

Description

The CNY17-X, CNY17F-X series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic DIP6 package with different lead forming options.

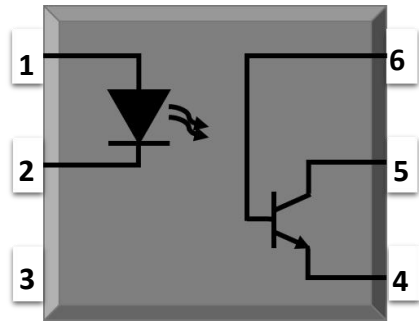
Features

- High isolation 5000 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating temperature range - 55 °C to 110 °C
- REACH compliance
- Halogen free
- MSL class 1
- Regulatory Approvals
 - UL - UL1577
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - cUL – CSA Component Acceptance Service Notice No. 5A

Applications

- Switch mode power supplies
- Programmable controllers
- Household appliances
- Office equipment

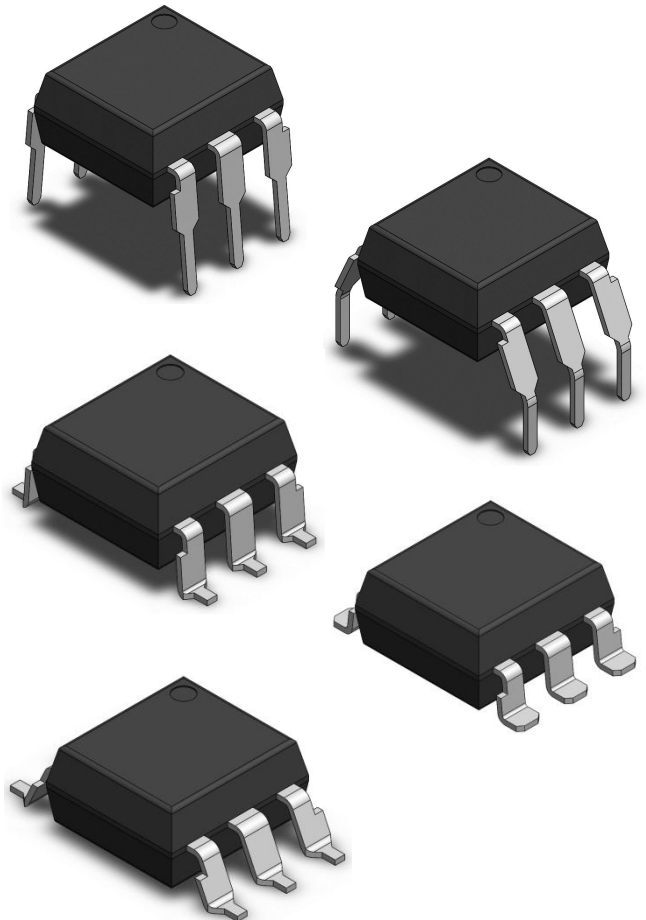
SCHEMATIC



PIN DEFINITION

1.Anode	6.Base(CNY17)
2.Cathode	or NC(CNY17-F)
3.NC	5.Collector
	4.Emitter

PACKAGE OUTLINE





CNY17-X, CNY17F-X Series

DIP6, DC Input, Photo Transistor Coupler

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT	NOTE
INPUT				
Forward Current	I_F	60	mA	
Peak Forward Current	I_{FP}	1	A	1
Reverse Voltage	V_R	6	V	
Input Power Dissipation	P_I	100	mW	
OUTPUT				
Collector - Emitter Voltage	V_{CEO}	80	V	
Emitter - Collector Voltage	V_{ECO}	7	V	
Collector Current	I_C	50	mA	
Output Power Dissipation	P_O	150	mW	
COMMON				
Total Power Dissipation	P_{tot}	250	mW	
Isolation Voltage	V_{iso}	5000	Vrms	2
Operating Temperature	T_{opr}	-55~110	°C	
Storage Temperature	T_{stg}	-55~150	°C	
Soldering Temperature	T_{sol}	260	°C	

Note 1. 100µs pulse, 100Hz frequency

Note 2. AC For 1 Minute, R.H. = 40 ~ 60%



CNY17-X, CNY17F-X Series

DIP6, DC Input, Photo Transistor Coupler

ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C								
PARAMETER	SYMBOL	MIN	TYP.	MAX.	UNIT	TEST CONDITION	NOTE	
INPUT								
Forward Voltage	V_F	-	1.24	1.4	V	$I_F=10mA$		
Reverse Current	I_R	-	-	10	μA	$V_R=6V$		
Input Capacitance	C_{in}	-	10	-	pF	$V=0, f=1kHz$		
OUTPUT								
Collector Dark Current	I_{CEO}	-	-	100	nA	$V_{CE}=20V, I_F=0$		
Collector-Emitter Breakdown Voltage	BV_{CEO}	80	-	-	V	$I_C=0.1mA, I_F=0$		
Emitter-Collector Breakdown Voltage	BV_{ECO}	7	-	-	V	$I_E=0.1mA, I_F=0$		
TRANSFER CHARACTERISTICS								
Current Transfer Ratio	CNY17-1 CNY17F-1	CTR	40	-	80	%	$I_F=10mA, V_{CE}=5V$	
	CNY17-2 CNY17F-2		63	-	125			
	CNY17-3 CNY17F-3		100	-	200			
	CNY17-4 CNY17F-4		160	-	320			
Current Transfer Ratio	CNY17-1 CNY17F-1	CTR	13	-	-	%	$I_F=1mA, V_{CE}=5V$	
	CNY17-2 CNY17F-2		22	-	-			
	CNY17-3 CNY17F-3		34	-	-			
	CNY17-4 CNY17F-4		56	-	-			
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	-	0.3	V	$I_F=10mA, I_C=2.5mA$		
Isolation Resistance	R_{ISO}	10^{12}	10^{14}	-	Ω	DC500V, 40 ~ 60% R.H.		
Floating Capacitance	C_{IO}	-	0.5	1	pF	$V=0, f=1MHz$		



CNY17-X, CNY17F-X Series

DIP6, DC Input, Photo Transistor Coupler

ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

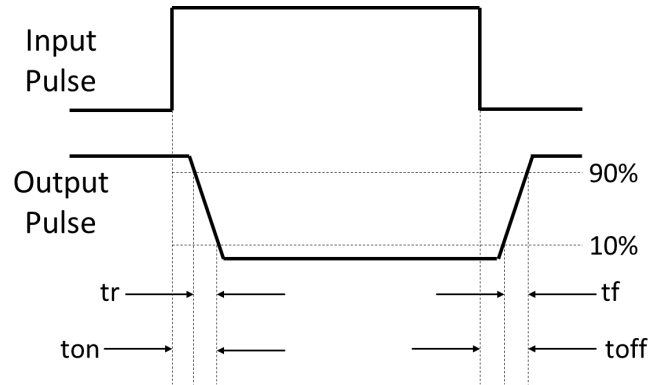
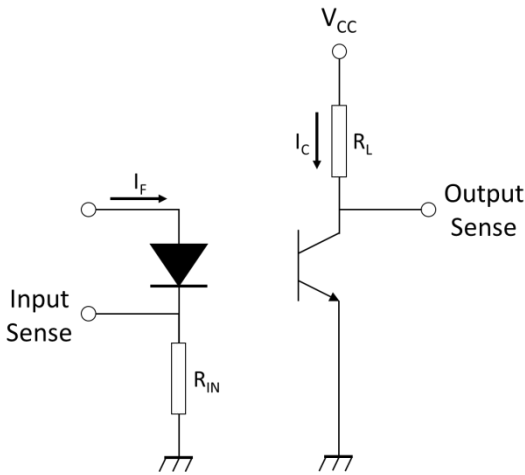
TRANSFER CHARACTERISTICS

