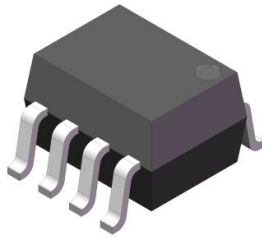
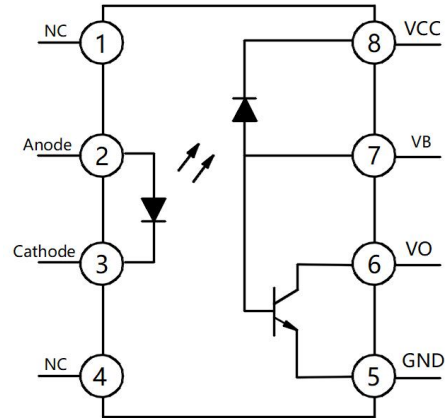


**Product packaging logic diagram**

SOP8



Pin Configuration

**Features**

- Very high speed: 1 MBit/s
- High isolation voltage between input and output ( $V_{iso} = 3750V \text{ rms}$ )
- Operating Temperature:  $-40^{\circ}C \sim 85^{\circ}C$
- Logic gate output
- Environmentally friendly products, compliant with CQC, UL, and VDE requirements

**Mechanical Data**

- Case: SOP8
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solder ability-per MIL-STD-202, Method 208

**Applications**

- Fiber optic communication, photoelectric conversion, and digital signal processing are widely used. Can improve data transmission speed and reliability
- In motor control, PLC systems, and industrial robots, Achieve precise control through microsecond-level response and enhance system stability.
- Relying on high-speed optocouplers to achieve real-time data transmission and electrical isolation, ensuring patient safety and data accuracy. Medical imaging equipment and vital signs monitors.
- Spacecraft, satellite communications and radar systems, High-speed digital signal transmission, whose anti-interference capability is crucial in complex environments
- Power system monitoring, frequency converters and renewable energy converters, Ensure the safe operation of equipment.
- In-vehicle entertainment system, BMS (Battery Management System), Improve audio quality and circuit safety.



### Ordering Information

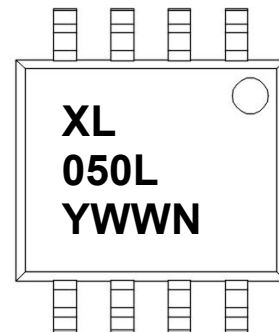
| <u>XL</u> | <u>050L</u> | <u>(M)</u> | <u>(G)</u> | <u>(X)</u> | - | <u>(U)</u> | <u>(N)</u> | <u>(Y)</u> |
|-----------|-------------|------------|------------|------------|---|------------|------------|------------|
| ①         | ②           | ③          | ④          | ⑤          |   | ⑥          | ⑦          | ⑧          |

- ① Brand (XL)
- ② Product series ( 050L )
- ③ Package type ( None: SOP8 )
- ④ Halogen )option (None : Halogen free
- ⑤ CTR Bank ( 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 |
|-------------|---------|-----------------------|--------------|
| XL050L      | SOP8    | 2000pcs / Tape & Reel | XL050L       |

### Marking Information

- " XL" denotes brand
- " 050 L" 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     | DC/Average Forward Input Current                      | IF         | 50         | mA   |
|           | Peak Transient Input Current<br>(≤1 μs P.W., 300 pps) | IF (trans) | 1          | A    |
|           | Reverse Voltage                                       | VR         | 5          | V    |
|           | Power Dissipation                                     | Pd         | 45         | mW   |
| Output    | Supply Voltage                                        | VCC        | -0.5 ~ 7.0 | V    |
|           | Average Output Current                                | IO         | 8          | mA   |
|           | Peak Output Current                                   | IO (pk)    | 16         | mA   |
|           | Output Voltage                                        | VO         | -0.5 ~ 7.0 | V    |
|           | Emitter-Base Reverse Voltage                          | VEBR       | 5          | V    |
|           | Base Current                                          | IB         | 5          | mA   |
|           | Collector Output Power Dissipation                    | PO         | 85         | mW   |

