

恒拓电子
HENG TUO ELECTRONICS

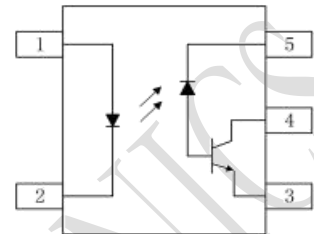


HT series

**Photo Coupler
Product Specification**

HTM-5XX

■ Package



Pin Configuration

1. Anode
2. Cathode
3. GND
4. VO
5. VCC

■ Description

The optocoupler HTM-6XX consist of a 850 nm AlGaAS LED, optically coupled to a very high speed integrated photo-detector logic gate with a strobable output. The devices are packaged in a 5-pin small outline package which conforms to the standard footprint.

■ Features

- High speed - 1 MBit/S
- High input-output isolation voltage($V_{iso} = 3,750V_{rms}$)
- TTL Compatibl
- Open-Collector Output
- Safety approval
 - UL approved
 - VDE approved
 - CQC approved

■ Applications

- Output interface to CMOS-LSTTL-TTL
- Telecommunication equipment
- Power transistor isolation in motor drives
- Replacement for low speed phototransistor photocouplers

■ Product Nomenclature

The product name is designated as below:

HTM-5XX - X X - X X - XX
① ② ③ ④ ⑤

Designation:

HT =Hengtuo Technology Co.,LTD.

M= Packaging form

5XX=Product series(501/511...)

- ① = Lead form, NONE:SMD ₍₁₎
- ② = Tape and Reel option(TP,TP1,NONE) ₍₂₎
- ③ = VDE order option(fixed code "V")
- ④ = Halogen free option(fixed code"G")
- ⑤ = Customer code

Notes

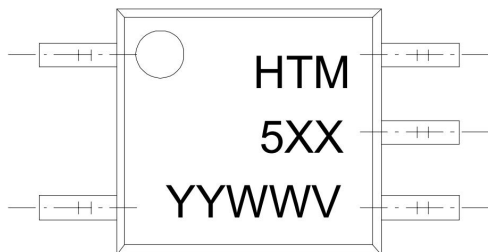
1. Lead form option:

Symbol	Description
NONE	SOP4

2. Tape and Reel option:

Symbol	Description
TP&TP1	Tape and Reel Type

■ Marking Information



Designation:

HT denotes Hengtuo
M Packaging form
5XX denotes Device
YY denotes year code
WW denotes week code
V denotes VDE

■ Maximum

Parameter		Symbol	Values	Unit
Input	Forward current	I_F	25	mA
	Peak forward current (50% duty, 1ms P.W)	IFP	50	mA
	Reverse Input	VR	5	V
	Peak transient current ($\leq 1 \mu s$ P.W, 300pps)	I_{Ftrans}	1	A
	Input Power Dissipation	PIN	45	mW
Output	Power dissipation	PO	100	mW
	Average Output current	IO(AVG)	8	mA
	Peak Output current	IO(PK)	16	mA
	Output voltage	VO	-0.5 to 20	V
	Supply voltage	VCC	-0.5 to 30	V
Operating temperature range		T_{op}	- 40 ~ 100	° C
Storage temperature range		T_{stg}	- 55 ~ 125	° C
Total Power consumption		$P_{(W)}$	330	mW
Soldering Temperature		T_{SOL}	260	° C

■ Electronic Optical Characteristics(TA = 25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditon
Input	Forward Voltage	V _F	-	1.45	1.7	V	I _F =16mA
	Reverse Breakdown Voltage	V _R	5	20	-	V	I _R =10μA
	Diode Temperature Coefficient	ΔV _F /ΔT _A	-	-1.6	-	mV/°C	I _F =16mA
Output	High Level Supply Current	I _{CCH}	-	-	1	μA	V _{CC} =15V I _F =0mA V _O =Open
			-	-	2	μA	I _F =0mA, V _O =Open, V _{CC} =15V
	Low Level Supply Current	I _{CCL}	-	120	800	uA	V _{CC} =15V I _F =16mA V _O =Open
	HIGH Level Output	I _{OH}	-	0.001	0.5	uA	I _F =0mA, V _O =V _{CC} =5.5V, T _A =25°C
			-	0.001	1		I _F =0mA, V _O =V _{CC} =15V, T _A =25°C
			-	-	50		I _F =0mA, V _O =V _{CC} =15V
Transfer Charact eristics	Current Transfer Ratio	CTR	20	-	50	%	I _F =16mA , V _O =0.4V, V _{CC} =4.5V, T _A =25° C
			15	-	-		I _F =16mA , V _O =0.5V, V _{CC} =4.5V
	Logic Low Output Voltage	V _{OL}	-	-	0.4	V	I _F =16mA , I _O = 3mA, V _{CC} =4.5V, TA=25° C
			-	-	0.5		I _F =16mA , I _O = 2.4mA, V _{CC} =4.5V
Isolation Voltage		V _{ISO}	3750	-	-	V _{RMS}	R.H<50% T _A =25°C I _{I-O} ≤50μA

