



CT1010-W, CT1011-W, CT1012-W, CT1013-W, CT1014-W CT1015-W, CT1016-W, CT1017-W, CT1018-W, CT1019-W 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 125 °C
- External creepage distance > 8 mm
- Internal creepage distance > 4.6 mm
- Distances through insulation > 0.4 mm
- Green Package
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950

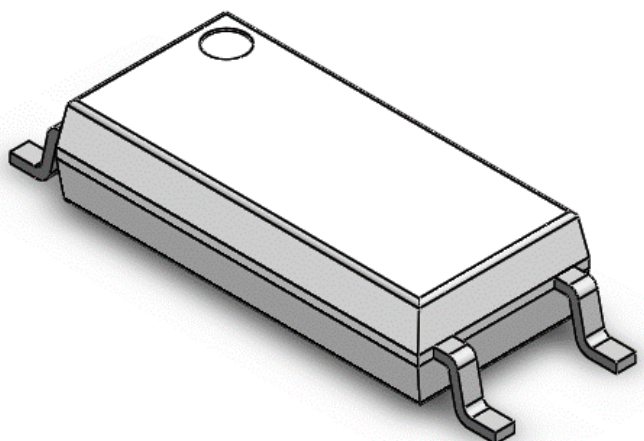
Applications

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

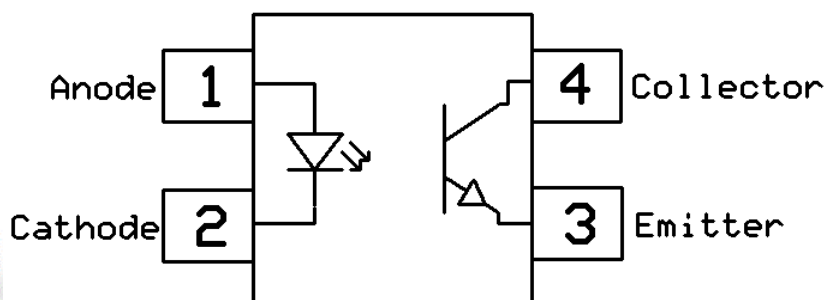
Description

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

Package Outline



Schematic





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

Absolute Maximum Rating at 25°C

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	5000	V _{RMS}	
T _{OPR}	Operating temperature	-55 ~ +125	°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	
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	

Thermal Characteristics

Symbol	Parameters	Ratings	Units	Notes
R _{θJA}	Thermal Resistance Junction-Ambient	445	°C/W	
T _J	Junction temperature	125	°C	



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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	$I_F = 10\text{mA}$		1.26	1.4	V	
		$I_F = 50\text{mA}$	-	1.42	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-W	$I_F = 1\text{mA}$, $V_{CE} = 5\text{V}$	22	-	-	%	
		CT1013-W		34	-	-		
		CT1014-W		56	-	-		
		CT1011-W	$I_F = 10\text{mA}$, $V_{CE} = 5\text{V}$	60	-	300		
		CT1012-W		63	-	125		
		CT1013-W		100	-	200		
		CT1014-W		160	-	320		
		CT1010-W	$I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$	50	-	600		
		CT1015-W		50	-	150		
		CT1016-W		100	-	300		
		CT1017-W		80	-	160		
		CT1018-W		130	-	260		
		CT1019-W		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	



**CT1010-W, CT1011-W, CT1012-W, CT1013-W, CT1014-W
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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	$I_C = 5\text{mA}$, $V_{CE} = 5\text{V}$, $R_L = 100\Omega$	-	4.8	22	μs	
T_{OFF}	Turn Off Time		-	4.2	22		
t_r	Rise Time		-	2.7	18		
t_f	Fall Time		-	4	18		



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Typical Characteristic Curves

