

KMOC305X Series

5PIN RANDOM-PHASE TRIAC DRIVER PHOTOCOUPLER

● 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.

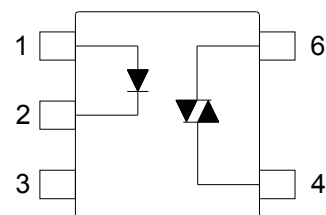
● Features

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

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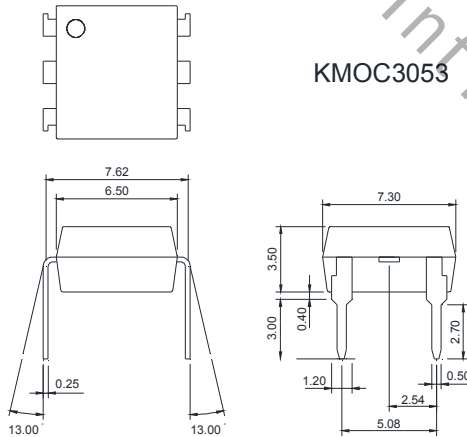
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● Outside Dimension

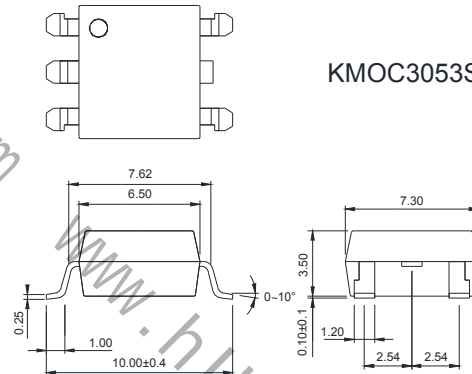
Unit : mm

1. Dual-in-line type.



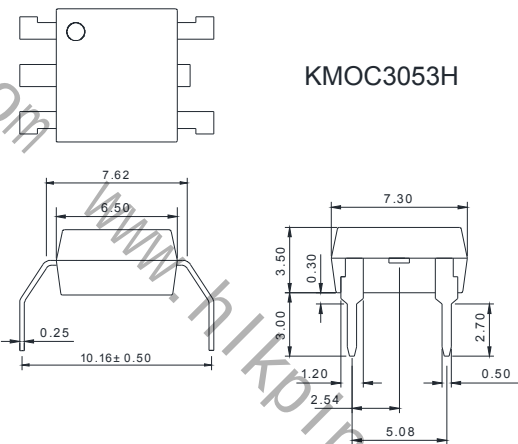
KMOC3053

2. Surface mount type.



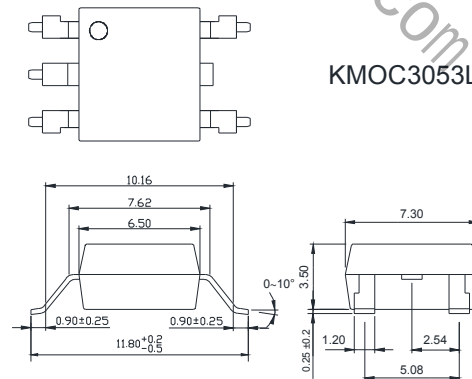
KMOC3053S

3. Long creepage distance type.



KMOC3053H

4. Long creepage distance for surface mount type.



KMOC3053L

TOLERANCE : ±0.2mm

● Device Marking



Notes :

cosmo

3051、3052、3053

YWW

Y : Year code / W : Week code

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Absolute Maximum Ratings

(Ta=25°C)

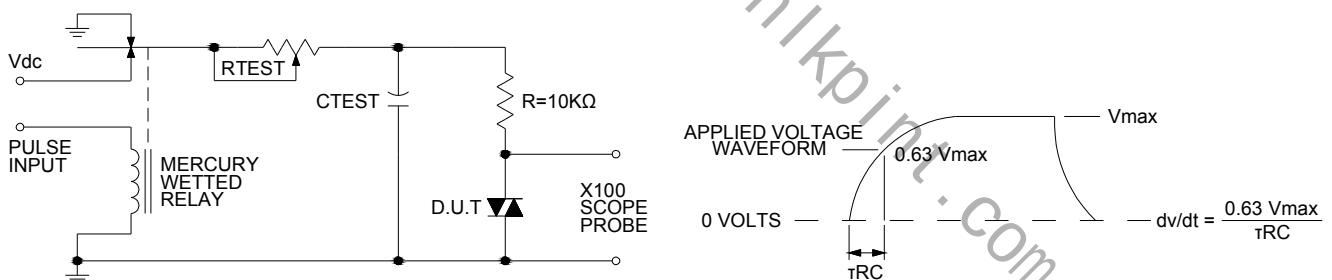
Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	70	mW
Output	Off-state output terminal voltage	V_{DRM}	600	V_{PEAK}
	On-state R.M.S. current	$I_{T(RMS)}$	100	mA
	Peak repetitive surge current (PW=10ms.DC 10%)	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/√2)*Rated		1000	-	-	V/μs
	Isolation resistance	R _{iso}	DC500V		5x10 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 =100Ω,I _F =20mA		-	-	100	μs	

