KPC354NT Series

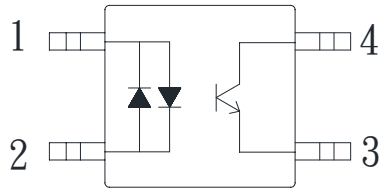
4PIN MINI-FLAT PHOTOTRANSISTOR PHOTOCOUPLER

cosmo

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

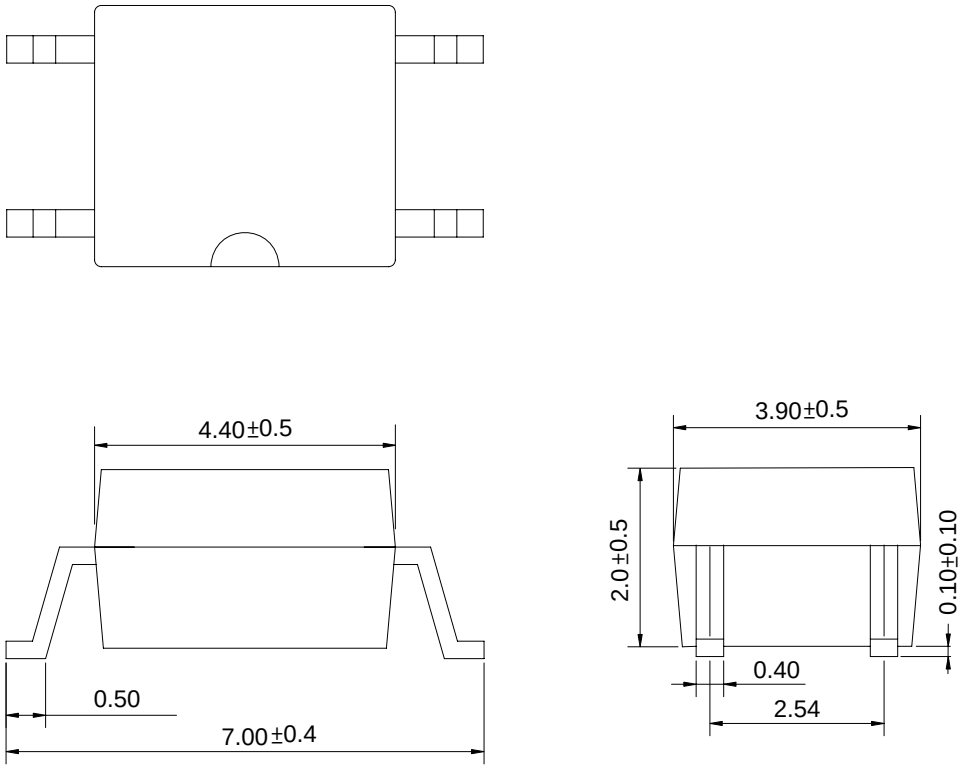
1. Pb free and RoHS compliant
2. AC input
3. Mini-flat package: compact 4 pin SOP with a 2.0mm profile
4. Subminiature type (The volume is smaller than that of our conventional DIP type by as far as 30%)
5. Isolation voltage between input and output (Viso : 3750vrms).
6. MSL class 1
7. Agency Approvals:
   - 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

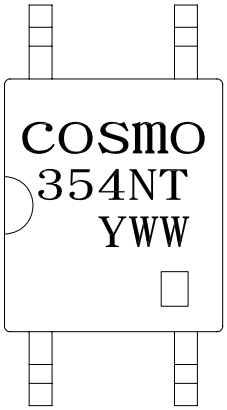
Outside Dimension

Unit : mm



TOLERANCE : ±0.2mm

Device Marking



Notes:

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354NT
YWW Y: Year code / WW: Week code
□ □:CTR rank

Absolute Maximum Ratings

(Ta=25℃)

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		Ptot	170	mW
Isolation voltage 1 minute		Viso	3750	Vrms
Operating temperature		Topr	-55 to +115	℃
Storage temperature		Tstg	-55 to +125	℃
Soldering temperature 10 seconds		Tsol	260	℃

