High-speed dual differential comparator/sense amp

521

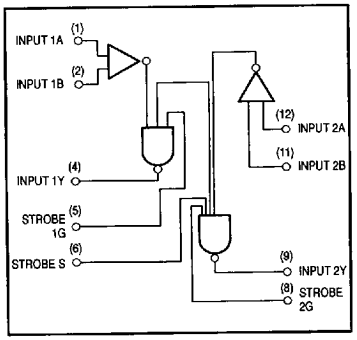
FEATURES

- 12ns max. guaranteed propagation delay
- 20μA max. input bias current
- TTL compatible strobes and outputs
- Large common-mode input voltage range
- Operates from standard supply voltages

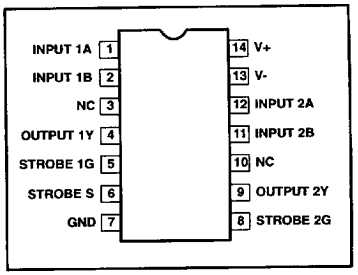
APPLICATIONS

- MOS memory sense amp
- A-to-D conversion
- High-speed line receiver

BLOCK DIAGRAM



PIN CONFIGURATION

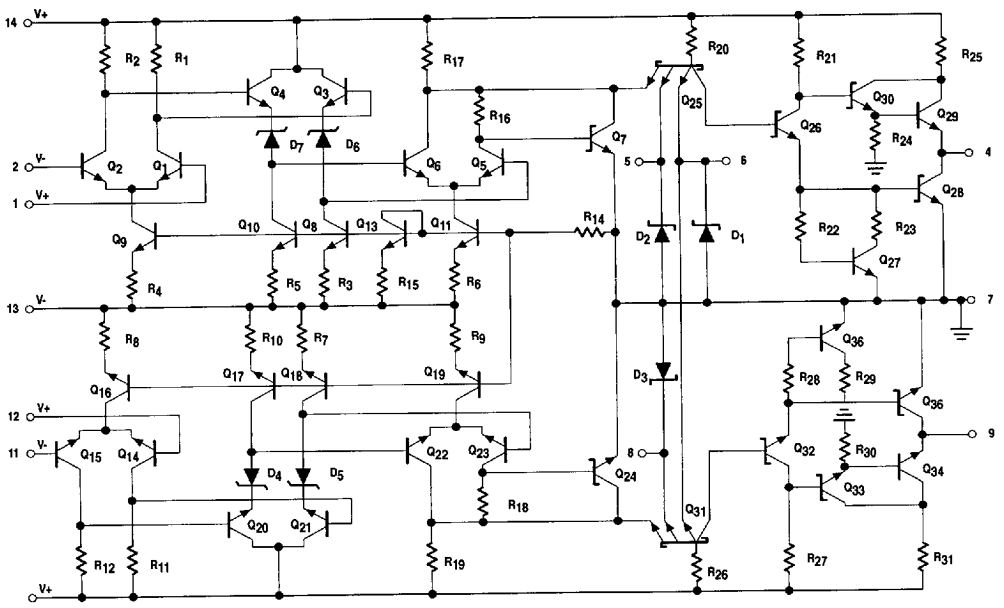


ORDERING INFORMATION

DESCRIPTION	ORDER CODE	PACKAGE DESIGNATOR*
14-Pin Ceramic DIP	521/BCA	GDIP1-T14
14-Pin Ceramic Flat Pack	521BDA	GDFP1-F14

* MIL-STD 1835 or Appendix A of 1995 Military Data Handbook

EQUIVALENT SCHEMATIC



ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING[1]	UNIT
V+ V-	Supply voltage - Positive Supply voltage - Negative	+7 -7	V V
V_{IDR}	Differential input voltage	±6	V
V_I	Input voltage - Common mode Input voltage - Strobe/gate	±5 +5.25	V V
P_D	Power dissipation	600	mW
T_{STG}	Storage temperature range	-65 to +150	°C

