



AC Input 4-Pin Half Pitch Mini-Flat DMC-Isolator[®] Phototransistor Optocoupler

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Features

- High isolation 3750 VRMS
- Patented coplanar structure DMC-Isolator[®]
- Various CTR selection available
- AC input with transistor output
- Operating Temperature range - 55 °C to 110 °C
- RoHS and REACH compliance
- Halogen Free compliance
- Regulatory Approvals
 - ✓ UL - UL1577 (E364000)
 - ✓ VDE - EN60747-5-5 (40039590)
 - ✓ CQC – GB4943.1, GB8898 (15001123951)
 - ✓ IEC62368 (FI/41119)

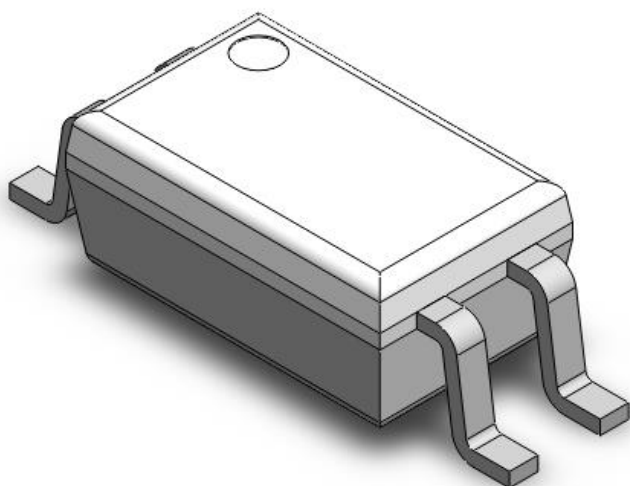
Description

The CTH214 series consists of a phototransistor optically coupled to two Infrared-emitting diodes, connected in inverse parallel in a 4-lead half pitch Mini-Flat DMC-Isolator[®] package.

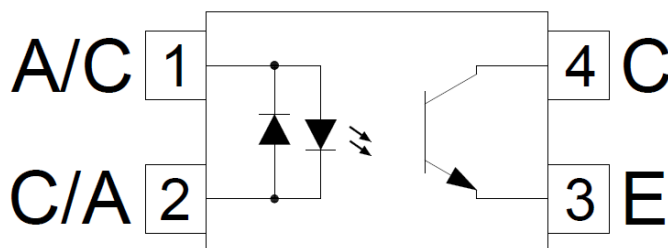
Applications

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

Package Outline



Schematic





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

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	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	
		CTH214B		100	-	300	
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 $T_A = 25^\circ\text{C}$, unless otherwise specified

