

# PRODUCT SPECIFICATION

DATE:11/29/2012

|   |                                   |              |           |
|---|-----------------------------------|--------------|-----------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | Photocoupler :<br><b>KPC357NT</b> | NO.61P04115  | REV.<br>8 |
|   |                                   | SHEET 1 OF 7 |           |

## Mini-Flat package General purpose Photocoupler

### ● Features

1. Halogen Free.
2. Pb free and RoHS compliant.
3. Mini-flat package:  
compact 4 pin SOP with a 2.0mm profile
4. Current transfer ratio  
(CTR : MIN.50% at IF=5mA Vce=5V)
5. Isolation voltage between input and output (Viso : 3750vrms).
6. Agency Approvals
  - UL approved : No.E169586
  - VDE approved : No.40014684
  - FIMKO approved : EN 60065 No. FI 23147 A1  
EN 60950 No. FI 24583 A1
  - CQC approved : No. CQC04001010530

### ● Applications

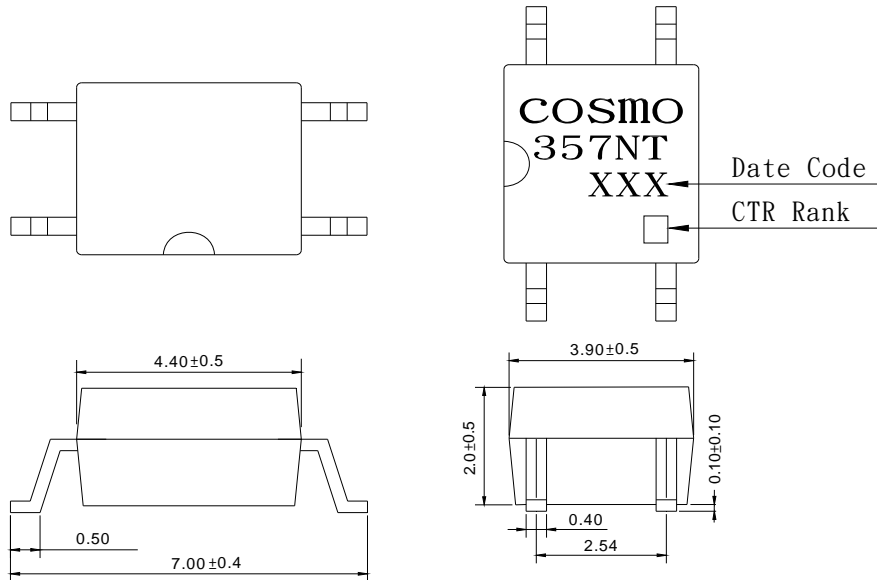
1. Hybrid substrates that require high density mounting.
2. Programmable controllers.

# PRODUCT SPECIFICATION

DATE:11/29/2012

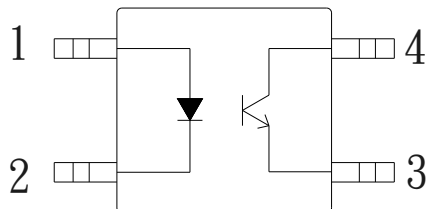
|   |                 |              |      |
|---|-----------------|--------------|------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | Photocoupler :  | NO.61P04115  | REV. |
|   | <b>KPC357NT</b> | SHEET 2 OF 7 | 8    |

## 1. OUTSIDE DIMENSION : UNIT (mm)



**TOLERANCE : ±0.2mm**

## 2. SCHEMATIC : TOP VIEW



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

# PRODUCT SPECIFICATION

DATE:11/29/2012

|   |                 |              |           |
|---|-----------------|--------------|-----------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | Photocoupler :  | NO.61P04115  | REV.<br>8 |
|   | <b>KPC357NT</b> | SHEET 3 OF 7 |           |

## ●Absolute Maximum Ratings

| 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           | $P$         | 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 second | $T_{sol}$                   | 260         | °C   |    |

## ●Electro-optical Characteristics

| 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  | %    |
|                          | Collector-emitter saturation voltage | $V_{CE(sat)}$ $I_F=20mA, I_c=1mA$      | -                  | 0.1       | 0.3  | V    |
|                          | Isolation resistance                 | $R_{iso}$ DC500V, 40 to 60%RH          | $5 \times 10^{10}$ | $10^{11}$ | -    | ohm  |
|                          | Floating capacitance                 | $C_f$ $V=0, f=1MHz$                    | -                  | 0.6       | 1.0  | pF   |
|                          | Response time (Rise)                 | $t_r$ $V_{ce}=2V, I_c=2mA, R_L=100ohm$ | -                  | 5         | 20   | us   |
| Response time (Fall)     | $t_f$                                | -                                      | 4                  | 20        | us   |      |

