

● Description

The KPC815 series consist of an infrared-emitting diode in a 4-pin DIP package and available in wide-lead spacing and SMD option. The input-output isolation voltage is rated at 5000 Vrms.

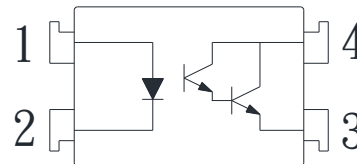
● Features

1. High current transfer ratio
(CTR : Min. 600% at $I_F=1\text{mA}$ $V_{CE}=2\text{V}$)
2. High isolation voltage between input and output
(Viso : 5000Vrms)
3. Compact dual-in-line package
4. Pb free and RoHS compliant
5. MSL class 1
6. Agency Approvals
 - UL Approved (No. E169586): UL1577
 - c-UL Approved (No. E169586)
 - VDE Approved (No. 40005500): DIN EN60747-5-5
 - FIMKO Approved: EN62368-1, EN60601-1
 - CQC Approved: GB4943.1-2022

● Applications

- System appliances, measuring instruments
- Industrial robots
- Copiers, automatic vending machines, facsimiles
- Signal transmission between circuits of different potentials and impedances

● Schematic

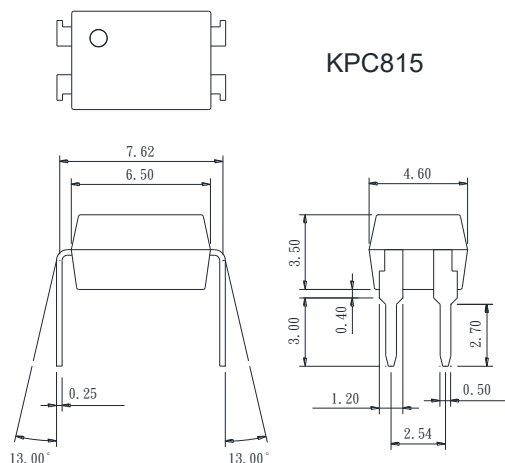


1. Anode
2. Cathode
3. Emitter
4. Collector

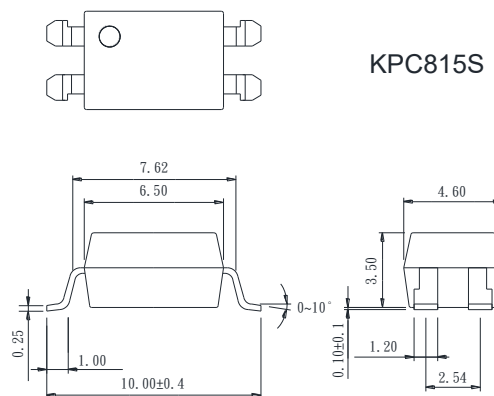
● Outside Dimension

Unit : mm

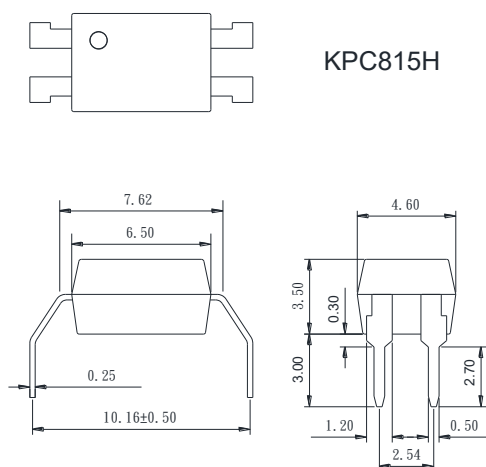
1. Dual-in-line type.



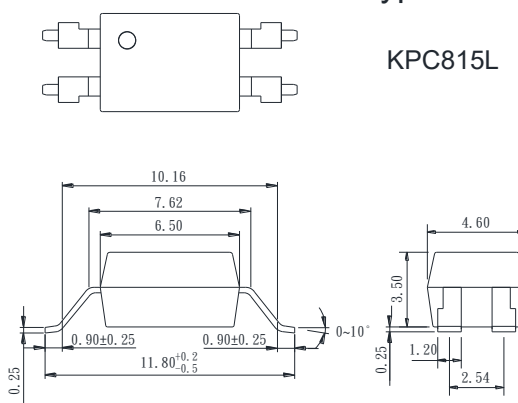
2. Surface mount type.



