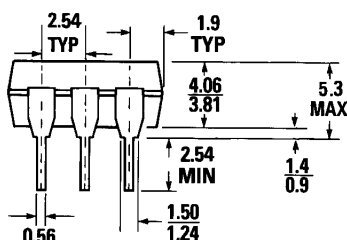
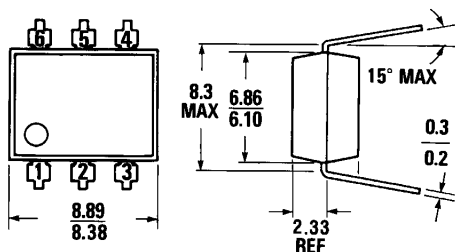


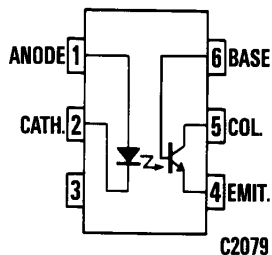
**CNY17-1 CNY17-3
CNY17-2 CNY17-4**

PACKAGE DIMENSIONS



DIMENSIONS IN mm
PACKAGE CODE K

ST1603A



Equivalent Circuit

DESCRIPTION

The CNY17 series consists of a Gallium Arsenide IRED coupled with an NPN phototransistor.

FEATURES

- High isolation voltage
5300 VAC RMS—1 minute
7500 VAC PEAK—1 minute
- High BV_{CEO} minimum 70 volts
- Current transfer ratio in selected groups:
CNY17-1: 40%- 80%
CNY17-2: 63%-125%
CNY17-3: 100%-200%
CNY17-4: 160%-320%
- Maximum switching time in saturation specified
- Underwriters Laboratory (UL) recognized File #E90700

APPLICATIONS

- Power supply regulators
- Digital logic inputs
- Microprocessor inputs
- Appliance sensor systems
- Industrial controls

ABSOLUTE MAXIMUM RATINGS

TOTAL PACKAGE

Storage temperature -55°C to 150°C
Operating temperature -55°C to 100°C
Lead temperature
(soldering, 10 sec) 260°C
Total package power dissipation @ 25°C
(LED plus detector) 260 mW
Derate linearly from 25°C 3.5 mW/°C

INPUT DIODE

Forward DC current 90 mA
Reverse voltage 6 V
Peak forward current
(1 μ s pulse, 300 pps) 3.0 A
Power dissipation 25°C ambient 135 mW
Derate linearly from 25°C 1.8 mW/°C

OUTPUT TRANSISTOR

Power dissipation @ 25°C 200 mW
Derate linearly from 25°C 2.67 mW/°C



PHOTOTRANSISTOR OPTOCOUPERS

ELECTRO-OPTICAL CHARACTERISTICS (25°C Temperature Unless Otherwise Specified)

INDIVIDUAL COMPONENT CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward voltage	V_f		1.3	1.50	V	$I_f = 60 \text{ mA}$
Forward voltage temp. coefficient	$\frac{\Delta V_f}{\Delta T_A}$		-1.8		mV/°C	
Reverse voltage	V_R	6.0	15		V	$I_R = 10 \text{ } \mu\text{A}$
Junction capacitance	C_j		50		pF	$V_f = 0 \text{ V}, f = 1 \text{ MHz}$
			65		pF	$V_f = 1 \text{ V}, f = 1 \text{ MHz}$
Reverse leakage current	I_R		.35	10	μA	$V_R = 3.0 \text{ V}$
OUTPUT TRANSISTOR						
DC forward current gain	h_{FE}	100	500			$V_{CE} = 5 \text{ V}, I_C = 100 \text{ } \mu\text{A}$
Breakdown voltage						
Collector to emitter	BV_{CEO}	70			V	$I_C = 1.0 \text{ mA}, I_F = 0$
Collector to base	BV_{CBO}	70			V	$I_C = 10 \text{ } \mu\text{A}, I_F = 0$
Emitter to collector	BV_{ECO}	7			V	$I_E = 100 \text{ } \mu\text{A}, I_F = 0$
Leakage current						
Collector to emitter	I_{CEO}		5	50	nA	$V_{CE} = 10 \text{ V}, I_F = 0$
Collector to base	I_{CBO}			20	nA	$V_{CB} = 10 \text{ V}, I_F = 0$
Capacitance						
Collector to emitter			8		pF	$V_{CE} = 0, f = 1 \text{ MHz}$
Collector to base			20		pF	$V_{CB} = 5, f = 1 \text{ MHz}$
Emitter to base			10		pF	$V_{EB} = 0, f = 1 \text{ MHz}$

TRANSFER CHARACTERISTICS

DC CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Current Transfer Ratio, collector to emitter CNY17-1	CTR				%	$I_F = 10 \text{ mA}; V_{CE} = 5 \text{ V}$
		40		80		
		63		125		
		100		200		
		160		320		
Saturation voltage	$V_{CE(SAT)}$		0.27	.40	V	$I_F = 10 \text{ mA}; I_C = 2.5 \text{ mA}$

TRANSFER CHARACTERISTICS

AC CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
SWITCHING TIMES						
Non-saturated						
Turn-on time	t_{on}		6.0	10	μs	$R_L = 100 \text{ } \Omega; I_C = 2 \text{ mA}; V_{CC} = 10 \text{ V}$
Turn-off time	t_{off}		5.5	10	μs	See Fig. 10 and Fig. 11.

