



CTM3010, CTM3011, CTM3012 CTM3020, CTM3021, CTM3022, CTM3023 250V/400V Random Phase MFP-4L Phototriac Optocoupler

Features

- High isolation 3750 VRMS
- Peak Breakdown Voltage
 - 250V – CTM3010,3011,3012
 - 400V – CTM3020,3021,3022,3023
- 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

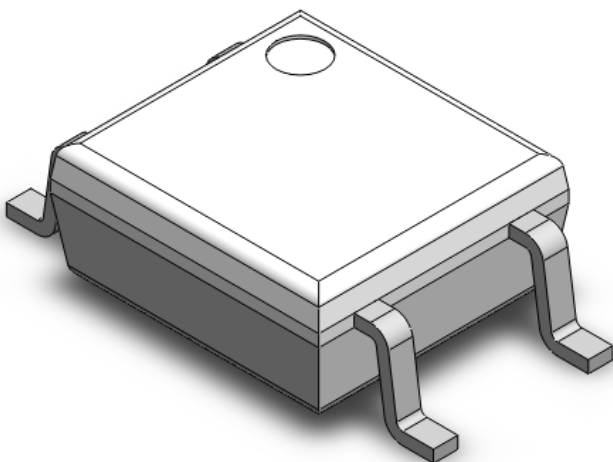
Description

The CTM3010, CTM3011, CTM3012, CTM3020, CTM3021, CTM3022 and CTM3023 consists of a Random Phase Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a 4 pin mini-flat package.

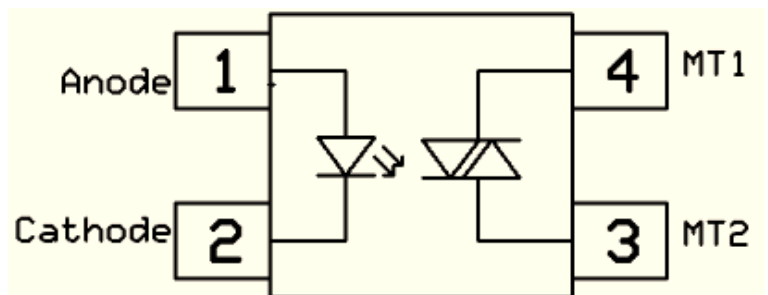
Applications

- 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

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	3750	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	CTM3010,3011,3012	250	V
		CTM3020,3021,3022,3023	400	V
I _{TSM}	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	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	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	$V_{PEAK} = \text{Rated } V_{DRM}$	-	100	-	$\text{V}/\mu\text{s}$	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes	
I_{FT}	Input Trigger Current	CTM3020	Terminal Voltage = 3V $I_{TM} = 100\text{mA}$	-	-	30	mA	
		CTM3010, CTM3021		-	-	15		
		CTM3011, CTM3022		-	-	10		
		CTM3012, CTM3023		-	-	5		
I_H	Holding Current		-	250	-	μA		
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	1×10^{11}	-	-			
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	-	pF		



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Typical Characteristic Curve

