恒拓电子
HENGTUO ELECTRONICS

HT series

Photocoupler
Product Date Sheet

HT-304X_306X_308X

Spec No:HT-PC-304X_306X_308X-P-006-A1
Effective Date:02/23/2024

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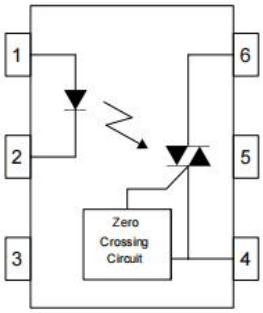
■ Package



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

- 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℃~110℃
- Safety approval
- (UL approved，VDE approved，CQC approved)
- RoHS
- MSL1

■ Applications

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

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■ 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)(1)

② = Tape and Reel option(TA,TA1,NONE)(2)

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
TA&TA1	Tape and Reel Type
NONE	DIP Type

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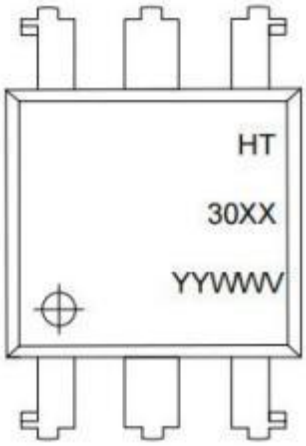
■ Marking Information



Designation:

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

■ Maximum Ratings

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	℃
Output	Off-State Output Terminal Voltage	HT-304X	V_{DRM}	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	℃
	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(1)			V_{ISO}	5000	Vrms

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

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■ 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	μA	V_R=6V
Output	Peak Blocking Current, Either Direction (1)		I_{DRM}	-	-	500	nA	V_{DRM} = Rated VDRM
	Peak On-State Voltage, Either Direction		V_{TM}	-	-	3	V	I_{TM}= 100mA Peak
	Critical rate of Rise of Off-State Voltage (2)		dv/dt	1000	-	-	V/μs	V_{in}=240Vrms
Couple	Led Trigger Current,Current Required to Latch Output, Either Direction	HT-3041 HT-3061 HT-3081	I_{FT}	-	-	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	-	uA	-
ZERO CROSSING	Inhibit Voltage		V_{INH}	-	5	20	Volts	IF=Rated IFT,MT1-MT2 Voltage above which device will not trigger.
	Leakage in Inhibited State		I_{DRM2}	-	-	500	μA	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.

