



# 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

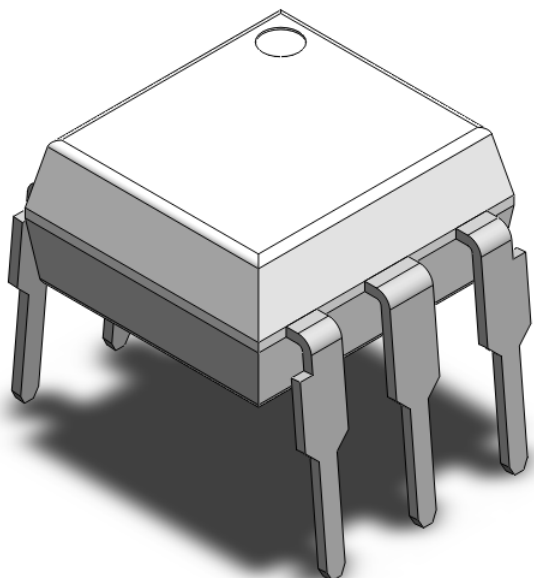
## Applications

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

## Description

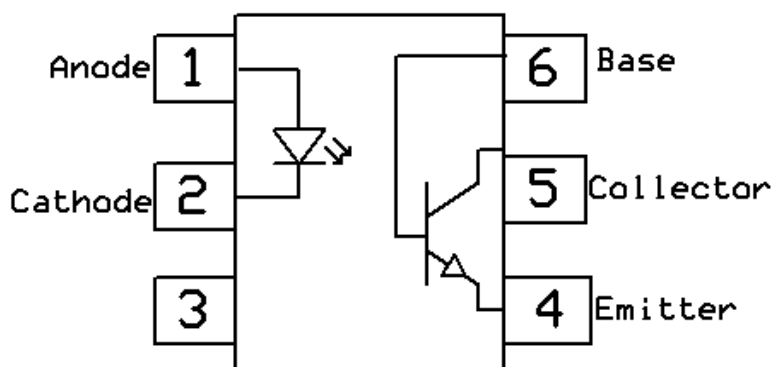
The CNY17 and CNY17F series consists of a photo transistor optically coupled to a gallium arsenide Infrared-emitting diode in a 6-lead DIP package with different lead forming options.

## Package Outline



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

## Schematic



Note: CNY17F without Base Connection



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

## Absolute Maximum Rating at 25°C

<b>Symbol</b>	<b>Parameters</b>	<b>Ratings</b>	<b>Units</b>	<b>Notes</b>
V <sub>ISO</sub>	Isolation voltage	5000	V <sub>RMS</sub>	
T <sub>OPR</sub>	Operating temperature	-55 ~ +110	°C	
T <sub>STG</sub>	Storage temperature	-55 ~ +150	°C	
T <sub>SOL</sub>	Soldering temperature	260	°C	
<b>Emitter</b>				
I <sub>F</sub>	Forward current	60	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	100	mW	
<b>Detector</b>				
P <sub>D</sub>	Power dissipation	150	mW	
B <sub>VCEO</sub>	Collector-Emitter Breakdown Voltage	80	V	
B <sub>VCBO</sub>	Collector-Base Breakdown Voltage	80	V	
B <sub>VECO</sub>	Emitter-Collector Breakdown Voltage	7	V	
B <sub>VEBO</sub>	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	$\mu\text{A}$	
$C_{IN}$	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	$I_F = 10\text{mA}, V_{CE} = 5\text{V}$	CNY17-1, CNY17F-1	40	-	80	%	
			CNY17-2, CNY17F-2	63	-	125		
			CNY17-3, CNY17F-3	100	-	200		
			CNY17-4, CNY17F-4	160	-	320		
	Ratio	$I_F = 1\text{mA}, V_{CE} = 5\text{V}$	CNY17-1, CNY17F-1	13	-	-		
			CNY17-2, CNY17F-2	22	-	-		
			CNY17-3, CNY17F-3	34	-	-		
			CNY17-4, CNY17F-4	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	$V_{IO} = 500\text{V}_{DC}$	$1 \times 10^{11}$	-	-	$\Omega$		
$C_{IO}$	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	-	pF		



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

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## Switching Characteristics

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



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## Typical Characteristic Curves

