

● Description

The KMOC3011 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.

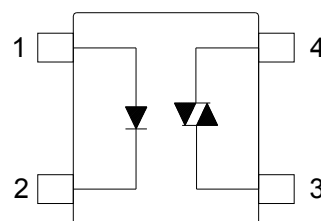
● Features

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. 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.C contactors
- AC motor contactors
- Solid state relay
- Programmable controllers

● Schematic

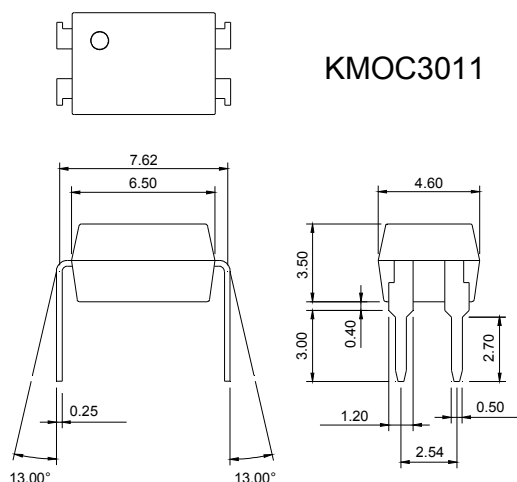


1. Anode
2. Cathode
3. Main terminal
4. Main terminal

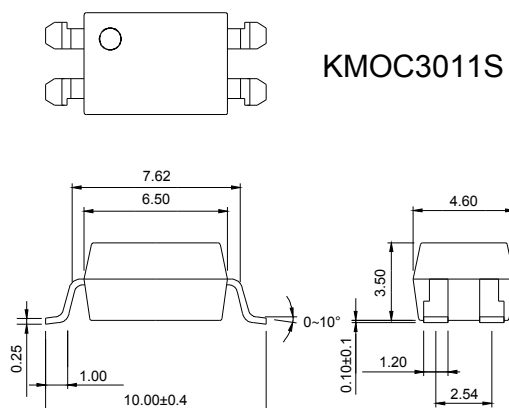
● Outside Dimension

Unit : mm

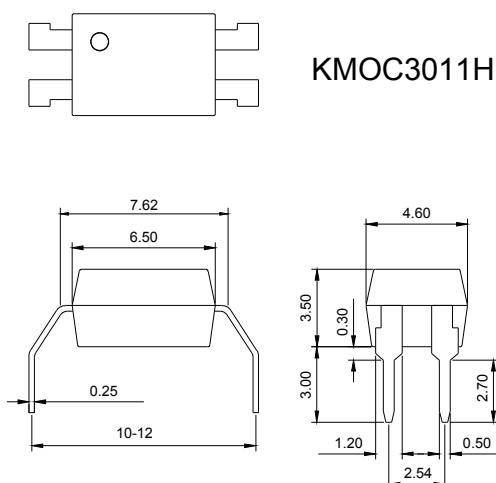
1. Dual-in-line type.



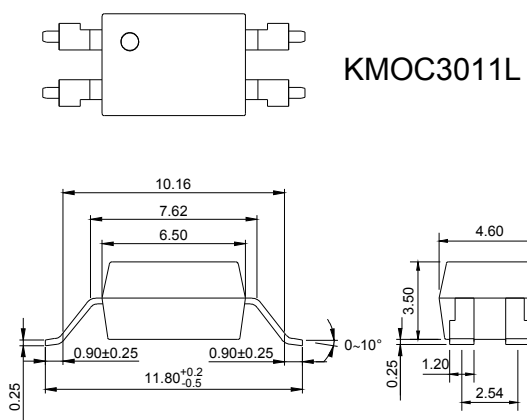
2. Surface mount type.



3. Long creepage distance type.

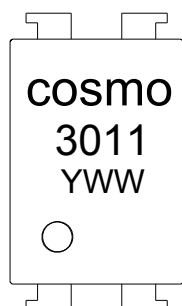


4. Long creepage distance for surface mount type.



TOLERANCE : ±0.2mm

● Device Marking



Notes :

cosmo
3011
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	-	-	10	mA
	Turn-on time	T_{ON}	$V_D=6V, R_L=100\Omega, I_F=20mA$	-	-	100	μs

