



CTH214 Series AC Input 4-Pin Half Pitch Mini-Flat Phototransistor Optocoupler

Features

- High isolation 3750 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating Temperature range - 55 °C to 110 °C
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950
- Green Package

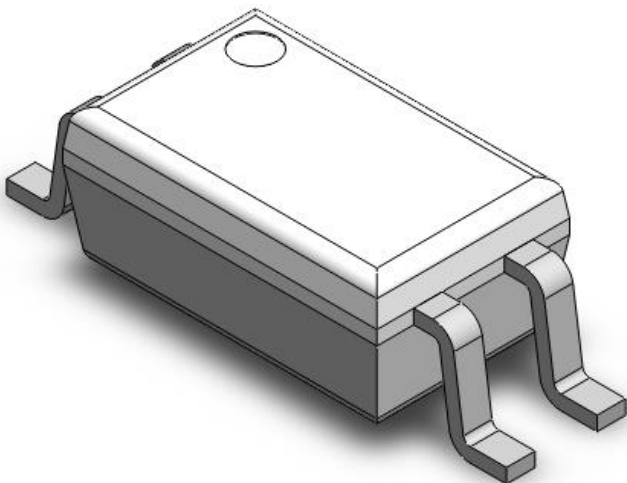
Description

The CTH214 series consists of a phototransistor optically coupled to two gallium arsenide Infrared-emitting diode, connected in inverse parallel in a 4-lead half pitch Mini-Flat package.

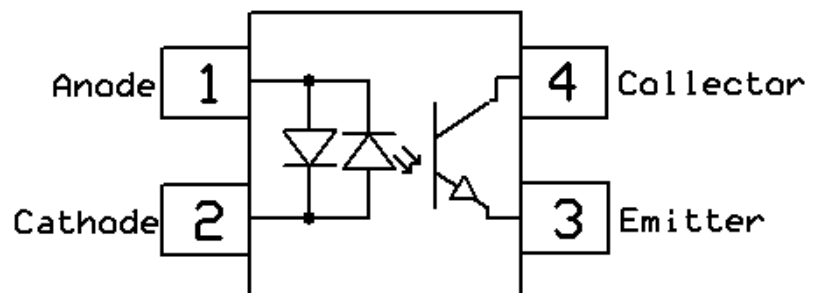
Applications

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

Package Outline



Schematic





CTH214 Series

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Absolute Maximum Rating at 25°C

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	3750	V _{RMS}	
P _{TOT}	Total power dissipation	200	mW	
T _{OPR}	Operating temperature	-55 ~ +110	°C	
T _{STG}	Storage temperature	-55 ~ +150	°C	
T _{SOL}	Soldering temperature	260	°C	
Emitter				
I _F	Forward current	±50	mA	
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	1	A	
P _D	Emitter power dissipation	70	mW	
Detector				
P _D	Detector power dissipation	150	mW	
B _{VCEO}	Collector-Emitter Breakdown Voltage	80	V	
B _{VECO}	Emitter-Collector Breakdown Voltage	6	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	$I_F = \pm 10\text{mA}$		1.24	1.4	V	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	30	-	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	$I_E = 100\mu\text{A}$	6	-	-	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	CTH214	$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$	20	-	300	%
		CTH214A		50	-	150	
CTR	Current Transfer Ratio	CTH214	$I_F = \pm 5\text{mA}, V_{CE} = 5\text{V}$	30	-	600	%
		CTH214A		80	-	300	
	CTR Symmetry	$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$	0.7	-	1.3		
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	$I_F = \pm 20\text{mA}, I_C = 1\text{mA}$	-	0.04	0.2	V	
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	5×10^{10}	-	-	Ω	
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.5	1	pF	

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
t_r	Rise Time	$I_C = 2\text{mA}, V_{CE} = 2\text{V}, R_L = 100\Omega$	-	6	-	μs	
t_f	Fall Time		-	8	-		



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Typical Characteristic Curves

