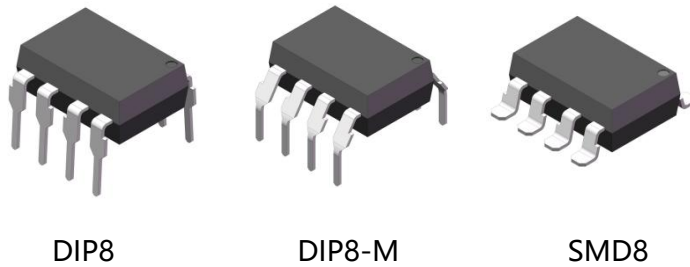


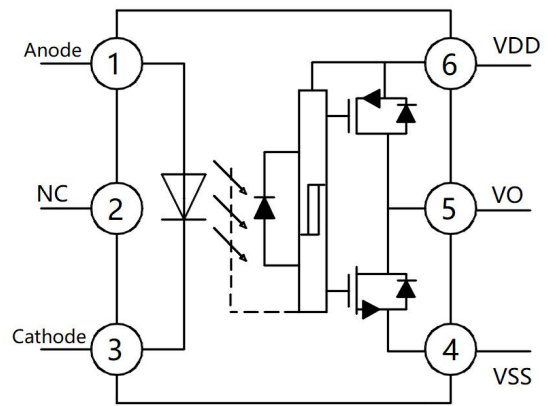
### Product packaging logic diagram



DIP8

DIP8-M

SMD8



Pin Configuration

### Features

- 35 kV/ $\mu$ s minimum Common Mode Rejection
- 15V ~ 30V Wide operating VCC Range
- Maximum peak output current 2.5A
- Creepage distance > 7.0mm;
- Operating Temperature: -55°C~110°C
- Environmentally friendly products, compliant with CQC, UL, and VDE requirements

### Mechanical Data

- Case: DIP8、DIP8-M、SMD8
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solder ability-per MIL-STD-202, Method 208

### Applications

- Industrial Automation and Electronic Power: Gate isolation drive for devices such as frequency converters and servo drives.
- New Energy and Power Systems: Vehicle mounted charging station (OBC), motor controller drives power devices.
- Power Control and Protection Devices: Solid state relay (SSR), isolation control terminal and power terminal in circuit breaker drive circuit.
- Noise Environment Equipment and Precision Medical Instruments: Suitable for industrial scenarios with severe electromagnetic interference, such as welding machines and induction cookers.
- Communications and Data Transmission: Communication interface circuits, data center server communication; Achieve high-speed signal isolation transmission, ensure data integrity.



### Ordering Information

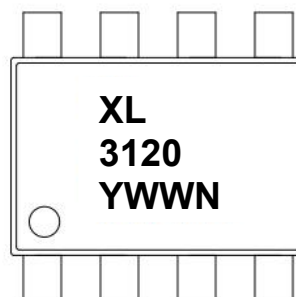
XL      3120      (X)      (X)      -      (U)      (N)      (Y)  
 ①          ②          ③          ④                   ⑤          ⑥          ⑦

- ① Brand(XL)
- ② Product series( 3120 )
- ③ Package type ( DIP8; DIP8-M, SMD8 )
- ④ Halogen option(None :Halogen free)
- ⑤ Lead frame (None: Copper)
- ⑥ Customer option 1 (0-9 or A-Z or none)
- ⑦ Customer option 2 (0-9 or A-Z or none)

| Part Number | Package | Shipping Quantity     | Marking Code |
|-------------|---------|-----------------------|--------------|
| XL3120X     | DIP8    | 45pcs / Tube          | XL3120X      |
| XL3120MX    | DIP8-M  | 45pcs / Tube          | XL3120X      |
| XL3120SX    | SMD-8   | 1000pcs / Tape & Reel | XL3120X      |

### Marking Information

- " XL" denotes brand.
- " 3120 " denotes Product series.
- " Y" denotes Year : A(2024), B(2025), C(2026)
- " WW" denotes Week' s number .
- " N" denotes the day of Week.



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

| Parameter |                     | Symbol    | Value  | Unit |
|-----------|---------------------|-----------|--------|------|
| Input     | Forward Current     | IF        | 50     | mA   |
|           | Power Dissipation   | PD        | 45     | mW   |
|           | Reverse Voltage     | VR        | 5      | V    |
| Output    | Peak Output Current | IO(PEAK)  | 3      | A    |
|           | Supply Voltage      | VDD - VSS | 0 ~30  | V    |
|           | Output Voltage      | VO        | 0 ~VDD | V    |

### Thermal Characteristics

| Parameter                 | Symbol | Value      | Unit |
|---------------------------|--------|------------|------|
| Isolation Voltage *1      | VISO   | 5000       | Vrms |
| Total Power Consumption   | Ptot   | 200        | mW   |
| Operating Temperature     | TOPR   | -55 ~ +100 | °C   |
| Storage Temperature Range | TSTG   | -55 ~ +125 | °C   |
| Soldering Temperature *2  | TSOL   | 260        | °C   |

Notes:

1. 40 to 60% RH, AC for 1 minute

2. For 10 seconds

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

| Parameter |                                 | Symbol  | Condition                     | Min.          | Typ.         | Max.          | Unit |
|-----------|---------------------------------|---------|-------------------------------|---------------|--------------|---------------|------|
| Input     | Forward Voltage                 | VF      | IF = 10mA                     | 1.2           | 1.5          | 1.8           | V    |
|           | Reverse Current                 | IR      | VR = 5V                       | -             | -            | 10            | μA   |
|           | Input The Turn On Current       | IFLH    | IO = 0mA , VO > 5V            | -             | 2.8          | 5.0           | mA   |
|           | Input The Turn Off Voltage      | VFHL    | IO = 0mA , VO < 5V            | 0.8           | -            | -             | V    |
|           | UVLO Threshold                  | VUVLO+  | IF = 10mA , VO > 5V           | 11.5          | 12.7         | 13.5          | V    |
|           |                                 | VUVLO - | IF = 10mA , VO < 5V           | 10.0          | 11.2         | 12            | V    |
|           | UVLO Hysteresis                 | UVLOHYS | -                             | -             | 1.5          | -             | V    |
| Output    | High Level Output Current       | IOH     | VO = VDD-3V                   | -1.0          | -2.0         | -2.5          | A    |
|           |                                 |         | VO = VDD-6V                   | -2.0          | -            | -2.5          |      |
|           | Low Level Output Current        | IOL     | VO = VSS+3V                   | 1.0           | 2.0          | 2.5           | A    |
|           |                                 |         | VO = VSS+6V                   | 2.0           | -            | 2.5           |      |
|           | High Level Output Voltage       | VOH     | IF = 10mA ;<br>IO = -2.5A     | VDD-<br>6.25V | VDD-<br>2.5V | -             | V    |
|           |                                 |         | IF = 10mA ;<br>IO = -100mA    | VDD-<br>0.3V  | VDD-<br>0.1V | -             |      |
|           | Low Level Output Voltage        | VOL     | IF = 0mA ;<br>IO = 2.5A       | -             | VSS+<br>2.5V | VSS+<br>6.25V | V    |
|           |                                 |         | IF = 0mA ;<br>IO = 100mA      | -             | VSS+<br>0.1V | VSS+<br>0.3V  |      |
|           | High Level Power Supply Current | IDDH    | VO = Open ,<br>IF = 7 to 16mA | -             | 1.8          | 3.8           | mA   |
|           | Low Level Power Supply Current  | IDDL    | VO = Open ,<br>VF = 0 to 0.8V | -             | 2.1          | 3.8           | mA   |

### XL3120

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

| Parameter                |                                                    | Symbol    | Condition                                                                       | Min. | Typ.             | Max. | Unit  |
|--------------------------|----------------------------------------------------|-----------|---------------------------------------------------------------------------------|------|------------------|------|-------|
| Transfer Characteristics | Propagation Delay Time to Low Output Level         | TPHL      | IF = 7mA to 16mA,<br>Rg = 10Ω ,<br>Cg = 10nF,<br>F = 10KHZ,<br>duty cycle = 50% | -    | 71               | 400  | ns    |
|                          | Propagation Delay Time to High Output Level        | TPLH      |                                                                                 | -    | 68               | 400  | ns    |
|                          | Pulse Width Distortion                             | PWD       |                                                                                 | -    | 3                | 100  | ns    |
|                          | Propagation Delay Difference Between Any Two Parts | PDD       |                                                                                 | -250 | -                | 250  | ns    |
|                          | Output Rise Time (10% To 90%)                      | Tr        |                                                                                 | -    | 60               | -    | ns    |
|                          | Output Drop Time (90% ~ 10%)                       | Tf        |                                                                                 | -    | 60               | -    | ns    |
|                          | Isolation Resistance                               | RISO      | VI-O = 500V ,<br>40 ~ 60% R.H.                                                  | -    | 10 <sup>11</sup> | -    | Ω     |
|                          | Isolation Capacitance                              | CISO      | VI-O = 0V;<br>Freq = 1MHZ                                                       | -    | 1                | -    | pF    |
|                          | UVLO Turn On Delay                                 | TUVLO ON  | IF = 10mA ;<br>VO > 5V                                                          | -    | 1.6              | -    | μs    |
|                          | UVLO Turn Off Delay                                | TUVLO OFF | IF = 10mA ;<br>VO < 5V                                                          | -    | 0.4              | -    | μs    |
|                          | Output High Level Common Mode Transient Immunity   | CMH       | TA = 25°C<br>VDD = 30V<br>VCM = 2000V                                           | 35   | 50               | -    | KV/μs |
|                          | Output Low Level Common Mode Transient Immunity    | CML       | IF = 7 ~ 16mA<br>VF = 0V                                                        | 35   | 50               | -    | KV/μs |

