



**CTM3031, CTM3032, CTM3033**

**CTM3041, CTM3042, CTM3043**

## **250V/400V Zero Cross MFP-4L Phototriac Optocoupler**

### **Features**

- High isolation 5000 VRMS
- Peak Breakdown Voltage
  - 250V – CTM3031,3032,3033
  - 400V – CTM3041,3042,3043
- 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

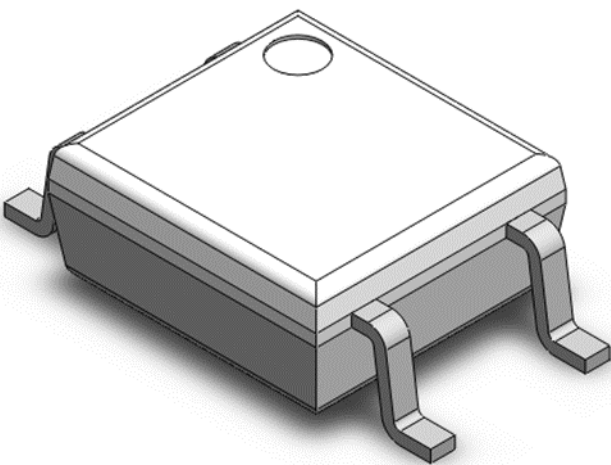
### **Description**

The CTM3031, CTM3032, CTM3033, CTM3041, CTM3042 and CTM3043 consists of a Zero Cross Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a MFP-4L package.

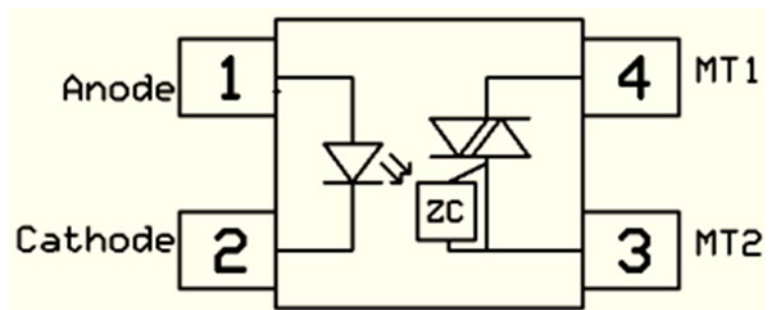
### **Applications**

- 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**

<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 ~ +150	°C	
T <sub>SOL</sub>	Soldering temperature	260	°C	
<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	CTM3031,3032,3033	250	V
		CTM3041,3042,3043	400	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
$I_{DRM1}$	Peak Blocking Current	$I_F = 0\text{mA}$ , $V_{DRM} = \text{Rated } V_{DRM}$	-	-	100	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	$V_{PEAK} = \text{Rated } V_{DRM}$	1000	-	-	V/ $\mu\text{s}$	

**Transfer Characteristics**

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$I_{FT}$	Input Trigger Current	Terminal Voltage = 3V $I_{TM} = 100\text{mA}$	-	-	15	mA	
					10		
					5		
$I_H$	Holding Current		-	270	-	$\mu\text{A}$	
$R_{IO}$	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	$1 \times 10^{11}$	-	-		
$C_{IO}$	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	-	pF	