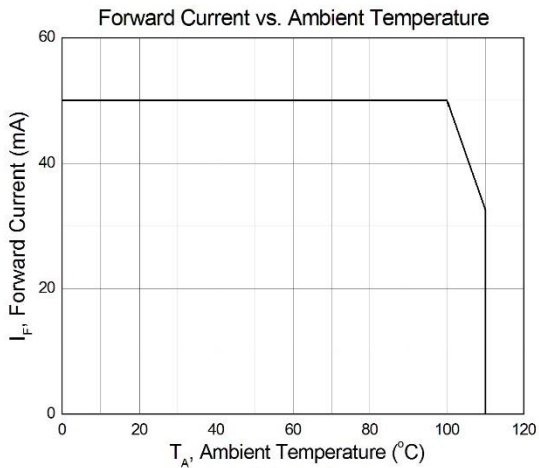


Figure 1

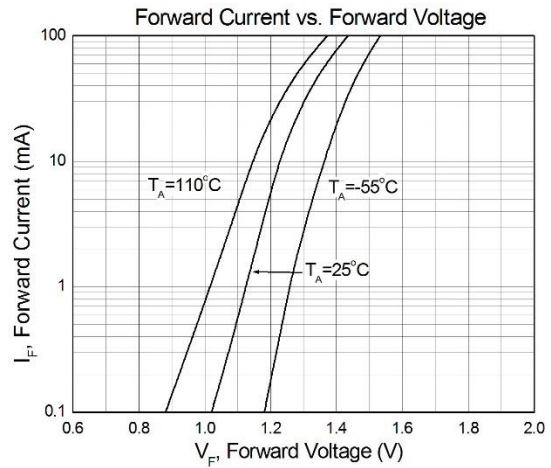


Figure 2

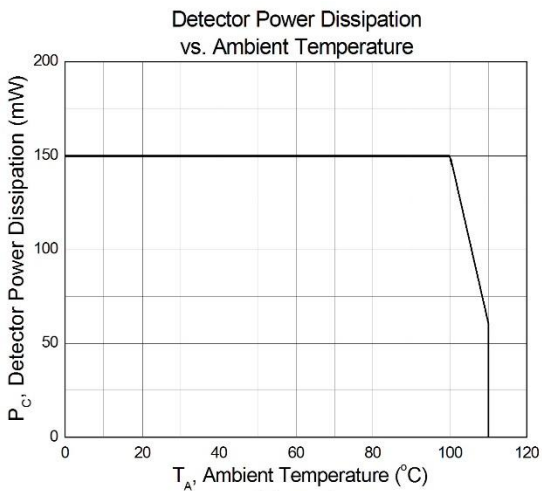


Figure 3

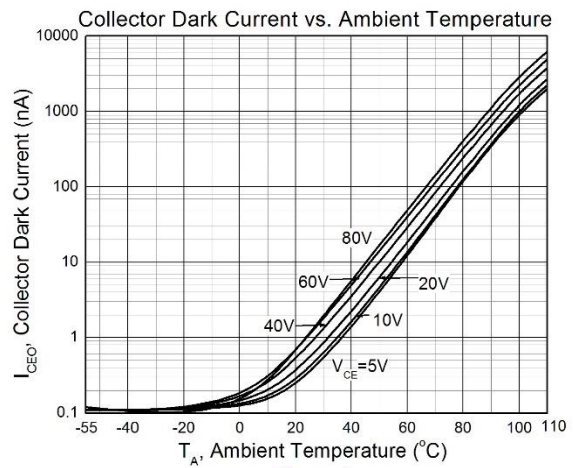


Figure 4

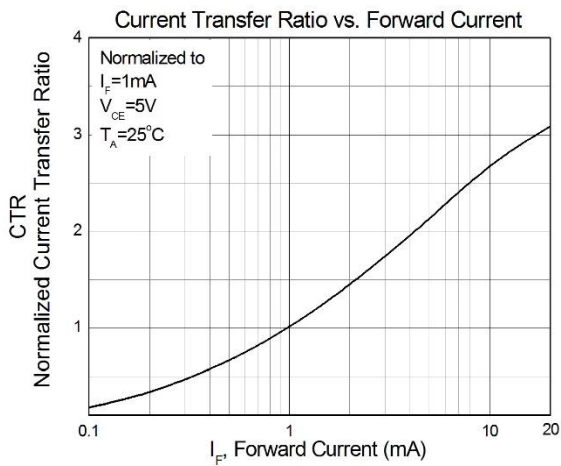


Figure 5

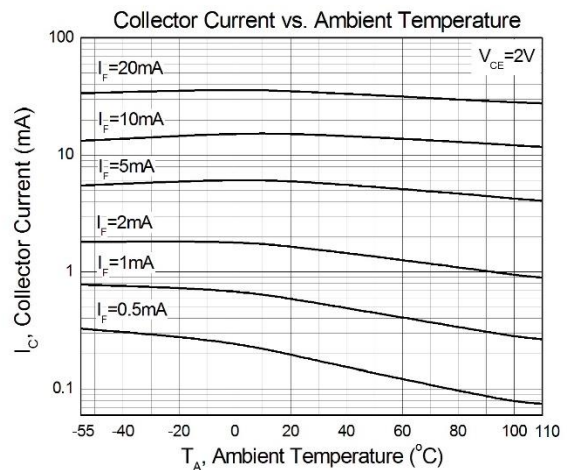


Figure 6



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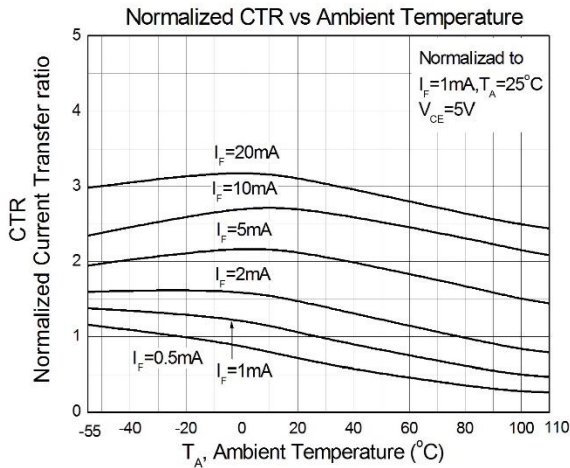


