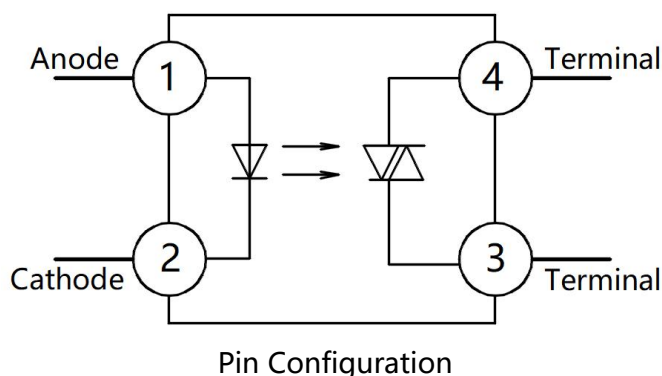


Product packaging logic diagram

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°C~100°C
- 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

- Commonly used in motor speed control systems, Power regulation system and follow-up system, Control of high-power equipment through low-power controls.
- Mainly used for motor speed control and temperature control.
- In the power system for power switches, Charging pile control and battery management system (BMS) ,Achieve precise control of voltage/current and equipment protection.
- Vehicle power management, Drive motor control and charge/discharge management, Improving vehicle energy efficiency and safety.
- In fiber optic communication equipment, routers and medical devices, signal isolation and power control in the middle, Ensure stable operation of equipment.



Ordering Information

XL M30VX (M) (G) - (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 °C)		3.8	mW/°C
Output	Power Dissipation	P _C	300	mW
	Derating factor (above Ta = 85 °C)		7.4	mW/°C
	Off-state Output Terminal Voltage	V _{DRM}	250	V
			400	
			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	V _{rms}
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			-	-	10	
		XLM3012			-	-	-	
		XLM3022			-	-	5	
		XLM3052			-	-	3	
		XLM3013			-	-	-	
		XLM3023			-	-	-	
		XLM3053			-	-	-	
		XLM3014			-	-	-	
		XLM3024			-	-	-	
		XLM3054			-	-	-	
	Holding Current		I _H		-	250		μA

