



DC 4-Pin DFN Phototransistor Optocoupler

Features

- High isolation 2500 VRMS
- DC input with transistor output
- Operating temperature range - 55 °C to 125 °C
- Leadless
- DMC™ structure
- RoHS compliance
- REACH compliance
- Halogen free
- External creepage >2.8mm
- Isolate distance >0.4mm
- Regulatory Approvals
 - UL - UL1577 (Pending approval)
 - VDE - EN60747-5-5

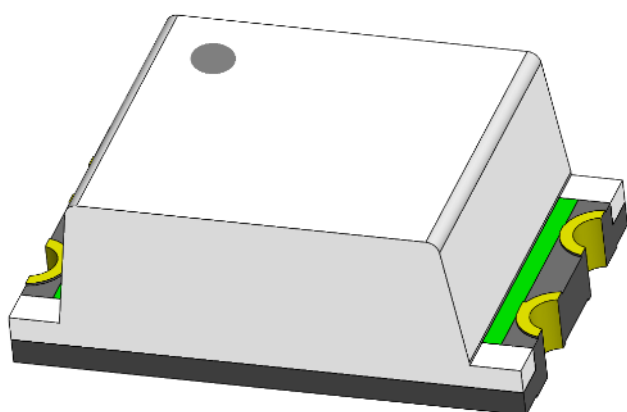
Description

The CTP17 series consists of a photo transistor optically coupled to a gallium arsenide Infrared-emitting diode in a DFN package.

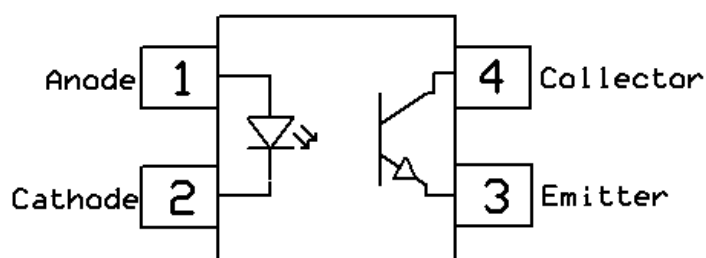
Applications

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

Package Outline



Schematic





DC 4-Pin DFN Phototransistor Optocoupler

Absolute Maximum Rating at 25°C

<i>Symbol</i>	<i>Parameters</i>	<i>Ratings</i>	<i>Units</i>	<i>Notes</i>
V _{ISO}	Isolation voltage	2500	V _{RMS}	
P _{TOT}	Total power dissipation	135	mW	
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	20	mA	
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	100	mA	
V _R	Reverse voltage	6	V	
P _D	Emitter power dissipation	35	mW	
Detector				
P _C	Detector power dissipation	100	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	$I_F = 10\text{mA}$	-	1.25	1.4	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	10	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	$I_{EC} = 100\mu\text{A}$	7	-	-	V	
I_{CEO}	Collector-Emitter Dark Current	$V_{CE} = 40\text{V}$, $I_F = 0\text{mA}$	-	-	100	nA	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes	
CTR	Current Transfer Ratio	$I_F = 1\text{mA}$, $V_{CE} = 5\text{V}$	CTP17	100	-	600	%	1
			CTP17B	100	-	300		
			CTP17C	200	-	400		
			CTP17D	300	-	600		
CTR	Current Transfer Ratio	$I_F = 1\text{mA}$, $V_{CE} = 0.4\text{V}$	50	-	-	%		
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	$I_F = 1\text{mA}$, $I_C = 0.5\text{mA}$	-	0.2	0.4	V		
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	5×10^{10}	-	-	Ω		
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	1	pF		

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
t_r	Rise Time	$I_C = 2\text{mA}$, $V_{CE} = 2\text{V}$ $R_L = 100\Omega$	-	5	16	μs	
t_f	Fall Time		-	6	16		
t_{on}	Turn-on time		-	8	20	μs	
t_{off}	Turn-off time		-	7	20		