3. Long creepage distance type



4. Long creepage distance for surface mount type.



TOLERANCE : ±0.2mm

● Device Marking



Notes:

cosmo
815
YWW

Y: Year code / WW: 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	Collector-emitter voltage	V _{CEO}	35	V
	Emitter-collector voltage	V _{ECO}	6	V
	Collector current	I _C	80	mA
	Collector power dissipation	P _C	150	mW
Total power dissipation		P _{tot}	200	mW
Isolation voltage 1 minute		V _{iso}	5000	V _{rms}
Operating temperature		T _{opr}	-55 to +115	°C
Storage temperature		T _{stg}	-55 to +125	°C
Soldering temperature 10 seconds		T _{sol}	260	°C

● Electro-optical Characteristics

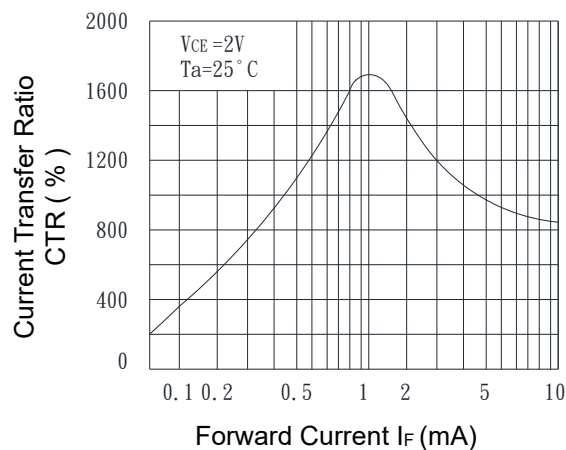
(Ta=25°C)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V _F	I _F =20mA	-	1.2	1.4	V
	Peak forward voltage	V _{FM}	I _{FM} =0.5A	-	-	3.5	V
	Reverse current	I _R	V _R =4V	-	-	10	μA
	Terminal capacitance	C _t	V=0, f=1KHz	-	30	-	pF
Output	Collector dark current	I _{CEO}	V _{CE} =10V, I _F =0	-	-	1.0	μA
Transfer characteristics	Current transfer ratio	CTR	I _F =1mA, V _{CE} =2V	600	-	7500	%
	Collector-emitter saturation	V _{CE(sat)}	I _F =80mA, I _C =2mA	-	-	1.0	V
	Isolation resistance	R _{iso}	DC500V	5x10 ¹⁰	-	-	Ω
	Floating capacitance	C _f	V=0, f=1MHz	-	0.6	1.0	pF
	Cut-off frequency	f _C	V _{CC} =5V, I _C =2mA, R _L =100Ω	-	7	-	KHz
	Response time (Rise)	t _r	V _{CE} =10V, I _C =50mA, R _L =100Ω	-	5	40	μs
	Response time (Fall)	t _f		-	60	100	μs

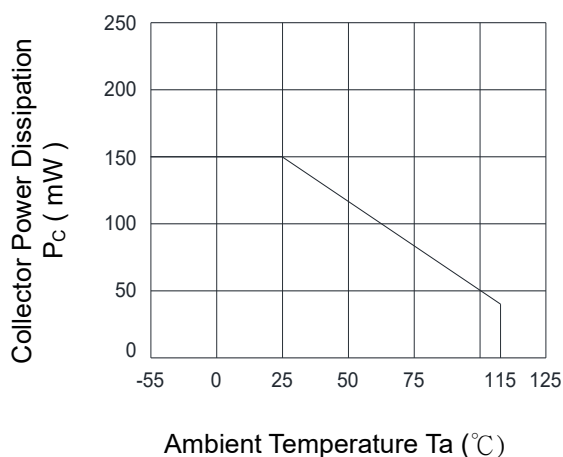
Classification table of current transfer ratio is shown below.