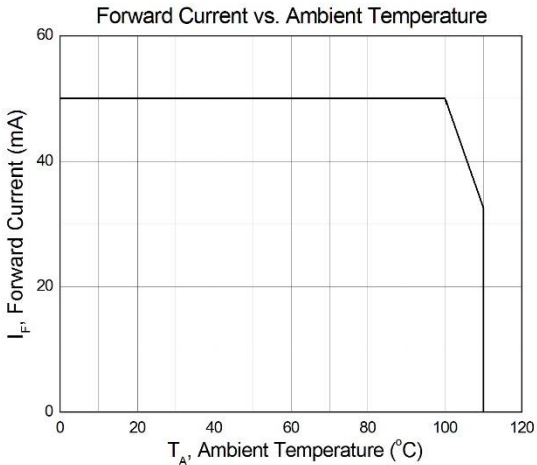


Figure 1

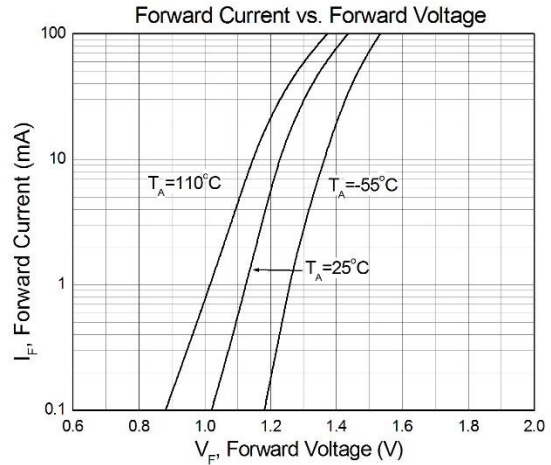


Figure 2

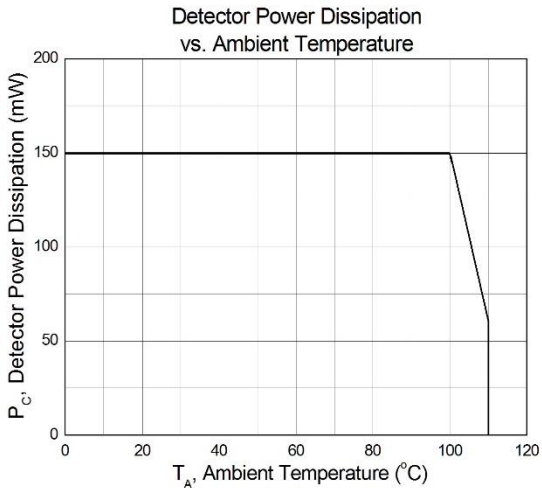


Figure 3

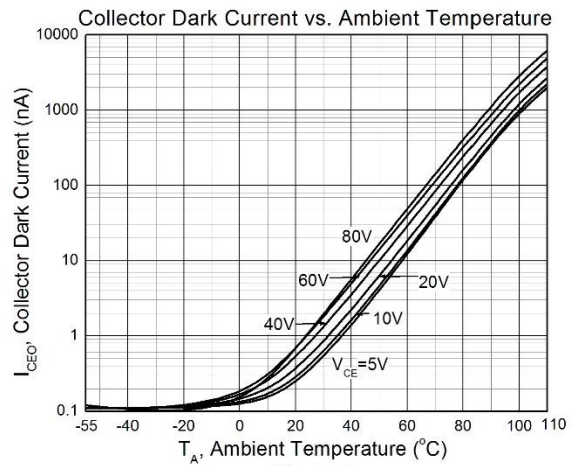


Figure 4

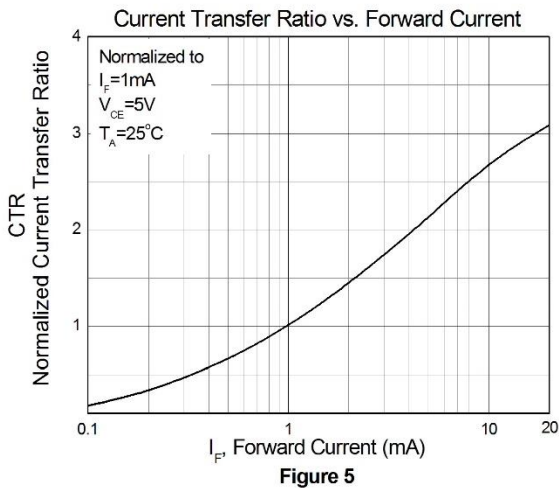


Figure 5

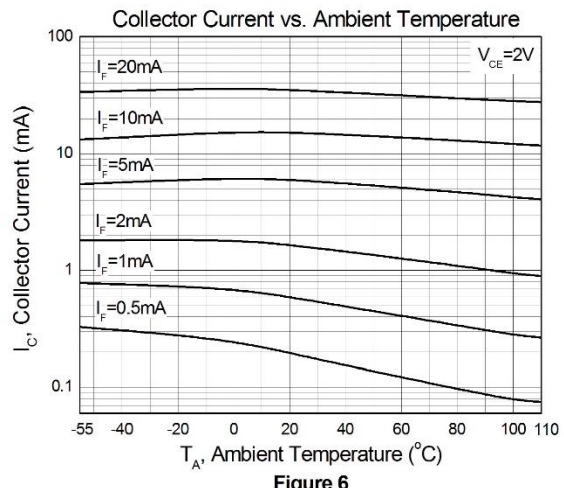


Figure 6



CTH214 Series AC Input 4-Pin Half Pitch Mini-Flat DMC-Isolator[®] Phototransistor Optocoupler