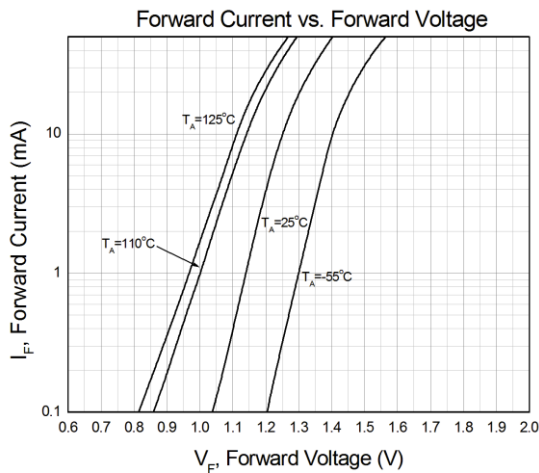


Figure 1

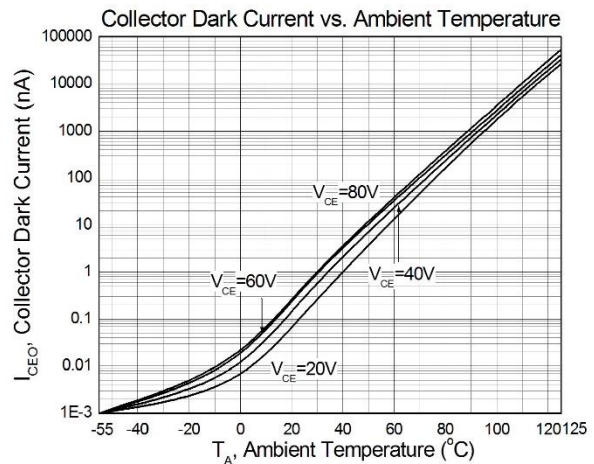


Figure 4

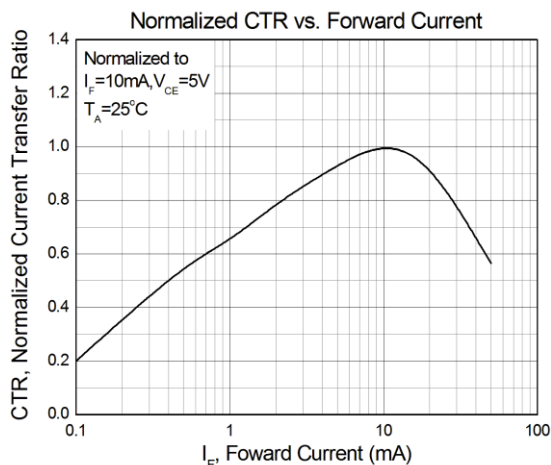


Figure 3

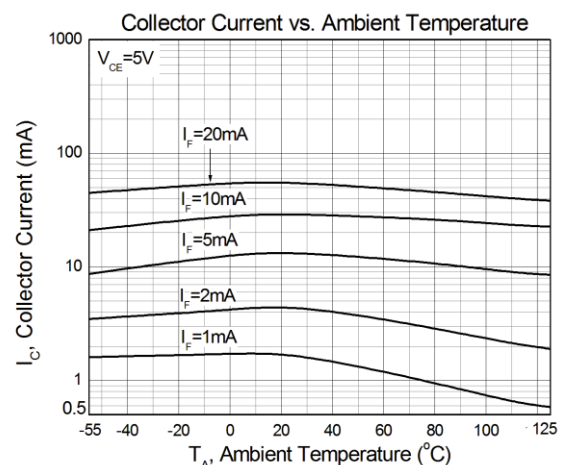


Figure 4

