

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^{\circ}C$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Reverse voltage		V_R	6.0	V
DC forward current		I_F	60	mA
Surge forward current	$t \leq 10 \mu s$	I_{FSM}	2.5	A
Power dissipation		P_{diss}	100	mW
OUTPUT				
Collector emitter breakdown voltage		BV_{CEO}	70	V
Collector current		I_C	50	mA
Collector peak current	$t_p/T = 0.5, t_p \leq 10 \text{ ms}$	I_{CM}	100	mA
Output power dissipation		P_{diss}	150	mW
COUPLER				
Isolation test voltage between emitter and detector referred to standard climate 23/50 DIN 50014	$t = 1 \text{ min}$	V_{ISO}	5000	V_{RMS}
Storage temperature range		T_{stg}	-55 to +150	°C
Ambient temperature range		T_{amb}	-55 to +110	°C
Soldering temperature ⁽¹⁾	2 mm from case, $\leq 10 \text{ s}$	T_{sld}	260	°C
Total power dissipation		P_{diss}	250	mW

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 devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP).

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}C$, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT							
Forward voltage	$I_F = 60 \text{ mA}$		V_F		1.39	1.65	V
Breakdown voltage	$I_R = 10 \mu A$		V_{BR}	6			V
Reverse current	$V_R = 6 \text{ V}$		I_R		0.01	10	μA
Capacitance	$V_R = 0 \text{ V}, f = 1 \text{ MHz}$		C_O		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	$V_{CE} = 5 \text{ V}, f = 1 \text{ MHz}$		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
Collector emitter, leakage current	$V_{CE} = 10 \text{ V}$	CNY117-1	I_{CEO}		2.0	50	nA
		CNY117-2	I_{CEO}		2.0	50	nA
		CNY117-3	I_{CEO}		5.0	100	nA
		CNY117-4	I_{CEO}		5.0	100	nA

Note

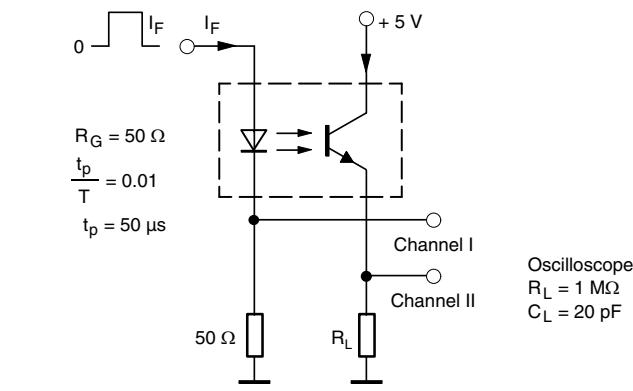
- Minimum and maximum values were tested requirements. Typical values are characteristics of the device and are the result of engineering evaluations. Typical values are for information only and are not part of the testing requirements.

CURRENT TRANSFER RATIO ($T_{amb} = 25^\circ C$, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio	$I_F = 10 \text{ mA}$	CNY117-1	CTR	40		80	%
		CNY117-2	CTR	63		125	%
		CNY117-3	CTR	100		200	%
		CNY117-4	CTR	160		320	%
	$I_F = 1.0 \text{ mA}$	CNY117-1	CTR	13	30		%
		CNY117-2	CTR	22	45		%
		CNY117-3	CTR	34	70		%
		CNY117-4	CTR	56	90		%

Note

- Current transfer ratio I_C/I_F at $V_{CE} = 5.0 \text{ V}$, $25^\circ C$ and collector emitter leakage current by dash number.

