

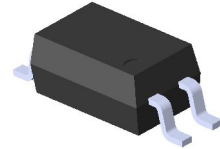


**THE DATASHEET OF
EL3H7(TA)-G**

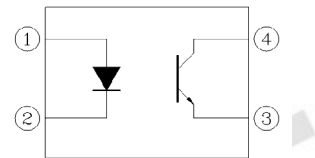


Features:

- Halogens free
- Current transfer ratio
(CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
(CTR: 40~320% at $I_F = 10\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output ($V_{iso} = 3750\text{ V rms}$)
- Compact 4 Pin SSOP with a 2.0 mm profile
- Pb free and RoHS compliant.
- UL approved (No. 214129)
- VDE approval (132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved



Schematic



Pin Configuration

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

Description

The EL3H7-G series devices consist of an infrared emitting diode, optically coupled to a phototransistor detector encapsulated with green compound.

They are packaged in a 4-pin small outline SMD package.

Applications

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

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

| Parameter | | Symbol | Rating | Unit |
|-------------------------------------|--|-----------|------------------------|------------------------|
| Input | Forward current | I_F | 50 | mA |
| | Peak forward current (1us, pulse) | I_{FP} | 1 | A |
| | Reverse voltage | V_R | 6 | V |
| | Power dissipation Derating factor (above $T_a = 90^{\circ}\text{C}$) | P_D | 70 | mW |
| 2.0 | | | mW/ $^{\circ}\text{C}$ | |
| Output | Power dissipation Derating factor (above $T_a = 70^{\circ}\text{C}$) | P_C | 150 | mW |
| | | | 3.1 | mW/ $^{\circ}\text{C}$ |
| | 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} | 200 | mW |
| Isolation voltage ^{*1} | | V_{ISO} | 3750 | V rms |
| Operating temperature | | T_{OPR} | -55 ~ +110 | $^{\circ}\text{C}$ |
| 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.

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 | μA | $V_R = 4\text{V}$ |
| 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 | $I_E = 0.1\text{mA}$ |

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

| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|------------------------|--------|------|-------|------|------|---|
| Current Transfer ratio | EL3H7 | 50 | - | 600 | % | $I_F = 5\text{mA}, V_{CE} = 5\text{V}$ |
| | EL3H7A | 80 | - | 160 | | |
| | EL3H7B | 130 | - | 260 | | |
| | EL3H7C | 200 | - | 400 | | |
| | EL3H7D | 300 | - | 600 | | |
| | EL3H7E | 100 | - | 200 | | |
| | EL3H7F | 150 | - | 300 | | $I_F = 10\text{mA}, V_{CE} = 5\text{V}$ |
| | EL3H7H | 40 | - | 80 | | |
| | EL3H7I | 63 | - | 125 | | |
| | EL3H7J | 100 | - | 200 | | |
| | EL3H7K | 160 | - | 320 | | |
| | | CTR | | | | |

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

| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|--------------------------------------|---------------|--------------------|-------|------|---------------|--|
| Collector-Emitter saturation voltage | $V_{CE(sat)}$ | - | 0.1 | 0.2 | V | $I_F = 10\text{mA}$, $I_C = 1\text{mA}$ |
| Isolation resistance | R_{IO} | 5×10^{10} | - | - | Ω | $V_{IO} = 500\text{Vdc}$, 40~60% R.H. |
| Floating capacitance | C_{IO} | - | 0.3 | 1.0 | pF | $V_{IO} = 0$, $f = 1\text{MHz}$ |
| Rise time | t_r | - | 5 | 18 | μs | $V_{CE} = 2\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$ |
| Fall time | t_f | - | 3 | 18 | μs | |

