

### Features

- Peak breakdown voltage:
- 250V: BLM301X; 400V: BLM302X; 600V: BLM305X
- High isolation voltage between input and output (Viso =3750V rms )
- Operating Temperature: -55°C~110°C

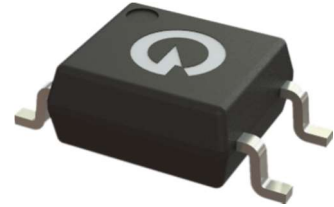
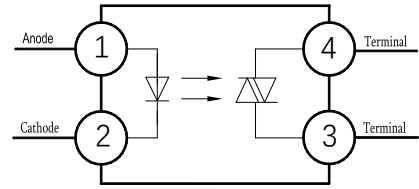
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### Applications

- Electromagnetic valve controls
- Ballasts
- Static AC power switch
- Interfacing microprocessors to 115 to 240Vac peripherals.
- Incandescent lamp dimmer
- Temperature controls
- Motor controls

### Mechanical Data

- Case: SOP4
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



### Ordering Information

BL    M30VX    (M)    (G)    -    (U)    (N)    (Y)

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

- ① Brand(BL)
- ② Product series(V:1,2,5;X:0,1,2,3)
- 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
BLM3051	SOP4	3000 pcs / Tape & Reel	BLM3051

### Marking Information

- "BL" denotes brand
- "V" denotes  $V_{DRM}$  digits: 1, 2, 5
- "X" denotes  $I_{FT}$  digits: 0, 1, 2, 3
- "Y" denotes Year : A(2024), B(2025), C(2026) .....
- "WW" denotes Week's number
- "N" denotes the day of Week



### Maximum Ratings (@ TA = 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	BLM301X	$V_{DRM}$	250	V
		BLM302X		400	
		BLM305X		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:

- 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.
- For 10 seconds

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

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Input	Forward Voltage	$V_F$	$I_F=20\text{mA}$	-	1.23	1.5	V	
	Reverse Leakage current	$I_R$	$V_R=6\text{V}$	-	-	10	$\mu\text{A}$	
Output	Peak Blocking Current	$I_{DRM}$	$V_{DRM} = \text{Rated } V_{DRM}, I_F=0\text{mA}$	-	-	100	nA	
	Peak on-state voltage	$V_{TM}$	$I_{TM}=100\text{mA}, I_F=\text{Rated } I_{FT}$	-	-	2.5	V	
	Critical Rate of Rise off-state Voltag	BLM301X	dv/dt	$V_{PEAK} = \text{Rated } V_{DRM}, I_F=0\text{mA}$	-	100	-	V/ $\mu\text{s}$
		BLM302X						
BLM305X		$V_{PEAK} = 400\text{V}, I_F=0$						
Transfer Characteristics	LED trigger current	BLM3010	$I_{FT}$	Main terminal voltage = 3V	-	-	30	mA
		BLM3020			-	-	15	
		BLM3011			-	-	10	
		BLM3021			-	-	5	
		BLM3051			-	-	5	
		BLM3012			-	-	10	
		BLM3022			-	-	10	
		BLM3052			-	-	5	
		BLM3013			-	-	5	
		BLM3023			-	-	5	
	BLM3053	-	-	5				
Holding Current	$I_H$		-	250		$\mu\text{A}$		

