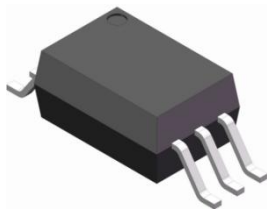
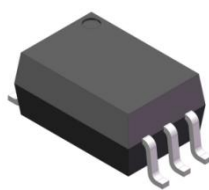


### XL501, XL511

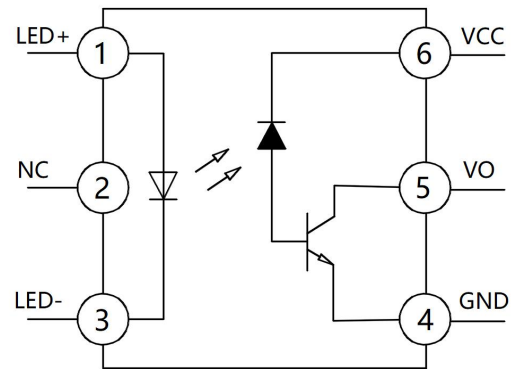
#### Product packaging logic diagram



SOP6-W



SOP6-P



Pin Configuration

#### Features

- Very high speed: 1MBit/s
- High isolation voltage between input and output ( $V_{iso} = 5000V_{rms}$ )
- Operating Temperature:  $-40^{\circ}C \sim 85^{\circ}C$
- Environmentally friendly products, compliant with CQC, UL, and VDE requirements

#### Mechanical Data

- Case: SOP6-W, SOP6-P
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solder ability-per MIL-STD-202, Method 208

#### Applications

- Widely used in communications and networking, industrial automation and control, motor drive and energy management, medical equipment, and automotive electronics fields.
- Communications and Networking: Fiber optic communication, data center.
- Industrial Automation and Control: PLC and frequency converter, Servo drive system, Industrial robot.
- Motor Drive and Energy Management: Motor control, Motor protection, Power electronics, Consumer Electronics.
- Emerging Technology Fields: Intelligent Transportation System, Medical equipment, Automatic production line.
- Automotive Electronics: In-vehicle Network System, Battery Management System (BMS), EV Charging Station.



### Ordering Information

XL    5XX    (X)    (X)    (X) -    (U)    (N)    (Y)  
 ①        ②        ③        ④        ⑤        ⑥        ⑦        ⑧

- ① Brand (XL)
- ② Product series (501, 511)
- ③ Package type(SOP6-P:P; SOP6-W:W)
- ④ Halogen option (None : Halogen free)
- ⑤ CTR Bank(A,B or None)
- ⑥ Lead frame (None: Copper)
- ⑦ Customer option 1 (0-9 or A- Z or none)
- ⑧ Customer option 2 (0-9 or A- Z or none)

Part Number	Package	Shipping Quantity	Marking Code
XL501P	SOP6-P	1000pcs / Tape & Reel	XL501

### Marking Information

- " XL" denotes brand
- " 5XX" denotes Product series: 01, 11.
- " Y" denotes Year : A(2024), B(2025), C(2026)
- " WW" denotes Week' s number
- " N" denotes the day of Week.



## XL501, XL511

### Maximum Ratings (@ T<sub>A</sub> = 25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Input	Forward Current	I <sub>F (avg)</sub>	25	mA
	Peak Forward Current (50% duty cycle, 1 ms p.w)	I <sub>F (pk)</sub>	50	mA
	Reverse Voltage	V <sub>R</sub>	5	V
	Transient Current Peak (≤1μs p.w, 300pps)	I <sub>F (trans)</sub>	1	A
	Power Dissipation	P <sub>I</sub>	45	mW
Output	Supply Voltage	V <sub>CC</sub>	-0.5 ~ 30	V
	Output Current	I <sub>O</sub>	8	mA
	Peak Output Current	I <sub>O (pk)</sub>	16	mA
	Collector Output	P <sub>O</sub>	100	mW
	Output Voltage	V <sub>O</sub>	-0.5 to 20	V
	Emitter-Base Reverse Voltage	V <sub>EBR</sub>	5	V
	Bass Current	I <sub>B</sub>	5	mA

