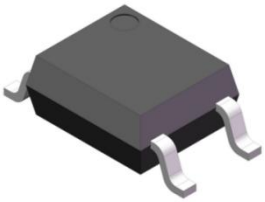
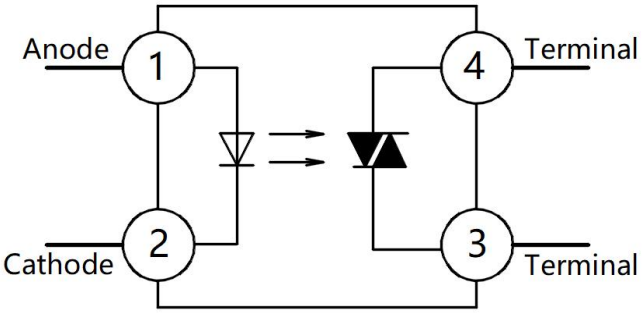
XLM301X,XLM302X,XLM305X

Product packaging logic diagram



SOP4



Pin Configuration

Features

- Peak breakdown voltage:
  250V：XLM301X；400V：XLM302X；600V：XLM305X
- High isolation voltage between input and output (Viso =3750V rms)
- Operating Temperature: -55℃~100℃
- Environmentally friendly products, compliant with CQC, UL, and VDE requirements

Mechanical Data

- Case: SOP4
- 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 Control.
- PLC and frequency converter, servo drive system, industrial robot.
- Zero crossing products are used for AC voltage regulation.
- Household appliances and consumer electronics: Motor forward and reverse heating control, speed regulation, etc
- Used for dimming control in lighting systems.
- Power System and Energy Management: Used for rectification, transformer protection, and power grid monitoring,Applied to uninterruptible power supply (UPS) and power protection equipment.
- Medical and Special Scenarios: Used for isolation and circuit protection of devices such as heart rate monitors and X-ray machines.



Ordering Information

XL	M30VX	(X)	(X)	-	(U)	(N)	(Y)
①	②	③	④		⑤	⑥	⑦

① Brand(XL)

② Product series(V:1,2,5; X:0,1,2,3,4)

③ Package type (SOP4:None)

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
XLM30V*1X*2	SOP4	3000pcs / Tape & Reel	XLM30V*1X*2

Marking Information

- " XL" denotes brand
- " V" denotes VDRM digit: 1, 2, 5
- " X" denotes IFT digit: 0, 1, 2, 3, 4
- " 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		I_F	60	mA
	Reverse Voltage		V_R	6	V
	Power Dissipation		P_D	100	mW
	Derating factor (above Ta = 85 ℃)			3.8	mW/°C
Output	Power Dissipation		P_C	300	mW
	Derating factor (above Ta = 85 ℃)			7.4	mW/°C
	Off-state Output Terminal Voltage	XLM301X	V_{DRM}	250	V
		XLM302X		400	
		XLM305X		600	
	Peak repetitive surge current (pw=100μs,120pps)		I_{TSM}	1	A
	Turn-on current (root mean square value)		$I_{T(RMS)}$	100	mA

Thermal Characteristics

Parameter	Symbol	Value	Unit
Total Power Dissipation	P_{TOT}	330	mW
Isolation Voltage *1	V_{ISO}	3750	Vrms
Operating Temperature	T_{OPR}	-55 ~ +110	°C
Storage Temperature Range	T_{STG}	-55 ~ +125	°C
Soldering Temperature *2	T_{SOL}	260	°C

Notes:

1. 40 to 60% RH, AC for 1 minute. At this time, pins 1, 2 & 3 are shorted, and pins 4, 5 & 6 are shorted together.
2. For 10 seconds

Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

Parameter			Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage		V_F	I_F=20mA	-	1.23	1.5	V
	Reverse Leakage current		I_R	V_R=6V	-	-	10	μA
Output	Peak Blocking Current		I_{DRM}	V_{DRM} =Rated V_{DRM}, I_F= 0mA	-	-	100	nA
	Peak on-state voltage		V_{TM}	I_{TM}=100mA, I_F=Rated I_{FT}	-	-	2.5	V
	Critical Rate of Rise off-state Voltage	XLM301X	dv/dt	V_{PEAK} =Rated V_{DRM}, I_F= 0mA	-	100	-	V/μs
		XLM302X						
		XLM305X		V_{PEAK} =400V, I_F=0	1000	-	-	
Transfer Characteristics	LED trigger current	XLM3010	I_{FT}	Main terminal voltage = 3V	-	-	30	mA
		XLM3020						
		XLM3011			-	-	15	
		XLM3021						
		XLM3051						
		XLM3012			-	-	10	
		XLM3022						
		XLM3052						
		XLM3013			-	-	5	
		XLM3023						
		XLM3053						
		XLM3014			-	-	3	
		XLM3024						
		XLM3054						
	Holding Current		I_H		-	250		μA

