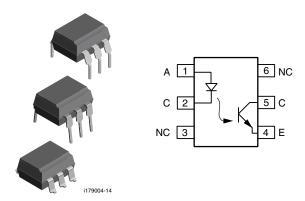


Optocoupler, Phototransistor Output, no Base Connection



DESCRIPTION

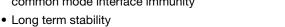
The CNY17F is an optocoupler consisting of a gallium arsenide infrared emitting diode optically coupled to a silicon planar phototransistor detector in a plastic plug-in DIP-6 package.

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 conected, resulting in a substantially improved common-mode interference immunity.

FEATURES

- Isolation test voltage, 5000 V_{RMS}
- No base terminal connection for improved common mode interface immunity



- · Industry standard dual-in-line package
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

CNY17F-3X016

CNY17F-3X017 (1)

CNY17F-3X019 (1)





RoHS COMPLIANT

CNY17F-4X016

CNY17F-4X017 (1)

AGENCY APPROVALS

- UL file no. E52744
- cUL tested to CSA 22.2 bulletin 5A
- DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 (pending), available with option 1
- BSI: EN 60065, EN 60950-1
- FIMKO
- CQC

ORDERING INFORMATION	N						
C N Y 1 7 F - # X 0 # # T PART NUMBER CTR PACKAGE OPTION TAPE AND REEL Option 7 Option 9 8 mm typ.							
AGENCY CERTIFIED/PACKAGE		CTF	R (%)				
UL, cUL, BSI, FIMKO	40 to 80	63 to 125	100 to 200	160 to 320			
DIP-6	CNY17F-1	CNY17F-2	CNY17F-3	CNY17F-4			
DIP-6, 400 mil, option 6	CNY17F-1X006	CNY17F-2X006	CNY17F-3X006	CNY17F-4X006			
SMD-6, option 7	CNY17F-1X007 (1)	CNY17F-2X007T (1)	CNY17F-3X007T (1)	CNY17F-4X007T (1)			
SMD-6, option 9	CNY17F-1X009T (1)	CNY17F-2X009T (1)	CNY17F-3X009T (1)	CNY17F-4X009T (1)			
VDE, UL, cUL, BSI, FIMKO	40 to 80	63 to 125	100 to 200	160 to 320			
DIP-6	CNY17F-1X001	CNY17F-2X001	CNY17F-3X001	CNY17F-4X001			

Notes

• Additional options may be possible, please contact sales office.

CNY17F-1X016

CNY17F-1X017 (1)

CNY17F-1X019

(1) Also available in tubes; do not put T on end.

DIP-6, 400 mil, option 6

SMD-6, option 7

SMD-6, option 9

CNY17F-2X016

CNY17F-2X017 (1)

CNY17F-2X019 (1)



PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Reverse voltage		V_{R}	6	V
DC forward current		I _F	60	mA
Surge forward current	t ≤ 10 µs	I _{FSM}	2.5	Α
Power dissipation		P _{diss}	70	mW
OUTPUT				
Collector emitter breakdown voltage		BV _{CEO}	70	V
Collector current		I _C	50	mA
Collector peak current	$t_p/T = 0.5, t_p \le 10 \text{ ms}$	I _{CM}	100	mA
Output power dissipation		P _{diss}	150	mW
COUPLER				
Isolation test voltage between emitter and detector		V _{ISO}	5000	V_{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/VDE 0303, part 1			≥ 175	
Isolation resistance	V _{IO} = 500 V	R _{IO}	≥ 10 ¹¹	Ω
Storage temperature range		T _{stg}	- 55 to + 150	°C
Ambient temperature range		T _{amb}	- 55 to + 100	°C
Junction temperature		Tj	100	°C
Soldering temperature (1)	2 mm from case, ≤ 10 s	T _{sld}	260	°C

Notes

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not
 implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute
 maximum ratings for extended periods of the time can adversely affect reliability.
- (1) Refer to reflow profile for soldering conditions for surface mounted parts (SMD). Refer to wave profile for soldering conditions for through hole parts (DIP).

ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)									
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT		
INPUT									
Forward voltage	I _F = 60 mA		V _F		1.39	1.65	V		
Breakdown voltage	I _R = 10 μA		V_{BR}	6			V		
Reverse current	V _R = 6 V		I _R		0.01	10	μΑ		
Capacitance	V _R = 0 V, f = 1 MHz		Co		25		pF		
OUTPUT									
Collector emitter capacitance	$V_{CE} = 5 \text{ V}, f = 1 \text{ MHz}$		C _{CE}		5.2		pF		
Base collector capacitance	$V_{CE} = 5 \text{ V}, f = 1 \text{ MHz}$		C _{BC}		6.5		pF		
Emitter base capacitance	V _{CE} = 5 V, f = 1 MHz		C _{EB}		7.5		pF		
COUPLER									
Collector emitter, saturation voltage	$I_F = 10 \text{ mA}, I_C = 2.5 \text{ mA}$		V _{CEsat}		0.25	0.4	V		
Coupling capacitance			C _C		0.6		pF		
Outlies to see the second	V _{CE} = 10 V	CNY17F-1	I _{CEO}		2	50	nA		
		CNY17F-2	I _{CEO}		2	50	nA		
Collector emitter, leakage current		CNY17F-3	I _{CEO}		5	100	nA		
		CNY17F-4	I _{CEO}		5	100	nA		

Note

Minimum and maximum values were tested requierements. Typical values are characteristics of the device and are the result of engineering
evaluations. Typical values are for information only and are not part of the testing requirements.



CURRENT TRANSFER RATIO (T _{amb} = 25 °C, unless otherwise specified)								
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT	
I _C /I _F	I _F = 10 mA	CNY17F-1	CTR	40		80	%	
		CNY17F-2	CTR	63		125	%	
		CNY17F-3	CTR	100		200	%	
		CNY17F-4	CTR	160		320	%	
	I _F = 1 mA	CNY17F-1	CTR	13	30		%	
		CNY17F-2	CTR	22	45		%	
		CNY17F-3	CTR	34	70		%	
		CNY17F-4	CTR	56	90		%	

Note

• Current transfer ratio I_C/I_F at V_{CE} = 5 V, 25 °C and collector emitter leakage current by dash number.

SWITCHING CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
LINEAR OPERATION (without	out saturation)	<u>.</u>					
Turn-on time	I_F = 10 mA, V_{CC} = 5 V, R_L = 75 Ω		t _{on}		3		μs
Rise time	I_F = 10 mA, V_{CC} = 5 V, R_L = 75 Ω		t _r		2		μs
Turn-off time	I_F = 10 mA, V_{CC} = 5 V, R_L = 75 Ω		t _{off}		2.3		μs
Fall time	I_F = 10 mA, V_{CC} = 5 V, R_L = 75 Ω		t _f		2		μs
Cut-off frequency	I_F = 10 mA, V_{CC} = 5 V, R_L = 75 Ω		f _{CO}		110		kHz
SWITCHING OPERATION (V	with saturation)	<u>.</u>					
	I _F = 20 mA	CNY17F-1	t _{on}		3		μs
Turn-on time	I _E = 10 mA	CNY17F-2	t _{on}		4.2		μs
rum-on time	IF = TO THA	CNY17F-3	t _{on}		4.2		μs
	$I_F = 5 \text{ mA}$	CNY17F-4	t _{on}		6		μs
Rise time	I _F = 20 mA	CNY17F-1	t _r		2		μs
	I _F = 10 mA	CNY17F-2	t _r		3		μs
nise time	IF = TO THA	CNY17F-3	t _r		3		μs
	$I_F = 5 \text{ mA}$	CNY17F-4	t _r		4.6		μs
	I _F = 20 mA	CNY17F-1	t _{off}		18		μs
Turn-off time	I _F = 10 mA	CNY17F-2	t _{off}		23		μs
Turn-oπ time	IF = 10 IIIA	CNY17F-3	t _{off}		23		μs
	$I_F = 5 \text{ mA}$	CNY17F-4	t _{off}		25		μs
	I _F = 20 mA	CNY17F-1	t _f		11		μs
Fall time	I _F = 10 mA	CNY17F-2	t _f		14		μs
i all tille	IF = 10 IIIA	CNY17F-3	t _f		14		μs
	I _F = 5 mA	CNY17F-4	t _f		15		μs



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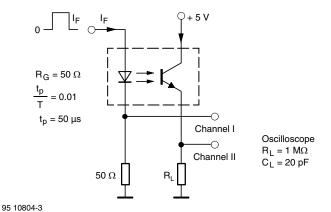