Resistance (Input)	R_{I-O}	-	10^{12}	-	Ω	$V_{I-O}=500V$
Capacitance (Input to Output)	C_{I-O}	-	0.6	-	pF	f=1MHz

■ Switching Specification

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditon
Propagation Delay Time to Output HIGH Level		T_{PLH}	-	150	800	ns	$I_F=16mA$ $R_L=1.9k\Omega$ $T_A=25^\circ C$
			-	-	800		$I_F=16mA$ $R_L=1.9k\Omega$ $T_A=0-100^\circ C$
Propagation Delay Time to Output Low Leve		T_{PHL}	-	200	800	ns	$I_F=16mA$ $R_L=1.9k\Omega$ $T_A=25^\circ C$
			-	-	800		$I_F=16mA$ $R_L=1.9k\Omega$ $T_A=0-100^\circ C$
Common Mode Transient Immunity (at Logic High)	M501	$ CM_H $	5000	-	-	V/us	$T_A=25^\circ C, I_F=0mA$ $ V_{CM} =10V(Peak)$ $C_L=15pF, R_L=1.9K\Omega$
	M511		15000	-	-		$T_A=25^\circ C, I_F=0mA$ $ V_{CM} =1500V(Peak)$ $C_L=15pF, R_L=1.9K\Omega$
Common Mode Transient Immunity (at Logic Low	M501	$ CM_L $	5000	-	-	V/us	$T_A=25^\circ C, I_F=16mA$ $ V_{CM} =10V(Peak)$ $C_L=15pF, R_L=1.9K\Omega$
	M511		15000	-	-		$T_A=25^\circ C, I_F=16mA$ $ V_{CM} =1500V(Peak)$ $C_L=15pF, R_L=1.9K\Omega$

