Mini-Flat package
AC Input type Photocoupler

● Features
1. Halogen Free.
2. Pb free and RoHS compliant.
3. AC inputs
4. Mini-flat package:
   compact 4 pin SOP with a 2.0mm profile
5. Subminiature type
   (The volume is smaller than that of our conventional DIP type by as far as 30%)
6. Isolation voltage between input and output (Viso : 3750vrms).
7. 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.
1. OUTSIDE DIMENSION : UNIT (mm)

![Dimensions Diagram]

TOLERANCE : ±0.2mm

2. SCHEMATIC : TOP VIEW

![Schematic Diagram]

1. Anode, Cathode
2. Anode, Cathode
3. Emitter
4. Collector
### Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward current</td>
<td>$I_F$</td>
<td>$\pm 50$</td>
<td>mA</td>
</tr>
<tr>
<td>Peak forward current</td>
<td>$I_{FM}$</td>
<td>$\pm 1$</td>
<td>A</td>
</tr>
<tr>
<td>Power dissipation</td>
<td>$P$</td>
<td>70</td>
<td>mW</td>
</tr>
<tr>
<td>Collector-emitter voltage</td>
<td>$V_{CEO}$</td>
<td>80</td>
<td>V</td>
</tr>
<tr>
<td>Emitter-collector voltage</td>
<td>$V_{ECO}$</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Collector current</td>
<td>$I_C$</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Collector power dissipation</td>
<td>$P_C$</td>
<td>150</td>
<td>mW</td>
</tr>
<tr>
<td>Total power dissipation</td>
<td>$P_{tot}$</td>
<td>170</td>
<td>mW</td>
</tr>
<tr>
<td>Isolation voltage 1 minute</td>
<td>$V_{iso}$</td>
<td>3750</td>
<td>Vrms</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>$T_{opr}$</td>
<td>-55 to +115</td>
<td>℃</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>$T_{stg}$</td>
<td>-55 to +125</td>
<td>℃</td>
</tr>
<tr>
<td>Soldering temperature 10 second</td>
<td>$T_{sol}$</td>
<td>260</td>
<td>℃</td>
</tr>
</tbody>
</table>

### Electro-optical Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward voltage</td>
<td>$V_F$</td>
<td>$IF=\pm 20mA$</td>
<td>-</td>
<td>1.2</td>
<td>1.4</td>
<td>V</td>
</tr>
<tr>
<td>Terminal capacitance</td>
<td>$C_T$</td>
<td>$V=0, f=1kHz$</td>
<td>-</td>
<td>30</td>
<td>250</td>
<td>pF</td>
</tr>
<tr>
<td>Collector dark current</td>
<td>$I_{CEO}$</td>
<td>$V_{CEO}=20V, IF=0$</td>
<td>-</td>
<td>-</td>
<td>0.1</td>
<td>uA</td>
</tr>
<tr>
<td>Collector-emitter breakdown voltage</td>
<td>$BV_{CEO}$</td>
<td>$I_C=0.1mA, IF=0$</td>
<td>80</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>Emitter-collector breakdown voltage</td>
<td>$BV_{ECO}$</td>
<td>$IF=100uA, IF=0$</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td><strong>Transfer characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current transfer ratio</td>
<td>$CTR$</td>
<td>$IF=\pm 1mA, V_{CEO}=5V$</td>
<td>20</td>
<td>-</td>
<td>400</td>
<td>%</td>
</tr>
<tr>
<td>Collector-emitter saturation voltage</td>
<td>$V_{CE(sat)}$</td>
<td>$IF=\pm 20mA, I_{C}=1mA$</td>
<td>-</td>
<td>0.1</td>
<td>0.3</td>
<td>V</td>
</tr>
<tr>
<td>Isolation resistance</td>
<td>$R_{iso}$</td>
<td>$DC500V$ to 60%RH</td>
<td>$5x10^{10}$</td>
<td>$10^{14}$</td>
<td>-</td>
<td>ohm</td>
</tr>
<tr>
<td>Floating capacitance</td>
<td>$C_l$</td>
<td>$V=0, f=1MHz$</td>
<td>-</td>
<td>0.6</td>
<td>1.0</td>
<td>pF</td>
</tr>
<tr>
<td>Response time (Rise)</td>
<td>$tr$</td>
<td>$V_{ce}=2V, I_{c}=2mA, RL=100ohm$</td>
<td>-</td>
<td>4</td>
<td>18</td>
<td>us</td>
</tr>
<tr>
<td>Response time (Fall)</td>
<td>$tf$</td>
<td></td>
<td>-</td>
<td>3</td>
<td>18</td>
<td>us</td>
</tr>
</tbody>
</table>

### Classification table of current transfer ratio

<table>
<thead>
<tr>
<th>CTR RANK</th>
<th>CTR(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPC354NT0A</td>
<td>50 TO 150</td>
</tr>
<tr>
<td>KPC354NT0B</td>
<td>20 TO 400</td>
</tr>
</tbody>
</table>
**PRODUCT SPECIFICATION**

**cosmo ELECTRONICS CORPORATION**

**Photocoupler:**

**KPC354NT**

**DATE:** 11/29/2012

**NO.61P04072**

**SHEET 4 OF 6**

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**Fig.1** Forward Current vs. Ambient Temperature

![Graph of Forward Current vs. Ambient Temperature](image1)

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

![Graph of Diode Power Dissipation vs. Ambient Temperature](image2)

**Fig.3** Collector Power Dissipation vs. Ambient Temperature

![Graph of Collector Power Dissipation vs. Ambient Temperature](image3)

**Fig.4** Total Power Dissipation vs. Ambient Temperature

![Graph of Total Power Dissipation vs. Ambient Temperature](image4)

**Fig.5** Peak Forward Current vs. Duty Ratio

![Graph of Peak Forward Current vs. Duty Ratio](image5)

**Fig.6** Forward Current vs. Forward Voltage

![Graph of Forward Current vs. Forward Voltage](image6)

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- **Forward current IF (mA)**
- **Diode power dissipation P (mW)**
- **Ambient temperature Ta(℃)**
- **Collector power dissipation Pc (mW)**
- **Total power dissipation Pc (mW)**
- **Ambient temperature Ta(℃)**
- **Peak forward current IFM (mA)**

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- **Pulse width ≤ 100μs**
- **Ta=25℃**

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- **Ta=75℃**
- **50℃**
- **25℃**
- **0℃**
- **-25℃**

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- **Forward voltage VF (V)**
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
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