



CTM3031, CTM3032, CTM3033
CTM3041, CTM3042, CTM3043
250V/400V Zero Cross MFP-4L DMC-Isolator®
Phototriac Optocoupler

Features

- High isolation 5000 VRMS
- Patented coplanar structure DMC-Isolator®
- Peak Breakdown Voltage
 - 250V – CTM3031, CT3032, CT3033
 - 400V – CTM3041, CT3042, CT3043
- Operating temperature range - 55 °C to 100 °C
- External Creepage $\geq 5.0\text{mm}$
- Distance Through Isolation $\geq 0.4\text{mm}$
- Clearance Distance $\geq 5.0\text{mm}$
- RoHS and REACH Compliance
- Halogen Free Compliance
- MSL class 1
- Regulatory Approvals
 - ✓ UL - UL1577 (E364000)
 - ✓ VDE - EN60747-5-5(VDE0884-5)
 - ✓ CQC – GB4943.1, GB8898
 - ✓ IEC60065, IEC60950

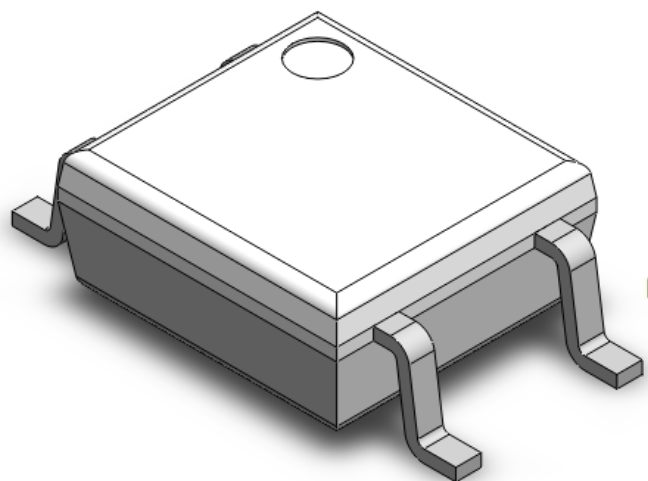
Description

The CTM3031, CTM3032, CTM3033, CTM3041, CTM3042 and CTM3043 consists of a Zero Cross Photo Triac optically coupled to an Infrared-emitting diode in a 4-lead Mini-Flat DMC-Isolator® package.

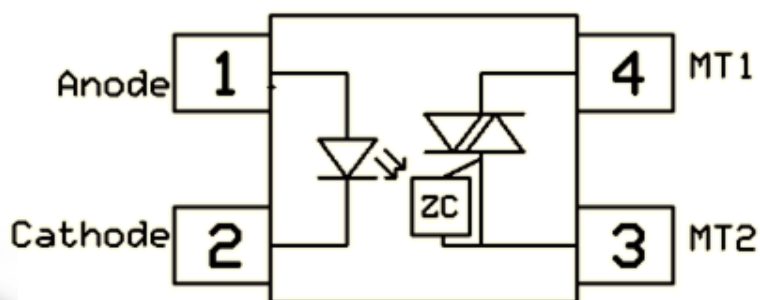
Applications

- Motor Controls
- Lamp ballasts
- Static AC Power Switch
- Solenoid/ Valve Control

Package Outline



Schematic





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Absolute Maximum Ratings $T_A = 25^\circ\text{C}$, unless otherwise specified

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameters		Ratings	Units	Notes
V _{ISO}	Isolation voltage (AC, 1 minute, 40 ~ 60% R.H.)		3750	V _{RMS}	
T _{OPR}	Operating temperature		-55 ~ +100	°C	
T _{STG}	Storage temperature		-55 ~ +150	°C	
T _{SOL}	Soldering temperature (For 10 seconds)		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	CTM3031, CT3032,CT3033	250	V	
		CTM3041, CT3042,CT3043	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_{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	μA	
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	-	-	$\text{V}/\mu\text{s}$	