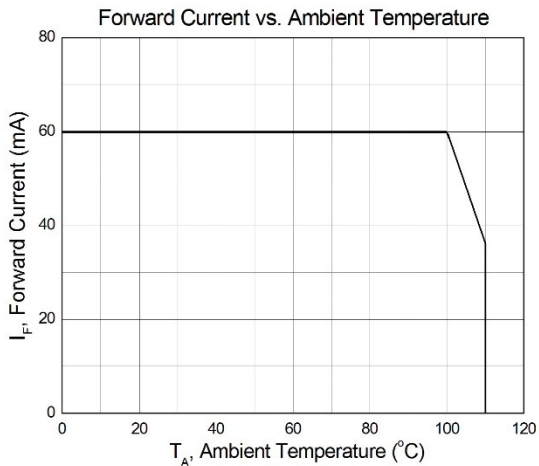


Figure 1

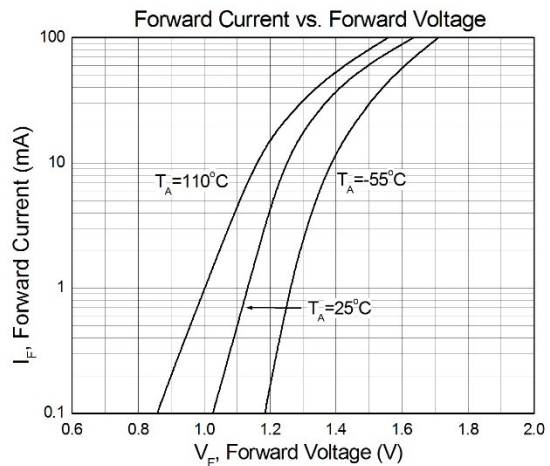


Figure 2

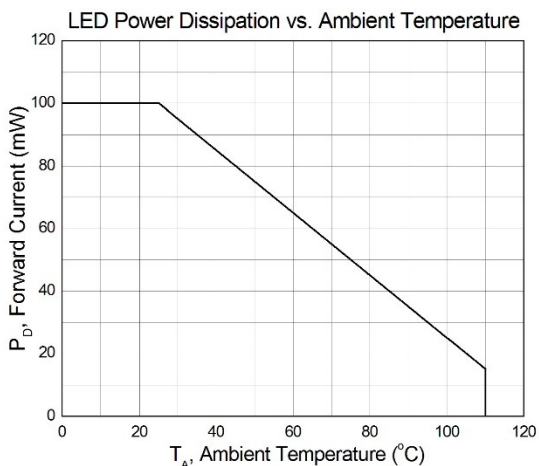


Figure 3

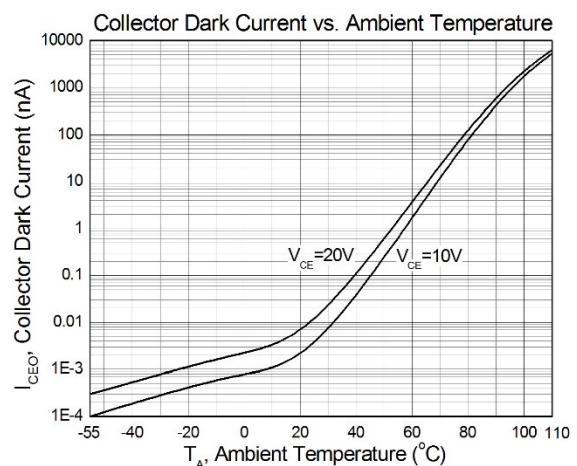


Figure 4

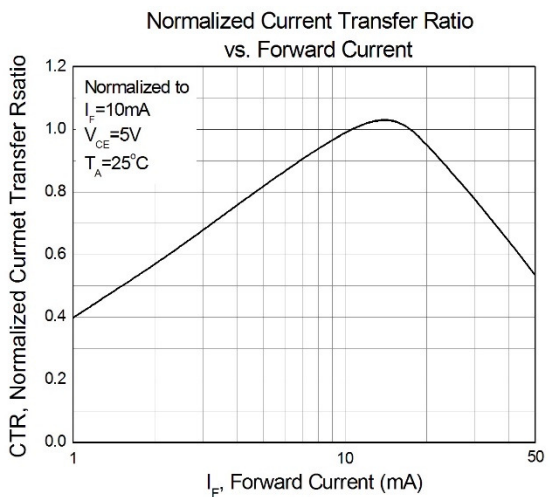


Figure 5

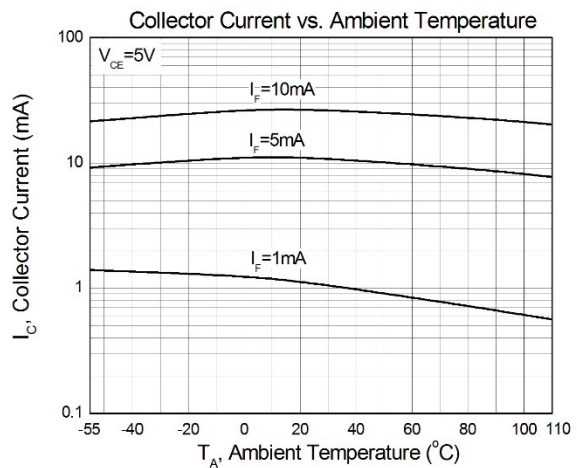


Figure 6