● Static dv/dt Test Circuit

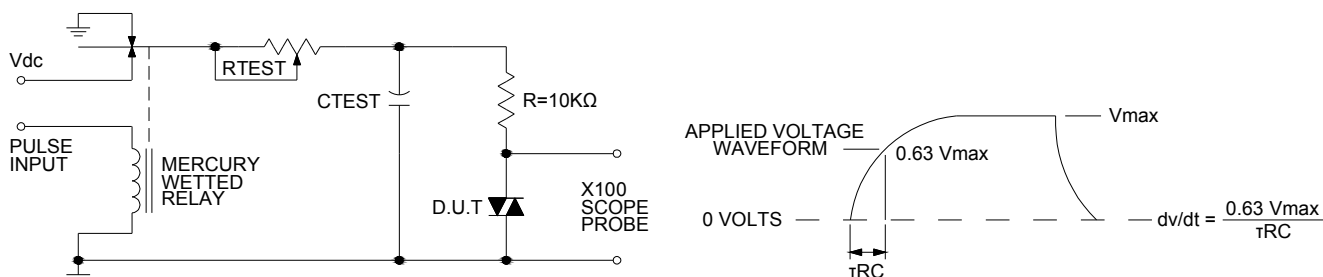


Fig.1 Forward Current vs. Ambient Temperature

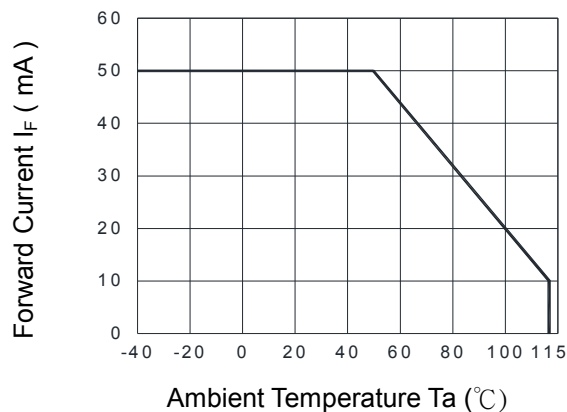


Fig.2 Diode Power Dissipation vs. Ambient Temperature

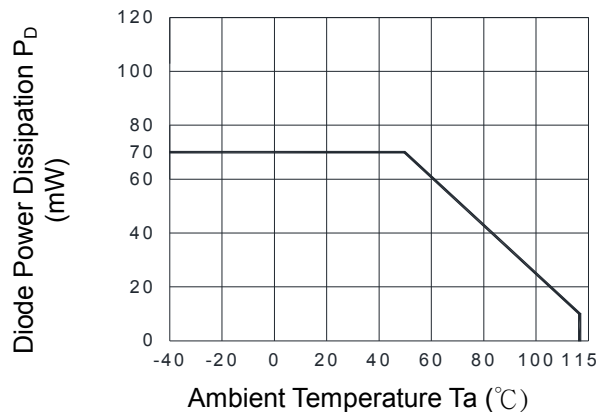


Fig.3 On-state R.M.S. Current vs. Ambient Temperature

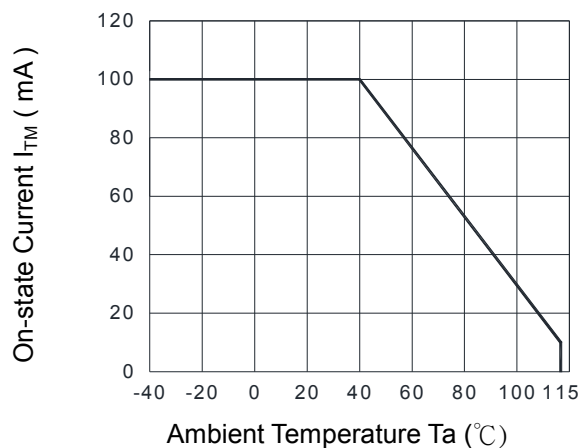


Fig.4 Total Power Dissipation vs. Ambient Temperature

