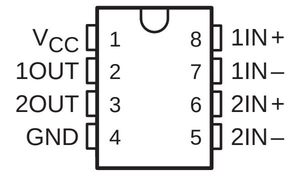
uA9639C
DUAL DIFFERENTIAL LINE RECEIVER

SLLS113C – OCTOBER 1986 – REVISED MARCH 1997

- **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 Packages**
- **Designed to Be Interchangeable With National DS9639AC**

P PACKAGE
(TOP VIEW)

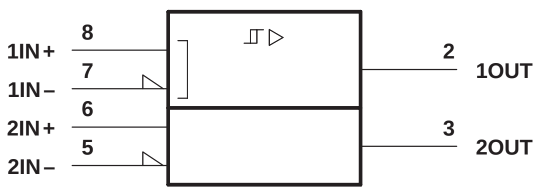


description

The uA9639C 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. It 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.

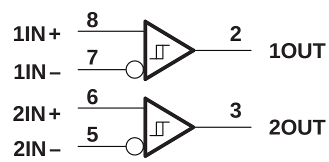
The uA9639C is characterized for operation from 0°C to 70°C.

logic symbol†



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

logic diagram



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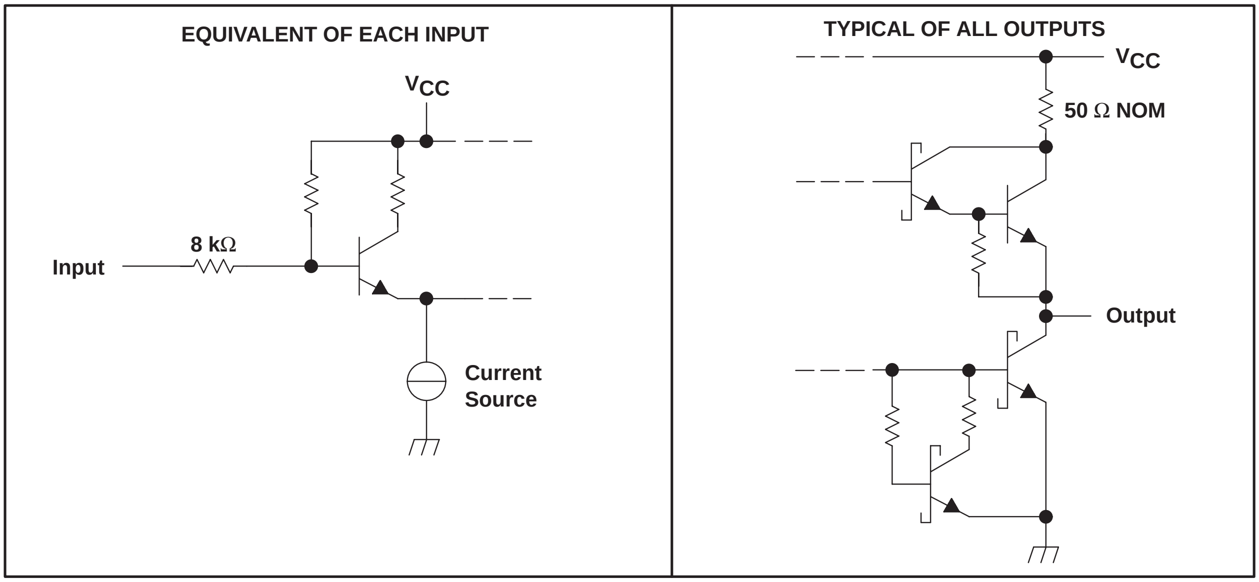
schematics of inputs and outputs



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	±15 V
Differential input voltage, V_{ID} (see Note 2)	±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
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	$T_A \le 25°C$ POWER RATING	OPERATING FACTOR ABOVE $T_A = 25°C$	$T_A = 70°C$ POWER RATING
P	1000 mW	8.0 mW/°C	640 mW