SWITCHING CHARACTERISTICS ($T_{amb} = 25^\circ C$, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
LINEAR OPERATION (without saturation)							
Turn-on time	$I_F = 10 \text{ mA}$, $V_{CC} = 5.0 \text{ V}$, $R_L = 75 \Omega$		t_{on}		3.0		μs
Rise time	$I_F = 10 \text{ mA}$, $V_{CC} = 5.0 \text{ V}$, $R_L = 75 \Omega$		t_r		2.0		μs
Turn-off time	$I_F = 10 \text{ mA}$, $V_{CC} = 5.0 \text{ V}$, $R_L = 75 \Omega$		t_{off}		2.3		μs
Fall time	$I_F = 10 \text{ mA}$, $V_{CC} = 5.0 \text{ V}$, $R_L = 75 \Omega$		t_f		2.0		μs
Cut-off frequency	$I_F = 10 \text{ mA}$, $V_{CC} = 5.0 \text{ V}$, $R_L = 75 \Omega$		f_{CO}		110		kHz
SWITCHING OPERATION (with saturation)							
Turn-on time	$I_F = 20 \text{ mA}$	CNY117-1	t_{on}		3.0		μs
	$I_F = 10 \text{ mA}$	CNY117-2	t_{on}		4.2		μs
		CNY117-3	t_{on}		4.2		μs
Rise time	$I_F = 5.0 \text{ mA}$	CNY117-4	t_{on}		6.0		μs
	$I_F = 20 \text{ mA}$	CNY117-1	t_r		2.0		μs
		CNY117-2	t_r		3.0		μs
		CNY117-3	t_r		3.0		μs
Turn-off time	$I_F = 5.0 \text{ mA}$	CNY117-4	t_r		4.6		μs
	$I_F = 20 \text{ mA}$	CNY117-1	t_{off}		18		μs
		CNY117-2	t_{off}		23		μs
		CNY117-3	t_{off}		23		μs
Fall time	$I_F = 5.0 \text{ mA}$	CNY117-4	t_{off}		25		μs
	$I_F = 20 \text{ mA}$	CNY117-1	t_f		11		μs
		CNY117-2	t_f		14		μs
		CNY117-3	t_f		14		μs
	$I_F = 5.0 \text{ mA}$	CNY117-4	t_f		15		μs



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Fig. 1 - Test Circuit, Non-Saturated Operation

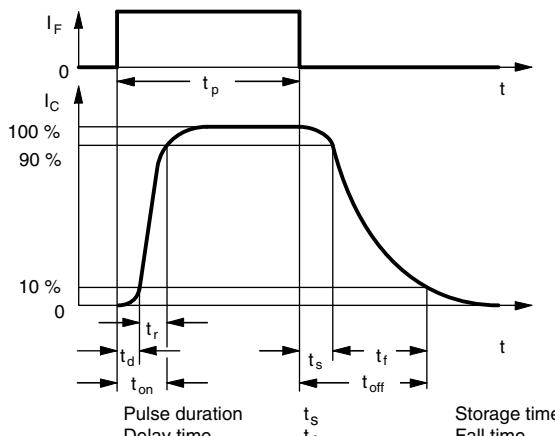


Fig. 3 - Switching Times

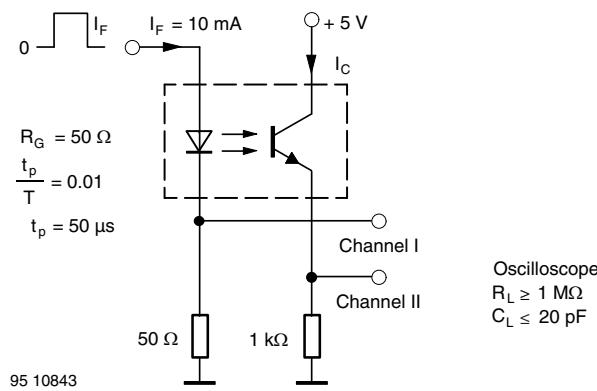


Fig. 2 - Test Circuit, Saturated Operation

SAFETY AND INSULATION RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
MAXIMUM SAFETY RATINGS			
Output safety power	P _{SO}	700	mW
Input safety current	I _{SI}	400	mA
Safety temperature	T _{SI}	175	°C
Comparative tracking index	CTI	175	
INSULATION RATED PARAMETERS			
Maximum withstanding isolation voltage	V _{ISO}	5000	V _{RMS}
Maximum transient isolation voltage	V _{IOTM}	8000	V _{peak}
Maximum repetitive peak isolation voltage	V _{IORM}	890	V _{peak}
Insulation resistance	T _{amb} = 25 °C, V _{DC} = 500 V	R _{IO}	≥ 10 ¹² Ω
Isolation resistance	T _{amb} = 100 °C, V _{DC} = 500 V	R _{IO}	≥ 10 ¹¹ Ω
Climatic classification (according to IEC 68 part 1)			55/115/21
Environment (pollution degree in accordance to DIN VDE 0109)			2
Creepage distance	Standard DIP-4		≥ 7 mm
	SMD		≥ 7 mm
Clearance distance	Standard DIP-4		≥ 8 mm
	SMD		≥ 8 mm
Insulation thickness	DTI	≥ 0.4	mm

Note

- As per DIN EN 60747-5-5, § 7.4.3.8.2, this optocoupler is suitable for “safe electrical insulation” only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits.