### Thermal Characteristics

Parameter	Symbol	Value	Unit
Isolation Voltage *1	V <sub>ISO</sub>	5000	V <sub>rms</sub>
Operating Temperature	T <sub>OPR</sub>	-40 ~ +85	°C
Storage Temperature Range	T <sub>STG</sub>	-55 ~ +125	°C
Soldering Temperature *2	T <sub>SOL</sub>	260	°C

#### Notes:

2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

## XL501, XL511

### Electrical Characteristics (@ T<sub>A</sub> = 25°C unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 16mA	-	1.45	1.7	V
	Reverse Breakdown Voltage	B <sub>V<sub>R</sub></sub>	I <sub>R</sub> =10μA	5	20	-	V
	Diode Temperature Coefficient	ΔV <sub>F</sub> /ΔT <sub>A</sub>	I <sub>F</sub> =10mA	-	-1.6	-	mV/°C
Output	High Level Supply Current	I <sub>CCH</sub>	V <sub>CC</sub> =15V, I <sub>F</sub> =0mA V <sub>O</sub> =Open	-	-	1	μA
			T <sub>A</sub> =0-70°C	-	-	2	μA
	Low Level Supply Current	I <sub>CCL</sub>	V <sub>CC</sub> =15V, I <sub>F</sub> =16mA, V <sub>O</sub> =Open	-	120	200	μA
Transfer Characteristics	High Level Output Current	I <sub>OH</sub>	I <sub>F</sub> = 0mA, V <sub>O</sub> =5.5V V <sub>CC</sub> =5.5V	-	0.001	0.5	μA
			I <sub>F</sub> = 0mA, V <sub>O</sub> =15V V <sub>CC</sub> =15V	-	0.005	1	
			T <sub>A</sub> =0-70°C	-	-	50	
	Low Level Output Voltage	V <sub>OL</sub>	V <sub>CC</sub> =4.5V, I <sub>F</sub> =16mA I <sub>O</sub> =3mA	-	0.1	0.4	V
			V <sub>CC</sub> =4.5V, I <sub>F</sub> =16mA I <sub>O</sub> =2.4mA	-	0.1	0.5	V
	Current transfer ratio	CTR	I <sub>F</sub> =16mA, V <sub>CC</sub> =4.5V V <sub>O</sub> =0.4V	19	24	88	%
			I <sub>F</sub> =16mA, V <sub>CC</sub> =4.5V V <sub>O</sub> =0.5V	15	25	-	
Isolation Resistance	R <sub>IO</sub>	V <sub>IO</sub> = 500Vdc 40~60% R.H.	-	1×10 <sup>12</sup>	-	Ω	
Floating Capacitance	C <sub>IO</sub>	f = 1MHz	-	0.6	-	pF	

### XL501, XL511

#### Switching Characteristics (@ $T_A = -40^{\circ}\text{C} \sim 85^{\circ}\text{C}$ , $V_{CC} = 5\text{V}$ , $I_F = 7.5\text{mA}$ , unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Propagation Delay Time to Output HIGH Level		$T_{PLH}$	$I_F = 16\text{mA}$ , $R_L = 1.9\text{k}\Omega$ , $T_A = 25^{\circ}\text{C}$	-	150	800	ns
			$I_F = 16\text{mA}$ , $R_L = 1.9\text{k}\Omega$			800	
Propagation Delay Time to Output Low Level		$T_{PHL}$	$I_F = 16\text{mA}$ , $R_L = 1.9\text{k}\Omega$ , $T_A = 25^{\circ}\text{C}$	-	200	800	ns
			$I_F = 16\text{mA}$ , $R_L = 1.9\text{k}\Omega$			800	
Common Mode Transient Immunity(at Logic High)	501	$ C_{MH} $	$T_A = 25^{\circ}\text{C}$ , $I_F = 0\text{mA}$ $ V_{CM}  = 10\text{V(Peak)}$ $C_L = 15\text{pF}$ , $R_L = 1.9\text{k}\Omega$	5000	-	-	$\text{V}/\mu\text{s}$
	511		$T_A = 25^{\circ}\text{C}$ , $I_F = 0\text{mA}$ $ V_{CM}  = 1500\text{V(Peak)}$ $C_L = 15\text{pF}$ , $R_L = 1.9\text{k}\Omega$	15000	-	-	
Common Mode Transient Immunity (at Logic Low)	501	$ C_{ML} $	$T_A = 25^{\circ}\text{C}$ , $I_F = 16\text{mA}$ $ V_{CM}  = 10\text{V(Peak)}$ $C_L = 15\text{pF}$ , $R_L = 1.9\text{k}\Omega$	5000	-	-	$\text{V}/\mu\text{s}$
	511		$T_A = 25^{\circ}\text{C}$ , $I_F = 16\text{mA}$ $ V_{CM}  = 1500\text{V(Peak)}$ $C_L = 15\text{pF}$ , $R_L = 1.9\text{k}\Omega$	15000	-	-	

