

### ● 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.

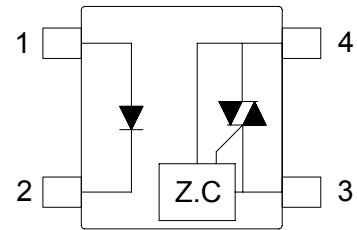
### ● Features

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

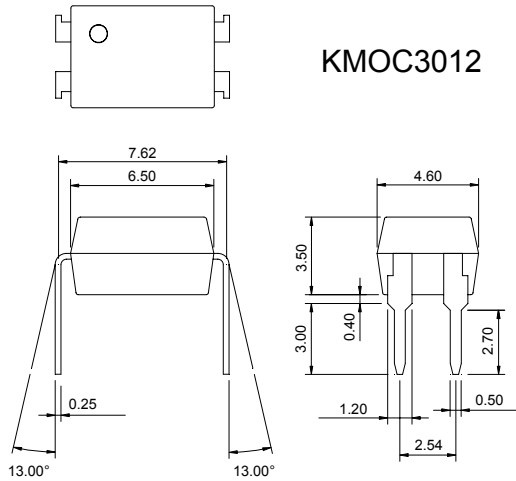


1. Anode
2. Cathode
3. Main terminal
4. Main terminal

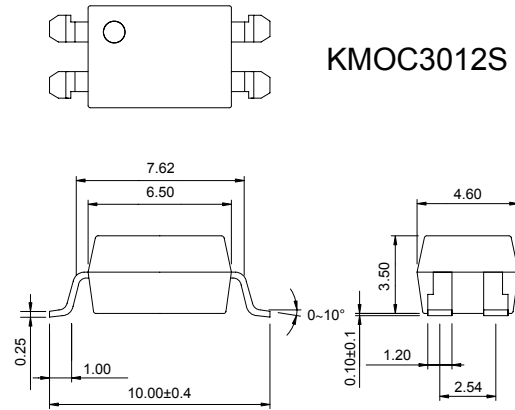
● **Outside Dimension**

Unit : mm

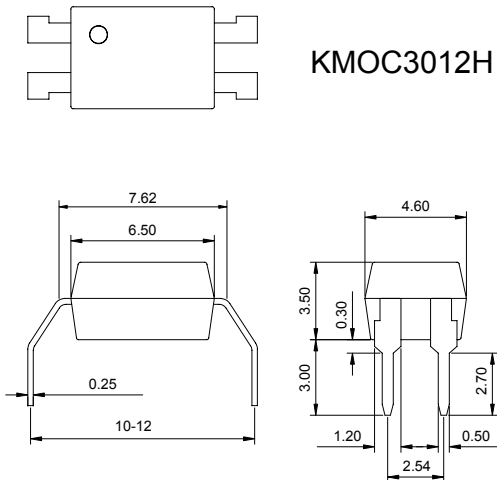
1. Dual-in-line type.



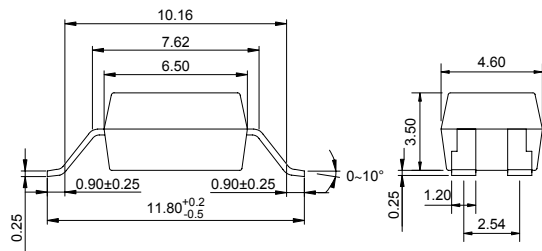
2. Surface mount type.



3. Long creepage distance type.

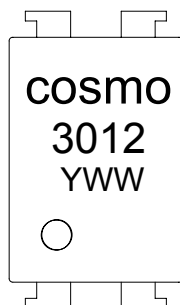


4. Long creepage distance for surface mount type.



TOLERANCE : ±0.2mm

● **Device Marking**



**Notes :**

cosmo  
3012  
YWW    Y : Year code / W : Week code

### ● Absolute Maximum Ratings

(Ta=25°C)

