



CTT0223, CTT1223, CTT2223, CTT3223

600V Random Phase High Power Photo TRIAC

Features

- High isolation 5000 VRMS
- Supports 0.3 A, 0.6 A, 0.9 A and 1.2 A
- RoHS compliance
- REACH compliance
- External creepage > 7.5mm
- Internal creepage > 6.0mm
- Insulation distance > 0.4mm
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950

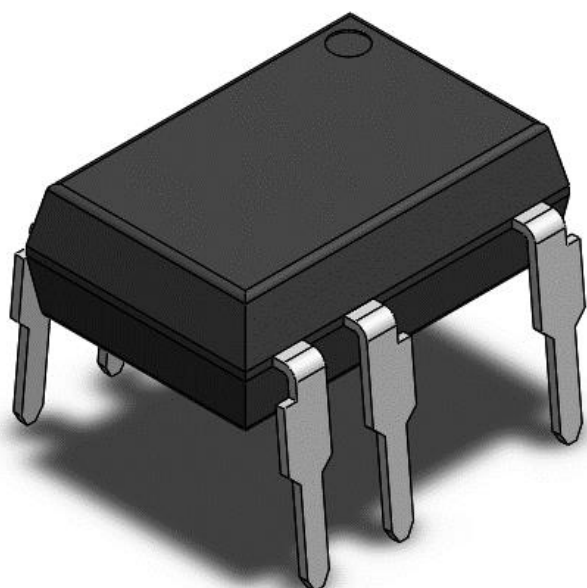
Description

The random phase power Triac consists of a Triac and a photo-Triac, which is optically coupled to a gallium arsenide Infrared emitting diode, and housed in a 7-lead DIP package. It also comes with different lead forming options.

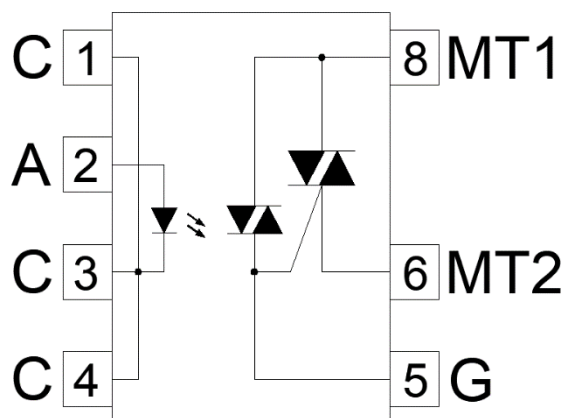
Applications

- Home appliances
- Industrial equipment

Package Outline



Schematic



Note: Different bending options available. See package dimension.



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Absolute Maximum Rating at 25°C

| Symbol | Parameters | Ratings | Units | Notes |
|---------------------|-----------------------------------|----------------|--------------|--------------|
| V _{iso} | Isolation voltage | 5000 | Vrms | |
| T _{OPR} | Operating temperature | -40 ~+85 | °C | |
| T _{STG} | Storage temperature | -40 ~+125 | °C | |
| T _{SOL} | Soldering temperature | 260 | °C | |
| | Wave soldering temperature | 260 | °C | |
| Emitter | | | | |
| I _F | LED forward current | 50 | mA | |
| V _R | LED reverse voltage | 6 | V | |
| I _{FP} | Peak forward current | 1 | A | |
| P _{in} | Power dissipation | 75 | mW | |
| Detector | | | | |
| V _{DRM} | Repetitive peak OFF-state voltage | 600 | V | |
| I _{T(RMS)} | Continuous Current Load | CTT0223 | 0.3 | A |
| | | CTT1223 | 0.6 | |
| | | CTT2223 | 0.9 | |
| | | CTT3223 | 1.2 | |
| I _{TSM} | Peak Current Load | CTT0223 | 3 | A |
| | | CTT1223 | 6 | |
| | | CTT2223 | 9 | |
| | | CTT3223 | 12 | |
| P _{out} | Power dissipation | 800 | mW | |
| P _T | Total power dissipation | 850 | mW | |



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

Emitter Characteristics

| Symbol | Parameters | Test Conditions | Min | Typ | Max | Units | Notes |
|----------|-------------------|---------------------|-----|-----|-----|---------------|-------|
| V_F | Forward voltage | $I_F = 10\text{mA}$ | - | - | 1.3 | V | |
| I_R | Reverse Current | $V_R = 6\text{V}$ | - | - | 5 | μA | |
| C_{IN} | Input Capacitance | $f = 1\text{MHz}$ | - | 45 | - | pF | |

