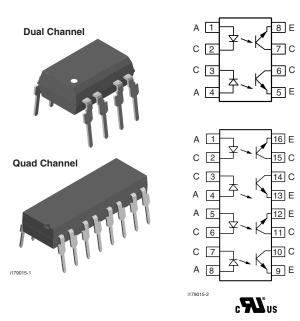


Vishay Semiconductors

RoHS

COMPLIANT

Optocoupler, Phototransistor Output (Multichannel)



DESCRIPTION

The CNY74-2H, CNY74-4H is an optically coupled pair with a GaAlAs infrared LED and a silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output.

The CNY74-2H, CNY74-4H is especially for driving medium-speed logic, where it may be used to eliminate troublesome ground loop and noise problems. Also it can be used to replace relays and transformers in many digital interface applications, as well as analog applications such as CTR modulation.

The CNY74-2H has two isolated channels in a single DIP package; the CNY74-4H has four isolated channels per package.

ORDER INFORMATION					
PART	REMARKS				
CNY74-2H	CTR 50 % to 600 %, dual channel DIP-8				
CNY74-4H	CTR 50 % to 600 %, quad channel DIP-16				

ABSOLUTE MAXIMUM RATINGS								
PARAMETER TEST CONDITION PART SYMBOL VALUE UNIT								
INPUT								
Peak reverse voltage			V _R	3	V			
Forward continuous current			١ _F	60	mA			
Power dissipation			P _{diss}	100	mW			
Derate linearly from 55 %				1.33	mW/°C			

FEATURES

- CNY74-2H, CNY74-4H TTL compatible
- Transfer ratio, 35 % typical
- Coupling capacitance, 0.5 pF
- Dual and quad channel
- Industry standard DIP packages
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

AGENCY APPROVALS

- UL1577, file no. E52744 system code H, double protection
- UL1577, file no. E52744, equivalent to CSA bulletin 5A

Vishay Semiconductors Optocoupler, Phototransistor Output



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(Multi	chai	nne	el)		

PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
OUTPUT			•	• • • •	
Collector emitter breakdown voltage			BV _{CEO}	70	V
Emitter collector breakdown voltage			BV _{ECO}	7	V
Power dissipation			P _{diss}	150	mW
Derate linearly from 25 °C				2	mW/°C
COUPLER					
Isolation test voltage	t = 1 s		V _{ISO}	5300	V _{RMS}
Isolation resistance	V _{IO} = 500 V, T _{amb} = 25 °C		R _{IO}	≥ 10 ¹²	Ω
	$V_{IO} = 500 \text{ V}, \text{ T}_{amb} = 100 ^{\circ}\text{C}$		R _{IO}	≥ 10 ¹¹	Ω
Total package dissipation		CNY74-2H	P _{tot}	400	mW
Total package dissipation		CNY74-4H	P _{tot}	500	mW
Derate linearly from 25 °C		CNY74-2H		5.33	mW/°C
Derate linearly from 25°C		CNY74-4H		6.67	mW/°C
Creepage distance				≥ 7	mm
Clearance distance				≥ 7	mm
Storage temperature			T _{stg}	- 55 to + 150	°C
Operating temperature			T _{amb}	- 55 to + 100	°C
Lead soldering time at 260 °C				10	s

Note

 $T_{amb} = 25 \ ^{\circ}C$, 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.

ELECTRICAL CHARACTERISTICS								
PARAMETER TEST CONDITION SYMBOL MIN. TYP. MAX.								
INPUT								
Forward voltage	I _F = 20 mA	V _F		1.3	1.5	V		
Reverse current	V _R = 3 V	I _R		0.1	100	μA		
Capacitance	V _R = 0 V	Co		25		pF		
OUTPUT								
Collector emitter breakdown voltage	$I_{\rm C} = 1 \rm{mA}$	BV _{CEO}	70			V		
Collector emitter leakage current	$V_{CE} = 5 V, I_F = 0 A$	I _{CEO}			100	nA		
Capacitance collector emitter	V _{CE} = 0 V, f = 1 Hz	C _{CE}		10		pF		
COUPLER								
Saturation voltage, collector emitter	I _C = 2 mA, I _F = 16 mA	V _{CEsat}		0.3	0.5	V		
Resistance (input to output)		R _{IO}		100		GΩ		
Capacitance (input to output)		C _{IO}		0.5		pF		