KPC815 Model No.	CTR (%)
KPC815 E	600 ~ 7500

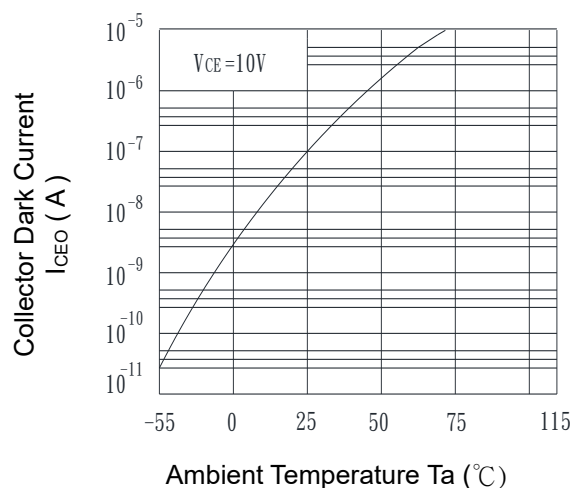
**Fig.1 Current Transfer Ratio
vs. Forward Current**



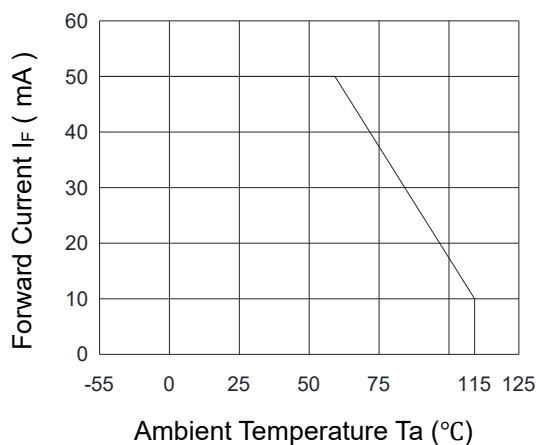
**Fig.2 Collector Power Dissipation
vs. Ambient Temperature**



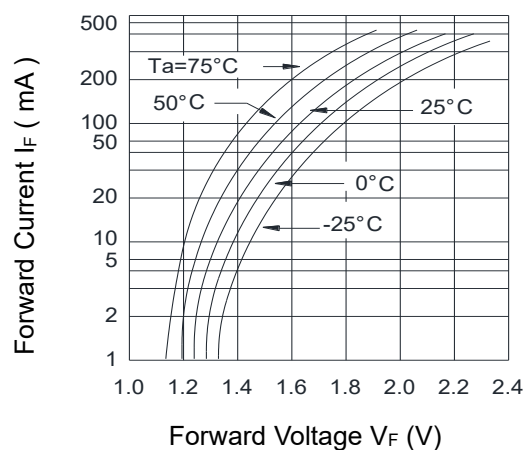
**Fig.3 Collector Dark Current
vs. Ambient Temperature**



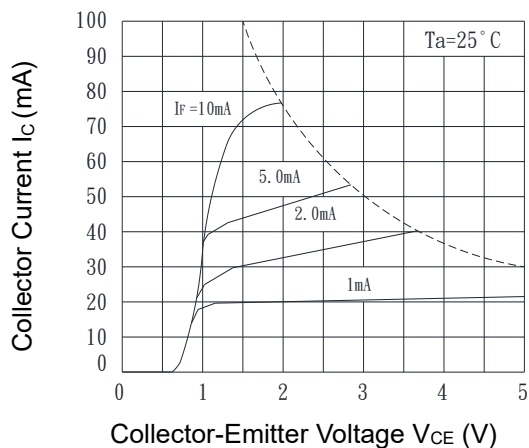
**Fig.4 Forward Current
vs. Ambient Temperature**



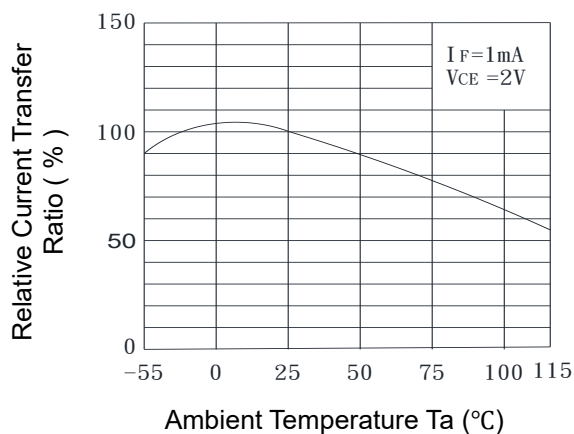
**Fig.5 Forward Current
vs. Forward Voltage**



