

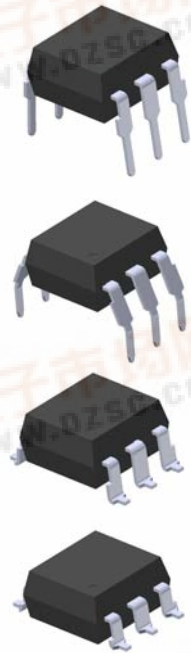


6 PIN DIP RANDOM-PHASE TRIAC DRIVER PHOTOCOUPLER

EL301X Series
EL302X Series
EL305X Series

Features:

- Peak breakdown voltage
 - 250V: EL301X
 - 400V: EL302X
 - 600V: EL305X
- High isolation voltage between input and output (Viso=5000 V rms)
- Compact dual-in-line package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approval (pending)
- SEMKO approval (pending)
- NEMKO approval (pending)
- DEMKO approval (pending)
- FIMKO approval (pending)
- CSA approval (pending)



Description

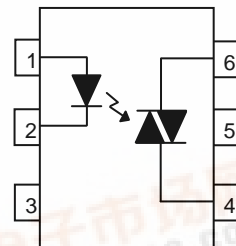
The EL301X, EL302X and EL305X series of devices each consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon random phase photo Triac.

They are designed for interfacing between electronic controls and power triacs to control resistive and inductive loads for 115 to 240 VAC operations.

Applications

- Solenoid/valve controls
- Lamp ballasts
- Static AC power switch
- Interfacing microprocessors to 115 to 240Vac peripherals
- Incandescent lamp dimmers
- Temperature controls
- Motor controls

Schematic



Pin Configuration

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





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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°C)	P_D	100 3.8	mW mW / $^{\circ}\text{C}$
Output	Off-state Output Terminal Voltage	EL301X	250	V
		EL302X	400	
		EL305X	600	
	Peak Repetitive Surge Current	I_{TSM}	1	A
	Power dissipation Derating factor (above 85°C)	P_D	300 7.4	mW mW / $^{\circ}\text{C}$
Isolation voltage ^{*1}		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 ^{*2}		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.

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

Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V _F	-	1.18	1.5	V	I _F = 10mA
Reverse Leakage current	I _R	-	-	10	μA	V _R = 6V

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Peak Blocking Current	I _{DRM}	-	-	100	nA	V _{DRM} = Rated V _{DRM} I _F = 0mA
Peak On-state Voltage	V _{TM}	-	-	2.5	V	I _{TM} =100mA peak, I _F =Rated I _{FT}
Critical Rate of Rise off-state Voltage	EL301X EL302X	-	100	-	V/μs	V _{PEAK} =Rated V _{DRM} , I _F =0 (Fig. 8)
	EL305X	1000	-	-		V _{PEAK} =400V, I _F =0 (Fig. 8)

Transfer Characteristics

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
LED Trigger Current	EL3010 EL3021 EL3051	-	-	15	mA	Main terminal Voltage=3V
	EL3011 EL3022 EL3052	-	-	10		
	EL3012 EL3023 EL3053	-	-	5		
Holding Current	I _H	-	250	-	μA	

