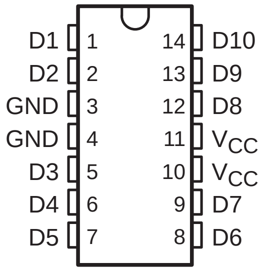
SN74ACT1071
10-BIT BUS-TERMINATION ARRAY WITH BUS-HOLD FUNCTION

SCAS192 – D3994, MARCH 1992 – REVISED APRIL 1993

- **Designed to Ensure Defined Voltage Levels on Floating Bus Lines in CMOS Systems**
- **Reduces Undershoot and Overshoot Caused By Line Reflections**
- **Repetitive Peak Forward Current . . . I_{FRM} = 100 mA**
- **Inputs Are TTL-Voltage Compatible**
- **Low Power Consumption (Like CMOS)**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015; Exceeds 200 V Using Machine Model (C = 200 pF, R = 0)**
- **Center-Pin V_{CC} and GND Configuration Minimizes High-Speed Switching Noise**

D PACKAGE
(TOP VIEW)



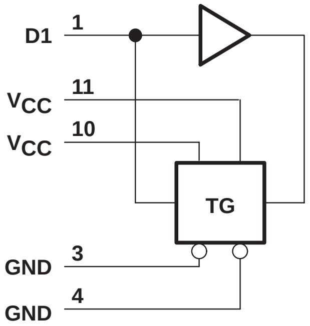
description

This device is designed to terminate bus lines in CMOS systems. The integrated low-impedance diodes clamp the voltage of undershoots and overshoots caused by line reflections and ensure signal integrity. The device also contains a bus-hold function that consists of a CMOS-buffer stage with a high-resistance feedback path between its output and its input. The SN74ACT1071 prevents bus lines from floating without using pullup or pulldown resistors.

The high-impedance inputs of these internal buffers are connected to the input terminals of the device. The feedback path on each internal buffer stage keeps a bus line tied to the bus holder at the last valid logic state generated by an active driver before the bus switches to the high-impedance state.

The SN74ACT1071 is characterized for operation from –40°C to 85°C.

logic diagram, one of ten channels (positive logic)



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)[†]

Supply voltage range, V_{CC}	–0.5 V to 7 V
Input voltage range, V_I (see Note 1)	–0.5 V to V_{CC} + 0.5 V
Continuous input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$)	±20 mA
Positive-peak input clamp current, I_{IK} ($V_I > V_{CC}$) ($t_w < 1$ µs, duty cycle < 20%)	100 mA
Negative-peak input clamp current, I_{IK} ($V_I < 0$) ($t_w < 1$ µs, duty cycle < 20%)	–100 mA
Storage temperature range	–65°C to 150°C

[†] Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The input negative-voltage rating may be exceeded if the input clamp-current rating is observed.

recommended operating conditions

		MIN	MAX	UNIT
V_{CC}	Supply voltage	4.5	5.5	V
V_{IH}	High-level input voltage	2.5		V
V_{IL}	Low-level input voltage		0.8	V
V_I	Input voltage	0	V_{CC}	V
T_A	Operating free-air temperature	–40	85	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS		TA = 25°C			MIN	MAX	UNIT
			MIN	TYP[†]	MAX			
I_{IL}	V_{CC} = 4.5 to 5.5 V,	V_I = 0.8 V	0.15	0.3	0.9	0.1	1	mA
I_{IH}	V_{CC} = 4.5 to 5.5 V,	V_I = 2.5 V	–0.2	–0.5	–1.4	–0.15	–1.5	mA
V_{IKL}	I_{IN} = –18 mA				–1.5		–1.5	V
V_{IKH}	I_{IN} = 18 mA				$V_{CC}+2$		$V_{CC}+2$	V
I_{CC}[‡]	V_{CC} = 5.5 V,	Inputs open			4		40	µA
ΔI_{CC}[§]	One input at 3.4 V,	Other inputs at V_{CC} or GND			0.9		1	mA
C_i	$V_I = V_{CC}$ or GND			3				pF

[†] All typical values are at V_{CC} = 5 V.

