



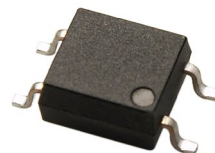
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## 4 PIN ULTRA SMALL SOP PHOTOTRANSISTOR PHOTOCOUPLER

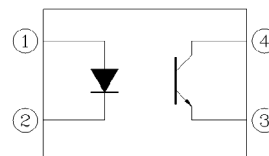
### EL357N-G Series

#### Features:

- Halogens free
- Current transfer ratio  
(CTR: 50~600% at  $I_F = 5\text{mA}$ ,  $V_{CE} = 5\text{V}$ )
- High isolation voltage between input and output ( $V_{iso} = 3750\text{ V rms}$ )
- Compact 4 Pin SOP with a 2.0 mm profile
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved (No. 1408633)



Schematic



#### Description

The EL357N-G series contains an infrared emitting diode, optically coupled to a phototransistor detector.

The devices in a 4-pin small outline SMD package.

#### Pin Configuration

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

#### Applications

- DC-DC Converters
- Programmable controllers
- Telecommunication equipments
- Signal transmission between circuits of different potentials and impedances

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# 4 PIN ULTRA SMALL SOP PHOTOTRANSISTOR PHOTOCOUPLER

## EL357N-G Series

### Absolute Maximum Ratings (T<sub>a</sub>=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I <sub>F</sub>	50	mA
	Peak forward current (1us, pulse)	I <sub>FP</sub>	1	A
	Reverse voltage	V <sub>R</sub>	6	V
	Power dissipation Derating factor (about Ta=100°C)	P <sub>D</sub>	70	mW
			2.9	mW/°C
Output	Power dissipation Derating factor (about Ta=80°C)	P <sub>C</sub>	150	mW
			3.7	mW/°C
	Collector current	I <sub>C</sub>	50	mA
	Collector-Emitter voltage	V <sub>CEO</sub>	80	V
	Emitter-Collector voltage	V <sub>ECO</sub>	7	V
Total power dissipation		P <sub>TOT</sub>	200	mW
Isolation voltage *1		V <sub>ISO</sub>	3750	V rms
Operating temperature		T <sub>OPR</sub>	-55 ~ +110	°C
Storage temperature		T <sub>STG</sub>	-55 ~ +125	°C
Soldering temperature *2		T <sub>SOL</sub>	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.



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## EL357N-G Series

### Electrical Characteristics ( $T_a=25^\circ\text{C}$ 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	$\mu\text{A}$	$V_R = 4\text{V}$
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	$BV_{ECO}$	7	-	-	V	$I_E = 0.01\text{mA}$

