



**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

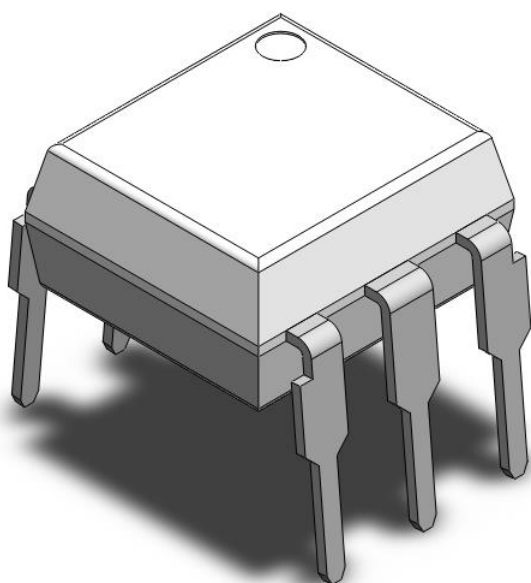
### **Description**

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.

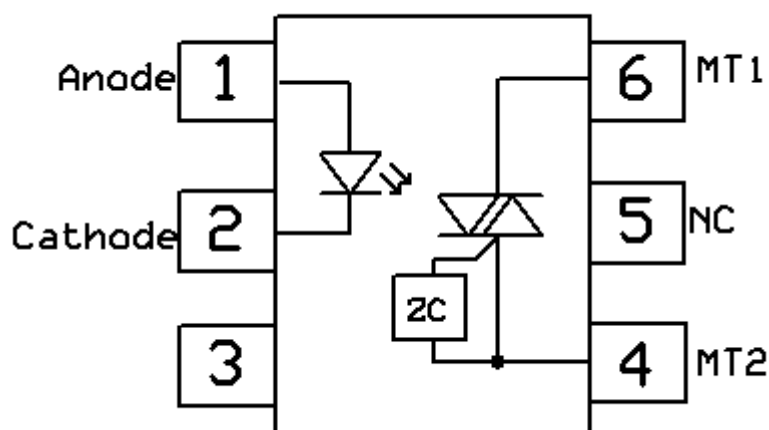
### **Applications**

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

### **Package Outline**



### **Schematic**



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



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### Absolute Maximum Rating at 25°C

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



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### **Electrical Characteristics** $T_A = 25^\circ\text{C}$ (unless otherwise specified)

#### **Emitter Characteristics**

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

#### **Detector Characteristics**

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

#### **Transfer Characteristics**

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



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### Typical Characteristic Curve