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■ Characteristics Curves

Fig.1 Forward current vs.Ambient temperature

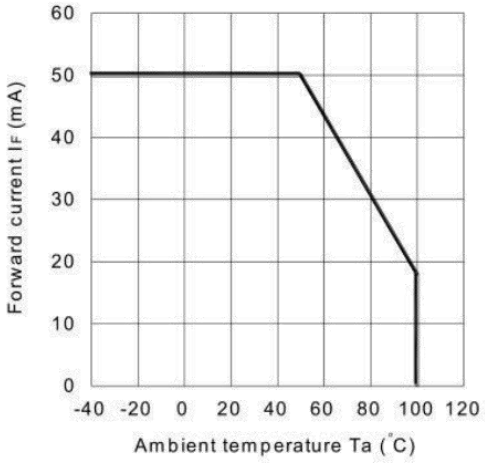


Fig.2 On-state current vs.Ambient temperature

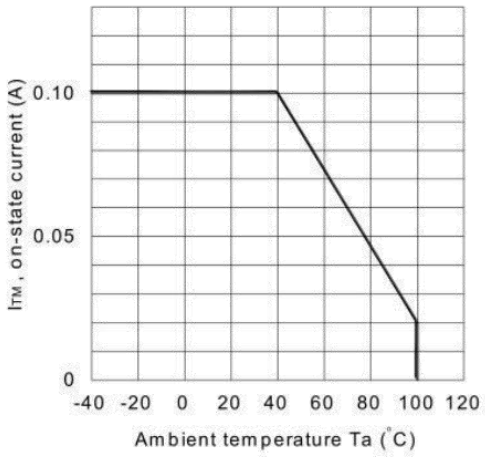


Fig.3 Minimun Trigger Current vs Ambient temperature

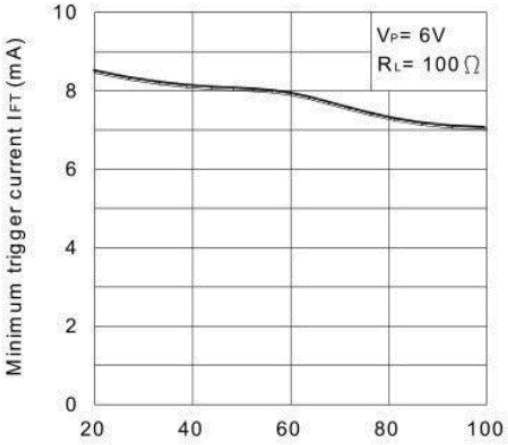


Fig.4 Forward current vs Forward Voltage

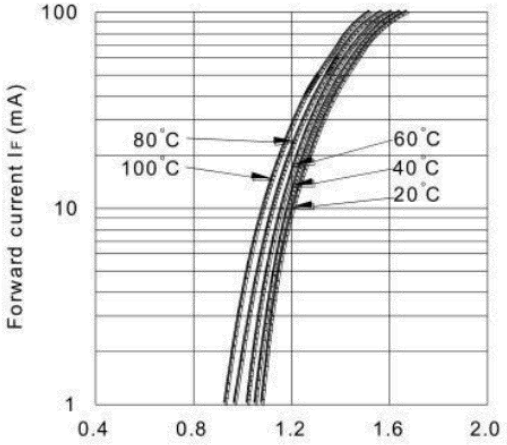


Fig.5 On-state voltage vs Ambient temperature

