



# CTM3051, CTM3052, CTM3053

## 600V Random Phase 4-Pin Mini-Flat Phototriac Optocoupler

### Features

- High isolation 3750 VRMS
- Peak Breakdown Voltage 600V
- Temperature range - 55 °C to 100 °C
- Regulatory Approvals
  - UL - UL1577 (E364000)
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC – GB4943.1, GB8898
  - IEC60065, IEC60950
- Green Package

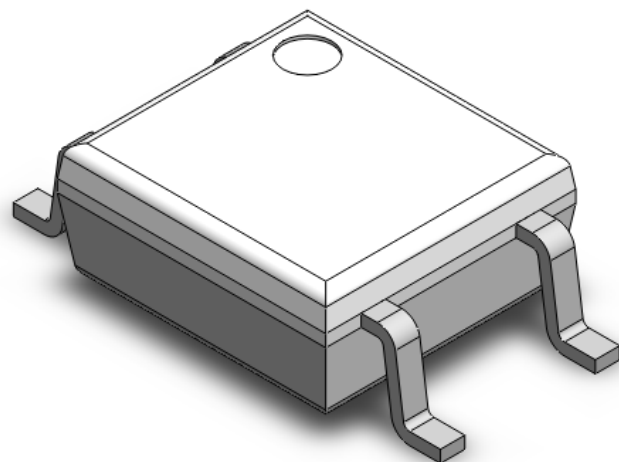
### Applications

- Motor Controls
- Lamp ballasts
- Static AC Power Switch

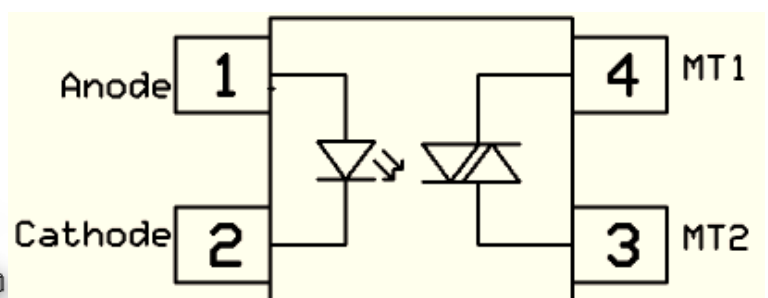
### Description

The CTM3051, CTM3052, CTM3053 series consists of a Random Phase Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a 4-lead Mini Flat package.

### Package Outline



### Schematic





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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	3750	V <sub>RMS</sub>	
T <sub>OPR</sub>	Operating temperature	-55 ~ +100	°C	
T <sub>STG</sub>	Storage temperature	-55 ~ +125	°C	
T <sub>SOL</sub>	Soldering temperature	260	°C	
P <sub>TOT</sub>	Total power dissipation	200	mW	
<b>Emitter</b>				
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	
<b>Detector</b>				
P <sub>D</sub>	Power dissipation	300	mW	
V <sub>DRM</sub>	Off-State Output Terminal Voltage	600	V	
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

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$V_F$	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

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	nA	
$V_{TM}$	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	CTM305X $V_{PEAK} = 600\text{V}$	1000	-	-	$\text{V}/\mu\text{s}$	

#### Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$I_{FT}$	Input	CTM3051	Terminal Voltage = 3V	-	-	15	mA
	Trigger	CTM3052		-	-	10	
	Current	CTM3053		-	-	5	
$I_H$	Holding Current		-	250	-	$\mu\text{A}$	
$R_{IO}$	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	$1 \times 10^{11}$	-	-	$\Omega$	
$C_{IO}$	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	-	pF	