Figure 7

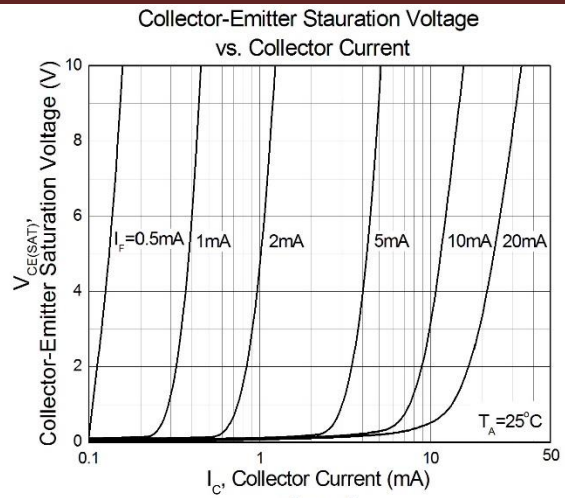


Figure 8

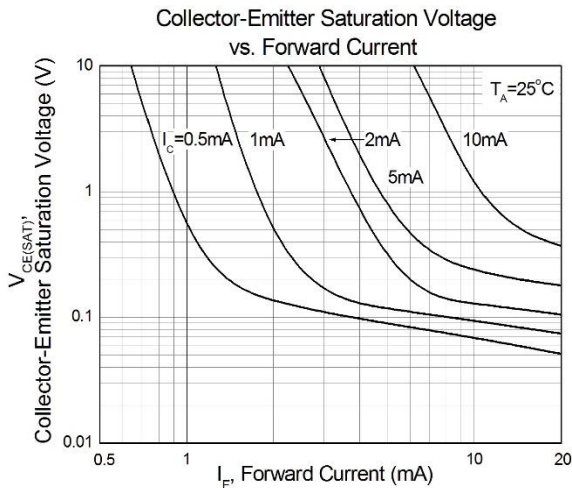


Figure 9

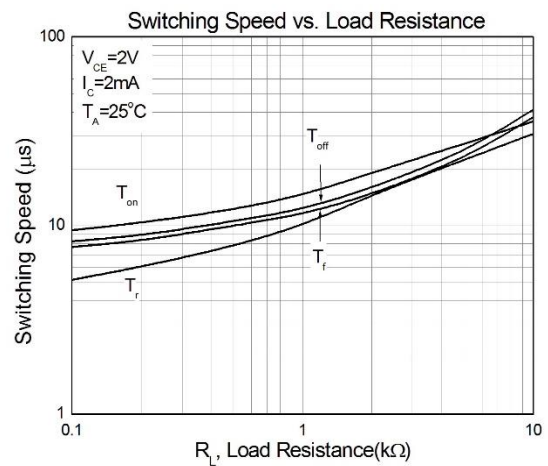


