# CT3061, CT3062, CT3063
# CT3081, CT3082, CT3083
# 600V/800V Zero Cross 6-Pin Phototriac Optocoupler

## Features

- High isolation 5000 VRMS
- Peak Breakdown Voltage
  - 600V – CT3061,3062,3063
  - 800V – CT3081,3082,3083
- Temperature range - 55 °C to 100 °C
- Regulatory Approvals
  - UL - UL1577 (E364000)
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC – GB4943.1, GB8898
  - IEC60065, IEC60950

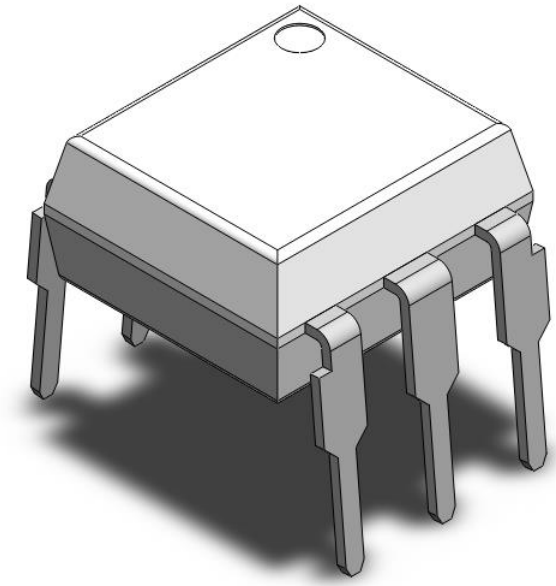
## Description

The CT3061, CT3062, CT3063, CT3081, CT3082 and CT3083 series consists of a Zero Cross Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a 6-lead DIP package with different lead forming options.

## Applications

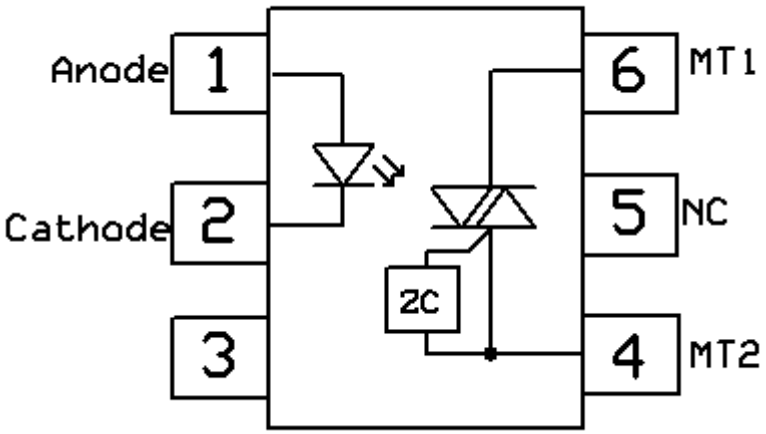
- Motor Controls
- Lamp ballasts
- Static AC Power Switch
- Solenoid/ Valve Control

## Package Outline



*Note: Different lead forming options available. See package dimension.*

## Schematic



## Absolute Maximum Rating at 25°C

| *Symbol* | *Parameters* | | *Ratings* | *Units* | *Notes* |
|---|---|---|---|---|---|
| $V_{ISO}$ | Isolation voltage | | 5000 | $V_{RMS}$ | |
| $T_{OPR}$ | Operating temperature | | -55 ~ +100 | °C | |
| $T_{STG}$ | Storage temperature | | -55 ~ +150 | °C | |
| $T_{SOL}$ | Soldering temperature | | 260 | °C | |
| **Emitter** | | | | | |
| $I_F$ | Forward current | | 60 | mA | |
| $I_{F(TRANS)}$ | Peak transient current (≤1μs P.W,300pps) | | 1 | A | |
| $V_R$ | Reverse voltage | | 6 | V | |
| $P_D$ | Power dissipation | | 100 | mW | |
| **Detector** | | | | | |
| $P_D$ | Power dissipation | | 300 | mW | |
| $V_{DRM}$ | Off-State Output Terminal Voltage | CT3061,3062,3063 | 600 | V | |
| | | CT3081,3082,3083 | 800 | V | |
| $I_{TM}$ | RMS on-state current | | 100 | mA | |
| $I_{TSM}$ | Peak Repetitive Surge Current | | 1 | A | |

## Electrical Characteristics $T_A$ = 25°C (unless otherwise specified)

### Emitter Characteristics

| Symbol | Parameters | Test Conditions | Min | Typ | Max | Units | Notes |
|---|---|---|---|---|---|---|---|
| $V_F$ | Forward voltage | $I_F$=10mA | - | - | 1.5 | V | |
| $I_R$ | Reverse Current | $V_R$ = 6V | - | - | 5 | μA | |
| $C_{IN}$ | Input Capacitance | f= 1MHz | - | 45 | - | pF | |

