



CNY17-1, CNY17-2, CNY17-3, CNY17-4 CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4 DC Input 6-Pin Phototransistor Optocoupler

Features

- High isolation 5000 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

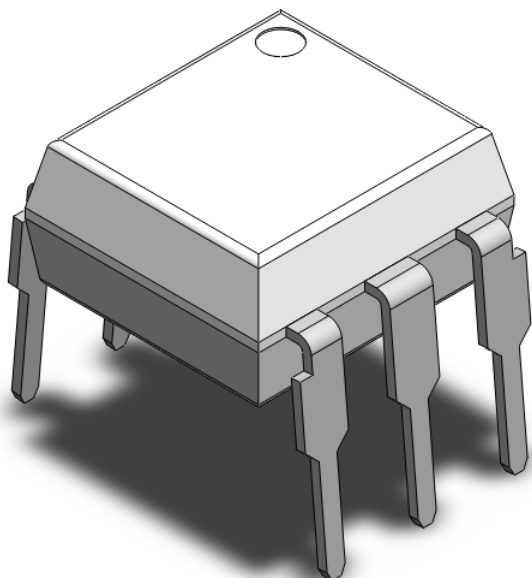
Applications

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

Description

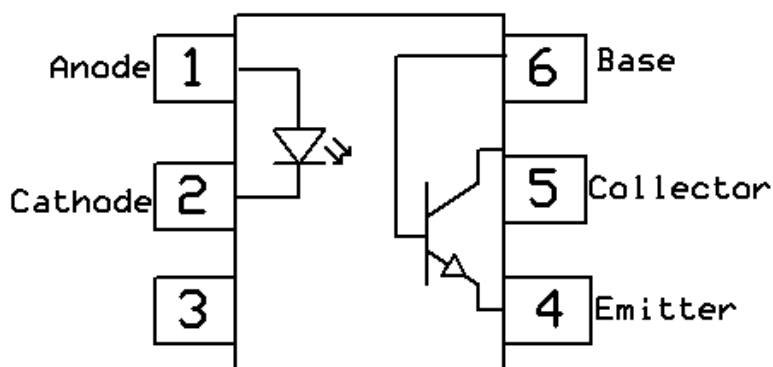
The CNY17 and CNY17F series consists of a photo transistor optically coupled to a gallium arsenide Infrared-emitting diode in a 6-lead DIP package with different lead forming options.

Package Outline



Note: Different lead forming options available. See package dimension.

Schematic



Note: CNY17F without Base Connection



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Absolute Maximum Rating at 25°C

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	5000	V _{RMS}	
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	60	mA	
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	1	A	
V _R	Reverse voltage	6	V	
P _D	Power dissipation	100	mW	
Detector				
P _D	Power dissipation	150	mW	
B _{VCEO}	Collector-Emitter Breakdown Voltage	80	V	
B _{VCBO}	Collector-Base Breakdown Voltage	80	V	
B _{VECO}	Emitter-Collector Breakdown Voltage	7	V	
B _{VEBO}	Emitter-Base Breakdown Voltage	7	V	



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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	$I_F = 10\text{mA}$		1.24	1.4	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	20	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$B_{V_{CEO}}$	Collector-Emitter Breakdown	$I_C = 0.1\text{mA}$	80	-	-	V	
$B_{V_{ECO}}$	Emitter-Collector Breakdown	$I_E = 0.1\text{mA}$	7	-	-	V	
$B_{V_{CBO}}$	Collector-Base Breakdown	$I_C = 0.1\text{mA}$	80	-	-	V	
$B_{V_{EBO}}$	Emitter-Base Breakdown						
I_{CEO}	Collector-Emitter Dark Current	$V_{CE} = 10\text{V}, I_F = 0\text{mA}$	-	-	50	nA	
I_{CBO}	Collector-Base Dark Current	$V_{CB} = 10\text{V}, I_F = 0\text{mA}$	-	-	20	nA	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
CTR	Current Transfer Ratio	$I_F = 10\text{mA}, V_{CE} = 5\text{V}$	40	-	80	%	
			63	-	125		
			100	-	200		
			160	-	320		
		$I_F = 1\text{mA}, V_{CE} = 5\text{V}$	13	-	-		
			22	-	-		
			34	-	-		
			56	-	-		
$V_{CE(SAT)}$	Collector- Emitter Saturation Voltage	$I_F = 10\text{mA}, I_C = 2.5\text{mA}$	-	-	0.3	V	
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	1×10^{11}	-	-	Ω	
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	-	pF	