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

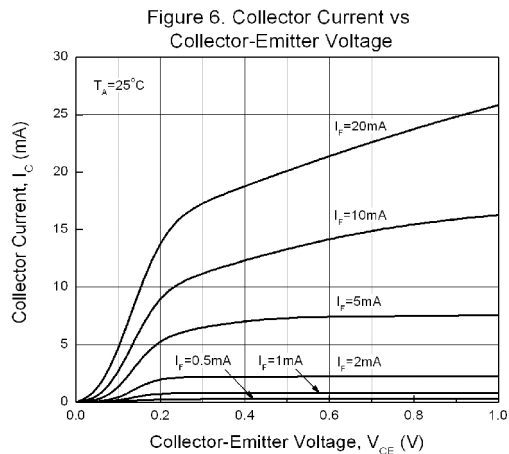
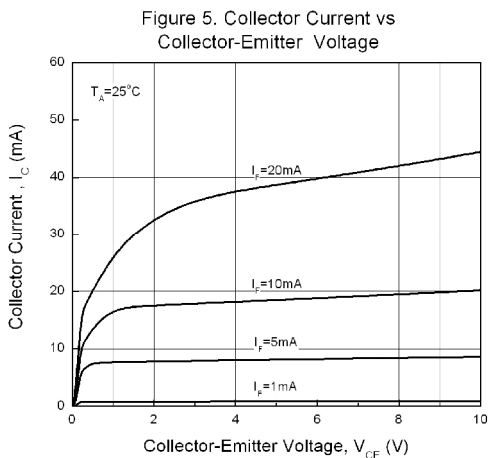
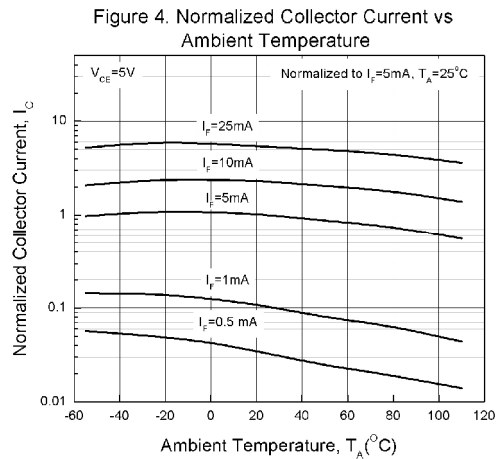
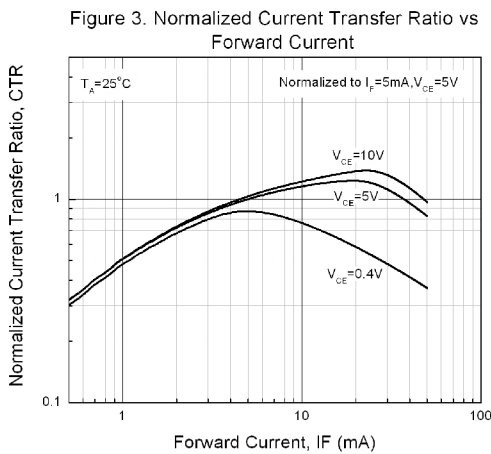
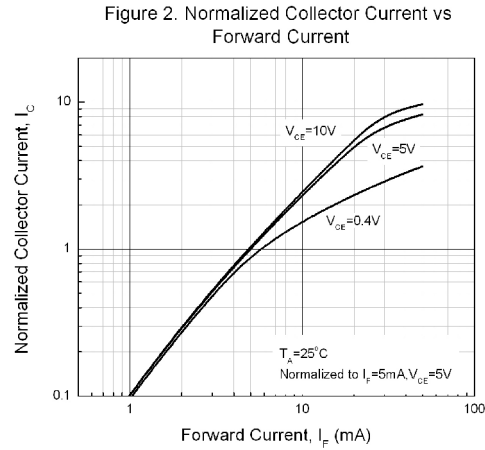
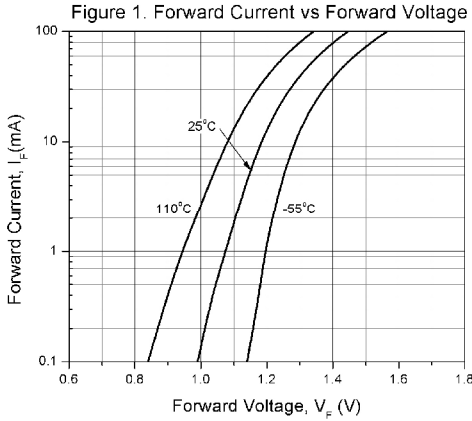
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	EL357N	50	-	600	%	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$
	EL357NA	80	-	160		
	EL357NB	130	-	260		
	EL357NC	200	-	400		
	EL357ND	300	-	600		
	EL357NE	100	-	200		
	EL357NF	150	-	300		
Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.1	0.2	V	$I_F = 20\text{mA}, I_C = 1\text{mA}$
Isolation resistance	$R_{IO}$	$5 \times 10^{10}$	-	-	$\Omega$	$V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{ R.H.}$
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	$t_r$	-	3	18	$\mu\text{s}$	$V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$
Fall time	$t_f$	-	4	18	$\mu\text{s}$	

