



# 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

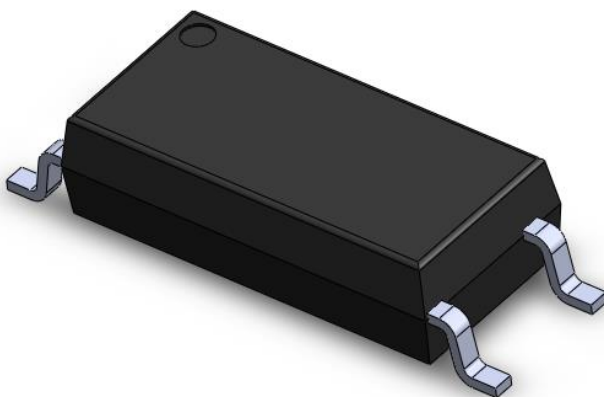
### Applications

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

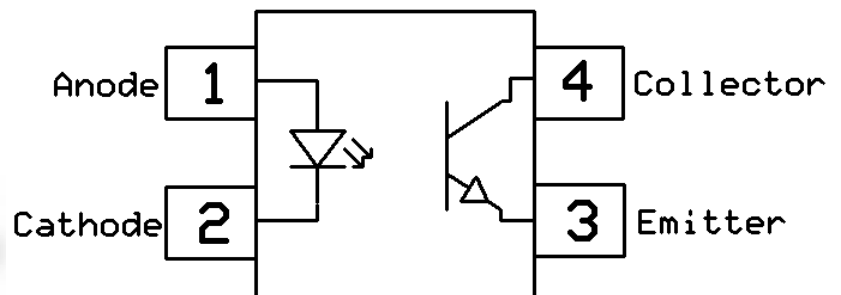
### Description

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

<i>Symbol</i>	<i>Parameters</i>	<i>Ratings</i>	<i>Units</i>	<i>Notes</i>
V <sub>ISO</sub>	Isolation voltage *1	5000	V <sub>RMS</sub>	
T <sub>OPR</sub>	Operating temperature	-55 ~ +110	°C	
T <sub>STG</sub>	Storage temperature	-55 ~ +125	°C	
T <sub>SOL</sub>	Soldering temperature *2	260	°C	
<b>Emitter</b>				
I <sub>F</sub>	Forward current	50	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	85	mW	
<b>Detector</b>				
P <sub>C</sub>	Power dissipation	150	mW	
B <sub>VCEO</sub>	Collector-Emitter Breakdown Voltage	80	V	
B <sub>VECO</sub>	Emitter-Collector Breakdown Voltage	7	V	
I <sub>C</sub>	Collector Current	50	mA	



# CT1010, CT1011, CT1012, CT1013, CT1014

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## DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

### 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	$\mu\text{A}$	
$C_{IN}$	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	$V_{IO} = 500\text{V}_{DC}$	$5 \times 10^{10}$			$\Omega$	
$C_{IO}$	Isolation Capacitance	$f = 1\text{MHz}$			1	pF	



# CT1010, CT1011, CT1012, CT1013, CT1014 CT1015, CT1016, CT1017, CT1018, CT1019 DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

## 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	$I_C = 5\text{mA}$ , $V_{CE} = 5\text{V}$ , $R_L = 100\Omega$	-	5	-	$\mu\text{s}$	
$T_{OFF}$	Turn Off Time		-	4.2	-		
$t_r$	Rise Time		-	2.8	-		
$t_f$	Fall Time		-	4.1	-		



# CT1010, CT1011, CT1012, CT1013, CT1014 CT1015, CT1016, CT1017, CT1018, CT1019 DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