* Typical values at T_a = 25°C

Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

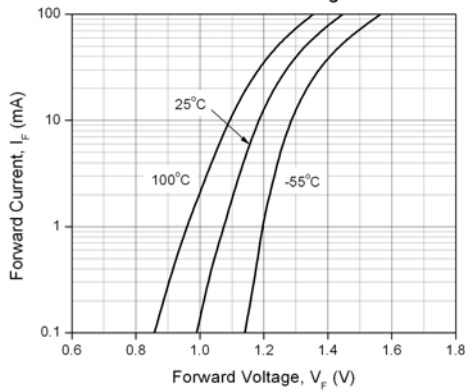


Figure 2. On-State Characteristics

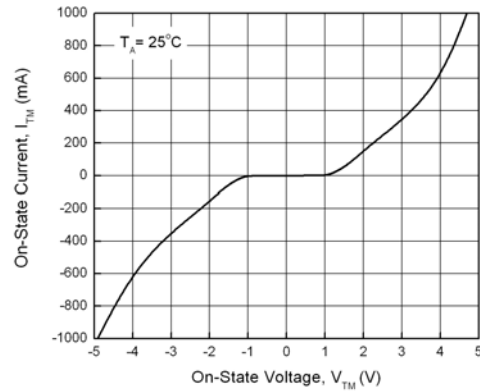


Figure 3. Holding Current vs. Ambient Temperature

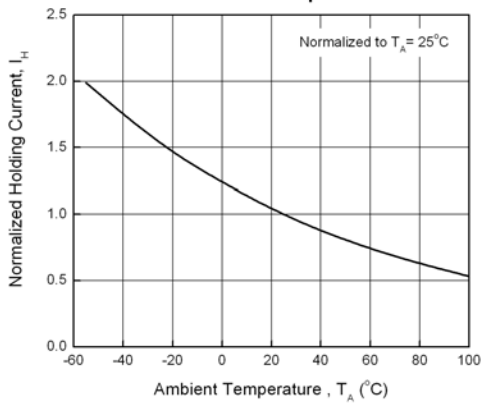


Figure 4. LED Current Required to Trigger vs. LED Pulse Width

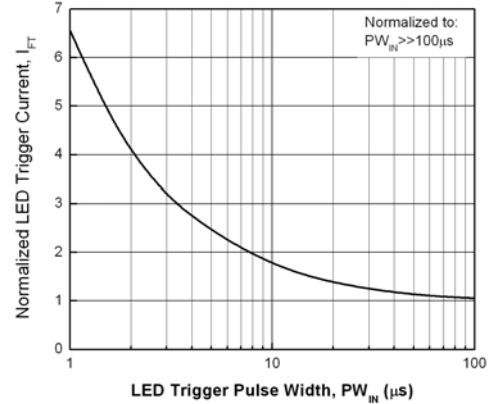


Figure 5. Leakage Current vs. Ambient Temperature

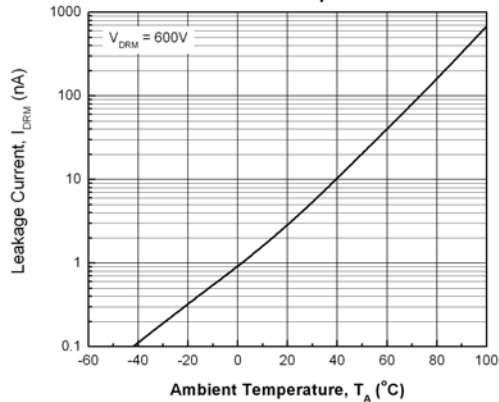
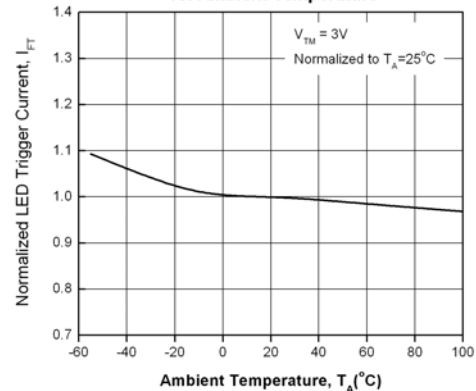


