



CT1010, CT1011, CT1012, CT1013, CT1014 CT1015, CT1016, CT1017, CT1018, CT1019

DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

Features

- High isolation 5000 VRMS
- CTR flexibility available see order information
- Extra low coupling capacitance
- DC input with transistor output
- Temperature range - 55 °C to 110 °C
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950
- Creepage distance > 8 mm
- Green Package

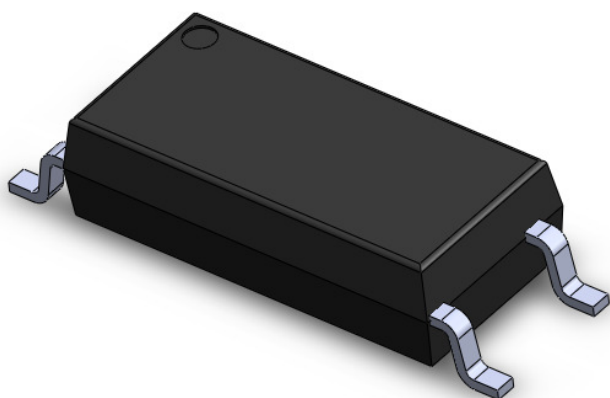
Applications

- Switch mode power supplies
- Computer peripheral interface
- Microprocessor system interface

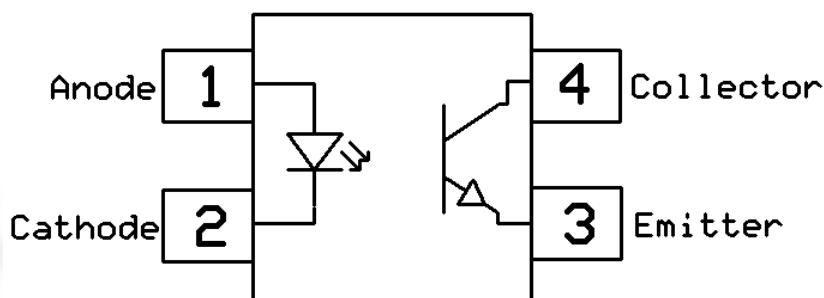
Description

The CT1010, CT1011, CT1012, CT1013, CT1014, CT1015, CT1016, CT1017, CT1018, CT1019 series consists of a photo transistor optically coupled to a gallium arsenide Infrared-emitting diode in a 4-lead SOP Package.

Package Outline



Schematic





CT1010, CT1011, CT1012, CT1013, CT1014

CT1015, CT1016, CT1017, CT1018, CT1019

DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

Absolute Maximum Rating at 25°C

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage *1	5000	V _{RMS}	
T _{OPR}	Operating temperature	-55 ~ +110	°C	
T _{STG}	Storage temperature	-55 ~ +125	°C	
T _{SOL}	Soldering temperature *2	260	°C	
Emitter				
I _F	Forward current	50	mA	
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	1	A	
V _R	Reverse voltage	6	V	
P _D	Power dissipation	85	mW	
Detector				
P _C	Power dissipation	150	mW	
B _{VCEO}	Collector-Emitter Breakdown Voltage	80	V	
B _{VECO}	Emitter-Collector Breakdown Voltage	7	V	
I _C	Collector Current	50	mA	



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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	$I_F = 10\text{mA}$		1.24	1.4	V	
		$I_F = 50\text{mA}$	-	1.45	1.5	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{kHz}$	-	45	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$B_{V_{CEO}}$	Collector-Emitter Breakdown	$I_C = 100\mu\text{A}$	80	-	-	V	
$B_{V_{ECO}}$	Emitter-Collector Breakdown	$I_E = 100\mu\text{A}$	7	-	-	V	
I_{CEO}	Collector-Emitter Dark Current	$V_{CE} = 20\text{V}$, $I_F = 0\text{mA}$	-	-	100	nA	

