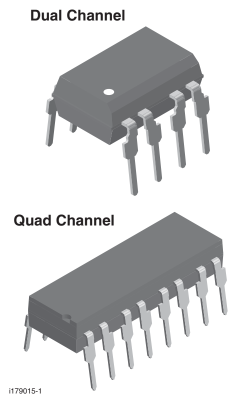
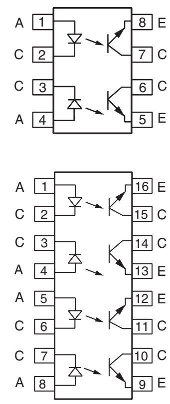
Optocoupler, Phototransistor Output (Dual, Quad Channel)





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

Pb-free
e3
RoHS COMPLIANT

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

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.

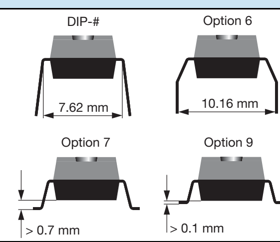
The ILD74 has two isolated channels in a single DIP package; the ILQ74 has four isolated channels per package.

ORDERING INFORMATION

I	L	x	7	4	-	X	0	#	#	T

PART NUMBER: I L x 7 4 — PACKAGE OPTION: X 0 # # — TAPE AND REEL: T

x = D (Dual) or Q (Quad)



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.

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}	≥ 10^{12}	Ω
	V_{IO} = 500 V, T_{amb} = 100 °C		R_{IO}	≥ 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.

For technical questions, contact: optocoupleranswers@vishay.com

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)