■ Characteristics Curves

Fig.1 Normalized CTR vs. Input current

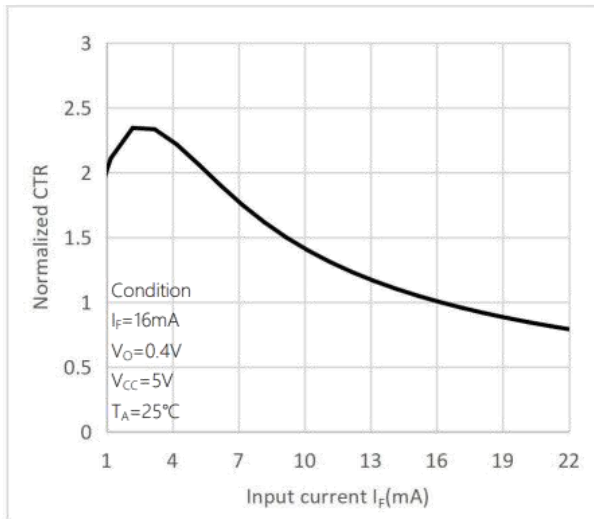


Fig.2 Normalized CTR vs. Ambient temperature

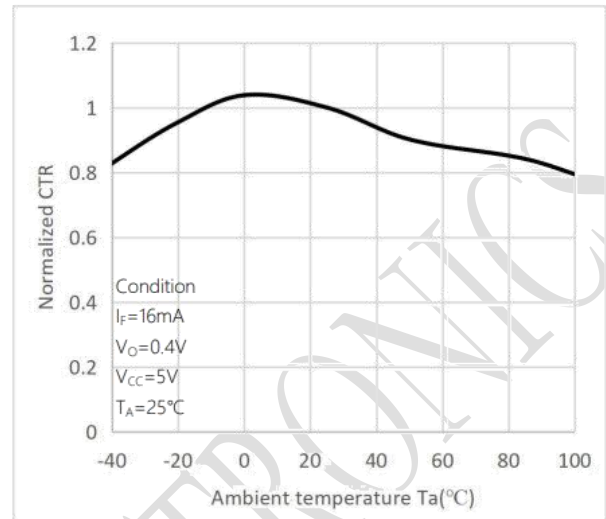


