KMOC308X Series
5PIN ZERO-CROSS TRIAC DRIVER PHOTOCOUPLER

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● **Description**

The KMOC3081 、 KMOC3082 、 KMOC3083 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 240 VAC lines, such as solid-state relays, industrial controls, motors, solenoids and consumer appliances, etc.
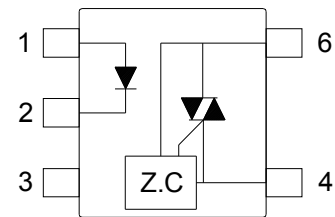
● **Schematic**

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

● **Features**

1. Pb free and RoHS compliant
2. 800V peak blocking voltage
3. Simplifies logic control of 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
• FIMKO Approved: EN60065, EN60950
• SEMKO Approved: EN60065
• 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

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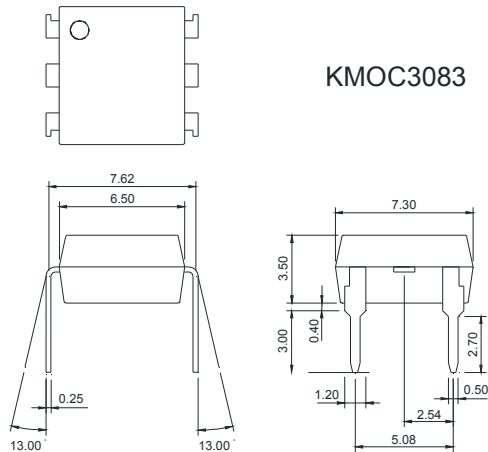● **Outside Dimension**

Unit：mm

1. Dual-in-line type.

KMOC3083

2. Surface mount type.

KMOC3083S
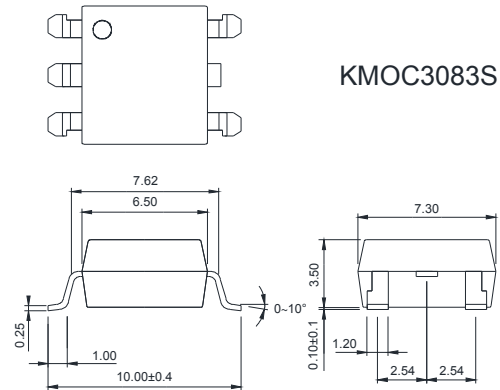
3. Long creepage distance type.

KMOC3083H
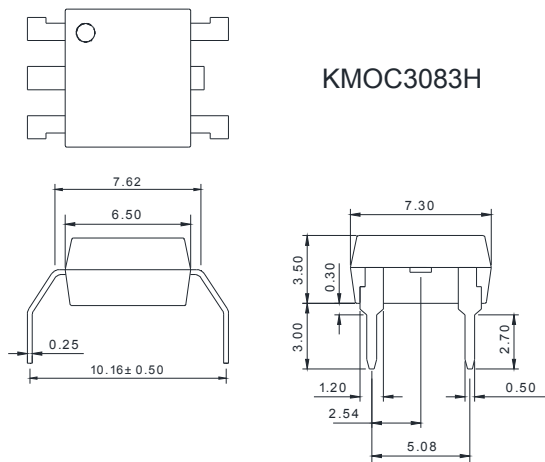
4. Long creepage distance for surface mount type.

KMOC3083L
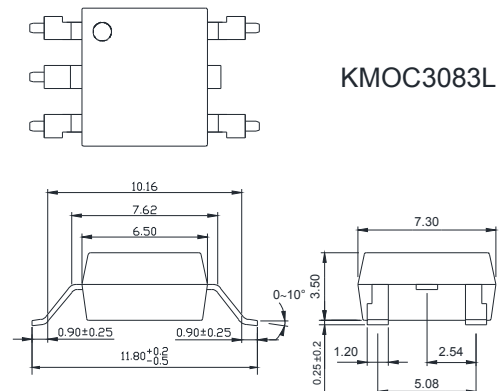
TOLERANCE：±0.2mm

● **Device Marking**
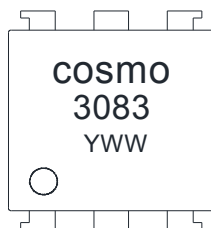
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3083
YWW

Notes：

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3081、3082、3083
YWW   Y：Year code / W：Week code

● Absolute Maximum Ratings

(Ta=25℃)

