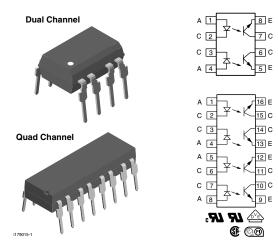


Optocoupler, Phototransistor Output (Dual, Quad Channel)



LINKS TO ADDITIONAL RESOURCES



DESCRIPTION

The ILD74, ILQ74 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 ILD74, ILQ74 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 ILD74 has two isolated channels in a single DIP package; the ILQ74 has four isolated channels per package.

FEATURES

- ILD74, ILQ74 TTL compatible
- Transfer ratio, 35 % typical
- · Coupling capacitance, 0.5 pF
- · Single, dual, and quad channel
- Industry standard DIP packages
- Material categorization:

for definitions of compliance please www.vishav.com/doc?99912





see

RoHS

AGENCY APPROVALS

- <u>UL</u> / <u>cUL</u> 1577
- DIN EN 60747-5-5 (VDE 0884-5), available with option 1

ILQ74-X001

- CQC
- CSA 93751
- FIMKO: ILQ74 series
- FIMKO: ILD74 series

ORDERING INFORMATION Option 6 7 Χ 0 Т 1 PART NUMBER PACKAGE OPTION TAPE AND RFFI x = D (Dual) or Q (Quad) **DUAL CHANNEL QUAD CHANNEL AGENCY CERTIFIED / PACKAGE CTR (%)** UL, cUL, CQC, CSA, FIMKO ≥ 12.5 ≥ 12.5 DIP-8 ILD74 ILD74-X009T SMD-8, option 9 ILQ74 DIP-16 SMD-16, option 9 ILQ74-X009T (1) VDE, UL, cUL, CQC, CSA, FIMKO ≥ **12.5** ≥ 12.5

Notes

DIP-16

Rev. 1.8, 15-Apr-2021

- · Additional options may be possible, please contact sales office
- (1) Also available in tubes, do not put "T" on the end



ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)								
PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT			
INPUT								
Peak reverse voltage			V_R	3	V			
Forward continuous current			I _F	60	mA			
Power dissipation			P _{diss}	100	mW			
Derate linearly from 55 %				1.33	mW/°C			
OUTPUT								
Collector emitter breakdown voltage			BV _{CEO}	20	V			
Emitter collector breakdown voltage			BV _{ECO}	5	V			
Collector base breakdown voltage			BV _{CBO}	70	V			
Power dissipation			P _{diss}	150	mW			
Derate linearly from 25 °C				2	mW/°C			
COUPLER								
Total control distinction		ILD74	P _{tot}	400	mW			
Total package dissipation		ILQ74	P _{tot}	500	mW			
Derate linearly from 25 °C		ILD74		5.33	mW/°C			
		ILQ74		6.67	mW/°C			
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

• 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 (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
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 _C = 1 mA	BV _{CEO}	20	50	-	V
Collector emitter leakage current	$V_{CE} = 5 \text{ V}, I_F = 0 \text{ A}$	I _{CEO}	-	5	500	nA
Capacitance collector emitter	$V_{CE} = 0 \text{ V}, f = 1 \text{ Hz}$	C _{CE}	-	10	-	pF
COUPLER						
Saturation voltage, collector emitter	$I_C = 2 \text{ mA}, I_F = 16 \text{ mA}$	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

 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 (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
DC current transfer ratio	$I_F = 16 \text{ mA}, V_{CE} = 5 \text{ V}$	CTR _{DC}	12.5	35	-	%



SWITCHING CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION SYMBOL MIN. TYP. MAX. UNIT					
Switching times	$R_L = 100 \Omega$, $V_{CE} = 10 V$, $I_C = 2 mA$	t _{on} , t _{off}	-	3	-	μs

SAFETY AND INSULATION RATINGS						
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT		
Climatic classification	According to IEC 68 part 1		55 / 100 / 21			
Comparative tracking index		CTI	175			
Maximum rated withstanding isolation voltage	t = 1 min	V _{ISO}	4420	V _{RMS}		
Maximum transient isolation voltage		V _{IOTM}	10 000	V _{peak}		
Maximum repetitive peak isolation voltage		V_{IORM}	890	V _{peak}		
Isolation resistance	$V_{IO} = 500 \text{ V}, T_{amb} = 25 ^{\circ}\text{C}$	R _{IO}	≥ 10 ¹²	Ω		
Isolation resistance	V _{IO} = 500 V, T _{amb} = 100 °C	R _{IO}	≥ 10 ¹¹	Ω		
Output safety power		P _{SO}	400	mW		
Input safety current		I _{SI}	275	mA		
Safety temperature		T _S	175	°C		
Creepage distance			≥ 7	mm		
Clearance distance			≥ 7	mm		
Insulation thickness		DTI	≥ 0.4	mm		