Transfer Characteristics

Symbol	Parameters		Test Conditions	Min	Typ	Max	Units	Notes
CTR	Current Transfer Ratio	CT1012	$I_F = 1\text{mA}$, $V_{CE} = 5\text{V}$	22	-	-	%	
		CT1013		34	-	-		
		CT1014		56	-	-		
		CT1011	$I_F = 10\text{mA}$, $V_{CE} = 5\text{V}$	60	-	300		
		CT1012		63	-	125		
		CT1013		100	-	200		
		CT1014		160	-	320		
		CT1010	$I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$	50	-	600		
		CT1015		50	-	150		
		CT1016		100	-	300		
		CT1017		80	-	160		
		CT1018		130	-	260		
		CT1019		200	-	400		
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage		$I_F = 10\text{mA}$, $I_C = 1\text{mA}$	-	-	0.4	V	
R_{IO}	Isolation Resistance		$V_{IO} = 500\text{V}_{DC}$	5×10^{10}			Ω	
C_{IO}	Isolation Capacitance		$f = 1\text{MHz}$			1	pF	



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Electrical Characteristics $T_A = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$ (unless otherwise specified)

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
T_{ON}	Turn On Time	$I_C = 5\text{mA}$, $V_{CE} = 5\text{V}$, $R_L = 100$	-	5	-	μs	
T_{OFF}	Turn Off Time		-	4.2	-		
t_r	Rise Time		-	2.8	-		
t_f	Fall Time		-	4.1	-		



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Typical Characteristic Curves

