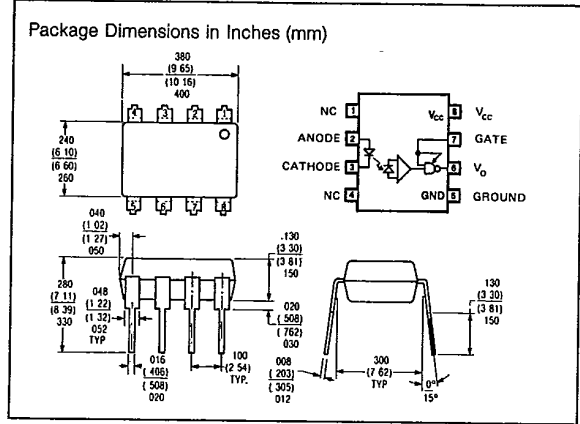
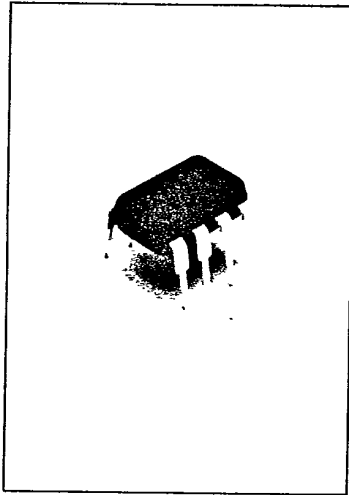


SIEMENS

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 _{CC}	7V
Enable Input Voltage - V _E	5.5V
	(Not to exceed V _{CC} by more than 500 mV)
Output Collector Current - I _C	100 mA
Output Collector Power Dissipation	100 mW
Output Collector Voltage - V _{OUT}	7V
Isolation Voltage (Input-Output) - DC	6000V

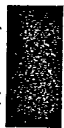
Electrical Characteristics

Over Recommended Temperature (T_A = 0°C - 70°C)

Parameter	Min.	Typ.	Max.	Units	Test	
					Conditions	Fig. Note
I _{in} (1): Logic (1) Input Current to Ensure						
Logic (0) Output	5			mA		1 -
I _{in} (0): Logic (0) Input Current to Ensure						
Logic (1) Output			250	µA		1 -
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} = 5 mA, I _{out} (Sinking) = 16 mA	
I _{CC}	18	22		mA	V _{CC} = 5.5V V _G = 0.5V I _{in} = 0.10 mA	

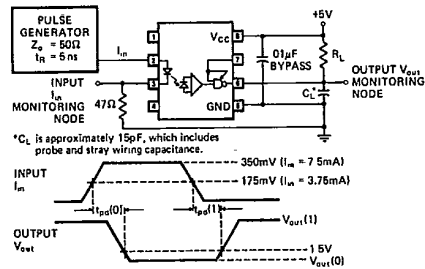
Specifications are subject to change without notice.

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}			Ω	$V_{1-0} = 500V$	-	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 (.01μF 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/°C