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

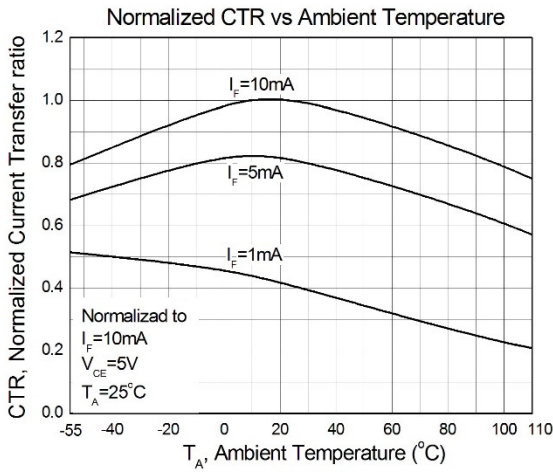


Figure 7

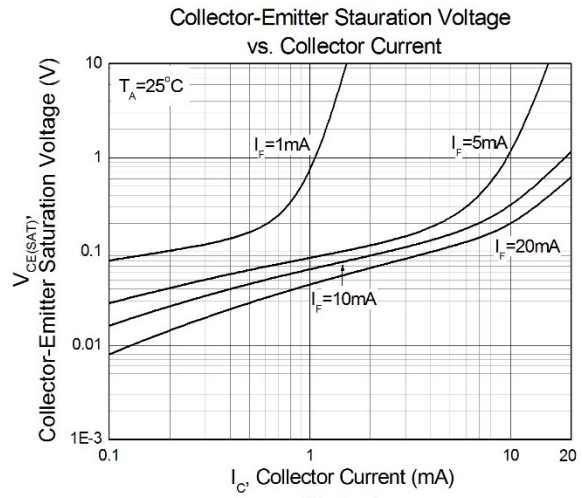


Figure 8

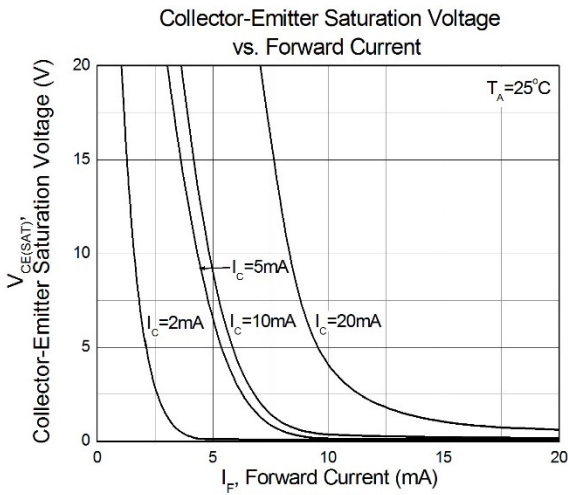


Figure 9

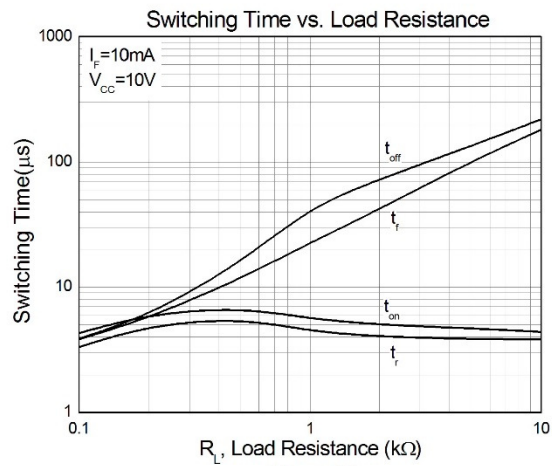


Figure 10

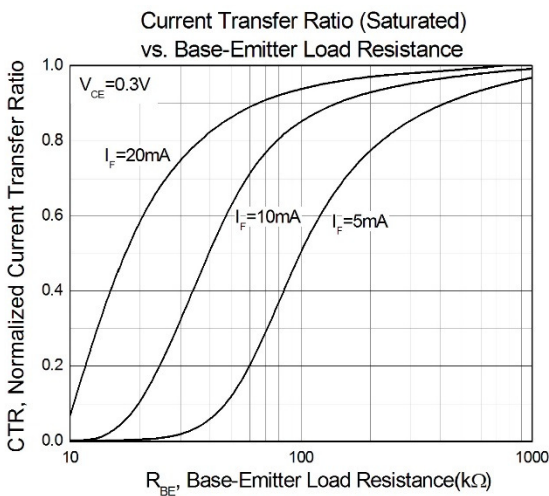


Figure 11 (For CNY17 Series Only)