Typical Characteristic Curve

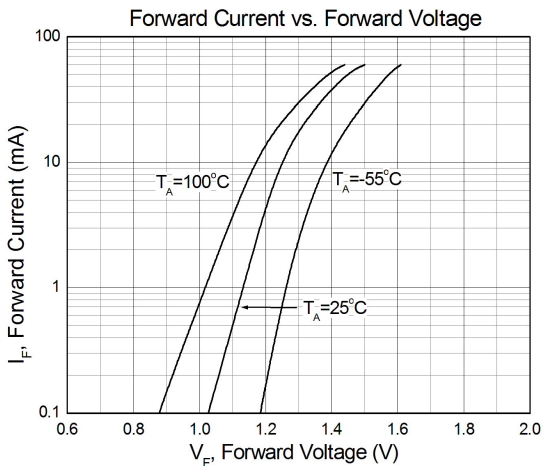


Figure 1

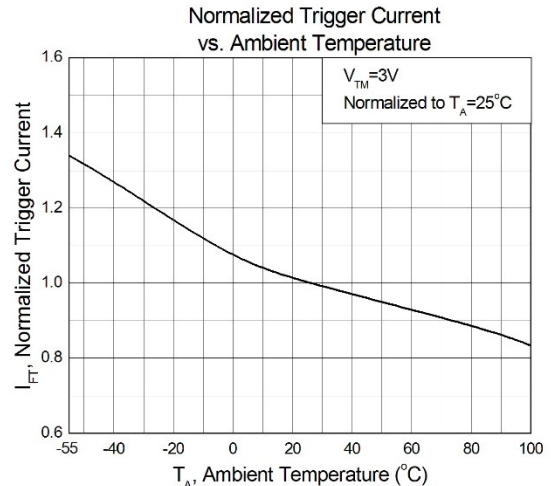


Figure 2

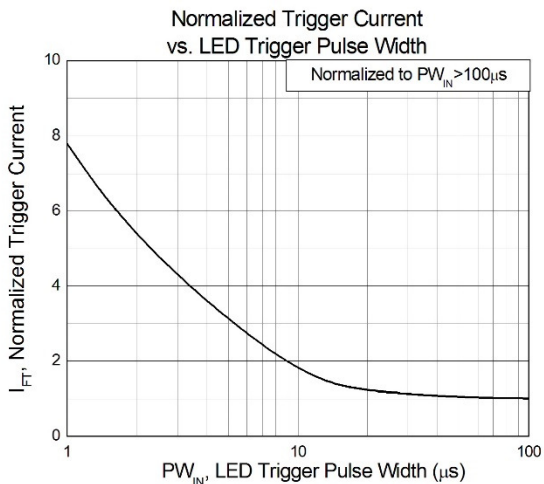


Figure 3

