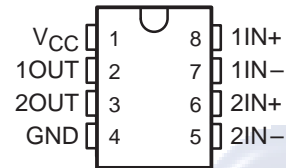


# uA9637AC DUAL DIFFERENTIAL LINE RECEIVER

SLLS111B – SEPTEMBER 1980 – REVISED MAY 1995

- Meets or Exceeds the Requirements of ANSI Standards EIA/TIA-422-B and EIA/TIA-423-B and ITU Recommendations V.10 and V.11
- Operates From Single 5-V Power Supply
- Wide Common-Mode Voltage Range
- High Input Impedance
- TTL-Compatible Outputs
- High-Speed Schottky Circuitry
- 8-Pin Dual-in-Line and Small-Outline Packages
- Designed to Be Interchangeable With National DS9637A

uA9637AC . . . D OR P PACKAGE  
(TOP VIEW)

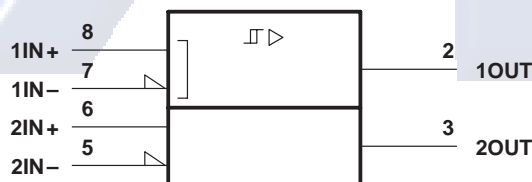


## description

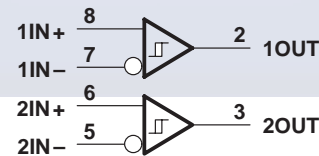
The uA9637AC is a dual differential line receiver designed to meet ANSI Standards EIA/TIA-422-B and EIA/TIA-423-B and ITU Recommendations V.10 and V.11. The line receiver utilizes Schottky circuitry and has TTL-compatible outputs. The inputs are compatible with either a single-ended or a differential-line system. This device operates from a single 5-V power supply and is supplied in an 8-pin dual-in-line package or small-outline package.

The uA9637AC is characterized for operation from 0°C to 70°C.

## logic symbol†



## logic diagram



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.



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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**

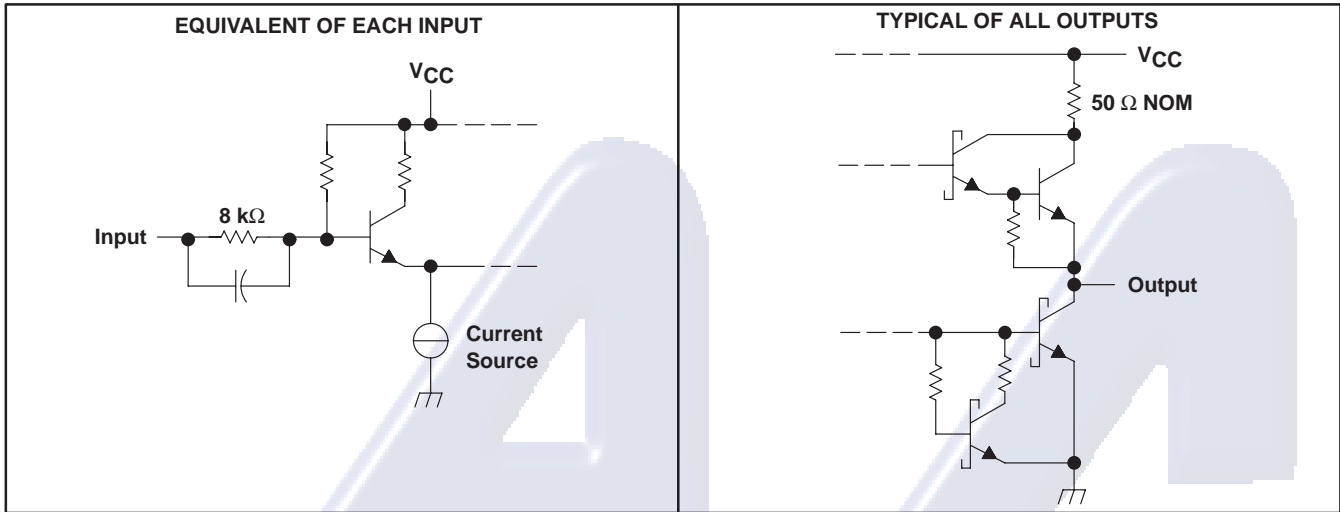
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## schematics of inputs and outputs