## Typical Characteristic Curves

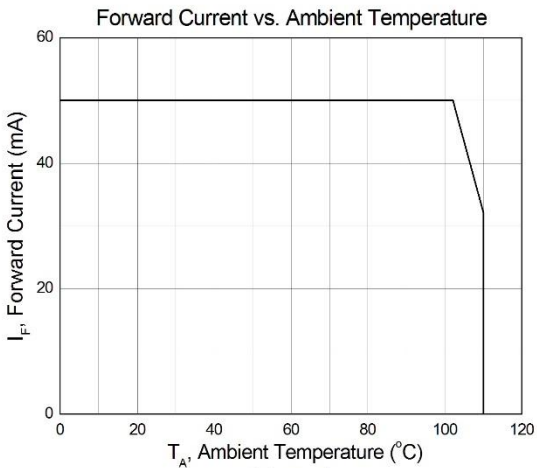


Figure 1

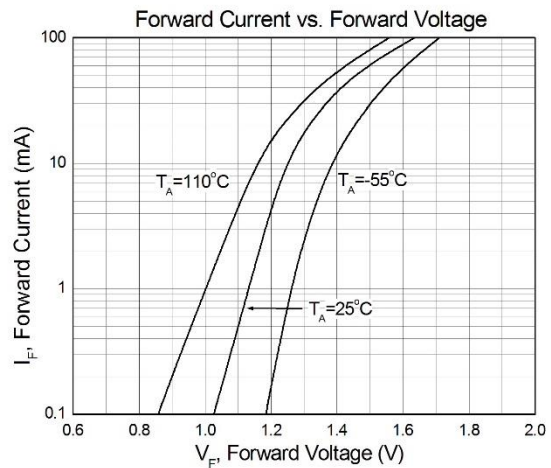


Figure 2

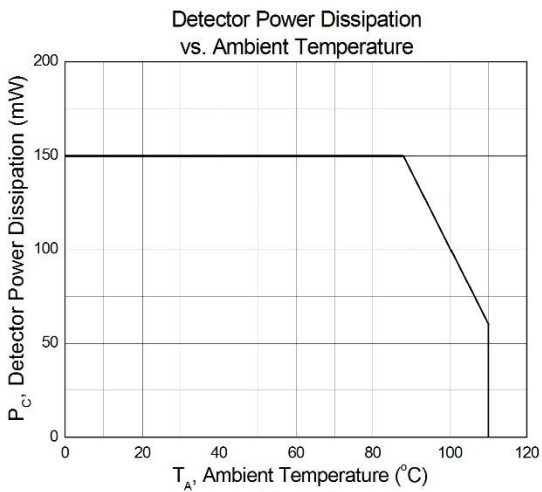


Figure 3

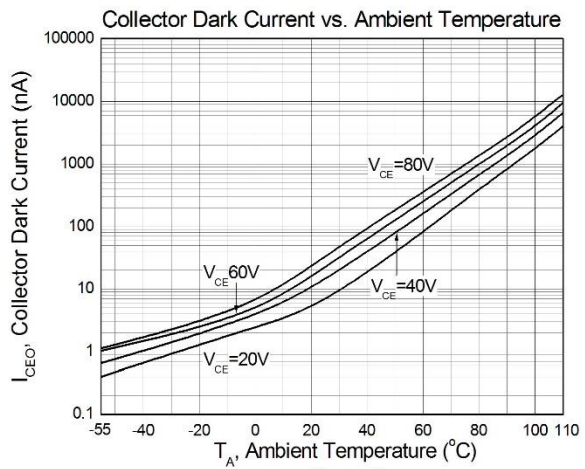


Figure 4

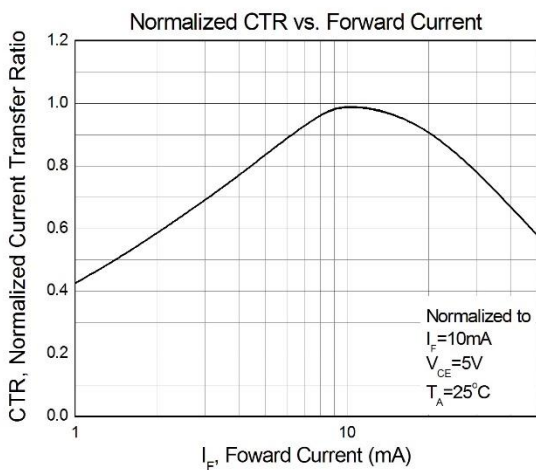


Figure 5

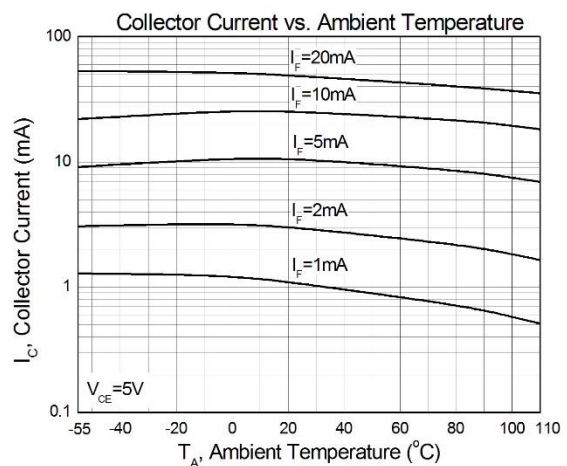


Figure 6



# CT1010, CT1011, CT1012, CT1013, CT1014 CT1015, CT1016, CT1017, CT1018, CT1019 DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

