

● Description

The KPC357 is DC-input single channel which contains a light emitting diode optically coupled to a phototransistor. It is packaged in a 4-pin Mini-Flat package. The input-output isolation voltage is rated at 3750 Vrms.

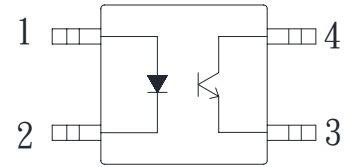
● Features

1. Pb free and RoHS compliant
2. Mini-flat package: compact 4 pin SOP with a 2.0mm profile
3. Current transfer ratio
(CTR : Min.50% at $I_F=5\text{mA}$ $V_{ce}=5\text{V}$)
4. Isolation voltage between input and output
(Viso : 3750vrms).
5. MSL class 1
6. 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
- DC-DC converters
- Telecommunication equipments

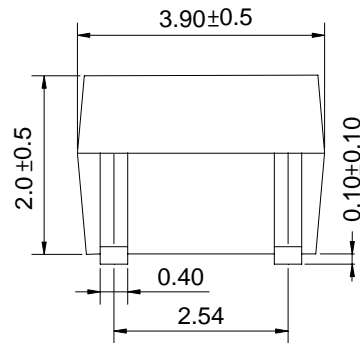
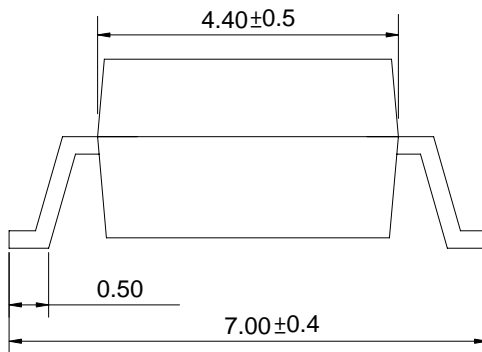
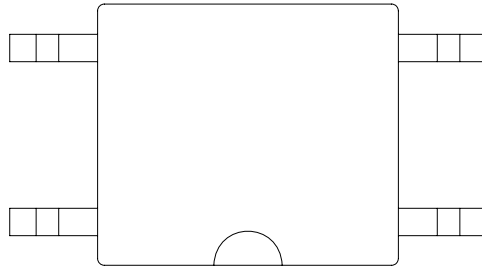
● Schematic



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

● **Outside Dimension**

Unit : mm



TOLERANCE : ±0.2mm

● **Device Marking**



Notes:

Cosmo
357NT
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
	Reverse voltage	V_R	6	V
	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	$I_F=20mA$	-	1.2	1.4	V
	Reverse current	I_R	$V_R=4V$	-	-	10	uA
	Terminal capacitance	C_t	$V=0, f=1KHz$	-	30	250	pF
Output	Collector dark current	I_{CEO}	$V_{CE}=20V, I_F=0$	-	-	0.1	uA
	Collector-Emitter breakdown voltage	BV_{CEO}	$I_C=100uA, I_F=0$	80	-	-	V
	Emitter-Collector breakdown voltage	BV_{ECO}	$I_E=100uA, I_F=0$	5	-	-	V
Transfer characteristics	Current transfer ratio	CTR	$I_F=5mA, V_{CE}=5V$	50	-	600	%
			$I_F=1mA, V_{CE}=5V$	15	-	-	%
	Collector-Emitter saturation voltage	$V_{CE(sat)}$	$I_F=20mA, I_C=1mA$	-	0.1	0.3	V
	Isolation resistance	Riso	DC500V, 40 to 60%RH	5×10^{10}	10^{11}	-	Ω
	Floating capacitance	C_f	$V=0, f=1MHz$	-	0.6	1.0	pF
	Response time (Rise)	tr	$V_{ce}=2V, I_C=2mA, R_L=100\Omega$	-	5	20	us
	Response time (Fall)	tf		-	4	20	us

Classification table of current transfer ratio is shown below.