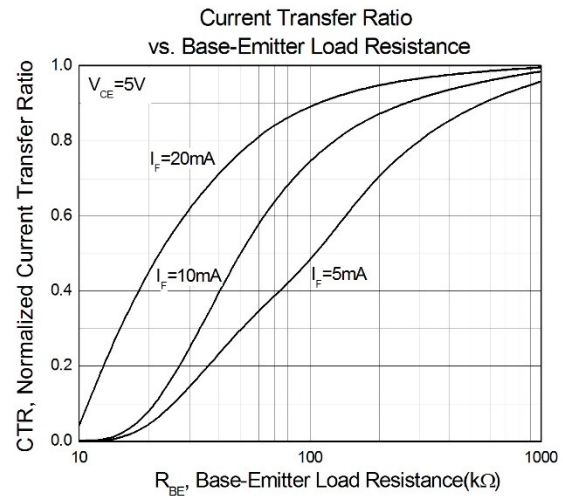


Figure 12 (For CNY17 Series Only)



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

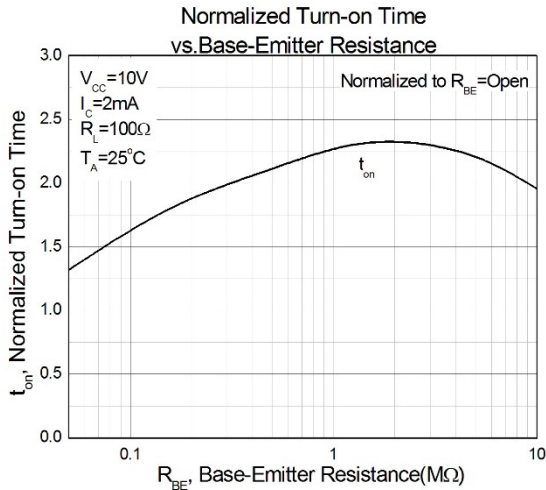


Figure 13(For CNY17 Series Only)

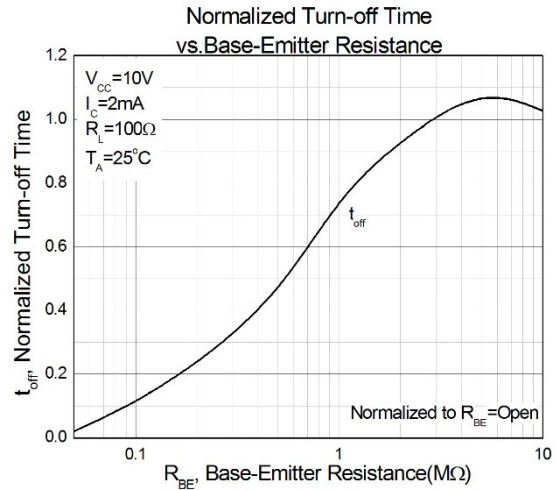


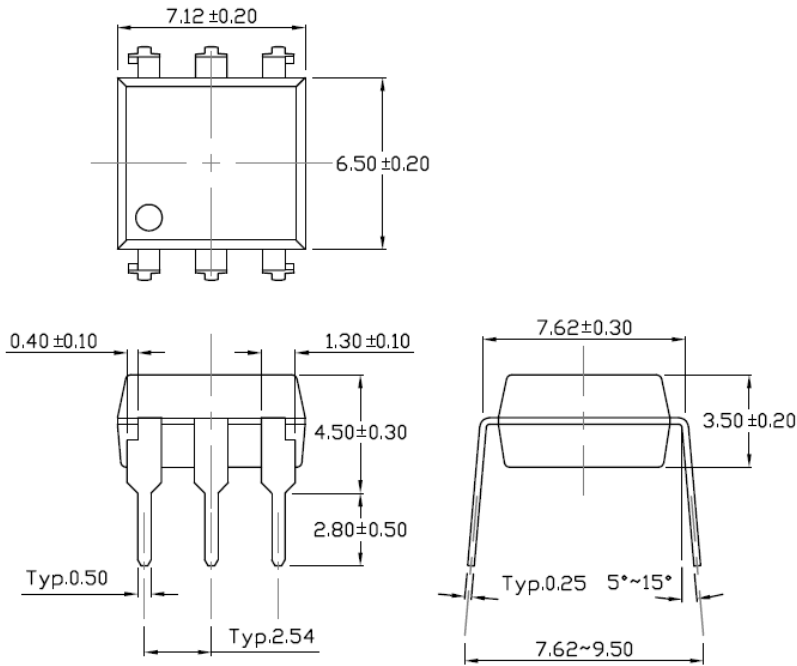
Figure 14(For CNY17 Series Only)