Detector Characteristics

| Symbol | Parameters | Test Conditions | Min | Typ | Max | Units | Notes |
|-----------|---|--|-----|-----|-----|------------------------|-------|
| I_{DRM} | Peak Blocking Current | $I_F = 0\text{mA}$, $V_{DRM} = \text{Rated } V_{DRM}$ | - | - | 100 | μA | |
| V_{TM} | Peak On-State Voltage | $I_F = \text{Rated } I_{FT}$, $I_{TM} = 100\text{mA}$ | - | - | 2.5 | V | |
| dv/dt | Critical Rate of Rise off-State Voltage | $V_{PEAK} = \text{Rated } V_{DRM}$ | 200 | - | - | $\text{V}/\mu\text{s}$ | |

Transfer Characteristics

| Symbol | Parameters | Test Conditions | Min | Typ | Max | Units | Notes |
|----------|-----------------------|-----------------------------|--------------------|------|-----|----------|-------|
| I_{FT} | Input Trigger Current | Terminal Voltage = 3V | - | - | 10 | mA | |
| I_H | Holding Current | | - | - | 25 | mA | |
| R_{IO} | Isolation Resistance | $V_{IO} = 500\text{V}_{DC}$ | 1×10^{11} | - | - | Ω | |
| C_{IO} | Isolation Capacitance | $f = 1\text{MHz}$ | - | 0.25 | - | pF | |



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Typical Characteristic Curves