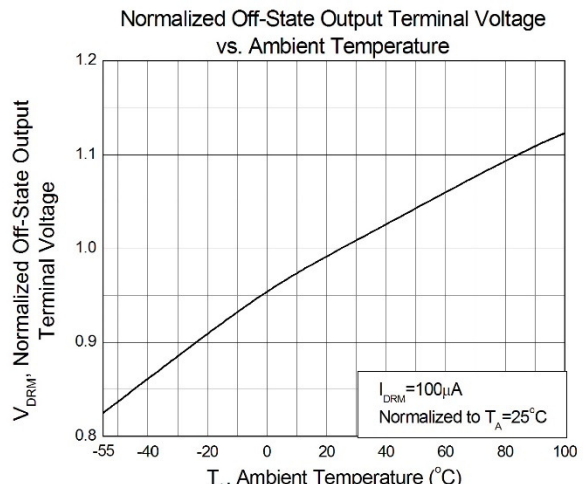


Figure 4

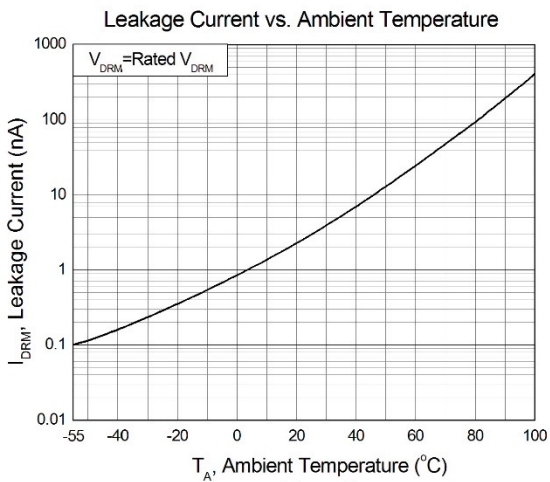


Figure 5

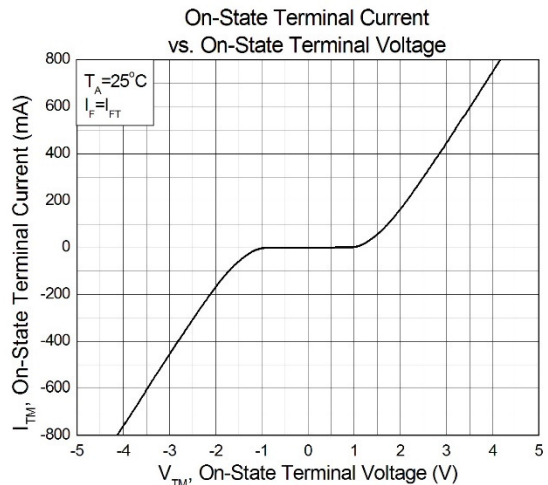
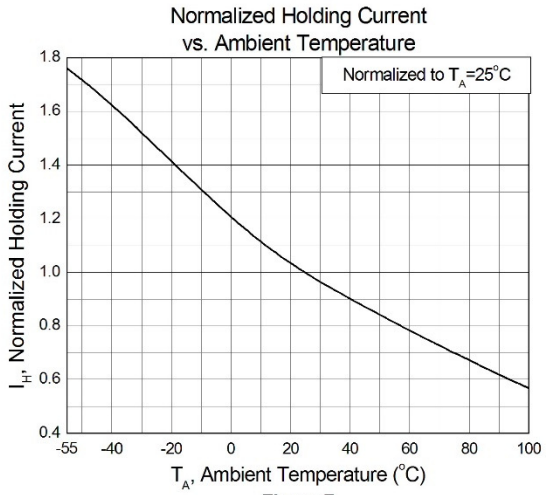