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Switching Characteristics

<i>Symbol</i>	<i>Parameters</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Units</i>	<i>Notes</i>
T_{ON}	Turn On Time	$I_c = 2mA, V_{CC} = 10V, R_L = 100$	-	4.3	11.5	μs	
t_r	Rise Time		-	9.8	9.8		
T_{OFF}	Turn Off Time		-	3.9	11.5	μs	
t_f	Fall Time		-	6.9	9.8		



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Typical Characteristic Curves

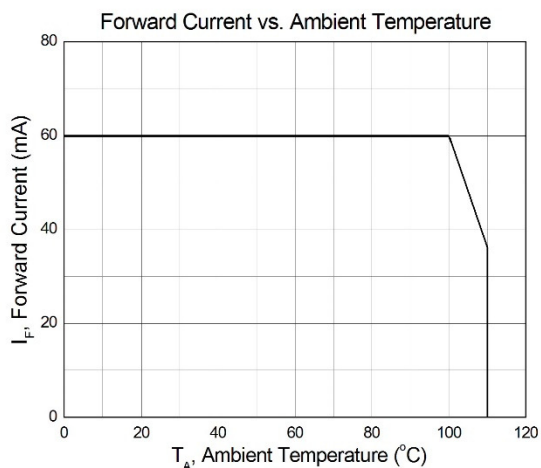


Figure 1

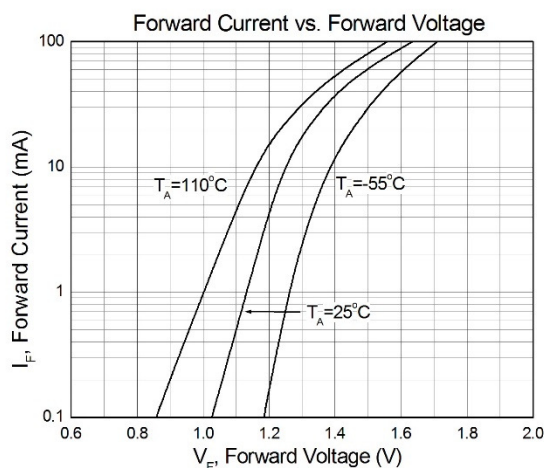


Figure 2

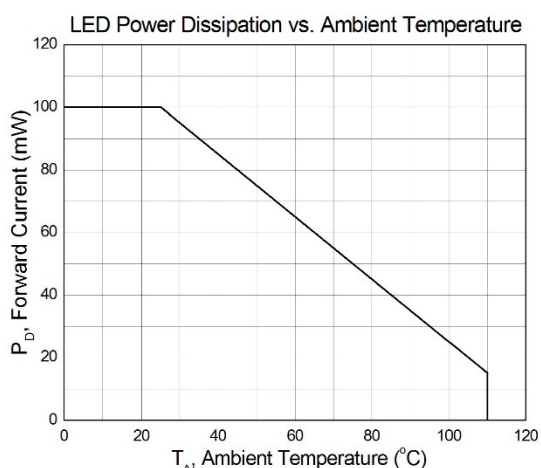


Figure 3

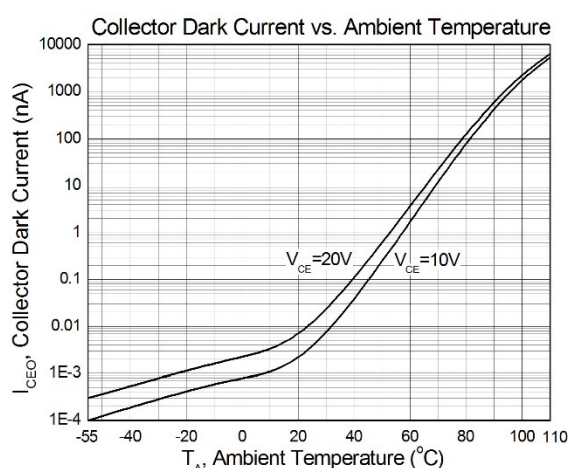


Figure 4

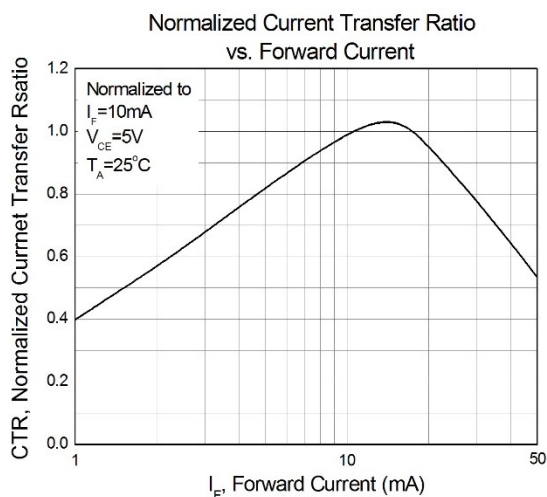


Figure 5

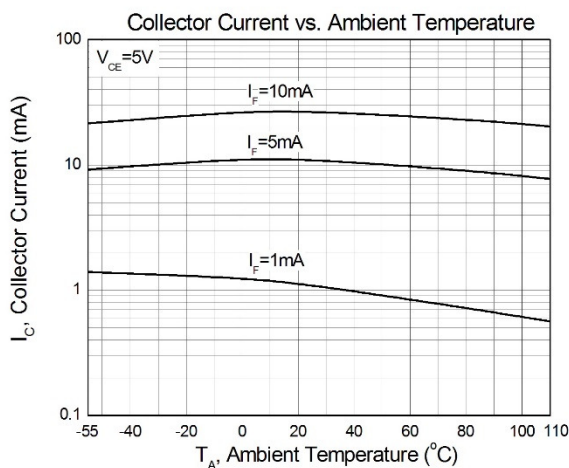


Figure 6



CNY17-1, CNY17-2, CNY17-3, CNY17-4 CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4 DC Input 6-Pin Phototransistor Optocoupler