Transfer Characteristics

Symbol	Parameters		Test Conditions	Min	Typ	Max	Units	Notes
I_{FT}	Input Trigger Current	CTM3031, CTM3041	Terminal Voltage = 3V $I_{TM} = 100\text{mA}$	-	-	15	mA	
		CTM3032, CTM3042		-	-	10		
		CTM3033, CTM3043		-	-	5		
I_H	Holding Current		Terminal Voltage from "ON" to "OFF" "ON" state $I_F = 0\text{mA}$	-	270	-	μA	
R_{IO}	Isolation Resistance		$V_{IO} = 500\text{V}_{DC}$, 40 ~ 60% R.H.	1×10^{11}	-	-	Ω	
C_{IO}	Isolation Capacitance		$f = 1\text{MHz}$	-	0.25	-	pF	



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Typical Characteristic Curves $T_A = 25^\circ\text{C}$, unless otherwise specified

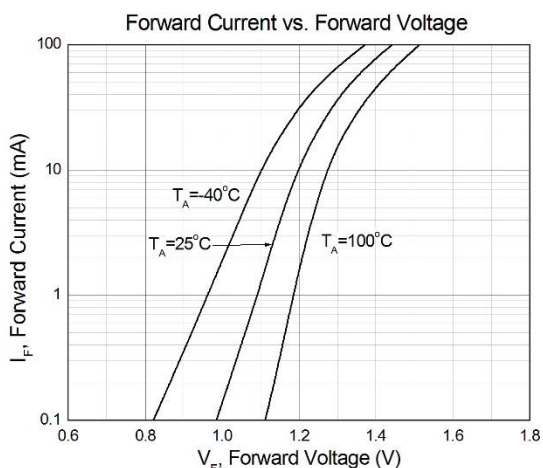


Figure 1

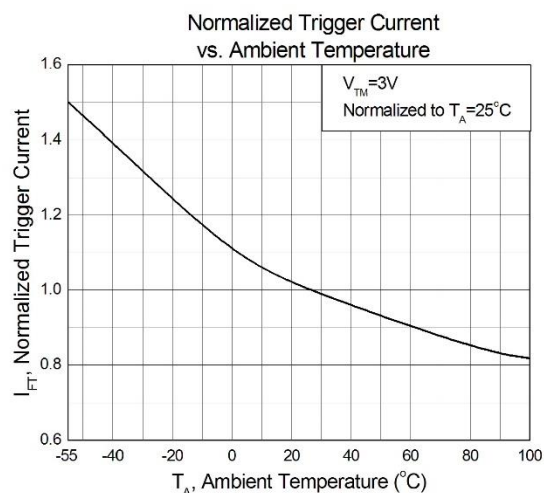


Figure 2

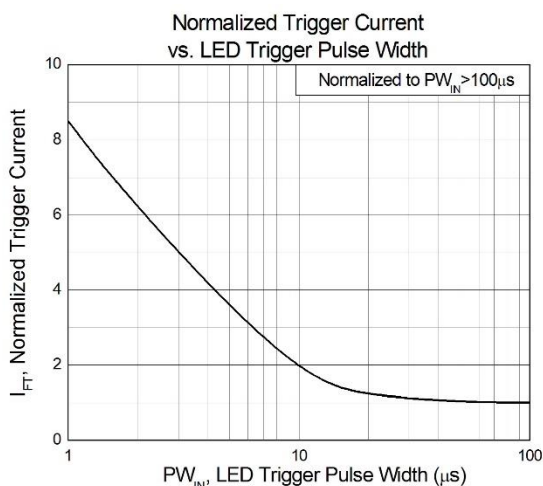


Figure 3

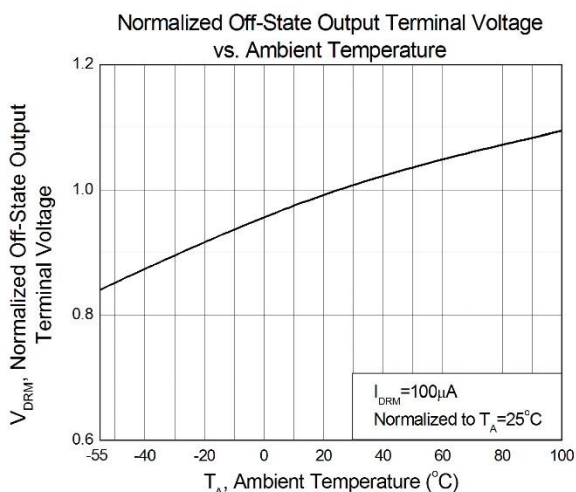


Figure 4

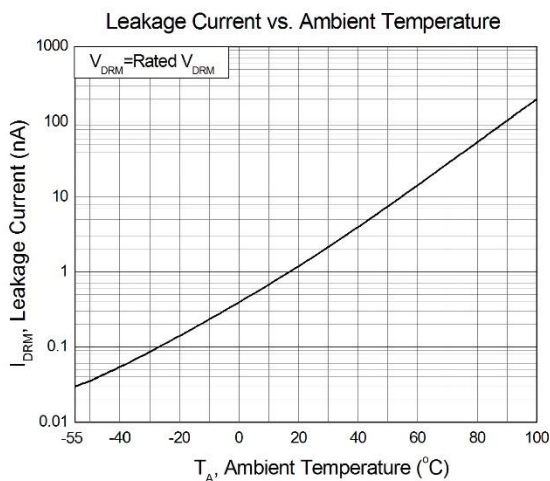


Figure 5

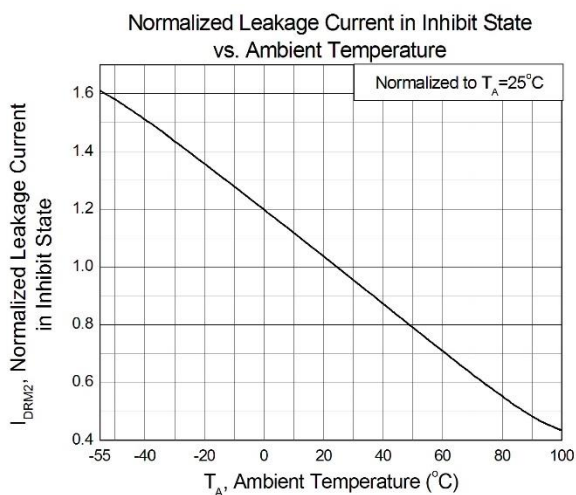
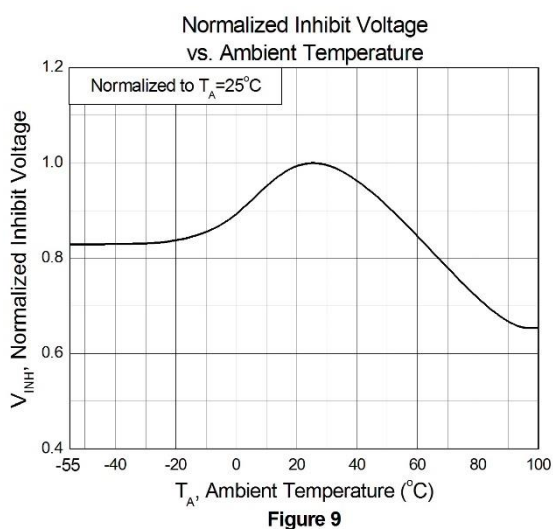
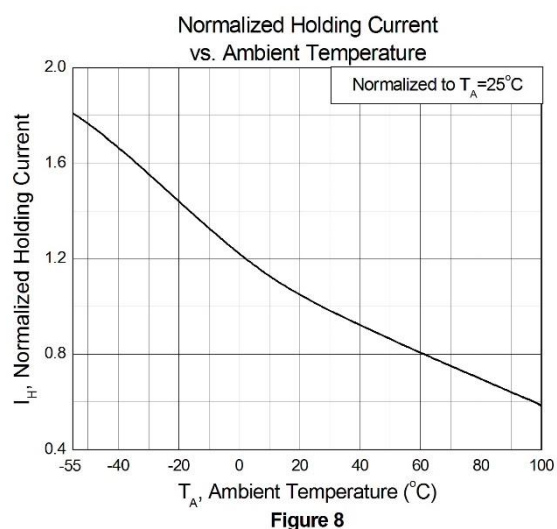
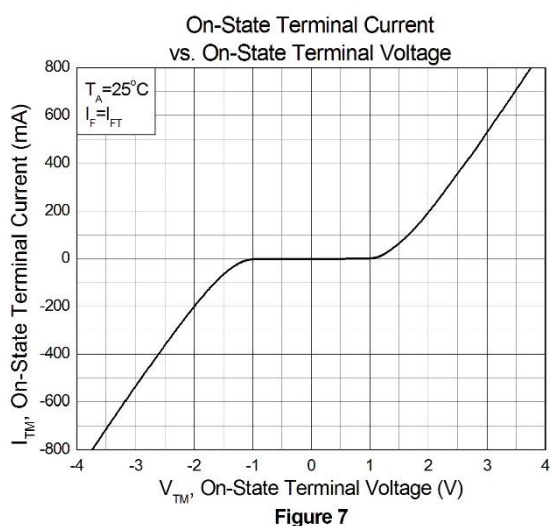