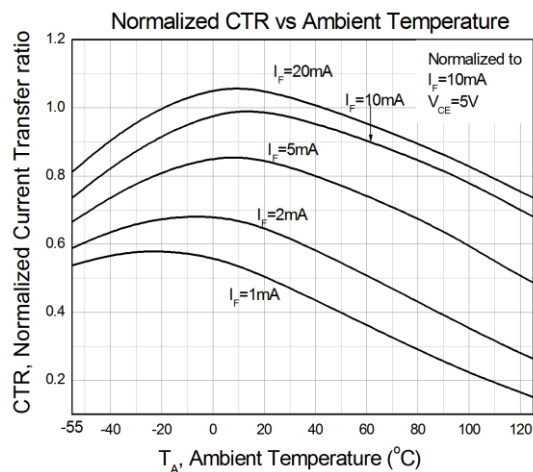


Figure 5

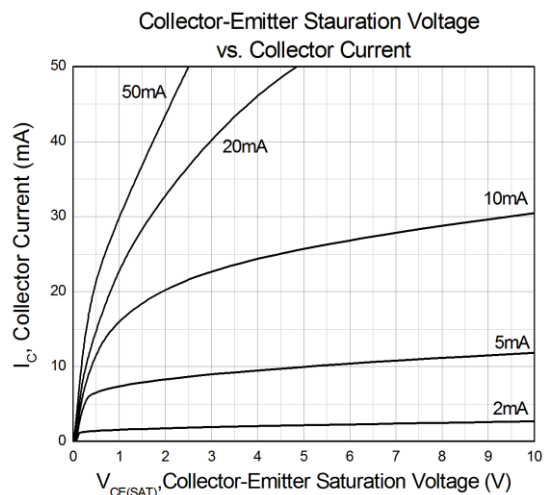


Figure 6



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

DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