### Detector Characteristics

| Symbol | Parameters | | Test Conditions | Min | Typ | Max | Units | Notes |
|---|---|---|---|---|---|---|---|---|
| $I_{DRM1}$ | Peak Blocking Current | CT3061,62,63<br>CT3081,82,83 | $I_F$= 0mA, $V_{DRM}$= Rated $V_{DRM}$ | - | - | 500 | nA | |
| $I_{DRM2}$ | Inhibit Leakage Current | | $I_F$= Rated $I_{FT,}$ $V_{DRM}$= Rated $V_{DRM}$ | - | - | 500 | μA | |
| $V_{INH}$ | Inhibit Voltage | | $I_F$= Rated $I_{FT,}$ | - | - | 20 | V | |
| $V_{TM}$ | Peak On-State Voltage | | $I_F$= Rated $I_{FT}$, $I_{TM}$= 100mA | - | - | 3 | V | |
| dv/dt | Critical Rate of Rise off-State Voltage | CT3061,62,63 | $V_{PEAK}$= Rated $V_{DRM}$ | 1000 | - | - | V/μs | |
| | | CT3081,82,83 | | 600 | - | - | | |

### Transfer Characteristics

| Symbol | Parameters | | Test Conditions | Min | Typ | Max | Units | Notes |
|---|---|---|---|---|---|---|---|---|
| $I_{FT}$ | Input Trigger Current | CT3061, CT3081 | Terminal Voltage = 3V<br>$I_{TM}$=100mA | - | - | 15 | mA | |
| | | CT3062, CT3082 | | - | - | 10 | | |
| | | CT3063, CT3083 | | - | - | 5 | | |
| $I_H$ | Holding Current | | Terminal Voltage from “ON” to “OFF”<br>“ON” state $I_F$=0mA | - | 380 | - | μA | |
| $R_{IO}$ | Isolation Resistance | | $V_{IO}$= 500$V_{DC}$ | $1x10^{11}$ | - | - | Ω | |
| $C_{IO}$ | Isolation Capacitance | | f= 1MHz | - | 0.25 | - | pF | |

