

恒拓电子
HENG TUO ELECTRONICS



HT series

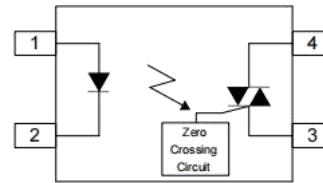
**Photocoupler
Product Date Sheet**

HTM-304X_306X_308X

Spec No:HT-PC-304X_306X_308X-P-017-A1
Effective Date:02/23/2024

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■ Package



Pin Configuration

- 1 Anode
- 2 Cathode
- 3 Terminal
- 4 Terminal

■ Description

The HTM-304X_306X_308X series devices are optocouplers composed of a GaAs infrared light emitting diode and a single-crystal silicon chip Zero-cross photoelectric bidirectional thyristor.

■ Features

- Peak breakdown voltage
 - HTM-304X: Min.400V
 - HTM-306X: Min.600V
 - HTM-308X: Min.800V
- 4pin zero-cross optoisolators triac driver outp
- High input-output isolation voltage(Viso = 3,750Vrms)
- Operating Temperature: -40°C~110°C
- Safety approval
 - UL approved
 - VDE approved
 - CQC approved
- RoHS
- MSL1

■ Applications

- Lighting Control
- AC Motor Starter
- Static power switc
- Temperature Controls



■ Product Nomenclature

The product name is designated as below:

HT M-30XX -X - X X-XX
① ② ③ ④

Designation:

HT =Hengtuo Technology Co.,LTD.

M= Packaging form

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

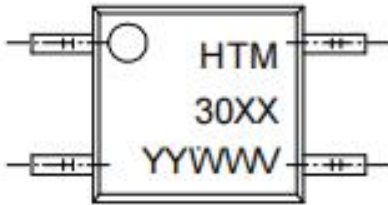
① = Tape and Reel option(TP,TP1,NONE)

② = VDE order option(fixed code "V")

③ = Halogen free option(fixed code"G")

④ = Customer code

■ Marking Information



Designation:

HT denotes Hengtuo
M Packaging form
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	100	°C	
Output	Off-State Output Terminal Voltage	V_{DRM}	HTM-304X	400	V
			HTM-306X	600	
			HTM-308X	800	
	On state RMS current	$I_{T(RMS)}$	100	mA(RMS)	
	Peak Repetitive Surge Current (PW=1ms, 120 pps)	I_{TSM}	1	A	
Junction Temperature	T_J	125	°C		
Collector Power Dissipation	P_C	300	mW		
Operating temperature range		T_{op}	- 40 ~ 110	° C	
Storage temperature range		T_{stg}	- 55 ~ 125	° C	
Total Power consumption		$P_{(W)}$	330	mW	
Isolation Voltage ⁽¹⁾		V_{ISO}	5000	Vrms	
Soldering Temperature ⁽²⁾		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	1.6	V	$I_F=10mA$
	Reverse Current	I_R	-	-	5	μA	$V_R=6V$
Output	Peak Blocking Current, Either Directiot ⁽¹⁾	I_{DRM}	-	10	100	nA	$V_{DRM} = \text{Rated } V_{DRM}$
	Inhibit Voltage (MT1-MT2 voltage above which device will not trigger)	V_{INH}	-	-	20	-	$I_F = \text{Rated } I_F$
	Peak On-State Voltage, Either Dire	V_{TM}	-	-	3	V	$I_{TM}=100mA$ Peak
	Critical rate of Rise of Off-State Voltage ⁽²⁾	dv/dt	1000	-	-	V/ μs	$V_{in}=240Vrms$
Transfer Characteristics	Led Trigger Current, Current Required to Latch Output, Either Direction	HTM-3041 HTM-3061 HTM-3081	-	-	15	mA	Main Terminal Voltage = 3V
		HTM-3041 HTM-3062 HTM-3082	-	-	10		
		HTM-3041 HTM-3063 HTM-3083	-	-	5		
	Holding Current, Either Direction	I_H	-	280	-	μA	
ZERO CROSSING	Leakage in Inhibited State	I_{DRM2}	-	-	500	μA	$I_F = \text{Rated } I_{FT}, \text{ Rated } V_{DRM}, \text{ Off State}$