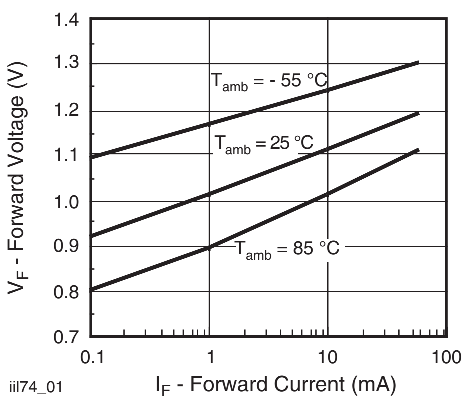


Fig. 1 - Forward Voltage vs. Forward Current

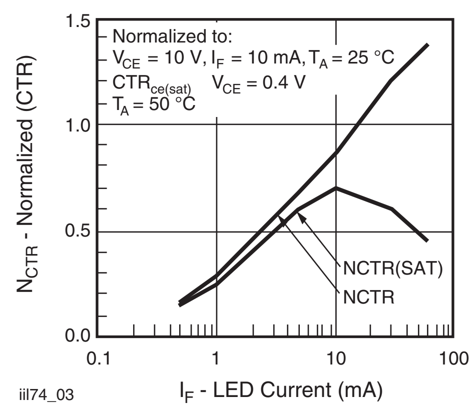


Fig. 3 - Normalized Non-Saturated and Saturated CTR vs. LED Current

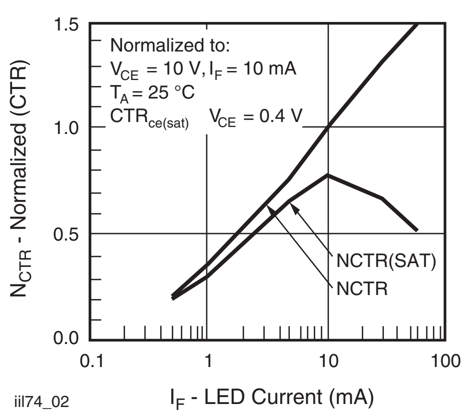


Fig. 2 - Normalized Non-Saturated and Saturated CTR vs. LED Current

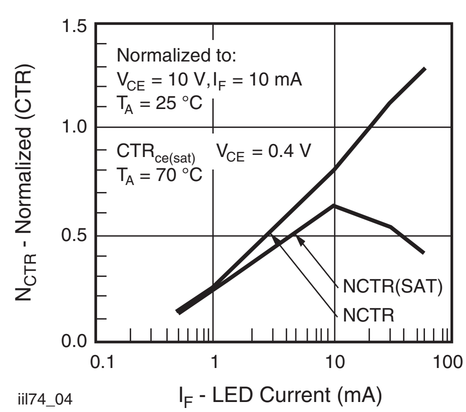


Fig. 4 - Normalized Non-Saturated and Saturated CTR vs. LED Current

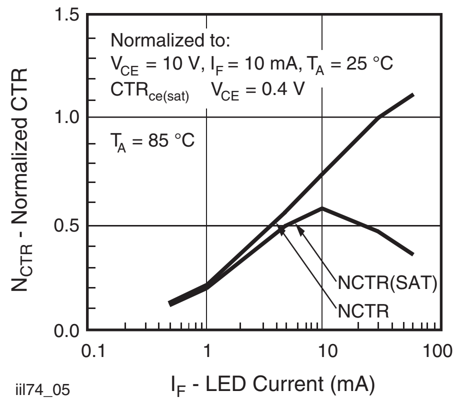


Fig. 5 - Normalized Non-Saturated and Saturated CTR vs. LED Current