Note1:CTP17 is random shipment



Typical Characteristic Curve

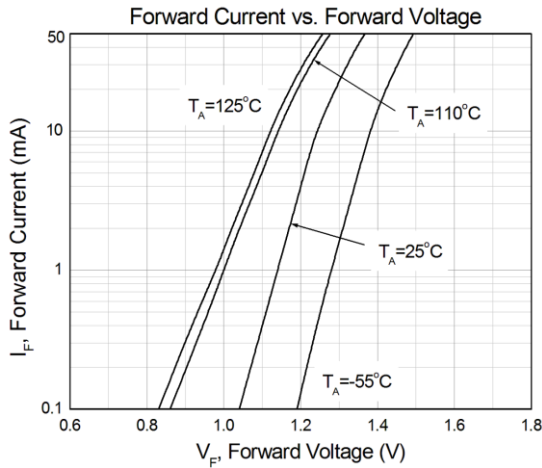


Figure 1

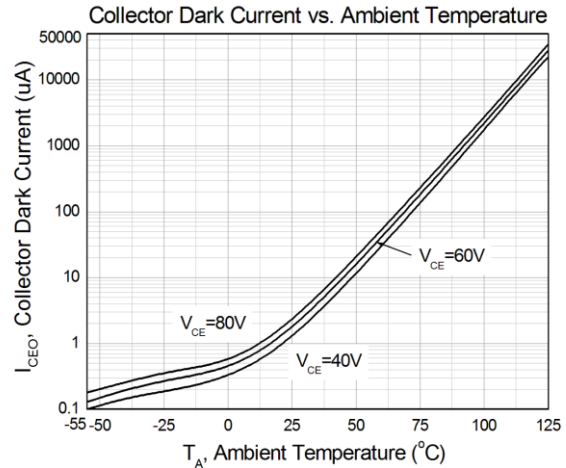


Figure 2

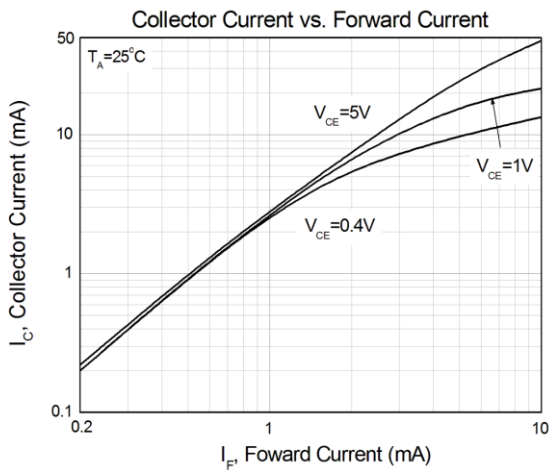


Figure 3

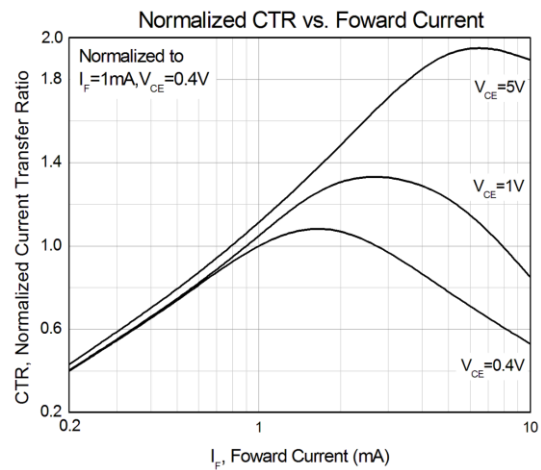


