



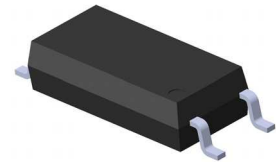
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# 4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER

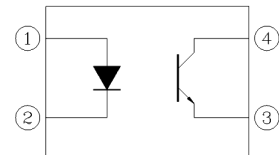
## EL101X-G Series

### Features:

- Free halogens compliant
- Current transfer ratio  
(CTR: 50~600% at  $I_F = 5\text{mA}$ ,  $V_{CE} = 5\text{V}$ )  
(CTR: 63~320% at  $I_F = 10\text{mA}$ ,  $V_{CE} = 5\text{V}$ )
- High isolation voltage between input and output (Viso=5000 V rms )
- Compact 4 Pin SOP with a 2.0 mm profile
- 8mm long creepage distance
- Pb free and RoHS compliant.
- CUL approved (No. E214129)
- VDE approved (No. 40028391)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved



### Schematic



### Pin Configuration

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

### Description

The EL101X-G series devices consist of an infrared emitting diode, optically coupled to a phototransistor detector. Compound use free halogens and  $\text{Sb}_2\text{O}_3$ . They are packaged in a 4-pin SOP 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



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## EL101X-G Series

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

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	60	mA
	Peak forward current (1us, pulse)	$I_{FP}$	1.5	A
	Reverse voltage	$V_R$	6	V
	Power dissipation	$P_D$	100	mW
Output	Power dissipation	$P_C$	150	mW
	Collector current	$I_C$	50	mA
	Collector-Emitter voltage	$V_{CEO}$	80	V
	Emitter-Collector voltage	$V_{ECO}$	7	V
Total power dissipation		$P_{TOT}$	250	mW
Isolation voltage <sup>*1</sup>		$V_{ISO}$	5000	V rms
Operating temperature		$T_{OPR}$	-55 ~ +110	$^{\circ}\text{C}$
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 are shorted together, and pins 3 & 4 are shorted together.

\*2 For 10 seconds.



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### Electrical Characteristics (T<sub>a</sub>=25°C unless specified otherwise)

#### Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V <sub>F</sub>	-	1.45	1.5	V	I <sub>F</sub> = 50mA
Reverse current	I <sub>R</sub>	-	-	10	μA	V <sub>R</sub> = 6V
Input capacitance	C <sub>in</sub>	-	50	-	pF	V = 0, f = 1kHz

#### Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I <sub>CEO</sub>	-	-	100	nA	V <sub>CE</sub> = 20V, I <sub>F</sub> = 0mA
Collector-Emitter breakdown voltage	BV <sub>CEO</sub>	80	-	-	V	I <sub>C</sub> = 0.1mA
Emitter-Collector breakdown voltage	BV <sub>ECO</sub>	7	-	-	V	I <sub>E</sub> = 0.1mA

### Transfer Characteristics (T<sub>a</sub>=25°C unless specified otherwise)

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition	
Current Transfer ratio	EL1010	CTR	50	-	600	%	I <sub>F</sub> = 5mA, V <sub>CE</sub> = 5V
	EL1017		80	-	160		
	EL1018		130	-	260		
	EL1019		200	-	400		
	EL1012	CTR	63	-	125	%	I <sub>F</sub> = 10mA, V <sub>CE</sub> = 5V
	EL1013		100	-	200		
	EL1014		160	-	320		
	EL1012		22	-	-		
	EL1013		34	-	-		
	EL1014		56	-	-		
Collector-Emitter saturation voltage	V <sub>CE(sat)</sub>	-	-	0.3	V	I <sub>F</sub> = 10mA, I <sub>C</sub> = 1mA	
Isolation resistance	R <sub>IO</sub>	5×10 <sup>10</sup>	-	-	Ω	V <sub>IO</sub> = 500Vdc, 40~60% R.H.	
Floating capacitance	C <sub>IO</sub>	-	-	1.0	pF	V <sub>IO</sub> = 0, f = 1MHz	