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

Fig.1 High Output Rail Voltage vs Ambient Temperature

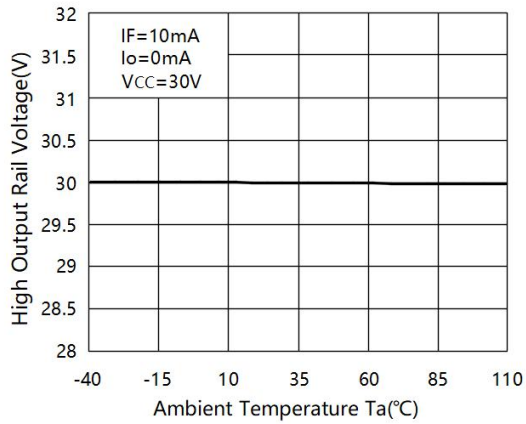


Fig.2 High Level Output Voltage vs Ambient temperature

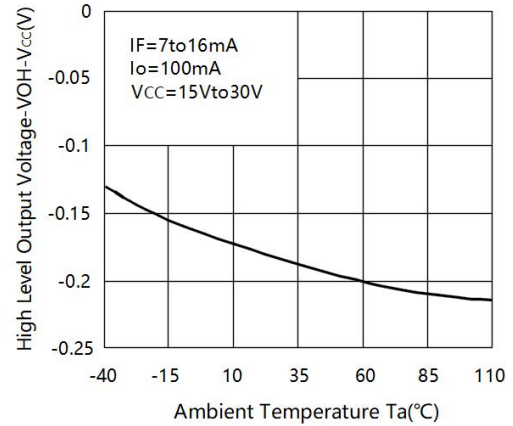


Fig.3 Low Level Output Voltage vs Ambient Temperature

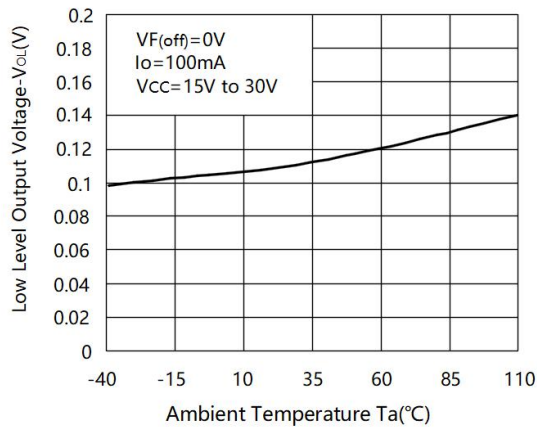


Fig.4 Supply Current vs Ambient temperature

