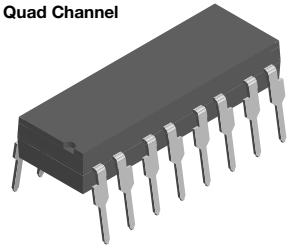
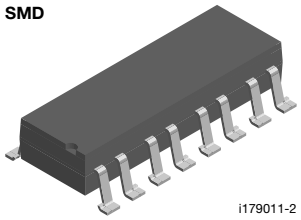
Optocoupler, Photodarlington Output, High Gain (Quad Channel)

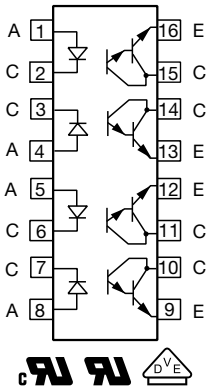
Quad Channel



SMD



i179011-2



FEATURES

- Isolation rated voltage 4420 V_{RMS}
- High isolation resistance, 10^{11} Ω typical
- Low coupling capacitance
- Standard plastic DIP package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

AGENCY APPROVALS

- UL 1577
- cUL
- DIN EN 60747-5-5 (VDE 0884), available with option 1

LINKS TO ADDITIONAL RESOURCES

Product Page | Design Tools | Models | Footprints | Schematics

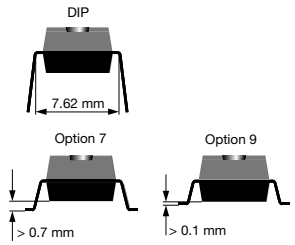
DESCRIPTION

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	-	X	0	0	#	T
PART NUMBER						PACKAGE OPTION				TAPE AND REEL



AGENCY CERTIFIED / PACKAGE	CTR (%)
UL, cUL, BSI, CQC	**≥ 500**
DIP-16	ILQ32
SMD-16, option 7	ILQ32-X007T (1)
SMD-16, option 9	ILQ32-X009T (1)

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 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					
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 mA	V_F	-	1.25	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 = 100 µA, 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 mA, I_F = 8 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.

CURRENT TRANSFER RATIO (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Current transfer ratio	I_F = 10 mA, V_{CE} = 10 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

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SAFETY AND INSULATION RATINGS				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Climatic classification	According to IEC 68 part 1		55 / 100 / 21	
Comparative tracking index		CTI	175	
Maximum rated withstanding isolation voltage	t = 1 min	V_{ISO}	4420	V_{RMS}
Maximum transient isolation voltage		V_{IOTM}	10 000	V_{peak}
Maximum repetitive peak isolation voltage		V_{IORM}	890	V_{peak}
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
Output safety power		P_{SO}	400	mW
Input safety current		I_{SI}	275	mA
Safety temperature		T_S	175	°C
Creepage distance			≥ 7	mm
Clearance distance			≥ 7	mm
Insulation thickness		DTI	≥ 0.4	mm

Note

- As per IEC 60747-5-5, § 7.4.3.8.2, 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 °C, unless otherwise specified)

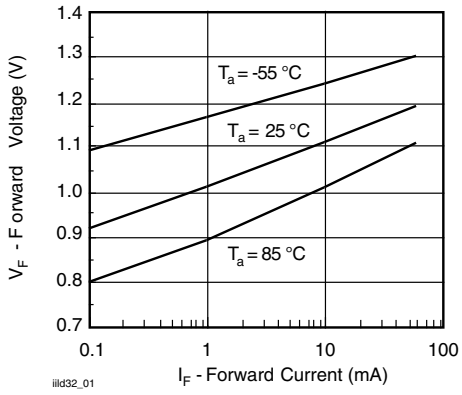


Fig. 1 - Forward Voltage vs. Forward Current

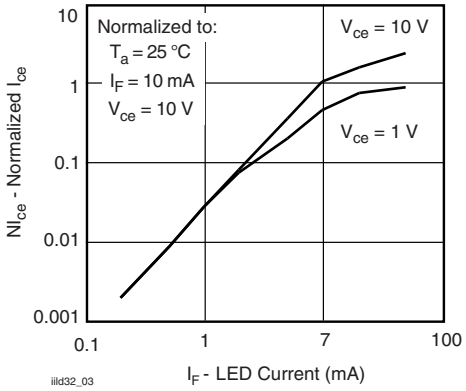


Fig. 3 - Normalized Non-Saturated and Saturated Collector Emitter Current vs. LED Current