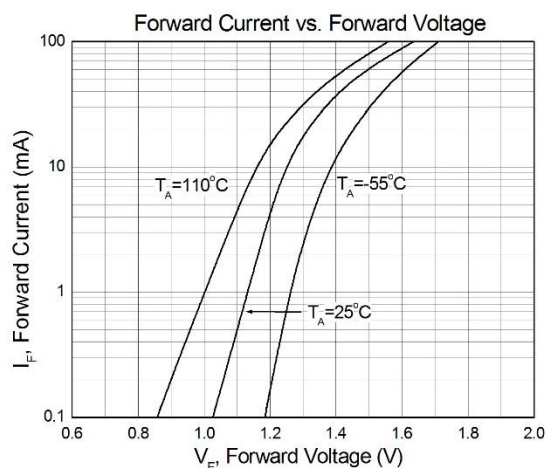


Figure 1

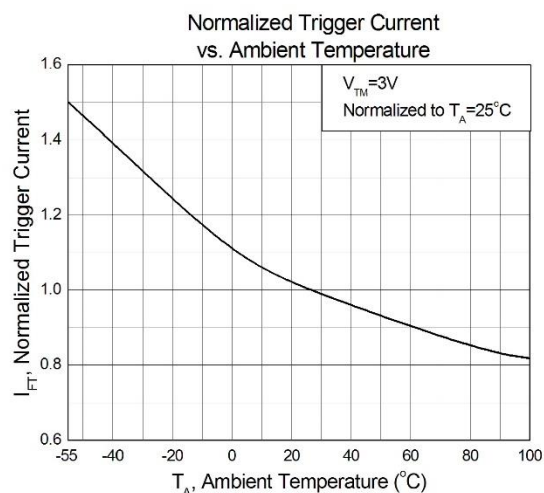


Figure 2

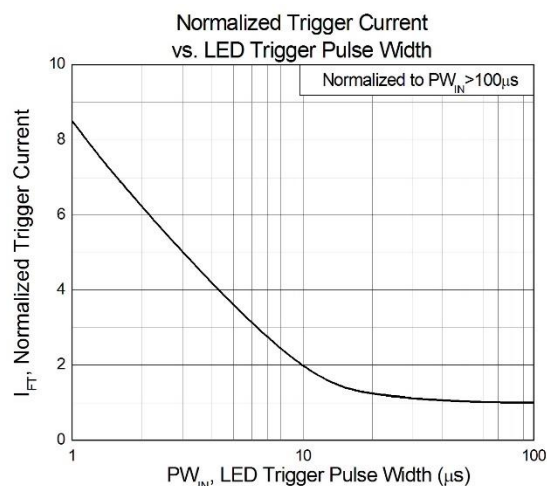


Figure 3

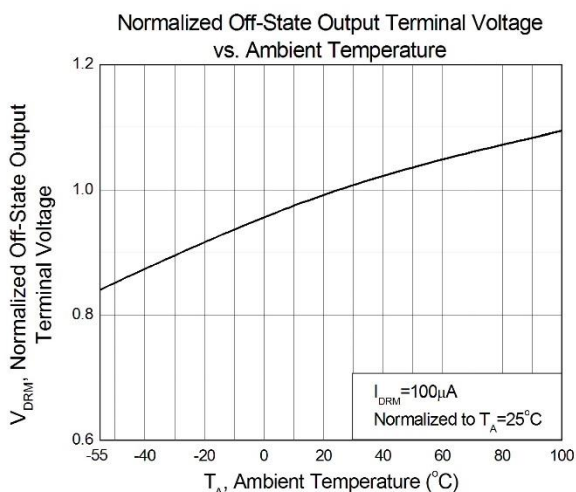


Figure 4

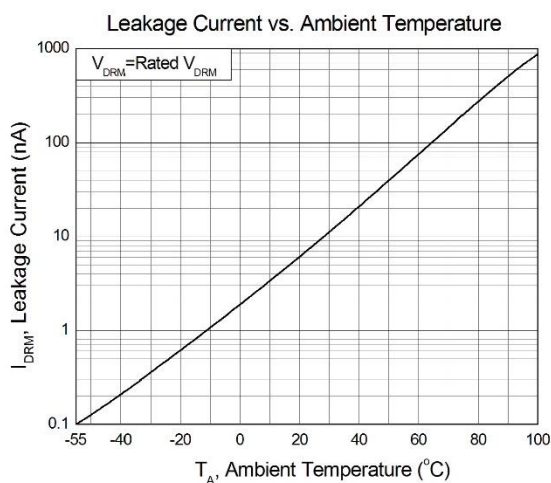


Figure 5

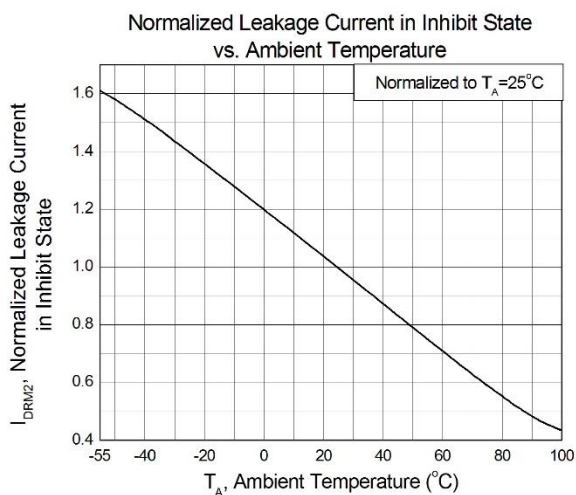


Figure 6



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## 600V/800V Zero Cross 6-Pin Phototriac Optocoupler

