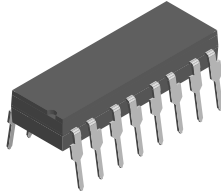
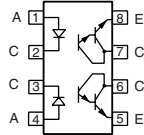
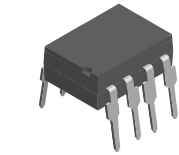
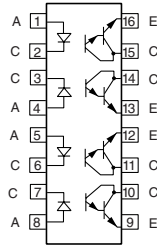


Optocoupler, Photodarlington Output, High Gain (Dual, Quad Channel)



1179017



FEATURES

- Isolation test voltage, 5300 V_{RMS}
- High isolation resistance, 10¹¹Ω typical
- Low coupling capacitance
- Standard plastic DIP package
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC


RoHS
COMPLIANT

AGENCY APPROVALS

- UL1577, file no. E52744 system code H or J, double protection
- DIN EN 60747-5-5 (VDE 0884) available with option 1
- BSI IEC 60950; IEC 60065

DESCRIPTION

The ILD32, ILQ32 are optically coupled isolators with a gallium arsenide infrared LED and a silicon photodarlington sensor. Switching can be achieved while maintaining a high degree of isolation between driving and load circuits.

These optocouplers can be used to replace reed and mercury relays with advantages of long life, high speed switching and elimination of magnetic fields.

ORDER INFORMATION	
PART	REMARKS
ILD32	CTR > 500 %, DIP-8
ILQ32	CTR > 500 %, DIP-16
ILD32-X006	CTR > 500 %, DIP-8 400 mil (option 6)
ILD32-X007	CTR > 500 %, SMD-8 (option 7)
ILD32-X009	CTR > 500 %, SMD-8 (option 9)
ILQ32-X007	CTR > 500 %, SMD-8 (option 7)
ILQ32-X009	CTR > 500 %, SMD-8 (option 9)

Note

For additional information on the available options refer to option information.

ABSOLUTE MAXIMUM RATINGS (1)					
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 25°C				1.33	mW/°C
OUTPUT					
Collector emitter breakdown voltage			BV _{CEO}	30	V
Collector (load) current			I _C	125	mA
Power dissipation			P _{diss}	150	mW
Derate linearly from 25°C				2	mW/°C

ABSOLUTE MAXIMUM RATINGS ⁽¹⁾					
PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
COUPLER					
Isolation test voltage between emitter and detector	t = 1.0 s		V _{ISO}	5300	V _{RMS}
Creepage distance				≥ 7	mm
Clearance distance				≥ 7	mm
Comparative tracking index per DIN IEC 112/VDE 0303, part 1			CTI	≥ 175	
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 dissipation		ILD32	P _{tot}	400	mW
		ILQ32	P _{tot}	500	mW
Derate linearly from 25 °C		ILD32		5.33	mW/°C
		ILQ32		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

Notes

⁽¹⁾ 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 ratings for extended periods of the time can adversely affect reliability.

ELECTRICAL CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
Forward voltage	I _F = 10 mA	V _F		1.25	1.5	V
Reverse current	V _R = 3 V	I _R		0.1	100	pF
Capacitance	V _R = 0 V	C _O		25		pF
OUTPUT						
Collector emitter breakdown voltage	I _C = 100 μA, I _F = 0 A	BV _{CEO}	30			V
Breakdown voltage emitter collector	I _E = 100 μA	BC _{EEO}	5	10		V
Collector emitter leakage current	V _{CE} = 10 V, I _F = 0 A	I _{CEO}		1	100	nA
COUPLER						
Collector emitter	I _C = 2 mA, I _F = 8 mA	V _{CEsat}			1.0	V
Capacitance (input to output)		C _{IO}		0.5		pF

Note

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.