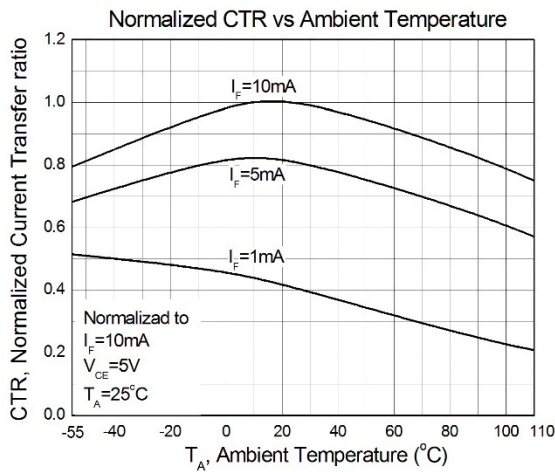


Figure 7

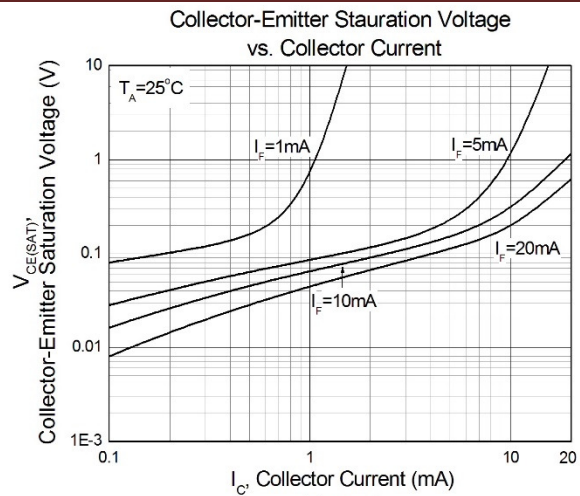


Figure 8

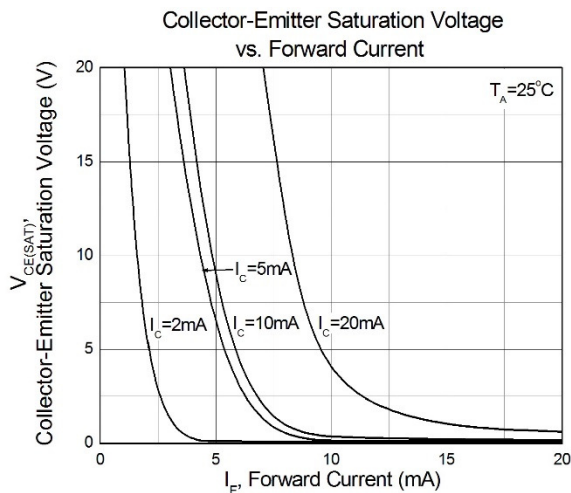


Figure 9

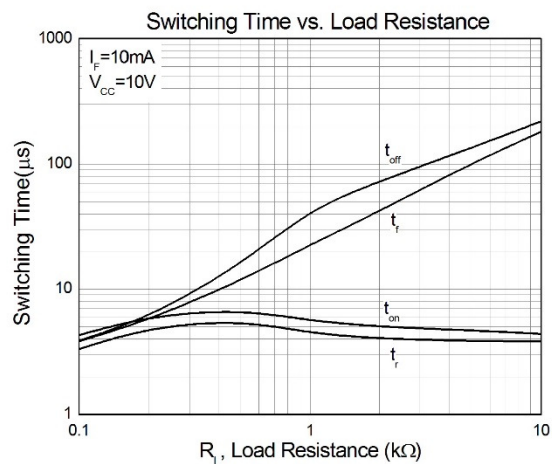


Figure 10

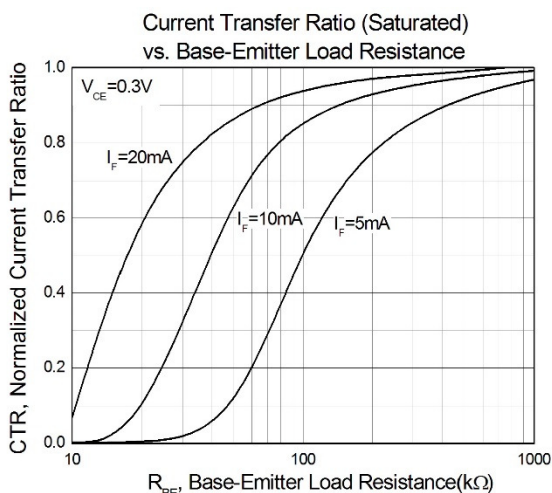


Figure 11 (For CNY17 Series Only)

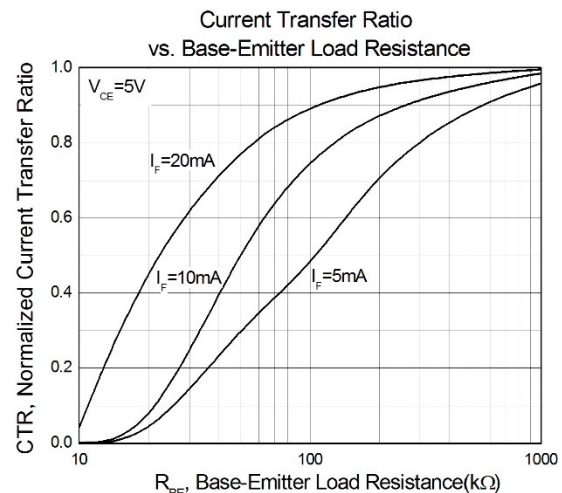


Figure 12 (For CNY17 Series Only)



CNY17-1, CNY17-2, CNY17-3, CNY17-4 CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4 DC Input 6-Pin Phototransistor Optocoupler

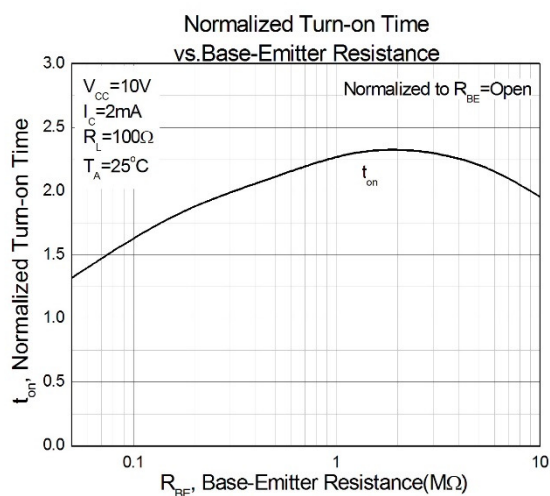


Figure 13(For CNY17 Series Only)

