



LIGHTING FOREVER

6 PIN DIP PHOTO COUPLER Schmitt Trigger

H11Lx Series

Features:

- High data rate, 1MHz typical (NRZ)
- Free from latch up and oscillation throughout voltage and temperature ranges.
- Microprocessor compatible drive
- Logic compatible output sinks 16mA at 0.4V maximum
- Guaranteed on/off threshold hysteresis
- Wide supply voltage capability, compatible with all popular logic systems
- High isolation voltage between input and output (Viso=5000 V rms)
- Compact dual-in-line package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approval (No.132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved (No. 2007798)



Description

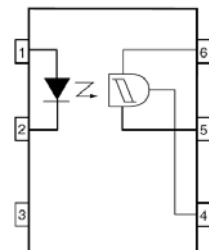
The H11LX series of devices each consist of a GaAs infrared emitting diode optically coupled a high speed integrated circuit detector. The output detector incorporates a Schmitt trigger, which provides hysteresis for noise immunity and pulse shaping.

The devices are in a 6-pin DIP package and available in wide-lead spacing and SMD option.

Applications

- Logic to logic isolator
- Programmable current level sensor
- Line receiver — eliminate noise and transient problems
- AC to TTL conversion — square wave shaping
- Digital programming of power supplies
- Interfaces computers with peripherals

Schematic



1. Anode
2. Cathode
3. No Connection
4. V_O
5. GND
6. V_{CC}

Truth Table

| Input | Output |
|-------|--------|
| H | L |
| L | H |



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

| Parameter | | Symbol | Rating | Unit |
|-------------------------------------|------------------------|-----------|----------|--------------------|
| Input | Forward current | I_F | 60 | mA |
| | Reverse voltage | V_R | 6 | V |
| | Power dissipation | P_D | 120 | mW |
| Output | V_{45} Allowed Range | V_o | 0 to 16 | V |
| | V_{65} Allowed Range | V_{CC} | 3 to 16 | V |
| | Output Current | I_o | 50 | mA |
| | power dissipation | P_D | 150 | mW |
| Total power dissipation | | P_{tot} | 250 | mW |
| Isolation voltage ^{*1} | | V_{iso} | 5000 | V rms |
| Operating temperature | | T_{opr} | -55~+100 | $^{\circ}\text{C}$ |
| Storage temperature | | T_{stg} | -55~+150 | $^{\circ}\text{C}$ |
| 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 & 3 are shorted together, and pins 4, 5 & 6 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 | - | 1.15 | 1.5 | V | I _F = 10mA |
| Reverse Leakage current | I _R | - | - | 10 | μA | V _R = 5V |
| Capacitance | C _J | - | - | 100 | pF | V=0, f=1MHz |

Output

| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|-------------------------|----------------------|------------------|-------|------|------|---|
| Operation Voltage Range | V _{CC} | 3 | - | 15 | V | |
| Supply Current | I _{CC(off)} | - | 1.6 | 5 | mA | I _F =0mA, V _{CC} =5V |
| Output Current, High | I _{OH} | - | - | 100 | μA | I _F =0mA, V _{CC} =V _O =15V |
| Isolation Resistance | R _{ISO} | 10 ¹¹ | - | - | Ω | V _{I-O} =500VDC |

Transfer Characteristics

| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|--|-------------------------------------|------|-------|------|------|---|
| Supply Current | I _{CC(on)} | - | 1.6 | 5 | mA | I _F =10mA, V _{CC} =5V |
| Output Voltage .low | V _{OL} | - | - | 0.4 | V | V _{CC} =5V, I _F =I _{Fon} (max.), R _L =270Ω |
| Turn on Threshold Current ¹ | H11L1 | - | - | 1.6 | mA | V _{CC} =5V, R _L =270Ω |
| | H11L2 | - | - | 10 | | |
| | H11L3 | - | - | 5 | | |
| Turn off Threshold Current | I _{Foff} | - | 1 | - | mA | V _{CC} =5V, R _L =270Ω |
| Hysteresis Ratio | I _{Fon} /I _{Foff} | 0.5 | - | 0.9 | | V _{CC} =5V, R _L =270Ω |
| Turn on Time | t _{on} | - | - | 4 | μS | V _{CC} =5V, I _F =I _{Fon} , R _L =270Ω |
| Fall Time | t _r | - | 0.1 | - | μS | |
| Turn off Time | t _{off} | - | - | 4 | μS | |
| Rise Time | t _r | - | 0.1 | - | μS | |
| Data Rate | | - | 1 | - | MHz | |

