

SIEMENS

CNY17F SERIES PHOTOTRANSISTOR NO BASE CONNECTION OPTOCOUPLER

FEATURES

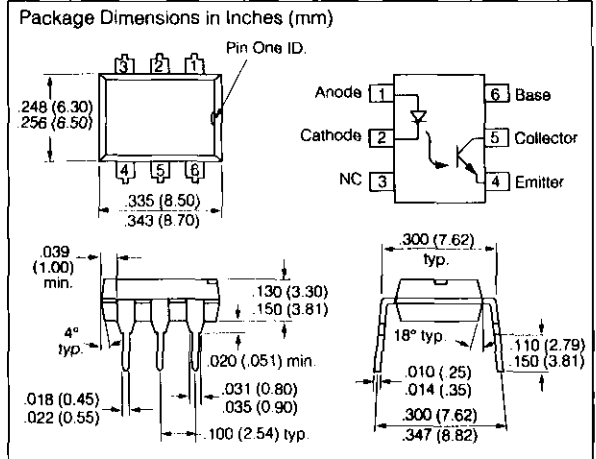
- High Current Transfer Ratio
CNY17F-1, 40-80%
CNY17F-2, 83-125%
CNY17F-3, 100-200%
CNY17F-4, 160-320%
- Breakdown Voltage, 5300 VAC_{RMS}
- High Collector-Emitter Voltage
- V_{CEO}=70 V
- No Base Terminal Connection for Improved Common Mode Interface Immunity
- Field-Effect Stable by TRIOS*
- Long Term Stability
- Industry Standard Dual-In-Line Package
- Underwriters Lab File #E52744
-  VDE #0884, Available with Option 1

DESCRIPTION

The CNY17F is an optocoupler consisting of a Gallium Arsenide infrared emitting diode optically coupled to a silicon planar phototransistor detector in a plastic plug-in DIP-6 package.

The coupling device is suitable for signal transmission between two electrically separated circuits. The potential difference between the circuits to be coupled is not allowed to exceed the maximum permissible reference voltages.

In contrast to the CNY17 Series, the base terminal of the F type is not connected, resulting in a substantially improved common-mode interference immunity.



Maximum Ratings (T_A=25°C)

Emitter	
Reverse Voltage	6 V
OC Forward Current	60 mA
Surge Forward Current (t ≤ 10 μs)	2.5 A
Total Power Dissipation	100 mW
Detector	
Collector-Emitter Breakdown Voltage	70 V
Collector Current	50 mA
Collector Current (t ≤ 1 ms)	100 mA
Total Power Dissipation	150 mW
Package	
Isolation Test Voltage (between emitter and detector referred to standard climate 23/50 DIN 50014)	5300 VAC _{RMS}
Creepage	> 7 mm
Clearance	> 7 mm
Isolation Thickness between Emitter and Detector	≥ 0.4 mm
Comparative Tracking Index per DIN IEC 112/ VDE 0303, part 1	175
Isolation Resistance (V ₁₀ =500 V)	≥ 10 ¹¹ Ω
Storage Temperature Range	-55 to +150°C
Ambient Temperature Range	-55 to +100°C
Junction Temperature	100°C
Soldering Temperature (max. 10 s, dip soldering: distance to seating plane ≥ 1.5 mm)	260°C

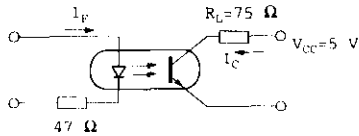
Characteristics (T_A=25°C)

	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	C _O	25 pF	V _R =0 V, f=1 MHz
Thermal Resistance	R _{thJA}	750 K/W	
Detector			
Capacitance	C _{CE}	5.2 pF	V _{CE} =5 V, f=1 MHz
Thermal Resistance	R _{thJA}	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	

Current Transfer Ratio (I_C/I_F at $V_{CE}=5\text{ V}$, 25°C) and Collector-Emitter Leakage Current by dash number

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

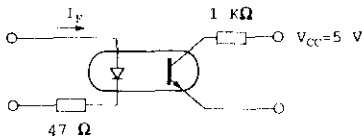
Linear Operation (without saturation)



$I_F=10\text{ mA}$, $V_{CC}=5\text{ V}$, $T_A=25^\circ\text{C}$

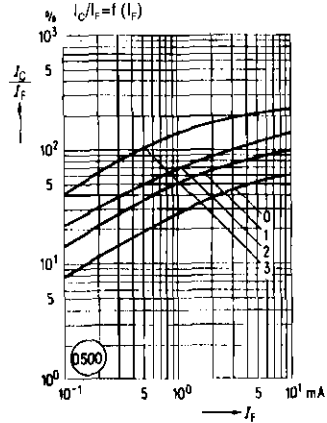
Load Resistance	R_L	75	Ω
Turn-On Time	t_{ON}	3.0	μs
Rise Time	t_R	2.0	μs
Turn-Off Time	t_{OFF}	2.3	μs
Fall Time	t_f	2.0	μs
Cut-Off Frequency	f_{CO}	250	kHz