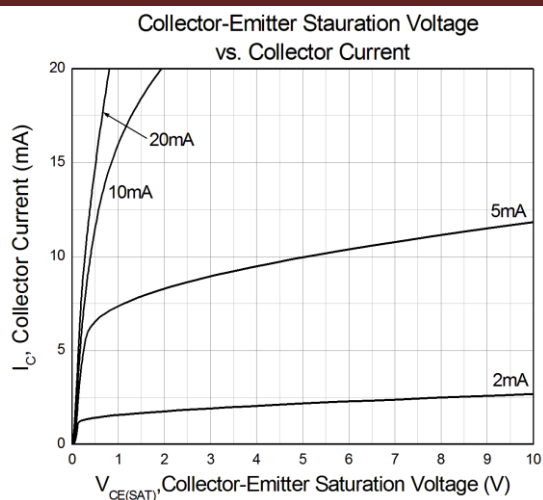


Figure 7

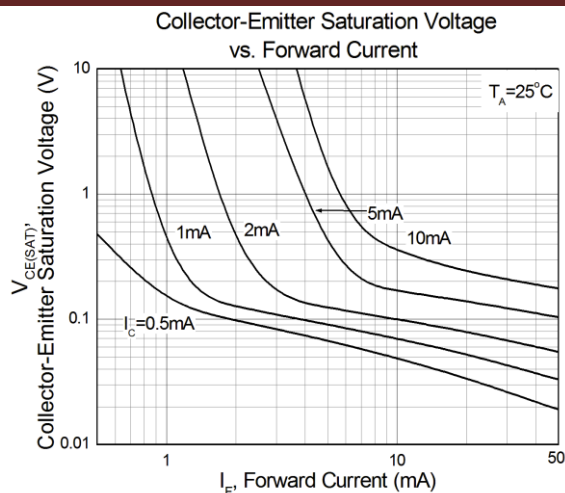


Figure 8

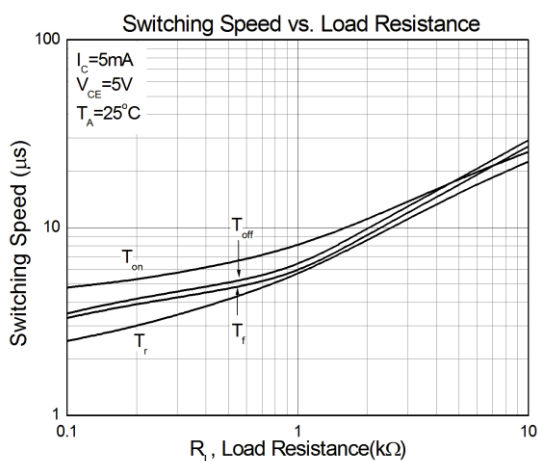


Figure 9

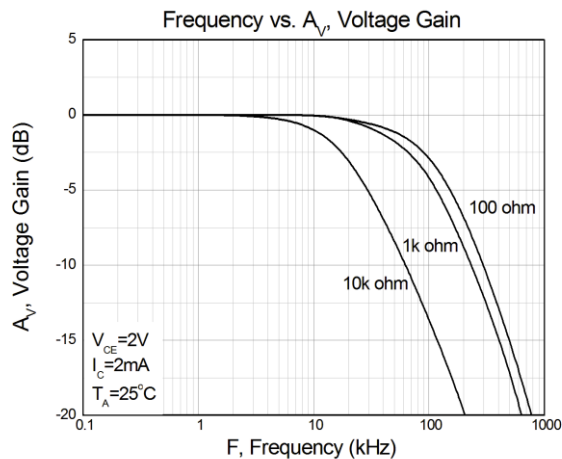
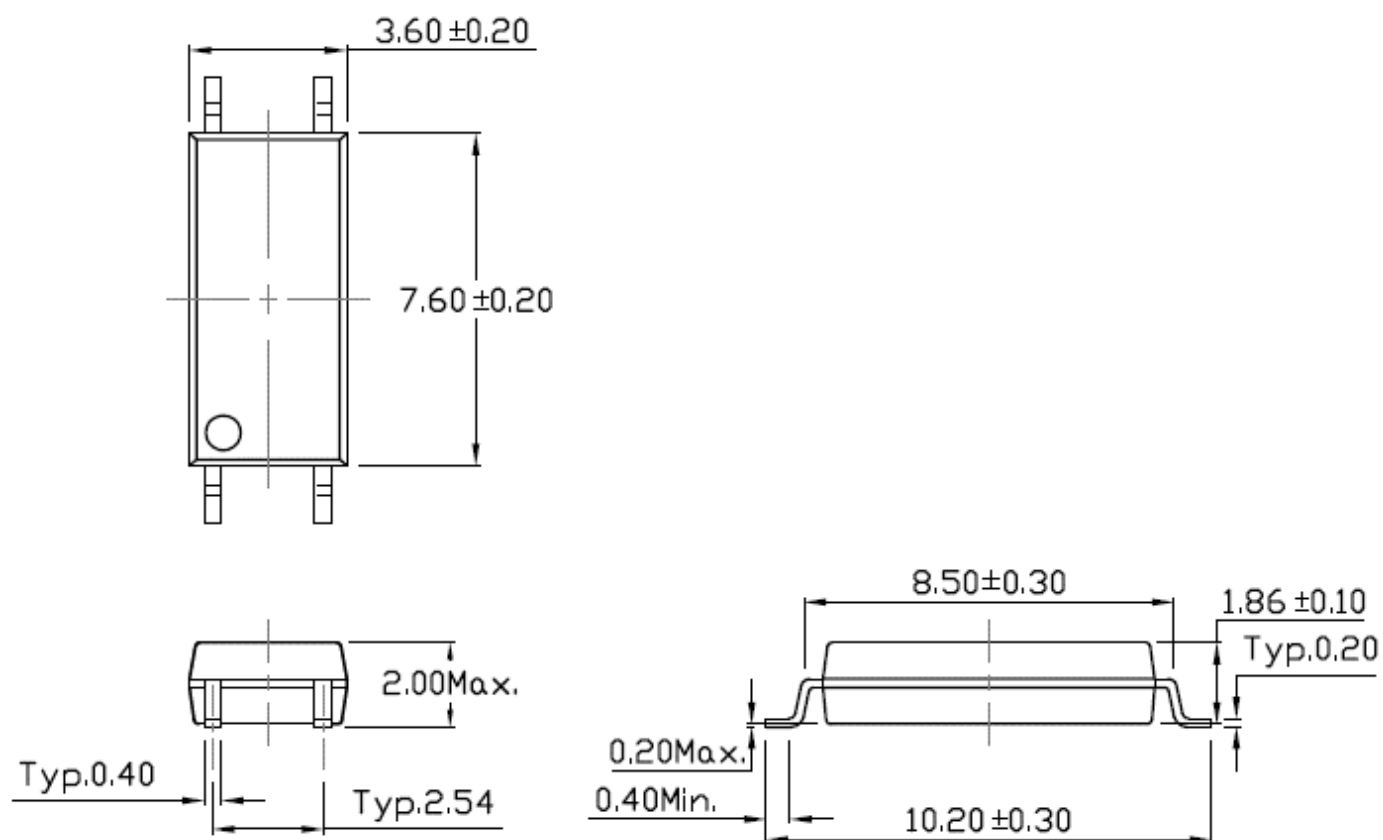


