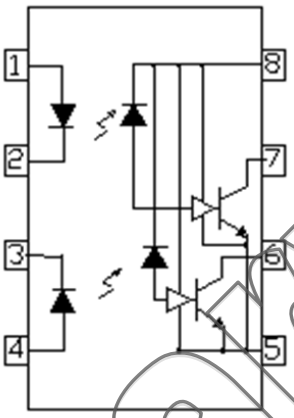
ICPL2630 / ICPL2631

DESCRIPTION

The ICPL2630 and ICPL2631 dual channel devices each consists of an infrared emitting diode, optically coupled to a high speed integrated photo detector logic gate with a strobable output.



1. Anode
2. Cathode
3. Cathode
4. Anode
5. Gnd
6. Vout2
7. Vout1
8. V_{CC}

FEATURES

- High speed 10Mbit/s
- High AC Isolation voltage 5000V_{RMS}
- Guaranteed performance from -40°C to 85°C
- Wide Operating temperature range
- Logic Gate Output
- RoHS Compliant
- Safety Approvals Pending

APPLICATIONS

- Line Receivers, Data Transmission
- Ground Loop Elimination
- LSTTL to TTL, LSTTL or 5V CMOS
- Data Multiplexing
- Pulse Transformer Replacement
- Computer Peripheral Interface

ORDER INFORMATION

- Add “X” as suffix for VDE DIN/EN60747-5-5 approval.
- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount,
- Add SMT/R after PN for Surface Mount Tape & Reel

.

AB- SOLUTE MAXI- MUM RATINGS

Input Diode

Forward Current (each Channel)	20mA
Reverse Voltage	5V
Power dissipation (each Channel)	40mW

Output

Output Current (each Channel)	50mA
Output Voltage	7V
Supply Voltage	7V
Power Dissipation	60mW

Total Package

Isolation Voltage	5000V_{RMS}
Operating Temperature	-40 to 100 °C
Storage Temperature	-55 to 125 °C
Power Dissipation	85mW
Lead Soldering Temperature (10s)	260°C

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ELECTRICAL CHARACTERISTICS

INPUT (T_A = -40°C to 85°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	I_F = 10mA T_A = 25°C		1.4	1.8	V
Reverse Voltage	V_R	I_R = 10µA	5.0			V
Temperature Coefficient	$\Delta V_F/\Delta T_A$	I_F = 10mA		-1.8		mV/°C
Input Capacitance	C_{IN}	V_F = 0V. f = 1MHz		60		pF

OUTPUT (T_A = -40°C to 85°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
High Level Supply Current	I_{CCH}	I_{F1} = 0mA, V_{CC} = 5.5V,		12.5	18	mA
Low Level Supply Current	I_{CCL}	I_{F1} = 10mA, V_{CC} = 5.5V,		14.5	21	mA

COUPLED (T_A = -40°C to 85°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
High Level Output Current	I_{OH}	V_{CC} = 5.5V, V_O = 5.5V, I_F = 250µA		2.1	100	µA
Low Level Output Voltage	V_{OL}	V_{CC} = 5.5V, I_F = 5mA, I_{CL} = 13mA		0.35	0.6	V
Input Threshold Current	I_{FT}	V_{CC} = 5.5V, V_O = 0.6V, I_{OL} = 13mA		2.5	5	mA

Preliminary

ELECTRICAL CHARACTERISTICS

Switching Characteristics (T_A = -40°C to 85°C, V_{CC} = 5V, I_F = 7.5mA unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Propagation Delay Time to Output High Level	t_{PLH}	C_L = 15pF, R_L = 350Ω, T_A = 25°C		35	100	ns
Propagation Delay Time to Output Low Level	t_{PHL}	C_L = 15pF, R_L = 350Ω, T_A = 25°C		40	100	ns
Pulse Width Distortion	$\lvert t_{PHL} - t_{PHL} \rvert$	C_L = 15pF, R_L = 350Ω		5	35	ns
Output Rise Time	tr	C_L = 15pF, R_L = 350Ω		40		ns
Output Fall time	tf	C_L = 15pF, R_L = 350Ω		10		ns
Common Mode Transient Immunity at Logic High	CM_H	ICPL2630 ICPL2631 I_F = 0mA, V_{CM} = 1kVp-p, V_{OH} = 2.0V R_L = 350Ω, T_A = 25°C	5000 10000	20000		V/µs
Common Mode Transient Immunity at Logic Low	CM_L	ICPL2630 ICPL2631 I_F = 7.5mA, V_{CM} = 1kVp-p, V_{OL} = 0.8V R_L = 350Ω, T_A = 25°C	5000 10000	20000		V/µs