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

Fig.1 LED Positive voltage vs Positive current

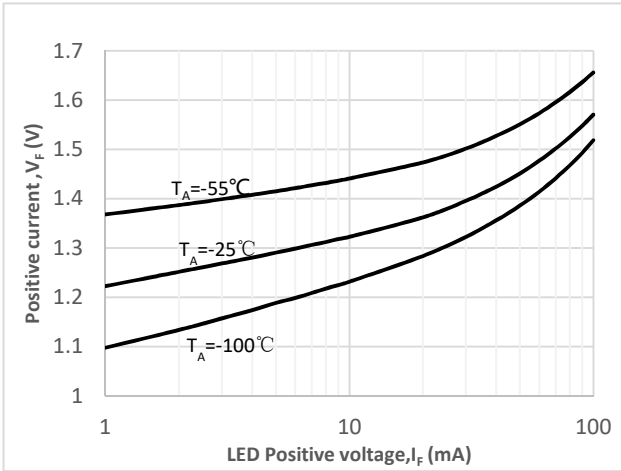


Fig.2 On-state characteristic

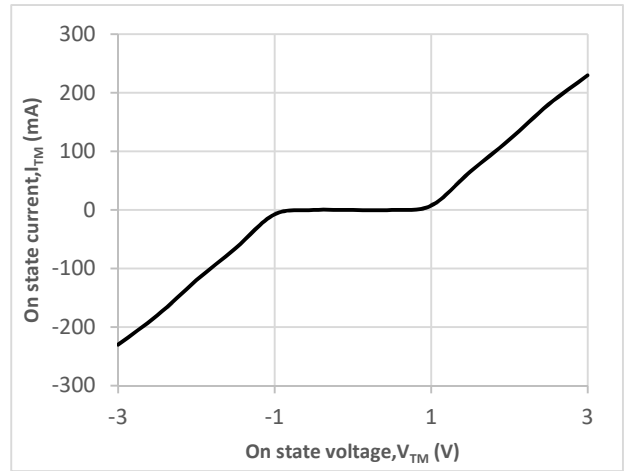


Fig.3 Trigger current vs Ambient temperature

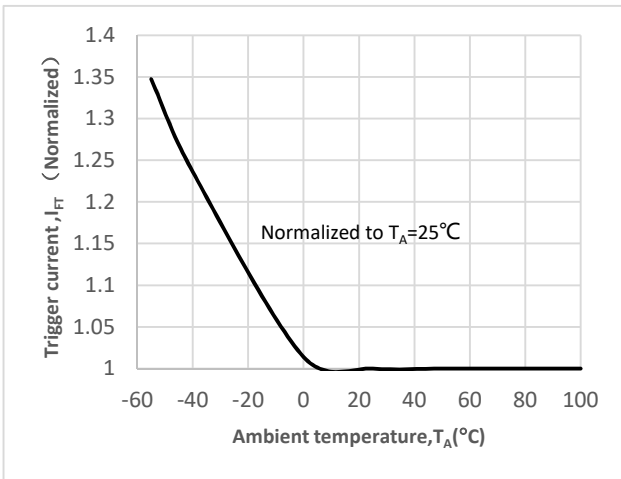


Fig.4 LED Trigger current vs LED Pulse Width

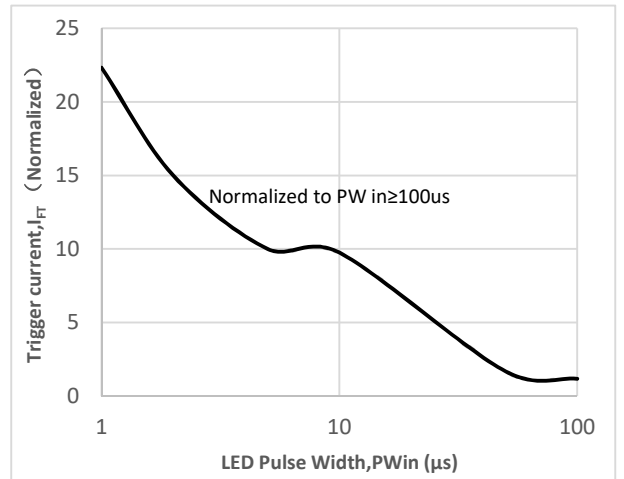


Fig.5 Holding current vs Temperature

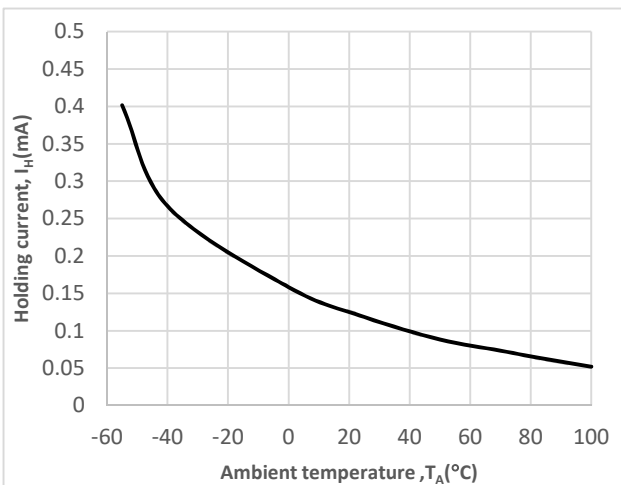


Fig.6 Leakage current vs Temperature