Figure 10

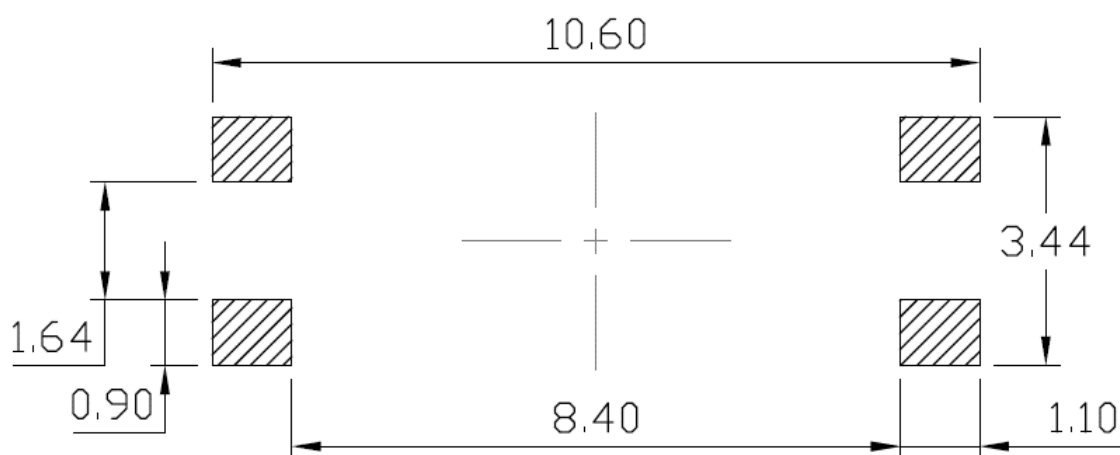


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CT1015-W, CT1016-W, CT1017-W, CT1018-W, CT1019-W
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Package Dimension *Dimensions in mm unless otherwise stated*



Recommended Solder Mask *Dimensions in mm unless otherwise stated*





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Marking Information



Note:

CT : Denotes "CT Micro"
1019 : Part Number
Y : Fiscal Year
V : VDE safety mark (option)
WW : Work Week
K : Manufacturing Code

Ordering Information

CT101X(V)(Y) -W

X = Part No. (0,1,2,3,4,5,6,7,8,9)
V = VDE safety mark option (V or none)
Y = Tape and reel option (T1 or T2)
W = Outline Color (W, White)

