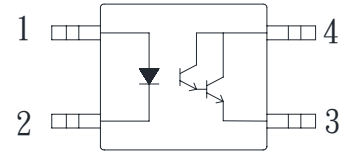


● Description

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

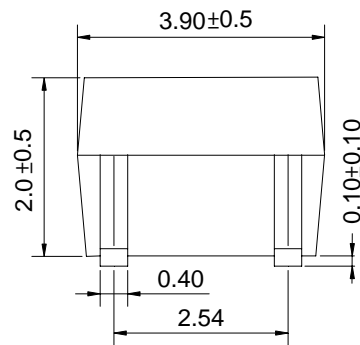
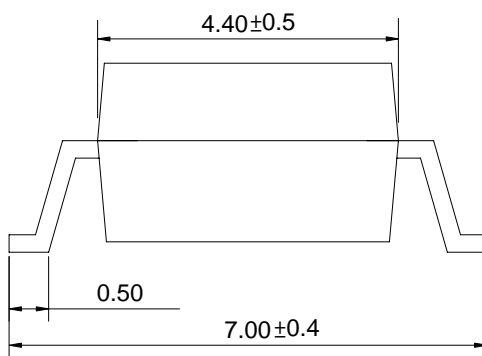
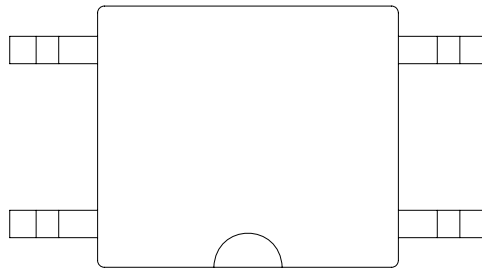
1. Halogen free
2. Pb free and RoHS compliant
3. High current transfer ratio
(CTR : Min.600% at $I_F = 1\text{mA}$, $V_{ce} = 2\text{V}$)
4. High isolation voltage between input and output
(Viso : 3750Vrms)
5. Mini-flat package: compact 4 pin SOP with a 2.0mm profile
6. Agency Approvals:
 - UL1577, File No. E169586
 - VDE EN 60747-5-2, File No.40014684
 - FIMKO EN 60065 , File No.FI 23147 A2
 - FIMKO EN 60950-1 File No.FI 24583 A2
 - CQC GB4943 / GB8898-2011, File No. CQC10001049555 / CQC08001023986

● 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

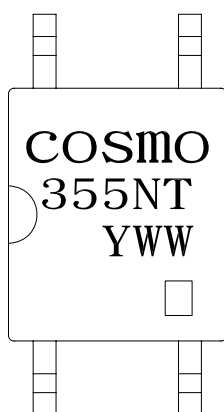
● **Outside Dimension**

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 | 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 |
| | 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 | 5×10^{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

