltage=3V
	EL3032 EL3042 EL3062 EL3082			10		
	EL3033 EL3043 EL3063 EL3083			5		
Holding Current	$I_H$	-	280	-	$\mu\text{A}$	

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

### Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

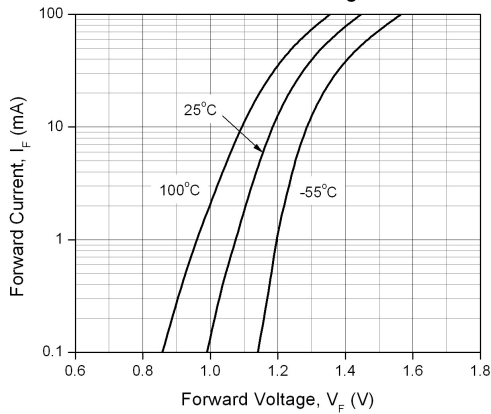


Figure 2. On-State Characteristics

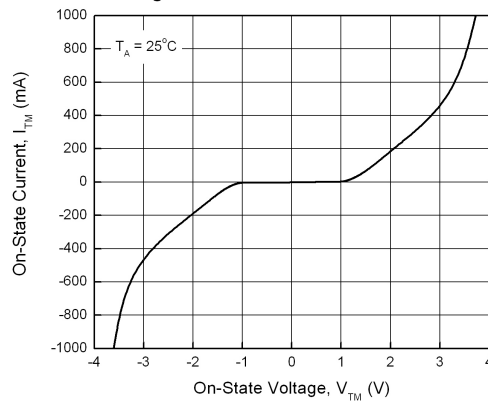


Figure 3. Holding Current vs. Ambient Temperature

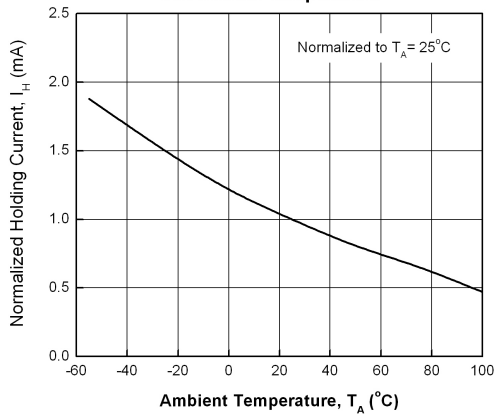


Figure 4. LED Current Required to Trigger vs. LED Pulse Width

