

● Description

The KMOC3051、KMOC3052、KMOC3053 series consist of a GaAs infrared emitting diode optically coupled to a non-zero-crossing silicon bilateral AC switch (TRIAC). These devices isolate low voltage logic from 115/240 VAC lines to provide random phase control of high current TRIACs or thyristors. These devices feature greatly enhanced static dv/dt capability to ensure stable switching performance of inductive loads.

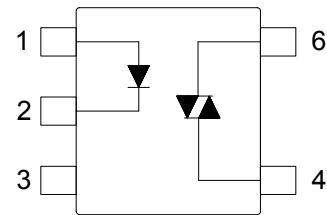
● Features

1. Pb free and RoHS compliant
2. 600V peak blocking voltage
3. Simplifies logic control of 115/240 VAC power
4. Non zero voltage crossing
5. Isolation voltage between input and output (Viso : 5300Vms)
6. MSL class 1
7. Agency Approvals :
 - UL Approved (No. E169586): UL1577
 - c-UL Approved (No. E169586)
 - VDE Approved (No. 40009235): DIN EN60747-5-5
 - CQC Approved: GB8898-2011, GB4943.1-2011

● Applications

- Solenoid/Valve controls
- Lighting controls
- Static power switches
- AC motor drives
- Temperature controls
- E.M contactors
- AC motor contactors
- Solid state relay
- Programmable controllers

● Schematic

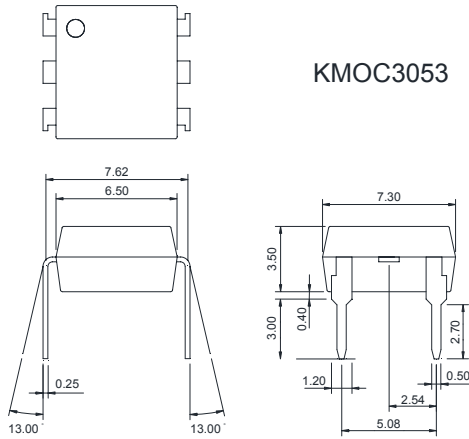


1. Anode
2. Cathode
3. NC
4. Main terminal
6. Main terminal

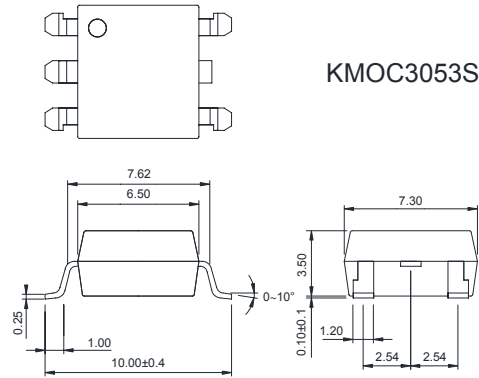
● **Outside Dimension**

Unit : mm

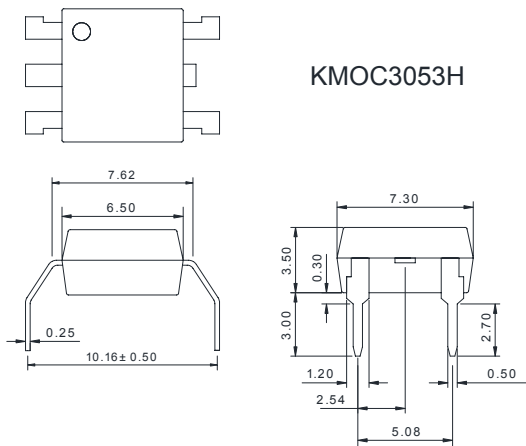
1. Dual-in-line type.



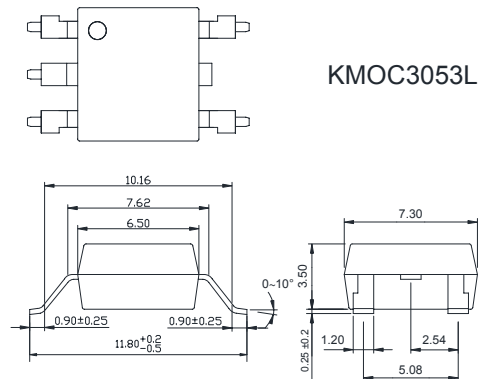
2. Surface mount type.