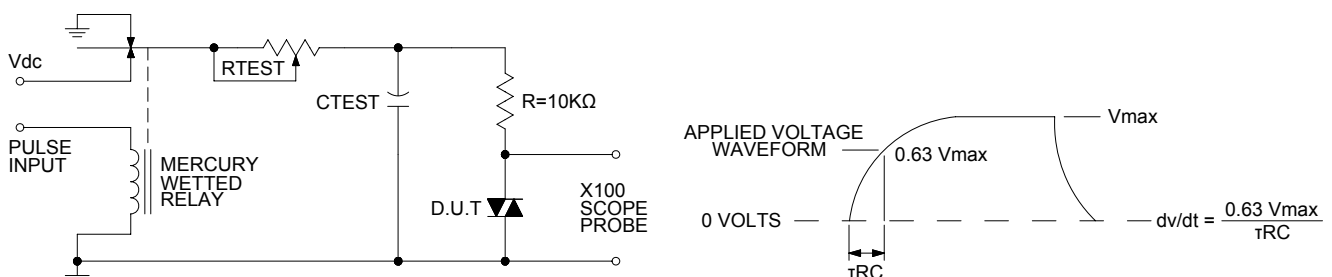
Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	Peak forward current	$I_{FM}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation	$P_D$	70	mW
Output	Off-state output terminal voltage	$V_{DRM}$	600	$V_{PEAK}$
	On-state R.M.S. current	$I_{T(RMS)}$	100	mA
	Peak repetitive surge current (PW=10ms.DC 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

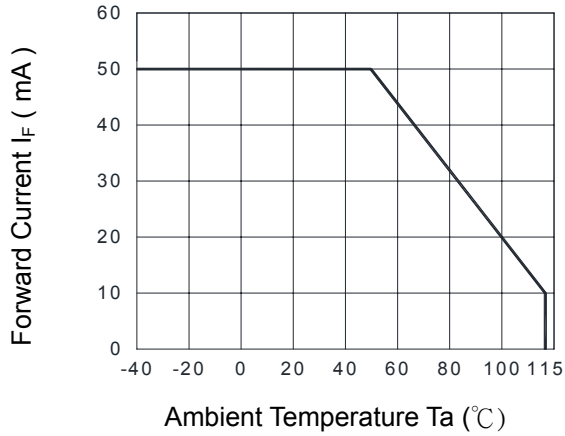
(Ta=25°C)

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

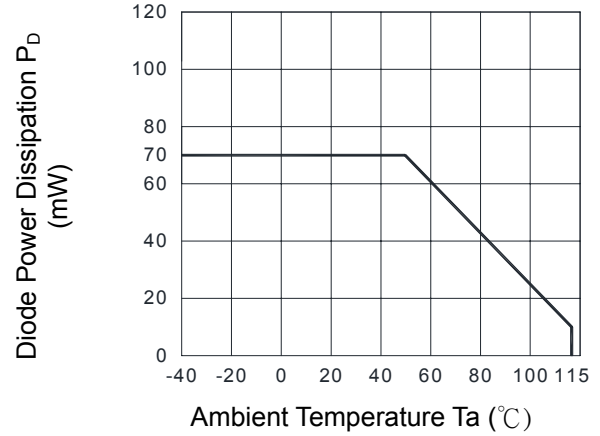
### ● Static dv/dt Test Circuit



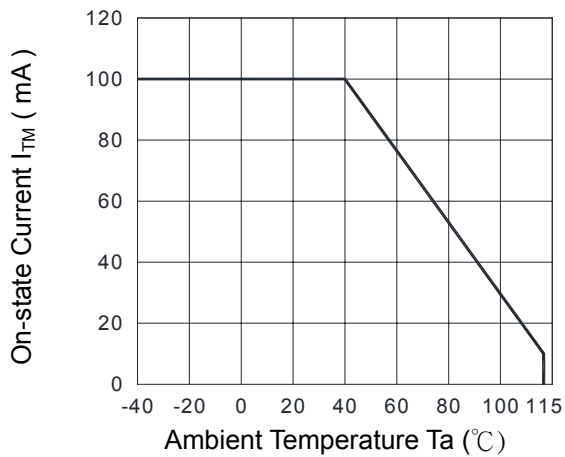
**Fig.1 Forward Current vs. Ambient Temperature**