Preliminary

Notes :

1. The V_{CC} supply must be bypassed by a 0.1µF capacitor or larger. This can be either a ceramic or solid tantalum capacitor with good high frequency characteristic and should be connected as close as possible to the package V_{CC} and Gnd pins.
2. t_{PLH}– Propagation delay is measured from the 3.75mA level on the HIGH to LOW transition of the input current pulse to the 1.5 V level on the LOW to HIGH transition of the output voltage pulse.
3. t_{PHL}– Propagation delay is measured from the 3.75mA level on the LOW to HIGH transition of the input current pulse to the 1.5 V level on the HIGH to LOW transition of the output voltage pulse.
4. tr– Rise time is measured from the 90% to the 10% levels on the LOW to HIGH transition of the output pulse.
5. tf– Fall time is measured from the 10% to the 90% levels on the HIGH to LOW transition of the output pulse.
6. CM_H– The maximum tolerable rate of rise of the common mode voltage to ensure the output will remain in the HIGH state (i.e., VOUT > 2.0V).
7. CM_L– The maximum tolerable rate of rise of the common mode voltage to ensure the output will remain in the LOW output state (i.e., VOUT < 0.8V).

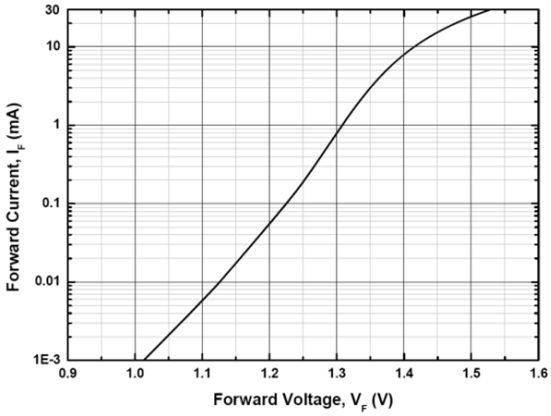

Fig 1 Forward Current vs Forward Voltage

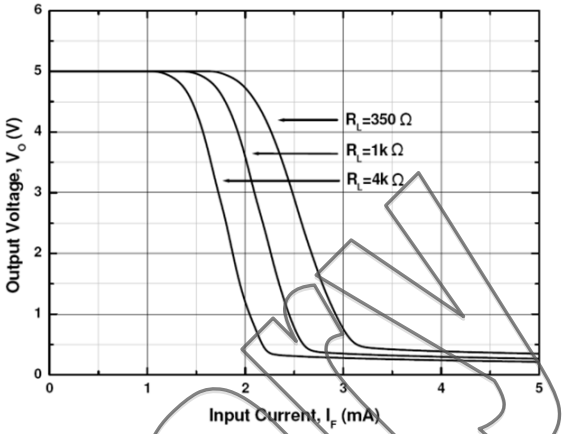

Fig 2 Out- put

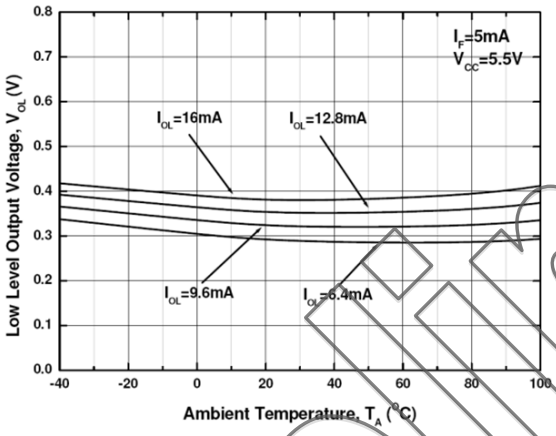

Fig 3 Low Level Output Voltage vs T_A

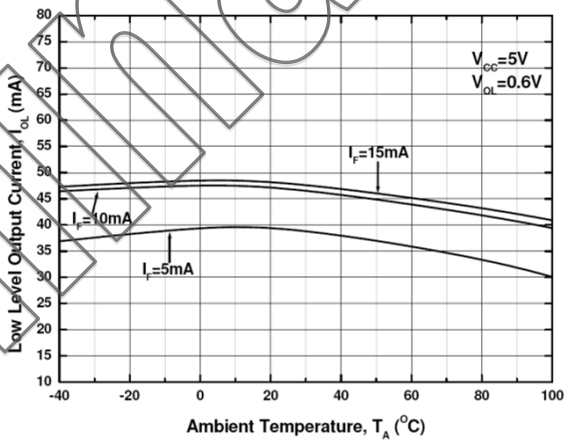

Fig 4 Low Level Output Current vs T_A

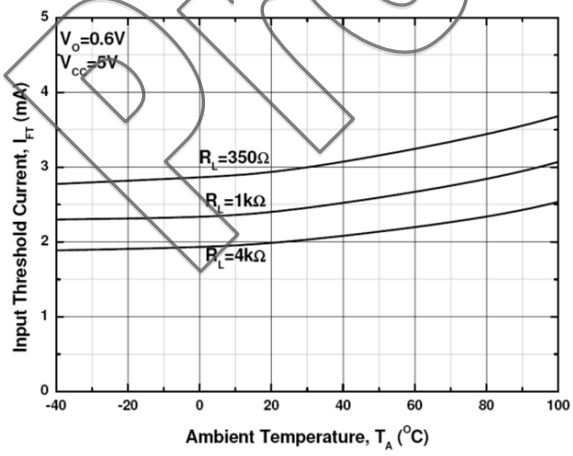

Fig 5 Input Threshold Current vs T_A

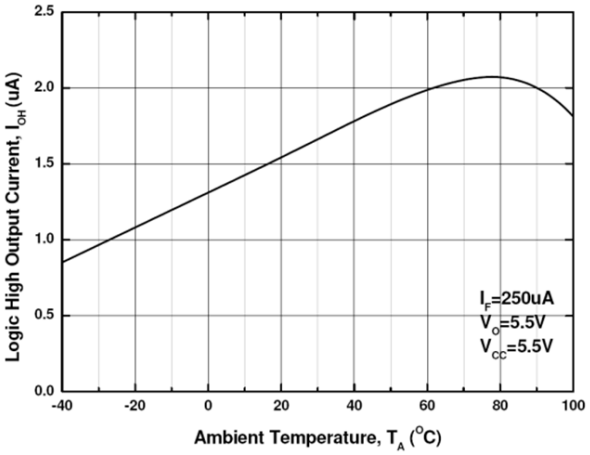

Fig 6 High Level Output Current vs T_A

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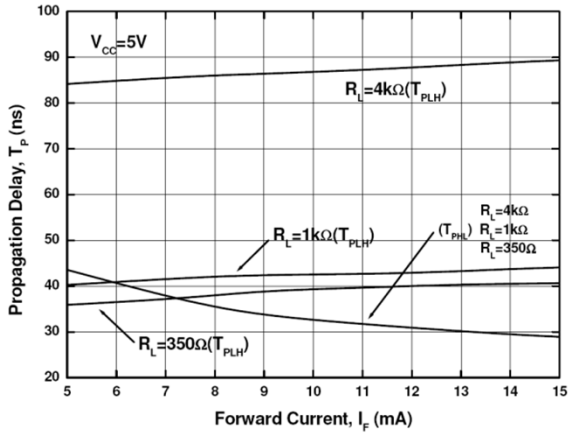