Fig.3 Output current vs. Output voltage

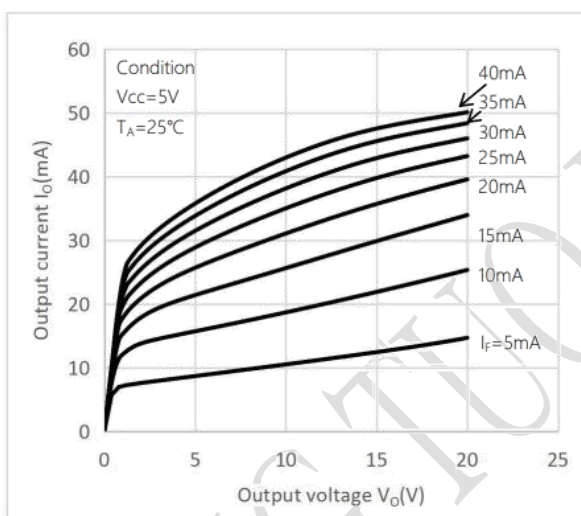


Fig.4 High level output current vs. Ambient temperature

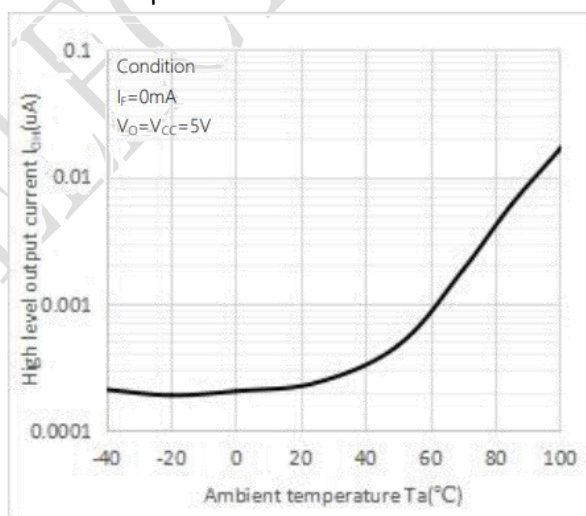