**Thermal Characteristics**

| Parameter                 | Symbol           | Value      | Unit             |
|---------------------------|------------------|------------|------------------|
| Isolation Voltage *2      | V <sub>ISO</sub> | 3750       | 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 *3  | T <sub>SOL</sub> | 260        | °C               |

**Notes:**

1. Pulse width ≤ 1μs, Duty ratio: 0.001
2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

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

| Parameter                |                                         | Symbol | Test Condition                                                        | Min.             | Typ.             | Max. | Unit |
|--------------------------|-----------------------------------------|--------|-----------------------------------------------------------------------|------------------|------------------|------|------|
| Input                    | Forward Voltage                         | VF     | IF = 10mA                                                             | -                | 1.45             | 1.7  | V    |
|                          |                                         |        | IF = 16mA                                                             | -                | -                | 1.8  |      |
|                          | Reverse Breakdown Voltage               | BVR    | IR=10μA                                                               | 5                | -                | -    | V    |
| Output                   | High Level Output Current               | IOH    | IF = 0 mA,<br>VO = VCC = 3.3 V & 5 V,<br>TA = 25°C                    | -                | 0.001            | 1    | μA   |
|                          | High Level Supply Current               | ICCH   | IF = 0 mA, VO = Open,<br>VCC= 3.3 V & 5 V,<br>TA = 25°C               | -                | -                | 0.3  | μA   |
|                          | Low Level Supply Current                | ICCL   | IF = 16 mA,<br>VO = Open,<br>VCC = 3.3 V & 5 V                        | -                | -                | 200  | μA   |
| Transfer Characteristics | Current Transfer Ratio(2)               | CTR    | IF = 16 mA, VO = 0.4 V,<br>VCC = 3.3 V & 5 V,<br>TA = 25°C            | 15               | -                | 50   | %    |
|                          | Low Level Output Voltage                | VOL    | IF = 16 mA, IO = 3 mA,<br>VCC= 3.3 V & 5 V,<br>TA = 25°C              | -                | -                | 0.3  | V    |
|                          | Input-Output Insulation Leakage Current | I(I-O) | Relative humidity = 45%,<br>TA = 25°C,<br>t = 5 s, VI-O = 3000 VDC(6) | -                | -                | 1.0  | μA   |
|                          | Isolation Resistance                    | RIO    | VI-O = 500 VDC(6)                                                     | 10 <sup>11</sup> | 10 <sup>12</sup> | -    | Ω    |
|                          | Floating Capacitance                    | CIO    | f = 1 MHz(6)                                                          | -                | 0.2              | -    | pF   |