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

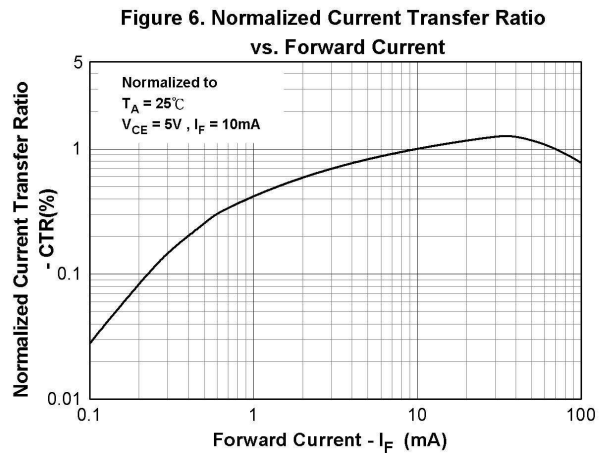
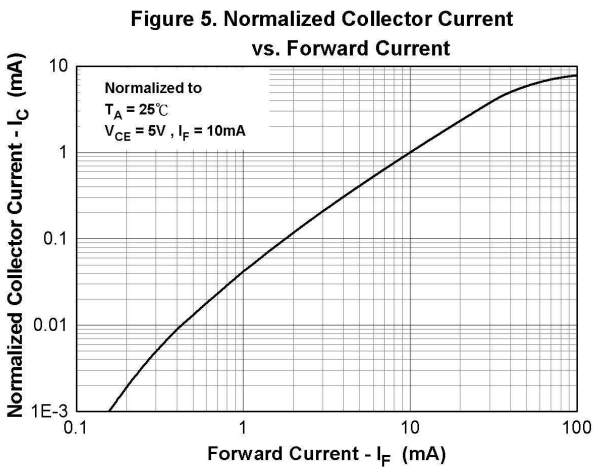
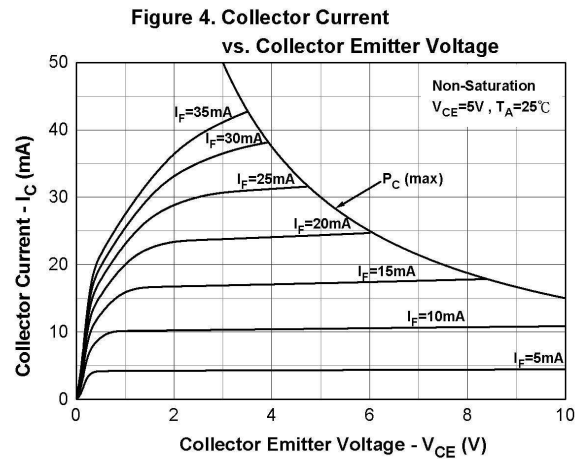
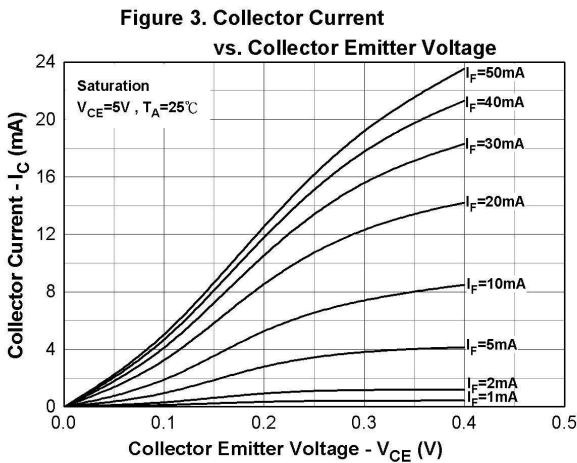
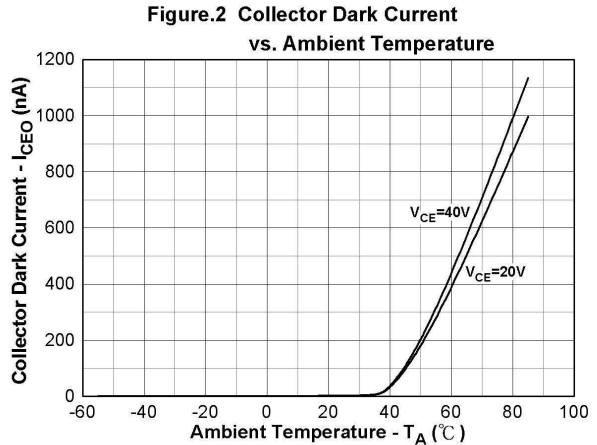
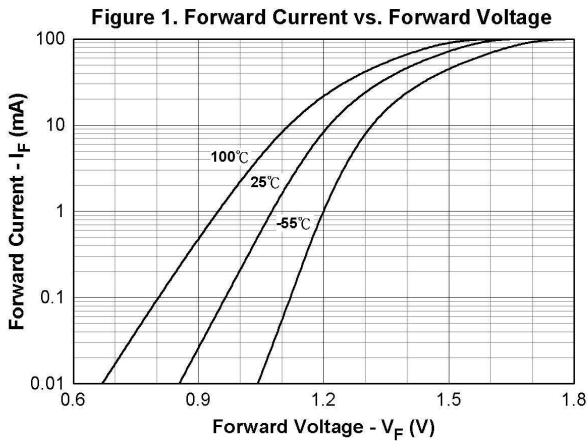
Turn on time	Ton	-	4	-	$\mu\text{s}$	$V_{CE} = 5\text{V}, I_C = 5\text{mA},$ $R_L = 100\Omega$
Turn off time	Toff	-	3	-		
Rise time	$t_r$	-	2	18	$\mu\text{s}$	$V_{CE} = 5\text{V}, I_C = 5\text{mA},$ $R_L = 100\Omega$
Fall time	$t_f$	-	3	18	$\mu\text{s}$	