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

Fig.1 LED Positive voltage vs Positive current

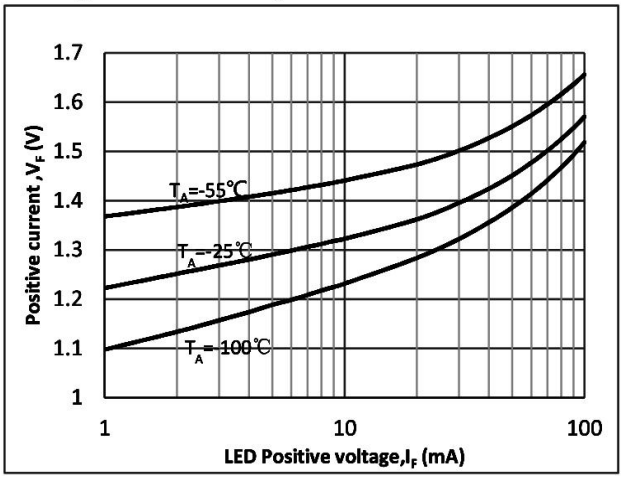


Fig.2 On-state characteristic

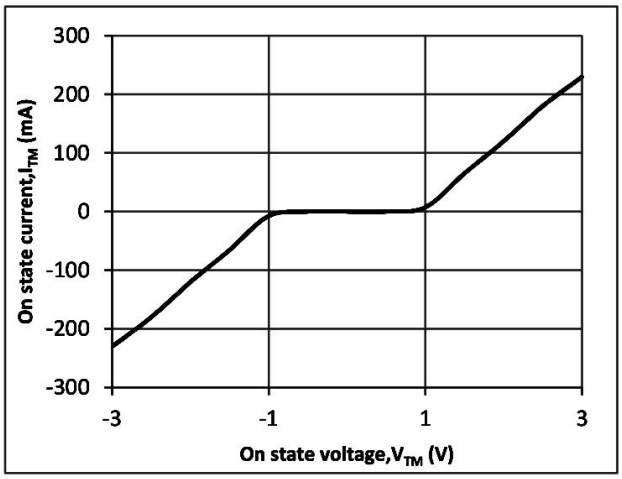


Fig.3 Trigger current vs Ambient temperature