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

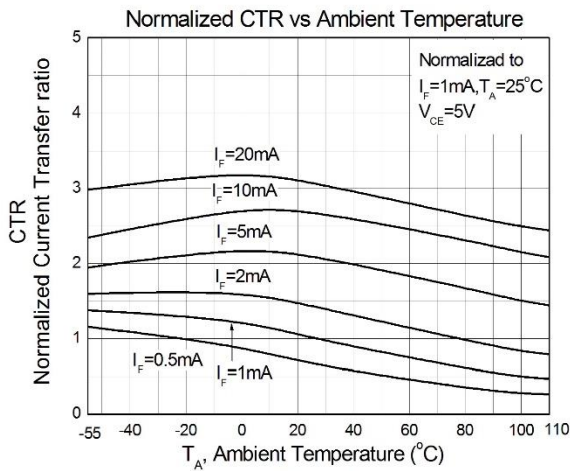


Figure 7

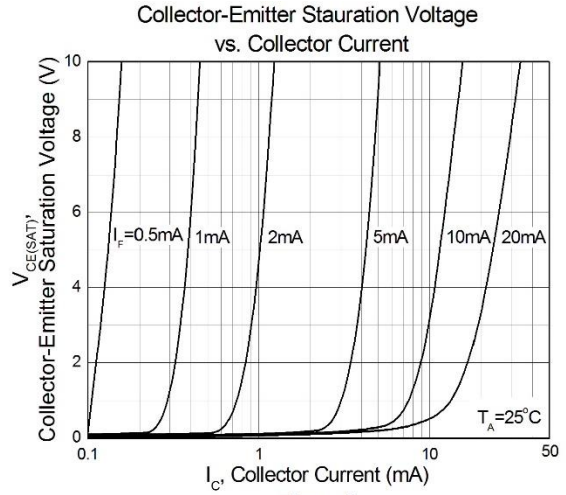


Figure 8

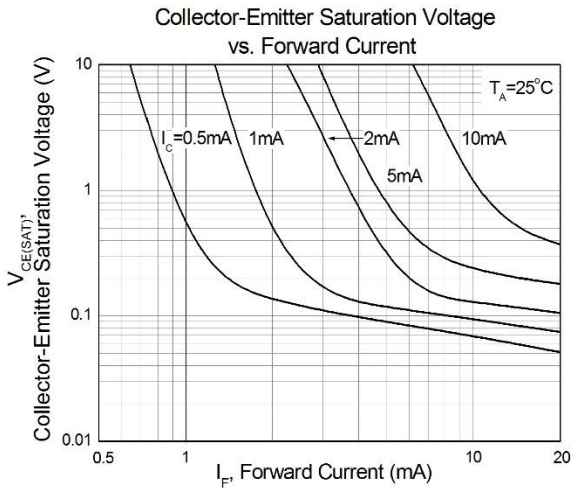


Figure 9

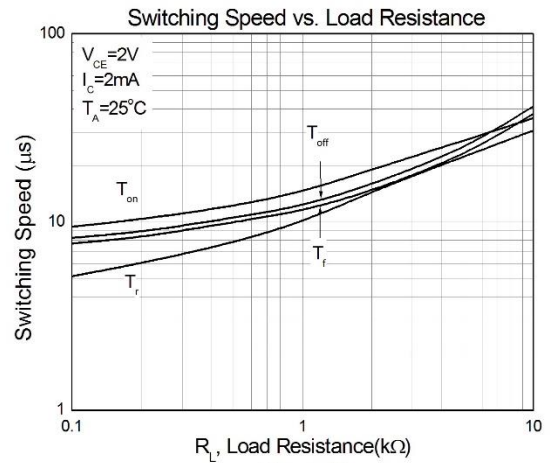


Figure 10