[‡] Inputs may be set high or low prior to the I_{CC} measurement.

[§] This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather than 0 V or V_{CC}.

TYPICAL CHARACTERISTICS

FORWARD CURRENT
vs
INPUT VOLTAGE
(UPPER CLAMPING DIODE)

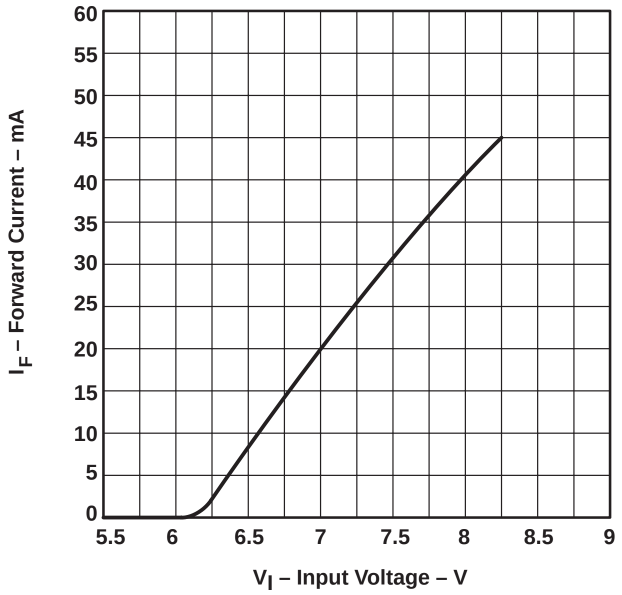


Figure 1

FORWARD CURRENT
vs
INPUT VOLTAGE
(LOWER CLAMPING DIODE)