Figure 10

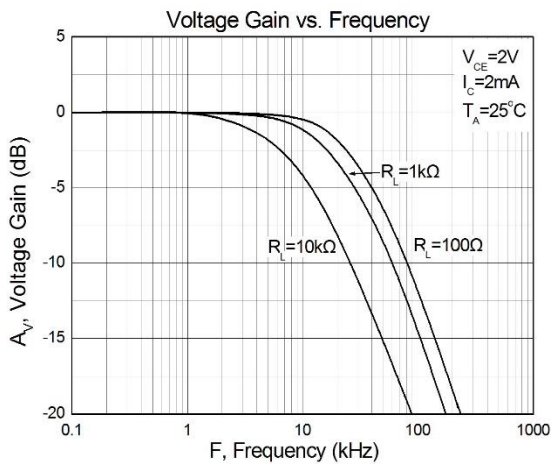


Figure 11

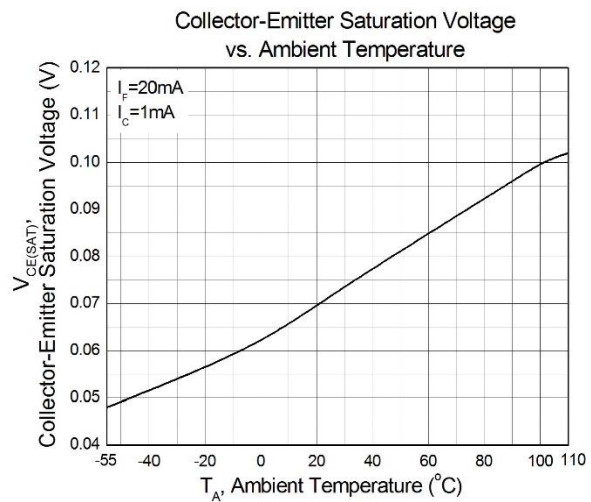
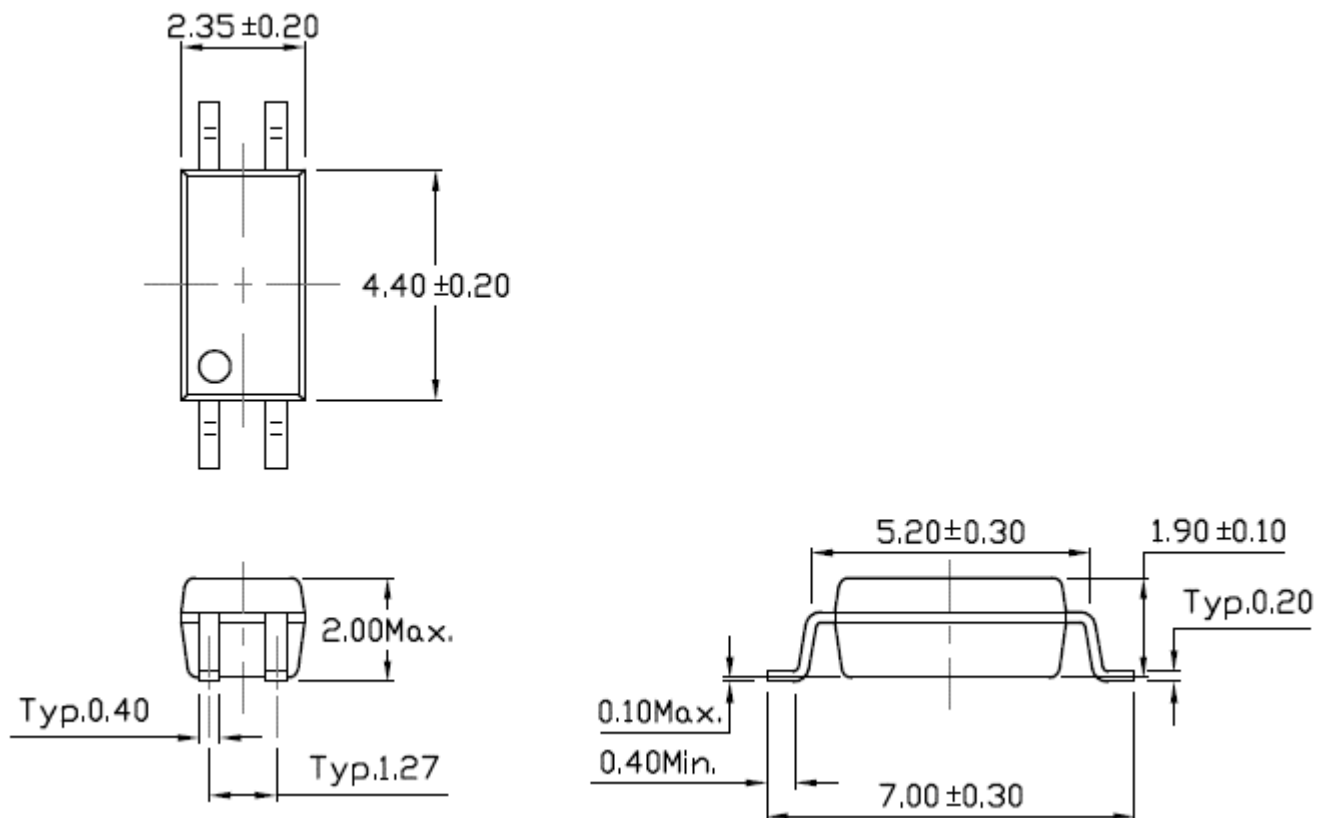


