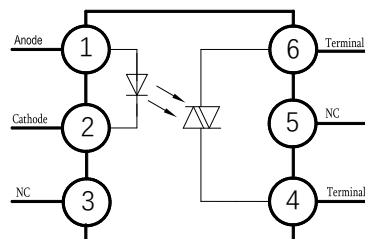


### Features

- Peak breakdown voltage:  
250V: BL301X; 400V: BL302X; 600V: BL305X; 800V: BL307X
- High isolation voltage between input and output (Viso =5000V rms )
- Operating Temperature: -55°C~110°C

HF

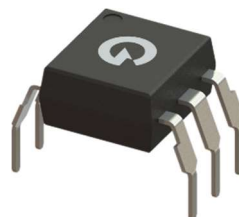
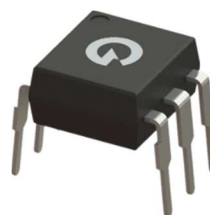


### Applications

- 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

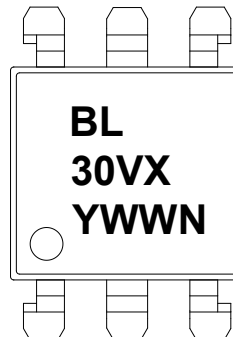
- ① Brand(BL)
- ② Product series(V:1,2,5,7;X:0,1,2,3)
- ③ Package type(DIP-6L:None, DIP-6L(M):M,SMD-6L:S)
- ④ Halogen option(None :Halogen free)
- ⑤ Lead frame (None: Copper)
- ⑥ Customer option 1 (0-9 or A-Z or none)
- ⑦ Customer option 2 (0-9 or A-Z or none)

| Part Number | Package   | Shipping Quantity      | Marking Code |
|-------------|-----------|------------------------|--------------|
| BL30V*1X*2  | DIP-6L    | 65 pcs / Tube          | BL30V*1X*2   |
| BL30V*1X*2M | DIP-6L(M) | 65 pcs / Tube          | BL30V*1X*2   |
| BL30V*1X*2S | SMD-6L    | 1000 pcs / Tape & Reel | BL30V*1X*2   |

Notes 1: V denotes V<sub>DRM</sub> digits: 1, 2, 5, 7.  
2: X denotes I<sub>FT</sub> digits: 0, 1, 2, 3.

### Marking Information

- "BL" denotes brand
- "V" denotes V<sub>DRM</sub> digits: 1, 2, 5, 7
- "X" denotes I<sub>FT</sub> 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 <sub>F</sub>      | 60    | mA    |
|           | Reverse Voltage                                 |        | V <sub>R</sub>      | 6     | V     |
|           | Power Dissipation                               |        | P <sub>D</sub>      | 100   | mW    |
|           | Derating factor (above Ta = 85 °C)              |        |                     | 3.8   | mW/°C |
| Output    | Power Dissipation                               |        | P <sub>C</sub>      | 300   | mW    |
|           | Derating factor (above Ta = 85 °C)              |        |                     | 7.4   | mW/°C |
|           | Off-state Output Terminal Voltage               | BL301X | V <sub>DRM</sub>    | 250   | V     |
|           |                                                 | BL302X |                     | 400   |       |
|           |                                                 | BL305X |                     | 600   |       |
|           |                                                 | BL307X |                     | 800   |       |
|           | Peak repetitive surge current (pw=100μs,120pps) |        | I <sub>TSM</sub>    | 1     | A     |
|           | Turn-on current (root mean square value)        |        | I <sub>T(RMS)</sub> | 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 ~ +110 | $^\circ\text{C}$ |
| 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<sub>A</sub> = 25°C unless otherwise specified)