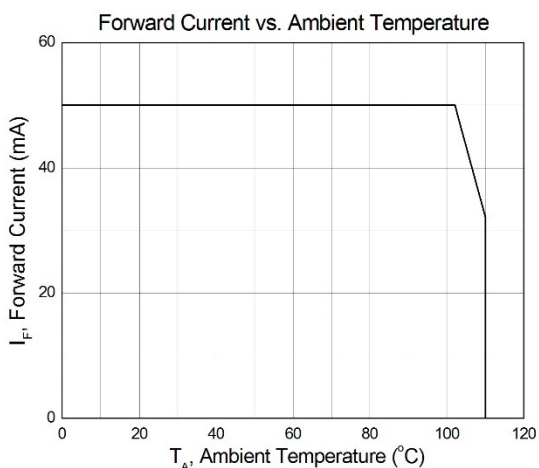


Figure 1

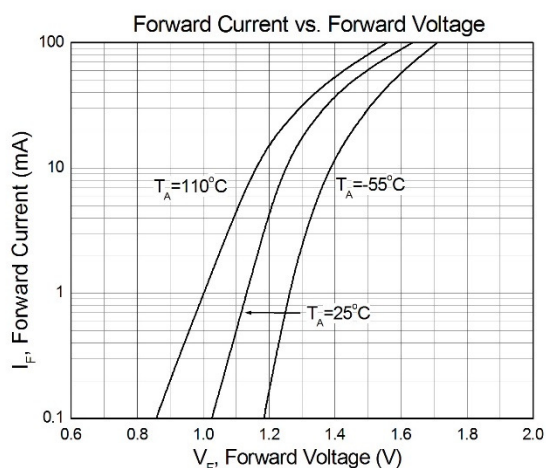


Figure 2

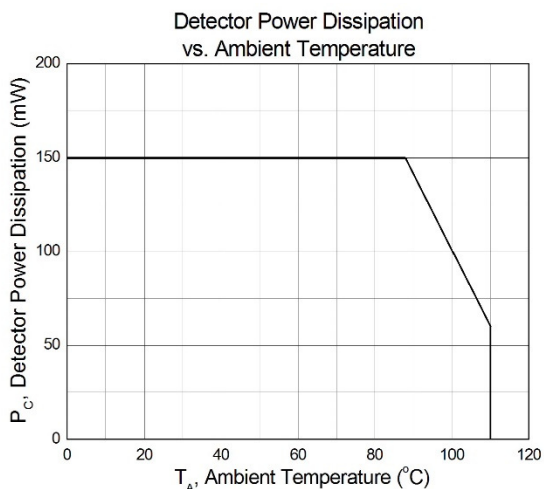


Figure 3

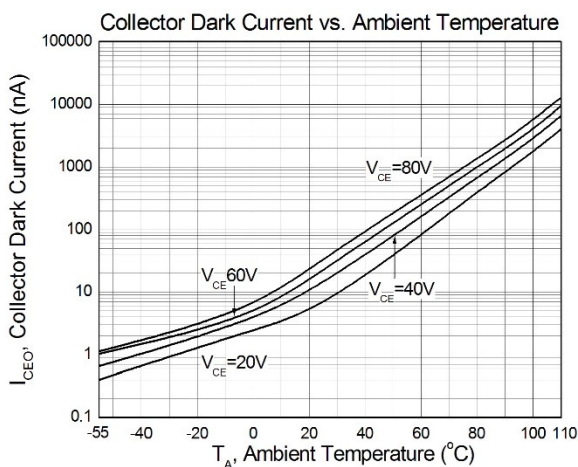


Figure 4

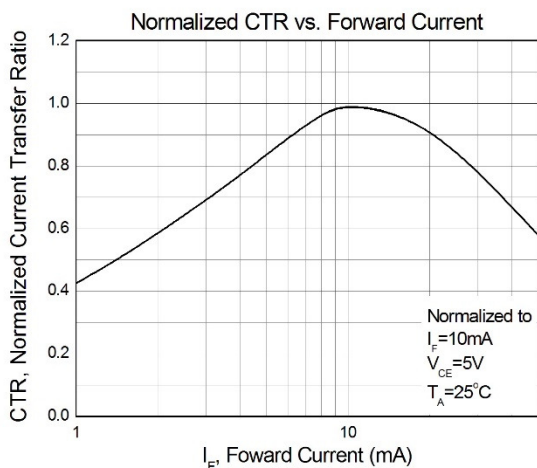


Figure 5

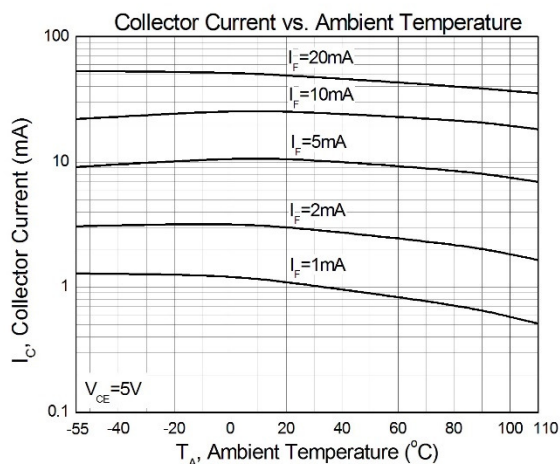
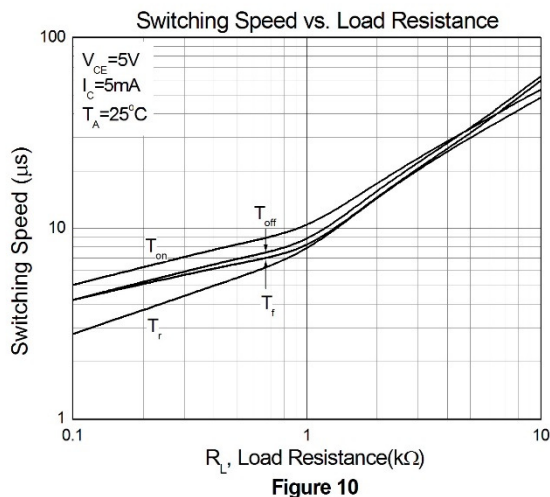
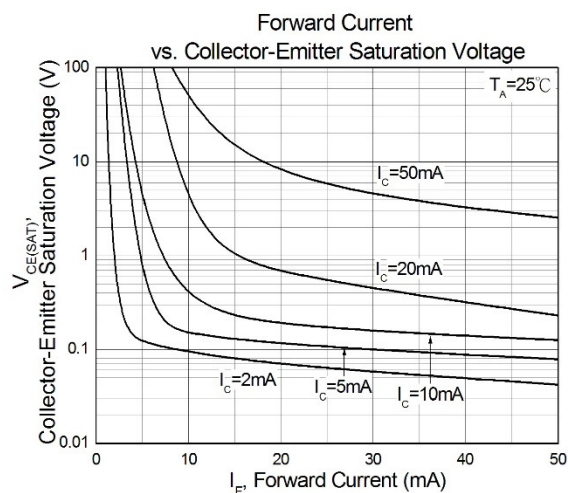
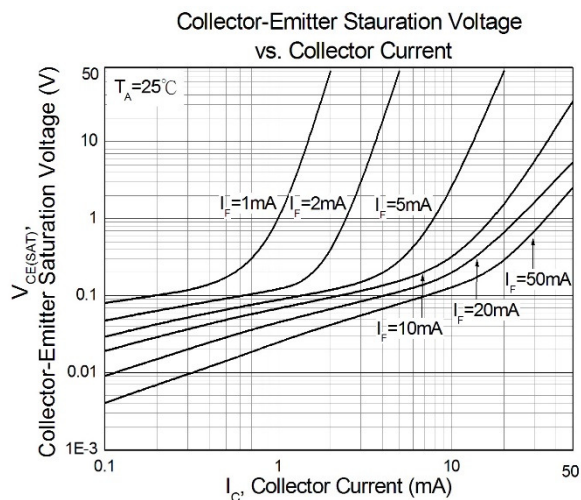
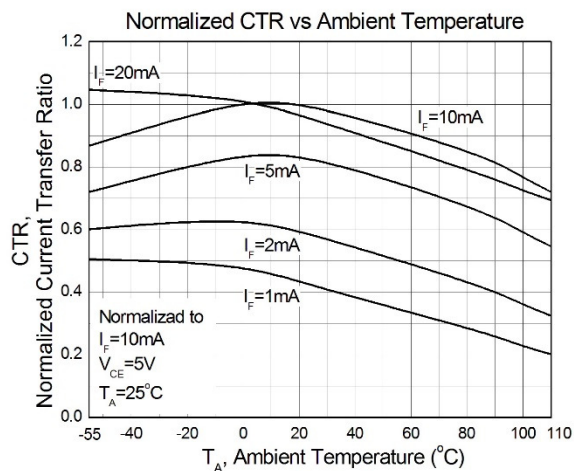


