

恒拓电子  
HENG TUO ELECTRONICS

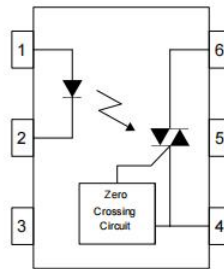
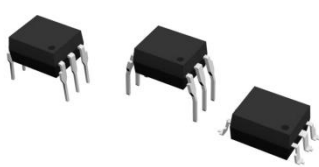


# ***HT series***

**Photo Coupler  
Product Specification**

**HT-304X\_306X\_308X**

## ■ Package



Pin Configuration	
1	Anode
2	Cathode
3	No Connection
4	Terminal
5	Substrate (do not connect)
6	Terminal

## ■ Description

The HT-304X\_306X\_308X series of devices each consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon zero voltage crossing photo triac. They are designed for use with a discrete power triac in the interface of logic systems, such as solid-state relays, industrial controls, motors, solenoids and consumer appliances.

## ■ Features

- 6pin zero-cross optoisolators triac driver
- High input-output isolation voltage(Viso = 5,000Vrms)
- High repetitive peak off-state voltage VDRM.
  - HT-304X: Min. 400V;
  - HT-306X: Min. 600V;
  - HT-308X: Min. 800V;
- High critical rate of rise of off-state voltage( dV/dt : MIN. 1000V /s )
- Operating Temperature: -40°C~110°C
- Safety approval  
(UL 1577, VDE DIN EN60747-5-5 , CQC11-471543-2022)
- RoHS
- MSL1

## ■ Applications

- Solenoid/valve controls
- Static power switch
- AC motor drivers
- Temperature controls



## ■ Product Nomenclature

The product name is designated as below:

HT-30XX X - X- X X- XX

① ② ③ ④ ⑤

Designation:

HT =Hengtuo Technology Co.,LTD.

30XX= Product Series (304X/306X/308X, X:1/2/3)

① = Lead form option(S1,M,NONE)<sup>(1)</sup>

② = Tape and Reel option(TP,TP1,NONE)<sup>(2)</sup>

③ = VDE order option(fixed code "V")

④ = Halogen free option(fixed code"G")

⑤ = Customer code

### Notes

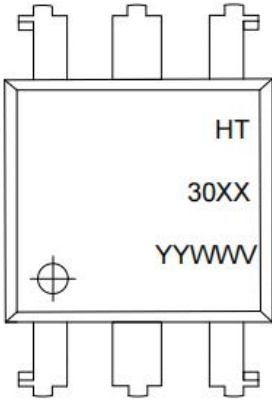
#### 1.Lead form option:

Symbol	Description
S1	DIP6-S1
M	DIP6-M
NONE	DIP6 Normal

#### 2.Tape and Reel option:

Symbol	Description
TP&TP1	Tape and Reel Type
NONE	DIP Type

## ■ Marking Information



### Designation:

HT denotes Hengtuo  
 30XX denotes Device  
 YY denotes year code  
 WW denotes week code  
 V denotes VDE

## ■ Maximum

Parameter		Symbol	Values	Unit
Input	Forward Current	$I_F$	50	mA
	Reverse Voltage	$V_R$	6	V
	Power Dissipation	P	120	mW
	Junction Temperature	$T_J$	125	°C
Output	Off-State Output Terminal Voltage	$V_{DRM}$	HT-304X 400	V
			HT-306X 600	
			HT-308X 800	
	Peak Repetitive Surge Current (PW=1ms, 120 pps)	$I_{TSM}$	1	A
	On-State RMS Current	$I_{T(RMS)}$	100	mA
	Junction Temperature	$T_J$	125	°C
	Collector Power Dissipation	$P_C$	150	mW
Operating temperature range		$T_{opr}$	- 40 ~ 110	° C
Storage temperature range		$T_{stg}$	- 55 ~ 125	° C
Total Power consumption		P(W)	250	mW
Isolation Voltage <sup>(1)</sup>		$V_{ISO}$	5000	Vrms
Soldering Temperature <sup>(2)</sup>		$T_{SOL}$	260	° C