Figure 6. LED Trigger Current vs. Ambient Temperature



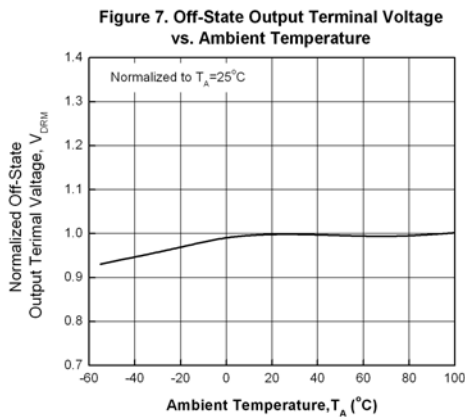
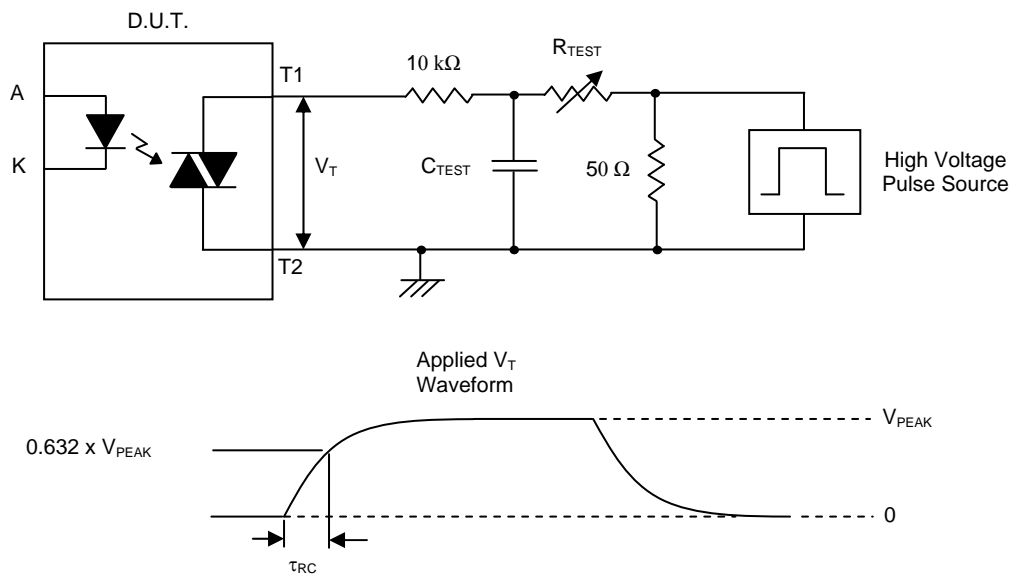


Figure 8. Static dv/dt Test Circuit & Waveform



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.

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



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For example, $V_{PEAK} = 400V$ for EL302X series. The dv/dt value is calculated as follows:

$$dv/dt = \frac{0.63 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

Order Information

Part Number

EL301XY(Z)-V
or **EL302XY(Z)-V**
or **EL305XY(Z)-V**

Note

X = Part No. for EL301x (0, 1 or 2)
X = Part No. for EL302x, EL305x (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

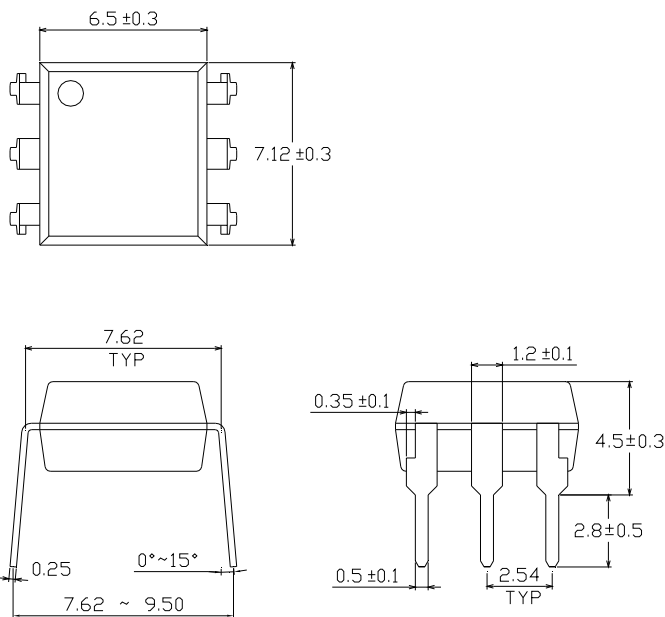
Option	Description	Packing quantity
None	Standard DIP-6	65 units per tube
M	Wide lead bend (0.4 inch spacing)	65 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount lead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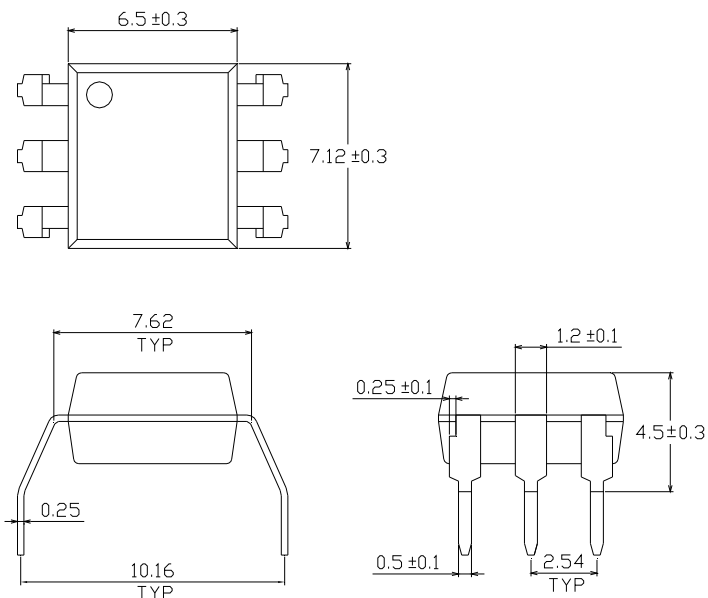
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**Package Drawings
(Dimensions in mm)**