Figure 12

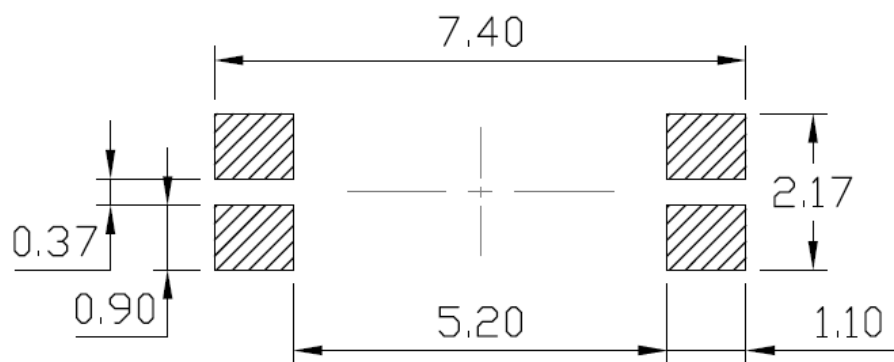


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Package Dimension *Dimensions in mm unless otherwise stated*



Recommended Solder Mask *Dimensions in mm unless otherwise stated*



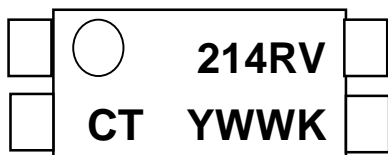


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Marking Information



Note:

- CT : Denotes "CT Micro"
- 214 : Product Number
- R : CTR Rank
- V : VDE Option
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code

Ordering Information

CTH214X(V)(Z)

X = Part No. (X=A or none)

V = VDE Option (V or none)

Z = Tape and reel option (T1 or T2)