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

Fig.1 LED Positive voltage vs Positive current

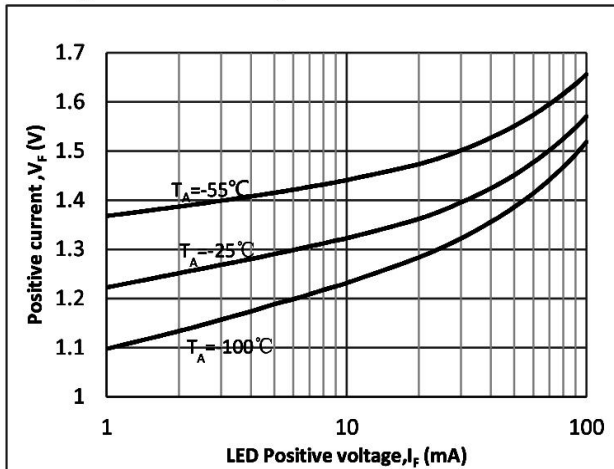


Fig.2 On-state characteristic

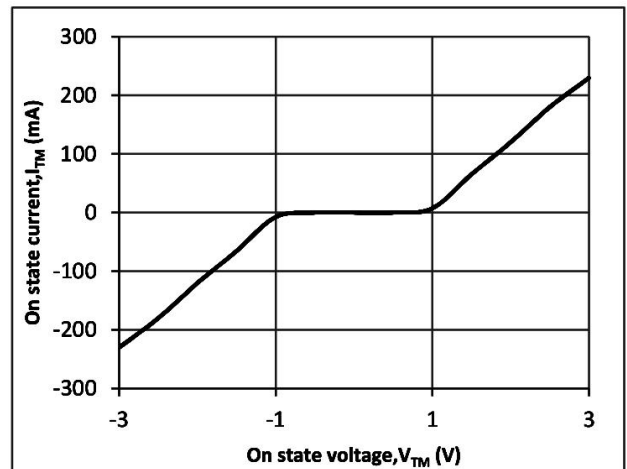


Fig.3 Trigger current vs Ambient temperature

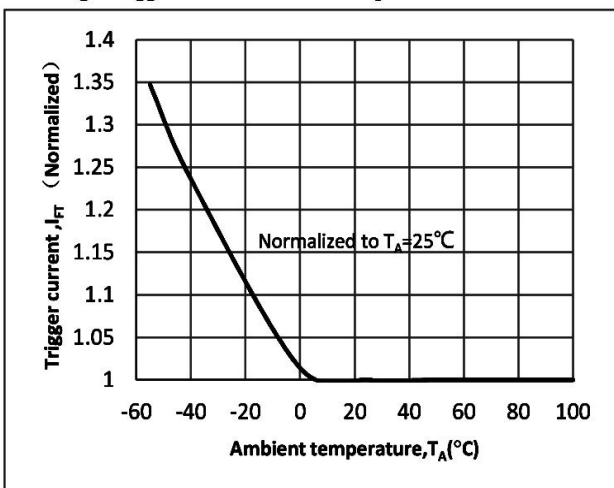


Fig.4 LED Trigger current vs LED Pulse Width

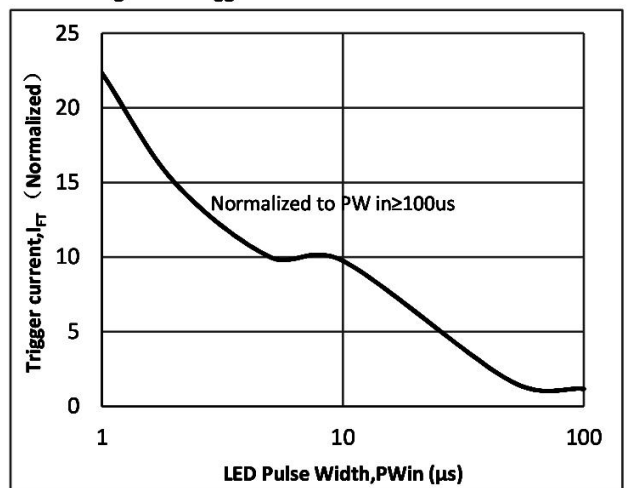


Fig.5 Holding current vs Temperature

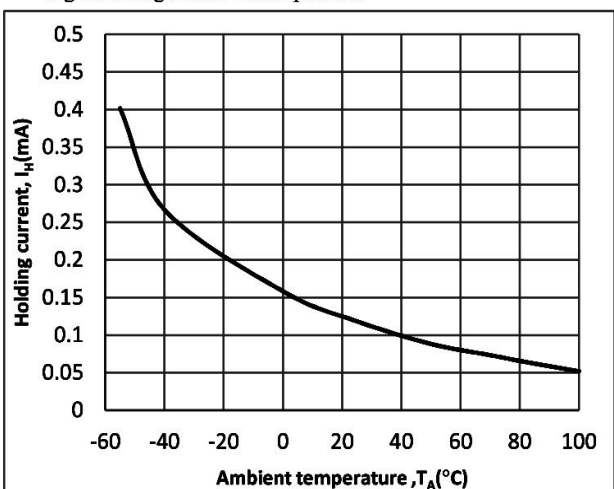
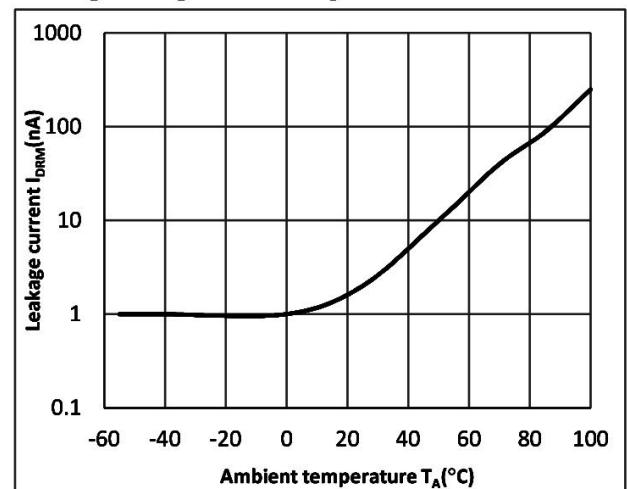
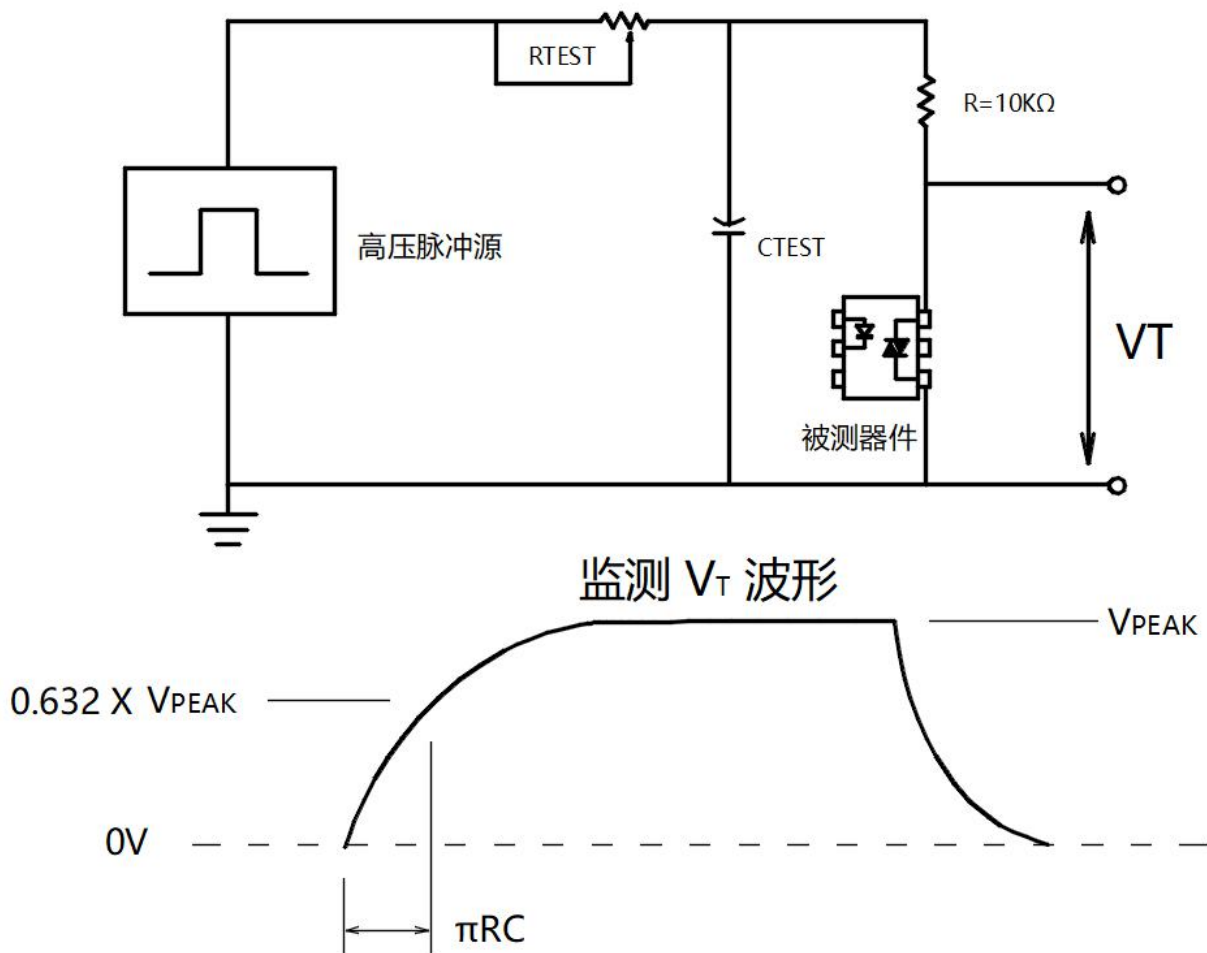