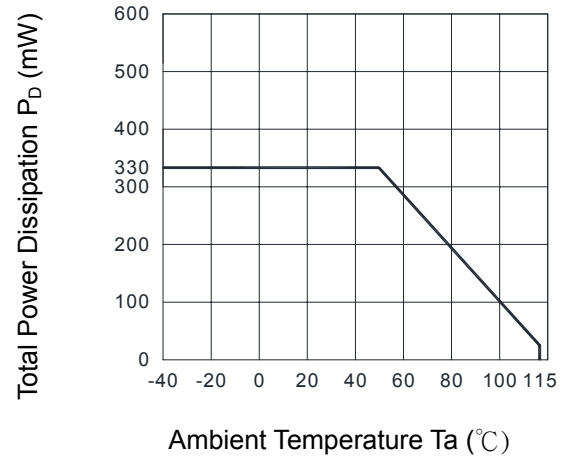
**Fig.2 Diode Power Dissipation vs. Ambient Temperature**



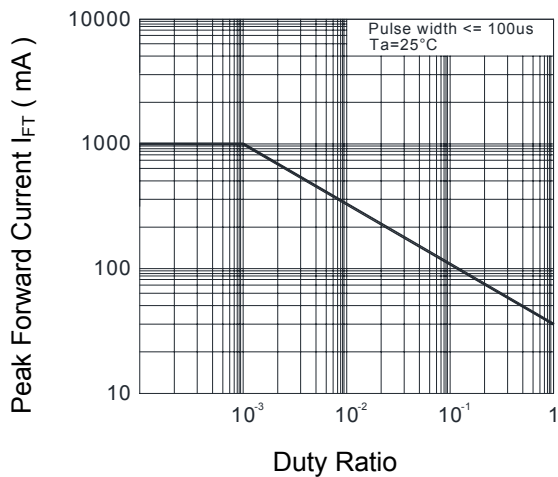
**Fig.3 On-state R.M.S. Current vs. Ambient Temperature**



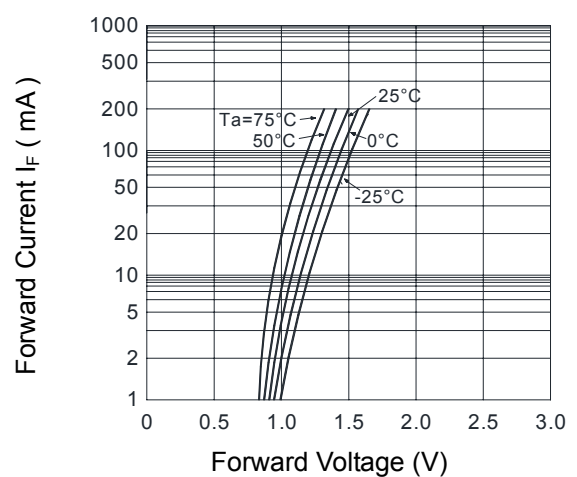
**Fig.4 Total Power Dissipation vs. Ambient Temperature**



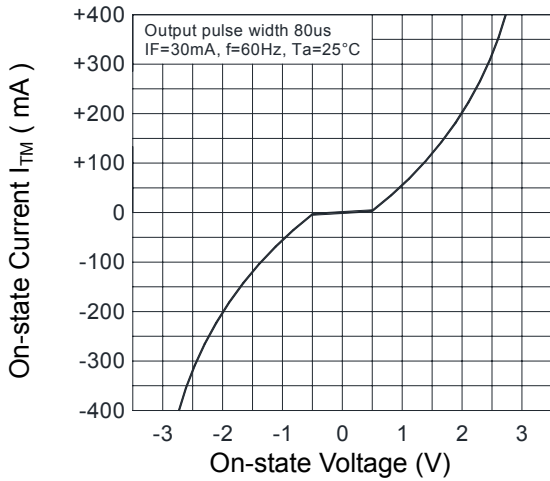
**Fig.5 Peak Forward Current vs. Duty Ratio**



