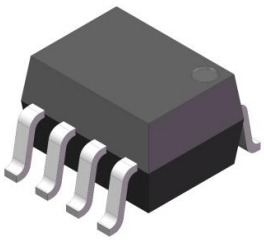
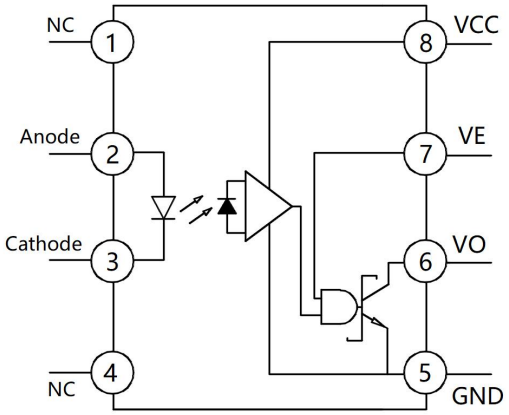
XL060L

Product packaging logic diagram



SOP8



Pin Configuration

Features

- Very high speed: 10 MBit/s
- High isolation voltage between input and output (Viso =3750Vrms)
- Operating Temperature: -40℃~85℃
- 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

- 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	060L	(X)	(X)	(X)	-	(U)	(N)	(Y)
①	②	③	④	⑤		⑥	⑦	⑧

① Brand (XL)

② Product series (060L)

③ Package type (None: SOP8)

④ Halogen)option (None : Halogen free

⑤ CTR Bank (None)

⑥ Lead frame (None: Copper)

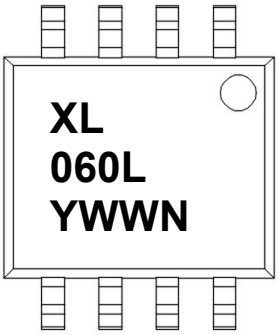
⑦ Customer option 1 (0-9 or A- Z or none)

⑧ Customer option 2 (0-9 or A- Z or none)

Part Number	Package	Shipping Quantity	Marking Code
XL060L	SOP8	1000pcs / Tape & Reel	XL060L

Marking Information

- " XL" denotes brand
- " 060 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_A = 25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Input	DC/Average Forward Input Current	IF	50	mA
	Enable Input Voltage, not to exceed VCC by more than 500 mV	VE	Vcc + 0.5V	V
	Reverse Voltage	VR	5	V
	Power Dissipation	Pd	45	mW
Output	Supply Voltage	VCC	7.0	V
	Output Current	I O	50	mA
	Output Voltage	VO	7.0	V
	Collector Output Power Dissipation	PO	85	mW

Thermal Characteristics

Parameter	Symbol	Value	Unit
Isolation Voltage *2	V_{ISO}	3750	Vrms
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature Range	T_{STG}	-55 ~ +125	°C
Soldering Temperature *3	T_{SOL}	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_A = 25°C unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	VF	IF = 10mA	-	1.4	1.8	V
	Reverse Breakdown Voltage	BVR	IR=10μA	5	-	-	V
	Capacitance	Cin	VR = 0V, f = 1MHz	-	60	-	pF
	Diode Temperature Coefficient	ΔVF/ΔTA	IF=10mA	-	-1.9	-	mV/ °C
Output	High Level Supply Current	ICCH	VE = 0.5 V, IF =0mA VCC = 3.3 V	-	3.5	7	mA
	Low Level Supply Current	ICCL		-	3.2	10	mA
	Low Level Enable Current	IEL	VCC = 3.3 V, VE = 0.5 V	-	-	-1.6	mA
	High Level Enable Current	IEH	VCC = 3.3 V, VE = 2.0 V	-	-	-1.6	mA
	High Level Enable Voltage	VEH	VCC = 3.3 V, IF = 10 mA	2.0	1.27	-	V
	Low Level Enable Voltage	VEL	VCC = 3.3 V, IF = 10 mA	-	1.18	0.8	V
Transfer Characteristics	High Level Output Current	IOH	IF = 250 μA, VCC = 3.3 V VO = 3.3 V, VE = 2.0 V	-	0.01	50	μA
	Low Level Output Voltage	VOL	VCC = 3.3 V, IF = 5 mA IOL = 13 mA, VE = 2.0 V	-	0.3	0.6	V
	Input Threshold Current	IFT	VCC = 3.3 V, VO = 0.6 V, IOL = 13 mA, VE = 2.0 V	-	-	5	mA
	Input-Output Insulation Leakage Current	I(I-O)	Relative humidity = 45%, TA = 25°C, t = 5 s, VI-O = 3000 VDC	-	-	1.0	μA
	Isolation Resistance	RIO	VI-O = 500 V (Note 12)	10^{12}	-	-	Ω
	Floating Capacitance	CIO	f = 1 MHz (Note 12)	-	0.6	-	pF