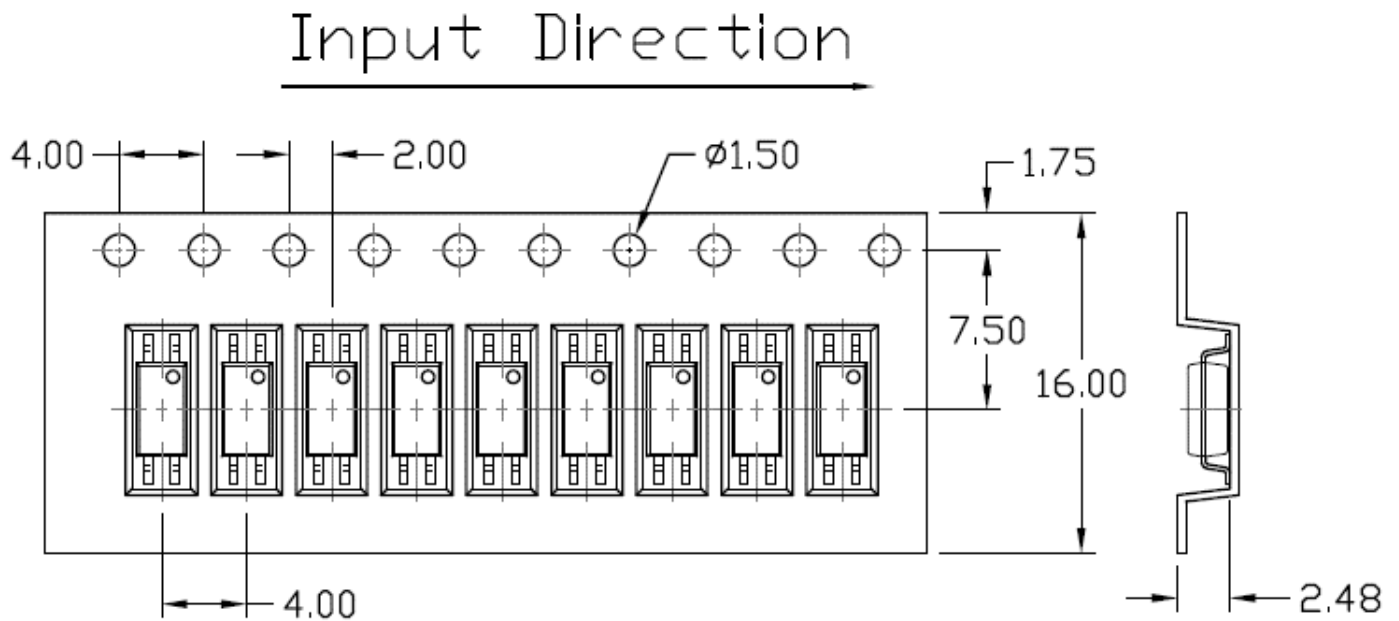
Option	Description	Quantity
T1	Surface Mount Lead Forming – With Option 1 Taping	5000 Units/Reel
T2	Surface Mount Lead Forming – With Option 2 Taping	5000 Units/Reel



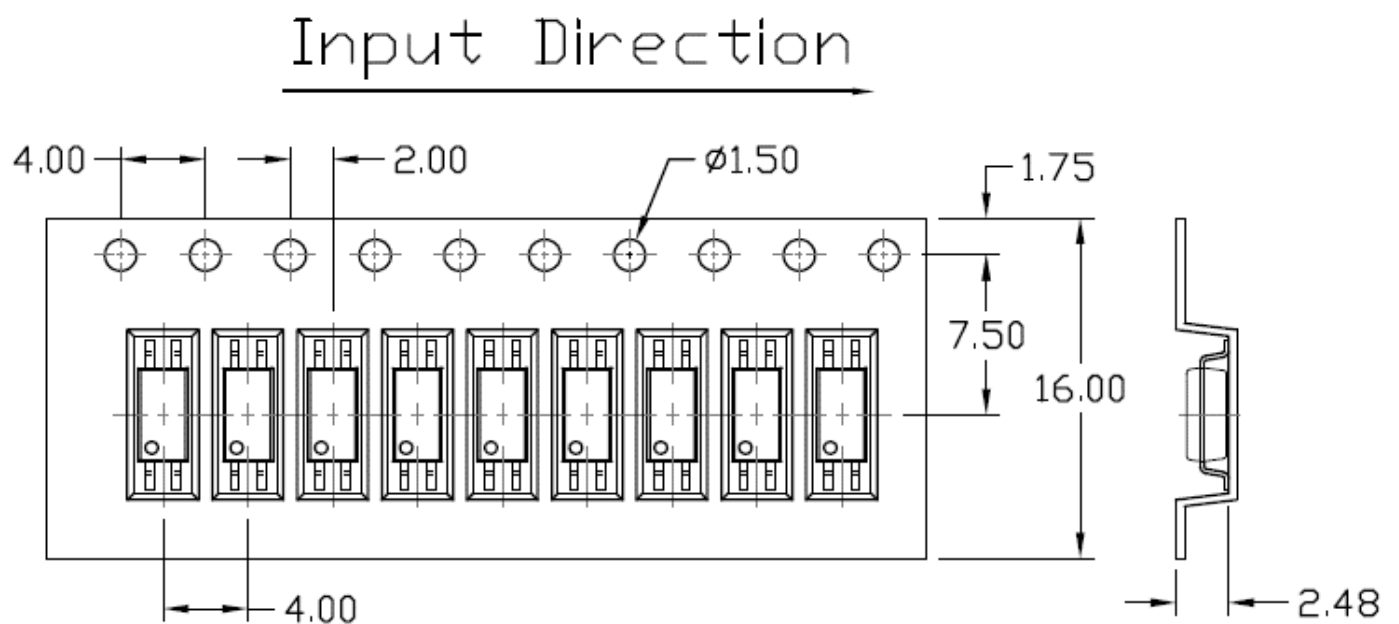
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1