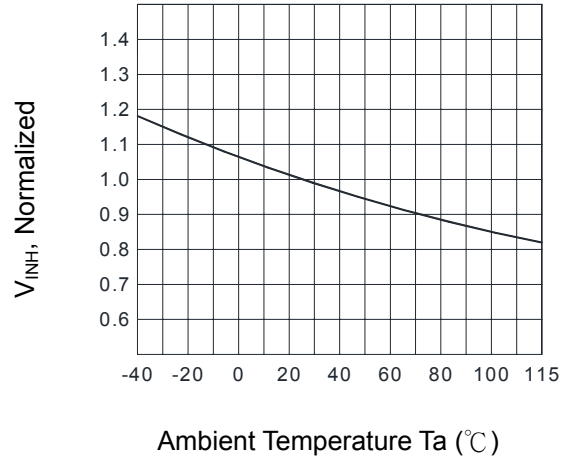
**Fig.6 Forward Current vs. Forward Voltage**



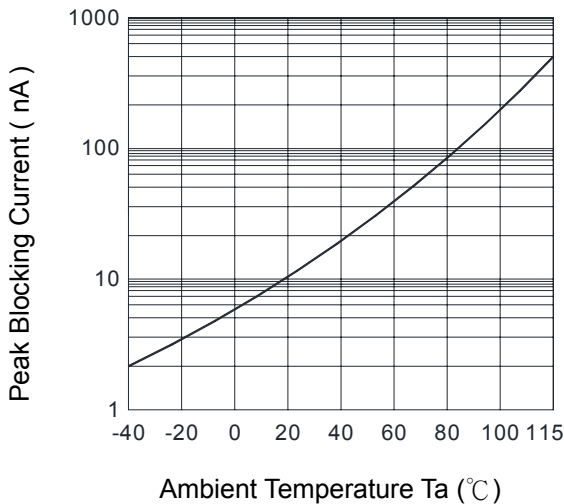
**Fig.7 On-state Characteristics**



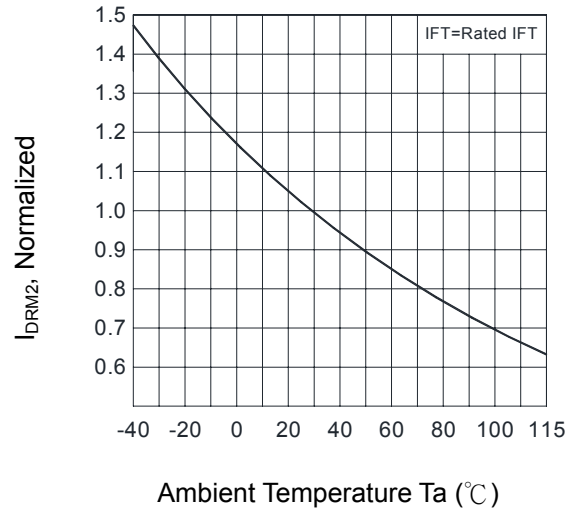
**Fig.8 Inhibit Voltage vs. Ambient Temperature**



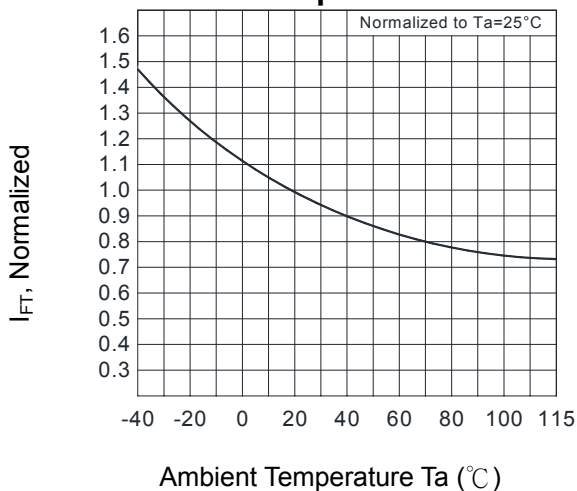
**Fig.9 Leakage with LED off vs. Ambient Temperature**