## XL501, XL511

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

Fig.1 Normalized CTR vs. Input current

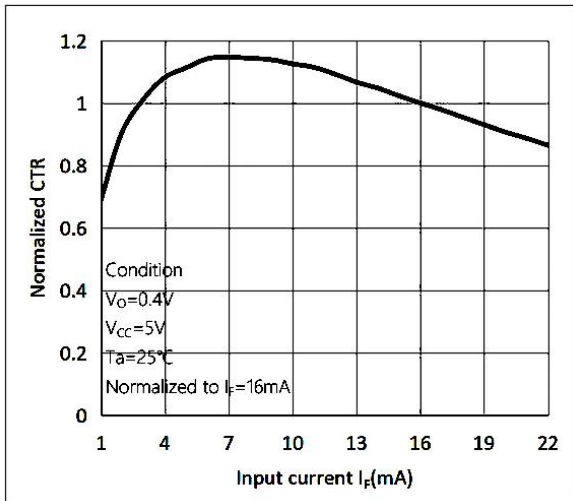


Fig.2 Normalized CTR vs. Ambient temperature

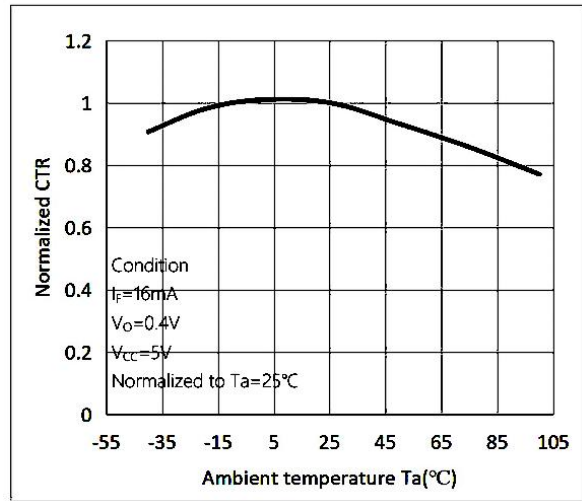


Fig.3 Output current vs. Output voltage