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

Supply voltage range, $V_{CC}$ (see Note 1)	.....	-0.5 V to 7 V
Input voltage, $V_I$	.....	$\pm 15$ V
Differential input voltage, $V_{ID}$ (see Note 2)	.....	$\pm 15$ V
Output voltage range, $V_O$ (see Note 1)	.....	-0.5 V to 5.5 V
Low-level output current, $I_{OL}$	.....	50 mA
Continuous total dissipation	.....	See Dissipation Rating Table
Operating free-air temperature range, $T_A$	.....	0°C to 70°C
Storage temperature range, $T_{stg}$	.....	-65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	.....	260°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. All voltage values, except differential input voltage, are with respect to the network ground terminal.  
 2. Differential input voltage is measured at the noninverting input with respect to the corresponding inverting input.

DISSIPATION RATING TABLE

PACKAGE	$T_A \leq 25^\circ\text{C}$ POWER RATING	OPERATING FACTOR ABOVE $T_A = 25^\circ\text{C}$	$T_A = 70^\circ\text{C}$ POWER RATING	$T_A = 125^\circ\text{C}$ POWER RATING
D	725 mW	5.8 mW/°C	464 mW	—
P	1000 mW	8.0 mW/°C	640 mW	—

# uA9637AC

## DUAL DIFFERENTIAL LINE RECEIVER

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### recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, $V_{CC}$	4.75	5	5.25	V
Common-mode input voltage, $V_{IC}$			$\pm 7$	V
Operating free-air temperature, $T_A$	0		70	$^{\circ}\text{C}$

### electrical characteristics over recommended ranges of supply voltage, common-mode input voltage, and operating free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP <sup>†</sup>	MAX	UNIT
$V_{IT+}$	Positive-going input threshold voltage	See Note 3				0.2 0.4	V
$V_{IT-}$	Negative-going input threshold voltage	See Note 3		-0.2 -0.4 <sup>‡</sup>			V
$V_{hys}$	Hysteresis voltage ( $V_{IT+} - V_{IT-}$ )				70		mV
$V_{OH}$	High-level output voltage	$V_{ID} = 0.2\text{ V}$ ,	$I_O = -1\text{ mA}$	2.5	3.5		V
$V_{OL}$	Low-level output voltage	$V_{ID} = -0.2\text{ V}$ ,	$I_O = 20\text{ mA}$		0.35	0.5	V
$I_I$	Input current	$V_{CC} = 0\text{ to }5.5\text{ V}$ , See Note 4	$V_I = 10\text{ V}$		1.1	3.25	mA
			$V_I = -10\text{ V}$		-1.6	-3.25	
$I_{OS}$	Short-circuit output current <sup>§</sup>	$V_O = 0$ ,	$V_{ID} = 0.2\text{ V}$	-40	-75	-100	mA
$I_{CC}$	Supply current	$V_{ID} = -0.5\text{ V}$ ,	No load		35	50	mA

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

<sup>‡</sup> The algebraic convention, in which the less positive (more negative) limit is designated as minimum, is used in this data sheet for threshold levels only.

<sup>§</sup> Only one output should be shorted at a time, and duration of the short circuit should not exceed one second.

NOTES: 3. The expanded threshold parameter is tested with a 500- $\Omega$  resistor in series with each input.

