



# 12-BIT SCHOTTKY BARRIER DIODE BUS TERMINATOR

### Features

- 24 integrated diodes in a single package offers 12 channel, dual rail clamping action
- Provides proper bus termination independent of external line or card loading conditions
- Schottky diode technology; excellent forward voltage and reverse recovery characteristics
- Enhanced performance over existing device
- 16-pin SOIC package

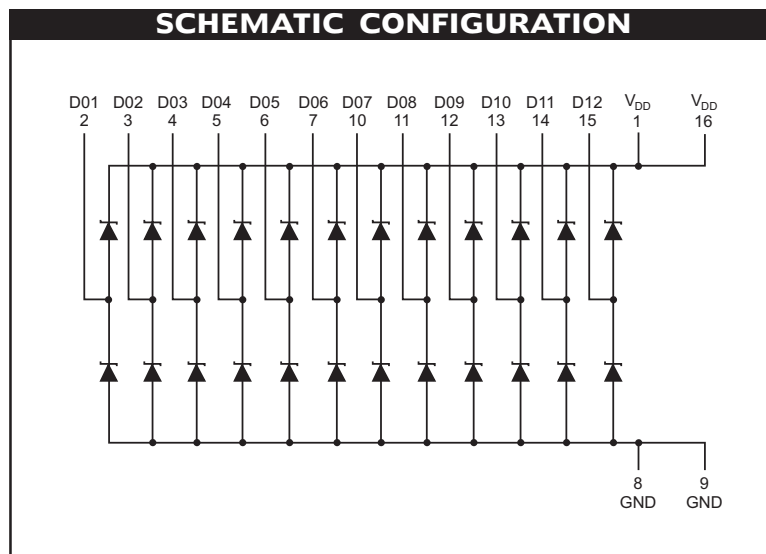
### Applications

- Local high speed bus termination for all popular RISC and embedded microprocessor applications
- High speed memory and SDRAM memory bus termination

### Product Description

Reflections on high speed data lines lead to undershoot and overshoot disturbances which may result in improper system operation. Resistor terminations, when used to terminate high speed data lines, increase power consumption and degrade output (high) levels resulting in reduced noise immunity. Schottky diode termination is the best overall solution for applications in which power consumption and noise immunity are critical considerations.

This integrated Schottky diode network provides very effective termination performance for high speed data lines under variable loading conditions. The device supports up to 12 terminated lines per package — each of which can be simultaneously clamped to both ground and power supply rail.



**STANDARD SPECIFICATIONS****ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Rating
Supply Voltage	$V_{DD}$	-0.3V to +7V
Channel clamp current (continuous)	$I_{clamp}$	$\pm 50\text{mA}$
Operating Temperature		0°C to 70°C
Storage Temperature	Tstg	-65°C to +150°C
Package Power Rating		625mW, max.

The absolute maximum ratings are limiting values, to be applied individually, beyond which the device may be permanently damaged. Functional operation under any of these conditions is not guaranteed. Exposing the device to its absolute maximum rating may affect its reliability.

**DIODE CHARACTERISTICS ( $T_A = 0^\circ\text{ to } 70^\circ\text{C}$ )**

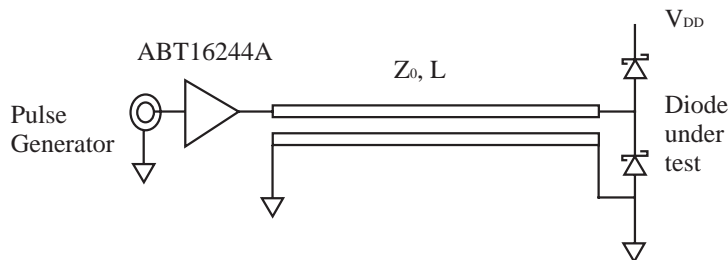
Parameter	Conditions	Min	Typ	Max
Diode forward voltage	To $V_{DD}$	$I_F = 16\text{ mA}$		0.70V
		$I_F = 50\text{ mA}$	0.55V	0.90V
	From GND	$I_F = 16\text{ mA}$		0.65V
		$I_F = 50\text{ mA}$	0.50V	0.85V
Reverse Recovery Time (See Note 1)	$I_F = 50\text{mA}$ (estimated)			<400pS
Channel leakage	$0 \leq V_{IN} \leq V_{DD}$		0.1 $\mu\text{A}$	5 $\mu\text{A}$
Input Capacitance	$f = 1\text{ MHz}$ , $V_{IN} = 2.5\text{V}$ , $T_A = 25^\circ\text{C}$ , $V_{DD} = 5.0\text{V}$		5pF	
ESD Protection	MIL-STD-883, Method 3015	4KV		

**STANDARD PART ORDERING INFORMATION**

Package		Ordering Part Number		
Pins	Style	Tubes	Tape & Reel	Part Marking
16	SOIC Narrow	SN 74S1051/T	SN 74S1051/R	SN 74S1051

Note 1:

The test circuit depicts the Schottky diodes in their typical application. The impact of a reverse recovery time is measured using a narrow pulse with 670- pS rise and fall times. This pulse propagates down a 60 cm, 54 ohm strip line fabricated on a multi-layer, controlled impedance printed circuit board. In testing the ground clamp diode, the negative going edge of the pulse causes a reflection which forces the diode under test to become forward biased. The positive going edge of the pulse attempts to pull this diode out of forward conduction. A reverse recovery phenomenon would cause a delay between the known arrival time of the positive edge and the observed edge due to the time it takes for the forward biased diode to actually become reversed biased. In this measurement, however, there is no observable difference and therefore no delay for the positive edge due to the presence of the diode. The waveforms are adjusted to individually test the ground and  $V_{DD}$  clamps. See test circuit.



Test Circuit. Line length, pulse width and duty cycle are selected such as that only one reflection is involved in the measurement.