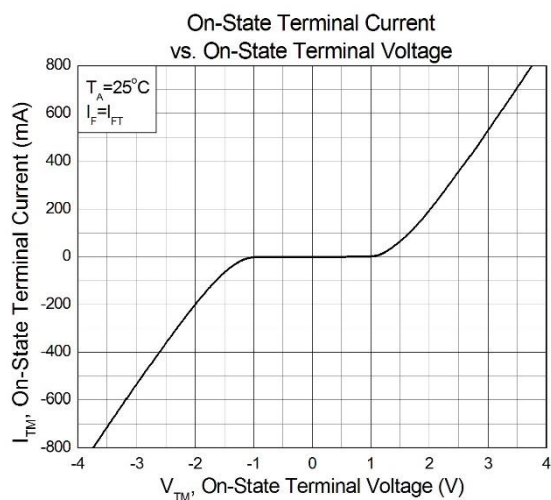


Figure 7

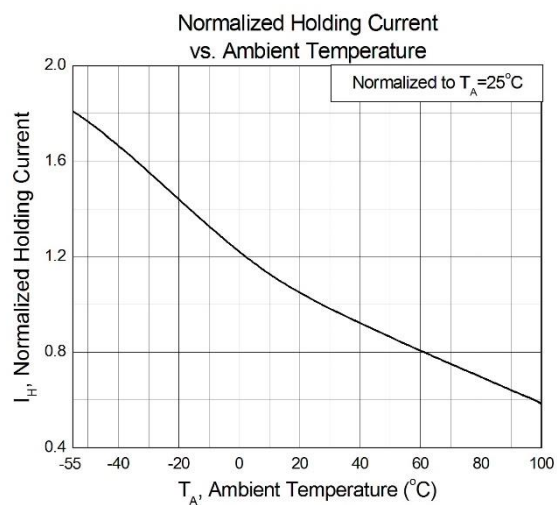


Figure 8

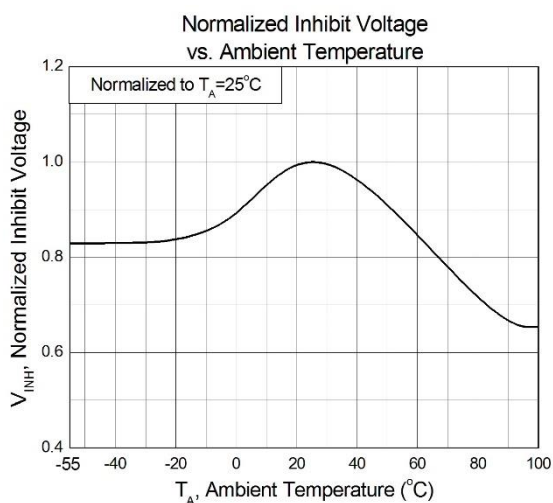


Figure 9



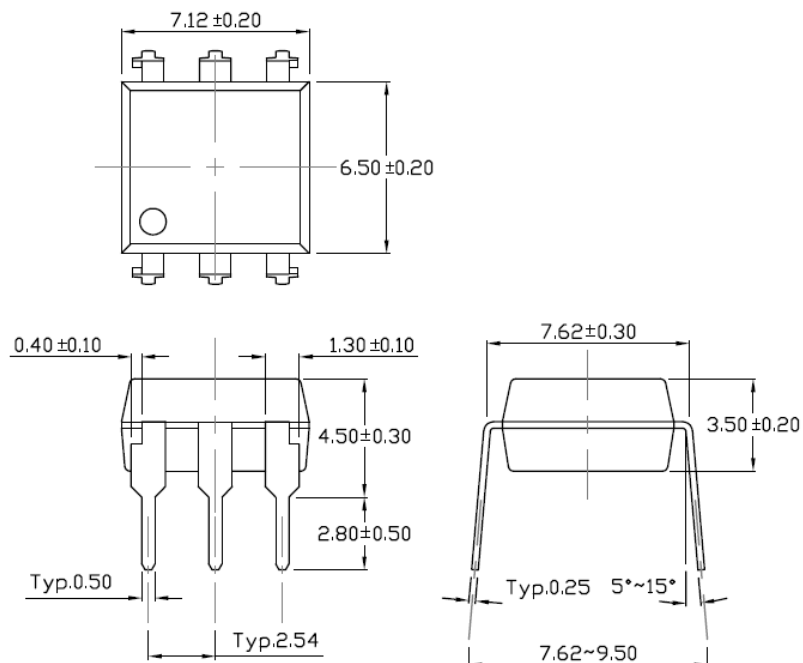
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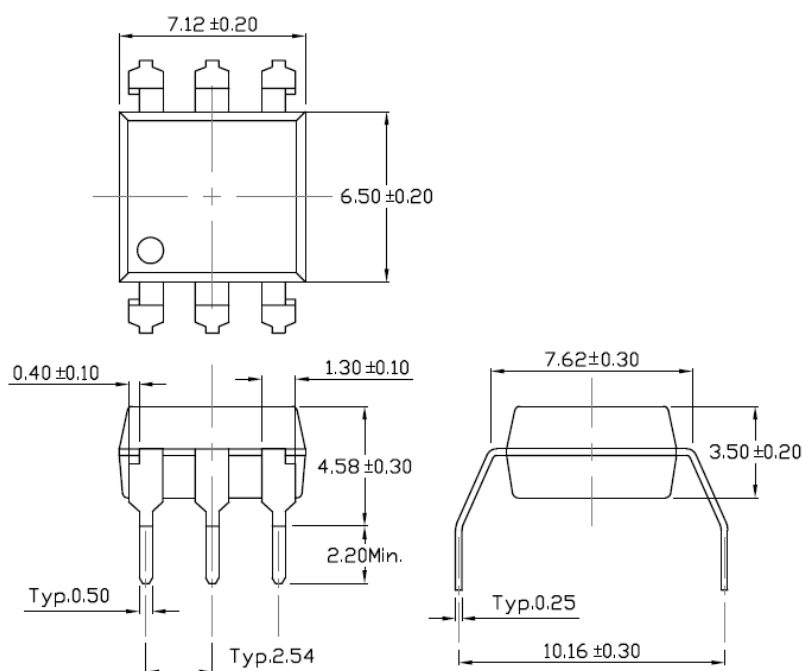
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### Package Dimension *Dimensions in mm unless otherwise stated*