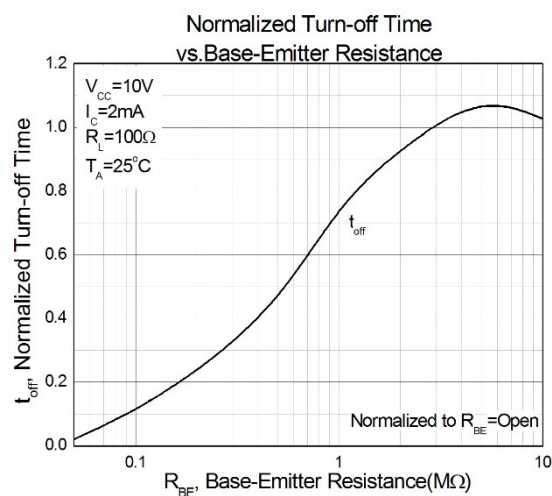
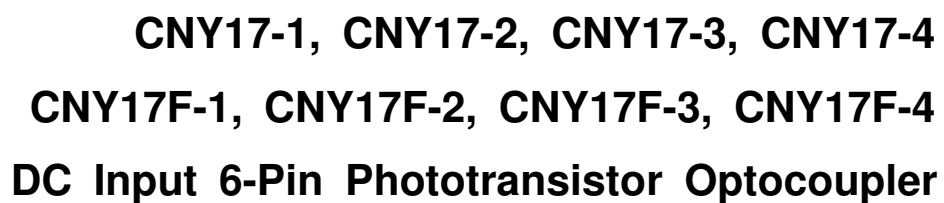
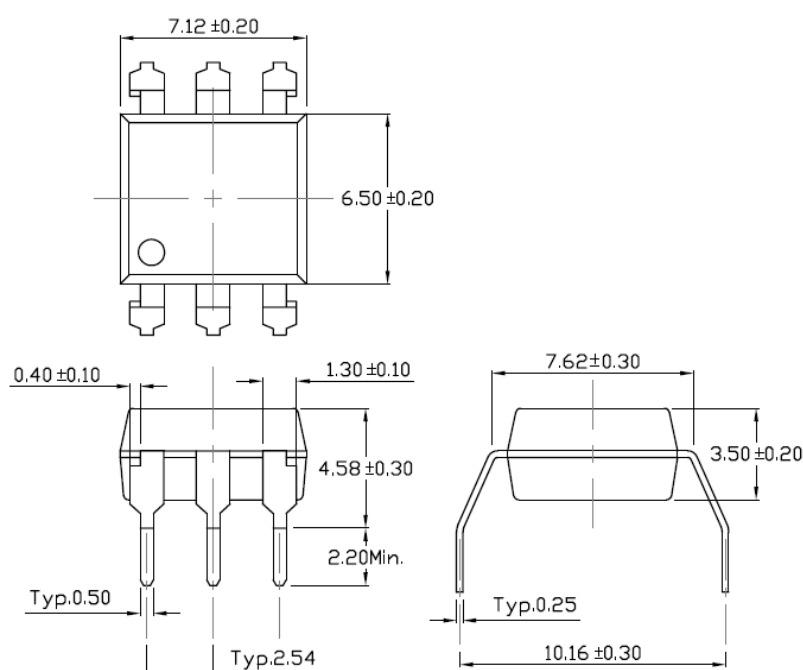


Figure 14(For CNY17 Series Only)