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

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**EL101X-G Series**

## Typical Performance Curves



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Figure 7. Normalized Current Transfer Ratio vs. Ambient Temperature

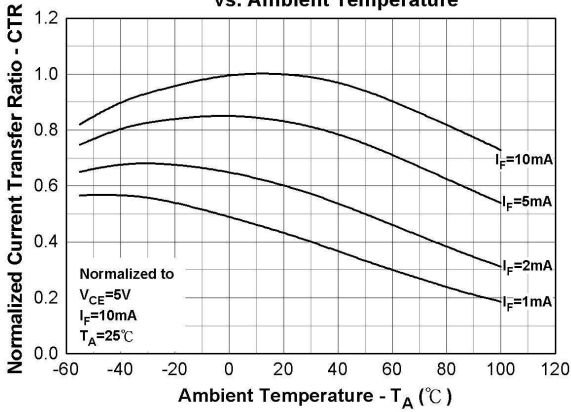


Figure 8. Normalized Current Transfer Ratio vs. Ambient Temperature

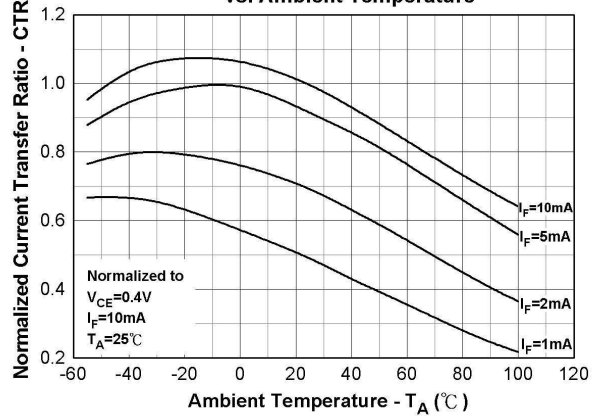


Figure 9. Turn on/off Time vs. Collector Current

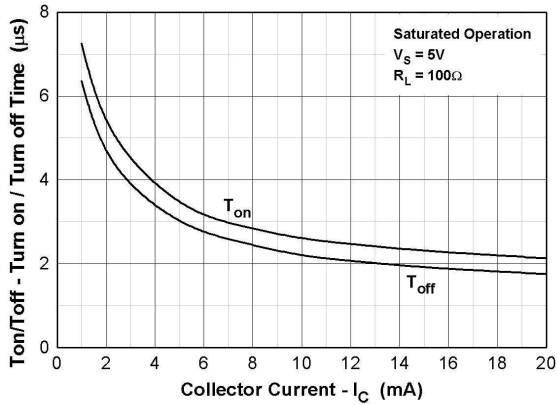


Figure 10. Turn on/off Time vs. Forward Current

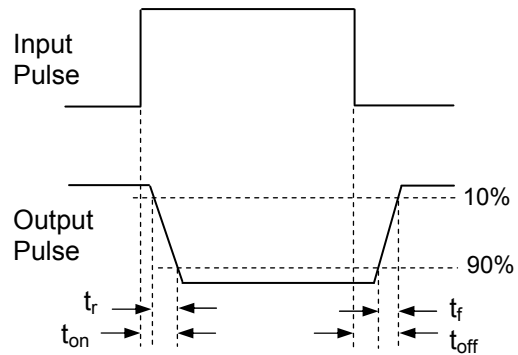
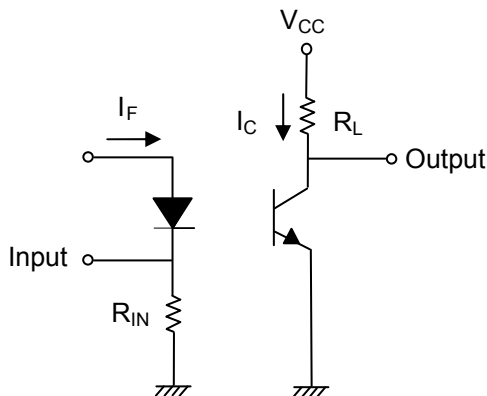
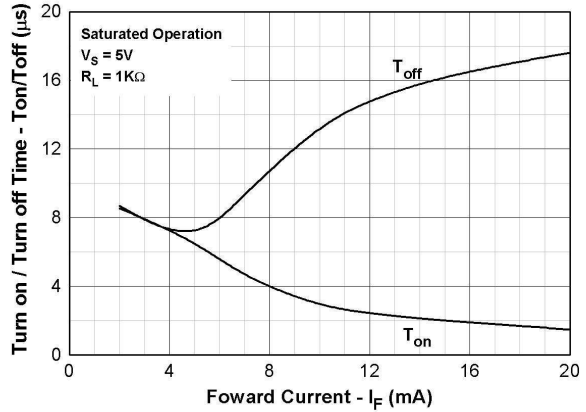