| Parameter                |                                         |        | Symbol           | Test Condition                                                      | Min. | Typ. | Max. | Unit |
|--------------------------|-----------------------------------------|--------|------------------|---------------------------------------------------------------------|------|------|------|------|
| Input                    | Forward Voltage                         |        | V <sub>F</sub>   | I <sub>F</sub> =20mA                                                | -    | 1.36 | 1.5  | V    |
|                          | Reverse Leakage current                 |        | I <sub>R</sub>   | V <sub>R</sub> =6V                                                  | -    | -    | 10   | μA   |
| Output                   | Peak Blocking Current                   | BL301X | I <sub>DRM</sub> | V <sub>DRM</sub> =Rated V <sub>DRM</sub> ,<br>I <sub>F</sub> = 0mA  | -    | -    | 100  | nA   |
|                          |                                         | BL302X |                  |                                                                     |      |      |      |      |
|                          |                                         | BL305X |                  |                                                                     | -    | -    | 500  |      |
|                          |                                         | BL307X |                  |                                                                     |      |      |      |      |
|                          | Peak on-state voltage                   |        | V <sub>TM</sub>  | I <sub>TM</sub> =100mA,<br>I <sub>F</sub> =Rated I <sub>FT</sub>    | -    | -    | 3    | V    |
|                          | Critical Rate of Rise off-state Voltage | BL301X | dv/dt            | V <sub>PEAK</sub> =Rated V <sub>DRM</sub> ,<br>I <sub>F</sub> = 0mA | -    | 100  | -    | V/μs |
|                          |                                         | BL302X |                  |                                                                     |      |      |      |      |
|                          |                                         | BL305X |                  | V <sub>PEAK</sub> =400V, I <sub>F</sub> =0                          | 1000 | -    | -    |      |
| BL307X                   |                                         |        |                  |                                                                     |      |      |      |      |
| Transfer Characteristics | LED trigger current                     | BL3020 | I <sub>FT</sub>  | Main terminal voltage = 3V                                          | -    | -    | 30   | mA   |
|                          |                                         | BL3011 |                  |                                                                     |      |      |      |      |
|                          |                                         | BL3021 |                  |                                                                     | -    | -    | 15   |      |
|                          |                                         | BL3051 |                  |                                                                     |      |      |      |      |
|                          |                                         | BL3071 |                  |                                                                     |      |      |      |      |
|                          |                                         | BL3012 |                  |                                                                     |      |      |      |      |
|                          |                                         | BL3022 |                  |                                                                     | -    | -    | 10   |      |
|                          |                                         | BL3052 |                  |                                                                     |      |      |      |      |
|                          |                                         | BL3072 |                  |                                                                     |      |      |      |      |
|                          |                                         | BL3013 |                  |                                                                     |      |      |      |      |
|                          |                                         | BL3023 |                  |                                                                     | -    | -    | 5    |      |
|                          |                                         | BL3053 |                  |                                                                     |      |      |      |      |
|                          |                                         | BL3073 |                  |                                                                     |      |      |      |      |
|                          | Holding Current                         |        | I <sub>H</sub>   |                                                                     | -    | 250  |      | μA   |

