



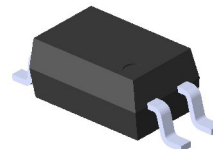
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4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

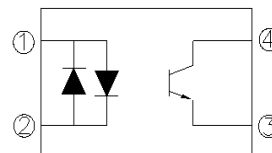
EL3H4-G Series

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 ($T_a=25^{\circ}\text{C}$)

| Parameter | | Symbol | Rating | Unit |
|-------------------------------------|---|-----------|----------|--------------------|
| Input | Forward current | I_F | ± 50 | mA |
| | Peak forward current ($t = 10\mu\text{s}$) | I_{FM} | 1 | A |
| | Power dissipation No derating required up to $T_a = 100^{\circ}\text{C}$ | P_D | 70 | mW |
| Output | Power dissipation Derating factor (above $T_a = 80^{\circ}\text{C}$) | P_C | 150 | mW |
| | | | 3.7 | mW/ |
| | Collector-Emitter voltage | V_{CEO} | 80 | V |
| | Emitter-Collector voltage | V_{ECO} | 6 | V |
| Total power dissipation | | P_{tot} | 200 | mW |
| Isolation voltage ^{*1} | | V_{iso} | 3750 | V rms |
| 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 are shorted together, and pins 3 & 4 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 | - | 1.2 | 1.4 | V | I _F = ± 20mA |
| Reverse current | I _R | - | - | 10 | μA | V _R = 4V |
| Input capacitance | C _{in} | - | 50 | 250 | pF | V = 0, f = 1KHz |

Output

| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|-------------------------------------|-------------------|------|-------|------|------|--|
| Collector-Emitter dark current | I _{CEO} | - | - | 100 | nA | V _{CE} = 20V, I _F =0mA |
| Collector-Emitter breakdown voltage | BV _{CEO} | 80 | - | - | V | I _C =0.1mA |
| Emitter-Collector breakdown voltage | BV _{ECO} | 6 | - | - | V | I _E =0.01mA |