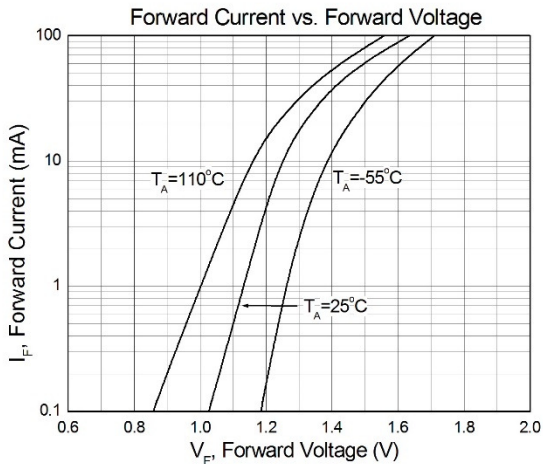


Figure 1

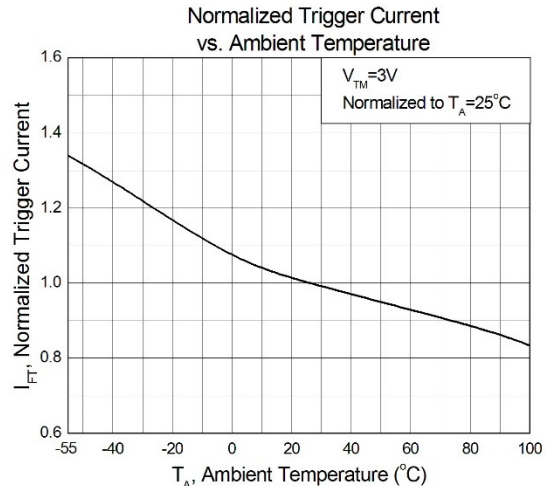


Figure 2

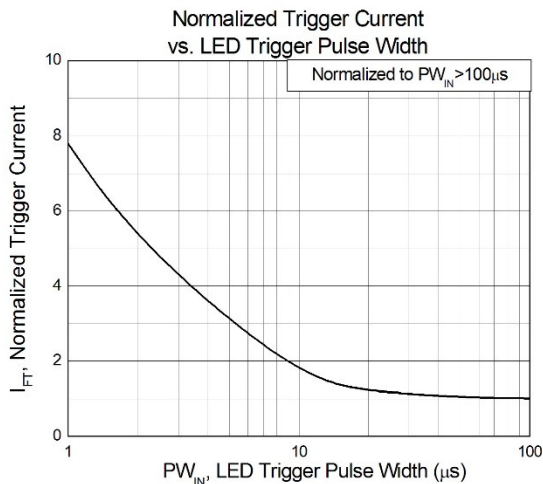


Figure 3

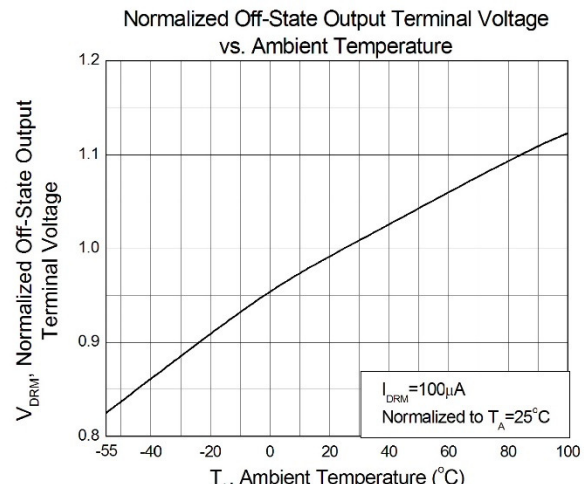


Figure 4

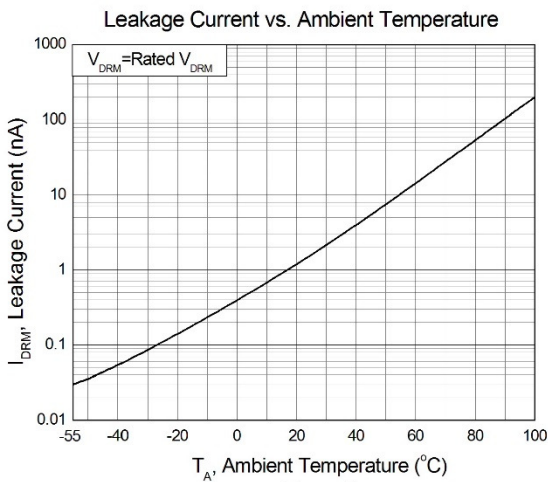