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

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Typical Performance Curves

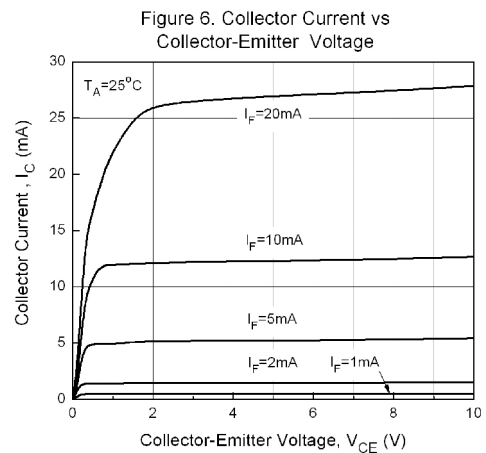
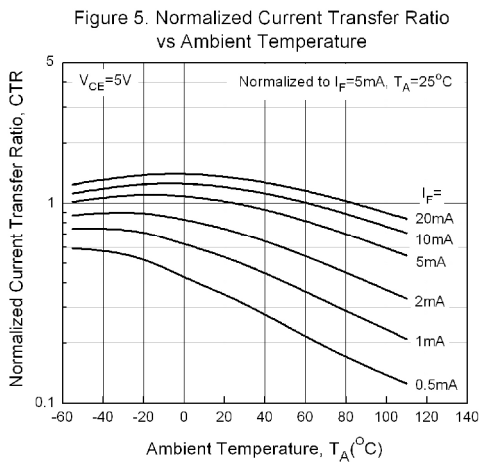
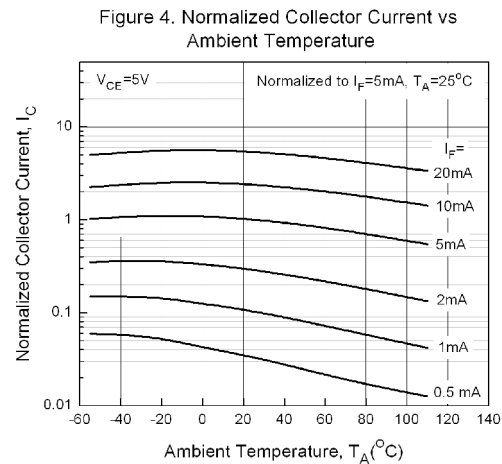
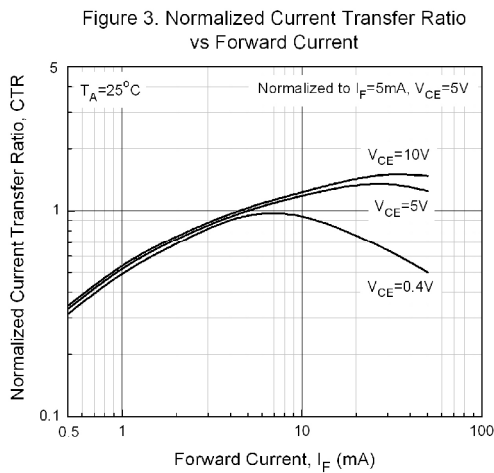
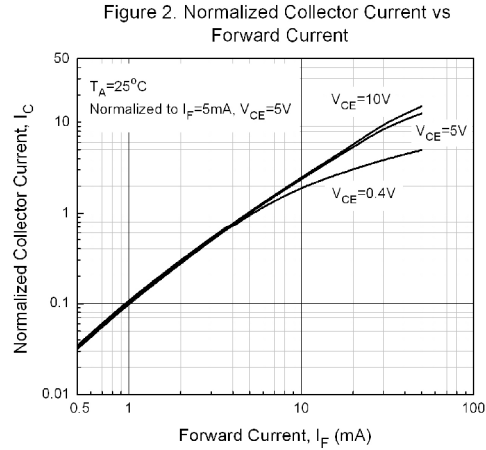
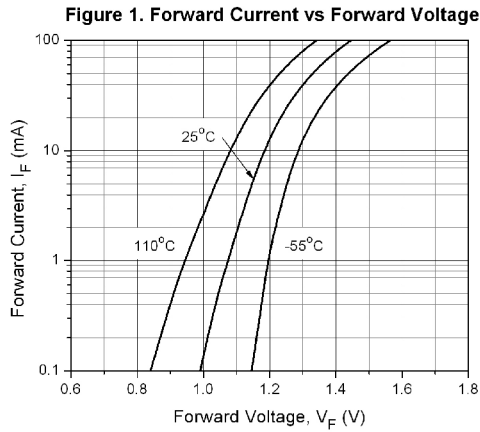