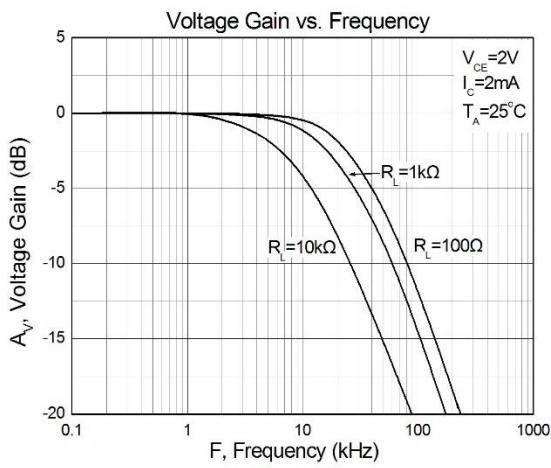


Figure 11

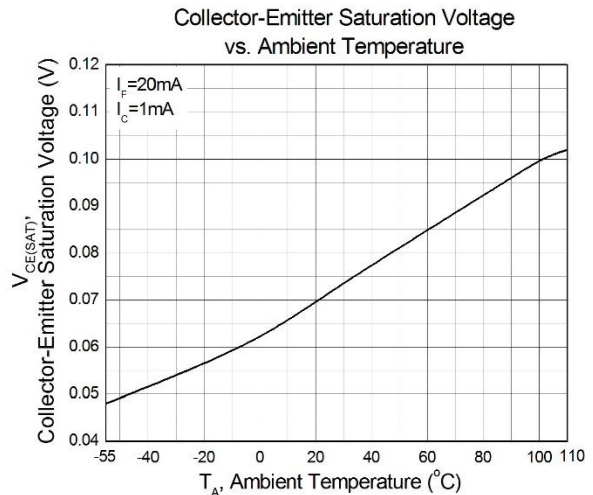


Figure 12



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

Test Circuit

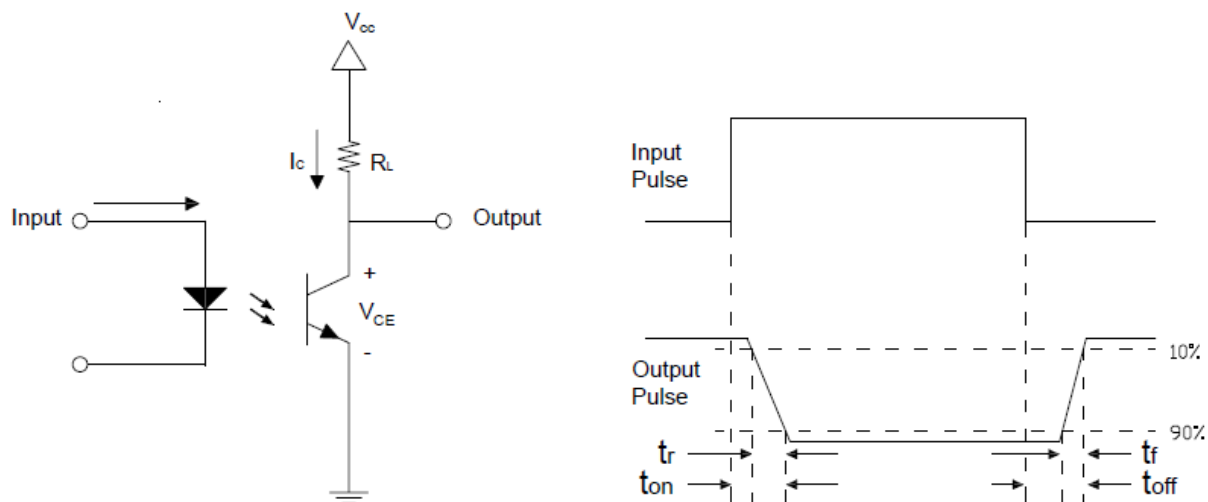
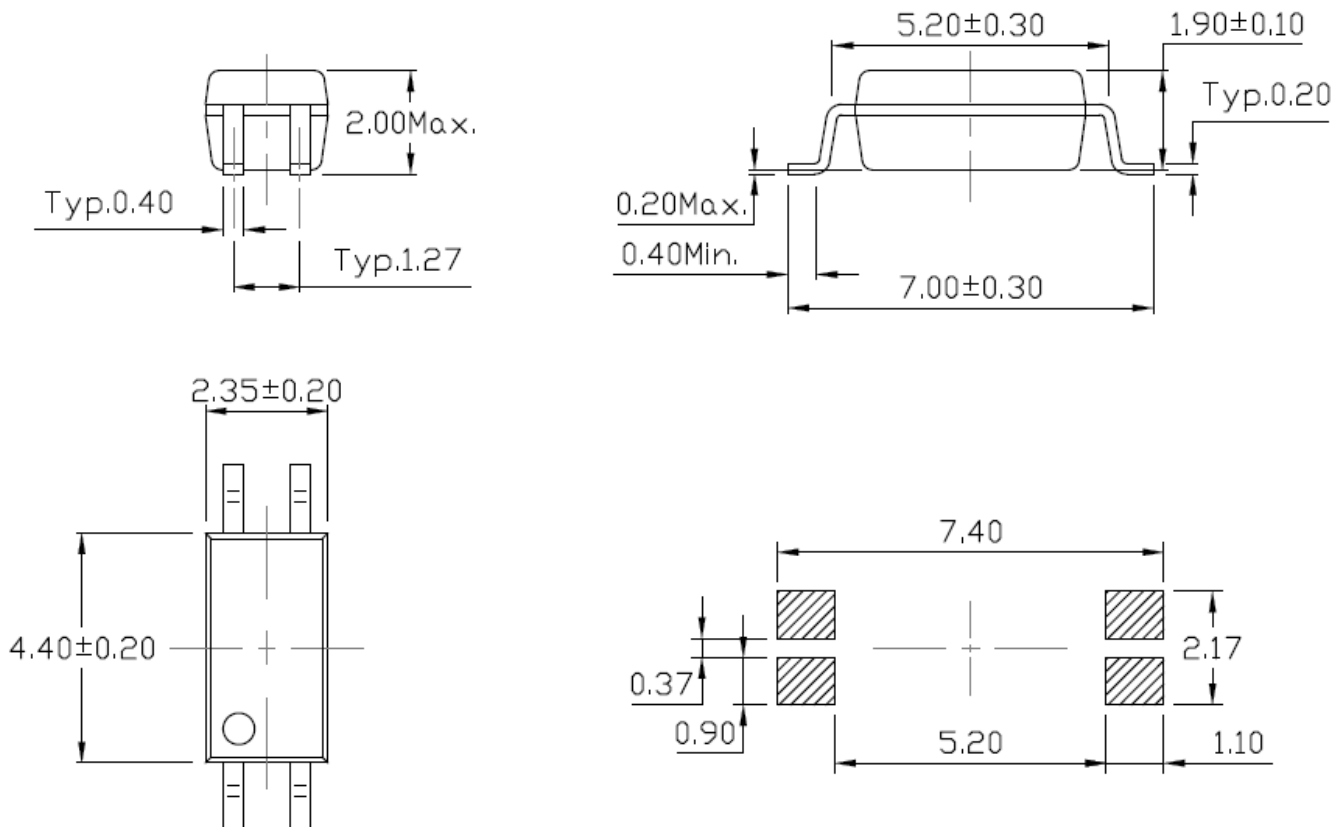