CTR Rank.	CTR (%)	Marking of Classification
KPC357NT0A	80 TO 160	A
KPC357NT0B	130 TO 260	B
KPC357NT0C	200 TO 400	C
KPC357NT0D	300 TO 600	D
KPC357NT0E	50 TO 600	Blank,A,B,C,D,E

Fig.1 Current Transfer Ratio vs. Forward Current

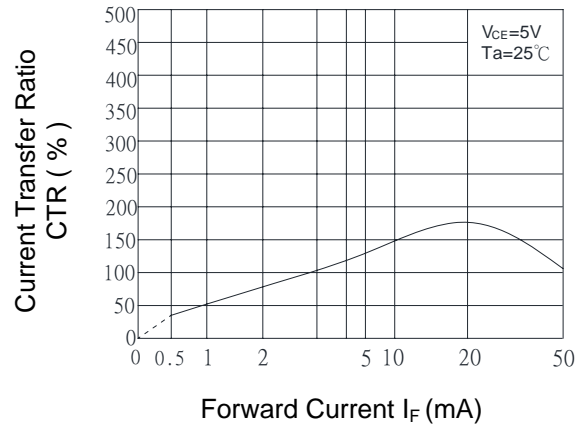


Fig.2 Collector Power Dissipation vs. Ambient Temperature

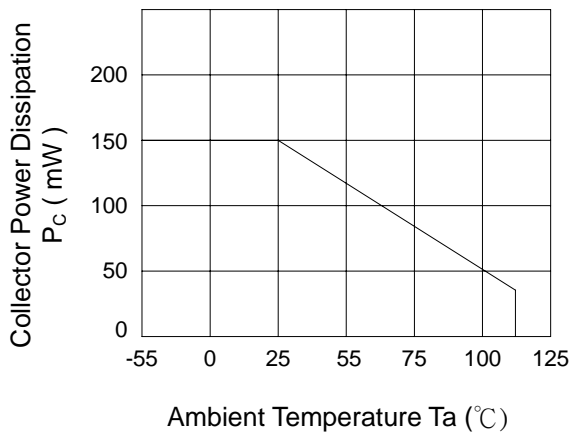


Fig.3 Collector Dark Current vs. Ambient Temperature