#### Standard DIP – Through Hole



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



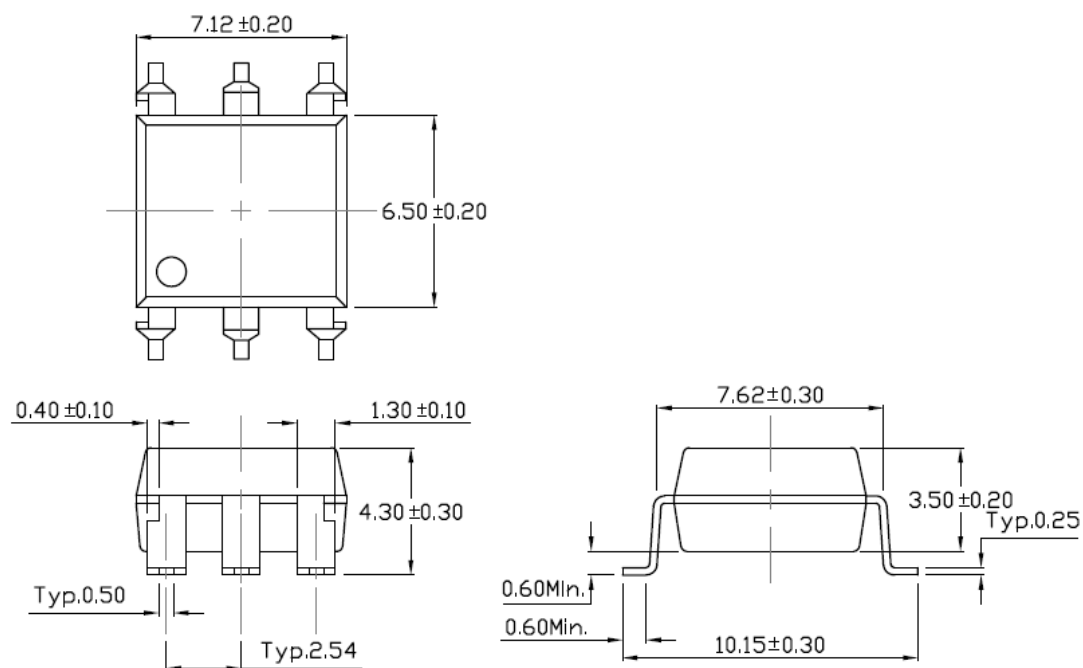


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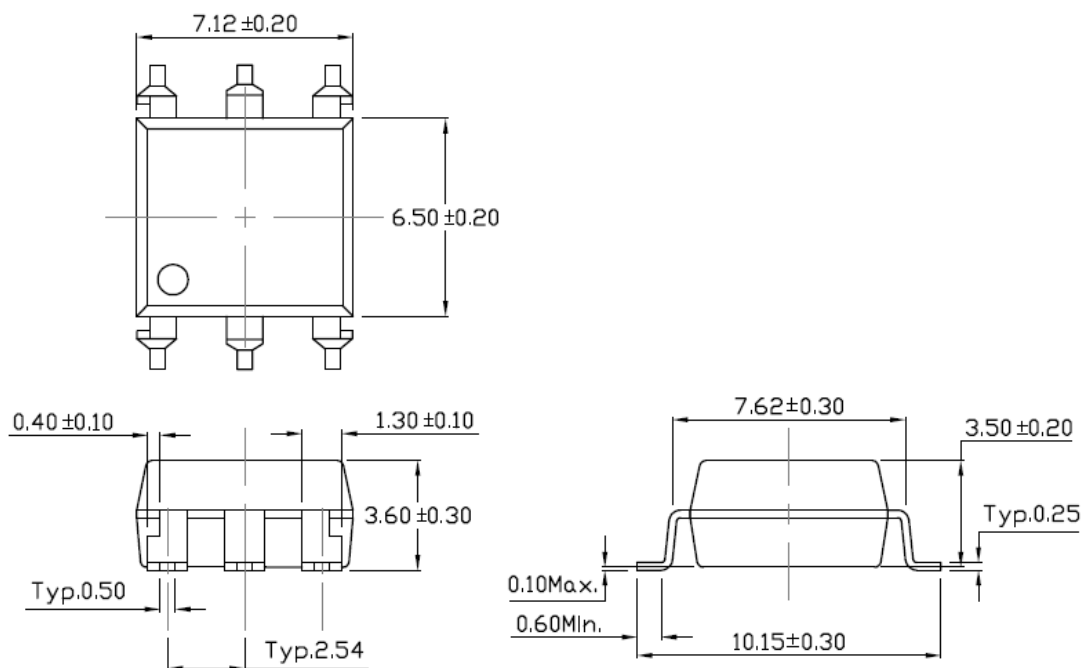
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### Surface Mount Forming (S Type)