Figure 6



CT1010, CT1011, CT1012, CT1013, CT1014 CT1015, CT1016, CT1017, CT1018, CT1019

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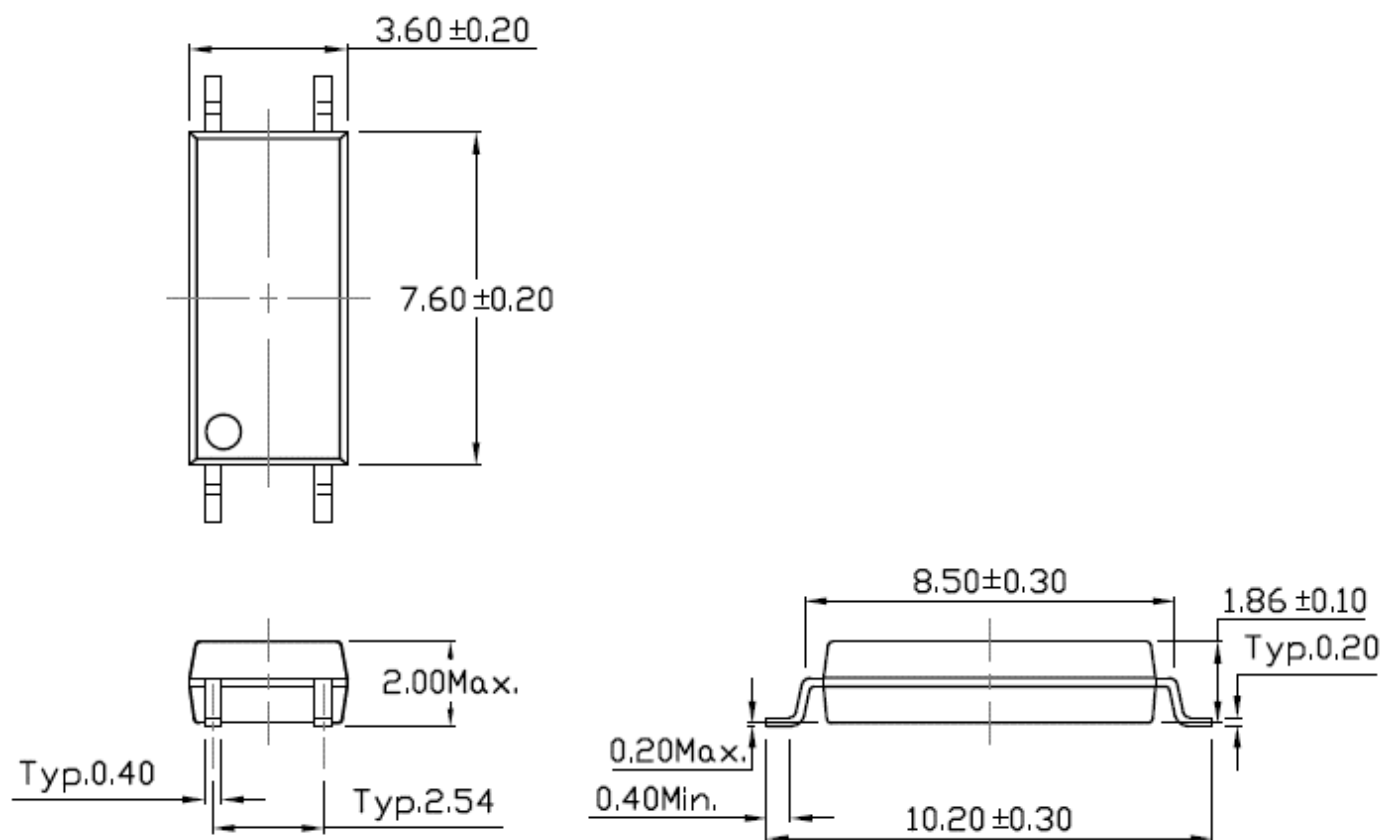