Switching Characteristics (@ T_A = -40°C～85°C, V_{CC}= 5V, I_F= 7.5mA, unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Propagation Delay Time to Output HIGH Level	TPLH	RL = 350Ω, CL = 15 pF (Fig. 9)(Note 3)	-	65	90	ns
Propagation Delay Time to Output Low Level	TPHL	RL = 350Ω, CL = 15 pF (Fig. 9)(Note 4)	-	43	75	ns
Pulse Width Distortion	TPHL–TPLH	RL = 350Ω, CL = 15 pF (Fig. 9)	-	23	25	ns
Propagation Delay Skew	tPSK	RL = 350Ω, CL = 15 pF (Note 5)	-	31	40	ns
Output Rise Time (10–90%)	Tr	RL = 350Ω, CL = 15 pF (Fig. 9)(Note 6)	-	22	-	ns
Output Rise Time (90–10%)	Tf	RL = 350Ω, CL = 15 pF (Fig. 12) (Note 7)	-	3	-	ns
Enable Propagation Delay Time to Output HIGH Level	tELH	VEH = 3 V, RL = 350Ω, CL = 15 pF (Fig. 10) (Note 8)	-	47	-	ns
Enable Propagation Delay Time to Output LOW Level	tEHL	VEH = 3 V, RL = 350Ω, CL = 15 pF (Fig. 10) (Note 9)	-	27	-	ns
Common Mode Transient Immunity (at Output HIGH Level)	|CMH|	RL = 350Ω, TA =25°C, IF = 0 mA, VOH (Min.) = 2.0V, |VCM| = 1,000 V (Fig. 11) (Note 10)	25000	50000	-	V/us
Common Mode Transient Immunity (at Output LOW Level)	|CML|	RL = 350Ω, TA =25°C, IF = 7.5 mA, VOL (Max.) = 0.8 V, |VCM| = 1,000 V (Fig. 11) (Note 11)	25000	50000	-	V/us

Notes
1. The VCC supply to each optoisolator must be bypassed by a 0.1μF capacitor or larger. This can be either a ceramic or solid tantalum capacitor with good high frequency characteristic and should be connected as close as possible to the package VCC and GND pins of each device.
2. Enable Input – No pull up resistor required as the device has an internal pull up resistor.
3. tPLH – Propagation delay is measured from the 3.75 mA level on the HIGH to LOW transition of the input current pulse to the 1.5V level on the LOW to HIGH transition of the output voltage pulse.
4. tPHL – Propagation delay is measured from the 3.75 mA level on the LOW to HIGH transition of the input current pulse to the 1.5V level on the HIGH to LOW transition of the output voltage pulse.
5. tPSK is the worst case difference between tPHL and tPLH for any devices at the stated test conditions.
6. tr – Rise time is measured from the 90% to the 10% levels on the LOW to HIGH transition of the output pulse.
7. tf – Fall time is measured from the 10% to the 90% levels on the HIGH to LOW transition of the output pulse.
8. tELH – Enable input propagation delay is measured from the 1.5V level on the HIGH to LOW transition of the input voltage pulse to the 1.5V level on the LOW to HIGH transition of the output voltage pulse.
9. tEHL – Enable input propagation delay is measured from the 1.5V level on the LOW to HIGH transition of the input voltage pulse to the 1.5V level on the HIGH to LOW transition of the output voltage pulse.
10. CMH – The maximum tolerable rate of rise of the common mode voltage to ensure the output will remain in the high state (i.e., VOUT > 2.0 V). Measured in volts per microsecond (V/μs).
11. CML – The maximum tolerable rate of fall of the common mode voltage to ensure the output will remain in the low output state (i.e., VOUT < 0.8 V). Measured in volts per microsecond (V/μs).
12. Device considered a two-terminal device: Pins 1, 2, 3 and 4 shorted together, and Pins 5, 6, 7 and 8 shorted together.