Figure 4

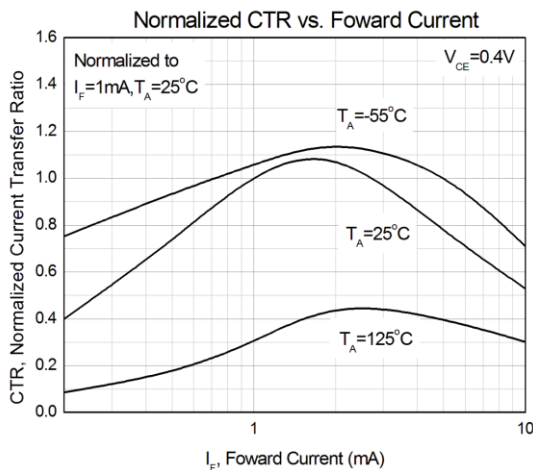


Figure 5

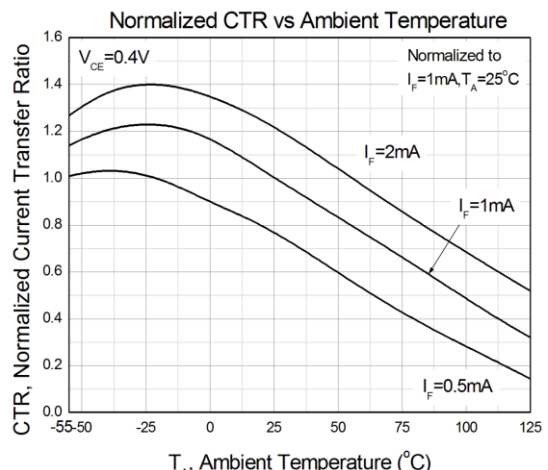


Figure 6



DC 4-Pin DFN Phototransistor Optocoupler

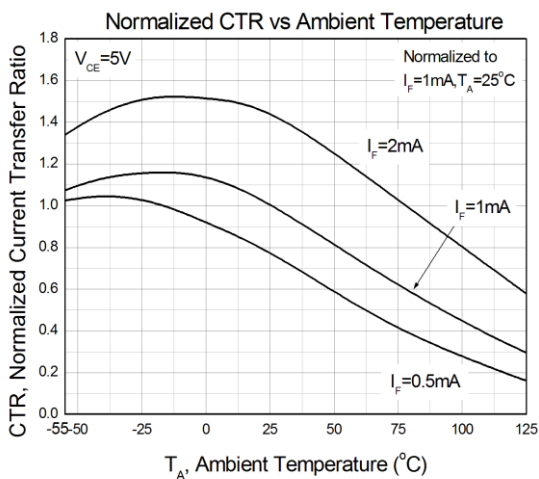


Figure 7

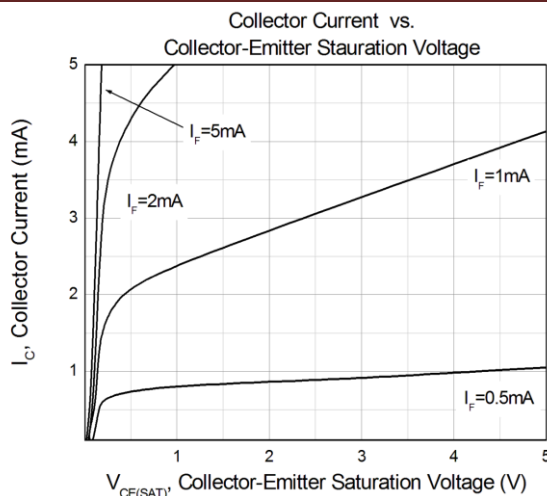