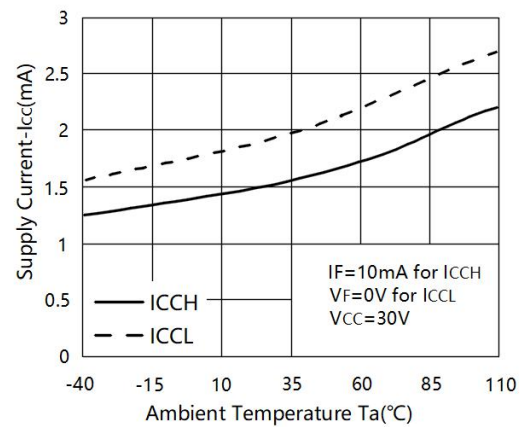


Fig.5 Supply Current vs Supply Voltage

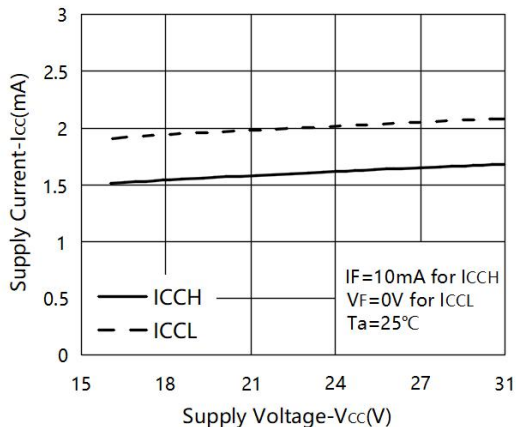
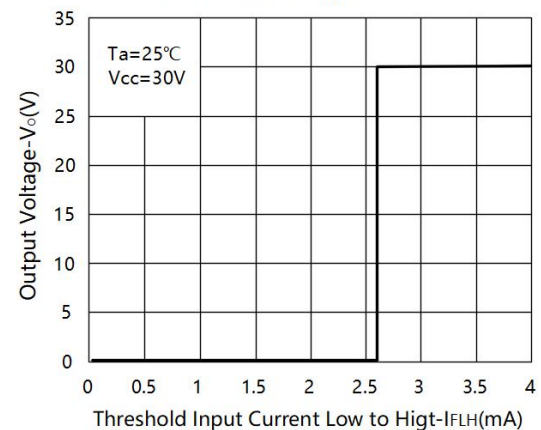
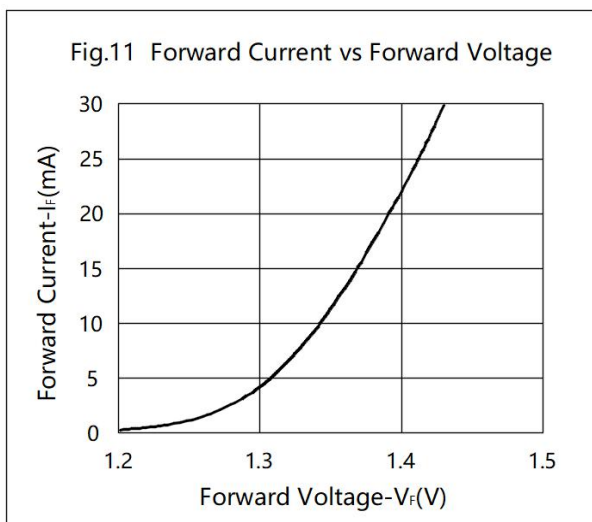
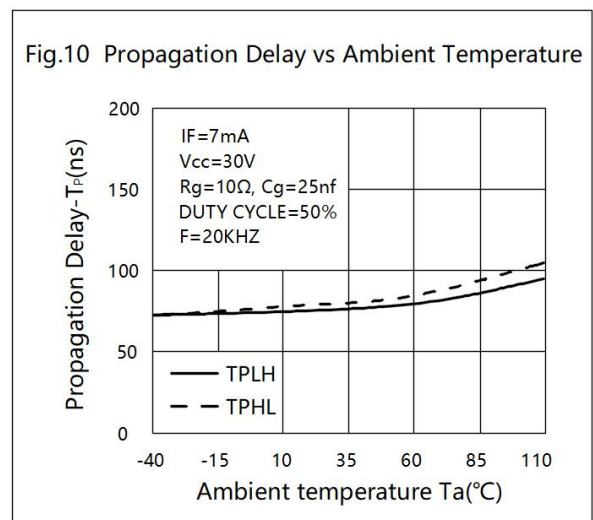
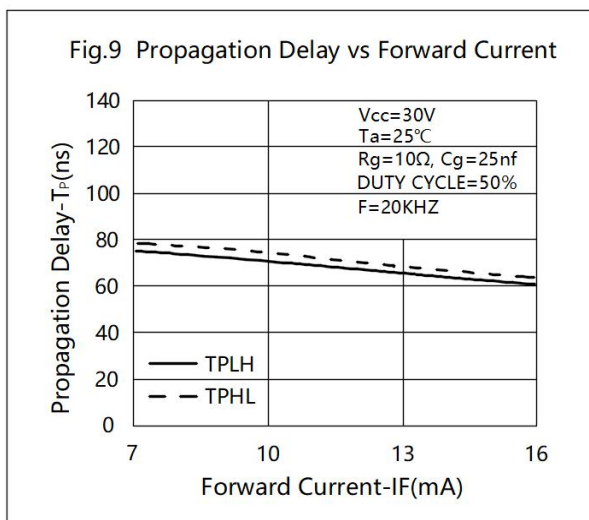
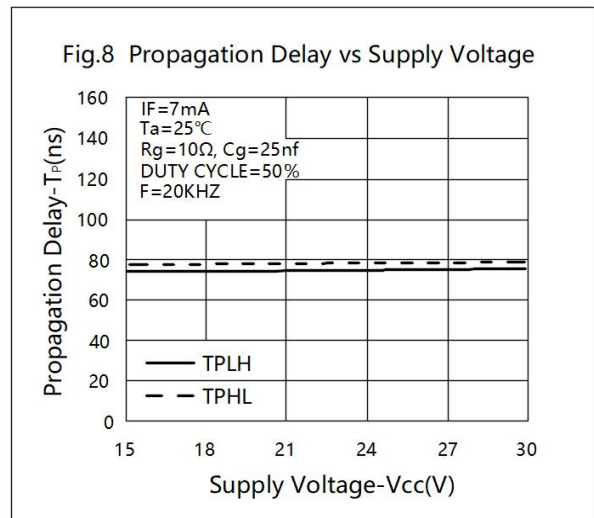
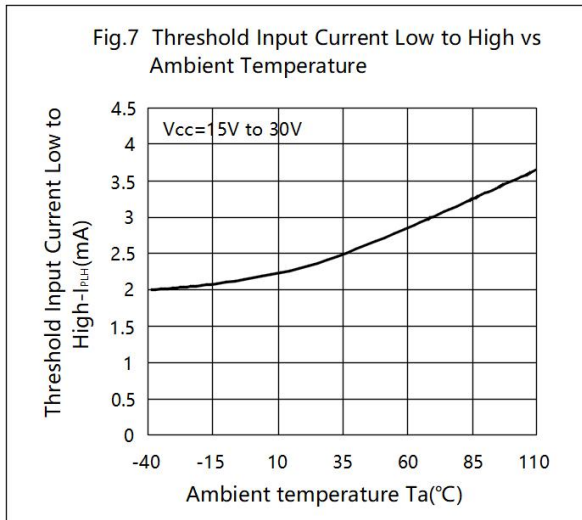