Electro-optical Characteristics

(Ta=25℃)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V_F	I_F=±20mA	-	1.2	1.4	V
	Terminal capacitance	Ct	V=0, f=1KH$_Z$	-	30	250	pF
Output	Collector dark current	I_{CEO}	V_{CE}=20V, I_F=0	-	-	0.1	uA
	Collector-Emitter breakdown voltage	BV_{CEO}	Ic=100uA, I_F=0	80	-	-	V
	Emitter-Collector breakdown voltage	BV_{ECO}	I_E=100uA, I_F=0	5	-	-	V
Transfer charac-teristics	Current transfer ratio	CTR	I_F=±1mA, V_{CE}=5V	20	-	400	%
	Collector-Emitter saturation voltage	V_{CE}(sat)	I_F=±20mA, Ic=1mA	-	0.1	0.3	V
	Isolation resistance	Riso	DC500V 40 to 60%RH	5x10^{10}	10^{11}	-	Ω
	Floating capacitance	Cf	V=0, f=1MH$_Z$	-	0.6	1.0	pF
	Response time (Rise)	tr	Vce=2V,Ic=2mA,R_L=100Ω	-	4	18	us
	Response time (Fall)	tf		-	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

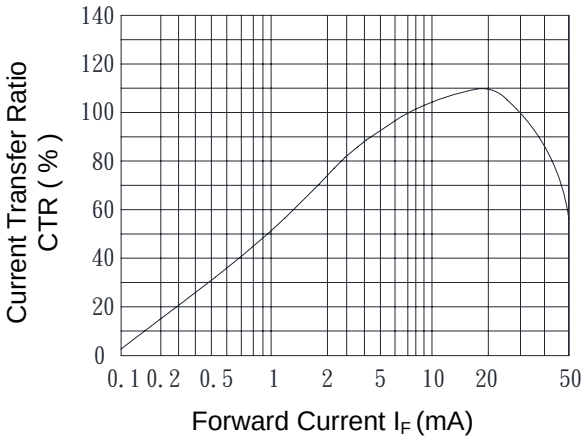


Fig.2 Collector Power Dissipation vs. Ambient Temperature

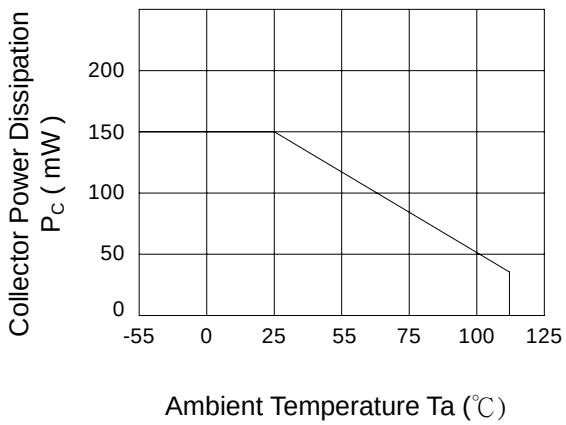


Fig.3 Collector Dark Current vs. Ambient Temperature

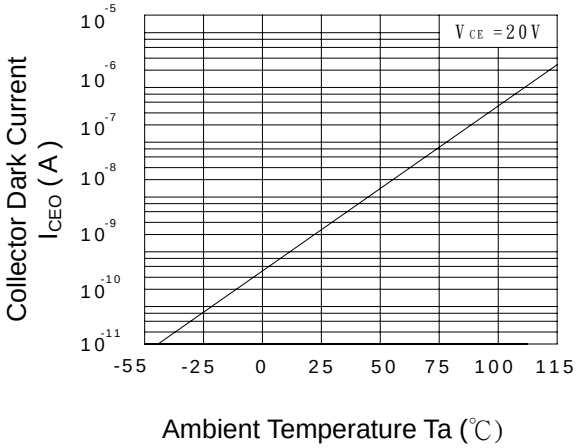


Fig.4 Forward Current vs. Ambient Temperature

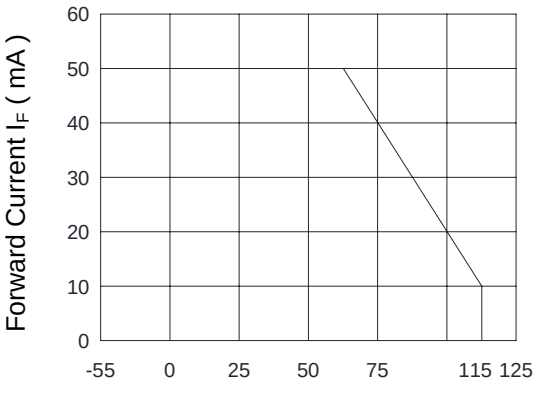


Fig.5 Forward Current vs. Forward Voltage