Figure 8

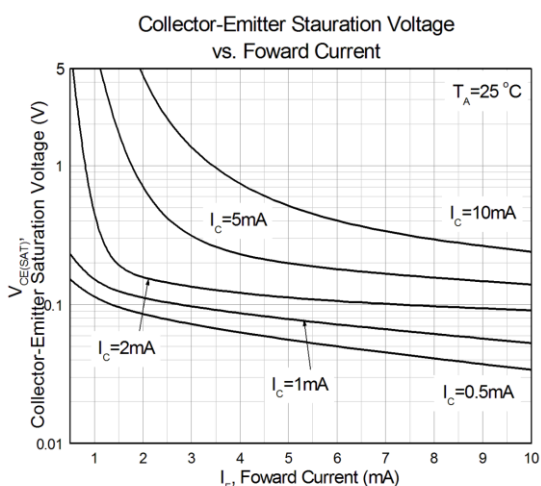


Figure 9

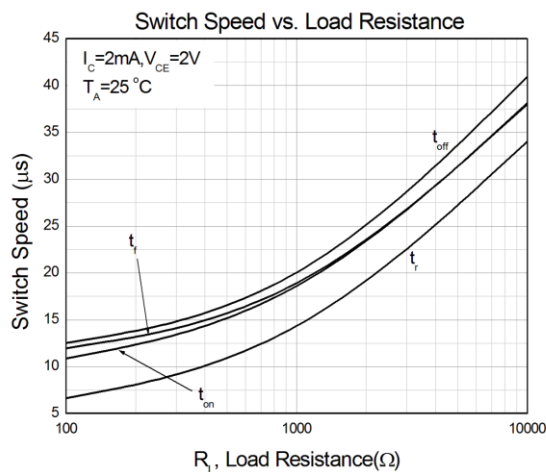


Figure 10

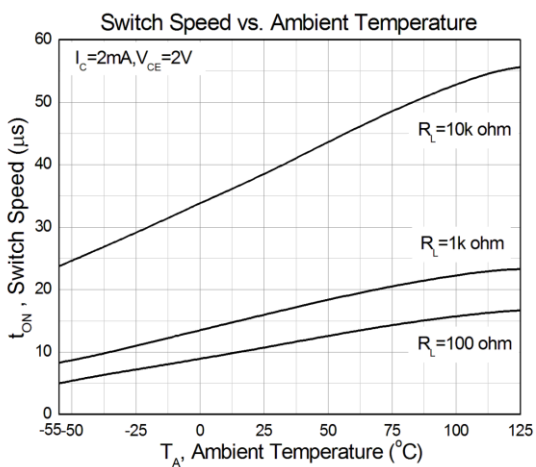


Figure 11

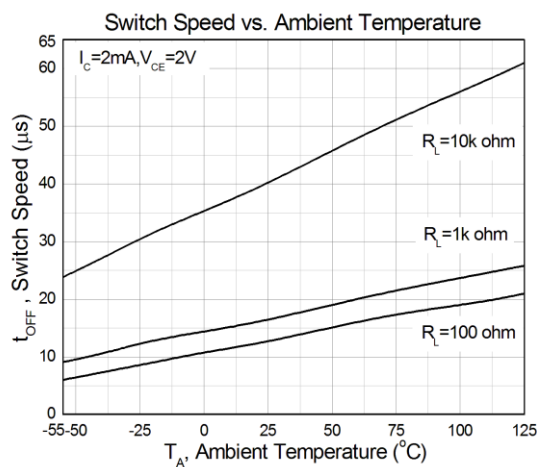
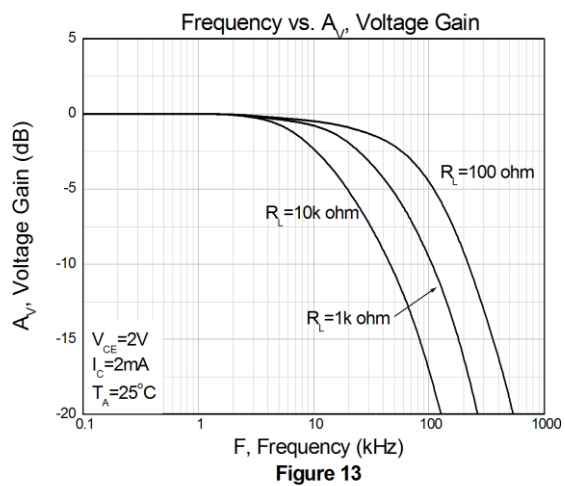