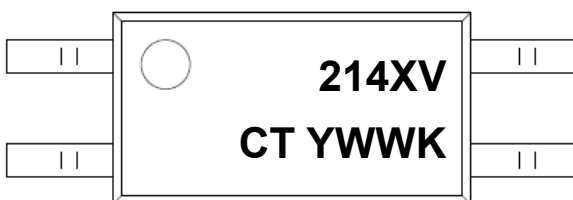
Figure 13: Switching Time Test Circuits



Package Dimension *Dimensions in mm unless otherwise stated*



Marking Information



Note:

- CT : Denotes "CT Micro"
- 214 : Part Number
- X : CTR Rank Option (Blank, A or B)
- 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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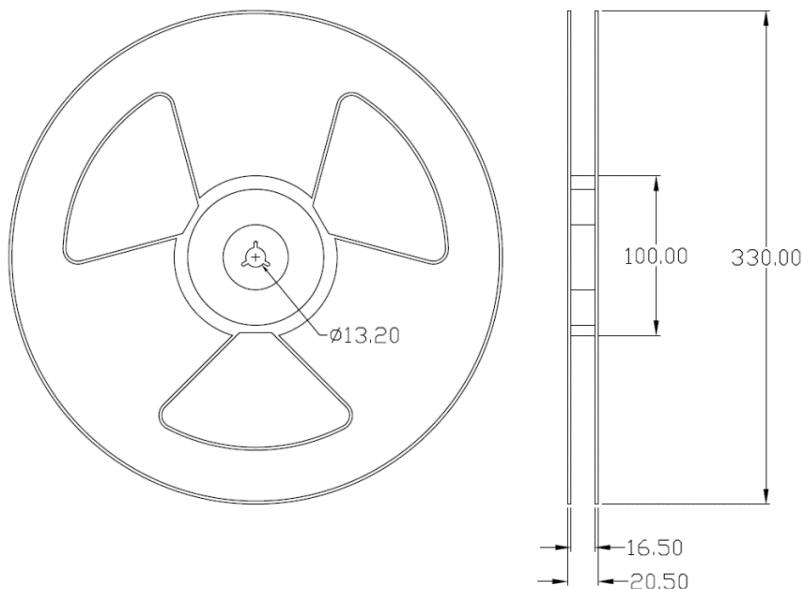
Ordering Information

