NON-BASE LEAD
OPTICALLY COUPLED ISOLATOR
PHOTOTRANSISTOR OUTPUT

APPROVALS
- UL recognised, File No. E91231
- VDE 0884 in 3 available lead forms:
  - STD
  - G form
  - SMD approved to CECC 00802
- Certified to EN60950 by the following Test Bodies:
  - Nemko - Certificate No. P01102464
  - Fimko - Certificate No. FI18166
  - Semko - Reference No. 0202037/01-22
  - Demko - Certificate No. 311158-01
- BSI approved - Certificate No. 8001

DESCRIPTION
The CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4 series of optically coupled isolators consist of infrared light emitting diode and NPN silicon photo transistor in a standard 6 pin dual in line plastic package with the base pin unconnected.

FEATURES
- Options:
  - 10mm lead spread - add G after part no.
  - Surface mount - add SM after part no.
  - Tape&reel - add SMT&R after part no.
- High BV (70V min)
- High Isolation Voltage (5.3kV_{RMS}, 7.5kV_{PK})
- Base pin unconnected for improved noise immunity in high EMI environment

APPLICATIONS
- DC motor controllers
- Industrial systems controllers
- Signal transmission between systems of different potentials and impedances

ABSOLUTE MAXIMUM RATINGS
(25°C unless otherwise specified)
- Storage Temperature: -55°C to +150°C
- Operating Temperature: -55°C to +100°C
- Lead Soldering Temperature: (1/16 inch (1.6mm) from case for 10 secs) 260°C

INPUT DIODE
- Forward Current: 60mA
- Reverse Voltage: 6V
- Power Dissipation: 105mW

OUTPUT TRANSISTOR
- Collector-emitter Voltage $BV_{CEO}$: 70V
- Emitter-collector Voltage $BV_{ECO}$: 6V
- Power Dissipation: 160mW

POWER DISSIPATION
- Total Power Dissipation: 200mW (derate linearly 2.67mW/°C above 25°C)

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**ELECTRICAL CHARACTERISTICS (Tₐ = 25°C Unless otherwise noted)**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNITS</th>
<th>TEST CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Forward Voltage (Vᵢᵢ)</td>
<td>1.2</td>
<td>1.65</td>
<td>V</td>
<td>Iᵢᵢ = 60mA</td>
<td></td>
</tr>
<tr>
<td>Reverse Current (Iᵢᵢ)</td>
<td></td>
<td></td>
<td>10</td>
<td>µA</td>
<td>Vᵢᵢ=6V</td>
</tr>
<tr>
<td>Output Collector-emitter Breakdown (BVᵥᵥᵥᵥᵥᵥ)</td>
<td>70</td>
<td></td>
<td>V</td>
<td>Iᵥᵥᵥᵥᵥᵥ = 1mA</td>
<td></td>
</tr>
<tr>
<td>Emitter-collector Breakdown (BVᵥᵥᵥᵥᵥᵥ)</td>
<td>6</td>
<td></td>
<td>V</td>
<td>Iᵥᵥᵥᵥᵥᵥ = 100µA</td>
<td></td>
</tr>
<tr>
<td>Collector-emitter Dark Current (Iᵥᵥᵥᵥᵥᵥ)</td>
<td></td>
<td></td>
<td>50</td>
<td>nA</td>
<td>Vᵥᵥᵥᵥᵥᵥ = 10V</td>
</tr>
<tr>
<td>Coupled Current Transfer Ratio (CTR) (Note 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CNY17F-1</td>
<td>40</td>
<td>80</td>
<td>%</td>
<td>10mA Iᵢᵢ, 5V Vᵥᵥᵥᵥᵥᵥ</td>
<td></td>
</tr>
<tr>
<td>CNY17F-2</td>
<td>63</td>
<td>125</td>
<td>%</td>
<td>10mA Iᵢᵢ, 5V Vᵥᵥᵥᵥᵥᵥ</td>
<td></td>
</tr>
<tr>
<td>CNY17F-3</td>
<td>100</td>
<td>200</td>
<td>%</td>
<td>10mA Iᵢᵢ, 5V Vᵥᵥᵥᵥᵥᵥ</td>
<td></td>
</tr>
<tr>
<td>CNY17F-4</td>
<td>160</td>
<td>320</td>
<td>%</td>
<td>10mA Iᵢᵢ, 5V Vᵥᵥᵥᵥᵥᵥ</td>
<td></td>
</tr>
<tr>
<td>CNY17F-1</td>
<td>13</td>
<td></td>
<td>%</td>
<td>1mA Iᵢᵢ, 5V Vᵥᵥᵥᵥᵥᵥ</td>
<td></td>
</tr>
<tr>
<td>CNY17F-2</td>
<td>22</td>
<td></td>
<td>%</td>
<td>1mA Iᵢᵢ, 5V Vᵥᵥᵥᵥᵥᵥ</td>
<td></td>
</tr>
<tr>
<td>CNY17F-3</td>
<td>34</td>
<td></td>
<td>%</td>
<td>1mA Iᵢᵢ, 5V Vᵥᵥᵥᵥᵥᵥ</td>
<td></td>
</tr>
<tr>
<td>CNY17F-4</td>
<td>56</td>
<td></td>
<td>%</td>
<td>1mA Iᵢᵢ, 5V Vᵥᵥᵥᵥᵥᵥ</td>
<td></td>
</tr>
<tr>
<td>Collector-emitter Saturation Voltage Vᵥᵥᵥᵥᵥᵥ</td>
<td>0.4</td>
<td></td>
<td>V</td>
<td>V_VOL</td>
<td></td>
</tr>
<tr>
<td>Input to Output Isolation Voltage Vᵥᵥᵥᵥᵥᵥ</td>
<td>5300</td>
<td></td>
<td>V</td>
<td>V_VOL</td>
<td></td>
</tr>
<tr>
<td>Input-output Isolation Resistance Rᵥᵥᵥᵥᵥᵥ</td>
<td>5x10¹⁰</td>
<td></td>
<td>Ω</td>
<td>V_VOL</td>
<td></td>
</tr>
</tbody>
</table>