Fig.5 Propagation delay vs. Ambient Temperature

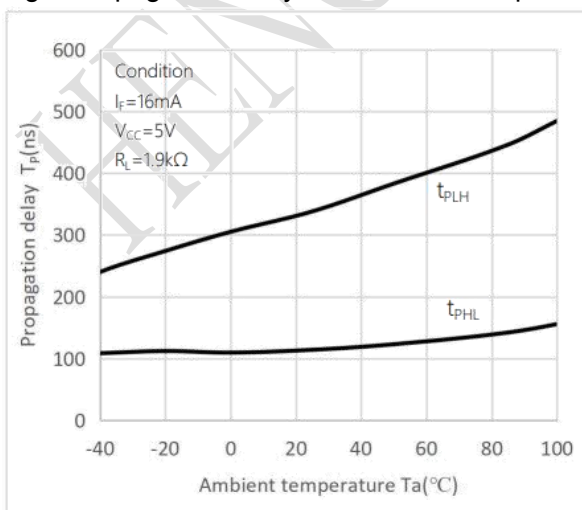
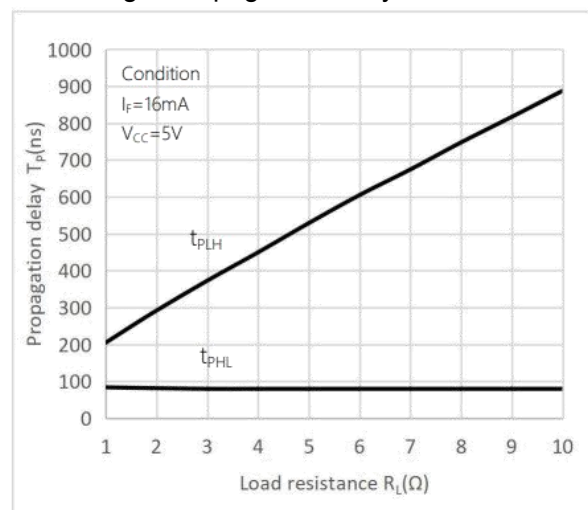
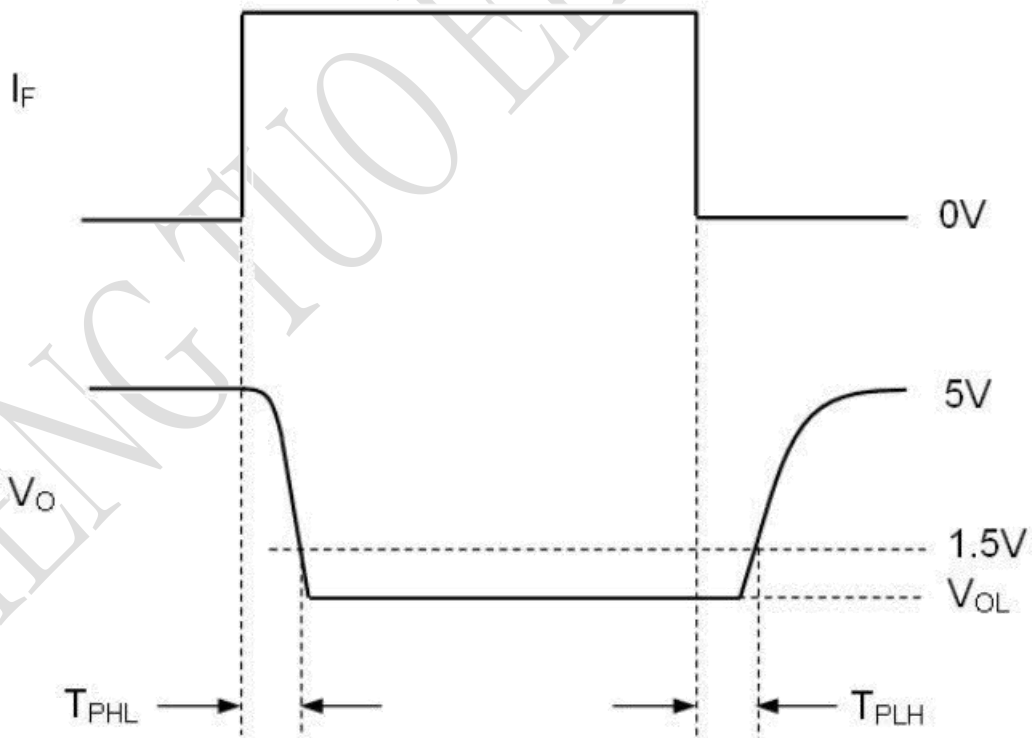
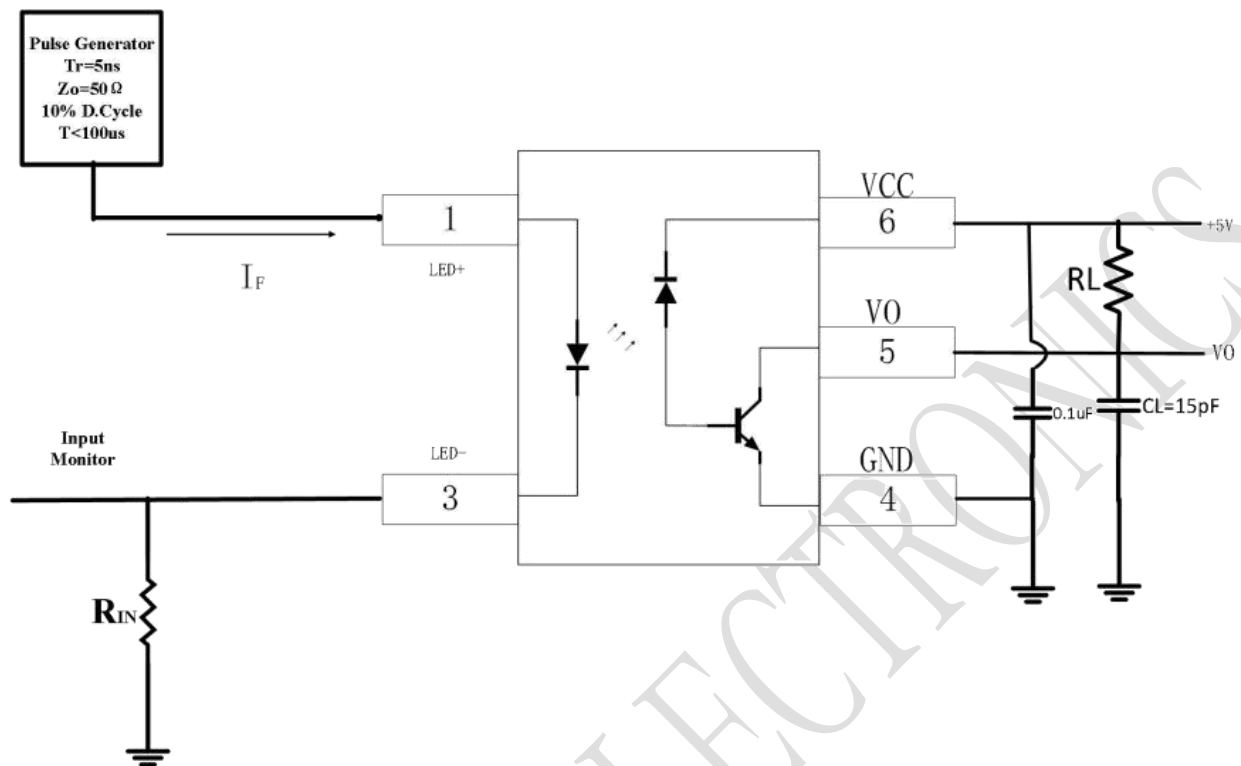