(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

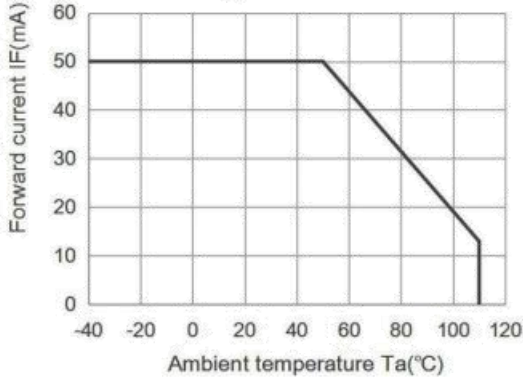


Fig.2 On-state current I_{TM} (A) vs Ambient temperature

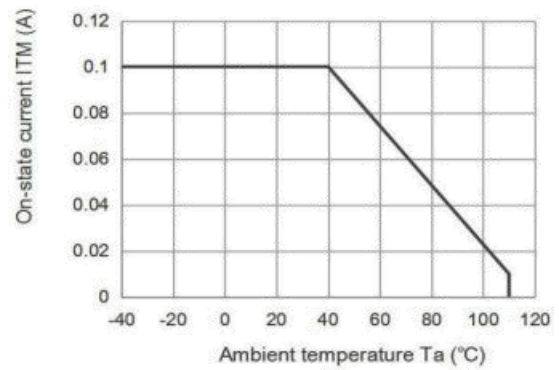


Fig.3 Minimum Trigger Current vs Ambient temperature

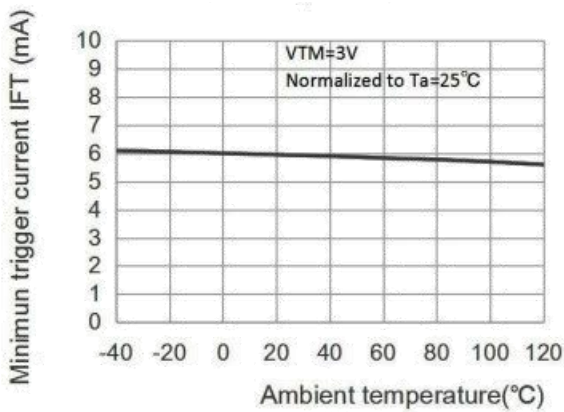