Note

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

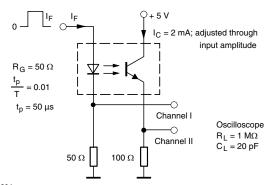
Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

CURRENT TRANSFER RATIO							
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT	
DC current transfer ratio	I _F = 5 mA, V _{CE} = 5 V	CTR	50		600	%	
DC current transfer ratio	$I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V}$	CTR	60			%	



Optocoupler, Phototransistor Output Vishay Semiconductors (Multichannel)

SWITCHING CHARACTERISTICS							
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Delay time	$V_S = 5 V$, $I_C = 2 mA$, $R_L = 100 \Omega$ (see figure 1)	t _d		3		μs	
Rise time	$V_S = 5 V$, $I_C = 2 mA$, $R_L = 100 \Omega$ (see figure 1)	t _r		3		μs	
Fall time	$V_S = 5 V$, $I_C = 2 mA$, $R_L = 100 \Omega$ (see figure 1)	t _f		4.7		μs	
Storage time	$V_S = 5 V$, $I_C = 2 mA$, $R_L = 100 \Omega$ (see figure 1)	t _s		0.3		μs	
Turn-on time	$V_S = 5 V$, $I_C = 2 mA$, $R_L = 100 \Omega$ (see figure 1)	t _{on}		6		μs	
Turn-off time	$V_S = 5 V$, $I_C = 2 mA$, $R_L = 100 \Omega$ (see figure 1)	t _{off}		5		μs	
Turn-on time	$V_{S} = 5 \text{ V}, I_{C} = 10 \text{ mA}, R_{L} = 1 \text{ k}\Omega \text{ (see figure 2)}$	t _{on}		9		μs	
Turn-off time	$V_S = 5 \text{ V}, I_C = 10 \text{ mA}, R_L = 1 \text{ k}\Omega \text{ (see figure 2)}$	t _{off}		18		μs	



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Fig. 1 - Test Circuit, Non-Saturated Operation

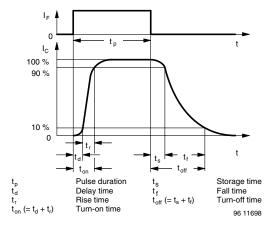


Fig. 3 - Switching Times

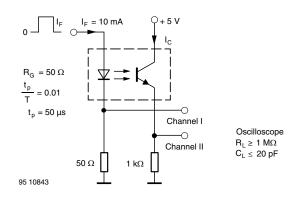


Fig. 2 - Test Circuit, Saturated Operation

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TYPICAL CHARACTERISTICS

T_{amb} = 25 °C, unless otherwise specified

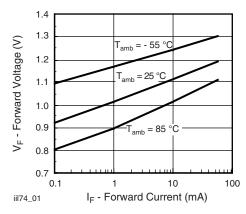


Fig. 4 - Forward Voltage vs. Forward Current

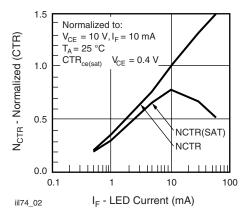
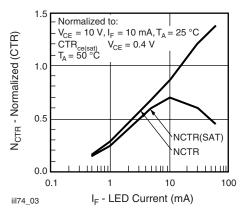
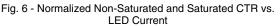