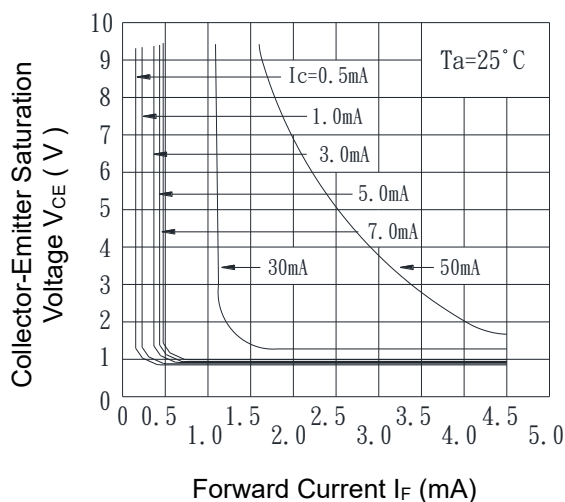
**Fig.6 Collector Current
vs. Collector-Emitter Voltage**



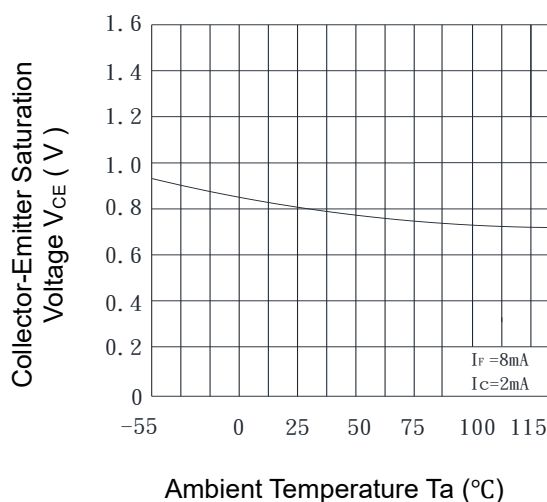
**Fig.7 Relative Current Transfer Ratio
vs. Ambient Temperature**



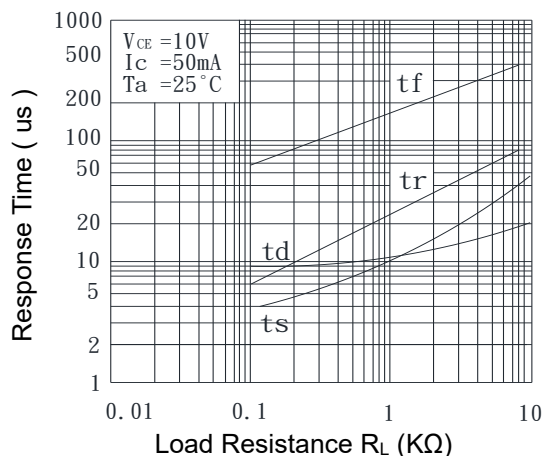
**Fig.8 Collector-Emitter Saturation
Voltage vs. Forward Current**



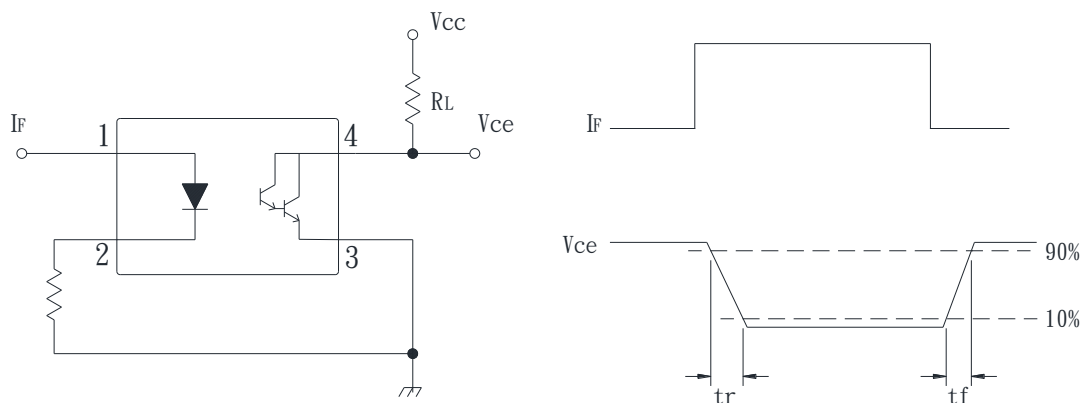
**Fig.9 Collector-Emitter Saturation
Voltage vs. Ambient Temperature**