**Note 1**  Measured with input leads shorted together and output leads shorted together.

**Note 2**  Special Selections are available on request. Please consult the factory.

**TYPICAL SWITCHING CHARACTERISTICS**

1. Linear Operation (without saturation) Fig 1
   \( \text{Iᵢᵢ} = 10\text{mA}, \ Vᵥᵥᵥᵥᵥᵥ = 5\text{V}, \ Rᵥᵥᵥᵥ = 75\Ω \)

2. Switching Operation (with saturation) Fig 2
   \( \text{Vᵥᵥᵥᵥᵥᵥ} = 5\text{V}, \ Rᵥᵥᵥᵥ = 1\kΩ \)

<table>
<thead>
<tr>
<th>GROUP</th>
<th>-1 (Iᵢᵢ=20mA)</th>
<th>-2 and -3 (Iᵢᵢ=10mA)</th>
<th>-4 (Iᵢᵢ=5mA)</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(-1)</td>
<td>(-2)</td>
<td>(-3)</td>
<td>(-4)</td>
</tr>
<tr>
<td>Turn-on Time ( tᵢᵢ )</td>
<td>3.0 µs</td>
<td>4.2 µs</td>
<td>6.0 µs</td>
<td>µs</td>
</tr>
<tr>
<td>Rise Time ( tᵢᵢ )</td>
<td>2.0 µs</td>
<td>3.0 µs</td>
<td>4.6 µs</td>
<td>µs</td>
</tr>
<tr>
<td>Turn-off Time ( tᵢᵢ )</td>
<td>18 µs</td>
<td>23 µs</td>
<td>25 µs</td>
<td>µs</td>
</tr>
<tr>
<td>Fall Time ( tᵢᵢ )</td>
<td>11 µs</td>
<td>14 µs</td>
<td>15 µs</td>
<td>µs</td>
</tr>
</tbody>
</table>

**Vᵥᵥᵥᵥᵥᵥ = 5.0V**

**FIG 1**

**FIG 2**

**Vᵥᵥᵥᵥᵥᵥ = 5.0V**