



### 7PIN DIP PHOTO POWER TRIAC PHOTOCOUPLER ELRX223 Series

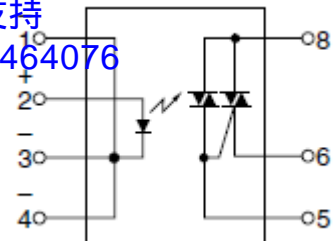
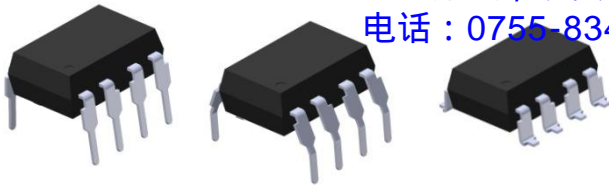
香港至恩科技有限公司

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|             |         |
|-------------|---------|
| LED Anode   | 2       |
| LED Cathode | 1, 3, 4 |
| Triac Gate  | 5       |
| Triac T1    | 6       |
| Triac T2,,  | 8       |

#### Features

- Low trigger current  $I_{FT}$  10mA
- Peak off state voltage 600V
- Load current 0.3 · 0.6 · 0.9 · 1.2A
- Wide operating temperature range of -40°C to 85°C
- High isolation voltage between input and output (Viso=5000 Vrms)
- Pb free and RoHS compliant
- UL and cUL approved (No.E214129)
- VDE approved (No.40028391)
- NEMKO(approved)
- FIMKO(approved)

#### Description

The ELRX223 series of devices are each consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon random phase photo triac and a main output triac. They are designed for interfacing between electronic controls and loads to control inductive for 115 to 240 VAC operations. They are packaged in 8pin DIP package and available in surface mount SMD option.

#### Applications

- Home appliances
- Industrial equipment
- Switching motors, fans, heaters, solenoids and valces.
- Power control such as lighting and temperature control

**Absolute Maximum Ratings (Ta=25°C, unless otherwise specified)**

| Parameter                           |   | Symbol     | Rating | Unit |
|-------------------------------------|---|------------|--------|------|
| Input                               | Forward Current                                 | $I_F$      | 60     | mA   |
|                                     | Reverse Voltage                                 | $V_R$      | 6      | V    |
|                                     | Peak Forward Current* <sup>1</sup>              | $I_{FP}$   | 1      | A    |
| Output                              | Repetitive peak OFF-state Voltage* <sup>2</sup> | $V_{DRM}$  | 600    | V    |
|                                     |   | ELR0223    | 0.3    |      |
|                                     | ON-state  | ELR1223    | 0.6    |      |
|                                     | RMS current                                     | ELR2223    | 0.9    | A    |
|                                     |   | ELR3223    | 1.2    |      |
|                                     | Non-repetitive surge current* <sup>3</sup>      | ELR0223    | 3      | A    |
|                                     |   | ELR1223    | 6      |      |
|                                     |   | ELR2223    | 9      |      |
|                                     |   | ELR3223    | 12     |      |
|                                     | Isolation Voltage* <sup>4</sup>                 | $V_{iso}$  | 5000   | Vrms |
| Storage Temperature                 | $T_{STG}$                                       | -40 to 125 | °C     |      |
| Operating Temperature               | $T_{OPR}$                                       | -40 to 85  | °C     |      |
| Soldering Temperature* <sup>5</sup> | $T_{SOL}$                                       | 260        | °C     |      |

Notes:

\*1 f =100Hz, Duty Cycle = 0.1%

\*2 Sine wave, 50 to 60Hz,  $I_{FT}=0mA$ .

\*3 f=60Hz, one cycle.

