



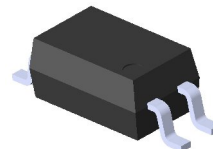
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# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

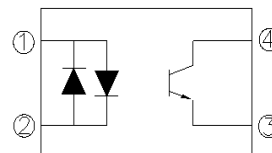
## EL3H4-G Series

### Features:

- AC input response
- Current transfer ratio  
(CTR: Min. 20% at  $I_F = \pm 1\text{mA}$ ,  $V_{CE} = 5\text{V}$ )
- High isolation voltage between input and output (Viso=3750 V rms)
- Compact small outline package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved (No. 2021495)



### Schematic



### Pin Configuration

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

### Description

The EL3H4 series contains two infrared emitting diode, connected in inverse parallel, optically coupled to a phototransistor encapsulated with green compound.

It is packaged in a 4-pin small outline SMD package.

### Applications

- AC line monitor
- Programmable controllers
- Telephone line interface
- Unknown polarity DC sensor

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## EL3H4-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 (t = 10μs)	I <sub>FM</sub>	1	A
	Power dissipation No derating required up to T <sub>a</sub> = 100°C	P <sub>D</sub>	70	mW
Output	Power dissipation Derating factor (above T <sub>a</sub> = 80°C)	P <sub>C</sub>	150	mW
			3.7	mW/
	Collector-Emitter voltage	V <sub>CEO</sub>	80	V