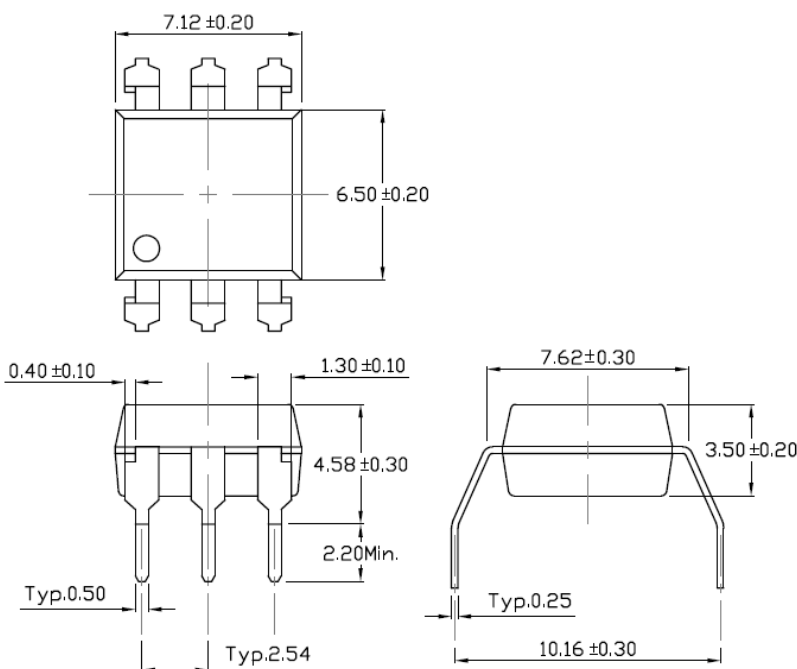
# CNY17-1, CNY17-2, CNY17-3, CNY17-4 CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4 DC Input 6-Pin Phototransistor Optocoupler

