

### ● Description

The KMOC3012 series consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon detector performing the function of a zero voltage crossing bilateral TRIAC driver. They are designed for use with a TRIAC in the interface of logic systems to equipment powered from 115/240 VAC lines, such as solid-state relays, industrial controls, motors, solenoids and consumer appliances, etc.

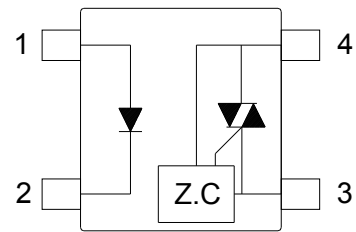
### ● Features

1. Pb free and RoHS compliant.
2. 600V peak blocking voltage.
3. Simplifies logic control of 115/240 VAC power.
4. 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. 101347): 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

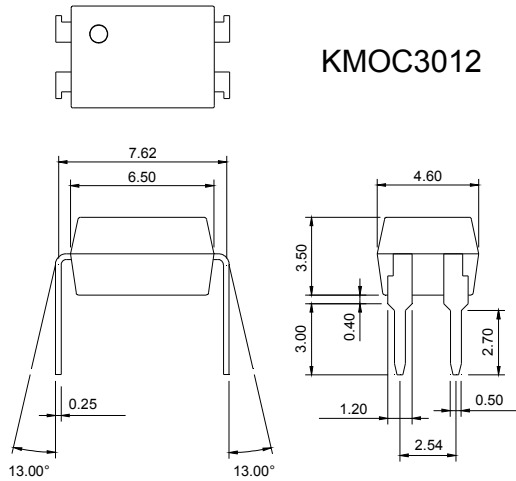


1. Anode
2. Cathode
3. Main terminal
4. Main terminal

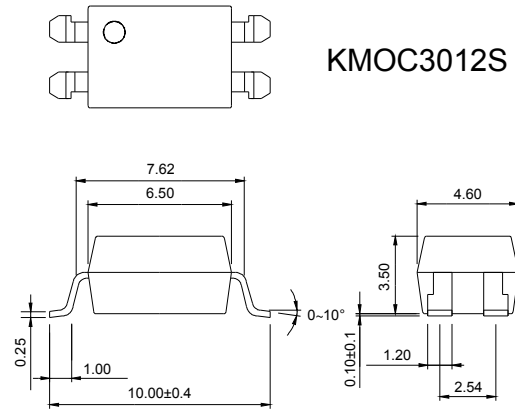
● **Outside Dimension**

Unit : mm

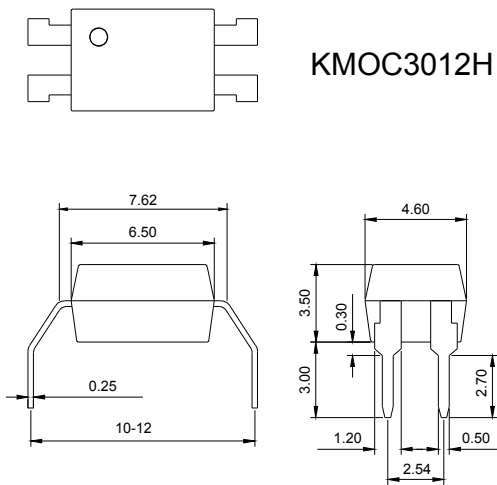
1. Dual-in-line type.



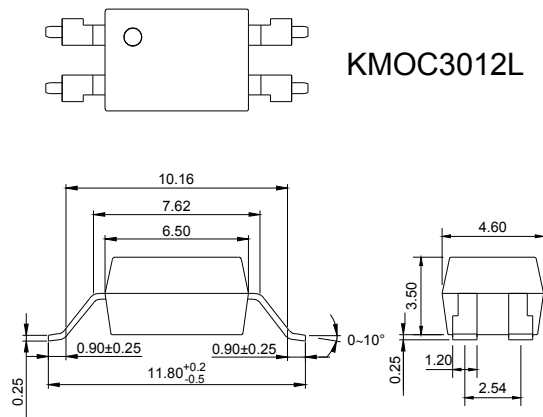
2. Surface mount type.