Turn-on Time	ton	-	10	12	μs	VCC=10V, IC=2mA RL=100Ω	
Turn-off Time	toff	-	9	12			
Response Time (Rise)	tr	-	6	10			
Response Time (Fall)	tf	-	8	10			
Response Time (Rise)	tr	-	2	10		VCC=5V, IF=10mA RL=75Ω	
Response Time (Fall)	tf	-	3	10			

TEST CIRCUITS

Test Circuits of Response Time

Curves of Response Time





CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Ambient Temperature

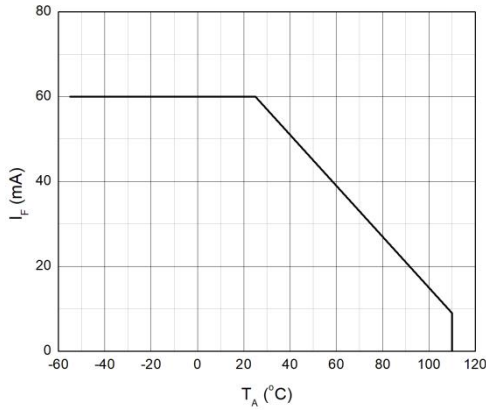


Fig.2 Collector Power Dissipation vs. Ambient Temperature

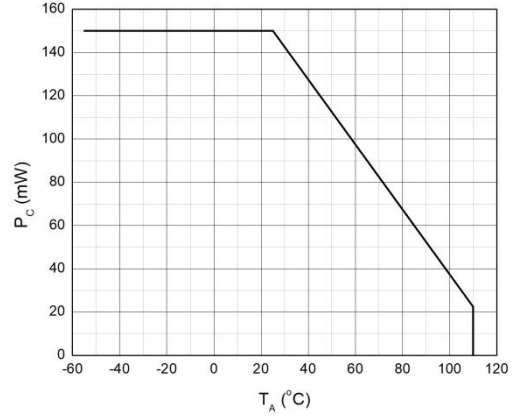


Fig.3 Forward Current vs. Forward Voltage

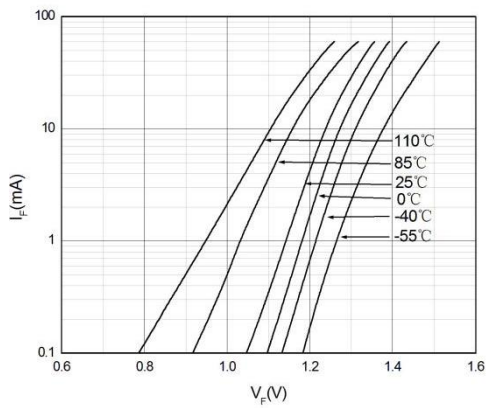


Fig.4 Collector Dark Current vs. Ambient Temperature

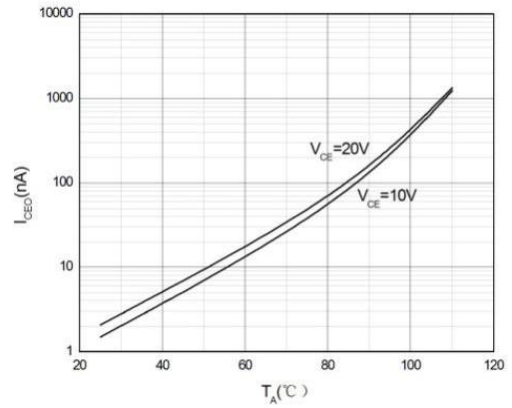


Fig.5 Collector Current vs. Collector-emitter Voltage

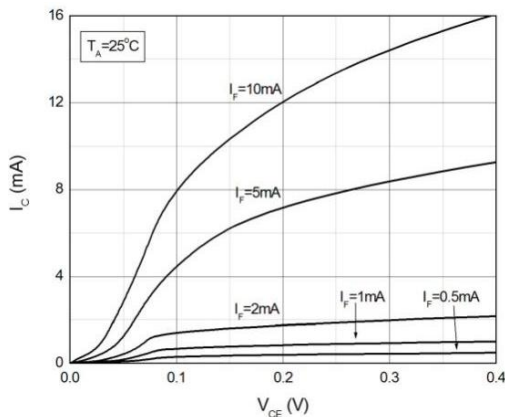
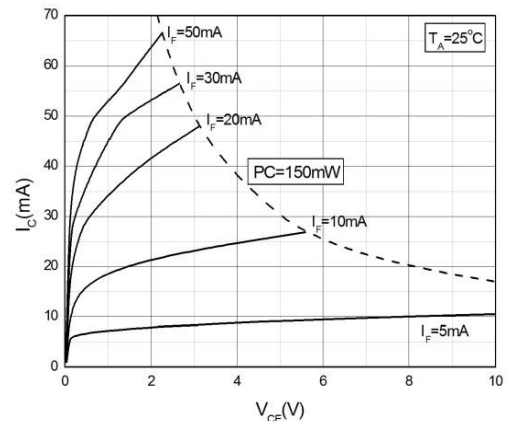