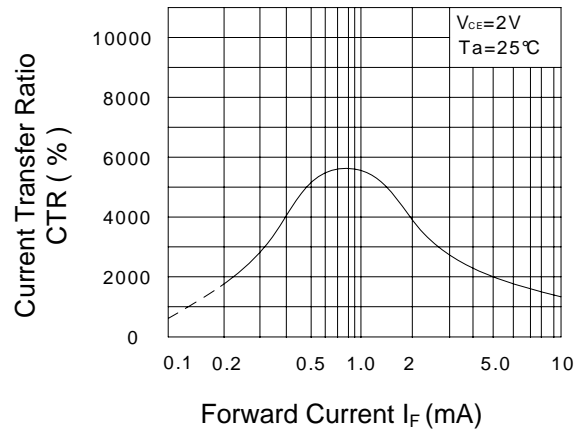


Fig.2 Collector Power Dissipation vs. Ambient Temperature

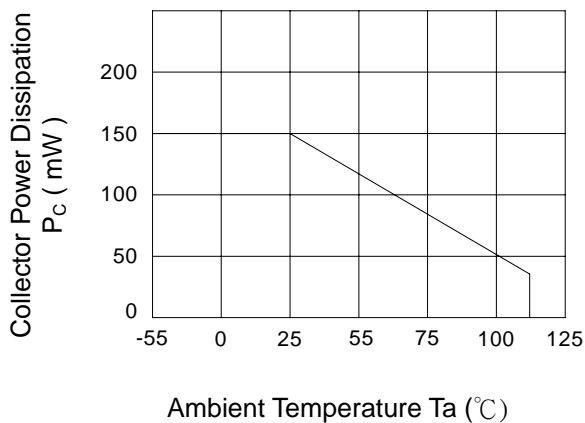


Fig.3 Collector Dark Current vs. Ambient Temperature

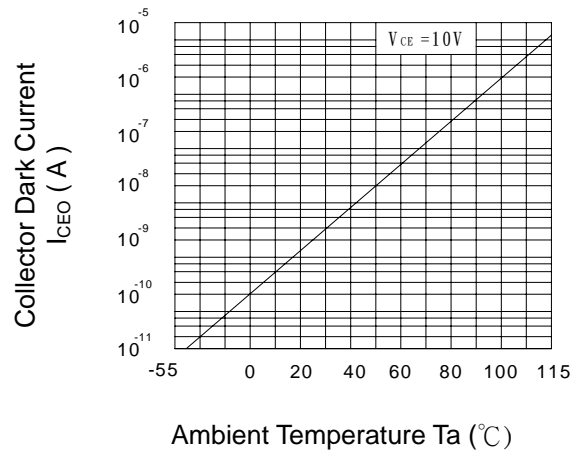


Fig.4 Forward Current vs. Ambient Temperature

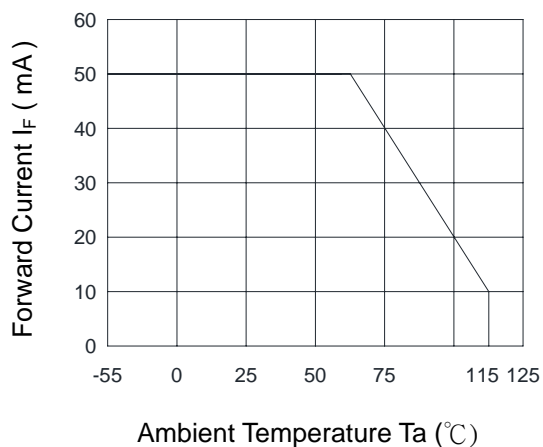


Fig.5 Forward Current vs. Forward Voltage

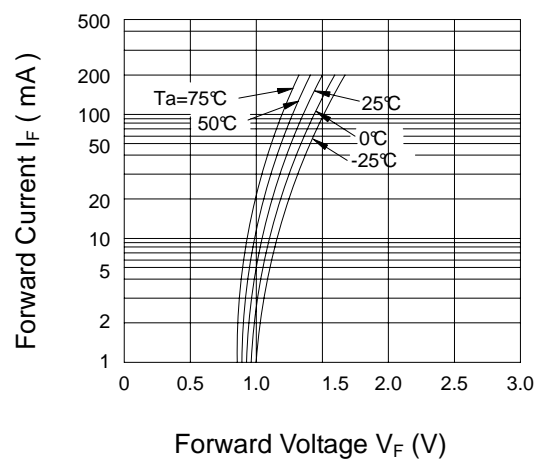


