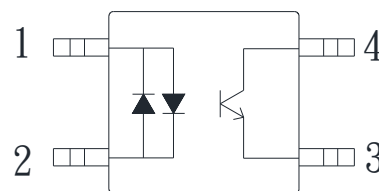


● Description

The KPC354 series of devices each consist of two infrared emitting diodes, connected in inverse parallel, optically coupled to a phototransistor detector. They are packaged in a 4-pin Mini-Flat package. The input-output Isolation voltage is rated at 3750 Vrms..

● Schematic



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

● Features

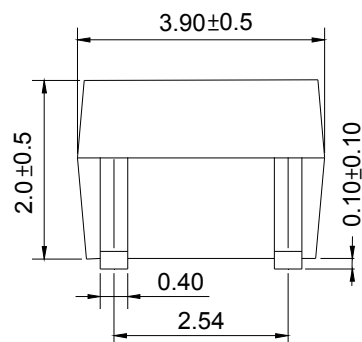
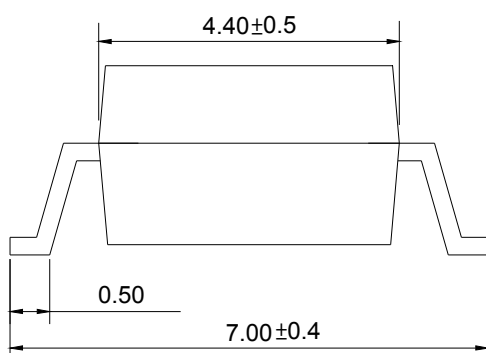
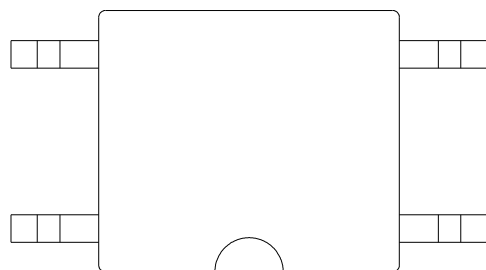
- 1. Halogen free
- 2. Pb free and RoHS compliant
- 3. AC input
- 4. Mini-flat package: compact 4 pin SOP with a 2.0mm profile
- 5. Subminiature type (The volume is smaller than that of our conventional DIP type by as far as 30%)
- 6. Isolation voltage between input and output (Viso : 3750vrms).
- 7. MSL class 1
- 8. Agency Approvals:
 - UL Approved (No. E169586): UL1577
 - c-UL Approved (No. E169586)
 - VDE Approved (No. 40014684): DIN EN 60747-5-5
 - FIMKO Approved: EN60065, EN60950
 - CQC Approved: GB8898-2011, GB4943.1-2011

● Applications

- Hybrid substrates that require high density mounting
- Programmable controllers

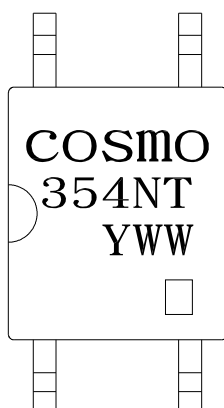
● Outside Dimension

Unit : mm



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

● Device Marking



Notes:

Cosmo

354NT

YWW

Y: Year code / WW: Week code



□: CTR rank

● Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	± 50	mA
	Peak forward current	I_{FM}	± 1	A
	Power dissipation	P_D	70	mW
Output	Collector-Emitter voltage	V_{CEO}	80	V
	Emitter-Collector voltage	V_{ECO}	5	V
	Collector current	I_C	50	mA
	Collector power dissipation	P_C	150	mW
Total power dissipation		P_{tot}	170	mW
Isolation voltage 1 minute		V_{iso}	3750	Vrms
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

