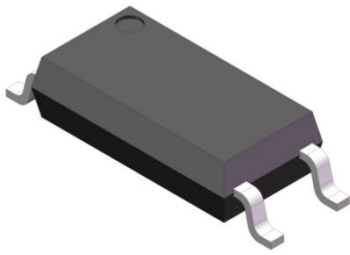
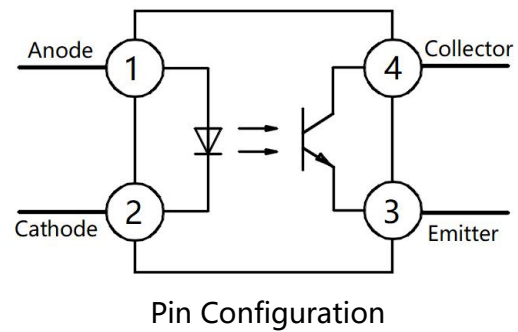


Product packaging logic diagram

LSOP4

**Features**

- Current transfer ratio
(CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$) / (CTR: 63~320% at $I_F = 10\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output ($V_{iso} = 5000\text{V}_{rms}$)
- Collector - emitter breakdown voltage $BV_{CEO} \geq 80\text{V}$
- Operating Temperature: $-55^\circ\text{C} \sim 110^\circ\text{C}$
- Environmentally friendly products, compliant with CQC, UL, and VDE requirements

Mechanical Data

- Case: LSOP4
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solder ability-per MIL-STD-202, Method 208

Applications

- Industrial automation equipment (PLC module, sensor interface)
- Measurement instrument signal isolation
- Design and application of smart meters and switching power supplies
- Photo voltaic inverters, energy storage system applications
- Main control circuit for household appliances (air conditioning, refrigerator, water heater);



Ordering Information

<u>XL</u>	<u>101</u>	<u>X</u>	<u>(G)</u>
①	②	③	④

- ① Brand(XL)
② Product series(101)
③ CTR Bank(0、2、3、4、7、8、9)
④ Halogen option(None :Halogen free;G: Halogen free)

Part Number	Package	Shipping Quantity	Marking Code
XL101X	LSOP4	3000pcs / Reel	XL101X
XL101X	LSOP4	3000pcs / Reel	XL101X

Notes 1: X denotes CTR Rank : 0, 2, 3, 4, 7, 8, 9.

Marking Information

- " XL" denotes brand.
- " X" denotes CTR Rank : 0、2、3、4、7、8、9
- " Y" denotes Year : A(2024), B(2025), C(2026)
- " WW" denotes Week' s number .
- " N" denotes the day of Week.

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Input	Forward Current	IF	60	mA
	Peak Forward Current *1	IFM	1.5	A
	Reverse Voltage	VR	6	V
	Power Dissipation	PD	100	mW
Output	Collector Power Dissipation	PC	150	mW
	Collector Current	IC	50	mA
	Collector-Emitter Voltage	VCEO	80	V
	Emitter-Collector Voltage	VECO	7	V

Thermal Characteristics

Parameter	Symbol	Value	Unit
Total Power Dissipation	PTOT	250	mW
Isolation Voltage *2	VISO	5000	Vrms
Operating Temperature	TOPR	-55 ~ +110	°C
Storage Temperature Range	TSTG	-55 ~ +125	°C
Soldering Temperature *3	TSOL	260	°C

Notes:

1. Pulse width $\leq 1\mu\text{s}$, Duty ratio: 0.001
2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	VF	IF = 50mA	-	1.3	1.5	V
	Reverse Current	IR	VR = 6V	-	-	10	μA
	Input Capacitance	Cin	VR = 0V, f = 1kHz	-	50	-	pF
Output	Collector-Emitter Dark Current	ICEO	VCE = 20V, IF = 0	-	-	100	nA
	Collector-Emitter Breakdown Voltage	BVCEO	IC = 0.1mA, IF = 0	80	-	-	V
	Emitter-Collector Breakdown Voltage	BVECO	IE = 0.1mA, IF = 0	7	-	-	V
Transfer Characteristics	Current Transfer Ratio	CTR	IF = 5 mA, VCE = 5V	50	-	600	%
			IF = 10 mA, VCE = 5V	63	-	320	%
			IF = 1 mA, VCE = 5V	22	-	-	%
	Collector-Emitter Saturation Voltage	VCE(sat)	IF = 10mA, IC = 1mA	-	0.1	0.3	V
	Isolation Resistance	RIO	VIO = 500Vdc 40~60% R.H.	1×10^{12}	-	-	Ω
	Floating Capacitance	CIO	VIO = 0, f = 1MHz	-	-	1.0	pF
	Turn On Time	Ton	VCE=5V IC=5mA RL= 100 Ω	1	4	19	μs
	Turn Off Time	Toff		1	3	19	
	Rise Time	tr		-	-	18	
	Fall Time	Tf		-	-	18	