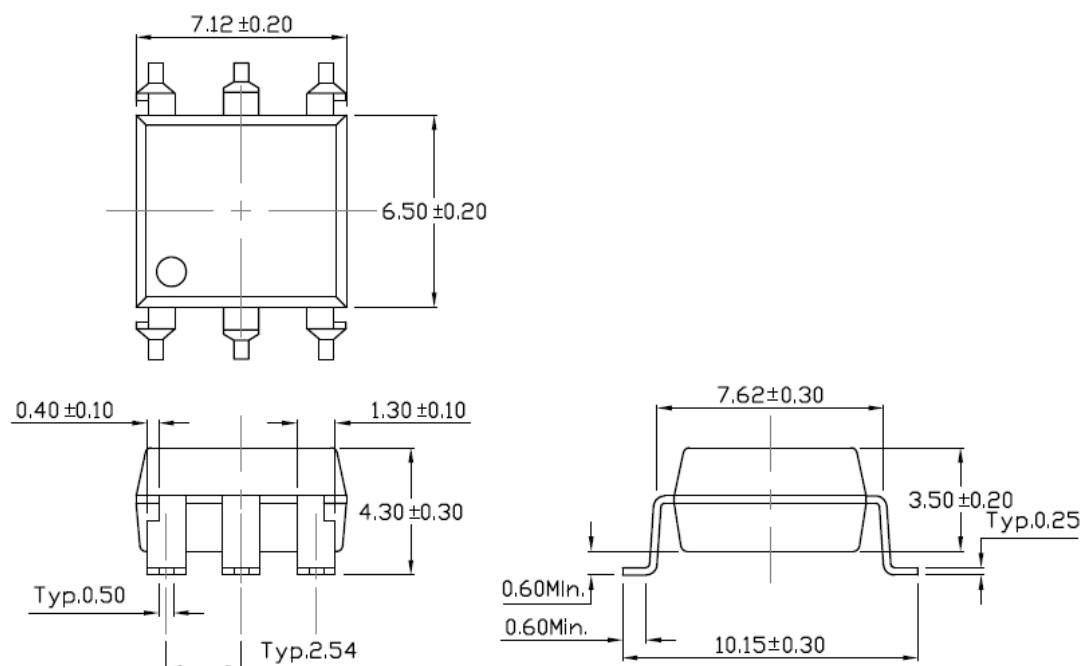
Standard DIP – Through Hole



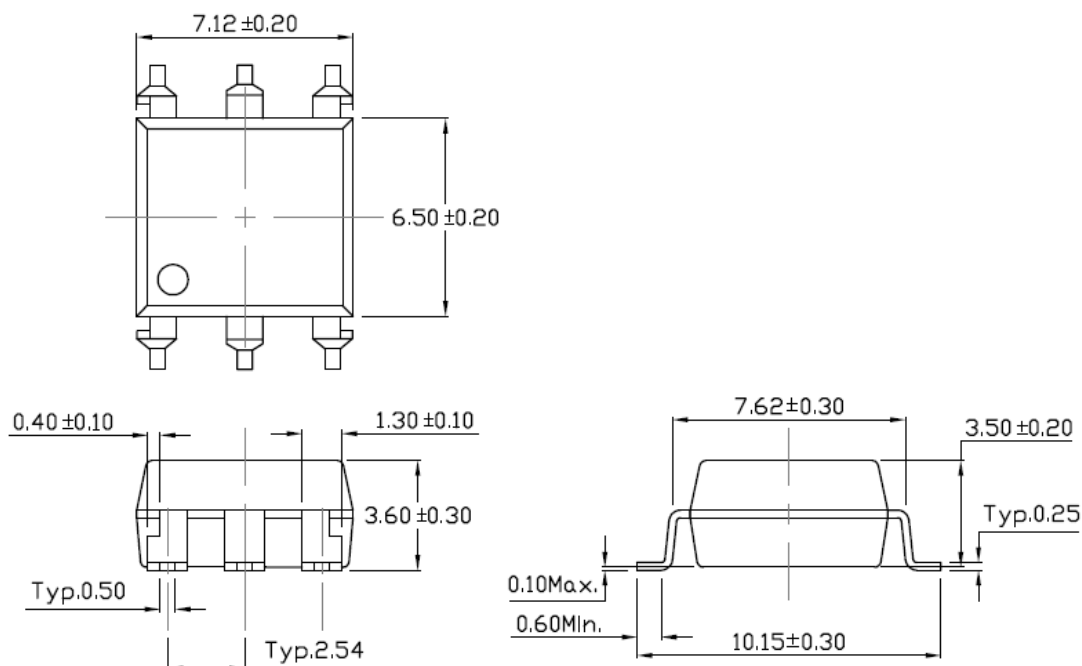


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Surface Mount Forming (S Type)



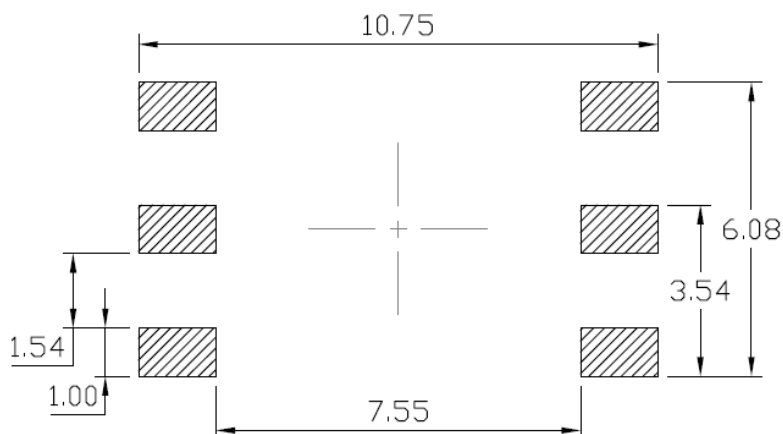
Surface Mount Forming (Low Profile) (SL Type)



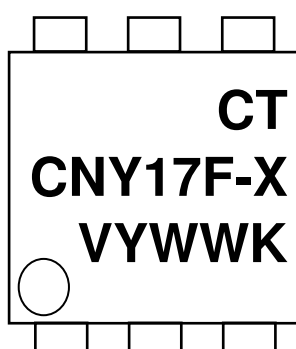
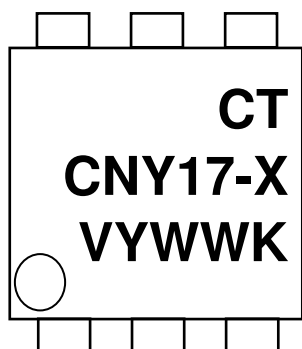


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Recommended Solder Mask Dimensions in mm unless otherwise stated



Marking Information



Note:

CT : Denotes "CT Micro"
CNY17-X : Part Number
X : CTR Rank
V : VDE Option
Y : Fiscal Year
WW : Work Week
K : Manufacturing Code



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Ordering Information

CNY17-X(V)(Y)(Z)-G, CNY17F-X(V)(Y)(Z)-G

X = Part No. (1,2,3,4)