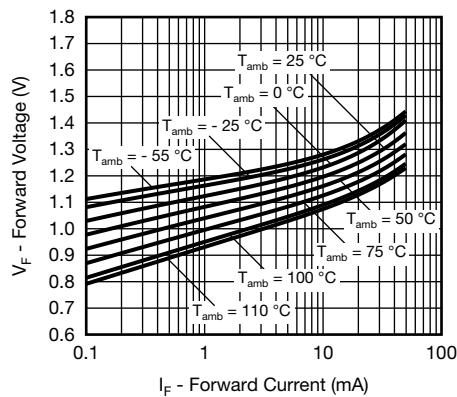
TYPICAL CHARACTERISTICS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)


Fig. 4 - Forward Voltage vs. Forward Current

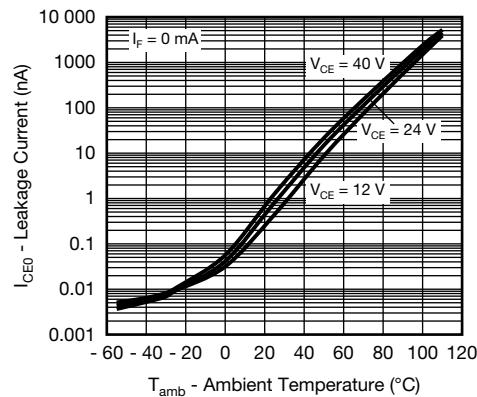


Fig. 7 - Leakage Current vs. Ambient Temperature

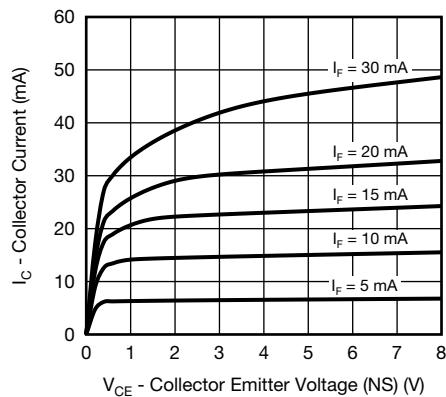


Fig. 5 - Collector Current vs. Collector Emitter Voltage (NS)

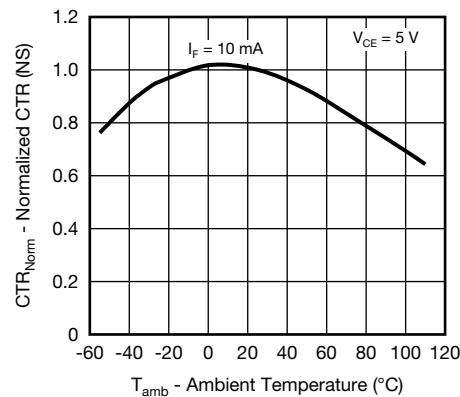


Fig. 8 - Normalized CTR (NS) vs. Ambient Temperature

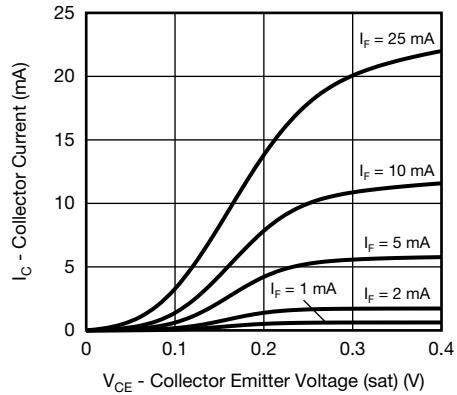


Fig. 6 - Collector Current vs. Collector Emitter Voltage (sat)

