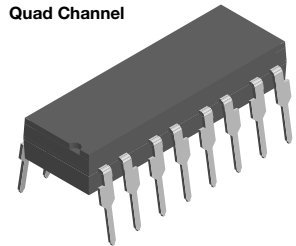


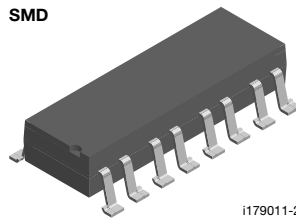


Optocoupler, Photodarlington Output, High Gain (Quad Channel)

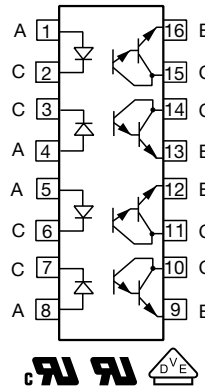
Quad Channel



SMD



i179011-2



FEATURES

- Isolation rated voltage 4420 V_{RMS}
- High isolation resistance, 10¹¹ Ω typical
- Low coupling capacitance
- Standard plastic DIP package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

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



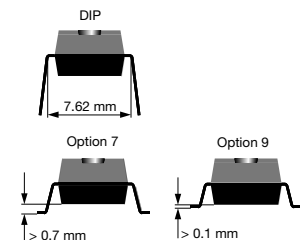
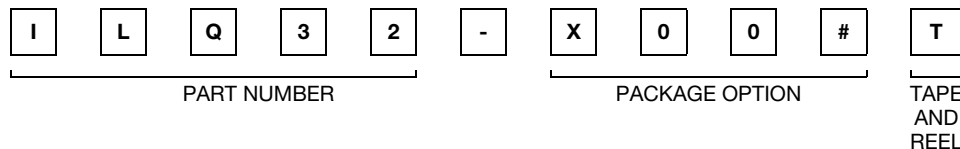
Schematics

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



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



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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	$V_R = 3\text{ V}$	I_R	-	0.1	100	μA
Capacitance	$V_R = 0\text{ V}$	C_O	-	25		pF
OUTPUT						
Collector emitter breakdown voltage	$I_C = 100\text{ }\mu\text{A}$, $I_F = 0\text{ A}$	BV_{CEO}	30	-	-	V
Breakdown voltage emitter collector	$I_E = 100\text{ }\mu\text{A}$	BC_{ECO}	5	10	-	V
Collector emitter leakage current	$V_{CE} = 10\text{ V}$, $I_F = 0\text{ A}$	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.

CURRENT TRANSFER RATIO ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Turn-on time	$V_{CC} = 10\text{ V}$, $I_F = 5\text{ mA}$, $R_L = 100\text{ }\Omega$	t_{on}	-	15	-	μs
Turn-off time	$V_{CC} = 10\text{ V}$, $I_F = 5\text{ mA}$, $R_L = 100\text{ }\Omega$	t_{off}	-	30	-	μs



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	$t = 1 \text{ min}$	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	$V_{\text{IO}} = 500 \text{ V}, T_{\text{amb}} = 25^\circ\text{C}$	R_{IO}	$\geq 10^{12}$	Ω
	$V_{\text{IO}} = 500 \text{ V}, T_{\text{amb}} = 100^\circ\text{C}$	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	$^\circ\text{C}$
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.

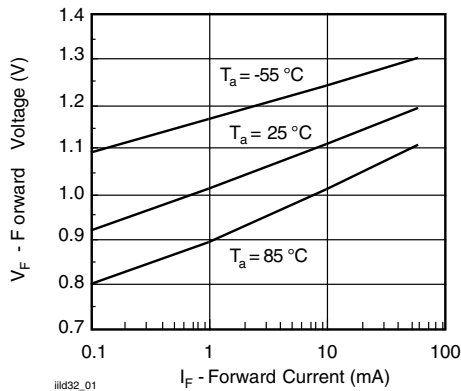
TYPICAL CHARACTERISTICS ($T_{\text{amb}} = 25^\circ\text{C}$, unless otherwise specified)

