

**1. Description**

Photocoupler, PC-17K1 consists of a Gallium Arsenide Infrared Emitting Diode and a Silicon NPN Phototransistor in a 4pin package

**2. Features**

- Small Package Size
- Collector – Emitter Voltage : Min.55V
- Current Transfer Ratio : Min.50%  
(at  $I_f=5mA, V_{CE}=5V$ )
- Electrical Isolation Voltage : [www.yozo.hk](http://www.yozo.hk)  
AC5000Vrms
- Creepage/Clearance between Input and Output : Min. 7.0mm
- UL Recognized File No. E107486
- VDE License No. 104861
- SEMKO License No. 9805214/01-04
- CSA License No. CA114264

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**3. Applications**

- Interface between two circuits of different potential
- Vending Machine, Cordless Phone, Key Phone, Fax, Motor Control
- Programmable Logic Control
- Power Supply
- Computer Terminals

**4. Outline Dimensions**

See the attached Drawing No. D-P17K-PK01

**5. Absolute Maximum Ratings (at 25°C Unless otherwise noted)**

| Parameter   |                             | Symbol | Rating   | Unit |
|---|-----------------------------|--------|----------|------|
| Input to Output Isolation Voltage *1                          |                             | VISO   | AC5000   | Vrms |
| Storage Temperature   |                             | Tstg   | -55 +125 |      |
| Operating Temperature   |                             | Topr   | -30 +100 |      |
| Lead Soldering Temperature<br>(1/16 inch from case for 10sec) |                             | Tsol   | 260      |      |
| Total Power Dissipation                                       |                             | Ptot   | 200      | mW   |
| Input   | Forward Current             | IF     | 50       | mA   |
|   | Reverse Voltage             | VR     | 5        | V    |
|   | Peak Forward Current *2     | IFP    | 1        | A    |
|   | Power Dissipation           | PD     | 70       | mW   |
| Output  | Collector-Emitter Voltage   | BVCEO  | 55       | V    |
|   | Emitter-Collector Voltage   | BVECO  | 7        | V    |
|   | Collector Current           | IC     | 50       | mA   |
|   | Collector Power Dissipation | PC     | 150      | mW   |

Notes : \*1. Measured at RH=40% 60% for 1min

\*2. Input current with 100 μ sec pulse width, 1% duty cycle

6. Electrical Characteristics (at 25 unless otherwise noted)

| Parameter |                                      | Symbol               | Min. | Typ.             | Max. | Unit  | Condition                                |
|-----------|--------------------------------------|----------------------|------|------------------|------|---|--|
| Input     | Forward Voltage                      | V <sub>F</sub>       | -    | 1.15             | 1.30 | V   | I <sub>F</sub> =10mA                     |
|           | Reverse Current                      | I <sub>R</sub>       | -    | -                | 10   | μA  | V <sub>R</sub> =5V                       |
|           | Capacitance                          | C <sub>T</sub>       | -    | 30               | -    | pF  | V=0, f=1MHz                              |
| Output    | Collector-Emitter Breakdown Voltage  | BV <sub>CEO</sub>    | 55   | -                | -    | V   | I <sub>C</sub> =0.5mA                    |
|           | Emitter-Collector Breakdown Voltage  | BV <sub>ECO</sub>    | 7    | -                | -    | V   | I <sub>E</sub> =0.1mA                    |
|           | Collector Dark Current               | I <sub>CEO</sub>     | -    | -                | 100  | nA  | I <sub>F</sub> =0, V <sub>CE</sub> =24V  |
|           | Capacitance                          | C <sub>CE</sub>      | -    | 10               | -    | pF  | V <sub>CE</sub> =0, f=1MHz               |
| Coupled   | Current Transfer Ratio *3            | CTR                  | 50   | -                | 600  | %   | I <sub>F</sub> =5mA, V <sub>CE</sub> =5V |
|           | Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | -    | 0.15             | 0.4  | V   | I <sub>F</sub> =5mA, I <sub>C</sub> =1mA |
|           | Input-Output Capacitance *4          | C <sub>I-O</sub>     | -    | 1                | -    | pF  | V=0, f=1MHz                              |
|           | Input-Output Isolation Resistance *4 | R <sub>I-O</sub>     | -    | 10 <sup>11</sup> | -    |   | RH=40 60%, V=500                         |
| Rise Time | t <sub>r</sub>                       | -                    | 2    | -                | μsec | V <sub>CC</sub> =5V, R <sub>L</sub> =100 ,<br>I <sub>C</sub> =2mA |  |
| Fall Time | t <sub>f</sub>                       | -                    | 3    | -                | μsec |   |  |

Notes : \*3. The Current Transfer Ratio is defined as the ratio of output current to the forward input current.