Y = Lead form option (S, SL, M or none)

Z = Tape and reel option (T1, T2 or none)

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

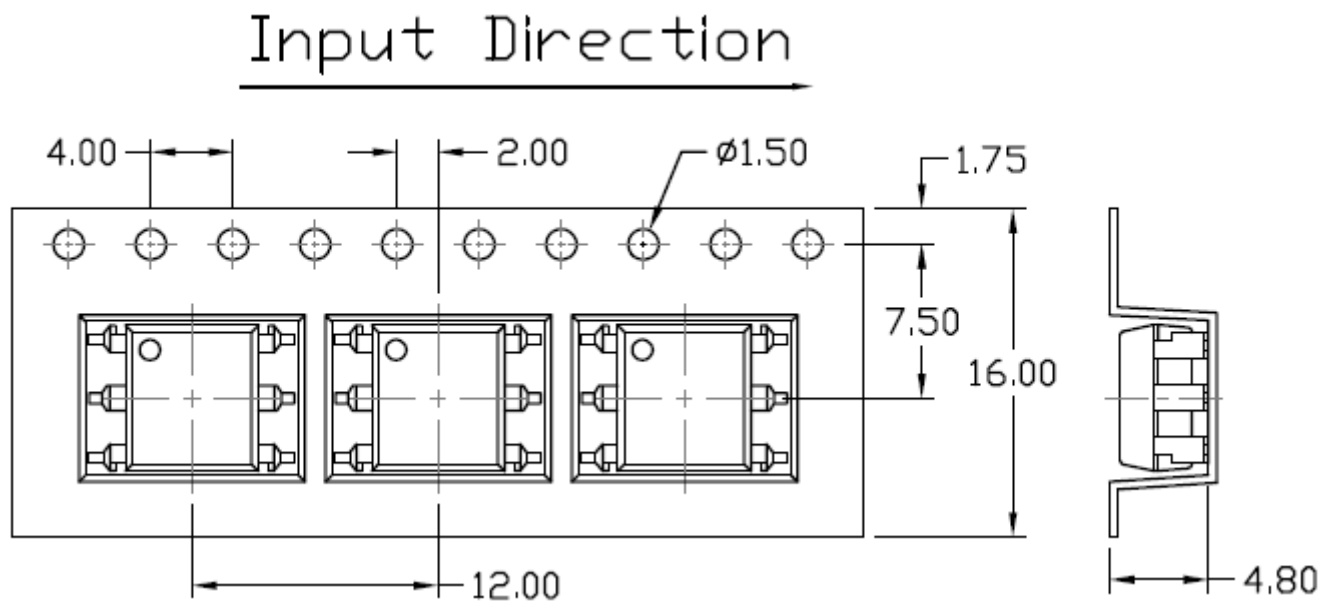
Option	Description	Quantity
None	Standard 6 Pin Dip	50Units/Tube
M	Gullwing (400mil) Lead Forming	50Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1000 Units/Reel



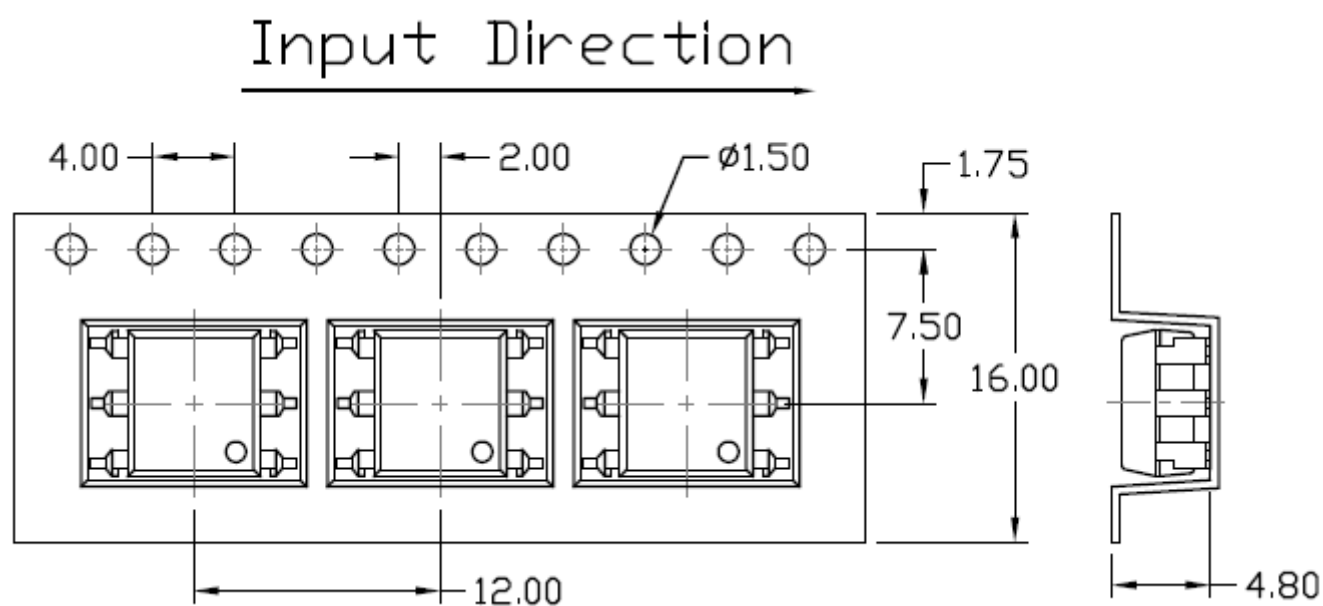
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option S(T1) & SL(T1)