	Emitter-Collector voltage	V <sub>ECO</sub>	6	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~+100	°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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### 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>	-	1.2	1.4	V	I <sub>F</sub> = ± 20mA
Reverse current	I <sub>R</sub>	-	-	10	μA	V <sub>R</sub> = 4V
Input capacitance	C <sub>in</sub>	-	50	250	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>	6	-	-	V	I <sub>E</sub> =0.01mA

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

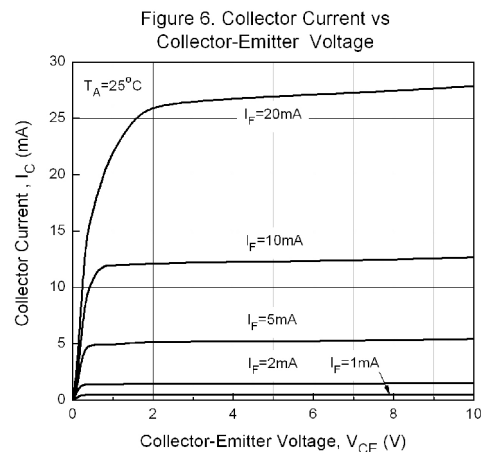
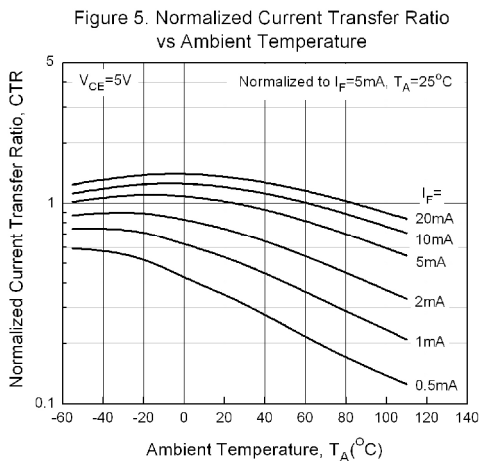
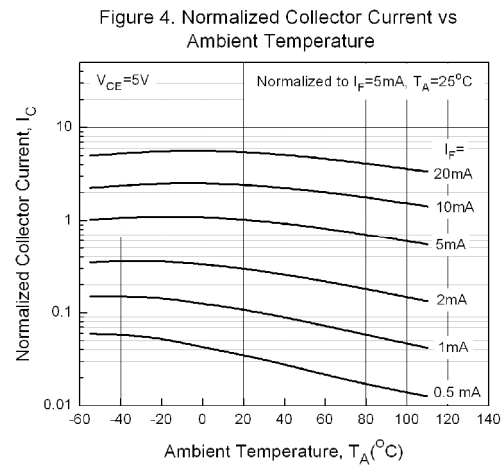
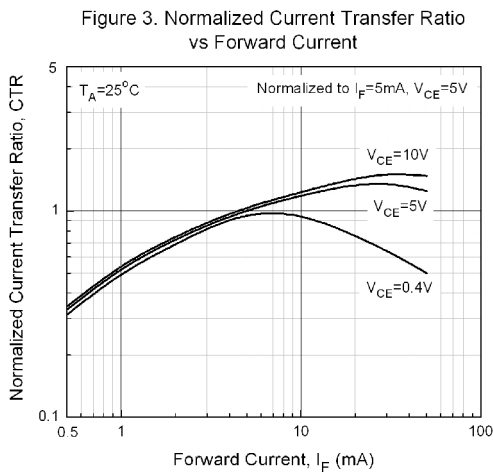
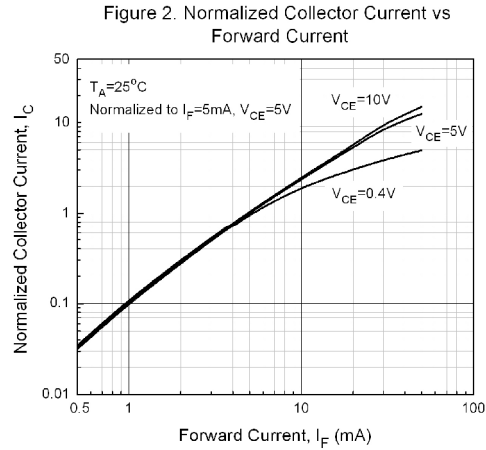
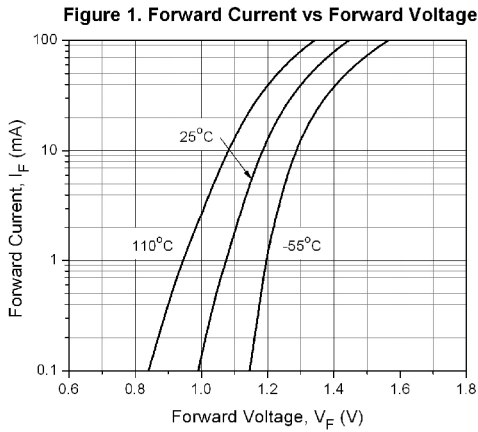
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	EL3H4	20	-	300	%	I <sub>F</sub> = ±1mA, V <sub>CE</sub> = 5V
	EL3H4A	50		150		
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	-	0.1	0.2	V	I <sub>F</sub> = ±20mA, I <sub>C</sub> = 1mA
Isolation resistance	R <sub>IO</sub>	5×10 <sup>10</sup>	10 <sup>11</sup>	-	Ω	V <sub>IO</sub> = 500Vdc, 40~60%R.H
Floating capacitance	C <sub>IO</sub>	-	0.6	1.0	pF	V <sub>IO</sub> = 0, f = 1MHz
Rise time	T <sub>r</sub>	-	6	18	μs	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω
Fall time	T <sub>f</sub>	-	8	18	μs	

