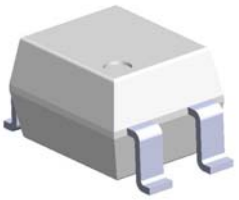
# 4 PIN DIP VERY HIGH ISOLATION VOLTAGE PHOTOCOUPLER

# CNY64S series

## Features

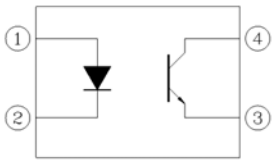


- High Voltage
  $BV_{CEO}$=80V (min.)
- Operating temperature up to +85°C
- High isolation voltage between input and output
  $V_{IOTM}$ = 8200 V perk for CNY64
  $V_{IOTM}$ = 10000 V perk for CNY64-V
- Rated recurring peak voltage (repetitive)
  $V_{IORM}$ = 2200 V
- Creepage current resistance according to VDE 0303/IEC 60112
  comparative tracking index: CTI ≥ 200
- Thickness through insulation ≧3mm
- Pb free and RoHS compliant.
- CUL approved (No. E214129)
- VDE approved (No. 40027351)
- FIMKO approved (No. 25464)

## Description

The CNY64S series contains an infrared emitting diode optically coupled to a phototransistor.

These device is packaged in an 4-pin SMD package and providing a distance between input and output for highest safety requirement of >3mm.




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

## Applications

- Switch mode power supply
- Line receiver
- Computer peripheral interface
- Microprocessor system interface
- Circuits for safe protective separation against electrical shock according to safety class II (reinforced isolation):
  - for appl. class I - IV at mains voltage ≤ 300 V
  - for appl. class I - IV at mains voltage ≤ 600 V
  - for appl. class I - III at mains voltage ≤ 1000 V

  according to DIN EN 60747-5-5

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## Absolute Maximum Ratings ($T_a$=25°C)

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Input | Forward current | $I_F$ | 75 | mA |
| | Peak forward current (<10μs) | $I_{FM}$ | 1.5 | A |
| | Reverse voltage | $V_R$ | 5 | V |
| | Power dissipation | $P_D$ | 120 | mW |
| Output | Collector current | $I_C$ | 50 | mA |
| | Collector power dissipation | $P_C$ | 150 | mW |
| | Collector-Emitter voltage | $V_{CEO}$ | 80 | V |
| | Emitter-Collector voltage | $V_{ECO}$ | 7 | V |
| Total power dissipation | | $P_{tot}$ | 250 | mW |
| Isolation voltage *1 | | $V_{iso}$ | 8200 | Vrms |
| Operating temperature | | $T_{opr}$ | -55~+85 | °C |
| Storage temperature | | $T_{stg}$ | -55~+100 | °C |
| Soldering temperature *2 | | $T_{sol}$ | 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 2mm from case, <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 | $V_F$ | - | 1.6 | 2.0 | V | $I_F$ = 50mA |
| Reverse current | $I_R$ | - | - | 10 | μA | $V_R$ = 5V |
| Input capacitance | $C_{in}$ | - | - | 100 | pF | V = 0, f = 1MHz |

### Output

| Parameter | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|---|---|---|---|---|---|---|
| Collector-Emitter dark current | $I_{CEO}$ | - | - | 200 | nA | $V_{CE}$ = 20V, $I_F$=0mA |
| Collector-Emitter breakdown voltage | $BV_{CEO}$ | 80 | - | - | V | $I_C$ = 1mA |
| Emitter-Collector breakdown voltage | $BV_{ECO}$ | 7 | - | - | V | $I_E$ = 0.1mA |
| Collector-Emitter capacitance | $C_{CE}$ | - | - | 50 | pF | $V_{CE}$ = 0V, f = 1MHz |