Fig. 1 - Forward Voltage vs. Forward Current

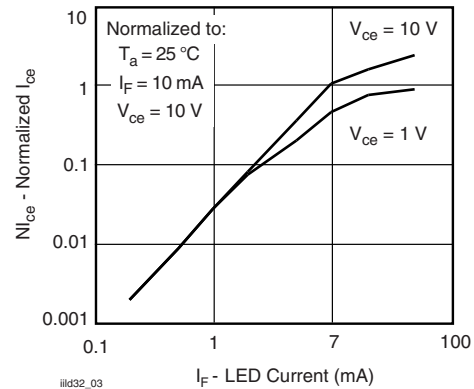


Fig. 3 - Normalized Non-Saturated and Saturated Collector Emitter Current vs. LED Current

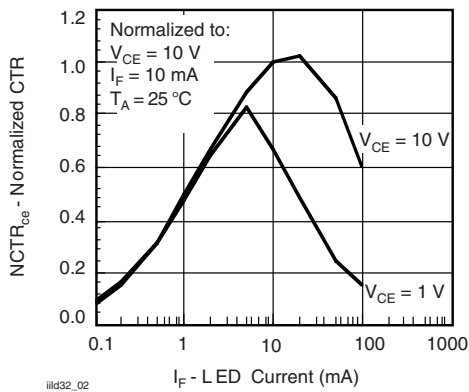
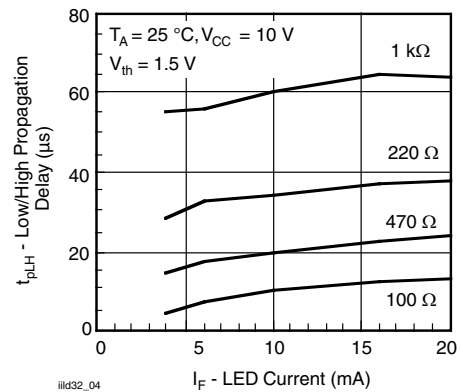
Fig. 2 - Normalized Non-saturated and Saturated CTR_{CE} vs. LED Current

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

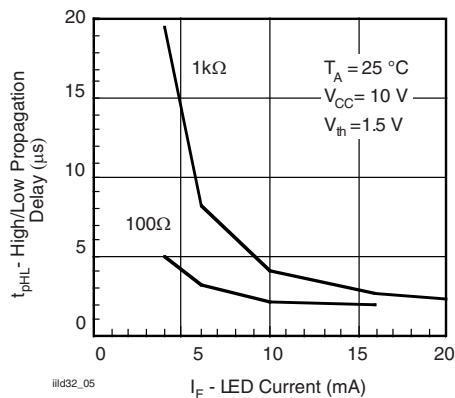


Fig. 5 - High to low Propagation Delay vs. Collector Load Resistance and LED Current