CTH214X (V)(Z)

- CT = Denotes "CT Micro"
- H214 = Part Number
- X = CTR Rank Option (Blank, A or B)
- V = VDE Safety Mark Option (Blank or V)
- 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

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

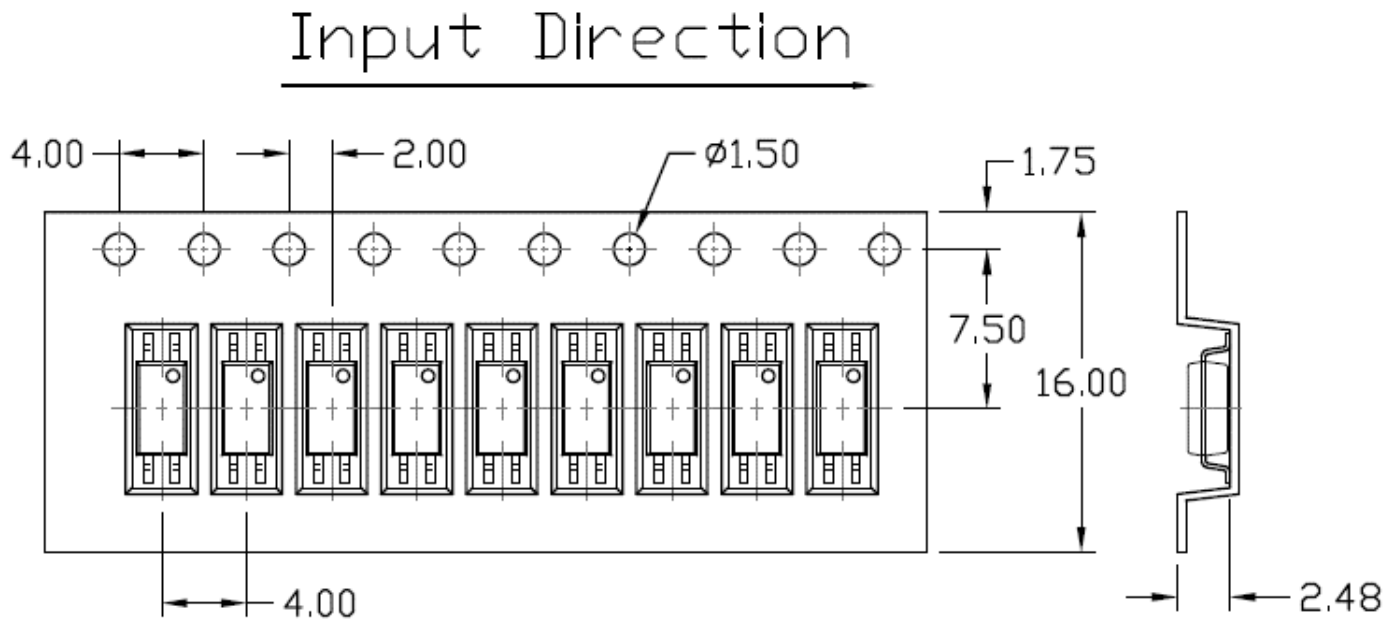




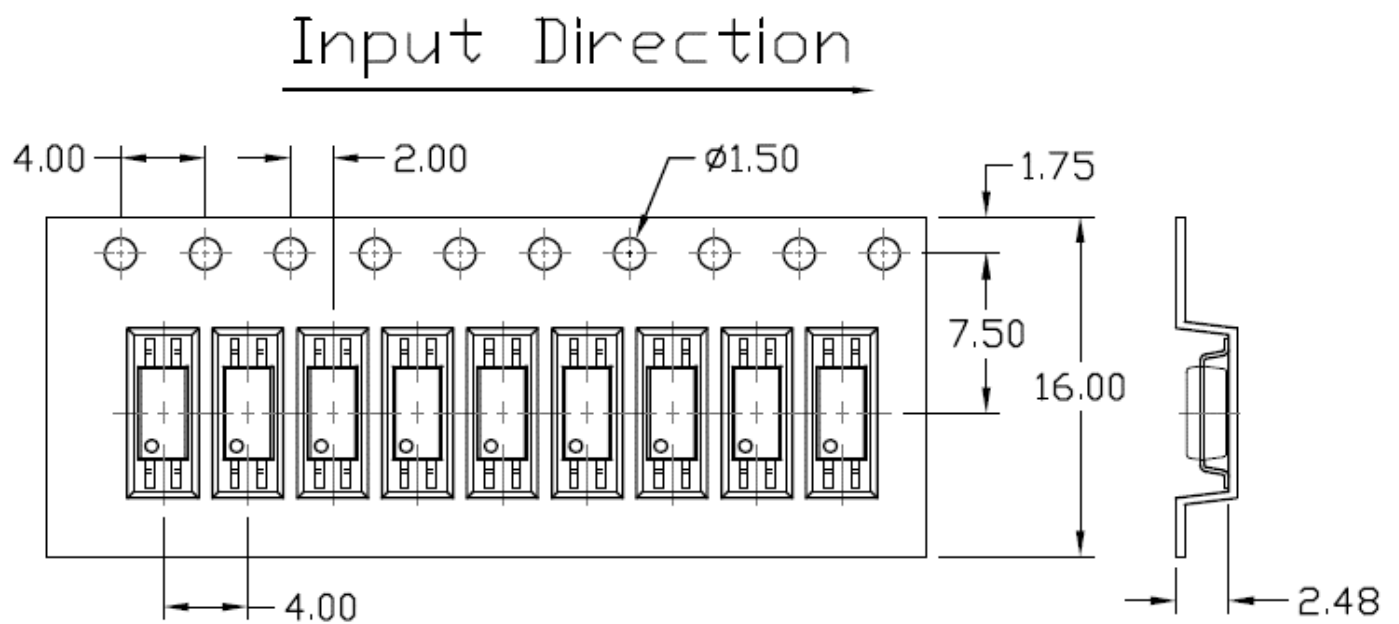
