Optocoupler, Phototransistor Output
(Dual, Quad Channel)

Dual Channel

Quad Channel

i179015-1

FEATURES

- ILD74, ILQ74 TTL compatible
- Transfer ratio, 35 % typical
- Coupling capacitance, 0.5 pF
- Single, 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 or J, double protection
- CSA 93751
- BSI IEC 60950; IEC 60065
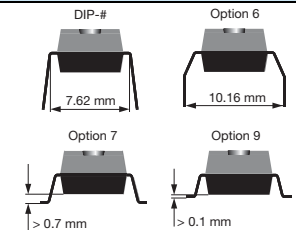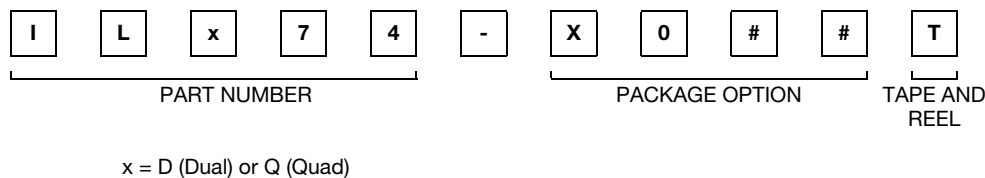- DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 pending available with option 1
- FIMKO

 RoHS COMPLIANT

DESCRIPTION

The ILD74, ILQ74 is an optically coupled pair with a GaAIAs 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.

ORDERING INFORMATION

I	L	x	7	4	-	X	0	#	#	T

PART NUMBER   PACKAGE OPTION   TAPE AND REEL

x = D (Dual) or Q (Quad)

DIP-# 7.62 mm Option 6 10.16 mm Option 7 > 0.7 mm Option 9 > 0.1 mm

AGENCY CERTIFIED/PACKAGE	DUAL CHANNEL	QUAD CHANNEL
	CTR (%)	
UL, CSA, BSI, FIMKO	**≥ 12.5**	**≥ 12.5**
DIP-8	ILD74	-
SMD-8, option 9	ILD74-X009T [1]	-
DIP-16	-	ILQ74
SMD-16, option 9	-	ILQ74-X009T [1]
VDE, UL, CSA, BSI, FIMKO	**≥ 12.5**	**≥ 12.5**
DIP-8	ILD74-X001	-
DIP-8, 400 mil, option 6	ILD74-X016	-
SMD-8, option 7	ILD74-X017T	-
DIP-16	-	ILQ74-X001

Notes
- Additional options may be possible, please contact sales office.
- [1] Also available in tubes, do not put "T" on the end.

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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					
Isolation test voltage	t = 1 s		V_{ISO}	5300	V_{RMS}
Isolation resistance	V_{IO} = 500 V, T_{amb} = 25 °C		R_{IO}	$\geq 10^{12}$	Ω
	V_{IO} = 500 V, T_{amb} = 100 °C		R_{IO}	$\geq 10^{11}$	Ω
Total package dissipation		ILD74	P_{tot}	400	mW
		ILQ74	P_{tot}	500	mW
Derate linearly from 25 °C		ILD74		5.33	mW/°C
		ILQ74		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

- 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	C_O		25		pF
OUTPUT						
Collector emitter breakdown voltage	I_C = 1 mA	BV_{CEO}	20	50		V
Collector emitter leakage current	V_{CE} = 5 V, I_F = 0 A	I_{CEO}		5	500	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

- 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 mA, V_{CE} = 5 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 Ω, V_{CE} = 10 V, I_C = 2 mA	t_{on}, t_{off}		3		µs

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

iil74_01
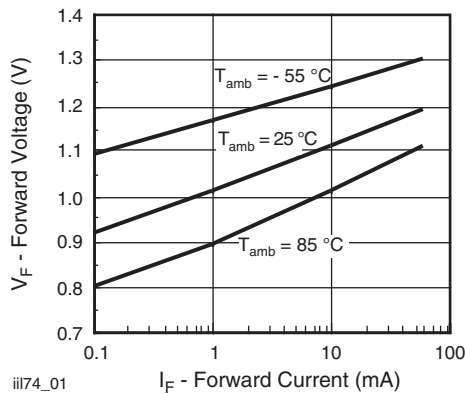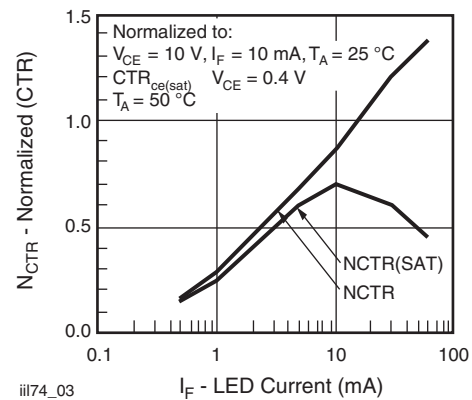
Fig. 1 - Forward Voltage vs. Forward Current