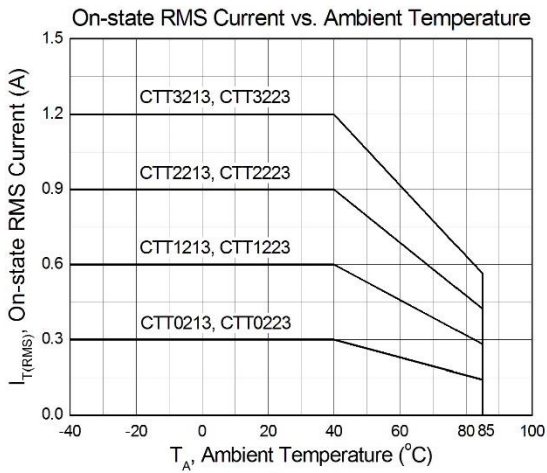


Figure 1

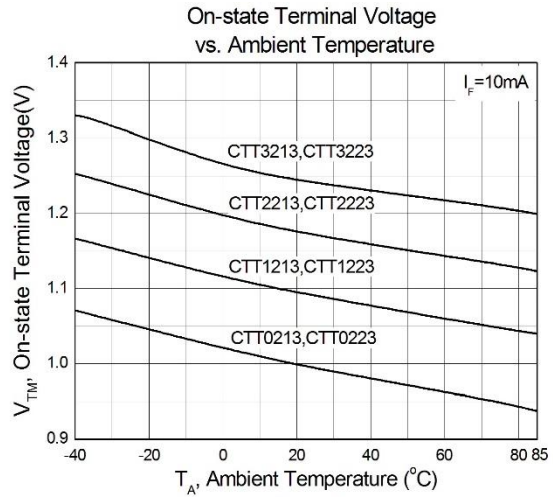


Figure 2

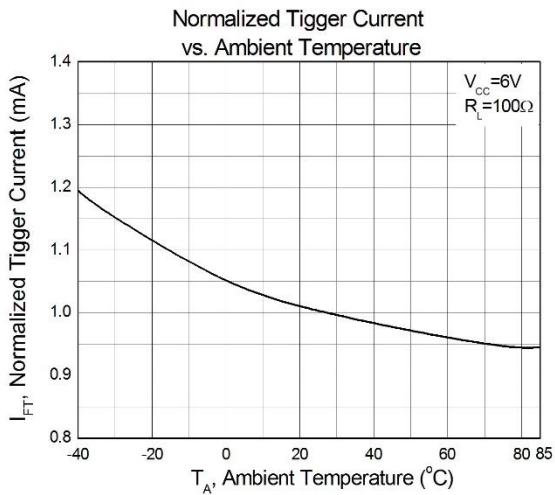


Figure 3

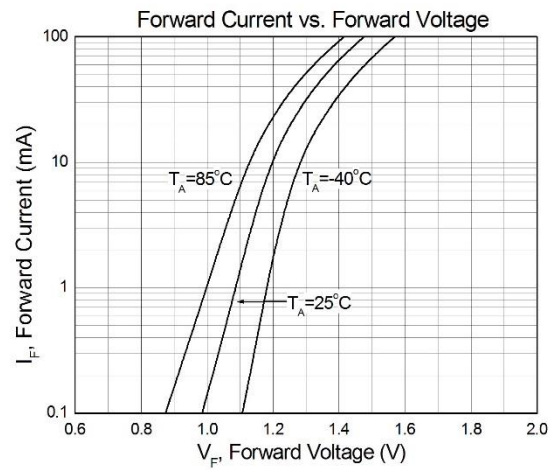


Figure 4

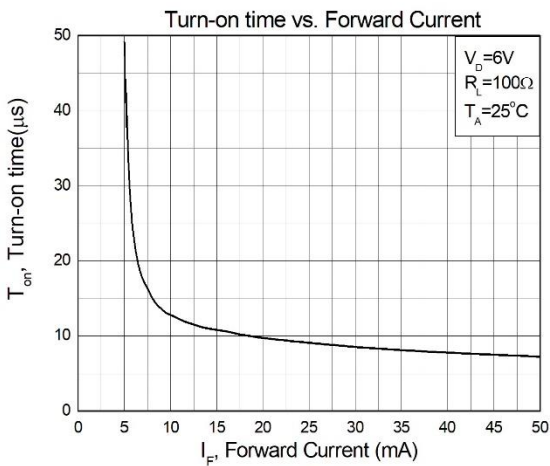


Figure 5

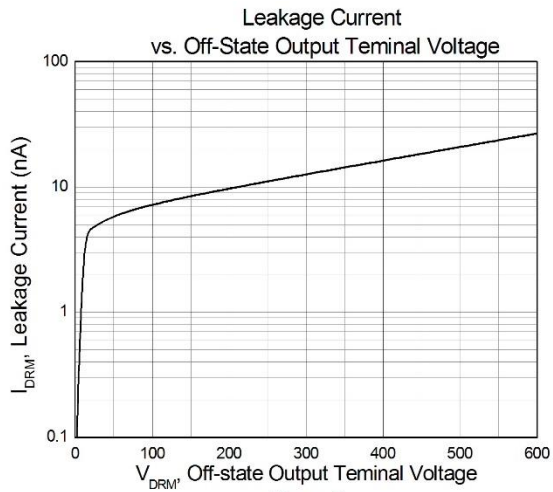
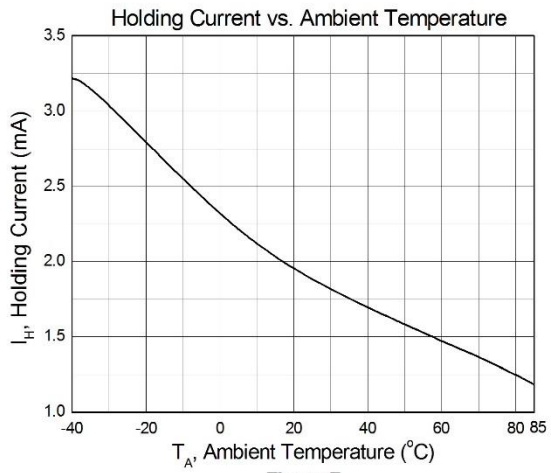


Figure 6



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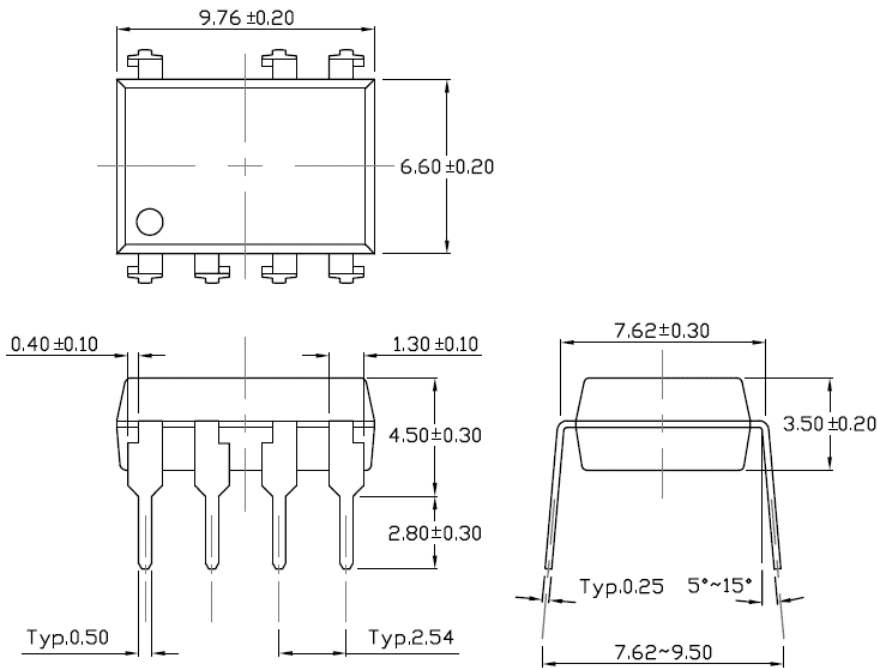


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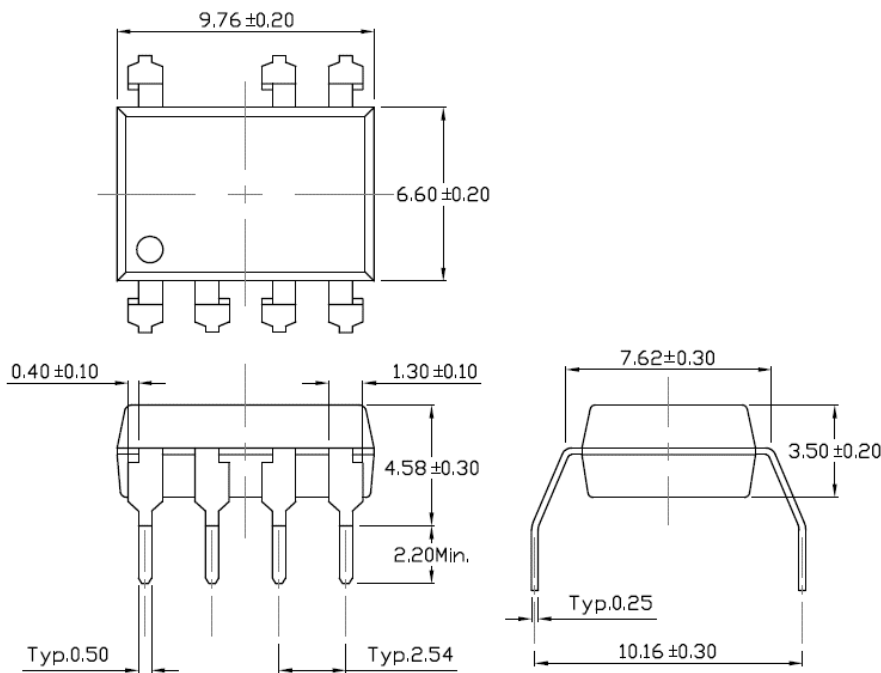
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Package Dimension *Dimensions in mm unless otherwise stated*

Standard DIP – Through Hole



Gullwing (400mil) Lead Forming – Through Hole (M Type)

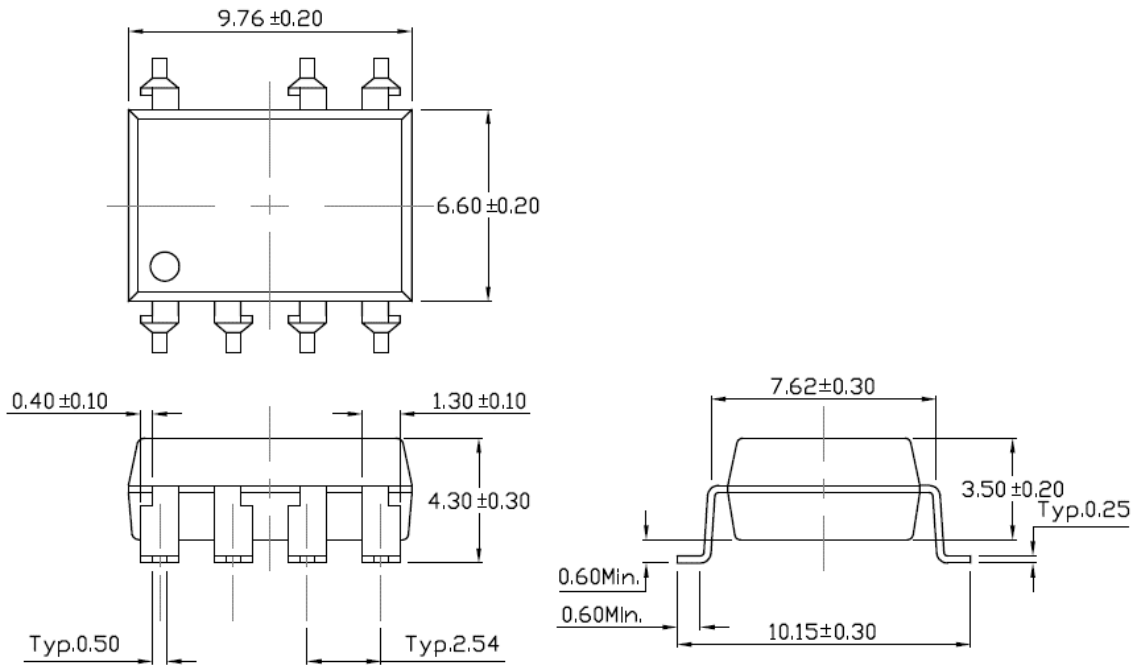




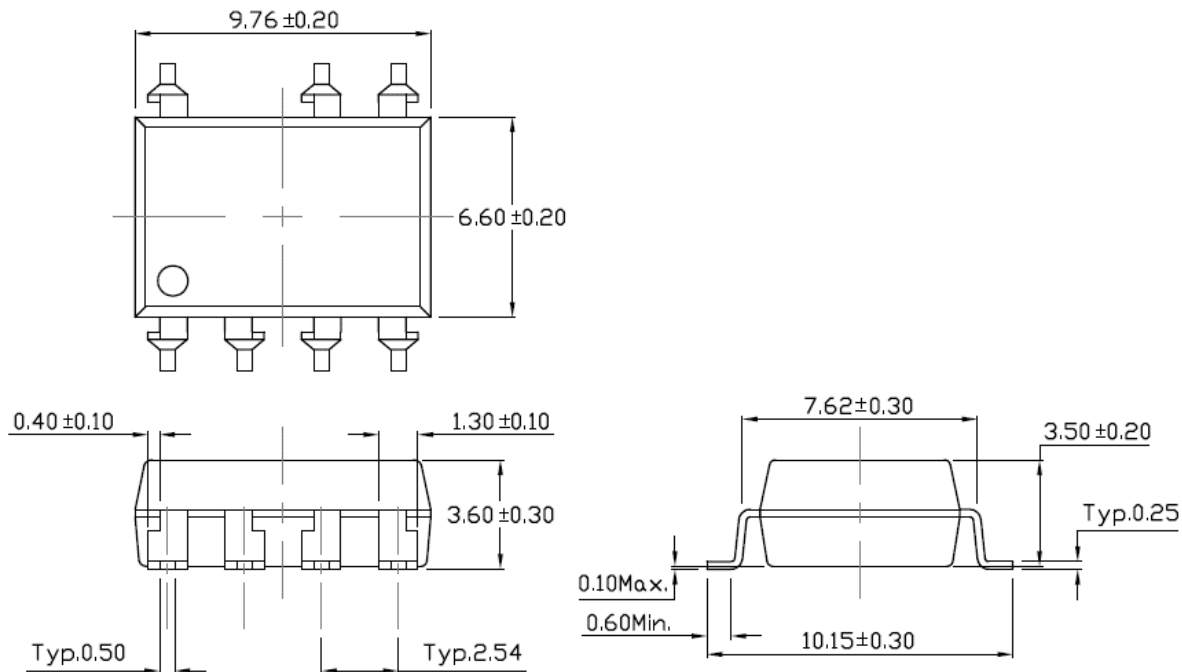
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Surface Mount Lead Forming (S Type)



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

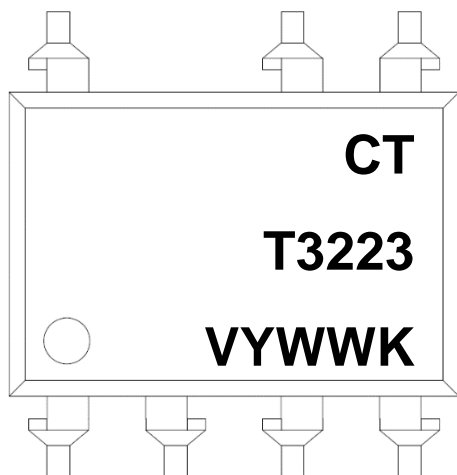




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Device Marking



Note:

- CT : Denotes “CT Micro”
- T3223 : Product Number
- V : VDE Safety Mark (option)
- Y : Fiscal Year
- WW : Work Week
- K : Production Code

Ordering Information

CTTX223(V)(Y)(Z)

- CT = Denotes “CT Micro”
- TX223 = Product Number (Current Rating Option X=0, 1, 2, or 3)
- V = VDE safety mark option (V, or none)
- Y = Lead form option (S, SL, M or none)
- Z = Tape and reel option (T1, T2 or none)

| Option | Description | Quantity |
|---------------|--|-----------------|
| None | Standard 8 Pin Dip | 40 Units/Tube |
| M | Gullwing (400mil) Lead Forming | 40 Units/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 |

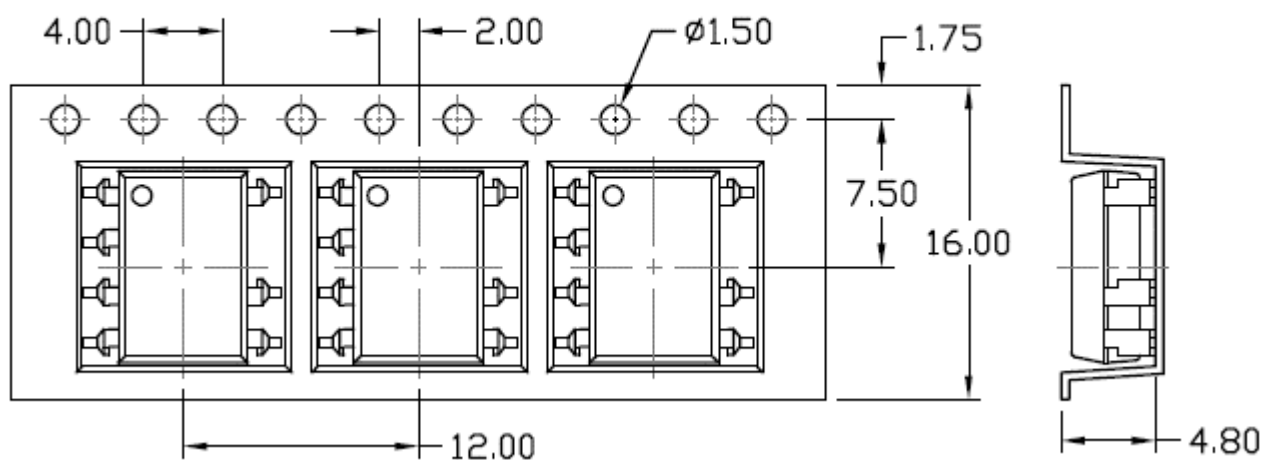


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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

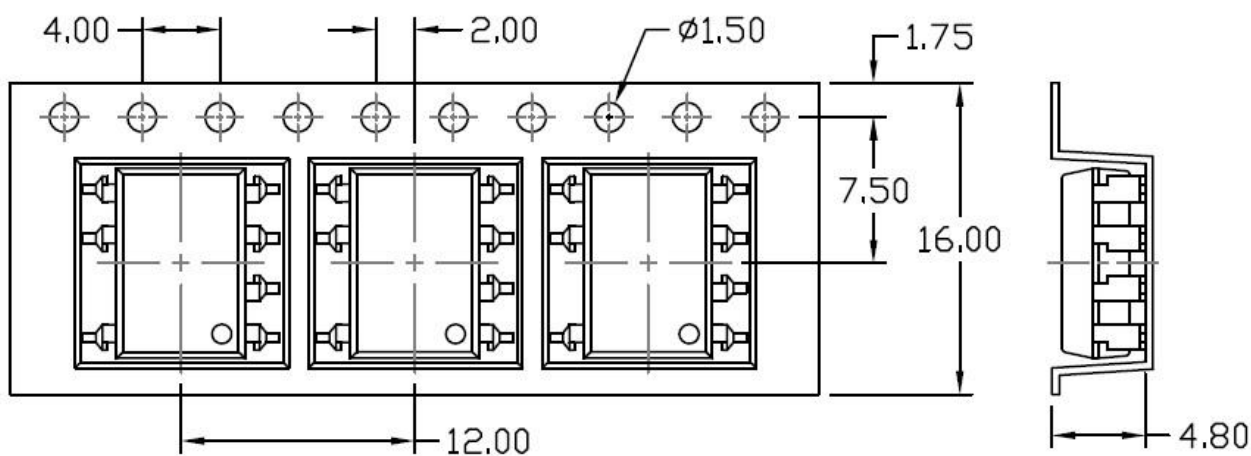
Option S(T1) & SL(T1)

Input Direction
→



Option S(T2) & SL(T2)

Input Direction
→





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Wave soldering (JEDEC22A111 compliant)

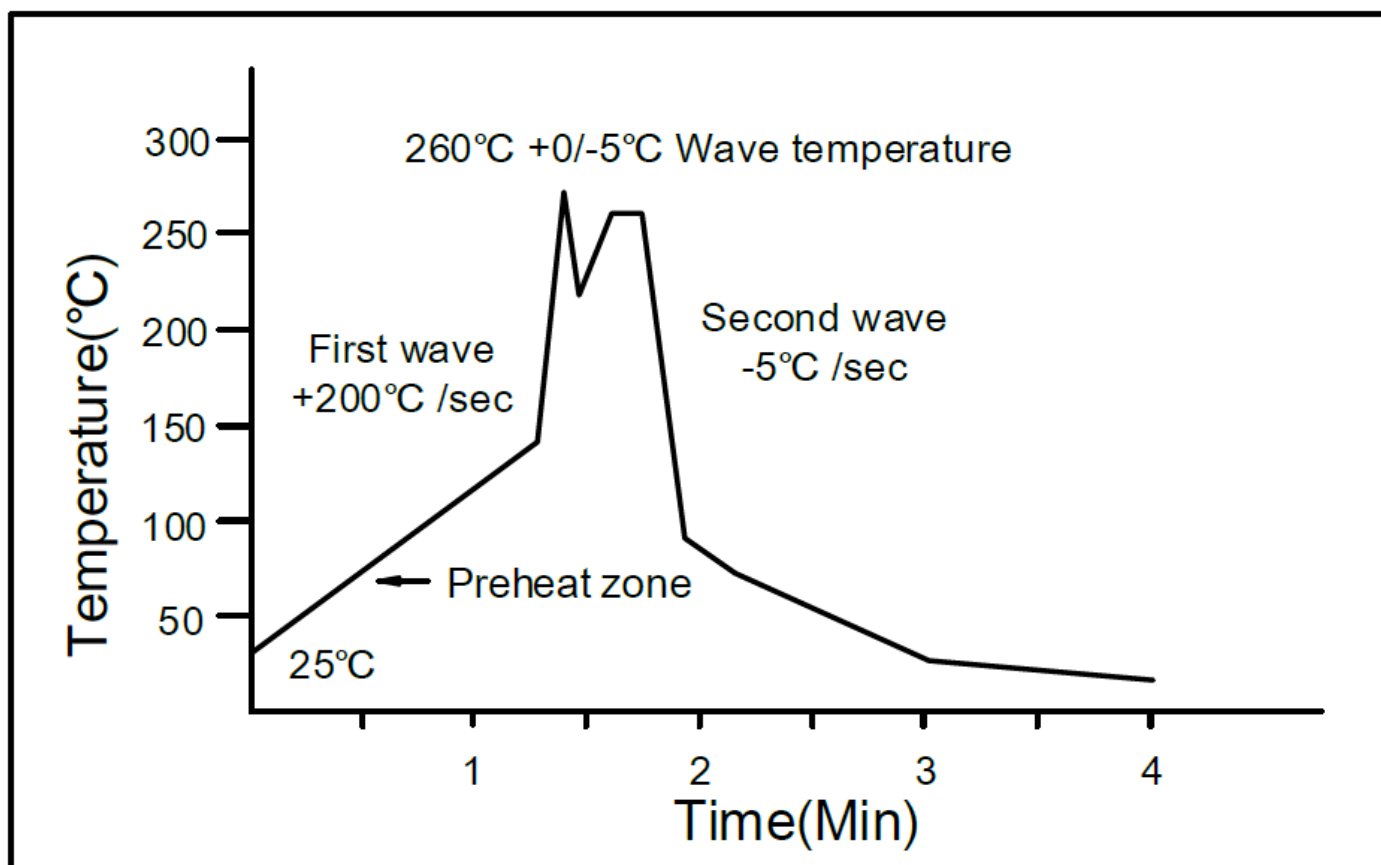
One time soldering is recommended within the condition of temperature.

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

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: $350 \pm 5^\circ\text{C}$

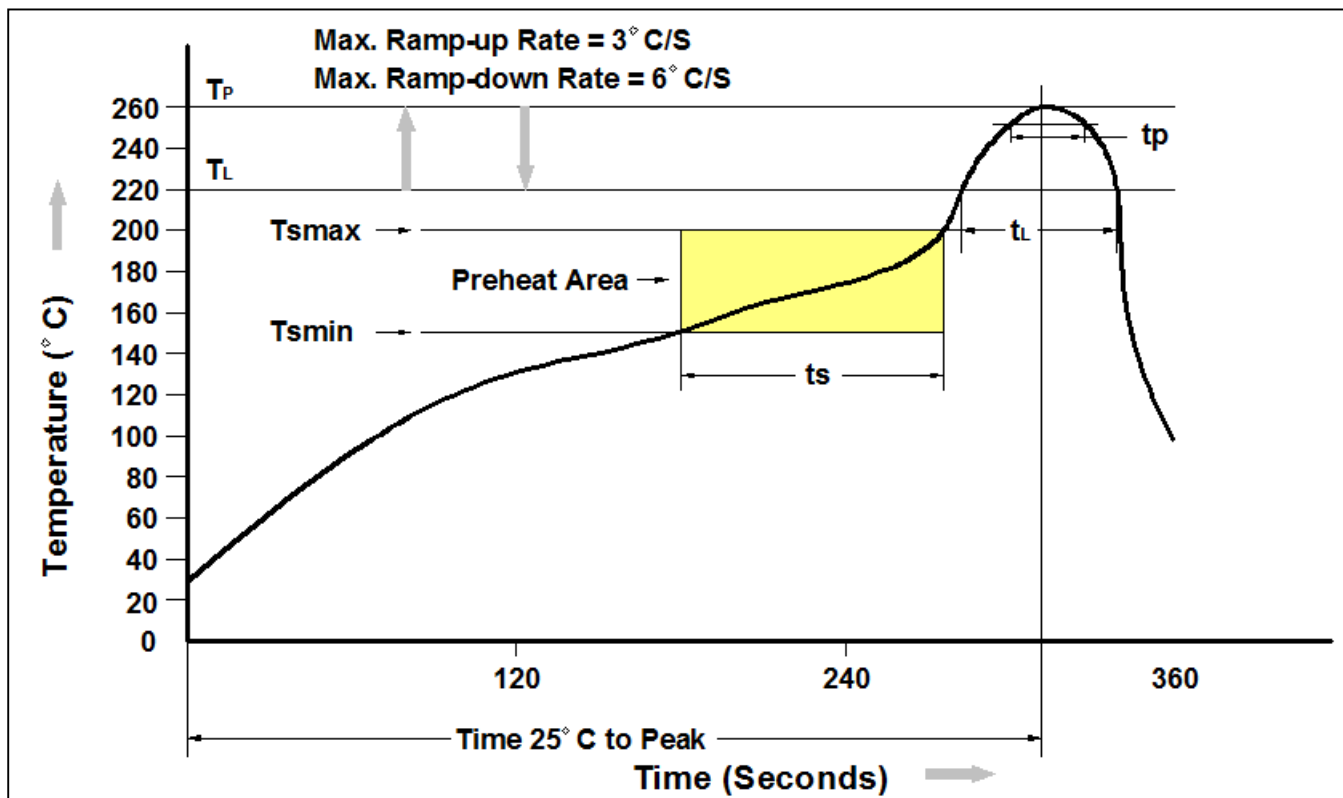
Time: 3 sec max.



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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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