Figure 6



### Typical Characteristic Curve

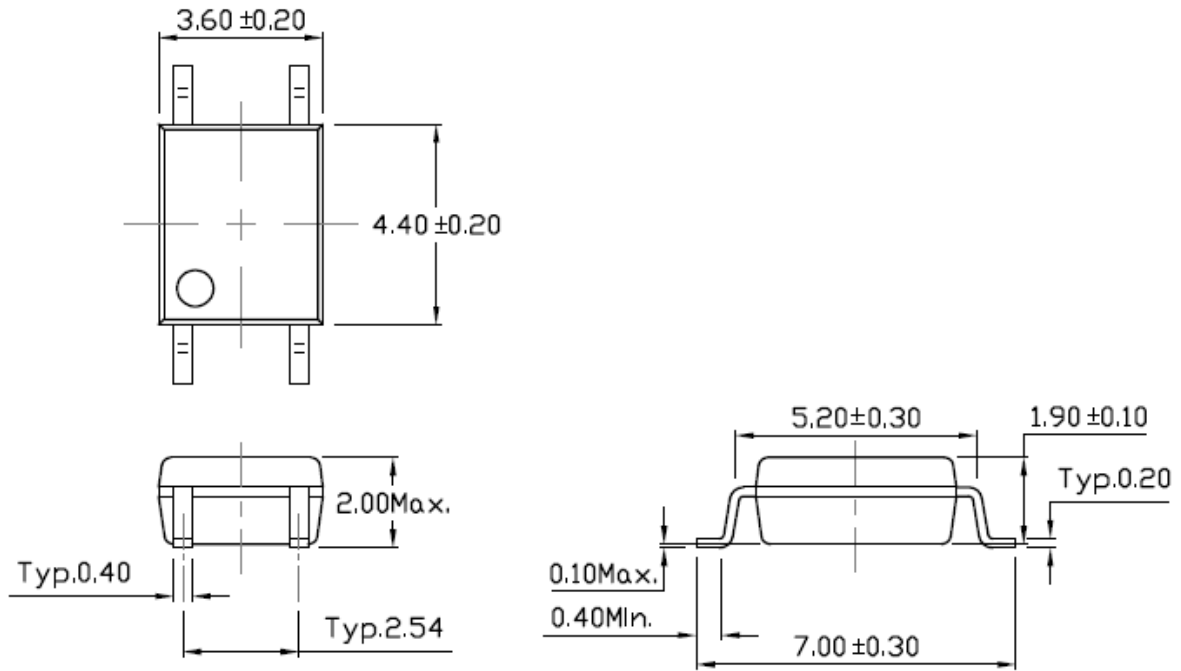




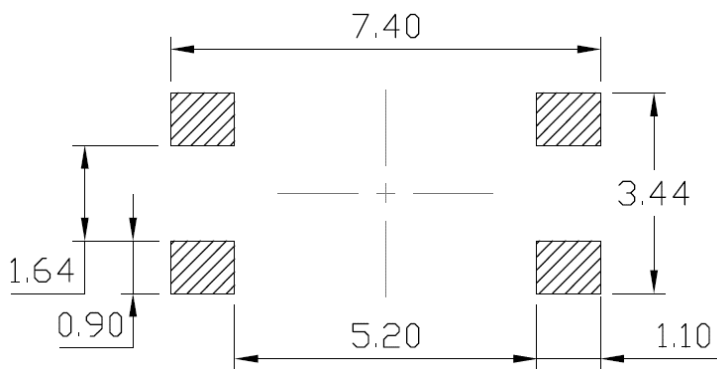
# CTM3051, CTM3052, CTM3053

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



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

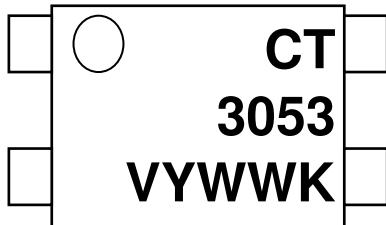




## CTM3051, CTM3052, CTM3053

### 600V Random Phase 4-Pin Mini-Flat Phototriac Optocoupler

#### Marking Information



**Note:**

- CT : Denotes “CT Micro”
- 3053 : Product Number
- V : VDE Option
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code

#### Ordering Information

##### CTM30XX(V)(Z)

XX = Part No. (XX=51, 52 or 53)

V = VDE Option ( V or None)

Z = Tape and reel option (T1 or T2)

<b>Option</b>	<b>Description</b>	<b>Quantity</b>
T1	Surface Mount Lead Forming – With Option 1 Taping	3000 Units/Reel
T2	Surface Mount Lead Forming – With Option 2 Taping	3000 Units/Reel