* Typical values at T_a = 25°C

¹. Max. I_{F(ON)} is the maximum current required to trigger the output. For examples, a 1.6mA maximum trigger current would require the LED to be driven at a current greater than 1.6mA to guarantee the device will turn on. A 10% guard band is recommended to account for degradation of the LED over its lifetime. The maximum allowable LED drive current is 60mA.

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Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

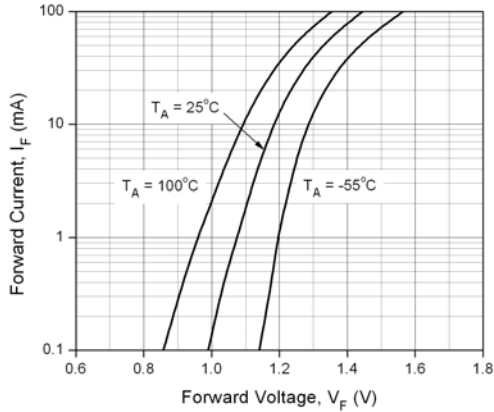


Figure 2. Transfer Characteristics

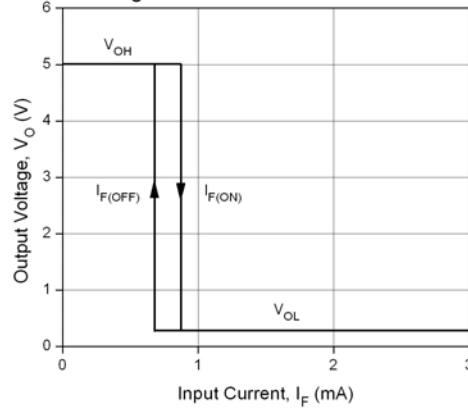


Figure 3. Turn On Threshold Current vs Supply Voltage

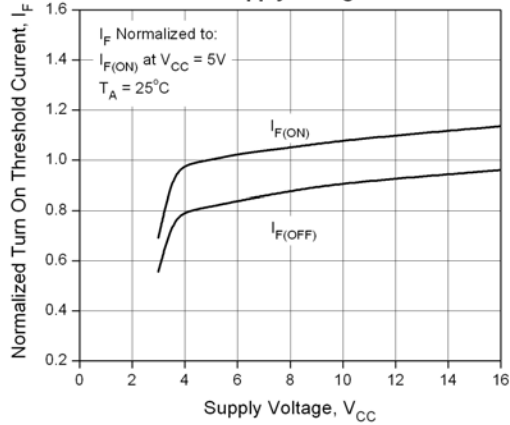


Figure 4. Turn On Threshold Current vs Ambient Temperature

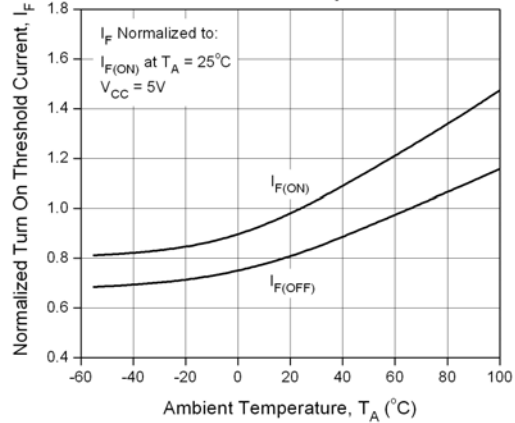


Figure 5. Low Level Output Voltage vs Load Current

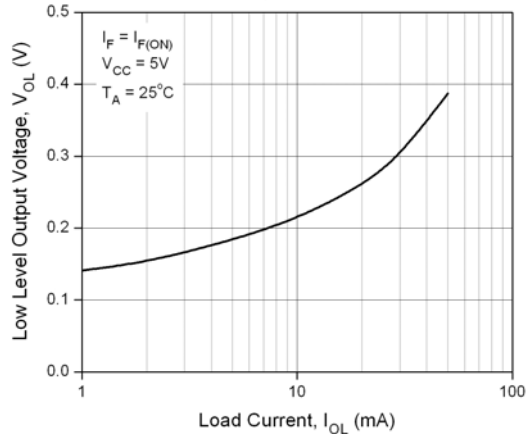
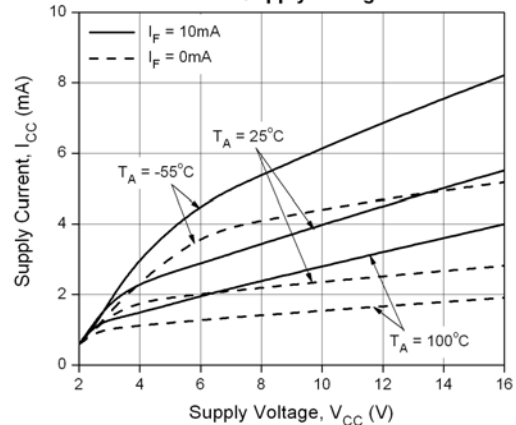