3. Long creepage distance type.

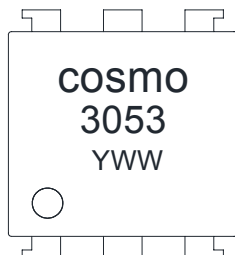


4. Long creepage distance for surface mount type.



TOLERANCE : ±0.2mm

● **Device Marking**



Notes :

cosmo

3051、3052、3053

YWW Y : Year code / W : Week code

● Absolute Maximum Ratings

(Ta=25°C)

| Parameter | | Symbol | Rating | Unit |
|----------------------------------|--|--------------|-------------|------------|
| Input | Forward current | I_F | 50 | mA |
| | Peak forward current | I_{FM} | 1 | A |
| | Reverse voltage | V_R | 6 | V |
| | Power dissipation | P_D | 70 | mW |
| Output | Off-state output terminal voltage | V_{DRM} | 600 | V_{PEAK} |
| | On-state R.M.S. current | $I_{T(RMS)}$ | 100 | mA |
| | Peak repetitive surge current (PW=10ms.DC 10%) | I_{TSM} | 1 | A |
| | Power dissipation | P_D | 300 | mW |
| Total power dissipation | | P_{tot} | 330 | mW |
| Isolation voltage 1 minute | | V_{iso} | 5300 | Vrms |
| Operating temperature | | T_{opr} | -40 to +115 | °C |
| Storage temperature | | T_{stg} | -50 to +125 | °C |
| Soldering temperature 10 seconds | | T_{sol} | 260 | °C |

● Electro-optical Characteristics

(Ta=25°C)

| Parameter | | Symbol | Conditions | Min. | Typ. | Max. | Unit | |
|--------------------------|--|-----------------------------------|-------------------------------------|--------------------|-----------|---------|------------|----|
| Input | Forward voltage | V_F | $I_F=10mA$ | - | 1.2 | 1.4 | V | |
| | Reverse current | I_R | $V_R=4V$ | - | - | 10 | μA | |
| Output | Peak blocking current | I_{DRM} | V_{DRM} Rated | - | - | 500 | nA | |
| | On-state voltage | V_{TM} | $I_{TM}=100mA$ | - | 1.6 | 3 | V | |
| Transfer characteristics | Holding current | I_H | | - | 0.1 | - | mA | |
| | Critical rate of rise of off-state voltage | dv/dt | $V_{DRM}=(1/\sqrt{2})*\text{Rated}$ | 1000 | - | - | V/ μs | |
| | Isolation resistance | R_{iso} | DC500V | 5×10^{10} | 10^{11} | - | Ω | |
| | Minimum trigger current | I_{FT} | Main terminal voltage=3V | KMOC3051 | - | - | 15 | mA |
| | | | | KMOC3052 | - | - | 10 | mA |
| KMOC3053 | | | | - | - | 5 | mA | |
| Turn-on time | T_{ON} | $V_D=6V, R_L=100\Omega, I_F=20mA$ | - | - | 100 | μs | | |

