Optocoupler, Phototransistor Output (Dual, Quad Channel)

Features

- Current Transfer Ratio at I_F = 1.6 mA
- Double Molded Package Offers Isolation Test Voltage 5300 V_{RMS}, 1.0 sec.

Agency Approvals

- UL - File No. E52744 System Code H or J
- CSA 93751
- BSI IEC60950 IEC60965
- FIMKO

Description

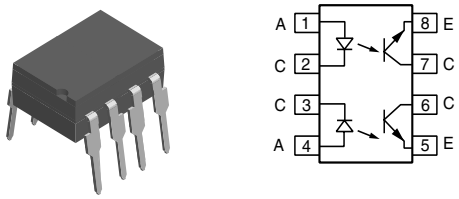
The ILD3/ ILQ3 are optically coupled isolated pairs employing GaAs infrared LEDs and silicon NPN phototransistors. Signal information, including a DC level, can be transmitted by the drive while maintaining a high degree of electrical isolation between input and output. The ILD3/ ILQ3 are especially designed for driving medium-speed logic and can be used to eliminate troublesome ground loop and noise problems. Also these couplers can be used to replace relays and transformers in many digital interface applications such as CTR modulation. The ILD3 has two isolated channels in a single DIP package and the ILQ3 has four isolated channels per package.

Order Information

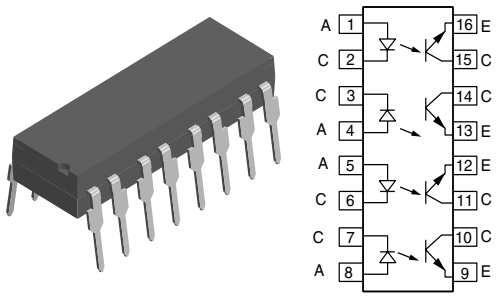
Part	Remarks
ILD3	CTR > 500 %, Dual Channel DIP-8
ILQ3	CTR > 500 %, Quad Channel DIP-16

For additional information on the available options refer to Option Information.

Dual Channel



Quad Channel



i179012

Absolute Maximum Ratings

T_{amb} = 25 °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 Rating for extended periods of the time can adversely affect reliability.

Input

Parameter	Test condition	Symbol	Value	Unit
Reverse current		V_R	6.0	V
Forward continuous current		I_F	60	mA
Surge current		I_{FSM}	2.5	A
Power dissipation		P_{diss}	100	mW
Derate linearly from 25 °C			1.3	mW/°C

Output

Parameter	Test condition	Symbol	Value	Unit
Collector-emitter breakdown voltage		BV_{CEO}	50	V
Collector current		I_C	50	mA
	t < 1.0 ms	I_C	400	mA
Power dissipation		P_{diss}	200	mW
Derate linearly from 25 °C			2.6	mW/°C

Coupler

Parameter	Test condition	Symbol	Value	Unit
Isolation test voltage (between emitter and detector, refer to standard climate 23°C/50% RH, DIN50014)	t = 1 sec.	V_{ISO}	5300	V_{RMS}
Creepage			≥ 7	mm
Clearance			≥ 7	mm
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
Power dissipation		P_{tot}	250	mW
Derate linearly from 25 °C			3.3	mW/°C
Storage temperature range		T_{stg}	- 40 to + 150	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Junction temperature		T_j	100	°C
Soldering temperature	2.0 mm case bottom	T_{sld}	260	°C

Electrical Characteristics

T_{amb} = 25 °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.

Input

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	I_F = 60 mA	V_F		1.25	1.65	V
Reverse current	V_R = 6.0 V	I_R		0.01	10	µA
Capacitance	V_R = 0 V, f = 1.0 MHz			25		pF
Thermal resistance, junction to lead		R_{thjl}		750		K/W

Output

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector-emitter leakage current	V_{CE} = 15 V	I_{CEO}		5.0	70	nA
Collector-emitter capacitance	V_{CE} = 5.0 V, f = 1.0 MHz	C_{CE}		6.8		pF
Thermal resistance, junction to lead		R_{thjl}		500		K/W

Coupler

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Capacitance (input-output)	V_{IO} = 0 V, f = 1.0 MHz	C_{IO}		0.8		pF