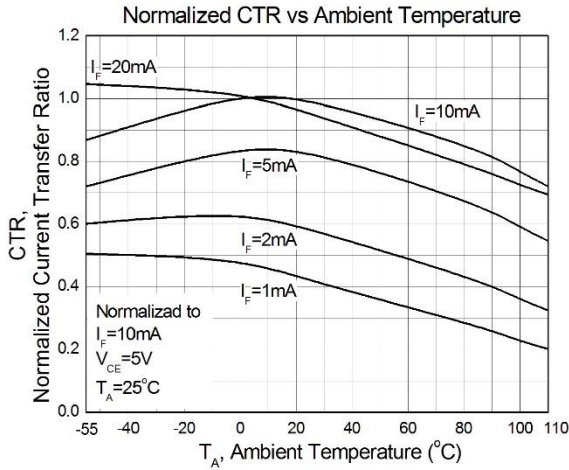


Figure 7

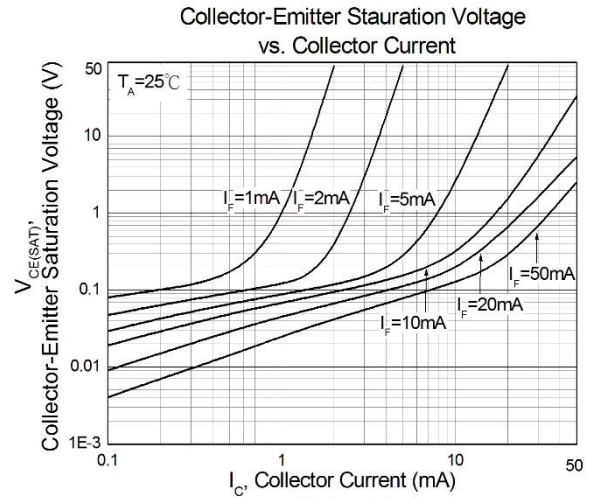


Figure 8

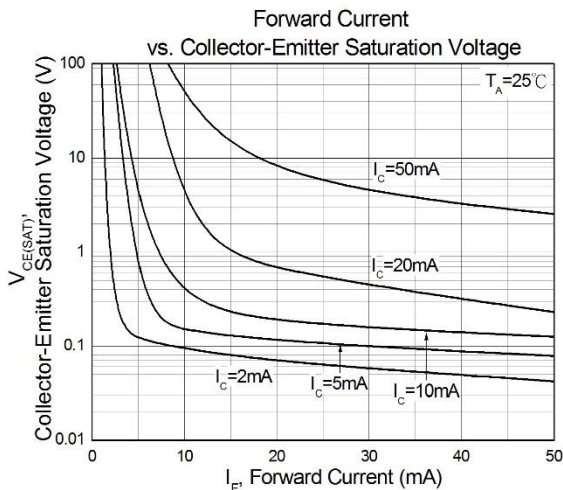


Figure 9

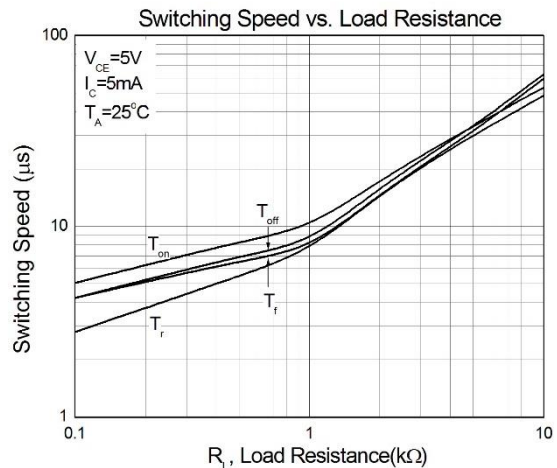


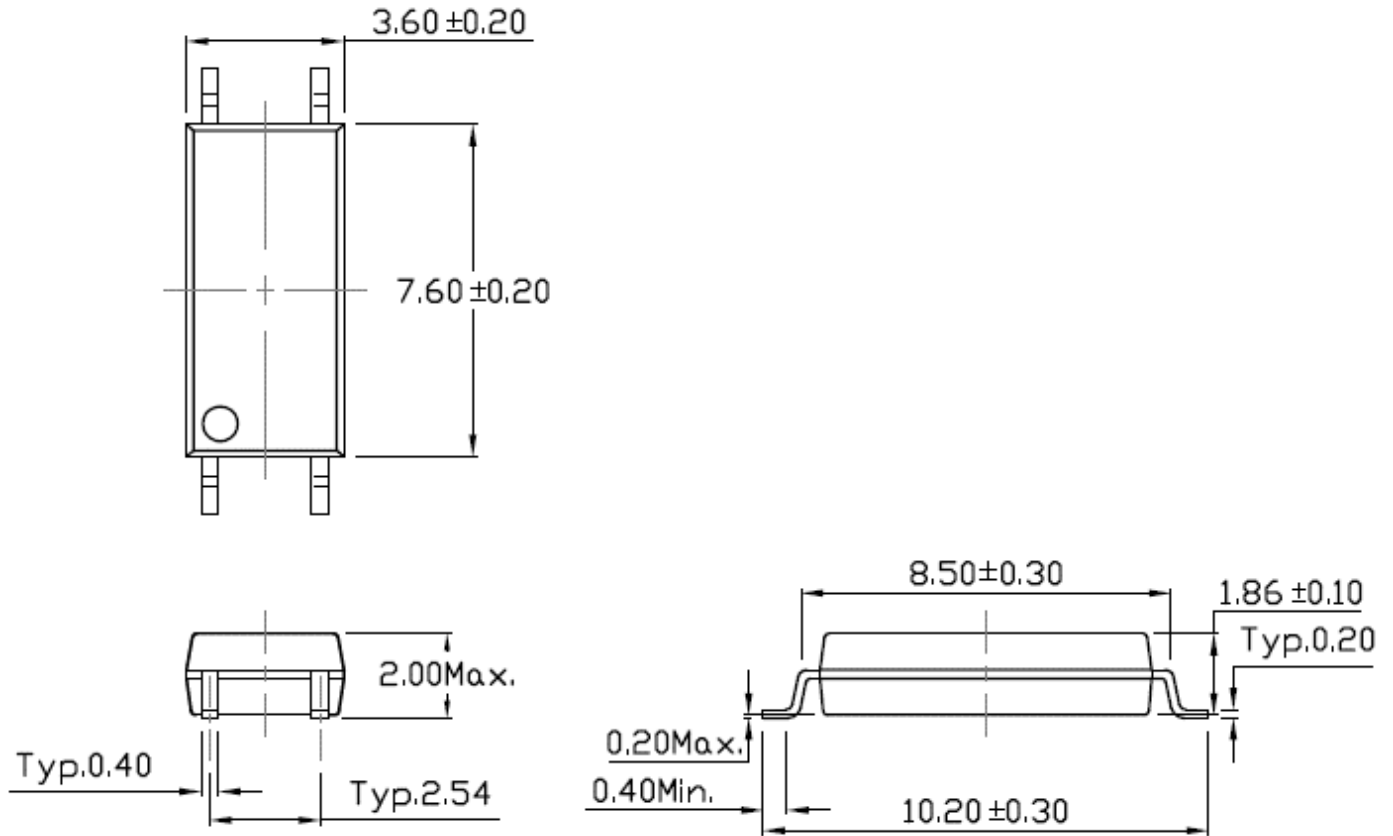
Figure 10



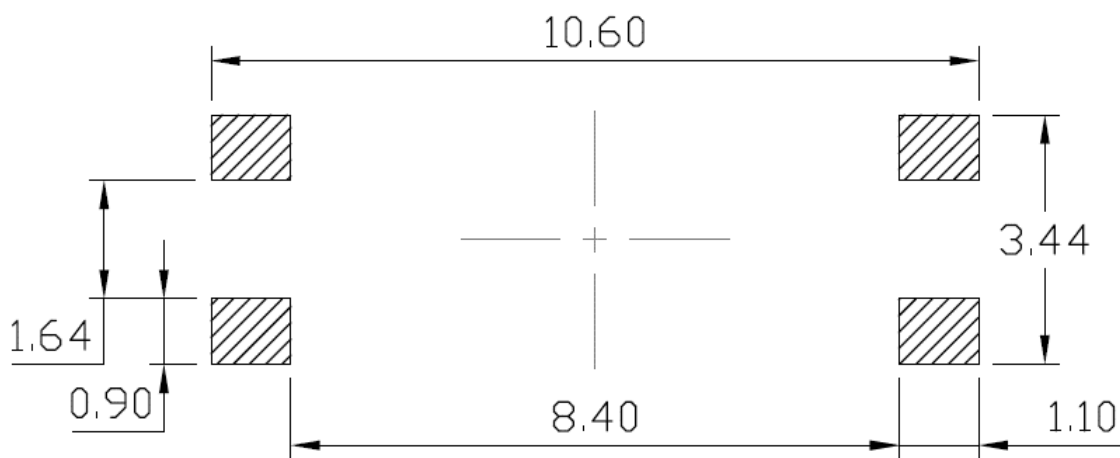
# CT1010, CT1011, CT1012, CT1013, CT1014 CT1015, CT1016, CT1017, CT1018, CT1019

## DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

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



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





CT1010, CT1011, CT1012, CT1013, CT1014

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## DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

### 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)-G

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)

G = Material option (G: Green, None: Non-green)