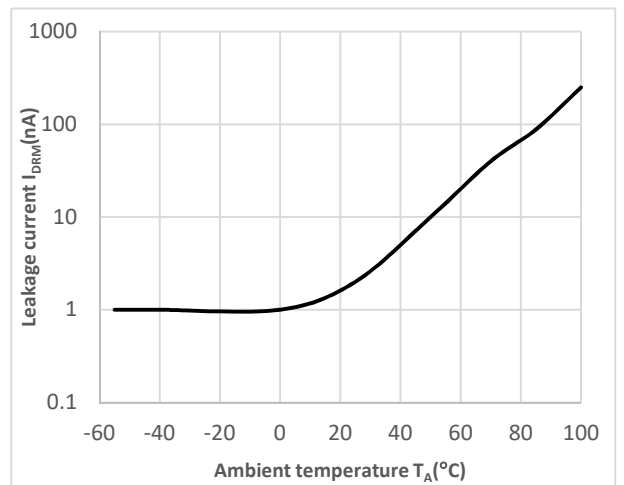
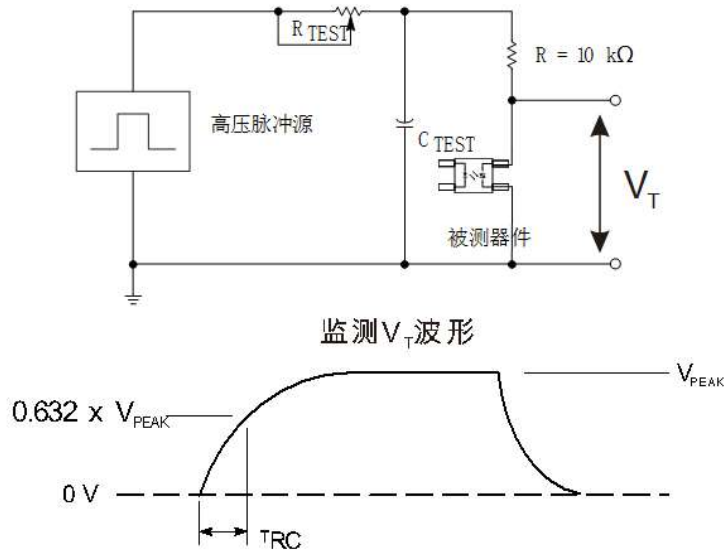


Fig.7 Static dv / dt test circuit and waveform



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.

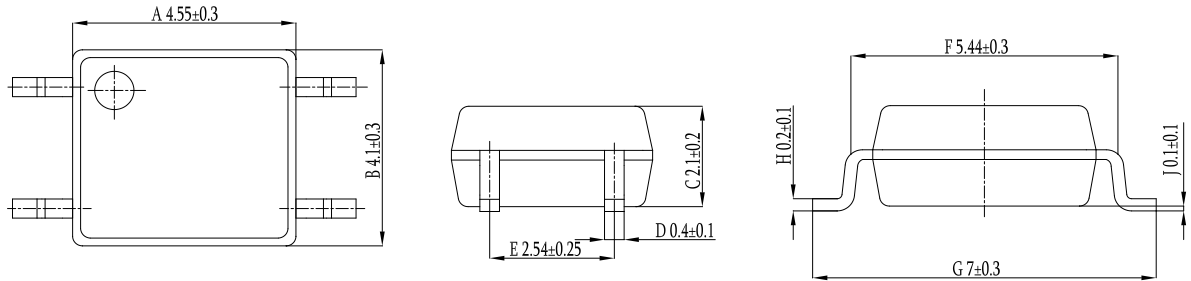
$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

For example,  $V_{PEAK} = 400V$  for QX302X series. The  $dv/dt$  value is calculated as follows:

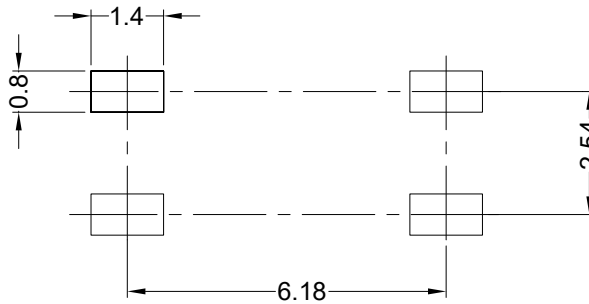
$$dv/dt = \frac{0.632 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

