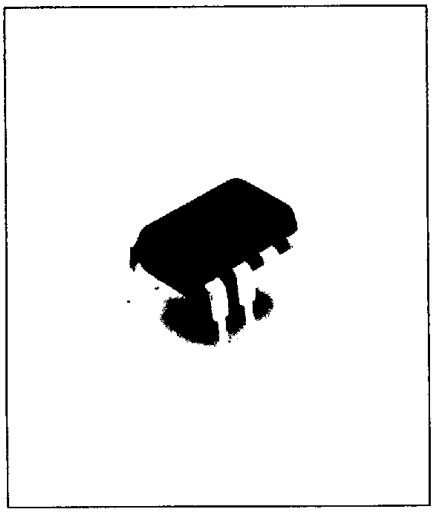
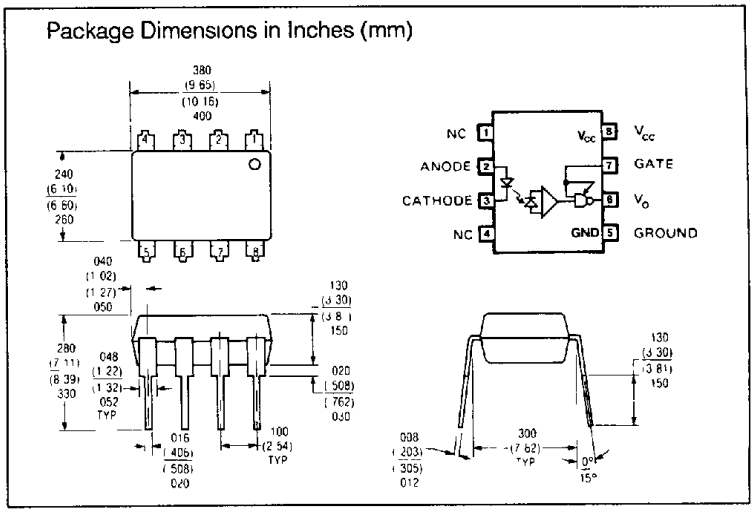
T-41-89

SIEMENS

IL101B

HIGH SPEED THREE STATE OPTOCOUPLER





FEATURES

- **High Speed**
- **Faraday Shielded Photodetector Improves Common Mode Rejection**
- **DTL/TTL Compatible, 5 V Supply**
- **Three State Output Logic for Multiplexing**
- **Built-In Schmitt Trigger Avoids Oscillation**
- **UL Approval #E52744**

DESCRIPTION

IL101B is an optically coupled pair with a Gallium Arsenide Phosphide LED and a silicon monolithic integrated circuit including a photodetector. High speed digital information can be transmitted while maintaining a high degree of electrical isolation between input and output. The IL101B can be used to replace pulse transformers in many digital interface applications. A built-in Schmitt Trigger provides hysteresis reducing oscillation possibility.

Maximum Ratings

Input Diode

Forward DC Current	25 mA
Reverse Voltage	5 V

Output IC

Supply Voltage (V_{CC})	7 V
Enable Input Voltage (V_E) (not to exceed V_{CC} by more than 500 mV)	5.5 V
Output Collector Current (I_C)	100 mA
Output Collector Power Dissipation	100 mW
Output Collector Voltage (V_{OUT})	7 V
Isolation Voltage (Input-Output), DC	6000 V

Package

Storage Temperature	-55°C to +125°C
Operating Temperature	0°C to +70°C
Lead Solder Temperature	260°C for 10 sec

Electrical Characteristics (T_{amb}=0°C to 70°C)

Parameter	Min.	Typ.	Max.	Unit	Test Condition
I_{in} (1) – Logic (1) Input Current for Logic (0) Output (Figure 1)	12			mA	
I_{in} (0) – Logic (0) Input Current for Logic (1) Output (Figure 1)			250	mA	
V_G (1) – Logic (1) Gate Voltage	2.0			V	
V_G (0) – Logic (0) Gate Voltage			8	V	
V_{OUT} (0) – Logic (0) Output Voltage		35	6	V	V_{CC}=5.5 V, V_G=2.4 V, I_{in}=12 mA, I_{out} (sinking) =16 mA
I_{CC}		18	22	mA	V_{CC}= 5.5 V, V_G=0.5 V, I_{in}=0.10 mA