● Static dv/dt Test Circuit

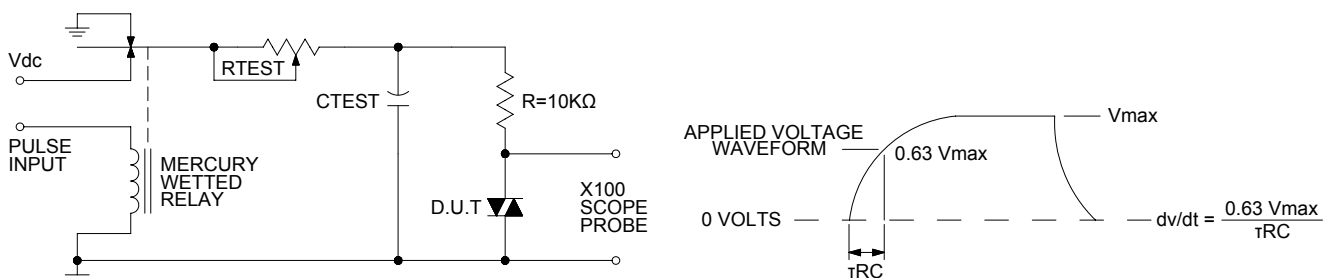


Fig.1 Forward Current vs. Ambient Temperature

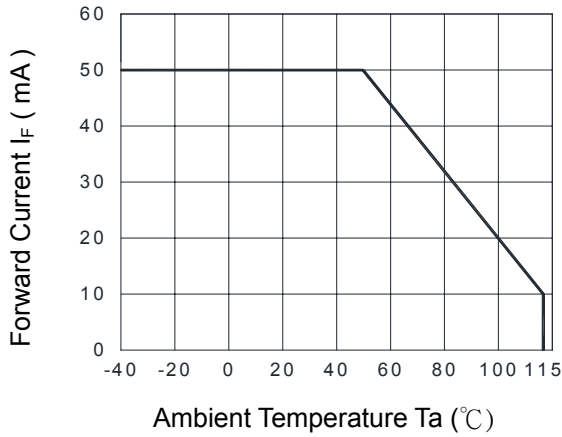


Fig.2 Diode Power Dissipation vs. Ambient Temperature

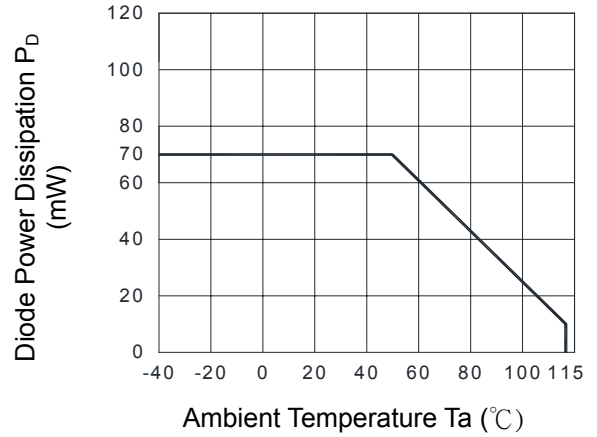


Fig.3 On-state R.M.S. Current vs. Ambient Temperature

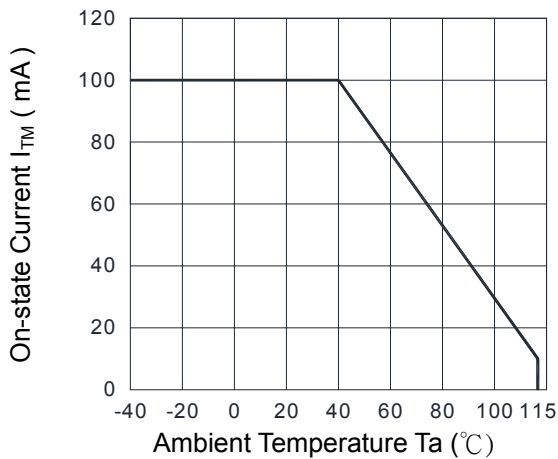


Fig.4 Total Power Dissipation vs. Ambient Temperature