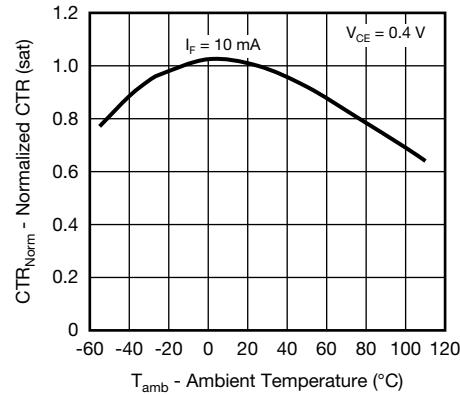


Fig. 9 - Normalized CTR (sat) vs. Ambient Temperature

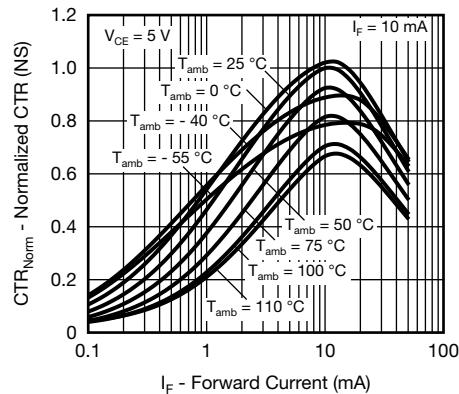


Fig. 10 - Normalized CTR (NS) vs. Forward Current

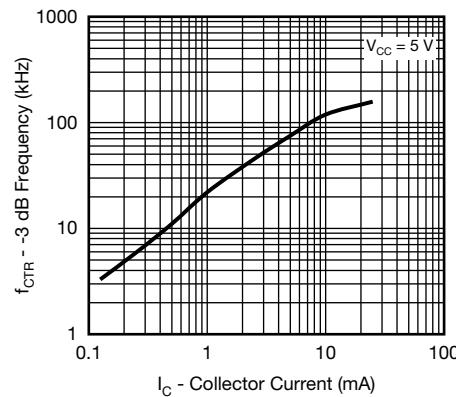


Fig. 13 - CTR -3 dB Frequency vs. Collector Current

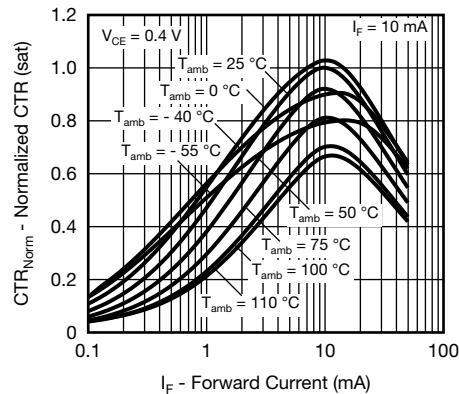


Fig. 11 - Normalized CTR (sat) vs. Forward Current

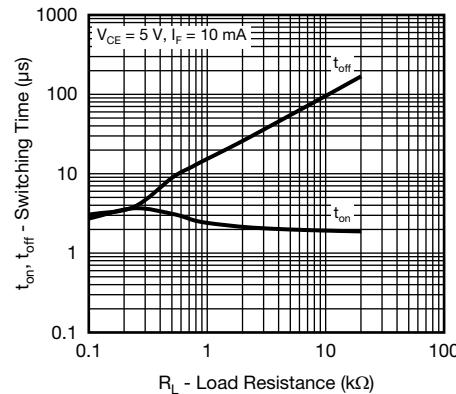


Fig. 14 - Switching Time vs. Load Resistance

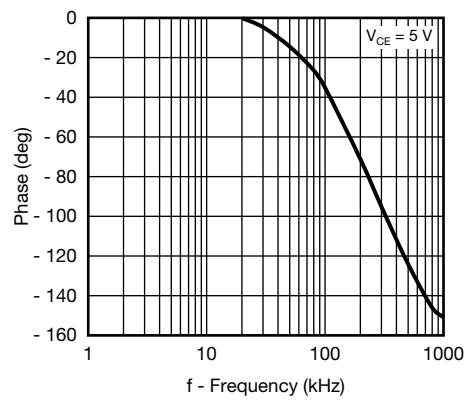
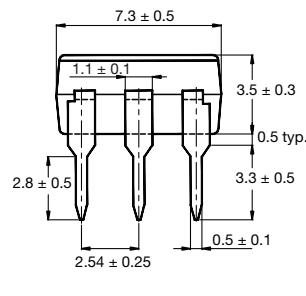
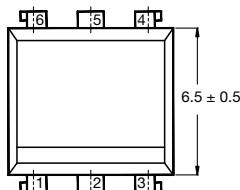