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

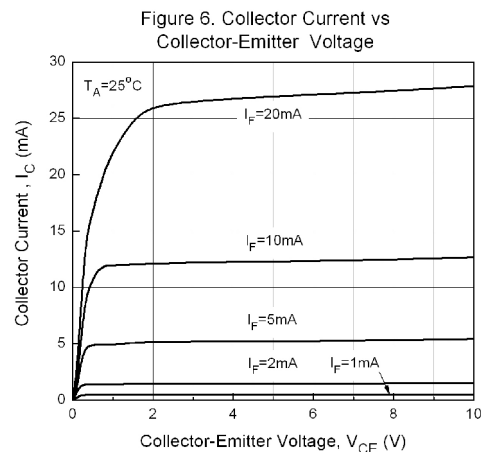
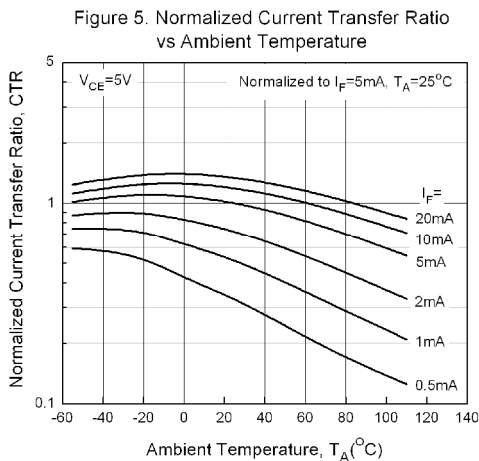
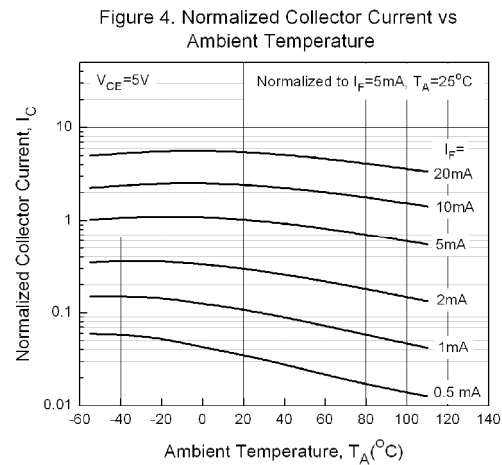
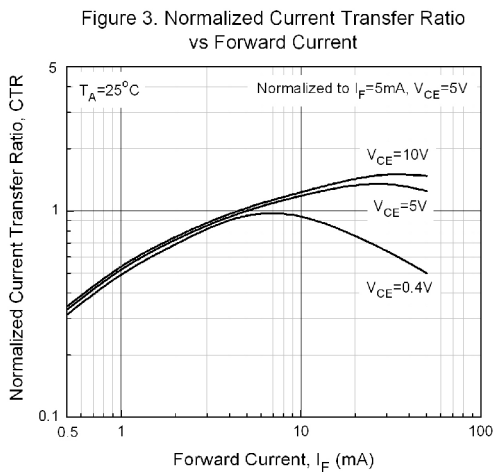
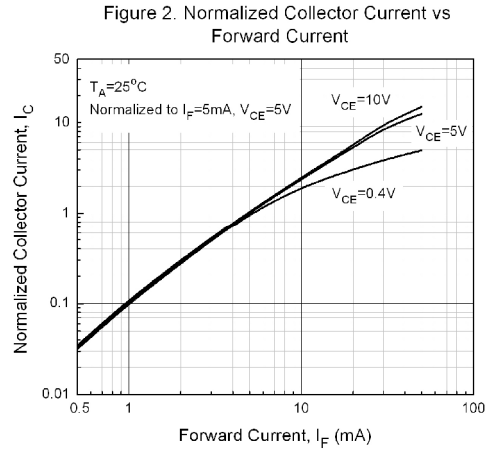
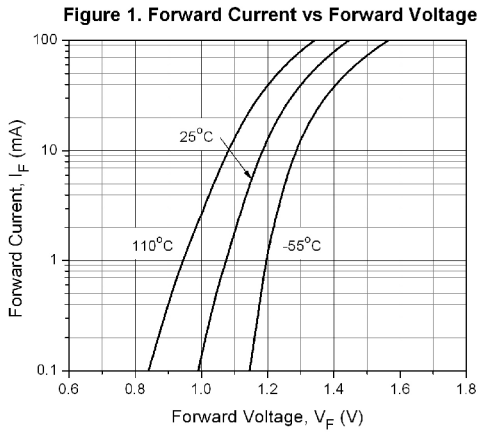
| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|--------------------------------------|----------------------|--------------------|------------------|------|------|--|
| Current Transfer ratio | EL3H4 | 20 | - | 300 | % | I _F = ±1mA, V _{CE} = 5V |
| | EL3H4A | 50 | | 150 | | |
| Collector-emitter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

* Typical values at T_a = 25°C

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EL3H4-G Series

Typical Performance Curves



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Figure 7. Collector Current vs Collector-Emitter Voltage