### 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 Low Level               | TPHL   | $R_L = 1.9\text{ k}\Omega$ , $I_F = 16\text{ mA}$ (3)<br>(Figure 9)                                                                      | -    | 300   | -    | ns   |
|                                                          |        | $R_L = 1.9\text{ k}\Omega$ , $I_F = 16\text{ mA}$ (3)<br>(Figure 9) ( $T_A = 25^{\circ}\text{C}$ )                                       | -    | 500   | -    | ns   |
| Propagation Delay Time to Output HIGH Level              | TPLH   | $R_L = 1.9\text{ k}\Omega$ , $I_F = 16\text{ mA}$ (3)<br>(Figure 9)                                                                      | -    | 300   | -    | ns   |
|                                                          |        | $R_L = 1.9\text{ k}\Omega$ , $I_F = 16\text{ mA}$ (3)<br>(Figure 9) ( $T_A = 25^{\circ}\text{C}$ )                                       | -    | 500   | -    | ns   |
| Common Mode Transient Immunity<br>(at Output HIGH Level) | CMH    | $I_F = 0\text{ mA}$ ,<br>$V_{CM} = 1,000\text{ VP-P}$ ,<br>$R_L = 4.1\text{ k}\Omega$ ,<br>$T_A = 25^{\circ}\text{C}$ (4)(5) (Figure 10) | 5000 | 50000 | -    | V/us |
|                                                          |        | $I_F = 0\text{ mA}$ ,<br>$V_{CM} = 1,000\text{ VP-P}$ ,<br>$T_A = 25^{\circ}\text{C}$ ,<br>$R_L = 1.9\text{ k}\Omega$ (3)(5) (Figure 10) | 5000 | 50000 | -    | V/us |
| Common Mode Transient Immunity<br>(at Output LOW Level)  | CML    | $I_F = 16\text{ mA}$ , $V_{CM} = 1,000\text{ VP-P}$ ,<br>$R_L = 4.1\text{ k}\Omega$ ,<br>$T_A = 25^{\circ}\text{C}$ (4)(5) (Figure 10)   | 5000 | 50000 | -    | V/us |
|                                                          |        | $I_F = 16\text{ mA}$ ,<br>$V_{CM} = 1,000\text{ VP-P}$ ,<br>$R_L = 1.9\text{ k}\Omega$ (3)(5)<br>(Figure 10)                             | 5000 | 50000 | -    | V/us |

Notes:

3. The  $1.9\text{ k}\Omega$  load represents 1 TTL unit load of  $1.6\text{ mA}$  and  $5.6\text{ k}\Omega$  pull-up resistor.

4. The  $4.1\text{ k}\Omega$  load represents 1 LSTTL unit load of  $0.36\text{ mA}$  and  $6.1\text{ k}\Omega$  pull-up resistor.

5. Common mode transient immunity in logic high level is the maximum tolerable (positive)  $dV_{cm} / dt$  on the leading edge of the common mode pulse signal  $V_{CM}$ , to assure that the output will remain in a logic high state (i.e.,  $V_O > 2.0\text{ V}$ ). Common mode transient immunity in logic low level is the maximum tolerable (negative)  $dV_{cm} / dt$  on the trailing edge of the common mode pulse signal,  $V_{CM}$ , to assure that the output will remain in a logic low state (i.e.,  $V_O < 0.8\text{ V}$ ).

6. Device is considered a two terminal device: pins 1, 2, 3 and 4 are shorted together and pins 5, 6, 7 and 8 are shorted together.