Fig 7 Propagation Delay vs Forward Current

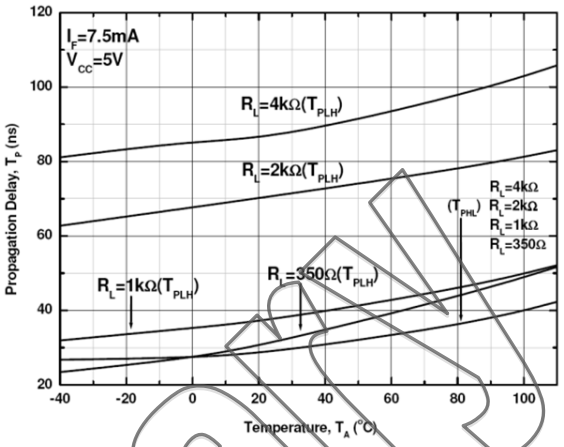

Fig 8 Prop-

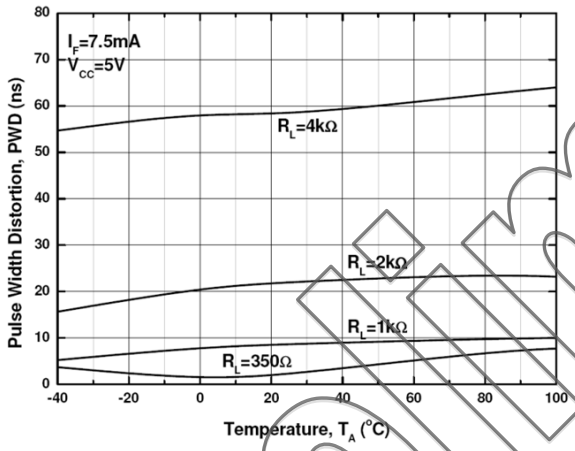

Fig 9 Pulse Width Distortion vs T_A

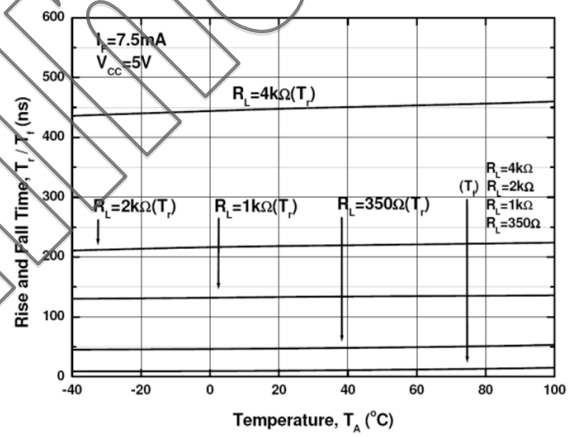

Fig 10 Rise Time and Fall Time vs T_A

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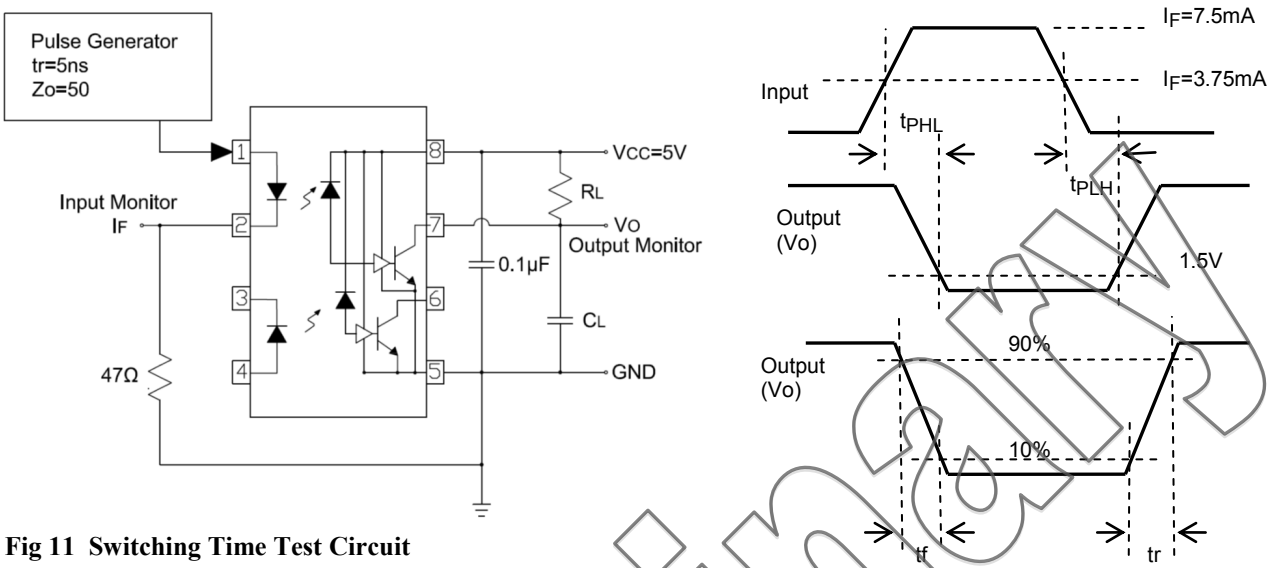