### Notes:

(1). AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

(2).For 10 seconds

## ■ Electronic Optical Characteristics

(TA = 25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditon
Input	Forward Voltage	$V_F$	-	1.2	1.4	V	$I_F=20mA$
	Reverse Current	$V_R$	-	-	5	$\mu A$	$V_R=6V$
Output	Peak Blocking Current, Either Direction <sup>(1)</sup>	$I_{DRM}$	-	-	500	nA	$V_{DRM} =$ Rated $V_{DRM}$
	Peak On-State Voltage, Either Direction	$V_{TM}$	-	-	3	V	$I_{TM}=100mA$ Peak
	Critical rate of Rise of Off-State Voltage <sup>(2)</sup>	dv/dt	6	-	-	V/ $\mu s$	$V_{in}=240V_{rms}$
Couple	Led Trigger Current, Current Required to Latch Output, Either Direction	HT-3041 HT-3061 HT-3081	-	-	15	mA	Main Terminal Voltage = 3V
		HT-3042 HT-3062 HT-3082	-	-	10		
		HT-3043 HT-3063 HT-3083	-	-	5		
	Holding Current, Either Direction	$I_H$	-	400	-	$\mu A$	
ZERO CROSSING	Inhibit Voltage	$V_{INH}$	-	5	20	Volts	$I_F =$ Rated $I_{FT}$ , MT1- MT2 Voltage above which device will not trigger.
	Leakage in Inhibited State	$I_{DRM2}$	-	-	500	$\mu A$	$I_F =$ Rated $I_{FT}$ , Rated $V_{DRM}$ , Off State

(1) Test voltage must be applied within dv/dt rating.

(2) This is static dv/dt. Commutating dv/dt is a function of the load-driving thyristor(s) only.