Figure 12



Test Circuit

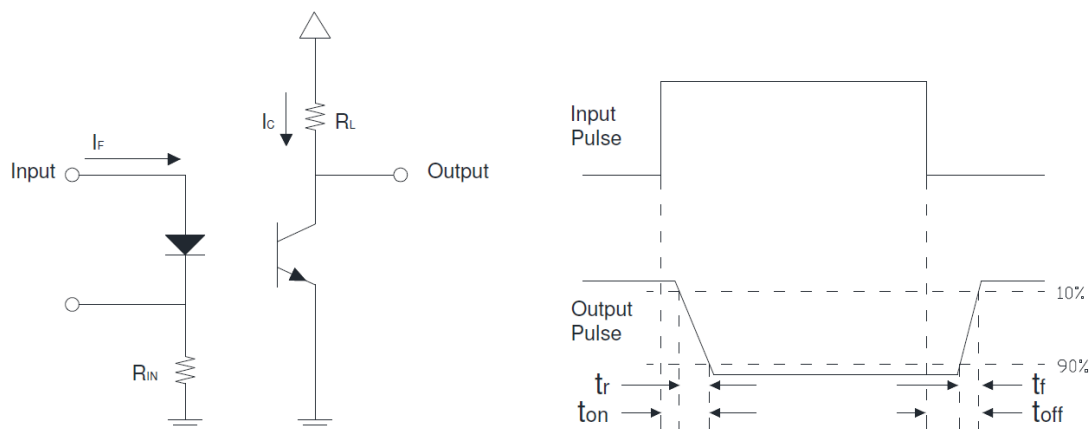
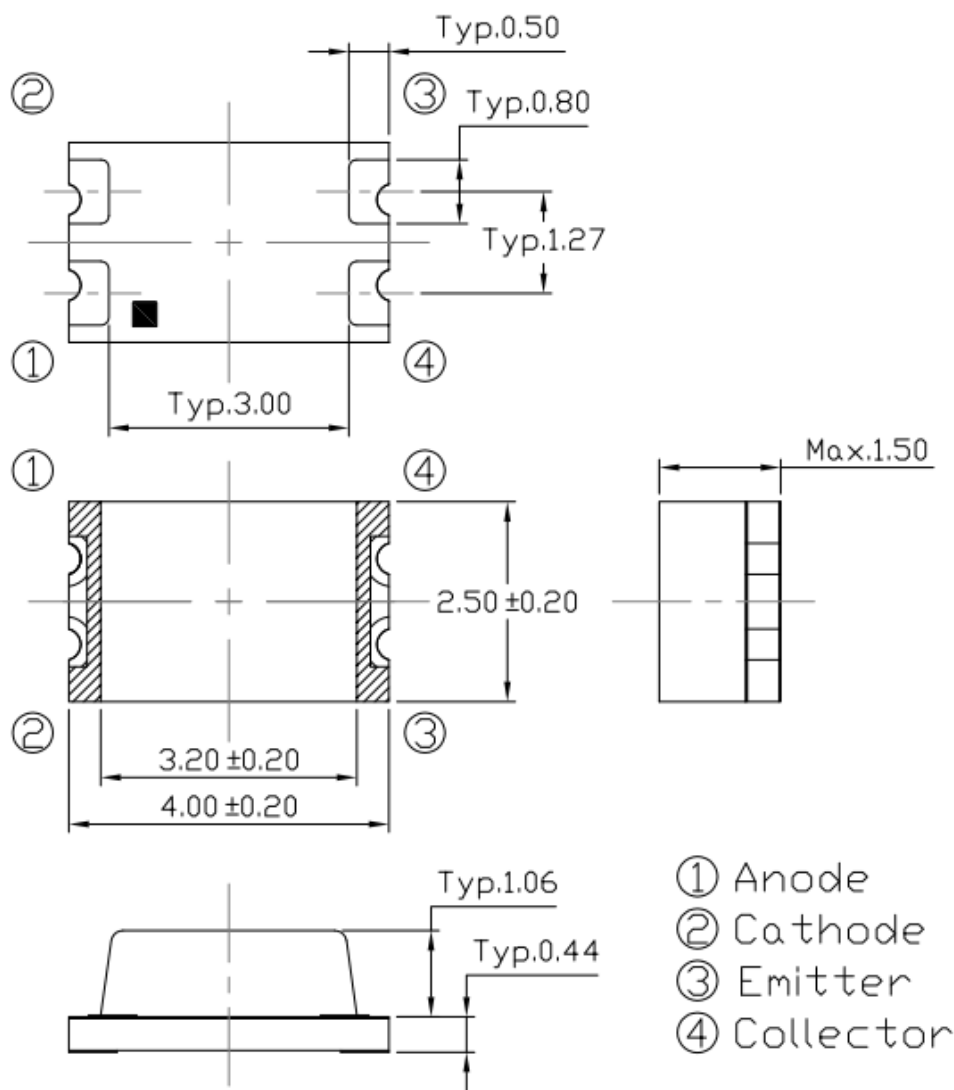


Figure 14: Switching Time Test Circuits

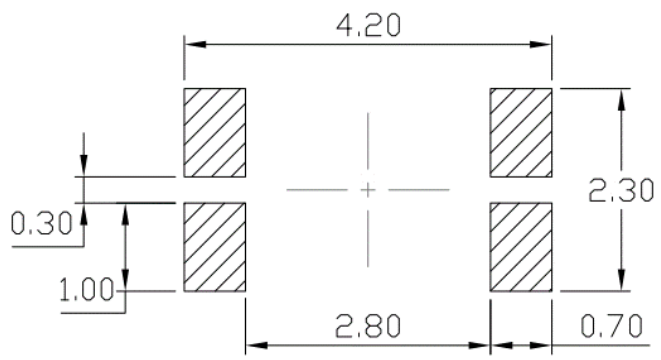


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Package Dimension *Dimensions in mm unless otherwise stated*