Note

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

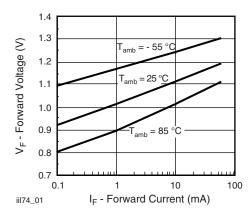


Fig. 1 Forward Voltage vs. Forward Current

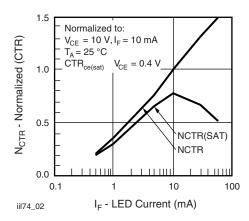


Fig. 1 - Normalized Non-Saturated and Saturated CTR vs. LED Current

As per IEC 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



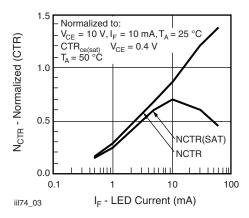


Fig. 2 - Normalized Non-Saturated and Saturated CTR vs. LED Current

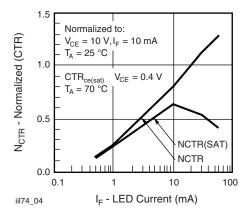


Fig. 3 - Normalized Non-Saturated and Saturated CTR vs. LED Current

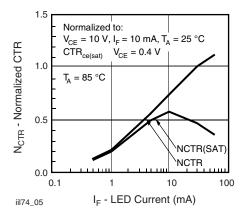


Fig. 4 - Normalized Non-Saturated and Saturated CTR vs. LED Current

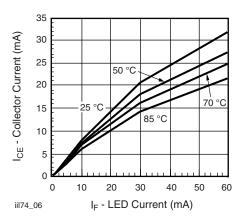


Fig. 5 - Collector Emitter Current vs. Temperature and LED Current

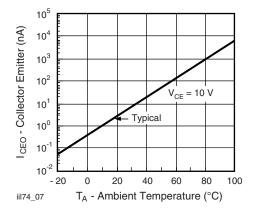


Fig. 6 - Collector Emitter Leakage Current vs. Temperature

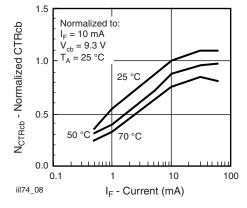
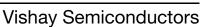


Fig. 7 - Normalized CTR_cb vs. LED Current and Temperature





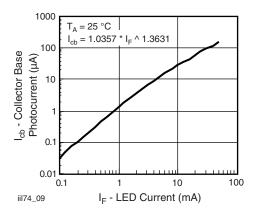


Fig. 8 - Collector Base Photocurrent vs. LED Current

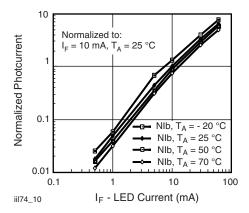


Fig. 9 - Normalized Photocurrent vs. I_F and Temperature

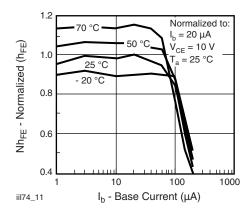


Fig. 10 - Normalized Non-Saturated h_{FE} vs. Base Current and Temperature

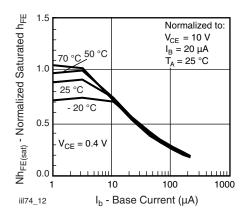


Fig. 11 - Normalized Saturated h_{FE} vs. Base Current and Temperature

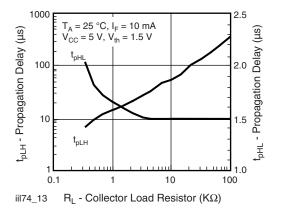
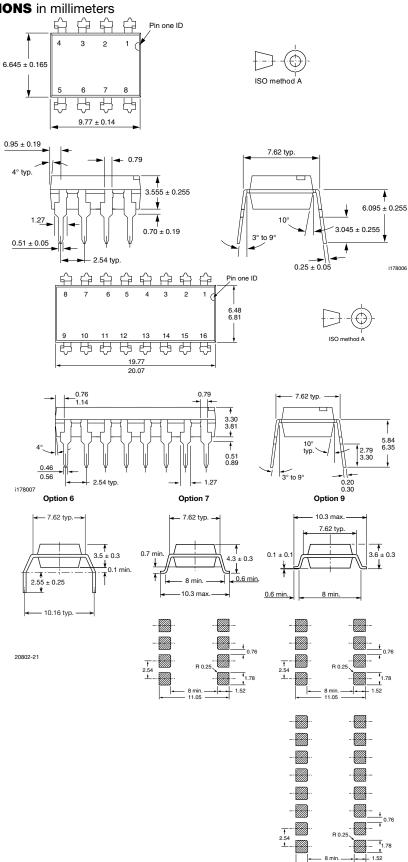


Fig. 12 - Propagation Delay vs. Collector Load Resistor



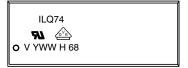
PACKAGE DIMENSIONS in millimeters





PACKAGE MARKING





Notes

- Only options 1 and 7 reflected in the package marking
- The VDE logo is only marked on option 1 parts
- Tape and reel suffix (T) is not part of the package marking



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