CURRENT TRANSFER RATIO						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio	I _F = 10 mA, V _{CE} = 10 V	CTR	500			%



SWITCHING CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Turn-on time	$V_{CC} = 10\text{ V}, I_F = 5\text{ mA}, R_L = 100\ \Omega$	t_{on}		15		μs
Turn-off time	$V_{CC} = 10\text{ V}, I_F = 5\text{ mA}, R_L = 100\ \Omega$	t_{off}		30		μs

SAFETY AND INSULATION RATINGS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Climatic classification (according to IEC 68 part 1)				55/100/21		
Comparative tracking index		CTI	175		399	
V_{IOTM}			10 000			V
V_{IORM}			890			V
P_{SO}					400	mW
I_{SI}					275	mA
T_{SI}					175	$^{\circ}\text{C}$
Creepage distance	standard DIP-8		7			mm
Clearance distance	standard DIP-8		7			mm
Creepage distance	400 mil DIP-8		8			mm
Clearance distance	400 mil DIP-8		8			mm
Insulation thickness, reinforced rated	per IEC 60950 2.10.5.1		0.4			mm

Note

As per IEC 60747-5-2, § 7.4.3.8.1, 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.

TYPICAL CHARACTERISTICS

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

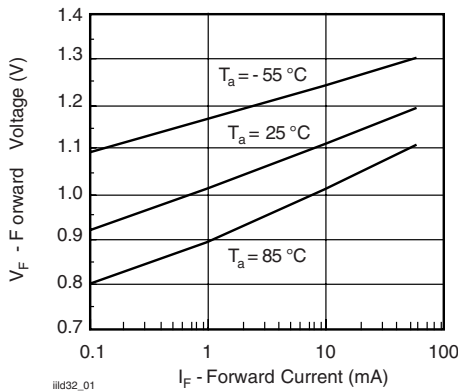


Fig. 1 - Forward Voltage vs. Forward Current

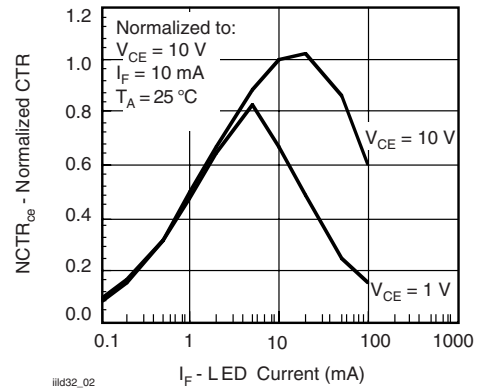


Fig. 2 - Normalized Non-saturated and Saturated CTR_{CE} vs. LED Current

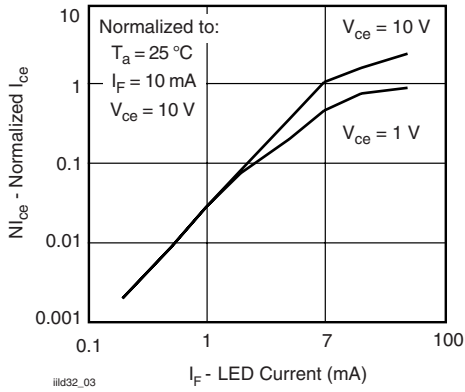


Fig. 3 - Normalized Non-Saturated and Saturated Collector Emitter Current vs. LED Current

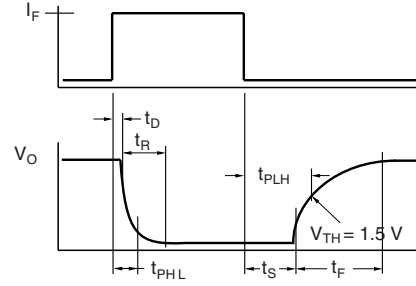


Fig. 6 - Switching Timing

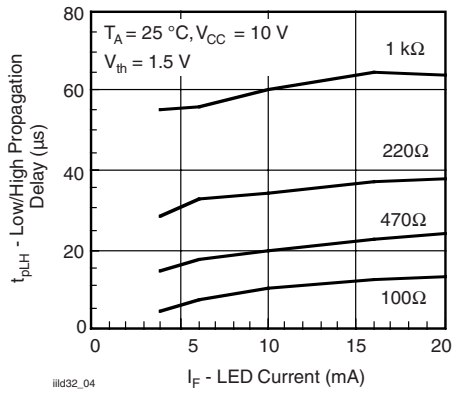


Fig. 4 - Low to High Propagation Delay vs. Collector Load Resistance and LED Current

