

CNY17-1X, CNY17-2X, CNY17-3X, CNY17-4X, CNY17-5X  
CNY17-1, CNY17-2, CNY17-3, CNY17-4, CNY17-5



## 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

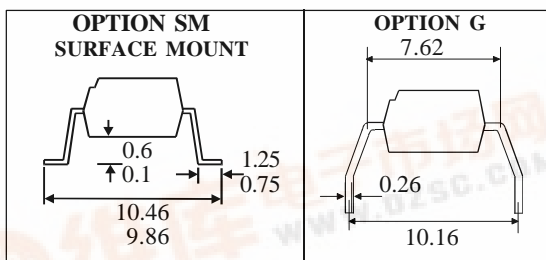
The CNY17-1, CNY17-2, CNY17-3, CNY17-4, CNY17-5 series of optically coupled isolators consist of an infrared light emitting diode and a NPN silicon photo transistor in a standard 6 pin dual in line plastic package.

### FEATURES

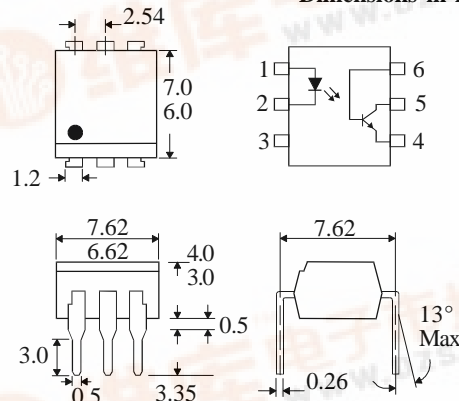
- Options :-
  - 10mm lead spread - add G after part no.
  - Surface mount - add SM after part no.
  - Tape&reel - add SMT&R after part no.
- High  $BV_{CEO}$  (70V min)
- High Isolation Voltage ( $5.3kV_{RMS}$ ,  $7.5kV_{PK}$ )
- All electrical parameters 100% tested
- Custom electrical selections available

### APPLICATIONS

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



Dimensions in mm



### 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  
Collector-base Voltage  $BV_{CBO}$  \_\_\_\_\_ 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	$\mu\text{A}$	$V_R = 6\text{V}$
Output	Collector-emitter Breakdown ( $BV_{CEO}$ )	70			V	$I_C = 1\text{mA}$ ( Note 2 )
	Collector-base Breakdown ( $BV_{CBO}$ )	70			V	$I_C = 100\mu\text{A}$
	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)					
	CNY17-1	40		80	%	$10\text{mA } I_F, 5\text{V } V_{CE}$
	CNY17-2	63		125	%	$10\text{mA } I_F, 5\text{V } V_{CE}$
	CNY17-3	100		200	%	$10\text{mA } I_F, 5\text{V } V_{CE}$
	CNY17-4	160		320	%	$10\text{mA } I_F, 5\text{V } V_{CE}$
	CNY17-5	200		400	%	$10\text{mA } I_F, 5\text{V } V_{CE}$
	CNY17-1	13			%	$1\text{mA } I_F, 5\text{V } V_{CE}$
	CNY17-2	22			%	$1\text{mA } I_F, 5\text{V } V_{CE}$
	CNY17-3	34			%	$1\text{mA } I_F, 5\text{V } V_{CE}$
	CNY17-4	56			%	$1\text{mA } I_F, 5\text{V } V_{CE}$
	CNY17-5	68			%	$1\text{mA } I_F, 5\text{V } V_{CE}$
	Collector-emitter Saturation Voltage $V_{CE(SAT)}$			0.4	V	$10\text{mA } I_F, 2.5\text{mA}$
	Input to Output Isolation Voltage $V_{ISO}$	5300			$V_{RMS}$	See note 1
	Input-output Isolation Resistance $R_{ISO}$	$5 \times 10^{10}$			$\Omega$	$V_{IO} = 500\text{V}$ (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	$\mu\text{s}$
Rise Time $t_r$	2.0	$\mu\text{s}$
Turn-off Time $t_{off}$	2.3	$\mu\text{s}$
Fall Time $t_f$	2.0	$\mu\text{s}$
Cut-off Frequency $F_{CO}$	250	kHz

