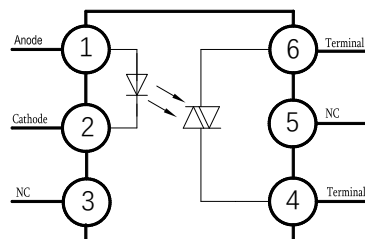


Features

- Peak breakdown voltage:
- 250V: QX301X; 400V: QX302X; 600V: QX305X; 800V: QX307X
- High isolation voltage between input and output (Viso =5000V rms)
- Operating Temperature: -55°C~100°C

HF

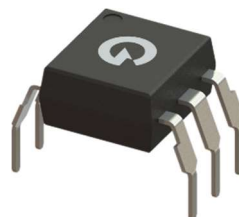
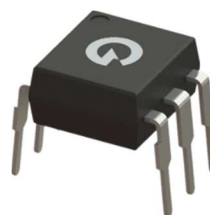


Applications

- 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: DIP-6L, DIP-6L(M),SMD-6L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



Ordering Information

BL 30VX (M) (G) - (U) (N) (Y)

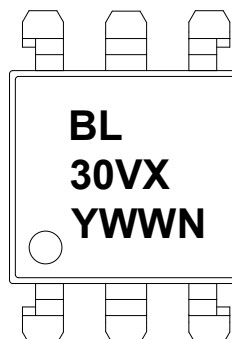
① ② ③ ④ ⑤ ⑥ ⑦

- ① Brand(BL)
- ② Product series(V:1,2,5,7;X:0,1,2,3)
- ③ Package type(DIP-6L:None, DIP-6L(M):M,SMD-6L:S)
- 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
BL3011	DIP-6L	65 pcs / Tube	BL3011
BL3021M	DIP-6L(M)	65 pcs / Tube	BL3021
BL3051S	SMD-6L	1000 pcs / Tape & Reel	BL3051

Marking Information

- "BL" denotes brand
- "V" denotes V_{DRM} digits: 1, 2, 5, 7
- "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 (@ $T_A = 25^\circ\text{C}$ 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 $T_a = 85^\circ\text{C}$)		3.8	mW/ $^\circ\text{C}$
Output	Power Dissipation	P_C	300	mW
	Derating factor (above $T_a = 85^\circ\text{C}$)		7.4	mW/ $^\circ\text{C}$
	Off-state Output Terminal Voltage	V_{DRM}	250	V
			400	
			600	
			800	
	Peak repetitive surge current (pw=100 μ s,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}	5000	Vrms
Operating Temperature	T_{OPR}	-55 ~ +100	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +125	$^\circ\text{C}$
Soldering Temperature *2	T_{SOL}	260	$^\circ\text{C}$

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

Random-phase Triac Driver Photocouple

BL301X ,BL302X,BL305X,BL307X

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	-	1.36	1.5	V
	Reverse Leakage current		I _R	V _R =6V	-	-	10	μA
Output	Peak Blocking Current	BL301X	I _{DRM}	V _{DRM} =Rated V _{DRM} , I _F = 0mA	-	-	100	nA
		BL302X			-	-	500	
		BL305X			-	-	500	
		BL307X			-	-	500	
	Peak on-state voltage		V _{TM}	I _{TM} =100mA, I _F =Rated I _{FT}	-	-	3	V
	Critical Rate of Rise off-state Voltag	BL301X	dv/dt	V _{PEAK} =Rated V _{DRM} , I _F = 0mA	-	100	-	V/μs
		BL302X			-	100	-	
		BL305X		V _{PEAK} =400V, I _F =0	1000	-	-	
		BL307X			1000	-	-	
Transfer Characteristics	LED trigger current	BL3020	I _{FT}	Main terminal voltage = 3V	-	-	30	mA
		BL3011			-	-	15	
		BL3021			-	-	15	
		BL3051			-	-	10	
		BL3071			-	-	10	
		BL3012			-	-	10	
		BL3022			-	-	10	
		BL3052			-	-	5	
		BL3072			-	-	5	
		BL3013			-	-	5	
		BL3023			-	-	5	
		BL3053			-	-	5	
		BL3073			-	-	5	
	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