Figure 7. Collector Current vs Collector-Emitter Voltage

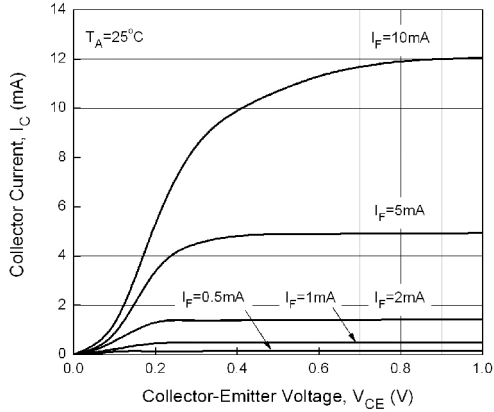


Figure 8. Collector Dark Current vs Ambient Temperature

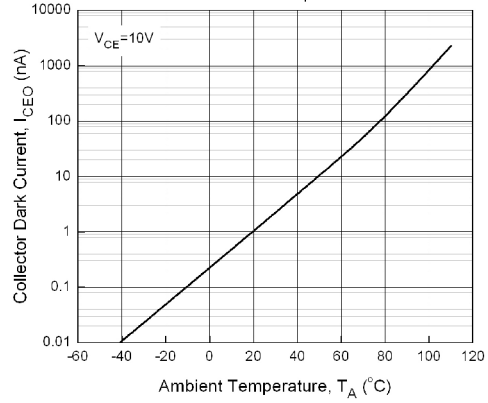


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

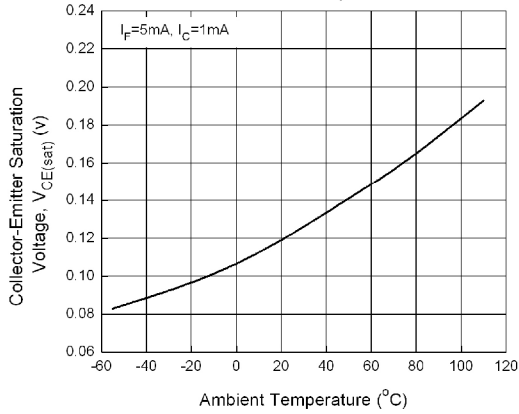


Figure 10. Switching Time vs Load Resistance

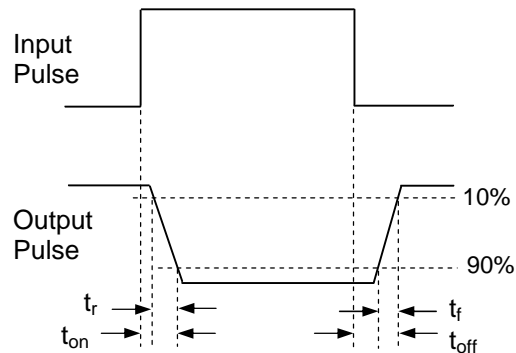
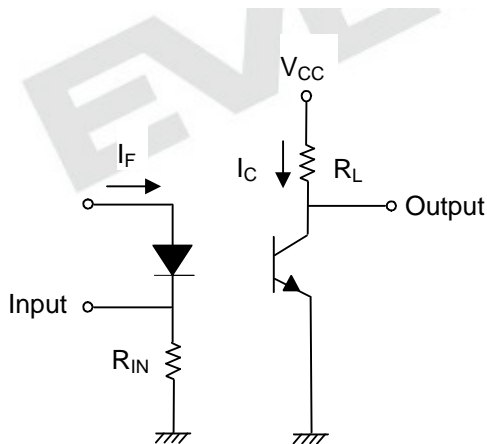
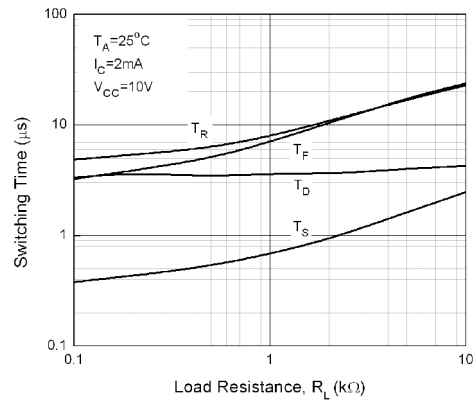


Figure 11. Switching Time Test Circuit & Waveforms

Order Information

Part Number

EL3H7(X)(Y)-VG

Note

3H7 = Part No.

X = CTR Rank (A, B, C, D, E, F, H, I, J, K or none)