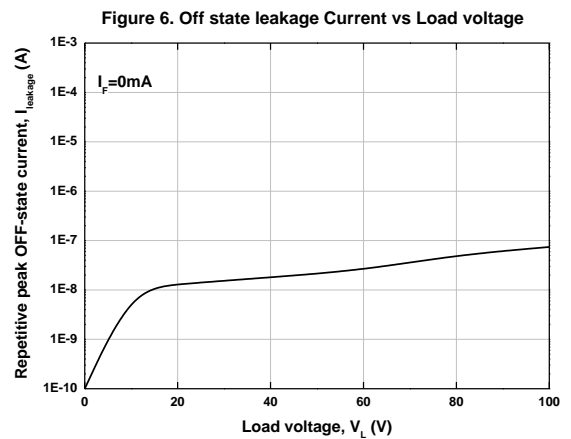
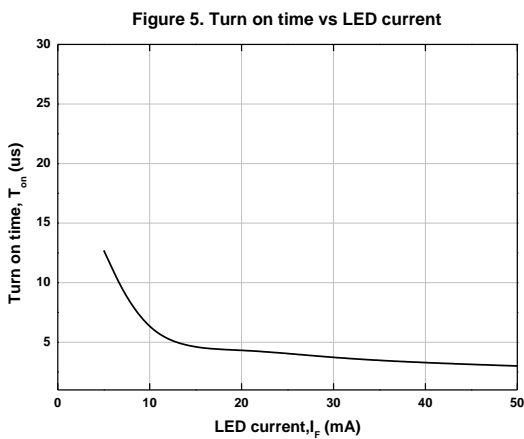
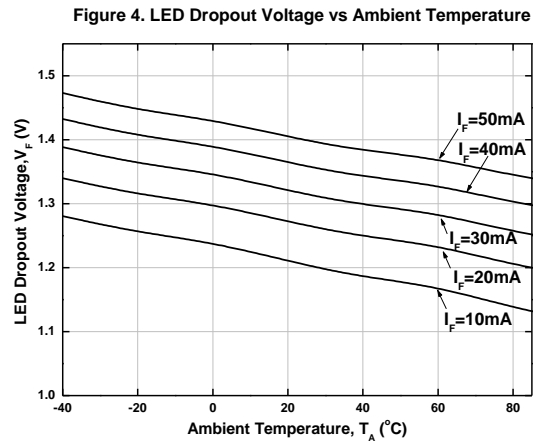
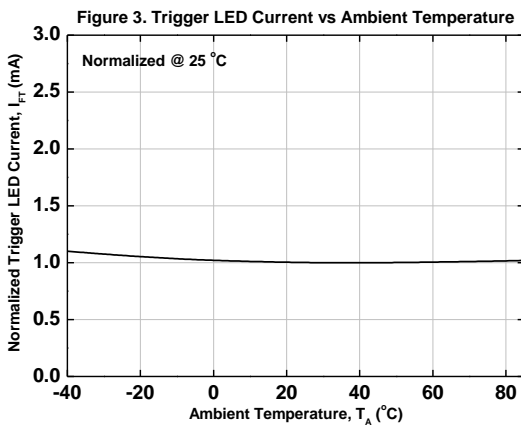
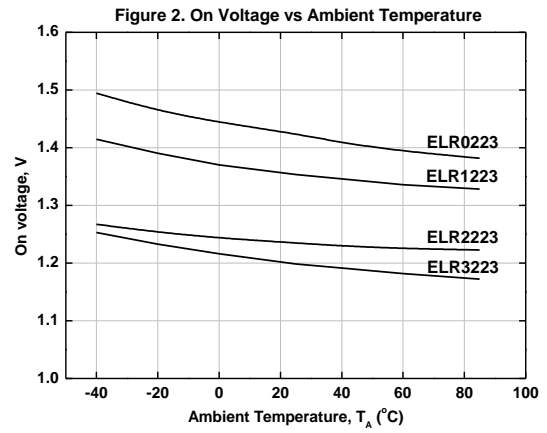
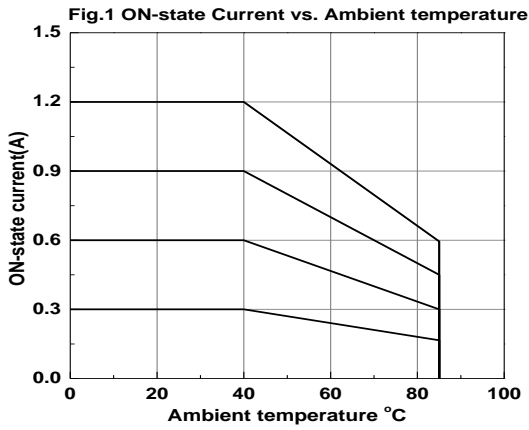
\*4 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2, 3, 4 are shorted together, and pins 5, 6, 7, 8 are shorted together.