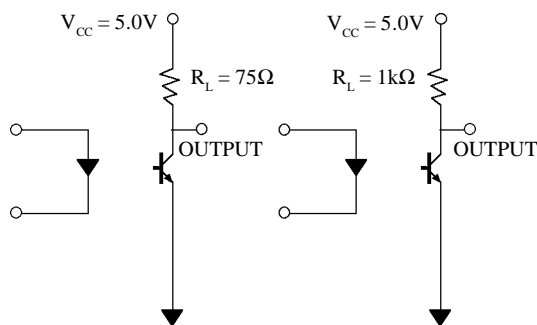


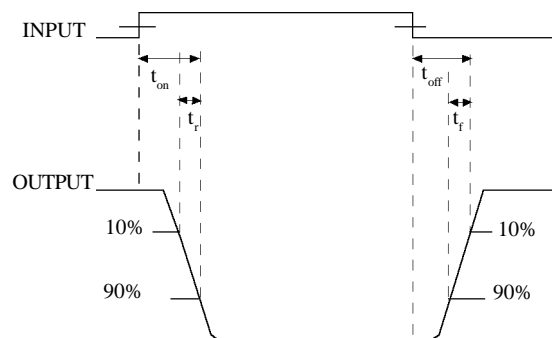
FIG 1

FIG 2

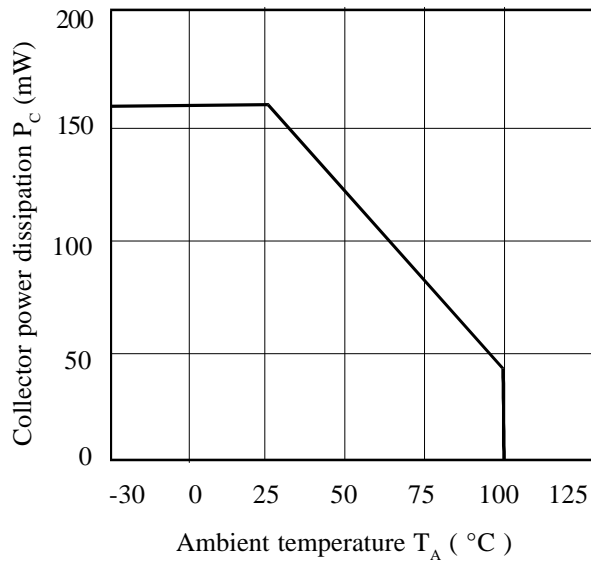
2 . Switching Operation (with saturation) Fig 2

$V_{CC} = 5\text{V}$ ,  $R_L = 1\text{k}\Omega$

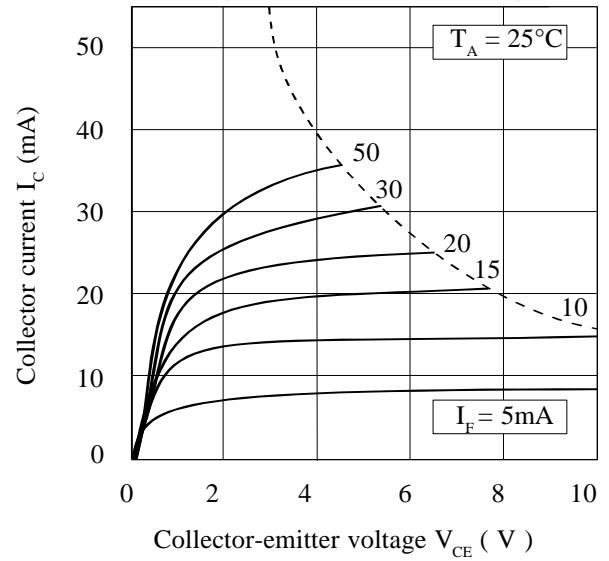
GROUP	-1 ( $I_F = 20\text{mA}$ )	-2 and -3 ( $I_F = 10\text{mA}$ )	-4 ( $I_F = 5\text{mA}$ )	UNITS
Turn-on Time $t_{on}$	3.0	4.2	6.0	$\mu\text{s}$
Rise Time $t_r$	2.0	3.0	4.6	$\mu\text{s}$
Turn-off Time $t_{off}$	18	23	25	$\mu\text{s}$
Fall Time $t_f$	11	14	15	$\mu\text{s}$
$V_{CESAT}$	$\leq 0.4$			V