Fig.6 Leakage current vs Temperature



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 V_{PEAK} value. LED current is not applied. The waveform V_T is monitored with X100 probe.

By adjusting the R_{TEST} 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.

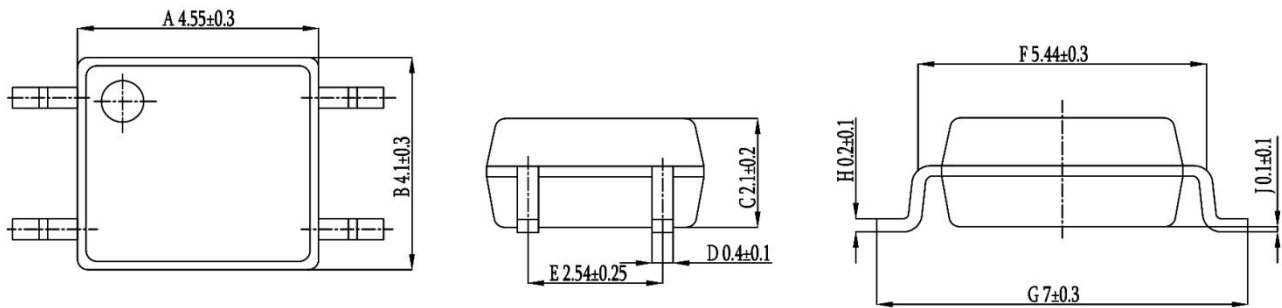
$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

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

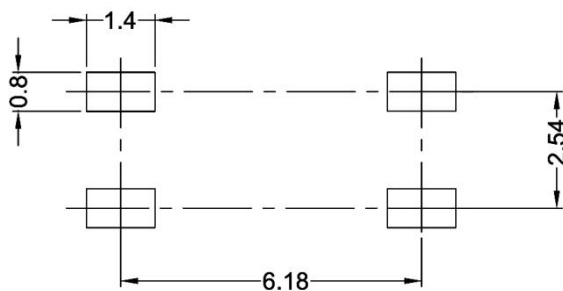
$$dv/dt = \frac{0.632 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

