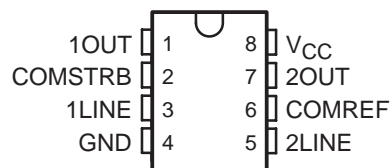


- Single 5-V Supply
- $\pm 100\text{-mV}$ Sensitivity
- For Application as:
 - Single-Ended Line Receiver
 - Gated Oscillator
 - Level Comparator
- Adjustable Reference Voltage
- TTL Outputs
- TTL-Compatible Strobe
- Designed for Party-Line (Data-Bus) Applications
- Common Reference-Voltage Pin
- Common Strobe

D PACKAGE
(TOP VIEW)



description/ordering information

This device consists of a dual single-ended line receiver with TTL-compatible strobes and outputs. The reference voltage (switching threshold) is applied externally and can be adjusted from 1.5 V to 3.4 V, making it possible to optimize noise immunity for a given system design. Due to the low input current (less than 100 μA), the device is suited ideally for party-line (data-bus) systems.

The SN74LS2323 has a common reference-voltage pin and a common strobe.

ORDERING INFORMATION

T_A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	SOIC – D	Tube	SN74LS2323D	LS2323
		Tape and reel	SN74LS2323DR	

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

FUNCTION TABLE
(each receiver)

LINE INPUT	STROBE	OUTPUT
$\leq (V_{REF} - 100\text{ mV})$	L	H
$\geq (V_{REF} + 100\text{ mV})$	X	L
X	H	L

H = high level, L = low level, X = irrelevant



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

**TEXAS
INSTRUMENTS**

POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

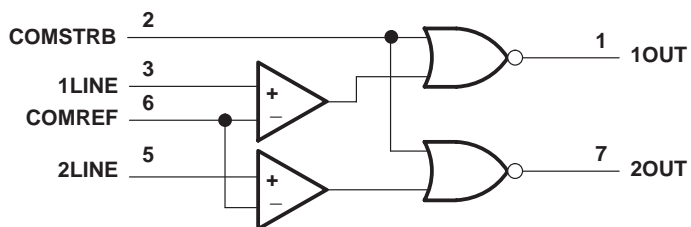
Copyright © 2004, Texas Instruments Incorporated