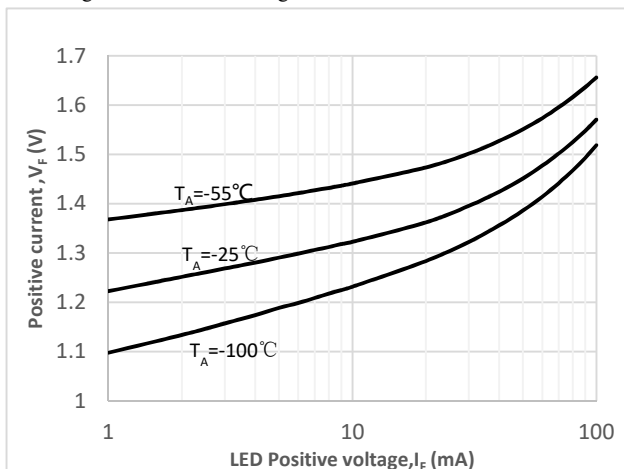


Fig.2 On-state characteristic

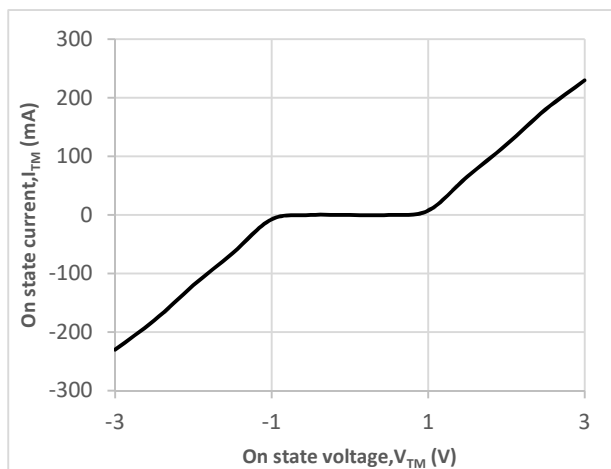


Fig.3 Trigger current vs Ambient temperature

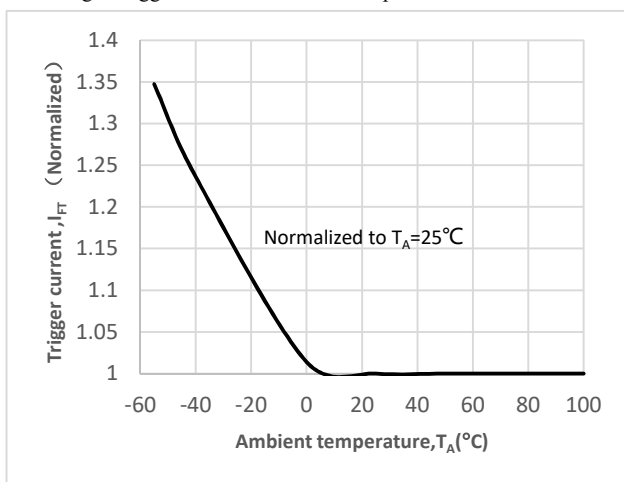


Fig.4 LED Trigger current vs LED Pulse Width

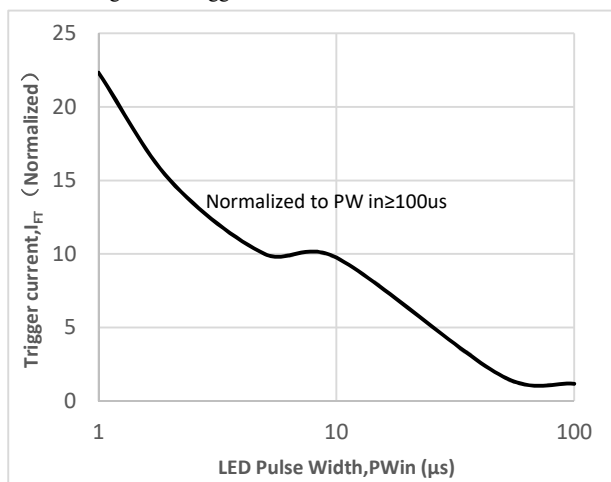


Fig.5 Holding current vs Temperature

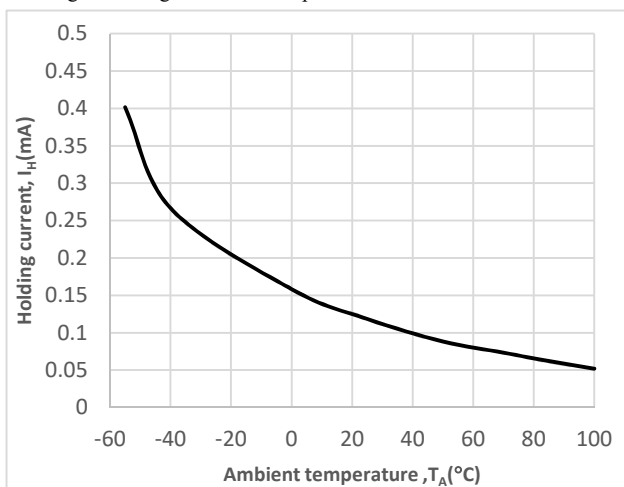