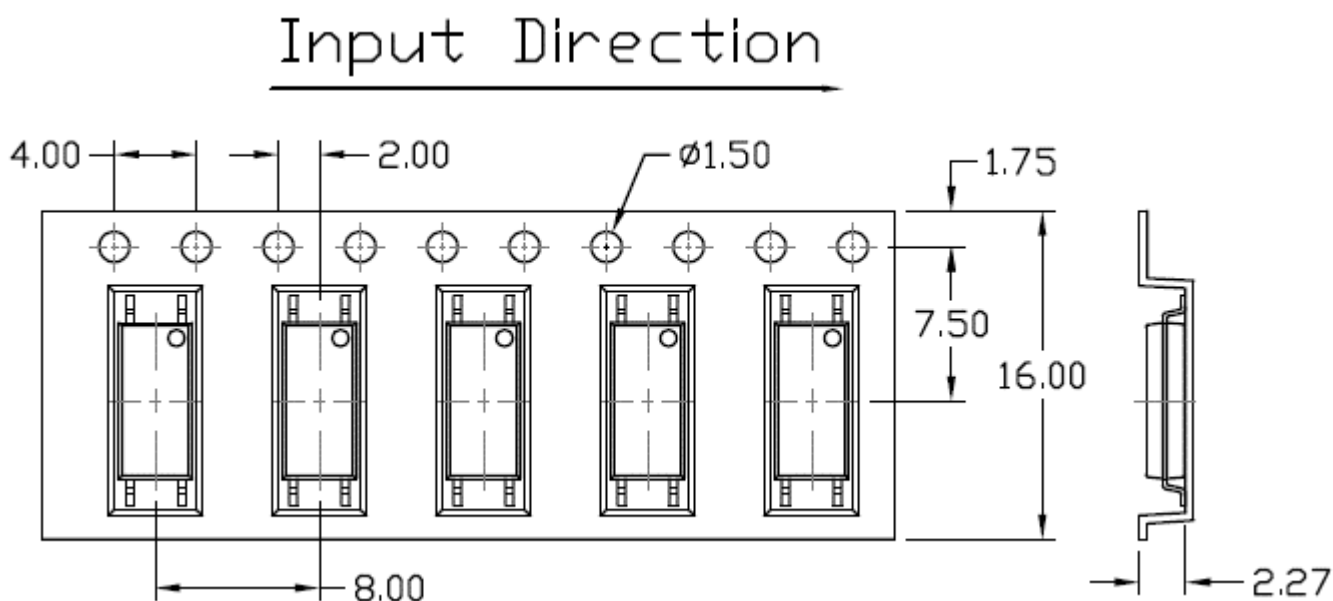
Option	Description	Quantity
T1	Surface Mount Lead Forming – With Option 1 Taping	3000Units/Reel
T2	Surface Mount Lead Forming – With Option 2 Taping	3000Units/Reel



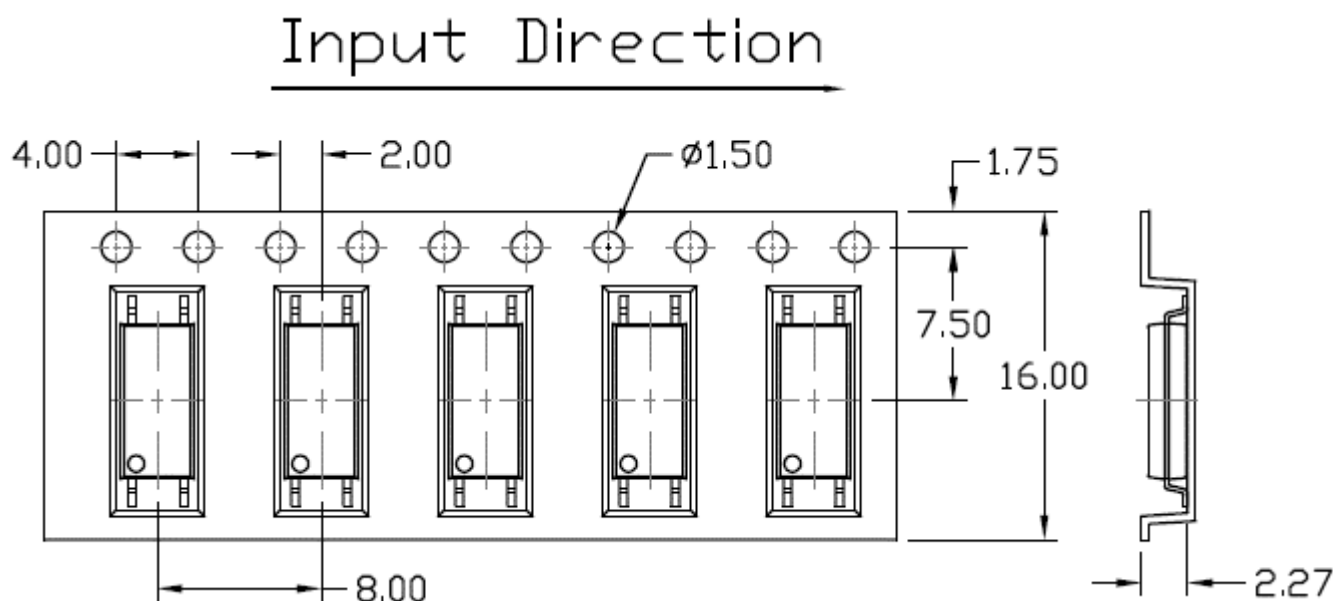
CT1010-W, CT1011-W, CT1012-W, CT1013-W, CT1014-W
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1