\* Typical values at T<sub>a</sub> = 25°C

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## EL3H4-G Series

### Typical Performance Curves



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Figure 7. Collector Current vs Collector-Emitter Voltage

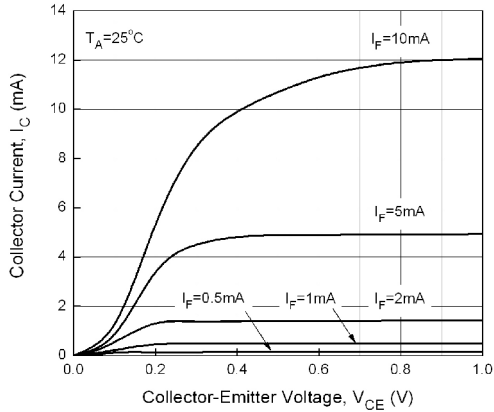


Figure 8. Collector Dark Current vs Ambient Temperature

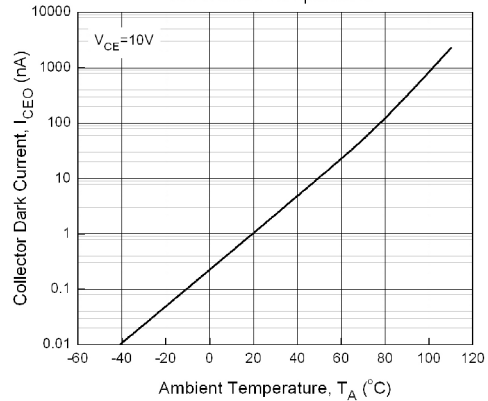


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

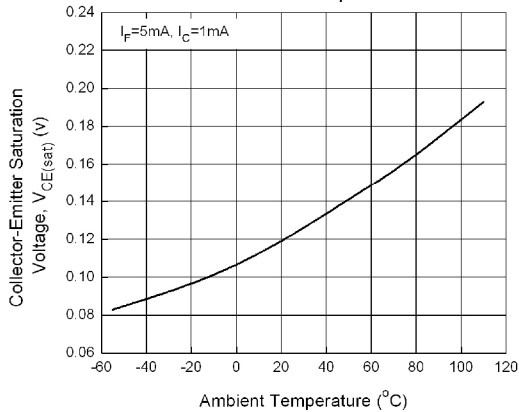


Figure 10. Switching Time vs Load Resistance

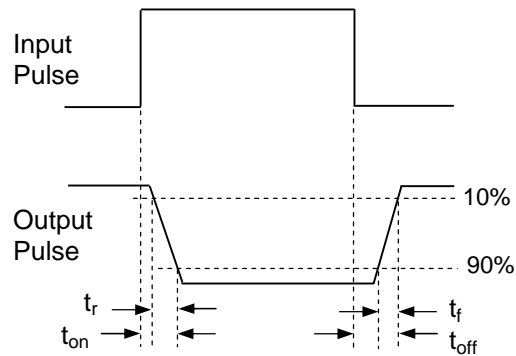
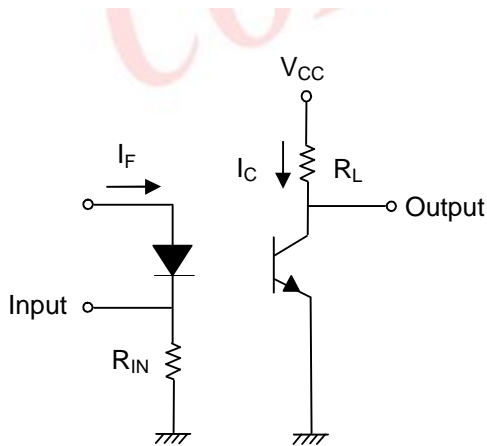
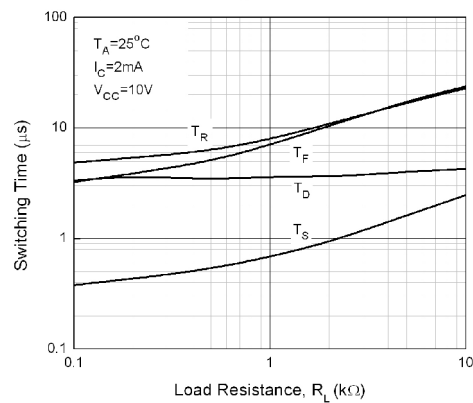


Figure 11. Switching Time Test Circuit & Waveforms



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## EL3H4-G Series

### Order Information

Part Number

# EL3H4(X)(Y)-VG

### Note

- 3H4 = Part No.
- X = CTR Rank (A or none)
- Y = Tape and reel option (TA, TB, EA, EB or none).
- V = VDE (optional)
- G = Halogens free

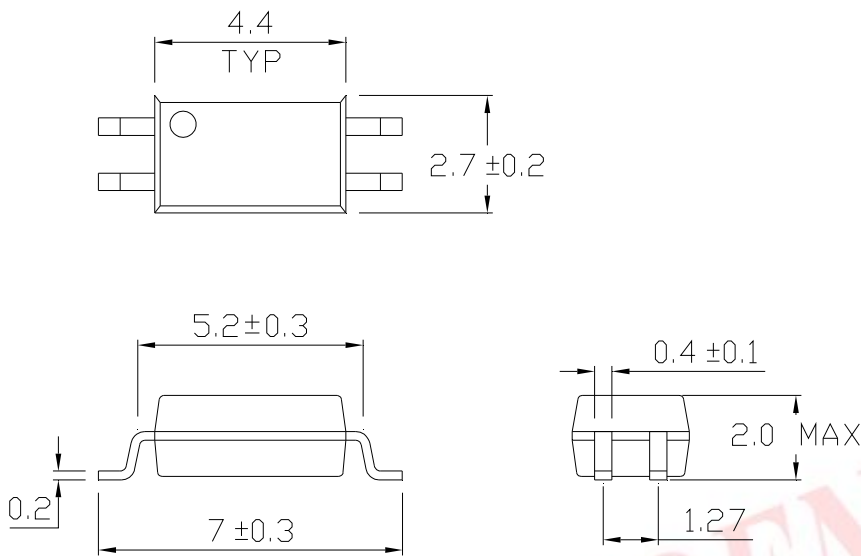
Option	Description	Packing quantity
None	Standard SMD option	100 units per tube
-V	Standard SMD option + VDE	100 units per tube
(TA)	TA Tape & reel option	5000 units per reel
(TB)	TB Tape & reel option	5000 units per reel
(TA)-V	TA Tape & reel option + VDE	5000 units per reel
(TB)-V	TB Tape & reel option + VDE	5000 units per reel
(EA)	TA Tape & reel option	1000 units per reel
(EB)	TB Tape & reel option	1000 units per reel
(EA)-V	TA Tape & reel option + VDE	1000 units per reel
(EB)-V	TB Tape & reel option + VDE	1000 units per reel