Figure 6. Supply Current vs Supply Voltage



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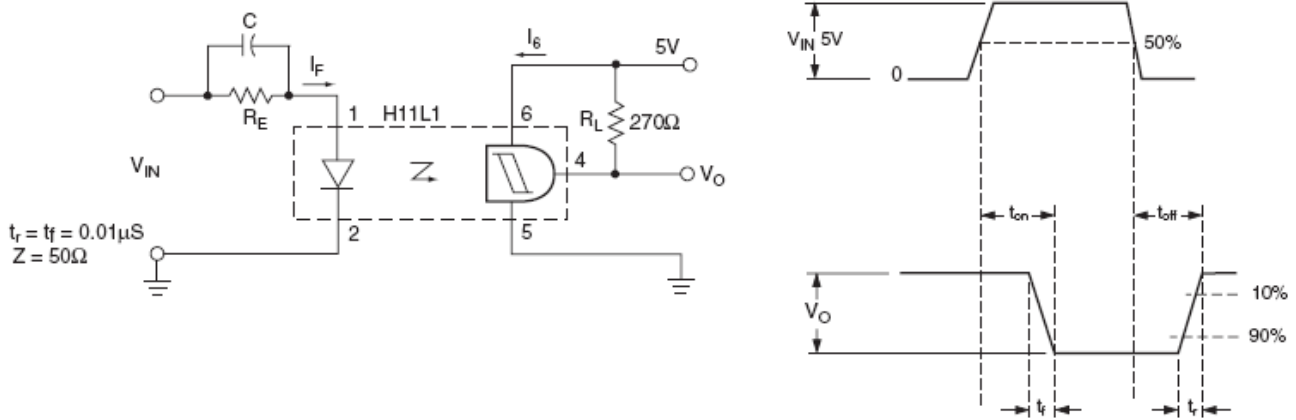


Figure. 7 Switching test circuit and waveform

Order Information

Part Number

H11LXY(Z)-V

Note

- X = Part No. for 1, 2 or 3
- Y = Lead form option (S, S1, M or none)
- Z = Tape and reel option (TA, TB or none).
- V = VDE (optional)

| Option | Description | Packing quantity |
|---------|---|---------------------|
| None | Standard DIP-6 | 65 units per tube |
| M | Wide lead bend (0.4 inch spacing) | 65 units per tube |
| S + TA | Surface mount lead form + TA tape & reel option | 1000 units per reel |
| S + TB | Surface mount lead form + TB tape & reel option | 1000 units per reel |
| S1 + TA | Surface mount lead form (low profile) + TA tape & reel option | 1000 units per reel |
| S1 + TB | Surface mount lead form (low profile) + TB tape & reel option | 1000 units per reel |