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



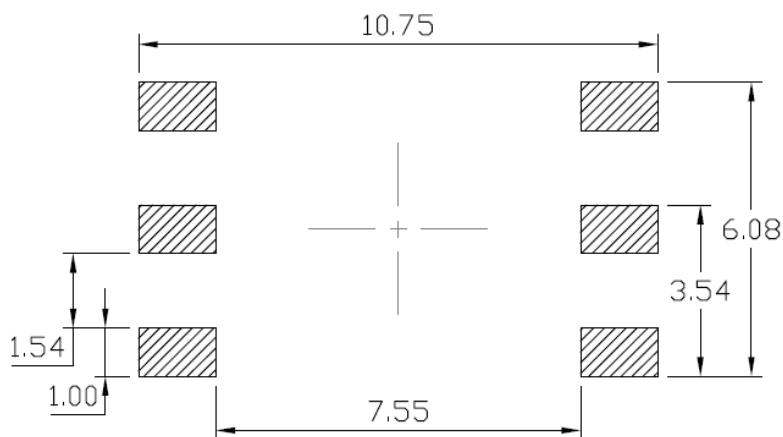


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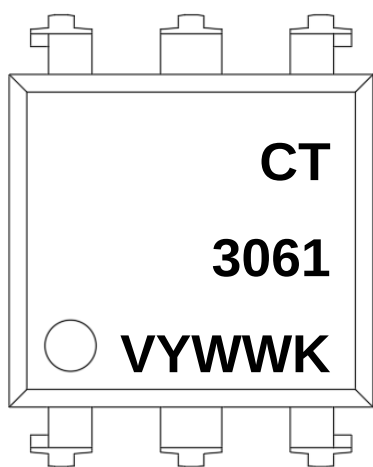
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## 600V/800V Zero Cross 6-Pin Phototriac Optocoupler