Fig.6 Collector Current vs. Collector-emitter Voltage





CHARACTERISTIC CURVES

Fig.7 Normalized Current Transfer Ratio vs. Forward Current

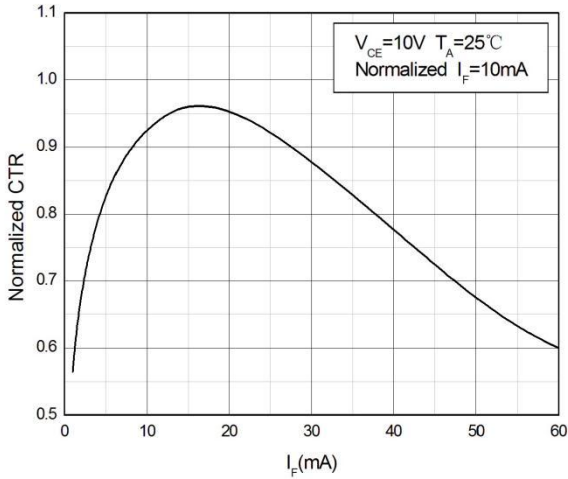


Fig.8 Normalized Current Transfer Ratio vs. Ambient Temperature

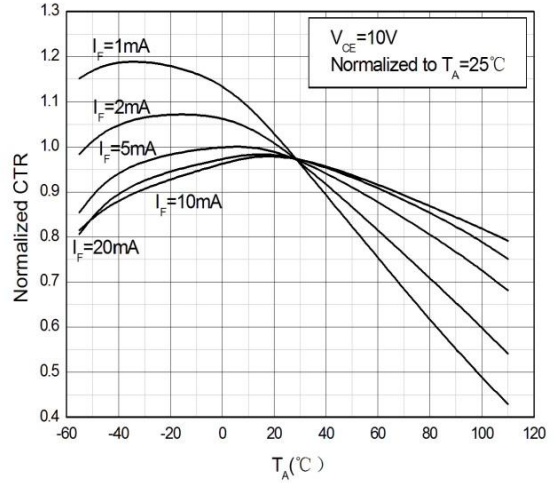


Fig.9 Current Transfer Ratio(Unsaturated) vs Base-Emitter Resistance

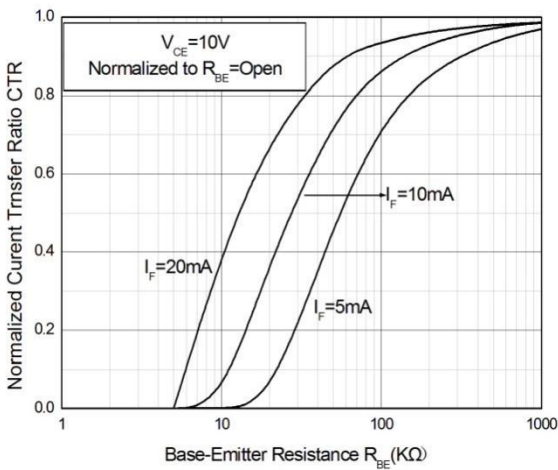
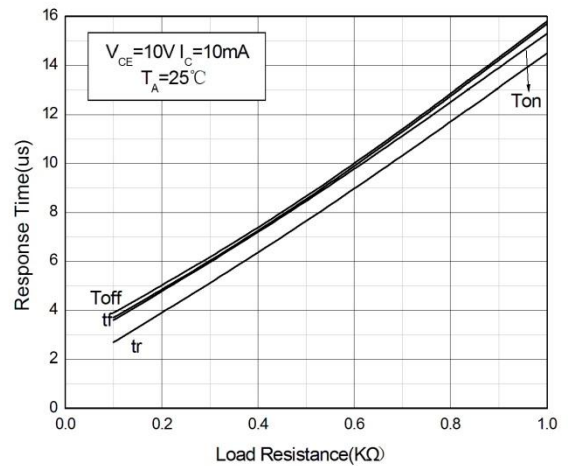


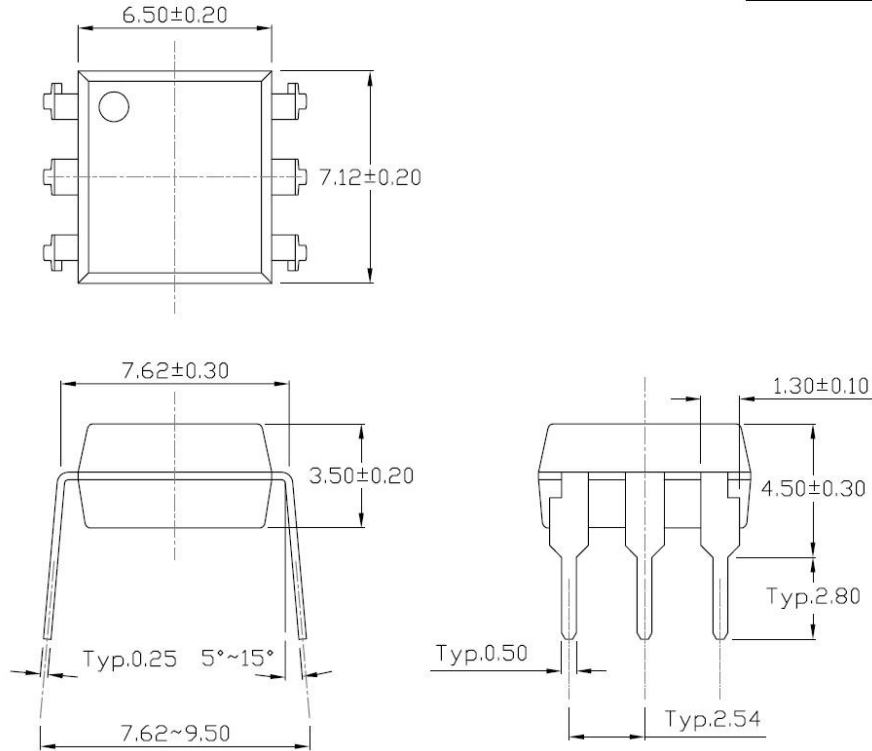
Fig.10 Switching Time vs. Load Resistance



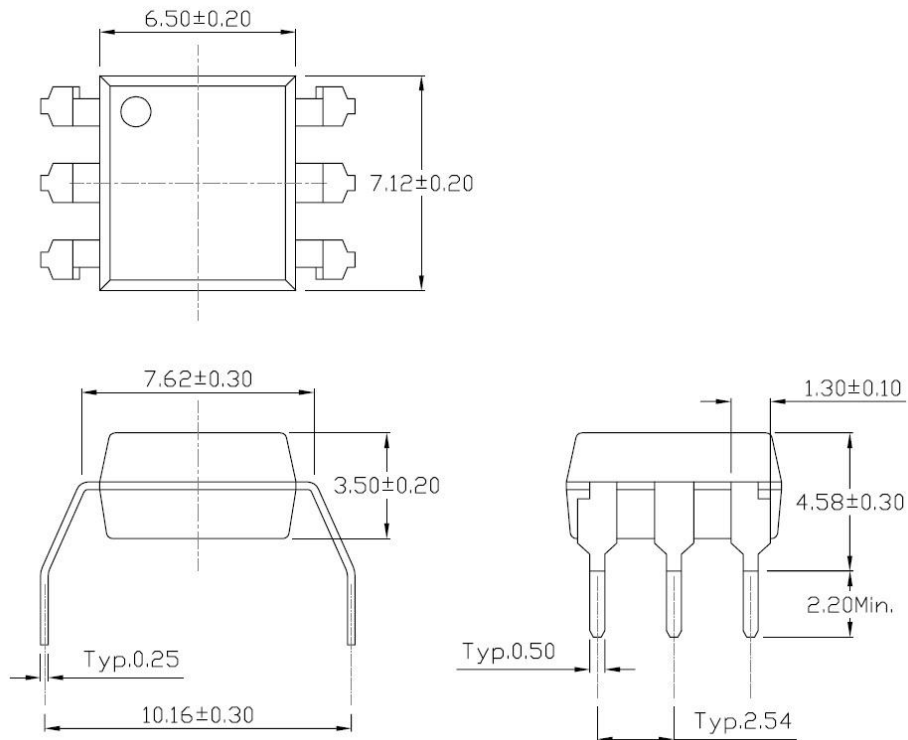


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Standard DIP – Through Hole (DIP Type)