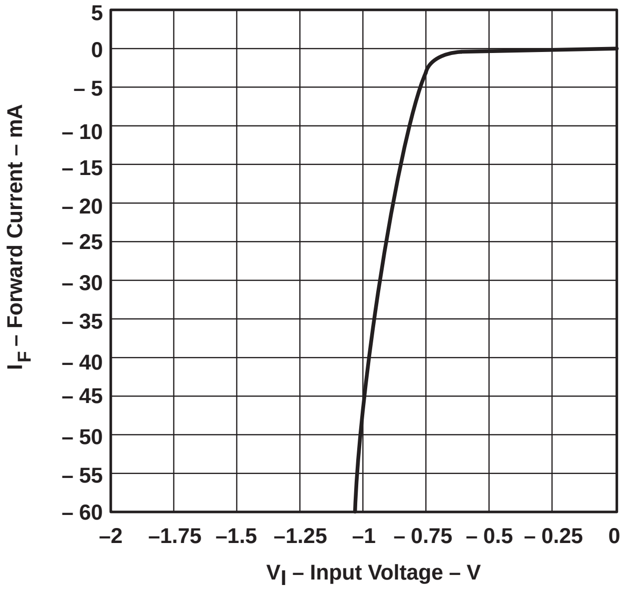


Figure 2

INPUT CURRENT
vs
INPUT VOLTAGE

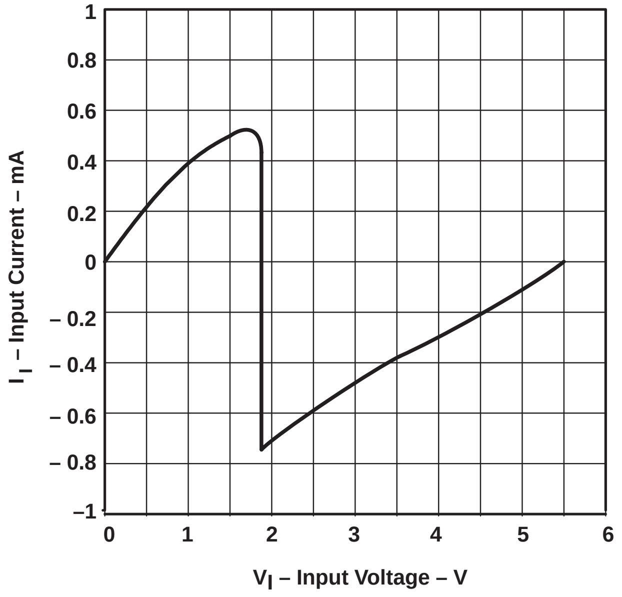


Figure 3

SUPPLY CURRENT
vs
INPUT VOLTAGE

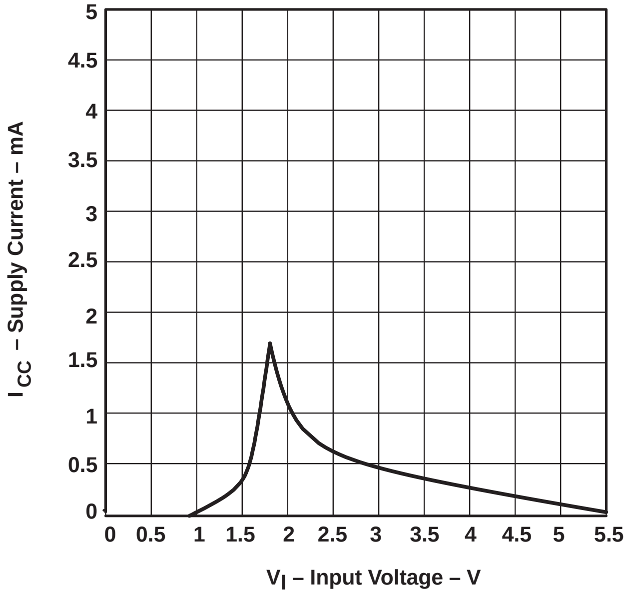


Figure 4

APPLICATION INFORMATION

The SN74ACT1071 terminates the output of a driving device and holds the input of the driven device at the logic level of the driver output prior to establishment of the high-impedance state on that output (see Figure 5).

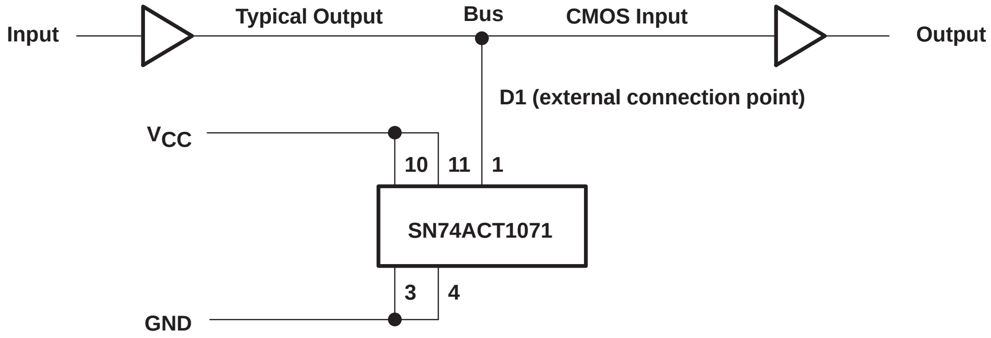


Figure 5. Bus-Hold Application

PACKAGE OPTION ADDENDUM

4-Mar-2005

PACKAGING INFORMATION

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]
SN74ACT1071D	ACTIVE	SOIC	D	14	50	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
SN74ACT1071DR	ACTIVE	SOIC	D	14	2500	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM

[1] The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

[2] Eco Plan - May not be currently available - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
None: Not yet available Lead (Pb-Free).
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Green (RoHS & no Sb/Br): TI defines "Green" to mean "Pb-Free" and in addition, uses package materials that do not contain halogens, including bromine (Br) or antimony (Sb) above 0.1% of total product weight.

[3] MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDECindustry standard classifications, and peak solder temperature.