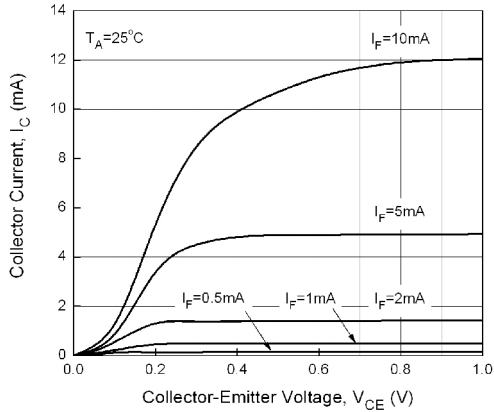


Figure 8. Collector Dark Current vs Ambient Temperature

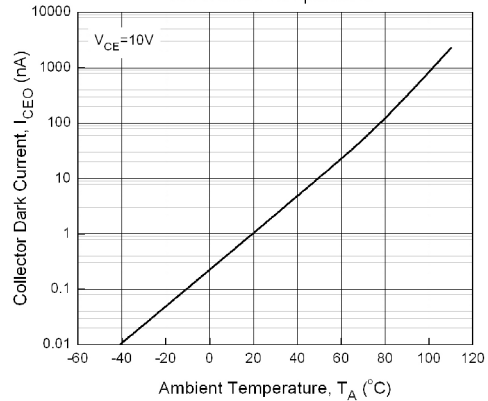


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

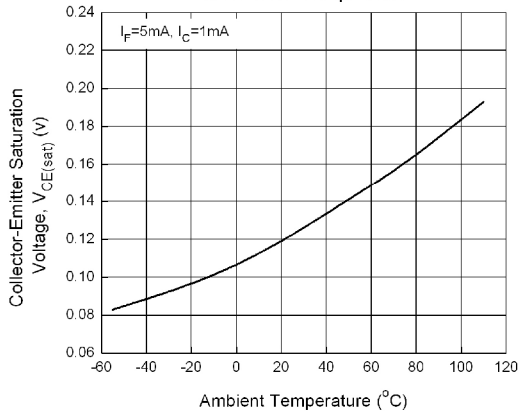


Figure 10. Switching Time vs Load Resistance

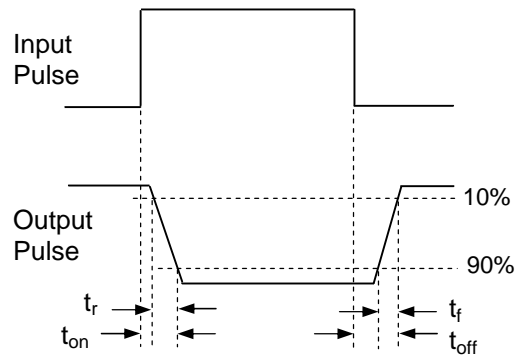
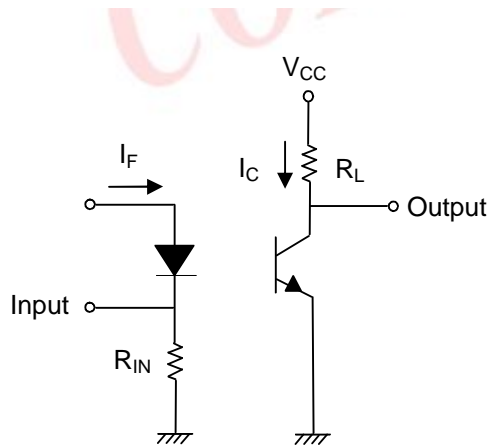
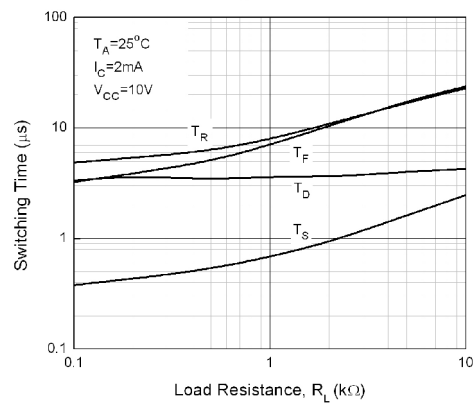


Figure 11. Switching Time Test Circuit & Waveforms



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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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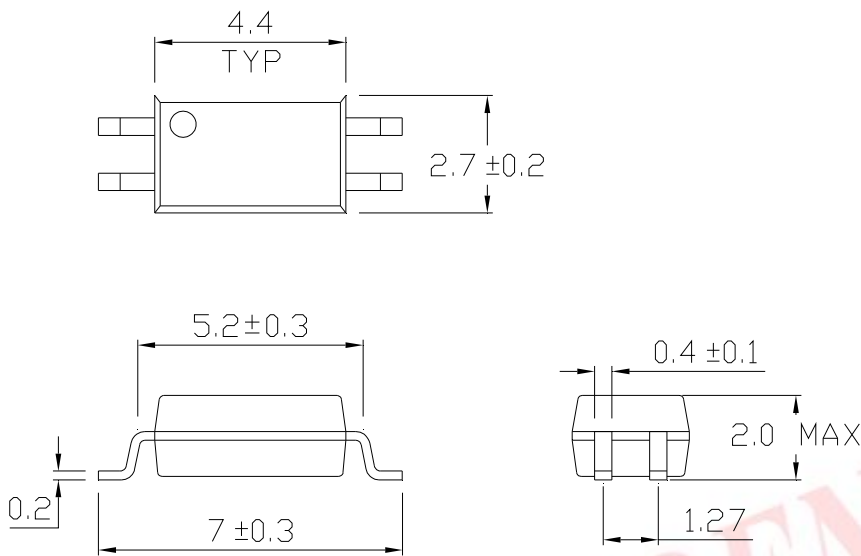
EL3H4-G Series