Option T2





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Wave soldering (JEDEC22A111 compliant)

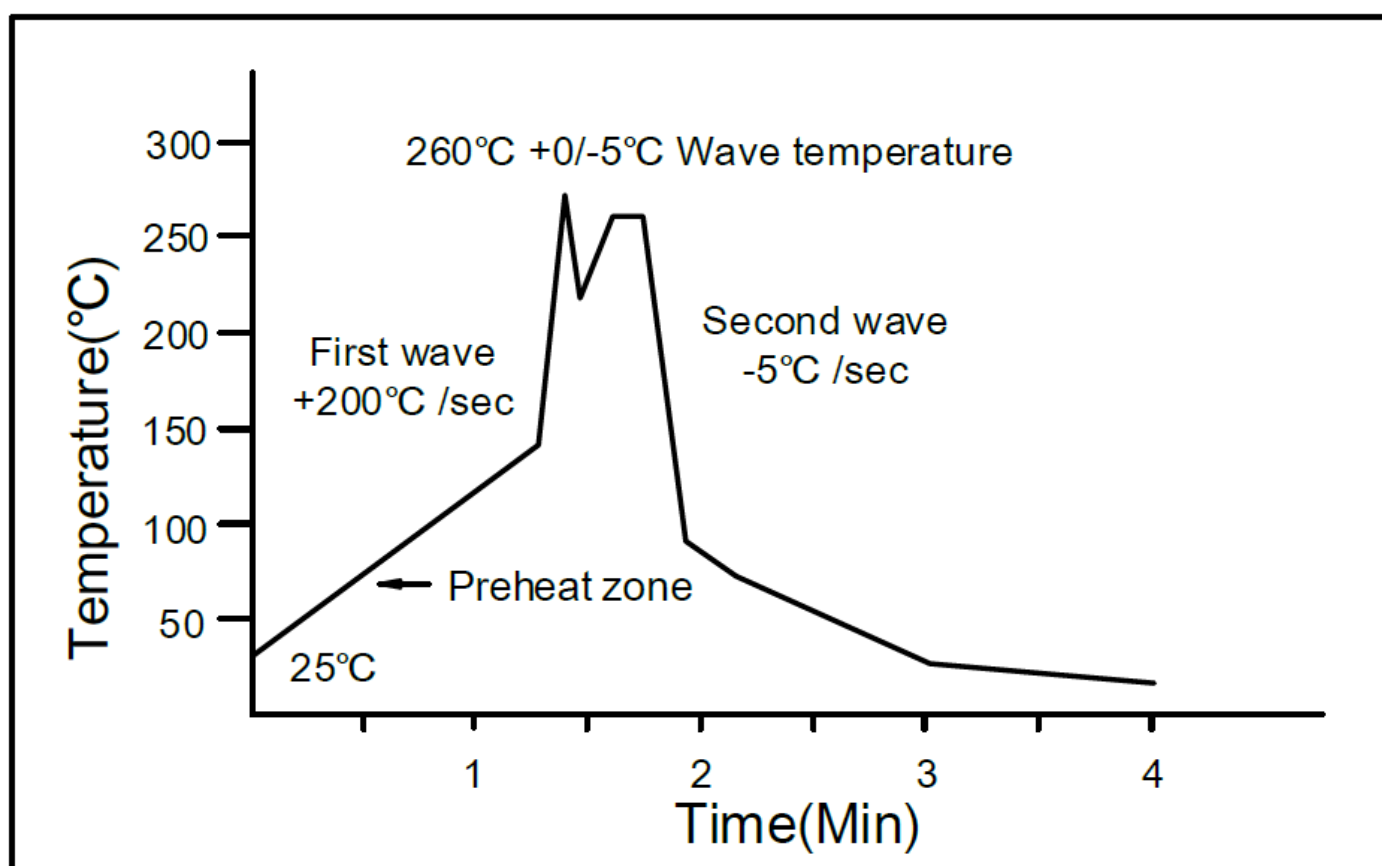
One time soldering is recommended within the condition of temperature.