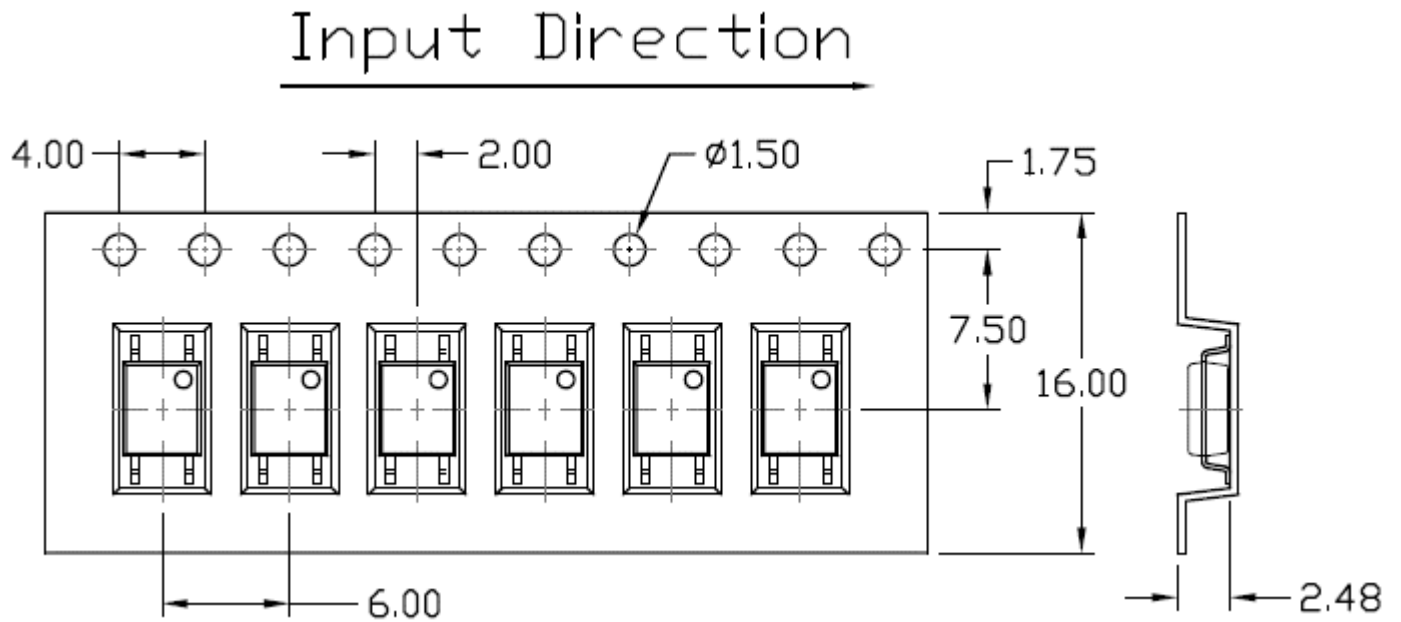


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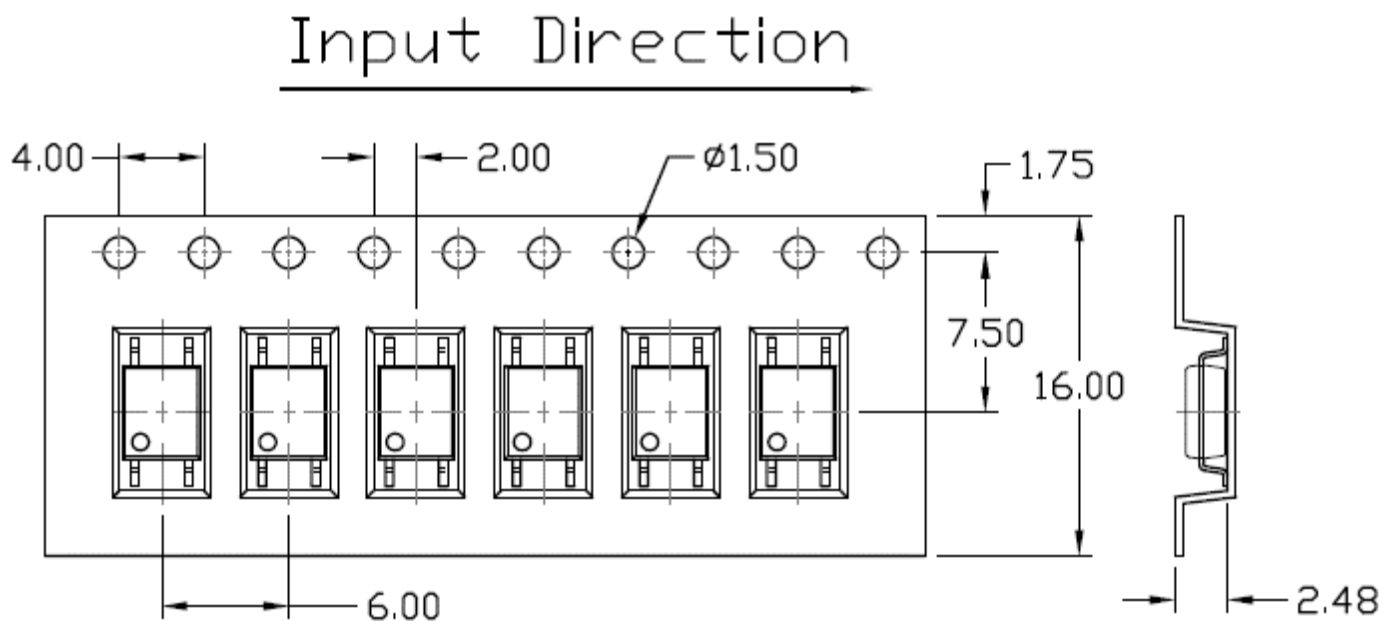
## 600V Random Phase 4-Pin Mini-Flat Phototriac Optocoupler