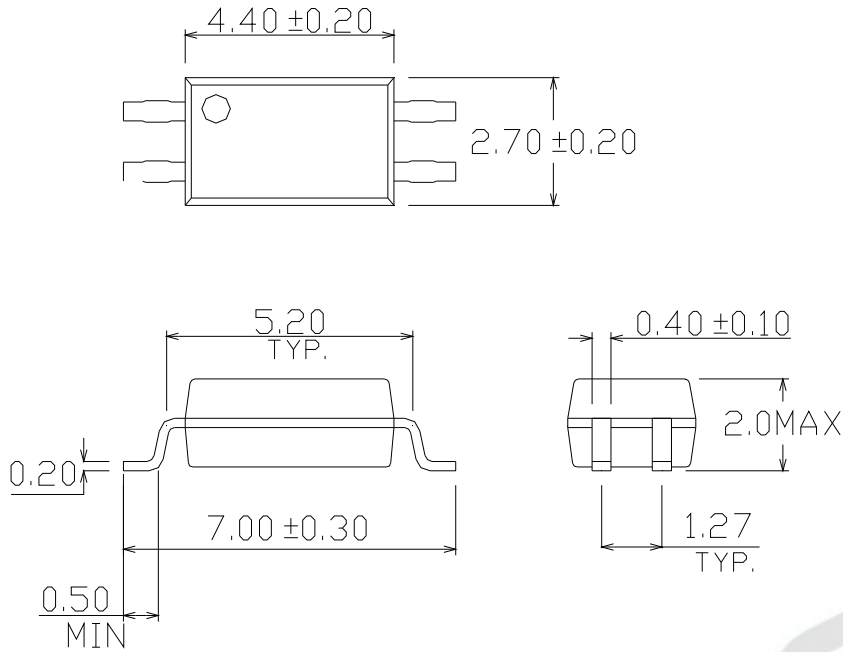
Y = Tape and reel option (TA, TB, EA, EB or none).

V = VDE (optional)

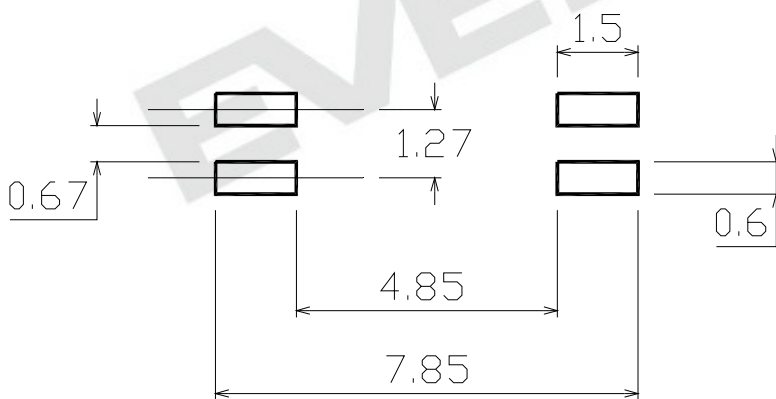
G = Halogens free

| 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 |

Package Drawing (Dimensions in mm)



Recommended pad layout for surface mount leadform



Device Marking



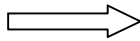
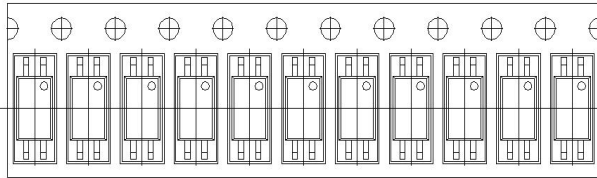
Notes

| | |
|-----|---|
| EL | denotes Everlight |
| 3H7 | denotes Device Number |
| R | denotes CTR Rank (A, B, C, D, E, F, H, I, J, K or none) |
| Y | denotes 1 digit Year code |
| WW | denotes 2 digit Week code |
| V | denotes VDE (optional) |

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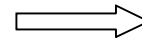
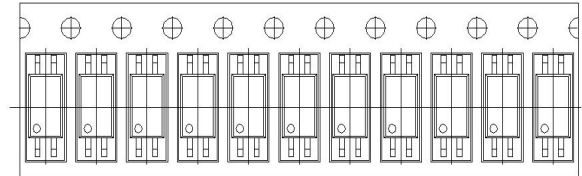
Tape & Reel Packing Specifications