	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}	800	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	℃
	Storage temperature	T_{stg}	-50 to +125	℃
	Soldering temperature 10 seconds	T_{sol}	260	℃

## ● Electro-optical Characteristics

(Ta=25℃)

|	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		-	1.8	3	V
Transfer charac-teristics	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/µs
	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	µA
	Isolation resistance	R_{iso}	DC500V		5×10^{10}	10^{11}	-	Ω
	Minimum trigger current	I_{FT}	Main terminal voltage=3V	KMOC3081	-	-	15	mA
				KMOC3082	-	-	10	mA
				KMOC3083	-	-	5	mA

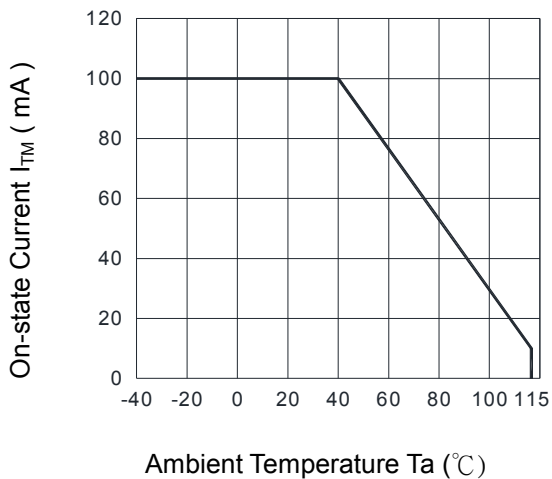## ● Static dv/dt Test Circuit
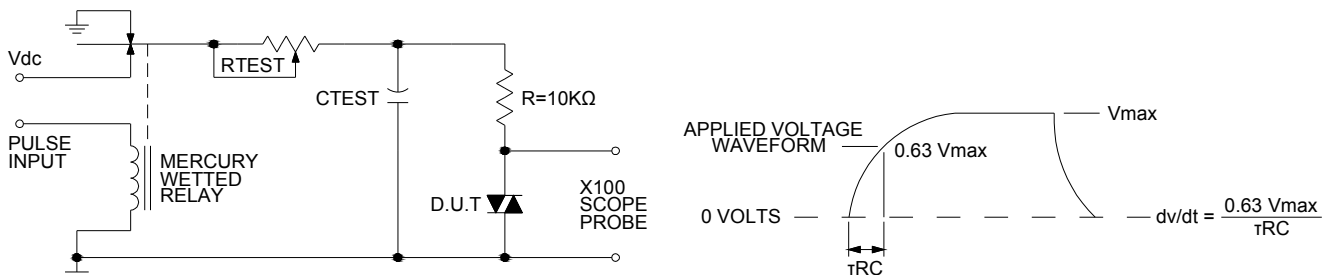
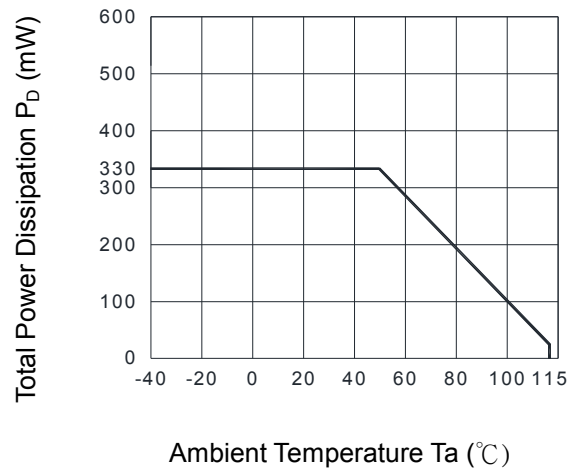**Fig.1 Forward Current vs. Ambient Temperature**
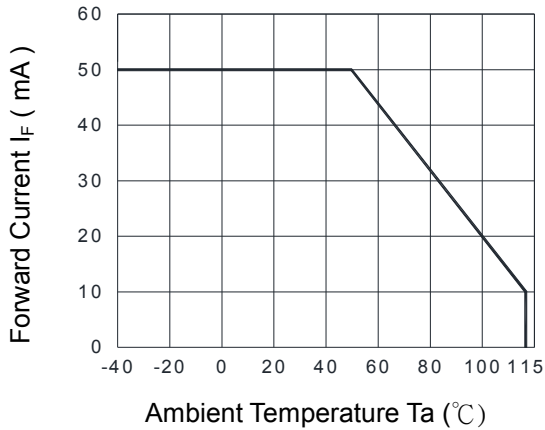
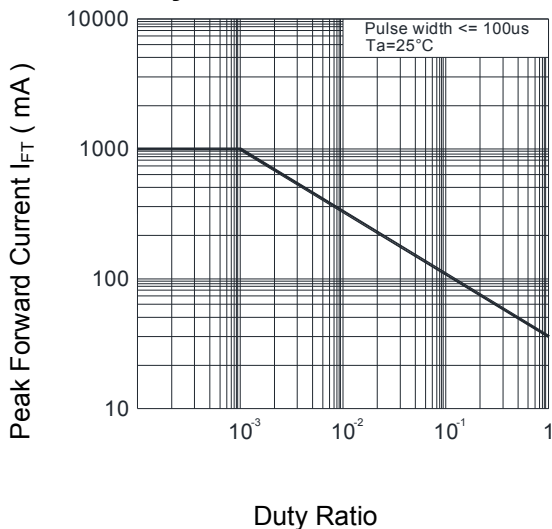**Fig.2 Diode Power Dissipation vs. Ambient Temperature**
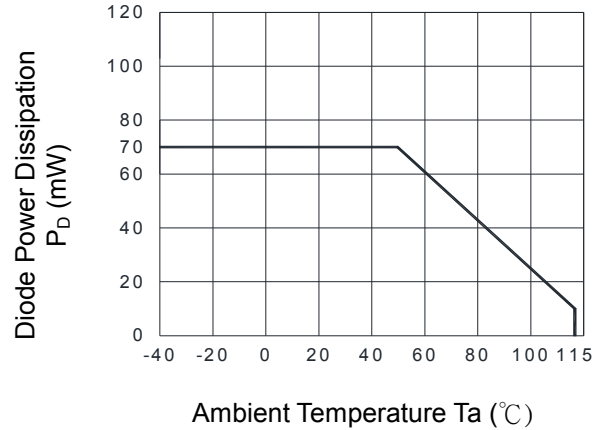
Fig.3 On-state R.M.S. Current vs. Ambient Temperature
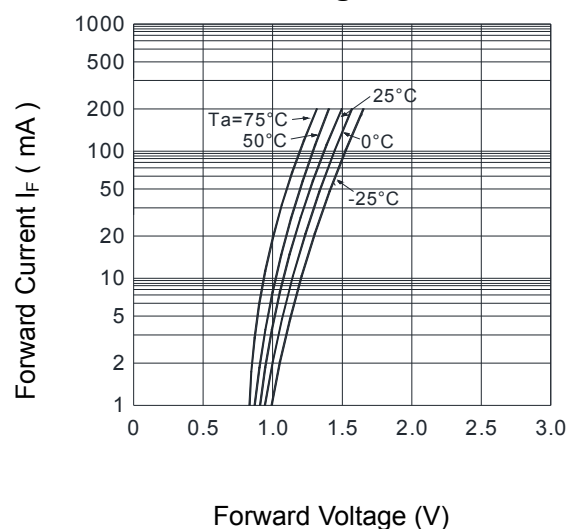