4. The input not under test is grounded.

### switching characteristics, $V_{CC} = 5\text{ V}$ , $T_A = 25^{\circ}\text{C}$

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
$t_{PLH}$	Propagation delay time, low- to high-level output	$C_L = 30\text{ pF}$ , See Figure 1			15	25	ns
$t_{PHL}$	Propagation delay time, high- to low-level output				13	25	ns

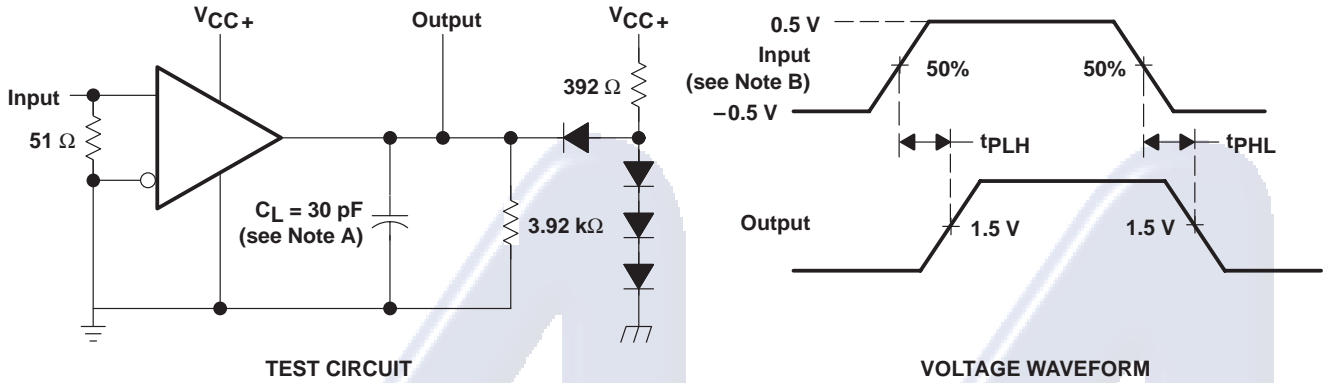
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## PARAMETER MEASUREMENT INFORMATION



- NOTES: A.  $C_L$  includes probe and jig capacitance.  
 B. The input pulse is supplied by a generator having the following characteristics:  $t_r \leq 5$  ns,  $t_f \leq 5$  ns,  $PRR \leq 5$  MHz, duty cycle = 50%.