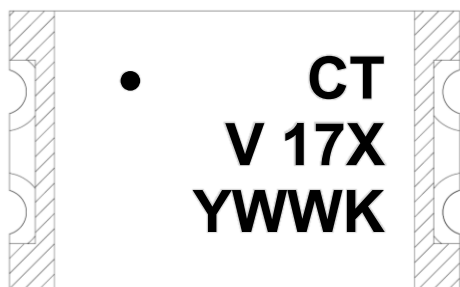


Recommended Solder Mask *Dimensions in mm unless otherwise stated*





Marking Information



Note:

- CT : Denotes “CT Micro”
- V : VDE Safety marking option (V, or none)
- 17 : Part Number
- X : CTR Rank (X= B, C, D, or none)
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Codes

Ordering Information

CTP17X(V)(Y)

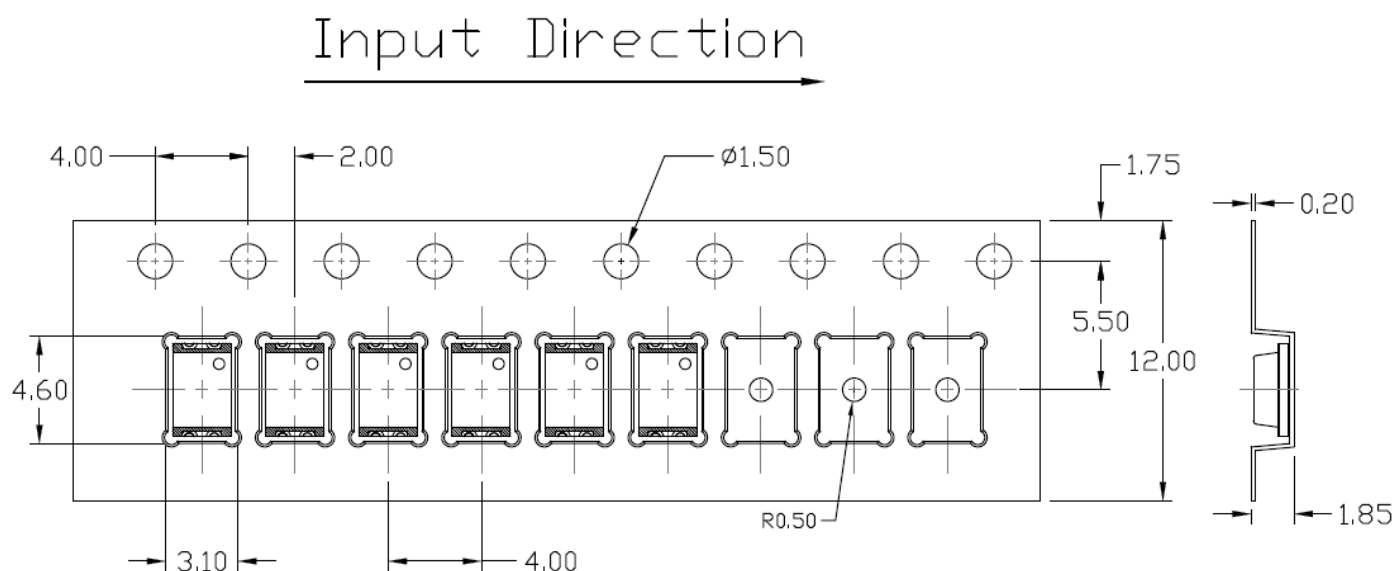
- CT = Denotes “CT Micro”
- P17 = Part Number
- X = CTR Rank (X= B, C, D, or none)
- V = VDE Safety marking option (V, or none)
- Y = Tape and reel info (Y= T1)

<i>Option</i>	<i>Description</i>	<i>Quantity</i>
T1	Option 1 Taping	2500 Units/Reel