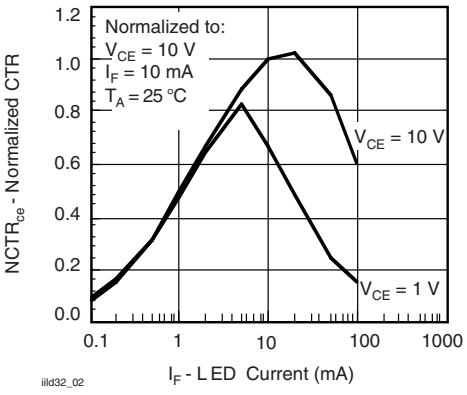


Fig. 2 - Normalized Non-saturated and Saturated CTR_{CE} vs. LED Current

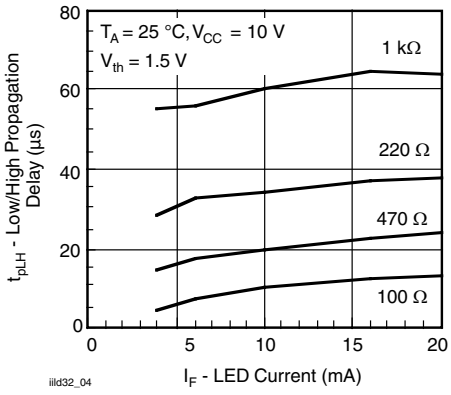


Fig. 4 - Low to High Propagation Delay vs. Collector Load Resistance and LED Current

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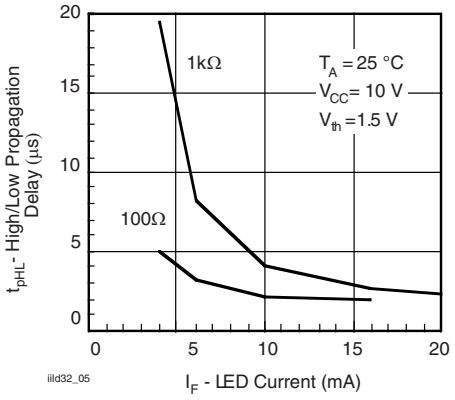


Fig. 5 - High to low Propagation Delay vs. Collector Load Resistance and LED Current