Option T2

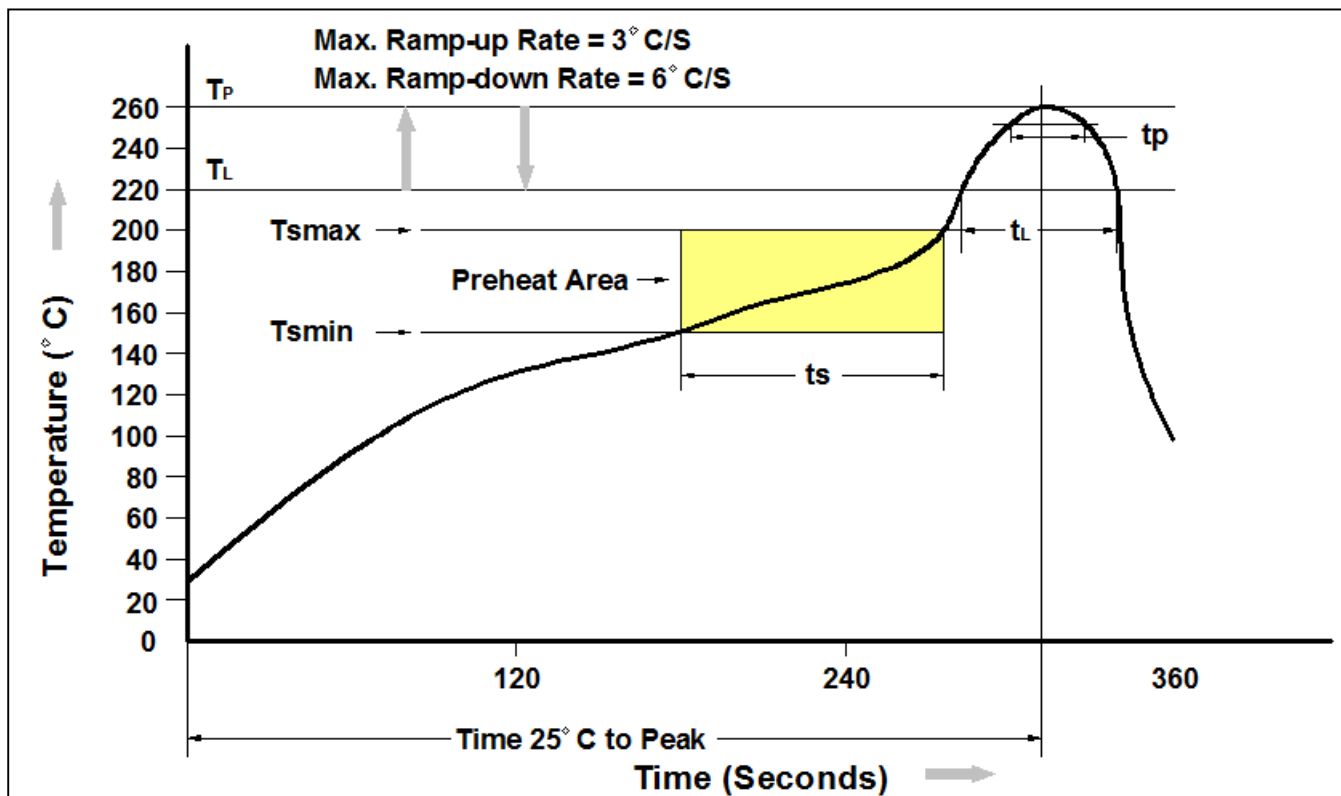




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Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (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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