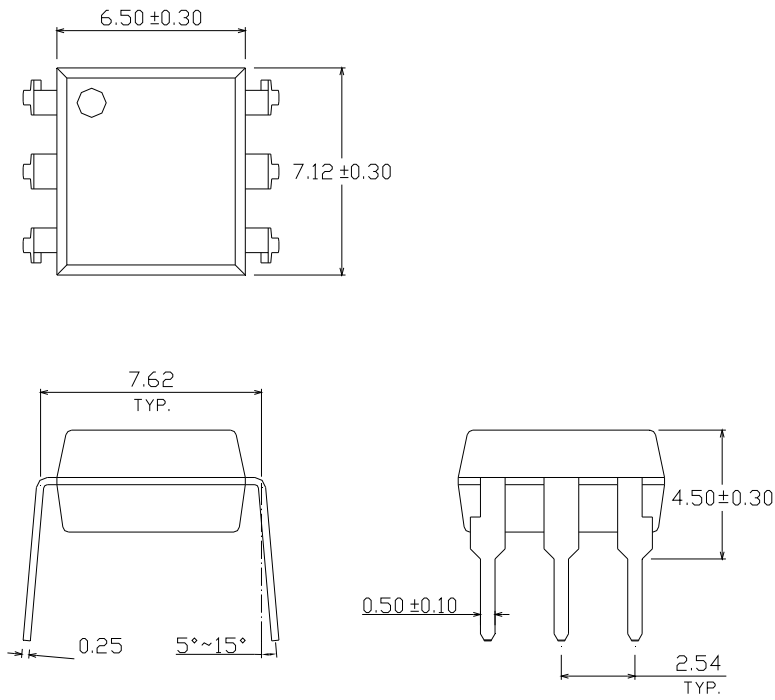
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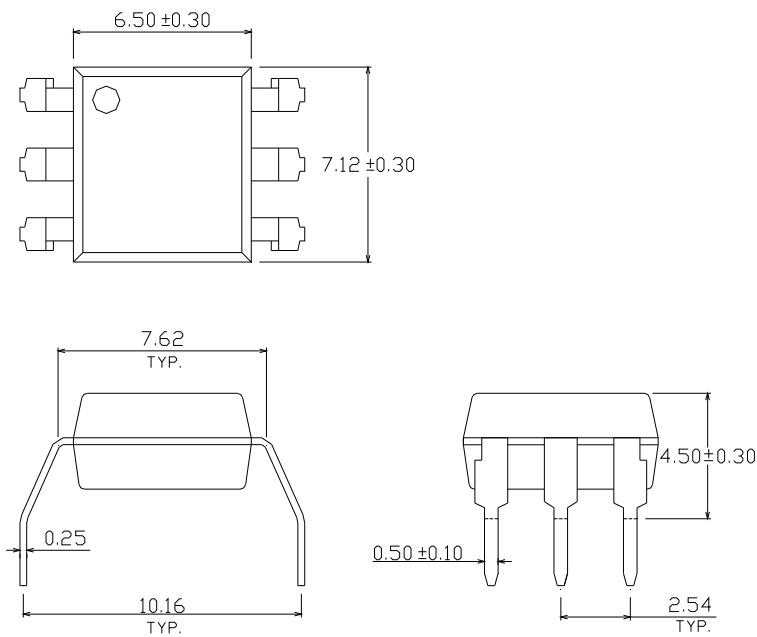
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Package Drawings (Dimensions in mm)