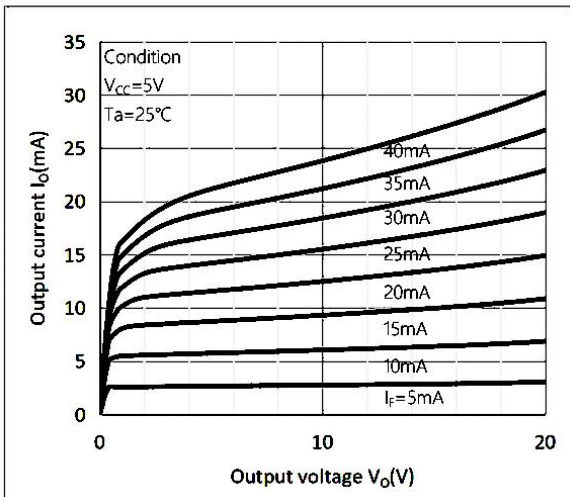


Fig.4 High level output voltage vs. Ambient temperature

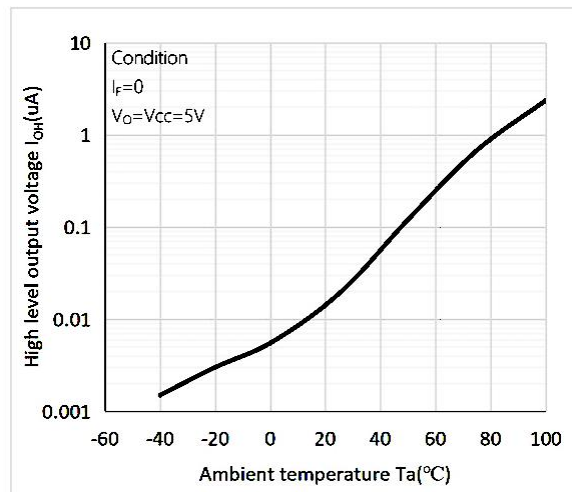


Fig.5 Propagation Delay Time vs. Ambient temperature

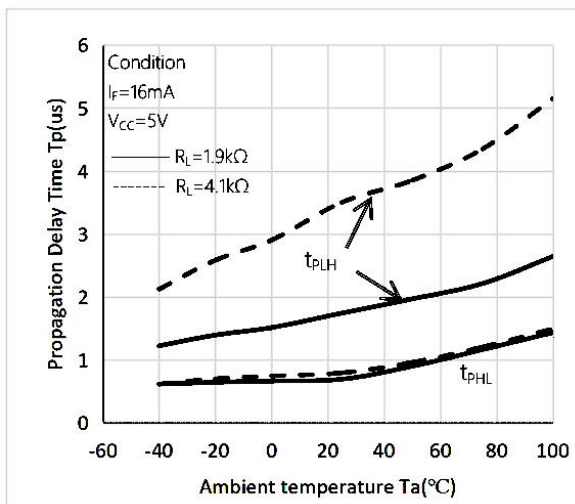
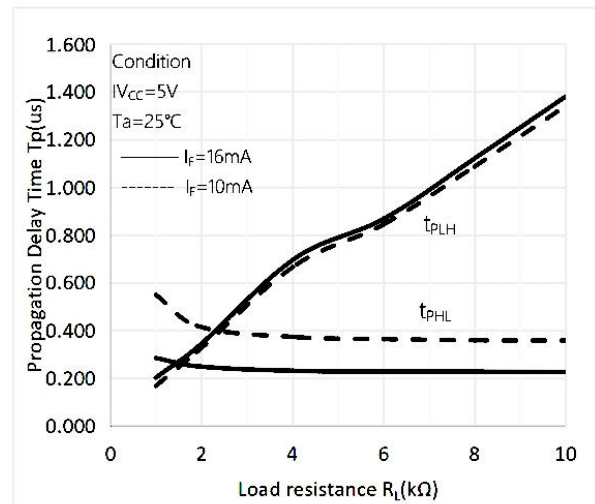