Fig. 5 - Normalized Non-Saturated and Saturated CTR vs. LED Current





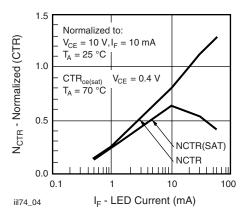


Fig. 7 - Normalized Non-Saturated and Saturated CTR vs. LED Current

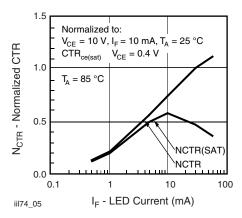


Fig. 8 - Normalized Non-Saturated and Saturated CTR vs. LED Current

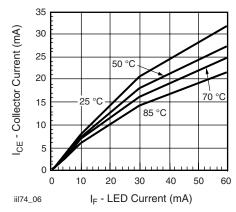


Fig. 9 - Collector Emitter Current vs. Temperature and LED Current



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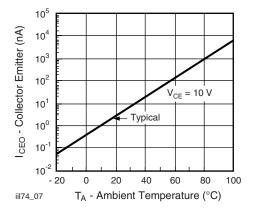


Fig. 10 - Collector Emitter Leakage Current vs. Temperature

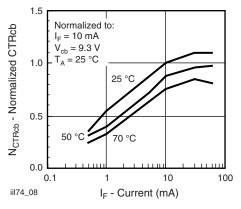


Fig. 11 - Normalized CTR_{cb} vs. LED Current and Temperature

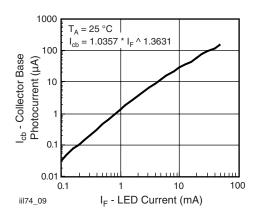


Fig. 12 - Collector Base Photocurrent vs. LED Current

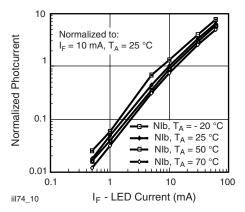


Fig. 13 - Normalized Photocurrent vs. I_F and Temperature

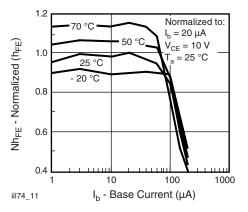


Fig. 14 - Normalized Non-Saturated h_{FE} vs. Base Current and Temperature

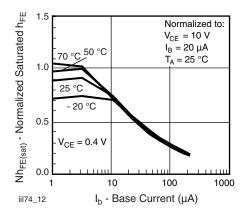


Fig. 15 - Normalized Saturated h_{FE} vs. Base Current and Temperature



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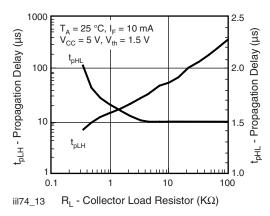
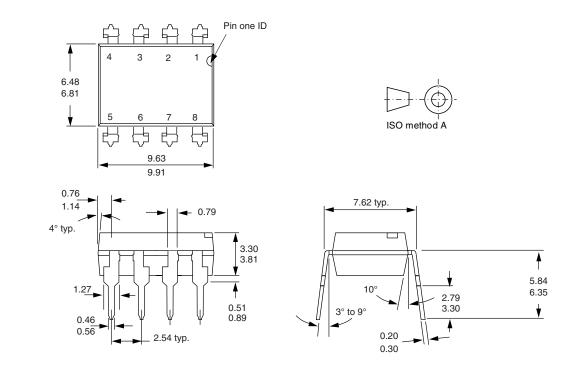


Fig. 16 - Propagation Delay vs. Collector Load Resistor

PACKAGE DIMENSIONS in millimeters

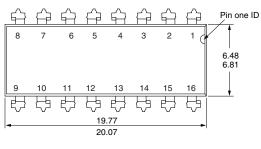


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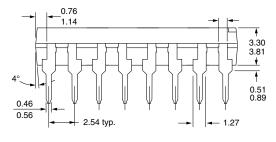


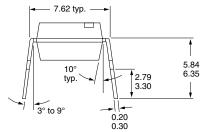
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PACKAGE DIMENSIONS in millimeters



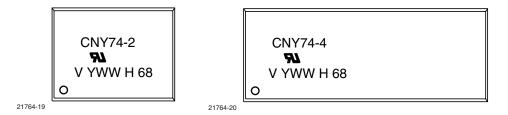






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PACKAGE MARKING



Note

CNY74-2H and CNY74-4H are marked as CNY74-2 and CNY74-4 respectively.



Vishay

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