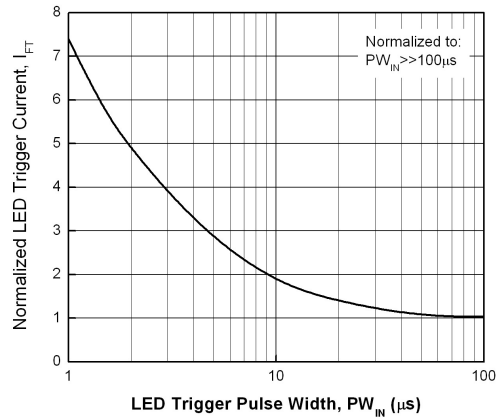


Figure 5. Leakage Current vs. Ambient Temperature

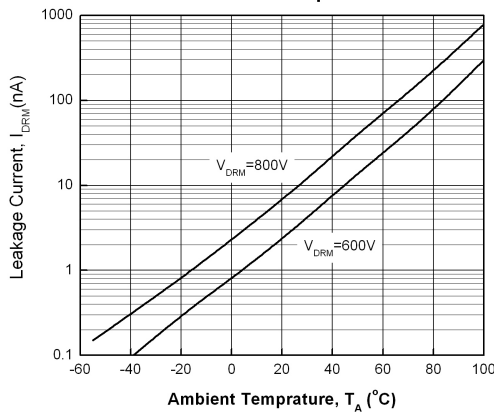
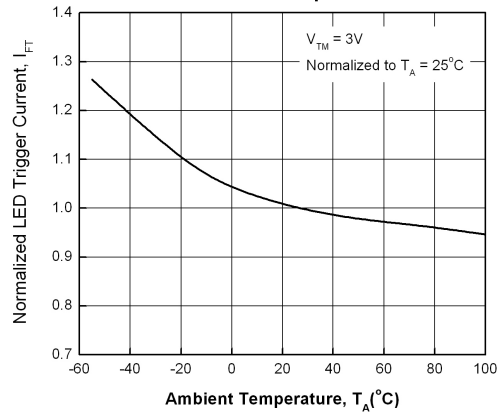
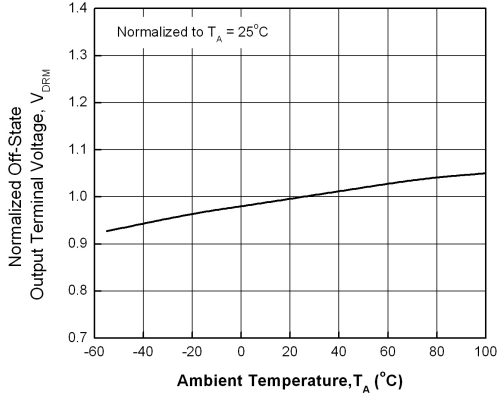


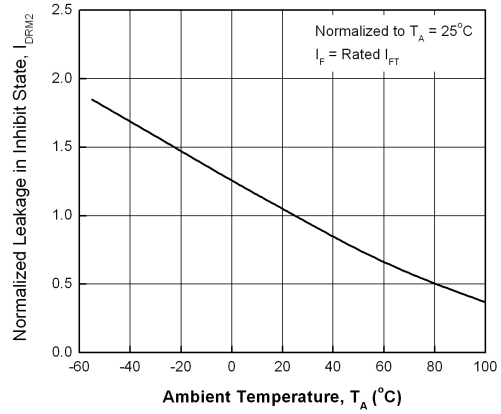
Figure 6. LED Trigger Current vs. Ambient Temperature



**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**

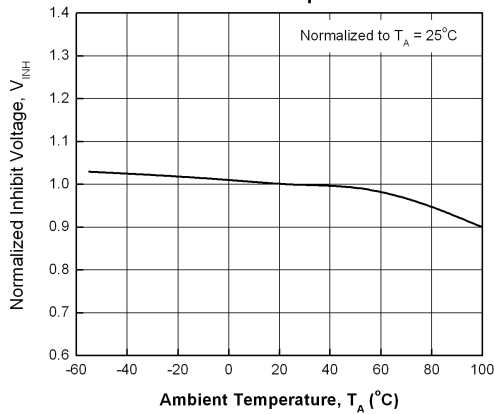
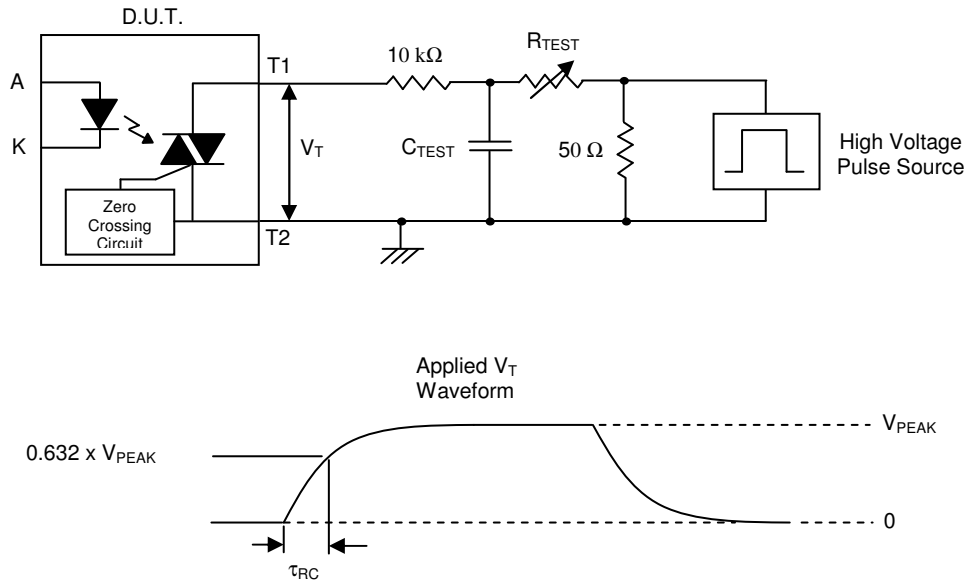