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

Fig. 1 Input Forward Current vs. Forward Voltage

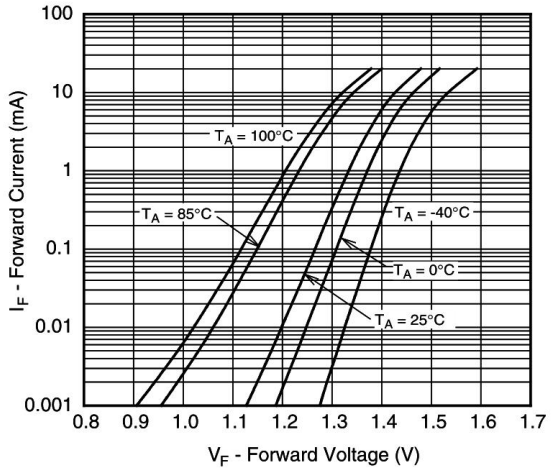


Fig. 2 Input Threshold Current vs. Ambient Temperature

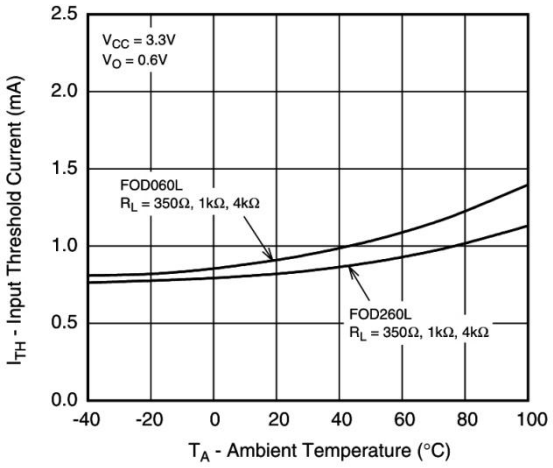


Fig. 3 Low Level Output Voltage vs. Ambient Temperature

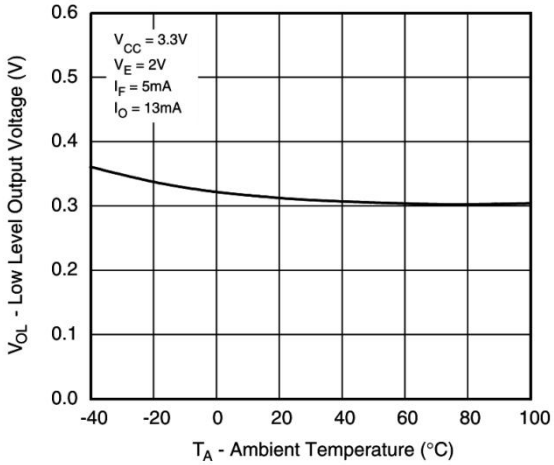


Fig. 4 High Level Output Current vs. Ambient Temperature

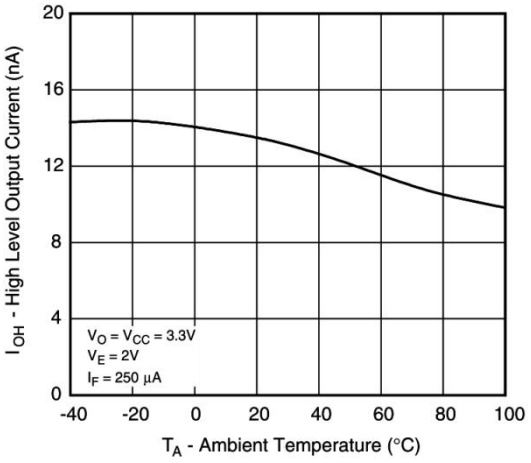