3. Long creepage distance type.

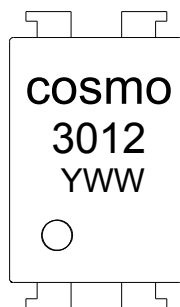


4. Long creepage distance for surface mount type.



TOLERANCE : ±0.2mm

● **Device Marking**



**Notes :**

cosmo

3012

YWW

Y : Year code / W : Week code

### ● Absolute Maximum Ratings

(Ta=25°C)

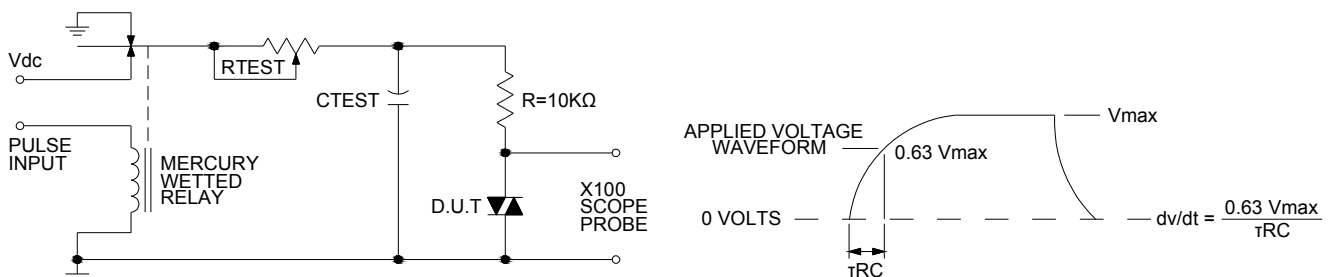
| Parameter                        |  | Symbol       | Rating      | Unit       |
|----------------------------------|--|--------------|-------------|------------|
| Input                            | Forward current                                | $I_F$        | 50          | mA         |
|                                  | 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

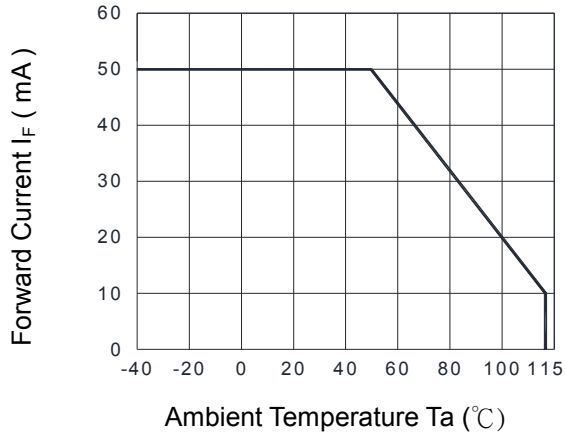
(Ta=25°C)

| 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   | $\mu A$    |
| Output                   | Peak blocking current  | $I_{DRM}$  | $V_{DRM}$ Rated                              | -                  | -         | 500  | nA         |
|                          | On-state voltage   | $V_{TM}$   | $I_{TM}=100mA$                               | -                  | 1.8       | 3    | V          |
| Transfer characteristics | Holding current  | $I_H$      |  | -                  | 0.1       | -    | mA         |
|                          | Critical rate of rise of Off-state voltage                             | dv/dt      | $V_{DRM}=(1/\sqrt{2})*Rated$                 | 1000               | -         | -    | V/ $\mu s$ |
|                          | Inhibit voltage (MT1-MT2 voltage above which device will not trigger.) | $V_{INH}$  | $I_F=Rated I_{FT}$                           | -                  | 10        | 20   | V          |
|                          | Leakage in inhibited state   | $I_{DRM2}$ | $I_F=Rated I_{FT}, Rated V_{DRM}, Off State$ | -                  | -         | 500  | $\mu A$    |
|                          | Isolation resistance   | $R_{iso}$  | DC500V                                       | $5 \times 10^{10}$ | $10^{11}$ | -    | $\Omega$   |
|                          | Minimum trigger current  | $I_{FT}$   | Main Terminal Voltage=3V                     | -                  | -         | 10   | mA         |