Fig 11 Switching Time Test Circuit

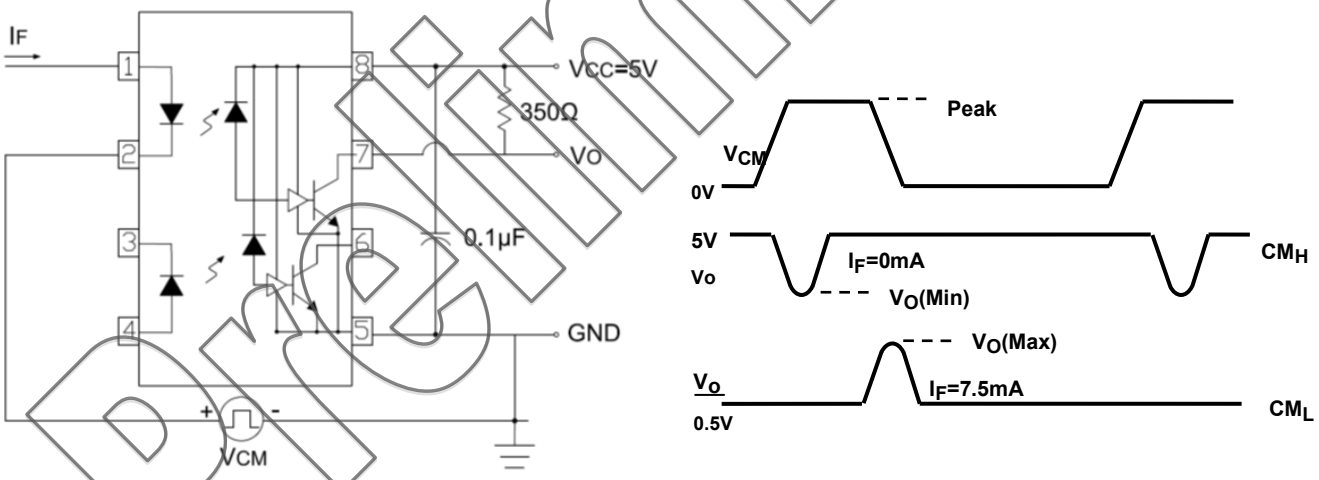

Fig 12 Com- mon Mode Transient Im-

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ORDER INFORMATION

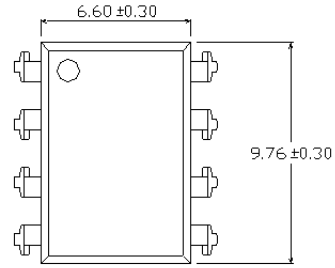
ICPL2630, ICPL2631

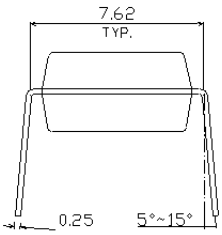
After PN	Description	Packing quantity
None	Standard DIP8	45 pcs per tube
X	VDE Approval	45 pcs per tube
G	10mm Lead Spacing	45 pcs per tube
SM	Surface Mount	45 pcs per tube
SMT/R	Surface Mount Tape & Reel	1000 pcs per reel
XSMT/R	Surface Mount Tape & Reel + VDE approval	1000 pcs per reel

