

FEATURES

- **High Current Transfer Ratio**
CNY17-1, 40 to 80%
CNY17-2, 63 to 125%
CNY17-3, 100 to 200%
CNY17-4, 160 to 320%
- **Breakdown Voltage, 5300 VAC_{RMS}**
- **Field-Effect Stable by TRIOS®**
- **Long Term Stability**
- **Industry Standard Dual-In-Line Package**
- **Underwriters Lab File #E52744**
- **VDE #0884, Available with Option 1**

DESCRIPTION

The CNY17 is an optically coupled pair consisting of a Gallium Arsenide infrared emitting diode optically coupled to a silicon NPN phototransistor.

Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output.

The CNY17 can be used to replace relays and transformers in many digital interface applications, as well as analog applications such as CRT modulation.

Maximum Ratings (T_A=25°C)

Emitter	
Reverse Voltage	6 V
Forward Current	60 mA
Surge Current (t ≤ 10 μs)	2.5 A
Power Dissipation	100 mW

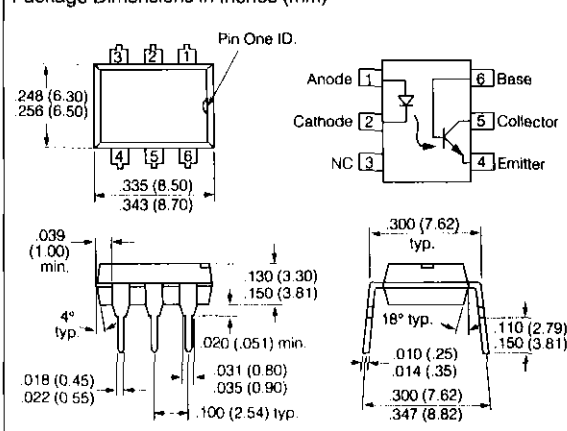
Detector

Collector-Emitter Breakdown Voltage	70 V
Emitter-Base Breakdown Voltage	7 V
Collector Current	50 mA
Collector Current (t < 1 ms)	100 mA
Power Dissipation	150 mW

Package

Isolation Test Voltage (Between emitter & detector referred to climate DIN 40046, part 2, Nov. 74)	5300 VAC _{RMS}
Creepage Distance	≥ 7 mm
Clearance Distance	≥ 7 mm
Isolation Thickness between Emitter and Detector	≥ 0.4 mm
Comparative Tracking Index per DIN IEC 112/ VDE0303, part 1	175
Isolation Resistance	
V _{IO} =500 V, T _A =25°C	≥ 10 ¹² Ω
V _{IO} =500 V, T _A =100°C	≥ 10 ¹¹ Ω
Storage Temperature	-55°C to +150°C
Operating Temperature	-55°C to +100°C
Junction Temperature	100°C
Soldering Temperature (max. 10 s, dip soldering: distance to seating plane ≥ 1.5 mm)	260°C

Package Dimensions in Inches (mm)



Characteristics (T_A=25°C)

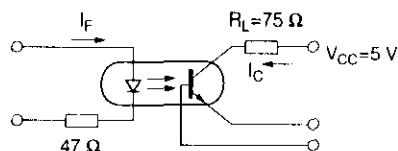
	Symbol	Unit	Condition
Emitter			
Forward Voltage	V _F	1.25 (≤ 1.65) V	I _F = 60 mA
Breakdown Voltage	V _{BR}	≥ 6 V	I _R = 10 μA
Reverse Current	I _R	0.01 (≤ 10) μA	V _R = 6 V
Capacitance		25 pF	V _R = 0 V, f = 1 MHz
Thermal Resistance	R _{thjamb}	750 K/W	
Detector			
Capacitance	C _{CE}	5.2 pF	V _{CE} = 5 V, f = 1 MHz
	C _{CB}	6.5 pF	V _{CB} = 5 V, f = 1 MHz
	C _{EB}	7.5 pF	V _{EB} = 5 V, f = 1 MHz
Thermal Resistance	R _{thjamb}	500 K/W	
Package			
Collector-Emitter Saturation Voltage	V _{CEsat}	0.25 (≤ 0.4) V	I _F = 10 mA, I _C = 2.5 mA
Coupling Capacitance	C _C	0.6 pF	