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

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## EL357N-G Series

### Typical Performance Curves



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## EL357N-G Series

Figure 7. Collector Dark Current vs Ambient Temperature

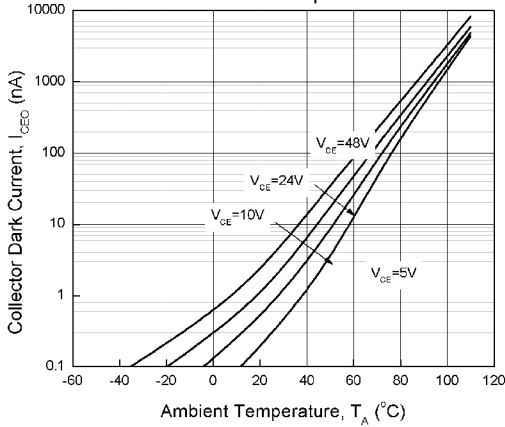


Figure 8. Switching Time vs Load Resistance

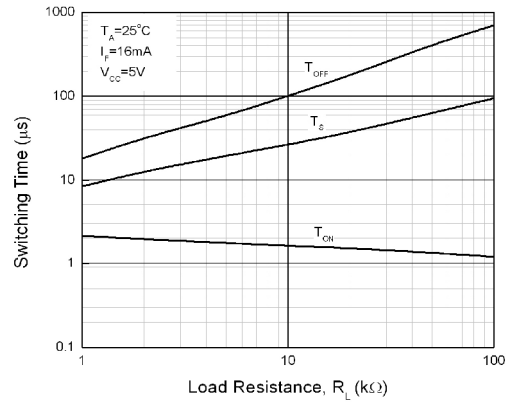
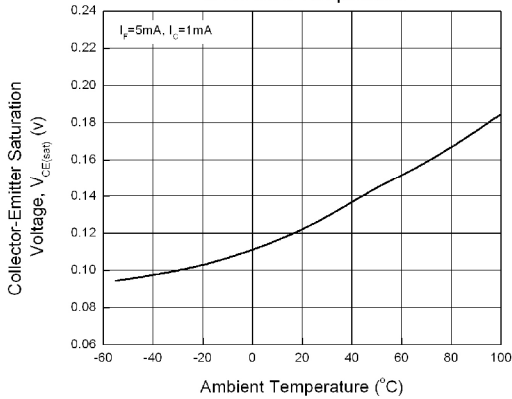


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature



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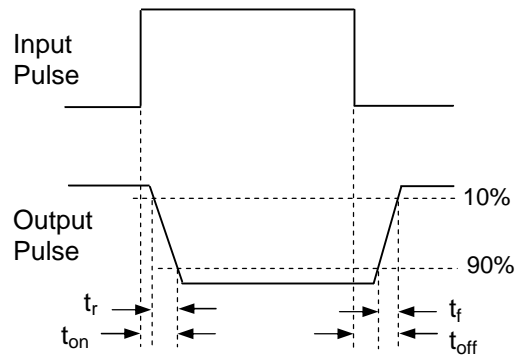
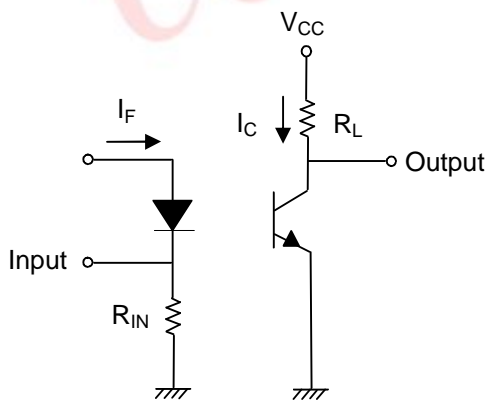