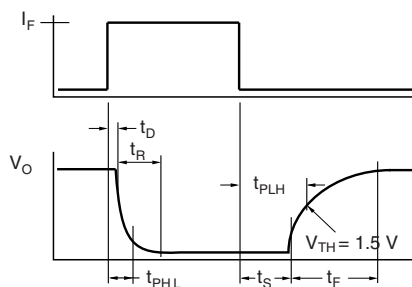


Fig. 6 - Switching Timing

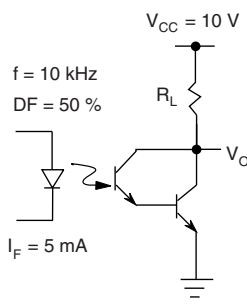
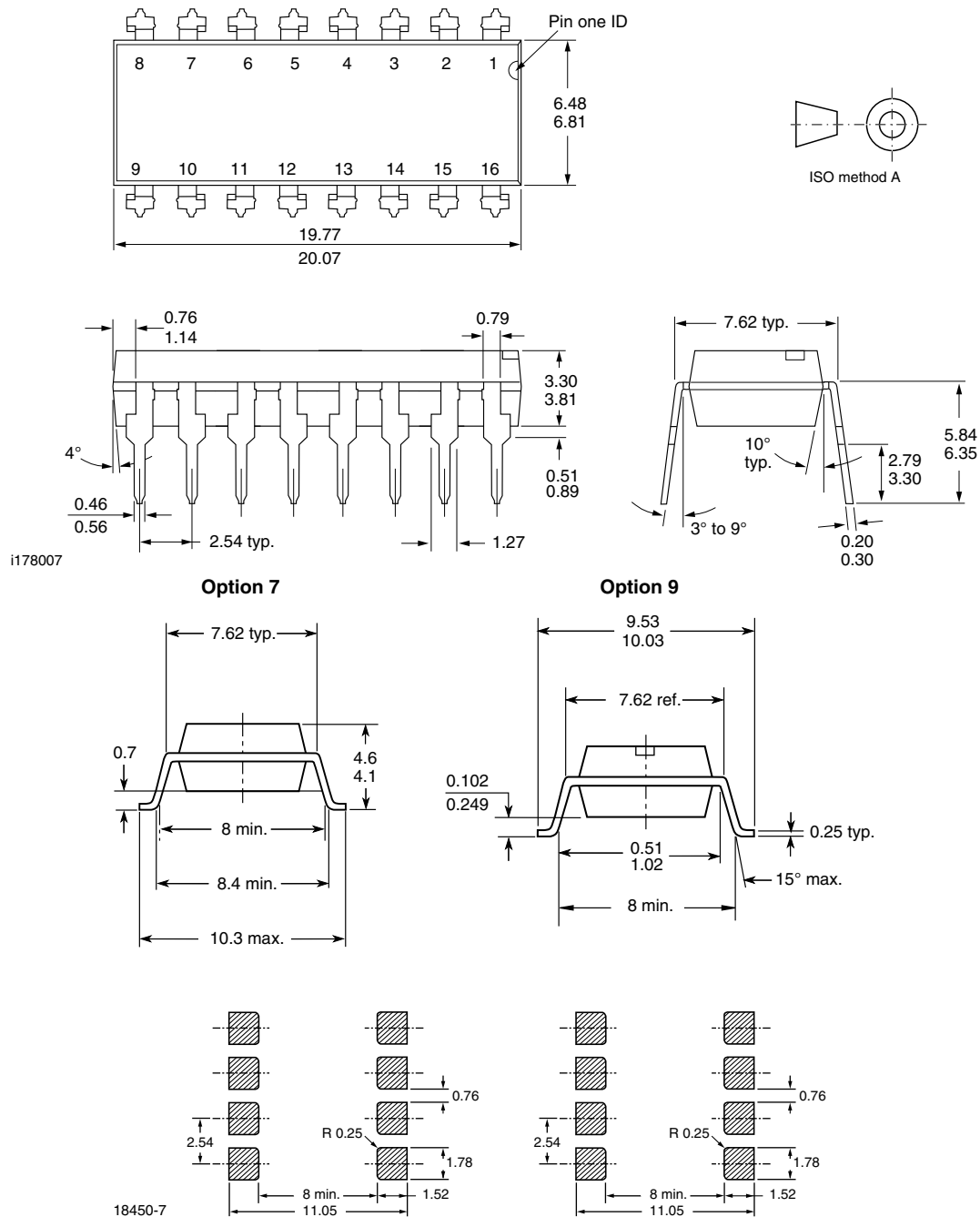
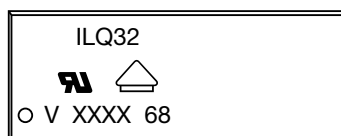


Fig. 7 - Switching Schematic

**PACKAGE DIMENSIONS** in millimeters**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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