## Typical Characteristic Curve

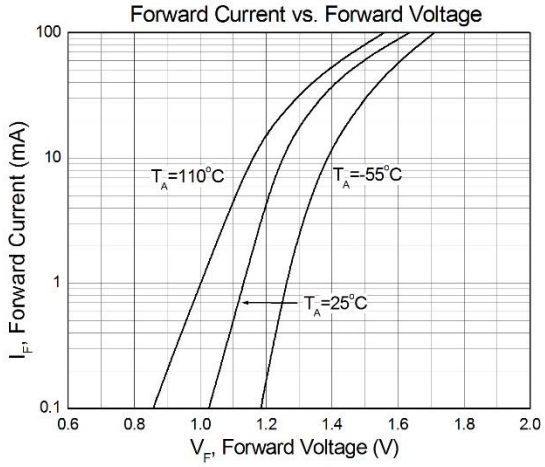



Figure 1

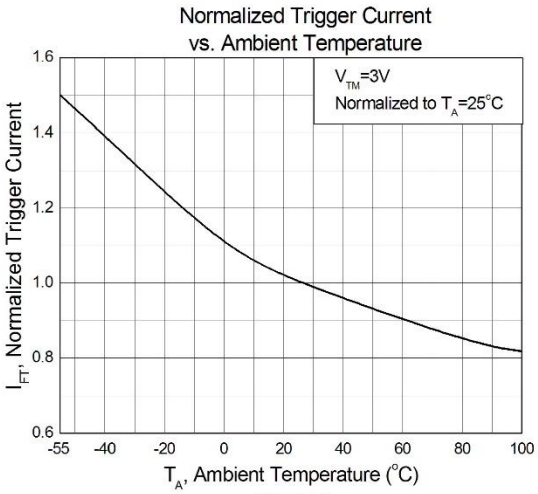



Figure 2

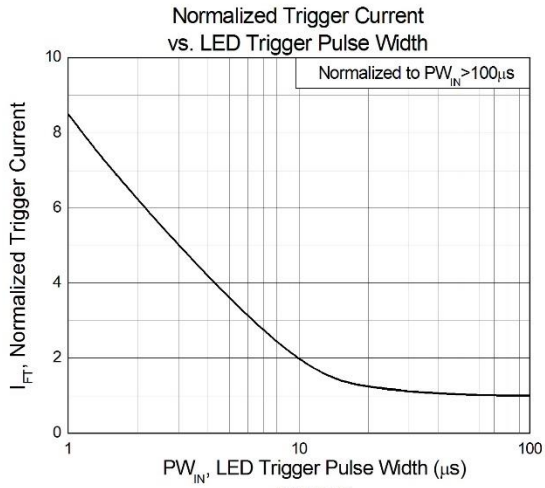



Figure 3

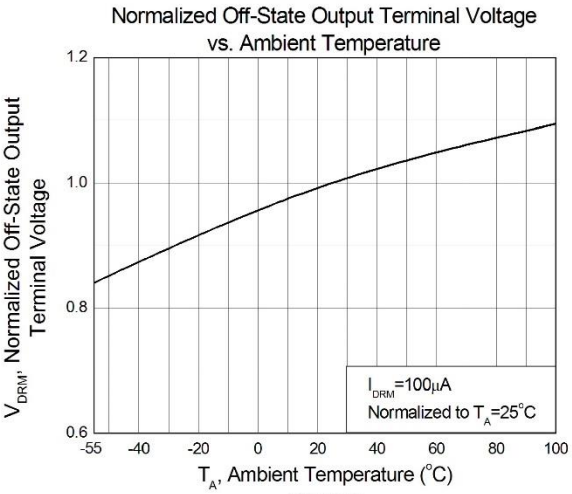



Figure 4

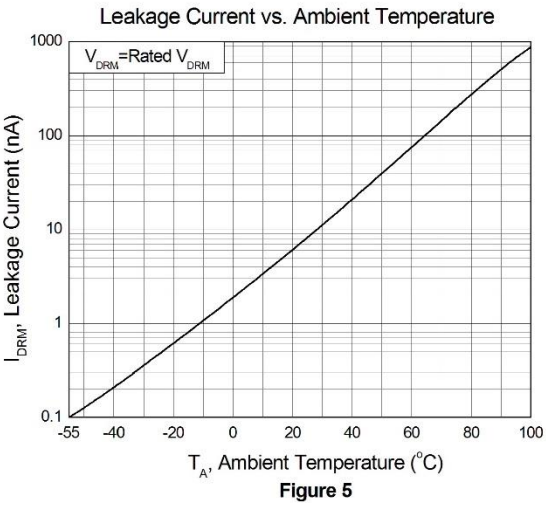