Figure 6



CTM3031, CTM3032, CTM3033
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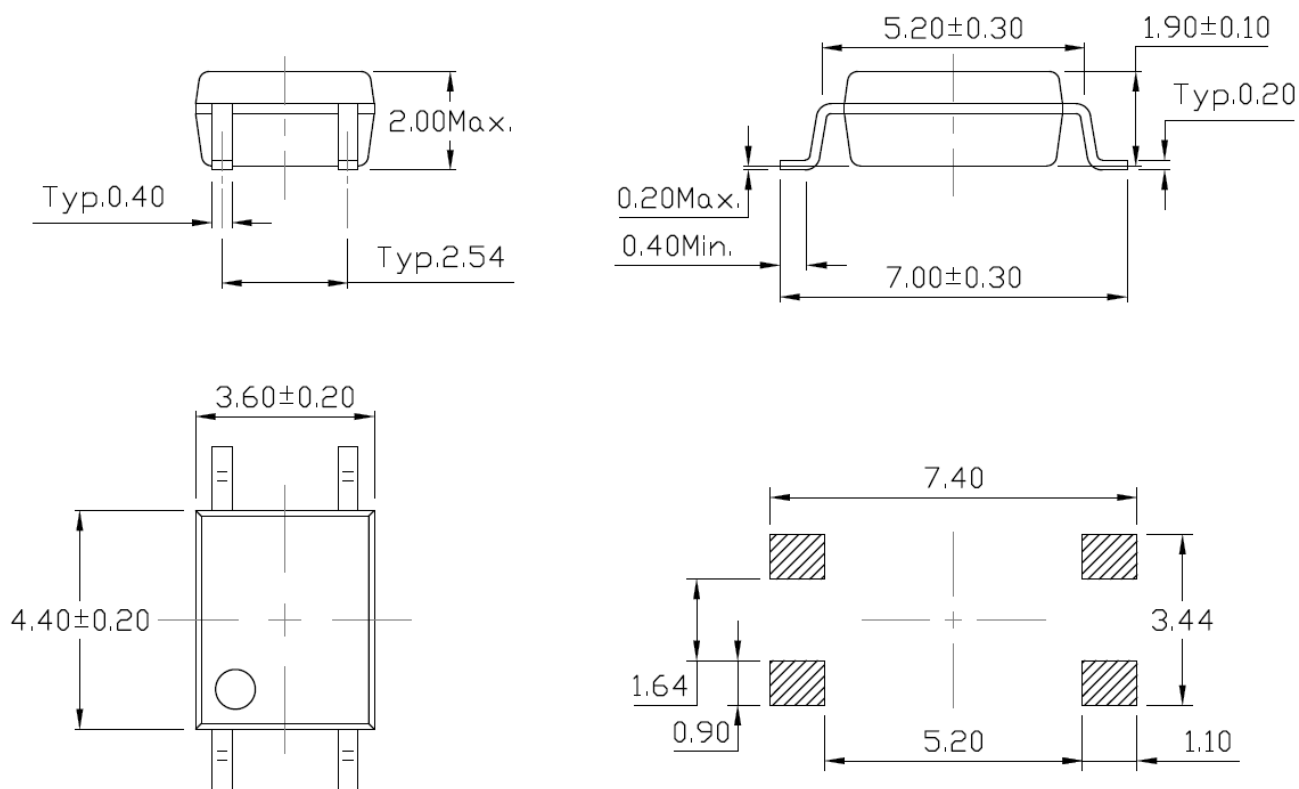
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Package Dimension *Dimensions in mm unless otherwise stated*