Figure 10. Switching Time Test Circuit & Waveforms



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## EL101X-G Series

### Order Information

Part Number

# EL101X(Y)-VG

#### Note

EL101 = Part No.

X = CTR Rank (0, 2, 3, 4, 7, 8 or 9)

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

V = VDE safety (optional)

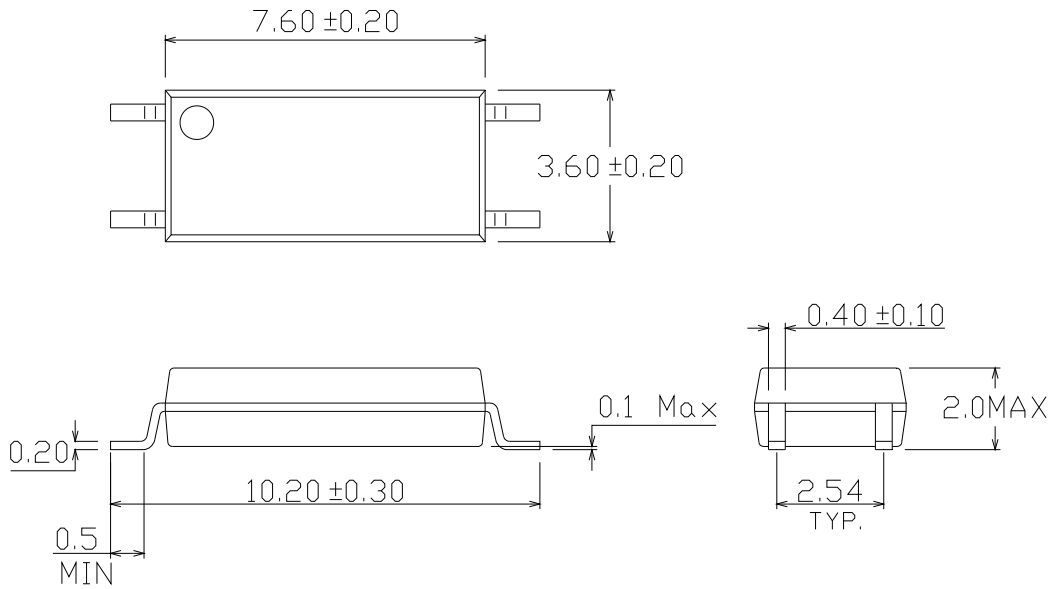
G = Halogens free

Option	Description	Packing quantity
None	Standard SMD option	100 units per tube
-V	Standard SMD option + VDE	100 units per tube
(TA)	TA Tape & reel option	2000 units per reel
(TB)	TB Tape & reel option	2000 units per reel
(TA)-V	TA Tape & reel option + VDE	2000 units per reel
(TB)-V	TB Tape & reel option + VDE	2000 units per reel