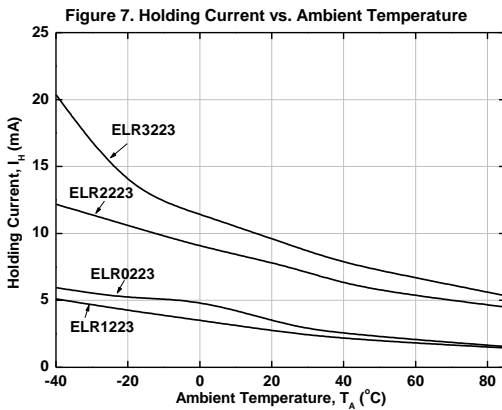
\*5 For 10 seconds

**Electro-Optical Characteristics (Ta=25°C)**

|                          | Parameter                                  | Symbol           | Condition   | Min. | Typ.               | Max. | Unit          |
|--------------------------|--|------------------|---|------|--------------------|------|---------------|
| Input                    | Forward Voltage                            | $V_F$            | $I_F=20\text{mA}$                                       | -    | 1.2                | 1.4  | V             |
|                          | Reverse Current                            | $I_R$            | $V_R=6\text{V}$   | -    | -                  | 10   | $\mu\text{A}$ |
| Output                   | Repetitive peak Off State Current          | $I_{\text{DRM}}$ | $I_F=0\text{mA}, V_{\text{DRM}}=600\text{V}$            | -    | -                  | 100  | $\mu\text{A}$ |
|                          | On state Voltage                           | $V_{\text{TM}}$  | $I_F = 10\text{mA}, I_{\text{TM}} = \text{MAX.}$        | -    | -                  | 2.5  | V             |
|                          | Critical rate of rise of OFF state voltage | $dV/dt$          | $V_{\text{DRM}}=600\text{V} \times 1/\sqrt{2}$          | 200  | -                  | -    | V/us          |
|                          | Holding Current                            | $I_H$            | -   | -    | -                  | 25   | mA            |
| Transfer Characteristics | Minimum trigger Current                    | $I_{\text{FT}}$  | $V_D=6\text{V}, R_L=100\Omega$                          | -    | -                  | 10   | mA            |
|                          | Turn On Time                               | $T_{\text{on}}$  | $I_F = 20 \text{ mA}, V_D = 6\text{V}, R_L = 100\Omega$ | -    | -                  | 10   | $\mu\text{s}$ |
|                          | Isolation Resistance                       | $R_{\text{I-O}}$ | $V_{\text{I-O}}=500\text{V DC}, 40 \text{ to } 60\%RH$  | -    | $5 \times 10^{11}$ | -    | $\Omega$      |