Marking Information



Note:

- CT : Denotes "CT Micro"
- 3031 : Part Number
- V : VDE Safety Mark Option (Blank or V)
- Y : One Digit Year Code
- WW : Two Digit Work Week
- K : Manufacturing Code



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Ordering Information

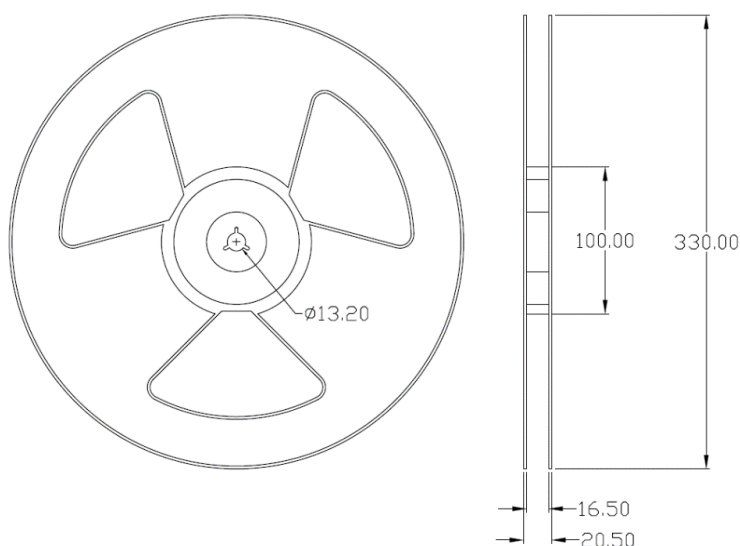
CTM303X(V)(Z)

CT	= Denotes "CT Micro"
303X	= Part No. (CT303X:0,1,2), (CT304X : 0,1,2,3)
V	= VDE Safety Mark Option (Blank or V)
Y	= Lead Form Option (Blank, S, SL, M or SLM)
Z	= Tape and Reel Option (Blank, T1, T2, T3 or T4)
G	= Material Option (G: Halogen Free, Blank: Non-Halogen Free)

