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**CNY17F-1X, CNY17F-2X, CNY17F-3X, CNY17F-4X**
**CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4**

ISOCOM COMPONENTS

# NON-BASE LEAD OPTICALLY COUPLED ISOLATOR PHOTOTRANSISTOR OUTPUT

ROHS COMPLIANT

## APPROVALS

- UL recognised, File No. E91231
  Package Code GG

**'X' SPECIFICATION APPROVALS**

- VDE 0884 in 3 available lead forms : -
  - STD
  - G form
  - SMD approved to CECC 00802
- Certified to EN60950 by
  Nemko - Certificate No. P01102464

## 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.

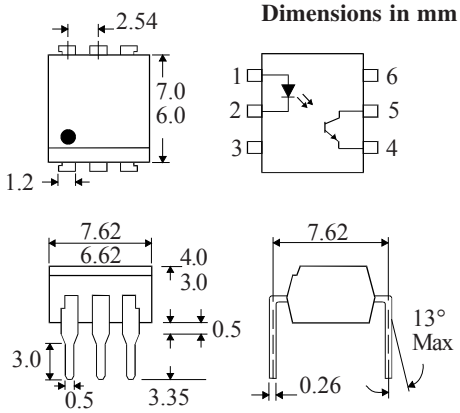
## FEATURES

- 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 $BV_{CEO}$ (70V min)
- High Isolation Voltage ($5.3kV_{RMS}$, $7.5kV_{PK}$)
- Base pin unconnected for improved noise immunity in high EMI environment

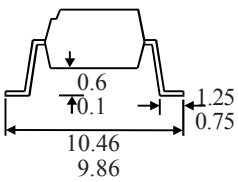
## APPLICATIONS

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

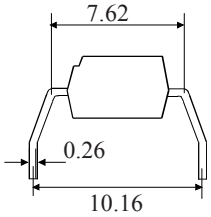
**Dimensions in mm**




**OPTION SM**
**SURFACE MOUNT**




**OPTION G**




## 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 |
| Collector Current | 50mA |
| Power Dissipation | 160mW |

## POWER DISSIPATION

| | |
|---|---|
| Total Power Dissipation | 200mW |
| (derate linearly 2.67mW/°C above 25°C) | |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**ELECTRICAL CHARACTERISTICS ( $T_A$= 25°C Unless otherwise noted )**

| PARAMETER | | MIN | TYP | MAX | UNITS | TEST CONDITION |
|---|---|---|---|---|---|---|
| Input | Forward Voltage ($V_F$) | | 1.2 | 1.65 | V | $I_F$ = 60mA |
| | Reverse Current ($I_R$) | | | 10 | µA | $V_R$=6V |
| Output | Collector-emitter Breakdown ($BV_{CEO}$) ( note 2 ) | 70 | | | V | $I_C$=1mA |
| | Emitter-collector Breakdown ($BV_{ECO}$) | 6 | | | V | $I_E$=100µA |
| | Collector-emitter Dark Current ($I_{CEO}$) | | | 50 | nA | $V_{CE}$=10V |
| Coupled | Current Transfer Ratio (CTR) (Note 2) | | | | | |
| | CNY17F-1 | 40 | | 80 | % | 10mA $I_F$, 5V $V_{CE}$ |
| | CNY17F-2 | 63 | | 125 | % | 10mA $I_F$, 5V $V_{CE}$ |
| | CNY17F-3 | 100 | | 200 | % | 10mA $I_F$, 5V $V_{CE}$ |
| | CNY17F-4 | 160 | | 320 | % | 10mA $I_F$, 5V $V_{CE}$ |
| | Collector-emitter Saturation Voltage $V_{CE(SAT)}$ | | | 0.4 | V | 10mA $I_F$, 2.5mA $I_C$ |
| | Input to Output Isolation Voltage $V_{ISO}$ | 5300 | | | $V_{RMS}$ | See note 1 |
| | | 7500 | | | $V_{PK}$ | See note 1 |
| | Input-output Isolation Resistance $R_{ISO}$ | $5x10^{10}$ | | | Ω | $V_{IO}$=500V (note 1) |