### Transfer Characteristics

| Parameter | | Symbol | Min. | Typ.* | Max. | Unit | Condition |
|---|---|---|---|---|---|---|---|
| Current Transfer Ratio | CNY64 | CTR | 50 | - | 300 | % | $I_F$ = 5mA ,$V_{CE}$ = 5V |
| | CNY64A | | 63 | - | 125 | | |
| | CNY64B | | 100 | - | 200 | | |
| Collector-emitter saturation voltage | | $V_{CE(sat)}$ | - | - | 0.3 | V | $I_F$ = 10mA , $I_C$ = 1mA |
| Coupling capacitance | | $C_{IO}$ | - | 0.3 | - | pF | f=1MHz |
| Isolation resistance | | $R_{IO}$ | $10^{11}$ | - | - | Ω | $V_{IO}$ = 500Vdc |
| Turn-on time | | $T_{on}$ | - | 6 | 18 | μs | $V_{CC}$ = 5V, $I_C$ = 5mA, $R_L$ = 100Ω |
| Turn-off time | | $T_{off}$ | - | 7 | 18 | | |
| Rise time | | tr | - | 3 | 18 | | $V_{CC}$ = 5V, $I_C$ = 5mA, $R_L$ = 100Ω |
| Fall time | | tf | - | 5 | 18 | | |

* Typical values at $T_a$ = 25°C

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## Typical Performance Curves