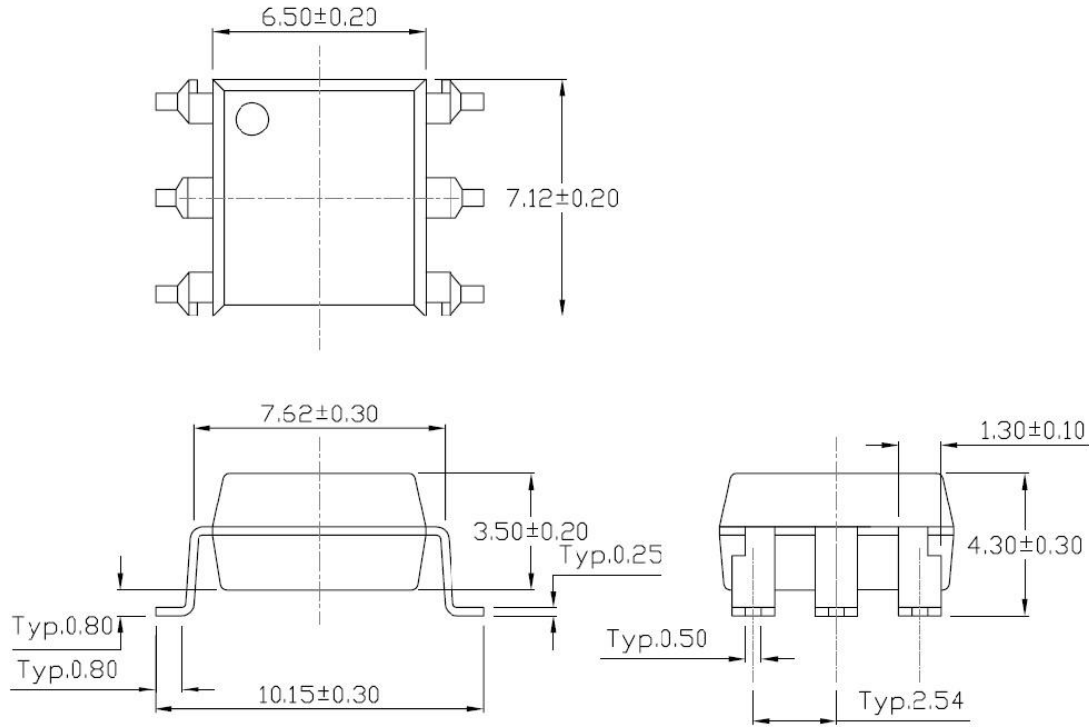


Gullwing (400mil) Lead Forming – Through Hole (M Type)

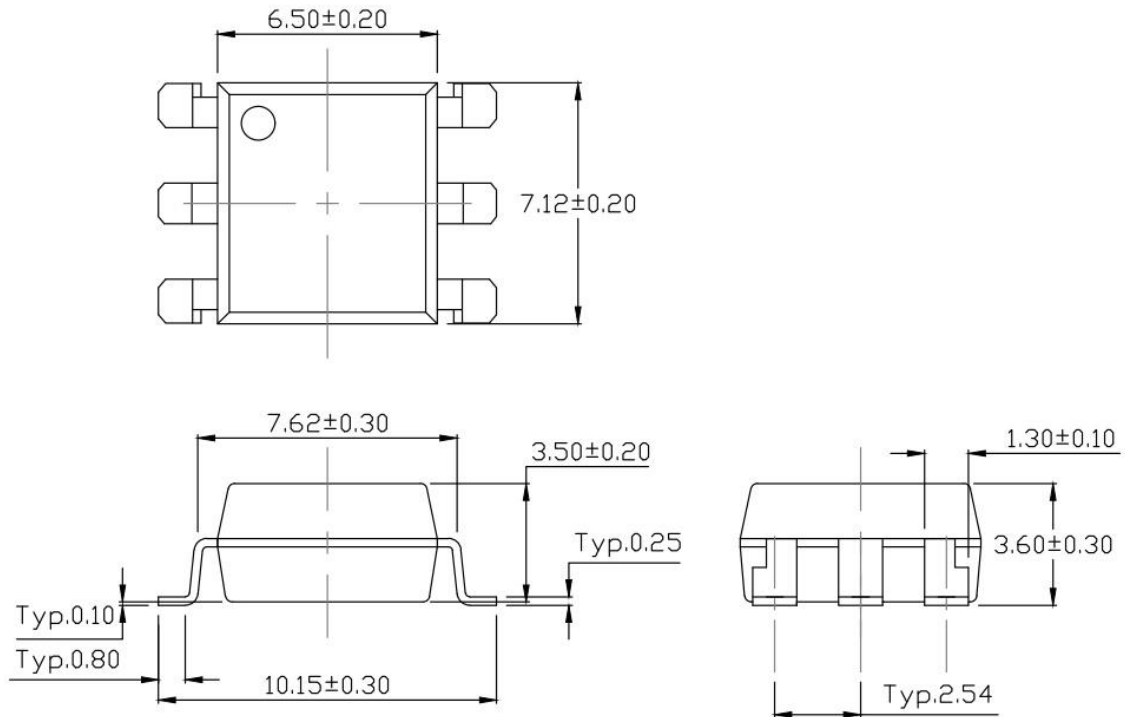


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming (S Type)