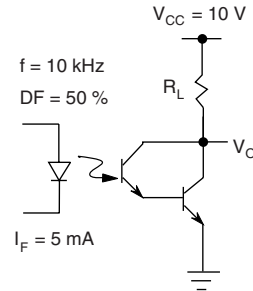


Fig. 7 - Switching Schematic

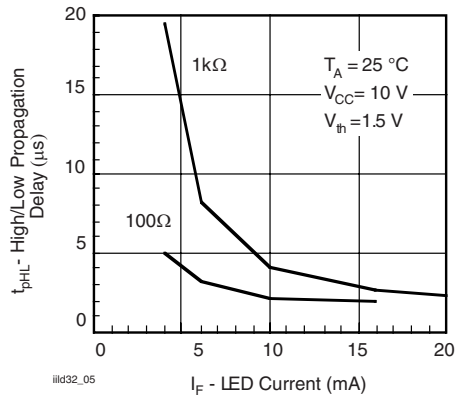
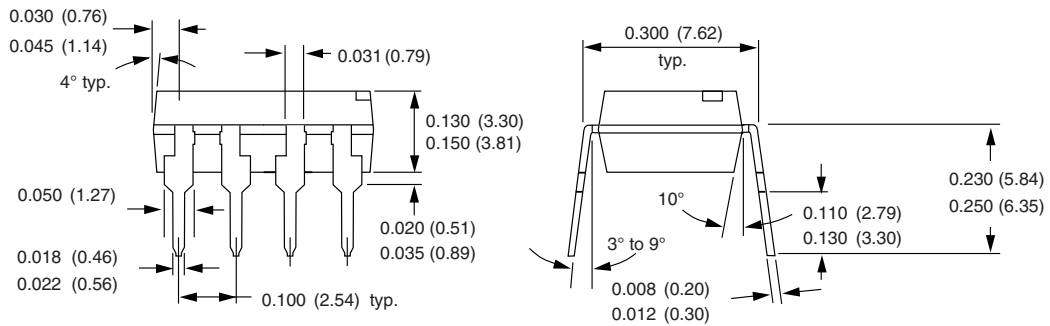
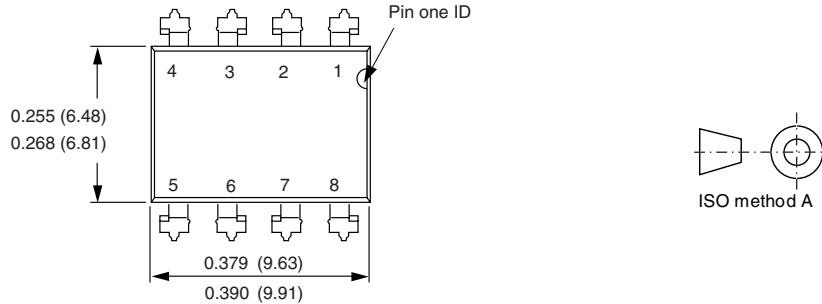


Fig. 5 - High to low Propagation Delay vs. Collector Load Resistance and LED Current