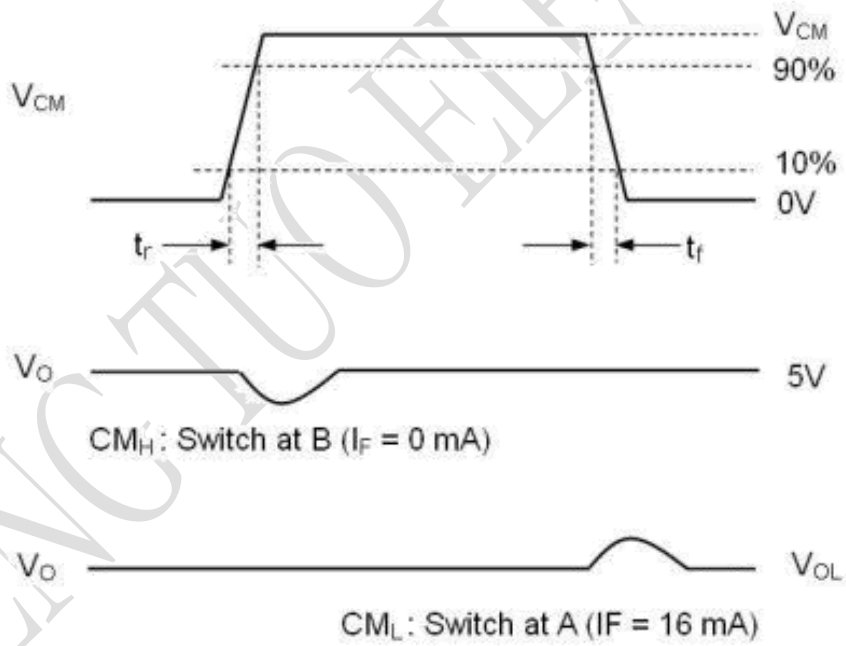
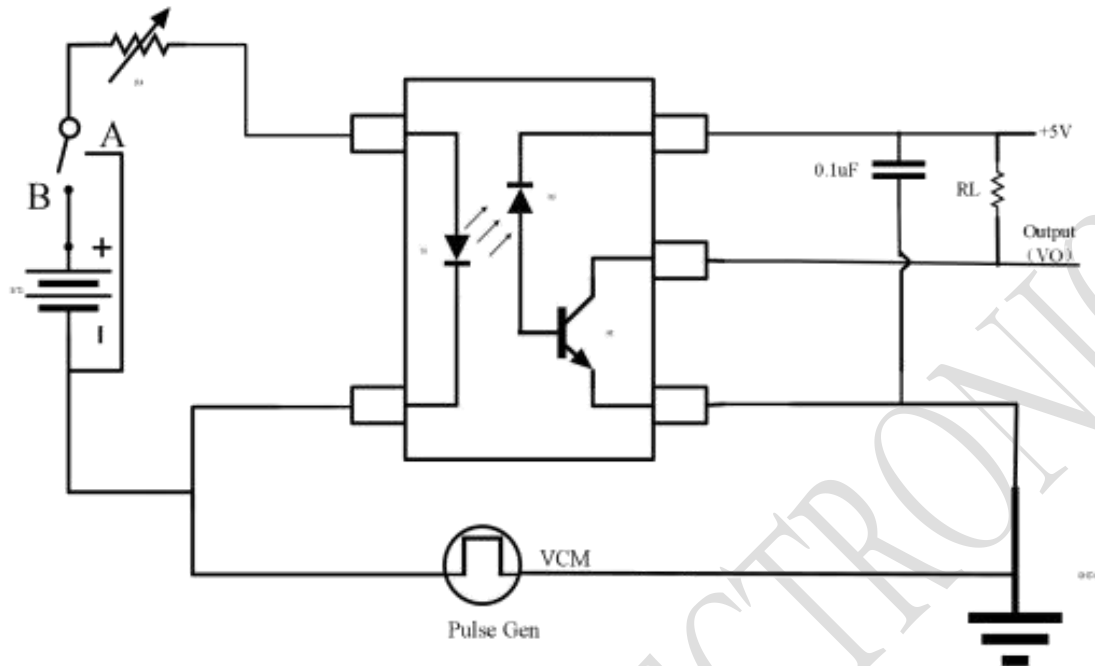
Fig.6 Propagation delay vs. Load resistance