### Typical Characteristic Curve

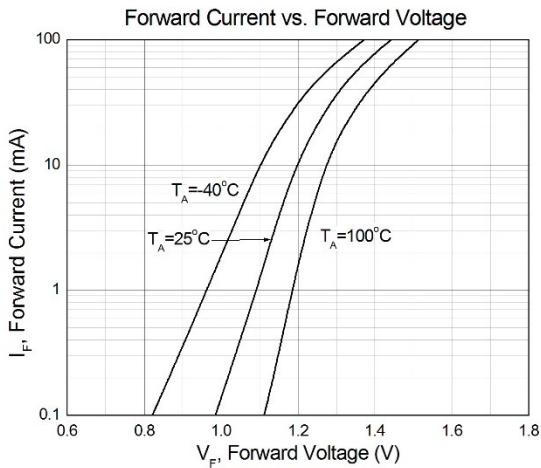


Figure 1

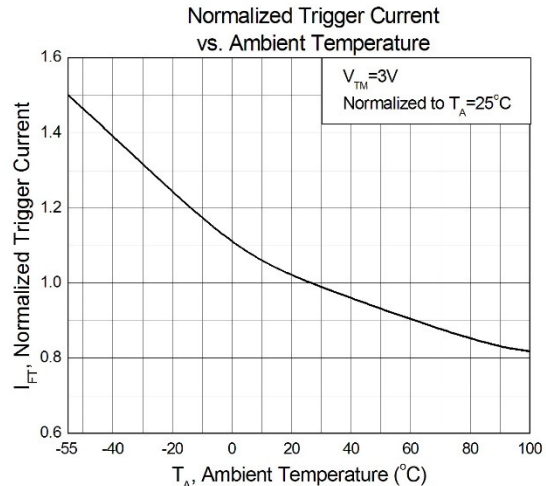


Figure 2

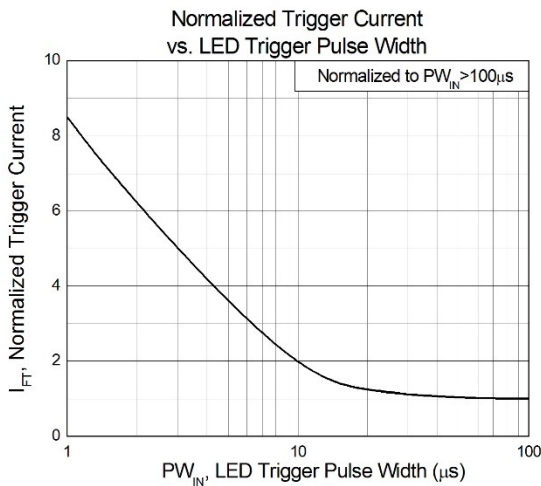


Figure 3

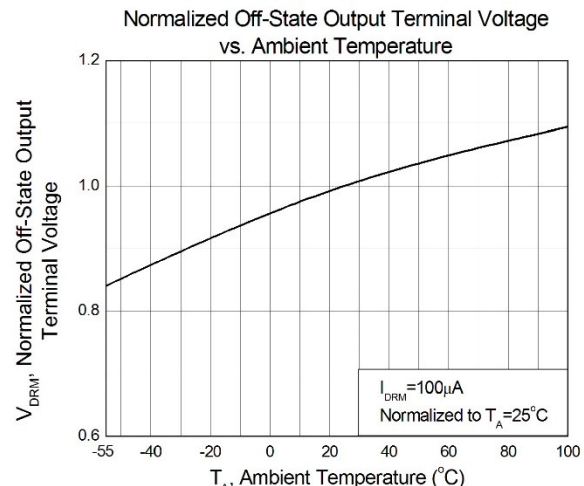


Figure 4

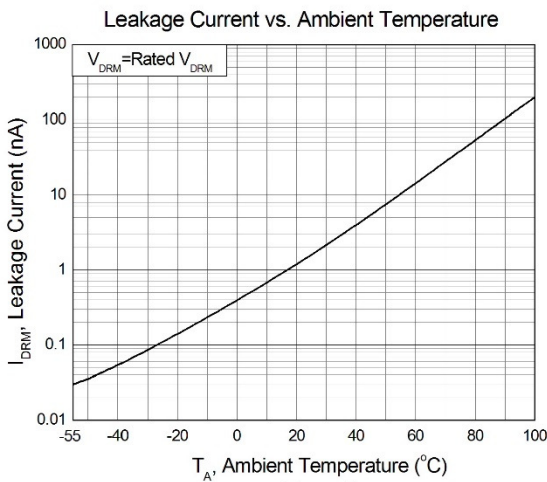


Figure 5

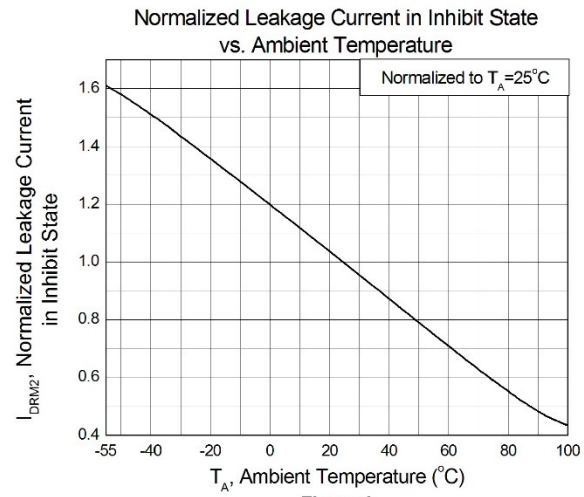


Figure 6



250V/400V Zero Cross MFP-4L Phototriac Optocouple

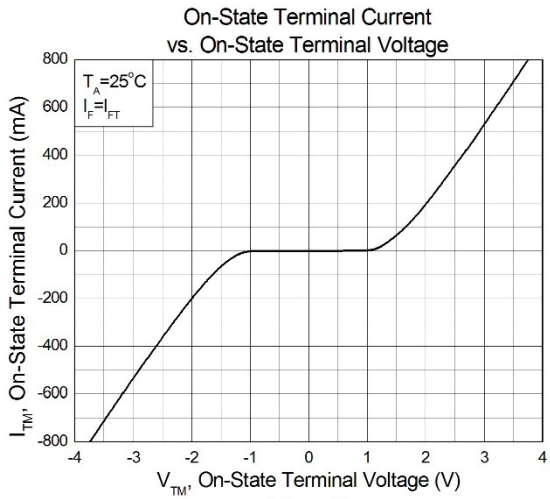