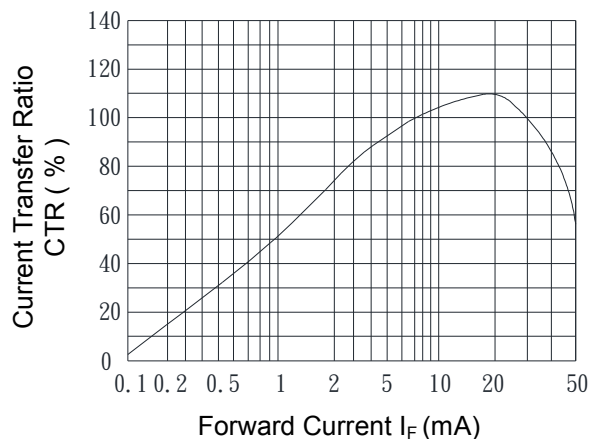
(Ta=25°C)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V_F	$I_F = \pm 20\text{mA}$	-	1.2	1.4	V
	Terminal capacitance	C_t	$V=0, f=1\text{KHz}$	-	30	250	pF
Output	Collector dark current	I_{CEO}	$V_{CE}=20\text{V}, I_F=0$	-	-	0.1	uA
	Collector-Emitter breakdown voltage	BV_{CEO}	$I_C=100\text{uA}, I_F=0$	80	-	-	V
	Emitter-Collector breakdown voltage	BV_{ECO}	$I_E=100\text{uA}, I_F=0$	5	-	-	V
Transfer characteristics	Current transfer ratio	CTR	$I_F = \pm 1\text{mA}, V_{CE}=5\text{V}$	20	-	400	%
	Collector-Emitter saturation voltage	$V_{CE(sat)}$	$I_F = \pm 20\text{mA}, I_C=1\text{mA}$	-	0.1	0.3	V
	Isolation resistance	Riso	DC500V 40 to 60%RH	5×10^{10}	10^{11}	-	Ω
	Floating capacitance	C_f	$V=0, f=1\text{MHz}$	-	0.6	1.0	pF
	Response time (Rise)	t_r	$V_{ce}=2\text{V}, I_C=2\text{mA}, R_L=100\Omega$	-	4	18	us
	Response time (Fall)	t_f		-	3	18	us

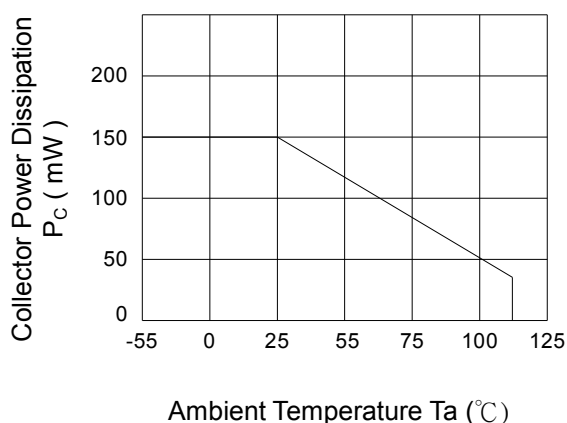
Classification table of current transfer ratio is shown below.

CTR Rank.	CTR (%)
KPC354NT0A	50 TO 150
KPC354NT0B	20 TO 400

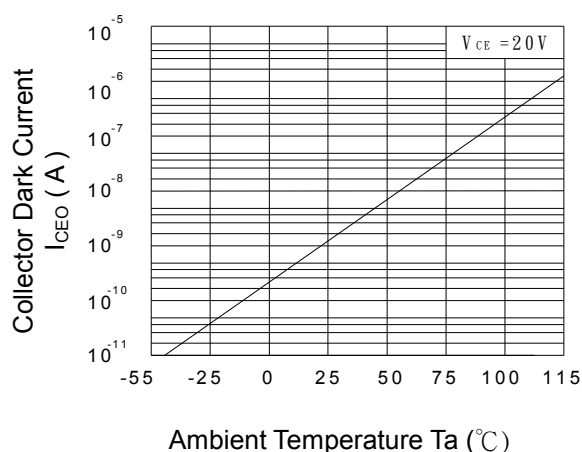
**Fig.1 Current Transfer Ratio
vs. Forward Current**



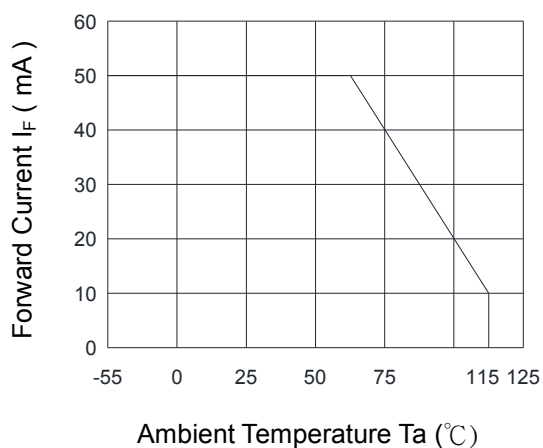
**Fig.2 Collector Power Dissipation
vs. Ambient Temperature**