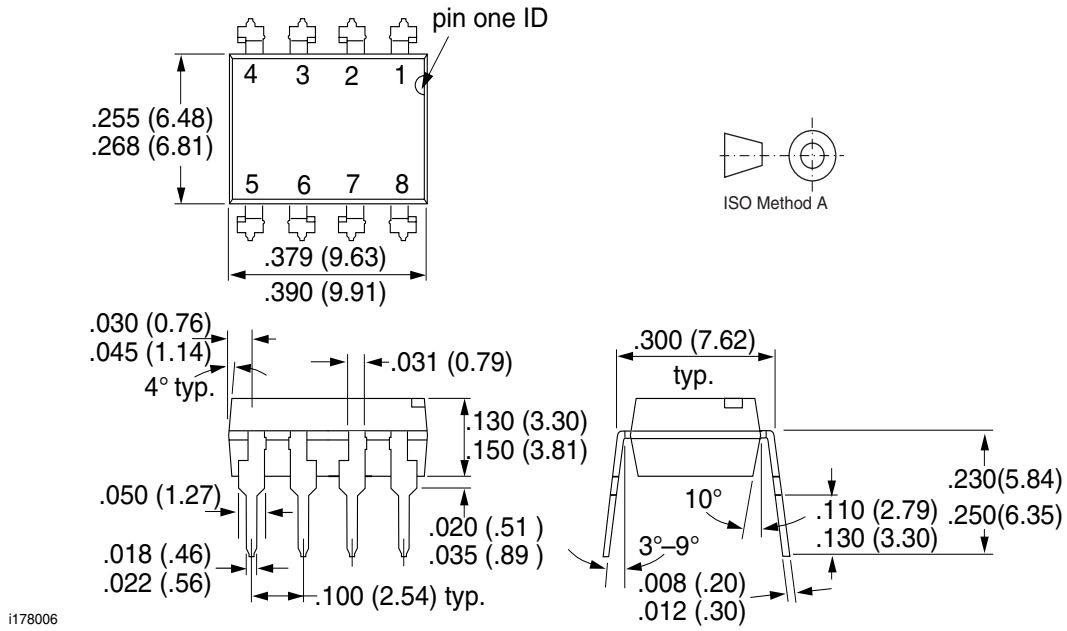
Current Transfer Ratio

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Saturated Current Transfer Ratio (ILD/Q3-1)	I_F = 1.6 mA, V_{CE} = 0.4 V	ILD3	CTR_{sat}	300			%
Saturated Current Transfer Ratio (ILD/Q3-2)	I_F = 1.0 mA, V_{CE} = 0.4 V	ILD3	CTR_{sat}	100			%

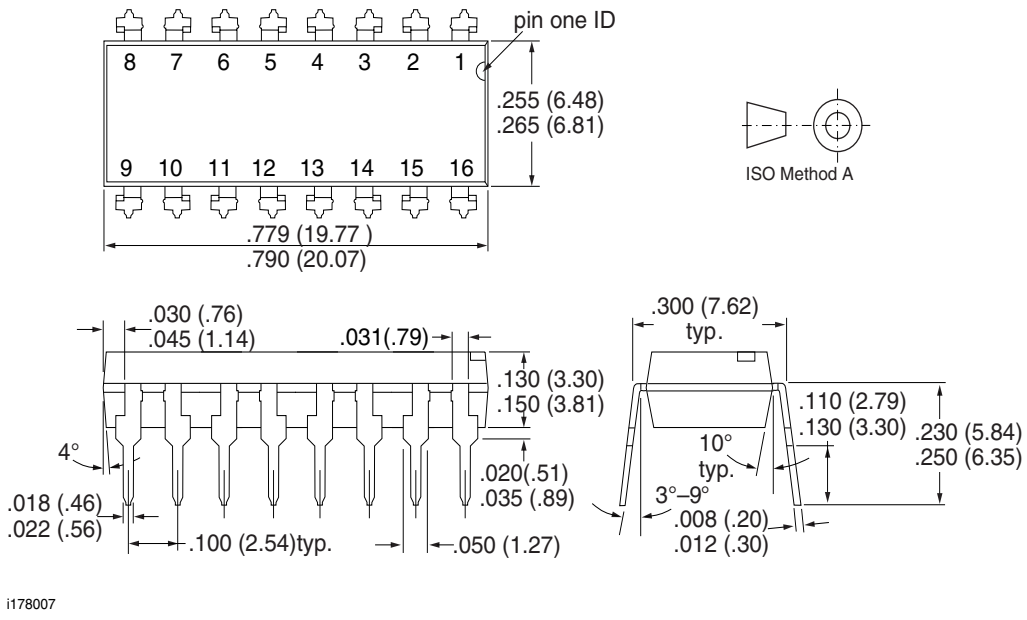
Common Mode Transient Immunity

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Common mode rejection output high	V_{CM} = 50 V_{P-P}, R_L = 10 KΩ, I_F = 0 mA	CM_H		5000		V/µs
Common mode rejection output low	V_{CM} = 50 V_{P-P}, R_L = 10 KΩ I_F = 0 mA	CM_L		5000		V/µs
Common mode coupling capacitance		C_{CM}		0.01		pF

Package Dimensions in Inches (mm)



Package Dimensions in Inches (mm)



Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operatingsystems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423