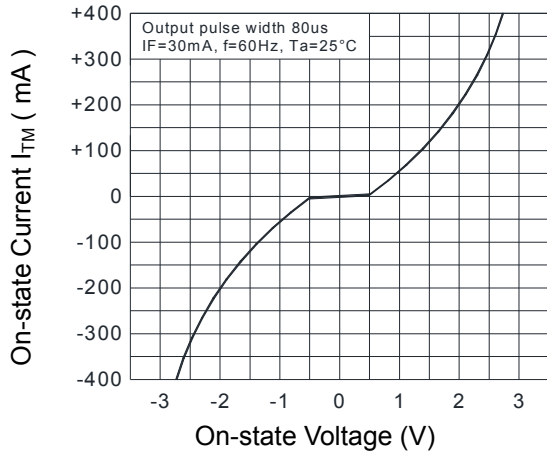**Fig.4 Total Power Dissipation vs. Ambient Temperature**
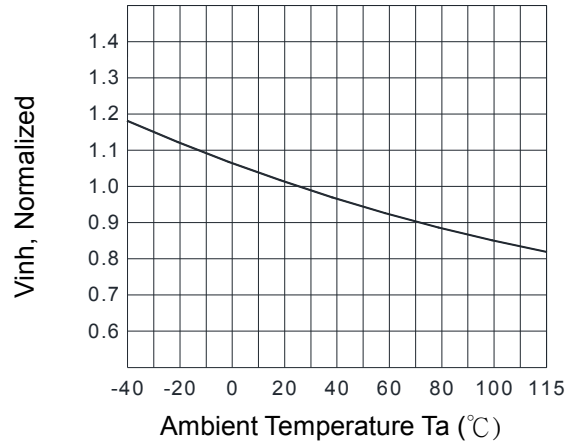