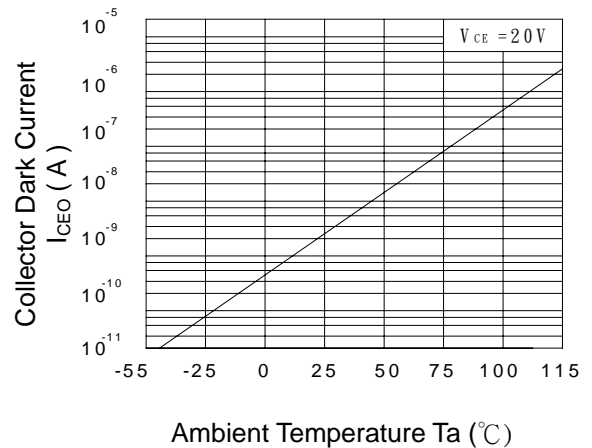


Fig.4 Forward Current vs. Ambient Temperature

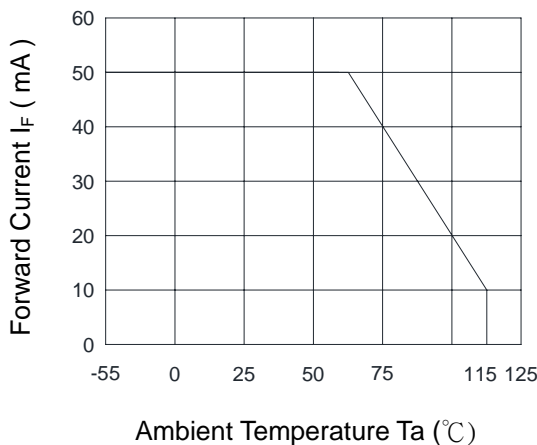


Fig.5 Forward Current vs. Forward Voltage

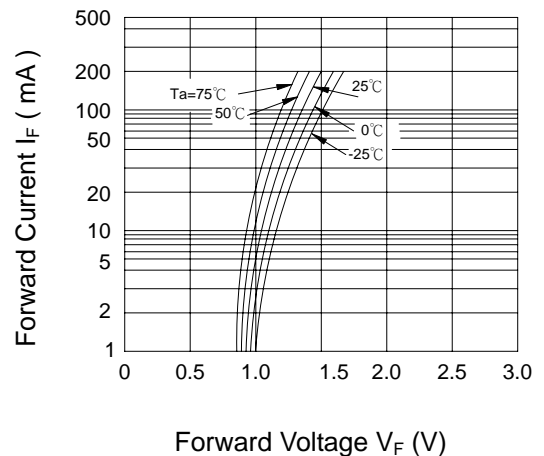


Fig.6 Collector Current vs. Collector-Emitter Voltage

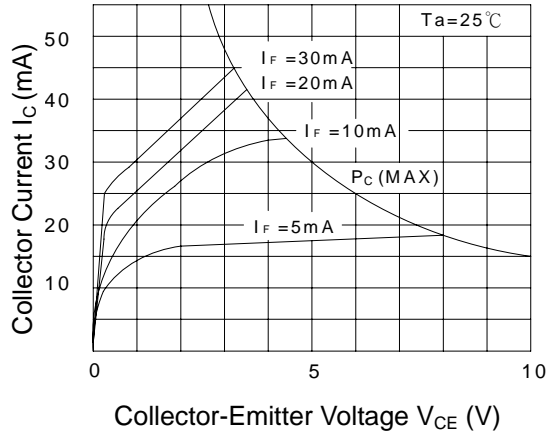


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