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

#### Option T1



#### Option T2



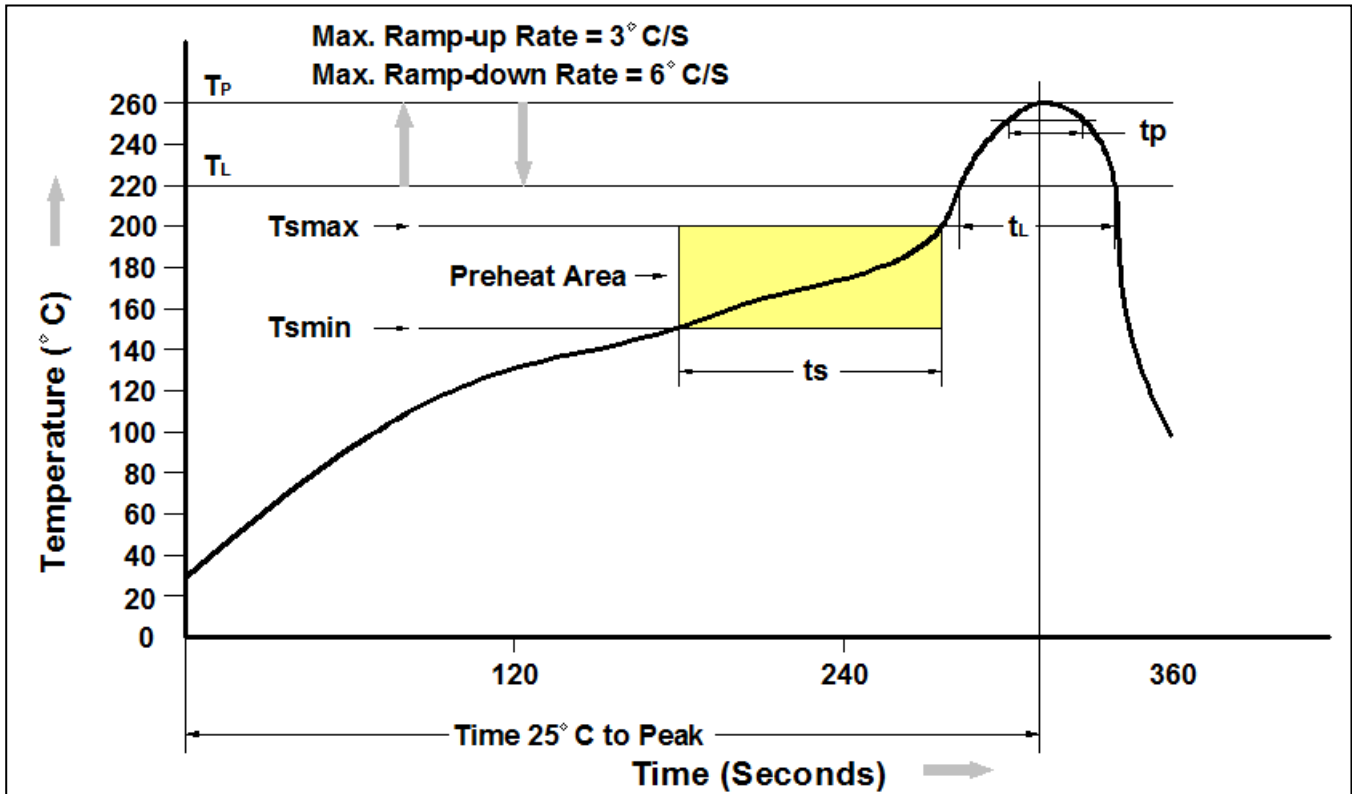




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### Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T <sub>smin</sub> )	150°C
Temperature Max. (T <sub>smax</sub> )	200°C
Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> )	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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