CT1010, CT1011, CT1012, CT1013, CT1014

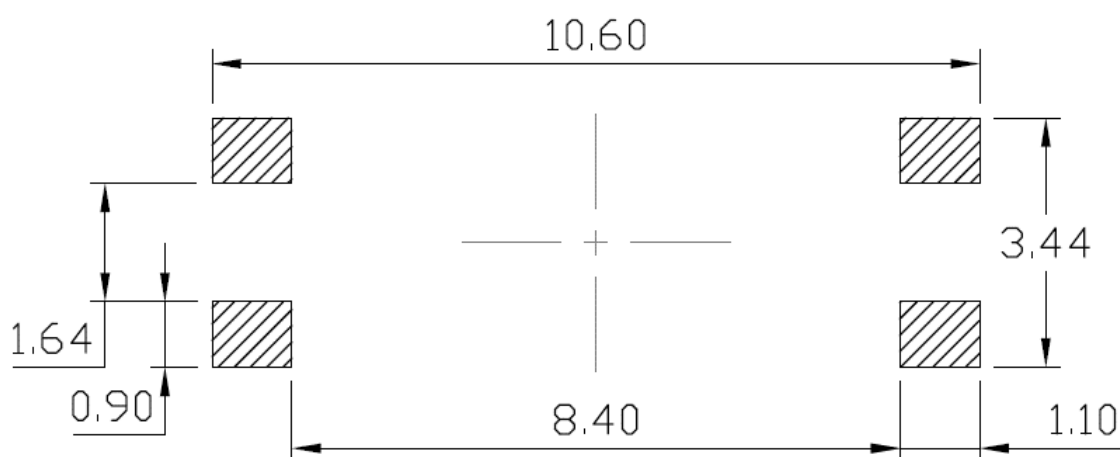
CT1015, CT1016, CT1017, CT1018, CT1019

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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”

1019 : Part Number

V : VDE Option

Y : Fiscal Year

WW : Work Week

K : Manufacturing Code

Ordering Information

CT101X(V)(Y)

X = Part No. (0,1,2,3,4,5,6,7,8,9)

V = VDE Option (V or None)

Y = Tape and reel option (T1 or T2)

