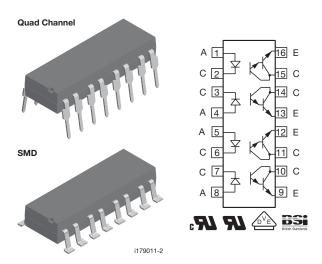


Vishay Semiconductors

Optocoupler, Photodarlington Output, High Gain (Quad Channel)



FEATURES

- Isolation test voltage, 5300 V_{RMS}
- High isolation resistance, $10^{11} \Omega$ typical
- · Low coupling capacitance
- Standard plastic DIP package
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC





RoHS COMPLIANT

AGENCY APPROVALS

- UL1577, file no. E52744 system code H, double protection
- cUL tested to CSA 22.2 bulletin 5A
- DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 (pending), available with option 1
- BSI IEC 60950; IEC 60065

DESCRIPTION

The ILQ32 is 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.

ORDERING INFORMATION					
I L Q 3 2 PART NUMBER	- X 0 0 # T PACKAGE OPTION TAPE AND REEL Option 7 Option 9				
AGENCY CERTIFIED/PACKAGE	CTR (%)				
UL, cUL, BSI	≥ 500				
DIP-16	ILQ32				
SMD-16, option 7	ILQ32-X007T ⁽¹⁾				
SMD-16, option 9	ILQ32-X009T ⁽¹⁾				
VDE, UL, cUL, BSI	≥ 500				
DIP-16	ILQ32-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 F		iess otherwis	se 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 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
COUPLER					
Isolation test voltage between emitter and detector	t = 1 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			СТІ	≥ 175	
Indiation variations	V _{IO} = 500 V, T _{amb} = 25 °C		R _{IO}	10 ¹²	Ω
Isolation resistance	V _{IO} = 500 V, T _{amb} = 100 °C		R _{IO}	10 ¹¹	Ω
Total dissipation		ILQ32	P _{tot}	500	mW
Derate linearly from 25 °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

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	$I_F = 10 \text{ mA}$	V _F		1.25	1.5	V
Reverse current	$V_R = 3 V$	I _R		0.1	100	μΑ
Capacitance	$V_R = 0 V$	Co		25		pF
OUTPUT						
Collector emitter breakdown voltage	$I_C = 100 \ \mu A, \ I_F = 0 \ A$	BV _{CEO}	30			V
Breakdown voltage emitter collector	I _E = 100 μA	BC _{ECO}	5	10		V
Collector emitter leakage current	V _{CE} = 10 V, I _F = 0 A	I _{CEO}		1	100	nA
COUPLER		•				
Collector emitter	$I_C = 2 \text{ mA}, I_F = 8 \text{ mA}$	V _{CEsat}			1	V
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.



Optocoupler, Photodarlington Output, High Gain (Quad Channel)

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CURRENT TRANSFER RATIO (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio	$I_F = 10 \text{ mA}, V_{CE} = 10 \text{ V}$	CTR	500			%

SWITCHING CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Turn-on time	V_{CC} = 10 V, I_F = 5 mA, R_L = 100 Ω	t _{on}		15		μs
Turn-off time	V_{CC} = 10 V, I_F = 5 mA, R_L = 100 Ω	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	°C	
Creepage distance			7			mm	
Clearance distance			7			mm	
Insulation thickness, reinforced rated	per IEC 60950 2.10.5.1		0.4			mm	

Note

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

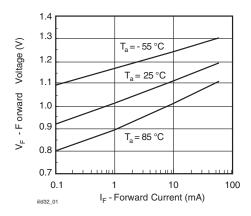


Fig. 1 - Forward Voltage vs. Forward Current

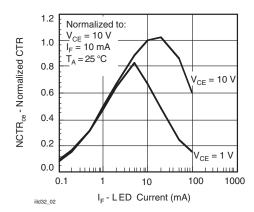


Fig. 2 - Normalized Non-saturated and Saturated CTR $_{\mbox{\footnotesize CE}}$ vs. LED Current

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.

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iild32_06



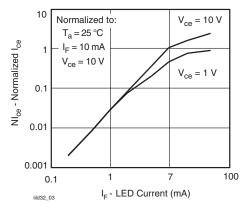


Fig. 3 - Normalized Non-Saturated and Saturated Collector Emitter Current vs. LED Current

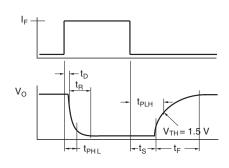


Fig. 6 - Switching Timing

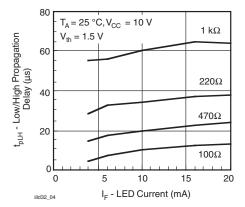


Fig. 4 - Low to High Propagation Delay vs. Collector Load Resistance and LED Current

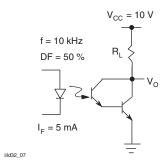


Fig. 7 - Switching Schematic

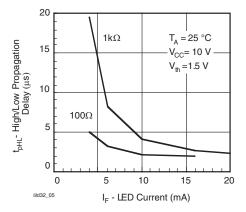


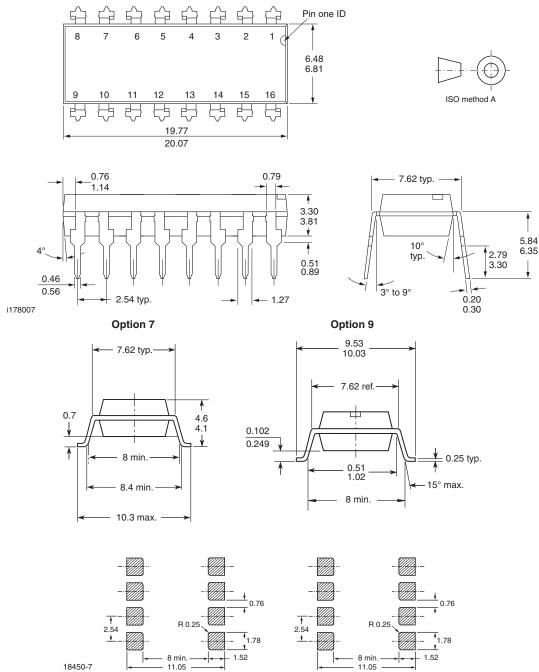
Fig. 5 - High to low Propagation Delay vs. Collector Load Resistance and LED Current



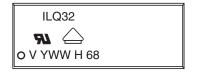
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PACKAGE DIMENSIONS in millimeters



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



Legal Disclaimer Notice

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