Fig.6 Output Voltage vs Threshold Input Current Low to Higt



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



### Test Circuits Diagrams

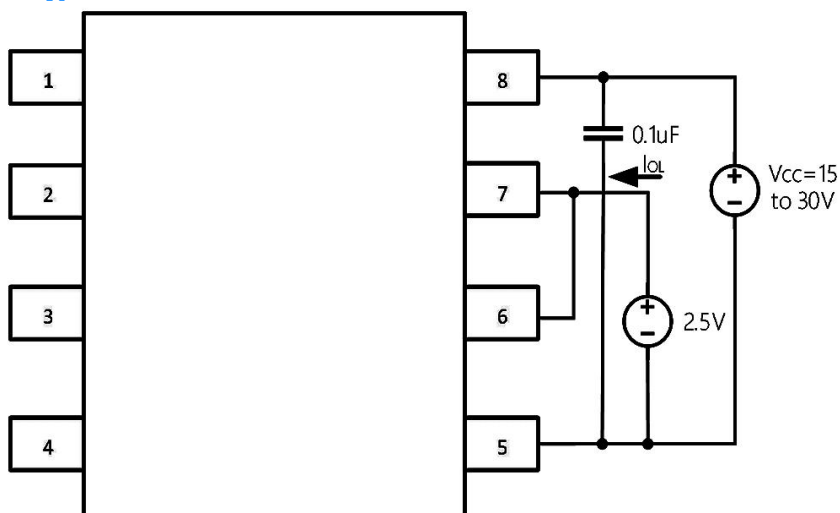


Fig.12  $I_{OL}$  Pulsed Test Circuit

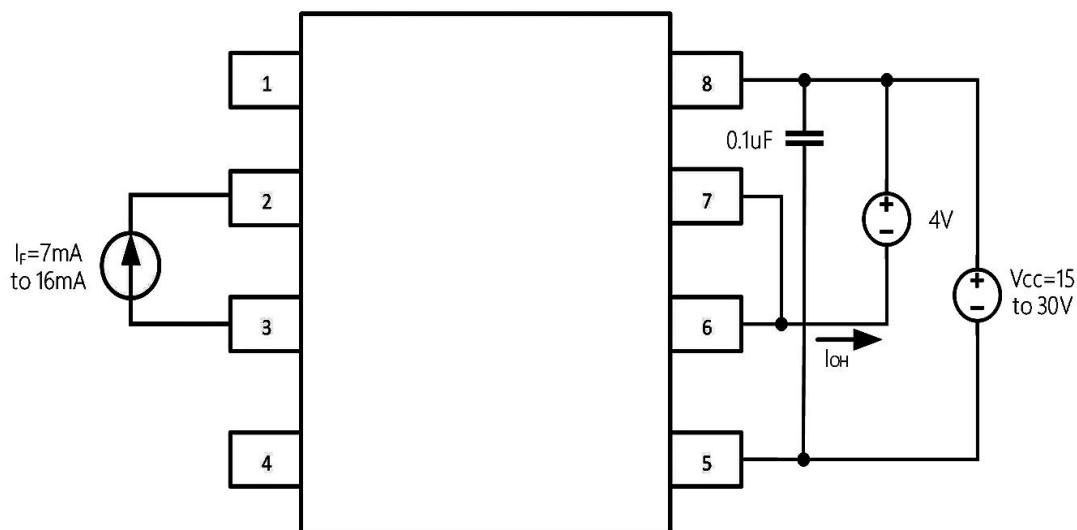


Fig.13  $I_{OH}$  Pulsed Test Circuit

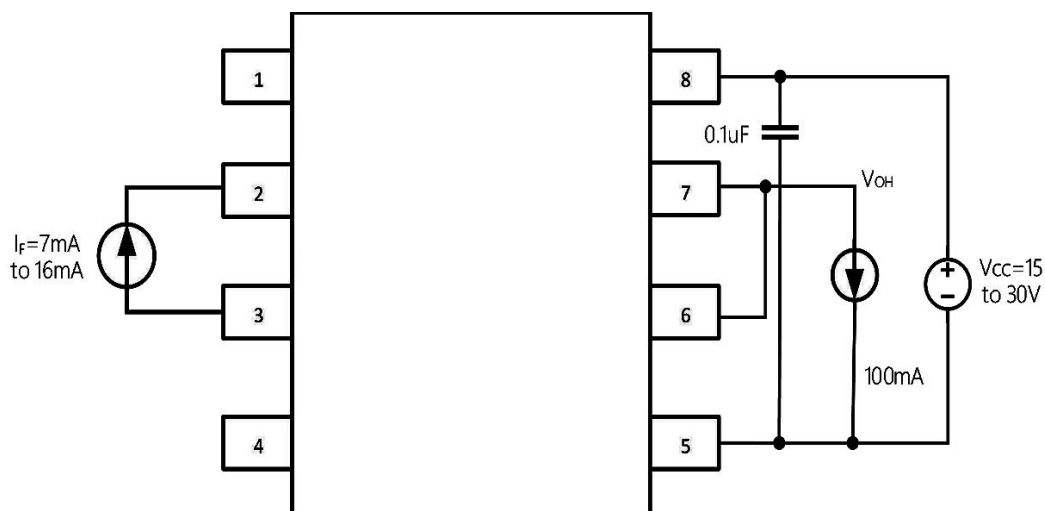