Figure 5

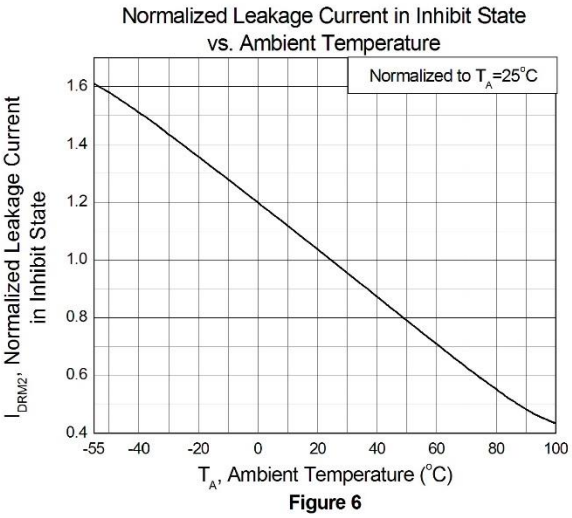



Figure 6

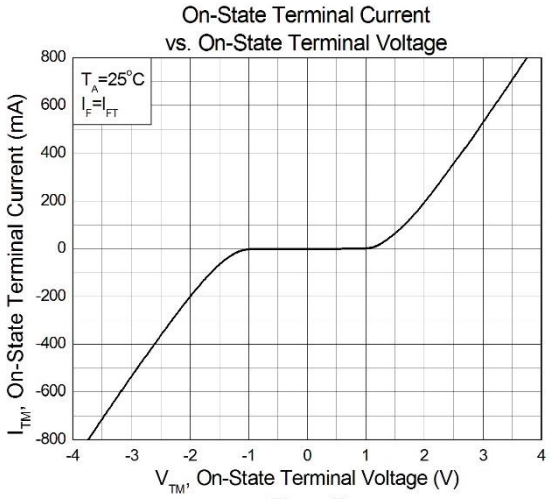



**Figure 7**

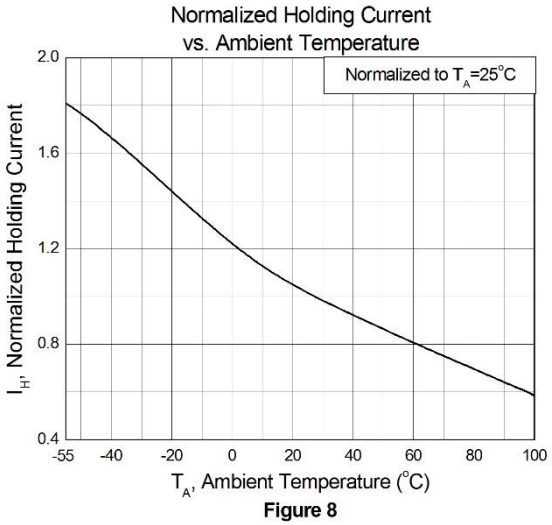



**Figure 8**

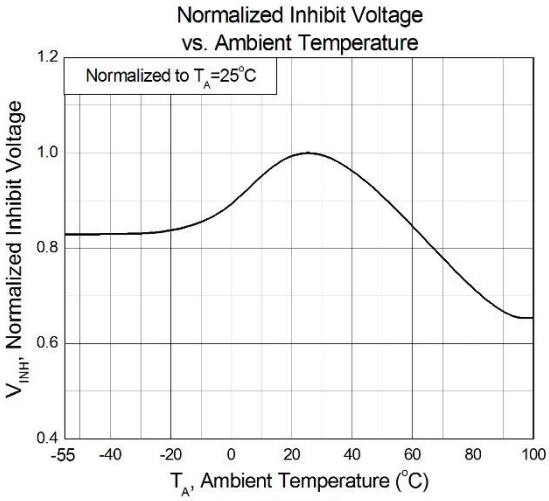
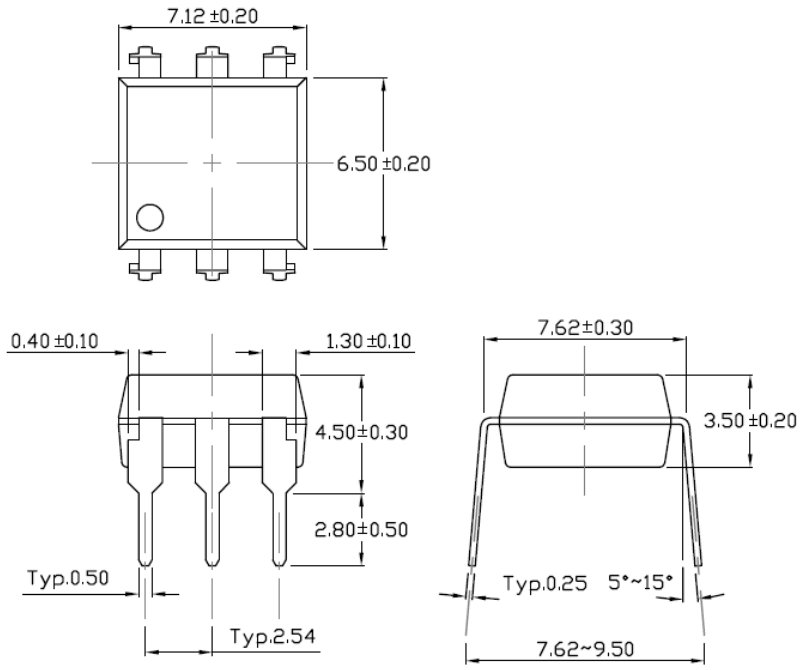