Figure 10. Static dv/dt Test Circuit & Waveform



### 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,  $\tau_{RC}$  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:

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

### Order Information

#### Part Number

**EL303XY(Z)(P5)-V**  
or **EL304XY(Z)(P5)-V**  
or **EL306XY(Z)(P5)-V**  
or **EL308XY(Z)(P5)-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).

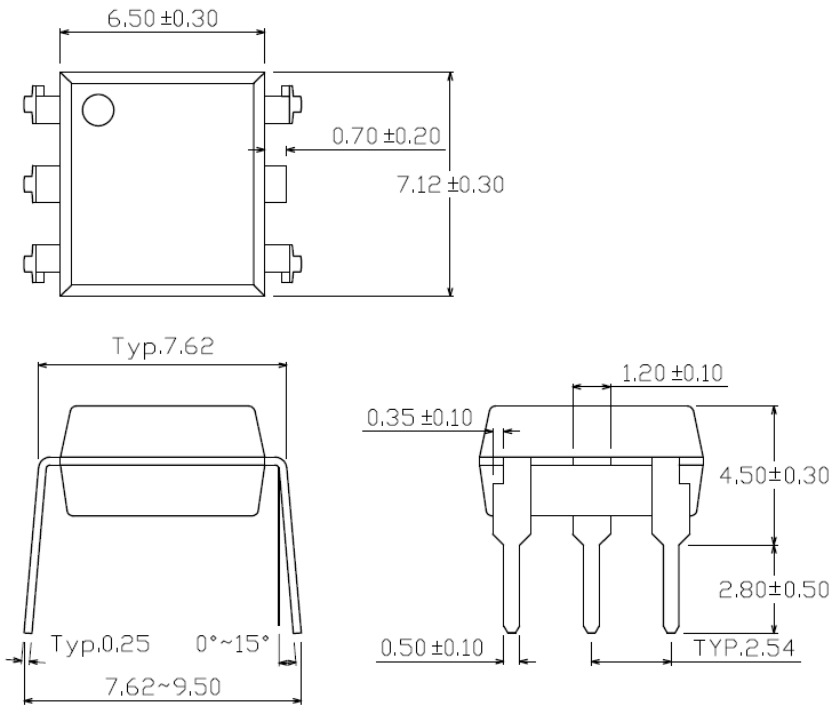
P5 = 5 pins type

V = VDE safety approved (optional)

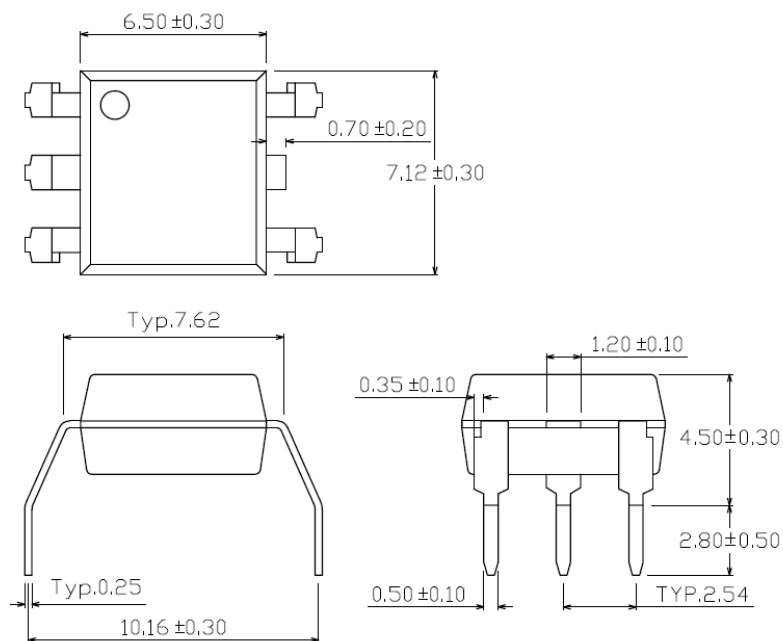
Option	Description	Packing quantity
None	Standard DIP-6	65 units per tube
M	Wide lead bend (0.4 inch spacing)	65 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount lead 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