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

Figure 1. LED Forward Current vs. Forward Voltage

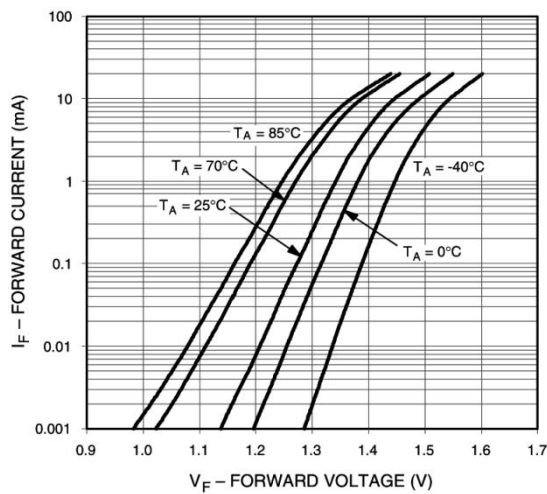


Figure 2. Current Transfer Ratio vs. Forward Current

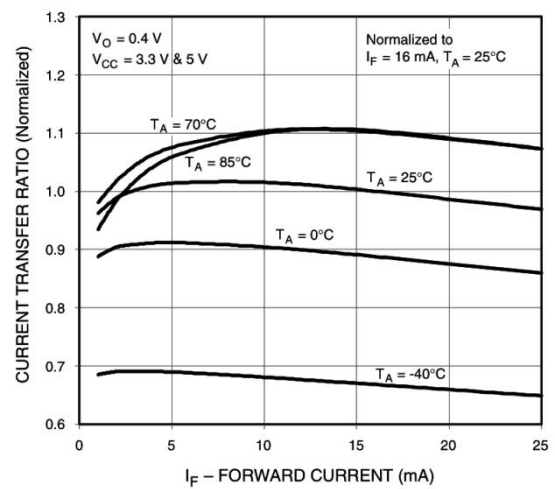


Figure 3. Current Transfer Ratio vs. Ambient Temperature

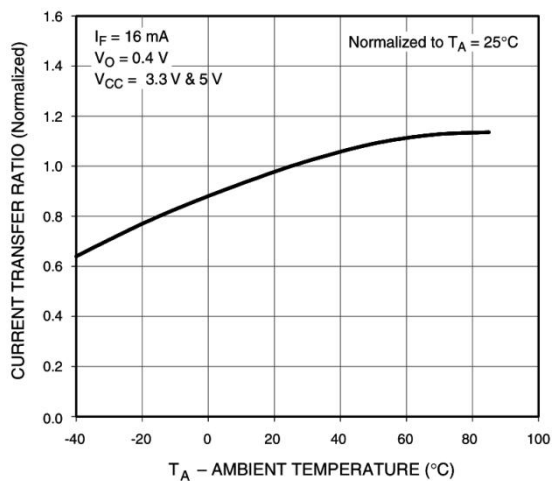


Figure 4. Output Current vs. Output Voltage

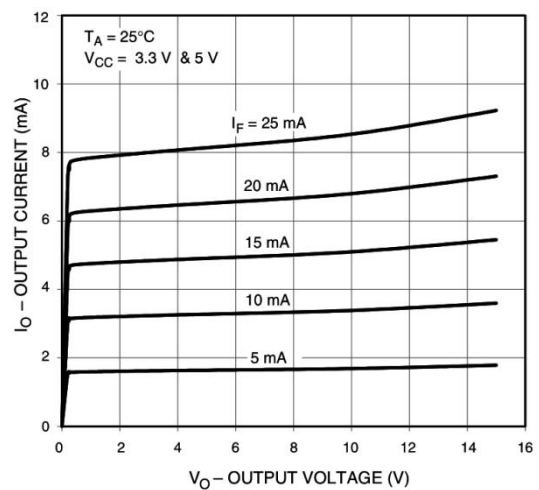


Figure 5. Logic High Output Current vs. Ambient Temperature

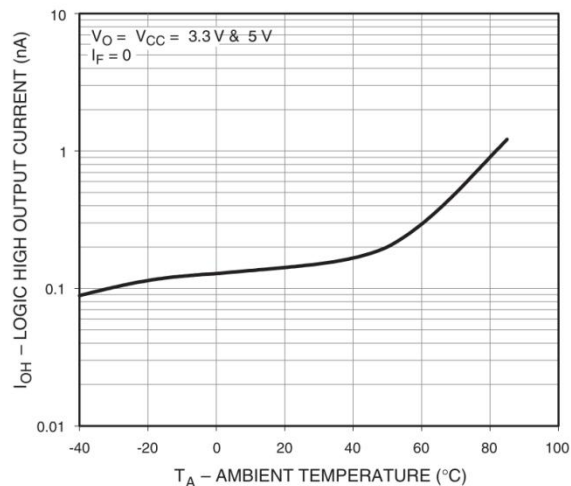
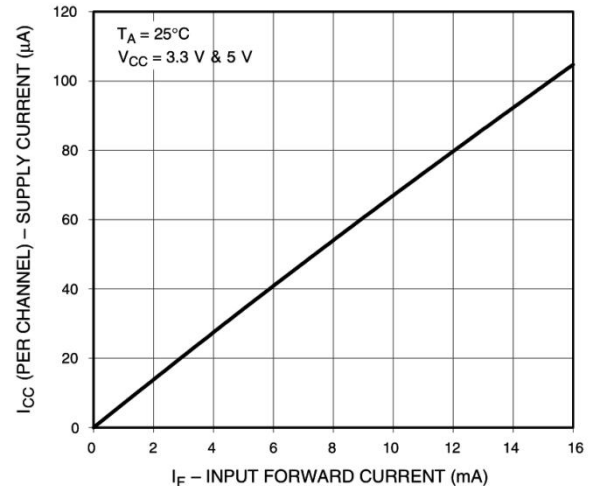