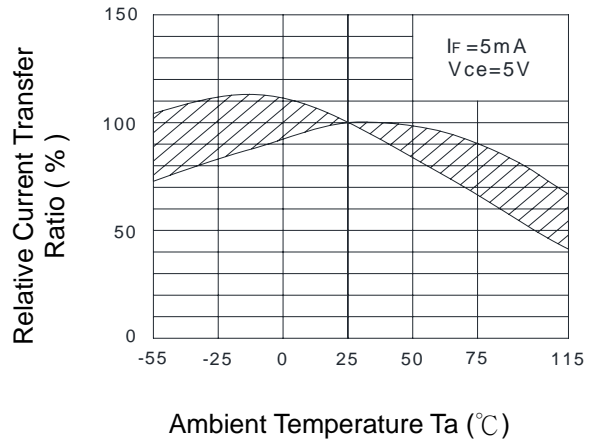


Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature

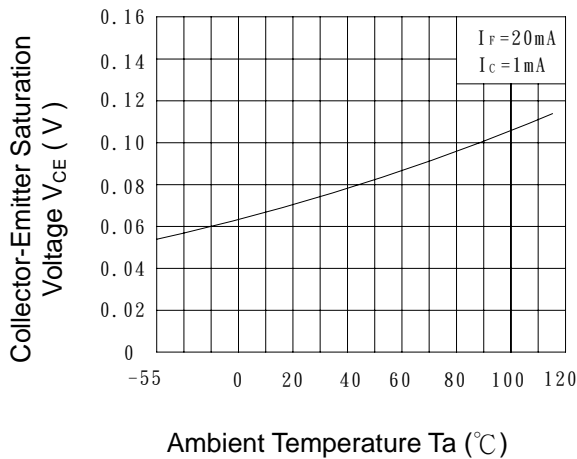


Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current

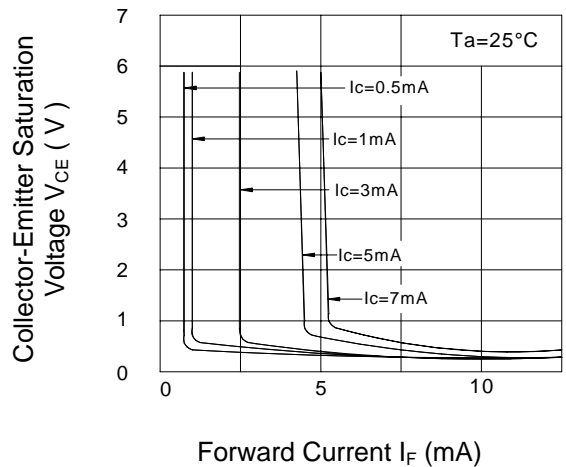


Fig.10 Response Time (Rise) vs. Load Resistance

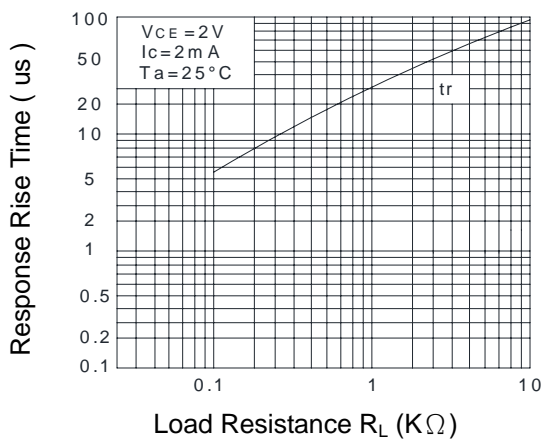
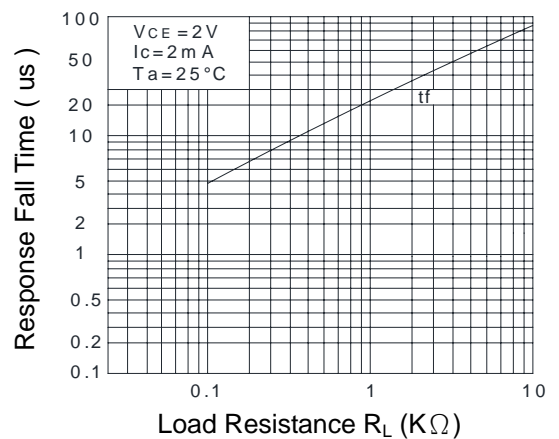
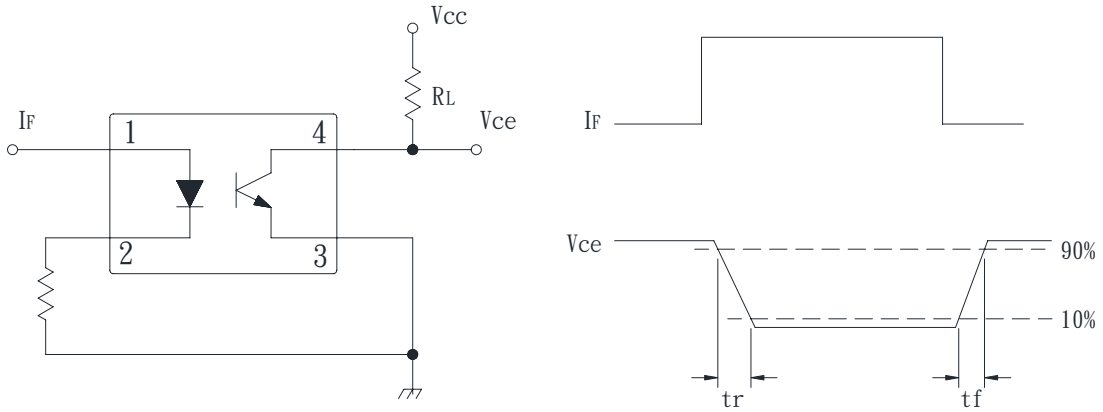