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.75	5	5.25	V
Common-mode input voltage, V_{IC}			±7	V
Operating free-air temperature, T_A	0		70	°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†	MAX	UNIT
V_{IT+}	Positive-going input threshold voltage	See Note 3				0.2	V
						0.4	
V_{IT-}	Negative-going input threshold voltage	See Note 3		−0.2			V
				−0.4‡			
V_{hys}	Hysteresis voltage ($V_{IT+} - V_{IT-}$)				70		mV
V_{OH}	High-level output voltage	V_{ID} = 0.2 V,	I_O = −1 mA	2.5	3.5		V
V_{OL}	Low-level output voltage	V_{ID} = −0.2 V,	I_O = 20 mA		0.35	0.5	V
I_I	Input current	V_{CC} = 0 to 5.5 V, See Note 4	V_I = 10 V		1.1	3.25	mA
			V_I = −10 V		−1.6	−3.25	
I_{OS}	Short-circuit output current§	V_O = 0,	V_{ID} = 0.2 V	−40	−75	−100	mA
I_{CC}	Supply current	V_{ID} = −0.5 V,	No load		35	50	mA

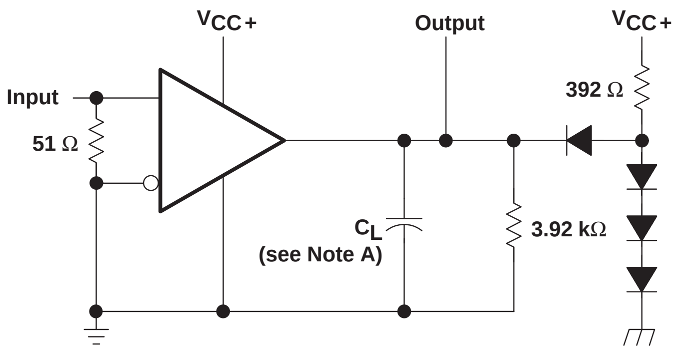
† All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡ The algebraic convention, in which the less positive (more negative) limit is designated as minimum, is used in this data sheet for threshold levels only.
§ Only one output should be shorted at a time, and duration of the short circuit should not exceed one second.

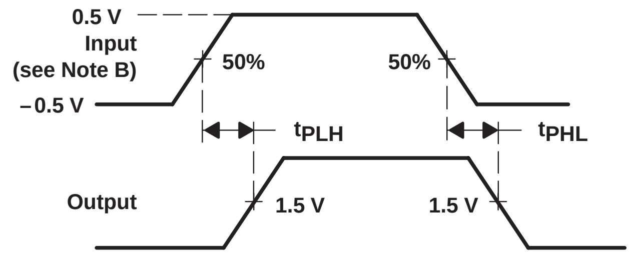
NOTES: 3. The expanded threshold parameter is tested with a 500-Ω resistor in series with each input.
4. The input not under test is grounded.

switching characteristics, V_{CC} = 5 V, T_A = 0°C to 70°C

PARAMETER		TEST CONDITIONS	MIN	MAX	UNIT
t_{PLH}	Propagation delay time, low- to high-level output	C_L = 50 pF, See Figure 1		85	ns
t_{PHL}	Propagation delay time, high- to low-level output			85	ns

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 ≤ 5 MHz, duty cycle = 50%.