Typical Electro-Optical Characteristics Curves





## Order Information

### Part Number

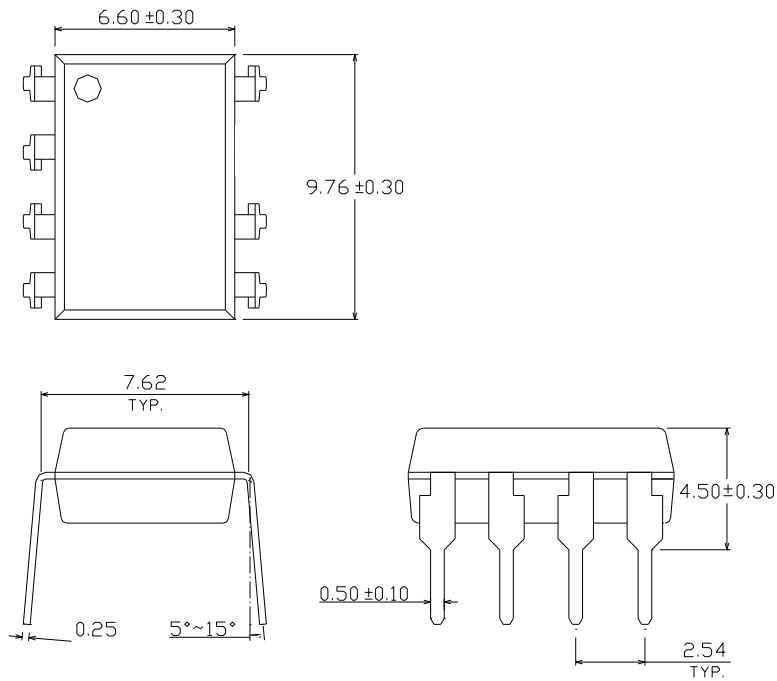
**ELRX223Y(Z)-V**

### Note

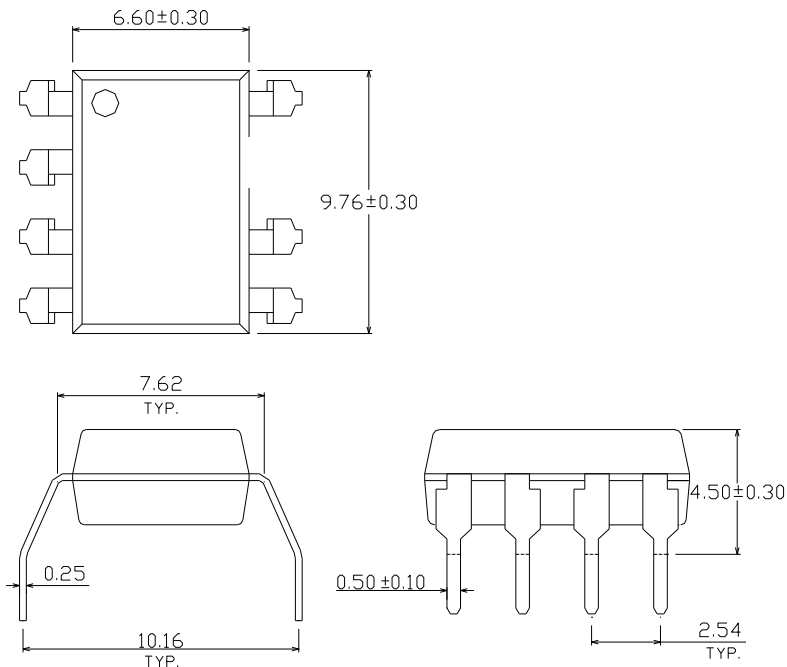
- X = (0or 1 or 2 or 3) for ELX223 part no.
- Y = Lead form option (S, S1, M or none)
- Z = Tape and reel option (TA, TB or none).
- V = VDE (optional)

| Option  | Description   | Packing quantity    |
|---------|---|---------------------|
| None    | Standard DIP-8  | 45 units per tube   |
| M       | Wide lead bend (0.4 inch spacing)                             | 45 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 |