Standard DIP Type



Option M Type



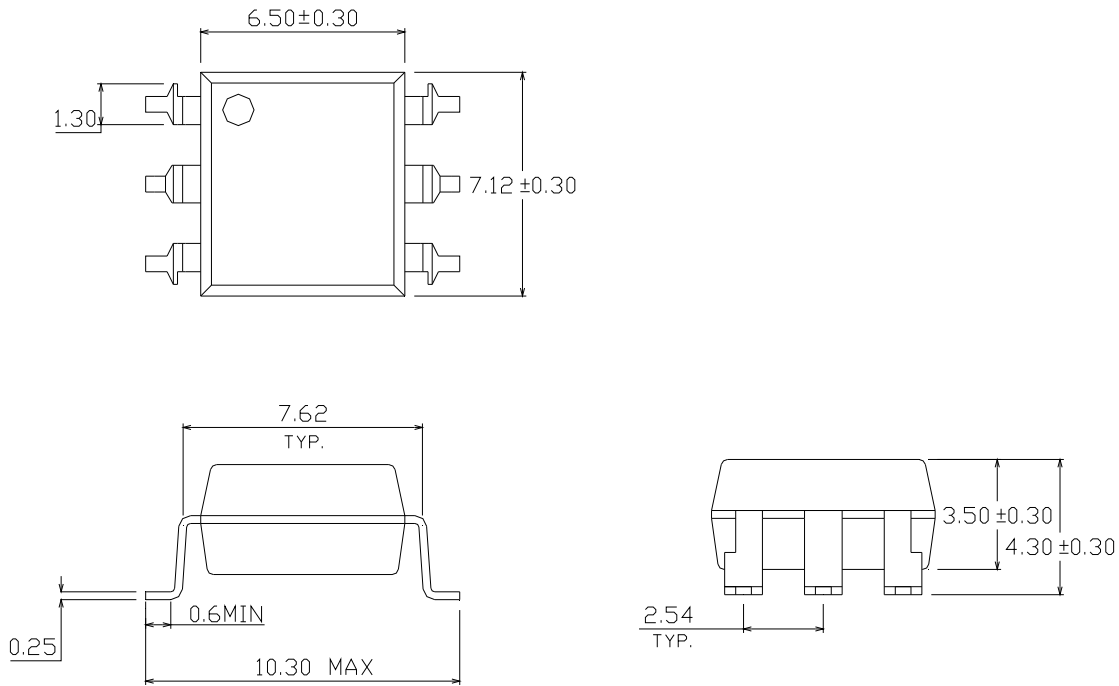


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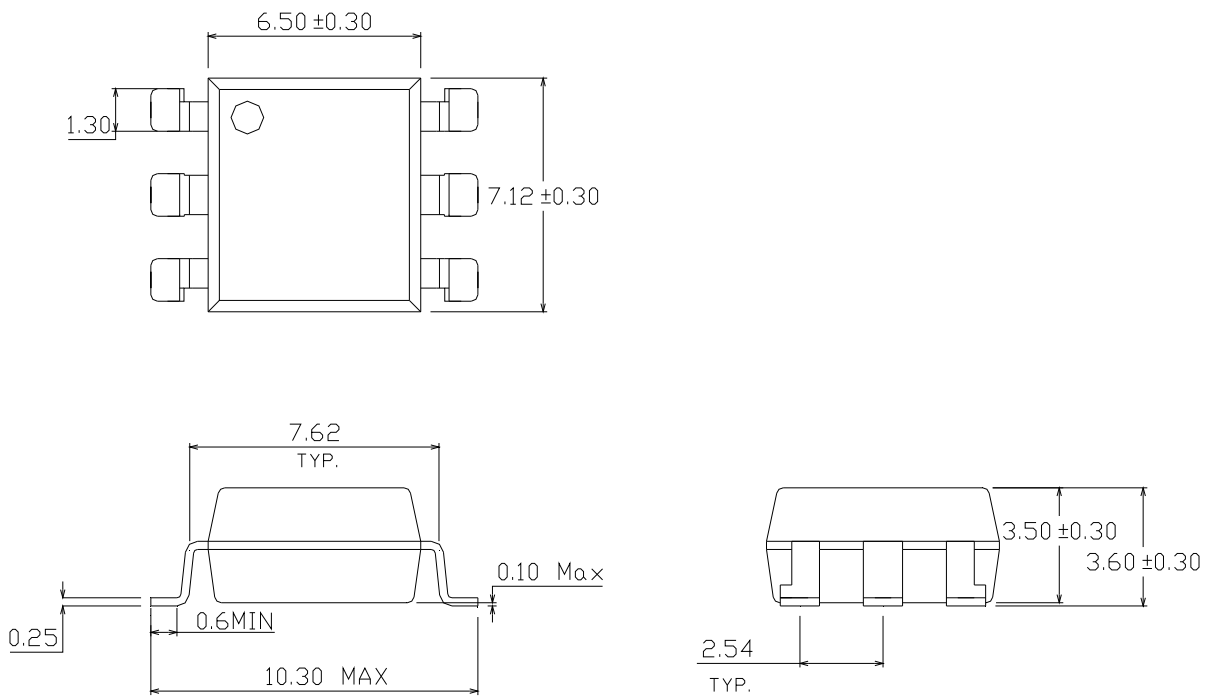
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Option S Type



