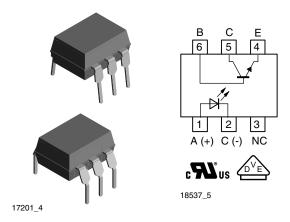


Vishay Semiconductors

Optocoupler, Phototransistor Output, with Base Connection



DESCRIPTION

The CNY75A, CNY75B, CNY75C, CNY75GA, CNY75GB, CNY75GC consists of a phototransistor optically coupled to a gallium arsenide infrared-emitting diode in a 6 pin plastic dual inline package.

AGENCY APPROVALS

- UL1577, file no. E52744, double protection
- BSI: BS EN 41003, BS EN 60095 (BS 415), BS EN 60950 (BS 7002), pending
- DIN EN 60747-5-5 (VDE 0884)
- FIMKO (SETI): EN 60950, certificate no. FI25155

FEATURES

- Isolation materials according to UL 94-VO
- Pollution degree 2 (DIN/VDE 0110/resp. IEC 60664)
- Climatic classification 55/110/21 (IEC 60068 part 1)
- Low temperature coefficient of CTR
- CTR offered in 3 groups
- Rated isolation voltage (RMS includes DC) V_{IOWM} = 600 V_{RMS} (848 V peak)
- Rated recurring peak voltage (repetitive) $V_{IORM} = 600 V_{RMS}$
- Rated impulse voltage (transient overvoltage) $V_{IOTM} = 6 kV_{peak}$
- Isolation test voltage (partial discharge test voltage) V_{pd} = 1.6 kV
- Creepage current resistance according to VDE 0303/ IEC 60112 comparative tracking index: CTI \geq 325
- Thickness through insulation $\ge 0.4 \text{ mm}$
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

APPLICATIONS

- · Switch-mode power supplies
- Line receiver
- · Computer peripheral interface
- · Microprocessor system interface
- Circuits for safe protective separation against electrical shock according to safety class II (reinforced isolation):
- for appl. class I IV at mains voltage $\leq 300~V$
- for appl. class I III at mains voltage $\leq 600~V$
- according to DIN EN 60747-5-5 (VDE 0884)

ORDER INFORMATION ⁽¹⁾					
PART	REMARKS				
CNY75A	CTR 63 % to 125 %, DIP-6				
CNY75B	CTR 100 % to 200 %, DIP-6				
CNY75C	CTR 160 % to 320 %, DIP-6				
CNY75GA	CTR 63 % to 125 %, DIP-6, 400 mil				
CNY75GB	CTR 100 % to 200 %, DIP-6, 400 mil				
CNY75GC	CTR 160 % to 320 %, DIP-6, 400 mil				

Note

⁽¹⁾ G = leadform 10.16 mm; G is not marked on the body.



ROHS COMPLIANT



Optocoupler, Phototransistor Output, Vishay Semiconductors with Base Connection

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
	TEST CONDITION	STWBOL	VALUE	UNIT
INPUT				
Reverse voltage		V _R	5	V
Forward current		I _F	60	mA
Forward surge current	$t_p \le 10 \ \mu s$	I _{FSM}	3	А
Power dissipation		P _{diss}	70	mW
Junction temperature		Т _і	125	°C
OUTPUT	·	·	• •	
Collector base voltage		V _{CBO}	70	V
Collector emitter voltage		V _{CEO}	70	V
Emitter collector voltage		V _{ECO}	7	V
Collector current		Ι _C	50	mA
Collector peak current	$t_p/T = 0.5, t_p \le 10 \text{ ms}$	I _{CM}	100	mA
Power dissipation		P _{diss}	70	mW
Junction temperature		Т _і	125	°C
COUPLER		,		
AC isolation test voltage (RMS)		V _{ISO}	5000	V _{RMS}
Total power dissipation		P _{tot}	200	mW
Ambient temperature range		T _{amb}	- 55 to + 110	°C
Storage temperature range		T _{stg}	- 55 to + 125	°C
Soldering temperature ⁽²⁾	2 mm from case, t \leq 10 s	T _{sld}	260	°C

Notes

 $^{(1)}$ T_{amb} = 25 °C, unless otherwise specified.

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.

⁽²⁾ Refer to wave profile for soldering conditions for through hole devices.

ELECTRICAL CHARACTERISTCS ⁽¹⁾								
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT	
INPUT								
Forward voltage	I _F = 50 mA		VF		1.25	1.6	V	
Reverse current	V _R = 6 V		I _R			10	μΑ	
Junction capacitance	V _R = 0 V, f = 1 MHz		Cj		50		pF	
OUTPUT								
Collector base voltage	I _C = 100 μA		V _{CBO}	70			V	
Collector emitter voltage	$I_{\rm C} = 1 \rm{mA}$		V _{CEO}	70			V	
Emitter collector voltage	I _E = 100 μA		V _{ECO}	7			V	
Collector emitter leakage current	V _{CE} = 20 V, I _F = 0 A		I _{CEO}			150	nA	
COUPLER								
Collector emitter saturation voltage	$I_{\rm F} = 10 \text{ mA}, I_{\rm C} = 1 \text{ mA}$		V _{CEsat}			0.3	V	
Cut-off frequency	$V_{CE} = 5 \text{ V}, \text{ I}_{F} = 10 \text{ mA},$ $R_{L} = 100 \Omega$		f _c		110		kHz	
Coupling capacitance	f = 1 MHz		C _k		0.6		pF	

Note

⁽¹⁾ $T_{amb} = 25 \text{ °C}$, unless otherwise specified.

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.