Figure 5

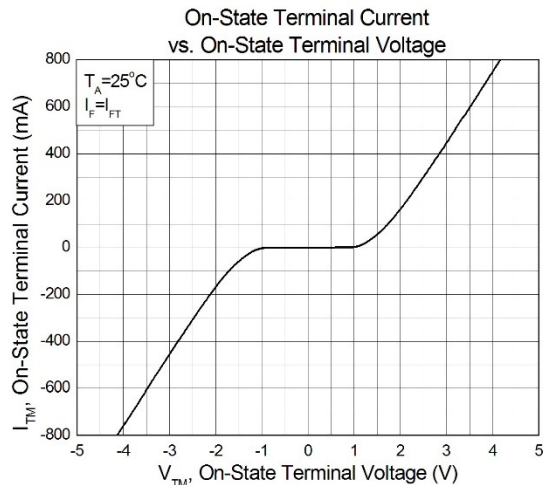
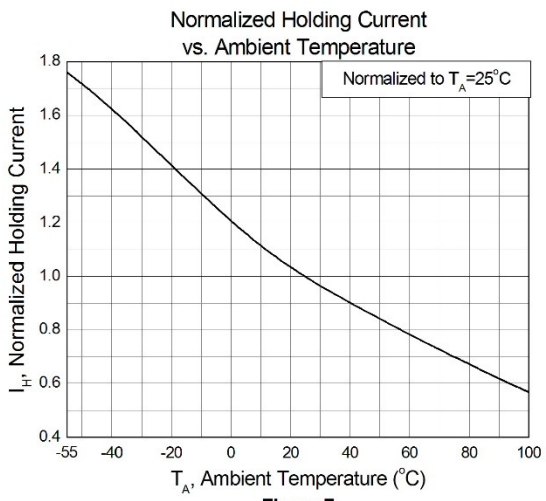


Figure 6



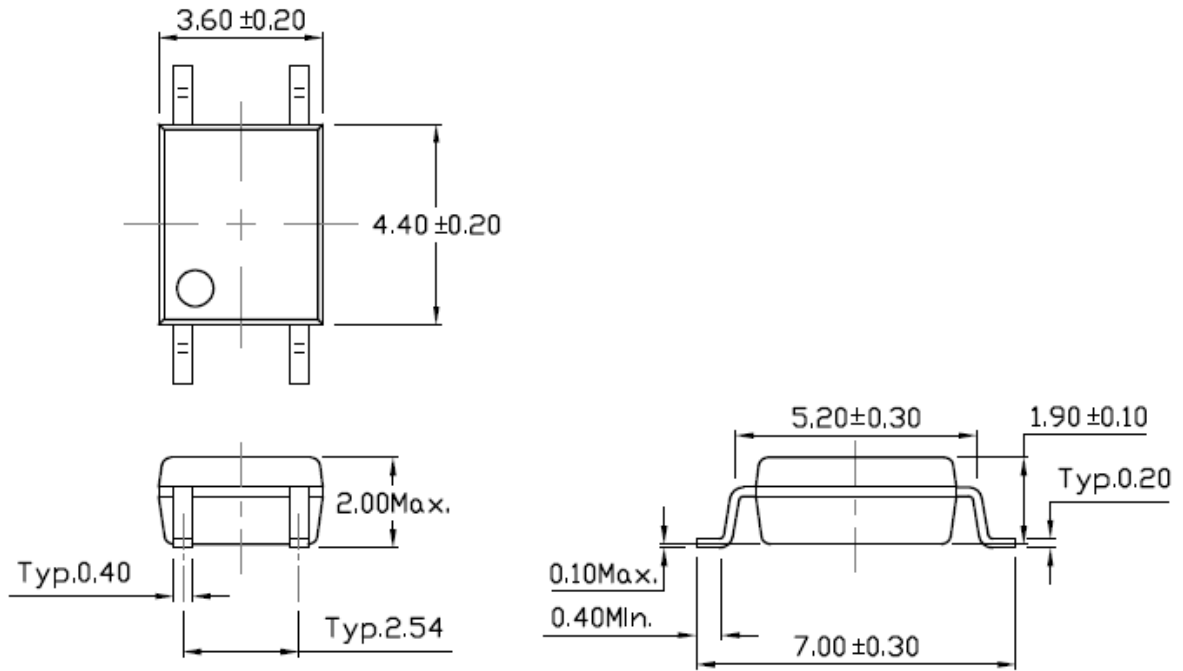
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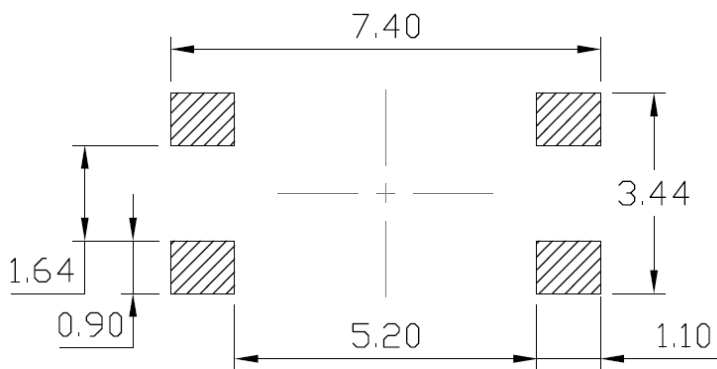