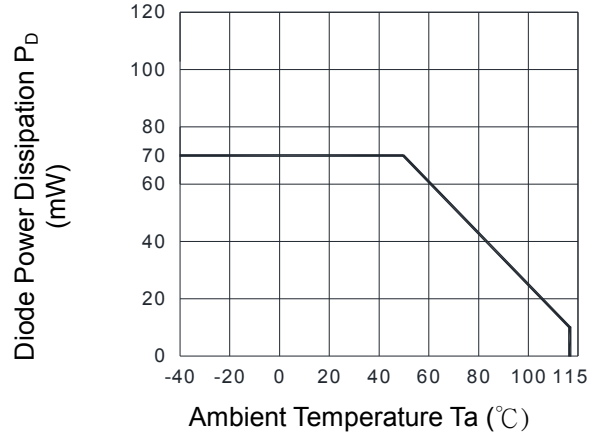
### ● Static dv/dt Test Circuit



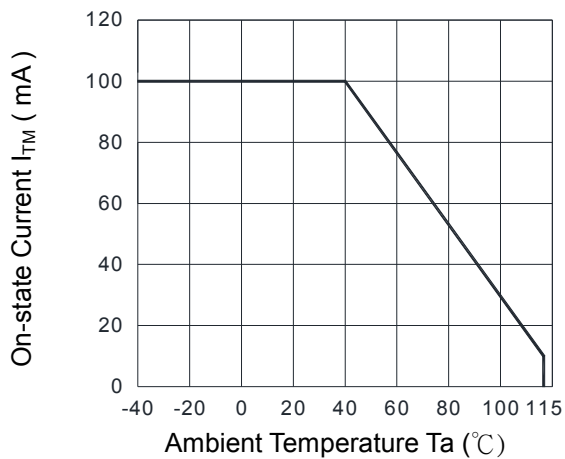
**Fig.1 Forward Current vs. Ambient Temperature**



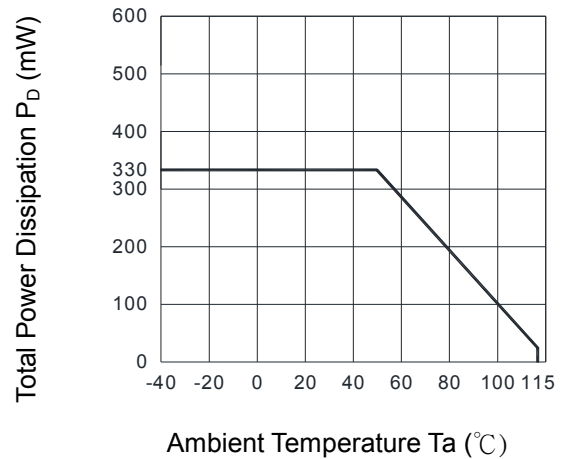
**Fig.2 Diode Power Dissipation vs. Ambient Temperature**



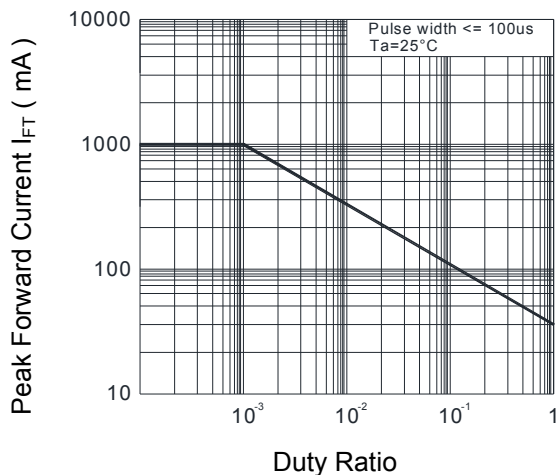
**Fig.3 On-state R.M.S. Current vs. Ambient Temperature**



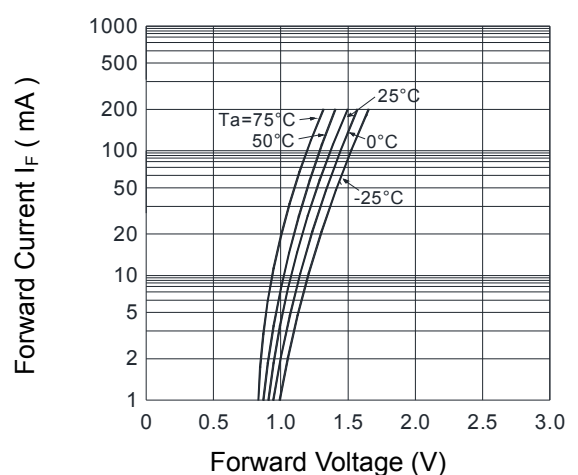
**Fig.4 Total Power Dissipation vs. Ambient Temperature**