Static dv/dt Test Circuit



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Fig.1 Forward Current vs. Ambient Temperature

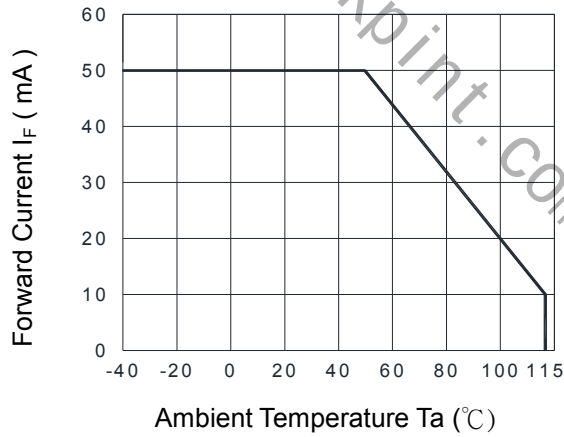


Fig.2 Diode Power Dissipation vs. Ambient Temperature

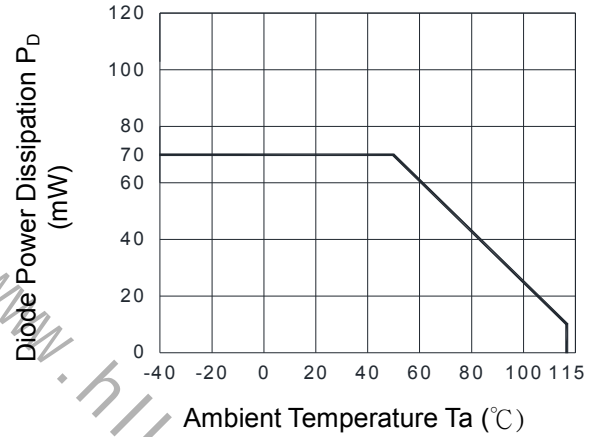


Fig.3 On-state R.M.S. Current vs. Ambient Temperature

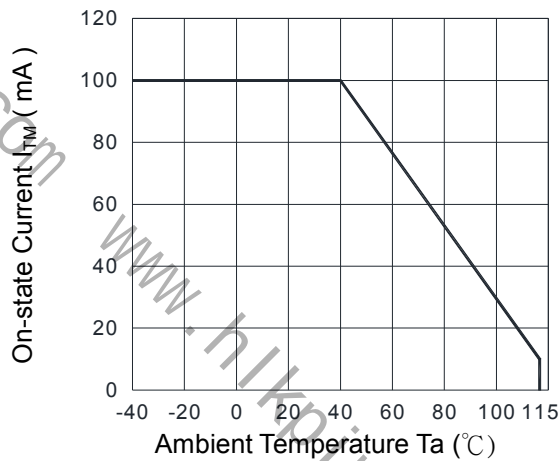


Fig.4 Total Power Dissipation vs. Ambient Temperature

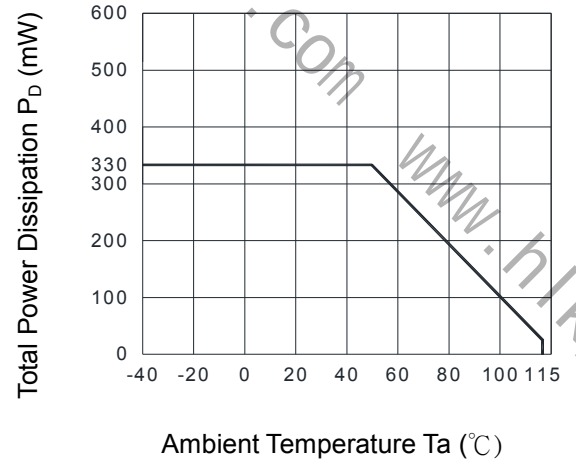