Rank Table of Current Transfer Ratio CTR

Rank Mark	Min. (%)	Max. (%)	Condition
BL1010	50	600	IF=5mA ,VCE=5V
BL1017	80	160	
BL1018	130	260	
BL1019	200	400	
BL1012	63	125	IF=10mA ,VCE=5V
BL1013	100	200	
BL1014	160	320	
BL1012	22	-	IF=1mA ,VCE=5V
BL1013	34	-	
BL1014	56	-	

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Fig.1 Allowable Forward Current vs. Ambient Temperature

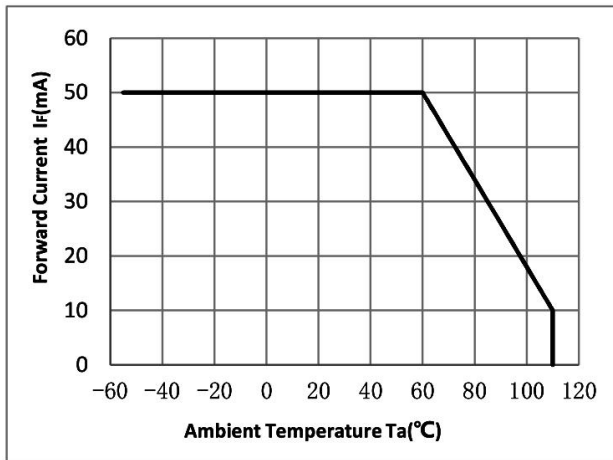


Fig.2 Allowable collector power dissipation vs. Ambient Temperature ($^\circ\text{C}$)