SN74LS2323

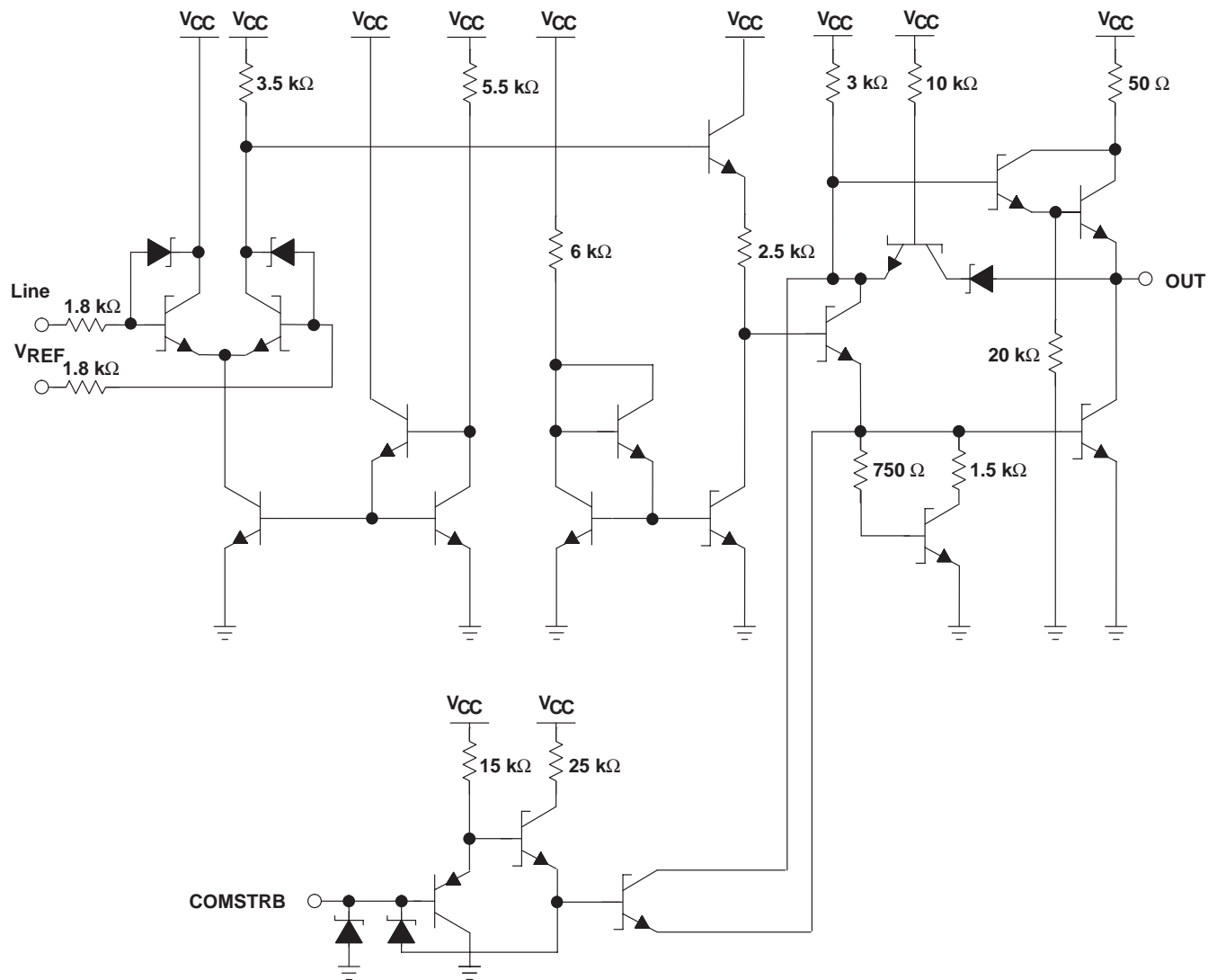
DUAL LINE RECEIVER

SDLS965 – OCTOBER 2004

logic diagram (positive logic)



schematic (each receiver)



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

Supply voltage, V_{CC} (see Note 1)	7 V
Reference input voltage, V_{REF}	5.5 V
Line input voltage range with respect to GND	–2 V to 7 V
Line input voltage with respect to V_{REF}	±5 V
Strobe input voltage, $V_{I(S)}$	7 V
Package thermal impedance, θ_{JA} (see Note 2)	97°C/W
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C
Storage temperature range, T_{stg}	–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.

NOTES: 1. Unless otherwise specified, voltage values are with respect to network ground terminal.
2. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions

		MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage	4.5	5	5.5	V
V_{ref}	Reference input voltage	1.8		‡	V
$V_{I(L)}$	High-level line input voltage	0		$V_{CC} - 1$	V
$V_{I(S)}$	High-level strobe input voltage	0		7	V
T_A	Operating free-air temperature range	0		70	°C