Switching Operation (with saturation)

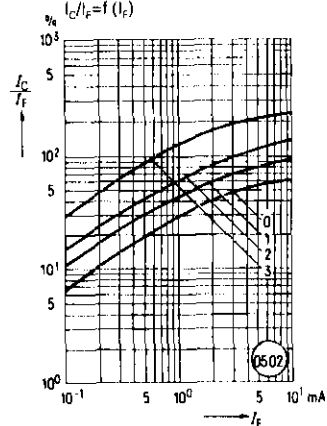


	-1 ($I_F=20\text{ mA}$)	-2 and -3 ($I_F=10\text{ mA}$)	-4 ($I_F=5\text{ mA}$)	
Turn-On Time t_{ON}	3.0	4.2	6.0	μs
Rise Time t_R	2.0	3.0	4.6	μs
Turn-Off Time t_{OFF}	18	23	25	μs
Fall Time t_f	11	14	15	μs

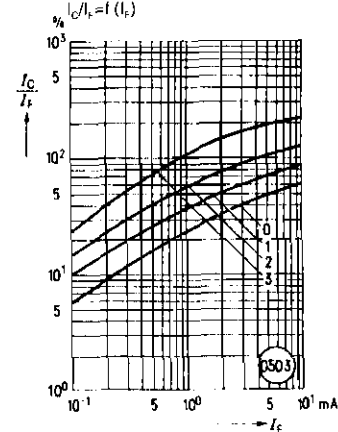
Current transfer ratio versus diode current ($T_A=-25^\circ\text{C}$, $V_{CE}=5\text{ V}$)

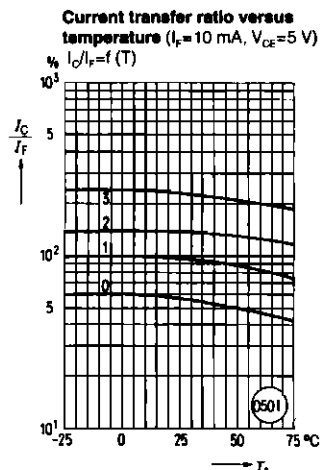
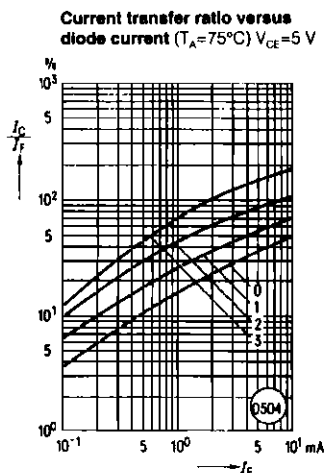
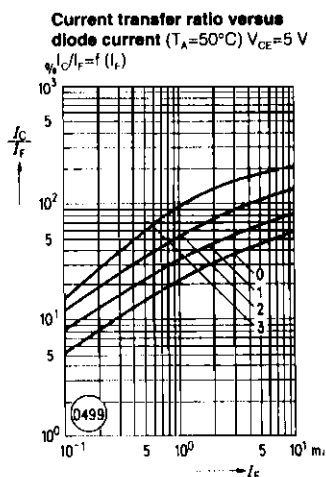


Current transfer ratio versus diode current ($T_A=0^\circ\text{C}$, $V_{CE}=5\text{ V}$)

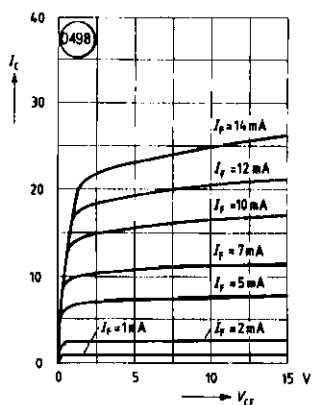


Current transfer ratio versus diode current ($T_A=25^\circ\text{C}$, $V_{CE}=5\text{ V}$)