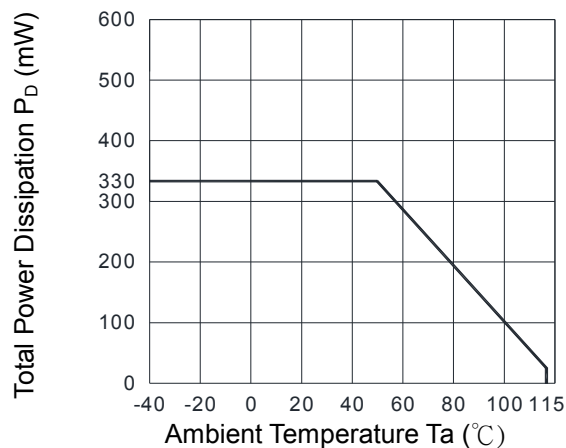


Fig.5 Peak Forward Current vs. Duty Ratio

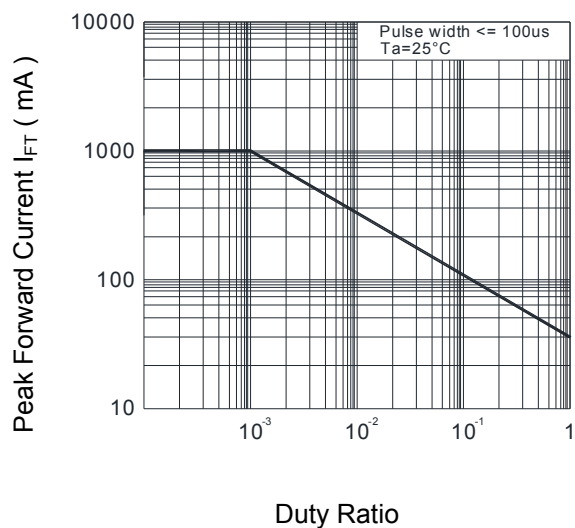


Fig.6 Forward Current vs. Forward Voltage

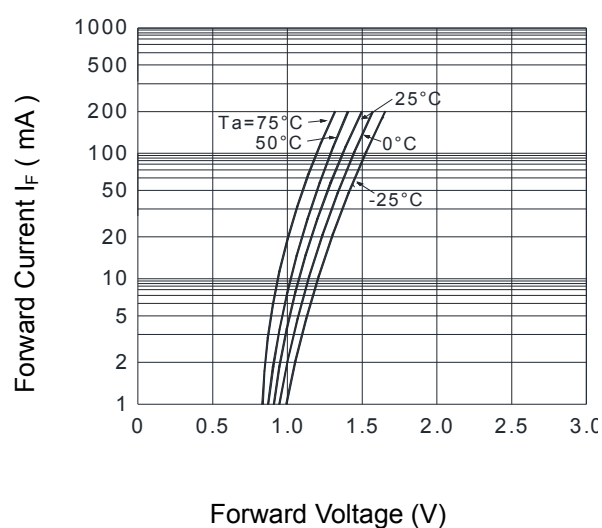


Fig.7 On-state Characteristics

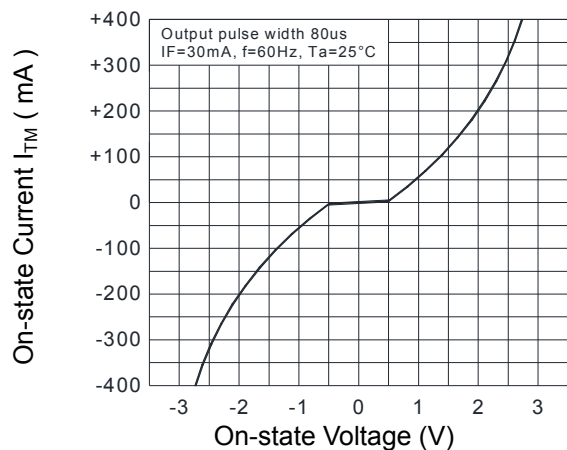


Fig.8 Leakage with LED off vs. Ambient Temperature

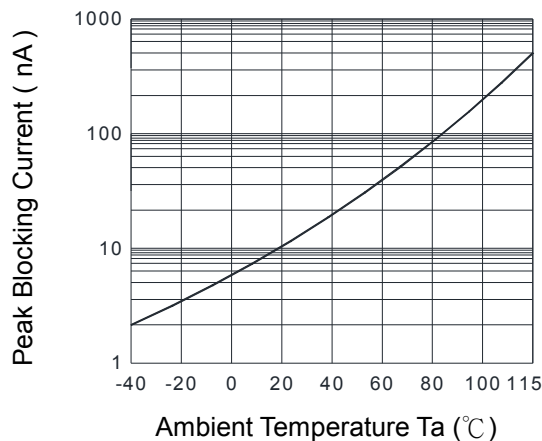
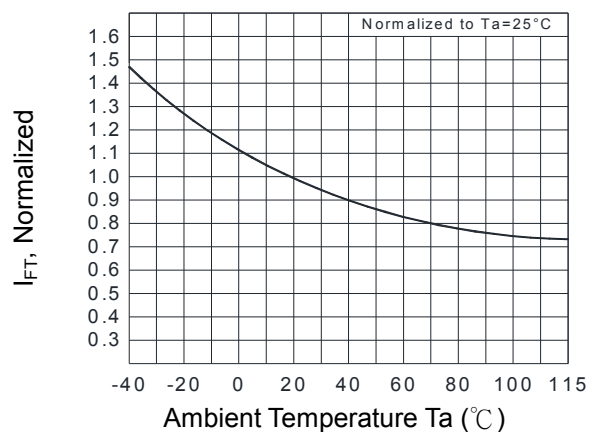