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

Reel Dimension *All dimensions are in mm, unless otherwise stated*

Option T1/T2





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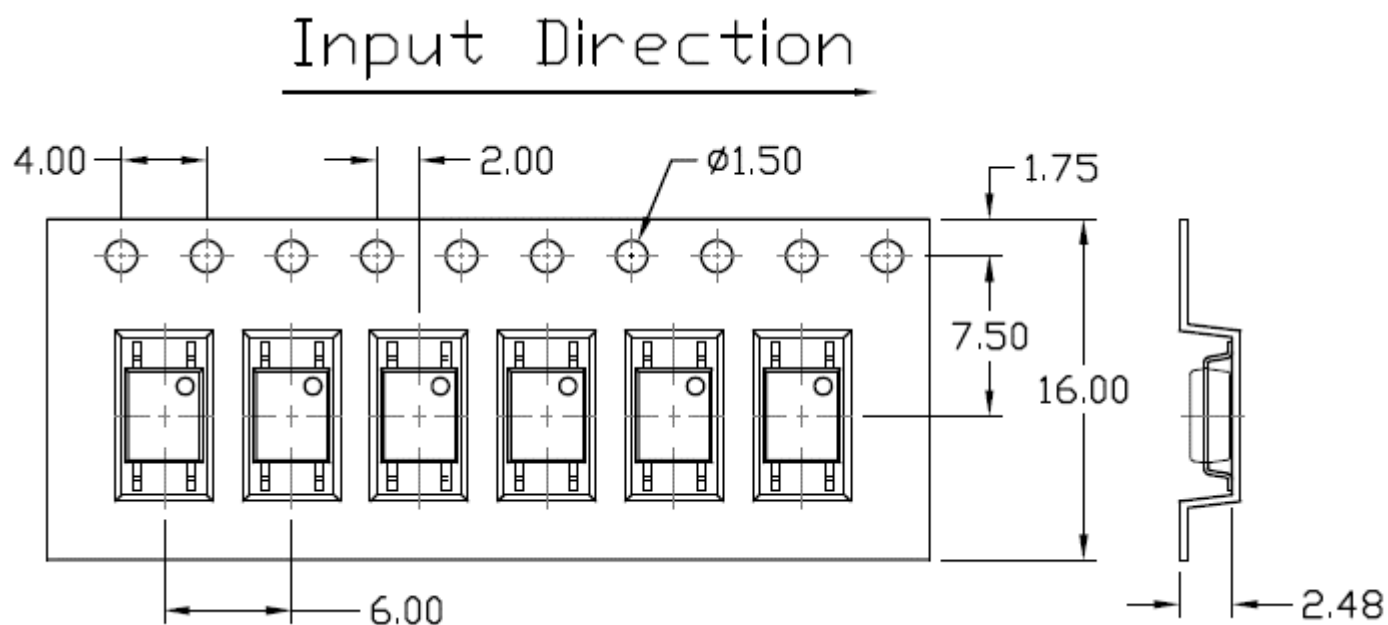
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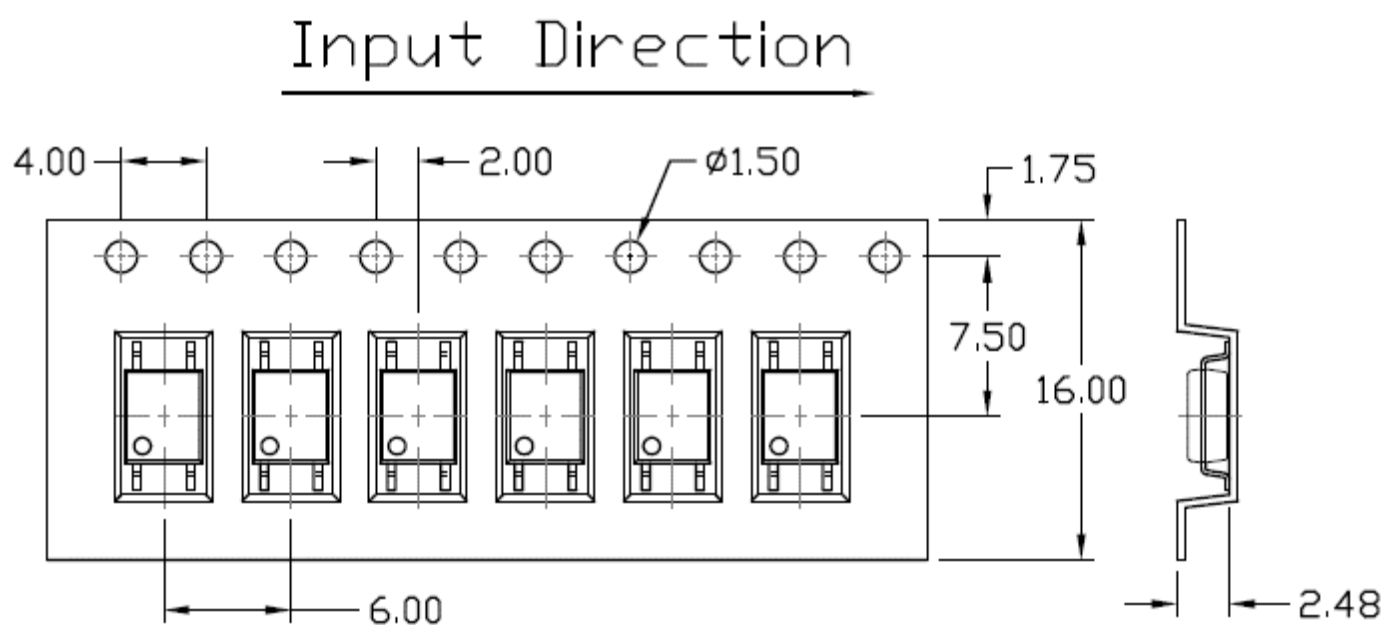
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1