Fig.6 Leakage current vs Temperature

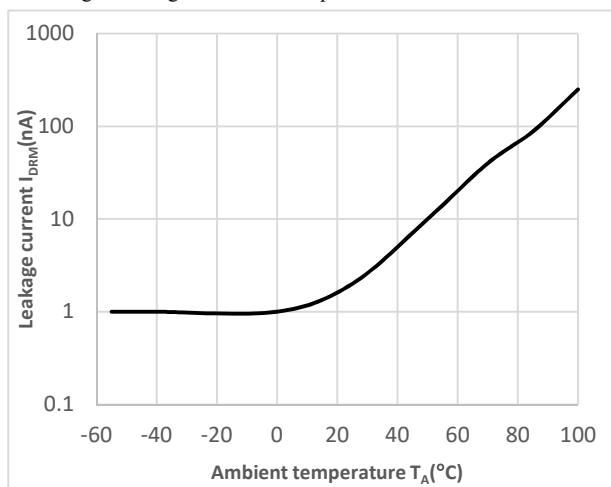
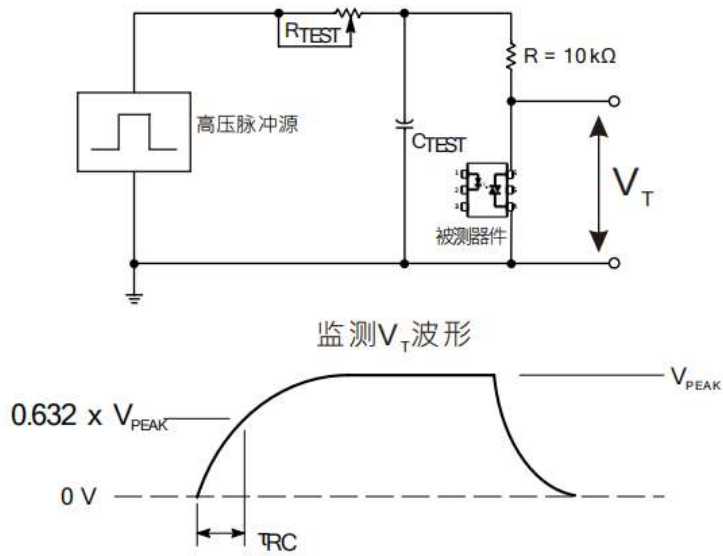


Fig.7 Static dv / dt test circuit and waveform



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, τ_{RC} is recorded and the dv/dt calculated.

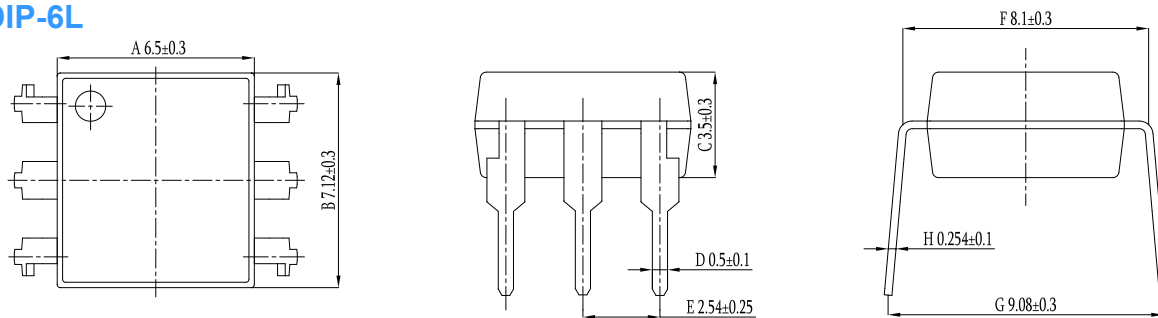
$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