Fig.14  $V_{OH}$  Pulsed Test Circuit

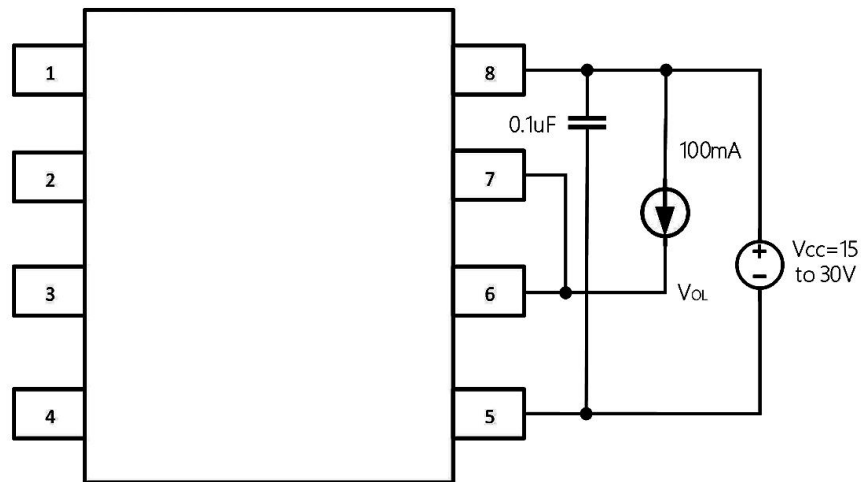


Fig.15 V<sub>OL</sub> Pulsed Test Circuit

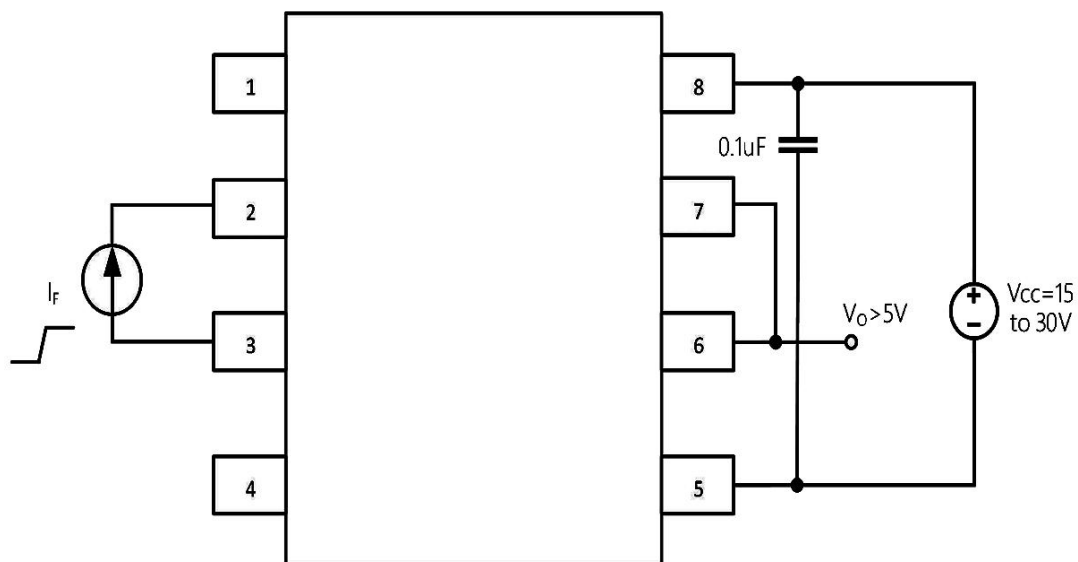


Fig.16 I<sub>FLH</sub> Pulsed Test Circuit



## XL3120

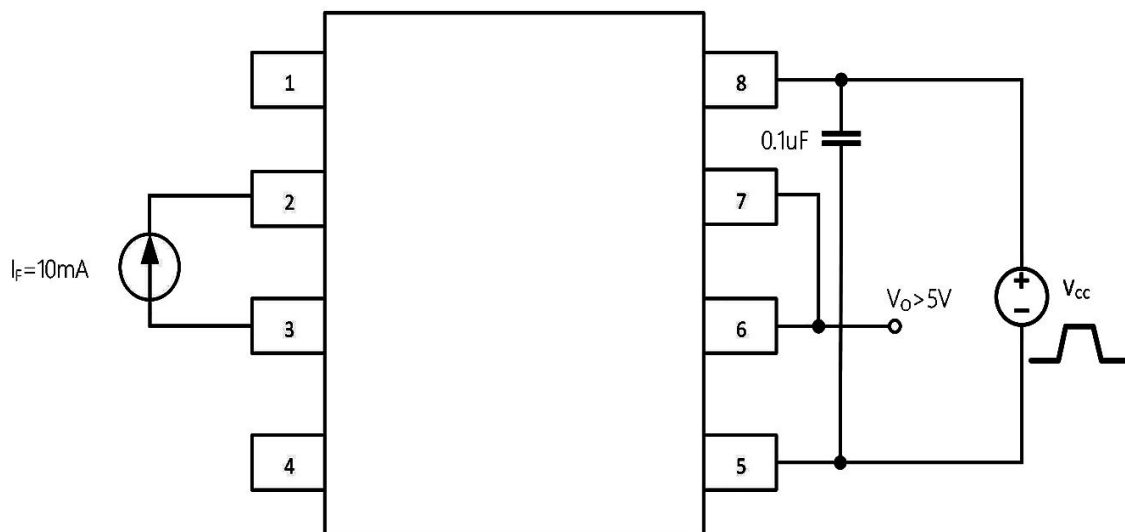


Fig.17 UVLO Test Circuit

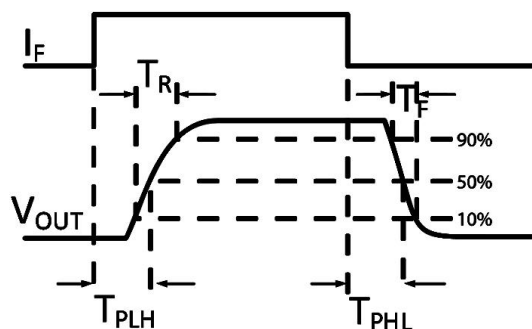
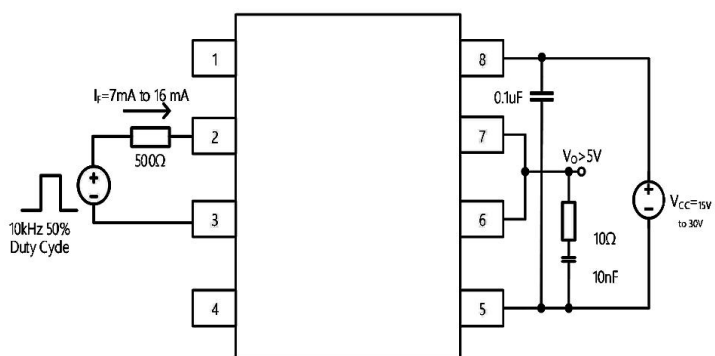