Fig.4 Forward current vs Forward Voltage

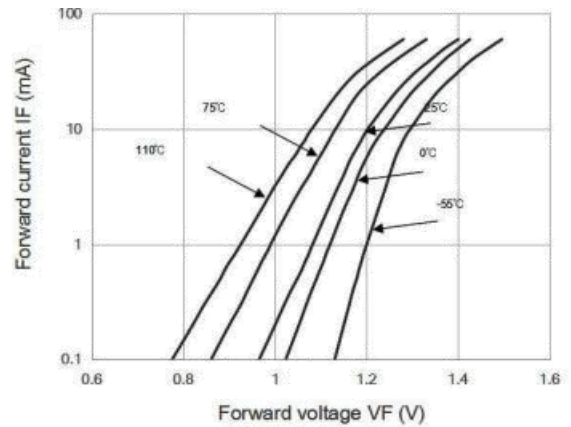


Fig.5 On-state voltage vs Ambient temperature

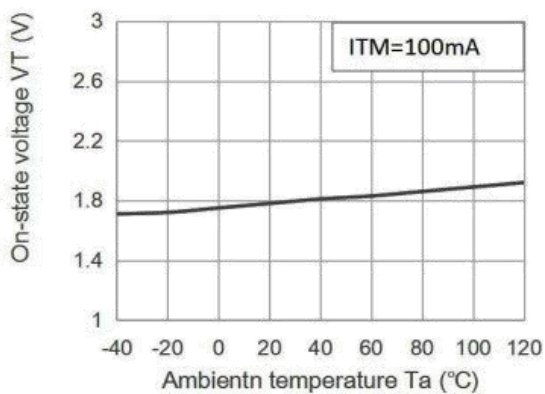


Fig.6 Holding current I_H (mA) vs Ambient temperature

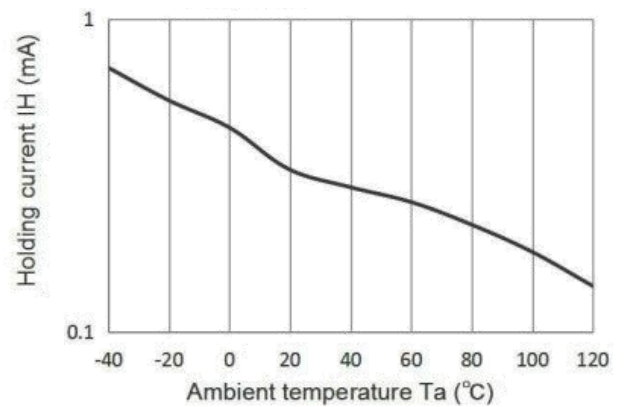


Fig.7 Repetitive peak off-state current vs Temperature