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



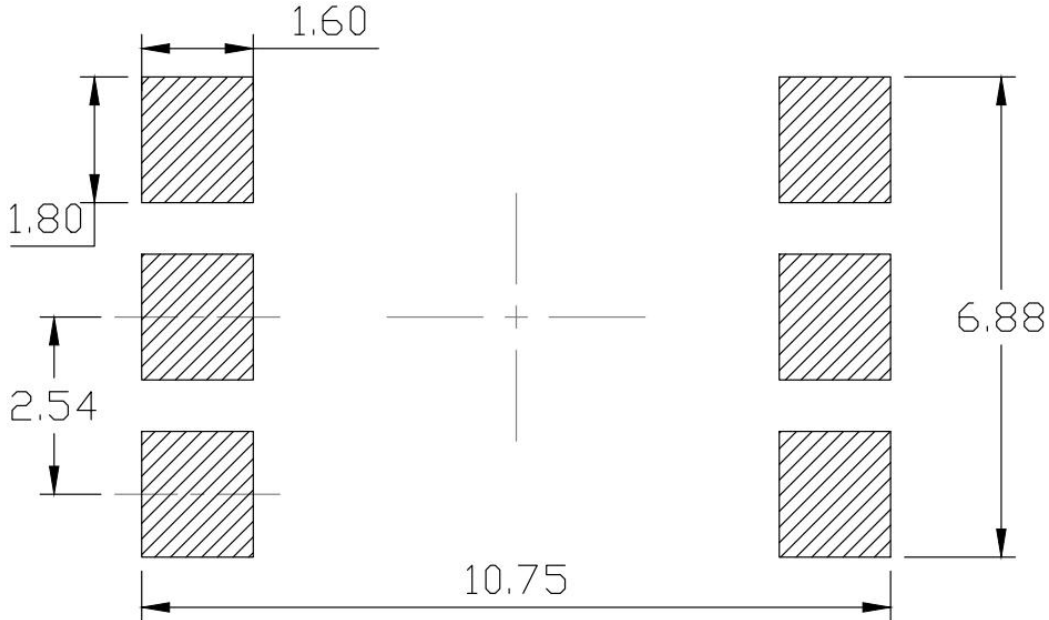


CNY17-X, CNY17F-X Series

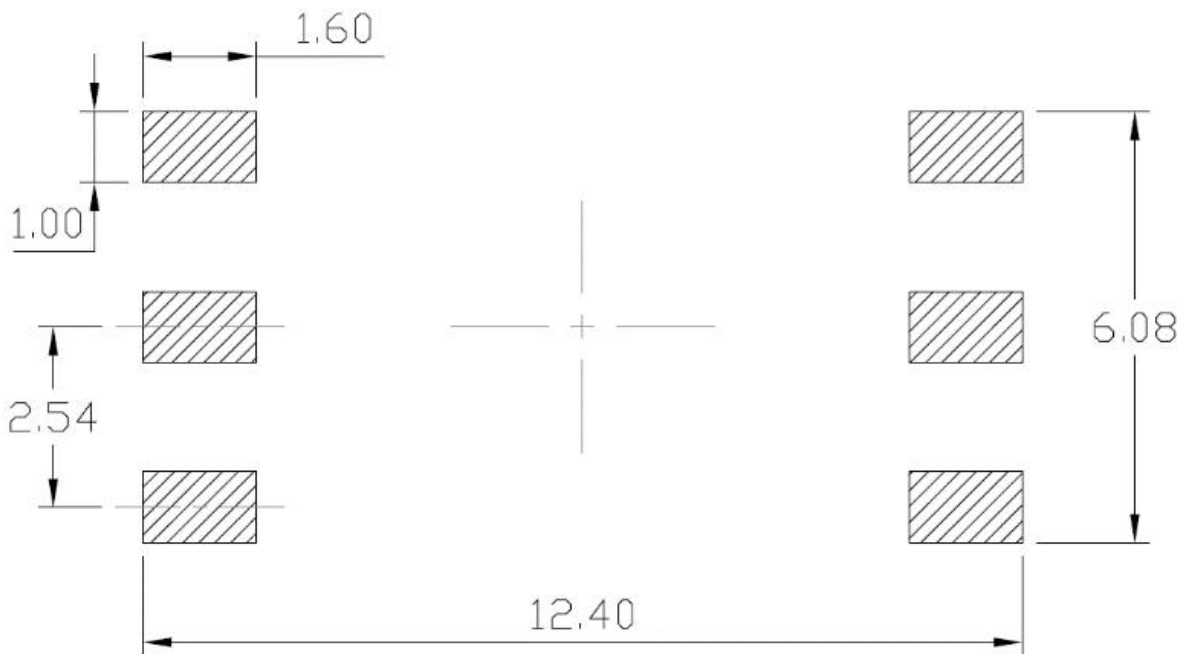
DIP6, DC Input, Photo Transistor Coupler

Recommended Solder Mask (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming

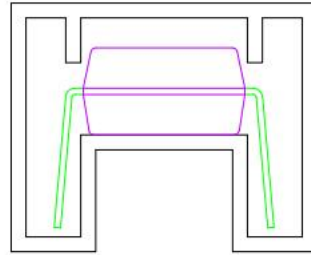
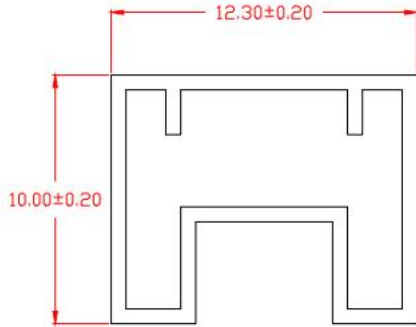


Surface Mount (Gullwing) Lead Forming

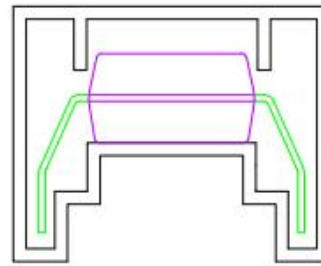
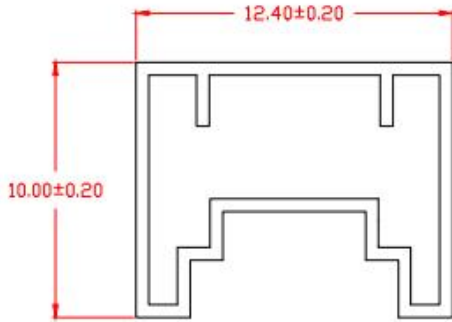


TUBE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Standard DIP



Option M



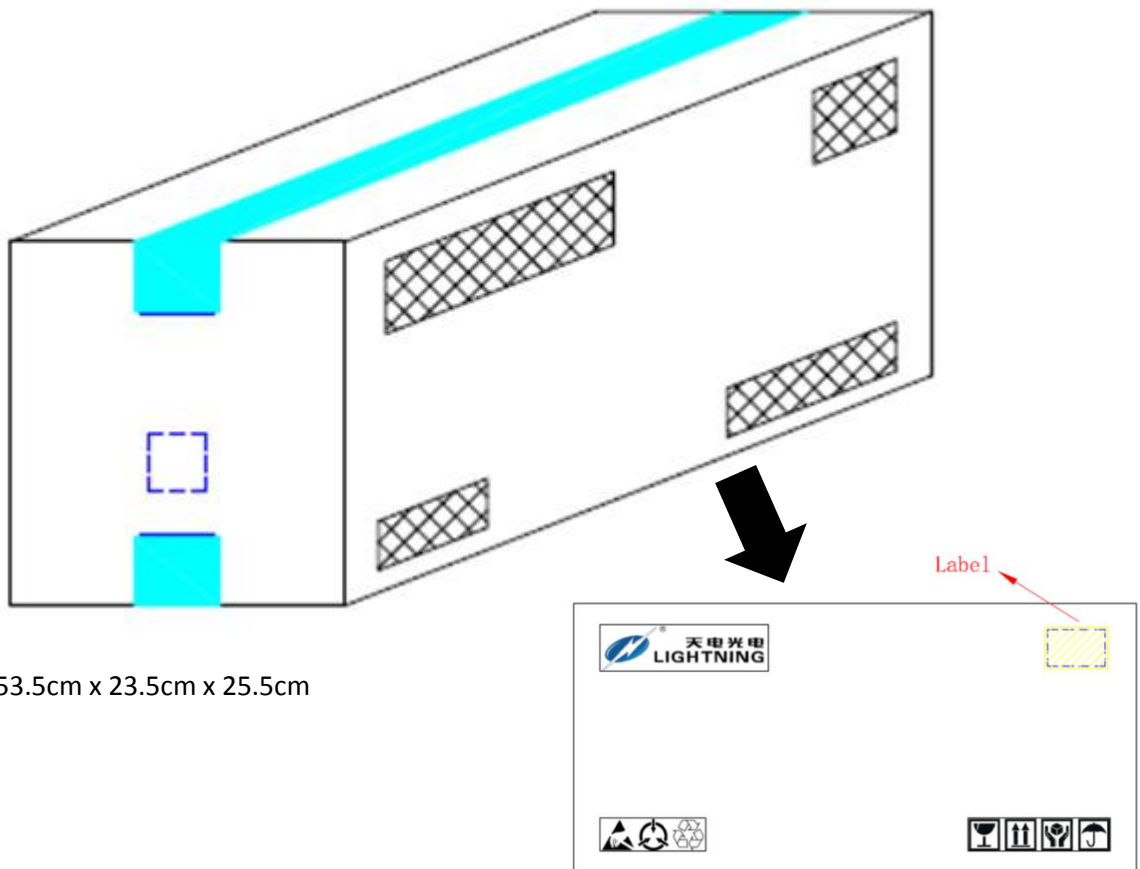
BOX SPECIFICATIONS (Tube Type)

