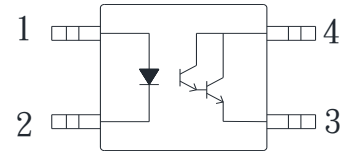


### ● Description

The KPC355NT series consist of a photodarlington optically coupled to a gallium arsenide infrared-emitting diodes in a 4-pin Mini-Flat package. The input-output isolation voltage is rated at 3750 Vrms.

### ● Schematic



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

### ● Features

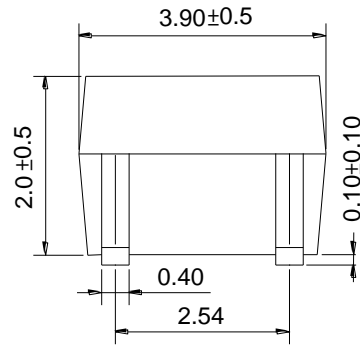
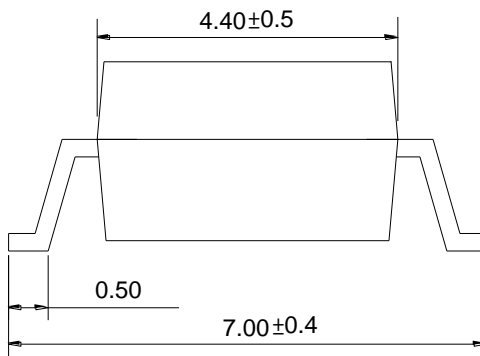
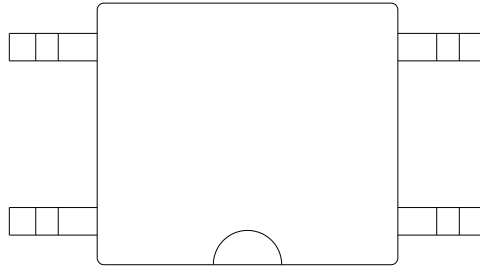
1. Pb free and RoHS compliant
2. High current transfer ratio  
(CTR : Min.600% at  $I_F = 1\text{mA}$ ,  $V_{ce} = 2\text{V}$ )
3. High isolation voltage between input and output  
(Viso : 3750Vrms)
4. Mini-flat package: compact 4 pin SOP with a 2.0mm profile
5. MSL class 1
6. Agency Approvals:
  - UL 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

- System appliances, measuring instruments
- Industrial robots
- Copiers, automatic vending machines
- Signal transmission between circuits of different potentials and impedances
- Telephone sets
- Copiers, facsimiles
- Interface with various power supply circuits, power distribution boards
- Numerical control machines

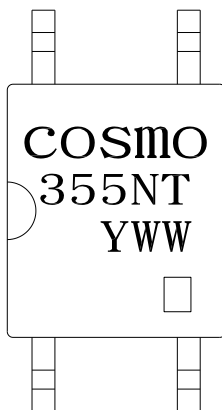
● **Outside Dimension**

Unit : mm



TOLERANCE : ±0.2mm

● **Device Marking**



**Notes:**

**Cosmo**

355NT

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	$V_{CEO}$	35	V
	Emitter-Collector voltage	$V_{ECO}$	5	V
	Collector current	$I_C$	150	mA
	Collector power dissipation	$P_C$	150	mW
Total power dissipation		$P_{tot}$	170	mW
Isolation voltage 1 minute		$V_{iso}$	3750	V <sub>rms</sub>
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**

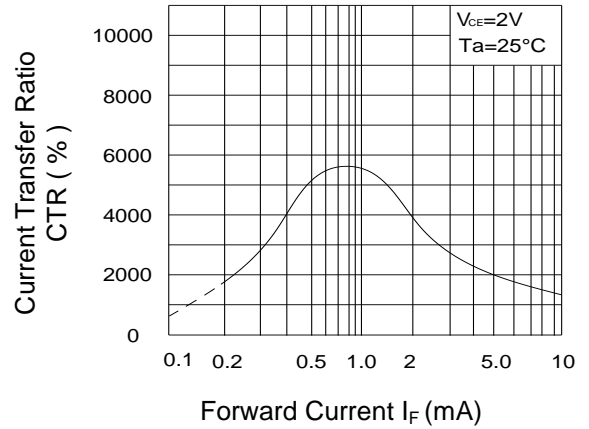
(Ta=25°C)