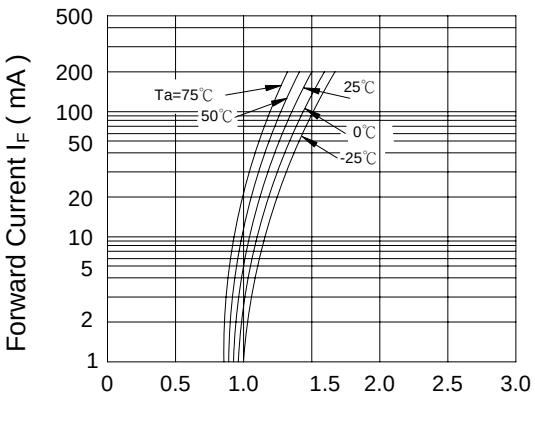


Fig.6 Collector Current vs. Collector-Emitter Voltage

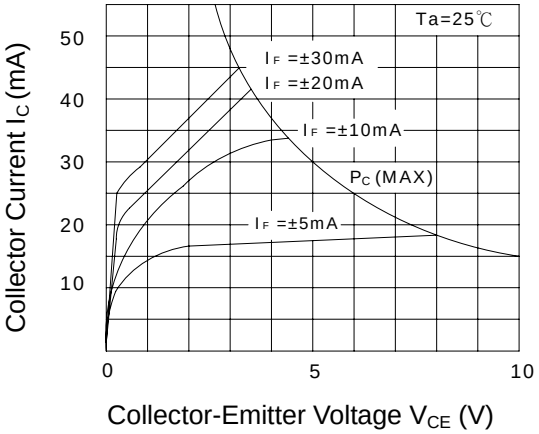


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

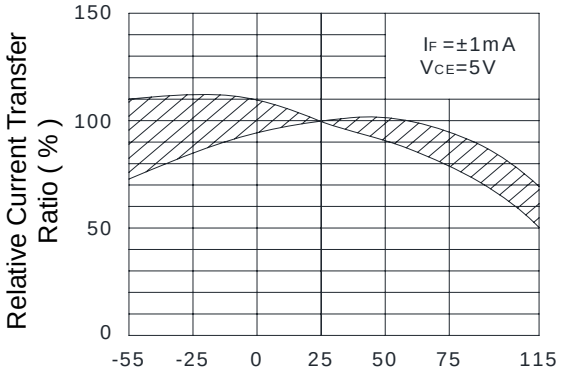


Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature

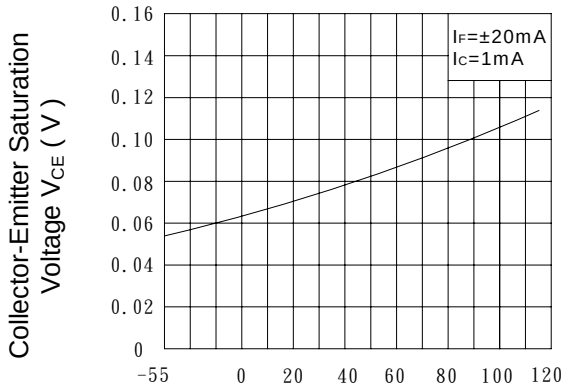


Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current

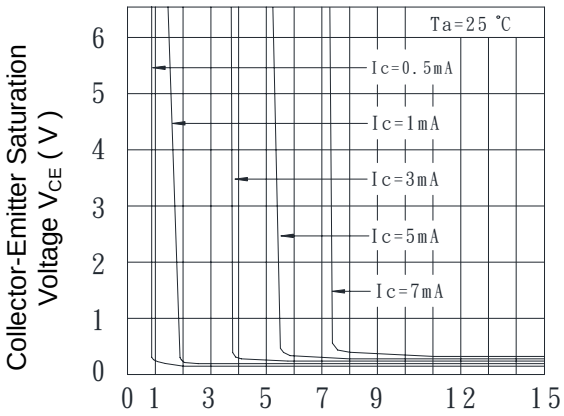


Fig.10 Response Time (Rise) vs. Load Resistance

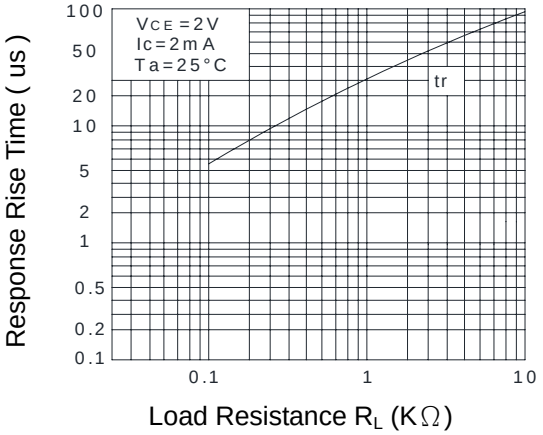
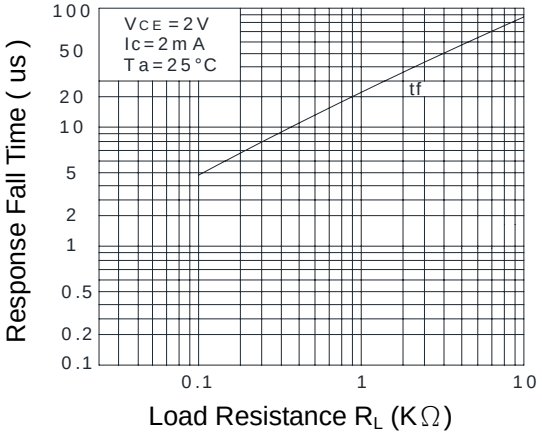
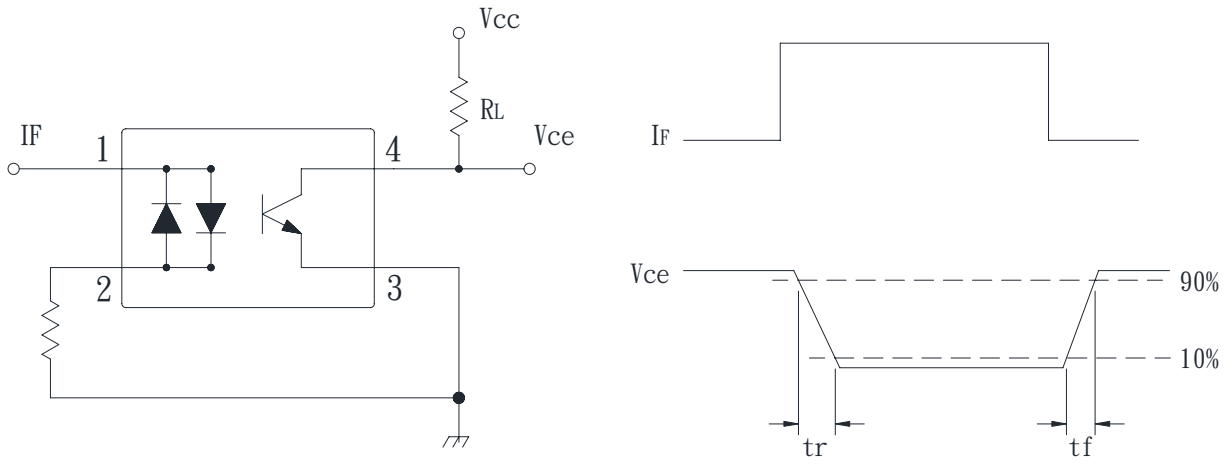