Fig.6 Propagation Delay Time vs. Load resistance



### XL501, XL511

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

Fig.7 Switching Time Test Circuit

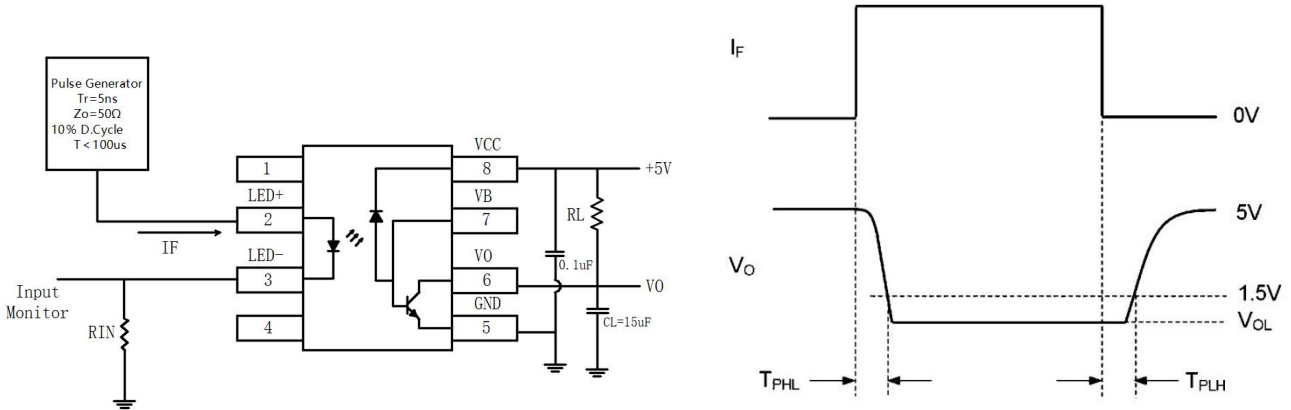
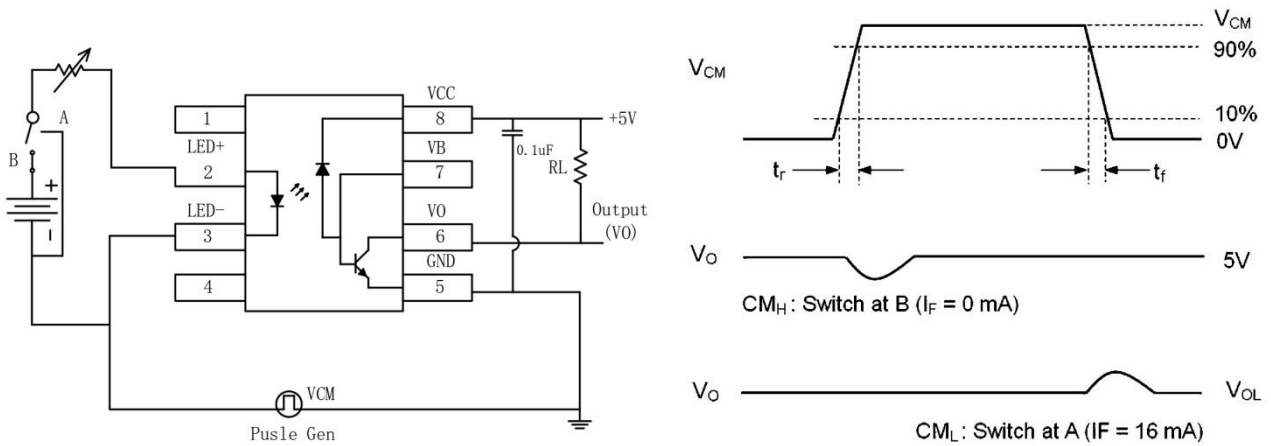


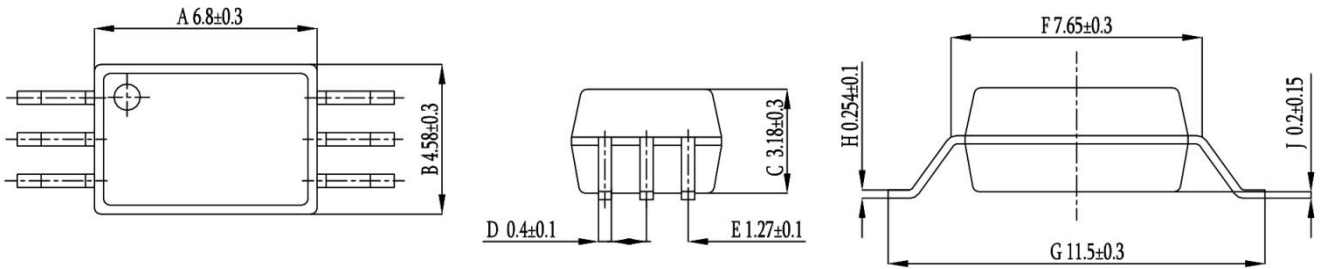
Fig.8 Test Circuit for Common Mode Transient Immunity