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	uA
	Terminal capacitance	$C_t$	$V=0, f=1KHz$	-	30	-	pF
Output	Collector dark current	$I_{CEO}$	$V_{CE}=10V, I_F=0$	-	-	1.0	uA
Transfer characteristics	Current transfer ratio	CTR	$I_F=1mA, V_{CE}=2V$	600	1600	7500	%
	Collector-Emitter saturation	$V_{CE}(sat)$	$I_F=20mA, I_C=1mA$	-	-	1.0	V
	Isolation resistance	Riso	DC500V	$5 \times 10^{10}$	-	-	Ω
	Floating capacitance	$C_f$	$V=0, f=1MHz$	-	0.6	1.0	pF
	Cut-off frequency	$f_c$	$V_{CC}=5V, I_C=2mA, R_L=100\Omega$	-	7	-	kHz
	Response time (Rise)	$t_r$	$V_{CE}=2V, I_C=2mA, R_L=100\Omega$	-	60	300	us
	Response time (Fall)	$t_f$		-	53	250	us

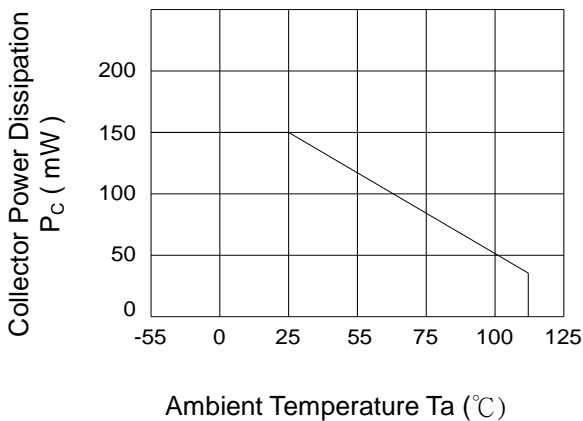
Classification table of current transfer ratio is shown below.

CTR RANK	CTR ( % )
KPC355NT0E	Min.600

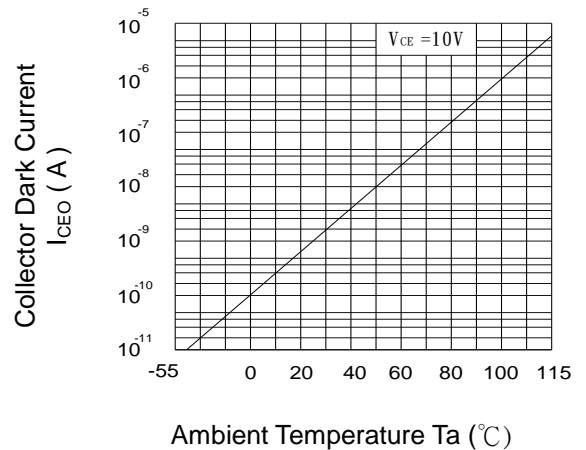
**Fig.1 Current Transfer Ratio vs. Forward Current**



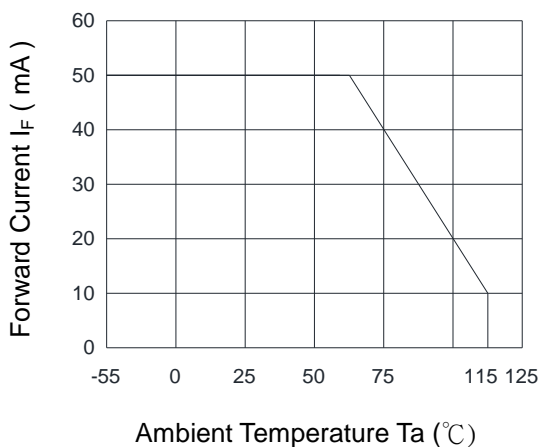
**Fig.2 Collector Power Dissipation vs. Ambient Temperature**



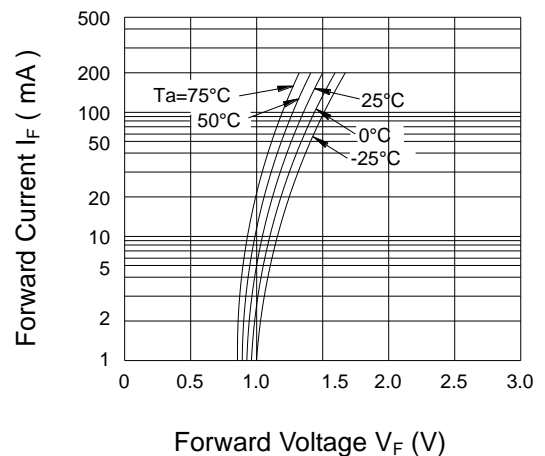
**Fig.3 Collector Dark Current vs. Ambient Temperature**