Fig.11 Response Time (Fall) vs. Load Resistance



- **Test Circuit for Response Time**

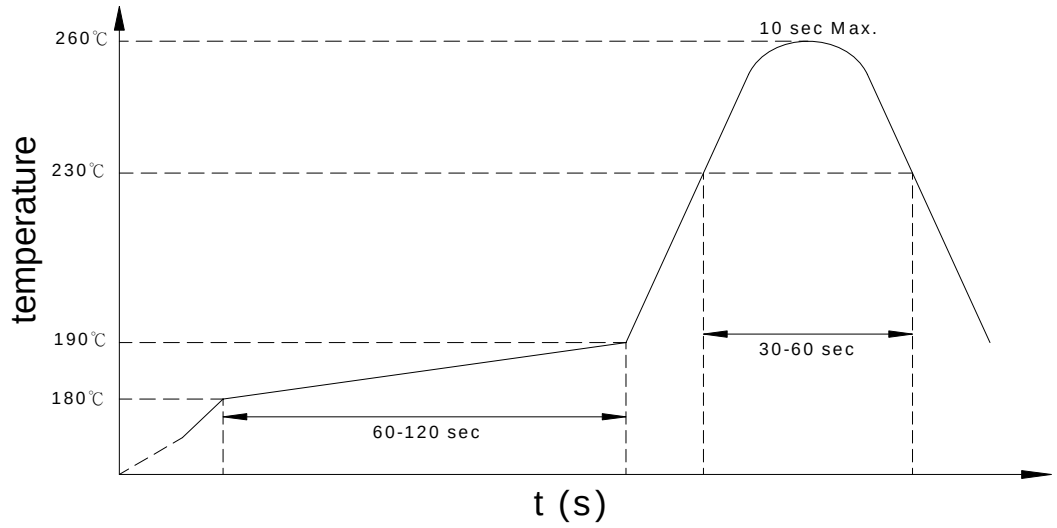


Recommended Soldering Conditions

(a) Infrared reflow soldering：

- Peak reflow soldering： 260℃ 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.

- **Numbering System**

KPC354NT Y (Z)

Notes:

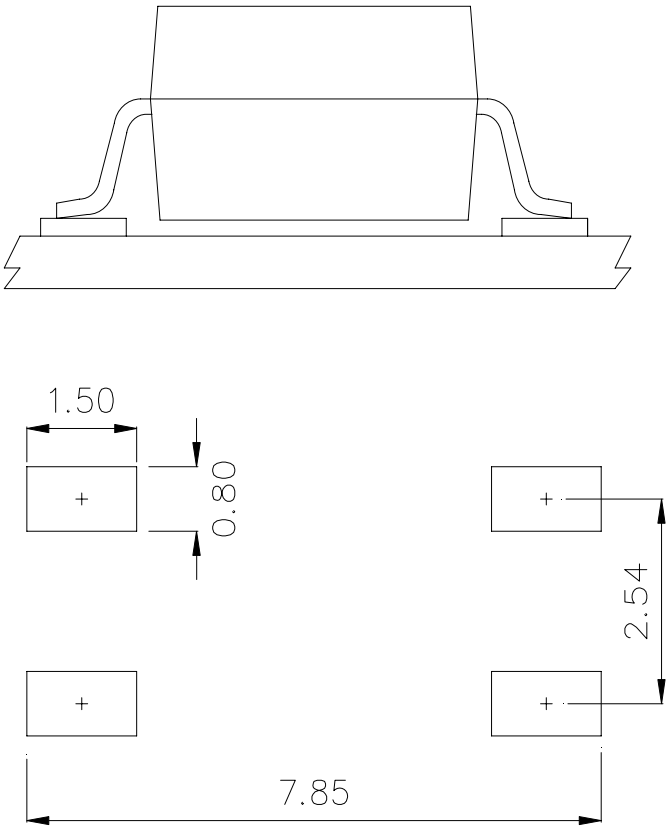
KPC354NT = Part No.