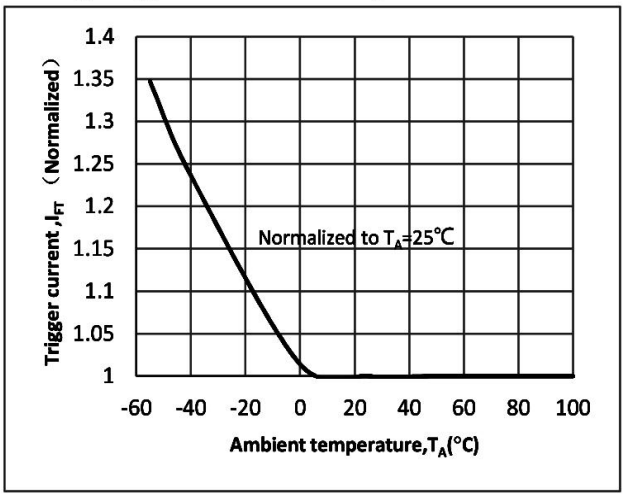


Fig4 LED Trigger current vs LED Pulse Width

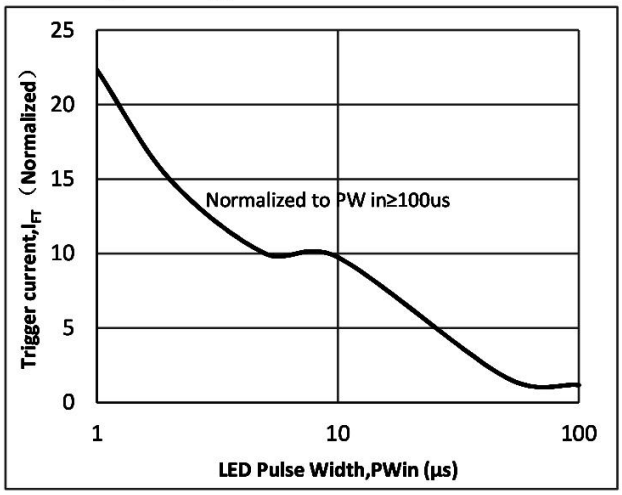


Fig.5 Holding current vs Temperature

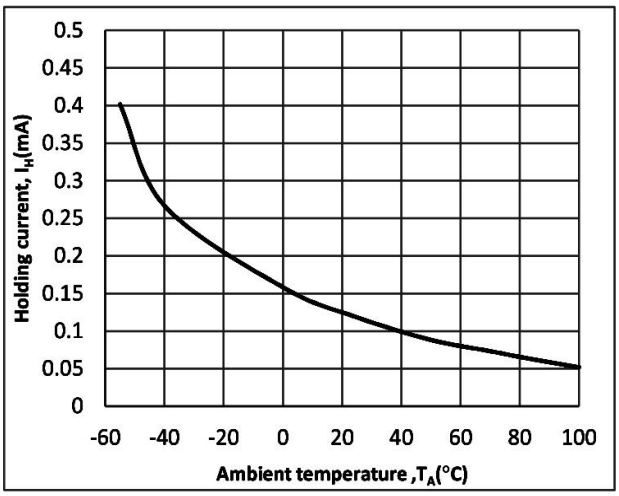
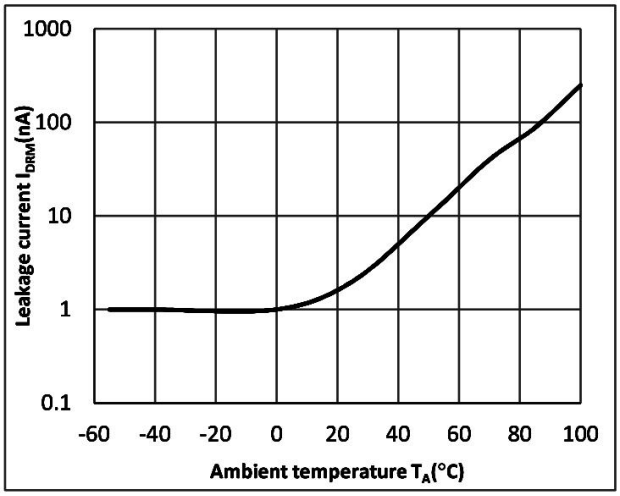
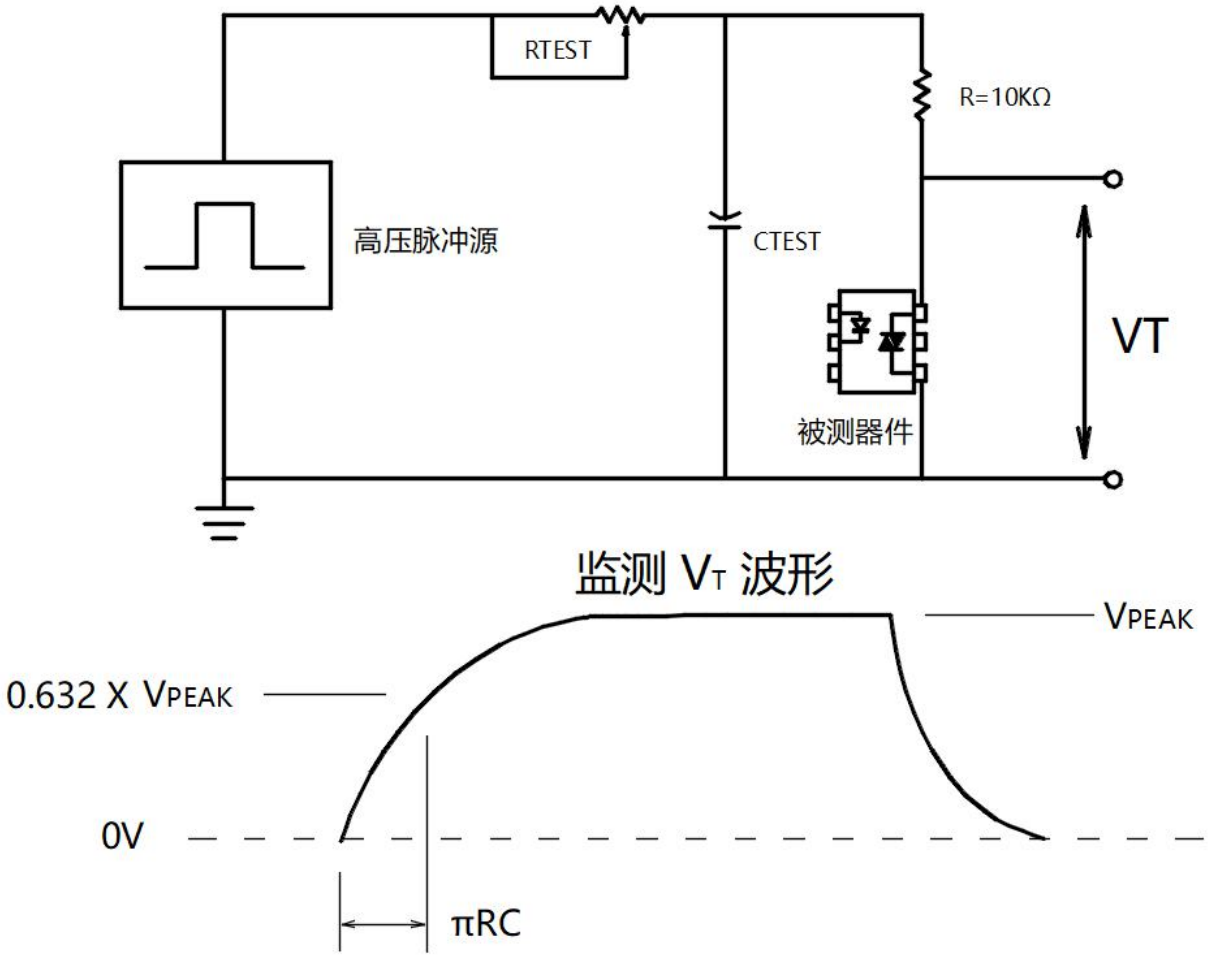