### 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



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## 600V/800V Zero Cross 6-Pin Phototriac Optocoupler

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### 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)

| <b>Option</b> | <b>Description</b>                                              | <b>Quantity</b> |
|---------------|-----------------------------------------------------------------|-----------------|
| 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 |



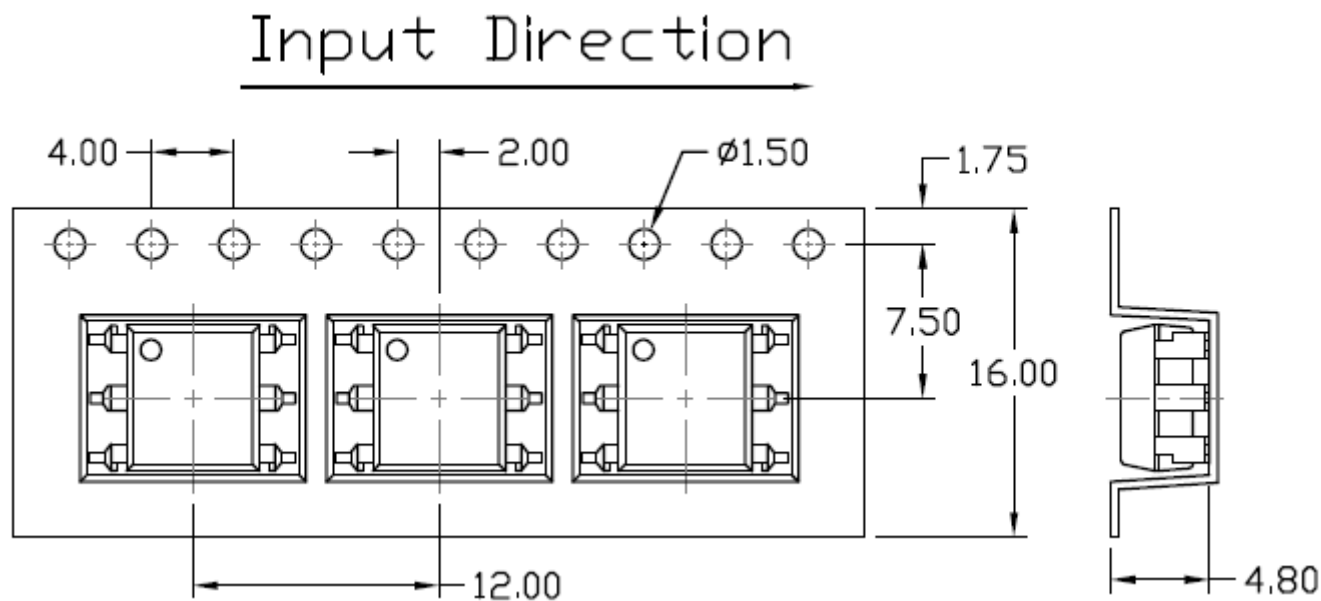
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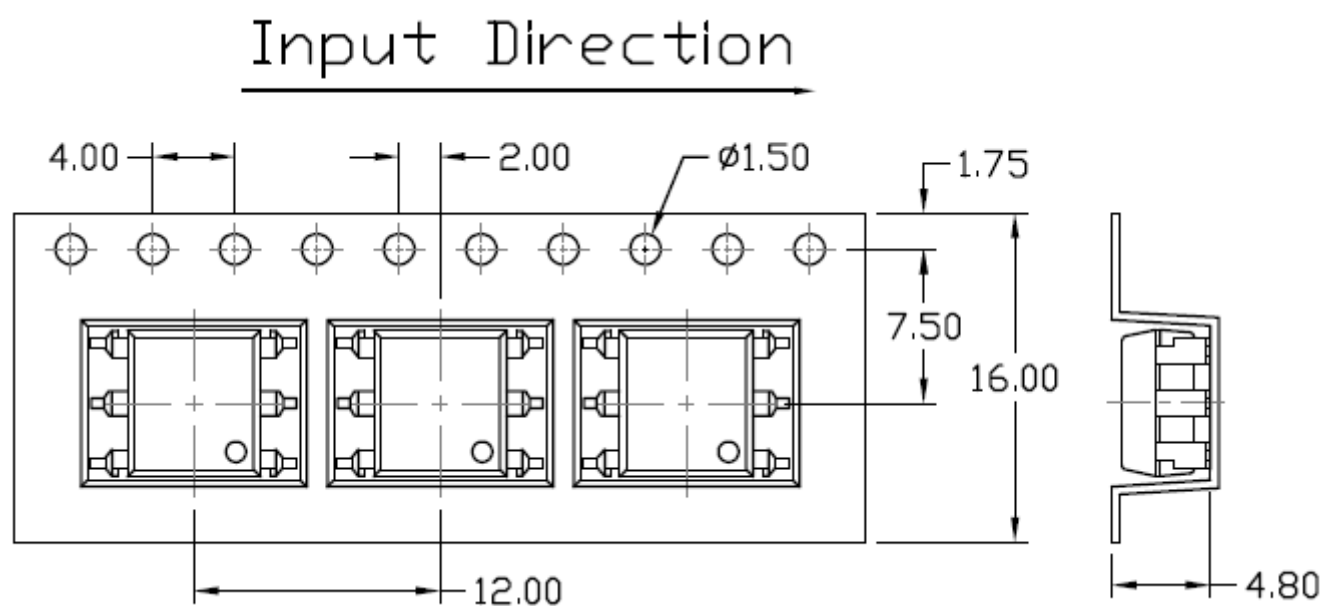
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### Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