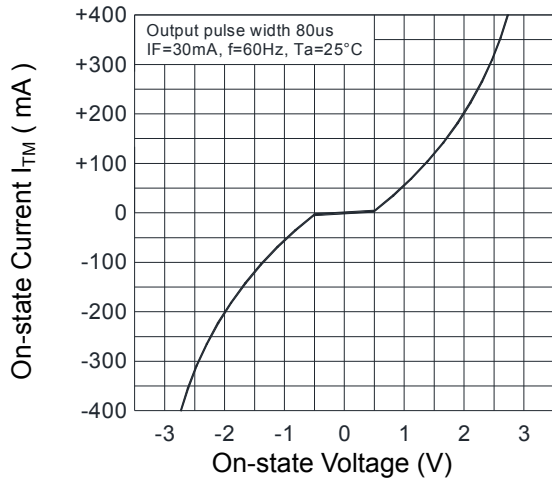
**Fig.5 Peak Forward Current vs. Duty Ratio**



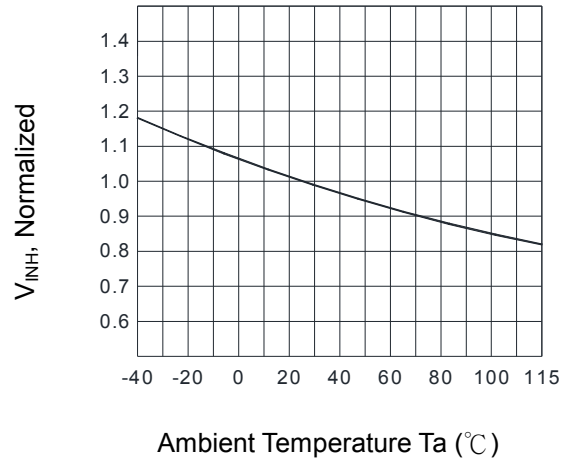
**Fig.6 Forward Current vs. Forward Voltage**



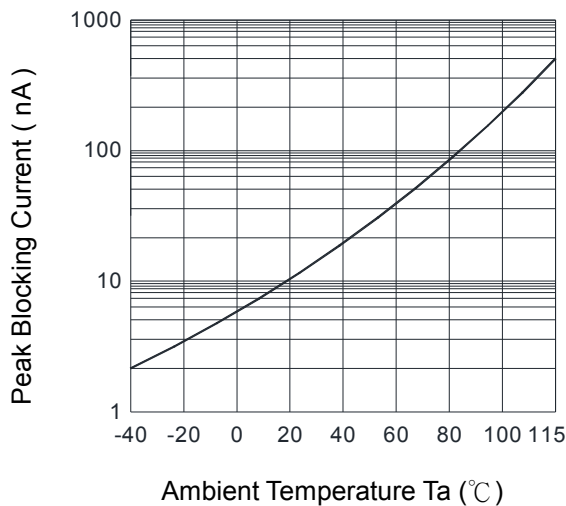
**Fig.7 On-state Characteristics**



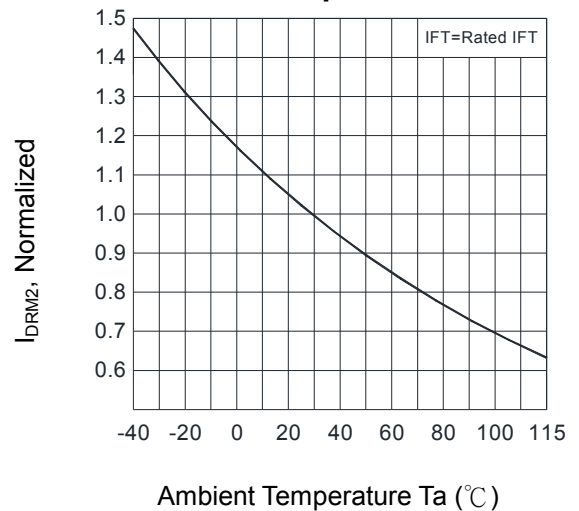
**Fig.8 Inhibit Voltage vs. Ambient Temperature**