Fig.5 Peak Forward Current vs. Duty Ratio

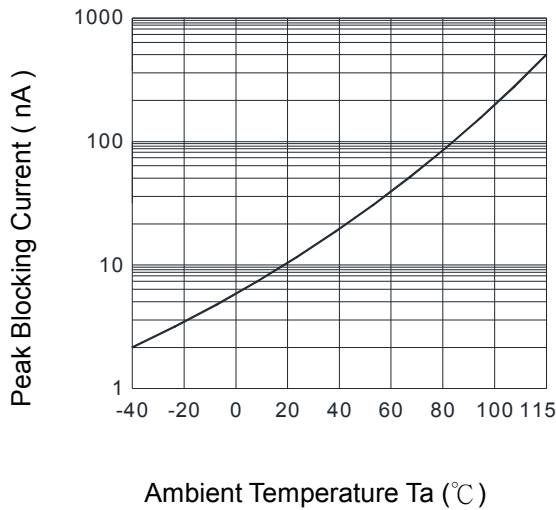**Fig.6 Forward Current vs. Forward Voltage**

Fig.7　On-state Characteristics

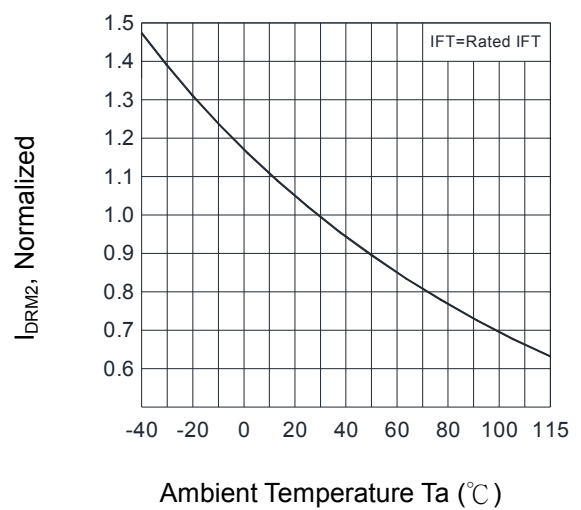**Fig.8　Inhibit Voltage**
vs. Ambient Temperature

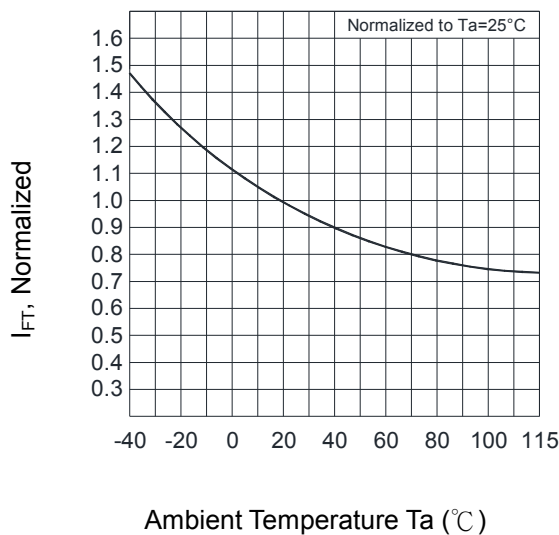**Fig.9　Leakage with LED off**
vs. Ambient Temperature