*TRIOS—Transparent IOn Shield

Current Transfer Ratio and Collector-Emitter Leakage Current by dash number (T_A=25°C)

	-1	-2	-3	-4	Unit
I _C /I _F at V _{CE} =5 V (I _F =10 mA)	40-80	63-125	100-200	160-320	%
I _C /I _F at V _{CE} =5 V (I _F =1 mA)	30 (>13)	45 (>22)	70 (>34)	90 (>56)	%
Collector-Emitter Leakage Current (V _{CE} =10 V) (I _{CEO})	2 (≤ 50)	2 (≤ 50)	5 (≤ 100)	5 (≤ 100)	nA

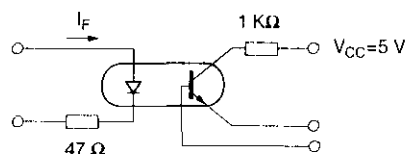
Linear Operation (without saturation)



I_F=10 mA, V_{CC}=5 V, T_A=25°C

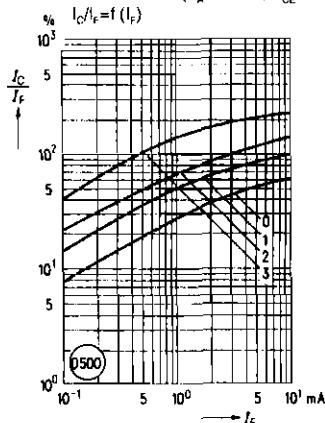
Load Resistance	R _L	75	Ω
Turn-On Time	t _{ON}	3.0	μs
Rise Time	t _R	2.0	μs
Turn-Off Time	t _{OFF}	2.3	μs
Fall Time	t _f	2.0	μs
Cut-Off Frequency	f _{CO}	250	kHz

Switching Operation (with saturation)

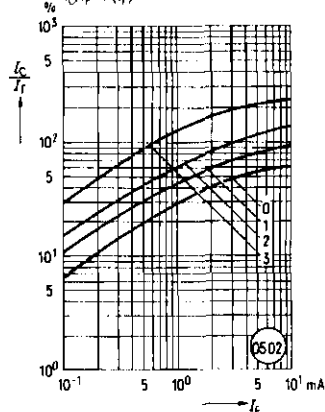


	-1 (I _F =20 mA)	-2 and -3 (I _F =10 mA)	-4 (I _F =5 mA)	
Turn-On Time t _{ON}	3.0	4.2	6.0	μs
Rise Time t _R	2.0	3.0	4.6	μs
Turn-Off Time t _{OFF}	18	23	25	μs
Fall Time t _f	11	14	15	μs

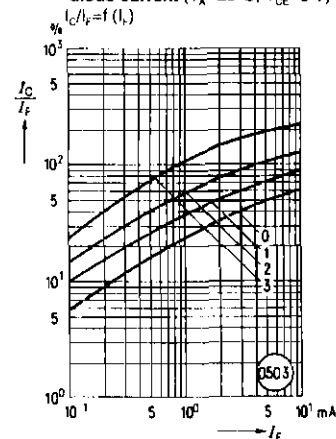
Current transfer ratio versus diode current (T_A=-25°C, V_{CE}=5 V)

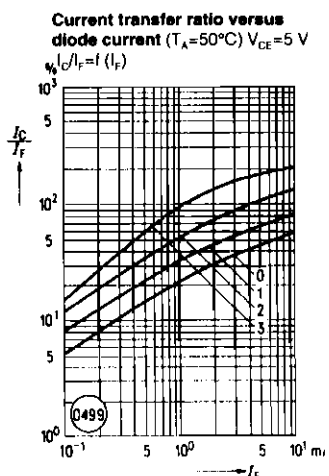


Current transfer ratio versus diode current (T_A=0°C, V_{CE}=5 V)