iil74_03

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

iil74_02
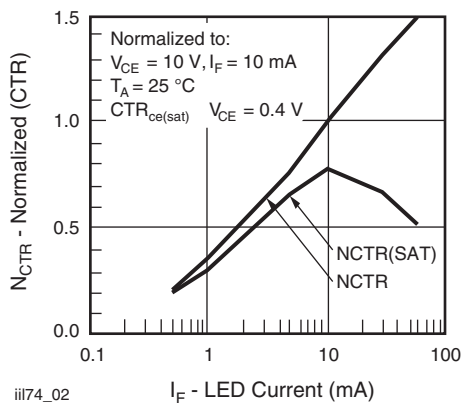
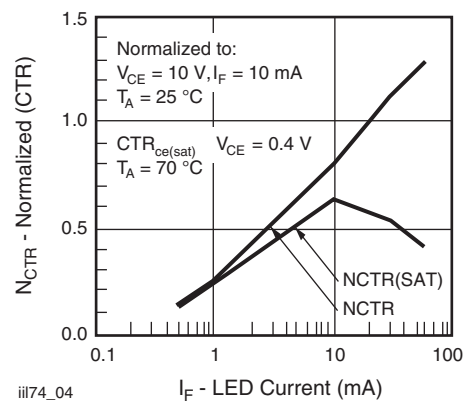Fig. 2 - Normalized Non-Saturated and Saturated CTR vs. LED Current

iil74_04

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

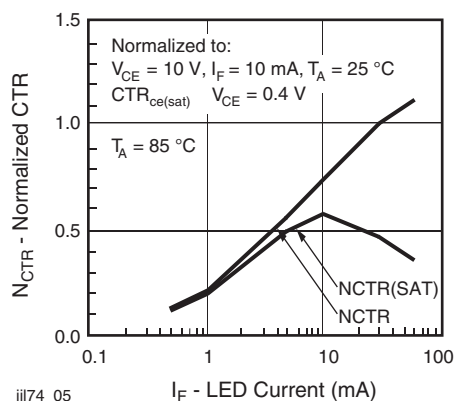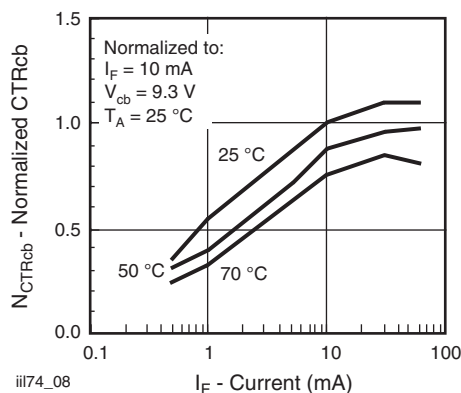This document is subject to change without notice.
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Fig. 5 - Normalized Non-Saturated and Saturated CTR vs. LED Current

Normalized to:
V_{CE} = 10 V, I_F = 10 mA, T_A = 25 °C
$CTR_{ce(sat)}$ V_{CE} = 0.4 V
T_A = 85 °C
NCTR(SAT)
NCTR
iil74_05
I_F - LED Current (mA)
N_{CTR} - Normalized CTR

Fig. 8 - Normalized CTR$_{cb}$ vs. LED Current and Temperature

Normalized to:
I_F = 10 mA
V_{cb} = 9.3 V
T_A = 25 °C
25 °C
50 °C   70 °C
iil74_08
I_F - Current (mA)
N_{CTRcb} - Normalized CTRcb
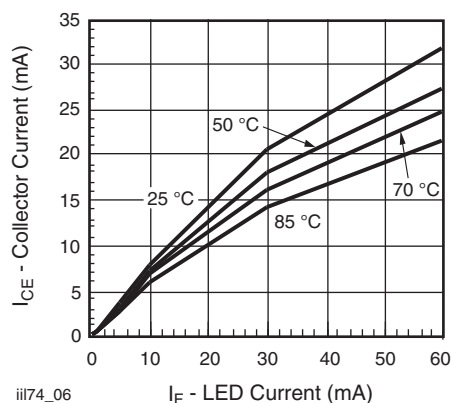
Fig. 6 - Collector Emitter Current vs. Temperature and LED Current