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



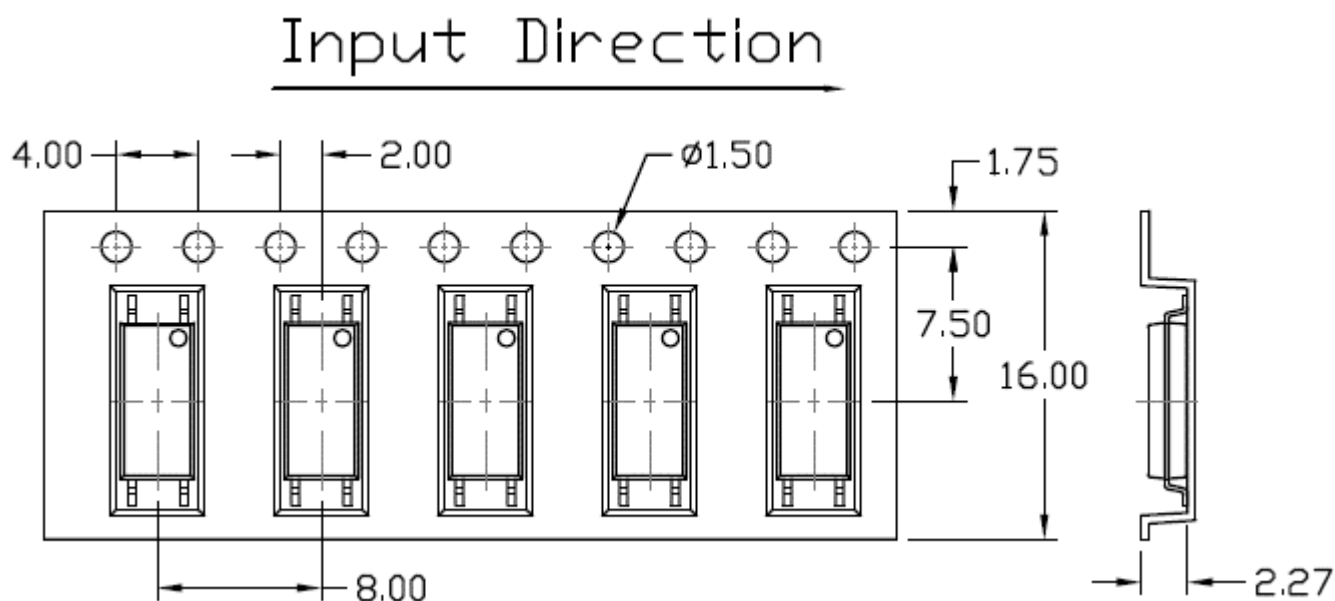
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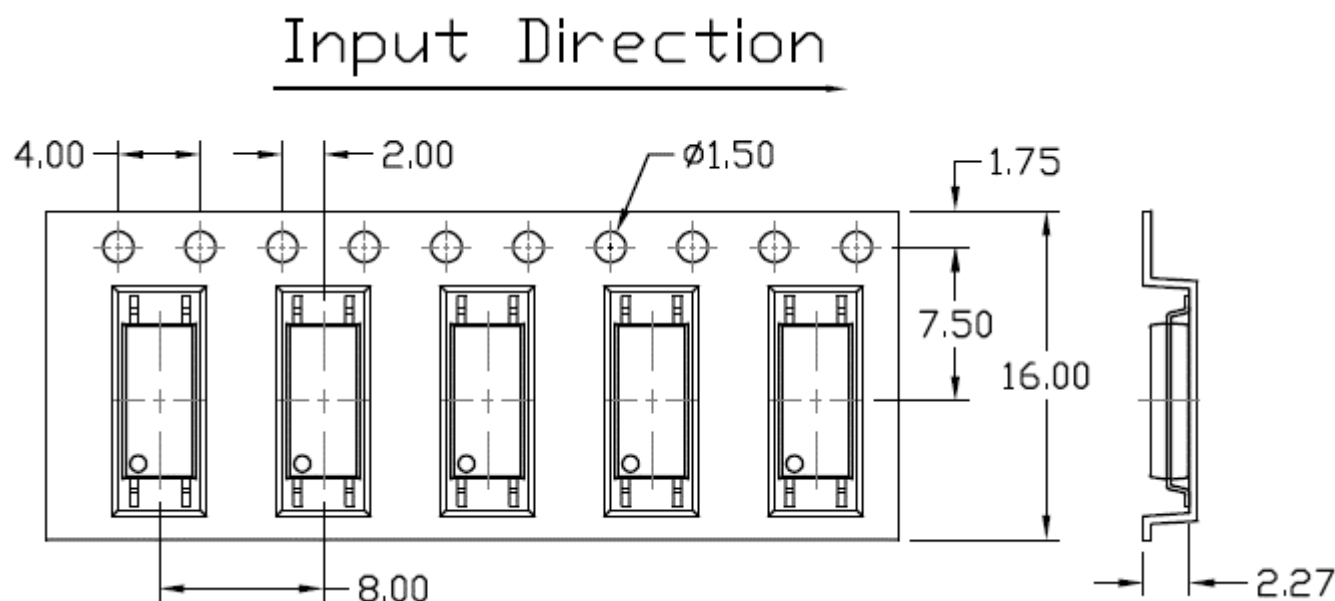
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1