Figure 1. Test Circuit and Voltage Waveforms

TYPICAL CHARACTERISTICS

OUTPUT VOLTAGE vs DIFFERENTIAL INPUT VOLTAGE

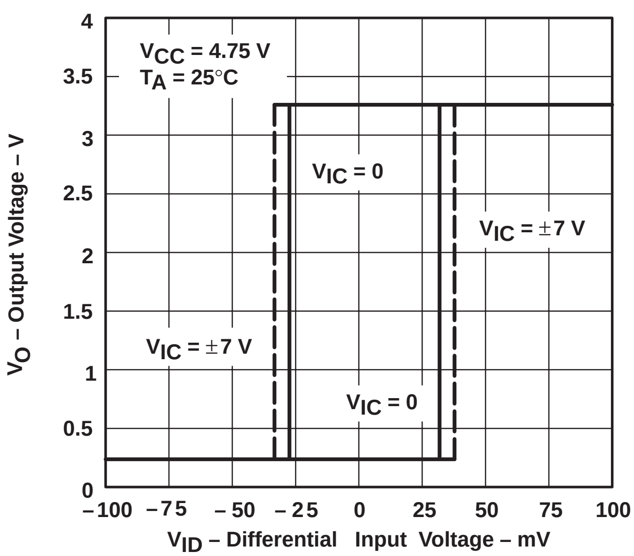


Figure 2

OUTPUT VOLTAGE vs DIFFERENTIAL INPUT VOLTAGE

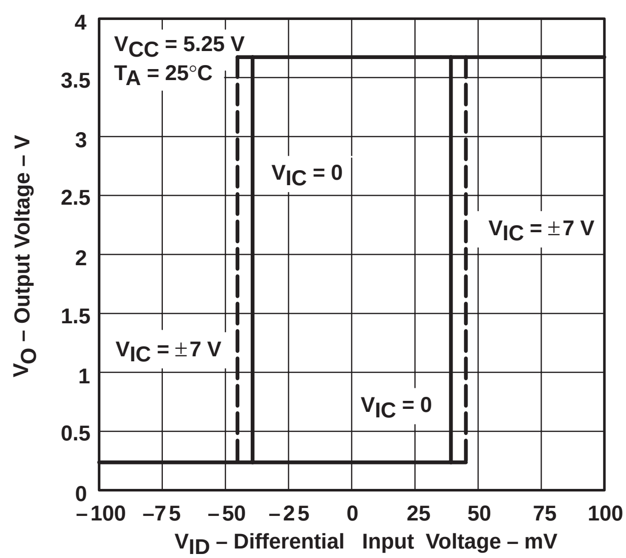


Figure 3

TYPICAL CHARACTERISTICS

HIGH-LEVEL OUTPUT VOLTAGE vs HIGH-LEVEL OUTPUT CURRENT

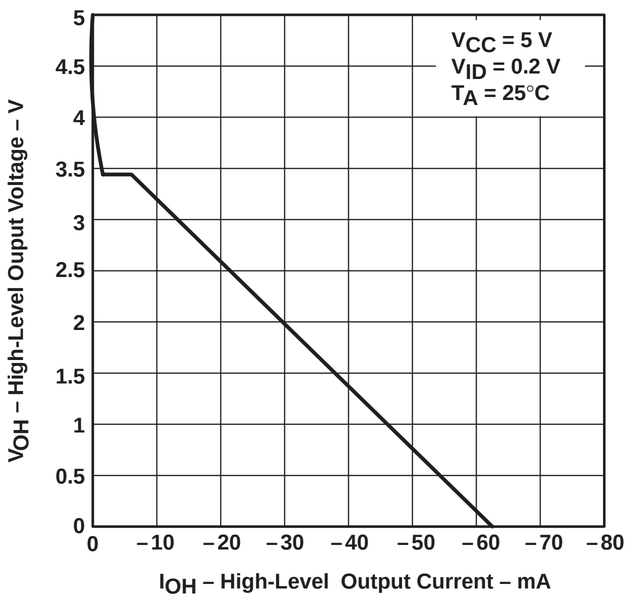