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℃ or below (package surface temperature)
- Time of peak reflow temperature： 10 sec
- Time of temperature higher than 230℃： 30-60 sec
- Time to preheat temperature from 180~190℃： 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
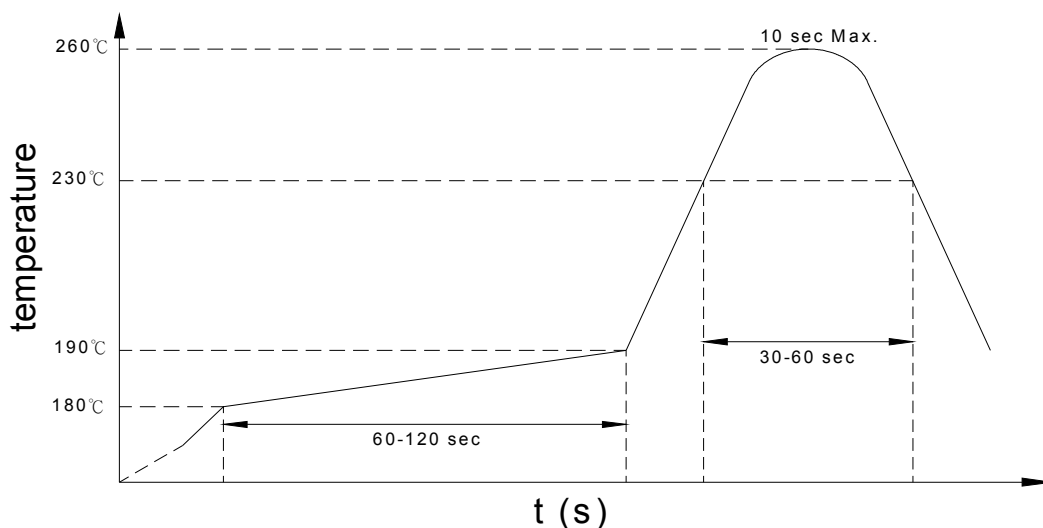
(b) Wave soldering：

- Temperature： 260℃ or below (molten solder temperature)
- Time： 10 seconds or less
- Preheating conditions： 120℃ 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.

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● **Numbering System**

KMOC3081 <u>X</u> (Y)

KMOC3082 <u>X</u> (Y)

KMOC3083 <u>X</u> (Y)
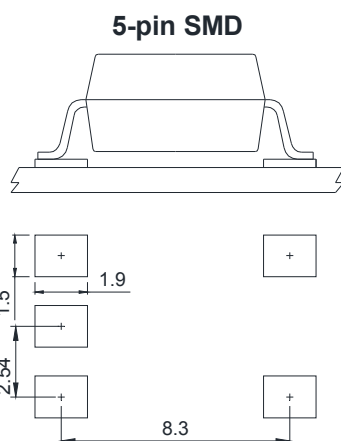
Notes：

KMOC3081 / KMOC3082 / KMOC3083 = Part No.

X = Lead form option (blank、S、H、L)

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

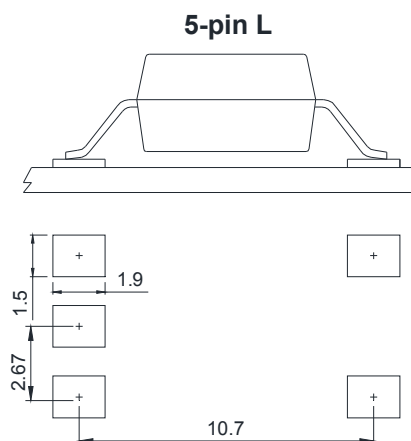| Option	Description	Packing quantity
S (TL)	surface mount type package + TL tape & reel option	1000 units per reel
S (TR)	surface mount type package + TR tape & reel option	1000 units per reel
L (TLD)	long creepage distance for surface mount type package + TLD tape & reel option	1000 units per reel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