Figure 1. Forward Current vs. Forward Voltage

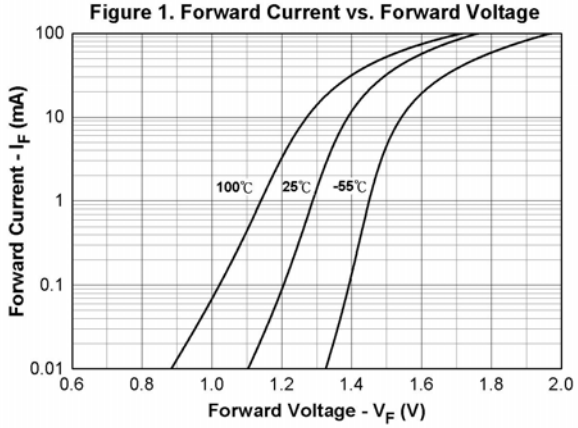


Figure 2. Normalized Current Transfer Ratio vs. Forward Current

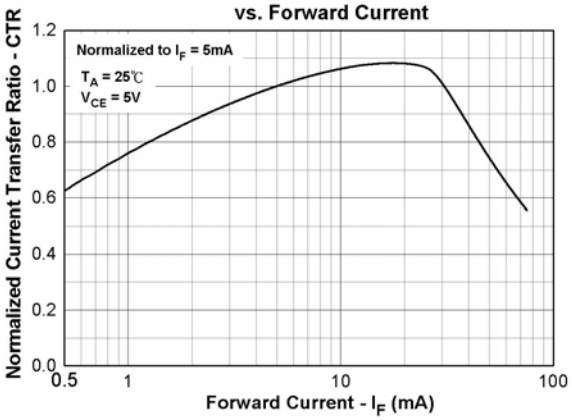


Figure 3. Normalized Current Transfer Ratio vs. Ambient Temperature

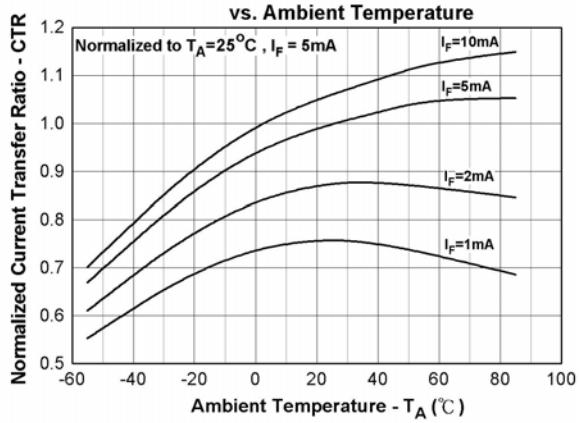


Figure 4. Collector Current vs. Forward Current

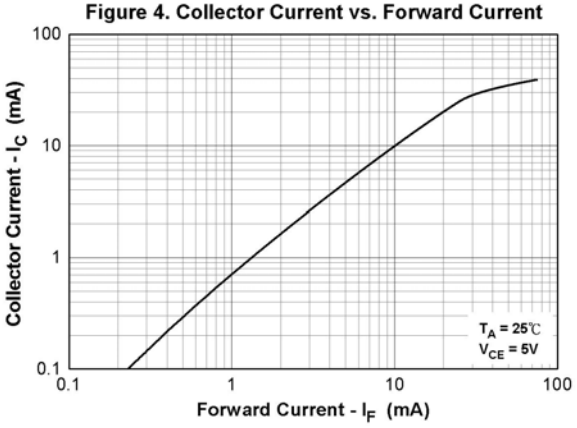


Figure 5. Collector-Emitter Saturation Voltage vs. Collector Current

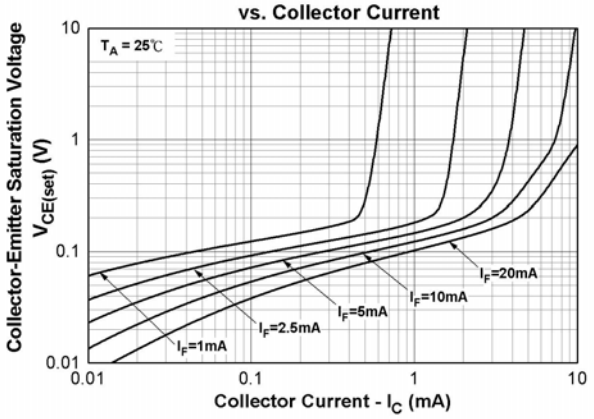


Figure 6. Collector Current vs. Collector Emitter Voltage

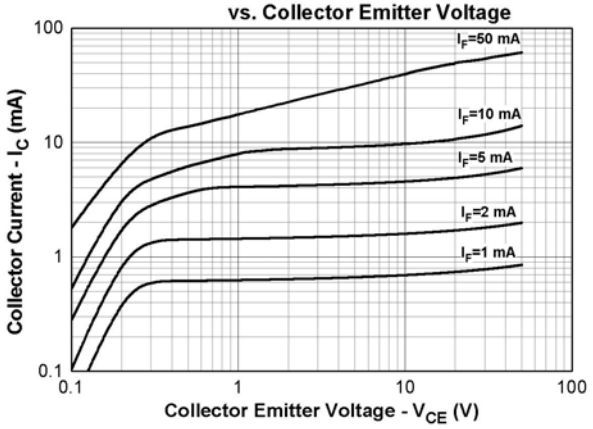

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Figure.7 Collector Dark Current vs. Ambient Temperature

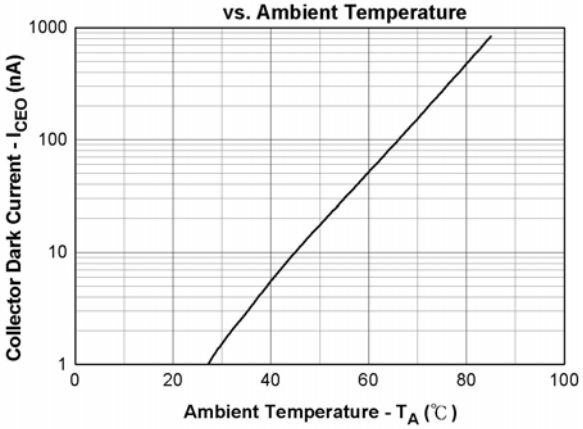



Figure 8. Turn on/off Time vs. Forward Current

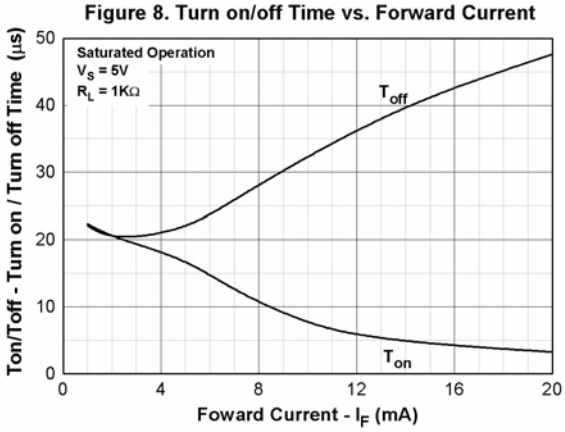
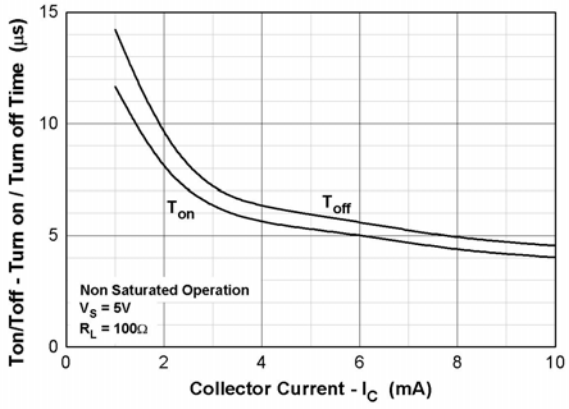