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



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





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## 600V/800V Zero Cross 6-Pin Phototriac Optocoupler

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

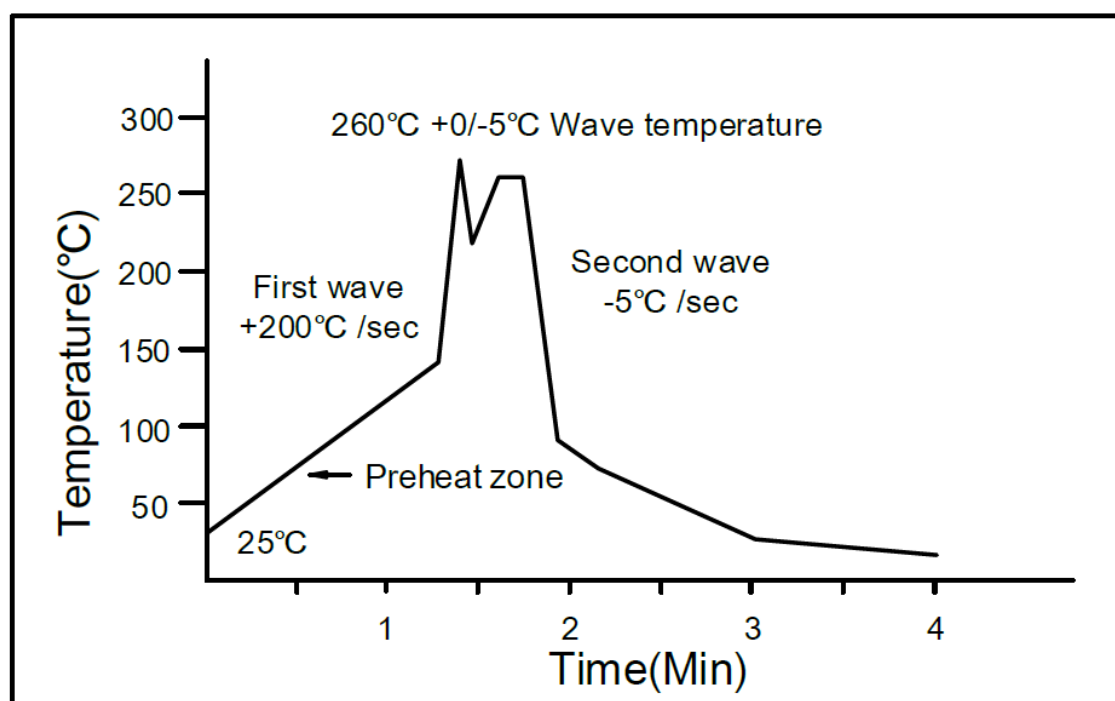
One time soldering is recommended within the condition of temperature.

Temperature:  $260 \pm 0/-5^{\circ}\text{C}$ .

Time: 10 sec.