Fig. 1 - Test Circuit, Non-Saturated Operation

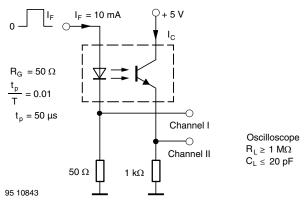


Fig. 2 - Test Circuit, Saturated Operation

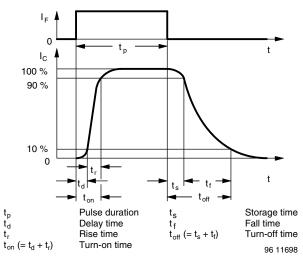


Fig. 3 - Switching Times

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

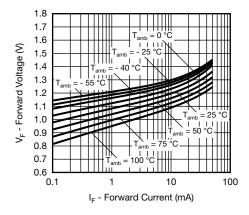


Fig. 4 - Forward Voltage vs. Forward Current

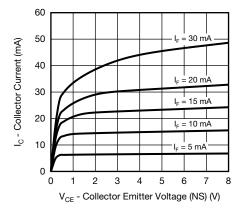


Fig. 5 - Collector Current vs. Collector Emitter Voltage (NS)



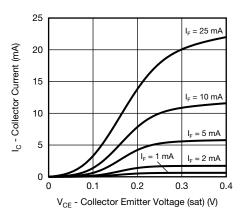


Fig. 6 - Collector Current vs. Collector Emitter Voltage (sat)

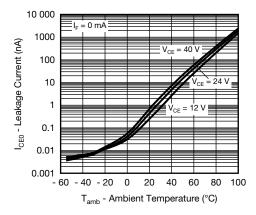


Fig. 7 - Leakage Current vs. Ambient Temperature

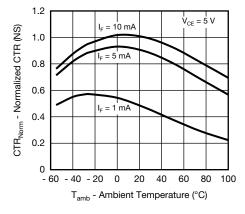


Fig. 8 - Normalized CTR (NS) vs. Ambient Temperature

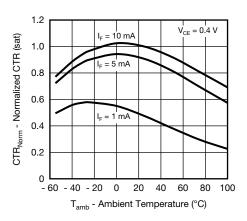


Fig. 9 - Normalized CTR (sat) vs. Ambient Temperature

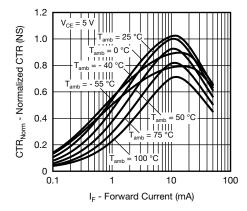


Fig. 10 - Normalized CTR (NS) vs. Forward Current

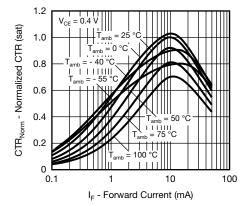


Fig. 11 - Normalized CTR (sat) vs. Forward Current



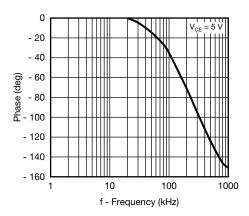


Fig. 12 - CTR Frequency vs. Phase Angle

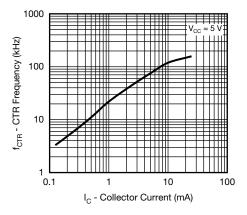


Fig. 13 - CTR Frequency vs. Collector Current

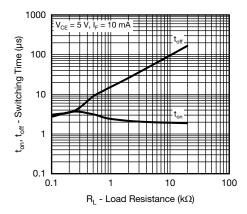
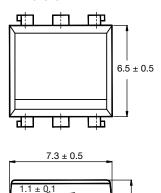
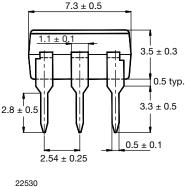


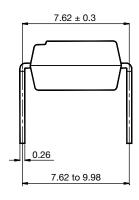
Fig. 14 - Switching Time vs. Load Resistance



PACKAGE DIMENSIONS in millimeters



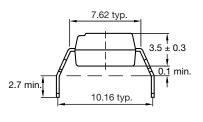


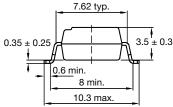


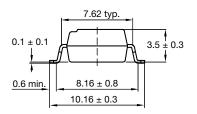
Option 6

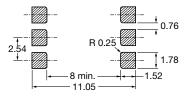
Option 7

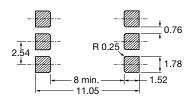
Option 9











20802-34

PACKAGE MARKING



Notes

- VDE logo is only marked on option 1 parts. Option information is not marked on the part.
- Tape and reel suffix (T) is not part of the package marking.



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