‡ Max = $V_{CC} - 1.5\text{ V} > V_{REF} < 3.4\text{ V}$

SN74LS2323

DUAL LINE RECEIVER

SDLS965 – OCTOBER 2004

electrical characteristics over recommended operating free-air temperature range,
 $V_{CC} = 5\text{ V} \pm 10\%$, $V_{REF} = 1.5\text{ V to } 3.5\text{ V}$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	MAX	UNIT
V _{IH(L)}	High-level line input voltage	V _{I(S)} = 0.8 V, I _{OL} = 12 mA, V _{REF} = 2.5 V, V _{OL} ≤ 0.6 V	V _{CC} = 4.5 V	2.62	6	V
		V _{I(S)} = 0.8 V, I _{OL} = 16 mA, V _{REF} = 3.4 V, V _{OL} ≤ 0.5 V	V _{CC} = 5.5 V	3.5	7	
V _{IL(L)}	Low-level line input voltage	V _{I(S)} = 0.8 V, I _{OH} = −0.4 mA, V _{REF} = 2.5 V, V _{OH} ≥ 2 V	V _{CC} = 4.5 V	−2	2.38	V
		V _{I(S)} = 0.8 V, I _{OH} = −0.4 mA, V _{REF} = 3.4 V, V _{OH} ≥ 3.2 V	V _{CC} = 5.5 V	−2	3.3	
V _{IH(S)}	High-level output control input voltage	V _{I(L)} = 1.8 V, V _{REF} = 2.5 V, V _O ≤ 0.4 V	V _{CC} = 4.5 V	2		V
V _{IL(S)}	Low-level output control input voltage	V _{I(L)} = 1.8 V, V _{REF} = 2.5 V, V _O ≥ 2.4 V	V _{CC} = 4.5 V		0.8	V
V _{OH}	High-level output voltage	V _{I(L)} = 1.4 V, V _{I(S)} = 0.8 V, I _{OH} = −1 mA, V _{REF} = 2.5 V	V _{CC} = 4.5 V	2		V
			V _{CC} = 5 V	2.7		
			V _{CC} = 5.5 V	2.7		
V _{OL}	Low-level output voltage	V _{I(L)} = 3.8 V, V _{I(S)} = 0.8 V, V _{REF} = 2.5 V	V _{CC} = 4.5 V, I _{OL} = 16 mA		0.6	V
			V _{CC} = 5 V, I _{OL} = 24 mA		0.5	
			V _{CC} = 5.5 V, I _{OL} = 24 mA		0.5	
I _{IH(S)}	High-level input current	V _{I(L)} = 3.8 V, V _{REF} = 2.5 V	V _{CC} = 5.5 V, V _{I(S)} = 2.4 V		20	μA
			V _{CC} = 5.5 V, V _{I(S)} = 7 V		100	
I _{IH(L)}	High-level input current	V _{I(S)} = 2.4 V, V _{REF} = 2.5 V	V _{CC} = 5 V, V _{I(L)} = 5 V		100	μA
			V _{CC} = 5 V, V _{I(L)} = 5.5 V		2	mA
I _{IH(REF)}	High-level input current	V _{I(S)} = 2.4 V, V _{REF} = 3.4 V	V _{CC} = 5.5 V, V _{I(L)} = 2.5 V		500	μA
I _{IL(S)}	Low-level input current	V _{I(L)} = 1.8 V, V _{REF} = 0.1 V	V _{CC} = 5.5 V, V _{I(S)} = 0.4 V		−400	μA
I _{IL(L)}	Low-level input current at Line input	V _{I(L)} = 0.1 V, V _{REF} = 1.8 V	V _{CC} = 5.5 V, V _{I(S)} = 0.4 V		−100	μA
I _{IL(REF)}	Low-level input current at REF pin	V _{I(L)} = 1.8 V, V _{REF} = 0.1 V	V _{CC} = 5.5 V, V _{I(S)} = 0.4 V		−100	μA
I _{OS}	Short-circuit output current†	V _{I(L)} = 1.8 V, V _{REF} = 2.8 V	V _{CC} = 5.5 V V _{I(S)} = 0.4 V	−30	−130	mA
I _{CCH}	Supply current, output high	V _{I(S)} = 0, V _{CC} = 5.5 V V _{I(L)} = V _{REF} − 100 mV			12	mA
I _{CCL}	Supply current, output low	V _{I(S)} = 0, V _{CC} = 5.5 V V _{I(L)} = V _{REF} + 100 mV			16	mA

[†] Only one output should be shorted at a time, and duration of the short circuit should not exceed one second.



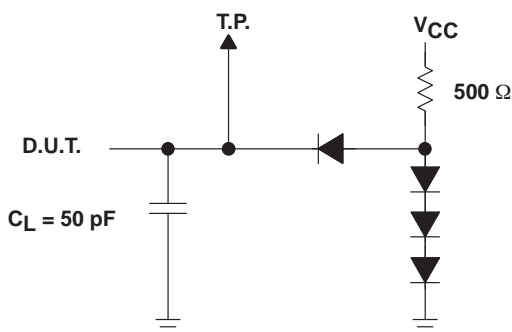
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

switching characteristics, $V_{CC} = 5\text{ V} \pm 10\%$, $V_{REF} = 2.5\text{ V}$, $T_A = 0^\circ\text{C}$ to 70°C

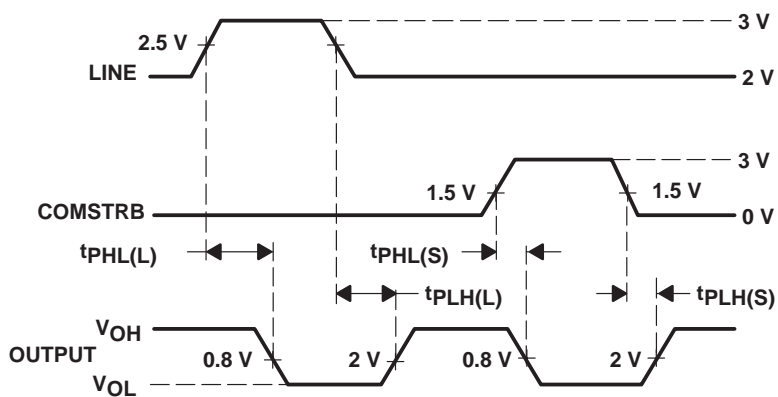
PARAMETER	TEST CONDITIONS	MIN	TYP†	MAX	UNIT
$t_{PLH(L)}$ Propagation delay time, low- to high-level output from LINE	$C_L = 50\text{ pF}$, $R_L = 500\ \Omega$, See Figure 1	10	25	35	ns
$t_{PHL(L)}$ Propagation delay time, high- to low-level output from LINE	$C_L = 50\text{ pF}$, $R_L = 500\ \Omega$, See Figure 1	10	25	35	ns
$t_{PLH(S)}$ Propagation delay time, low- to high-level output from COMSTRB	$C_L = 50\text{ pF}$, $R_L = 500\ \Omega$, See Figure 1		11	22	ns
$t_{PHL(S)}$ Propagation delay time, high- to low-level output from COMSTRB	$C_L = 50\text{ pF}$, $R_L = 500\ \Omega$, See Figure 1		8	15	ns

† All typical values are at $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$.