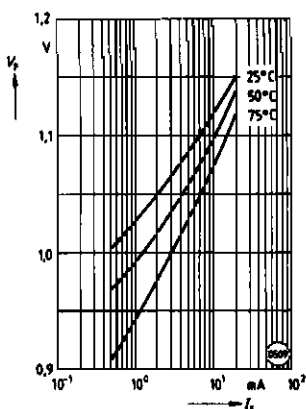




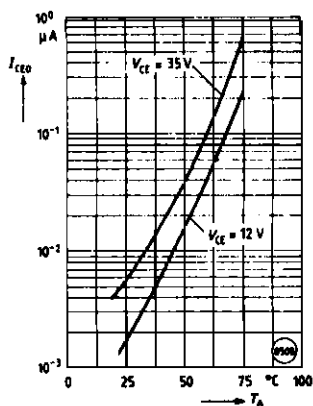
Output characteristics
CNY17F-2, -3 ($T_A=25^\circ\text{C}$) $I_C=f(V_{CE})$



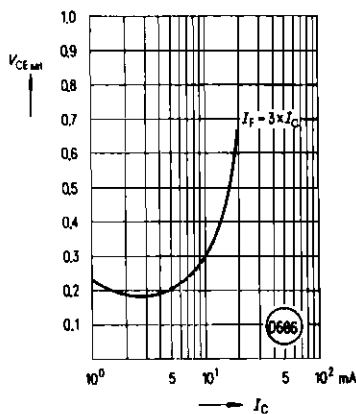
Forward voltage $V_F=f(I_F)$



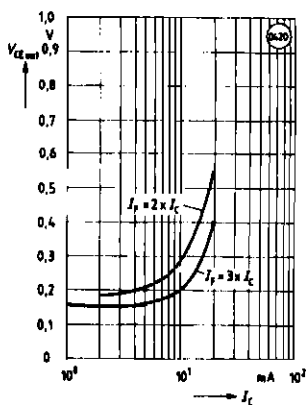
Collector emitter off-state current
 $I_{CEO}=f(V, T)$ ($T_A=25^\circ\text{C}$, $I_F=0$)



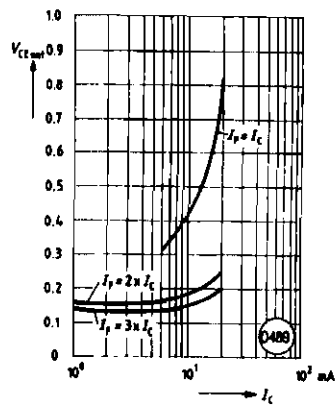
Saturation voltage versus collector current and modulation depth
CNY17F-1 $V_{CEsat}=f(I_C)$ ($T_A=25^\circ\text{C}$)



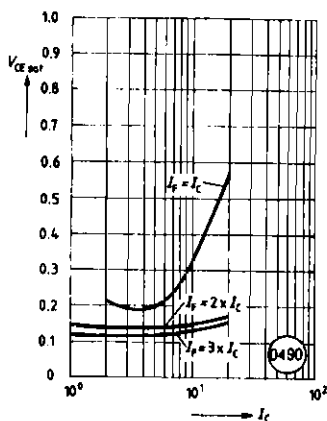
Saturation voltage versus collector current and modulation depth
CNY17F-2 $V_{CEsat}=f(I_C)$ ($T_A=25^\circ\text{C}$)



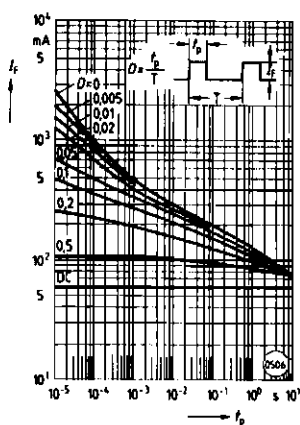
Saturation voltage versus collector current and modulation depth
CNY17F-3 $V_{CEsat}=f(I_C)$ ($T_A=25^\circ\text{C}$)



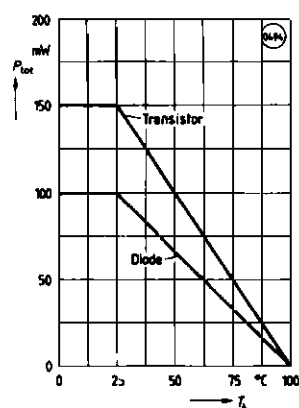
Saturation voltage versus collector current and modulation depth
CNY17F-4 $V_{CEsat}=f(I_C)$ ($T_A=25^\circ\text{C}$)



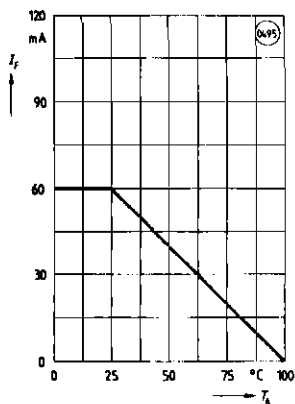
Permissible pulse load
 $D=\text{parameter}$, $T_A=25^\circ\text{C}$, $I_F=f(I_C)$



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



Permissible forward current diode
 $I_F=f(T_A)$



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