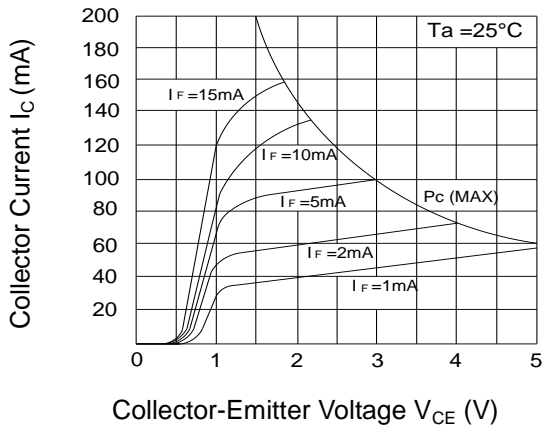
**Fig.4 Forward Current vs. Ambient Temperature**



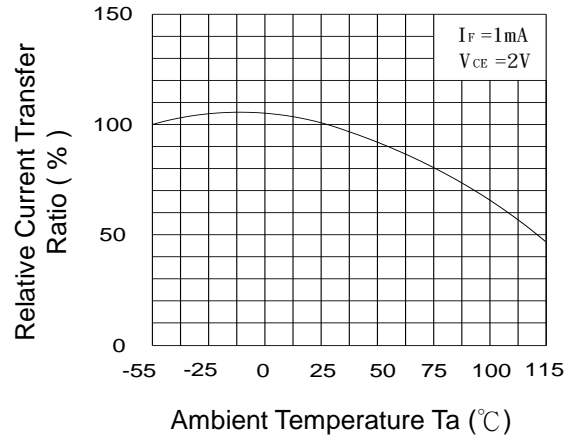
**Fig.5 Forward Current vs. Forward Voltage**



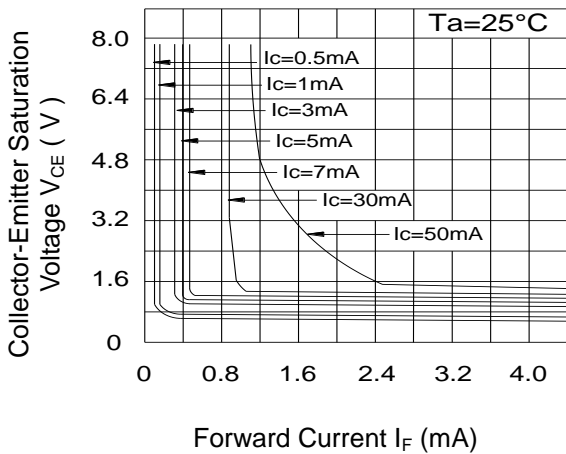
**Fig.6 Collector Current vs. Collector-Emitter Voltage**



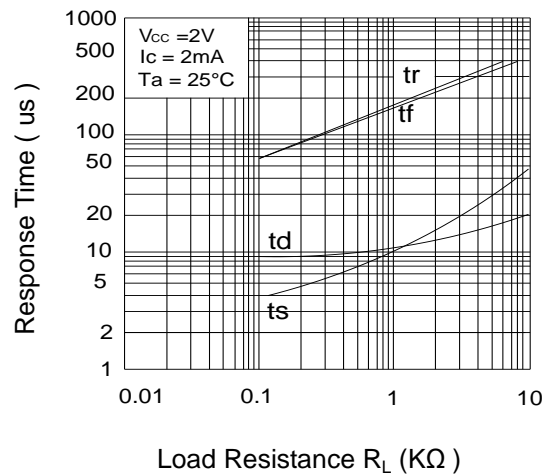
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