Fig. 5 Low Level Output Current vs. Ambient Temperature

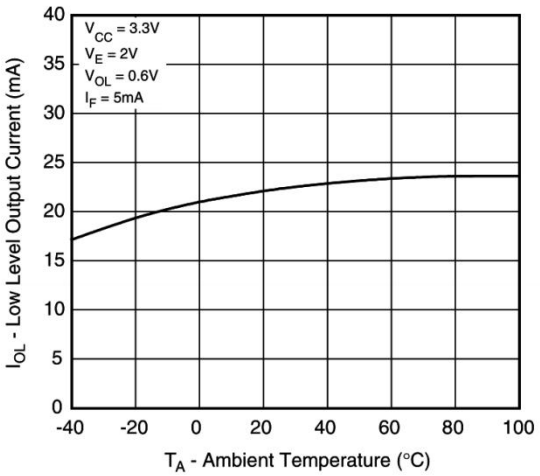
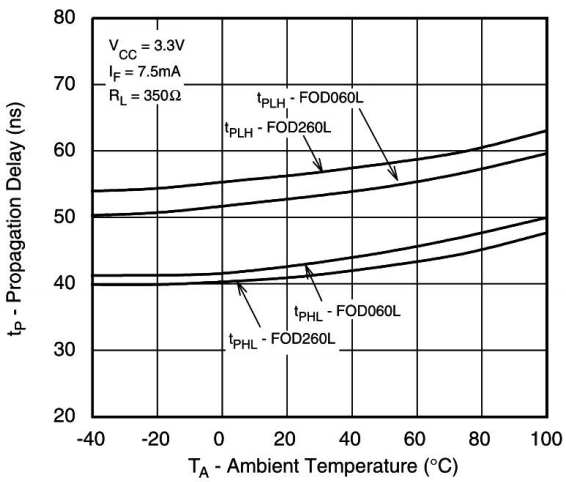


Fig. 6 Propagation Delay vs. Ambient Temperature



Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

Fig. 7 Rise and Fall Times vs. Ambient Temperature

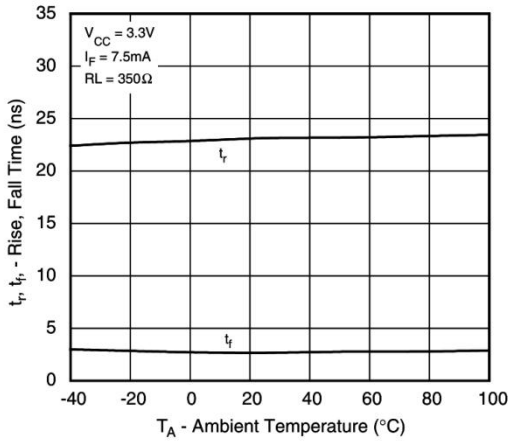


Fig. 8 Pulse Width Distortion vs. Ambient Temperature

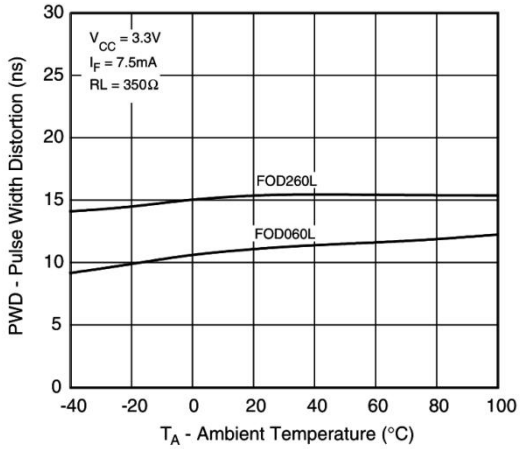


Fig. 9 Test Circuit and Waveforms for tPLH, tPHL, tr and tf.