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Package Dimension *Dimensions in mm unless otherwise stated*



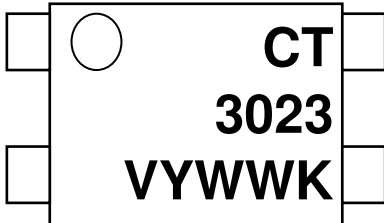
Recommended Solder Mask *Dimensions in mm unless otherwise stated*





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Marking Information



Note:

- CT : Denotes “CT Micro”
- 3023 : Product Number
- V : VDE Option
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code

Ordering Information

CTM30XX(V)(Z)

XX = Part No. (XX=10, 11, 12, 20, 21, 22 or 23)

V = VDE Option (V or None)

Z = Tape and reel option (T1 or T2)

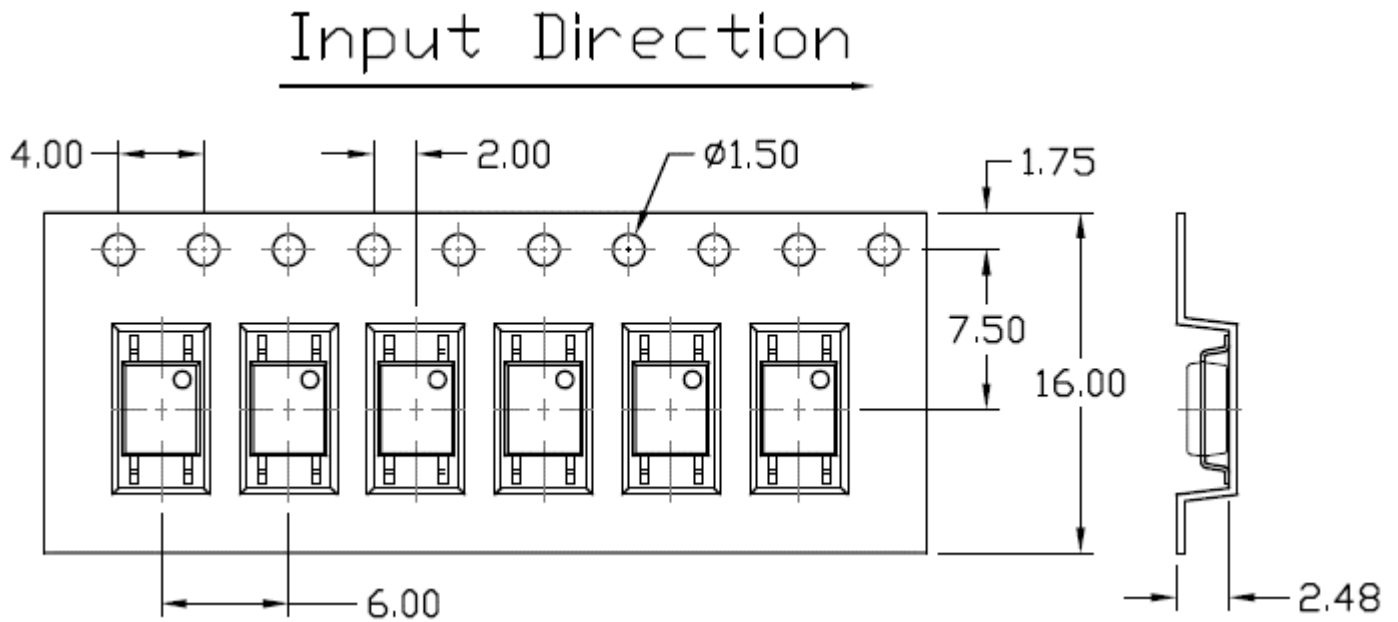
Option	Description	Quantity
T1	Surface Mount Lead Forming – With Option 1 Taping	3000 Units/Reel
T2	Surface Mount Lead Forming – With Option 2 Taping	3000 Units/Reel