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



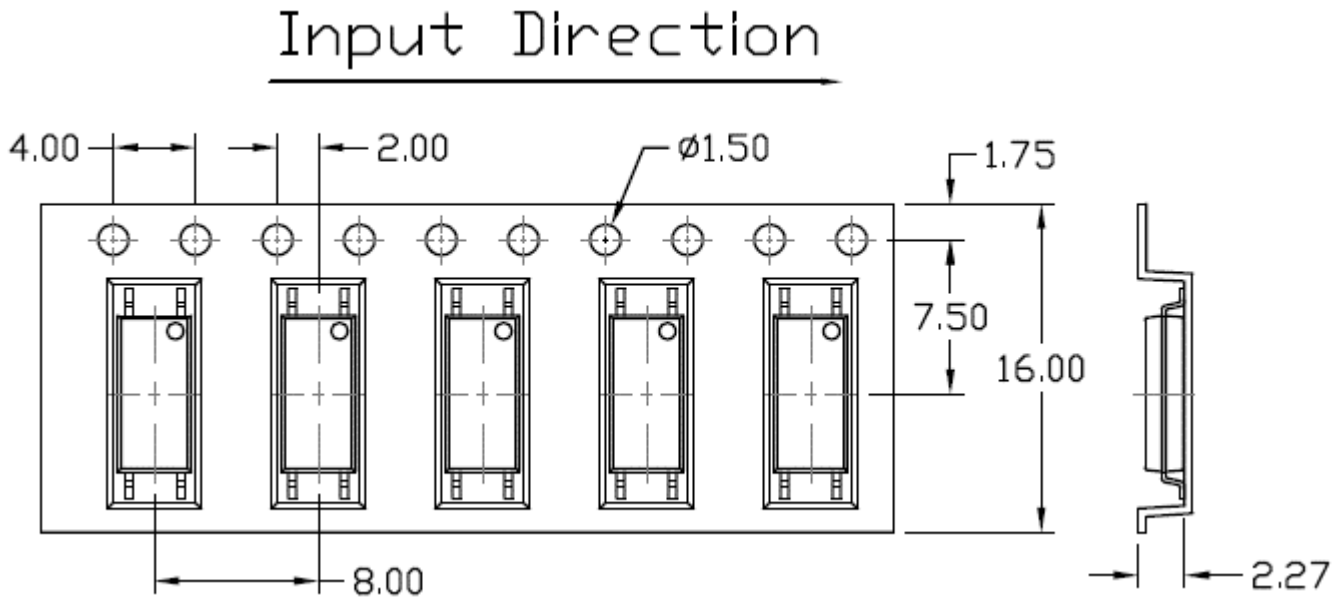


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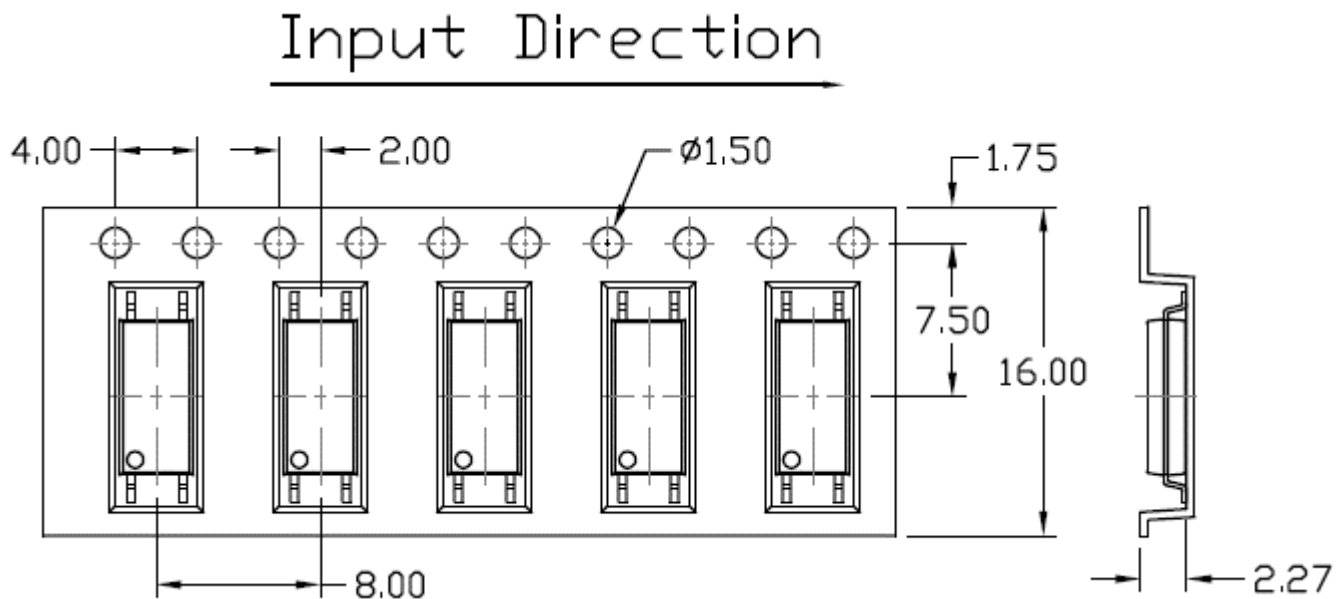
## DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