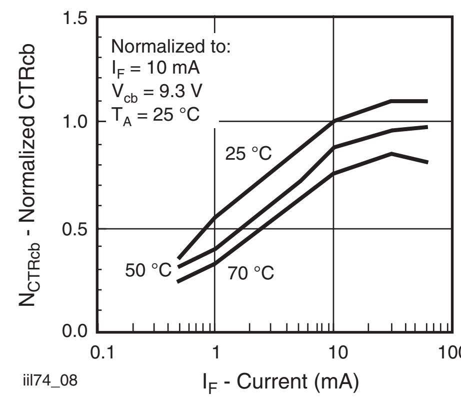


Fig. 8 - Normalized CTR_{cb} vs. LED Current and Temperature

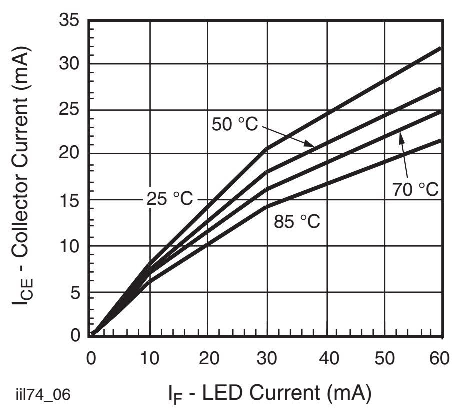


Fig. 6 - Collector Emitter Current vs. Temperature and LED Current

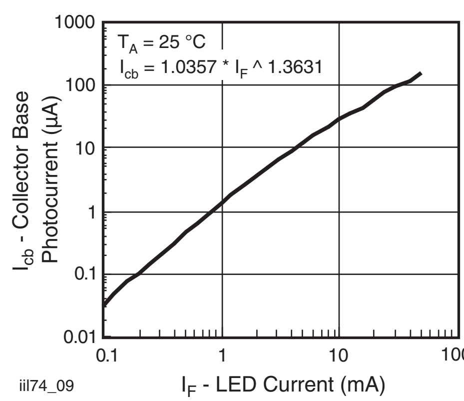


Fig. 9 - Collector Base Photocurrent vs. LED Current

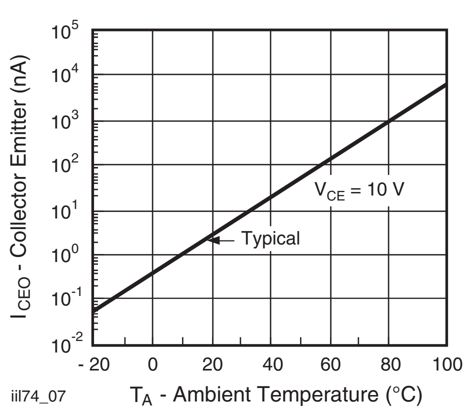


Fig. 7 - Collector Emitter Leakage Current vs.Temperature

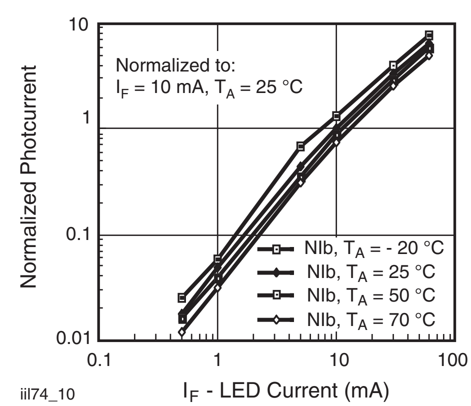


Fig. 10 - Normalized Photocurrent vs. I_F and Temperature

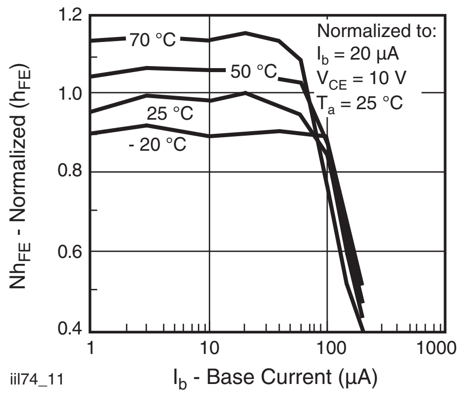