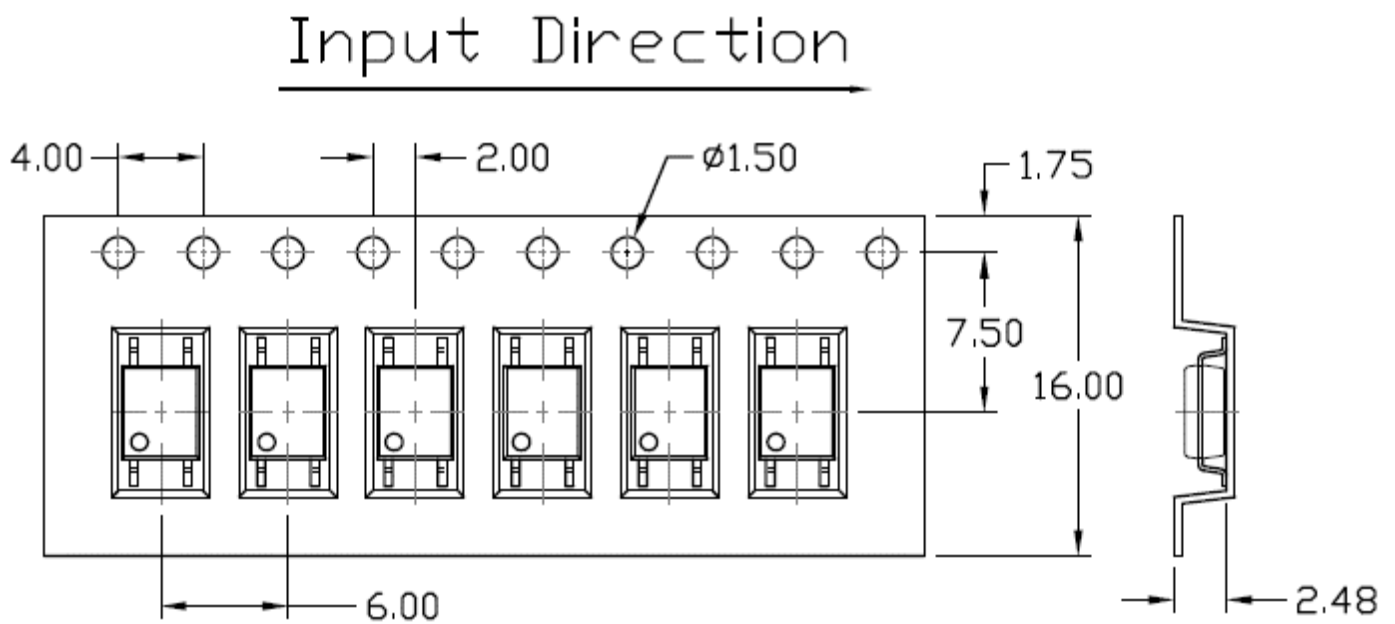
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1