**Fig.10 Response Time
vs. Load Resistance**



● Test Circuit for Response Time

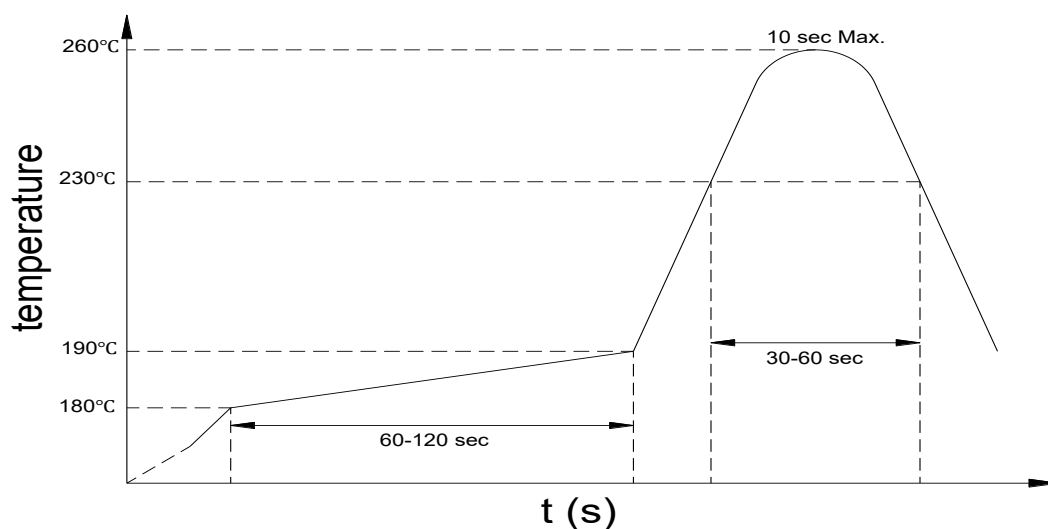


● Recommended Soldering Conditions

(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

KPC815 X Y (Z)

Notes:

KPC815 = Part No.

X = Lead form option (0,S,H,L)

Y = CTR rank (E)

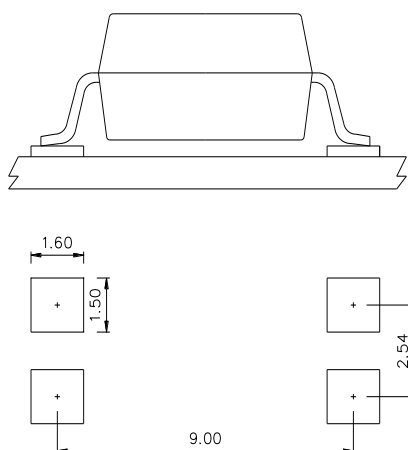
Z = Tape and reel option (TLD, TRU)

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

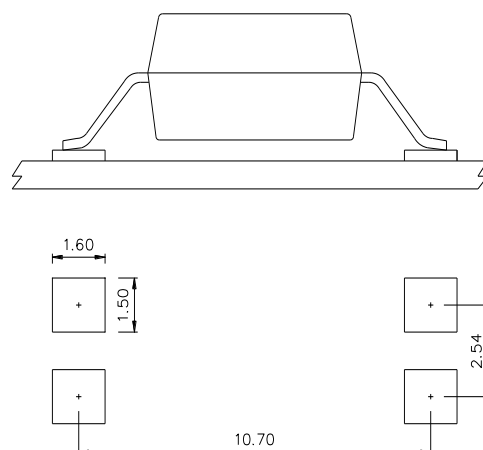
1.Surface mount type.