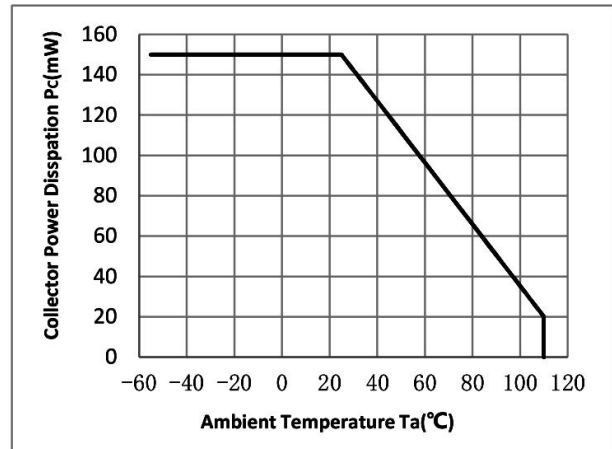


Fig.3 Relative Current Transfer Ratio vs. Forward Current

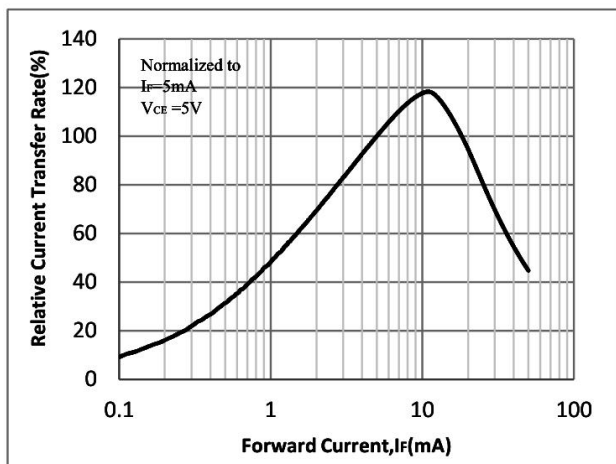


Fig.4 Forward Current vs. Forward Voltage

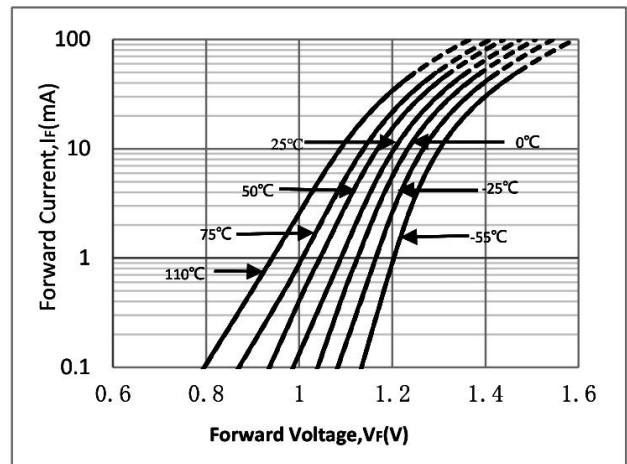


Fig.5 Collector Current vs. Collector-emitter Voltage

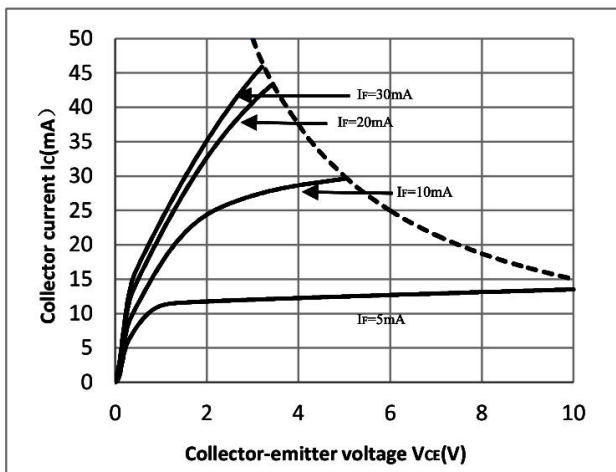
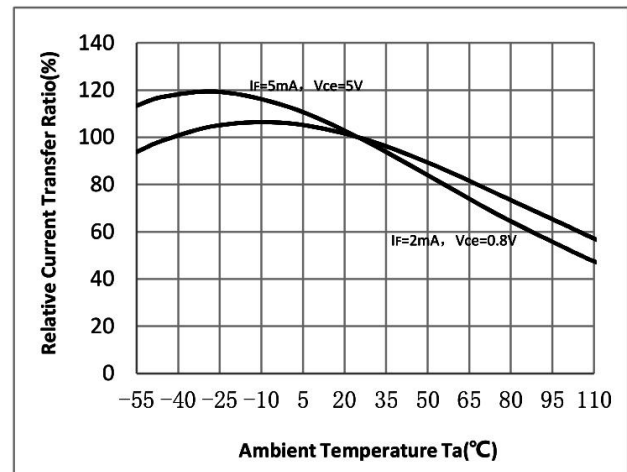


Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature



Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

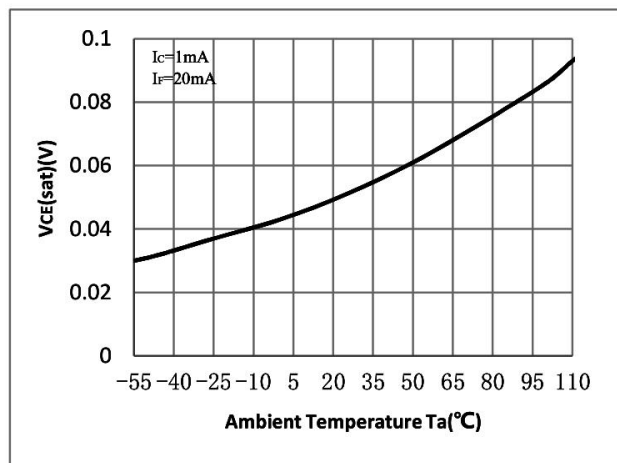


Fig.8 Collector Dark Current vs. Ambient Temperature

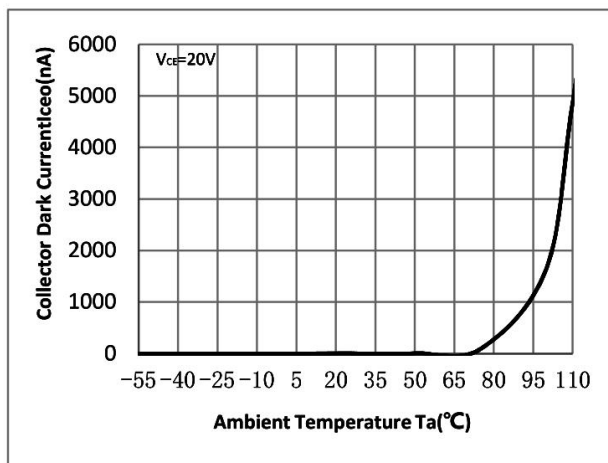


Fig.9 Response Time vs. Load Resistance

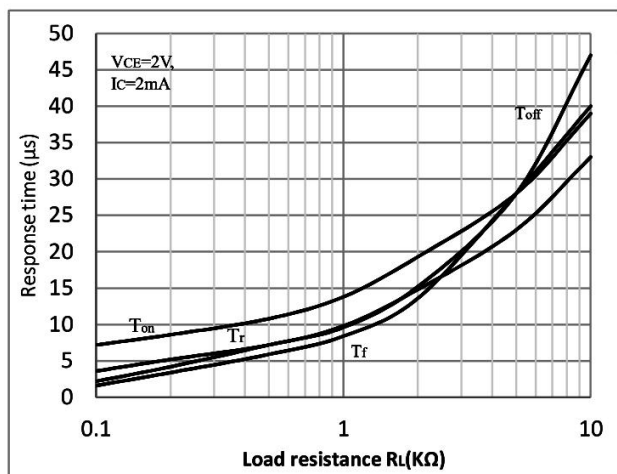


Fig.10 Frequency Response

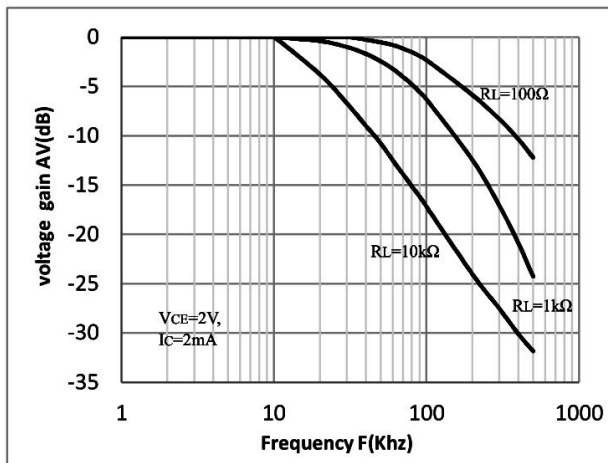


Fig.11 Collector-emitter Saturation Voltage vs. Forward Current

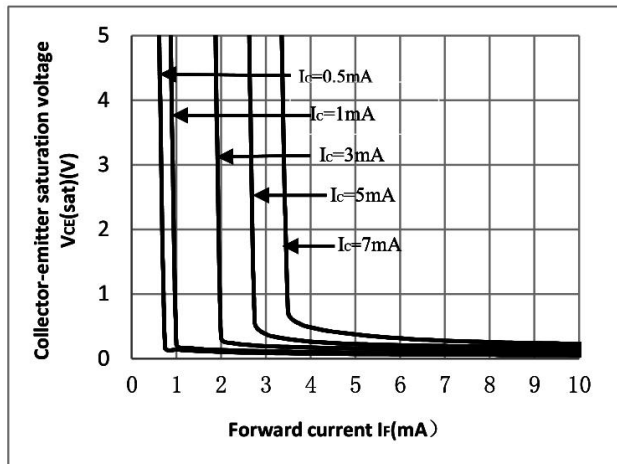
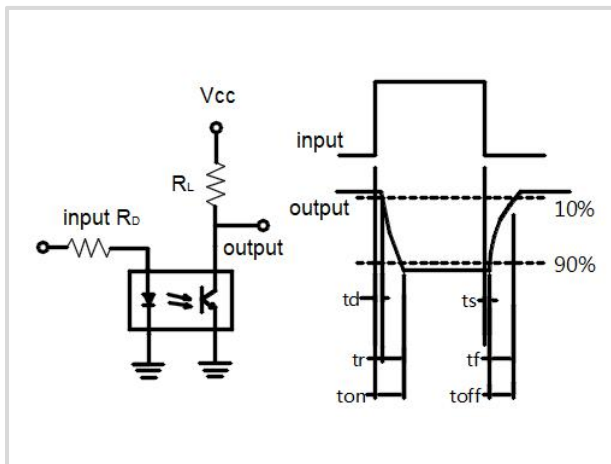
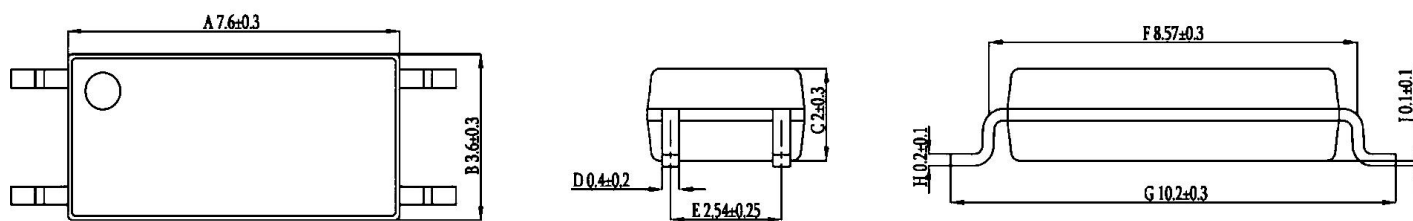