Figure 10. Switching Time Test Circuit & Waveforms



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## EL357N-G Series

### Order Information

Part Number

# EL357NX(Y)-VG

#### Note

- 357N = Part No.
- X = CTR Rank (A, B, C, D, E, For none)
- Y = Tape and reel option (TA, TB or none).
- V = VDE (optional)
- G = Halogen free

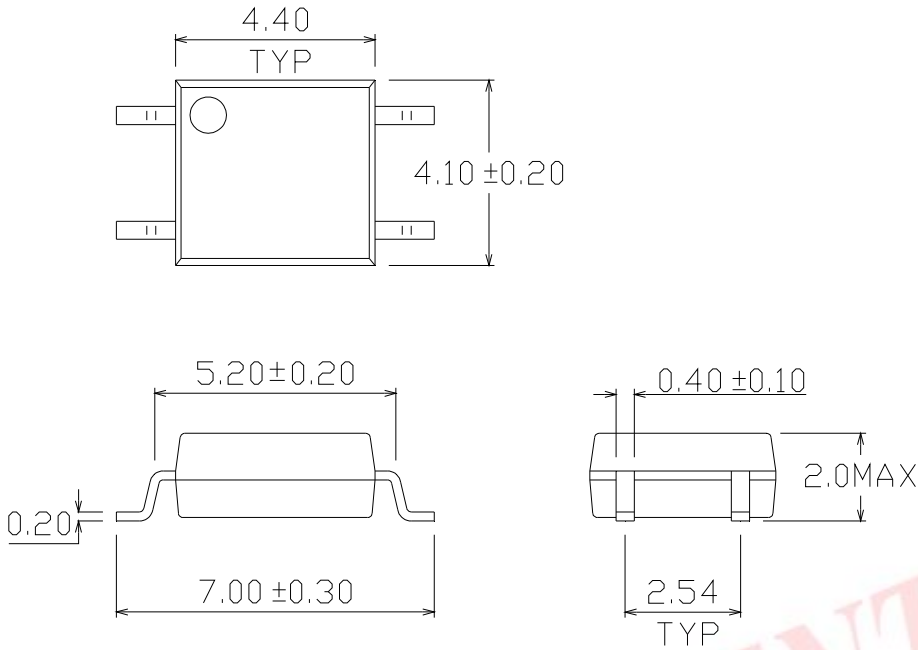
Option	Description	Packing quantity
None	Standard SMD option	100 units per tube
-V	Standard SMD option + VDE	100 units per tube
(TA)	TA Tape & reel option	3000 units per reel
(TB)	TB Tape & reel option	3000 units per reel
(TA)-V	TA Tape & reel option + VDE	3000 units per reel
(TB)-V	TB Tape & reel option + VDE	3000 units per reel

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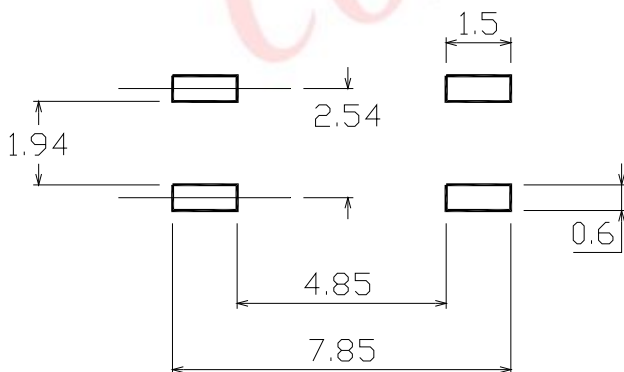
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**EL357N-G Series**

**Package Drawing**  
(Dimensions in mm)



**Recommended pad layout for surface mount leadform**





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# 4 PIN ULTRA SMALL SOP PHOTOTRANSISTOR PHOTOCOUPLER

## EL357N-G Series

### Device Marking



### Notes

- EL denotes Everlight
- 357N denotes Device Number
- R denotes CTR Rank (A, B, C, D, E, F or none)
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE (optional)