Figure 7

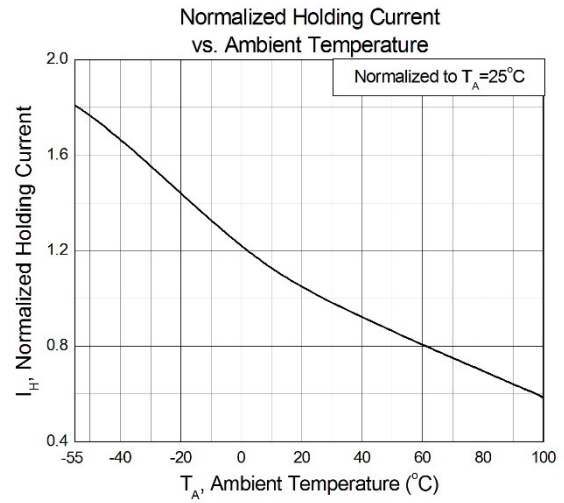


Figure 8

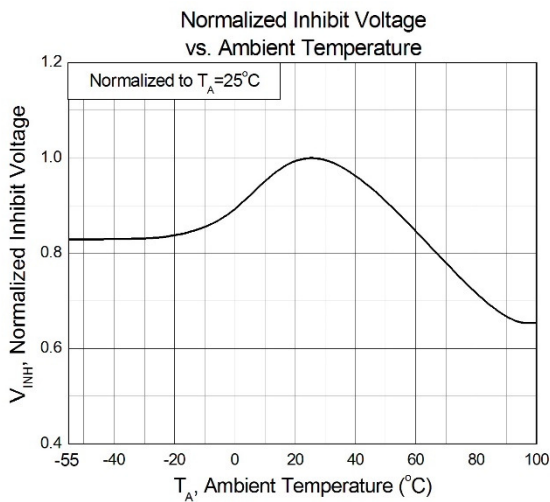


Figure 9

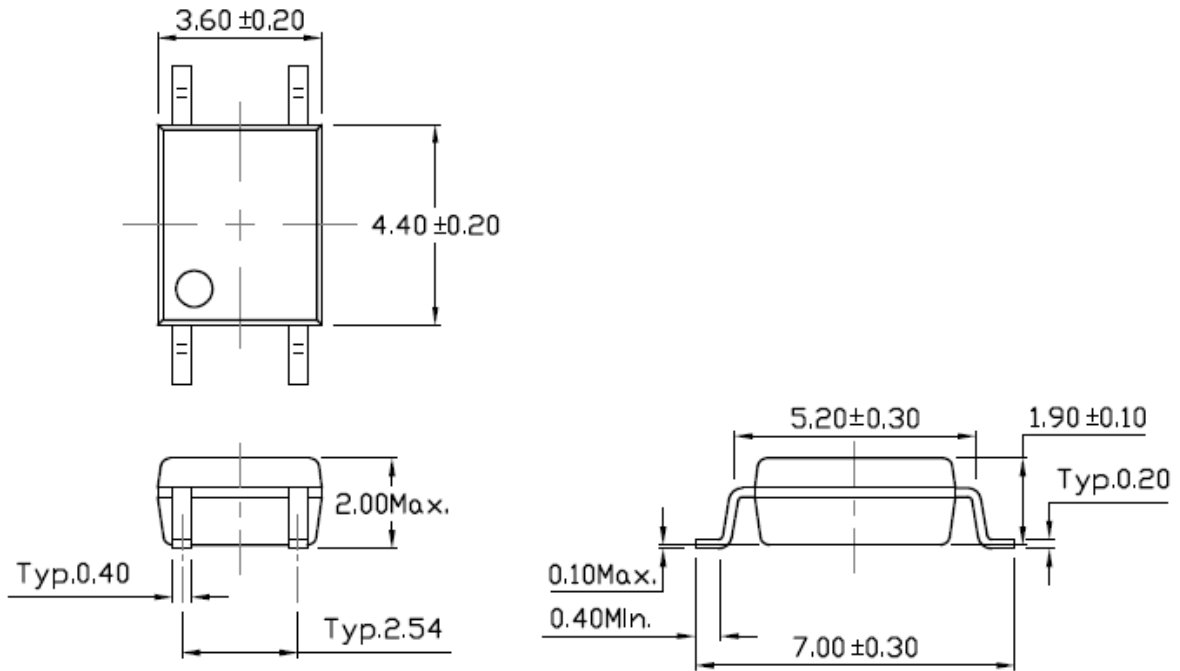


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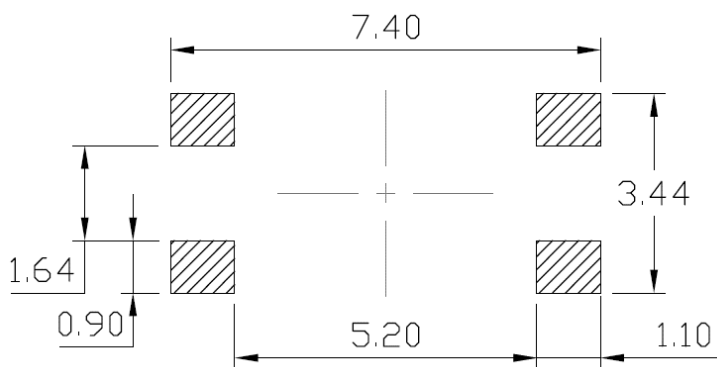
CTM3041, CTM3042, CTM3043

## 250V/400V Zero Cross MFP-4L Phototriac Optocoupler

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



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



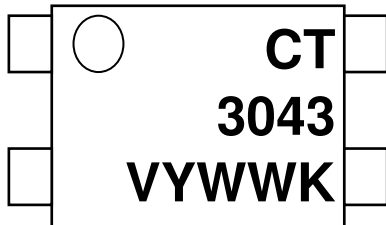


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## 250V/400V Zero Cross MFP-4L Phototriac Optocouple

### Marking Information



**Note:**

CT : Denotes “CT Micro”

3043 : Product Number

V : VDE Option

Y : Fiscal Year

WW : Work Week

K : Manufacturing Code

### Ordering Information

CTM30XX(V)(Z)

XX = Part No. (XX=31, 32, 33, 41, 42 or 43)