Fig.5 Peak Forward Current vs. Duty Ratio

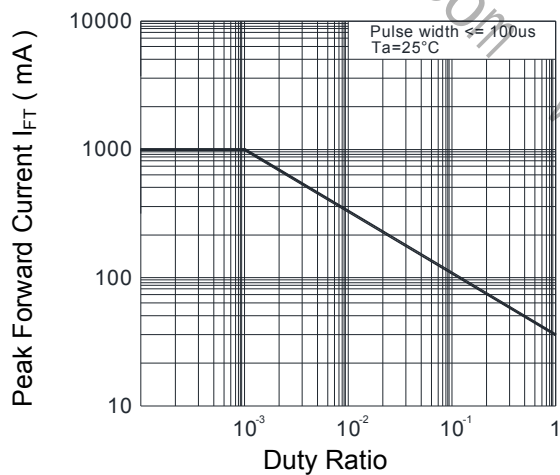
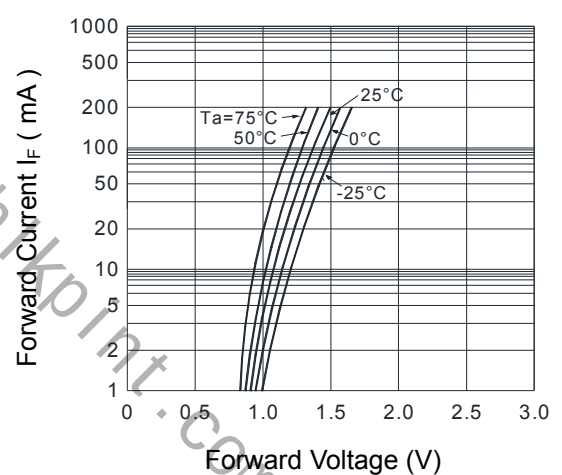


Fig.6 Forward Current vs. Forward Voltage



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Fig.7 On-state Characteristics

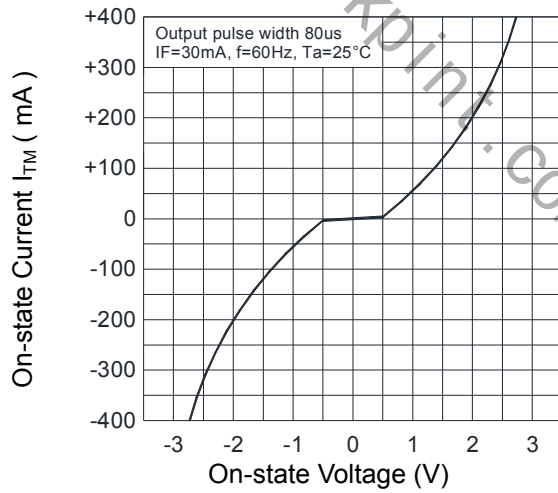


Fig.8 Leakage with LED off vs. Ambient Temperature

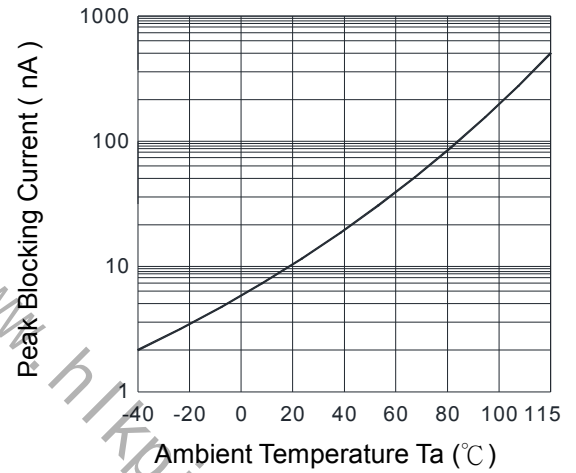
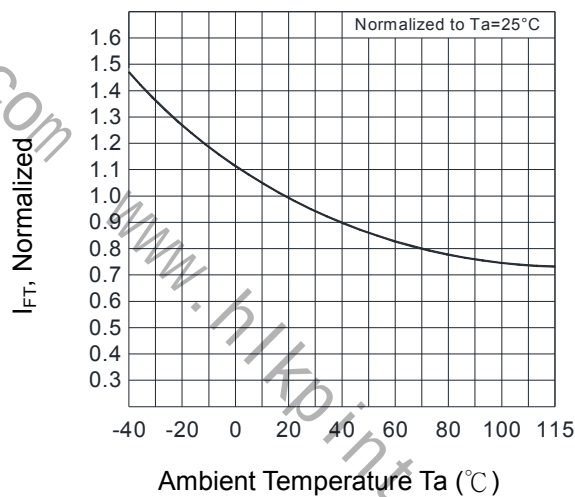