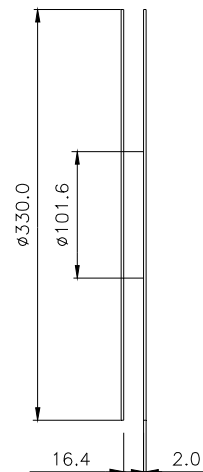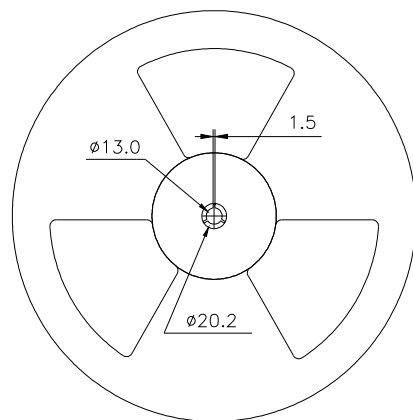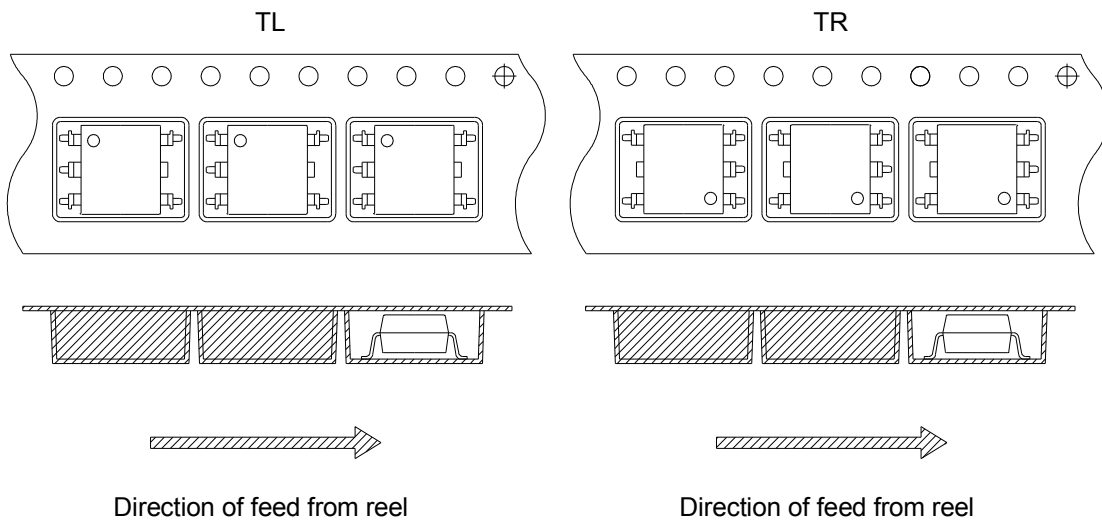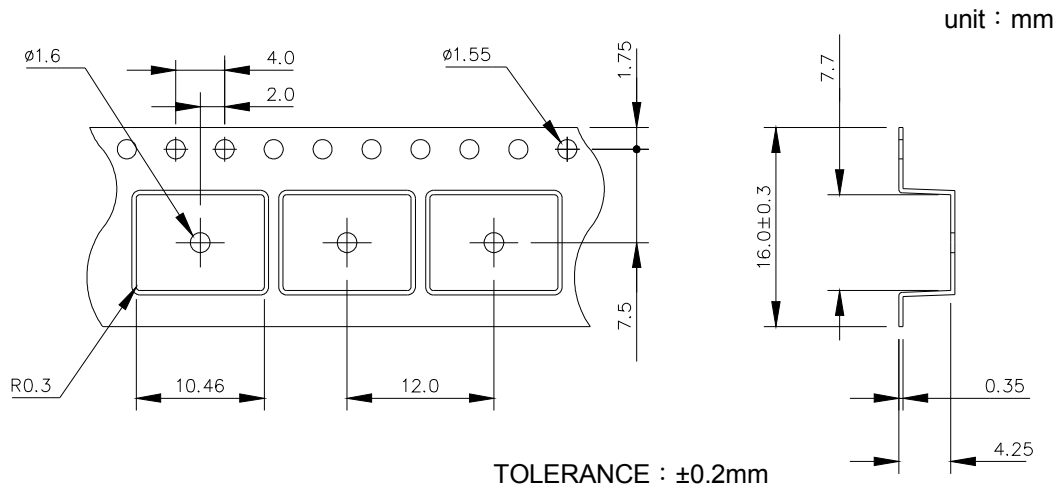● **Recommended Pad Layout for Surface Mount Lead Form**