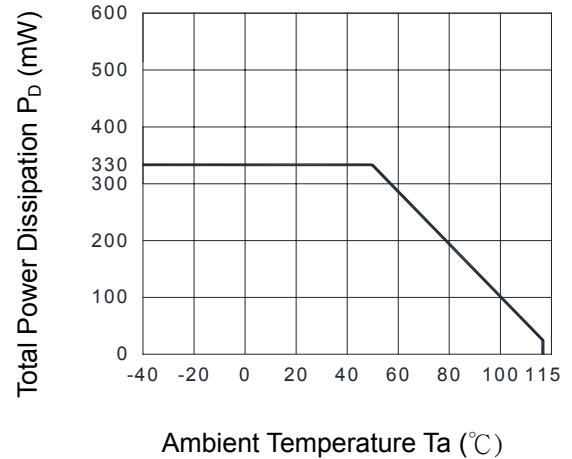


Fig.5 Peak Forward Current vs. Duty Ratio

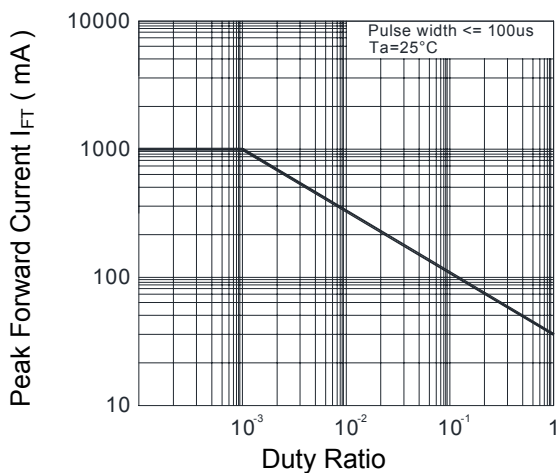


Fig.6 Forward Current vs. Forward Voltage

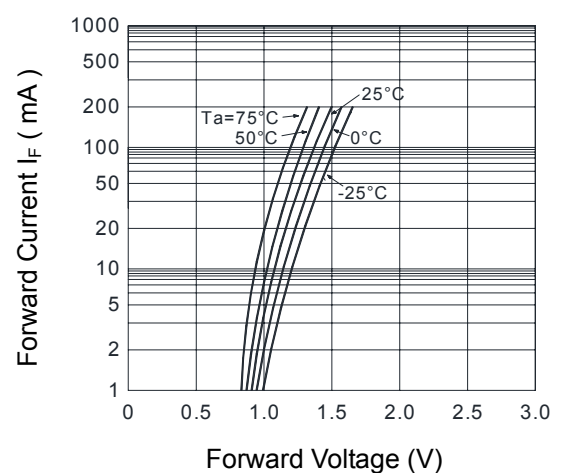


Fig.7 On-state Characteristics

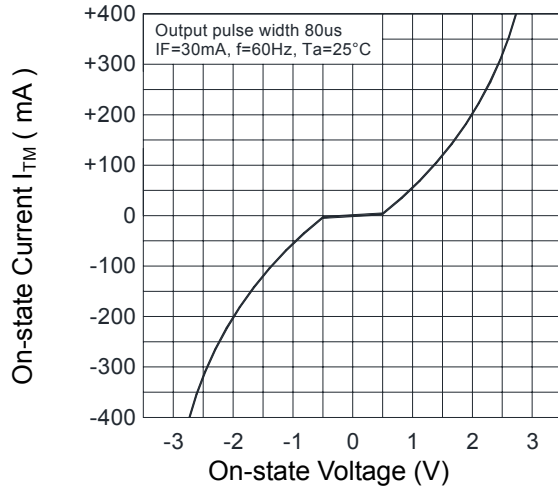


Fig.8 Leakage with LED off vs. Ambient Temperature

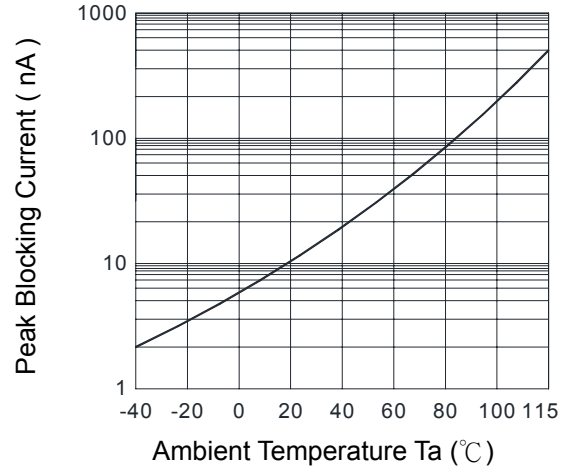
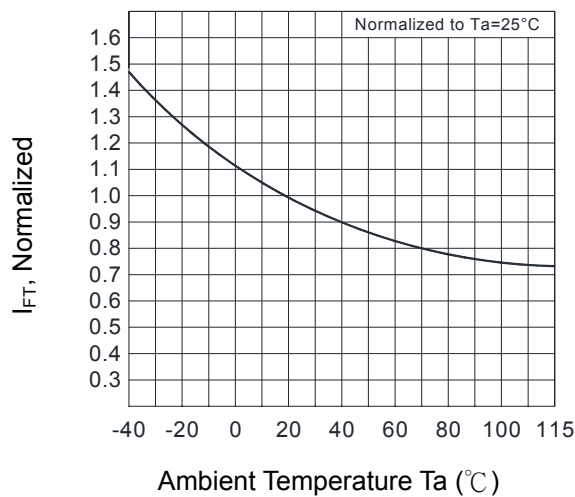


