

μA9637A Dual Differential Line Receiver

Linear Division Interface Products

Description

The μA9637A is a Schottky dual differential line receiver which has been specifically designed to satisfy the requirements of EIA Standards RS-422 and RS-423. In addition, the μA9637A satisfies the requirements of MIL-STD 188-114 and is compatible with the International Standard CCITT recommendations. The μA9637A is suitable for use as a line receiver in digital data systems, using either single ended or differential, unipolar or bipolar transmission. It requires a single 5.0 V power supply and has Schottky TTL compatible outputs. The μA9637A has an operational input common mode range of ±7.0 V either differentially or to ground.

- Dual Channels
- Single 5.0 V Supply
- Satisfies EIA Standards RS-422 And RS-423
- Built-In ±35 mV Hysteresis
- High Common Mode Range
- High Input Impedance
- TTL Compatible Output
- Schottky Technology
- Extended Temperature Range

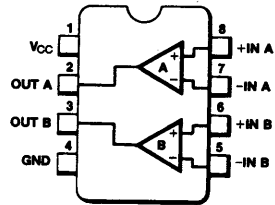
Absolute Maximum Ratings

Storage Temperature Range	
Ceramic DIP	-65°C to +175°C
Molded DIP	-65°C to +150°C
Operating Temperature Range	
Extended (μA9637AM)	-55°C to +125°C
Commercial (μA9637AC)	0°C to +70°C
Lead Temperature	
Ceramic DIP (soldering, 30 s)	300°C
Molded DIP and SO Package (soldering, 10 s)	265°C
Internal Power Dissipation ^{1, 2}	
8L-Ceramic DIP	1.30 W
8L-Molded DIP	0.93 W
SO-8	0.81 W
V _{CC} Lead Potential to Ground	-0.5 V to 7.0 V
Input Potential to Ground	±15 V
Differential Input Voltage	±15 V
Output Potential to Ground	-0.5 V to +5.5 V
Output Sink Current	50 mA

Notes

1. T_{J Max} = 175°C for the Ceramic DIP, and 150°C for the Molded DIP.
2. Ratings apply to ambient temperature at 25°C. Above this temperature, derate the 8L-Ceramic DIP at 8.7 mW/°C, the 8L-Molded DIP at 7.5 mW/°C, and the SO-8 at 6.5 mW/°C.

Connection Diagram 8-Lead DIP and SO-8 Package (Top View)



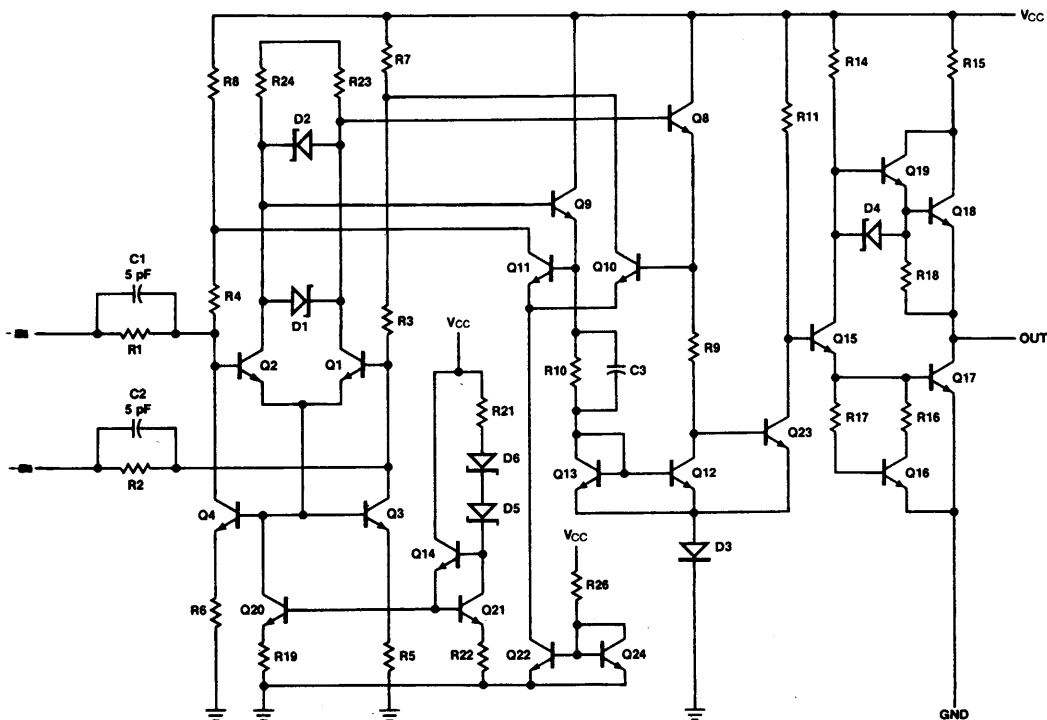
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Order Information

Device Code	Package Code	Package Description
μA9637ARM	6T	Ceramic DIP
μA9637ARC	6T	Ceramic DIP
μA9637ATC	9T	Molded DIP
μA9637ASC	KC	Molded Surface Mount

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Equivalent Circuit



8000120F

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Recommended Operating Conditions

Symbol	Characteristic	μA9637A			μA9637AC			Unit
		Min	Typ	Max	Min	Typ	Max	
V _{CC}	Supply Voltage	4.5	5.0	5.5	4.75	5.0	5.25	V
T _A	Operating Temperature	-55	25	125	0	25	70	°C

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Electrical Characteristics Over recommended operating temperature and supply voltage ranges, unless otherwise specified.