50 °C
25 °C
85 °C
70 °C
iil74_06
I_F - LED Current (mA)
I_{CE} - Collector Current (mA)
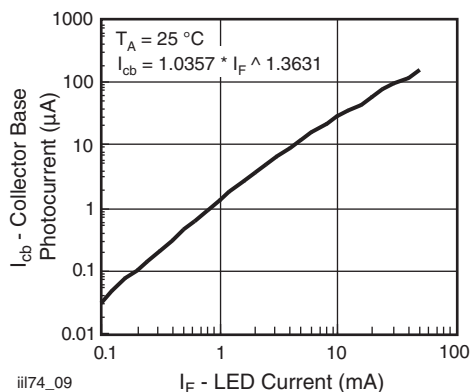
Fig. 9 - Collector Base Photocurrent vs. LED Current

T_A = 25 °C
I_{cb} = 1.0357 * I_F ^ 1.3631
iil74_09
I_F - LED Current (mA)
I_{cb} - Collector Base Photocurrent (µA)
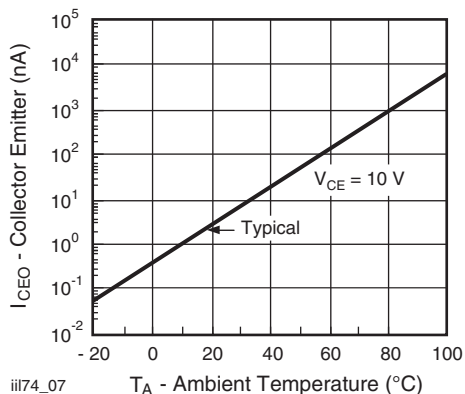
Fig. 7 - Collector Emitter Leakage Current vs. Temperature

V_{CE} = 10 V
Typical
iil74_07
T_A - Ambient Temperature (°C)
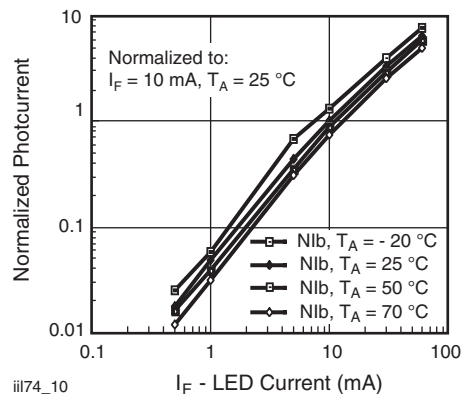I_{CEO} - Collector Emitter (nA)

Fig. 10 - Normalized Photocurrent vs. I_F and Temperature

Normalized to:
I_F = 10 mA, T_A = 25 °C
NIb, T_A = - 20 °C
NIb, T_A = 25 °C
NIb, T_A = 50 °C
NIb, T_A = 70 °C
iil74_10
I_F - LED Current (mA)
Normalized Photcurrent