Y = CTR rank option (A、B)

Z = Tape and reel option (TLD、TRU)

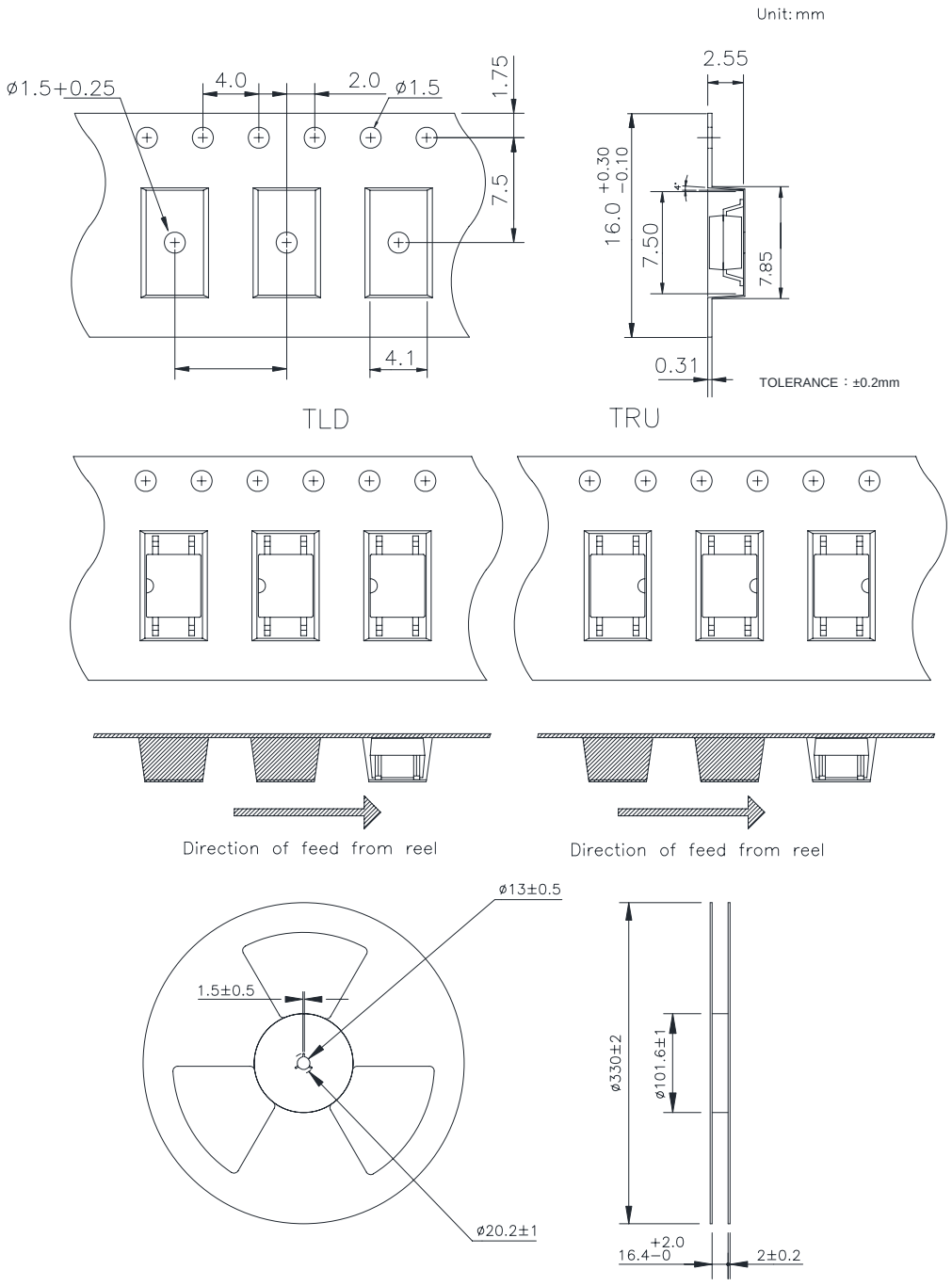
Option	Description	Packing quantity
TLD	TLD tape & reel option	3000 units per reel
TRU	TRU tape & reel option	3000 units per reel

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



Unit : mm

● 4-pin Mini-Flat Carrier Tape & Reel



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