Standard DIP Type



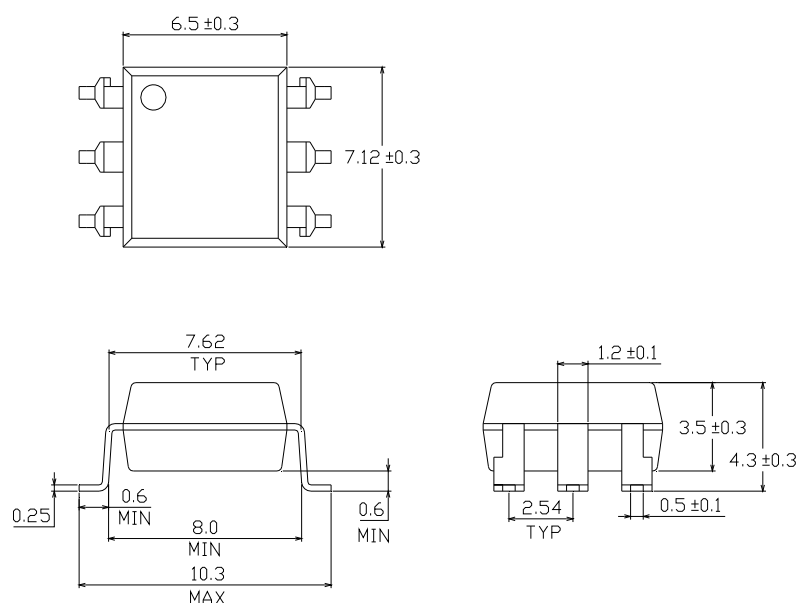
Option M Type



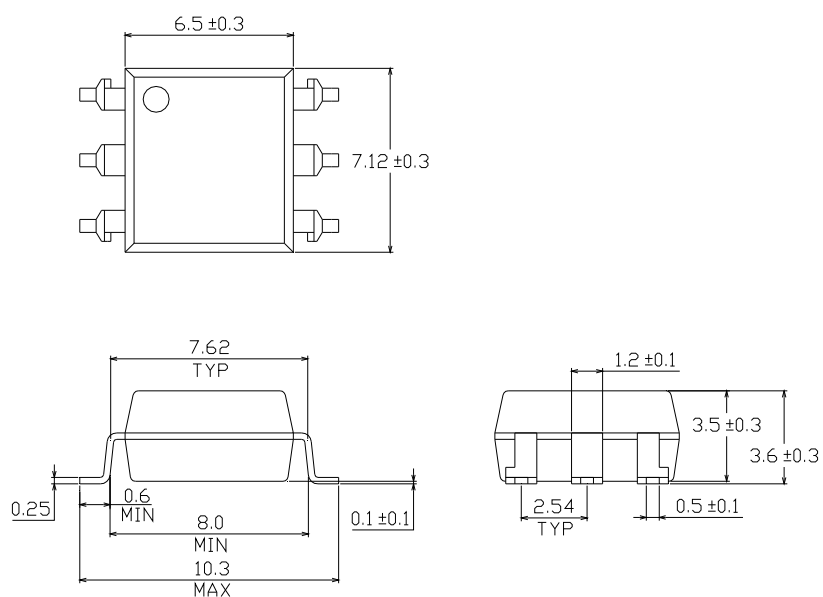
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Option S Type