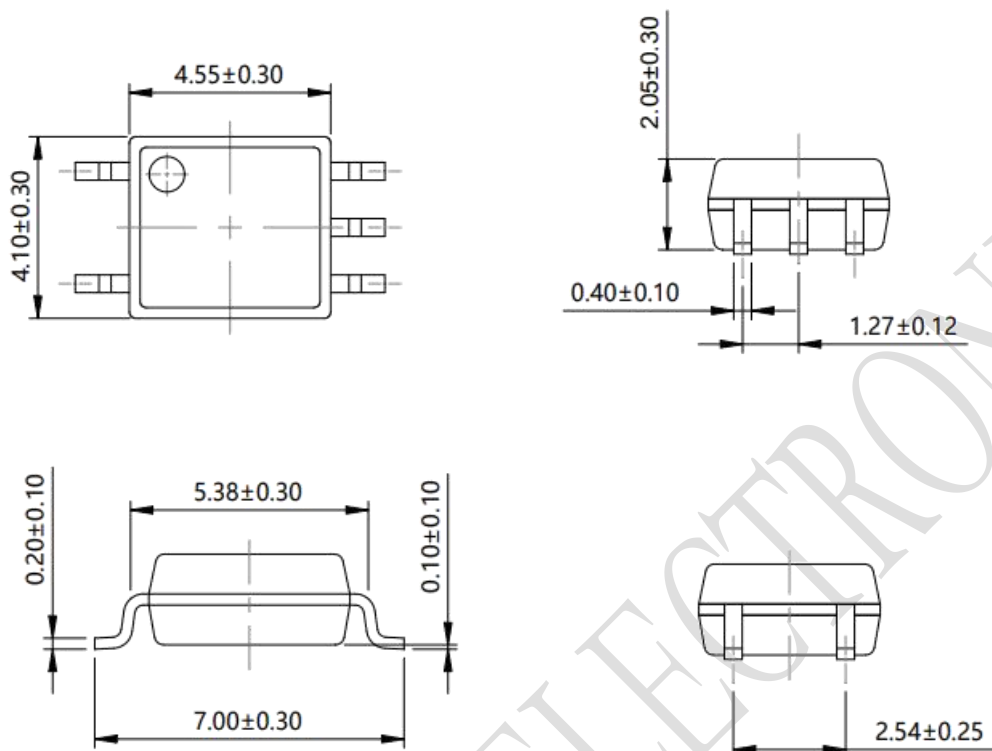
Propagation Delay Time Test Circuit



Test Circuit for Common Mode Transient Immunity



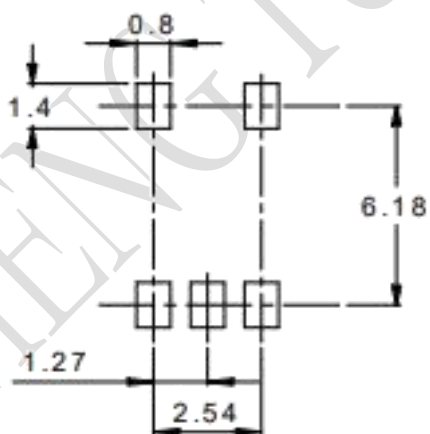
■ Outline Dimension



Unit: mm

Tolerance: ± 0.1 mm

■ Recommended solder pad Design



Unit: mm

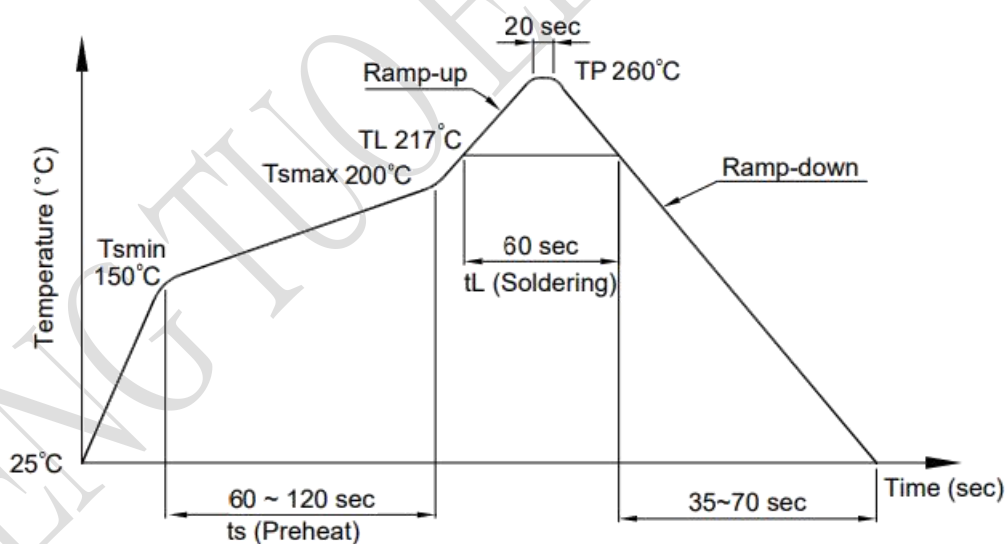
Tolerance: ± 0.1 mm

■ Temperature Profile Of Soldering

1. IR Reflow soldering

(JEDEC-STD-020D compliant)

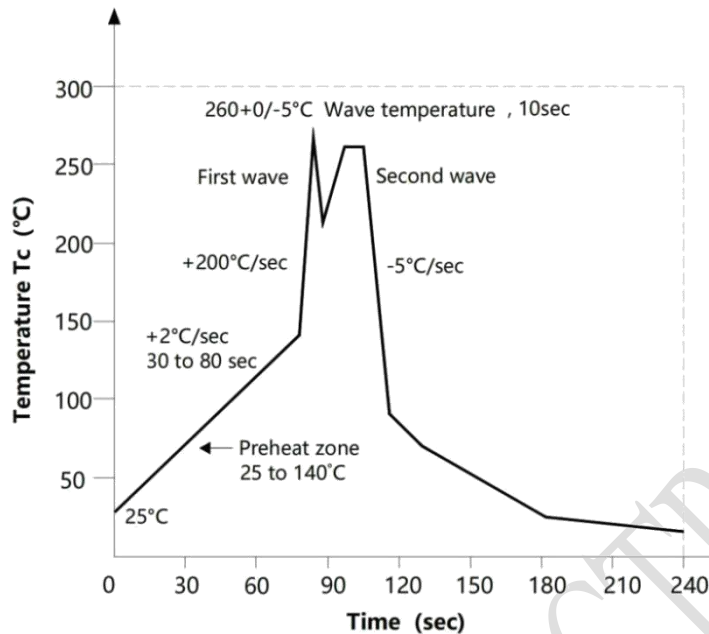
Profile item	Conditon
Preheat	150°C
-Temperature Min (TSmin)	200°C
-Temperature Max (TSmax)	90 ± 30 sec
-Time (min to max) (ts)	
Soldering zone	217°C
-Temperature (TL)	60 sec
-Time (tL)	
Peak Temperature (TP)	260°C
Ramp-up rate	3°C / sec max
Ramp-down rate	3~6°C/ sec