Fig.12 Switching Time Test Circuit & Waveforms

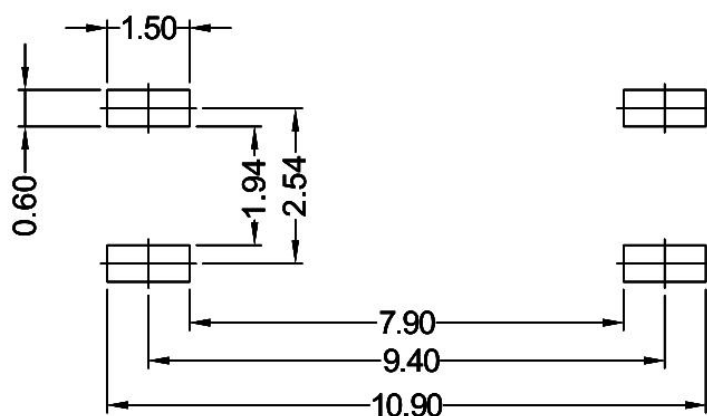


Package Outline Dimensions (unit: mm)

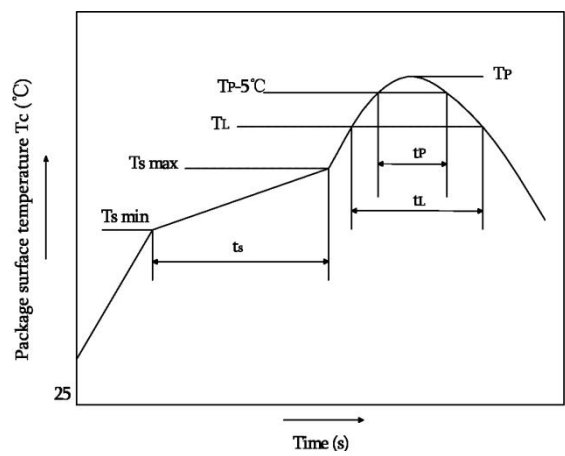
LSOP4



SOLDERING FOOTPRINT (unit: mm)



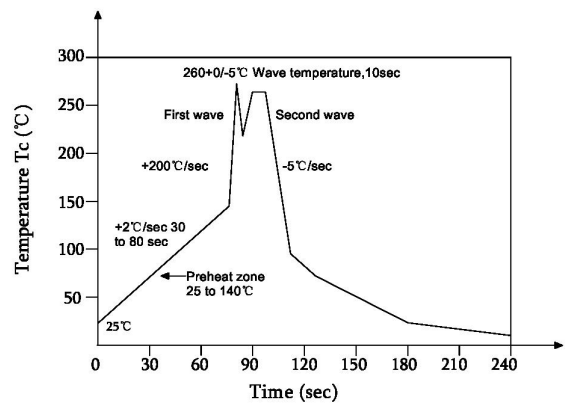
Reflow soldering



	Symbol	Min	Max	Unit
Preheat temperayure	Ts	150	200	°C
Preheat time	ts	60	120	s
Ramp-up ratea(TL to TP)			3	°C/s
Liquidus temperature	TL	217		°C
Time above TL	tL	60	150	s
Peak temperature	TP		260	°C
Time during which Tc is between (TP-5) and TP	tP		30	s
Ramp-down rate(TP to TL)			6	°C/s