Switching Characteristics (T_{amb}=25°C, V_{CC}=5 V)

Parameter	Min.	Typ.	Max.	Unit	Test Condition
t_{pd} (1) – Propagation Delay Time to Logic Level (1) (Fig 1, Note 1)		175	300	ns	R_L=350 Ω, C_L=15 pF, I_{in}=12 mA
t_{pd} (0) – Propagation Delay Time to Logic Level (0) (Fig. 1, Note 2)		70	300	ns	R_L = 350 Ω, C_L=15 pF, I_{in}=12 mA
t_R - t_F(0) – Output Rise-Fall Time (10-90%)		15		ns	R_L=350 Ω, C_L=15 pF, I_{in}=12 mA

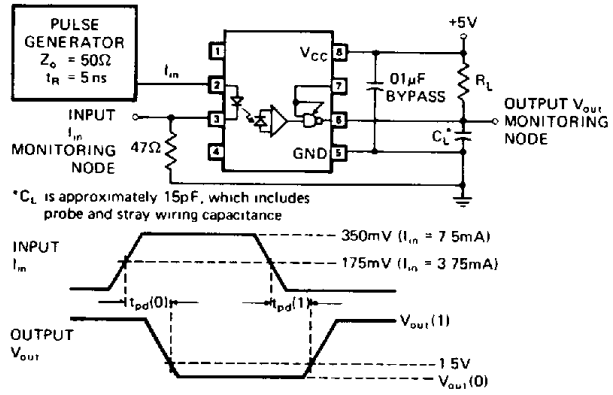
Electrical Characteristics (T_{amb}=25°C) – Input to Output

Parameter	Min.	Typ.	Max.	Unit	Test Condition
Insulation Voltage Input-Output (BV_{I0}) (Note 3)	6000	7500		VDC	t = 1 sec.
Resistance, Input-Output (R_{I-O}) (Note 3)	10^{12}			Ω	V_{I-O}= 500 V
Capacitance Input-Output (C_{I-O}) (Note 3)	0.5	0.8		pF	f = 1 MHz

Electrical Characteristics (T_{amb}=25°C) – Input Diode

Parameter	Min.	Typ.	Max.	Unit	Test Condition
Forward Voltage (V_F)		1 5	1 75	V	I_{in}=10 mA
Reverse Breakdown Voltage (V_{BR})	5			V	I_R=10 mA
Capacitance (I_{in})		10		pF	V = 0, f = 1MHz

FIGURE 1. TEST CIRCUIT FOR t_{pd} (0) AND t_{pd} (1)



Notes:
1. The t_{pd}(1) propagation delay is measured from the 3 75 mA point on the trailing edge of the input pulse to the 1.5 V point on the trailing edge of the output pulse
2. The t_{pd}(0) propagation delay is measured from the 3 75 mA point on the input pulse to the 1.5 V point on the leading edge of the output pulse
3. Pins 2 and 3 are shorted together, and pins 5, 6, 7, and 8 shorted together.
4. At 10 mA V_F decreases with increasing temperature at the rate of 1.6 mV/°C.

OPERATING PROCEDURES AND DEFINITIONS

Logic Convention: The IL101B is defined in terms of positive logic.

Bypassing: A ceramic capacitor (.01mF min.) should be connected from pin 8 to pin 5 to stabilize the switching amplifier operation. Switching properties may be impaired by not providing for bypassing.

Polarities: All voltages are referenced to network ground (pin 5). Current flowing toward a terminal is considered positive.

Gate input: No external pull-up required for a logic (1).

TRUTH TABLE (Positive Logic)

Input*	Enable	Output
1	1	0
0	1	1
1	0	off
0	0	off

*See definition of terms for logic state.

littlediode
COMPONENTS FOR ALL

Littlediode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.