Fig.6 Leakage current vs Temperature



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

Fig.7 Static dv / dt test circuit and waveform



The high voltage pulse applied to the output of the device under test through the RC circuit is set to the required VPEAK value. LED current is not applied. The waveform VT is monitored with X100 probe.

By adjusting the RTEST value, the dv/dt (slope) increases until the device under test is observed to be triggered (waveform collapse).Then dv/dt drops until the device under test stops being triggered. At this point, RC is recorded and the dv/dt calculated.

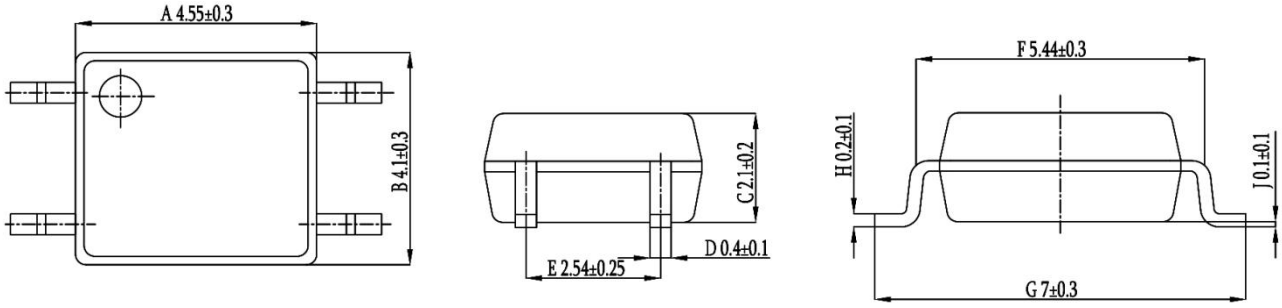
$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

For example, VPEAK = 400V for BL52X series. The dv/dt value is calculated as follows:

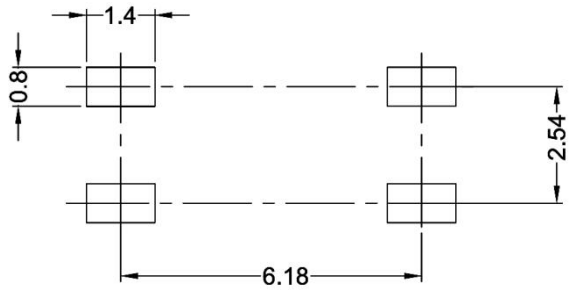
$$dv/dt = \frac{0.632 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

Package Outline Dimensions (unit: mm)