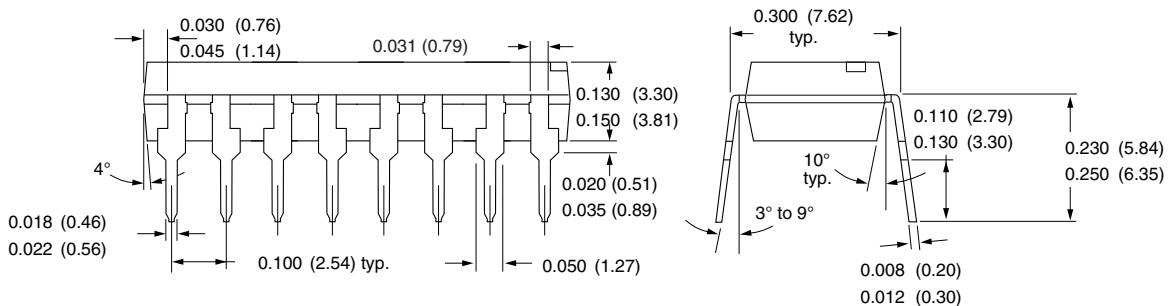
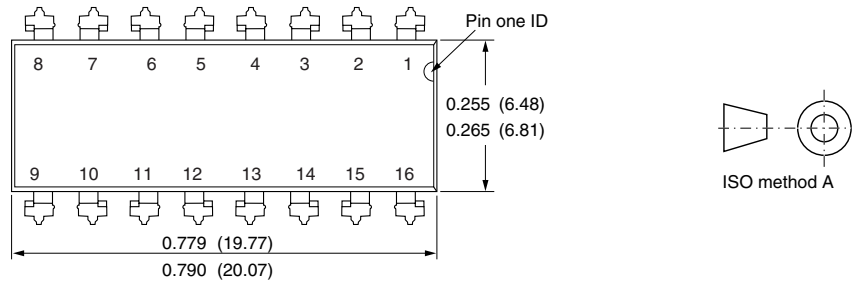


Optocoupler, Photodarlington Output, Vishay Semiconductors
High Gain (Dual, Quad Channel)

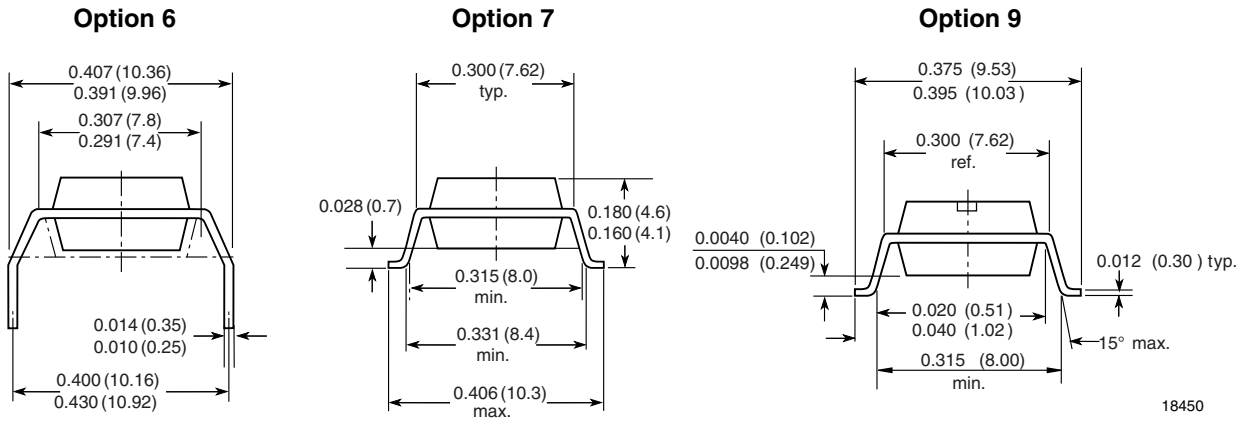
PACKAGE DIMENSIONS in Inches (millimeters)



i178006



i178007



**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 operating systems 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.

We reserve the right to make changes to improve technical design
and may do so without further notice.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany



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