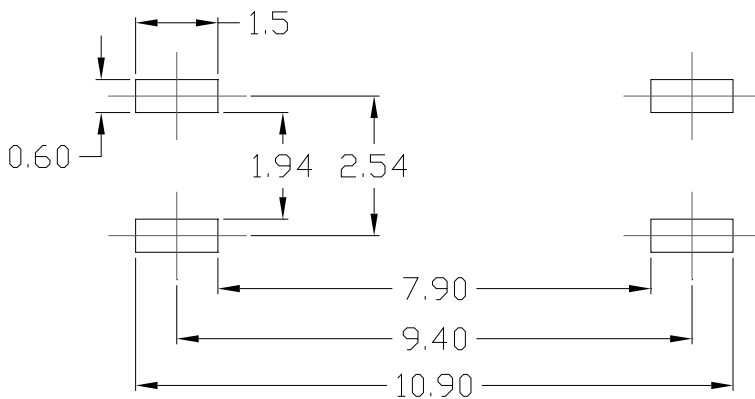
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**EL101X-G Series**

**Package Drawing**  
(Dimensions in mm)



**Recommended pad layout for surface mount leadform**



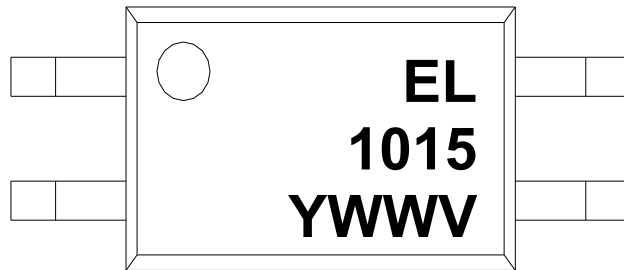


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**Device Marking**



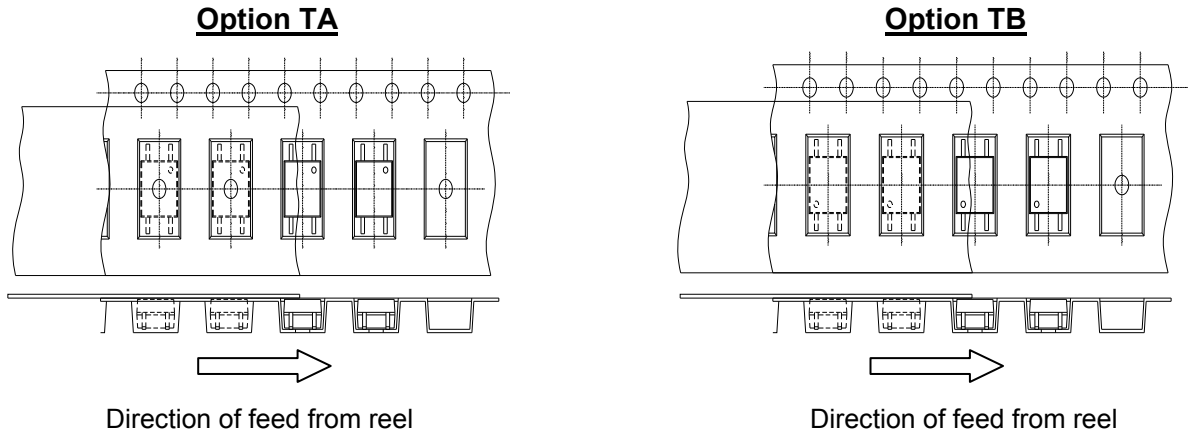
**Notes**

EL	denotes Everlight
1015	denotes Device Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

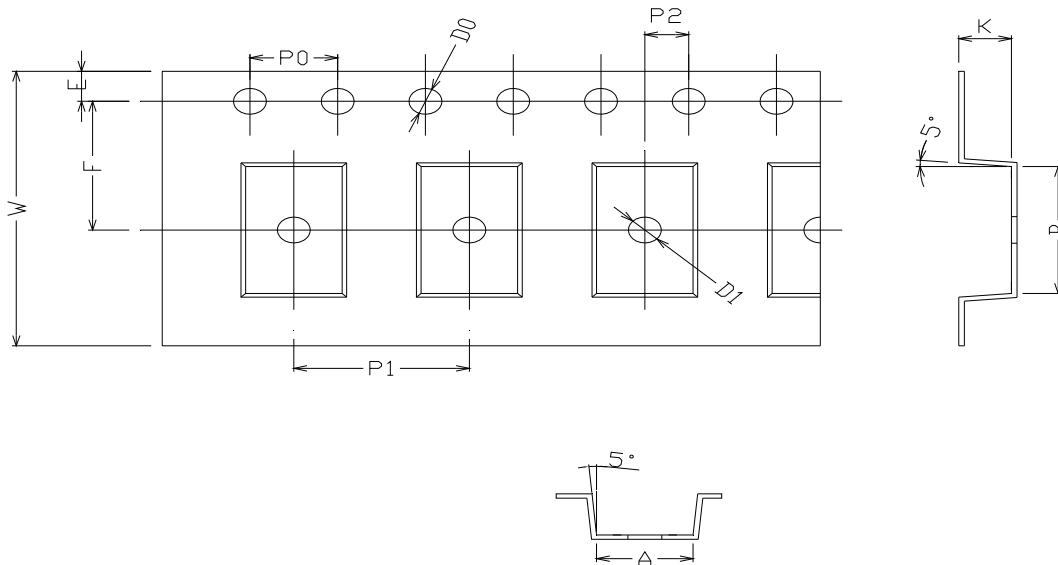
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## Tape & Reel Packing Specifications