Option T2

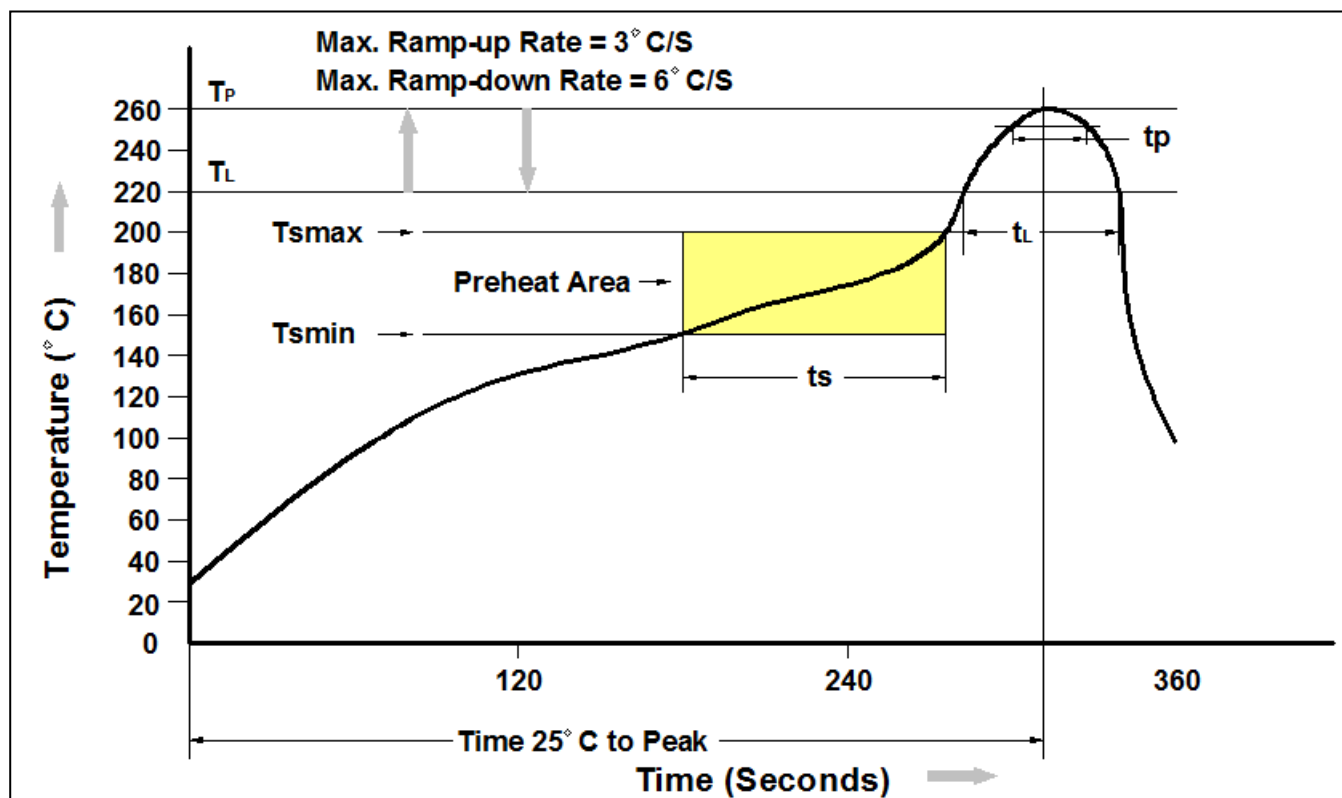




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Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Ramp-up Rate (tL to tp)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (tp) within 5°C of 260°C	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.



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