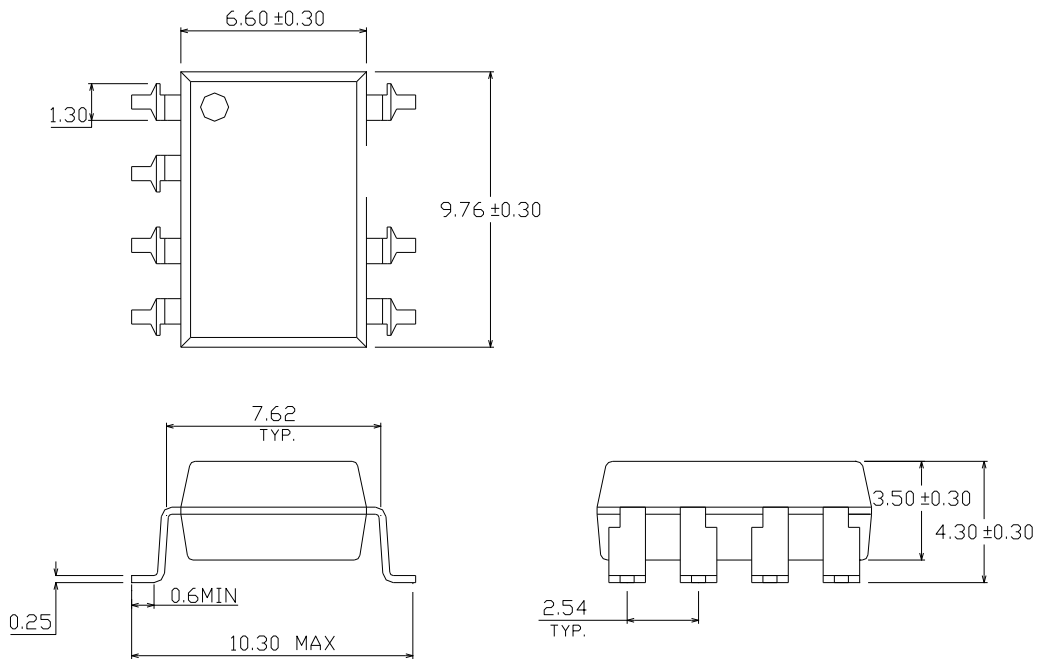
**Package Dimension**  
Standard DIP Type