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



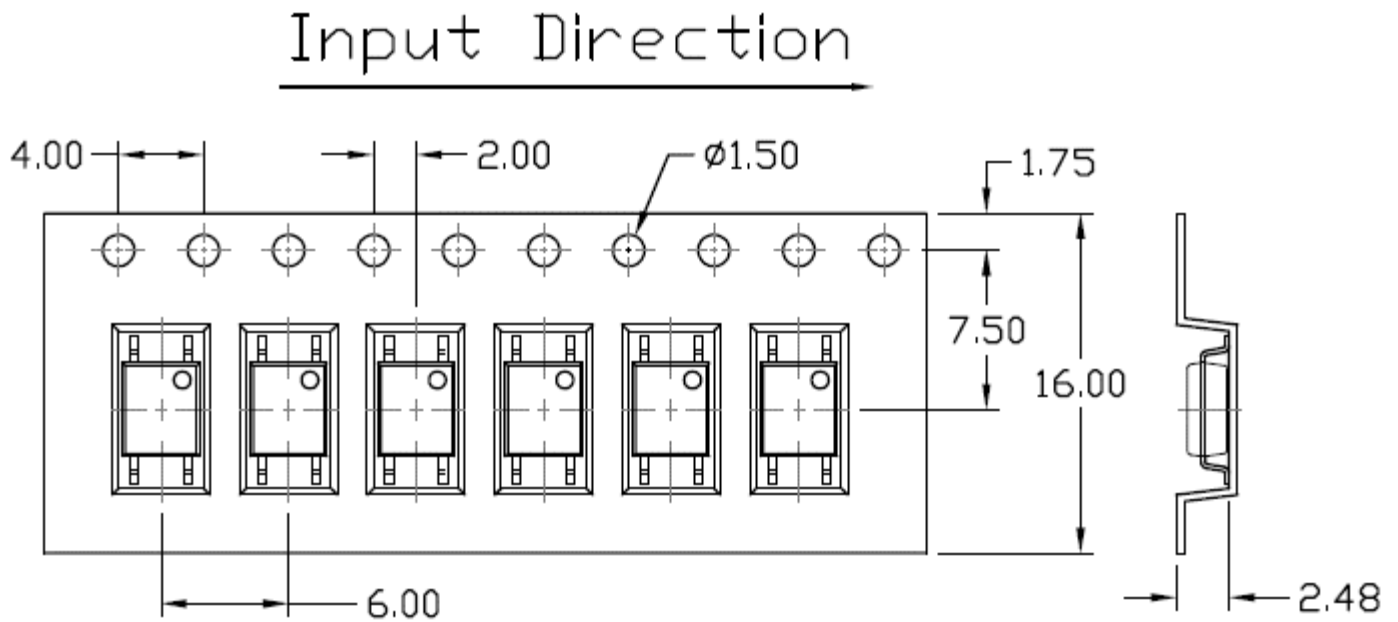
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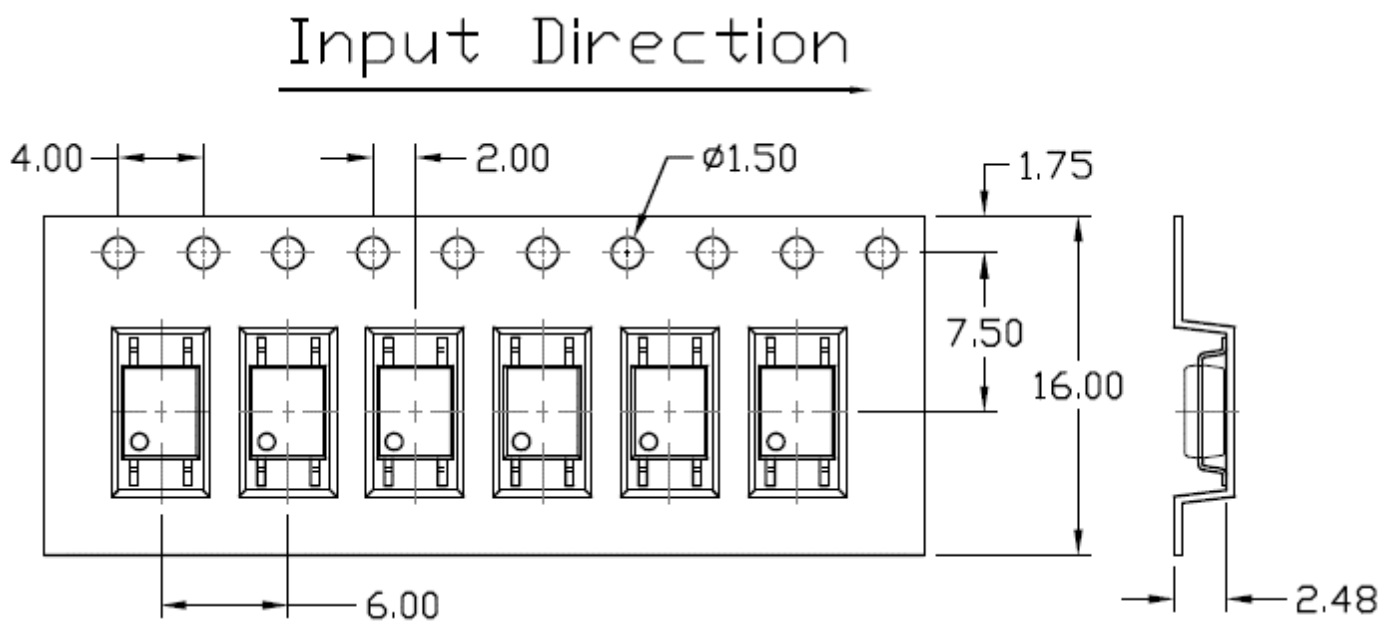
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### Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