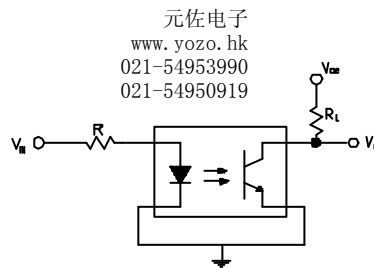
The equation is described as following;

$$CTR = (I_C / I_F) \times 100(\%)$$

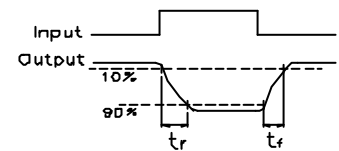
CTR Classification

| C/O | Rank Mark | Rank Range(%) |
|-----|-----------|---------------|
|     | AA        | 80 120        |
|     | BB        | 100 200       |
|     | CB        | 150 250       |
|     | DB        | 200 300       |
|     | EC        | 250 400       |
|     | GF        | OVER350       |
|     | AF        | 50 600        |
|     |           |               |
|     |           |               |

[ C/O : Customer Option ]



Test Circuit



Waveform

\*4. These parameters are measured between all input leads shorted together and all output leads shorted together.

7. Reliability

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| Items                                | Condition   | Failure Criteria  | Sample Size   |
|--------------------------------------|---|---|---|
| High Temperature Operating Test      | T <sub>A</sub> =80 , I <sub>F</sub> =30mA, V <sub>CE</sub> =30V<br>Time=1000Hr's  | VF, I <sub>F</sub> =10mA 1.30V<br>IR, V <sub>R</sub> =5V, I <sub>0</sub> A<br>BV <sub>CEO</sub> , I <sub>C</sub> =0.5mA 35V<br>BV <sub>ECO</sub> , I <sub>E</sub> =0.1mA 5V<br>I <sub>CEO</sub> , V <sub>CC</sub> =24V, 100nA<br>V <sub>CES</sub> , I <sub>F</sub> =5mA<br>I <sub>C</sub> =1mA 0.4V<br>I <sub>CEL</sub> , I <sub>F</sub> =5mA, V <sub>CE</sub> =5V<br><br>I : Initial Value<br>L : Lower Spec. Limit<br>U : Upper Spec. Limit | I ± 10%<br>U  |
| Low Temperature Operating Test       | T <sub>A</sub> =-30 , I <sub>F</sub> =10mA, V <sub>CE</sub> =30V<br>Time=1000Hr's |   | L   |
| High Temp. and High Humidity Storage | T <sub>A</sub> = 85 , RH= 85%,<br>Time=1000Hr's                                   |   | L<br>Ux2<br>U                                       |
| Temperature Cycling                  | T <sub>A</sub> =-30 /+100 Each 30min<br>Cycles=200                                |   | I ± 30%   |
| Pressure Cooker Test                 | T <sub>A</sub> =121 , RH=100%<br>Press= 2atm, Time= 48Hr                          |   | 元佐电子<br>www.yozo.hk<br>021-54953990<br>021-54950919 |

8. QA Outgoing Inspection

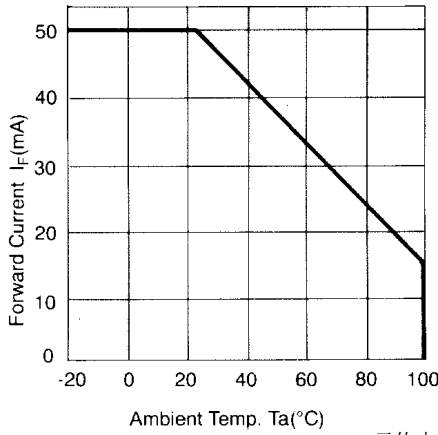
| Defect/Item | AQL Level | Sample Size | Reject |
|-------------|-----------|-------------|--------|
| Critical    | 0.065     | 200         | 0      |
| Major       | 0.1       | 125         | 0      |
| Minor       | 0.4       | 32          | 0      |

NOTE) 1. Inspection Items : Electrical Test, Visual Inspection  
2. Reference : MIL-STD-105D, LEVEL II