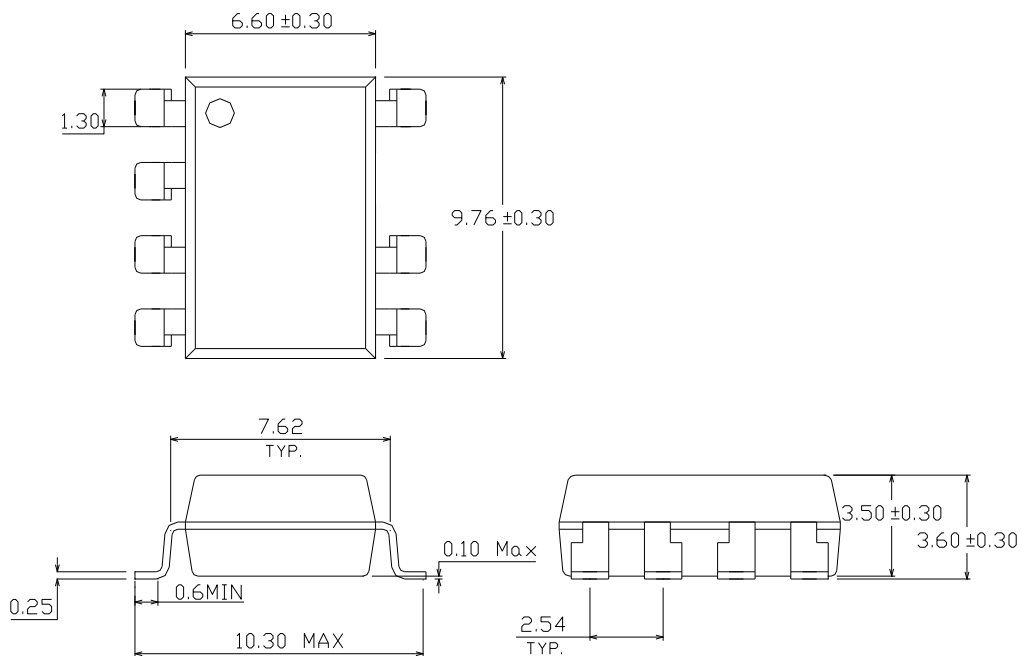
**Option M Type**



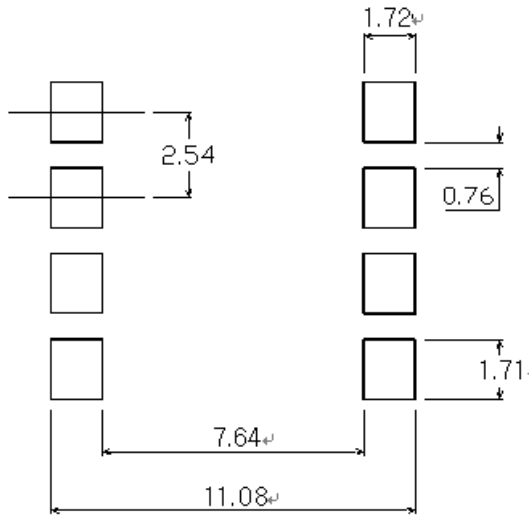
Option S Type



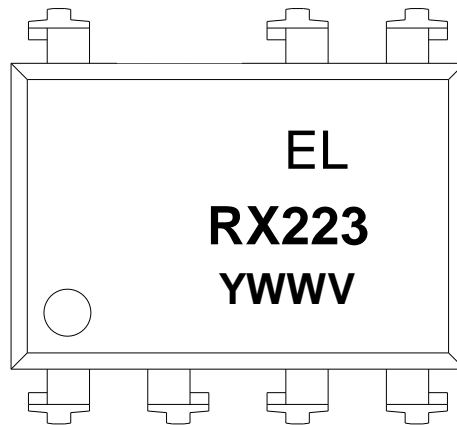
Option S1 Type



**Recommended pad layout for surface mount leadform**



**Device Marking**



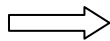
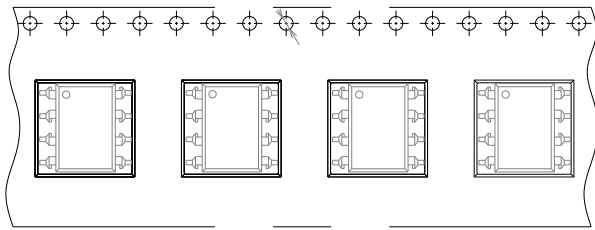
**Notes**

- EL denotes EVERLIGHT
- RX223 denotes Device Number(X = 0 or 1 or 2 or 3 for ELX223 part no.)
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE (optional)



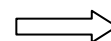
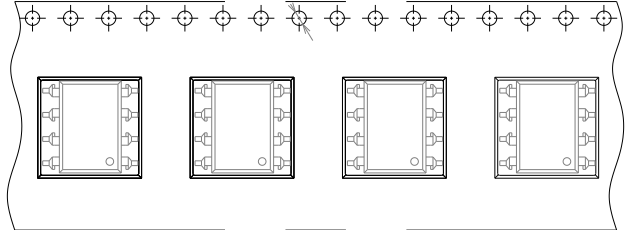
**Tape & Reel Packing Specifications**