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

Fig.1 LED Positive voltage vs Positive current

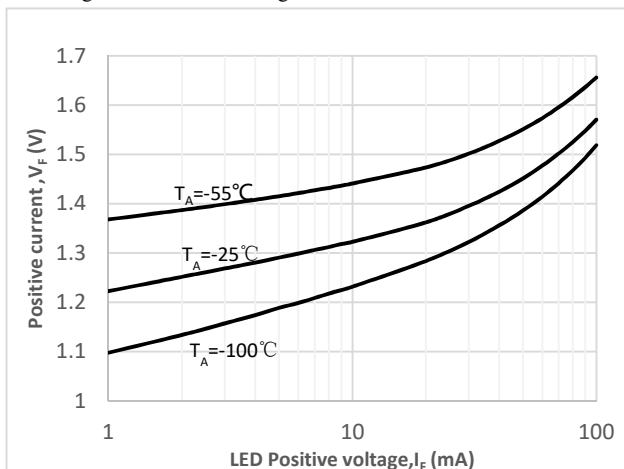


Fig.2 On-state characteristic

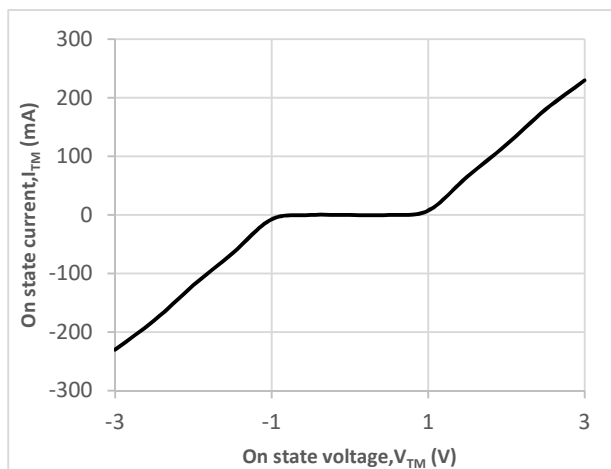


Fig.3 Trigger current vs Ambient temperature

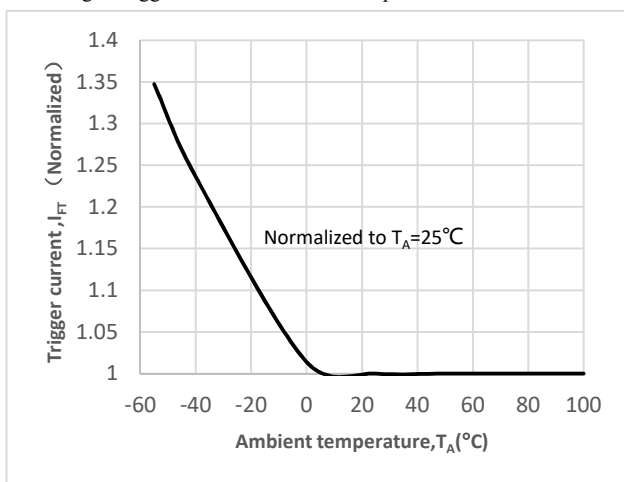


Fig.4 LED Trigger current vs LED Pulse Width

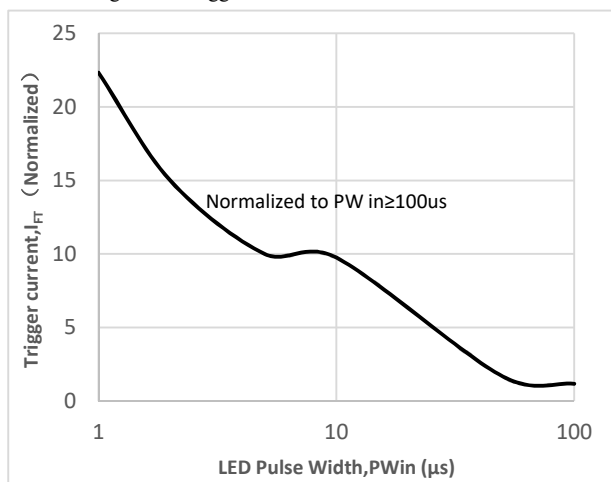


Fig.5 Holding current vs Temperature

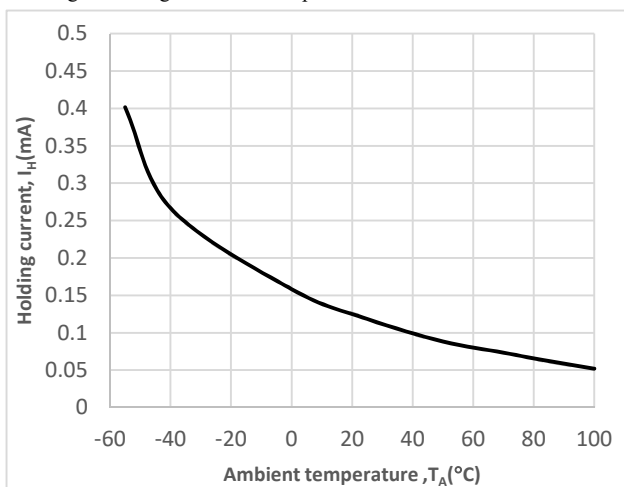


Fig.6 Leakage current vs Temperature

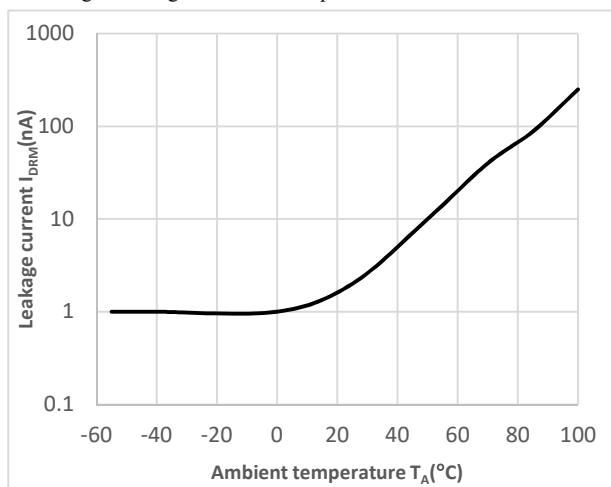
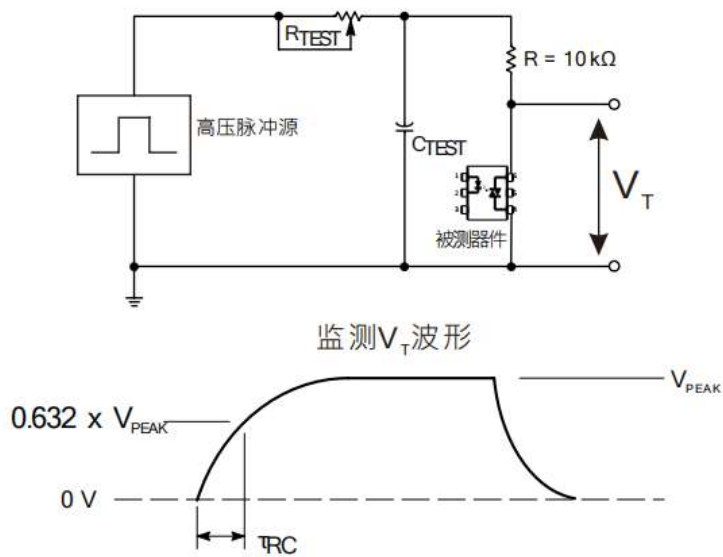