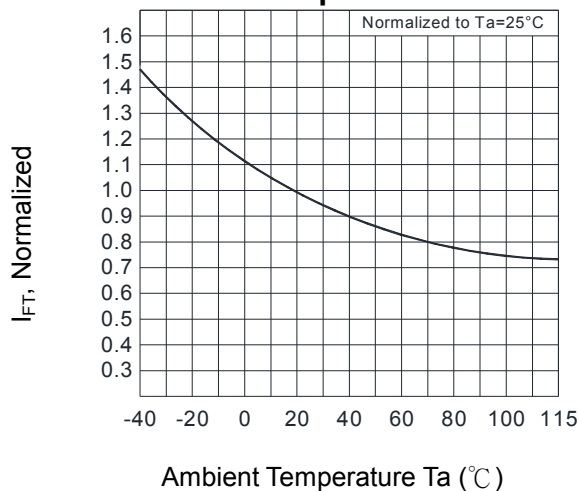
**Fig.9 Leakage with LED off vs. Ambient Temperature**



**Fig.10 I\_DRM2, Leakage in Inhibited State vs. Ambient Temperature**



**Fig.11 Trigger Current vs. Ambient Temperature**

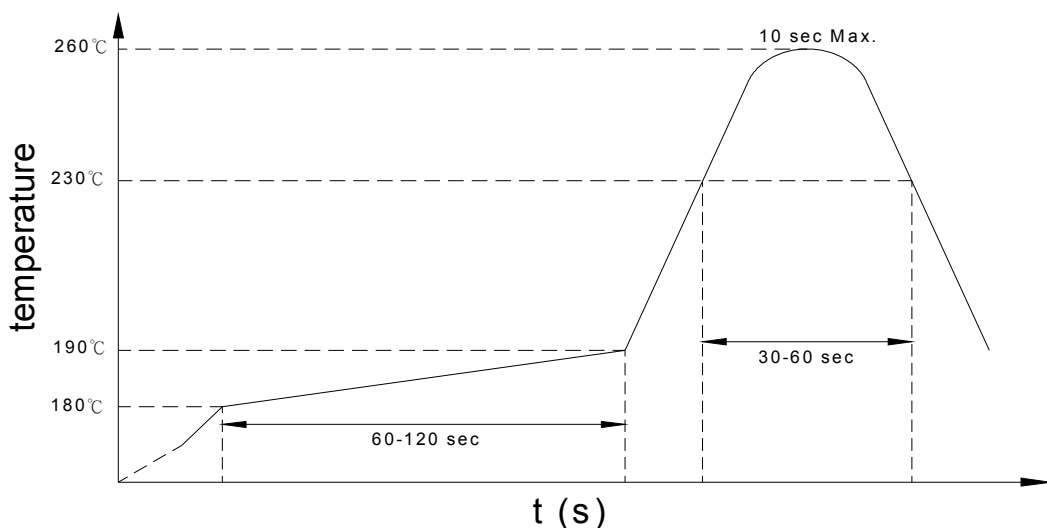


### ● Recommended Soldering Conditions

#### (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**

### KMOC3012 X (Y)

**Notes :**

KMOC3012 = Part No.

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

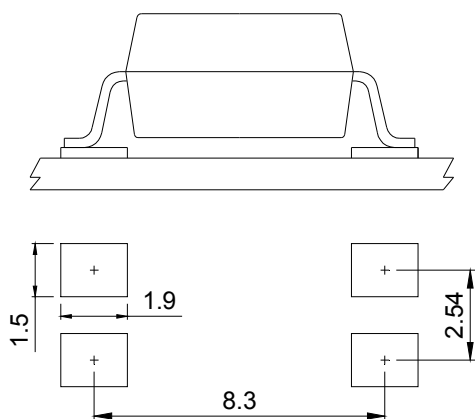
Y = Tape and reel option ( TLD 、 TRU )

| Option  | Description  | Packing quantity    |
|---------|--|---------------------|
| S (TLD) | surface mount type package + TLD tape & reel option                            | 2000 units per reel |
| S (TRU) | surface mount type package + TRU tape & reel option                            | 2000 units per reel |
| L (TLD) | long creepage distance for surface mount type package + TLD tape & reel option | 2000 units per reel |
| L (TRU) | long creepage distance for surface mount type package + TRU tape & reel option | 2000 units per reel |

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

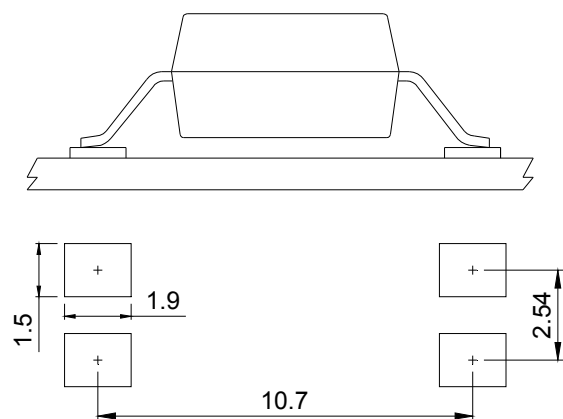
#### 1. Surface mount type.