Fig.9 Trigger Current vs. Ambient Temperature



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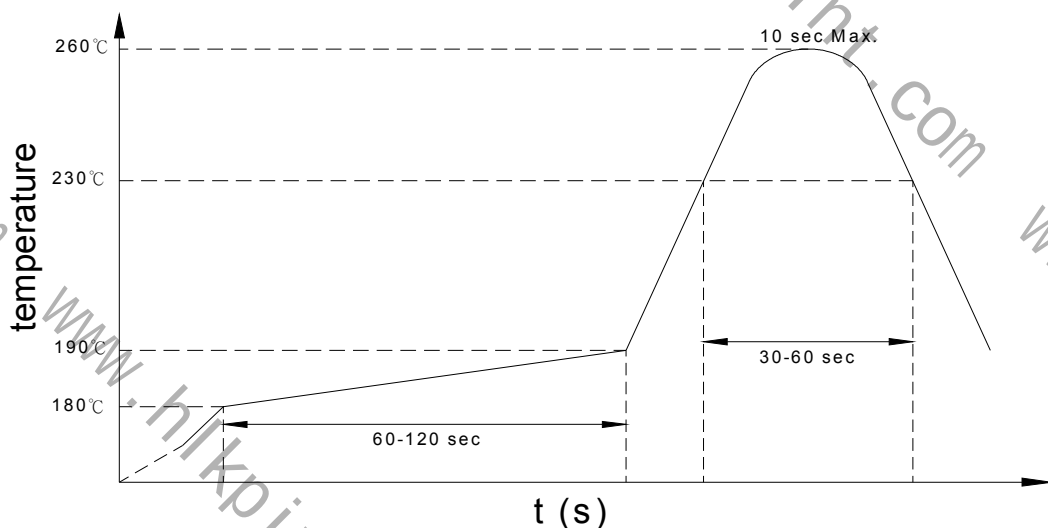
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● Recommended Soldering Conditions

(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.

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● Numbering System

KMOC3051 X (Y)

KMOC3052 X (Y)

KMOC3053 X (Y)

Notes :

KMOC3051 / KMOC3052 / KMOC3053 = Part No.

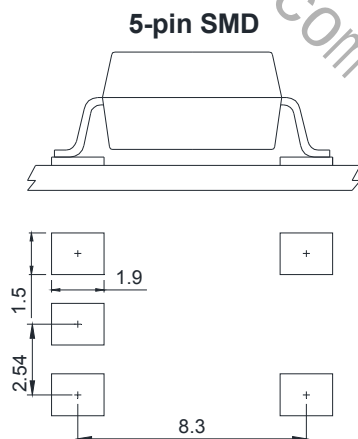
X = Lead form option (blank 、 S 、 H 、 L)

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

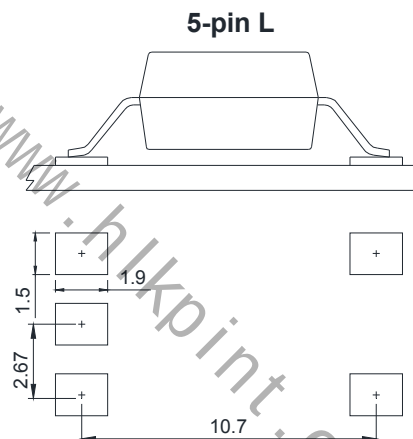
Option	Description	Packing quantity
S (TL)	surface mount type package + TL tape & reel option	1000 units per reel
S (TR)	surface mount type package + TR tape & reel option	1000 units per reel
L (TLD)	long creepage distance for surface mount type package + TLD tape & reel option	1000 units per reel
L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