Fig.7 Static dv / dt test circuit and waveform



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,  $\tau_{RC}$  is recorded and the  $dv/dt$  calculated.

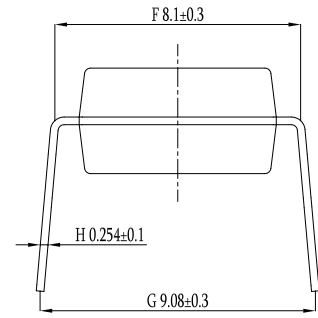
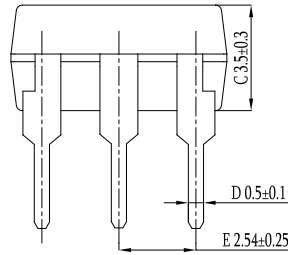
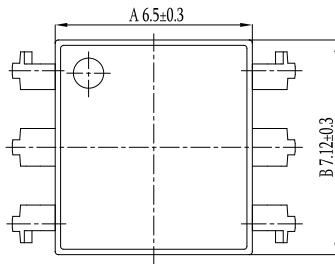
$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

For example,  $V_{PEAK} = 400\text{V}$  for BL302X series. The  $dv/dt$  value is calculated as follows:

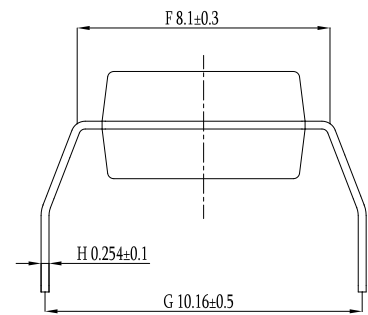
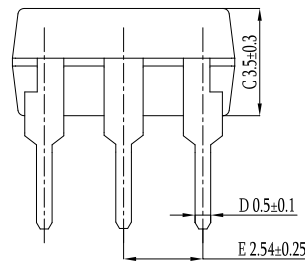
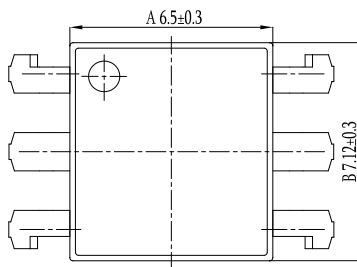
$$dv/dt = \frac{0.632 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

### Package Outline Dimensions (unit: mm)

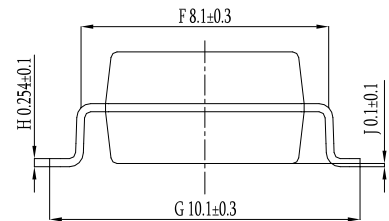
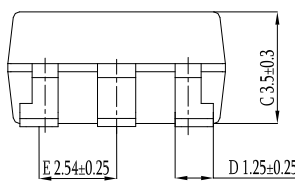
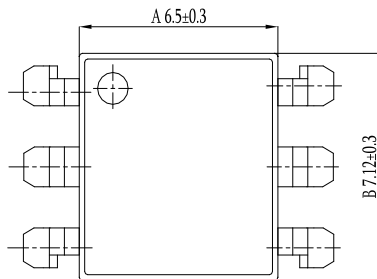
#### DIP-6L



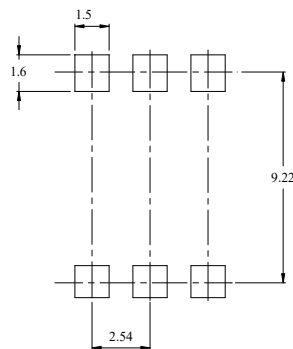
#### DIP-6L(M)