Fig.9 Trigger Current vs. Ambient Temperature

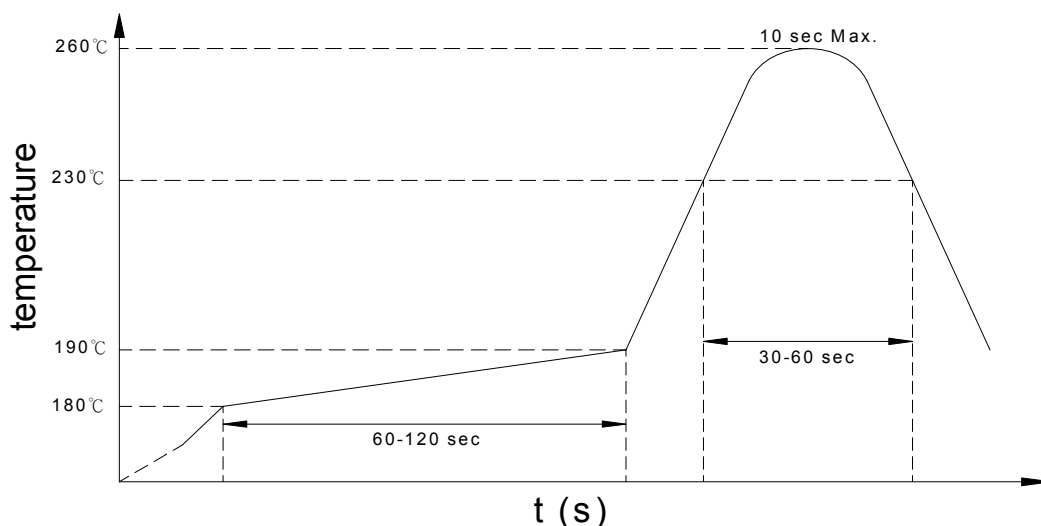


● Recommended Soldering Conditions

(a) Infrared reflow soldering :

- Peak reflow soldering : 260°C or below (package surface temperature)
- Time of peak reflow temperature : 10 sec
- Time of temperature higher than 230°C : 30-60 sec
- Time to preheat temperature from 180~190°C : 60-120 sec
- Time(s) of reflow : Two
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

Recommended Temperature Profile of Infrared Reflow



(b) Wave soldering :

- Temperature : 260°C or below (molten solder temperature)
- Time : 10 seconds or less
- Preheating conditions : 120°C or below (package surface temperature)
- Time(s) of reflow : One
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(c) Cautions :

- Fluxes : Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- Avoid shorting between portion of frame and leads.

● **Numbering System**

KMOC3051 X (Y)

KMOC3052 X (Y)

KMOC3053 X (Y)

Notes :

KMOC3051 / KMOC3052 / KMOC3053 = Part No.

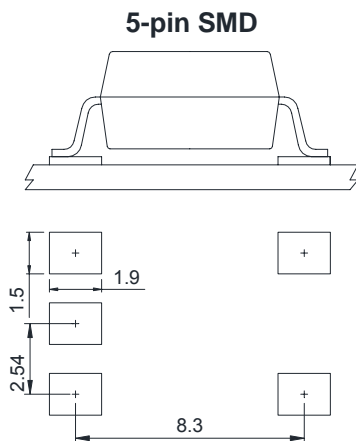
X = Lead form option (blank 、 S 、 H 、 L)

Y = Tape and reel option (TL 、 TR 、 TLD 、 TRU)

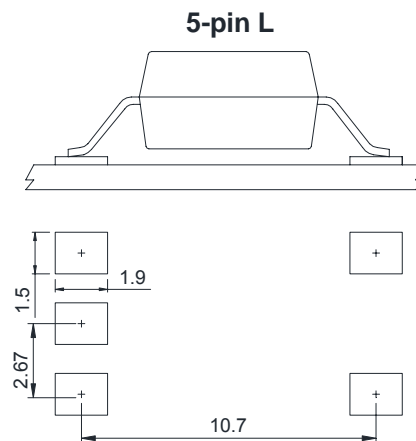
| Option | Description | Packing quantity |
|---------|--|---------------------|
| S (TL) | surface mount type package + TL tape & reel option | 1000 units per reel |
| S (TR) | surface mount type package + TR tape & reel option | 1000 units per reel |
| L (TLD) | long creepage distance for surface mount type package + TLD tape & reel option | 1000 units per reel |
| L (TRU) | long creepage distance for surface mount type package + TRU tape & reel option | 1000 units per reel |