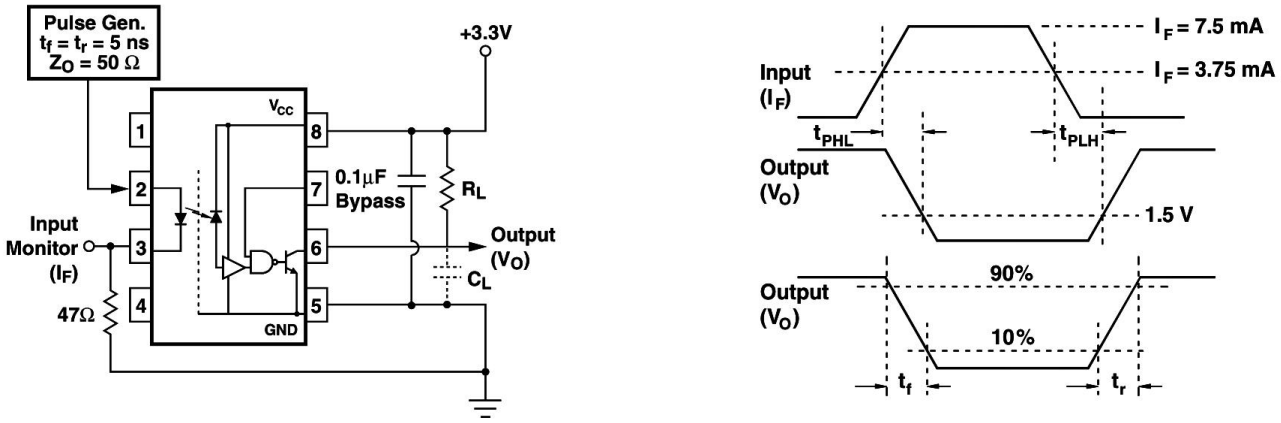


Fig. 10 Test Circuit tEHL and tELH.