Option S1 Type



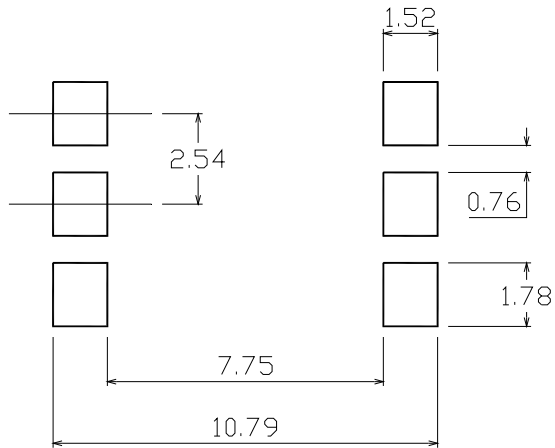


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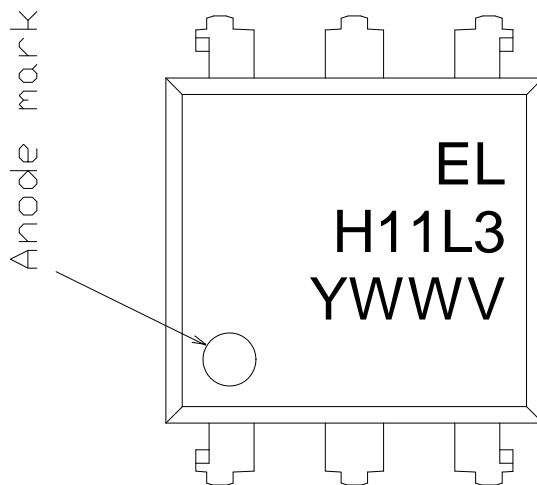
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Recommended pad layout for surface mount leadform



Device Marking



Notes

- EL denotes Everlight
- H11L3 denotes Device Number
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE (optional)



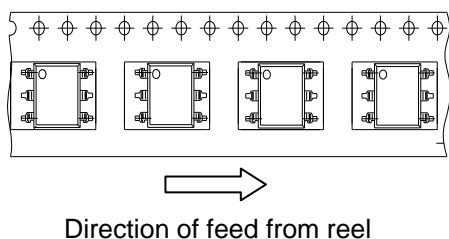
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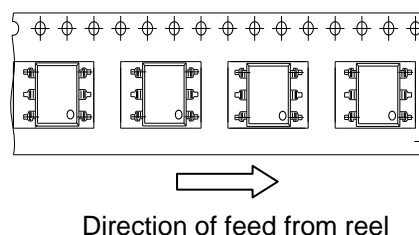
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Tape & Reel Packing Specifications

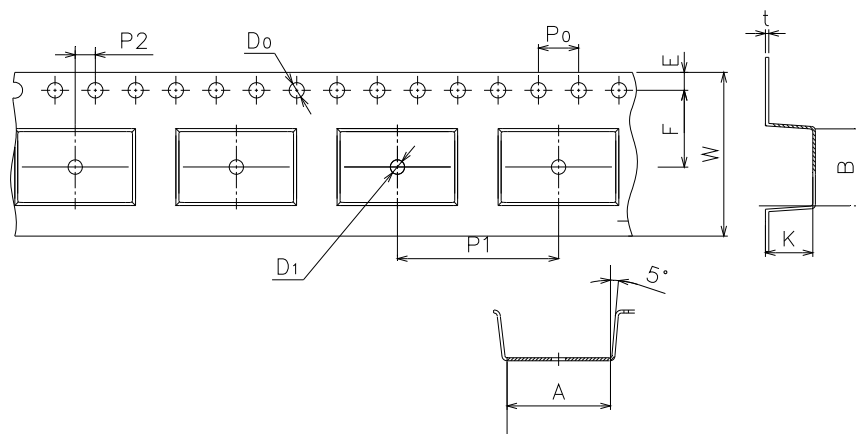
Option TA



Option TB



Tape dimensions



| Dimension No. | A | B | Do | D1 | E | F |
|----------------|----------|----------|---------|------------|----------|---------|
| Dimension (mm) | 10.4±0.1 | 7.52±0.1 | 1.5±0.1 | 1.5+0.1/-0 | 1.75±0.1 | 7.5±0.1 |

