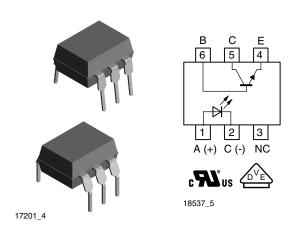
Vishay Semiconductors



Optocoupler, Phototransistor Output, with Base Connection



DESCRIPTION

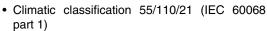
The CNY75A, CNY75B, CNY75C, CNY75GA, CNY75GB, CNY75GC consists of a phototransistor optically coupled to a gallium arsenide infrared-emitting diode in a 6 pin plastic dual inline package.

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)





COMPLIANT

• 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) $V_{IOTM} = 6 \text{ kV}_{peak}$
- 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 ≥ 325
- Thickness through insulation ≥ 0.4 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 ≤ 300 V
 - for appl. class I III at mains voltage ≤ 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.



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ABSOLUTE MAXIMUM RATINGS ⁽¹⁾							
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT			
INPUT	·						
Reverse voltage		V _R	5	V			
Forward current		I _F	60	mA			
Forward surge current	t _p ≤ 10 μs	I _{FSM}	3	Α			
Power dissipation		P _{diss}	70	mW			
Junction temperature		T _j	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		I _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		T _j	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 ≤ 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.

⁽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	$I_F = 50 \text{ mA}$		V_{F}		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	OUTPUT							
Collector base voltage	I _C = 100 μA		V_{CBO}	70			V	
Collector emitter voltage	I _C = 1 mA		V_{CEO}	70			V	
Emitter collector voltage	I _E = 100 μA		V_{ECO}	7			V	
Collector emitter leakage current	$V_{CE} = 20 \text{ V}, I_F = 0 \text{ A}$		I _{CEO}			150	nA	
COUPLER								
Collector emitter saturation voltage	$I_F = 10 \text{ mA}, I_C = 1 \text{ mA}$		V _{CEsat}			0.3	V	
Cut-off frequency	V_{CE} = 5 V, I_F = 10 mA, R_L = 100 Ω		f _c		110		kHz	
Coupling capacitance	f = 1 MHz		C _k		0.6		pF	

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.

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

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



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

SWITCHING CHA	RACTERISTICS						
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
		CNY75GA	I _F		10		mA
Current time	$V_{CC} = 5 \text{ V}, R_L = 100 \Omega$	CNY75GB	I _F		10		mA
		CNY75GC	IF		10		mA
		CNY75GA	t _d		2		μs
Delay time	$V_{CC} = 5 \text{ V}, R_L = 100 \Omega$	CNY75GB	t _d		2.5		μs
		CNY75GC	t _d		2.8		μs
		CNY75GA	t _r		2.5		μs
Rise time	$V_{CC} = 5 \text{ V}, R_L = 100 \Omega$	CNY75GB	t _r		3		μs
		CNY75GC	t _r		4.2		μs
		CNY75GA	t _f		2.7		μs
Fall time	$V_{CC} = 5 \text{ V}, R_L = 100 \Omega$	CNY75GB	t _f		3.7		μs
		CNY75GC	t _f		4.7		μs
		CNY75GA	t _s		0.3		μs
Storage time	$V_{CC} = 5 \text{ V}, R_L = 100 \Omega$	CNY75GB	ts		0.3		μs
		CNY75GC	t _s		0.3		μs
		CNY75GA	t _{on}		4.5		μs
Turn-on time	$V_{CC} = 5 \text{ V}, R_L = 100 \Omega$	CNY75GB	t _{on}		5.5		μs
		CNY75GC	t _{on}		7		μs
		CNY75GA	t _{off}		3		μs
Turn-off time	$V_{CC} = 5 \text{ V}, R_L = 100 \Omega$	CNY75GB	t _{off}		4		μs
		CNY75GC	t _{off}		5		μs
		CNY75GA	t _{on}		10		μs
Turn-on time	$V_{CC} = 5 \text{ V}, R_L = 1 \text{ k}\Omega$	CNY75GB	t _{on}		16.5		μs
		CNY75GC	t _{on}		11		μs
		CNY75GA	t _{off}		25		μs
Turn-off time	$V_{CC} = 5 \text{ V}, R_L = 1 \text{ k}\Omega$	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		I _F			130	mA	
OUTPUT							
Power dissipation		P _{diss}			265	mW	
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 -	$t_{Tr} = 60 \text{ s}, t_{test} = 10 \text{ s},$ (see figure 1)	V_{IOTM}	6			kV	
lot test (sample test)		V_{pd}	1.3			kV	
Insulation resistance	V _{IO} = 500 V	R _{IO}	10 ¹²			Ω	
	$V_{IO} = 500 \text{ V}, T_{amb} \leq 100 ^{\circ}\text{C}$	R _{IO}	10 ¹¹			Ω	
	V _{IO} = 500 V, T _{amb} ≤ 150 °C (construction test only)	R _{IO}	10 ⁹			Ω	

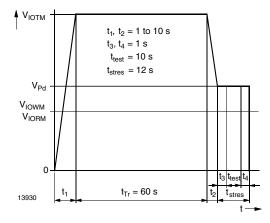
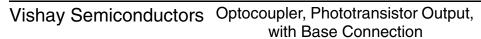


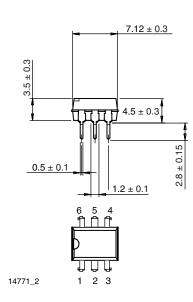
Fig. 1 - Test Pulse Diagram for Sample Test according to DIN EN 60747-5-5 (VDE 0884)/DIN EN 60747-; IEC60747

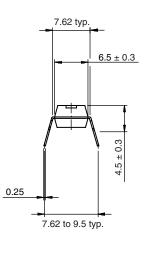




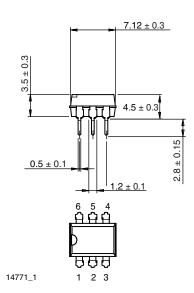
PACKAGE DIMENSIONS in millimeters

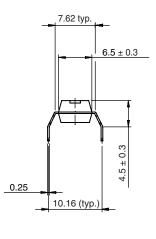
DIP-6



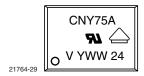


DIP-6, 400 mil





PACKAGE MARKING





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