Note:
Reflow soldering is recommended at the temperatures and times shown, no more than three times.

Wave soldering



Profile feature	
Average ramp-up rate	~200°C/s
Heating rate during preheat	1°C/s to 2°C/s typical; 4°C/s maximum
Final preheat temperature Ts	~130°C
Preheat time (25°C to Ts)	>60s
Peak temperature TP	260°C
Time within peak temperature tp	10s
Ramp-down rate	5°C/s maximum

Soldering with hand soldering iron

- A. Hand soldering iron is only used for product rework or sample testing.
- B. Hand soldering iron requirements:Temperature:360 °C+5°C within 3s.

Packing

Package Type	Packing Form	Quantity per Tube & Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
LSOP4	Reel($\phi 330$ mm)	3000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Guard band 200mm/min.

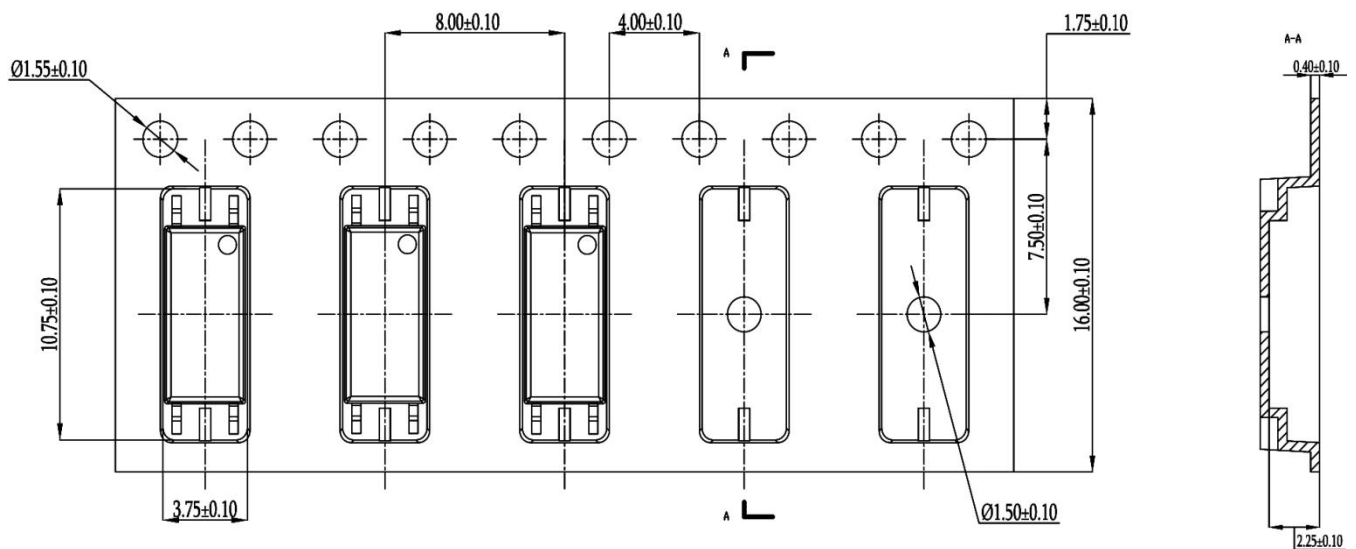
■ Summary table

■ LSOP4 (Reel)

Qty/reel: 3000pcs. Qty/box: 6000pcs.

Qty/ctn : 30000pcs.

Schematic: (unit:mm)



IMPORTANT NOTICE

XINGLIGHT reserves the right to make changes without further notice to any product herein to make corrections, modifications, improvements, or other changes. XINGLIGHT does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others.