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

Time: 10 sec.

Preheat temperature: 25 to 140°C .

Preheat time: 30 to 80 sec.



Hand soldering by soldering iron

Allow single lead soldering in every single process.

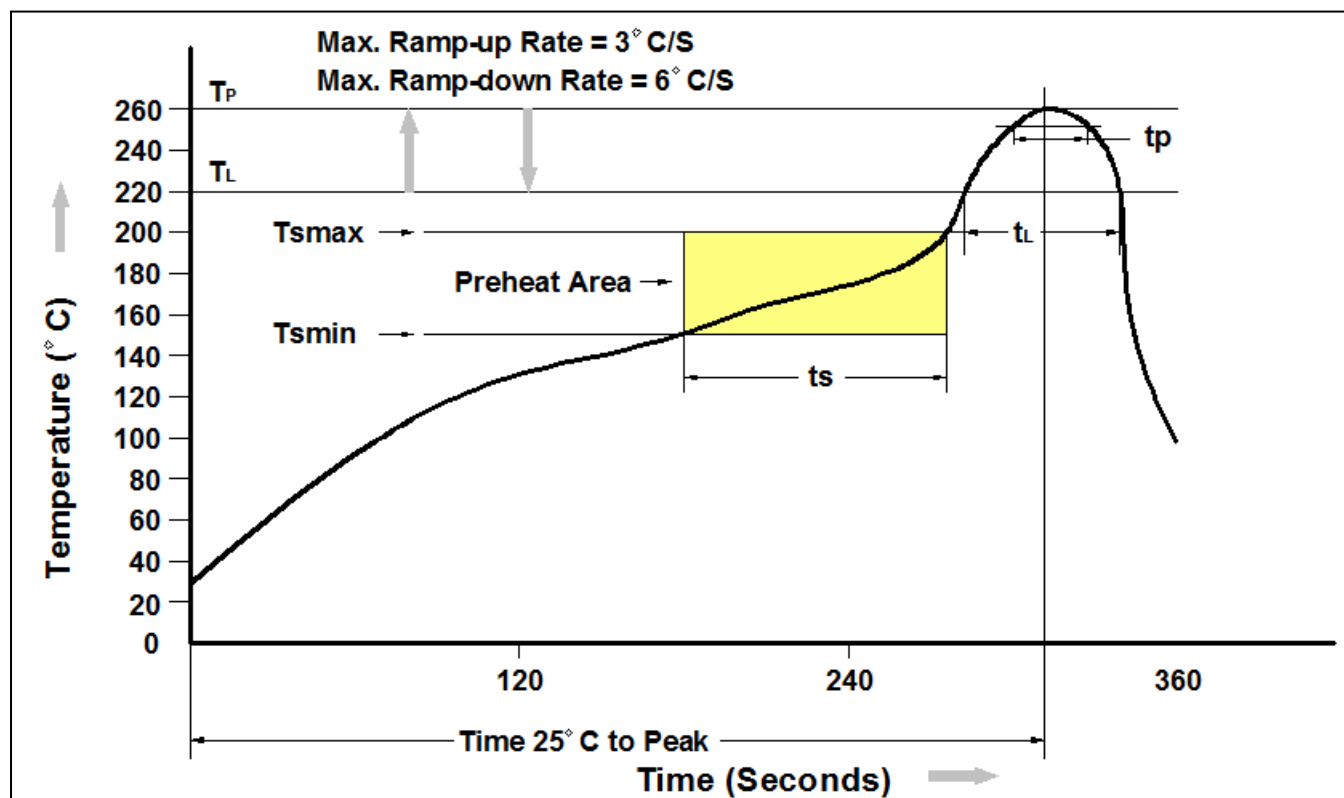
One time soldering is recommended. Temperature: $350 \pm 5^\circ\text{C}$

Time: 3 sec max.



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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 (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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