For technical questions, contact: optocoupleranswers@vishay.com

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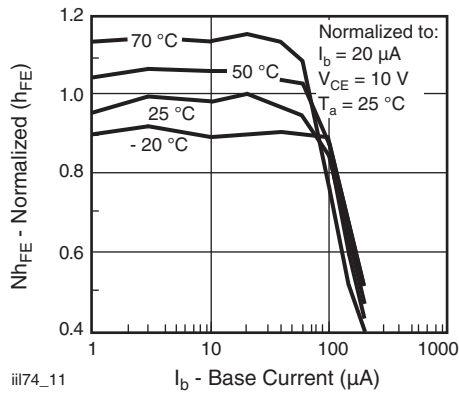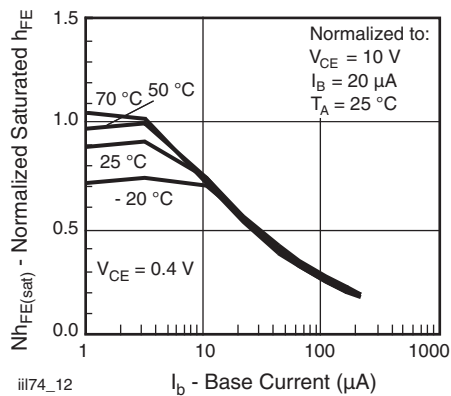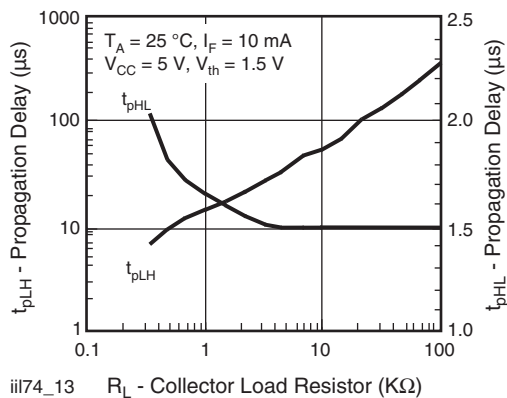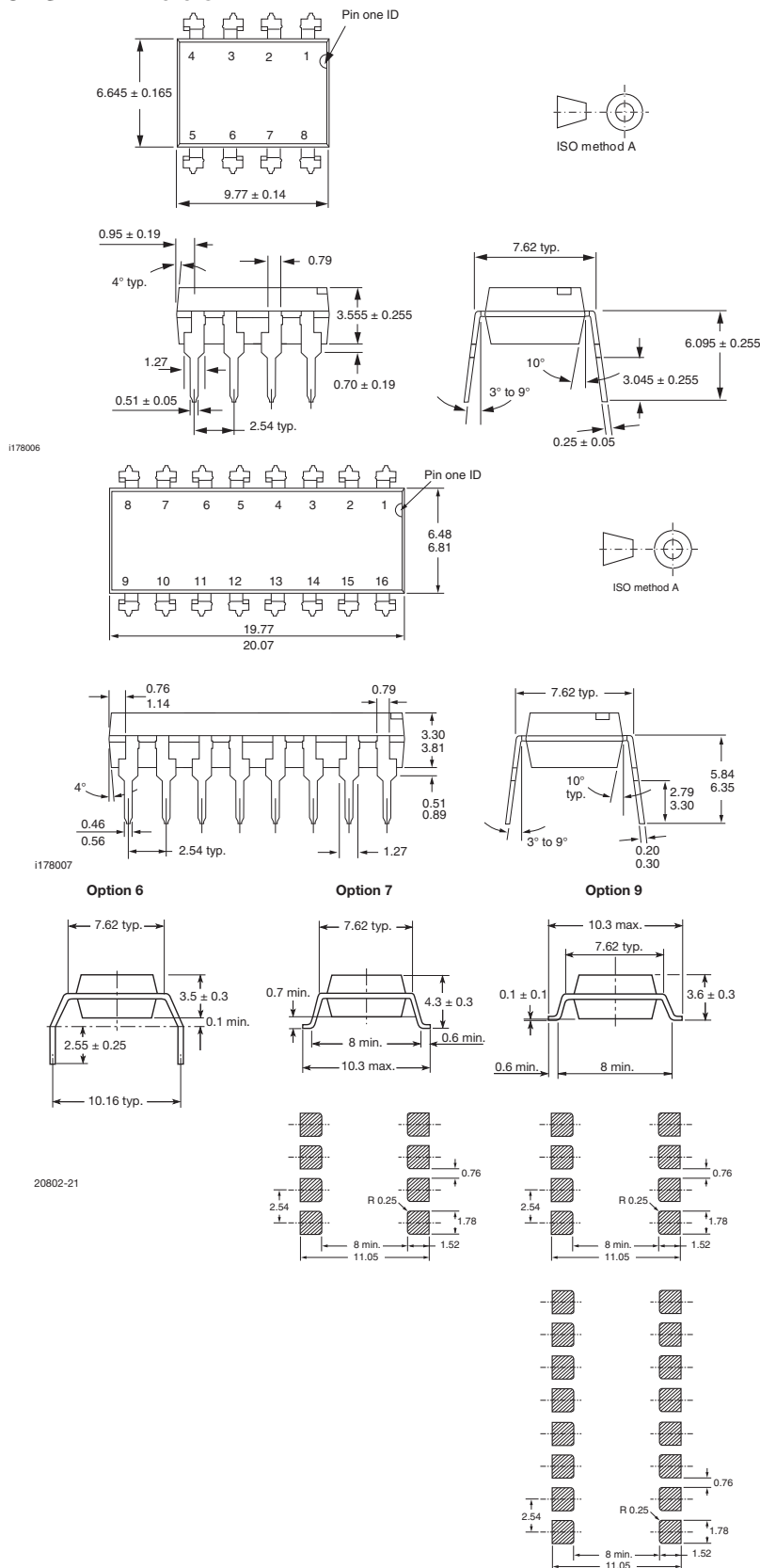(Dual, Quad Channel)

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

Fig. 12 - Normalized Saturated h_{FE} vs. Base Current and Temperature

Fig. 13 - Propagation Delay vs. Collector Load Resistor

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PACKAGE DIMENSIONS in millimeters

i178006

i178007

Option 6   **Option 7**   **Option 9**

20802-21

For technical questions, contact: optocoupleranswers@vishay.com

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Optocoupler, Phototransistor Output
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PACKAGE MARKING

ILD74

🆄 △VDE

○ V YWW H 68

ILQ74

🆄 △VDE

○ V YWW H 68
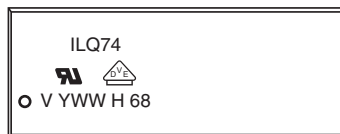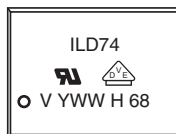
Notes
- Only options 1 and 7 reflected in the package marking
- The VDE logo is only marked on option 1 parts
- Tape and reel suffix (T) is not part of the package marking

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