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



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

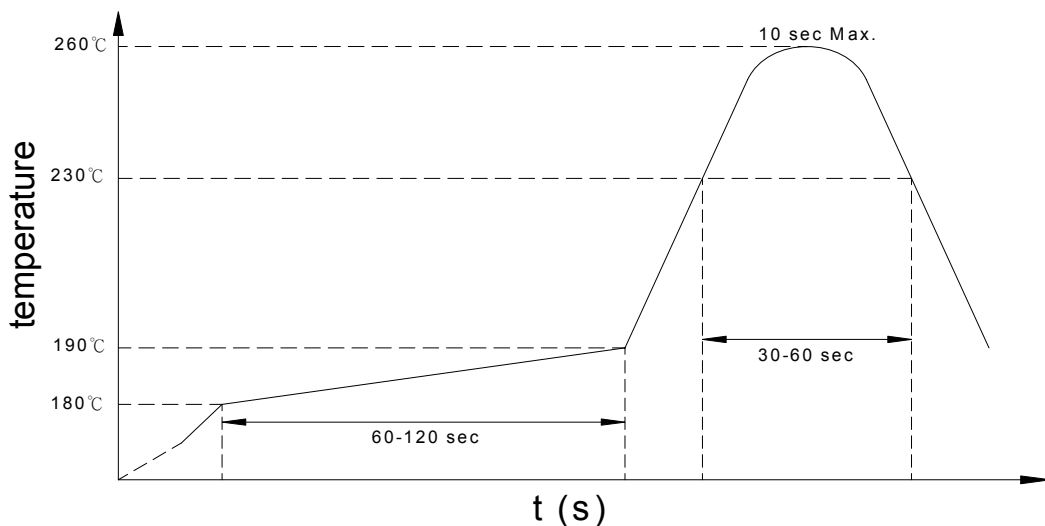


### ● Recommended Soldering Conditions

#### (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.

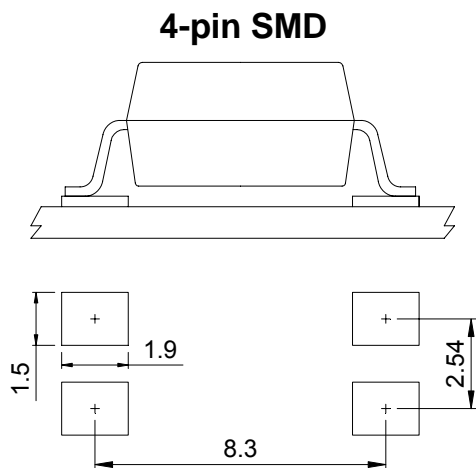
X = Lead form option ( blank · S · H · L )

Y = Tape and reel option ( TLD · TRU )

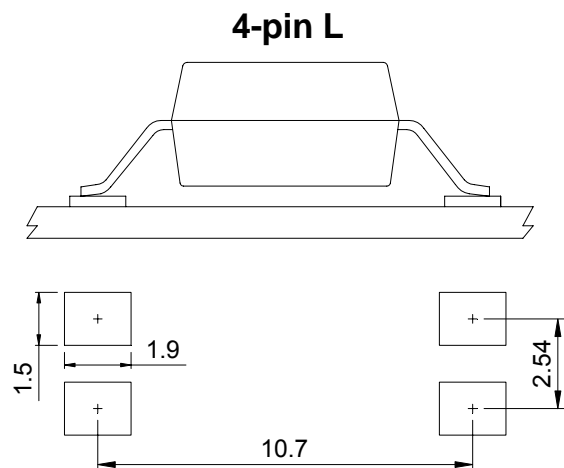
Option	Description	Packing quantity
S (TLD)	surface mount type package + TLD tape & reel option	2000 units per reel
S (TRU)	surface mount type package + TRU tape & reel option	2000 units per reel
L (TLD)	long creepage distance for surface mount type package + TLD tape & reel option	2000 units per reel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