1. Surface mount type.

2. Long creepage distance for surface mount type.

5-pin SMD
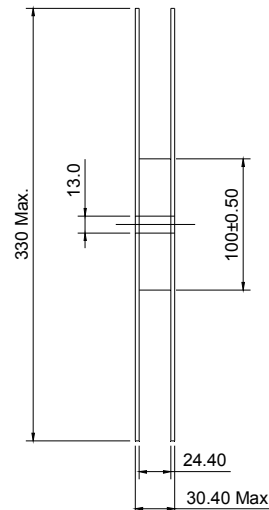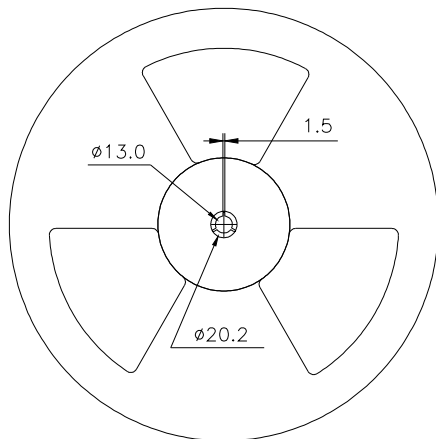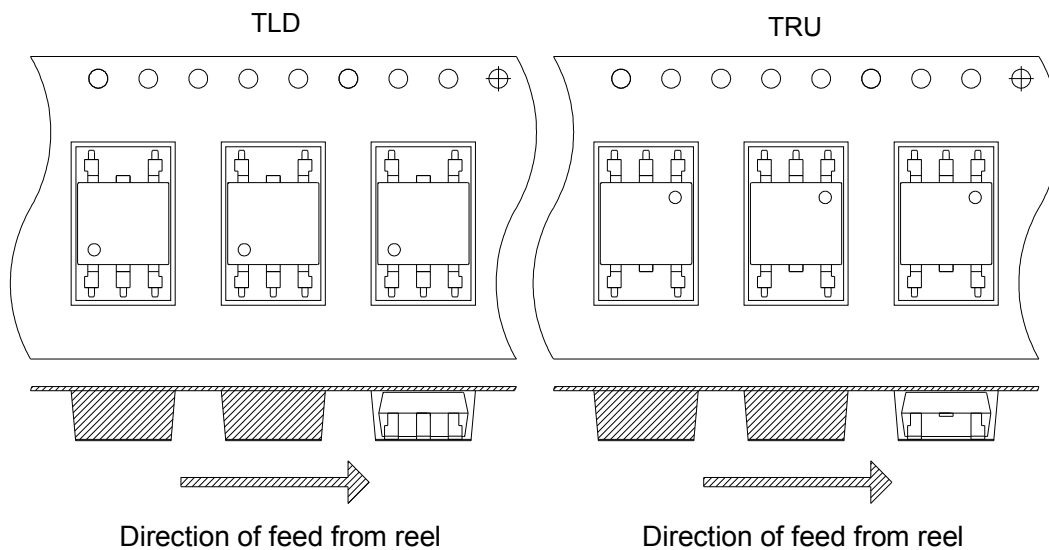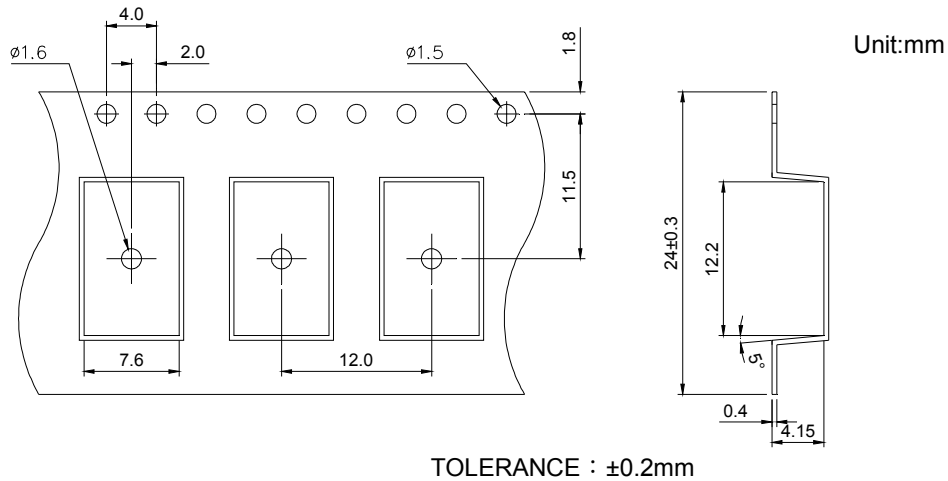
5-pin L

Unit：mm

● **SMD Carrier Tape & Reel**

unit：mm

TOLERANCE：±0.2mm

TL

TR

Direction of feed from reel

Direction of feed from reel

● **L Carrier Tape & Reel**

Unit:mm

TOLERANCE：±0.2mm

TLD

TRU

Direction of feed from reel

Direction of feed from reel

● **Application Notice**

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