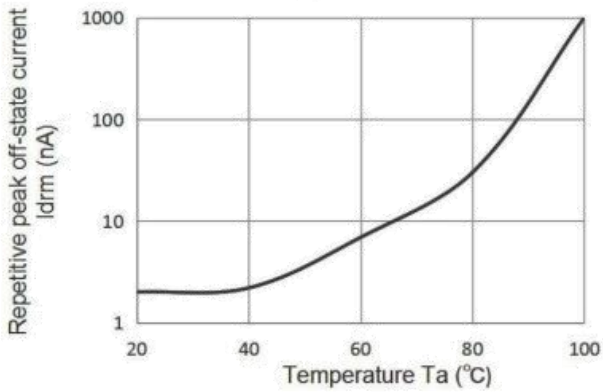


Fig.8 On-state current vs On-state voltage

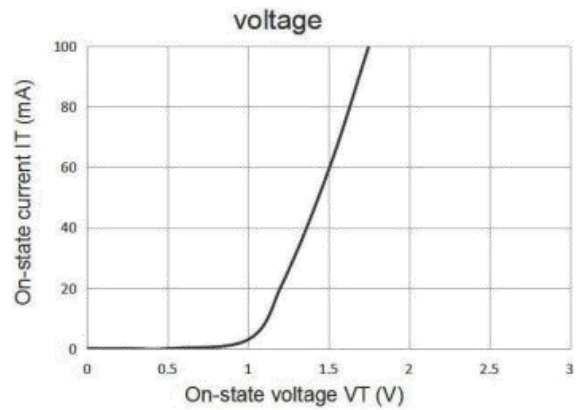


Fig.9 Basic Operation Circuit Medium/High Power Triac Drive Circuit

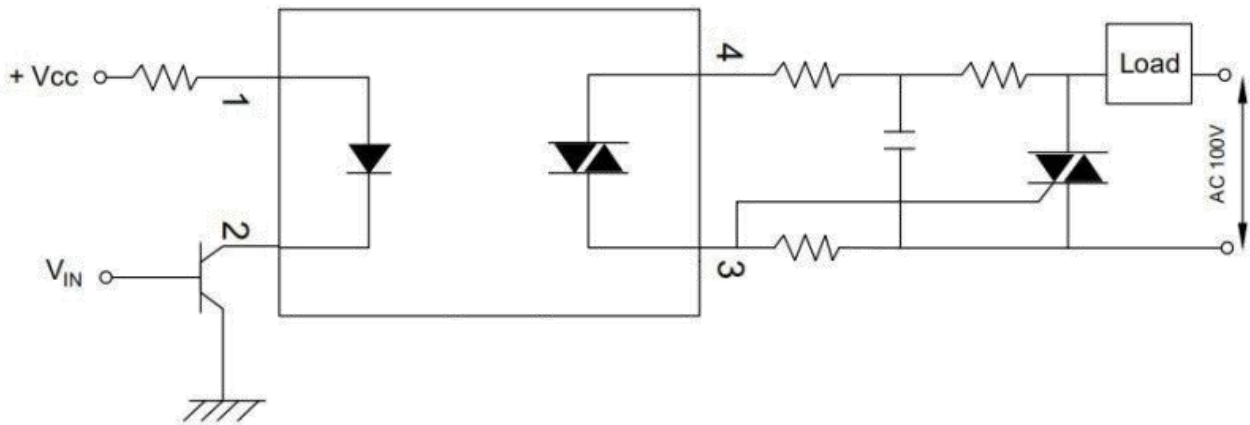
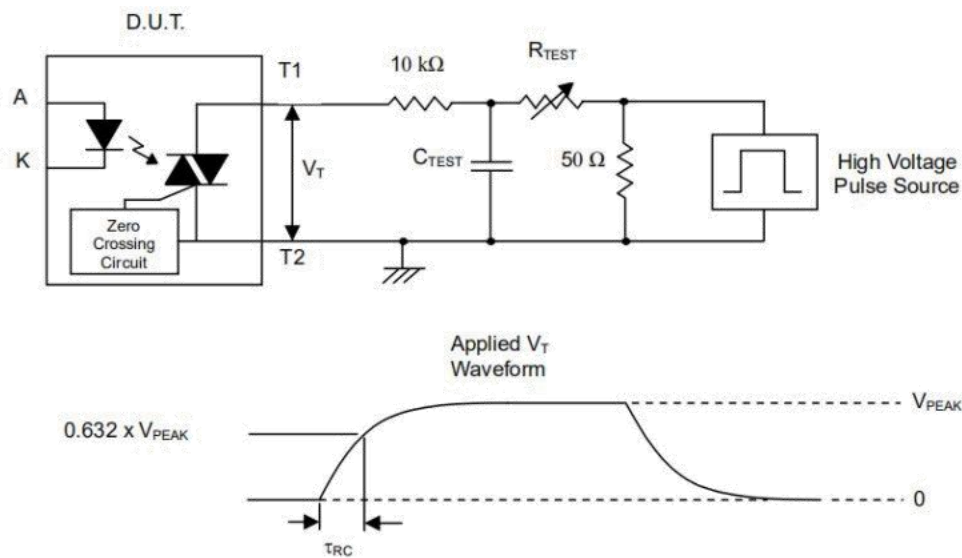
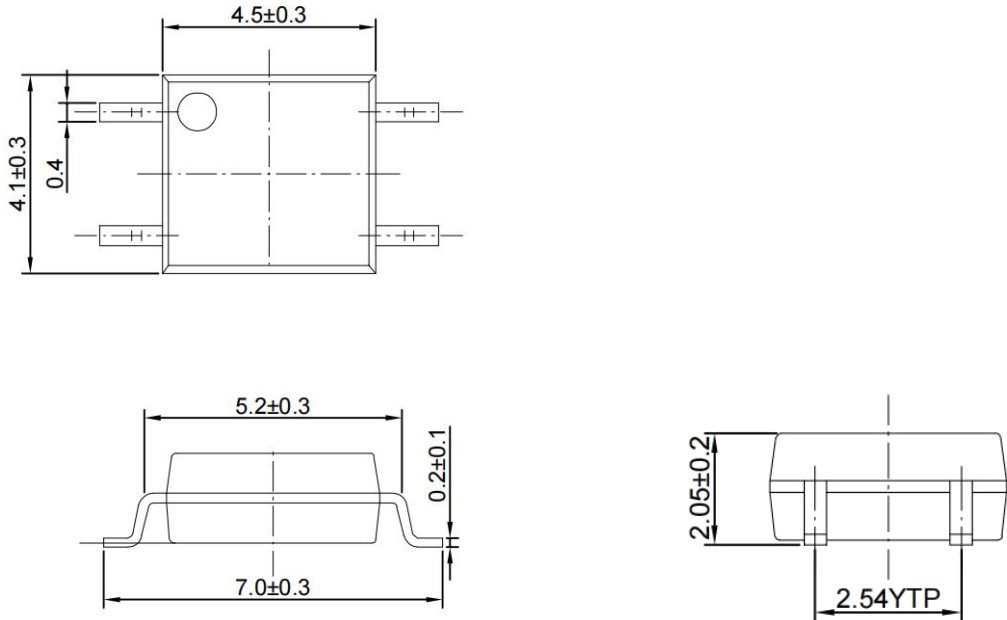