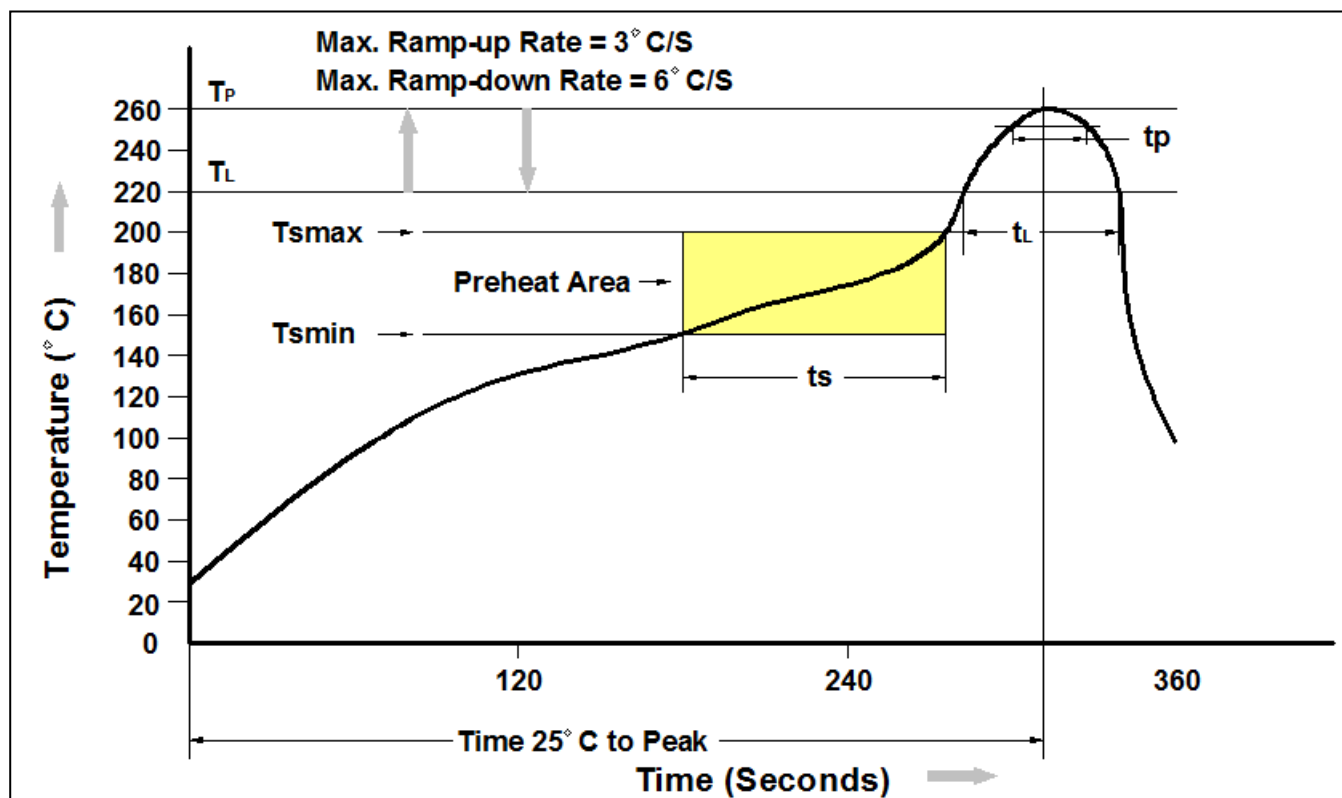
Option S(T2) & SL(T2)





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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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