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

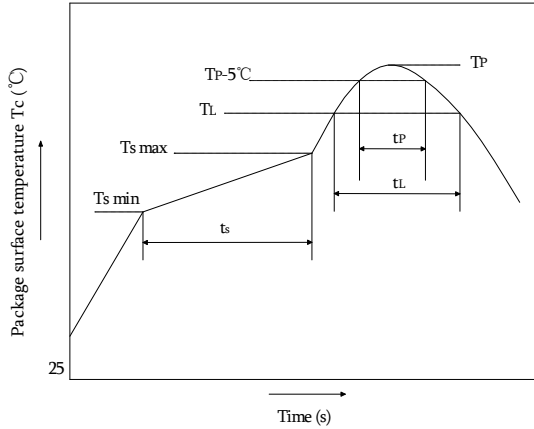
**SOP4**



**SOLDERING FOOTPRINT** (unit: mm)



### Reflow soldering

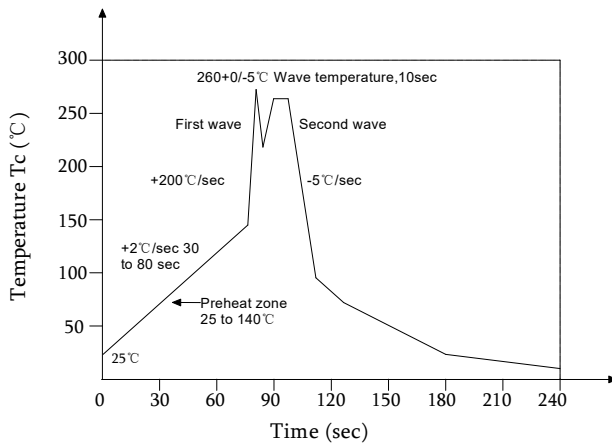


	Symbol	Min	Max	Unit
Preheat temperature	Ts	150	200	°C
Preheat time	ts	60	120	s
Ramp-up rate(T <sub>L</sub> to T <sub>P</sub> )			3	°C/s
Liquidus temperature	T <sub>L</sub>	217		°C
Time above T <sub>L</sub>	t <sub>L</sub>	60	150	s
Peak temperature	T <sub>P</sub>		260	°C
Time during which T <sub>c</sub> is between (T <sub>P</sub> -5) and T <sub>P</sub>	t <sub>p</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 T <sub>p</sub>	260°C
Time within peak temperature t <sub>p</sub>	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.

### Pcaking

Package Type	Packing Form	Quantity per Tube &Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
SOP4	Reel( $\phi$ 330mm)	3000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Guard band 200mm /min.

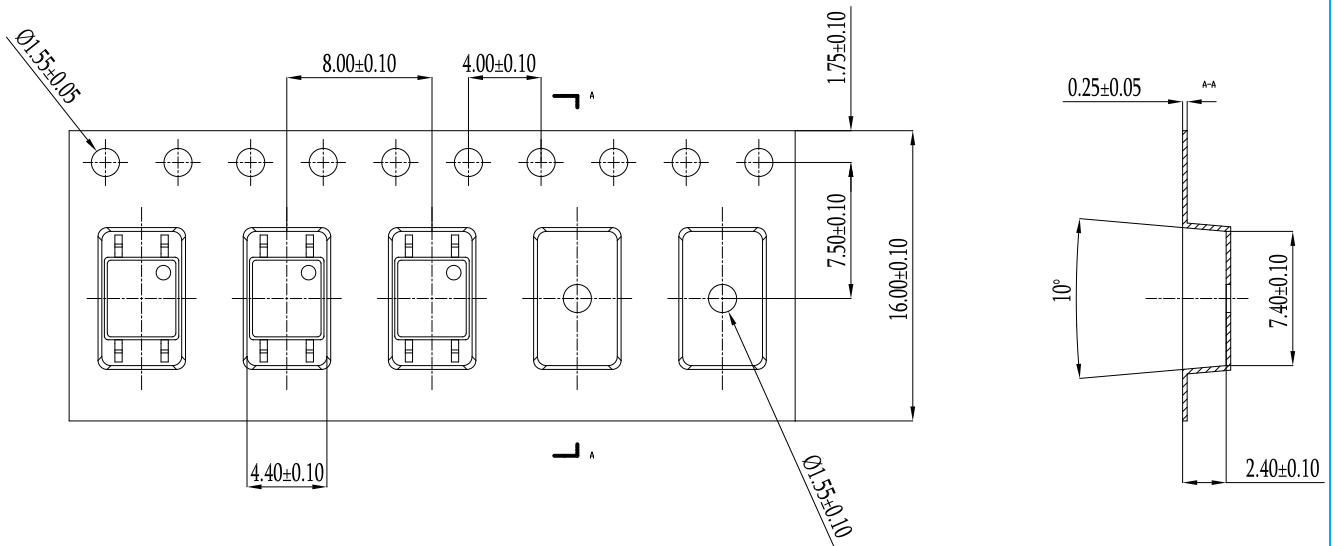
■ Summary table

■ ■ SOP4 (Reel)

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

Qty/ctn : 30000 pcs.

Schematic: (unit:mm)



### IMPORTANT NOTICE

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