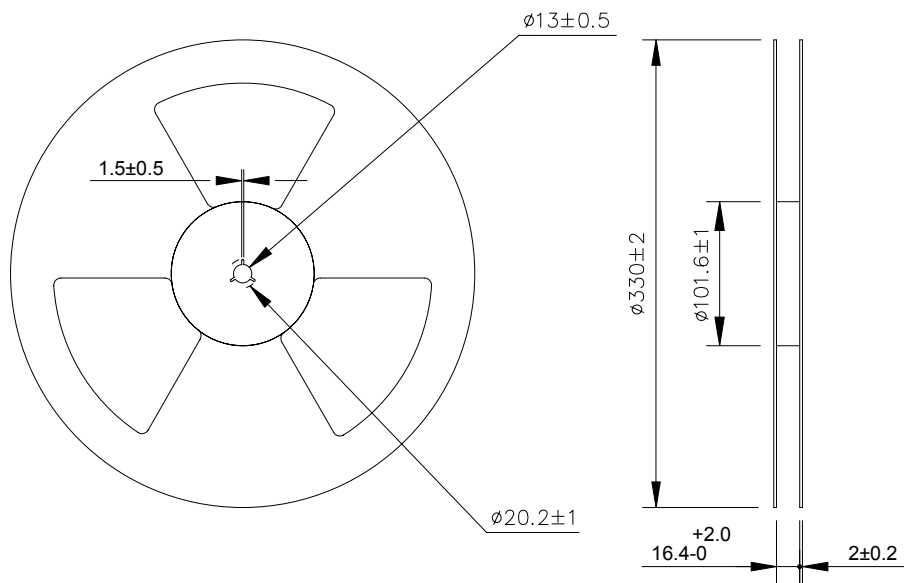
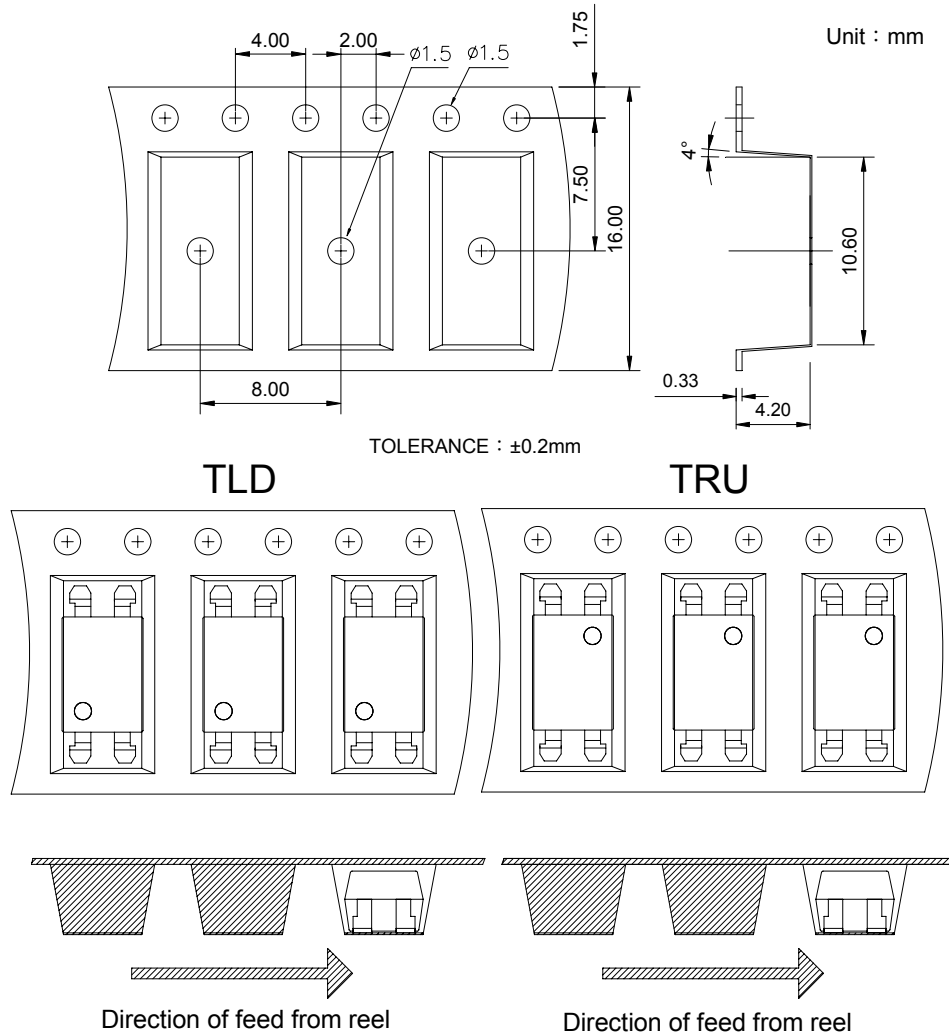