Figure 9. Turn on/off Time vs. Collector Current



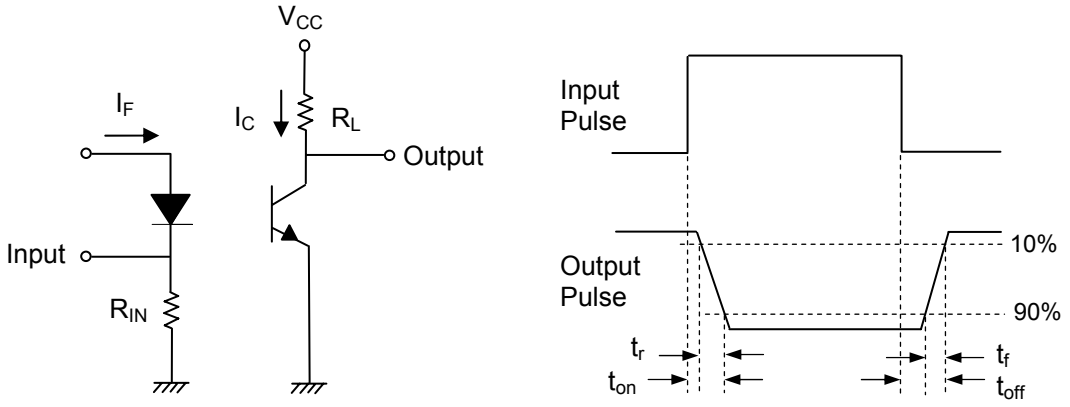




**Figure 10. Switching Time Test Circuit & Waveforms**

## Order Information

### Part Number

# CNY64SX-V

Note
X = CTR rank option (A, B or none)
V = VDE safety (optional)

| Option | Description | Packing quantity |
|---|---|---|
| CNY64S | Standard | 60 units per tube |
| CNY64S-V | Standard + VDE | 60 units per tube |
| CNY64S(TA) | Standard | 500 units per tube |