●Classification table of current transfer ratio is shown below.

| CTR RANK   | CTR(%)     |
|------------|------------|
| KPC357NT0A | 80 TO 160  |
| KPC357NT0B | 130 TO 260 |
| KPC357NT0C | 200 TO 400 |
| KPC357NT0D | 300 TO 600 |
| KPC357NT0E | 50 TO 600  |

# PRODUCT SPECIFICATION

DATE:11/29/2012

|   |                 |              |           |
|---|-----------------|--------------|-----------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | Photocoupler :  | NO.61P04115  | REV.<br>8 |
|   | <b>KPC357NT</b> | SHEET 4 OF 7 |           |

Fig.1 Forward Current vs.Ambient Temperature

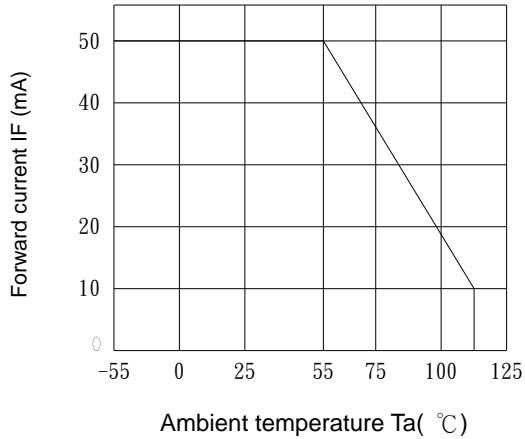


Fig.2 Diode Power Dissipation vs. Ambient Temperature

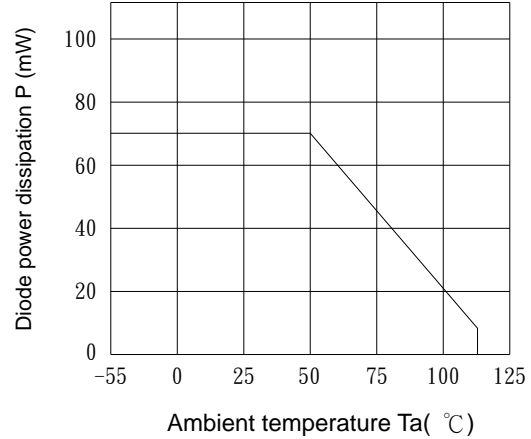


Fig.3 Collector Power Dissipation vs. Ambient Temperature

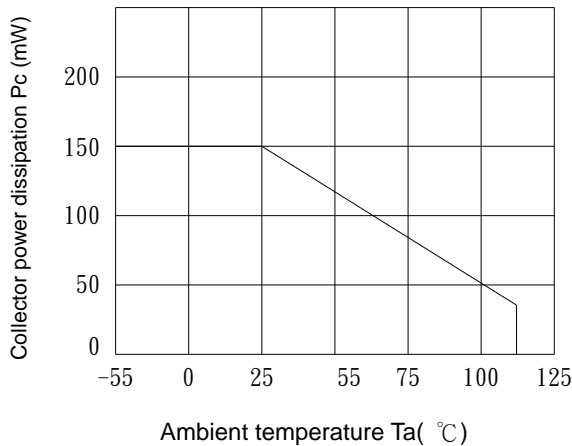


Fig.4 Total Power Dissipation vs. Ambient Temperature

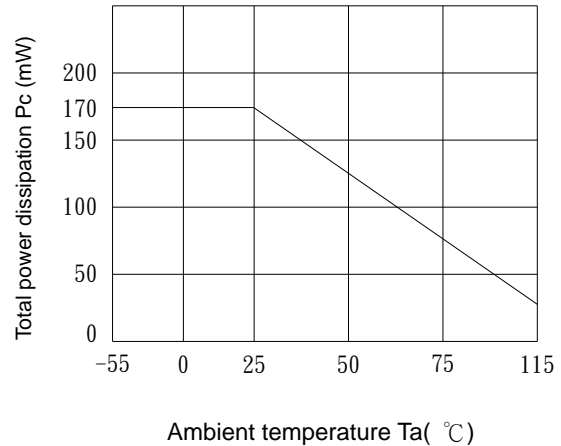


Fig.5 Peak Forward Current vs. Duty Ratio

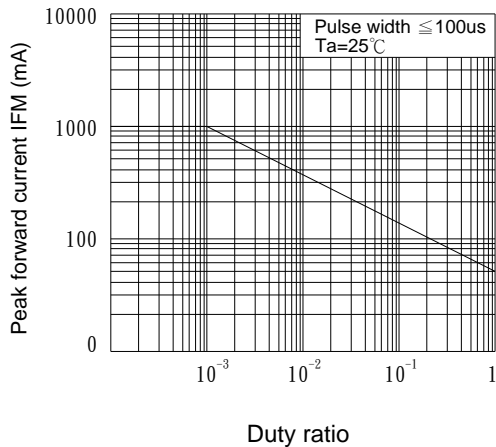
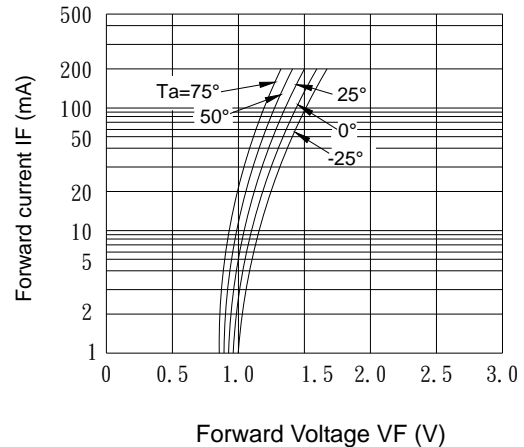


Fig.6 Forward Current vs. Forward Voltage



# PRODUCT SPECIFICATION

DATE:11/29/2012

|   |                 |              |           |
|---|-----------------|--------------|-----------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | Photocoupler :  | NO.61P04115  | REV.<br>8 |
|   | <b>KPC357NT</b> | SHEET 5 OF 7 |           |