Inner Box



- L x W x H = 52.5cm x 10.7cm x 4.7cm

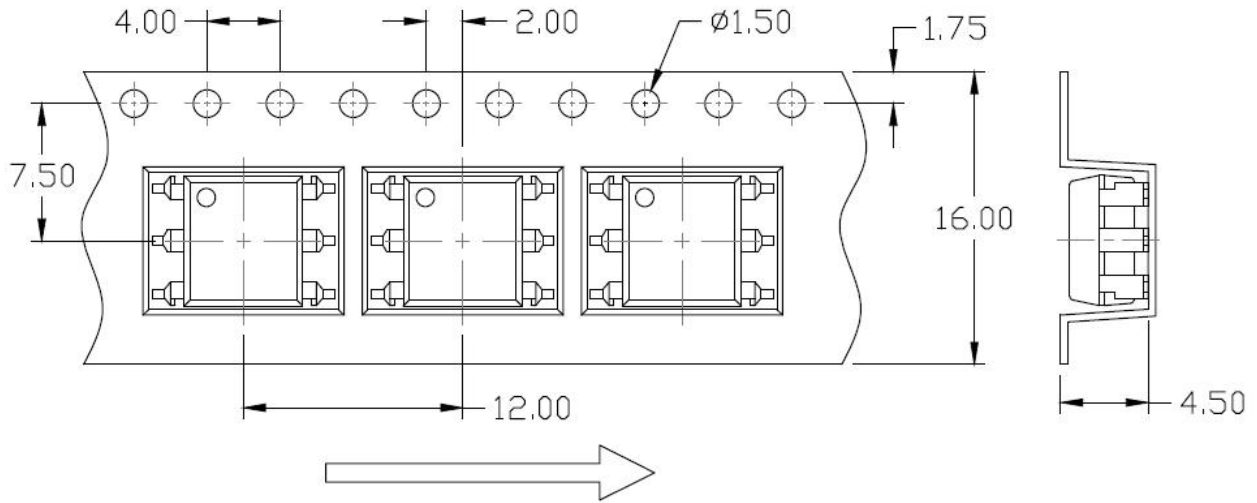
Outer Box



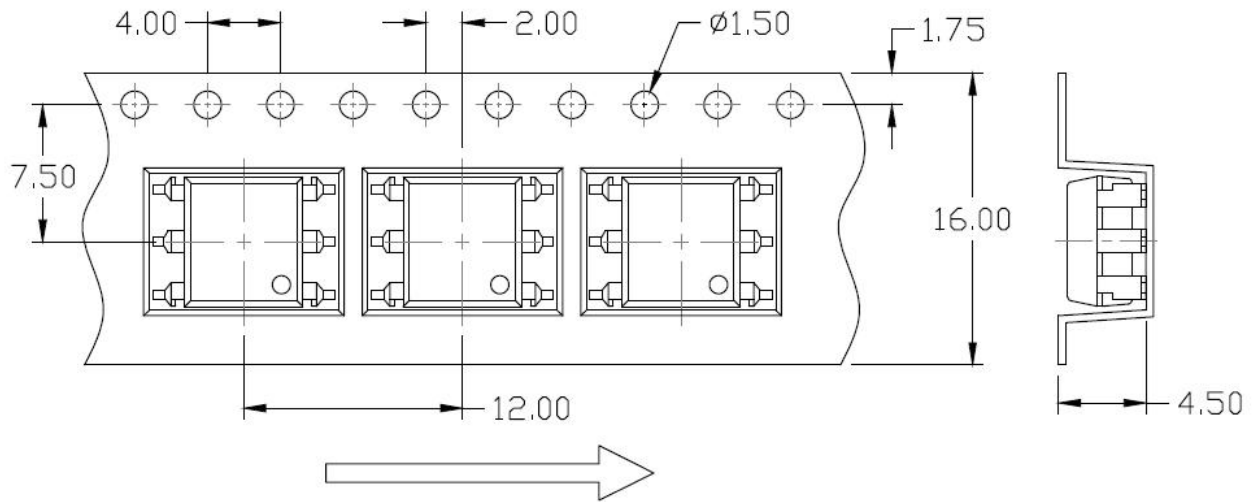
- L x W x H = 53.5cm x 23.5cm x 25.5cm

Carrier Tape Specifications (Dimensions in mm unless otherwise stated)

Option S(T1)

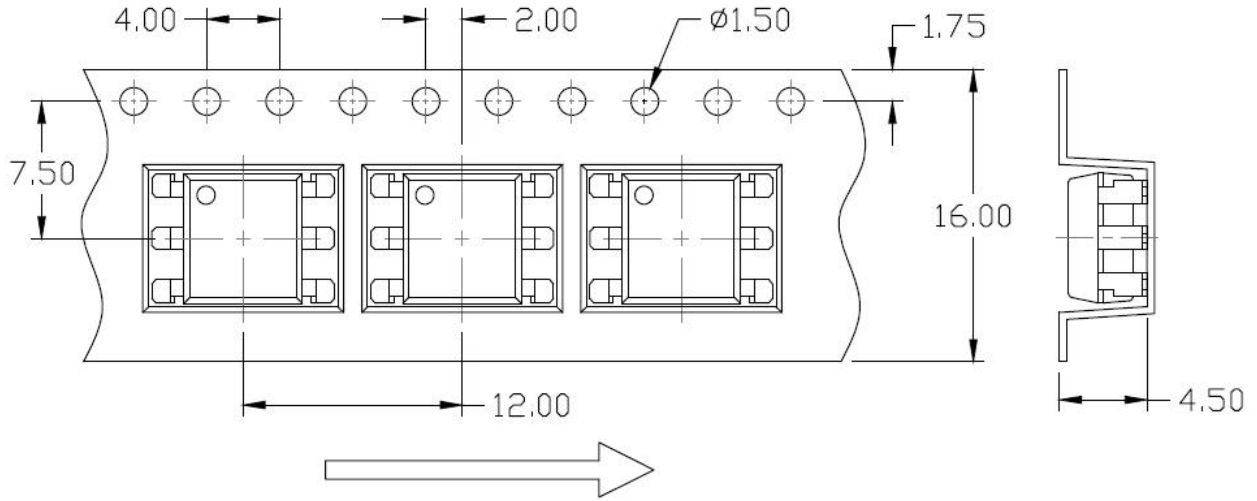


Option S(T2)

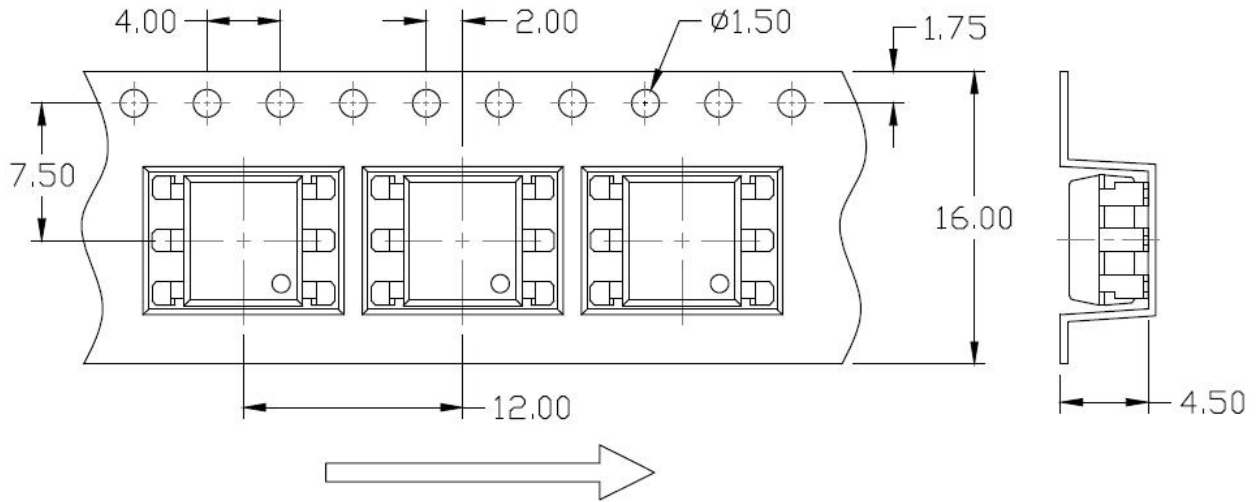


Carrier Tape Specifications (Dimensions in mm unless otherwise stated)