Figure 1. Test Circuit and Voltage Waveform

## TYPICAL CHARACTERISTICS

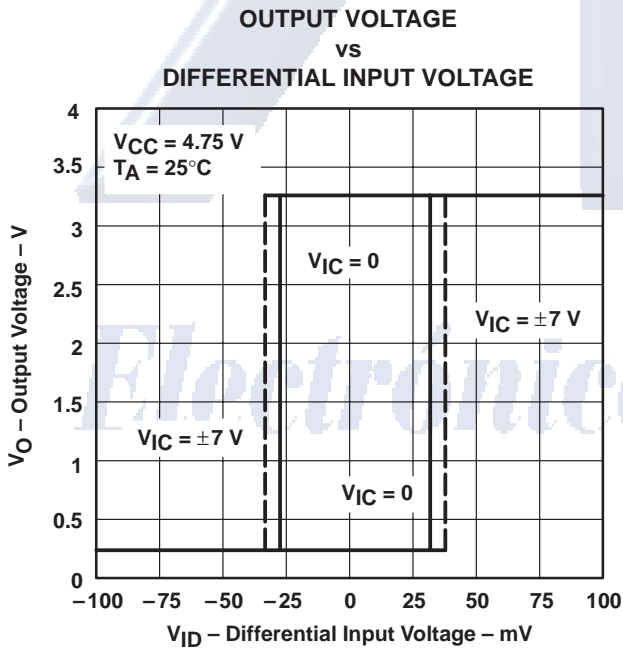


Figure 2

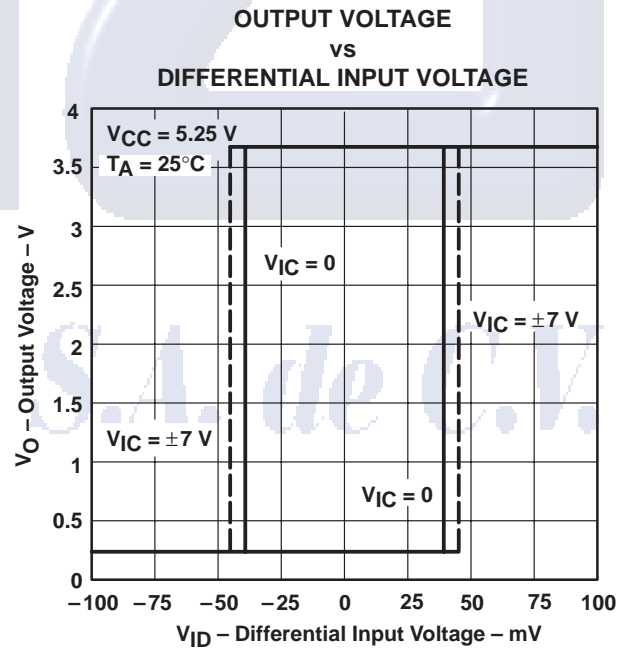


Figure 3



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## TYPICAL CHARACTERISTICS

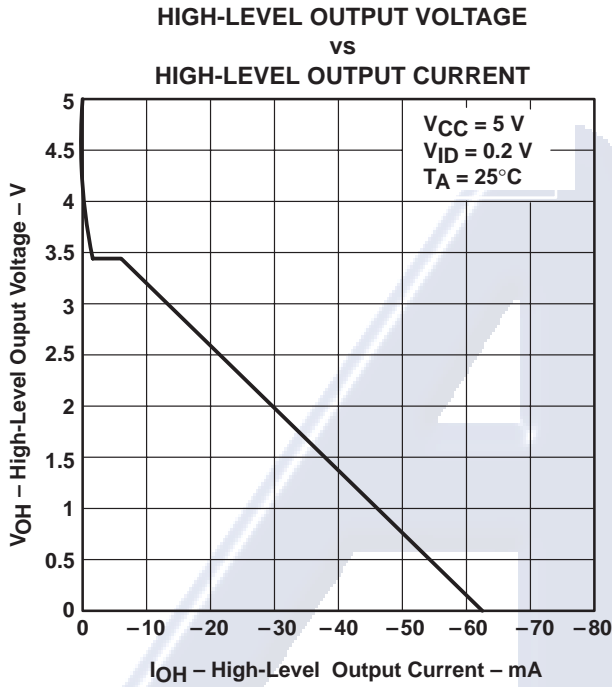


Figure 4