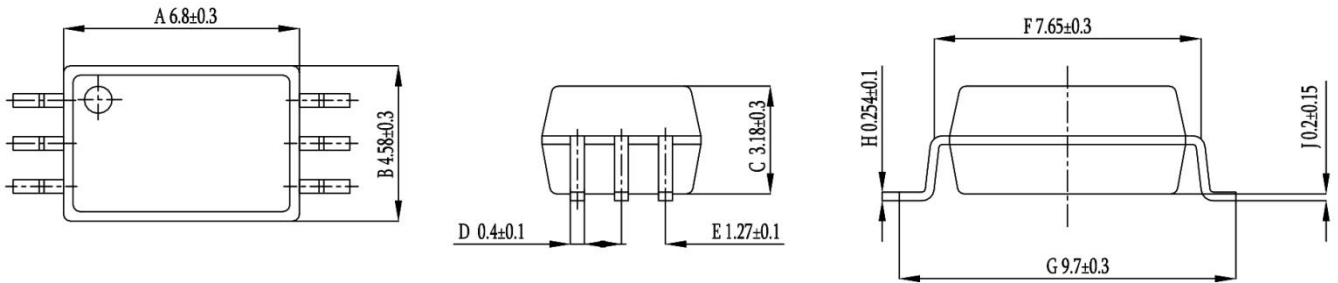
## XL501, XL511

### Package Outline Dimensions (unit: mm)

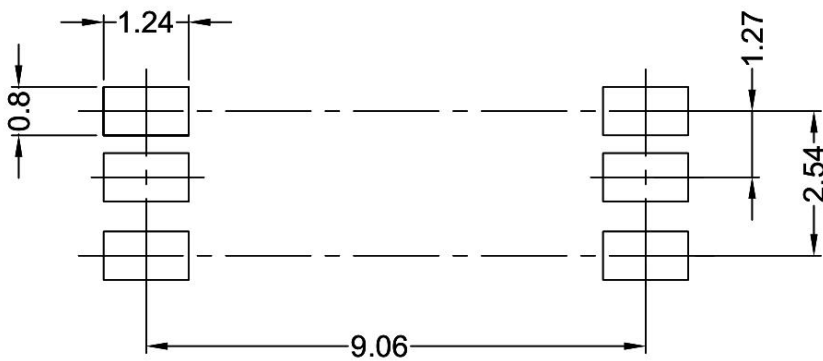
#### SOP6-W



#### SOP6-P

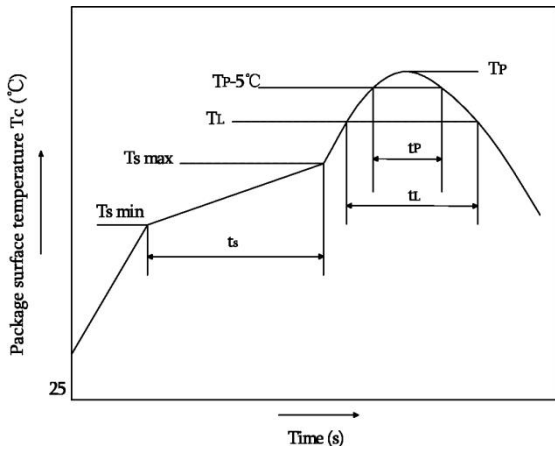


### SOLDERING FOOTPRINT (unit: mm)



## XL501, XL511

### Reflow soldering

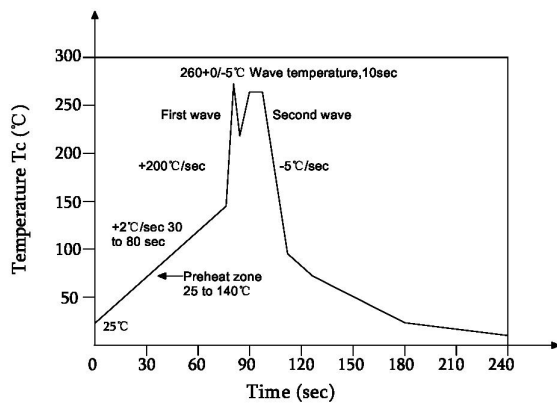


	Symbol	Min	Max	Unit
Preheat temperature	Ts	150	200	°C
Preheat time	ts	60	120	s
Ramp-up rate(T <sub>L</sub> to T <sub>P</sub> )			3	°C/s
Liquidus temperature	T <sub>L</sub>	217		°C
Time above T <sub>L</sub>	t <sub>L</sub>	60	150	s
Peak temperature	T <sub>P</sub>		260	°C
Time during which T <sub>c</sub> is between (T <sub>P</sub> -5) and T <sub>P</sub>	t <sub>p</sub>		30	s
Ramp-down rate(T <sub>P</sub> to T <sub>L</sub> )			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