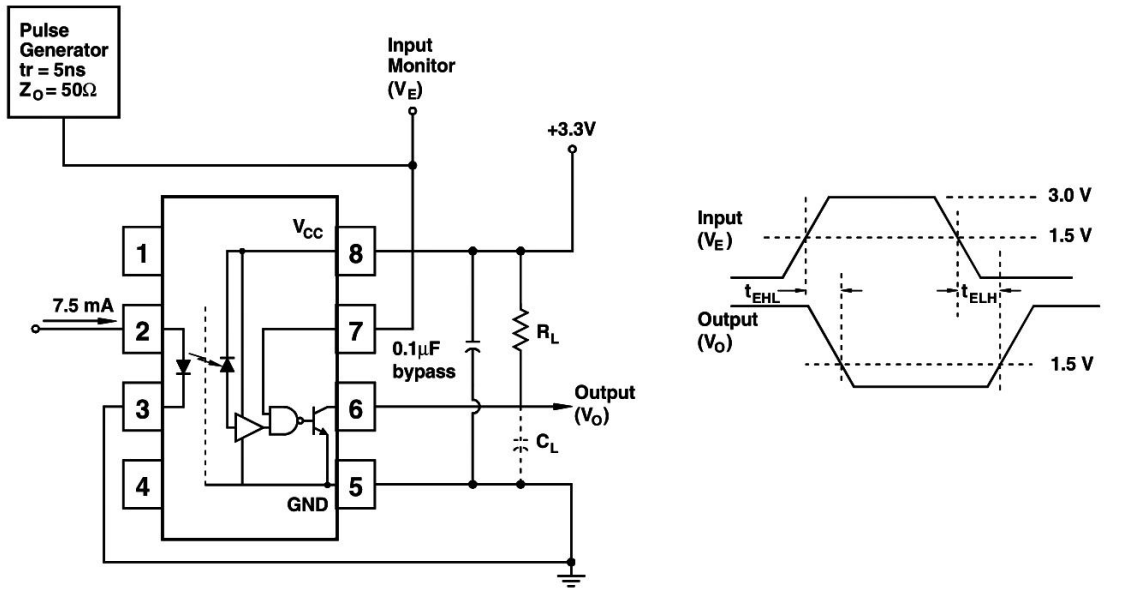
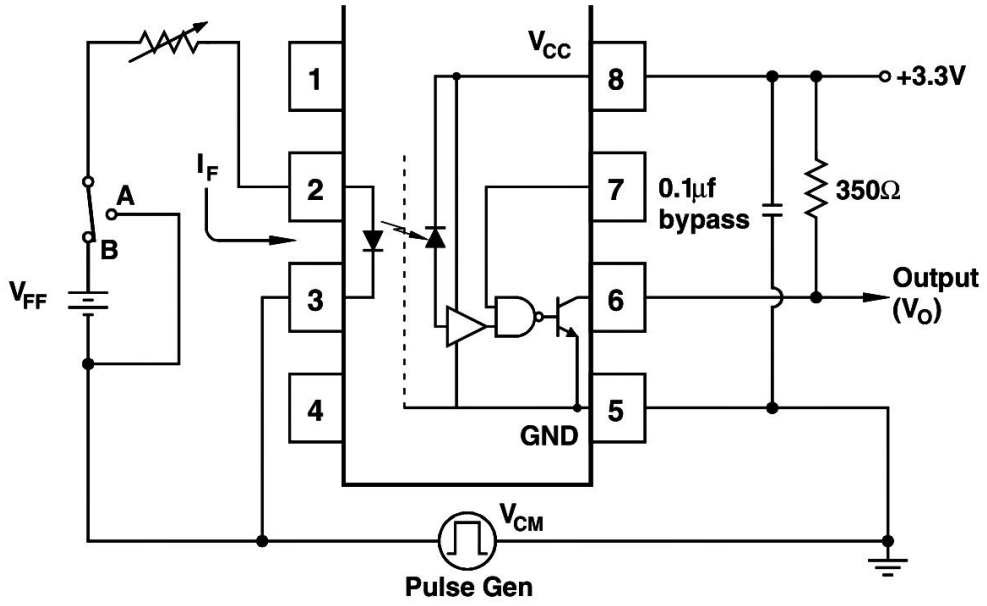
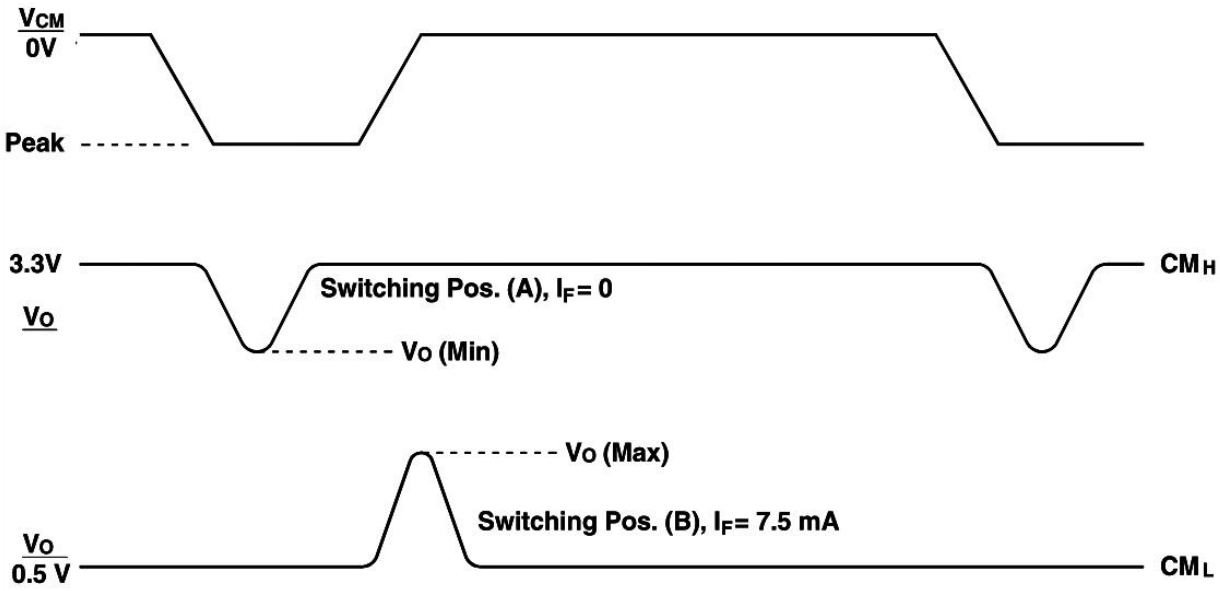