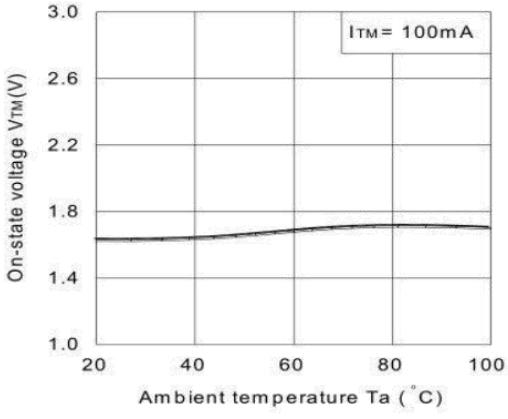


Fig.6 Holding current vs Ambient temperature

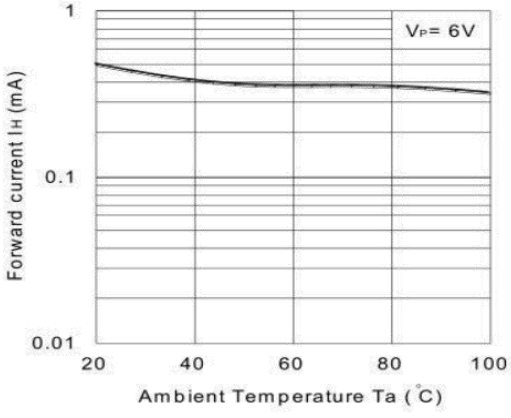


Fig.7 Repetitive peak off-state current vs Temperature

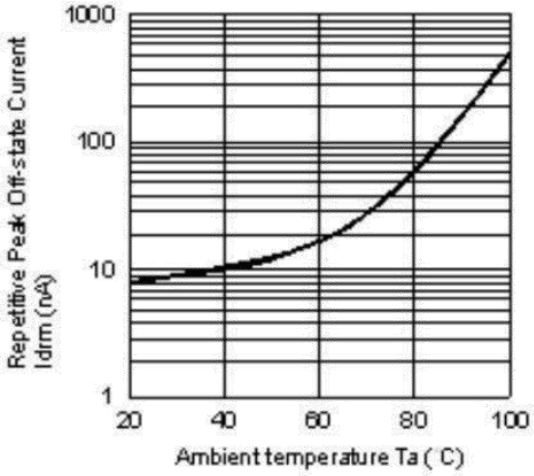


Fig.8 On-state current vs On-state voltage

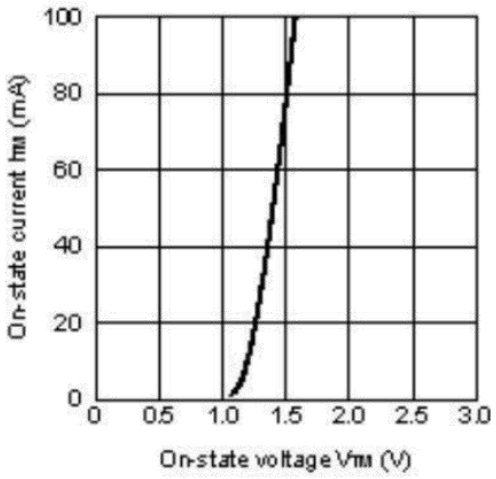


Fig.9 Basic Operation Circuit Medium/High Power Triac Drive Circuit

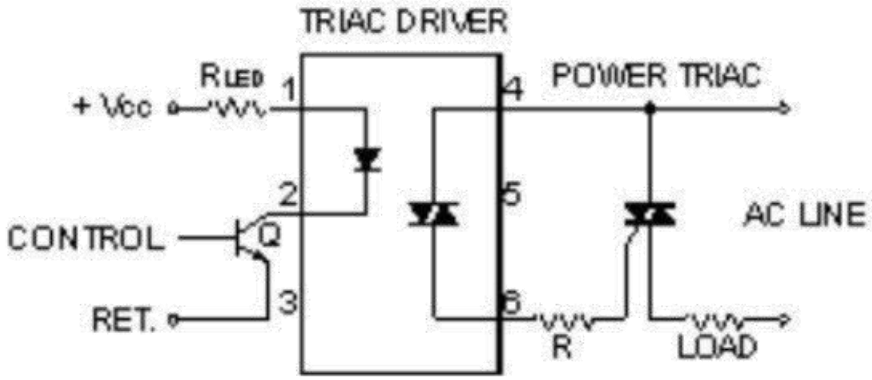
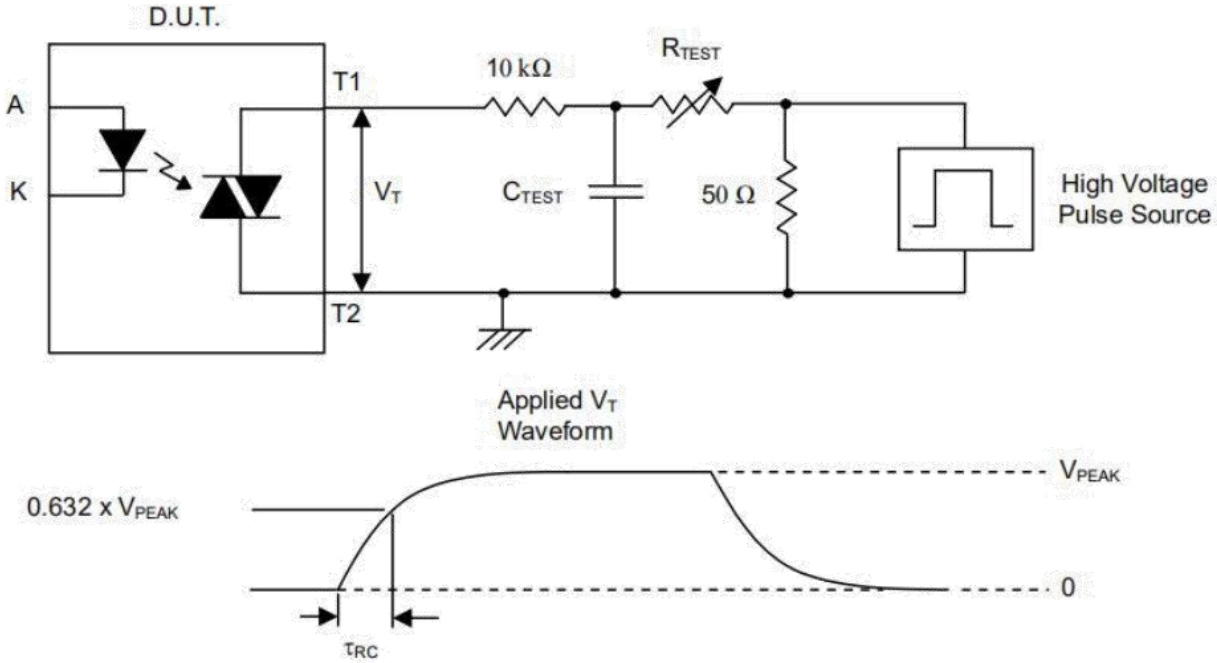