### Package Drawings (Dimensions in mm)

#### Standard DIP Type

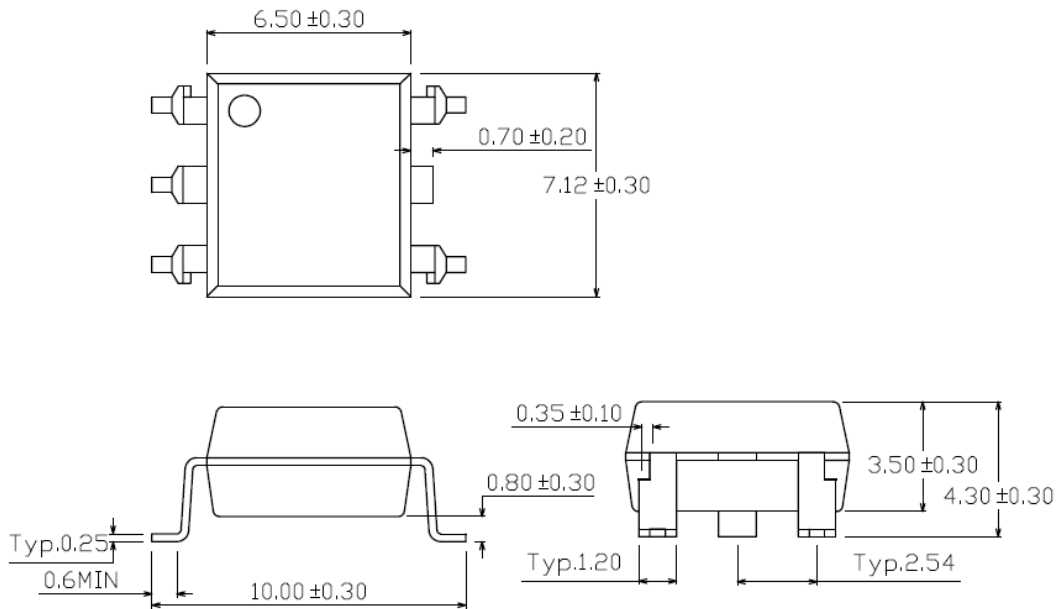


#### Option M Type

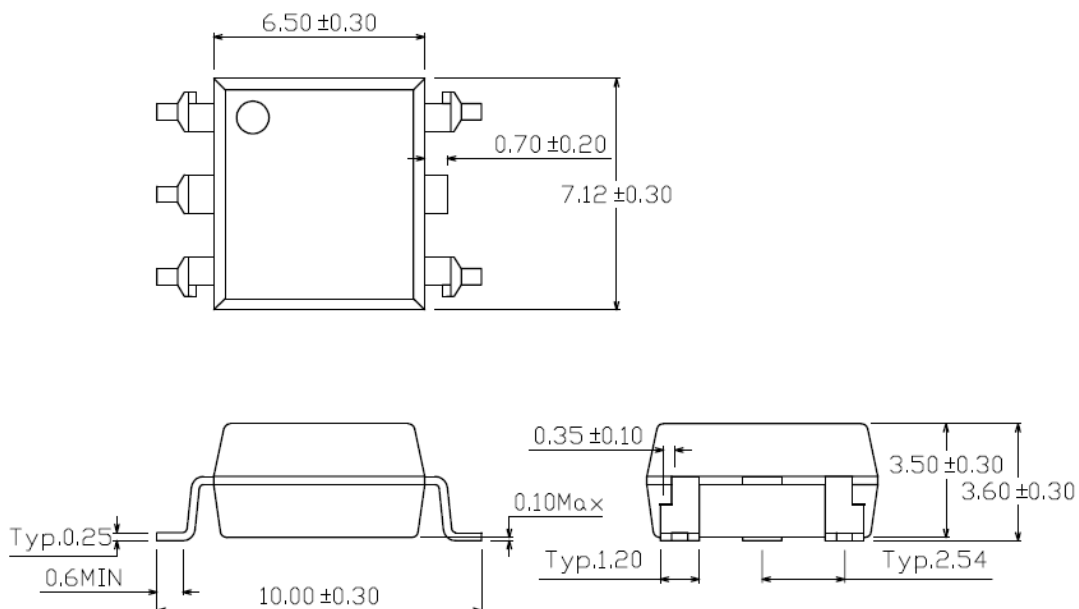




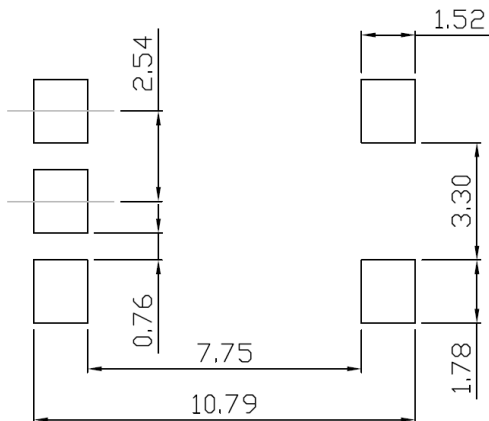
### Option S Type



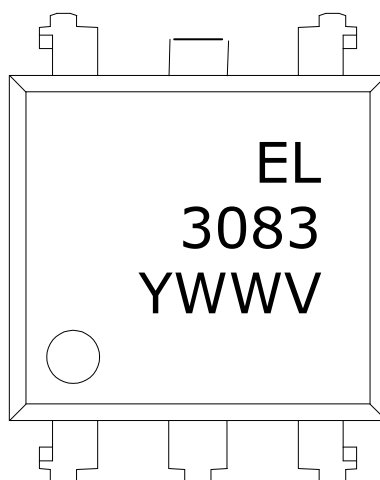
### Option S1 Type



### Recommended pad layout for surface mount leadform



### Device Marking

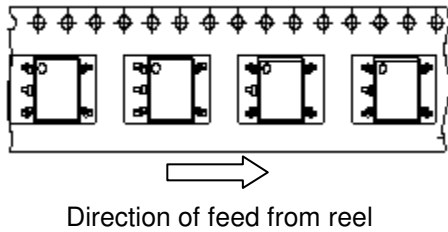


### Notes

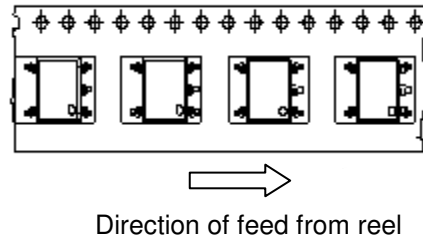
EL	denotes Everlight
3083	denotes Device Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE optional