| Dimension No. | Po | P1 | P2 | t | W | K |
|----------------|----------|---------|---------|-----------|----------|---------|
| Dimension (mm) | 4.0±0.15 | 1.6±0.1 | 2.0±0.1 | 0.35±0.03 | 16.0±0.2 | 4.5±0.1 |

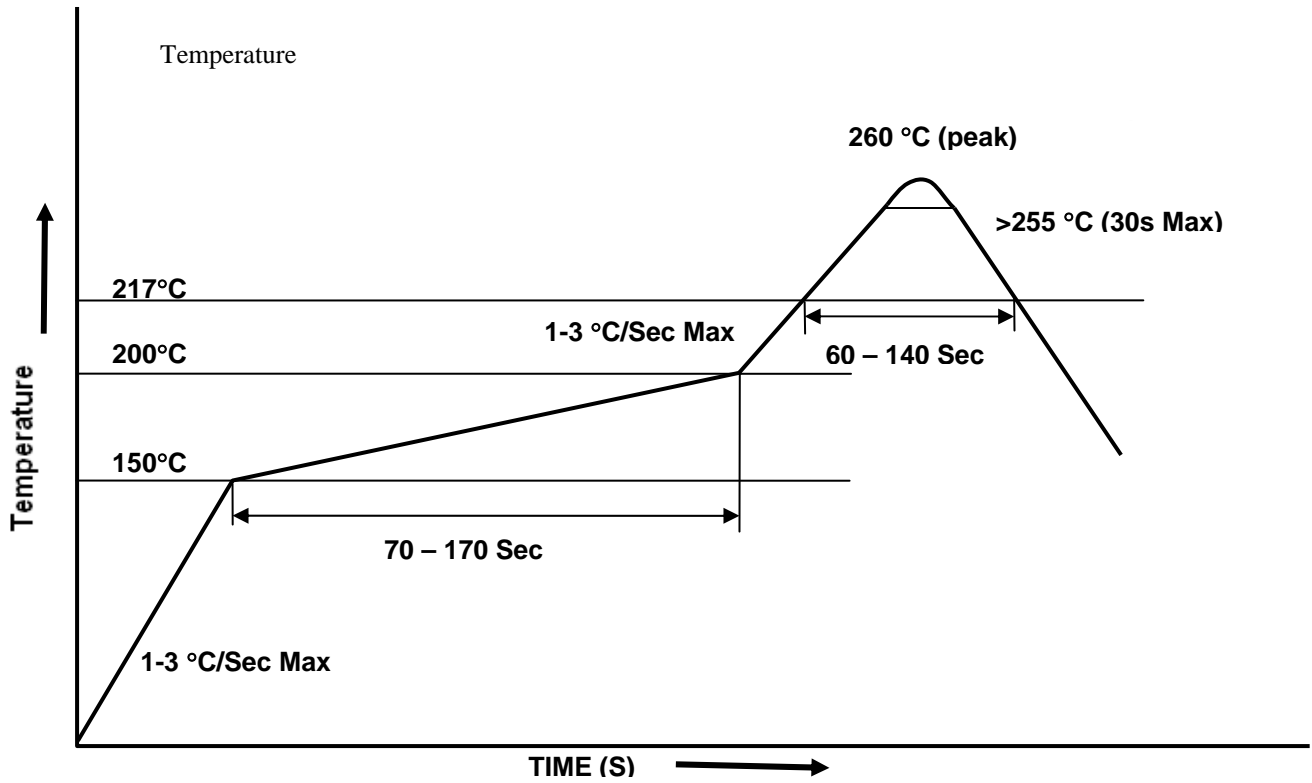


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Solder Reflow Temperature Profile





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Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru