



# 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 compliant
- REACH compliance
- External creepage > 7.5mm
- Internal creepage > 6.0mm
- Insulation distance > 0.4mm
- Regulatory Approvals
  - UL - UL1577 (pending approval)
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC – GB4943.1, GB8898
  - IEC60065, IEC60950

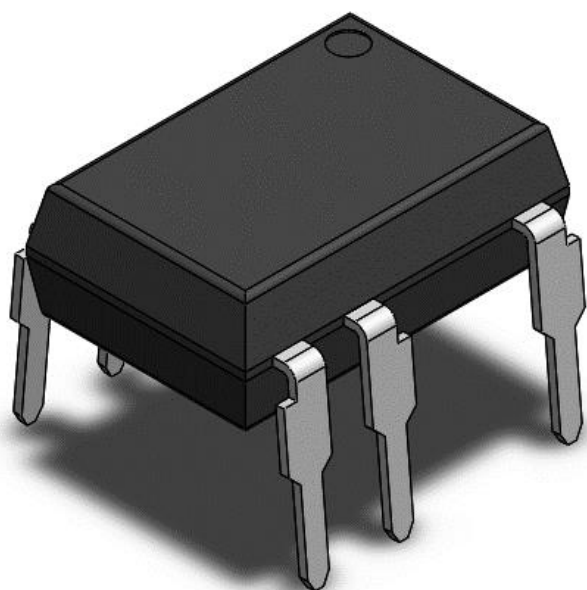
### Description

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 house in a 7-lead DIP package. It also comes with different lead forming options.

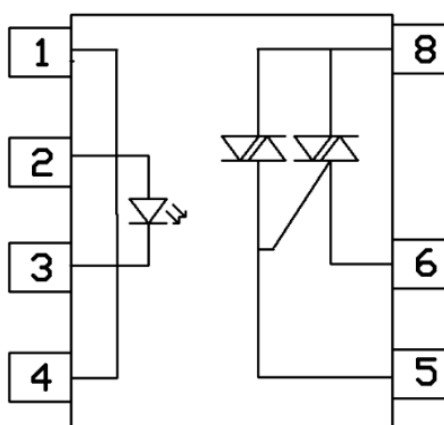
### Applications

- 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

<b>Symbol</b>	<b>Parameters</b>	<b>Ratings</b>	<b>Units</b>	<b>Notes</b>
V <sub>iso</sub>	Isolation voltage	5000	V <sub>rms</sub>	
T <sub>OPR</sub>	Operating temperature	-40 ~+85	°C	
T <sub>STG</sub>	Storage temperature	-40 ~+125	°C	
T <sub>SOL</sub>	Soldering temperature	260	°C	
	Wave soldering temperature	260	°C	
<b>Emitter</b>				
I <sub>F</sub>	LED forward current	50	mA	
V <sub>R</sub>	LED reverse voltage	6	V	
I <sub>FP</sub>	Peak forward current	1	A	
P <sub>in</sub>	Power dissipation	75	mW	
<b>Detector</b>				
V <sub>DRM</sub>	Repetitive peak OFF-state voltage	600	V	
I <sub>T(RMS)</sub>	Continuous Current Load	CTT0223	0.3	A
		CTT1223	0.6	
		CTT2223	0.9	
		CTT3223	1.2	
I <sub>TSM</sub>	Peak Current Load	CTT0223	3	A
		CTT1223	6	
		CTT2223	9	
		CTT3223	12	
P <sub>out</sub>	Power dissipation	800	mW	
P <sub>T</sub>	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	$\mu\text{A}$	
$C_{IN}$	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	$\mu\text{A}$	
$V_{INH}$	Inhibit Voltage	$I_F = \text{Rated } I_{FT}$	-	-	50	V	
$V_{TM}$	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

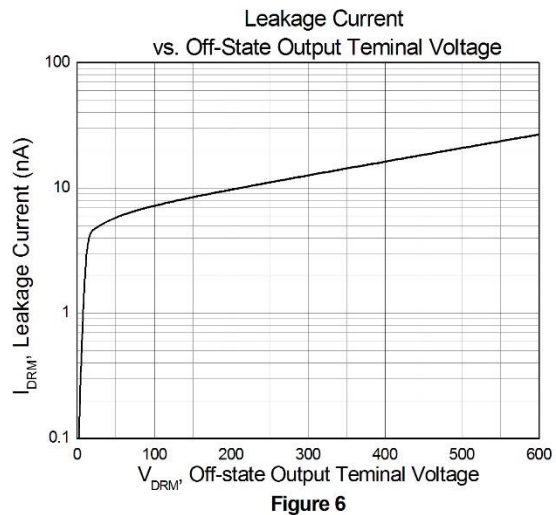
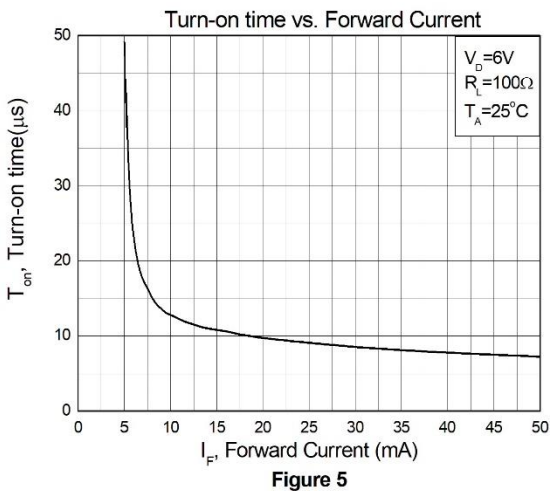
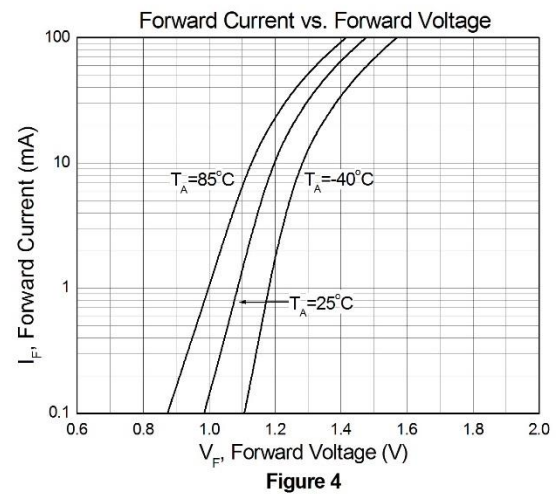
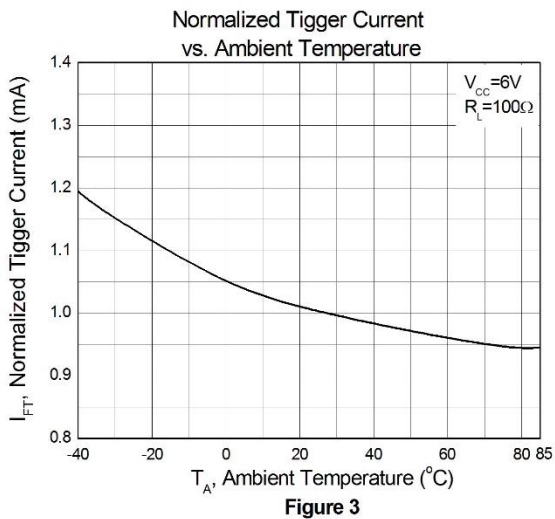
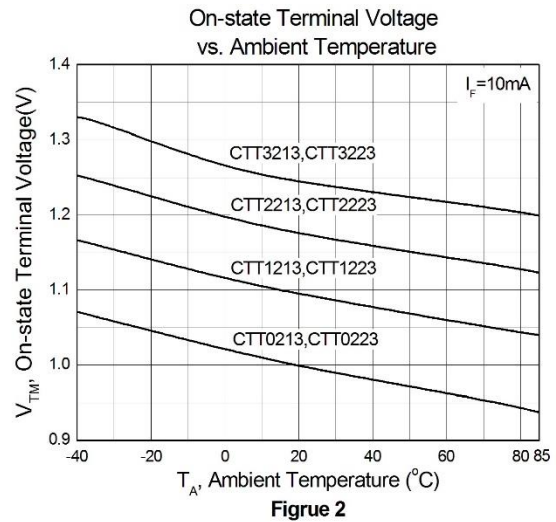
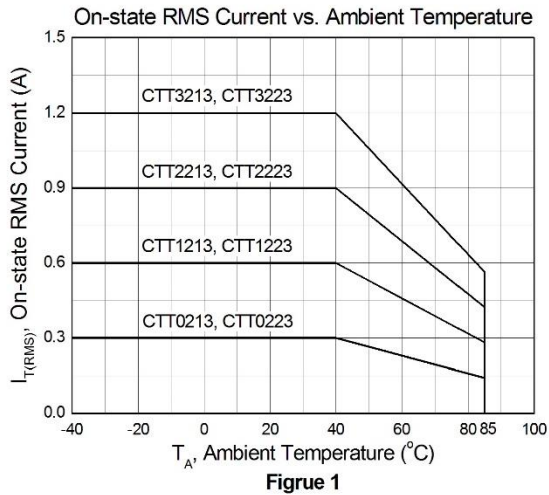
Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$I_{FT}$	Input Trigger Current	Terminal Voltage = 3V	-	-	10	mA	
$I_H$	Holding Current		-	-	25	mA	
$R_{IO}$	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	$1 \times 10^{11}$	-	-	$\Omega$	
$C_{IO}$	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25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



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### Typical Characteristic Curves





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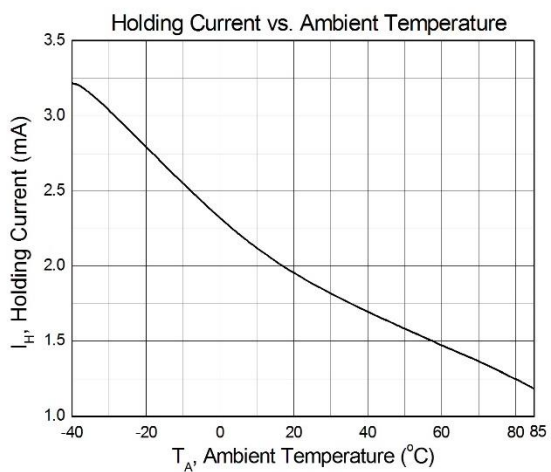


Figure 7

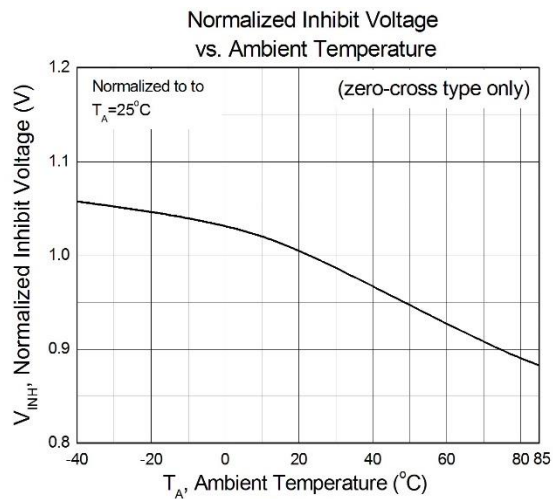


Figure 8

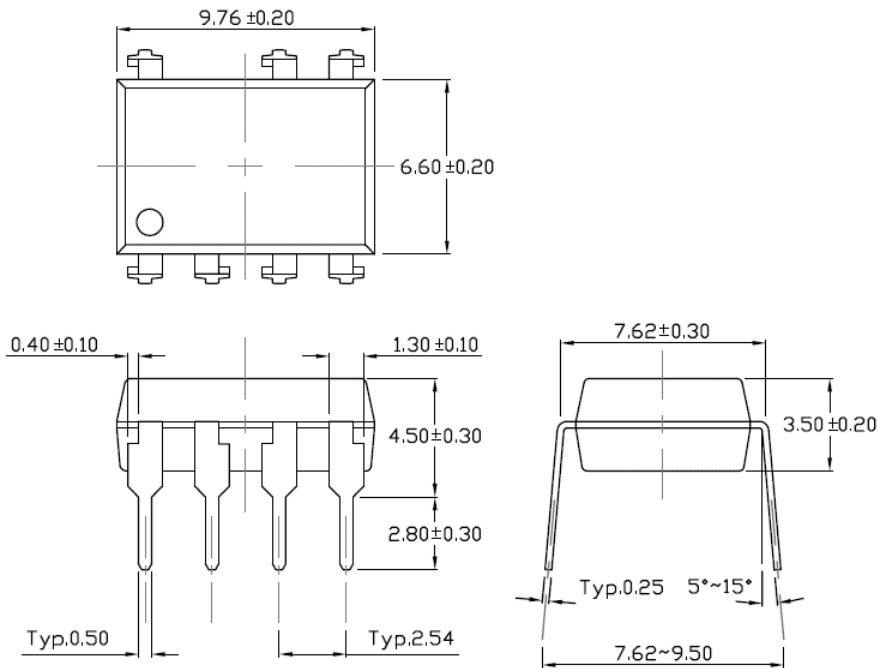


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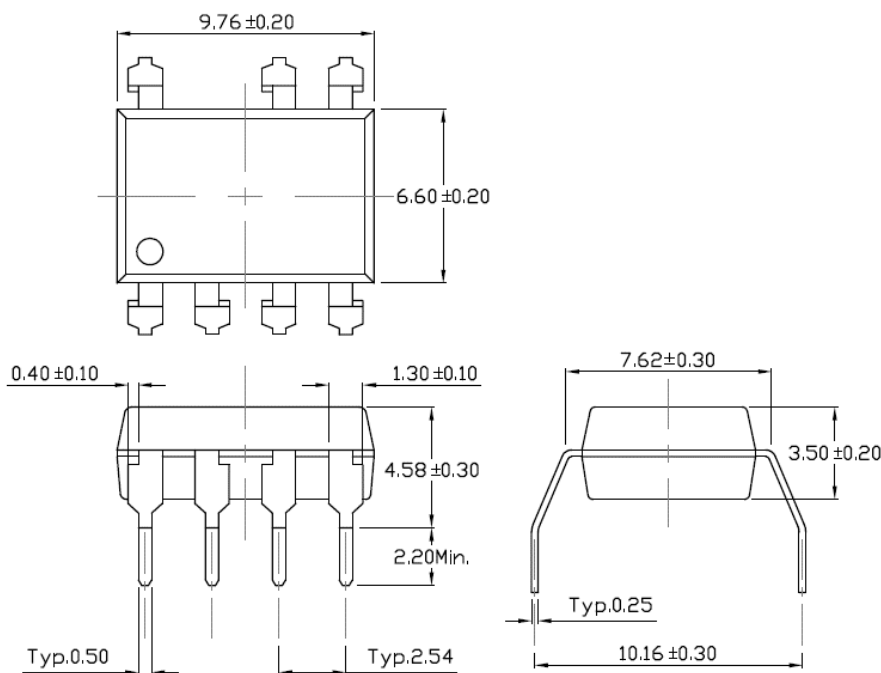
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### Package Dimension *Dimensions in mm unless otherwise stated*

#### Standard DIP – Through Hole



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

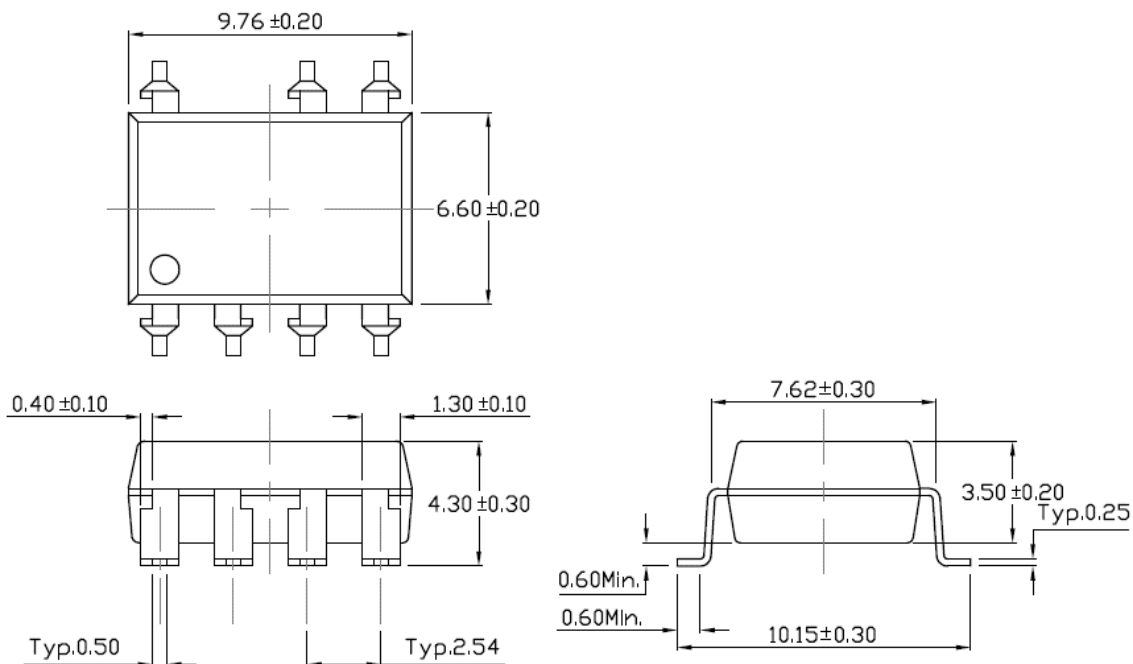




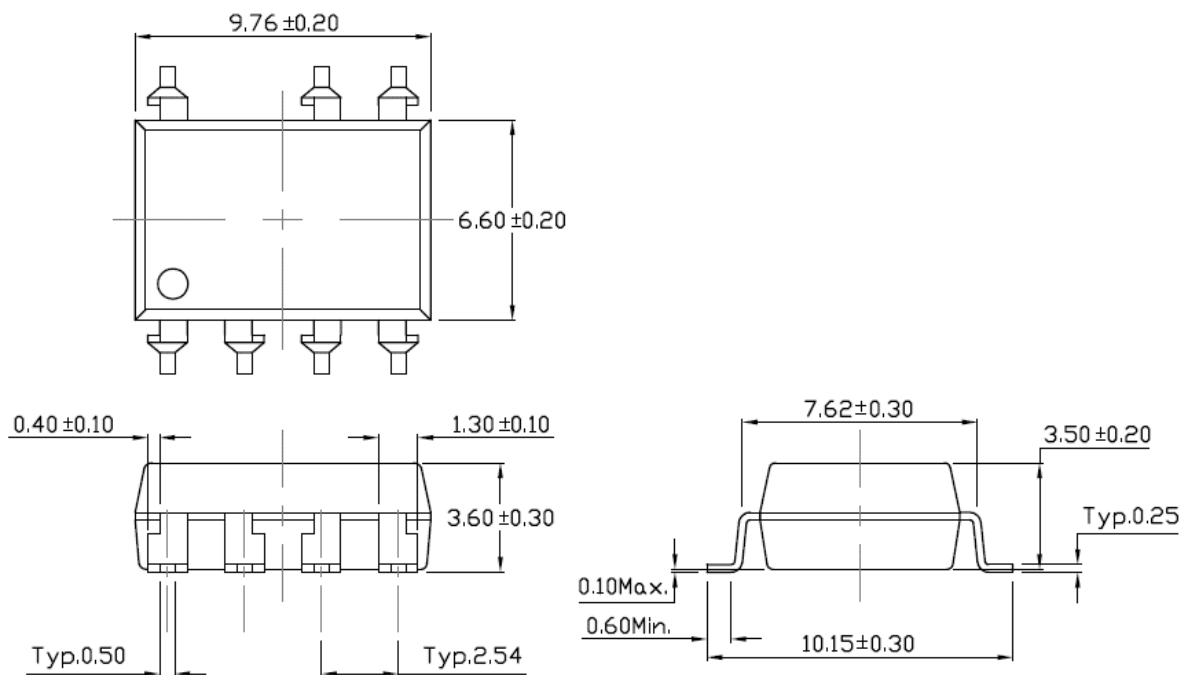
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## 600V Random Phase High Power Photo TRIAC

### Surface Mount Lead Forming (S Type)



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

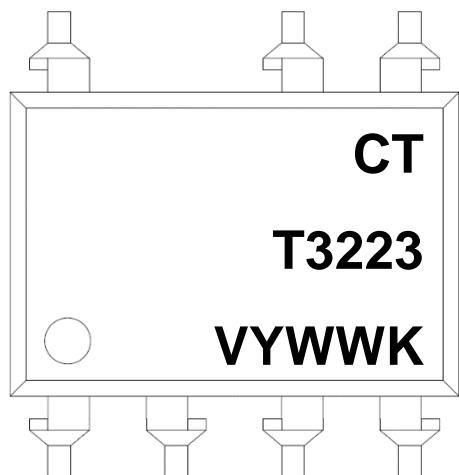




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### Device Marking



**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)

<b>Option</b>	<b>Description</b>	<b>Quantity</b>
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



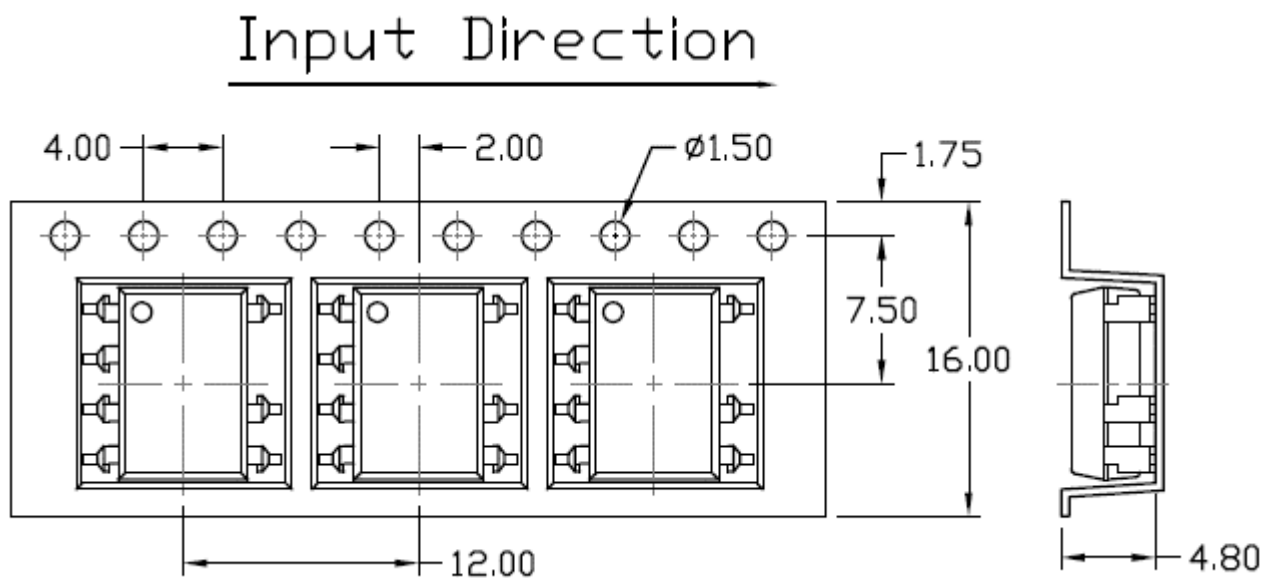


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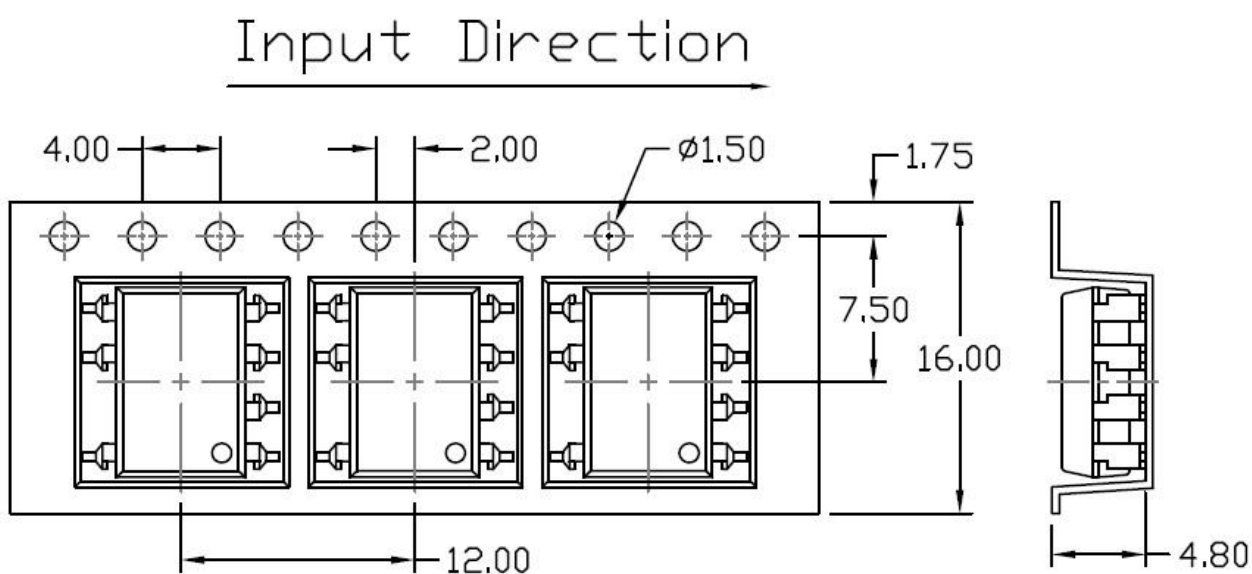
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### Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

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



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





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### Wave soldering (JEDEC22A111 compliant)

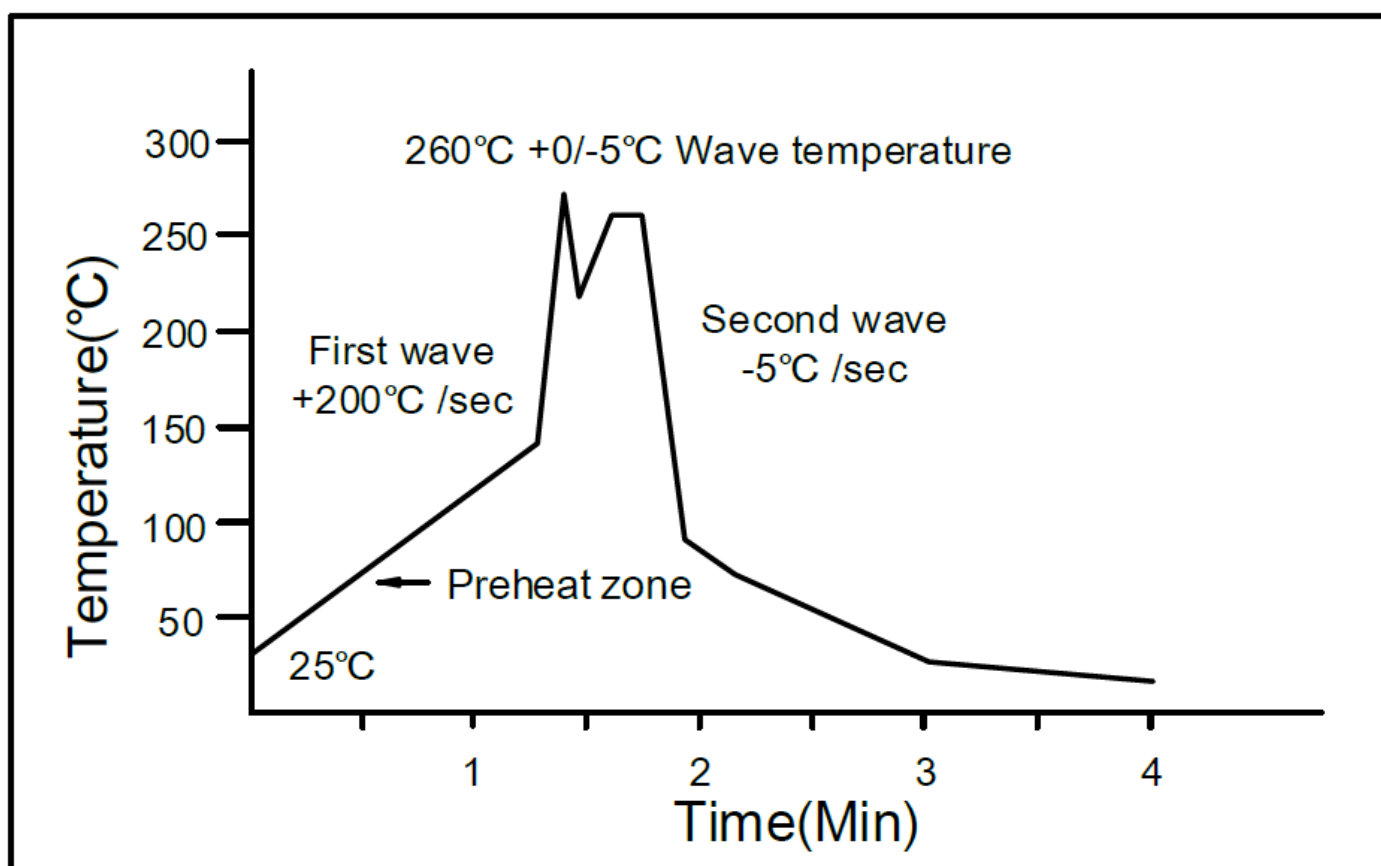
One time soldering is recommended within the condition of temperature.

