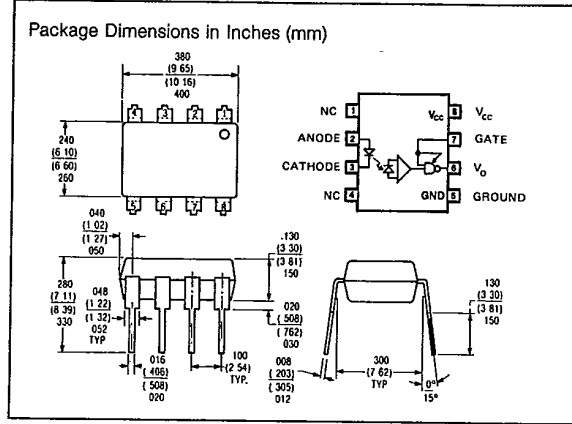
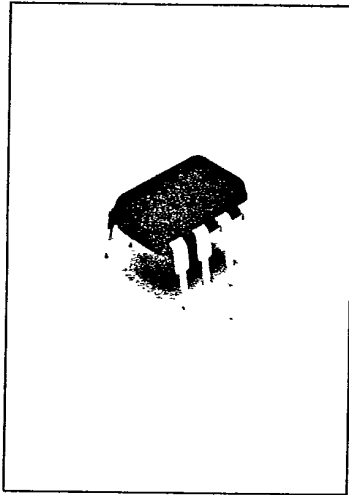


**SIEMENS**

**IL101**

**HIGH SPEED  
THREE STATE  
OPTOCOUPLER**



**FEATURES**

- High Speed
- Faraday Shielded Photodetector for Improved Common Mode Rejection
- DTL/TTL Compatible -5V supply
- Three State Output Logic for Multiplexing
- Built-in Schmitt Trigger to Avoid Oscillation
- Underwriters Lab Approval #E52744

**DESCRIPTION**

IL101 is an optically coupled pair employing a Gallium Arsenide Phosphide LED and a silicon monolithic integrated circuit including a photodetector. High speed digital information can be transmitted by the device while maintaining a high degree of electrical isolation between input and output. The IL101 can be used to replace pulse transformers in many digital interface applications. A built-in Schmitt Trigger provides hysteresis to reduce the possibility of oscillation.

**Absolute Maximum Ratings**

Storage Temperature	-55°C to +125°C
Operating Temperature	0°C to +70°C
Lead Solder Temperature	260°C for 10 Sec.
Input Diode	
Forward DC Current	10 mA
Reverse Voltage	5V
Output - IC	
Supply Voltage - V <sub>CC</sub>	7V
Enable Input Voltage - V <sub>E</sub>	5.5V
	(Not to exceed V <sub>CC</sub> by more than 500 mV)
Output Collector Current - I <sub>C</sub>	100 mA
Output Collector Power Dissipation	100 mW
Output Collector Voltage - V <sub>OUT</sub>	7V
Isolation Voltage (Input-Output) - DC	6000V

**Electrical Characteristics**

Over Recommended Temperature (T<sub>A</sub> = 0°C - 70°C)

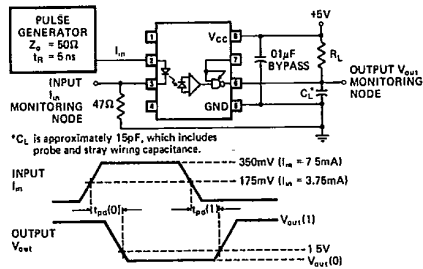
Parameter	Min.	Typ.	Max.	Units	Test	
					Conditions	Fig. Note
I <sub>in</sub> (1): Logic (1) Input Current to Ensure Logic (0) Output	5			mA		1 -
I <sub>in</sub> (0): Logic (0) Input Current to Ensure Logic (1) Output			250	µA		1 -
V <sub>G</sub> (1): Logic (1) Gate Voltage	2.0			V		- -
V <sub>G</sub> (0): Logic (0) Gate Voltage		.8		V		- -
V <sub>out</sub> (0): Logic (0) Output Voltage	.35	.6		V	V <sub>CC</sub> = 5.5 V, V <sub>G</sub> = 2.4 V, I <sub>in</sub> = 5 mA, I <sub>out</sub> (Sinking) = 16 mA	
I <sub>CC</sub>	18	22		mA	V <sub>CC</sub> = 5.5V V <sub>G</sub> = 0.5V I <sub>in</sub> = 0.10 mA	

Specifications are subject to change without notice.

Optocouplers  
(Optoisolators)

Switching Characteristics at  $T_A = 25^\circ$ ,  $V_{CC} = 5V$

Parameter	Min.	Typ.	Max.	Units	Conditions	Fig.	Note
$t_{pd}(1)$ : Propagation Delay Time to Logical (1) Level	175	300		ns	$R_L = 350\Omega$ , $C_L = 15pF$ , $I_{in} = 7.5 mA$	1	1
$t_{pd}(0)$ : Propagation Delay Time to Logical (0) Level	70	100		ns	$R_L = 350\Omega$ , $C_L = 15pF$ , $I_{in} = 7.5 mA$	1	2
$t_{R-F}$ : Output Rise-Fall Time (10 90%)	15			ns	$R_L = 350\Omega$ , $C_L = 15pF$ , $I_{in} = 7.5 mA$	-	-



Test Circuit for  $t_{pd}(0)$  and  $t_{pd}(1)$ .

Fig. 1

Electrical Characteristics—Input-Output at  $T_A = 25^\circ C$

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions	Fig.	Note
Insulation Voltage (Input-Output)	$BV_{1-0}$	6000	7500		VDC	$t = 1 Sec.$	-	3
Resistance (Input-Output)	$R_{1-0}$	$10^{12}$			$\Omega$	$V_{1-0} = 500V$	-	3
Capacitance (Input-Output)	$C_{1-0}$	0.5	0.8		pF	$f = 1MHz$	-	3

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.

Electrical Characteristics—Input Diode at  $T_A = 25^\circ C$

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions	Fig.	Note
Forward Voltage	$V_F$	1.5	1.75		V	$I_{in} = 10 mA$	-	4
Reverse Break-down Voltage	$V_{BR}$	5			V	$I_R = 10\mu A$	-	-
Capacitance	$C_n$		10		pF	$V = 0$ , $f = 1MHz$	-	-

Operating Procedures and Definitions

- Logic Convention.** The IL-101 is defined in terms of positive logic.
  - Bypassing.** A ceramic capacitor (.01 $\mu F$  min.) should be connected from pin 8 to pin 5. Its purpose is to stabilize the operation of the switching amplifier. Failure to provide the bypassing may impair the switching properties.
  - 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).
- NOTES:**
- The  $t_{pd}(1)$  propagation delay is measured from the 3.75 mA point on the trailing edge of the input pulse to the 1.5V point on the trailing edge of the output pulse.
  - The  $t_{pd}(0)$  propagation delay is measured from the 3.75 mA point on the input pulse to the 1.5V point on the leading edge of the output pulse.
  - Pins 2 and 3 shorted together, and pins 5, 6, 7, and 8 shorted together.
  - At 10 mA  $V_F$  decreases with increasing temperature at the rate of 1.6mV/ $^\circ C$ .