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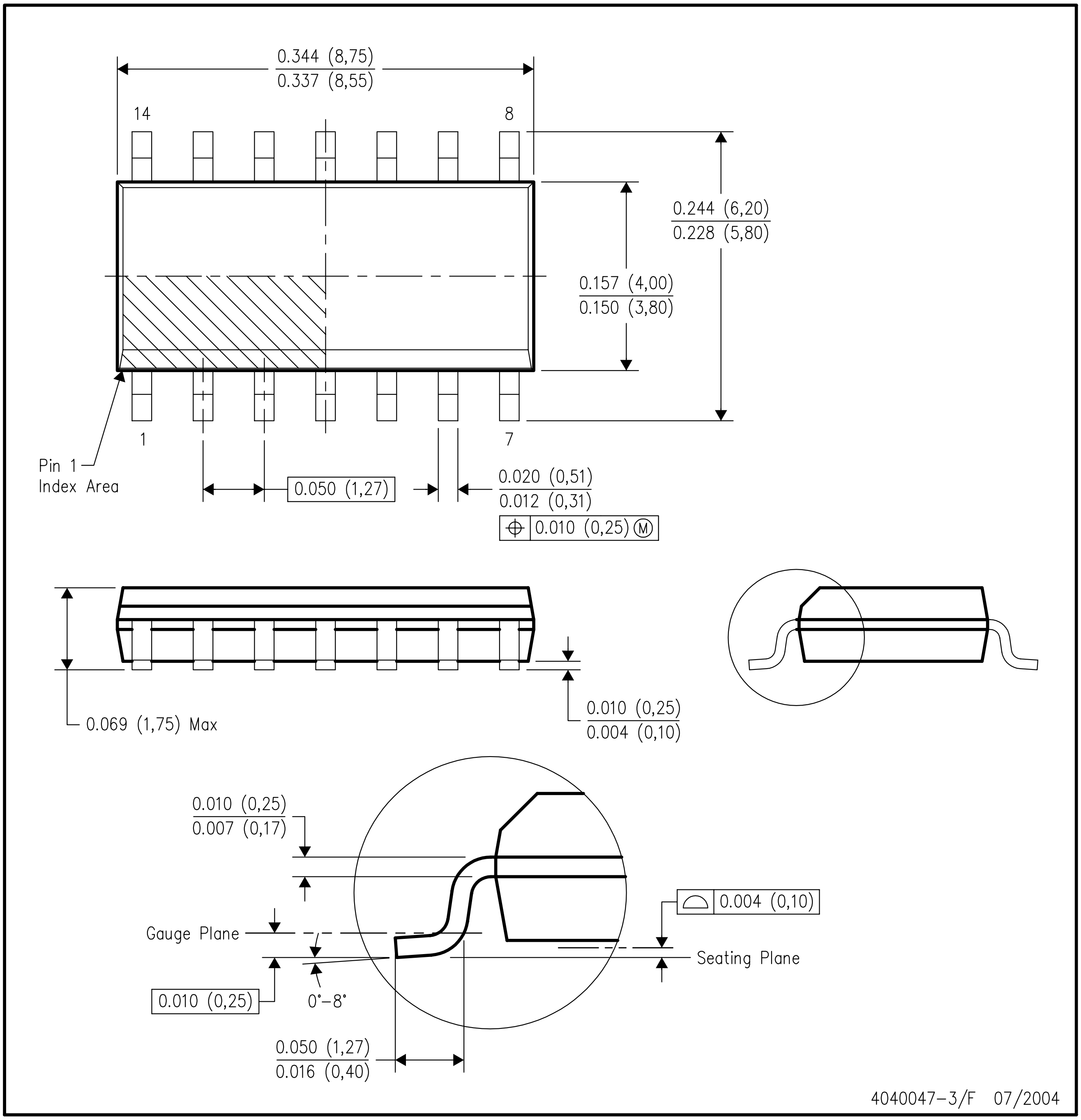
D (R–PDSO–G14) PLASTIC SMALL–OUTLINE PACKAGE



NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
- D. Falls within JEDEC MS–012 variation AB.

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