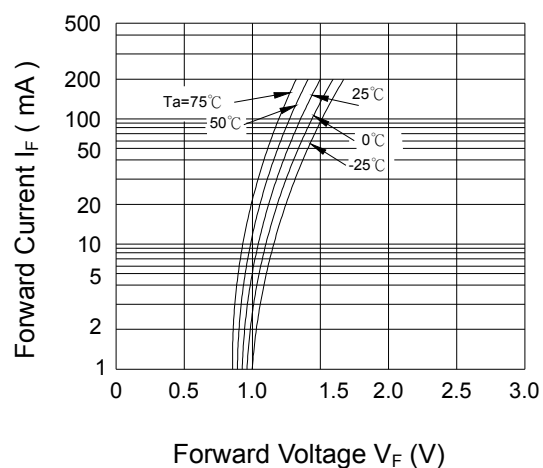
**Fig.3 Collector Dark Current
vs. Ambient Temperature**



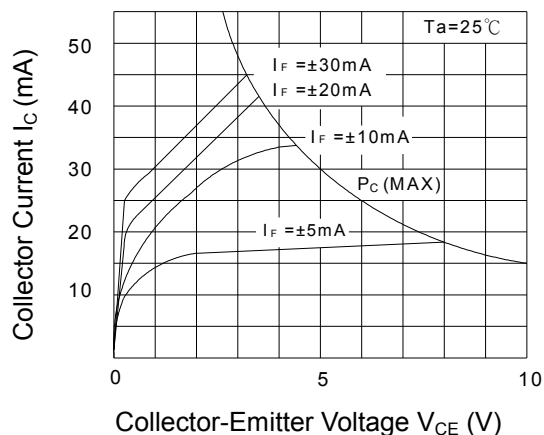
**Fig.4 Forward Current
vs. Ambient Temperature**



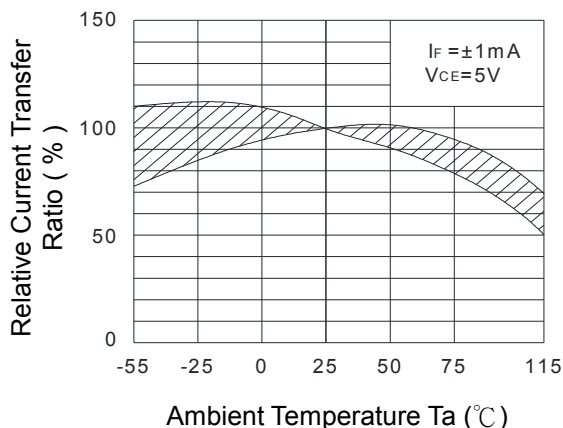
**Fig.5 Forward Current
vs. Forward Voltage**



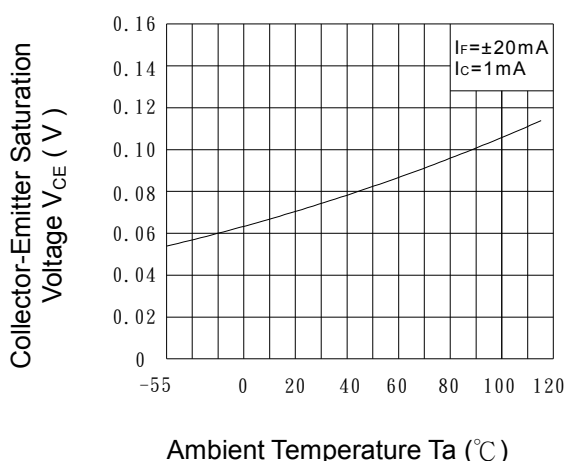
**Fig.6 Collector Current
vs. Collector-Emitter Voltage**