CTH214 Series AC Input 4-Pin Half Pitch Mini-Flat DMC-Isolator® Phototransistor Optocoupler

Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option (T1)



Option (T2)





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

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)

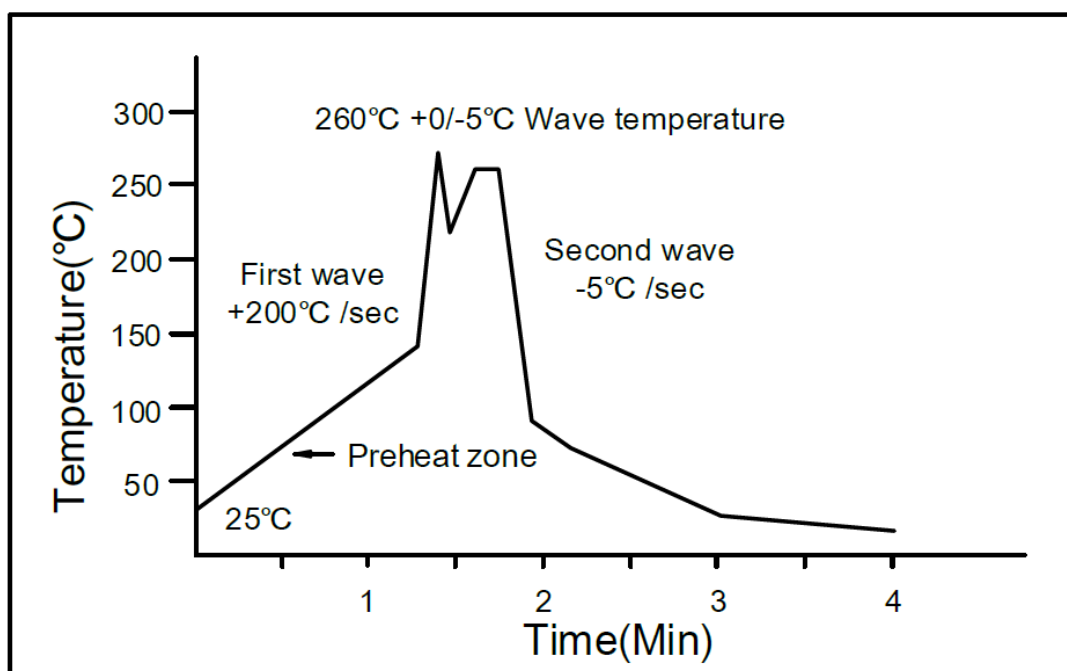
One time soldering is recommended within the condition of temperature.