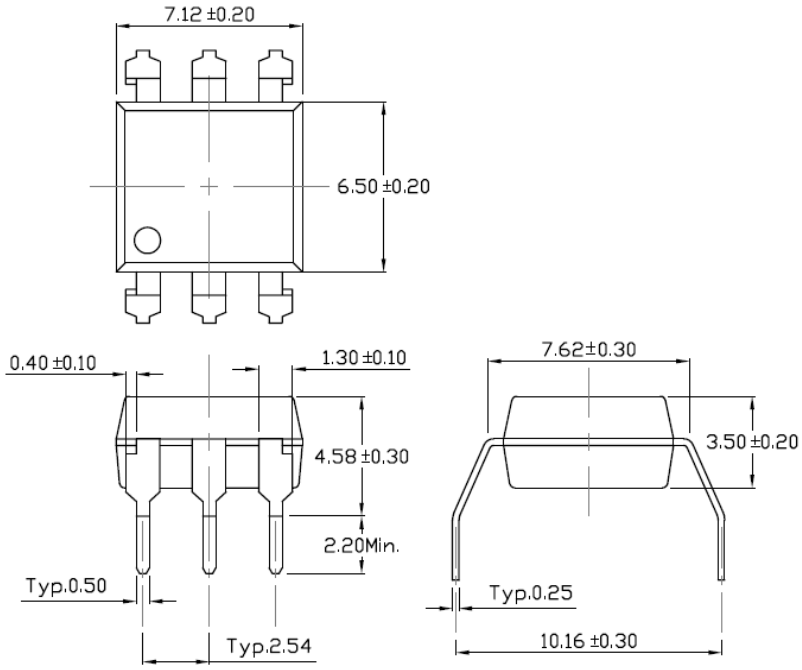

**Figure 9**

## Package Dimension *Dimensions in mm unless otherwise stated*

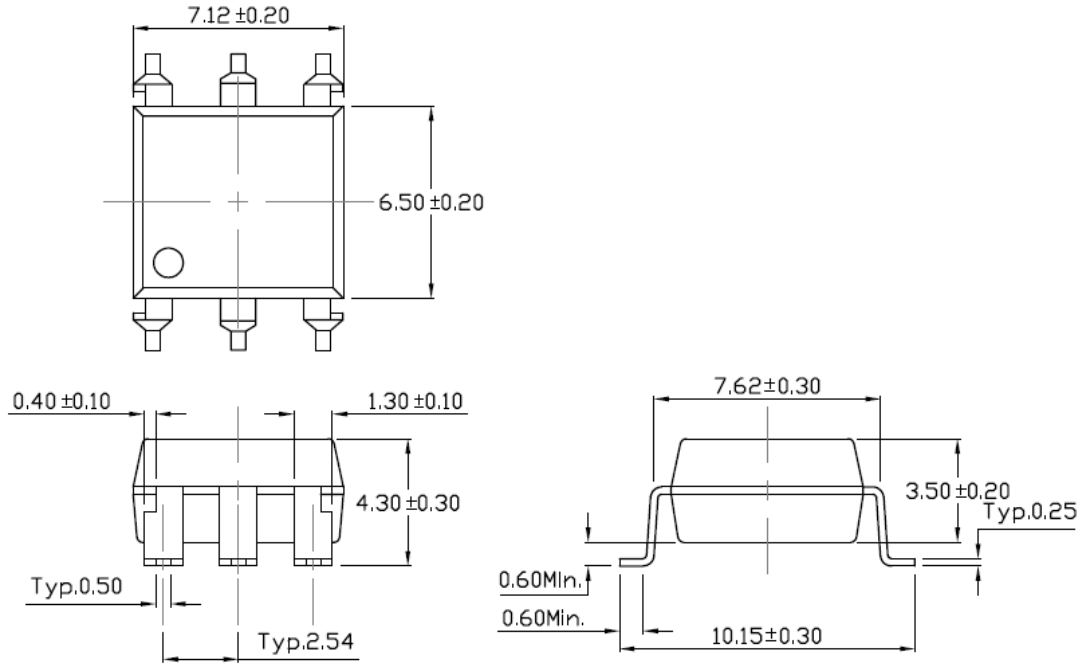
### Standard DIP – Through Hole



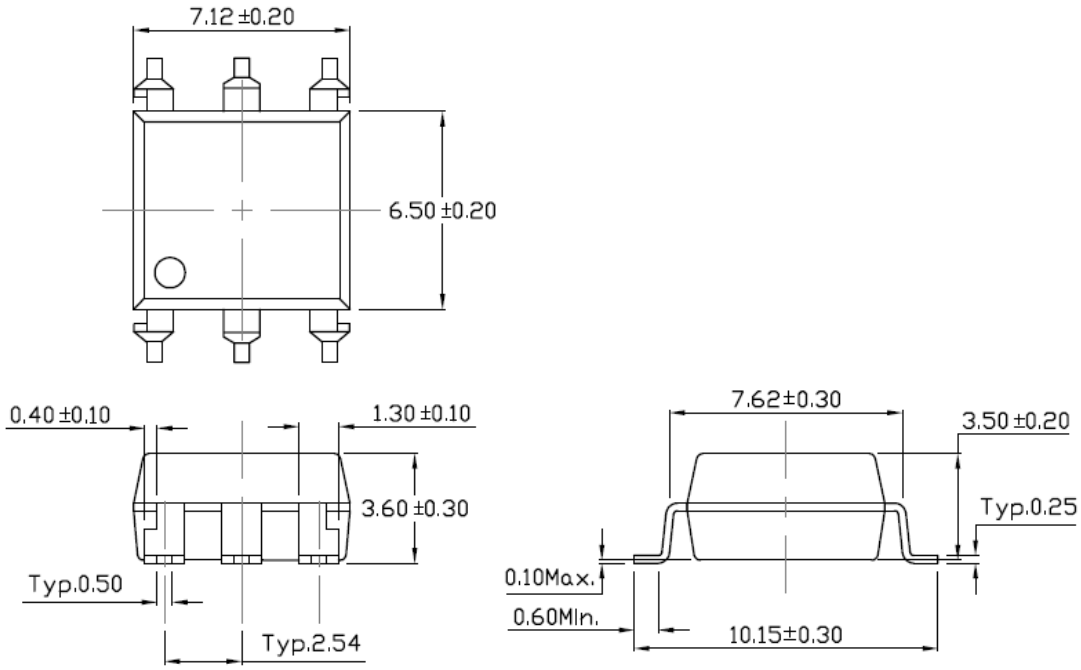

### Wide Lead Forming – Through Hole (M Type)



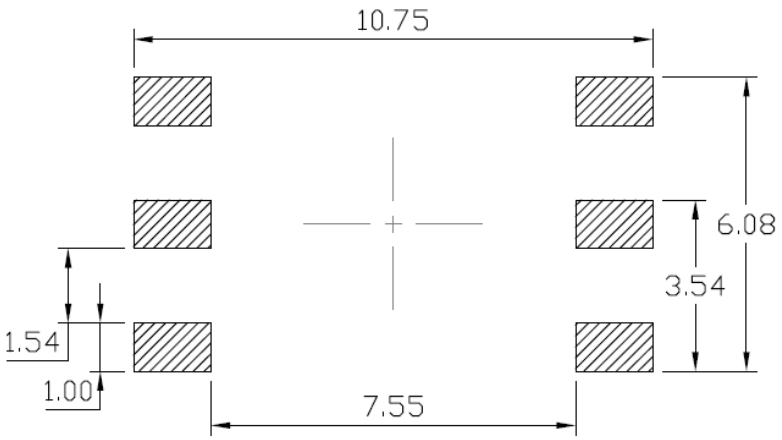
## Surface Mount Forming (S Type)