Option T2





Solderability spec (Follow the JEDEC standard JESD22-B102)

Reflow Soldering: Immersed surface, other than the end of pin as cut-surface, must be covered by solder.

Solder-Bath: More than 95% of the electrode must be covered with solder.

Wave soldering (Follow the JEDEC standard JESD22-A111)

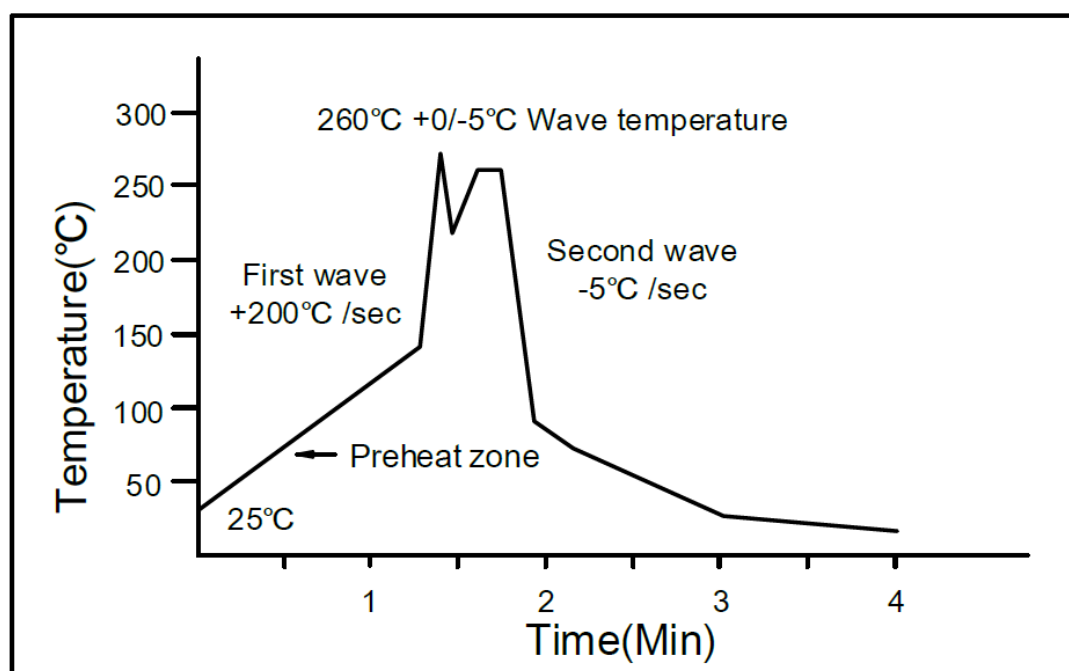
One time soldering is recommended within the condition of temperature.

Temperature: $260 \pm 0/-5^{\circ}\text{C}$.