**2. Long creepage distance for surface mount type.**



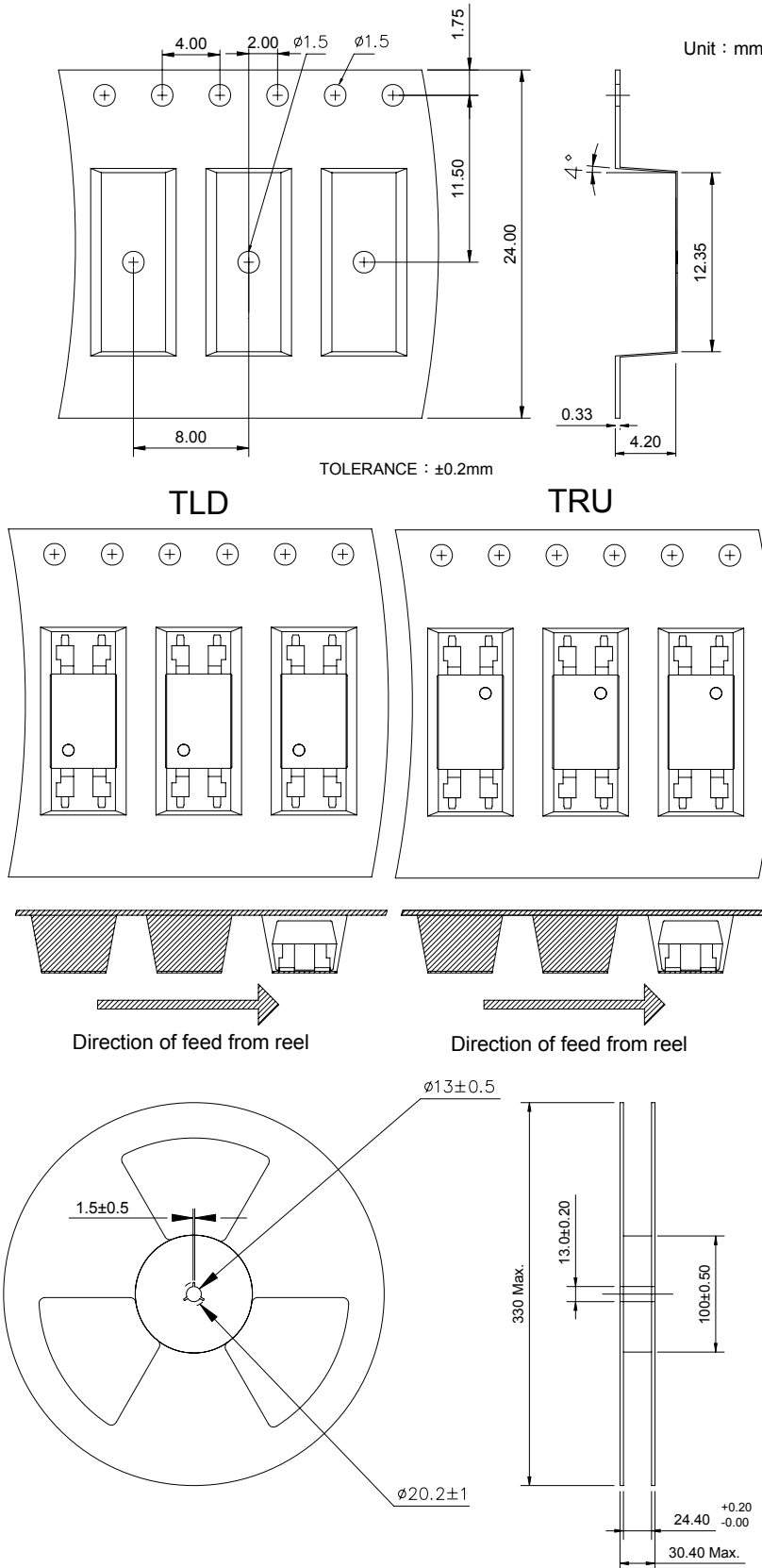
Unit : mm

● 4-pin SMD Carrier Tape & Reel





● 4-pin L Carrier Tape & Reel



- **Application Notice**

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