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT

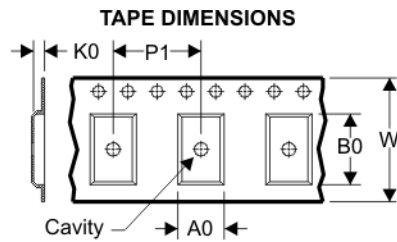
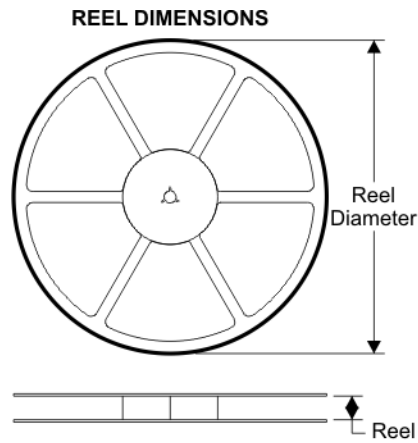


VOLTAGE WAVEFORMS

- NOTES: A. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1\text{ MHz}$, t_r and $t_f \leq 2\text{ ns}$, and duty cycle = 50%.
- B. C_L includes probe and jig capacitance.
- C. All diodes are 1N914 (or equivalent).
- D. The outputs are measured one at a time, with one input transition per measurement.

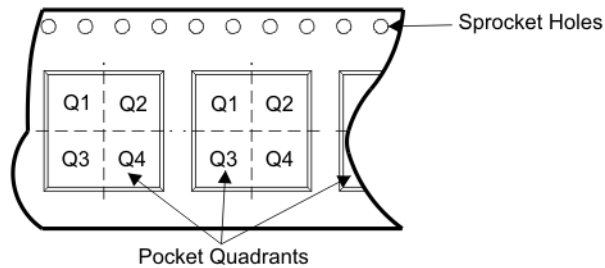
Figure 1. Load Circuit and Voltage Waveforms

TAPE AND REEL BOX INFORMATION



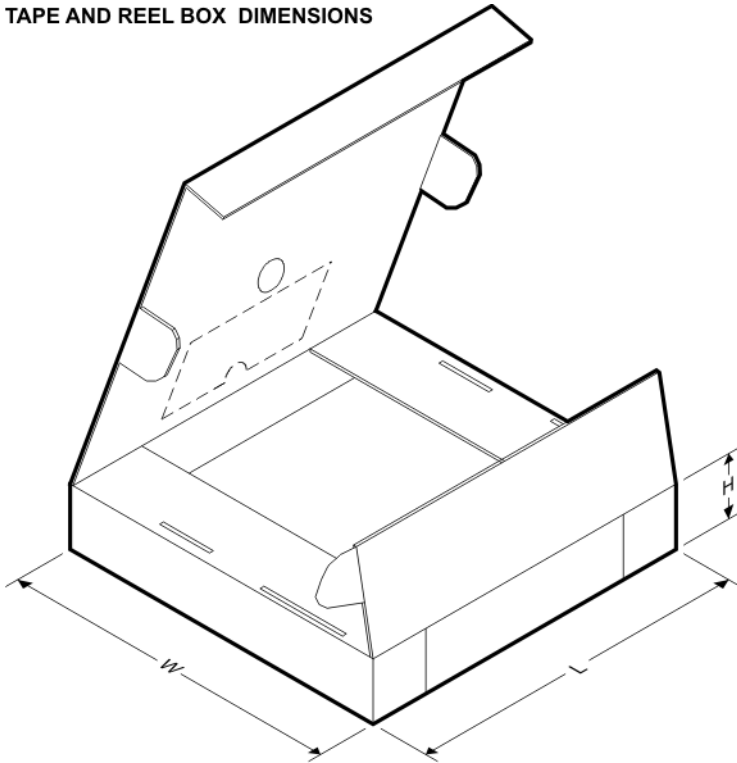
A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