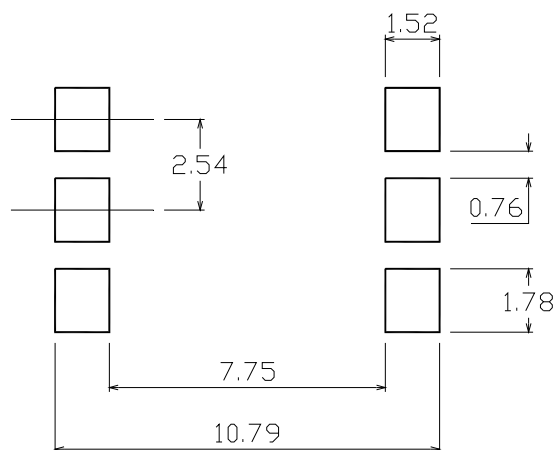
Option S1 Type



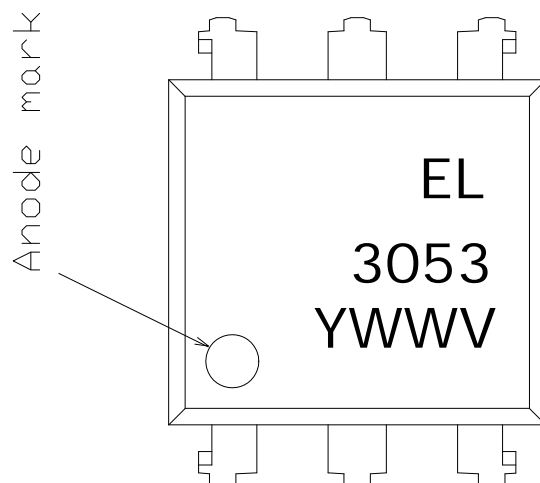
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Recommended pad layout for surface mount leadform



Device Marking



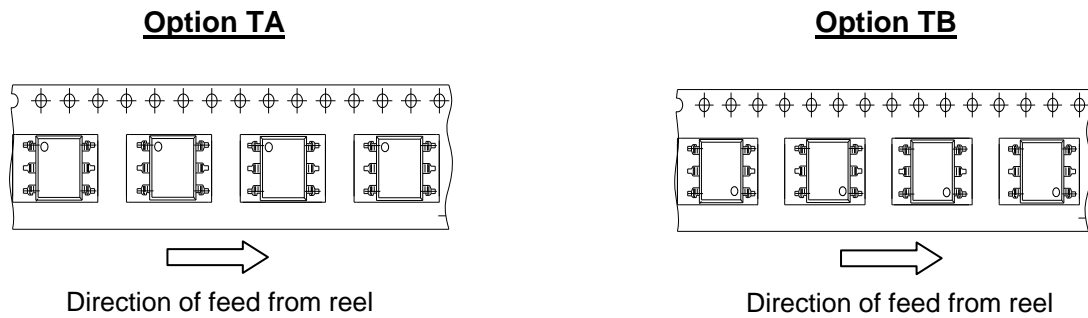
Notes

EL denotes Everlight
3053 denotes Device Number
Y denotes 1 digit Year code
WW denotes 2 digit Week code
V denotes VDE option