Option SL(T1)



Option SL(T2)

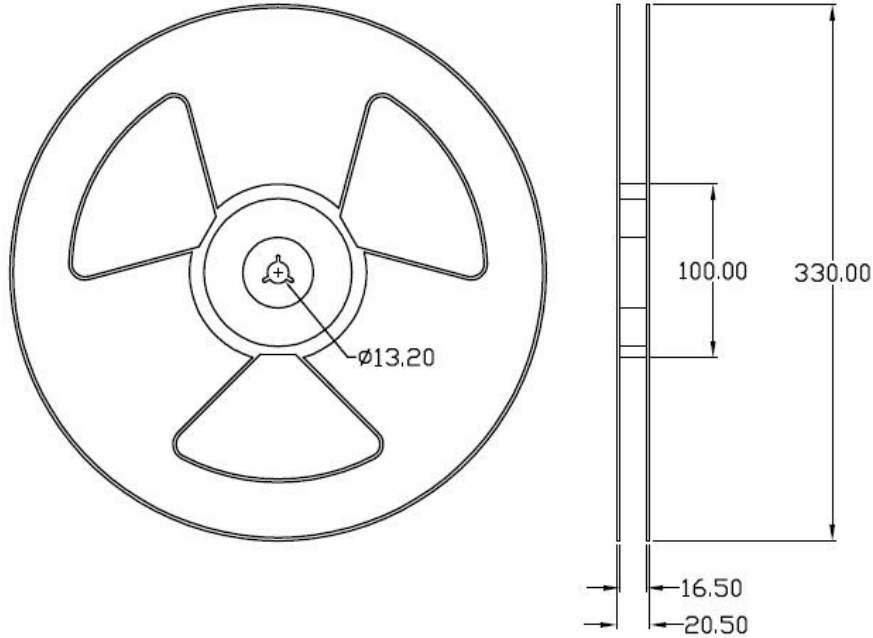




CNY17-X, CNY17F-X Series **DIP6, DC Input, Photo Transistor Coupler**

REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S & Option SL



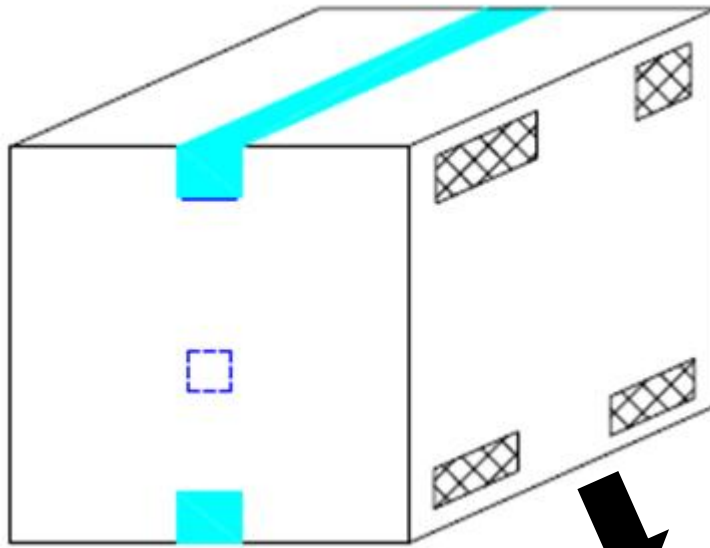
BOX SPECIFICATIONS (Reel Type)

Inner Box

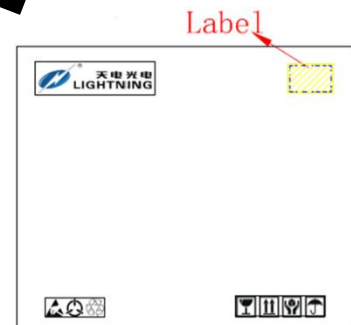


- L x W x H = 36cm x 36cm x 6.9cm

Outer Box



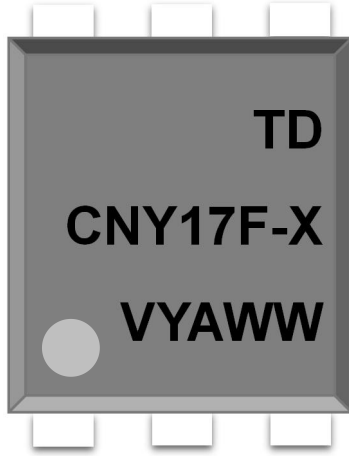
- L x W x H = 45cm x 38cm x 38cm





ORDERING AND MARKING INFORMATION

MARKING INFORMATION



TD : Company Abbr.
CNY17F-X : Part Number & Rank
V : VDE Option
Y : Fiscal Year
A : Manufacturing Code
WW : Work Week

ORDERING INFORMATION

CNY17F-X(Y)(Z)-GV

TD – Company Abbr.
CNY17 – Part Number
F – Configuration (F: Without Base, None: With Base)
-X – Rank (X=1 to 4)
Y – Lead Form Option (M/S/SL/None)
Z – Tape and Reel Option (T1/T2)
G – Material Option (G: Green, None: Non-Green)
V – VDE Option (V or None)