Fig. 11 - Normalized Non-Saturated h_{FE} vs. Base Current and Temperature

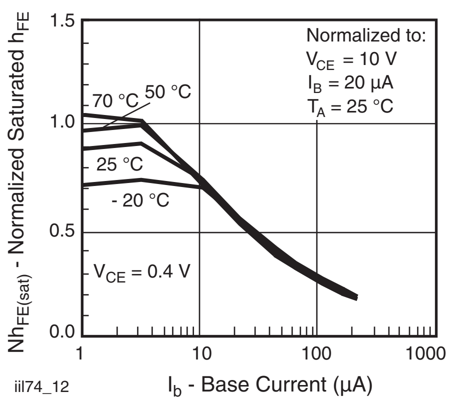


Fig. 12 - Normalized Saturated h_{FE} vs. Base Current and Temperature

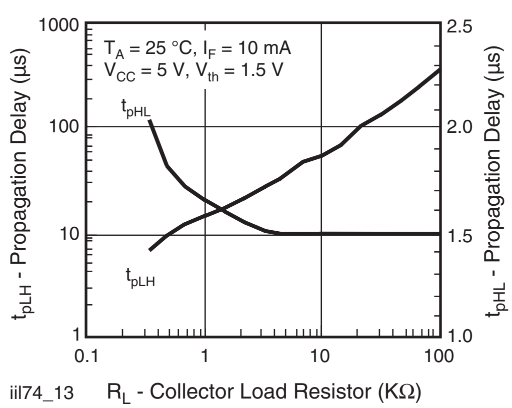
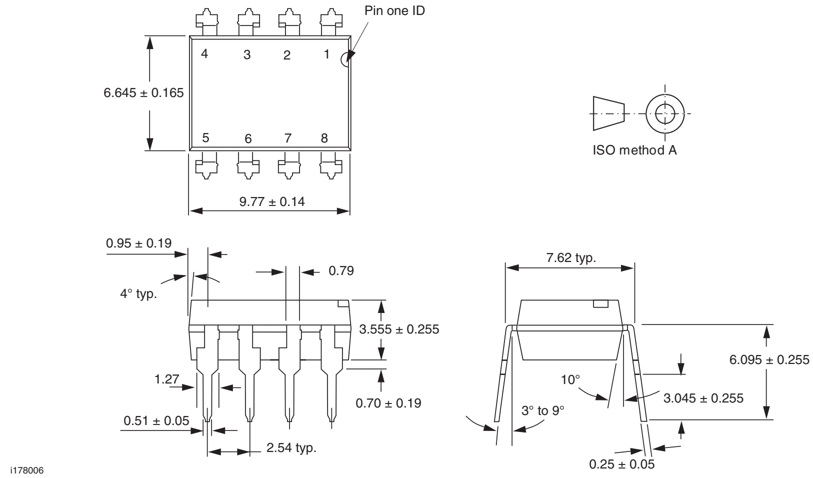
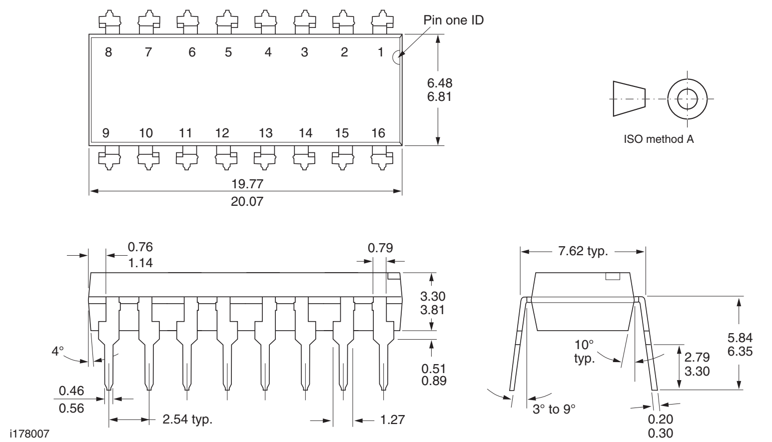
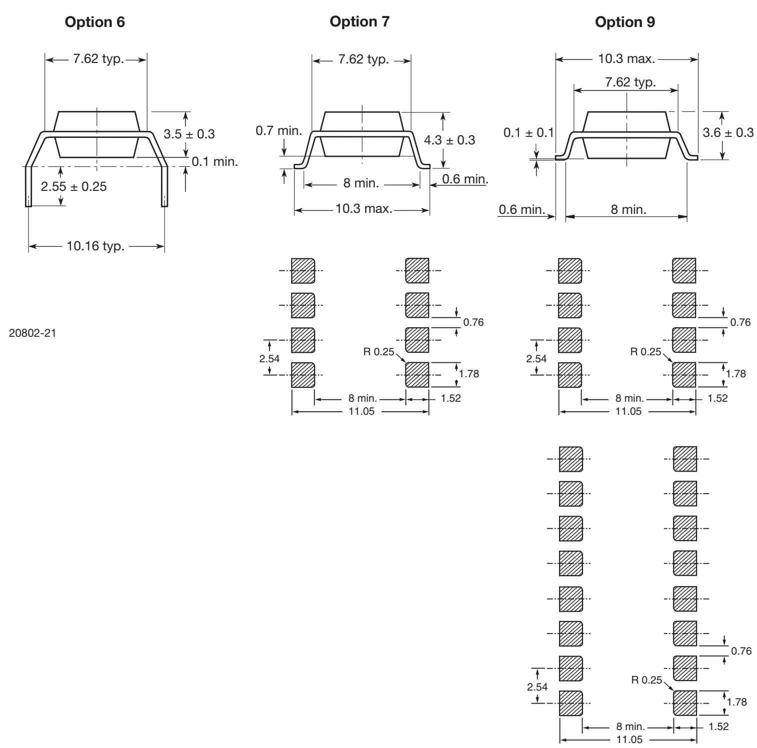


Fig. 13 - Propagation Delay vs. Collector Load Resistor

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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