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

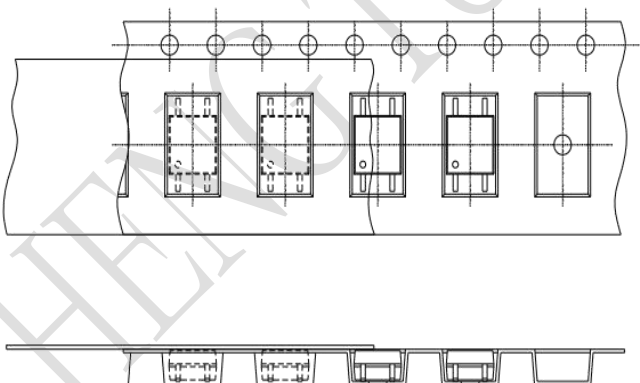
Allow single lead soldering in every single process. One time soldering is recommended.

Temperature: $380 \pm 5^\circ\text{C}$

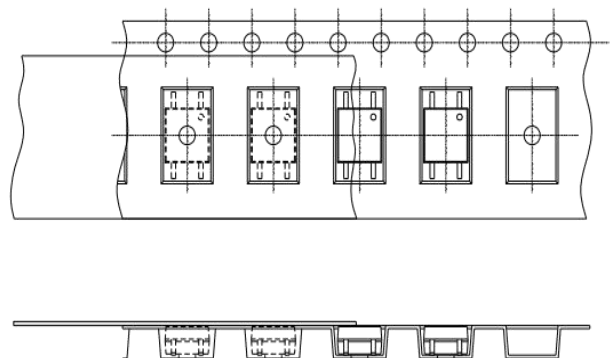
Time: 3 sec max.

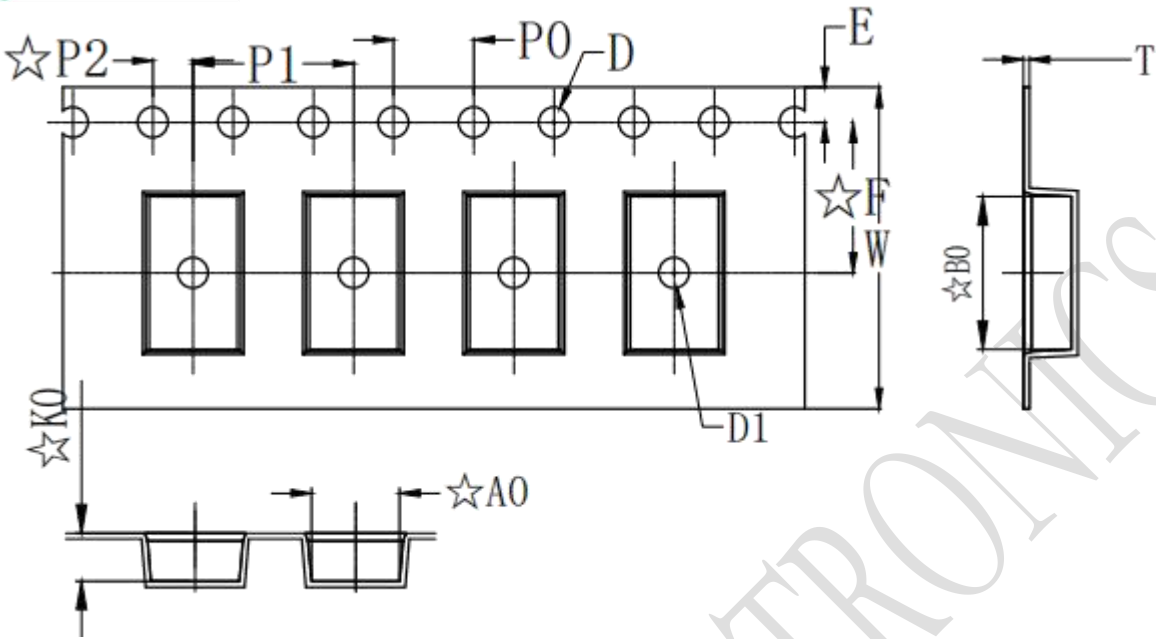
■ Packing Tape and Reel

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	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.
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- When requiring a device for any "specific" application, please contact our sales in advice.
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