Figure 6. Supply Current vs. Input Forward Current



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

Figure 7. Propagation Delay vs. Ambient Temperature

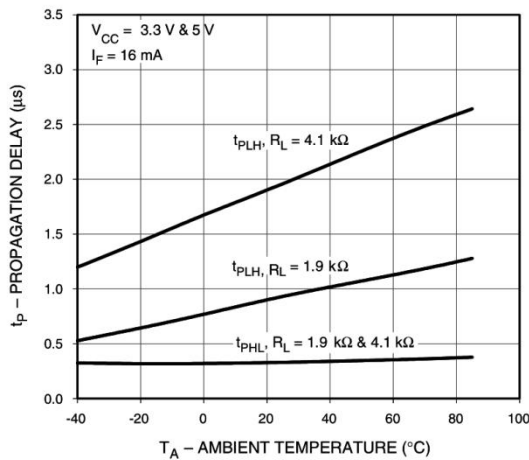


Figure 8. Propagation Delay vs. Load Resistance

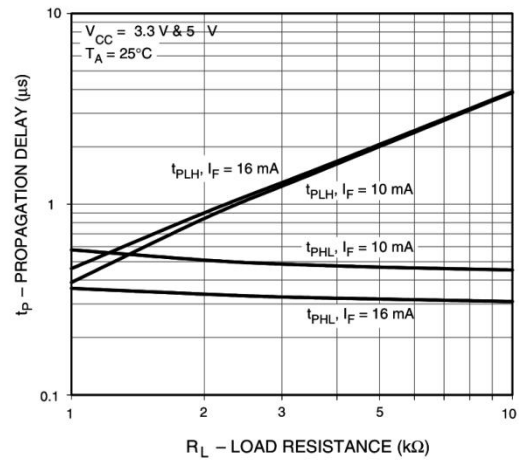


Figure 9. Switching Time Test Circuit

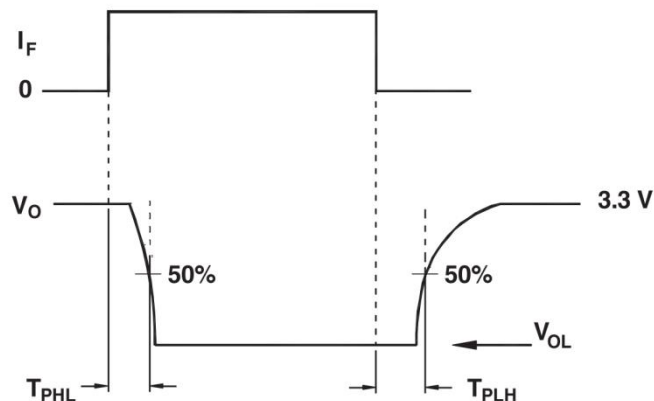
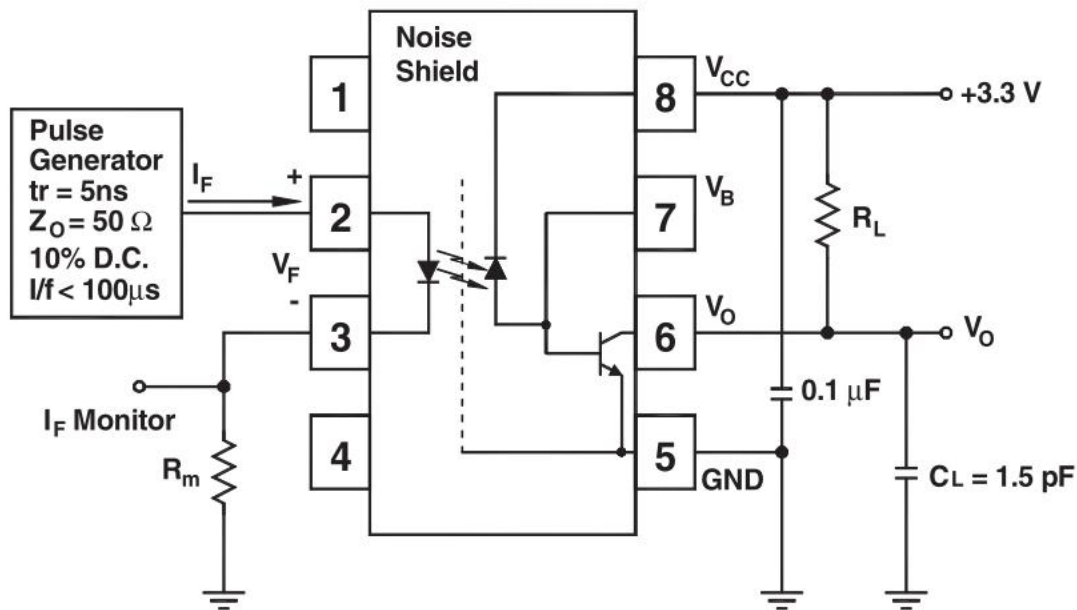
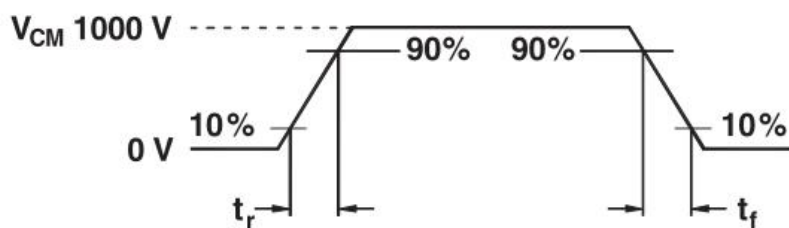
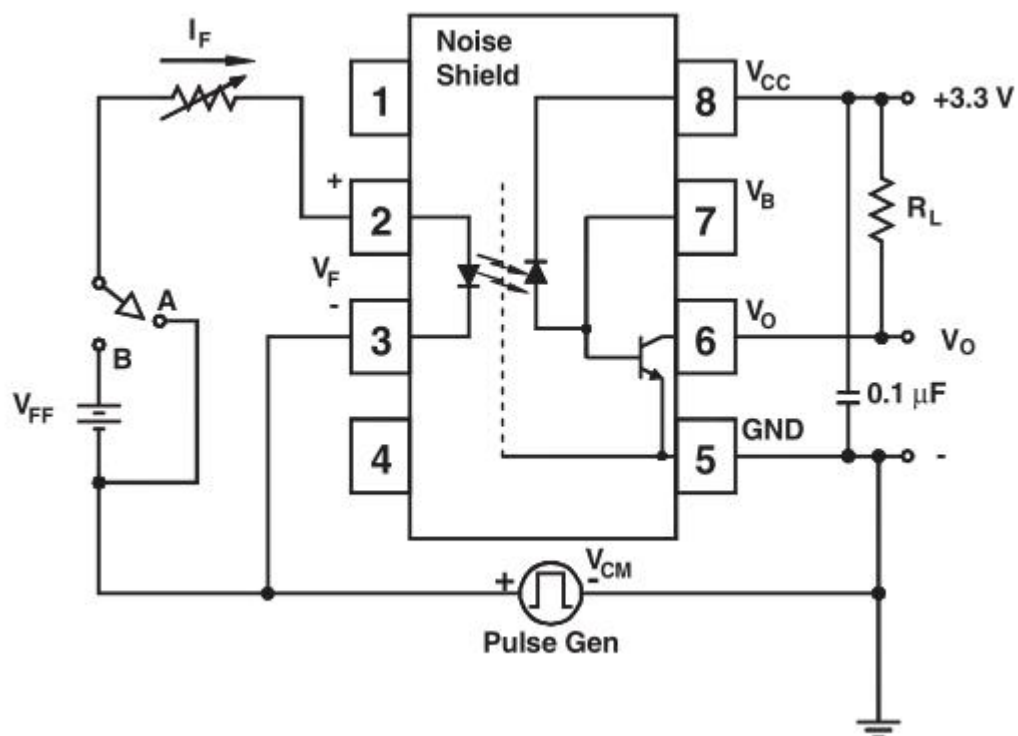