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.
$I_F$ = 10mA, $V_{CC}$ = 5V, $R_L$ = 75Ω

| | | UNITS |
|---|---|---|
| Turn-on Time $t_{on}$ | 3.0 | µs |
| Rise Time $t_r$ | 2.0 | µs |
| Turn-off Time $t_{off}$ | 2.3 | µs |
| Fall Time $t_f$ | 2.0 | µs |
| Cut-off Frequency $F_{CO}$ | 250 | kHz |

2. Switching Operation (with saturation) Fig 2
$V_{CC}$ = 5V, $R_L$ = 1kΩ

| GROUP | -1 ($I_F$=20mA) | -2 and -3 ($I_F$=10mA) | - 4 ($I_F$=5mA) | UNITS |
|---|---|---|---|---|
| Turn-on Time $t_{on}$ | 3.0 | 4.2 | 6.0 | µs |
| Rise Time $t_r$ | 2.0 | 3.0 | 4.6 | µs |
| Turn-off Time $t_{off}$ | 18 | 23 | 25 | µs |
| Fall Time $t_f$ | 11 | 14 | 15 | µs |
| $V_{CESAT}$ | ≤ 0.4 | | | V |

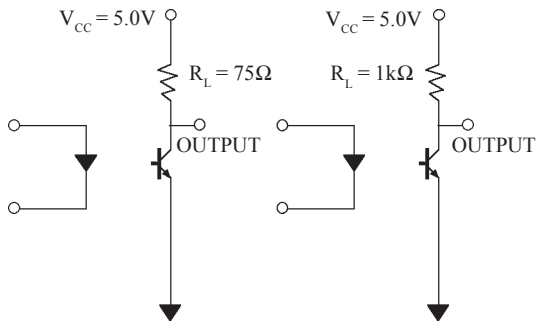
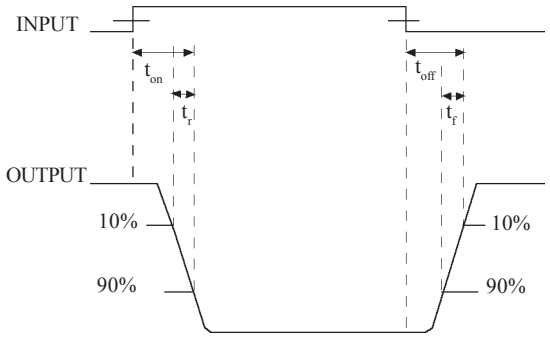
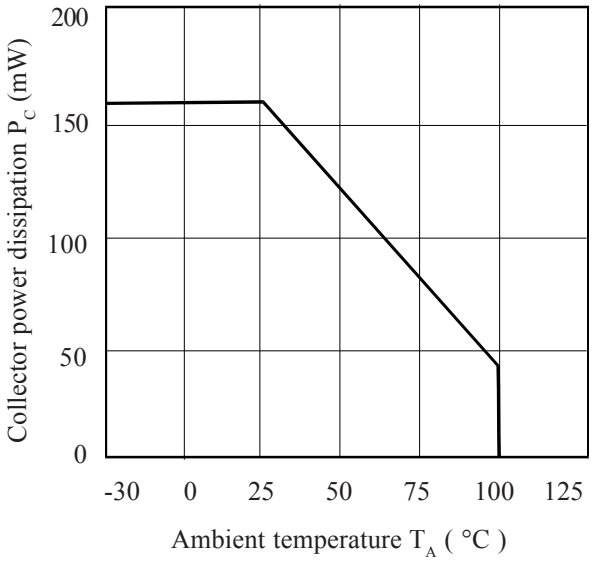