9. Option Request

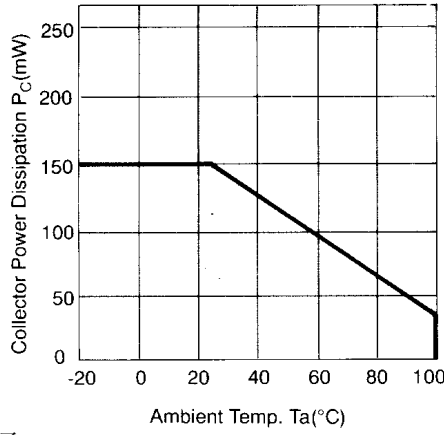
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| NO. | ITEMS                               | REFERENCE            | Q'TY | PAGE |
|-----|-------------------------------------|----------------------|------|------|
| 1   | Internal Construction               | DWG NO. D-P17L-ITN01 | 1    | 7    |
| 2   | Packing                             | DWG NO. D-P17L-BOX01 | 1    | 8    |
| 3   | Reliability Test Report( 가 )        | P-04-9711AB37(H)     | 3    | 9    |
| 4   | Safety Test per DIN VDE0884         | DWG NO. D-P17L-ITN01 | 1    | 10   |
| 5   | Certification                       |                      |      |      |
|     | - UL Recognized No. E107486         | Recognized List      | 1    | 11   |
|     | - VDE Licensed No. 104861           | Approval Sheet       | 5    | 12   |
|     | - SEMKO Licensed No. 9805214/ 01-04 | Approval Sheet       | 1    | 13   |
|     | - CSA Licensed No. CA114264         | Approval Sheet       | 2    | 14   |



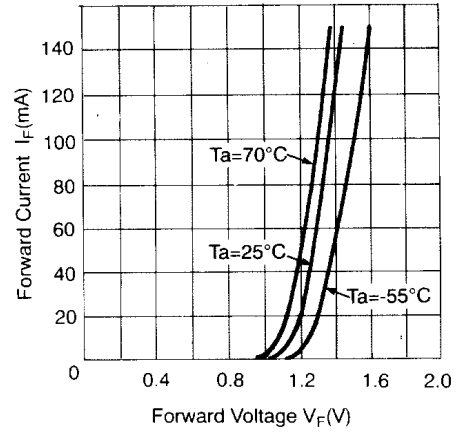
Ambient Temp.  $T_a$ (°C)

Forward Current vs. Ambient Temp.



Ambient Temp.  $T_a$ (°C)

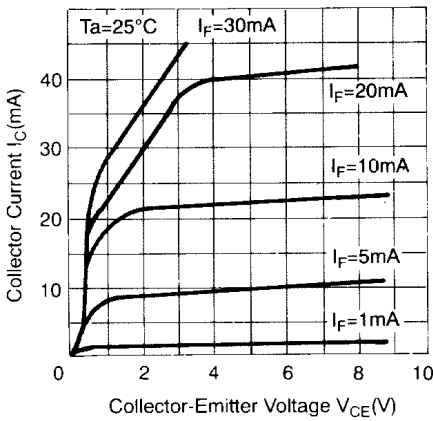
Collector Power Dissipation vs Ambient Temp.



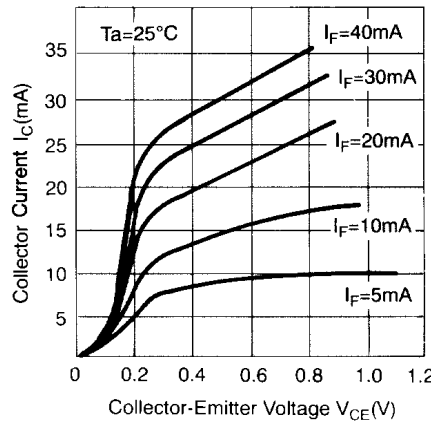
Forward Voltage  $V_F$ (V)

Forward Current vs. Forward Voltage

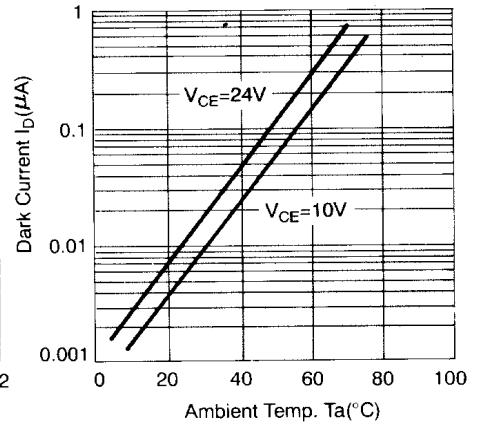
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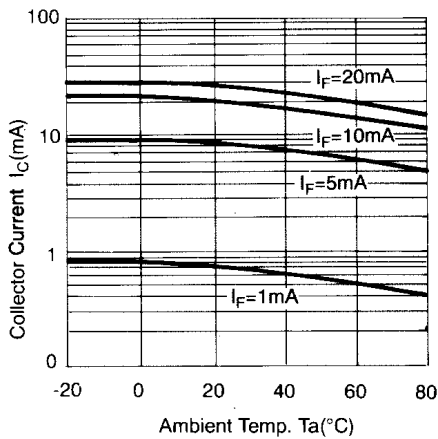
Collector Current vs. Collector-Emitter Voltage