ELECTRO-OPTICAL CHARACTERISTICS
(25°C Temperature Unless Otherwise Specified) (Cont'd)

TRANSFER CHARACTERISTICS (Cont'd)

AC CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
SATURATED SWITCHING TIMES						
Turn-on time	t_{on}					
CNY17-1			3.0	5.5	μS	$I_F = 20 \text{ mA}$, $V_{CE} = 0.4 \text{ V}$
CNY17-2, CNY17-3, CNY17-4			4.2	8.0	μS	$I_F = 10 \text{ mA}$, $V_{CE} = 0.4 \text{ V}$
Rise-time	t_r					
CNY17-1			2.0	4.0	μS	$I_F = 20 \text{ mA}$, $V_{CE} = 0.4 \text{ V}$
CNY17-2, CNY17-3, CNY17-4			3.0	6.0	μS	$I_F = 10 \text{ mA}$, $V_{CE} = 0.4 \text{ V}$
Turn-off time	t_{off}					
CNY17-1			18	34	μS	$I_F = 20 \text{ mA}$, $V_{CE} = 0.4 \text{ V}$
CNY17-2, CNY17-3, CNY17-4			23	39	μS	$I_F = 10 \text{ mA}$, $V_{CE} = 0.4 \text{ V}$
Fall-time	t_f					
CNY17-1			11	20	μS	$I_F = 20 \text{ mA}$, $V_{CE} = 0.4 \text{ V}$
CNY17-2, CNY17-3, CNY17-4			14	24	μS	$I_F = 10 \text{ mA}$, $V_{CE} = 0.4 \text{ V}$

ISOLATION CHARACTERISTICS

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Isolation Voltage	V_{iso}	5300			$V_{AC} \text{ RMS}$	$I_{FO} \leq 1 \mu A$, 1 minute
	V_{iso}	7500			$V_{AC} \text{ PEAK}$	$I_{FO} \leq 1 \mu A$, 1 minute
Isolation resistance	R_{iso}	10^{11}			ohms	$V_{FO} = 500 \text{ VDC}$
Isolation capacitance	C_{iso}		0.5		pF	$f = 1 \text{ MHz}$

ELECTRICAL CHARACTERISTIC CURVES
(25°C Free Air Temperature Unless Otherwise Specified)

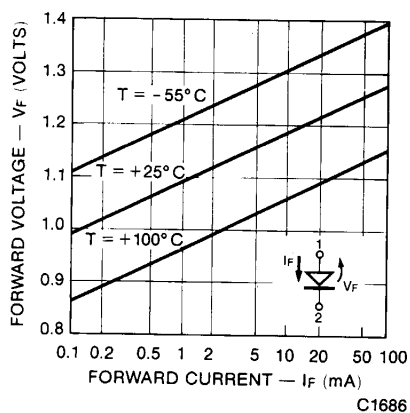


Fig. 1. Forward Voltage vs. Current

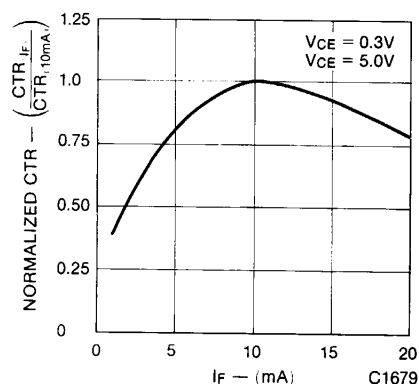


Fig. 2. Normalized CTR vs. Forward Current

ELECTRICAL CHARACTERISTIC CURVES

(25°C Free Air Temperature Unless Otherwise Specified) (Cont'd)