## Tape dimensions

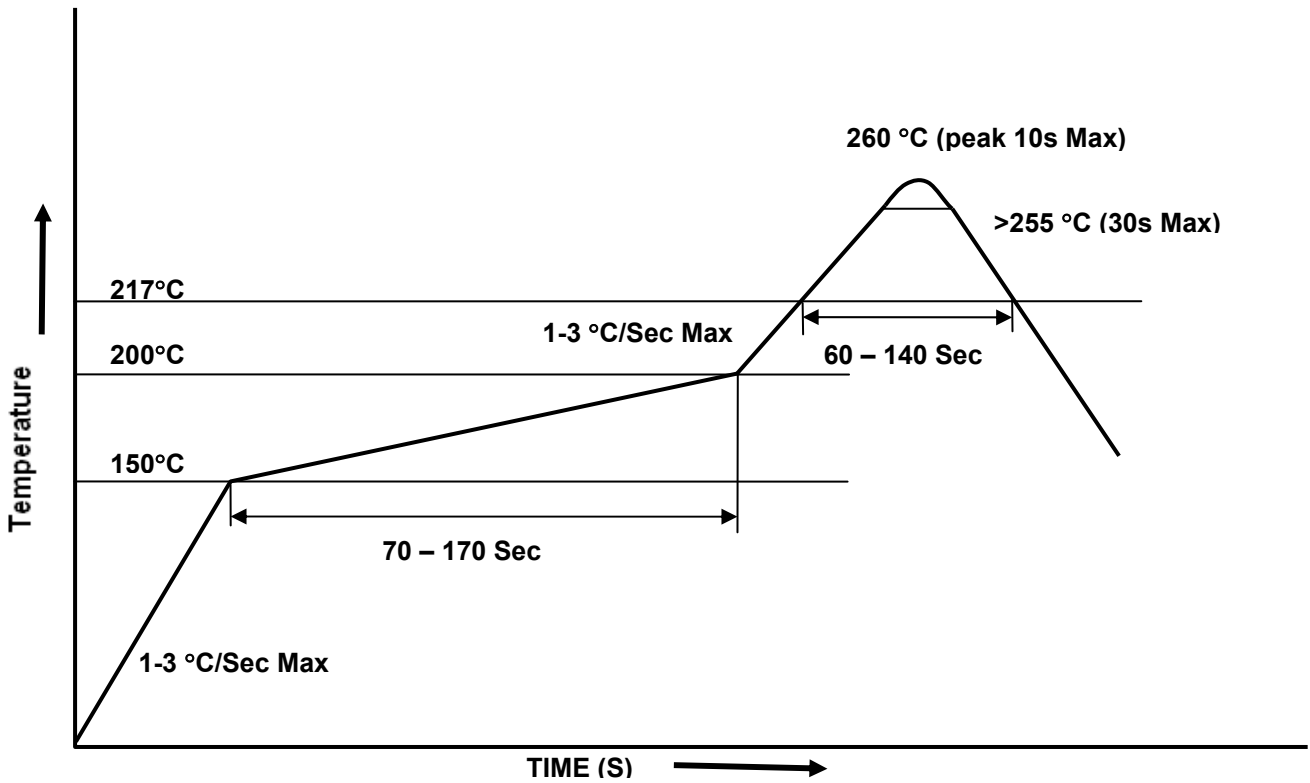


Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	4.4 ± 0.1	10.5 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75 ± 0.1	7.5 ± 0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	3.8 ± 0.1	8.0 ± 0.1	2.0 ± 0.1	0.3 ± 0.05	16.0 ± 0.3	2.14 ± 0.1

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## Solder Reflow Temperature Profile





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**EL101X-G Series**

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