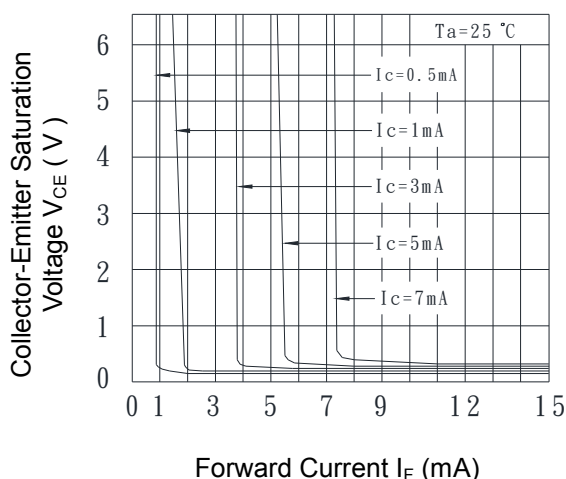
**Fig.7 Relative Current Transfer Ratio
vs. Ambient Temperature**



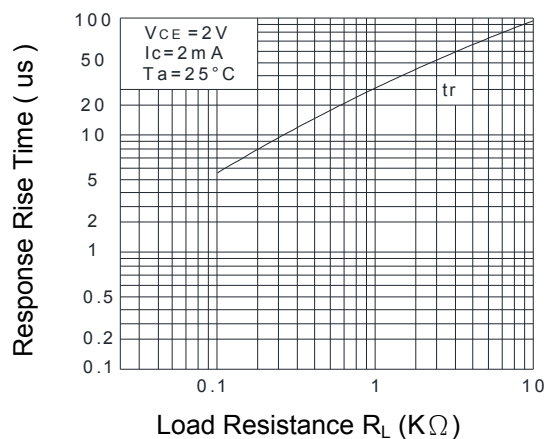
**Fig.8 Collector-Emitter Saturation Voltage
vs. Ambient Temperature**



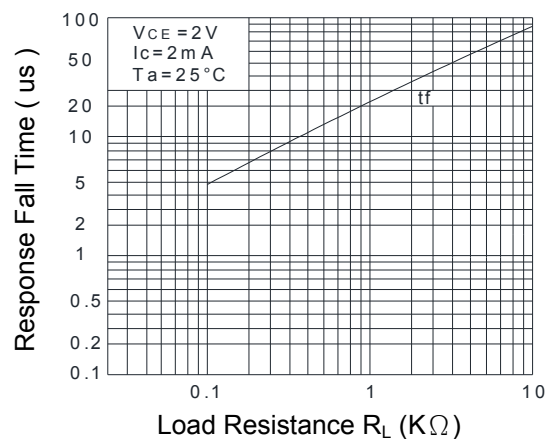
**Fig.9 Collector-Emitter Saturation
Voltage vs. Forward Current**



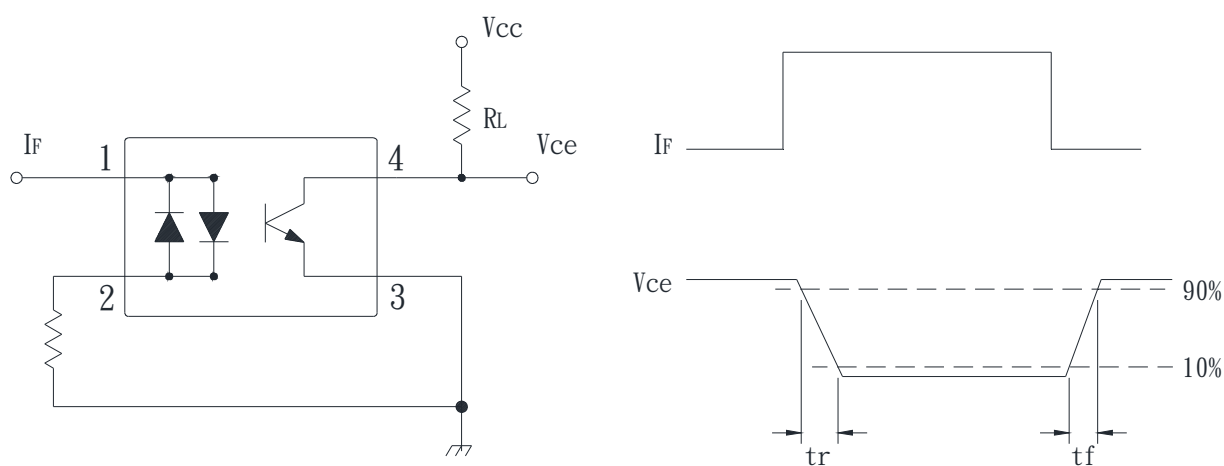
**Fig.10 Response Time (Rise)
vs. Load Resistance**