Fig.6 Collector Current vs. Collector-Emitter Voltage

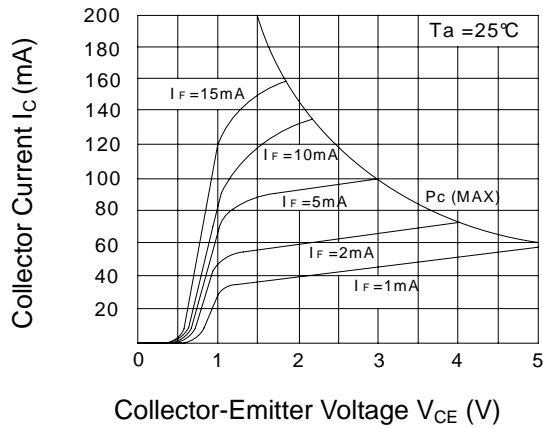


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

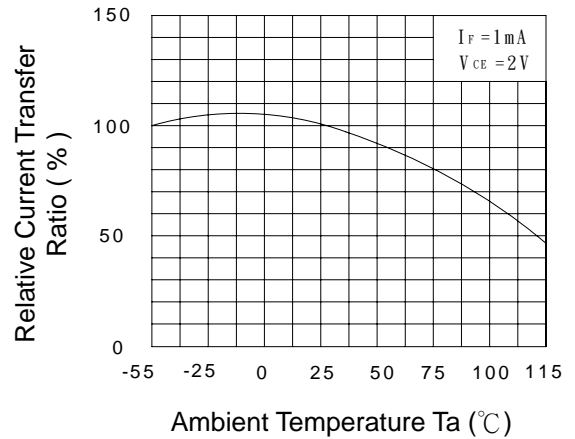


Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current

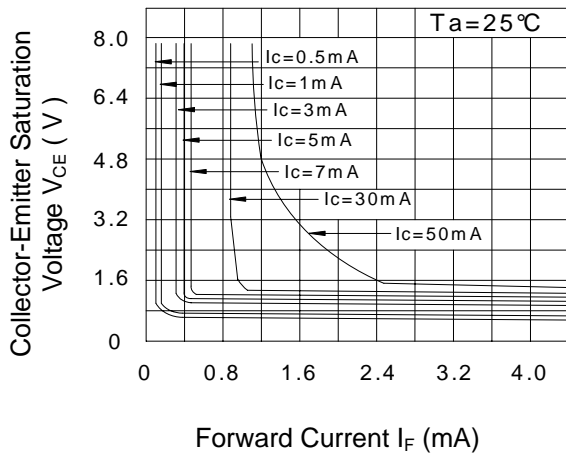
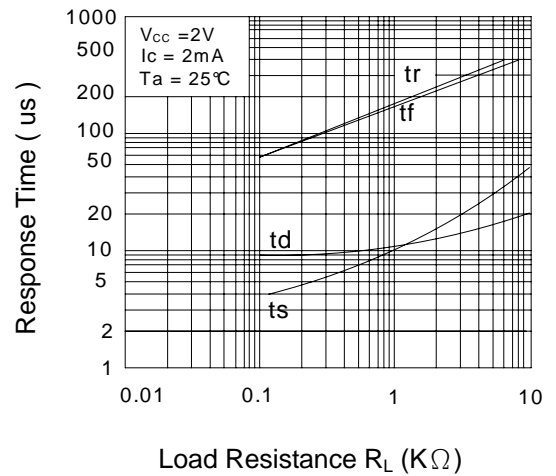
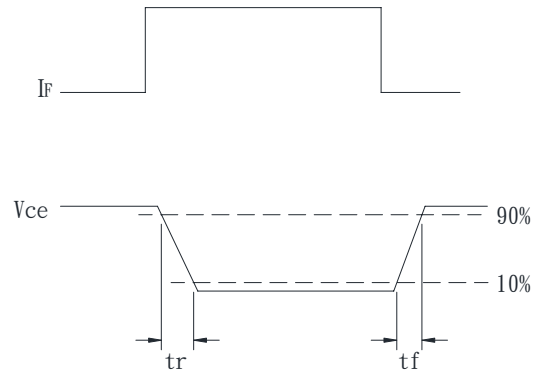
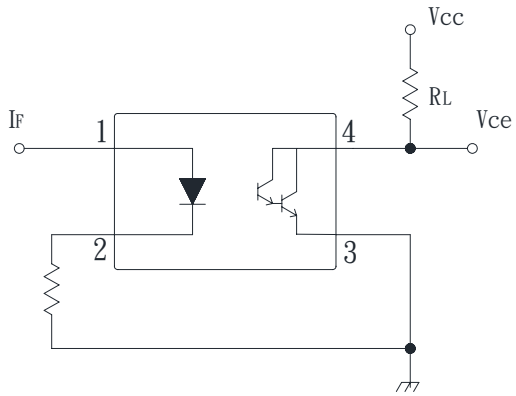