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

### Standard DIP – Through Hole



### Wide Lead Forming – Through Hole (M Type)

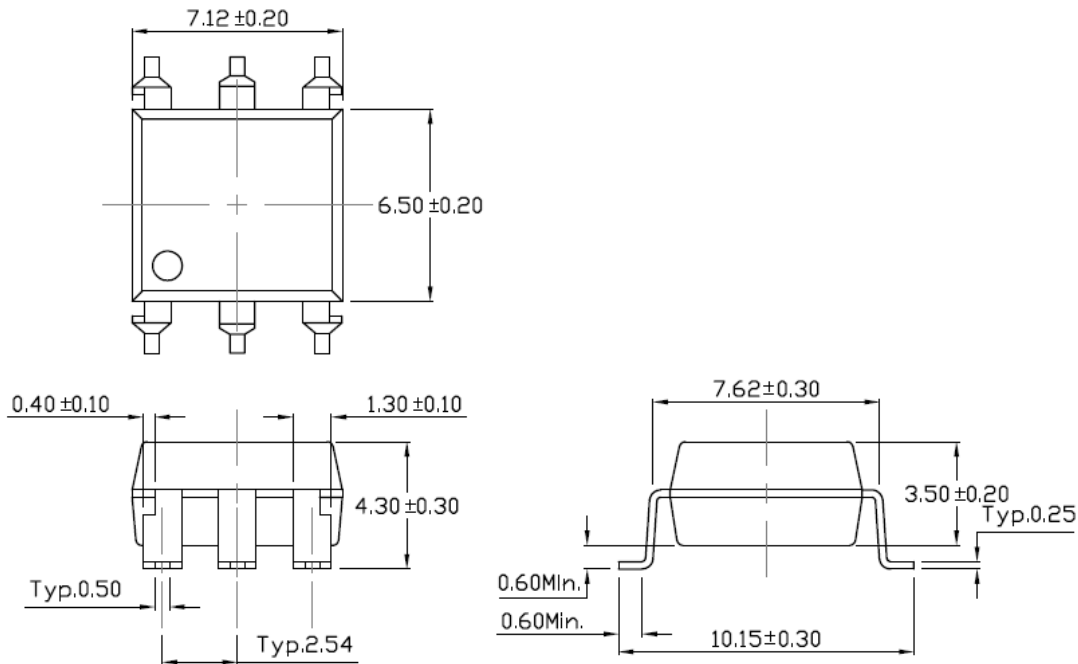




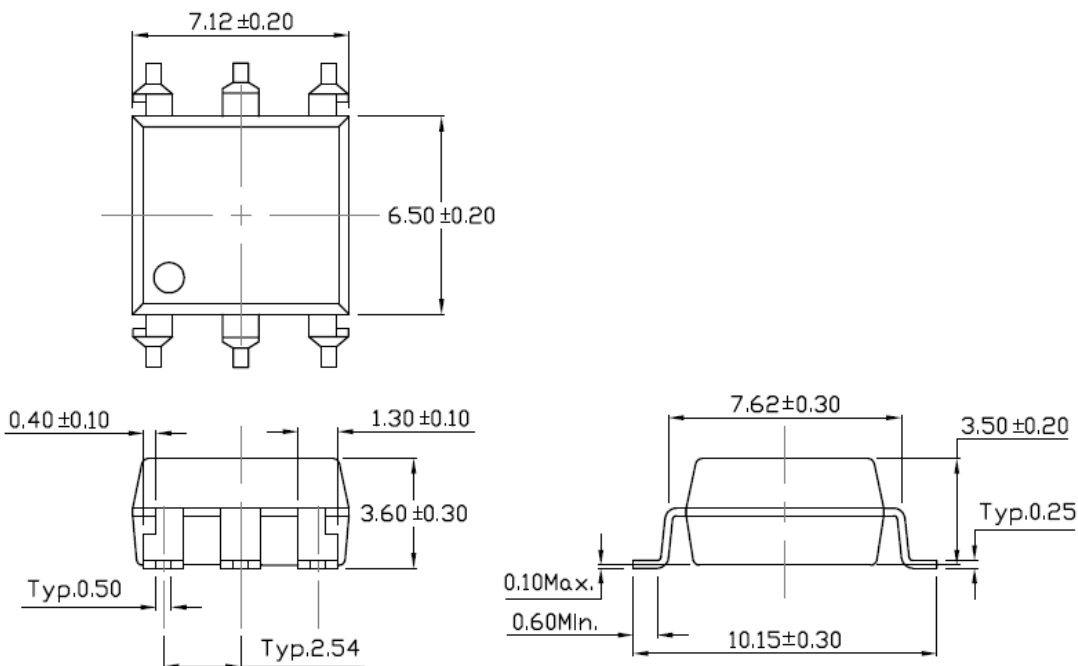


# CNY17-1, CNY17-2, CNY17-3, CNY17-4 CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4 DC Input 6-Pin Phototransistor Optocoupler

## Surface Mount Forming (S Type)



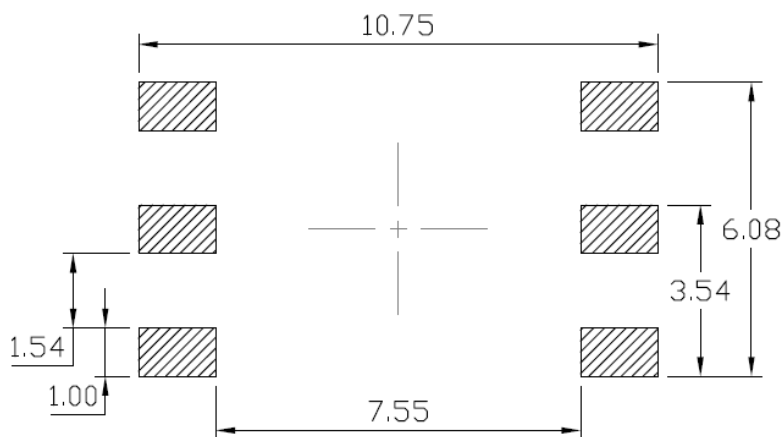
## Surface Mount Forming (Low Profile) (SL Type)



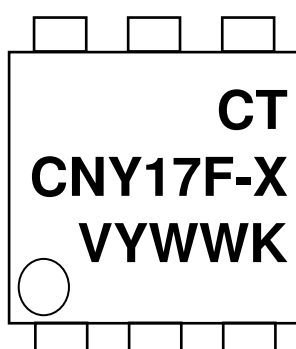
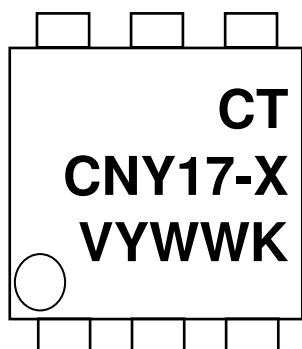


# CNY17-1, CNY17-2, CNY17-3, CNY17-4 CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4 DC Input 6-Pin Phototransistor Optocoupler

## 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



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

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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)