DC Characteristics

Symbol	Characteristic	Condition ¹	Min	Typ ²	Max	Unit
V_{TH}	Differential Input Threshold Voltage ³	$-7.0 \text{ V} \leq V_{CM} \leq +7.0 \text{ V}$	-0.2		+0.2	V
$V_{TH(R)}$	Differential Input Threshold Voltage ⁴	$-7.0 \text{ V} \leq V_{CM} \leq +7.0 \text{ V}$	-0.4		+0.4	V
I_I	Input Current ⁵	$V_I = 10 \text{ V}, 0 \text{ V} \leq V_{CC} \leq +5.5 \text{ V}$		1.1	3.25	mA
		$V_I = -10 \text{ V}, 0 \text{ V} \leq V_{CC} \leq +5.5 \text{ V}$	-3.25	-1.6		
V_{OL}	Output Voltage LOW	$I_{OL} = 20 \text{ mA}, V_{CC} = \text{Min}$		0.35	0.5	V
V_{OH}	Output Voltage HIGH	$I_{OH} = -1.0 \text{ mA}, V_{CC} = \text{Min}$	2.5	3.5		V
I_{OS}	Output Short Circuit Current ⁶	$V_O = 0 \text{ V}, V_{CC} = \text{Max}$	-40	-75	-100	mA
I_{CC}	Supply Current	$V_{CC} = \text{Max}, V_{I+} = 0.5 \text{ V}, V_{I-} = \text{GND}$		35	50	mA
V_{HYST}	Input Hysteresis	$V_{CM} = \pm 7.0 \text{ V}$ (See Curves)		70		mV

AC Characteristics $V_{CC} = 5.0 \text{ V}, T_A = 25^\circ\text{C}$

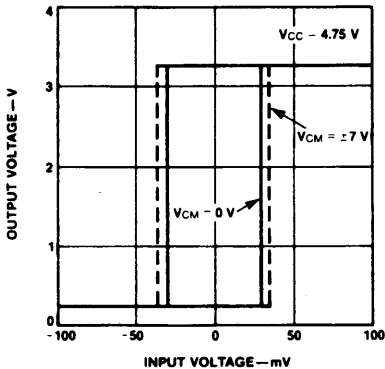
Symbol	Characteristic	Condition	Min	Typ	Max	Unit
t_{PLH}	Propagation Delay Time Low to High	See AC Test Circuit		15	25	ns
t_{PHL}	Propagation Delay Time High to Low	See AC Test Circuit		13	25	ns

Notes

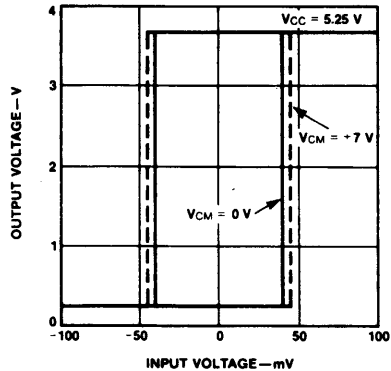
1. Use Min/Max values specified in recommended operating conditions.
2. Typical limits are at $V_{CC} = 5.0 \text{ V}$ and $T_A = 25^\circ\text{C}$.
3. V_{DIFF} (Differential Input Voltage) = $(V_{I+}) - (V_{I-})$. V_{CM} (Common Mode Input Voltage) = V_{I+} or V_{I-} .

4. $500 \Omega \pm 1\%$ in series with inputs.
5. The input not under test is tied to ground.
6. Only one output should be shorted at a time.

Typical Input/Output Transfer Characteristics



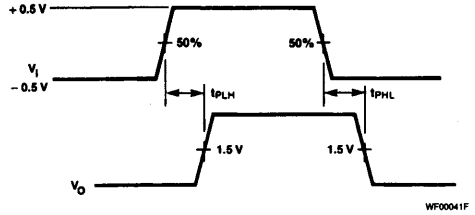
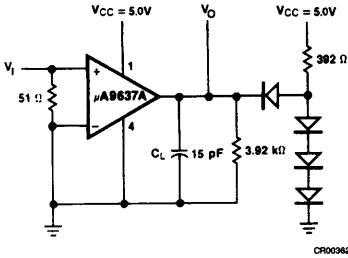
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AC Test Circuit and Waveforms

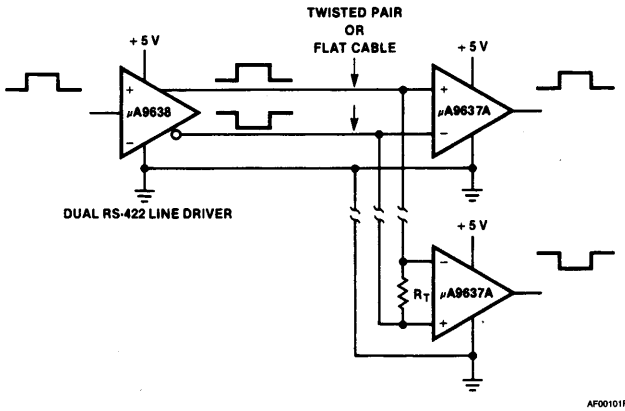


Notes
 C_L includes jig and probe capacitance.
 All diodes are FD700 or equivalent.

V_i
 Amplitude: 1.0 V
 Offset: 0.5 V
 Pulse Width: 100 ns
 PRR: 5.0 MHz
 $t_r = t_f \leq 5.0$ ns

Typical Applications

RS-422 System Application (FIPS 1020) Differential Simplex Bus Transmission



Notes
 $R_T \geq 50 \Omega$ for RS-422 operation
 R_T combined with input impedance of receivers must be greater than 90Ω .