Fig.7 Current Transfer Ratio vs. Forward Current

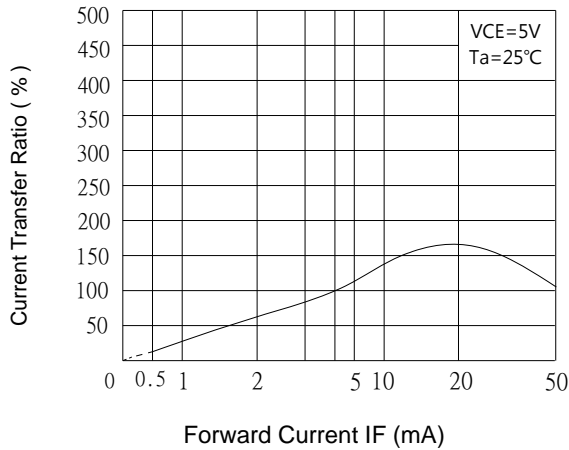


Fig.8 Collector Current vs. Collector-Emitter Voltage

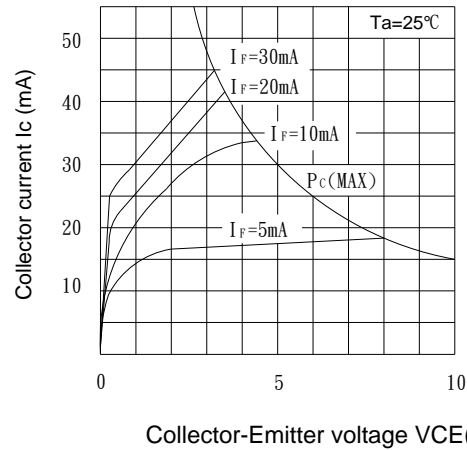


Fig.9 Relative Current Transfer Ratio vs. Ambient Temperature

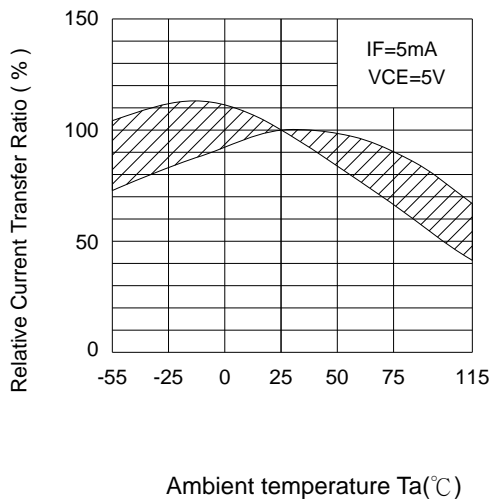


Fig.10 Collector-Emitter Saturation Voltage vs. Ambient Temperature

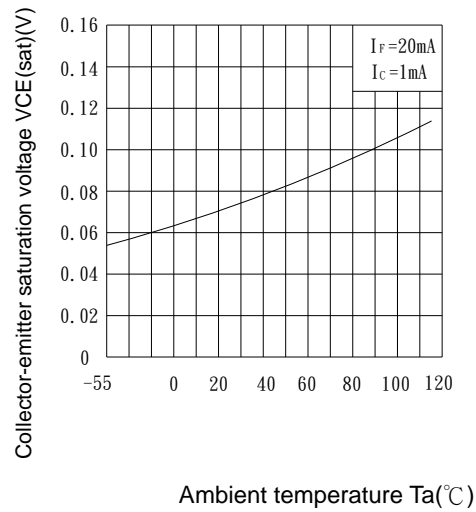


Fig.11 Collector Dark Current vs. Ambient Temperature

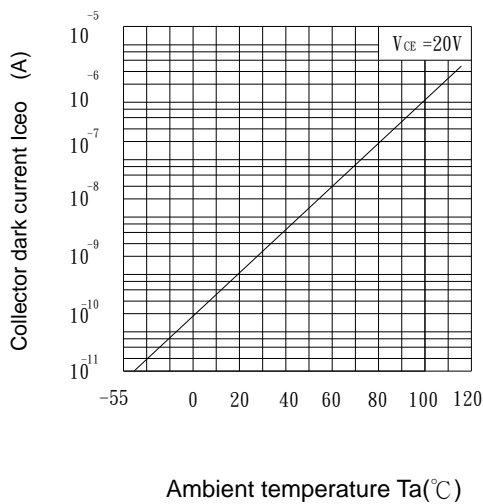
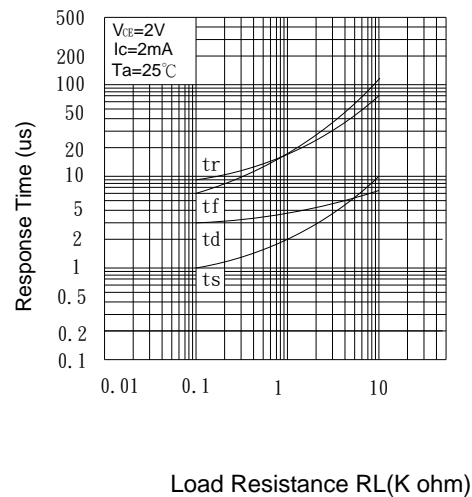


Fig.12 Response Time vs. Load Resistance

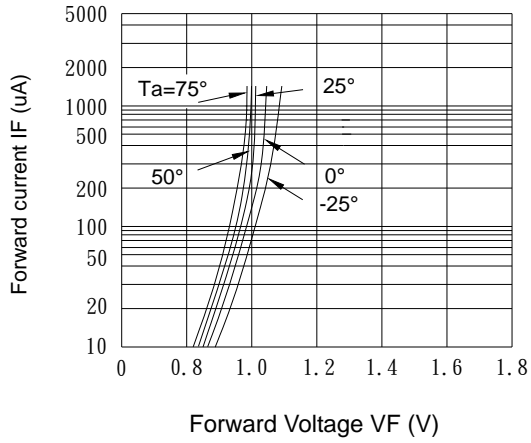


# PRODUCT SPECIFICATION

DATE:11/29/2012

|   |                 |              |      |
|---|-----------------|--------------|------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | Photocoupler :  | NO.61P04115  | REV. |
|   | <b>KPC357NT</b> | SHEET 6 OF 7 | 8    |

Fig.13 Forward Current vs.  
Forward Voltage



# PRODUCT SPECIFICATION

DATE:11/29/2012

|   |                                   |              |           |
|---|-----------------------------------|--------------|-----------|
| <b>cosmo</b><br>ELECTRONICS CORPORATION | Photocoupler :<br><b>KPC357NT</b> | NO.61P04115  | REV.<br>8 |
|   |                                   | SHEET 7 OF 7 |           |

## NOTICE

The information contained in this document is a general product description and is subject to change without notice. Please contact cosmo in order to obtain the latest device data sheets before using any cosmo device. cosmo does not assume any responsibility for use of any circuitry described. No circuit patent licenses are implied. This publication is the property of cosmo. No part of this publication may be reproduced or copied in any form or by any means, or transferred to any third party without the prior written consent of cosmo Electronics Corporation.

The devices listed in this document are designed for general applications only in electronic equipment. No devices shall be deployed which require higher level of reliability such as:

- Medical and other life support equipments.
- Space application.
- Telecommunication equipment (trunk lines).
- Nuclear power control equipment.

Unless it received prior written approval from cosmo.

cosmo takes no responsibility for damages arise form the improper usage of our device. Please contact cosmo for further information regarding the above notices.