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

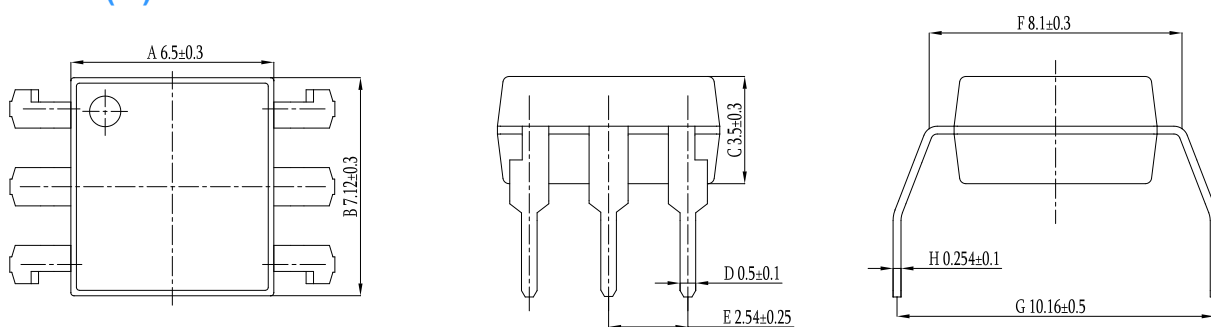
$$dv/dt = \frac{0.632 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

Package Outline Dimensions (unit: mm)

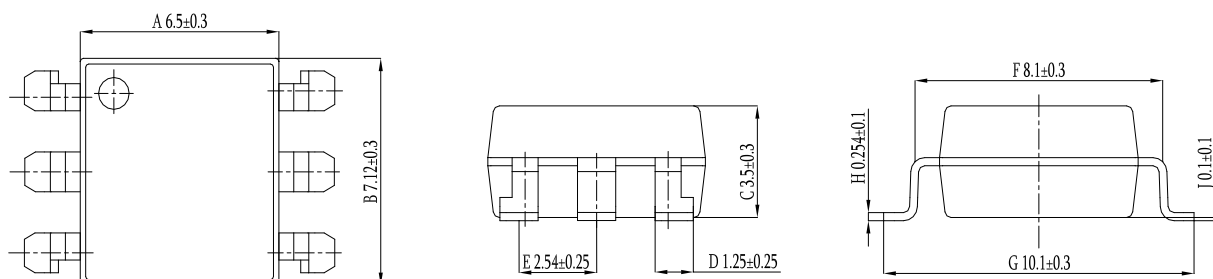
DIP-6L



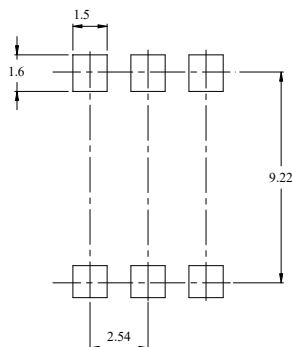
DIP-6L(M)