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.

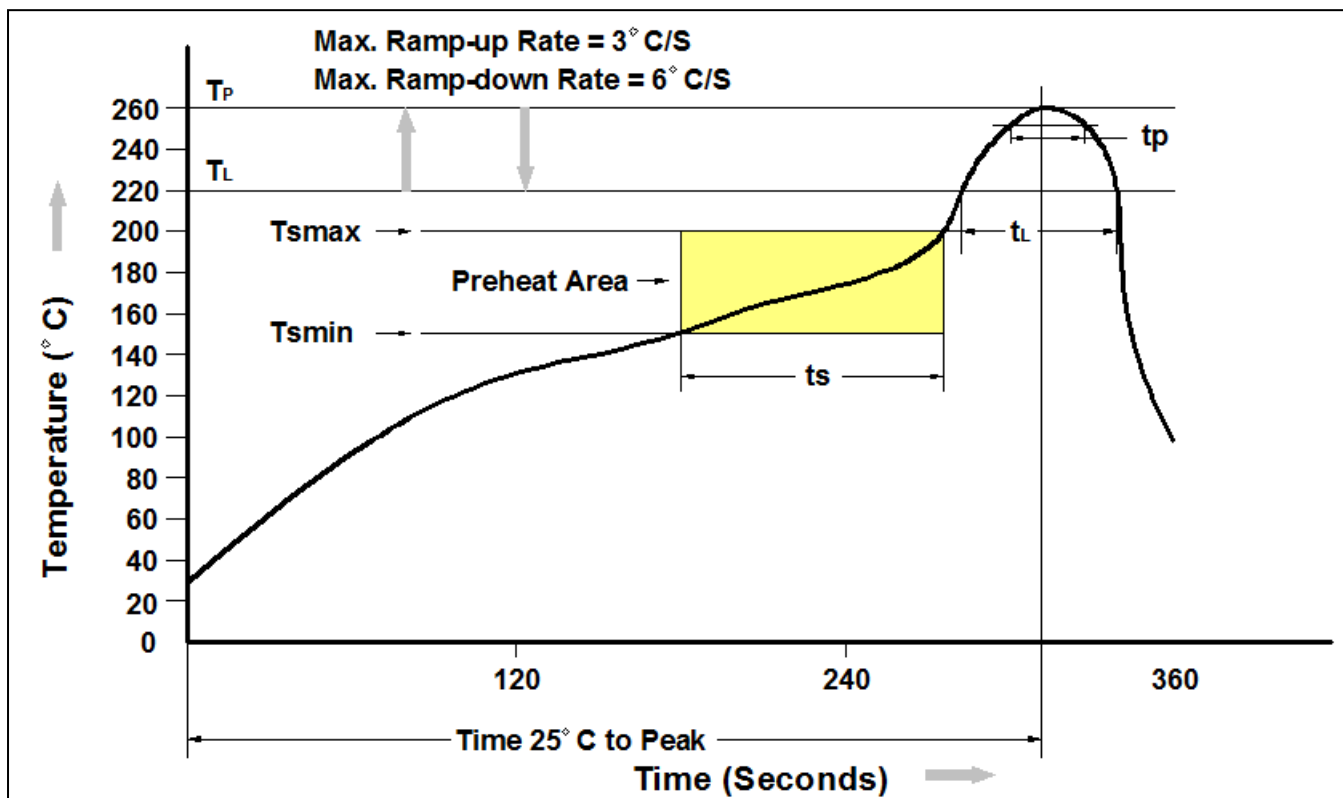
One time soldering is recommended.

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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