Option TA



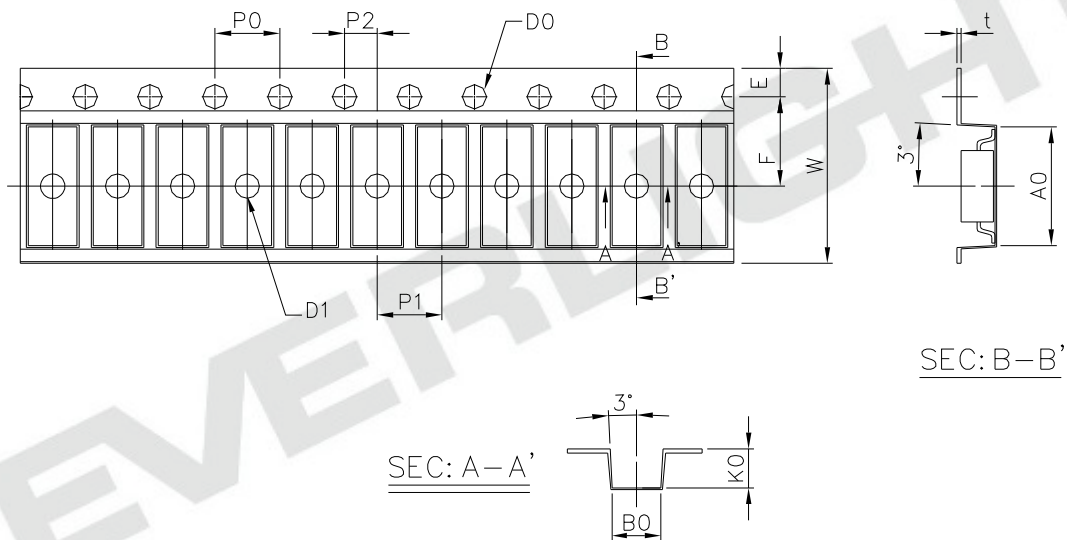
Direction of feed from reel

Option TB



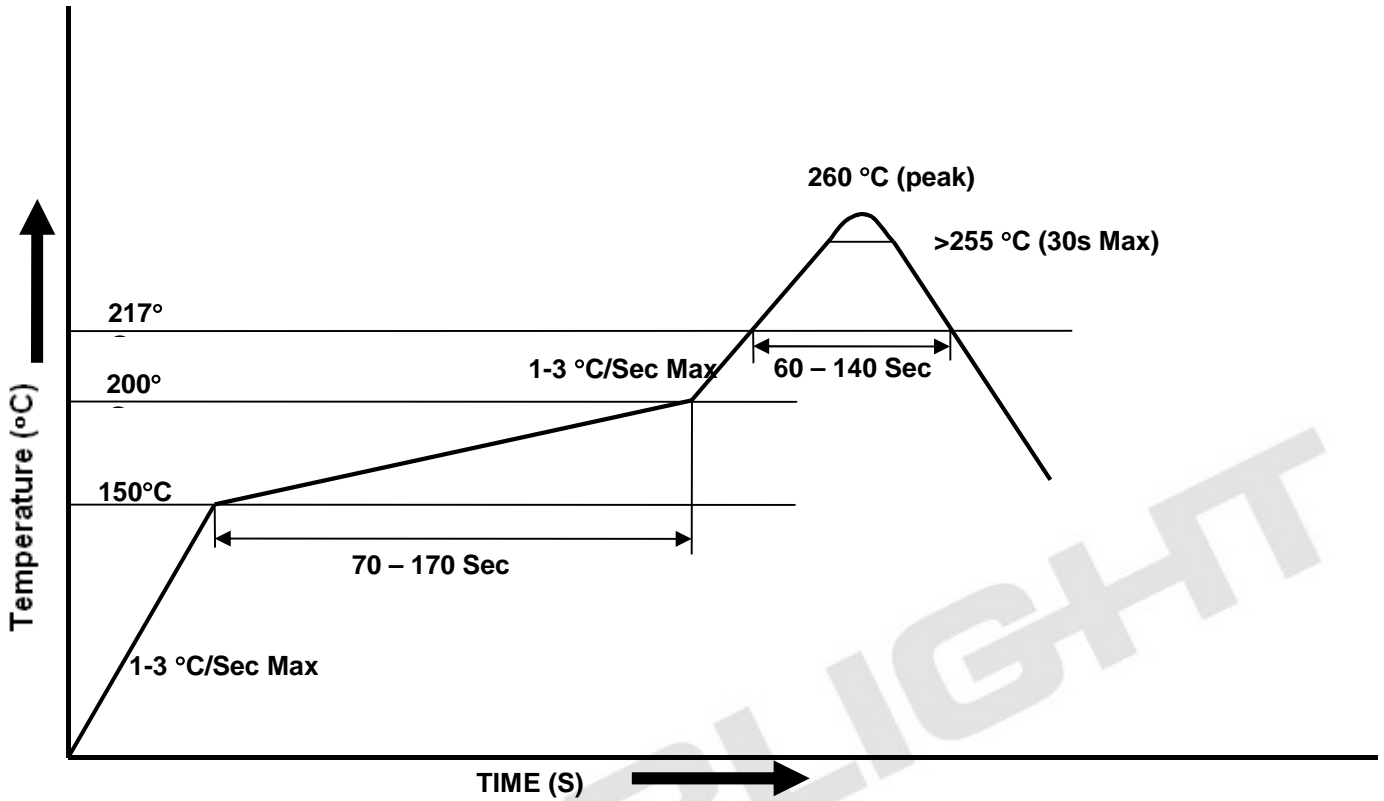
Direction of feed from reel

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 | 1.75 ± 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 |

Solder Reflow Temperature Profile



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