● **Recommended Pad Layout for Surface Mount Lead Form**

1. Surface mount type.

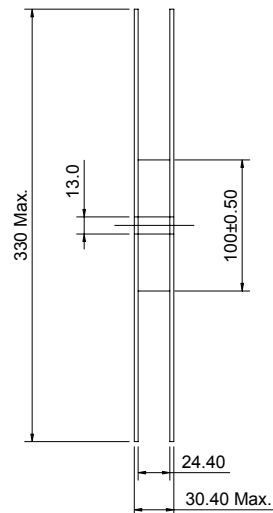
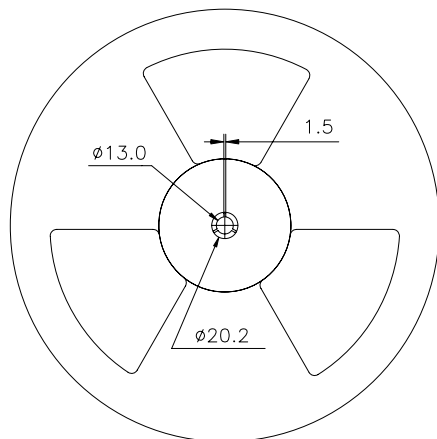
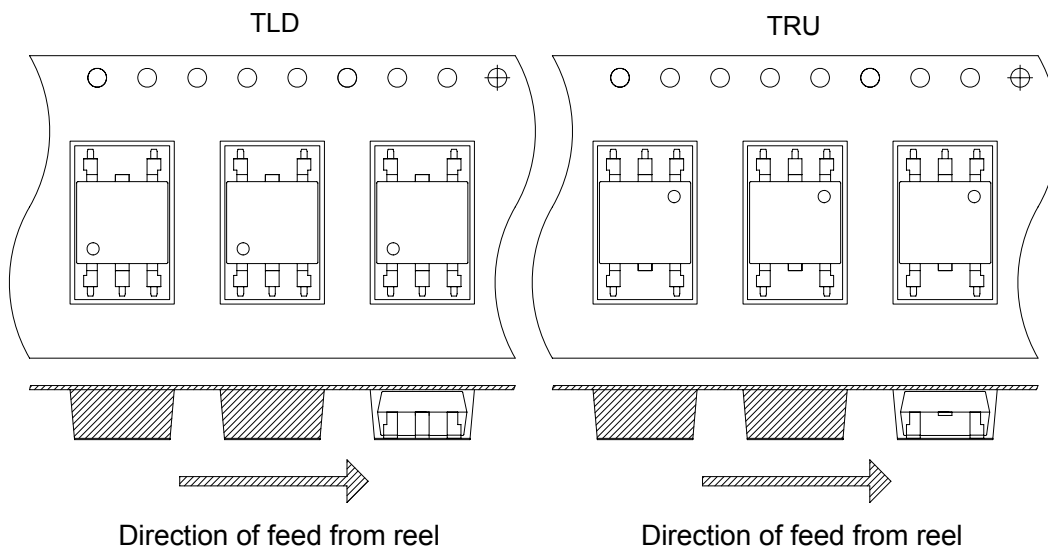
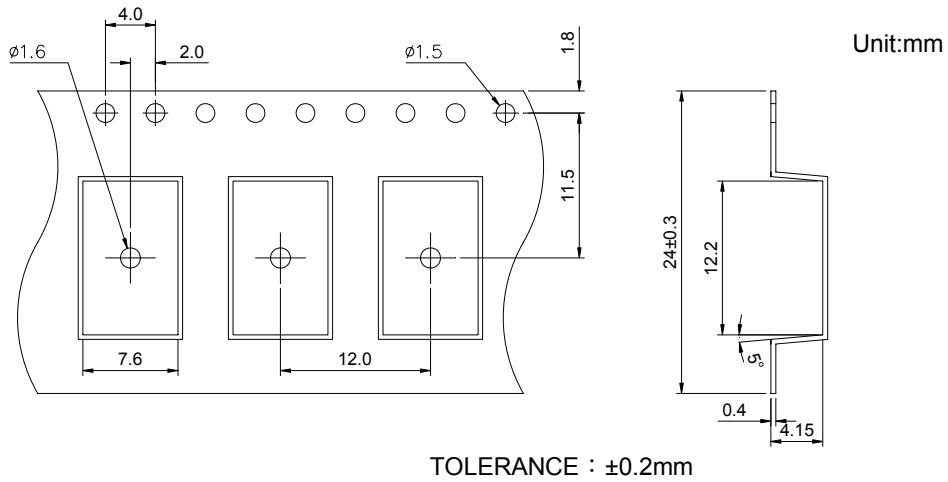


2. Long creepage distance for surface mount type.



Unit : mm

● L Carrier Tape & Reel



- **Application Notice**

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