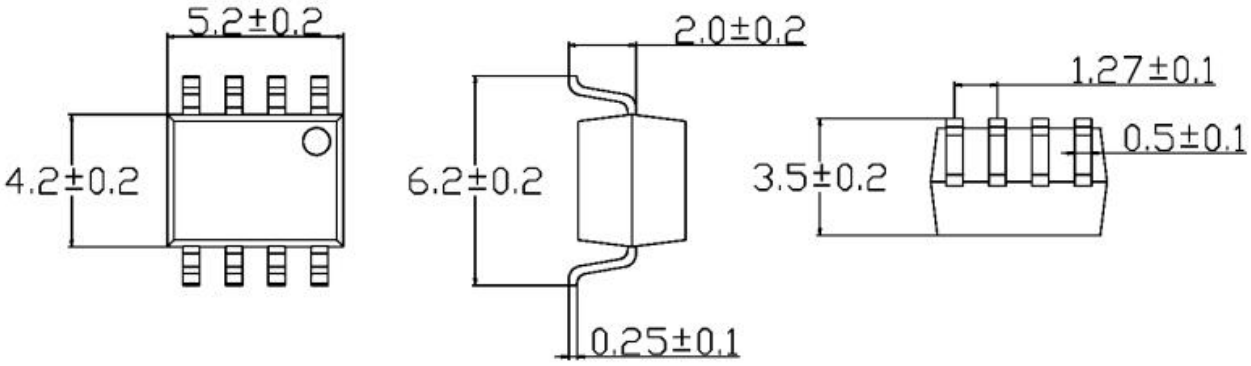
Fig. 11 Test Circuit Common Mode Transient Immunity



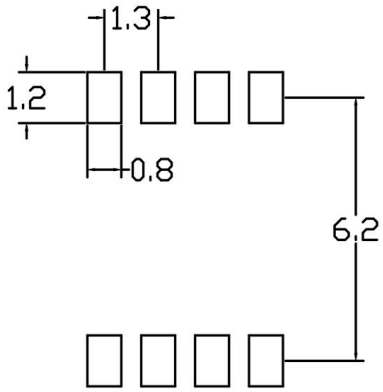


Package Outline Dimensions (unit: mm)