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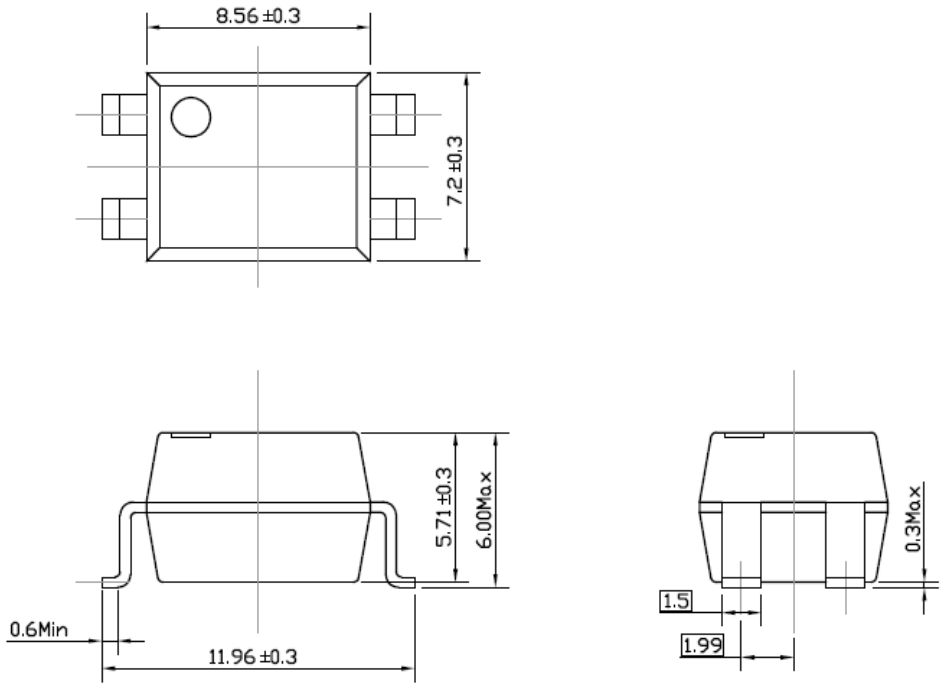
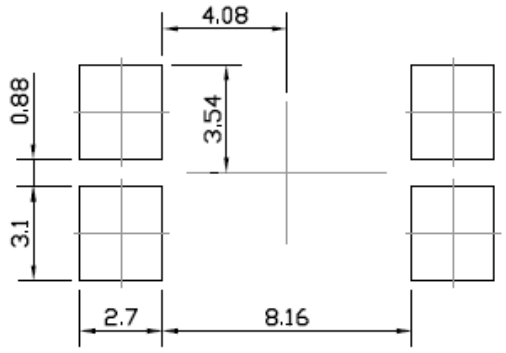
## Package Drawings

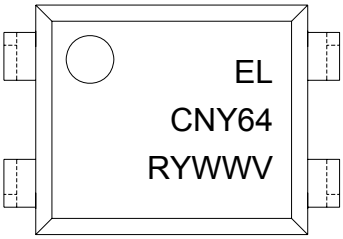
**(Dimensions in mm)**




## Recommended pad layout for surface mount leadform



## Device Marking




**Notes**

| | |
|---|---|
| EL | denotes Everlight |
| CNY64 | denotes Part no. |
| R | denotes CTR rank (A or B) |
| Y | denotes 1 digit Year code |
| WW | denotes 2 digit Week code |
| V | denotes VDE safety (optional) |

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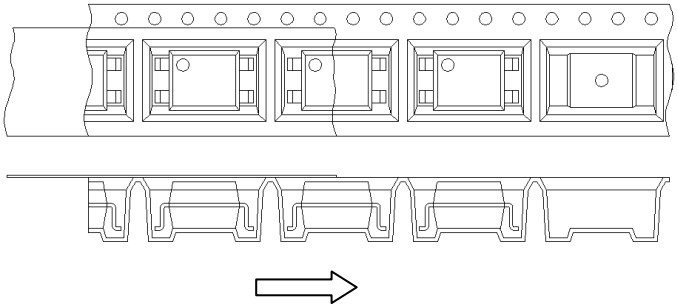
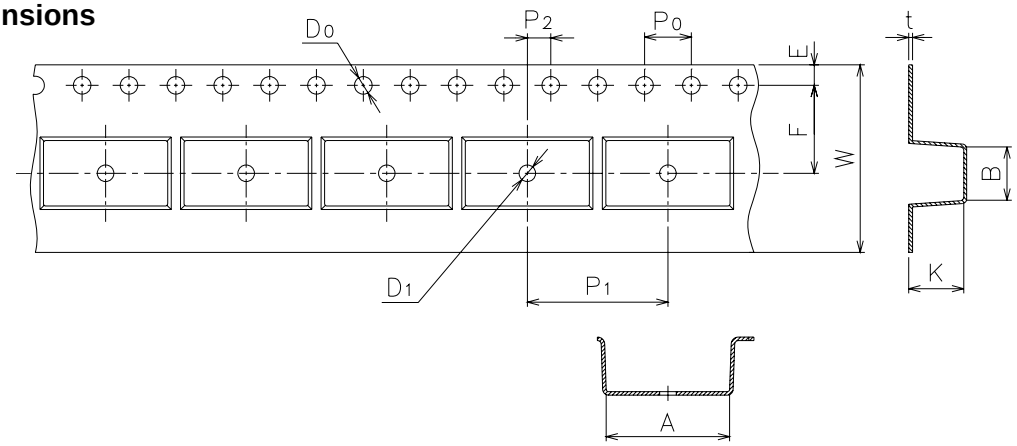
## Tape & Reel Packing Specifications