Preheat temperature: 25 to  $140^{\circ}\text{C}$ .

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:  $380 \pm 0/-5^{\circ}\text{C}$

Time: 3 sec max.

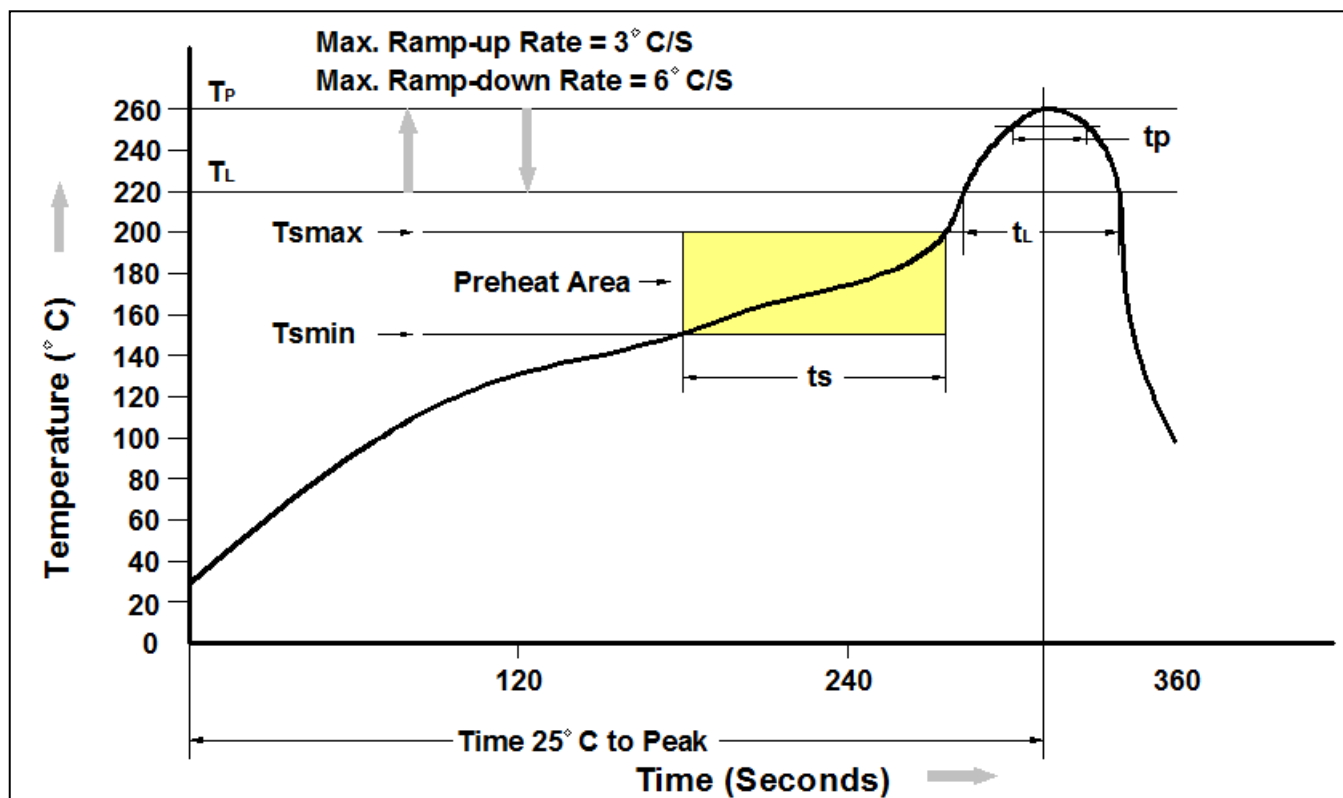


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## 600V/800V Zero Cross 6-Pin Phototriac Optocoupler

### 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 (tL to tP)         | 3°C/second max.          |
| Liquidous Temperature (TL)      | 217°C                    |
| Time (tL) Maintained Above (TL) | 60 – 150 seconds         |
| Peak Body Package Temperature   | 260°C +0°C / -5°C        |
| Time (tP) within 5°C of 260°C   | 30 seconds               |
| Ramp-down Rate (TP to TL)       | 6°C/second max           |
| Time 25°C to Peak Temperature   | 8 minutes max.           |



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