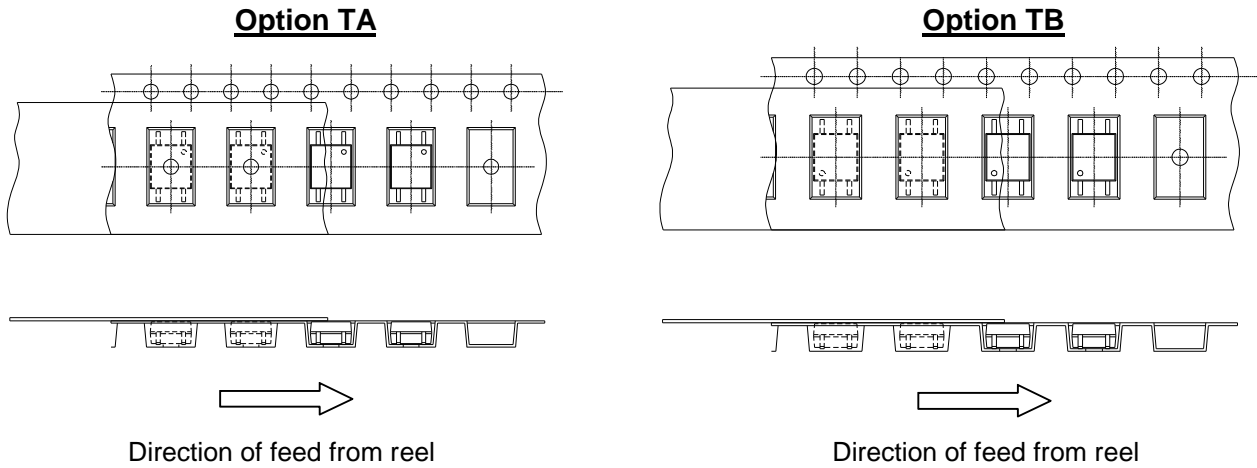
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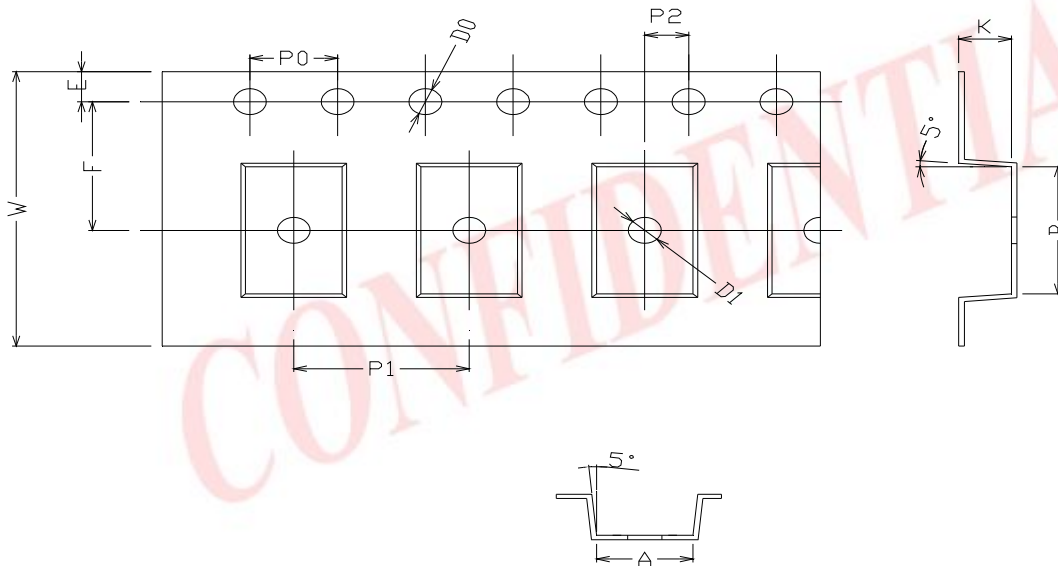
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**EL357N-G Series**