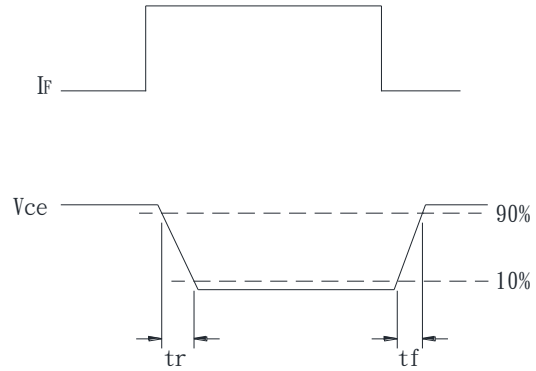
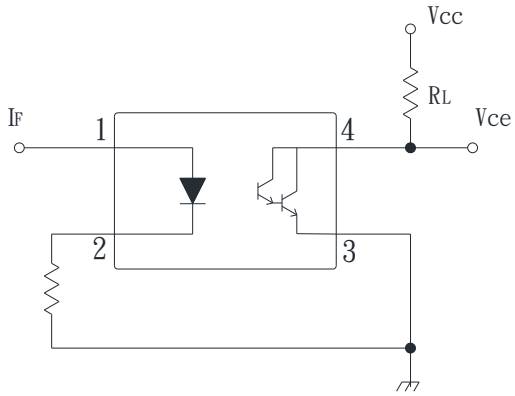
**Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current**



**Fig.9 Response Time vs. Load Resistance**



- **Test Circuit for Response Time**

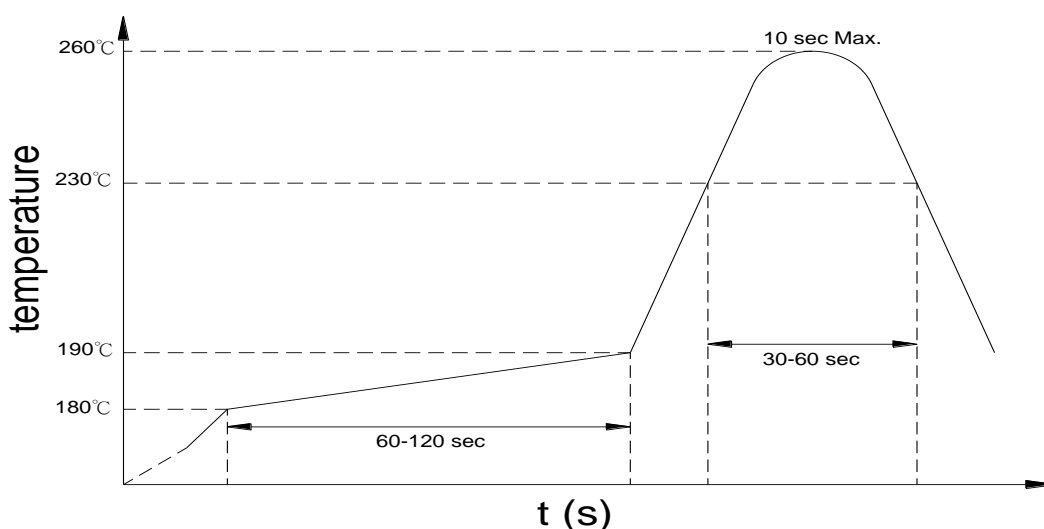


### ● Recommended Soldering Conditions

#### (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**

## KPC355NT Y (Z)

**Notes:**

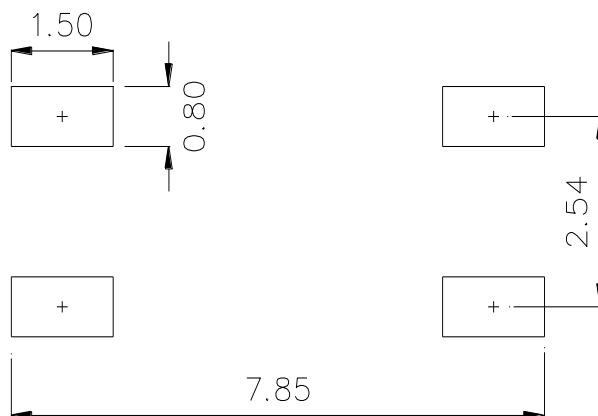
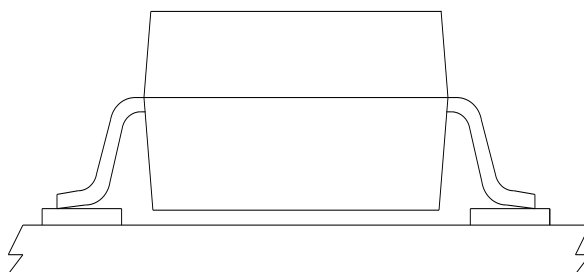
KPC355NT = Part No.