Fig10.Static dv/dt Test Circuit & Waveform



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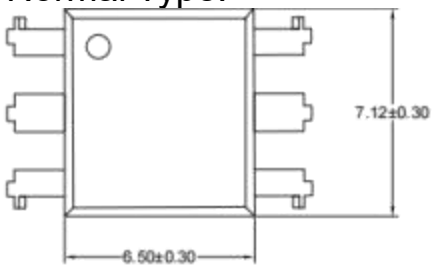
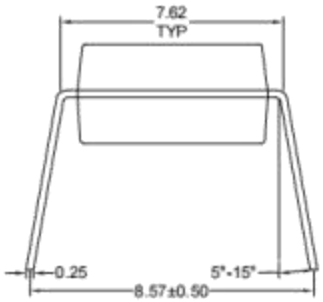
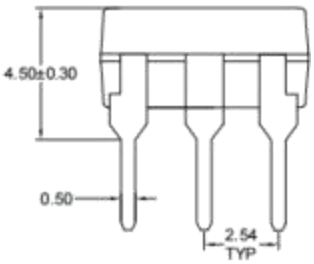
■ Outline Dimension

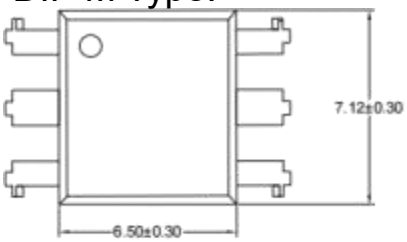
DIP Normal Type:

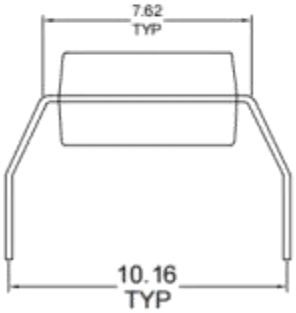


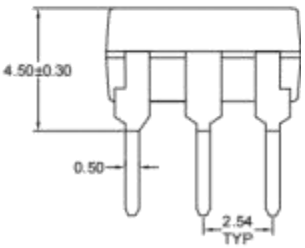




DIP M Type:







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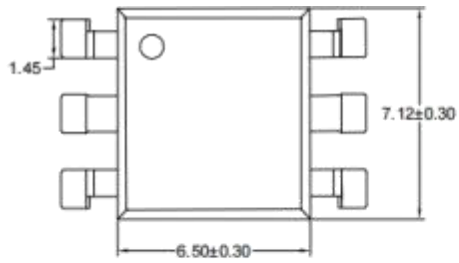
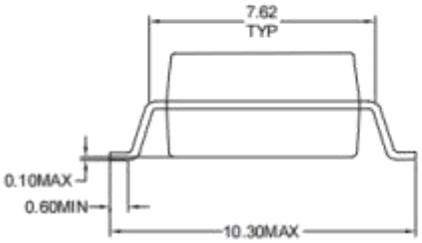
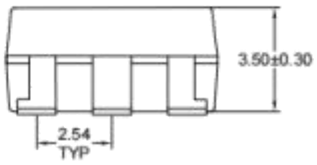
SMD S1 Type:



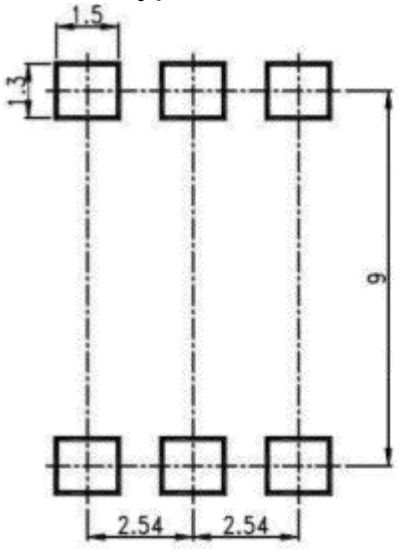




Unit: mm
Tolerance: ±0.1mm

■ Recommended solder pad Design

For S1 type:



Unit: mm

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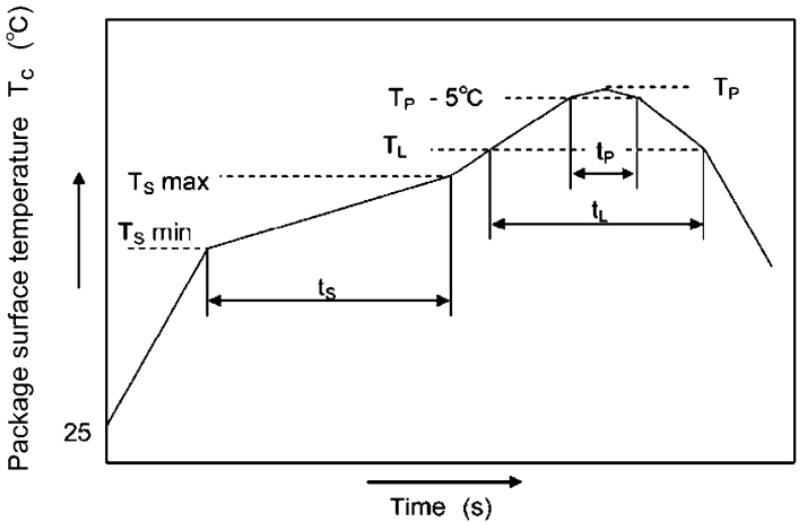
Tolerance: ±0.1mm

■ Temperature Profile Of Soldering

1. IR Reflow soldering

(JEDEC-STD-020D compliant)

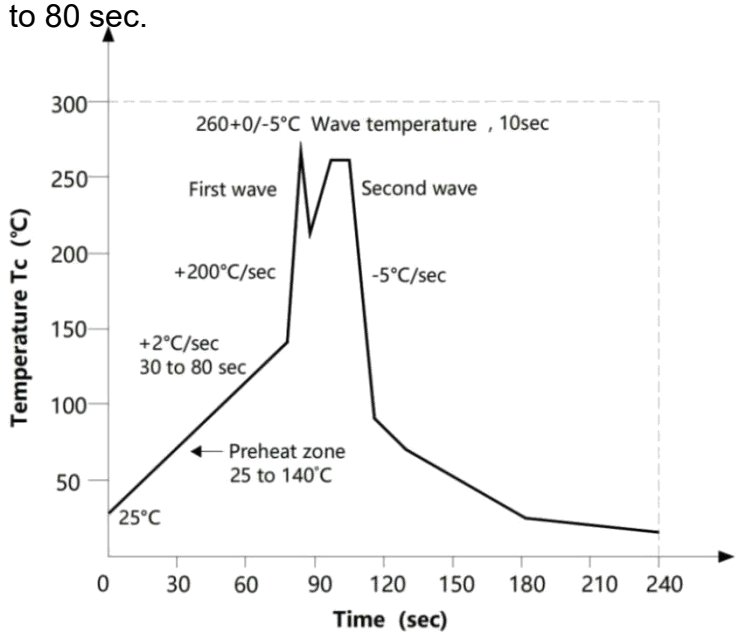
Profile item	Conditon
Preheat	
-Temperature Min (TSmin)	150°C
-Temperature Max (TSmax)	200°C
-Time (min to max) (ts)	90±30 sec
Soldering zone	
-Temperature (TL)	217°C
-Time (t_L)	60-150 sec
Peak Temperature (TP)	260°C
-Time (TP-5℃to TP) (ts)	30 sec
Ramp-up rate	3°C / sec max
Ramp-down rate	3~6°C/ sec



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)

One time soldering is recommended within the condition.
Temperature:260+0/-5˚C.
Time:10 sec.
Preheat temperature:25 to 140˚C.
Preheat time:30 to 80 sec.