Fig10. Static dv/dt Test Circuit & Wave form



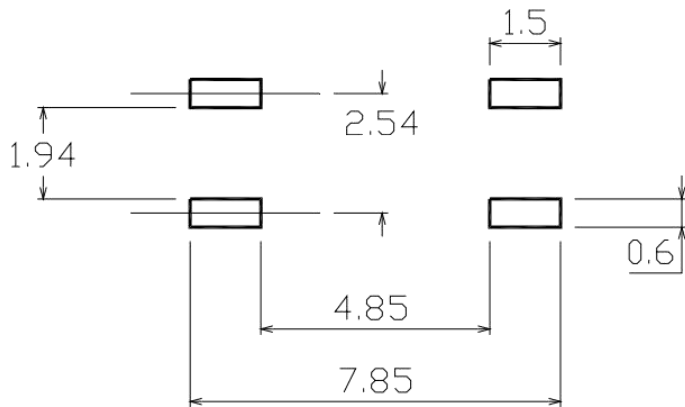


■ Outline Dimension



Unit: mm
Tolerance: ± 0.1 mm

■ Recommended solder pad Design



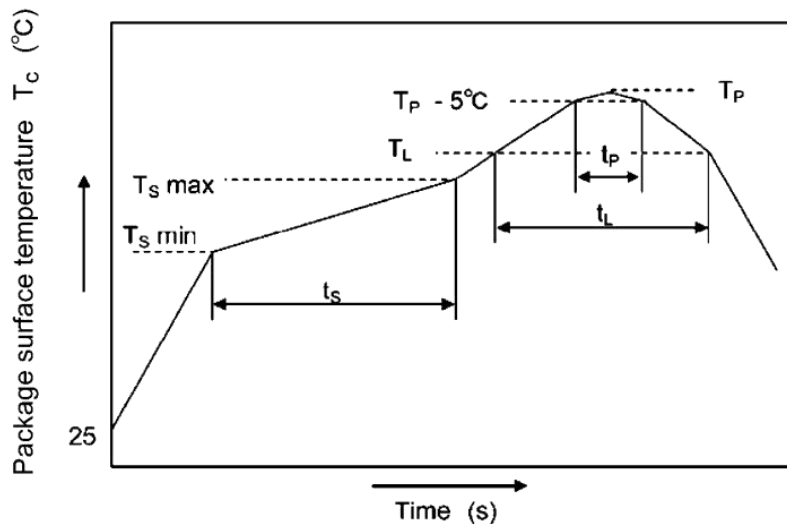
Unit: mm
Tolerance: ± 0.1 mm

■ 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 (tL)	60-150 sec
Peak Temperature (TP)	260°C
-Time (TP-5°C 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)

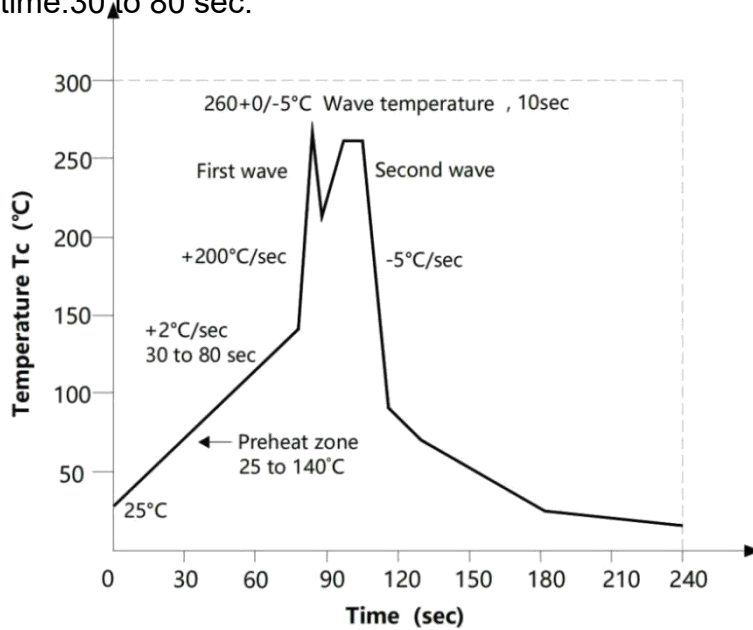
One time soldering is recommended within the condition.