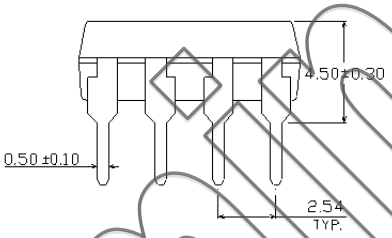
Preliminary

PACKAGE DIMENSIONS (mm)

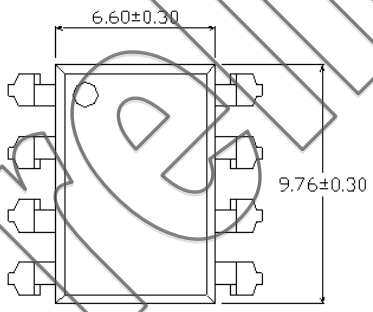
DIP

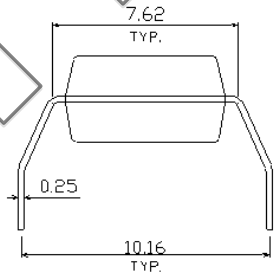


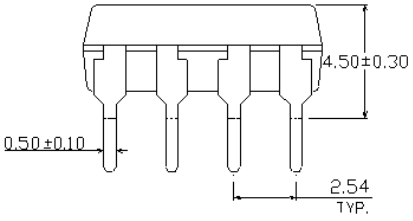




G FORM







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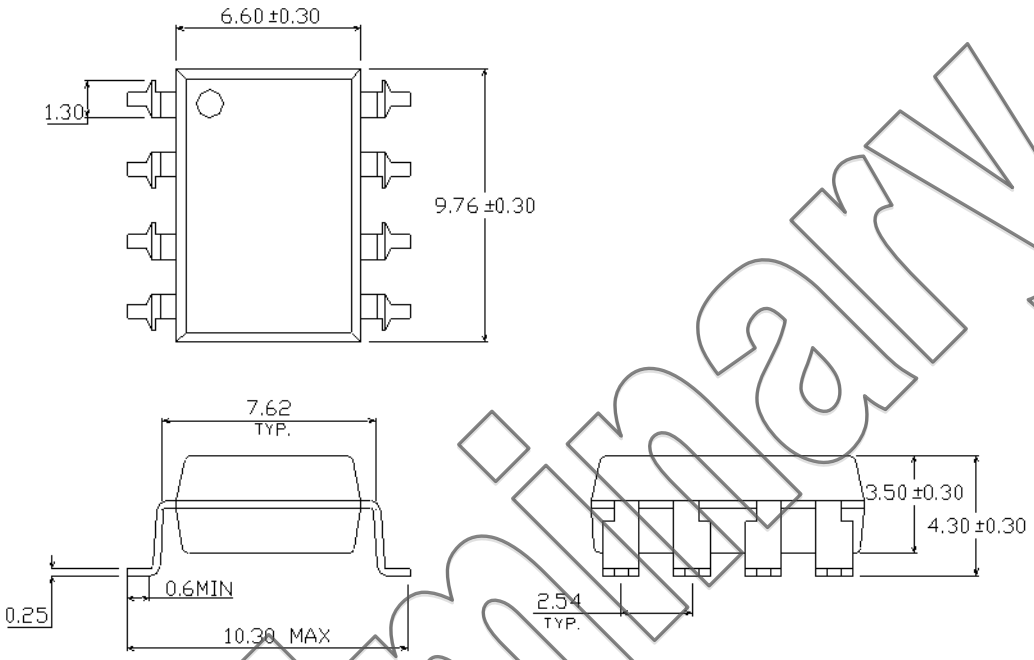
SMD



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REFLOW SOLDERING TEMPERATURE PROFILE