Figure 10. Common Mode Immunity Test Circuit



Switch at A :  $I_F = 0$  mA

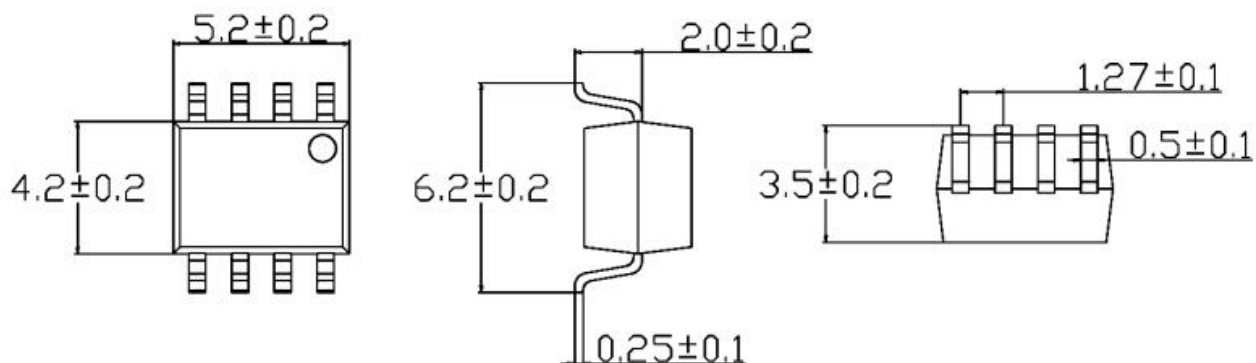


Switch at A :  $I_F = 16$  mA

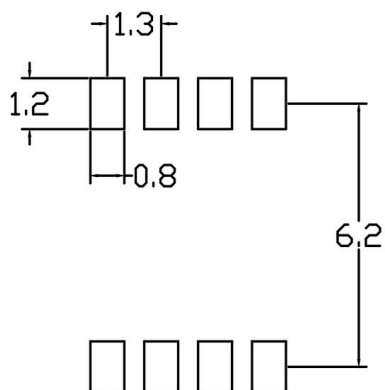


### Package Outline Dimensions (unit: mm)

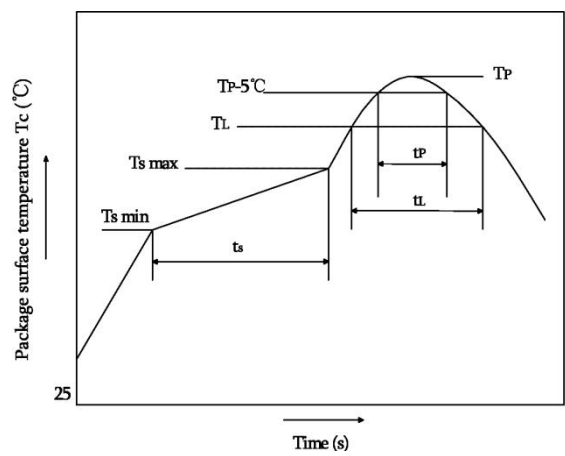
#### SOP8



### SOLDERING FOOTPRINT (unit: mm)



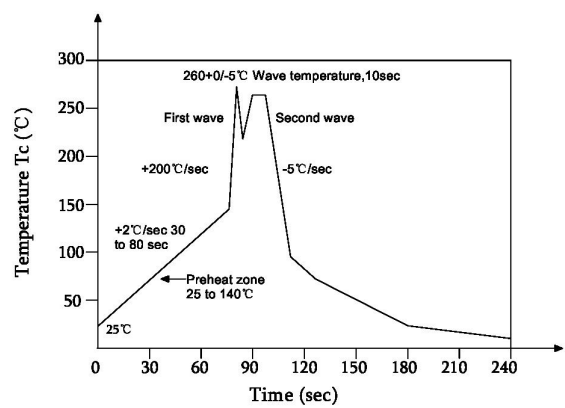
Reflow soldering



|                                               | Symbol | Min | Max | Unit |
|-----------------------------------------------|--------|-----|-----|------|
| Preheat temprayure                            | 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                  |