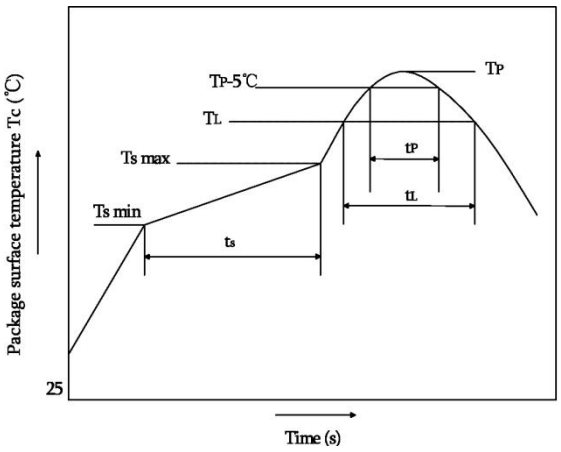
SOP4



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

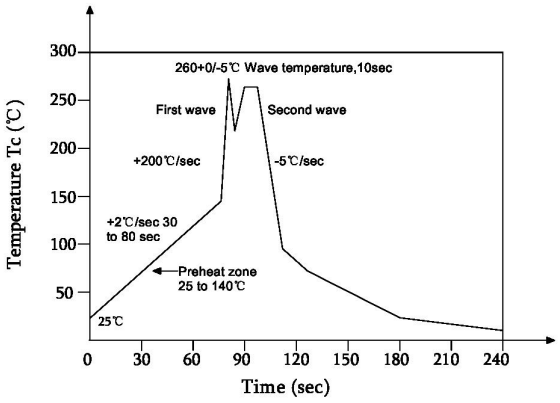


	Symbol	Min	Max	Unit
Preheat temperayure	Ts	150	200	℃
Preheat time	ts	60	120	s
Ramp-up ratea(T_L to T_P)			3	℃/s
Liquidus temperature	T_L	217		℃
Time above T_L	t_L	60	150	s
Peak temperature	Tp		260	℃
Time during which Tc is between (T_P-5) and T_P	t_p		30	s
Ramp-down rate(T_P to T_L)			6	℃/s

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
SOP4	Reel(ϕ330mm)	3000pcs/reel	2 reels /box	10 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Leave 20 Spaces at the beginning and 50 Spaces at the end

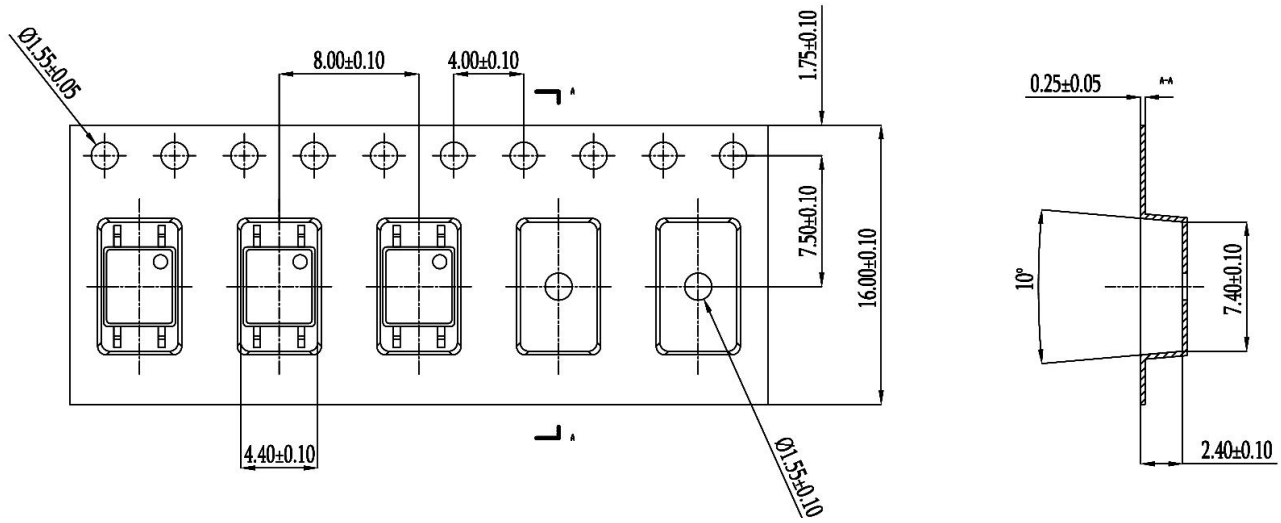
■ Summary table

■ SOP4 (Reel)

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

Qty/ctn: 60000pcs.

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.