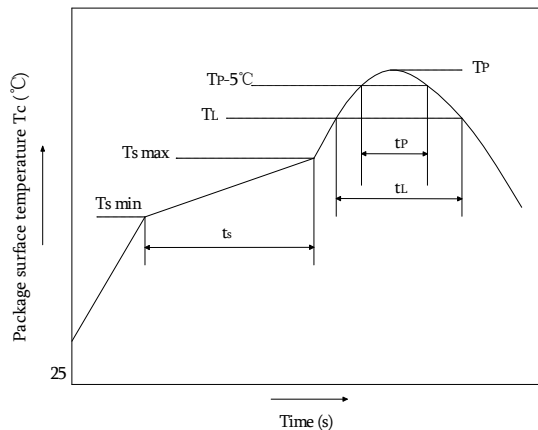
#### SMD-6L



### SOLDERING FOOTPRINT (unit: mm)



### Reflow soldering

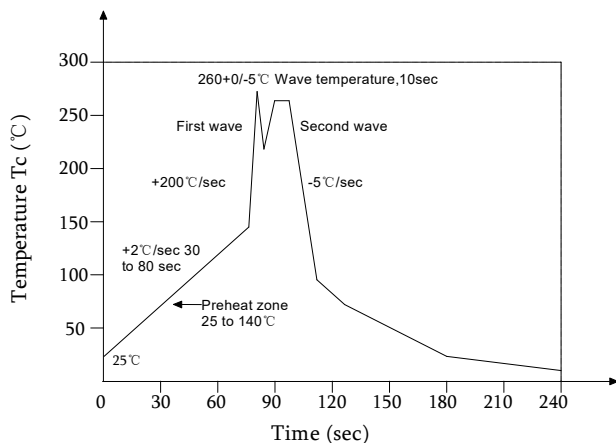


|                                                                                    | Symbol         | Min | Max | Unit |
|------------------------------------------------------------------------------------|----------------|-----|-----|------|
| Preheat temperature                                                                | Ts             | 150 | 200 | °C   |
| Preheat time                                                                       | ts             | 60  | 120 | s    |
| Ramp-up rate(T <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<br>typical; 4°C/s<br>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( $\phi$ 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: 1625 pcs.

Qty/ctn : 19500 pcs.

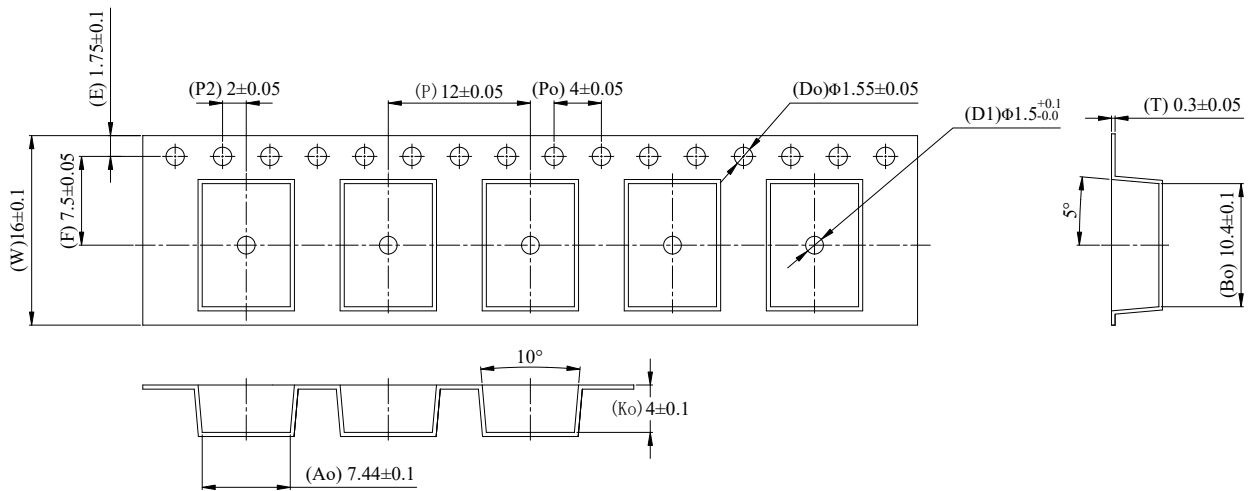
Schematic: (unit:mm)

##### ■SMD-6L (Reel)

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

Qty/ctn : 10000 pcs.

Schematic: (unit:mm)



### IMPORTANT NOTICE

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