|--------------|--------------------|--------------------------|------------------|---------------------|------------------------------|-------------------|----------------------|-----------------------|
| SOP8         | Reel (φ330mm Blue) | 2k pcs/reel              | 2 reels /box     | 10 boxes /ctn       | 450*390*0.1mm                | 340*60*340mm      | 620*360*365mm        | Guard band 200mm min. |

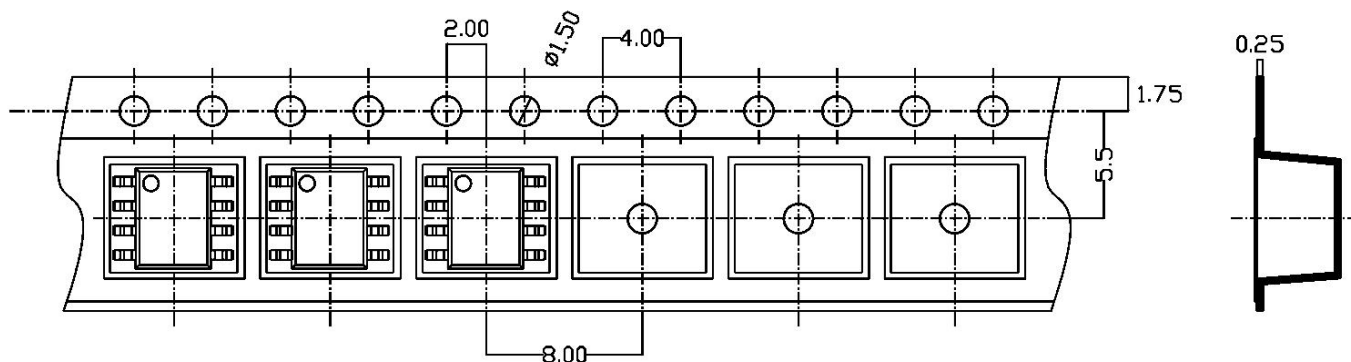
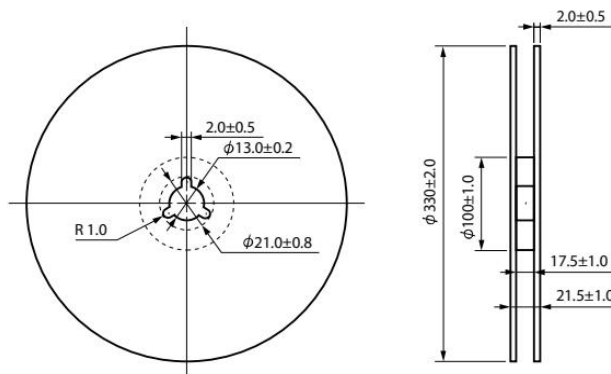
#### ■ Summary table

#### ■ SOP8 (Reel)

Qty/reel: 2000pcs. Qty/box: 4000pcs.

Qty/ctn : 40000pcs.

Schematic: (unit:mm)



### IMPORTANT NOTICE

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