## Characteristics Curves

Fig.1 Forward current vs.Ambient temperature

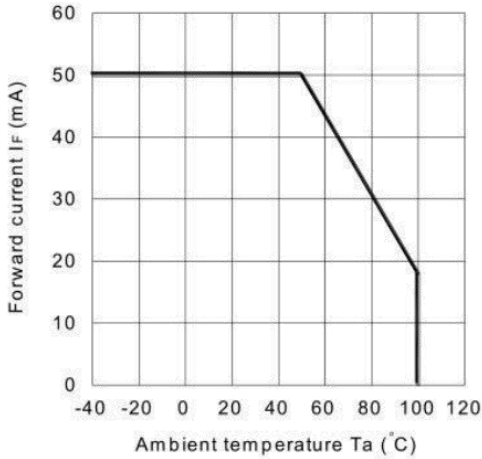


Fig.2 On-state current vs.Ambient temperature

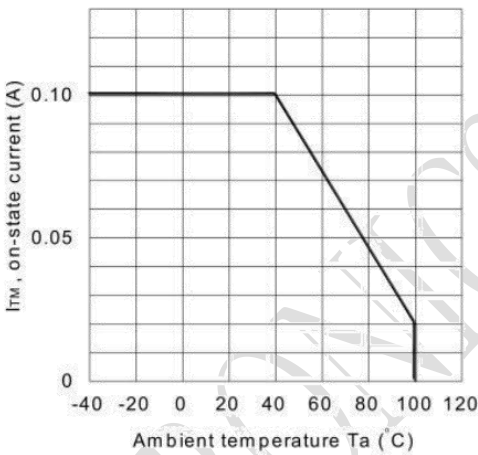


Fig.3 Minimum Trigger Current vs.Ambient temperature

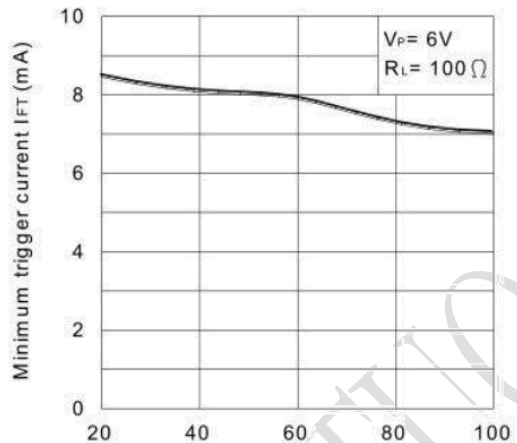


Fig.4 Forward current vs Forward Voltage

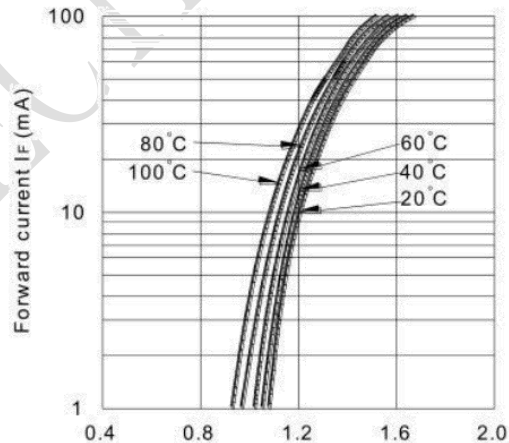


Fig.5 On-state voltage vs . Ambient temperature

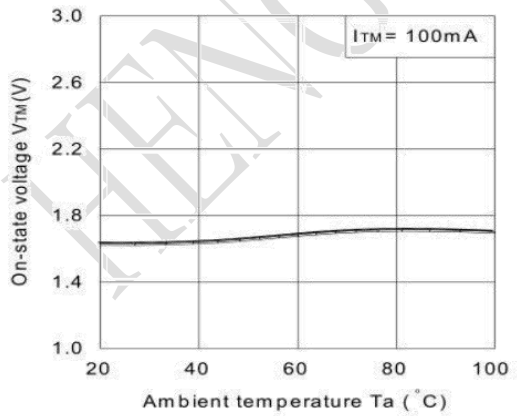


Fig.6 Holding current vs Ambient temperature