**Fig.11 Response Time (Fall)
vs. Load Resistance**



● **Test Circuit for Response Time**

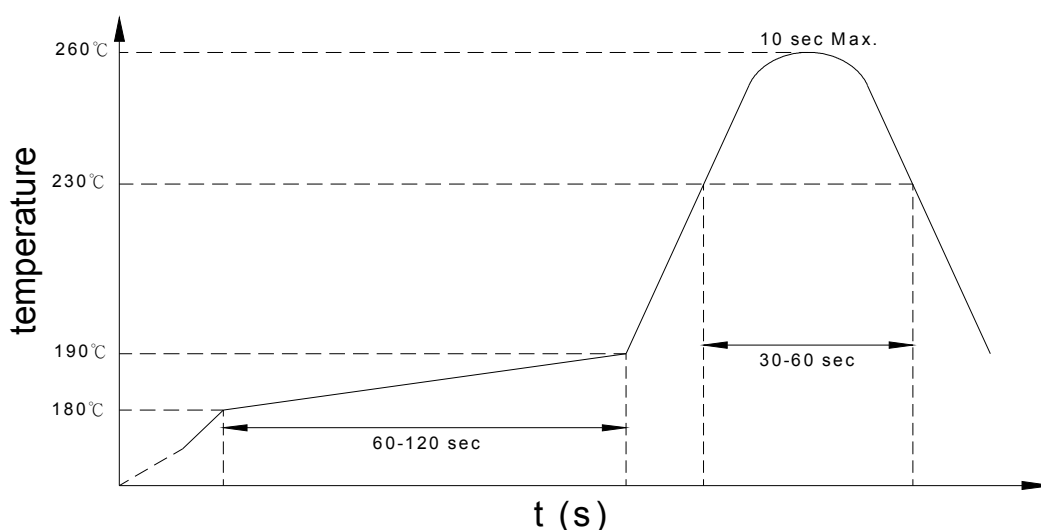


● Recommended Soldering Conditions

(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

KPC354NT Y (Z)

Notes:

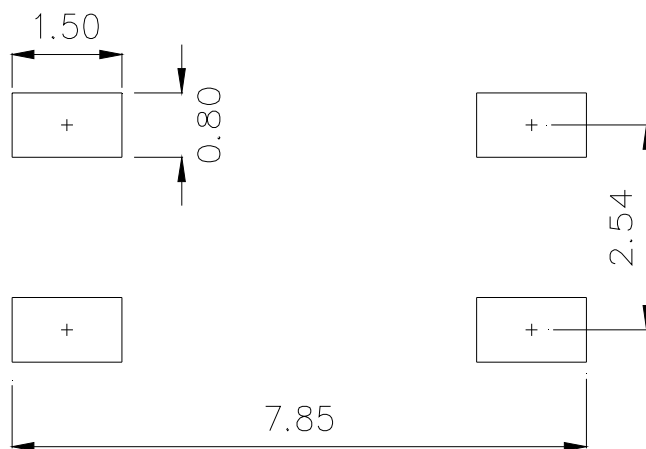
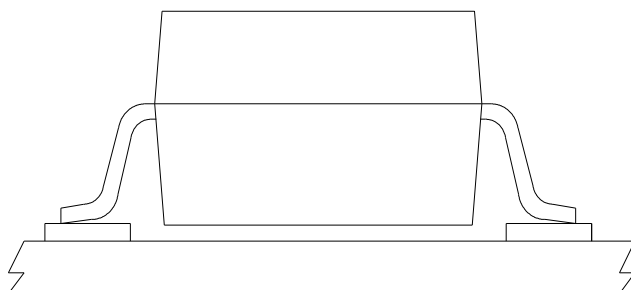
KPC354NT = Part No.