Fig.9 Trigger Current vs. Ambient Temperature

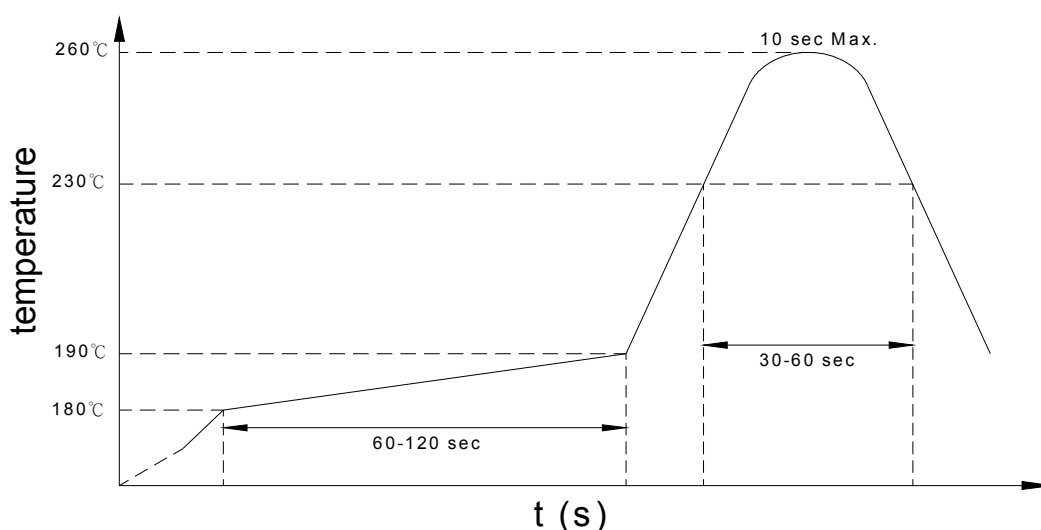


● Recommended Soldering Conditions

(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

KMOC3011 X (Y)

Notes :

KMOC3011 = Part No.

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

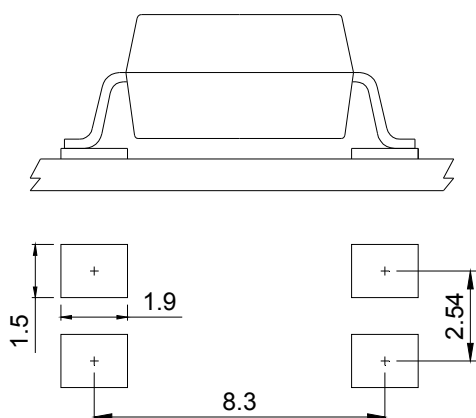
Y = Tape and reel option (TLD 、 TRU)

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

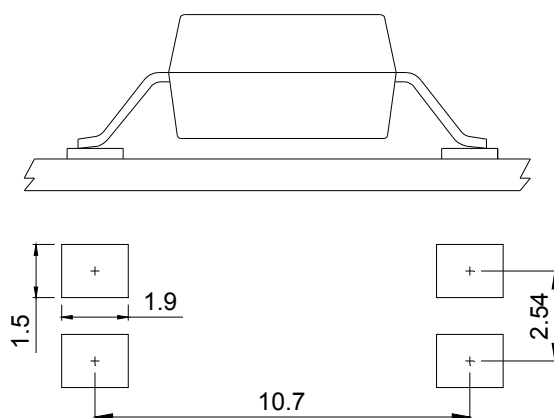
1. Surface mount type.

4-pin SMD

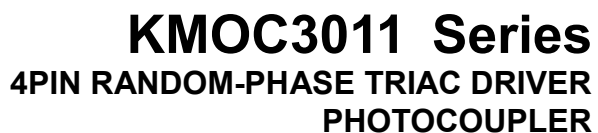


2. Long creepage distance for surface mount type.

4-pin L



Unit : mm



Unit : mm

Dimensions (mm):

