

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



**NON-BASE LEAD
 OPTICALLY COUPLED ISOLATOR
 PHOTOTRANSISTOR OUTPUT**

APPROVALS

- UL recognised, File No. E91231
- 'X' SPECIFICATION APPROVALS
 - 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

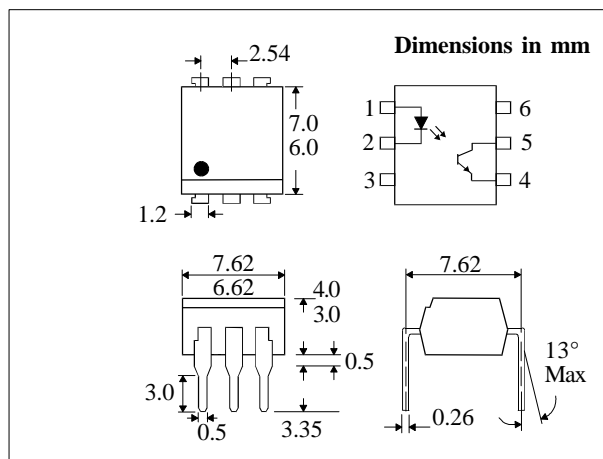
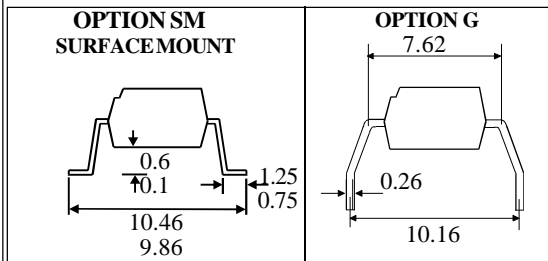
The CNY17F-1, CNY17F-2, CNY17F-3, CNY17F-4 series of optically coupled isolators consist of infrared light emitting diode and NPN silicon photo transistor in a standard 6 pin dual in line plastic package with the base pin unconnected.

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_{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



**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 ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

| PARAMETER | | MIN | TYP | MAX | UNITS | TEST CONDITION |
|---|--|--------------------|-----|------|---------------|---------------------------------------|
| Input | Forward Voltage (V_F) | | 1.2 | 1.65 | V | $I_F = 60\text{mA}$ |
| | Reverse Current (I_R) | | | 10 | μA | $V_R = 6\text{V}$ |
| Output | Collector-emitter Breakdown (BV_{CE0}) (note 2) | 70 | | | V | $I_C = 1\text{mA}$ |
| | Emitter-collector Breakdown (BV_{ECO}) | 6 | | | V | $I_E = 100\mu\text{A}$ |
| | Collector-emitter Dark Current (I_{CEO}) | | | 50 | nA | $V_{CE} = 10\text{V}$ |
| Coupled | Current Transfer Ratio (CTR) (Note 2) | | | | | |
| | CNY17F-1 | 40 | | 80 | % | $10\text{mA } I_F, 5\text{V } V_{CE}$ |
| | CNY17F-2 | 63 | | 125 | % | $10\text{mA } I_F, 5\text{V } V_{CE}$ |
| | CNY17F-3 | 100 | | 200 | % | $10\text{mA } I_F, 5\text{V } V_{CE}$ |
| | CNY17F-4 | 160 | | 320 | % | $10\text{mA } I_F, 5\text{V } V_{CE}$ |
| | CNY17F-1 | 13 | | | % | $1\text{mA } I_F, 5\text{V } V_{CE}$ |
| | CNY17F-2 | 22 | | | % | $1\text{mA } I_F, 5\text{V } V_{CE}$ |
| | CNY17F-3 | 34 | | | % | $1\text{mA } I_F, 5\text{V } V_{CE}$ |
| | CNY17F-4 | 56 | | | % | $1\text{mA } I_F, 5\text{V } V_{CE}$ |
| | Collector-emitter Saturation Voltage $V_{CE(SAT)}$ | | | 0.4 | V | $10\text{mA } I_F, 2.5\text{mA } I_C$ |
| 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} | | 5×10^{10} | | | Ω | $V_{IO} = 500\text{V}$ (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 .
 $I_F = 10\text{mA}, V_{CC} = 5\text{V}, R_L = 75\Omega$

| | | 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 |

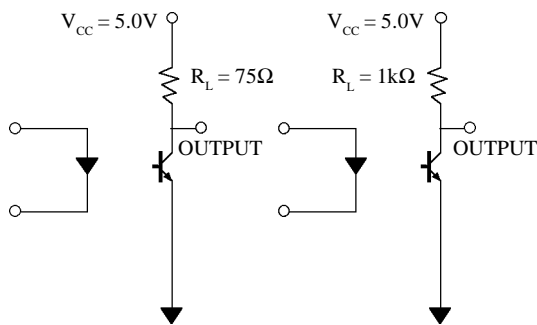
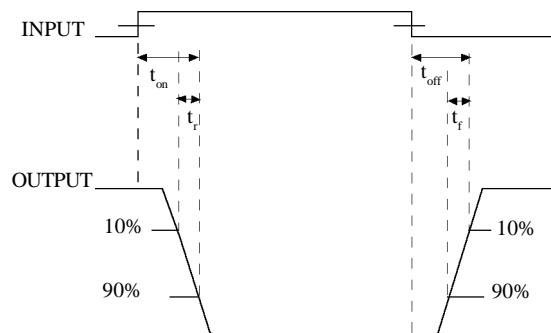