4 pin SMD



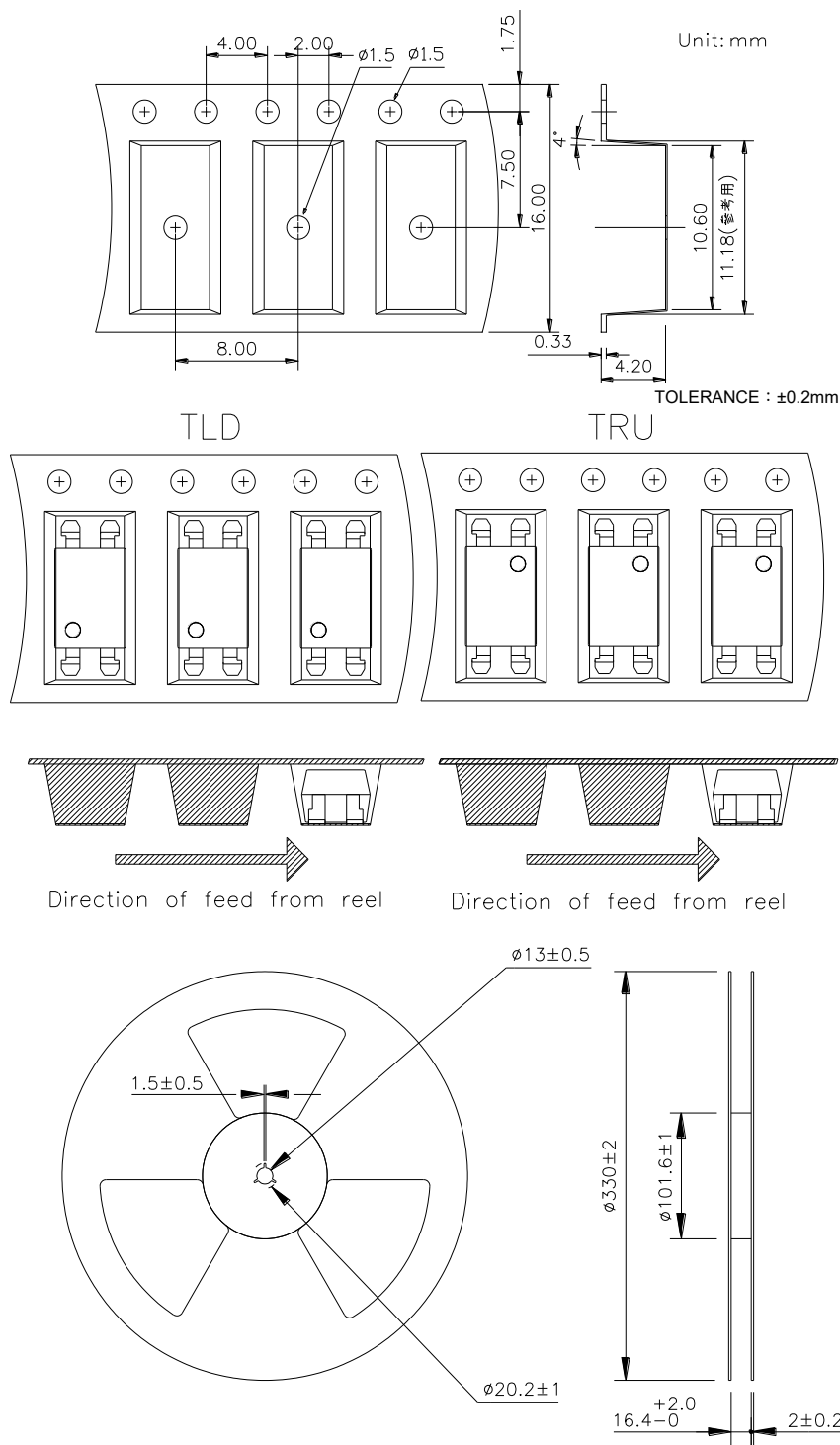
2.Long creepage distance for surface mount type.