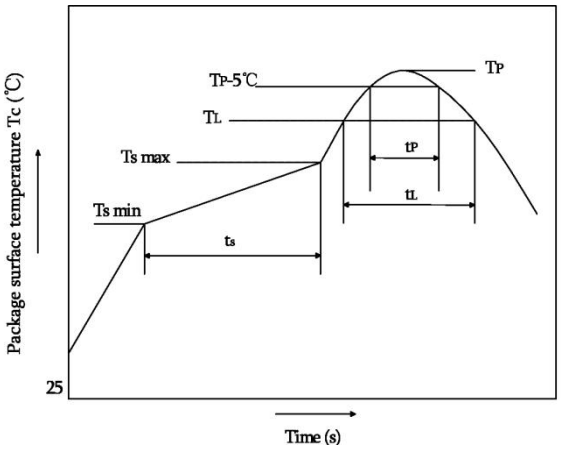
SOP8



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

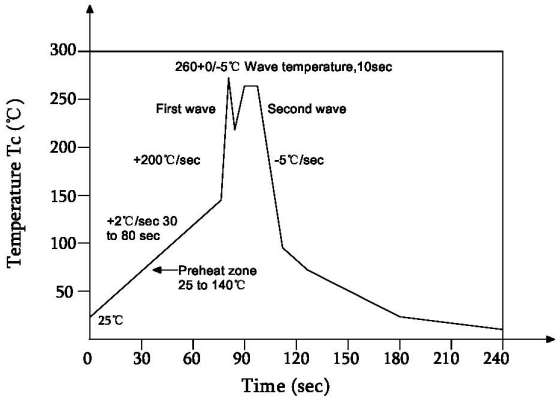


	Symbol	Min	Max	Unit
Preheat temperayure	Ts	150	200	℃
Preheat time	ts	60	120	s
Ramp-up ratea(T_L to T_P)			3	℃/s
Liquidus temperature	T_L	217		℃
Time above T_L	t_L	60	150	s
Peak temperature	Tp		260	℃
Time during which Tc is between (T_P-5) and T_P	t_p		30	s
Ramp-down rate(T_P to T_L)			6	℃/s

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℃/s
Heating rate during preheat	1℃/s to 2℃/s typical;4℃/s maximum
Final preheat temperature Ts	~130℃
Preheat time (25℃ to Ts)	>60s
Peak temperature Tp	260℃
Time within peak temperature tp	10s
Ramp-down rate	5℃/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 ℃+5℃ 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)	1000 pcs/reel	2 reels/box	10boxes /ctn	450*390*0.1mm	340*60*340mm	620*360*365mm	Guard band 200mm min.

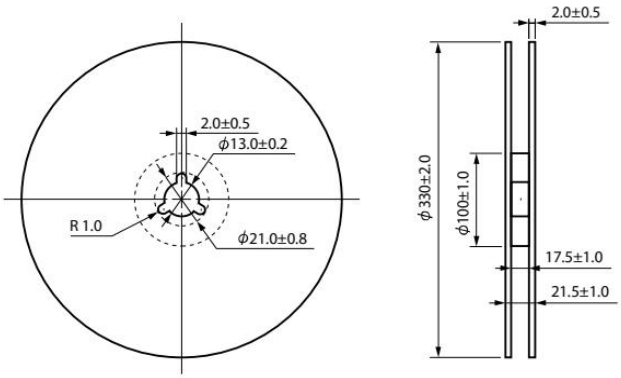
■ Summary table

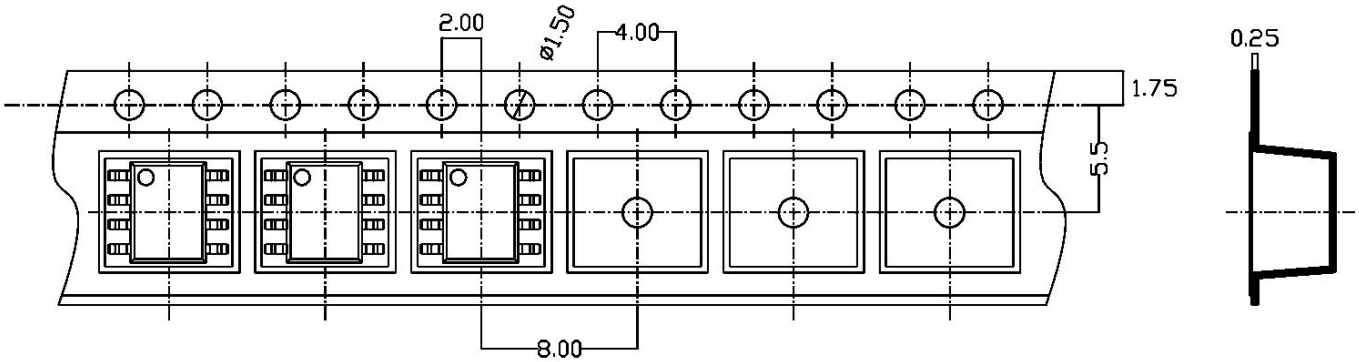
■ SOP8 (Reel)

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.