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

### XL501, XL511

#### Packing

Package Type	Packing Form	Quantity per Tube & Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
SOP6	Reel(φ330mm)	1000pcs/reel	2 reels /box	10 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Guard band 200mm/min.

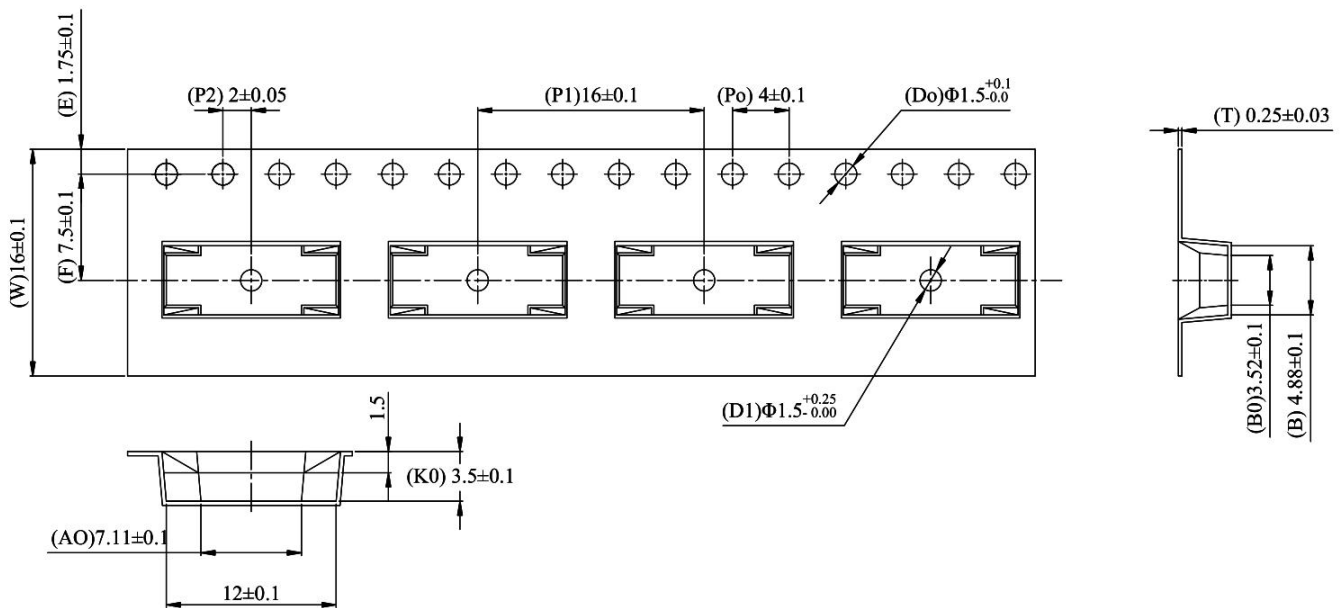
- Summary table

- SOP6 (Reel)

Qty/reel: 1000pcs. Qty/box: 2000pcs.

Qty/ctn: 20000pcs.

Schematic: (unit:mm)



#### Attention

- XINGLIGHT implements dynamic technical updates. Specifications are subject to change. Refer to the official website for the latest version.
- Users must strictly adhere to specified conditions. Failures caused by misuse (overload, high temperature, incompatible circuits) are excluded from warranty.
- Contact technical support for customized validation in critical applications (medical devices, industrial control).
- This document is valid until Dec 31, 2026. Updates will be notified on the official website.
- For further clarification on technical specifications or application solutions, please contact us through official channels.