**Option TA**



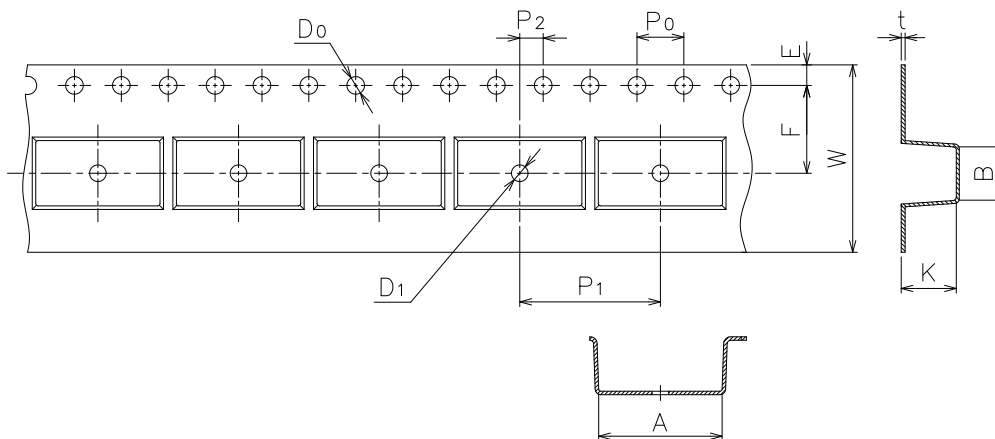
Direction of feed from reel

**Option TB**



Direction of feed from reel

**Tape dimension**

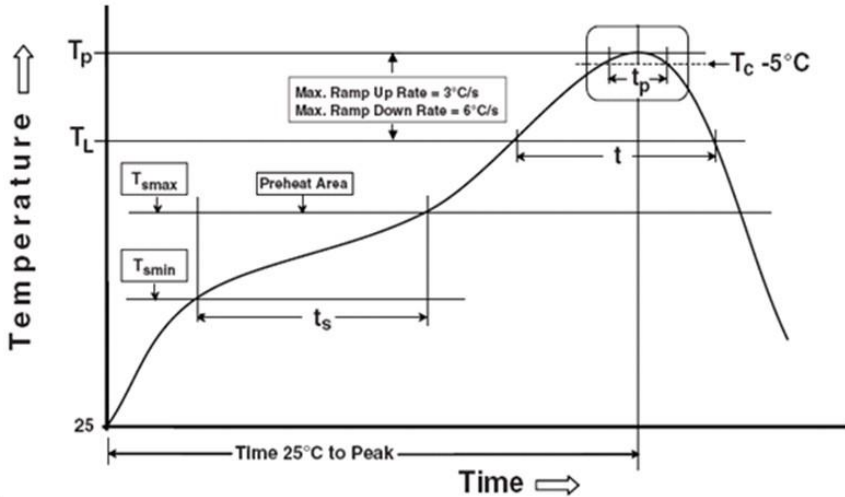


|               |           |           |            |             |           |          |
|---------------|-----------|-----------|------------|-------------|-----------|----------|
| Dimension No. | <b>A</b>  | <b>B</b>  | <b>Do</b>  | <b>D1</b>   | <b>E</b>  | <b>F</b> |
| Dimension(mm) | 10.4±0.1  | 10.0±0.1  | 1.5+0.1/-0 | 1.5±0.25/-0 | 1.75±0.1  | 7.5±0.1  |
| Dimension No. | <b>Po</b> | <b>P1</b> | <b>P2</b>  | <b>t</b>    | <b>W</b>  | <b>K</b> |
| Dimension(mm) | 4.0±0.1   | 12.0±0.1  | 2.0±0.05   | 0.4±0.05    | 16.0±0.3/ | 4.5±0.1  |

## Precautions for Use

### 1. Soldering Condition

#### 1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



Note:

Reference: IPC/JEDEC J-STD-020D

#### Preheat

|  |                 |
|--|-----------------|
| Temperature min ( $T_{smin}$ )               | 150 °C          |
| Temperature max ( $T_{smax}$ )               | 200°C           |
| Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )  | 60-120 seconds  |
| Average ramp-up rate ( $T_{smax}$ to $T_p$ ) | 3 °C/second max |

#### Other

|  |                  |
|--|------------------|
| Liquidus Temperature ( $T_L$ )                                       | 217 °C           |
| Time above Liquidus Temperature ( $t_L$ )                            | 60-100 sec       |
| Peak Temperature ( $T_p$ )   | 260°C            |
| Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$ | 30 s             |
| Ramp- Down Rate from Peak Temperature                                | 6°C /second max. |
| Time 25°C to peak temperature  | 8 minutes max.   |
| Reflow times   | 3 times          |

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