LABEL INFORMATION



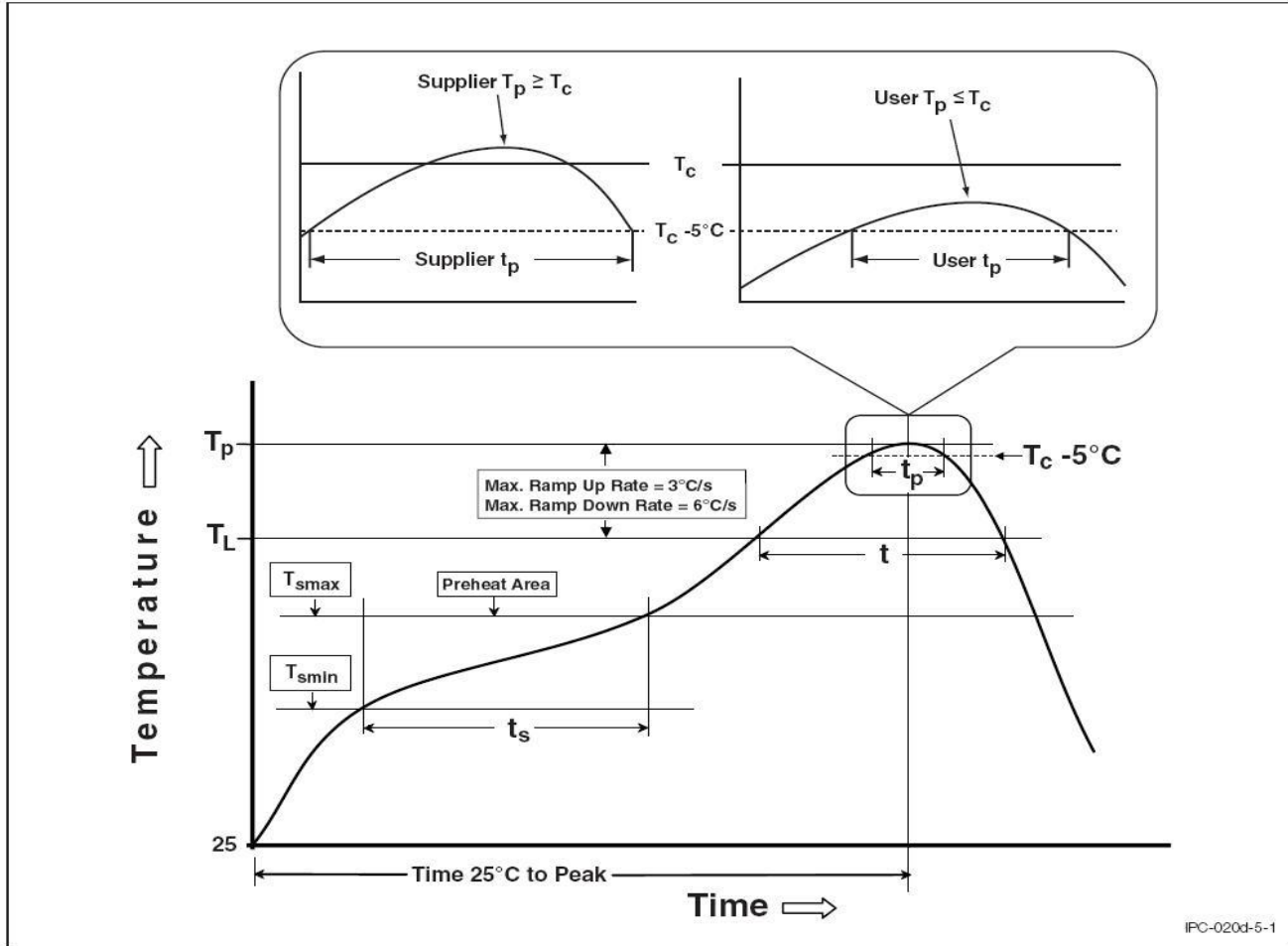
PACKING QUANTITY

Option	Quantity	Quantity – Inner box	Quantity – Outer box
None	65 Units/Tube	32 Tubes/Inner box	10 Inner box/Outer box = 20.8k Units
M	65 Units/Tube	32 Tubes/Inner box	10 Inner box/Outer box = 20.8k Units
S(T1)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
S(T2)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SL(T1)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SL(T2)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units



REFLOW INFORMATION

REFLOW PROFILE

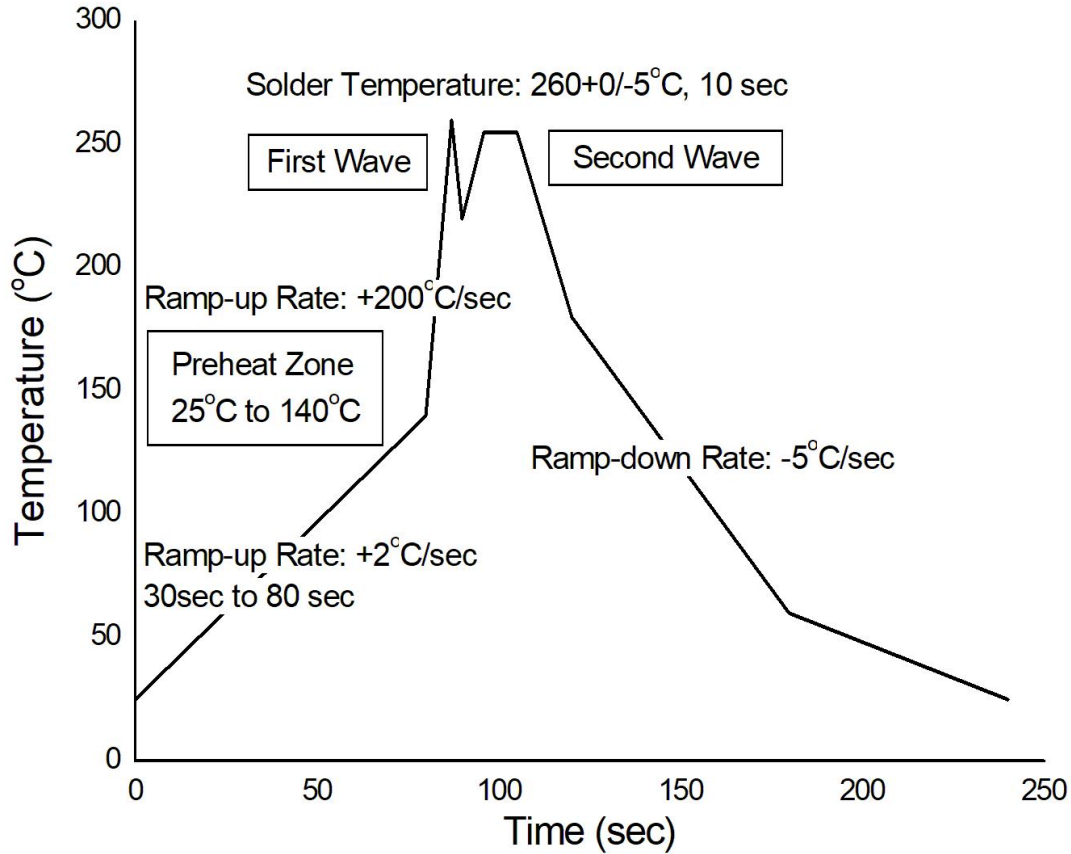


Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T _{smn})	100	150°C
Temperature Max. (T _{smax})	150	200°C
Time (t _s) from (T _{smn} to T _{smax})	60-120 seconds	60-120 seconds
Ramp-up Rate (t _L to t _P)	3°C/second max.	3°C/second max.
Liquidous Temperature (T _L)	183°C	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (t _P) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (T _P to T _L)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.



TEMPERATURE PROFILE OF SOLDERING

WAVE SOLDERING (JESD22-A111 COMPLIANT)



HAND SOLDERING BY SOLDERING IRON

Soldering Temperature	380+0/-5°C
Soldering Time	3 sec max.

- One time soldering is recommended for all soldering method.
- Do not solder more than three times for IR reflow soldering.



DISCLAIMER

- LIGHTNING is continually improving the quality, reliability, function and design. LIGHTNING reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
- LIGHTNING makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, LIGHTNING disclaims (a) any and all liability arising out of the application or use of any product, (b) any and all liability, including without limitation special, consequential or incidental damages, and (c) any and all implied warranties, including warranties of fitness for particular
- The products shown in this publication are designed for the general use in electronic applications such as office automation, equipment, communications devices, audio/visual equipment, electrical application and instrumentation purpose, non-infringement and merchantability.
- This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or lifesaving applications or any other application which can result in human injury or death.
- Please contact LIGHTNING sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
- Parameters provided in datasheets may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated in each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify LIGHTNING's terms and conditions of purchase, including but not limited to the warranty expressed therein.
- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.