Fig.11 Response Time (Fall) vs. Load Resistance



● Test Circuit For Response Time

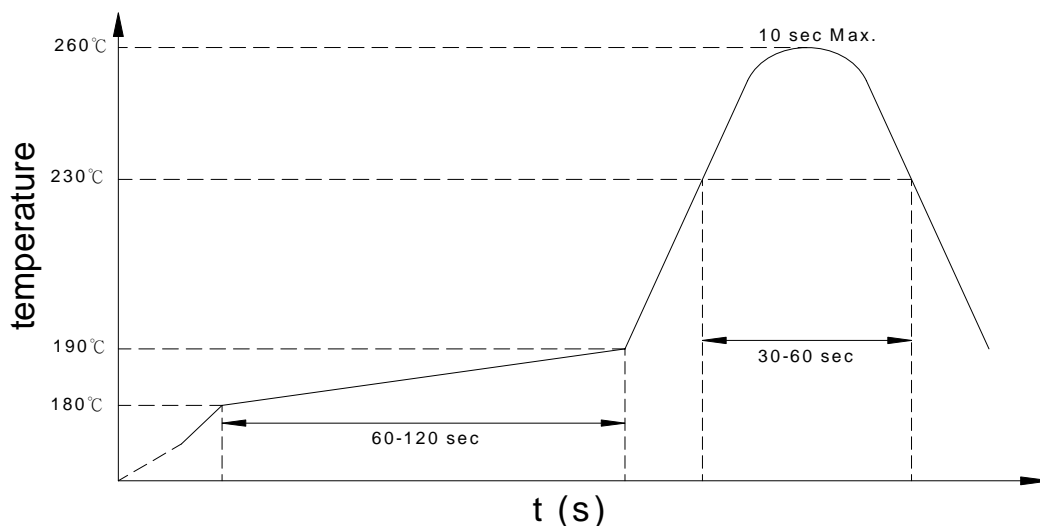


● Recommended Soldering Conditions

(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**

KPC357NT Y (Z)

Notes:

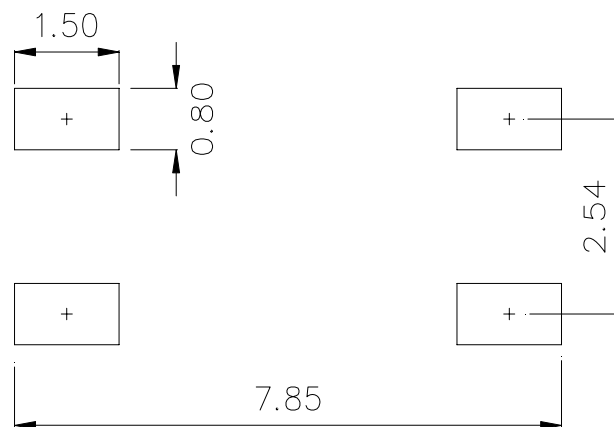
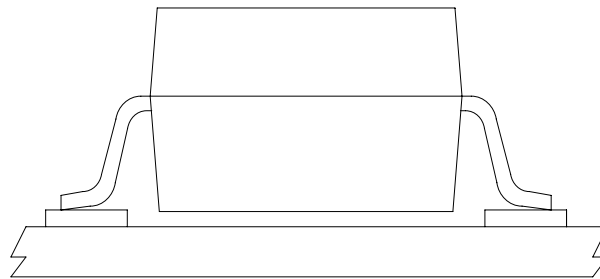
KPC357NT = Part No.