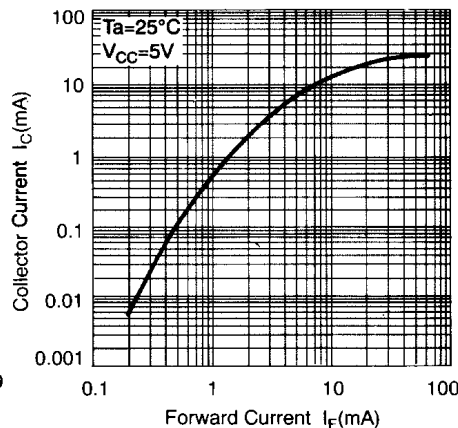
Collector Current vs. Collector-Emitter Voltage



Dark Current vs. Ambient Temp.

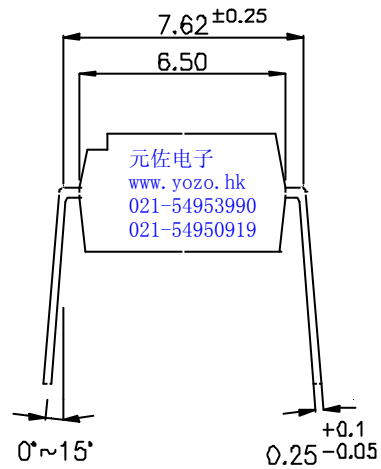
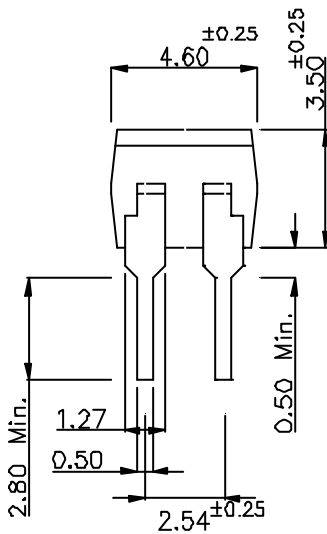
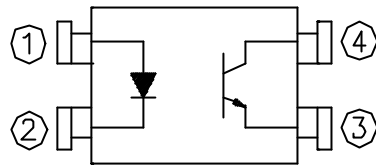
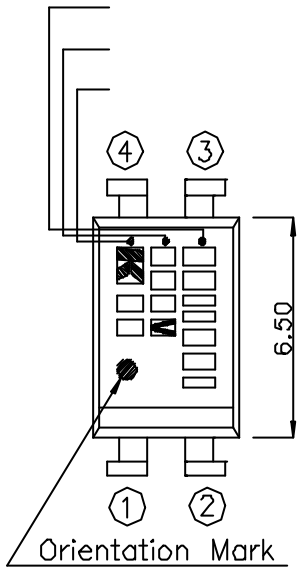



Collector Current vs. Ambient Temp.



Collector Current vs. Forward Current

| NO | REVISION | BY | DATE |
|----|----------|----|------|
|    |          |    |      |
|    |          |    |      |
|    |          |    |      |
|    |          |    |      |
|    |          |    |      |



|                           |             |             |        |   |           |  |                           |
|---------------------------|-------------|-------------|--------|---|-----------|--|---------------------------|
| PC-17K1                   |             |             |        |   |           |  |                           |
| NO                        | DESCRIPTION |             |        | MAT'L   | DIMENSION |  | REMARK                    |
| DRAWN                     | DESIGN      | CHEK'D      | APRV'D | Q'TY  | TITLE     |  |                           |
|                           |             |             |        | UNIT  | mm        |  | Outline Package & Circuit |
|                           |             |             |        | SCALE   | 5 / 1     |  |                           |
| DRAWING NO<br>D-P17K-PK01 |             | REF DWG NO. |        |  <b>KODENSHI KOREA CORP.</b> |           |  |                           |