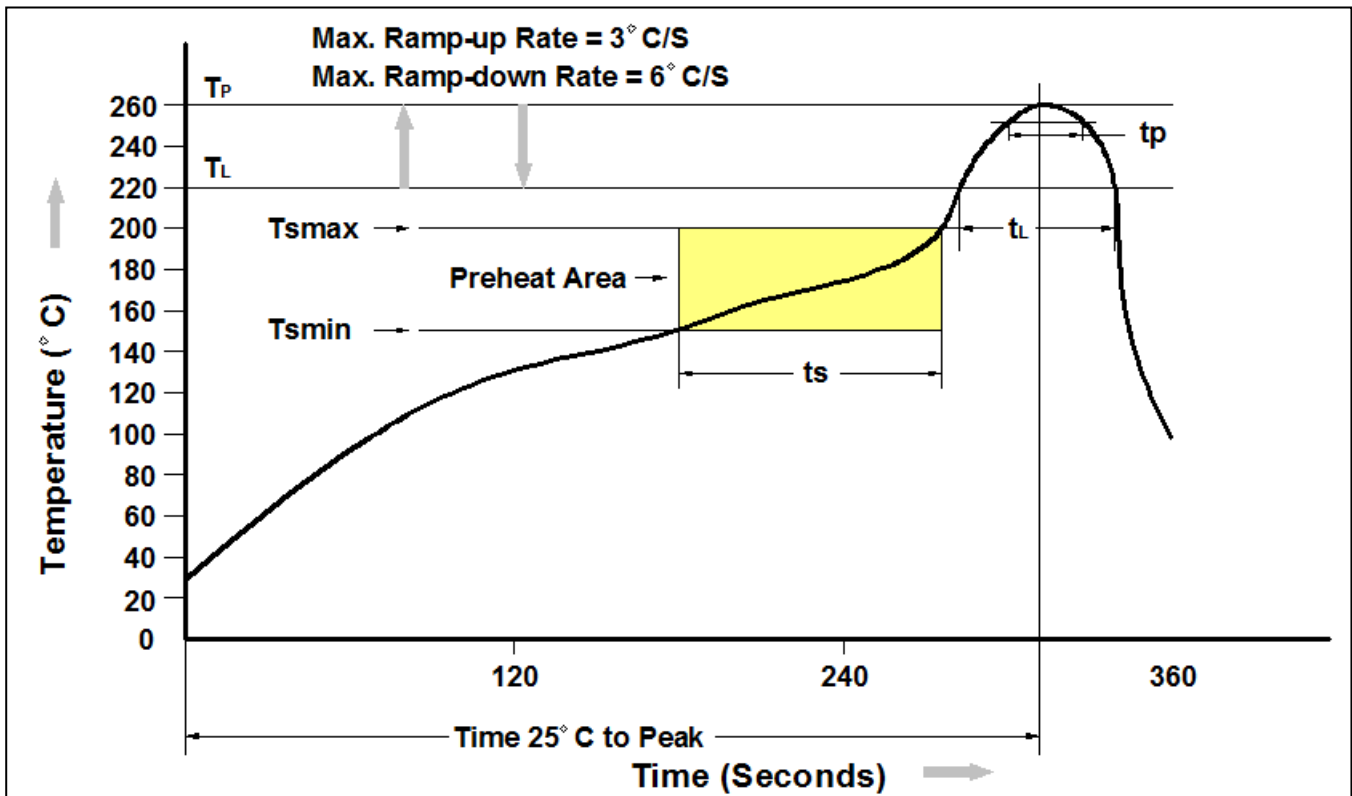
Option T2





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Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	150°C
Temperature Max. (T_{smax})	200°C
Time (t_s) from (T_{smin} to T_{smax})	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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