Package Drawings

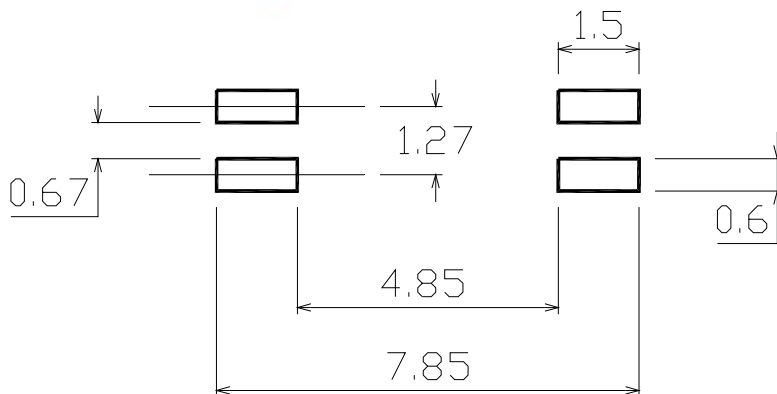
(Dimensions in mm)

Package Drawing

(Dimensions in mm)



Recommended pad layout for surface mount leadform





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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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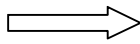
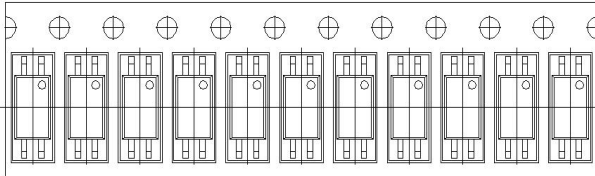
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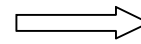
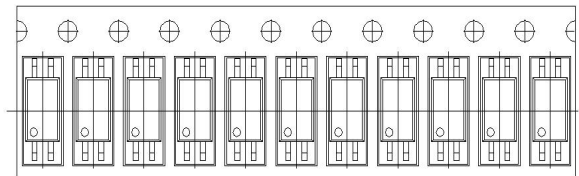
Tape & Reel Packing Specifications

Option TA



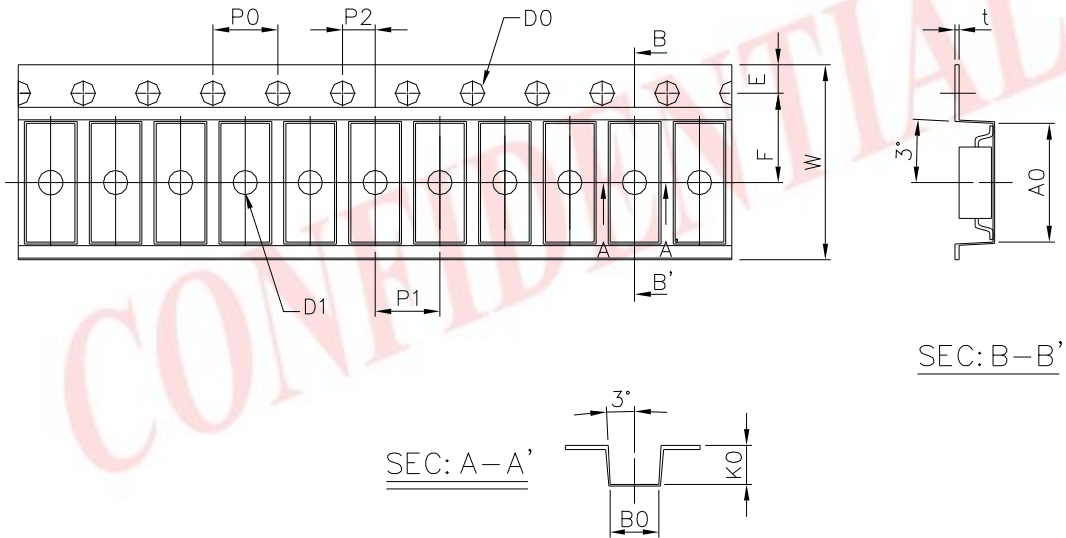
Direction of feed from reel

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 | 1.7 5± 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 |