### Tape & Reel Packing Specifications

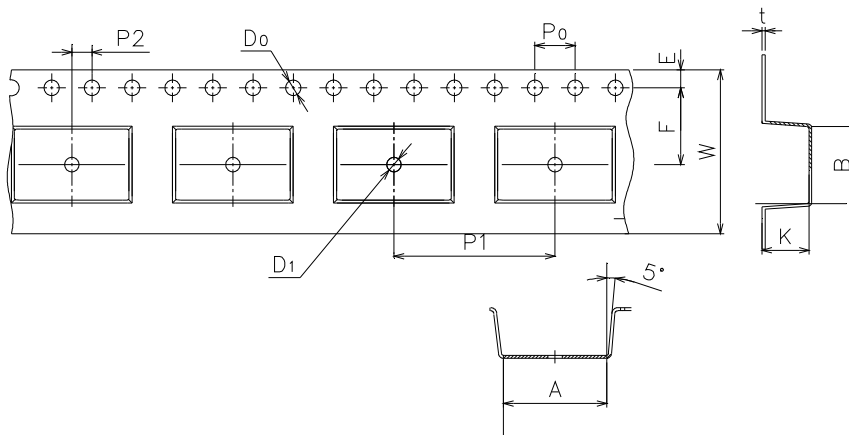
**Option TA**



**Option TB**



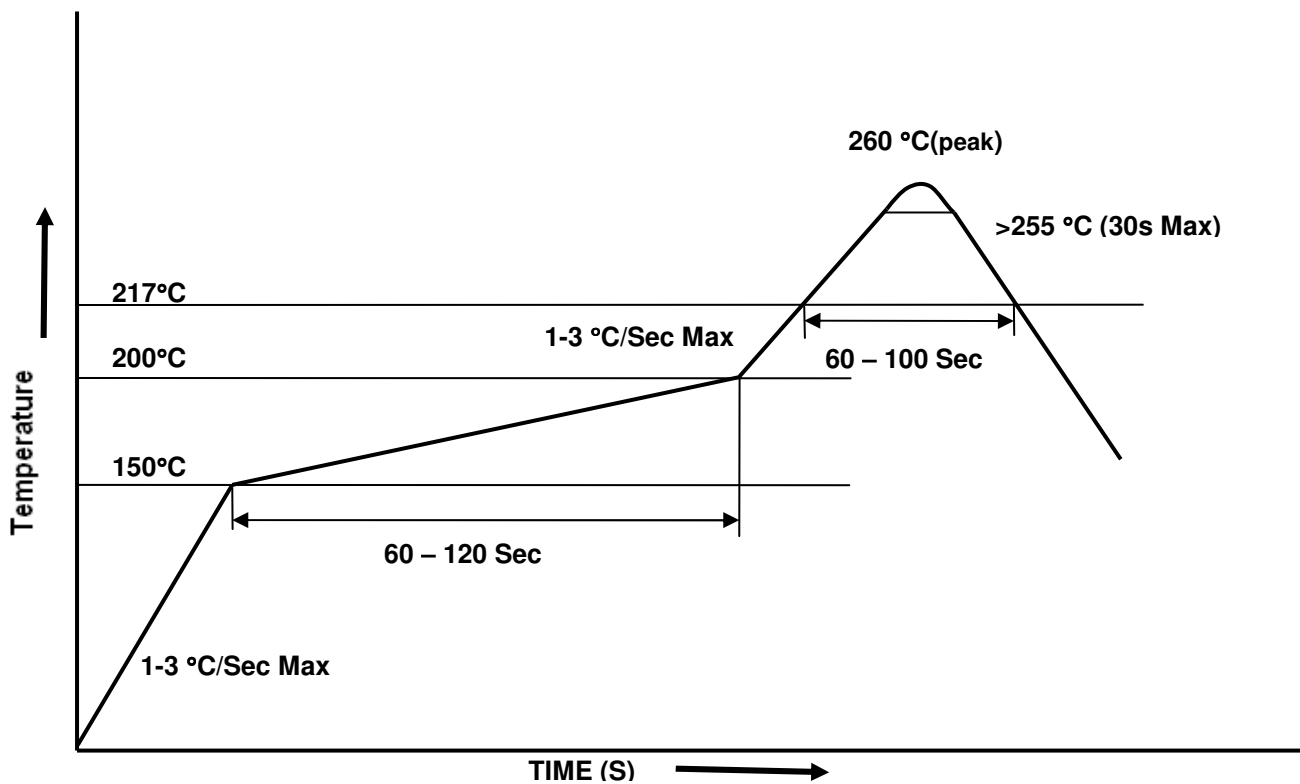
### Tape dimensions



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

### Solder Reflow Temperature Profile



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