Fig.9 Response Time vs. Load Resistance



- **Test Circuit for Response Time**

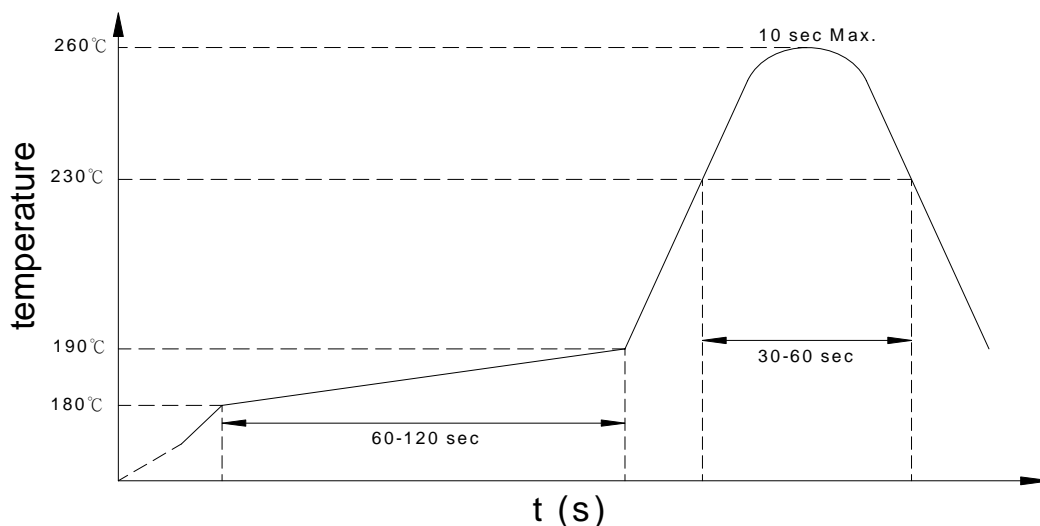


● Recommended Soldering Conditions

(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:

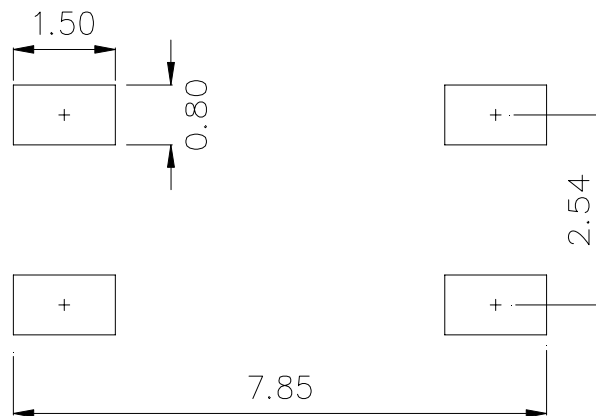
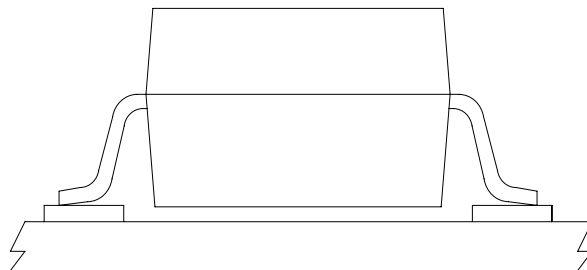
KPC355NT = Part No.

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



KPC355NT Series

4PIN MINI-FLAT PHOTODARLINGTON PHOTOCOUPLER

● Application Notice

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- d. Instrumentation
- e. Electrical application
- f. Measurement equipment
- g. Consumer electronics
- h. Telecommunication

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- b. Space application
- c. Telecommunication equipment (trunk lines)
- d. Nuclear power control
- e. Equipment used for automotive vehicles, trains, ships...etc.

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