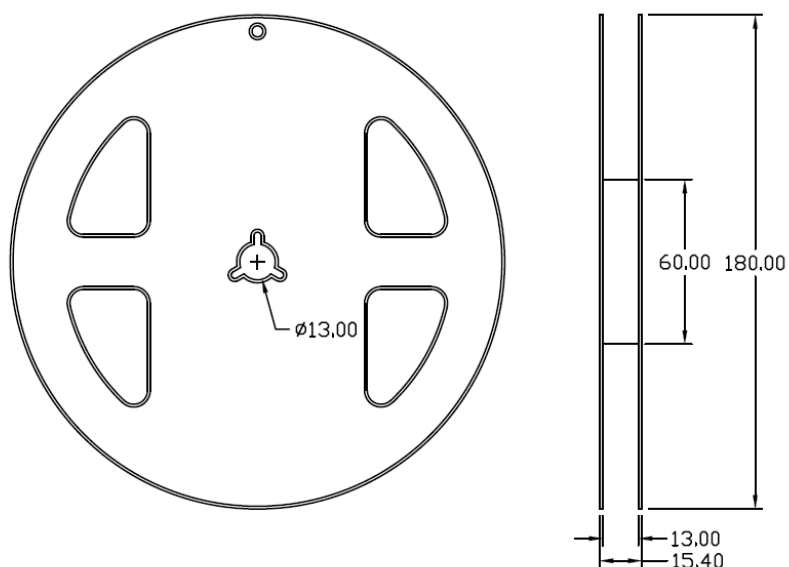


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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*



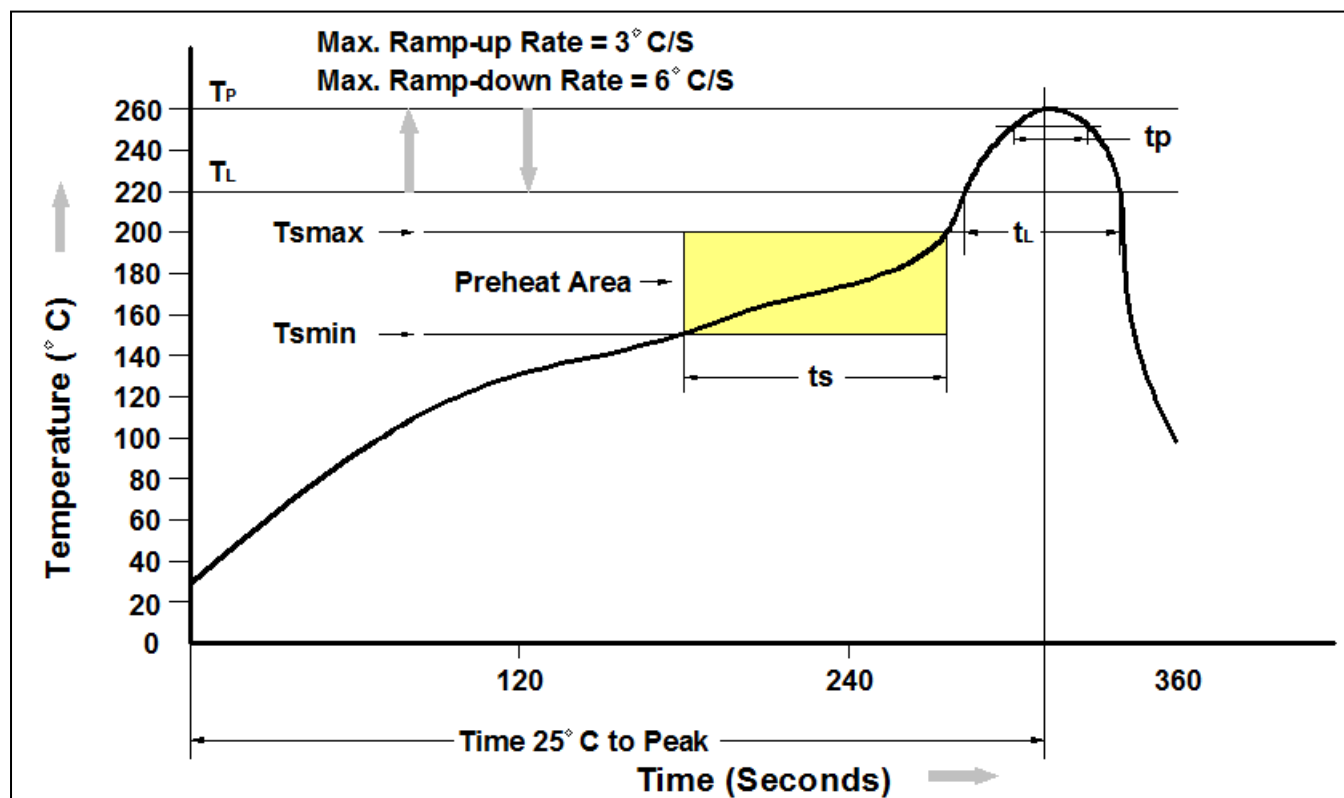
Carrier Reel Specifications *Dimensions in mm unless otherwise stated*





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Reflow Profile



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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