FAIRCHILD
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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**

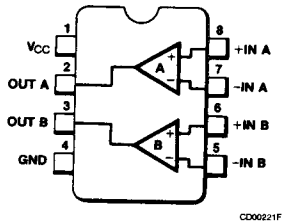
Absolute Maximum Ratings

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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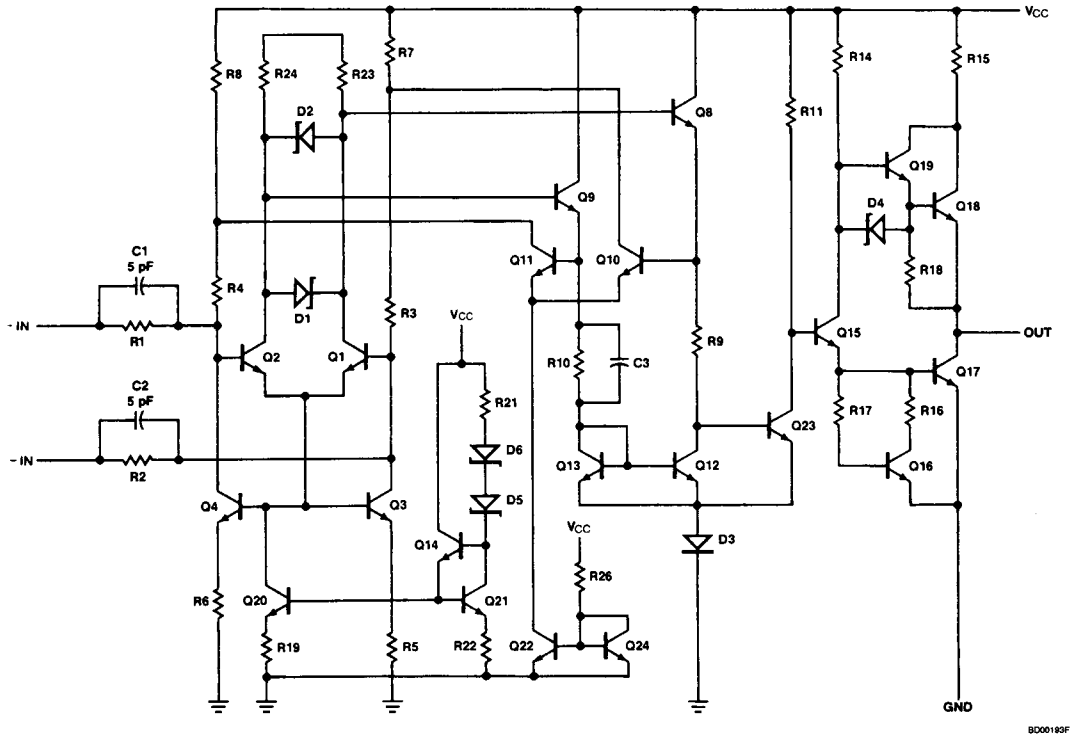
Order Information

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

Equivalent Circuit



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

μA9637A

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

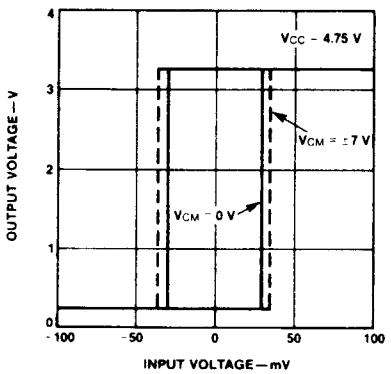
AC Characteristics $V_{CC} = 5.0\ V,\ T_A = 25°C$

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 $V_{CC} = 5.0\ V$ and $T_A = 25°C$.
3. V_{DIFF} (Differential Input Voltage) = $(V_I+) - (V_I-)$. V_{CM} (Common Mode Input Voltage) = V_I+ or V_I-.
4. 500 Ω ±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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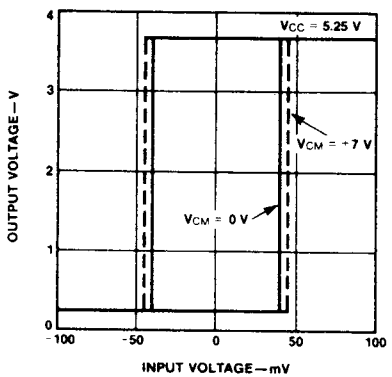

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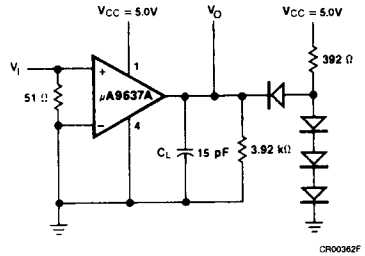
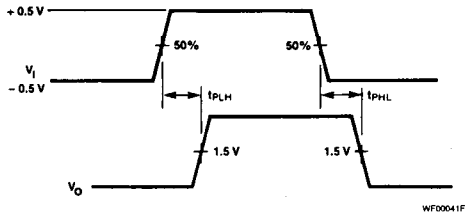
AC Test Circuit and Waveforms





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
$t_r = t_f \leqslant 5.0$ ns

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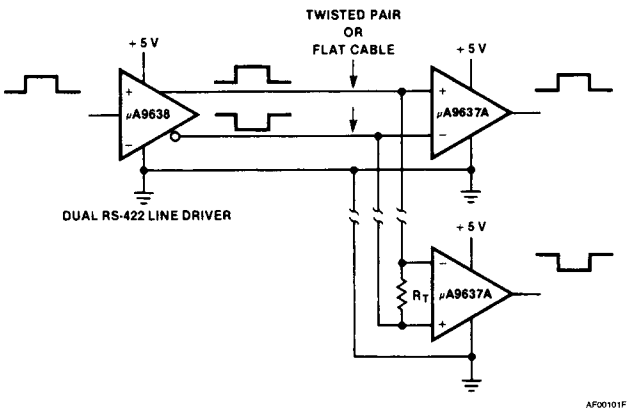
Typical Applications

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



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