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CURRENT TRANSFER RATIO									
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT		
I _C /I _F		CNY75GA	CTR	15			%		
	$V_{CE} = 5 \text{ V}, \text{ I}_{F} = 1 \text{ mA}$	CNY75GB	CTR	30			%		
		CNY75GC	CTR	60			%		
		CNY75GA	CTR	63		125	%		
	$V_{CE} = 5 V, I_F = 10 mA$	CNY75GB	CTR	100		200	%		
		CNY75GC	CTR	160		320	%		

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
		CNY75GA	I _F		10		mA
Current time	$V_{CC} = 5 \text{ V}, \text{ R}_{L} = 100 \Omega$	CNY75GB	١ _F		10		mA
		CNY75GC	I _F		10		mA
		CNY75GA	t _d		2		μs
Delay time	V_{CC} = 5 V, R_L = 100 Ω	CNY75GB	t _d		2.5		μs
		CNY75GC	t _d		2.8		μs
		CNY75GA	t _r		2.5		μs
Rise time	$V_{CC} = 5 \text{ V}, \text{ R}_{L} = 100 \Omega$	CNY75GB	tr		3		μs
		CNY75GC	t _r		4.2		μs
		CNY75GA	t _f		2.7		μs
Fall time	$V_{CC} = 5 \text{ V}, \text{ R}_{L} = 100 \Omega$	CNY75GB	t _f		3.7		μs
		CNY75GC	t _f		4.7	2 2.5 2.8 2.5 3 4.2 2.7 3.7 4.7 0.3 0.3 0.3 4.5 5.5 7 3 4 5 10	μs
		CNY75GA	t _s		0.3		μs
Storage time	V_{CC} = 5 V, R_L = 100 Ω	CNY75GB	ts		0.3		μs
		CNY75GC	t _s		2.7 3.7 4.7 0.3 0.3 0.3 4.5 5.5	μs	
		CNY75GA	t _{on}		4.5		μs
Turn-on time	V_{CC} = 5 V, R_L = 100 Ω	CNY75GB	t _{on}		5.5		μs
		CNY75GC	t _{on}		7	10 10 10 10 10 10 10 2 2.5 2.8 2.5 3 4.2 2.7 3.7 4.2 2.7 3.7 4.7 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 10 6.5 11 25	μs
		CNY75GA	t _{off}		3		μs
Turn-off time	V_{CC} = 5 V, R_L = 100 Ω	CNY75GB	t _{off}		4		μs
		CNY75GC	t _{off}		5		μs
		CNY75GA	t _{on}		10		μs
Turn-on time	$V_{CC} = 5 \text{ V}, \text{ R}_{L} = 1 \text{ k}\Omega$	CNY75GB	t _{on}		16.5		μs
		CNY75GC	t _{on}		11		μs
		CNY75GA	t _{off}		25		μs
Turn-off time	$V_{CC} = 5 \text{ V}, \text{ R}_{L} = 1 \text{ k}\Omega$	CNY75GB	t _{off}		20		μs
		CNY75GC	t _{off}		37.5		μs



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MAXIMUM SAFETY RATINGS ⁽¹⁾								
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT		
INPUT								
Forward current		IF			130	mA		
OUTPUT								
Power dissipation		P _{diss}			265	mW		
COUPLER	COUPLER							
Rated impulse voltage		V _{IOTM}			6	kV		
Safety temperature		T _{si}			150	°C		

Note

⁽¹⁾ According DIN EN 60747-5-5. This optocoupler is suitable for safe electrical isolation only within the safety ratings. Compliance with the safety ratings shall be ensured by means of suitable protective circuits.

INSULATION RATED PARAMETERS								
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT		
Partial discharge test voltage - routine test	100 %, t _{test} = 1 s	V_{pd}	1.6			kV		
Partial discharge test voltage -	t _{Tr} = 60 s, t _{test} = 10 s,	VIOTM	6			kV		
lot test (sample test)	(see figure 1)	V _{pd}	1.3			kV		
Insulation resistance	V _{IO} = 500 V	R _{IO}	10 ¹²			Ω		
	$V_{IO}=500~V,~T_{amb}\leq 100~^{\circ}C$	R _{IO}	10 ¹¹			Ω		
	V_{IO} = 500 V, $T_{amb} \le$ 150 °C (construction test only)	R _{IO}	10 ⁹			Ω		

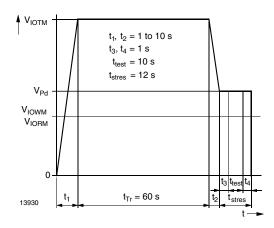


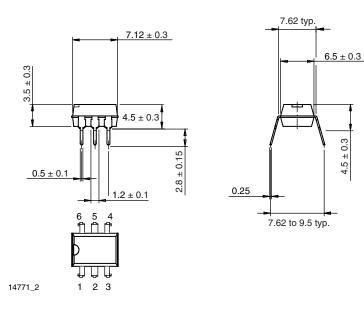
Fig. 1 - Test Pulse Diagram for Sample Test according to DIN EN 60747-5-5 (VDE 0884)/DIN EN 60747-; IEC60747

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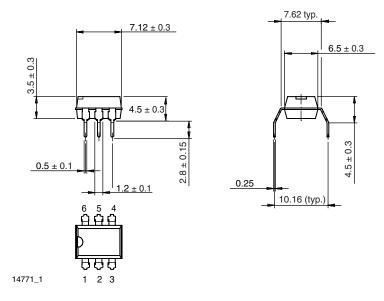


PACKAGE DIMENSIONS in millimeters

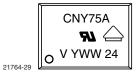
DIP-6



DIP-6, 400 mil



PACKAGE MARKING





Vishay

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