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

#### Option T1



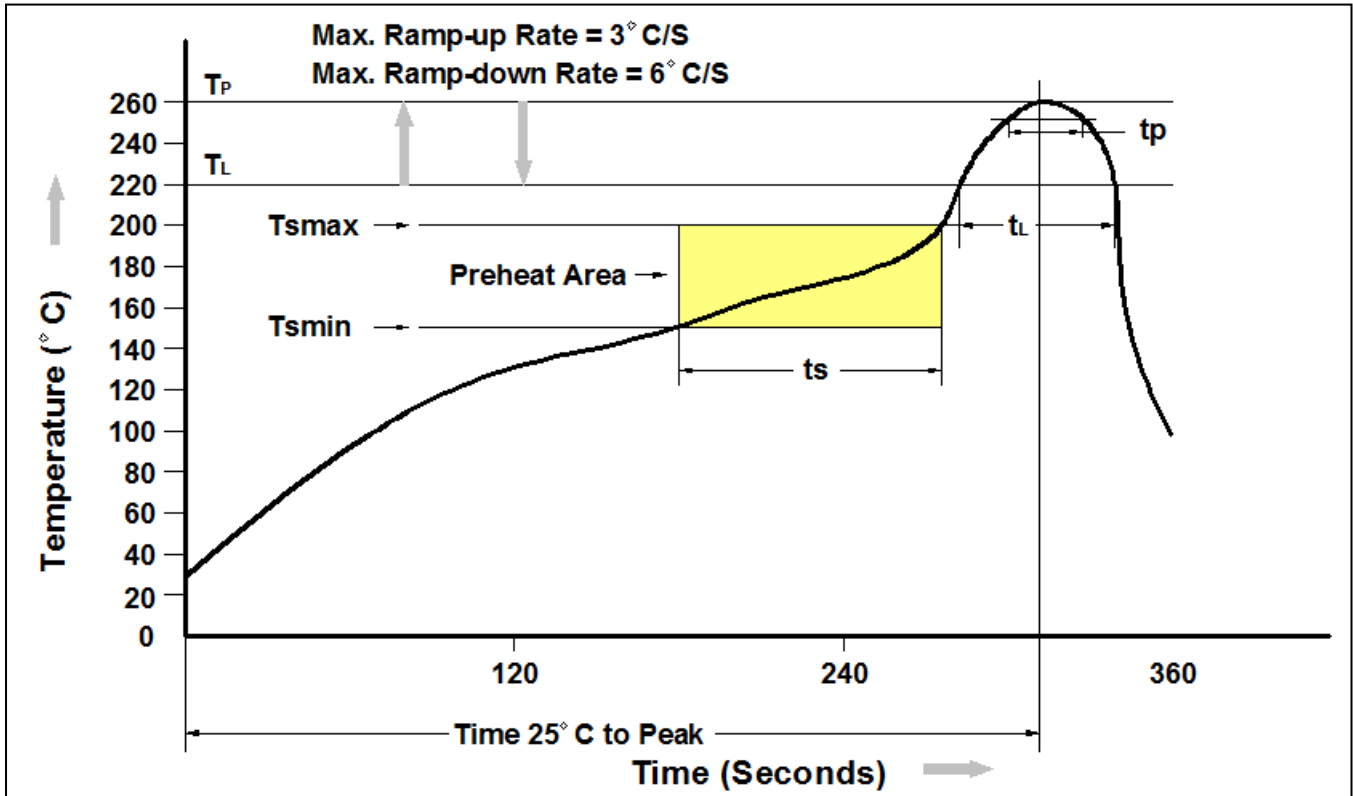
#### Option T2





**CT1010, CT1011, CT1012, CT1013, CT1014  
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**Reflow Profile**



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T Amin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (T Amin 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.



**CT1010, CT1011, CT1012, CT1013, CT1014  
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