## Tape & Reel Packing Specifications



## Tape dimensions



Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	4.4 ± 0.1	7.4 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.7 5± 0.1	7.5 ± 0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.15	8.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	16.0 ± 0.2	2.4 ± 0.1

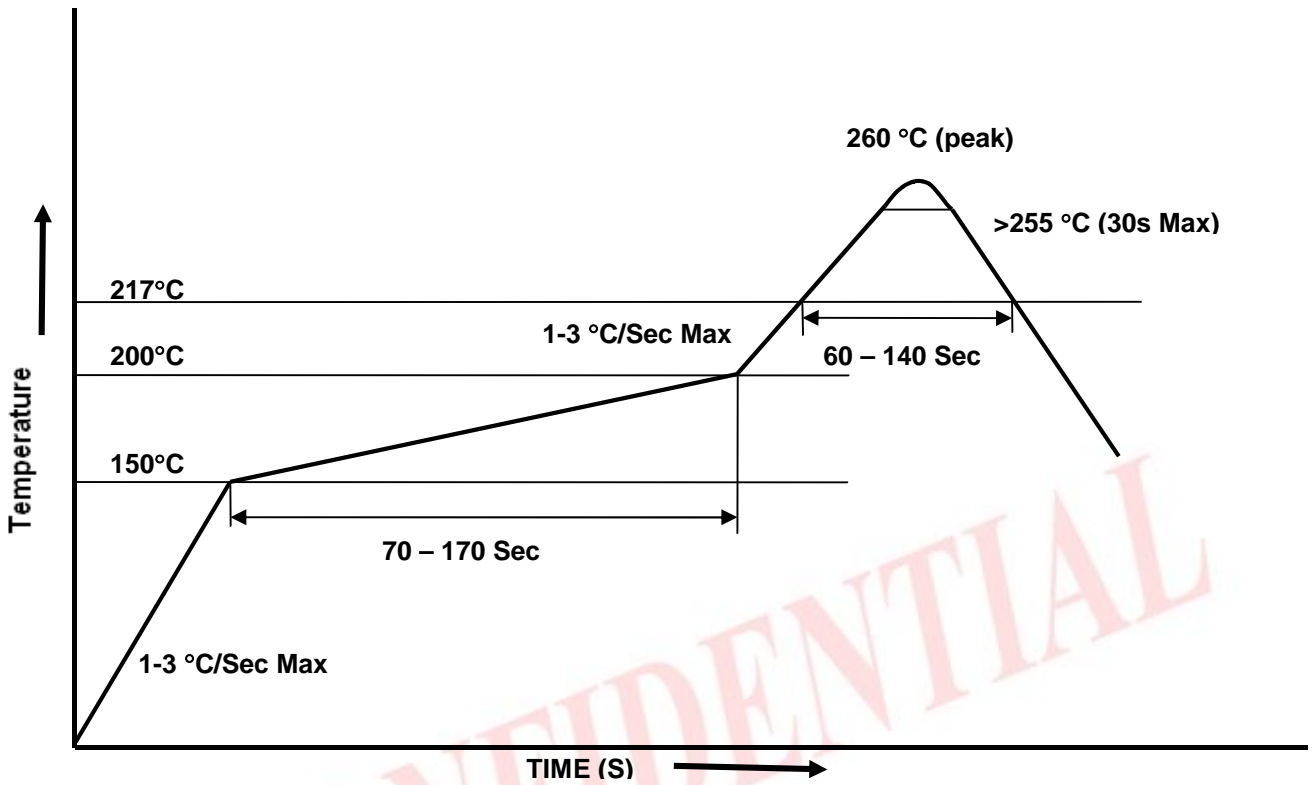


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## EL357N-G Series

### Solder Reflow Temperature Profile



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EL357N-G Series

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