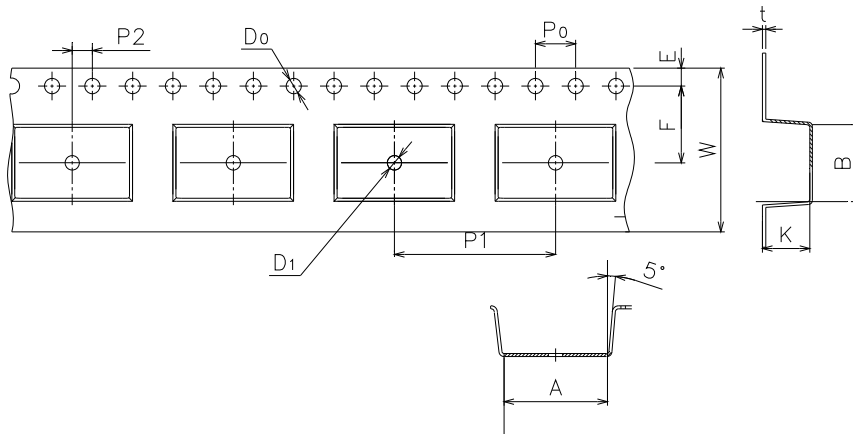
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Tape & Reel Packing Specifications



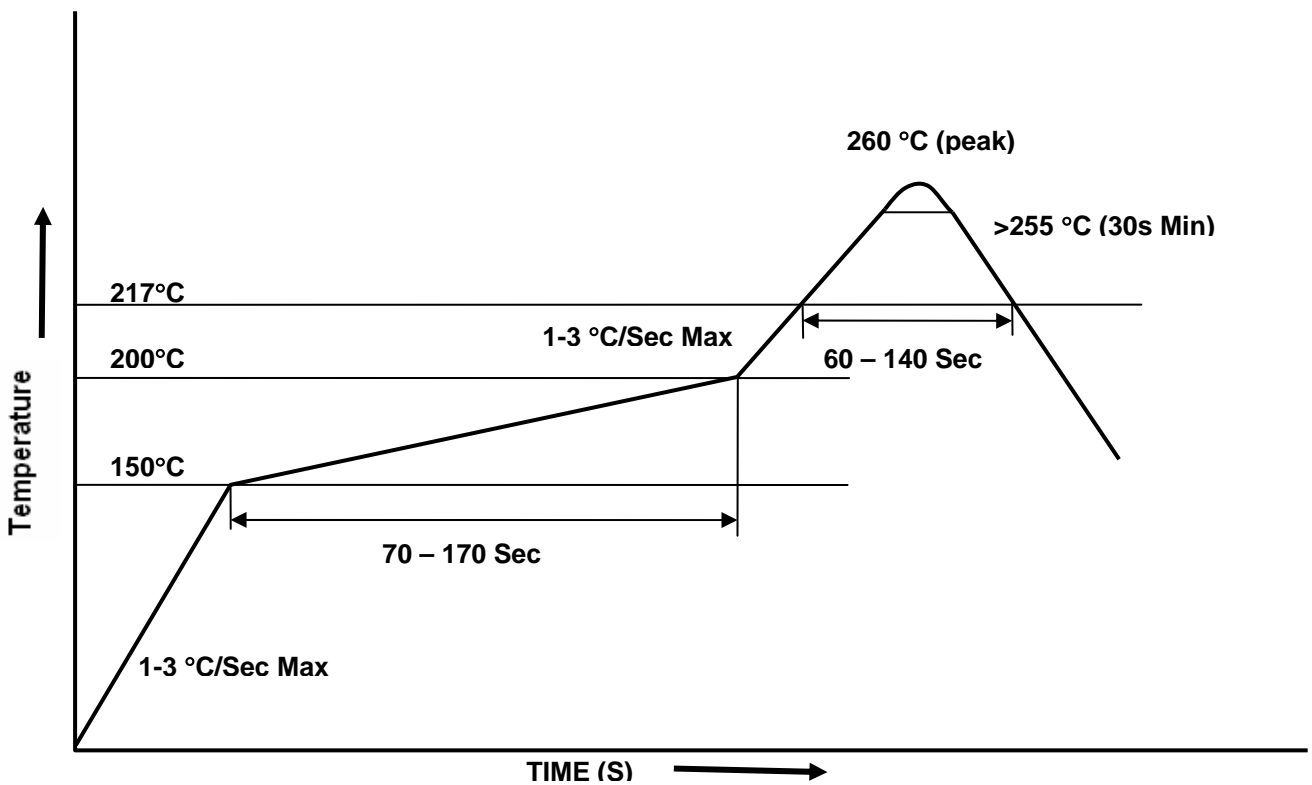
Tape dimensions



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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