**Option TA**



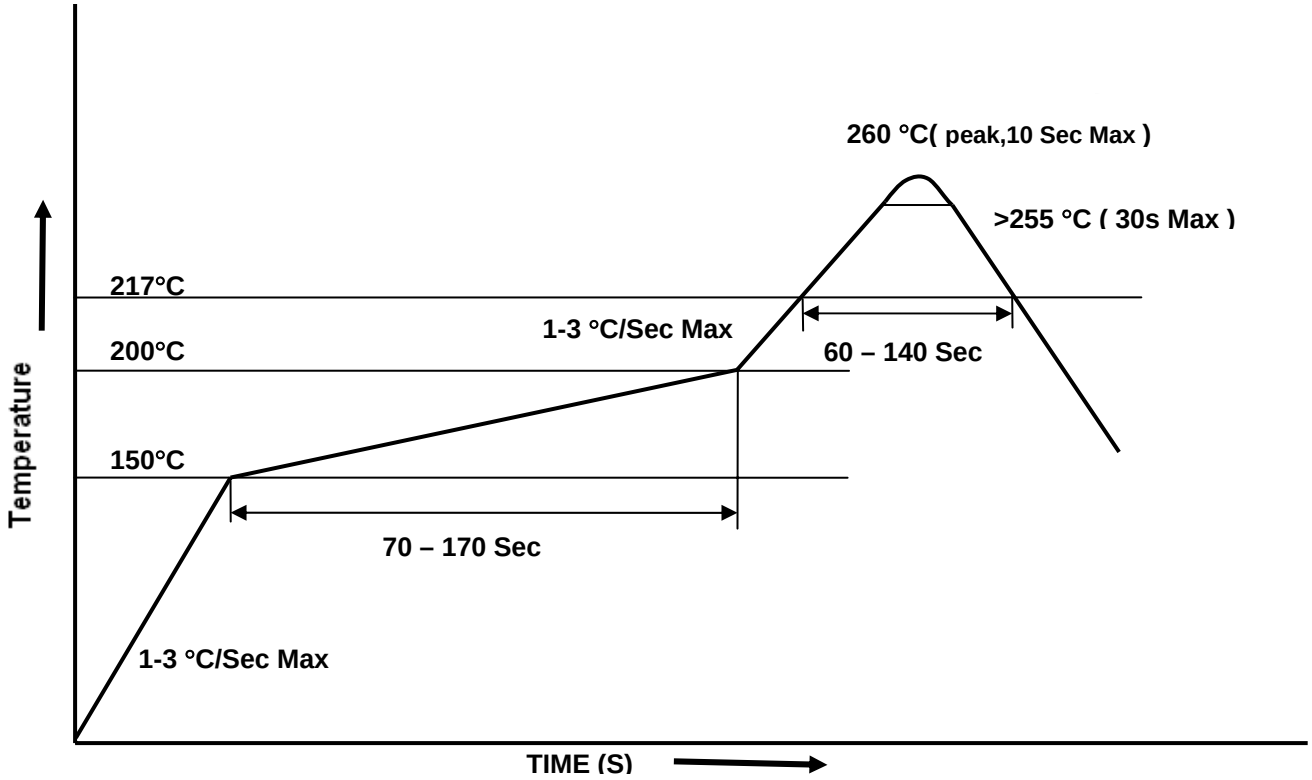
Direction of feed from reel

**Tape dimensions**




| Dimension No. | A | B | Do | D1 | E | F |
|---|---|---|---|---|---|---|
| Dimension(mm) | 12.6±0.1 | 6.6±0.1 | 1.5+0.1/-0 | 1.5±0.1 | 1.75±0.1 | 7.5±0.1 |
| Dimension No. | Po | P1 | P2 | t | W | K |
| Dimension(mm) | 4.0±0.1 | 16.0±0.1 | 2.0±0.1 | 0.5±0.05 | 16.0±0.3 | 7.31±0.1 |

## Solder Reflow Temperature Profile



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