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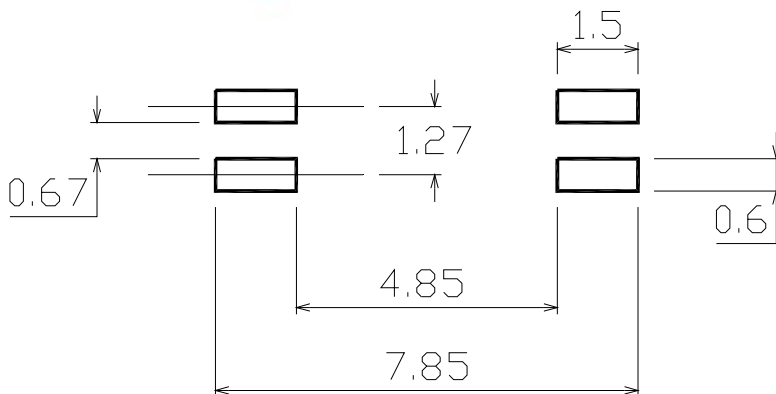
**EL3H4-G Series**

**Package Drawings**  
(Dimensions in mm)

**Package Drawing**  
(Dimensions in mm)



**Recommended pad layout for surface mount leadform**





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# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## EL3H4-G Series

### Device Marking



### Notes

- EL denotes Everlight
- 3H4 denotes Part Number
- R denotes CTR Rank (A or none)
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE approved (optional)

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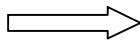
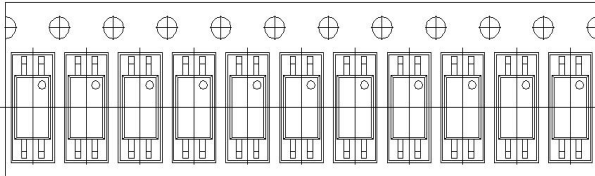


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**EL3H4-G Series**

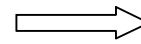
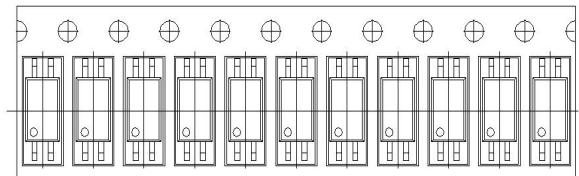
## Tape & Reel Packing Specifications

### Option TA



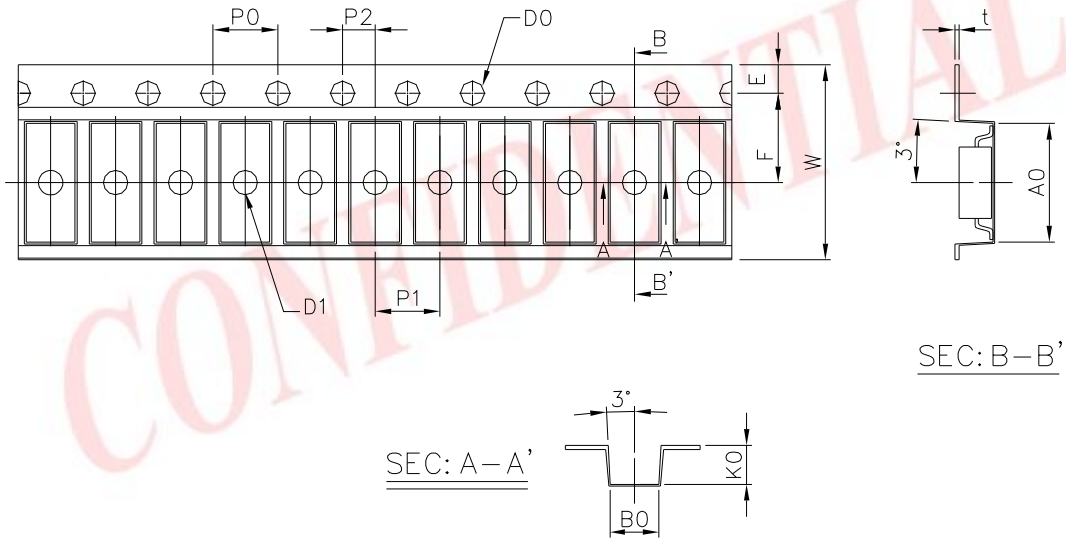
Direction of feed from reel

### Option TB



Direction of feed from reel

## Tape dimensions



Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	3.0 ± 0.1	7.3 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75 ± 0.1	5.5 ± 0.1

Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.15	4.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	12.0 ± 0.2	2.4 ± 0.1

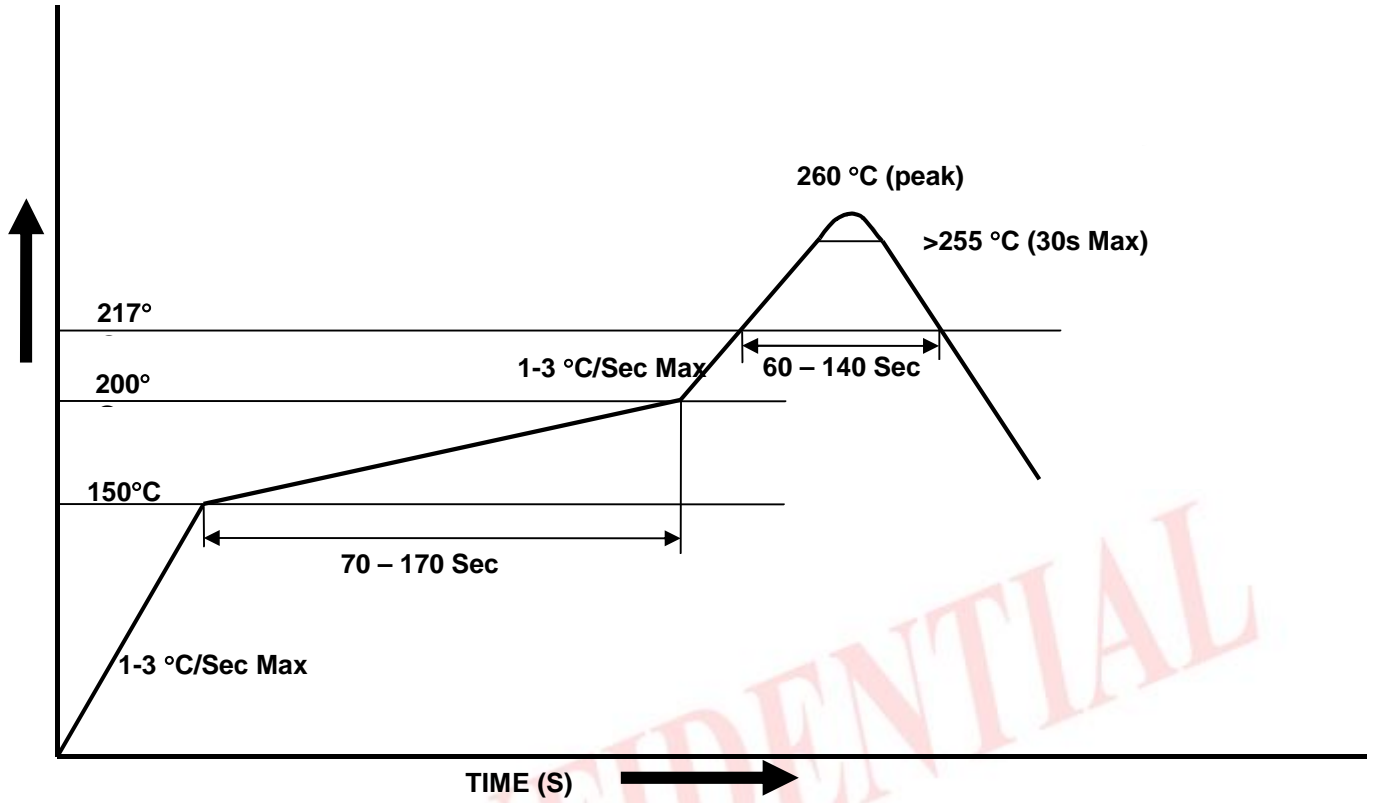


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## EL3H4-G Series

### Solder Reflow Temperature Profile



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EL3H4-G Series

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