Y = CTR rank (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

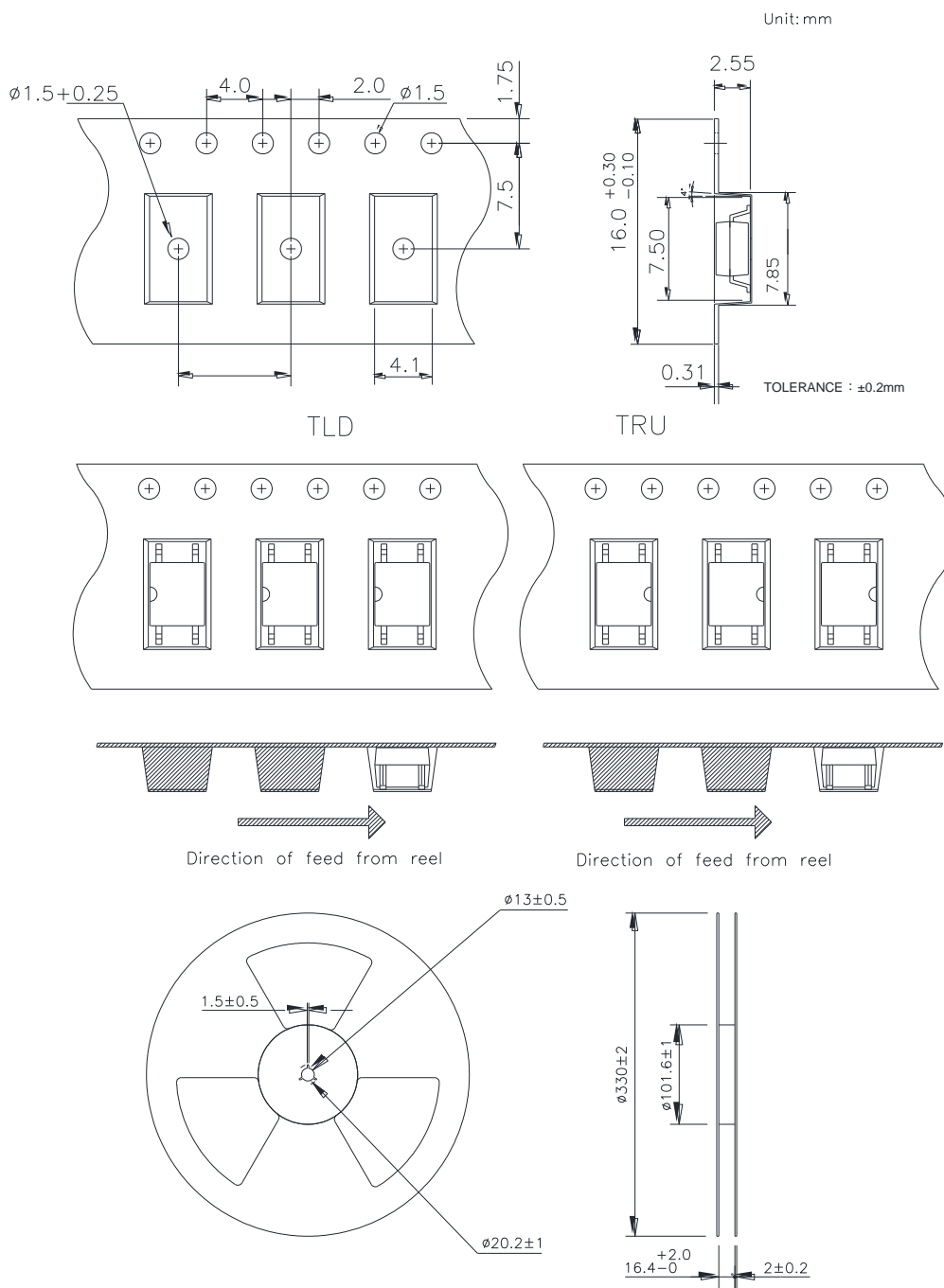
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm



- 4-pin Mini-Flat Carrier Tape & Reel





# KPC355NT Series

## 4PIN MINI-FLAT PHOTODARLINGTON PHOTOCOUPLER

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### ● Application Notice

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

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