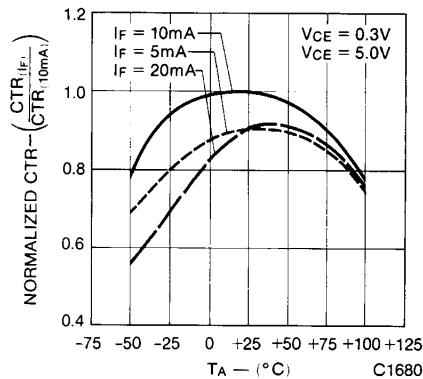


Fig. 3. Normalized CTR vs. Temperature

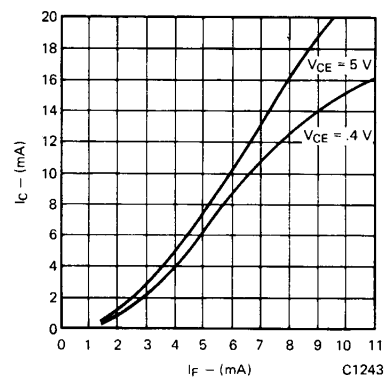


Fig. 4. Collector Current vs. Forward Current

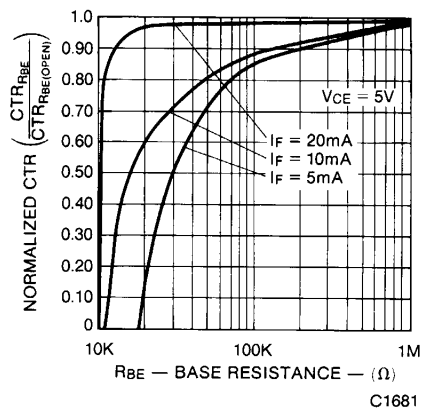


Fig. 5. CTR vs. R_{BE} (Unsaturated)

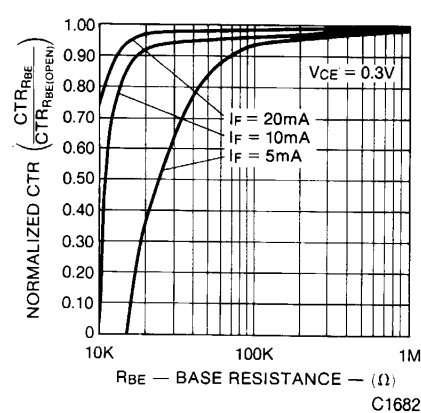


Fig. 6. CTR vs. R_{BE} (Saturated)

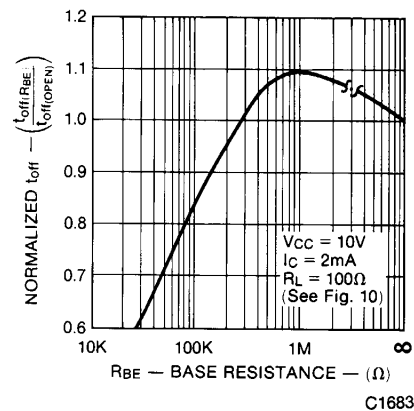


Fig. 7. Normalized T_{OFF} vs. R_{BE}

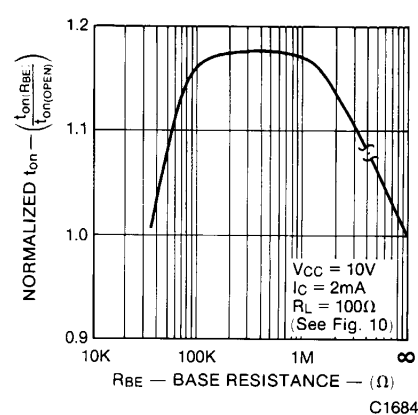


Fig. 8. Normalized T_{ON} vs. R_{BE}

ELECTRICAL CHARACTERISTIC CURVES
(25°C Free Air Temperature Unless Otherwise Specified) (Cont'd)

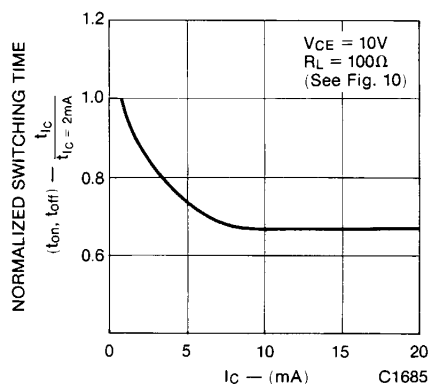


Fig. 9. Switching Time vs. I_C

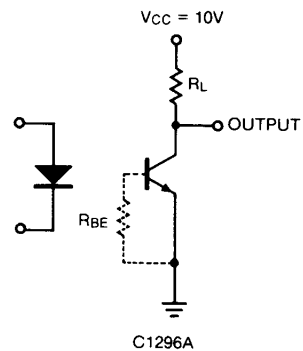


Fig. 10. Switching Time Test Circuit

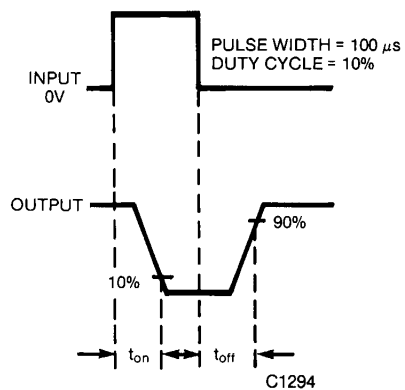


Fig. 11. Switching Time Waveforms