Package Outline Dimensions (unit: mm)

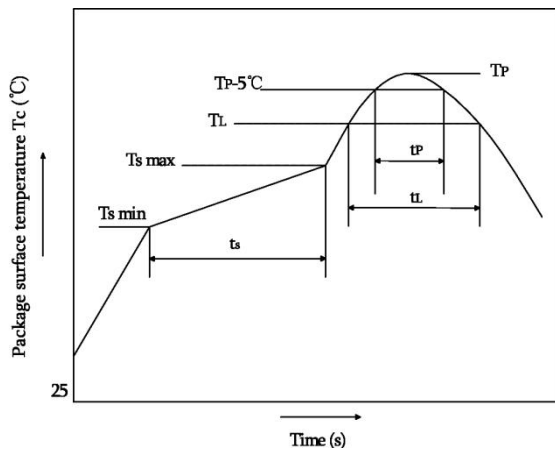
SOP4



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

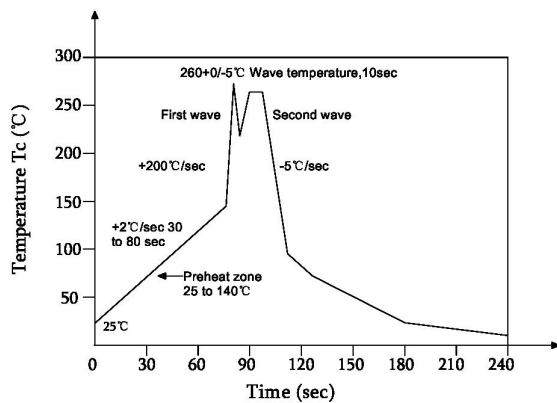


	Symbol	Min	Max	Unit
Preheat temperature	Ts	150	200	°C
Preheat time	ts	60	120	s
Ramp-up rate(T _L to T _P)			3	°C/s
Liquidus temperature	T _L	217		°C
Time above T _L	t _L	60	150	s
Peak temperature	T _P		260	°C
Time during which T _c is between (T _P -5) and T _P	t _p		30	s
Ramp-down rate(T _P to T _L)			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 T _P	260°C
Time within peak temperature t _p	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.

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($\phi 330$ mm)	3000pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Leave 20 Spaces at the beginning and 50 Spaces at the end

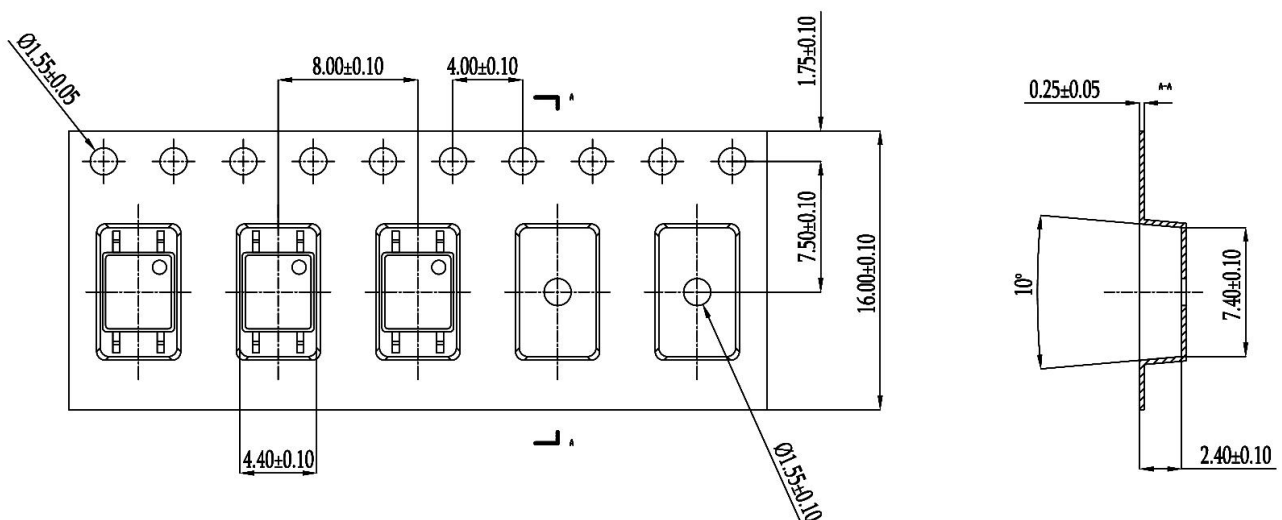
■ Summary table

■ SOP4 (Reel)

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

Qty/ctn : 30000pcs.

Schematic: (unit:mm)



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