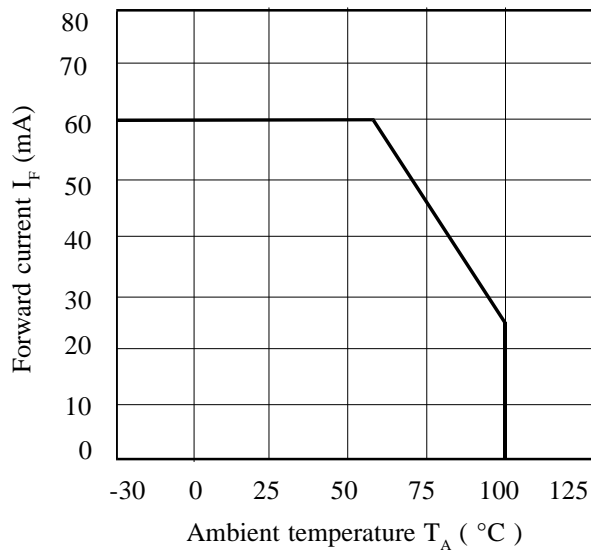
**Collector Power Dissipation vs. Ambient Temperature**



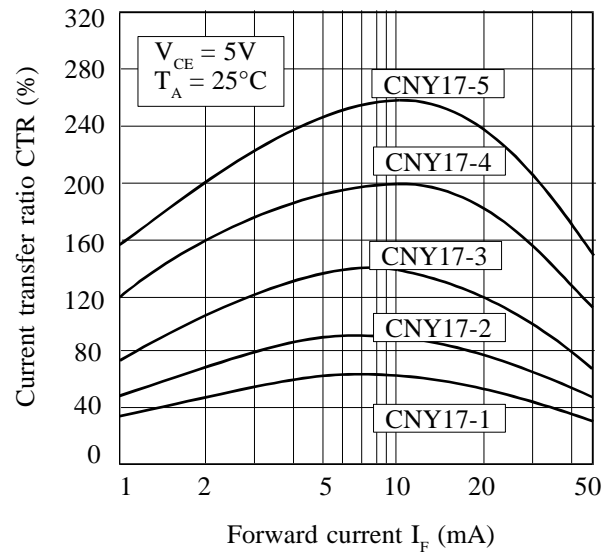
**Collector Current vs. Collector-emitter Voltage  
( normalised to CNY17-3 )**



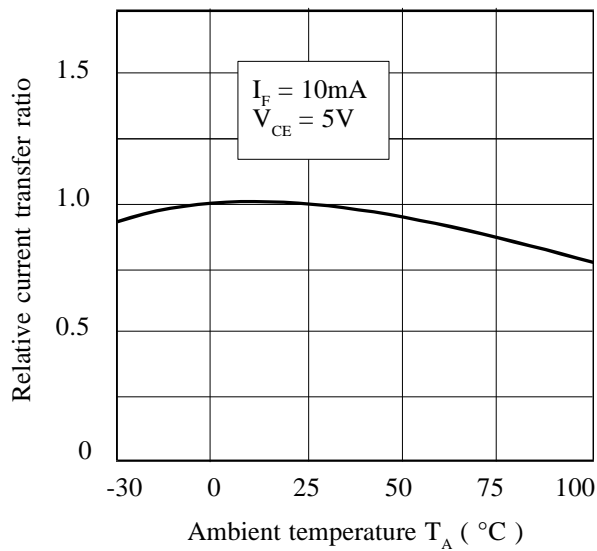
**Forward Current vs. Ambient Temperature**



**Current Transfer Ratio vs. Forward Current**



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



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