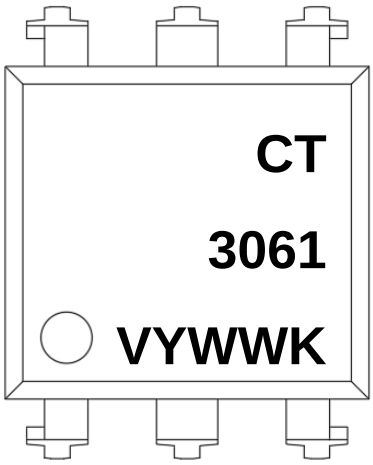

## Surface Mount Forming (Low Profile) (SL Type)



## Recommended Solder Mask *Dimensions in mm unless otherwise stated*




## Marking Information




**Note:**

CT : Denotes “CT Micro”
3061 : Part Number
V : VDE Option
Y : Fiscal Year
WW : Work Week
K : Manufacturing Code

## Ordering Information

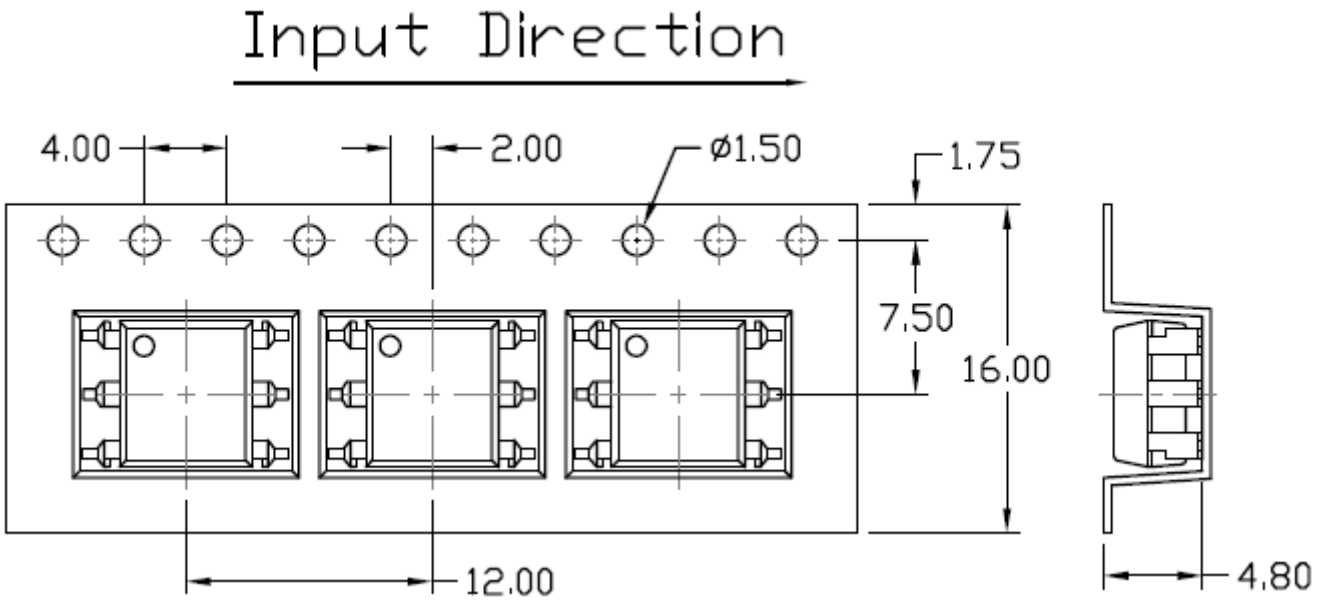
### CT306X(V)(Y)(Z)-G, CT308X(V)(Y)(Z)-G

X = Part No.(X=1,2,3)
V = VDE Option (V or None)
Y = Lead form option (S, SL, M or none)
Z = Tape and reel option (T1, T2 or none)
G= Material option (G: Green, None: Non-green)