**4-pin SMD**



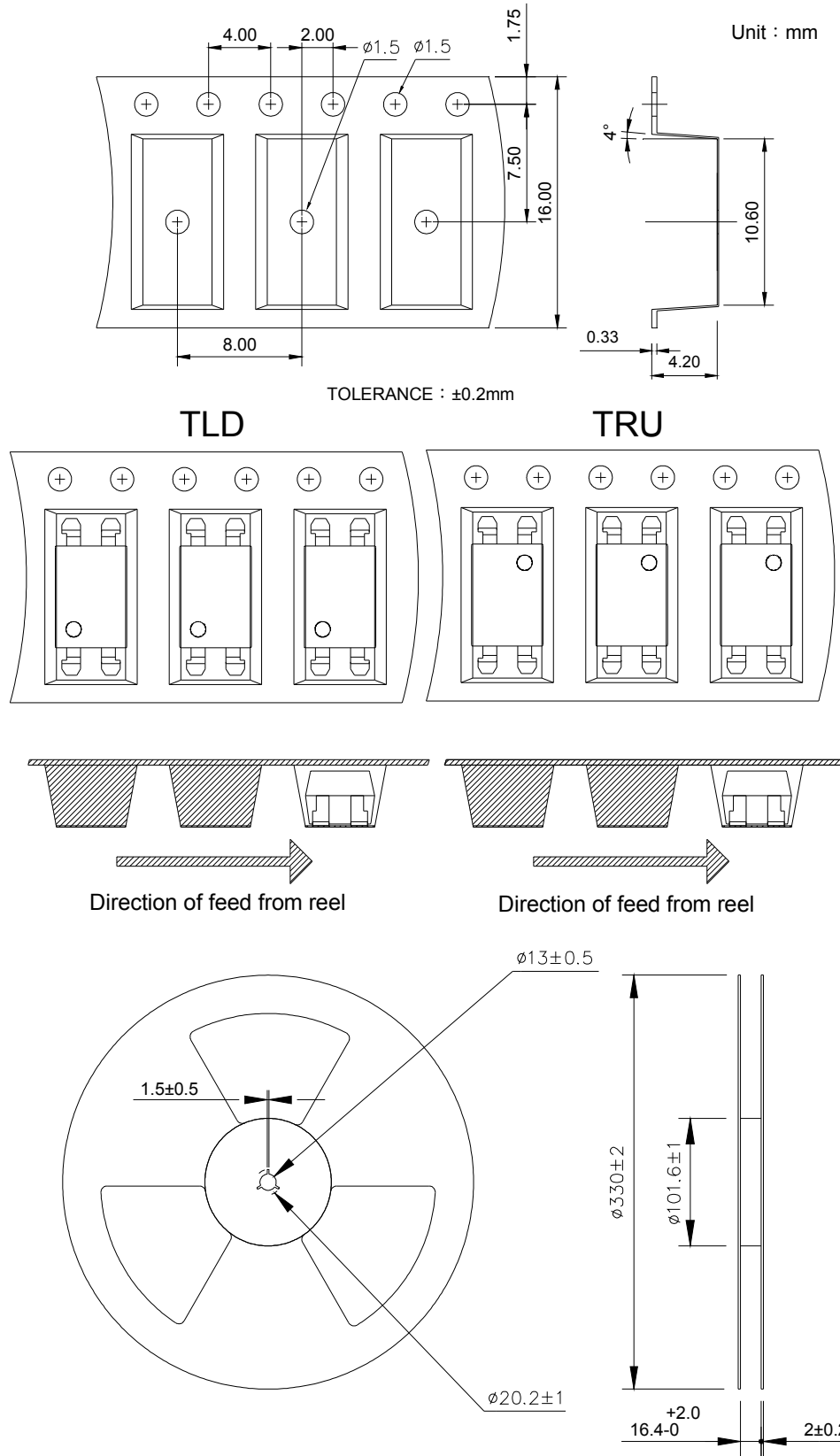
#### 2. Long creepage distance for surface mount type.