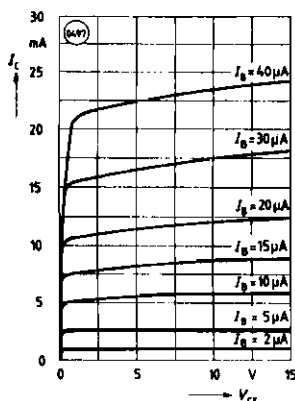


Current transfer ratio versus diode current (T_A=25°C, V_{CE}=5 V)

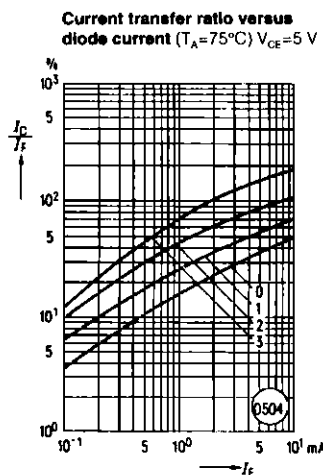
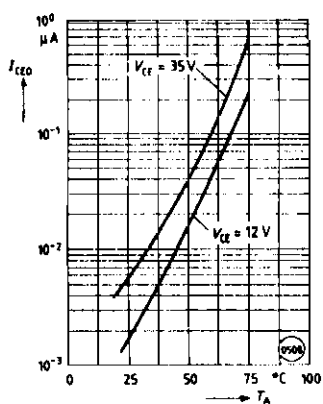




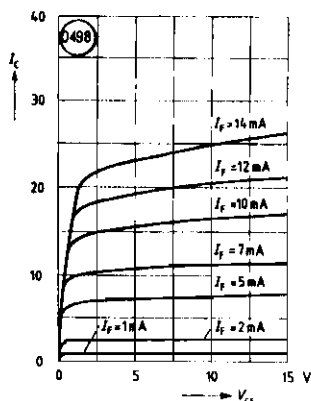
Transistor characteristics ($B=550$)
CNY17-3, -4 $I_C=f(V_{CE})$ ($T_A=25^\circ\text{C}$, $I_F=0$)



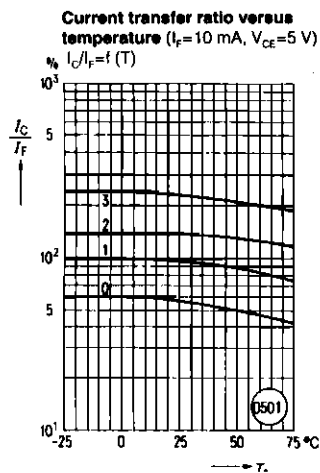
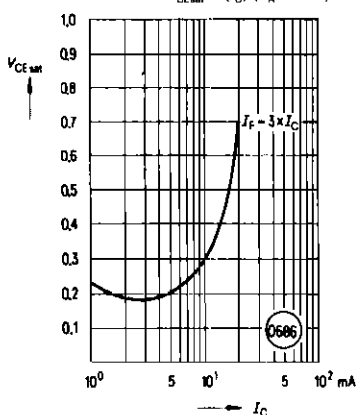
Collector emitter off-state current
 $I_{CEO}=f(V, T)$ ($T_A=25^\circ\text{C}$, $I_F=0$)



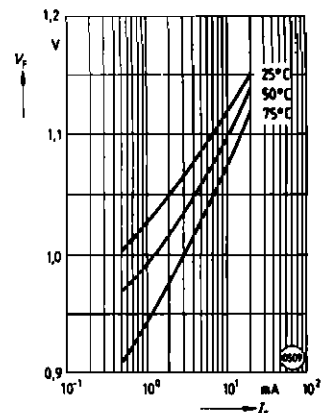
Output characteristics
CNY17-3, -4 ($T_A=25^\circ\text{C}$) $I_C=f(V_{CE})$