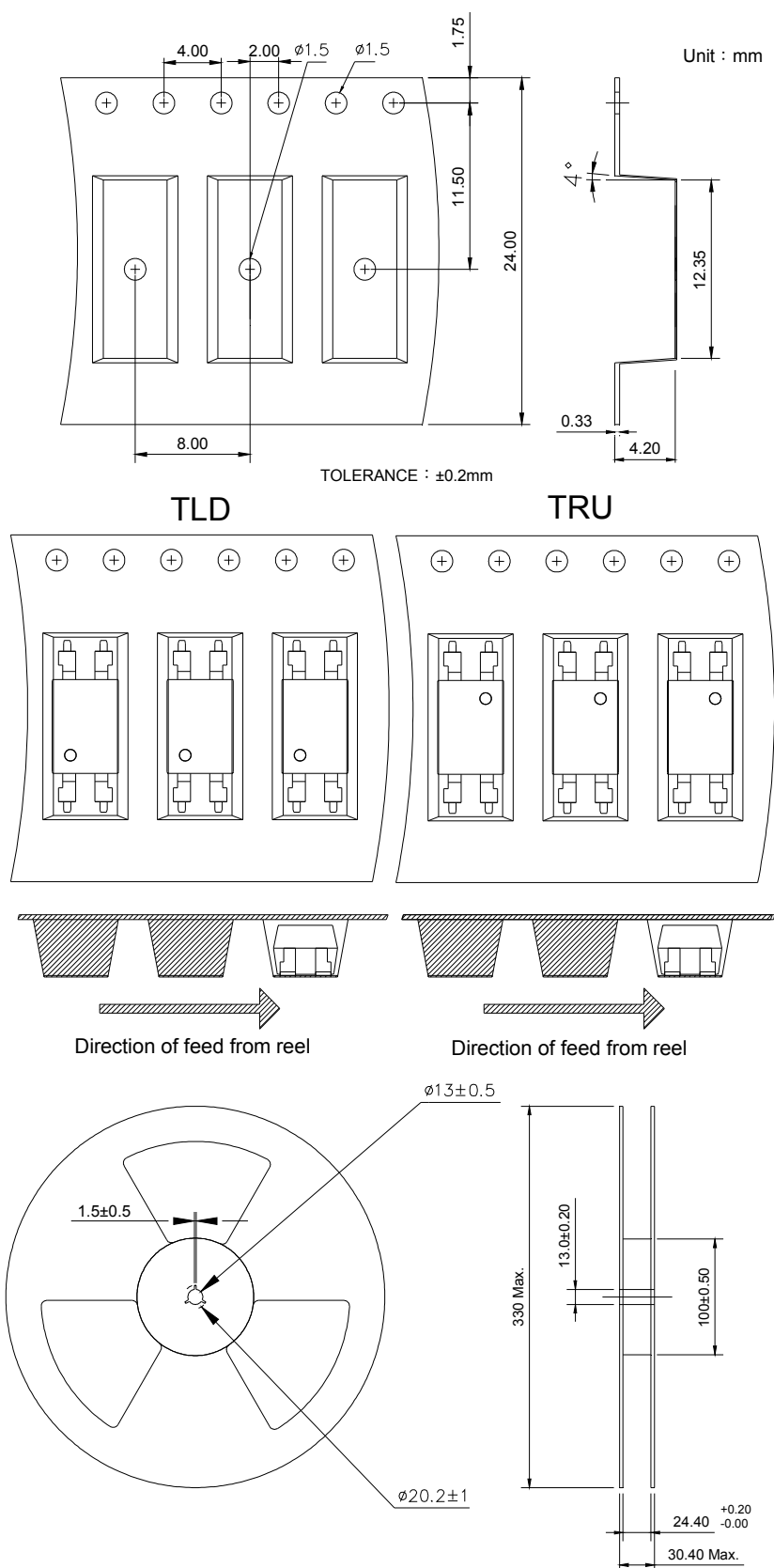
- Top spacing: 4.00, 2.00
- Top hole diameter: $\phi 1.5$
- Top hole spacing: 1.75
- Switch height: 7.50
- Switch width: 16.00
- Bottom spacing: 8.00
- Bottom hole diameter: $\phi 1.5$
- Bottom hole spacing: 0.33
- Bottom hole width: 4.20
- Switch angle: 4°
- Switch depth: 10.60

TOLERANCE : $\pm 0.2\text{mm}$

Assembly Details:

- TLD**: 3-position 2-pole 2-way switch assembly.
- TRU**: 3-position 2-pole 2-way switch assembly.
- Direction of feed from reel: Indicated by arrows pointing right.
- Dimensions for reel feed: $\phi 13 \pm 0.5$, 1.5 ± 0.5 , $\phi 20.2 \pm 1$, $\phi 33.0 \pm 2$, $\phi 101.6 \pm 1$, 16.4 ± 0 , 2 ± 0 .

● 4-pin L Carrier Tape & Reel



● Application Notice

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- g. Consumer electronics
- h. Telecommunication

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