Fig.18  $T_{PHL}$ ,  $T_{PLH}$ ,  $T_R$ ,  $T_F$  Test Circuit

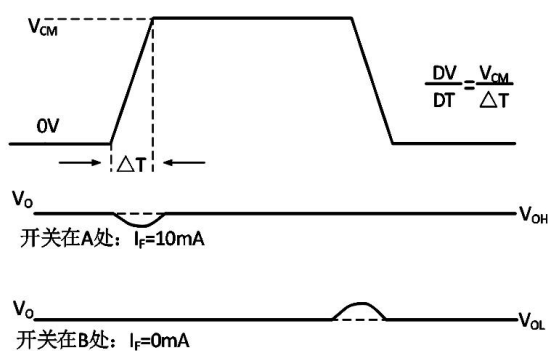
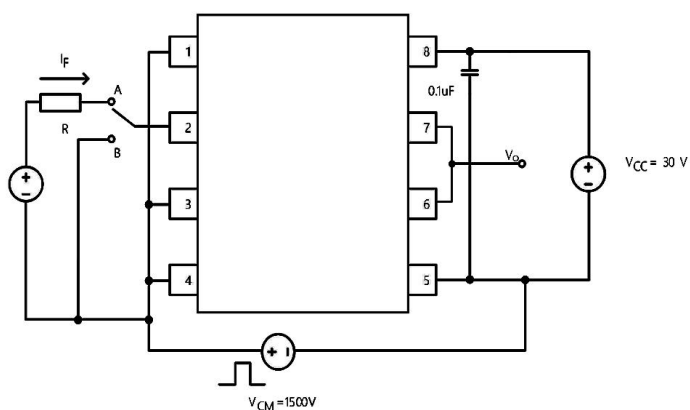
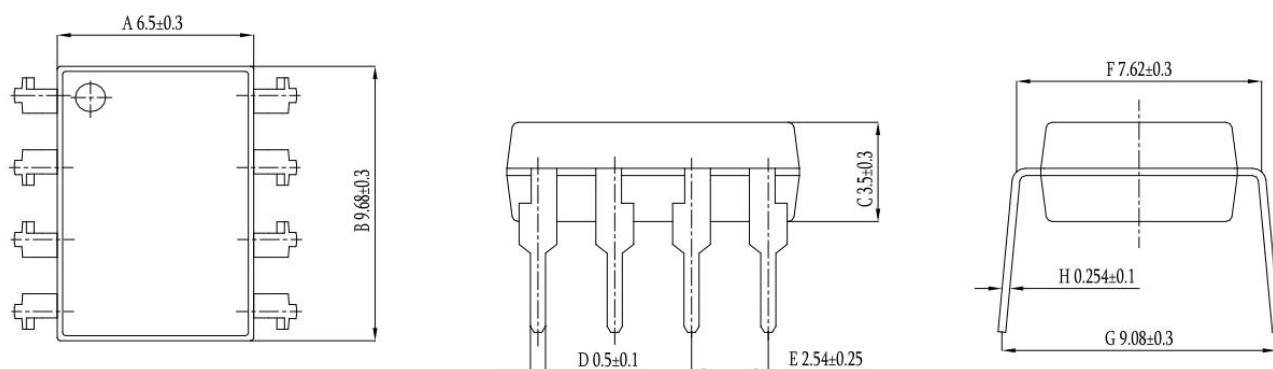