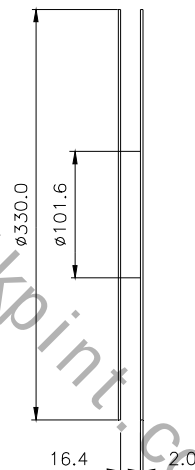
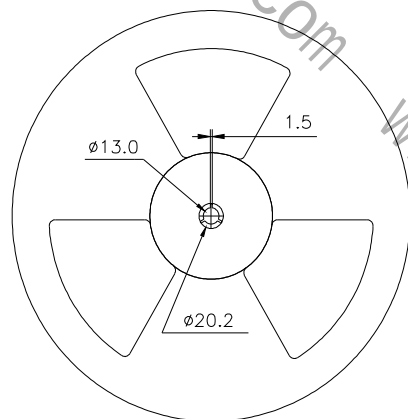
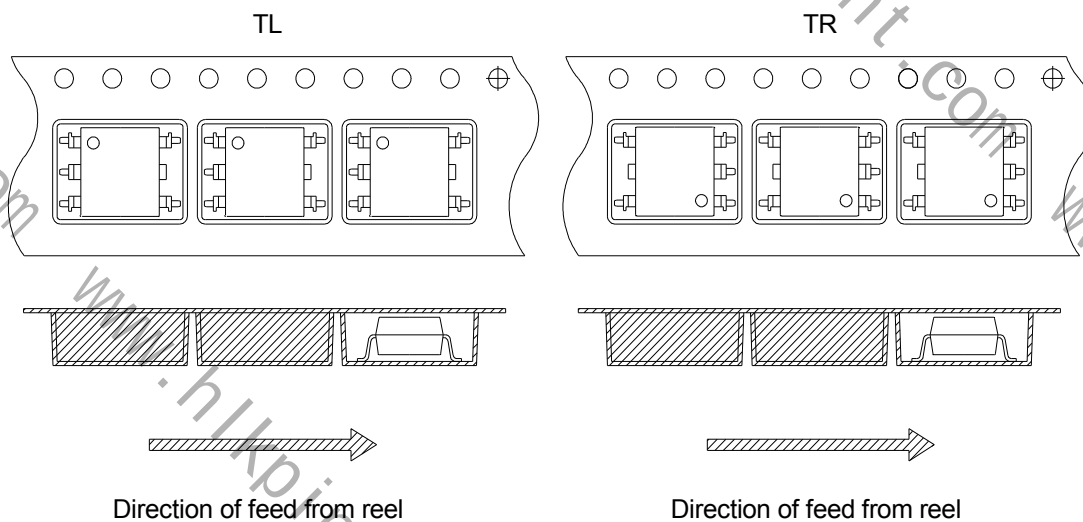
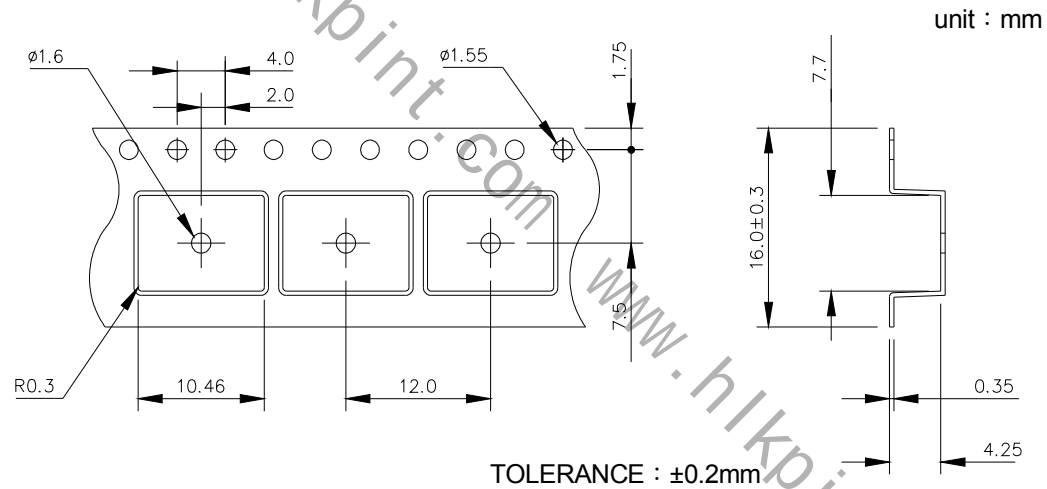
Unit : mm

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● SMD Carrier Tape & Reel



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● L Carrier Tape & Reel