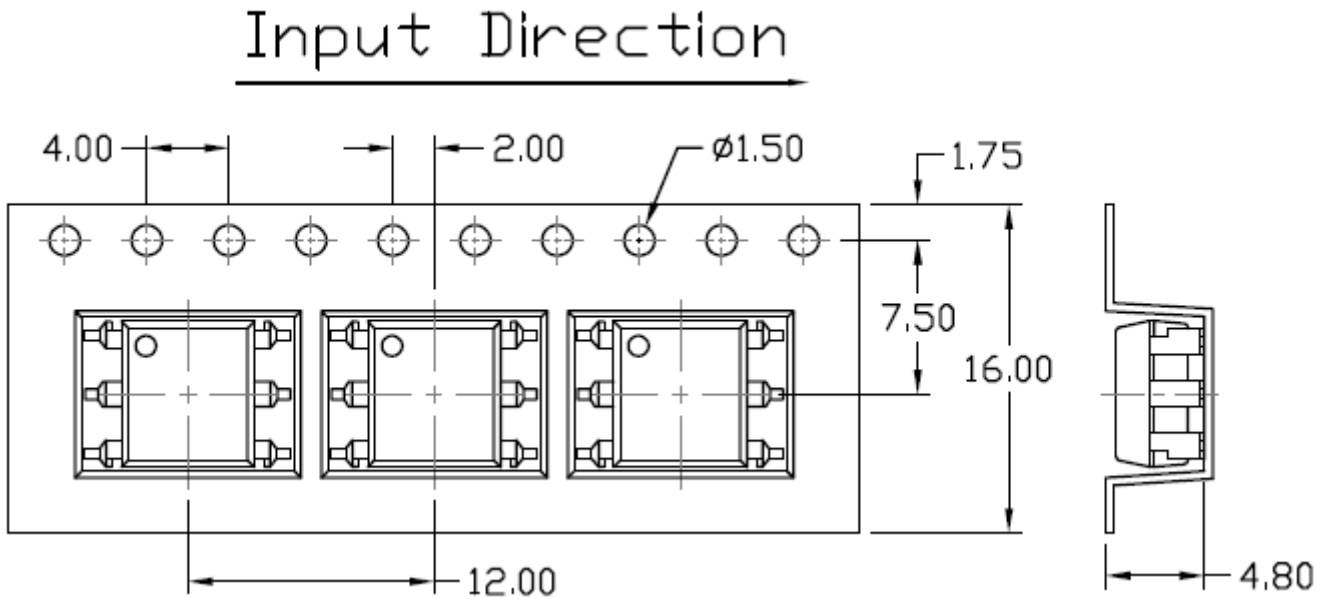
<b>Option</b>	<b>Description</b>	<b>Quantity</b>
None	Standard 6 Pin Dip	50Units/Tube
M	Gullwing (400mil) Lead Forming	50Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low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



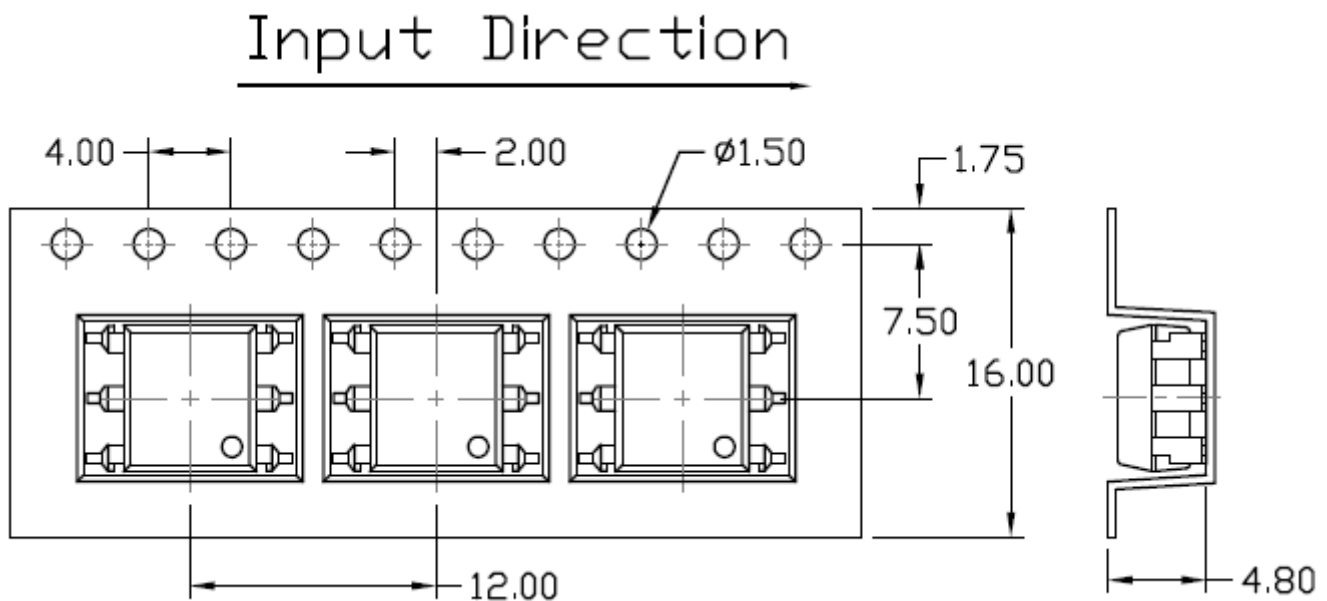
# CNY17-1, CNY17-2, CNY17-3, CNY17-4 CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4 DC Input 6-Pin Phototransistor Optocoupler