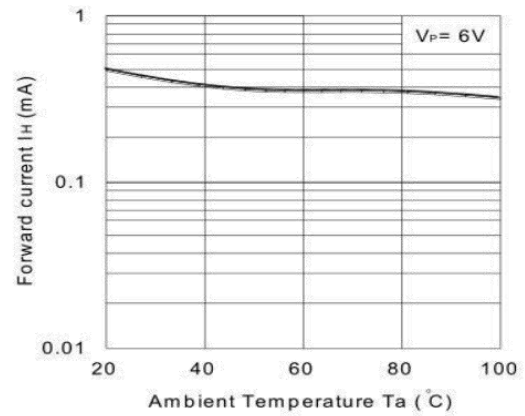


Fig.7 Repetitive peak off-state current vs Temperature

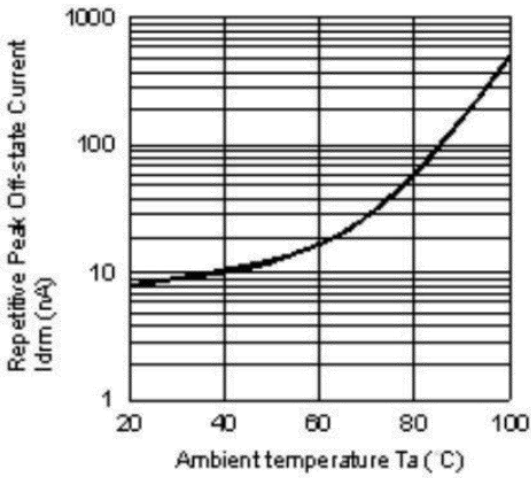


Fig.8 On-state current vs On-state voltage

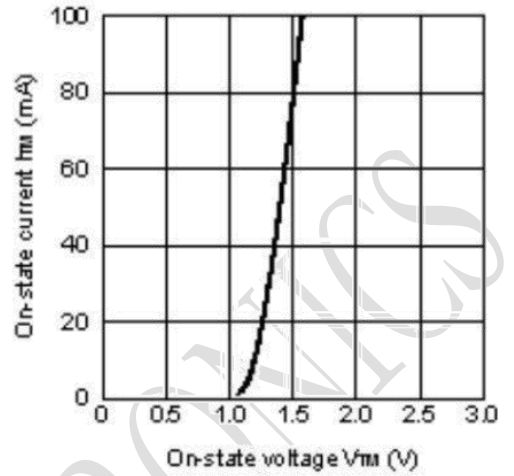


Fig.9 Basic Operation Circuit Medium/High Power Triac Drive Circuit

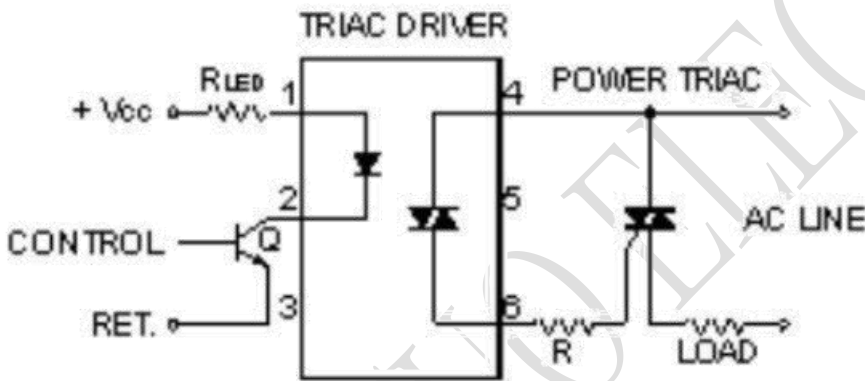
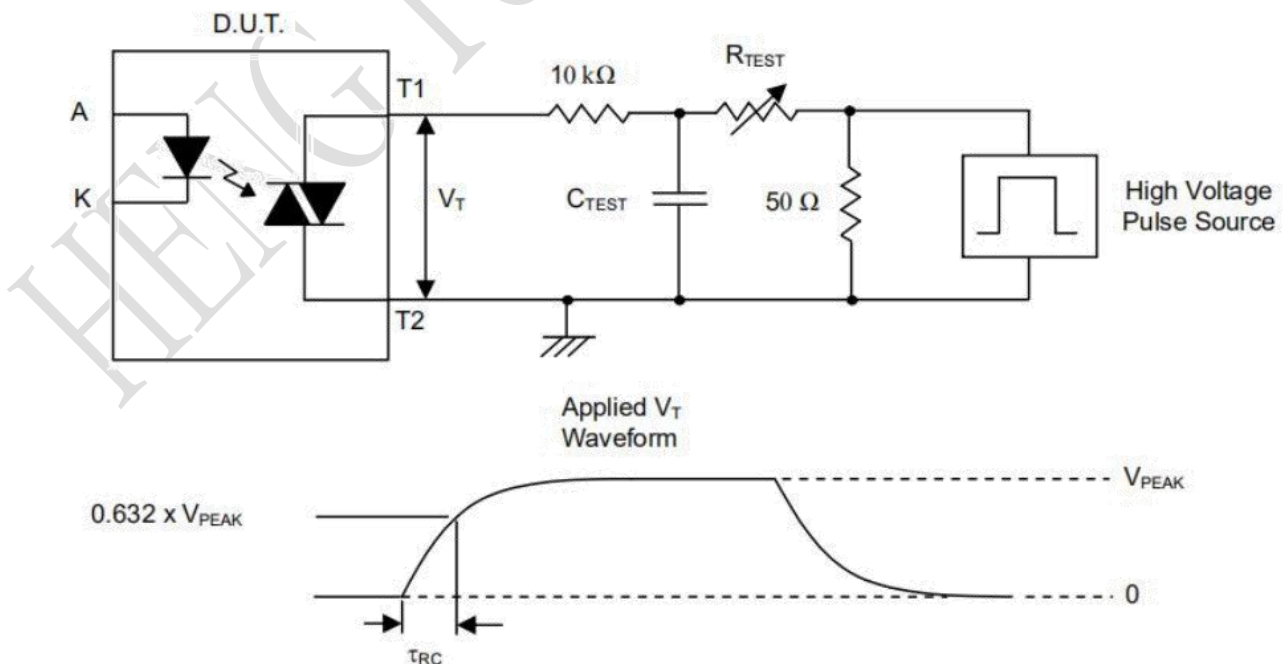
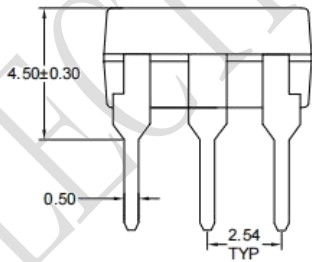
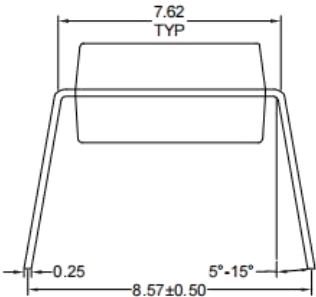
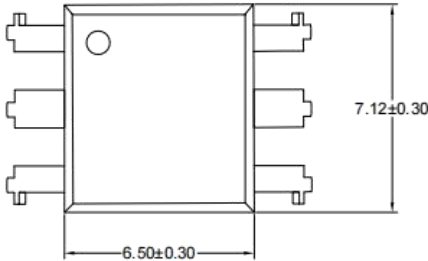