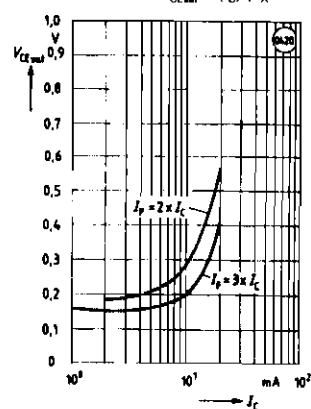
Saturation voltage versus collector current and modulation depth
CNY17-1 $V_{CE(sat)}=f(I_C)$ ($T_A=25^\circ\text{C}$)



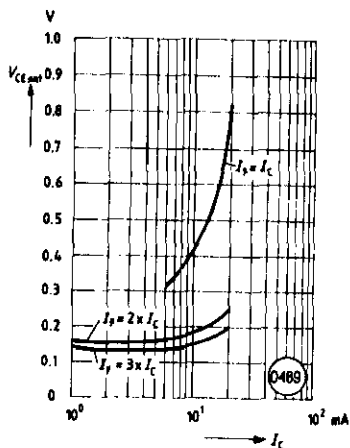
Forward voltage $V_F=f(I_F)$



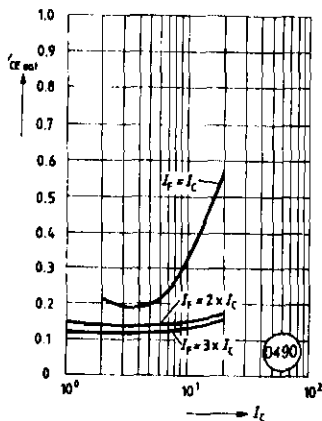
Saturation voltage versus collector current and modulation depth
CNY17-2 $V_{CE(sat)}=f(I_C)$ ($T_A=25^\circ\text{C}$)



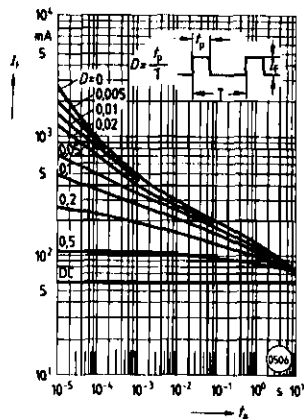
Saturation voltage versus collector current and modulation depth
CNY17-3 $V_{CEsat} = f(I_C)$ ($T_A = 25^\circ\text{C}$)



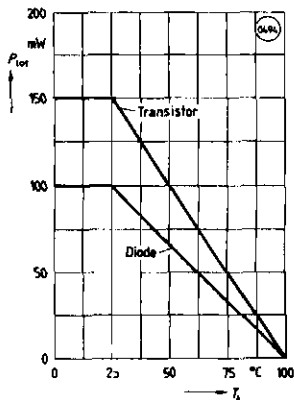
Saturation voltage versus collector current and modulation depth
CNY17-4 $V_{CEsat} = f(I_C)$ ($T_A = 25^\circ\text{C}$)



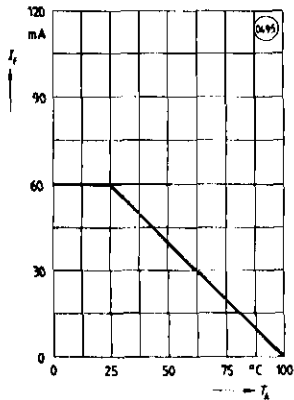
Permissible pulse load
 $D = \text{parameter}$, $T_A = 25^\circ\text{C}$, $I_p = f(t_p)$



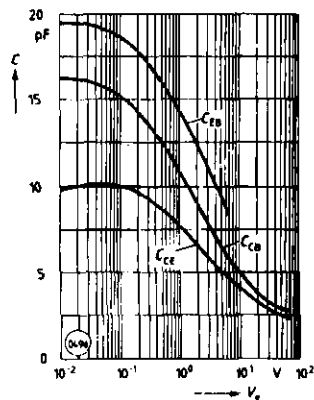
Permissible power dissipation transistor and diode $P_{tot} = f(T_A)$



Permissible forward current $I_F = f(T_A)$



Transistor capacitance
 $C = f(V_C)$ ($T_A = 25^\circ\text{C}$, $f = 1 \text{ MHz}$)



Optocouplers
 (Optoisolators)

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