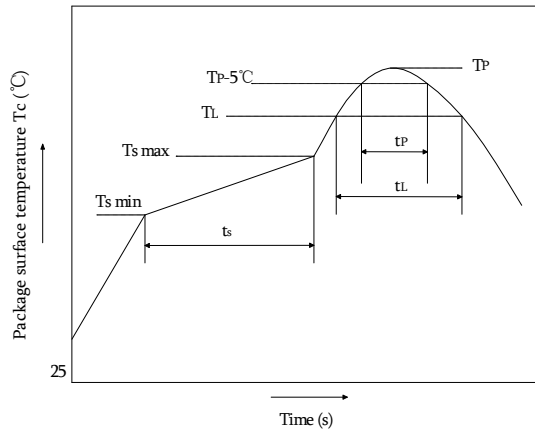
SMD-6L



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

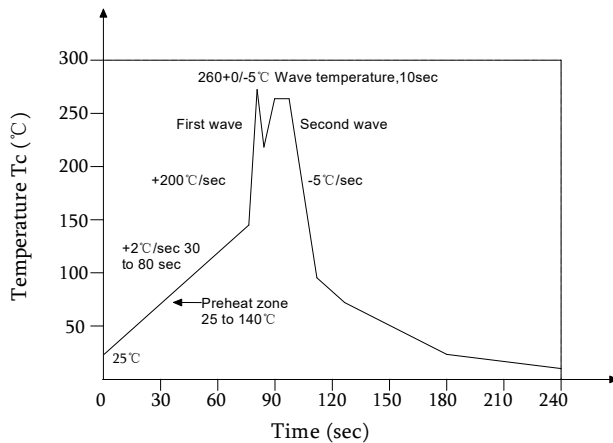


	Symbol	Min	Max	Unit
Preheat temperature	Ts	150	200	°C
Preheat time	ts	60	120	s
Ramp-up rate(T _L to T _P)			3	°C/s
Liquidus temperature	T _L	217		°C
Time above T _L	t _L	60	150	s
Peak temperature	T _P		260	°C
Time during which T _c is between (T _P -5) and T _P	t _p		30	s
Ramp-down rate(T _P to T _L)			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 Tp	260°C
Time within peak temperature tp	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
DIP-6L	Tube(500mm)	65 pcs/tube	25 tubes /box	12 boxes /ctn	190*670mm	520*105*50mm	545*372*235mm	Straight insert type material tube
DIP-6L(M)	Tube(500mm)	65 pcs/tube	25 tubes /box	12 boxes /ctn	190*670mm	520*105*50mm	545*372*235mm	Seagull foot (M foot) tube
SMD-6L	Reel(ϕ 330mm)	1000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Guard band 200mm /min.

■Summary table

■ DIP-6L/ DIP-6L(M) (Tube)

Qty/ tube : 65 pcs. Qty/box: 1.625 pcs.

Qty/ctn : 19500 pcs.

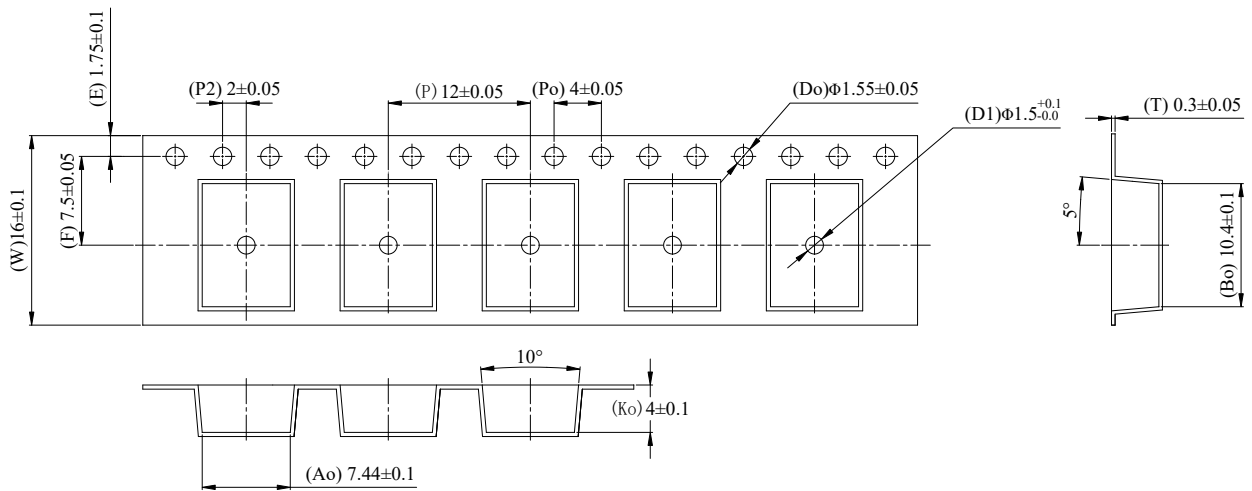
Schematic: (unit:mm)

■SMD-6L (Reel)

Qty/reel: 1000 pcs. Qty/box: 2000 pcs.

Qty/ctn : 10000 pcs.

Schematic: (unit:mm)



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