Fig.19 CMR Test Circuit

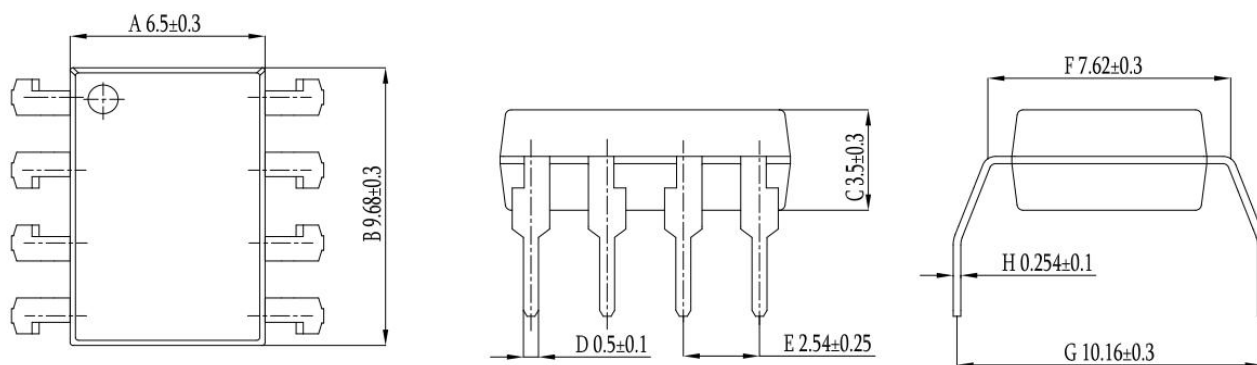
### XL3120

#### Package Outline Dimensions (unit: mm)

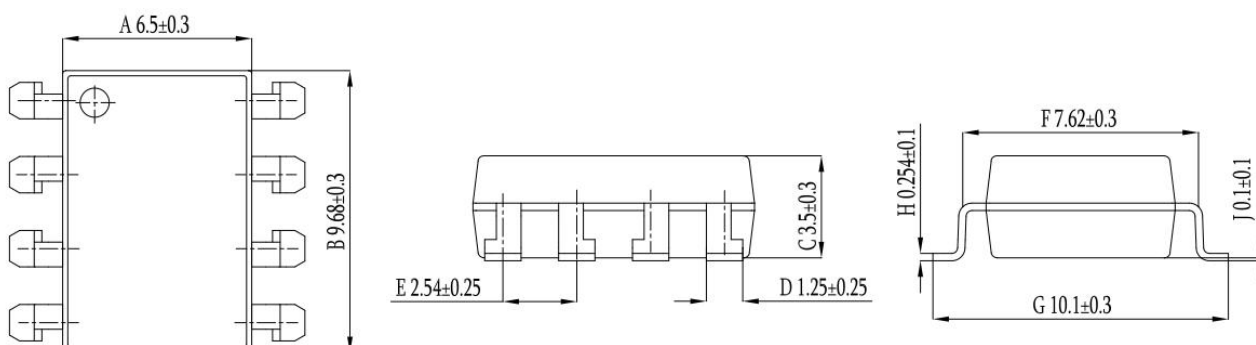
##### DIP8



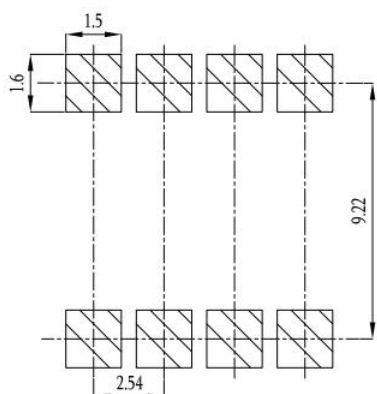
##### DIP8-M



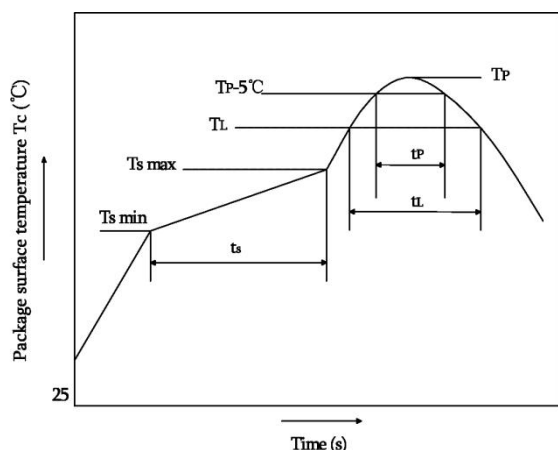
##### SMD8



#### SOLDERING FOOTPRINT (unit: mm)



### Reflow soldering

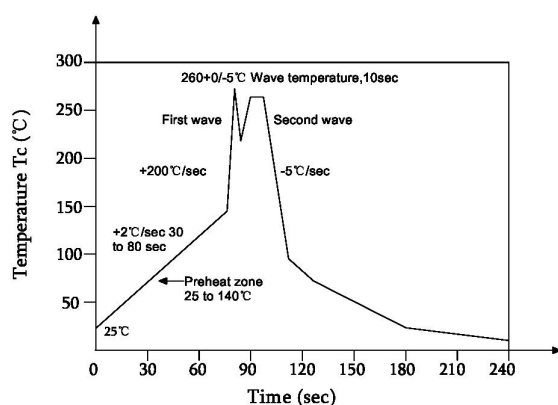


|                                                                                    | Symbol         | Min | Max | Unit |
|------------------------------------------------------------------------------------|----------------|-----|-----|------|
| Preheat temperature                                                                | 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>φ</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.

## XL3120

### Packing

| Package Type | Packing Form | Quantity per Tube & Reel | Quantity per Box | Quantity per Carton | Antistatic Bag Specification | Box Specification | Carton Specification | Note                               |
|--------------|--------------|--------------------------|------------------|---------------------|------------------------------|-------------------|----------------------|------------------------------------|
| DIP8         | Tube(500mm)  | 45pcs/tube               | 50 tubes /box    | 10 boxes /ctn       | 190*670mm                    | 520*105*50mm      | 545*372*235mm        | Straight insert type material tube |
| DIP8-M       | Tube(500mm)  | 45pcs/tube               | 50 tubes /box    | 10 boxes /ctn       | 190*670mm                    | 520*105*50mm      | 545*372*235mm        | Seagull foot (M foot) tube         |
| SMD8         | Reel(φ330mm) | 1000pcs/reel             | 2 reels /box     | 10 boxes /ctn       | 380*420mm                    | 350*340*60mm      | 365*330*370mm        | Guard band 200mm /min.             |

#### ■ Summary table

#### ■ DIP8/DIP8-M (Tube)

Qty/tube: 45pcs. Qty/box: 2250pcs.

Qty/ctn: 22500pcs.

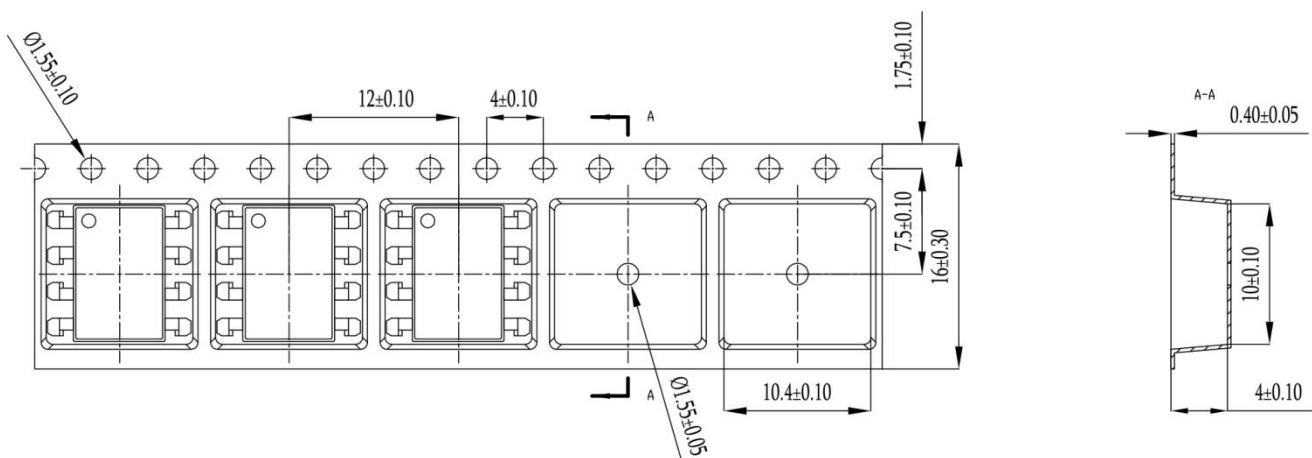
Schematic: (unit: mm)

#### ■ SMD8 (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.