Temperature: $260 \pm 0/-5^\circ\text{C}$.

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: $380 \pm 0/-5^\circ\text{C}$

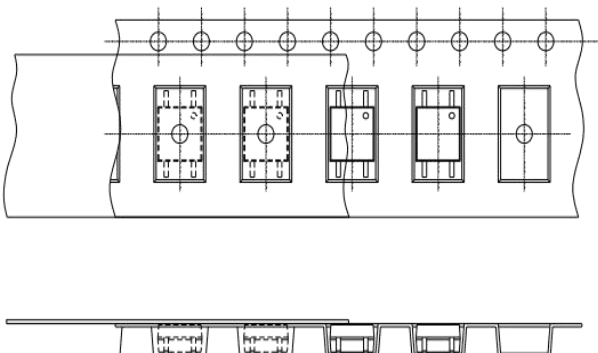
Time: 3 sec max.

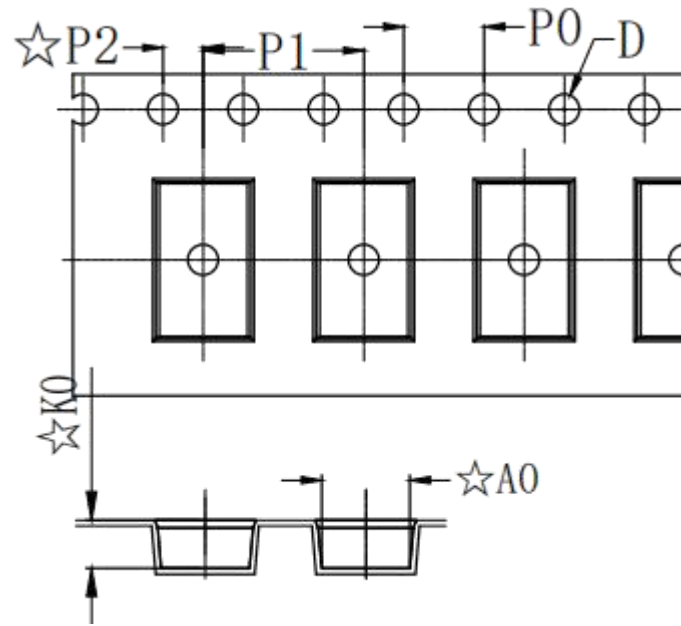
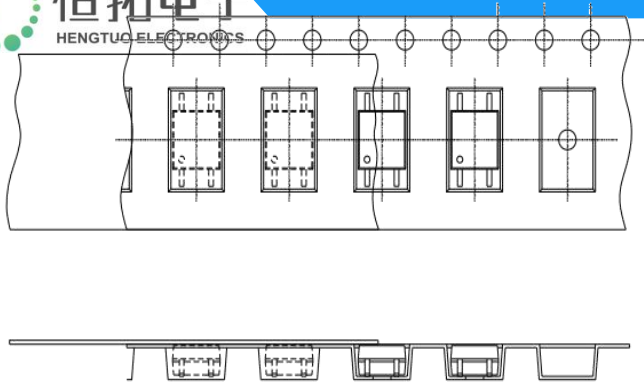
■ Packing

Tape and Reel

Option TP1:

Option TP:





Deminsion/mm	W	E	F	P0	P1	P2
Packagetype:S	16 ± 0.2	1.75 ± 0.1	7.5 ± 0.1	4 ± 0.1	8 ± 0.1	2 ± 0.1

Deminsion/mm	A0	B0	D0	D1	K0
Packagetype:S	4.4 ± 0.1	7.6 ± 0.1	1.5 ± 0.1	1.5 ± 0.1	2.4 ± 0.1

Packagetype:S	Reel	Inner carton	Outer carton
QTY/PCS	3K/reel	6K(2 reels)	60K



■ 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