Device	Package	Pins	Site	Reel Diameter (mm)	Reel Width (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LS2323DR	D	8	SITE 27	330	12	6.4	5.2	2.1	8	12	Q1

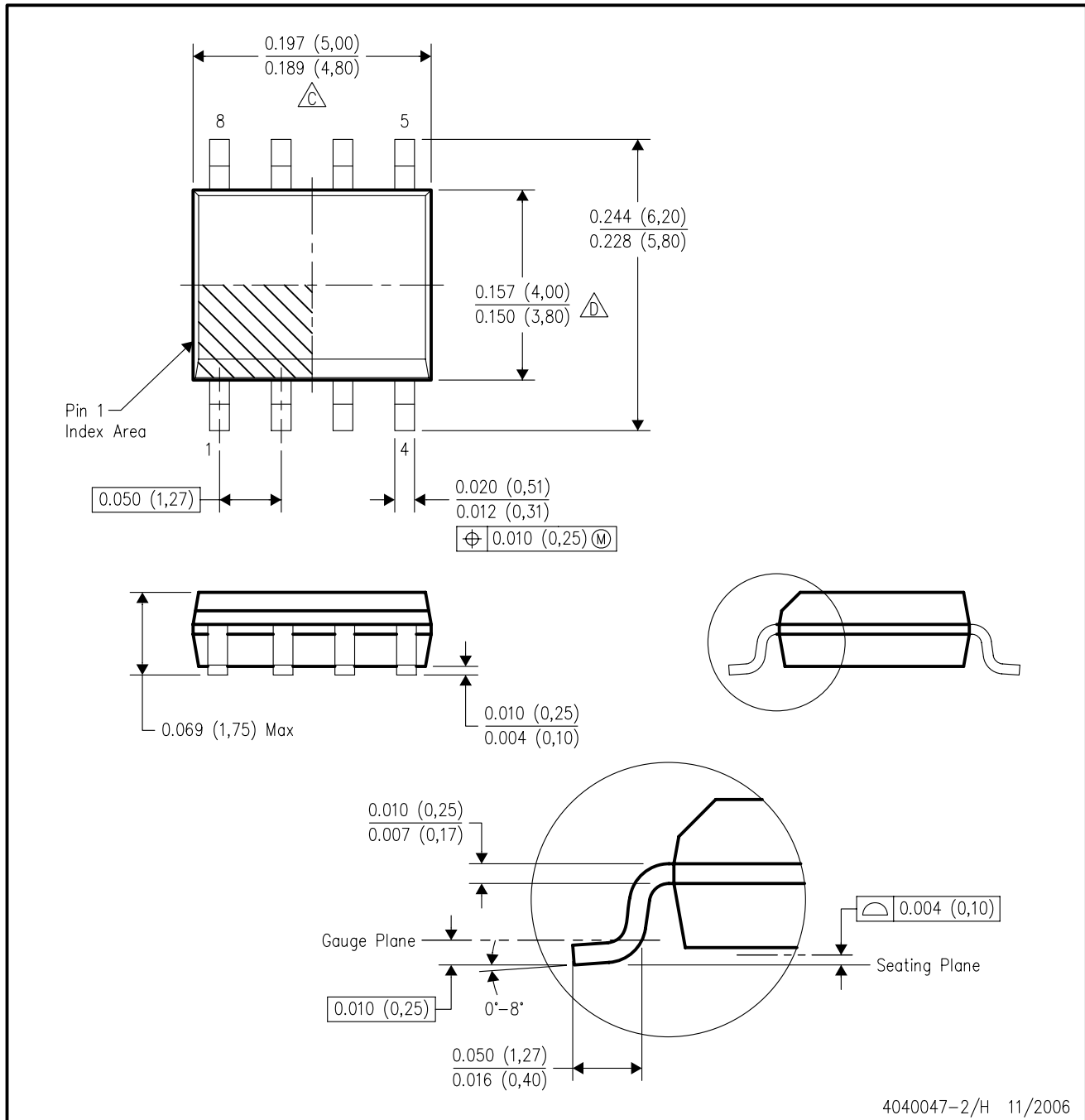
TAPE AND REEL BOX DIMENSIONS



Device	Package	Pins	Site	Length (mm)	Width (mm)	Height (mm)
SN74LS2323DR	D	8	SITE 27	342.9	336.6	20.64

D (R-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE



4040047-2/H 11/2006

- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 (0,15) per end.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
 - E. Reference JEDEC MS-012 variation AA.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
RFID	www.ti-rfid.com	Telephony	www.ti.com/telephony
Low Power Wireless	www.ti.com/lpw	Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2007, Texas Instruments Incorporated