4 pin L

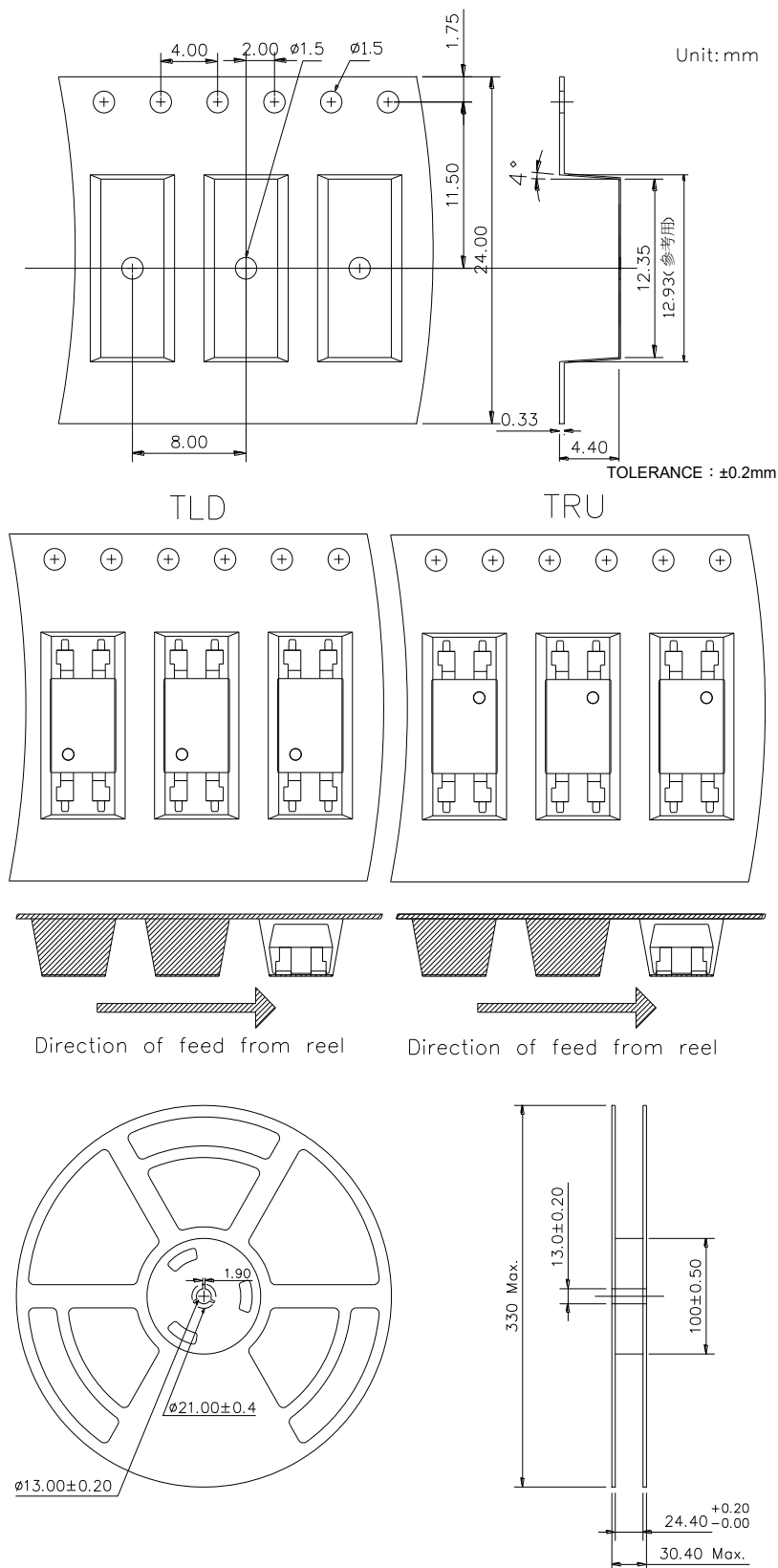


Unit : mm

● 4-pin SMD Carrier Tape & Reel



● 4-pin L Carrier Tape & Reel



● Application Notice

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