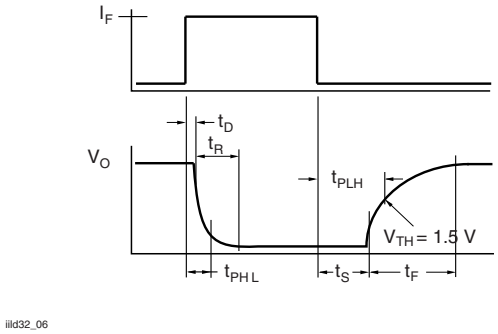


Fig. 6 - Switching Timing

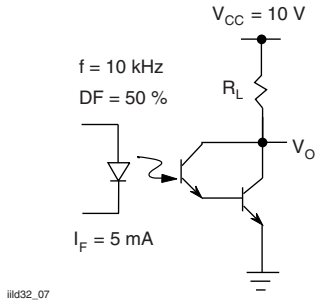
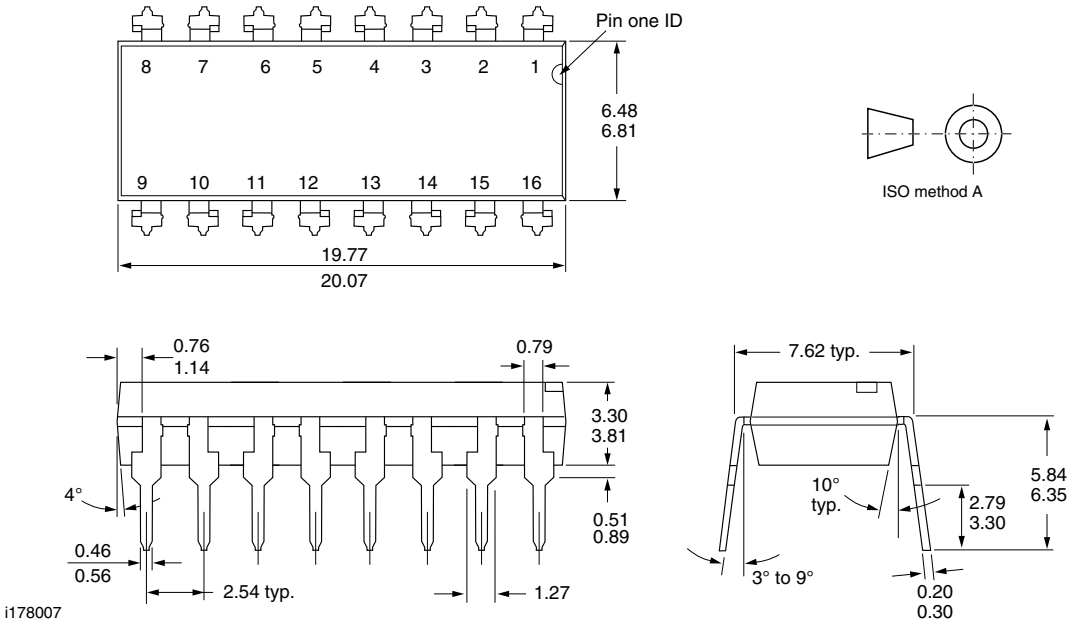


Fig. 7 - Switching Schematic

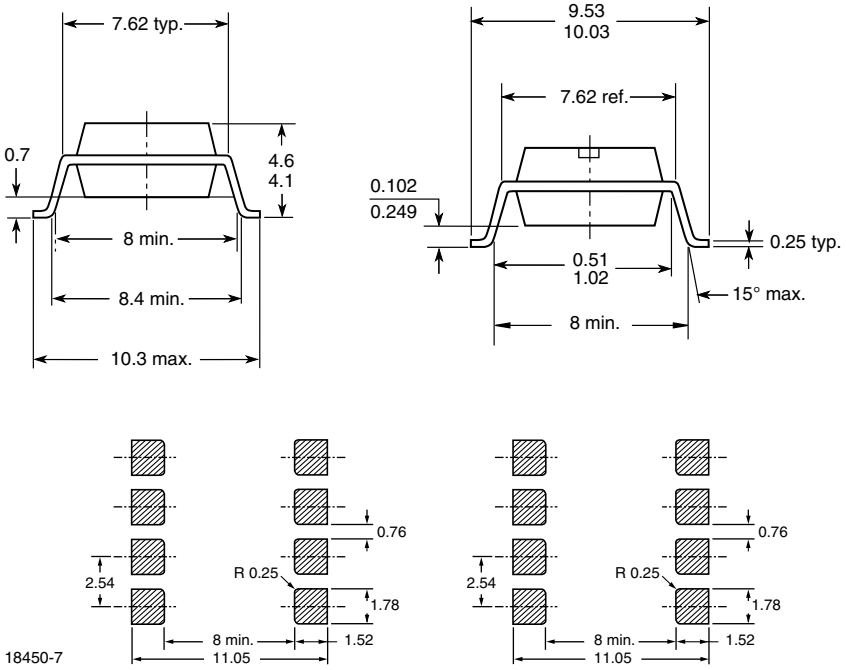
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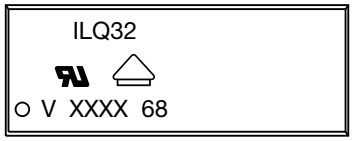
PACKAGE DIMENSIONS in millimeters



Option 7 **Option 9**



PACKAGE MARKING



Notes

- XXXX = LMC (lot marking code)
- 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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