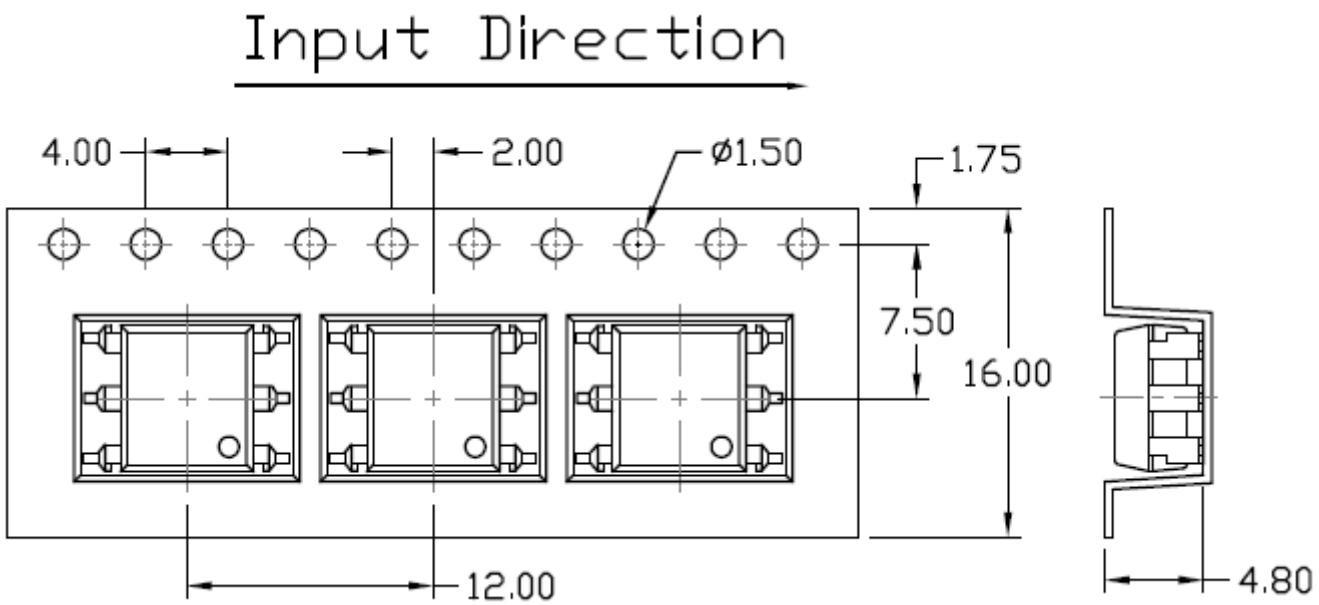
| ***Option*** | ***Description*** | ***Quantity*** |
|---|---|---|
| None | Standard 6 Pin Dip | 50Units/Tube |
| M | Gullwing (400mil) Lead Forming | 50Units/Tube |
| S(T1) | Surface Mount Lead Forming – With Option 1 Taping | 1000 Units/Reel |
| S(T2) | Surface Mount Lead Forming – With Option 2 Taping | 1000 Units/Reel |
| SL(T1) | Surface Mount (Low Profile) Lead Forming– With Option 1 Taping | 1000 Units/Reel |
| SL(T2) | Surface Mount (Low Profile) Lead Forming – With Option 2 Taping | 1000 Units/Reel |

## Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

### Option S(T1) & SL(T1)

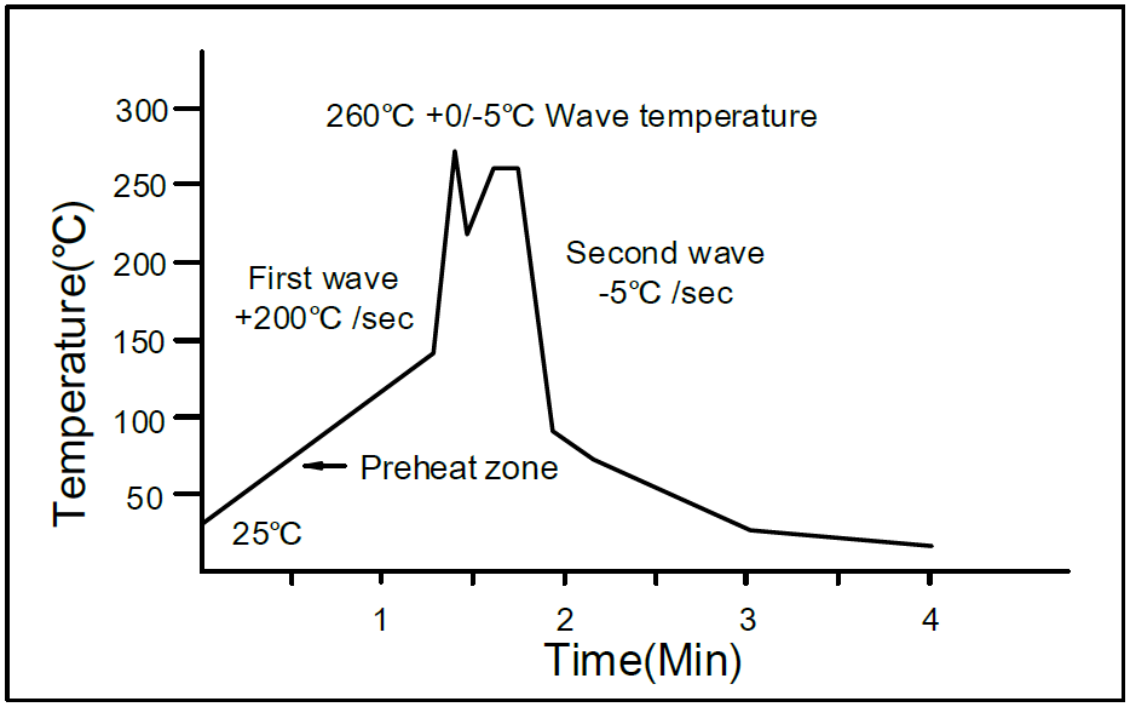



### Option S(T2) & SL(T2)



## Wave soldering (follow the JEDEC standard JESD22-A111)

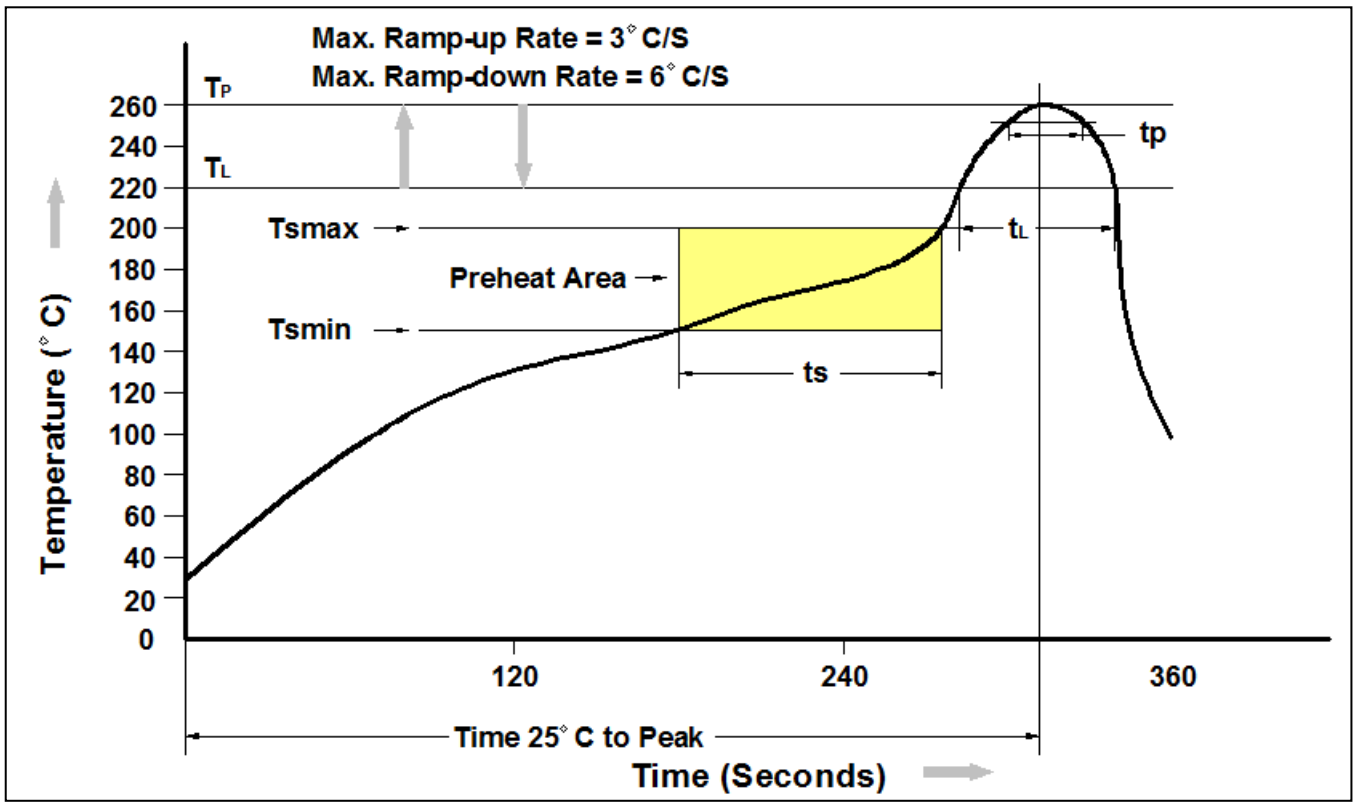
One time soldering is recommended within the condition of temperature.
Temperature: 260+0/-5˚C.
Time: 10 sec.
Preheat temperature:25 to 140˚C.
Preheat time: 30 to 80 sec.




## Hand soldering by soldering iron

Allow single lead soldering in every single process.
One time soldering is recommended. Temperature: 380+0/-5˚C
Time: 3 sec max.

## Reflow Profile




| Profile Feature | Pb-Free Assembly Profile |
|---|---|
| Temperature Min. (Tsmin) | 150°C |
| Temperature Max. (Tsmax) | 200°C |
| Time (ts) from (Tsmin to Tsmax) | 60-120 seconds |
| Ramp-up Rate ($t_L$ to $t_P$) | 3°C/second max. |
| Liquidous Temperature ($T_L$) | 217°C |
| Time ($t_L$) Maintained Above ($T_L$) | 60 – 150 seconds |
| Peak Body Package Temperature | 260°C +0°C / -5°C |
| Time ($t_P$) within 5°C of 260°C | 30 seconds |
| Ramp-down Rate ($T_P$ to $T_L$) | 6°C/second max |
| Time 25°C to Peak Temperature | 8 minutes max. |

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