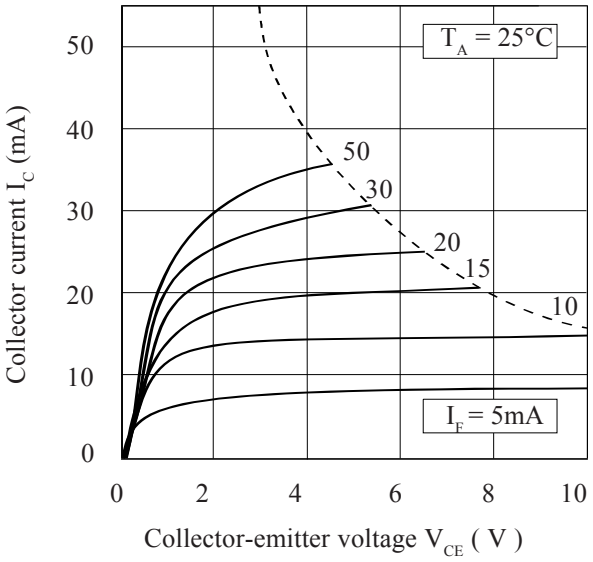

FIG 1 FIG 2



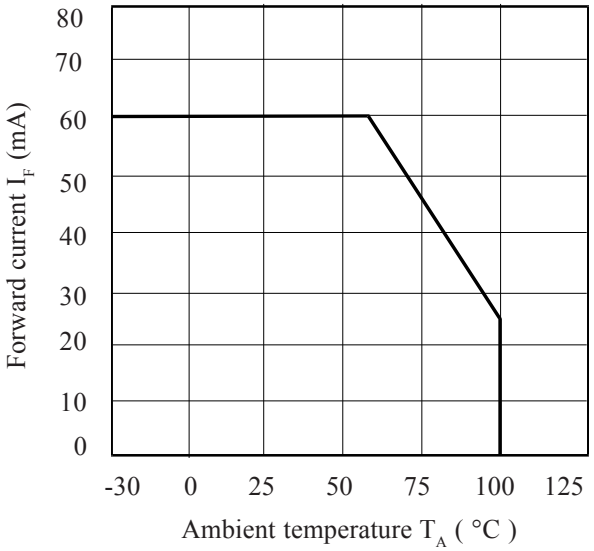
**Collector Power Dissipation vs. Ambient Temperature**



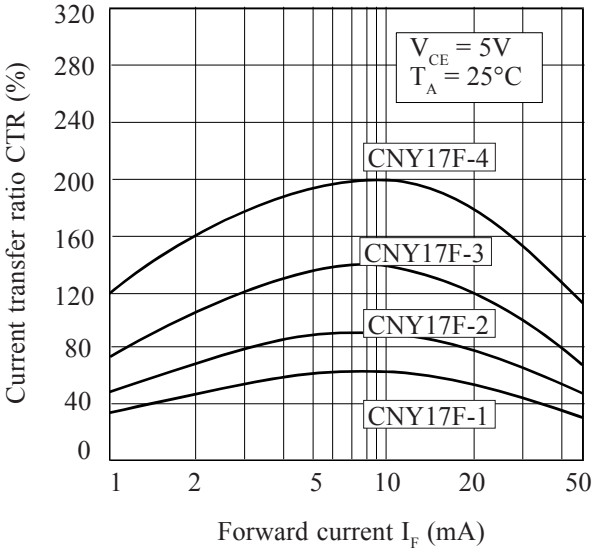

**Collector Current vs. Collector-emitter Voltage**
**( normalised to CNY17F-3 )**



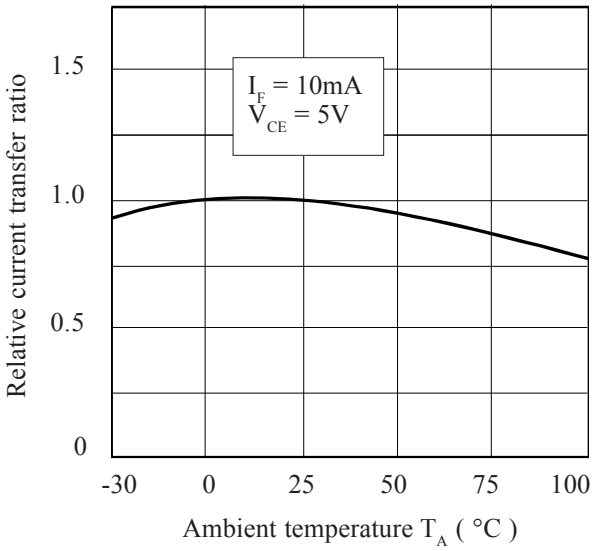

**Forward Current vs. Ambient Temperature**




**Current Transfer Ratio vs. Forward Current**




**Relative Current Transfer Ratio**
**vs. Ambient Temperature**




**Collector-emitter Saturation**
**Voltage vs. Ambient Temperature**