Y = CTR rank option (A ~ E)

Z = Tape and reel option (TLD、TRU)

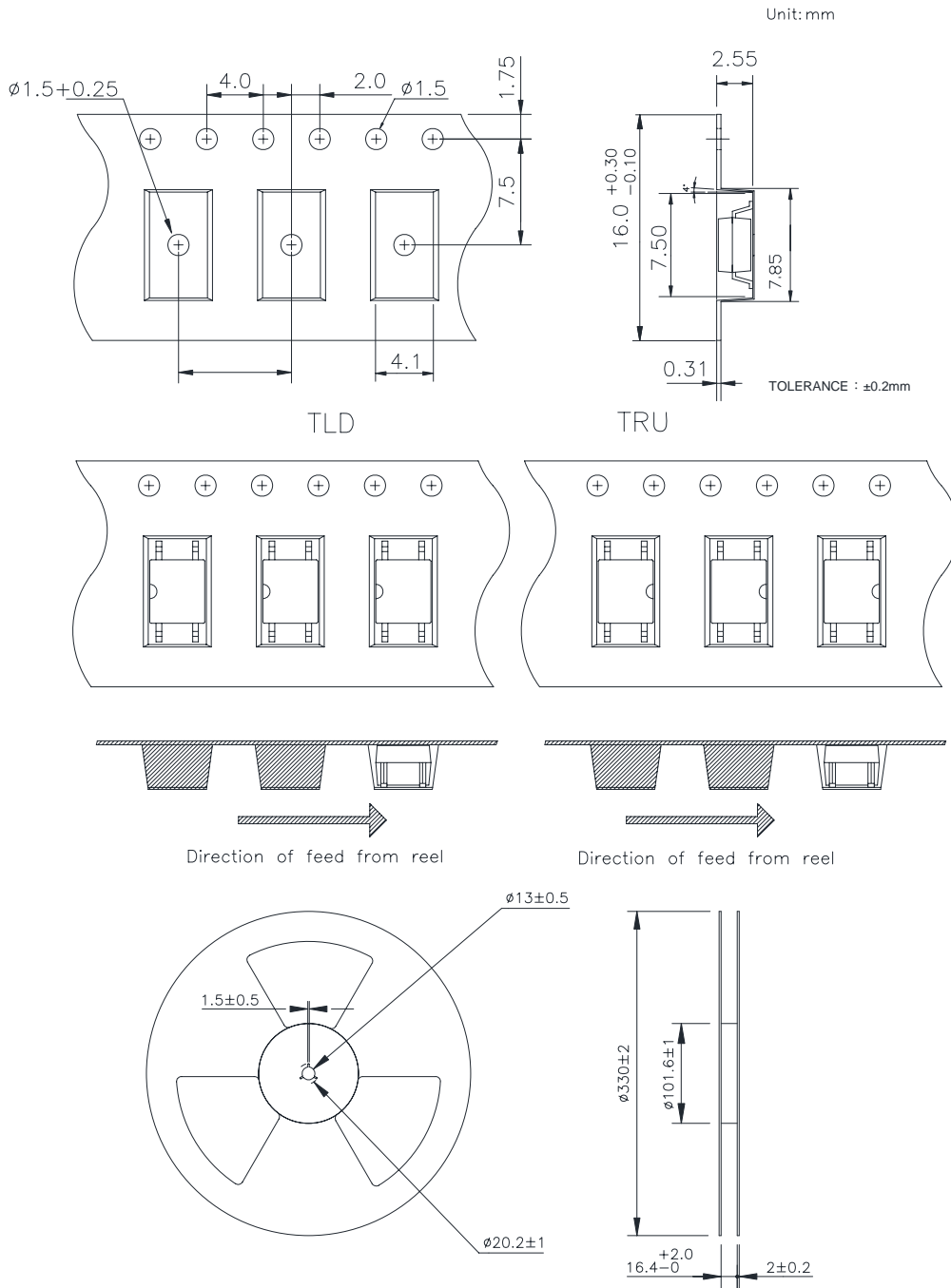
Option	Description	Packing quantity
TLD	TLD tape & reel option	3000 units per reel
TRU	TRU tape & reel option	3000 units per reel

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



Unit : mm

● 4-pin Mini-Flat Carrier Tape & Reel





KPC357NT Series

4PIN MINI-FLAT PHOTOTRANSISTOR PHOTOCOUPLER

● Application Notice

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

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