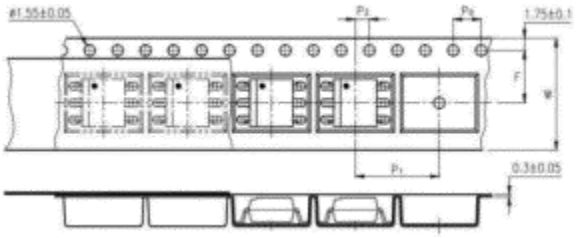
3. Hand soldering by soldering iron

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

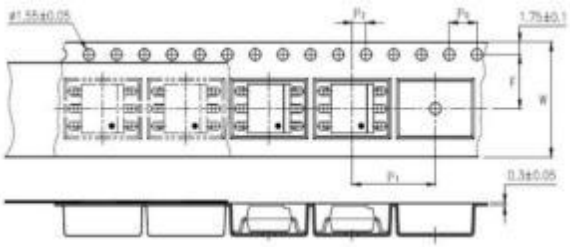
■ Packing

1. Tape and Reel

OptionTA1:



Option TA:



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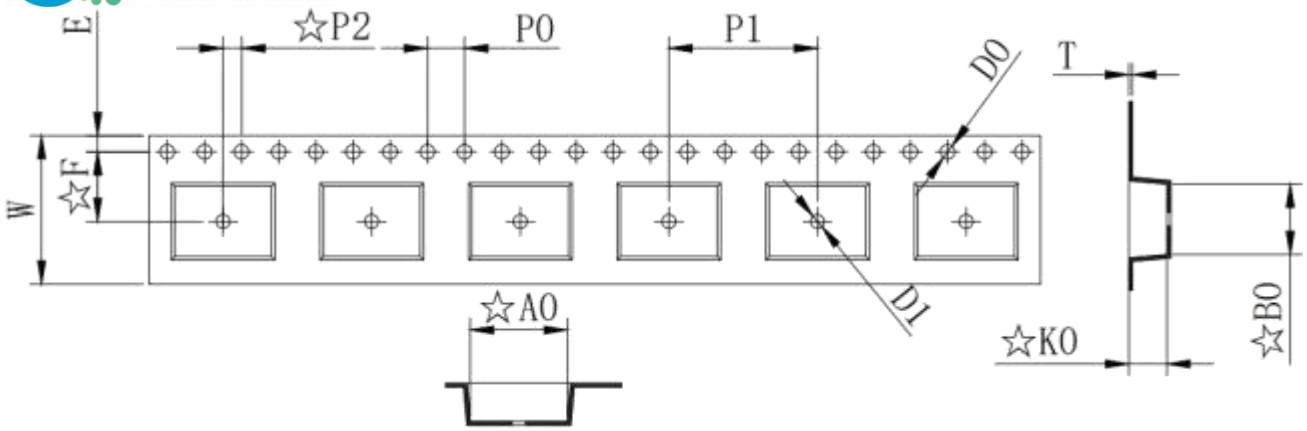

Deminsion/mm	W	E	F	P0	P1	P2
Packagetype:S	16±0.2	1.75±0.1	7.5±0.1	4±0.1	16±0.1	2±0.1

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

1.Reel

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

2.Tape and Tube

Package type:Normal&M	Tube	Outer carton
QTY/PCS	65	3.25K(50 tubes)

■ Attention:

- Hengtuo is continually improving the quality, reliability, function or design and Hengtuo reserves the right to make changes without further notices.
- 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.
- For equipment/devices where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc, please contact our sales representatives.
- When requiring a device for any ”specific” application, please contact our sales in advice.
- If there are any questions about the contents of this publication, please contact us at your convenience.

文件修订履历			
版本号	修订内容	修订人	修订日期
A0	首次发布	孙科	2024.2.23
A1	1. 更新 reflow 曲线图； 2. 文件首页更正为 DATA SHEET	宋重阳	2024.7.24