FIG 1

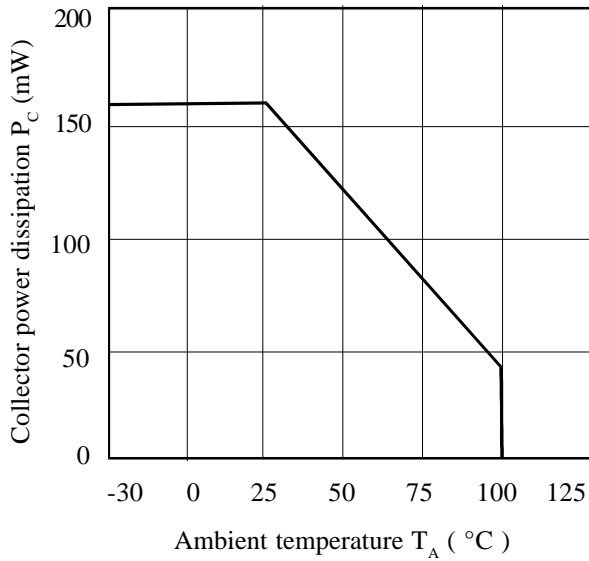
FIG 2

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

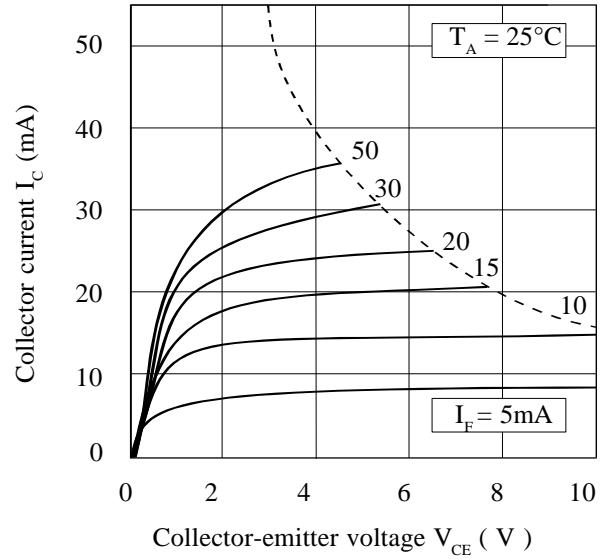
| GROUP | -1 ($I_F = 20\text{mA}$) | -2 and -3 ($I_F = 10\text{mA}$) | -4 ($I_F = 5\text{mA}$) | UNITS |
|-------------------------|-------------------------------|--------------------------------------|------------------------------|---------------|
| Turn-on Time t_{on} | 3.0 | 4.2 | 6.0 | μs |
| Rise 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 |



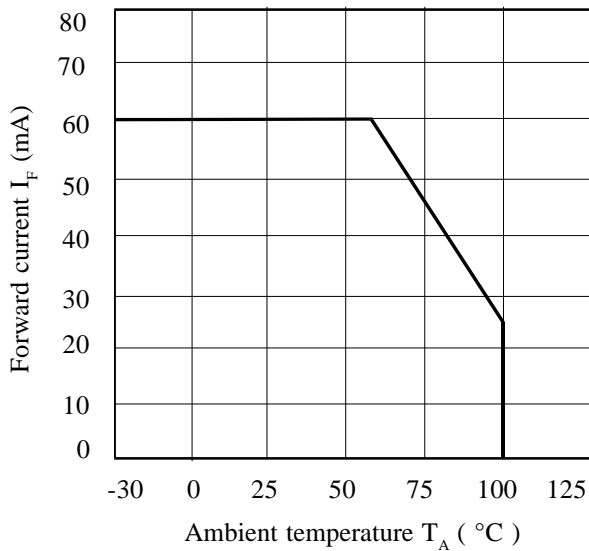
Collector Power Dissipation vs. Ambient Temperature



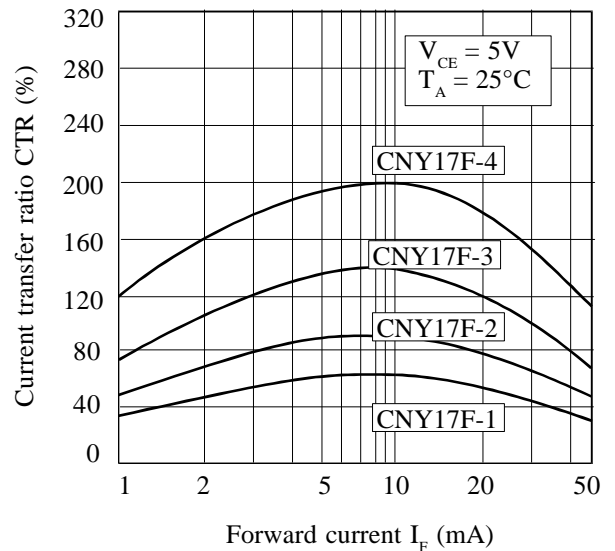
Collector Current vs. Collector-emitter Voltage (normalised to CNY17F-3)



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