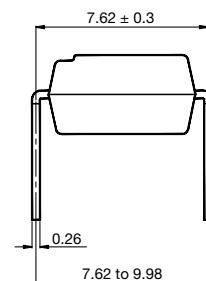
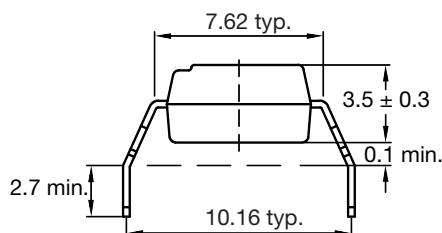
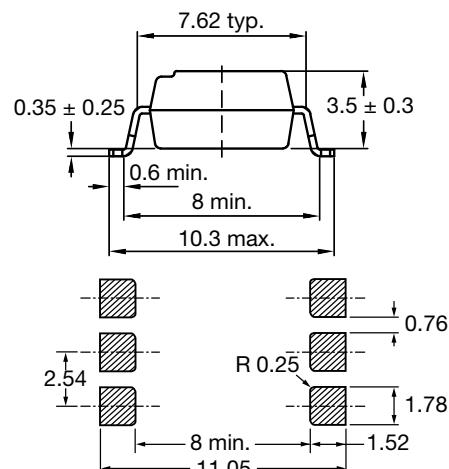


Fig. 12 - CTR Frequency vs. Phase Angle

PACKAGE DIMENSIONS in millimeters

Option 6

Option 7


20802-35


PACKAGE MARKING (Example of CNY117-3X017T)

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.

TUBE AND TAPE INFORMATION

DEVICES PER TUBE			
TYPE	UNITS/TUBE	TUBES/BOX	UNITS/BOX
DIP-6	50	40	2000

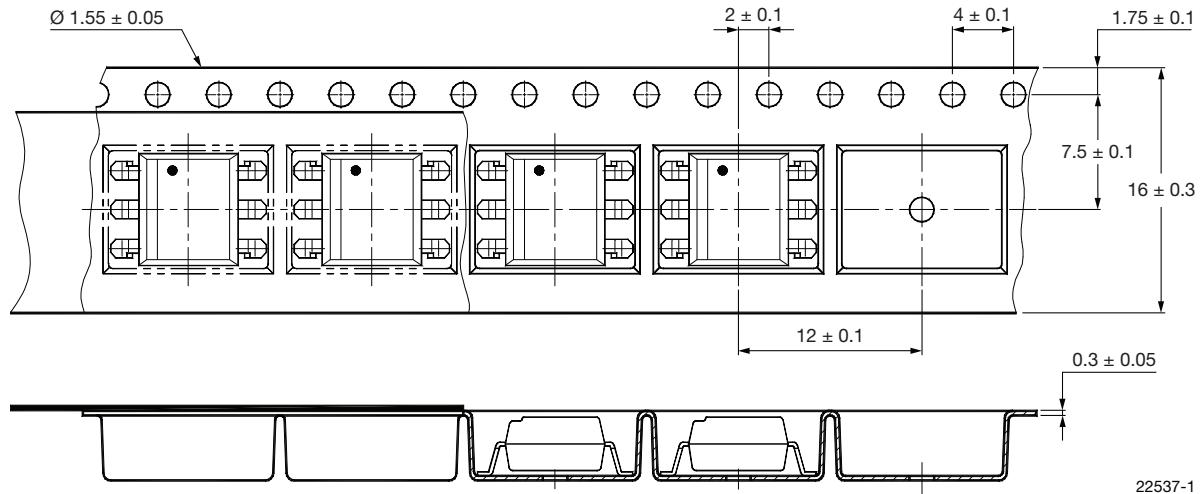


Fig. 15 - Tape and Reel Drawing, 1000 Units per Reel

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