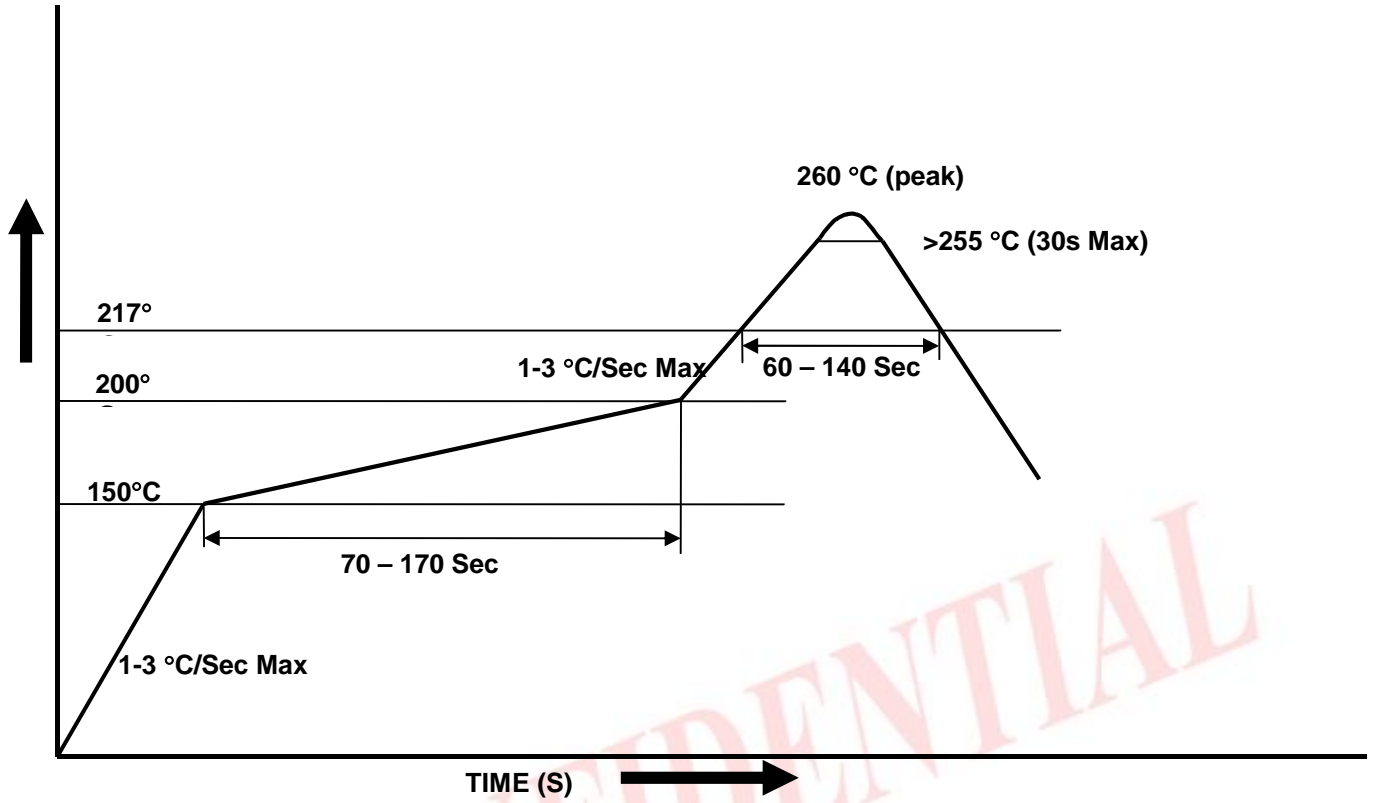


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Solder Reflow Temperature Profile



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EL3H4-G Series

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