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

Time: 10 sec.

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

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

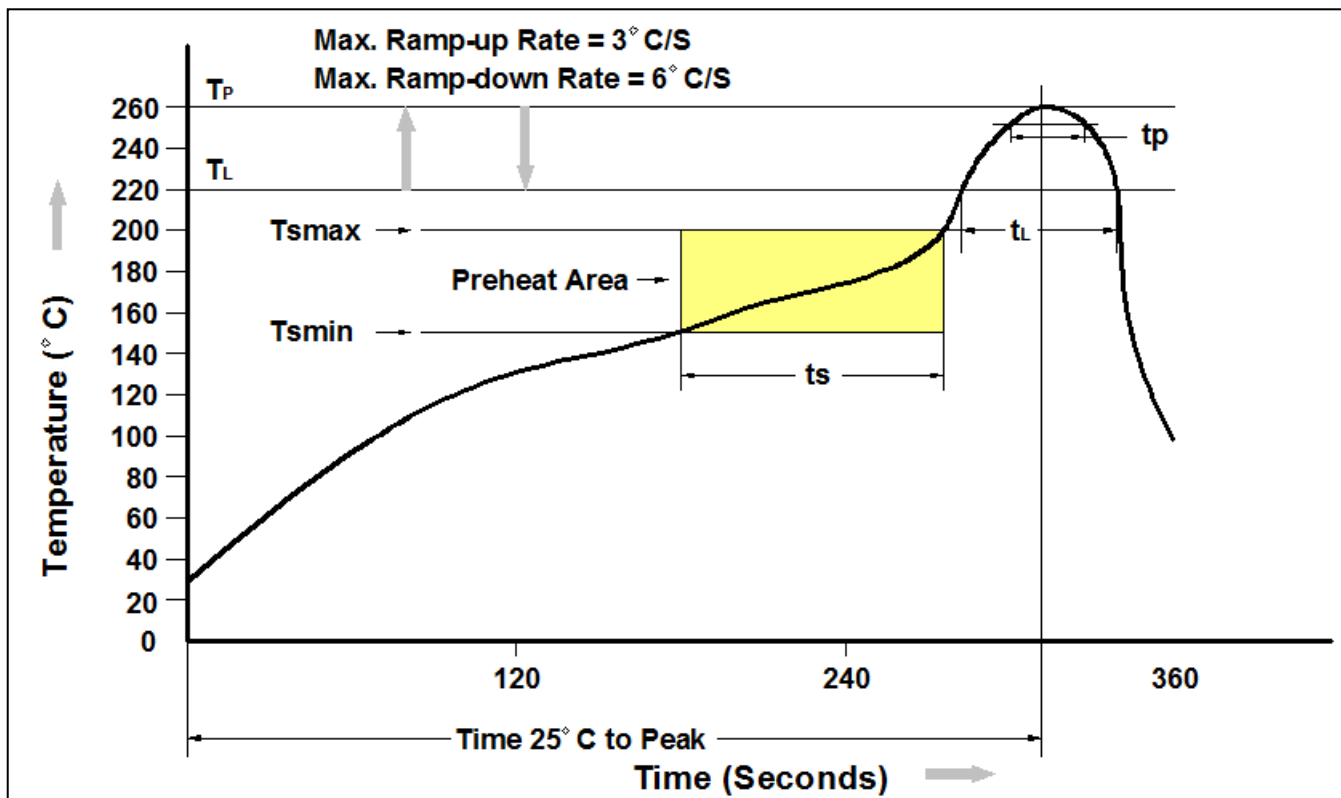
Time: 3 sec max.



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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 <sub>L</sub> to t <sub>P</sub> )	3°C/second max.
Liquidous Temperature (T <sub>L</sub> )	217°C
Time (t <sub>L</sub> ) Maintained Above (T <sub>L</sub> )	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t <sub>P</sub> ) within 5°C of 260°C	30 seconds
Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.



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