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

### Option S(T1) & SL(T1)



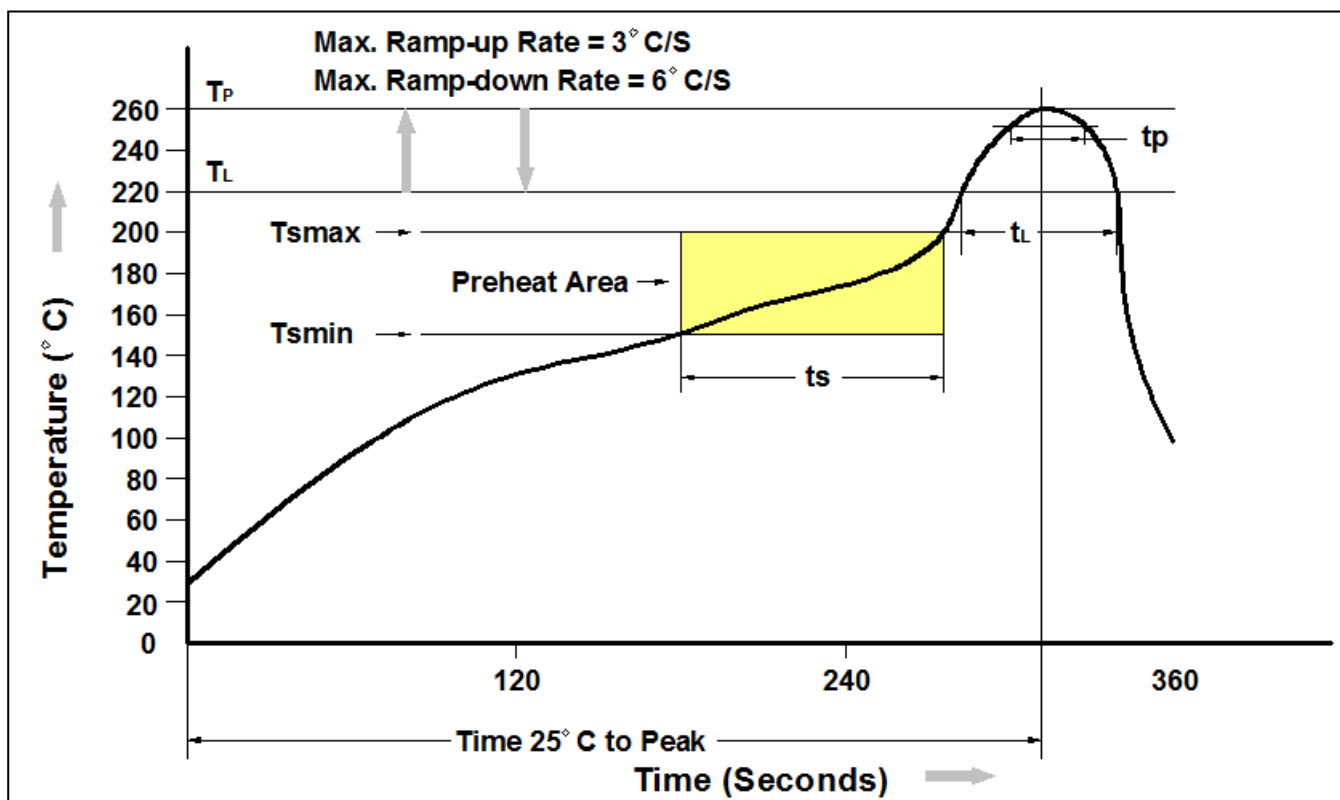
### Option S(T2) & SL(T2)





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

## 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 <sub>L</sub> to t <sub>P</sub> )	3 °C/second max.
Liquidous Temperature (T <sub>L</sub> )	217 °C
Time (t <sub>L</sub> ) Maintained Above (T <sub>L</sub> )	60 – 150 seconds
Peak Body Package Temperature	260 °C +0 °C / -5 °C
Time (t <sub>P</sub> ) within 5 °C of 260 °C	30 seconds
Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )	6 °C/second max
Time 25 °C to Peak Temperature	8 minutes max.



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

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