**4-pin L**



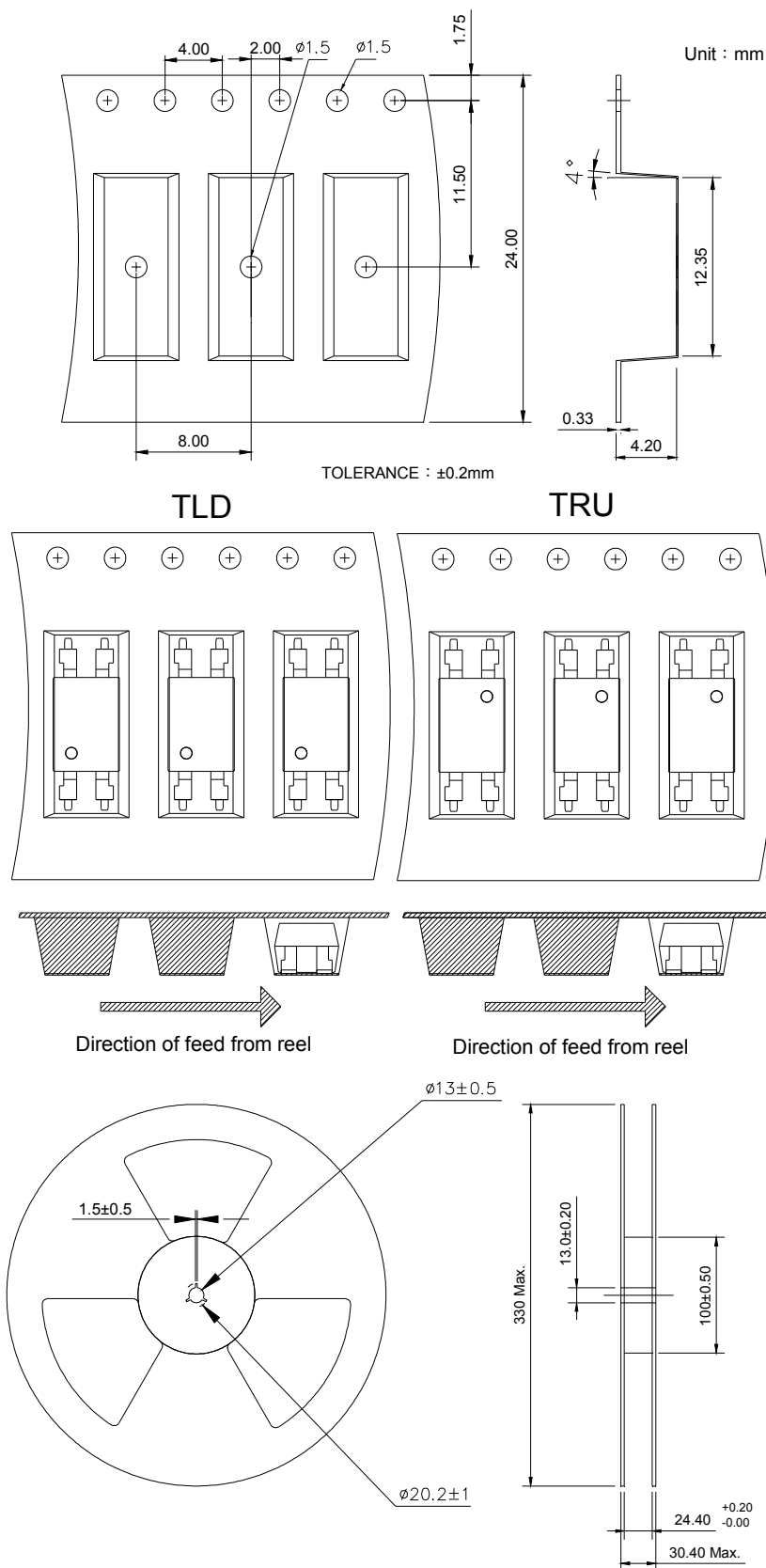
Unit : mm

● 4-pin SMD Carrier Tape & Reel





● 4-pin L Carrier Tape & Reel





# KMOC3012 Series

## 4PIN ZERO-CROSS TRIAC DRIVER PHOTOCOUPLER

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### ● Application Notice

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- d. Instrumentation
- e. Electrical Application
- f. Measurement equipment
- g. Consumer electronics
- h. Telecommunication

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- b. Space application
- c. Telecommunication equipment (trunk lines)
- d. Nuclear power control
- e. Equipment used for automotive vehicles, trains, ships...etc.

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