Y = CTR rank option (A 、 B)

Z = Tape and reel option (TLD 、 TRU)

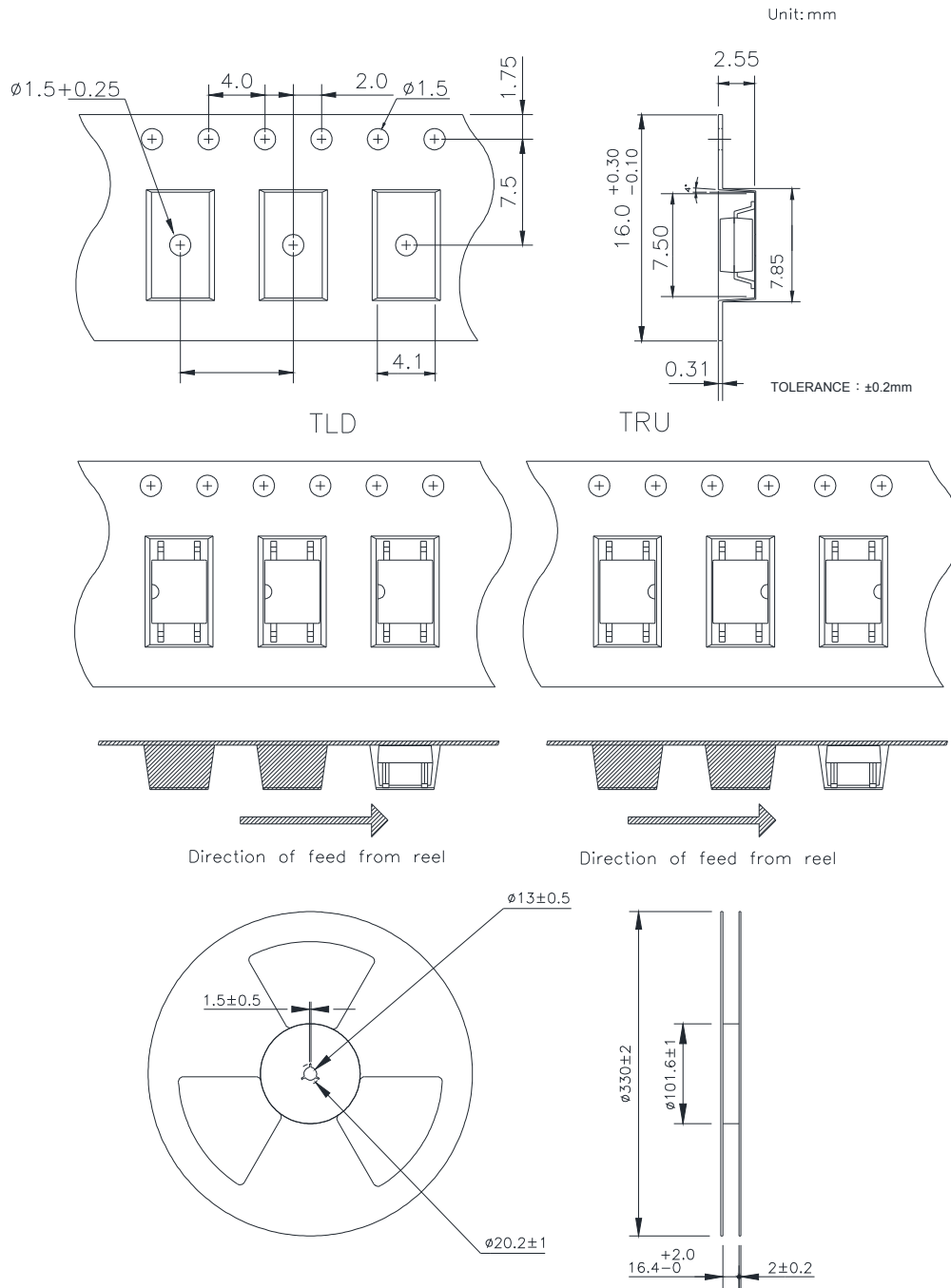
Option	Description	Packing quantity
TLD	TLD tape & reel option	3000 units per reel
TRU	TRU tape & reel option	3000 units per reel

● Recommended Pad Layout for Surface Mount Lead Form



Unit : mm

● 4-pin Mini-Flat Carrier Tape & Reel



● Application Notice

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- d. Instrumentation
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- h. Telecommunication

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- b. Space application
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- d. Nuclear power control
- e. Equipment used for automotive vehicles, trains, ships...etc.

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