Fig10.Static dv/dt Test Circuit & Waveform



## ■ Outline Dimension

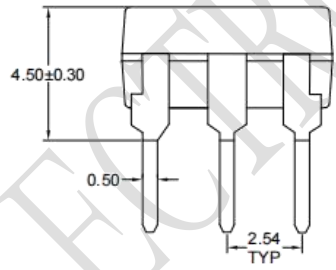
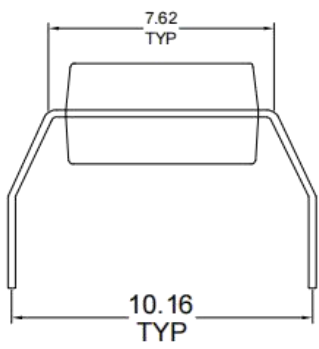
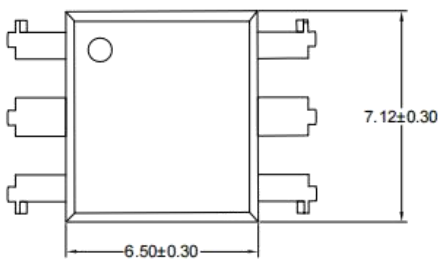
DIP Normal Type:



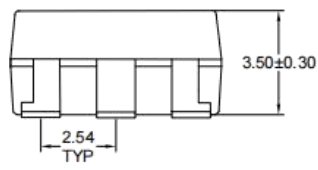
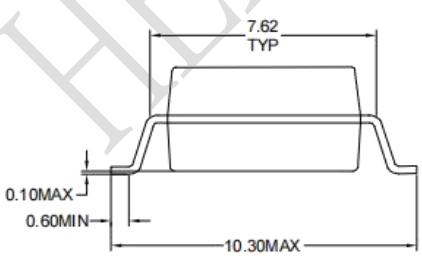
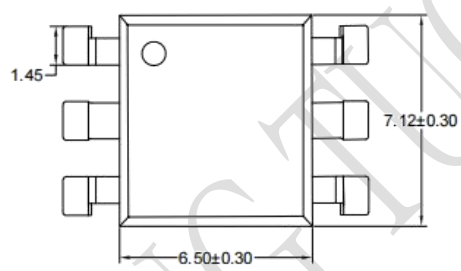




DIP M Type:



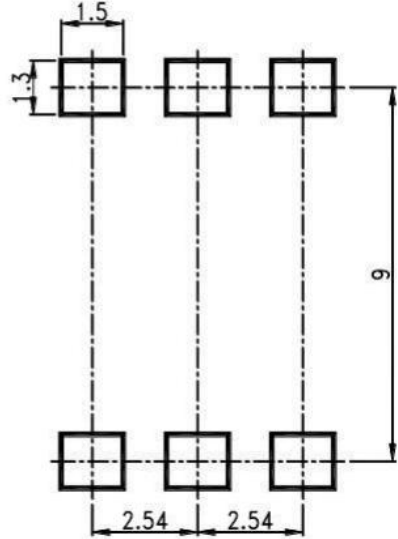
SMD S1 Type:



Unit: mm  
Tolerance:  $\pm 0.1$  mm

### ■ Recommended solder pad Design

For S1 type:



Unit: mm  
Tolerance:  $\pm 0.1\text{mm}$

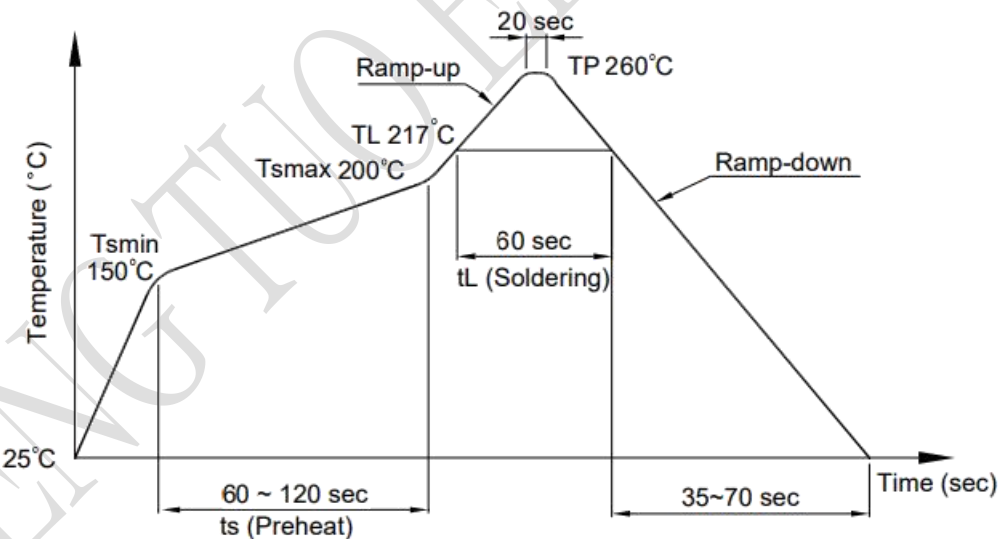
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# Temperature Profile Of Soldering

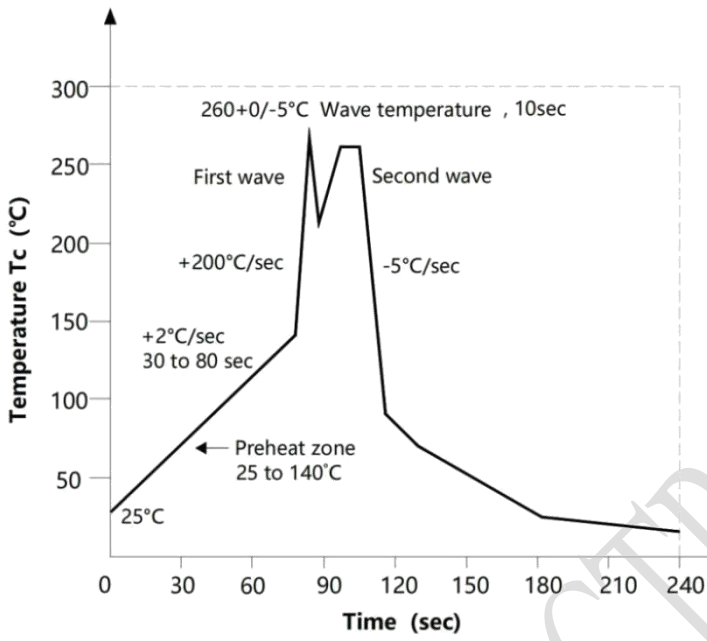
## 1. IR Reflow soldering (JEDEC-STD-020 compliant)

Profile item	Conditon
Preheat	150°C
-Temperature Min (T <sub>Smin</sub> )	200°C
-Temperature Max (T <sub>Smax</sub> )	90 ± 30 sec
-Time (min to max) (ts)	
Soldering zone	217°C
-Temperature (TL)	60 sec
-Time (tL)	
Peak Temperature (TP)	260°C
Ramp-up rate	3°C / sec max
Ramp-down rate	3~6°C/ sec