#### Option T1



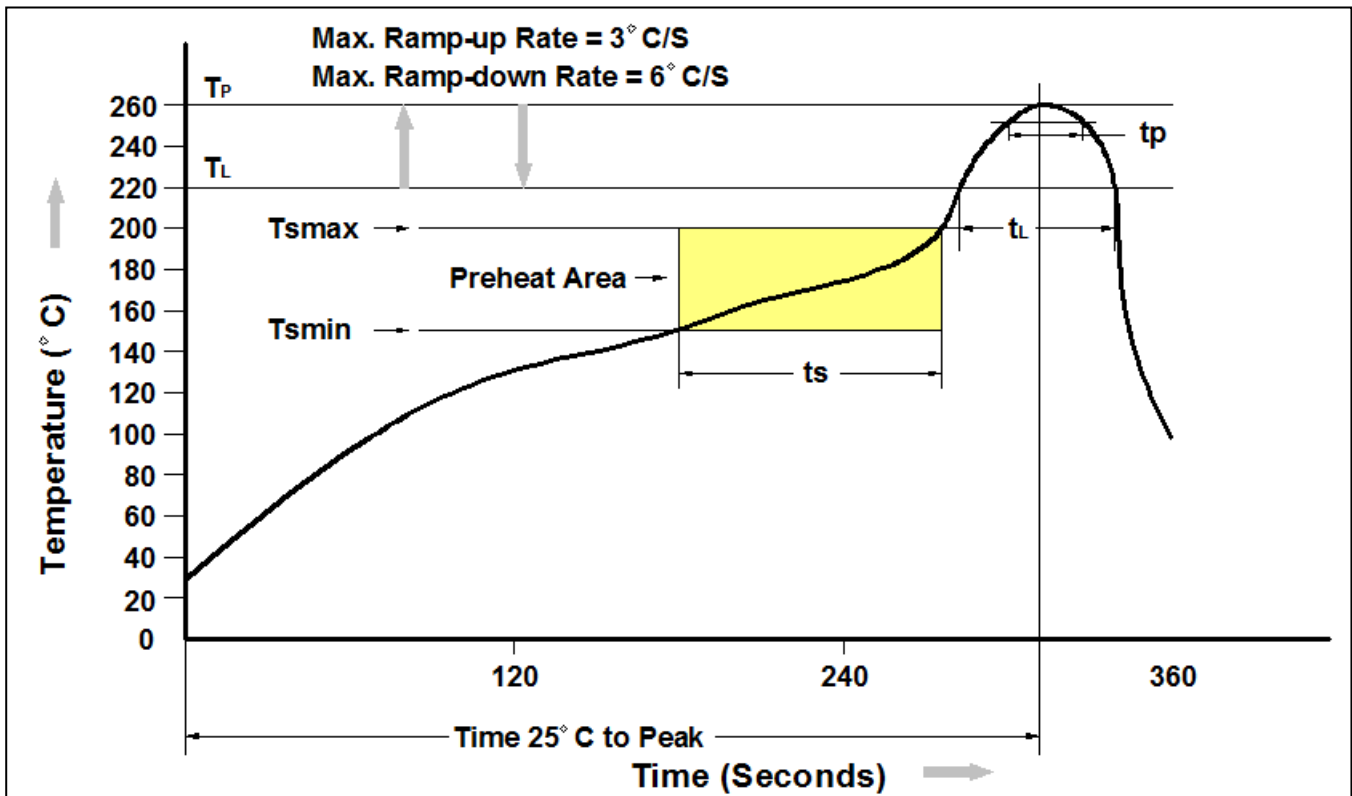
#### Option T2







## 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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