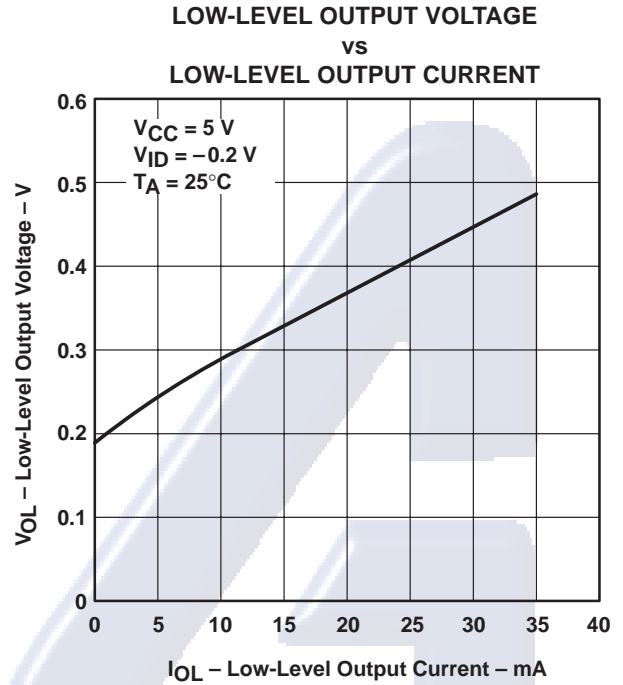


Figure 5

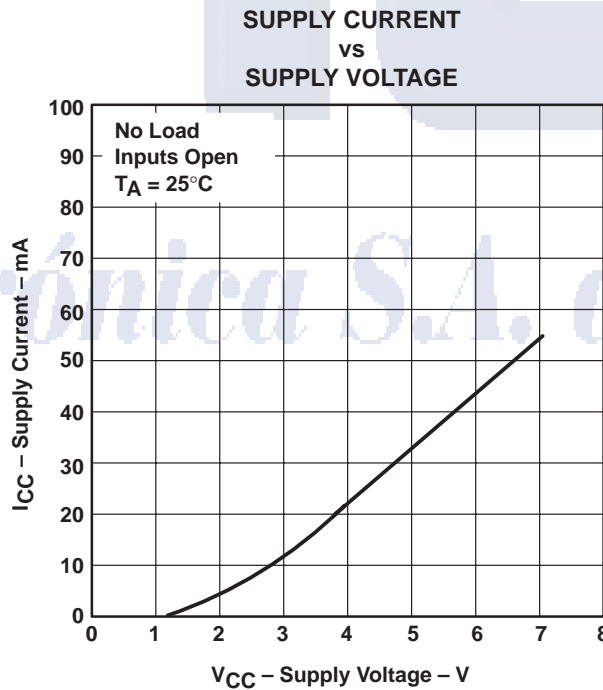


Figure 6



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## APPLICATION INFORMATION

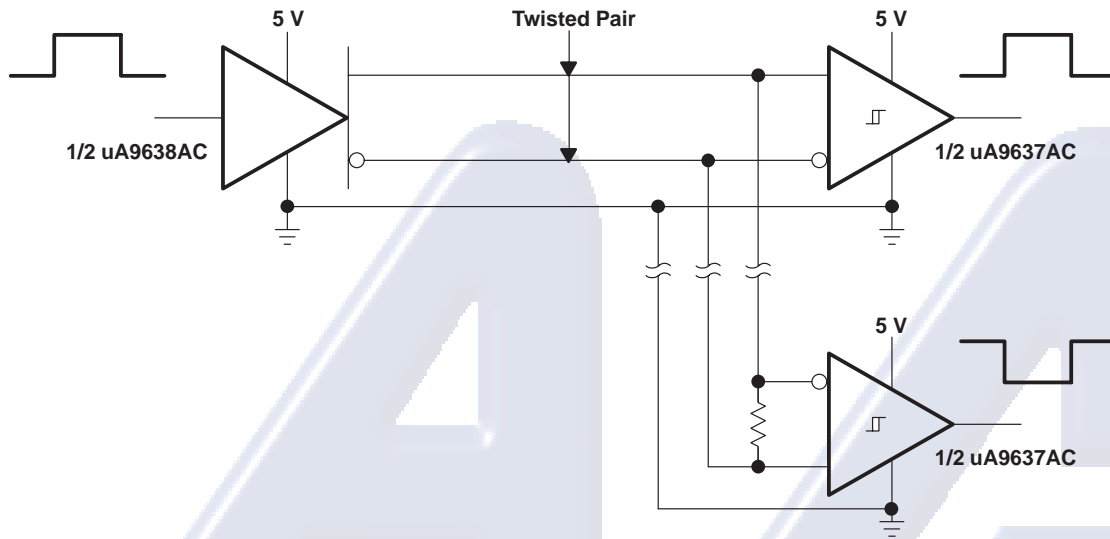


Figure 7. EIA/TIA-422-B System Applications

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