Notes:  
One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

**2. Wave soldering (JEDEC22A111 compliant)**



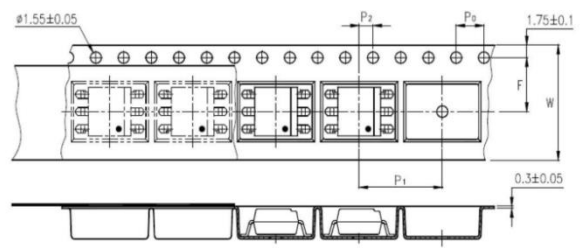
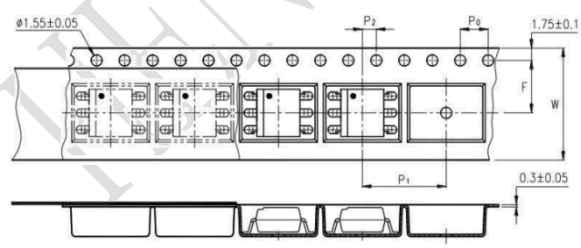
**3. Hand soldering by soldering iron**

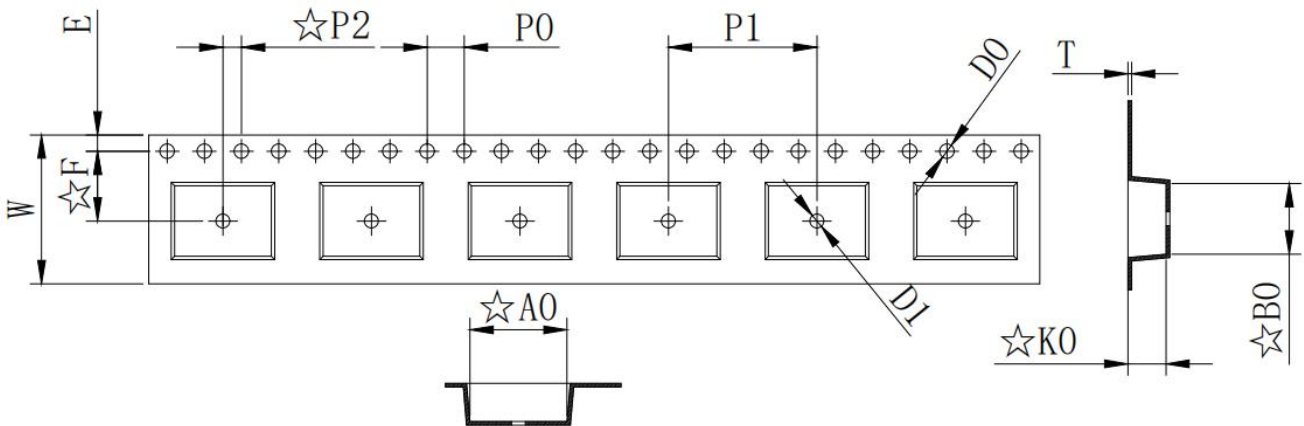
Allow single lead soldering in every single process. One time soldering is recommended.  
Temperature: 380±0/-5°C  
Time: 3 sec max.

**■ Packing  
Tape and Reel**

**Option TP:**

**Option TP1:**





Deminsion/mm	W	E	F	P0	P1	P2
Packagetype:S	16±0.2	1.75±0.1	7.5±0.1	4±0.1	16±0.1	2±0.1

Deminsion/mm	A0	B0	D0	D1	K0
Packagetype:S	10.45±0.1	7.6±0.1	1.5±0.1	1.5±0.1	4.1±0.1

Packagetype:S	Reel	Inner carton	Outer carton
QTY/PCS	1K/reel	2K(2 reels)	20K

## 1. Tape and Tube

Package type:Normal&M	Tube	Outer carton
QTY/PCS	66	3.3K(50 tubes)

## ■ Attention:

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- 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.
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