Time: 10 sec.

Preheat temperature: 25 to 140°C .

Preheat time: 30 to 80 sec.

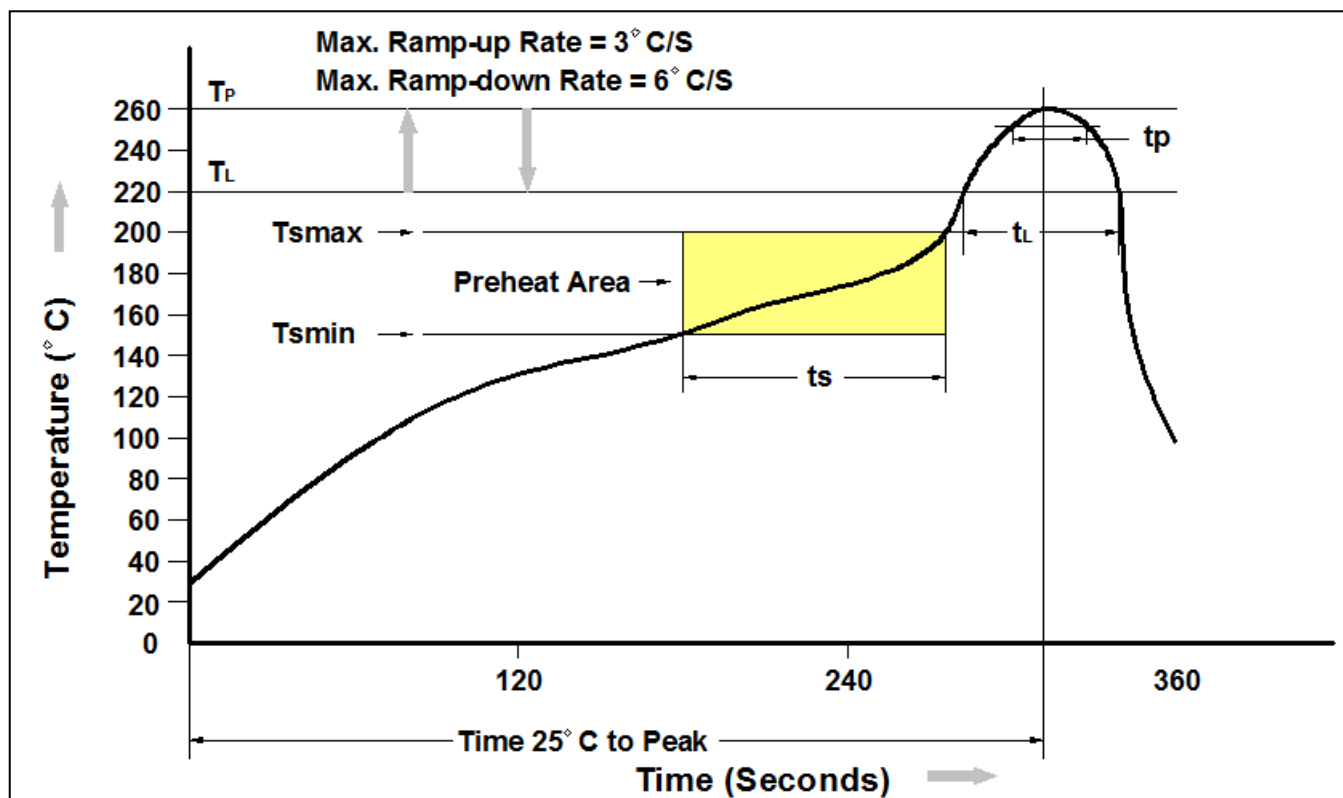


Iron soldering (Follow the standard MIL-STD 202G, Method 210F)

Allow single lead soldering in every single process.

One time soldering is recommended. Temperature: $350 \pm 10^{\circ}\text{C}$

Time: 5 sec max.

**Reflow Profile (Follow the JEDEC standard J-STD-020)**

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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