Figure 4

LOW-LEVEL OUTPUT VOLTAGE vs LOW-LEVEL OUTPUT CURRENT

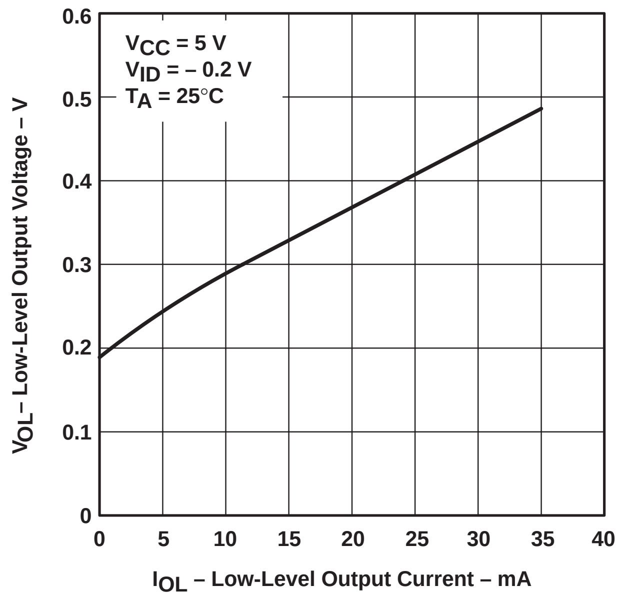


Figure 5

SUPPLY CURRENT vs SUPPLY VOLTAGE

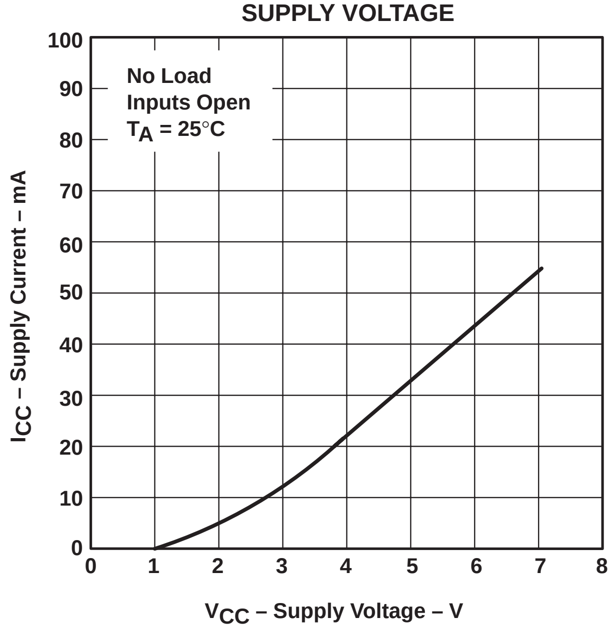


Figure 6

APPLICATION INFORMATION

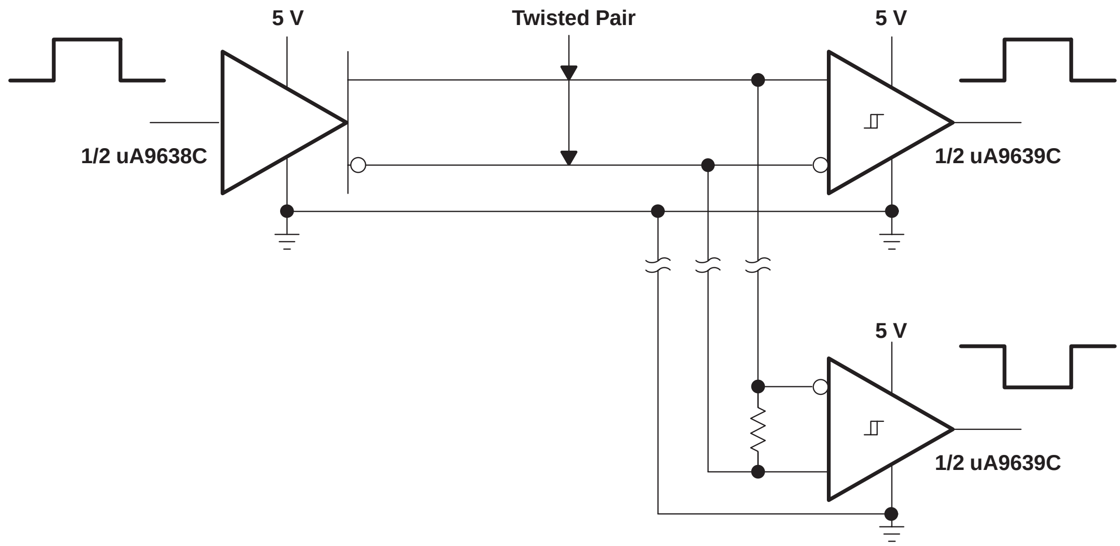


Figure 7. EIA/TIA-422-B System Applications

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