DC ELECTRICAL CHARACTERISTICS

V+ = +5V, V- = -5V, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	T_{amb} = +25°C			T_{amb} = -55°C, +125°C			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
Input Characteristics									
V_{IO}	Input offset voltage	V+ = +4.5V, V- = -4.5V		6	7.5			15	mV
I_{IB}	Input bias current	V+ = +5.5V, V- = -5.5V		7.5	20			40	µA
I_{IO}	Input offset current	V+ = +5.5V, V- = -5.5V		1.0	5			12	µA
V_{ICR}	Common mode voltage range	V+ = +4.5V, V- = -4.5V	+3			+3			V
Gate Characteristics									
V_{IL}	"0" input voltage	V+ = +4.5V, V- = -4.5V			0.8			0.7	V
V_{IH}	"1" input voltage	V+ = +4.5V, V- = -4.5V	2.0			2.0			V
I_{IH}	"1" input current	V+ = +5.5V, V- = -5.5V, V_{IH} = 2.7V 1G or 2G strobe Common strobe S			 50 100			 50 100	 µA µA
I_{IL}	"0" Input current	V+ = +5.5V, V- = -5.5V, V_{IL} = 0.5V 1G or 2G strobe Common strobe S			 -2.0 -4.0			 -2.0 -4.0	 mA mA
 V_{OH} V_{OL} V_{OL}	Output voltage "1" State "0" State "0" State	$V_{I(S)}$ = 2.0V V+ = +4.5V, V- = -4.5V, I_{OH} = -1mA V+ = +4.5V, V- = -4.5V, I_{OL} = 10mA V+ = +4.5V, V- = -4.5V, I_{OL} = 20mA	 2.5	 3.3	 0.5	 2.5	 	 0.5 	 V V V
I_{SC}	Short-circuit output current	V+ = +5.5V, V- = -5.5V	-35		-115	-35		-115	mA
Power Supply Requirements									
 V+ V-	Supply voltage Positive Negative		 4.5 -4.5	 5.0 -5.0	 5.5 -5.5	 4.5 -4.5	 	 5.5 -5.5	 V V
 I_{CC}+ I_{CC}-	Supply current Positive Negative	V+ = +5.5V, V- = -5.5V V_{STROBE} = 0V		 27 -15	 35 -28			 50 -28	 mA mA

AC ELECTRICAL CHARACTERISTICS

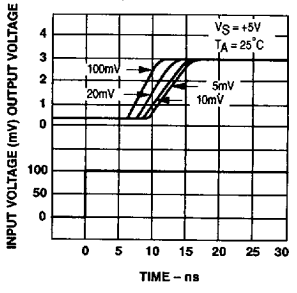
T_A = 25°C, R_L = 280Ω, C_L = 15pF, V+ = +5V, V- = -5V

SYMBOL	PARAMETER	FROM INPUT	TO OUTPUT	LIMITS			UNIT
				MIN	TYP	MAX	
Large Signal Switching Speed Propagation Delay							
$t_{PLH(D)}$	Low-to-High[2]	Amp	Output		8	12	ns
$t_{PHL(D)}$	High-to-Low[2]	Amp	Output		6	9	ns
$t_{PLH(S)}$	Low-to-High[3]	Strobe	Output		4.5	10	ns
$t_{PHL(S)}$	High-to-Low[3]	Strobe	Output		3.0	6	ns

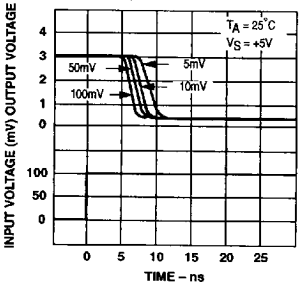
NOTES:
1. Operation beyond limits in this table may impair the useful life of the device.
2. Response time measured from 0V point of ± 100mV_{P-P} 10MHz square wave to the 1.5 point of the output.
3. Response time measured from 1.5V point of input to 1.5V point of the output.

TYPICAL PERFORMANCE CHARACTERISTICS

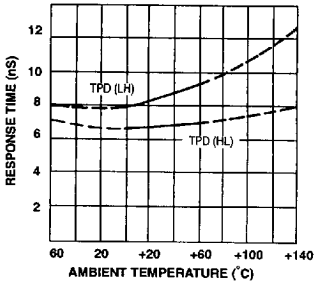
Response Time for Various Input Overdrives



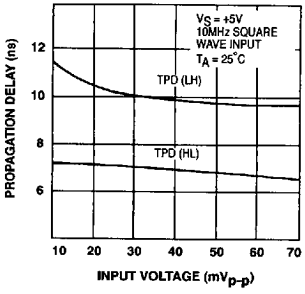
Response Time for Various Input Overdrives



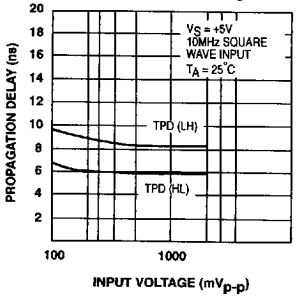
Response Time vs. Temperature



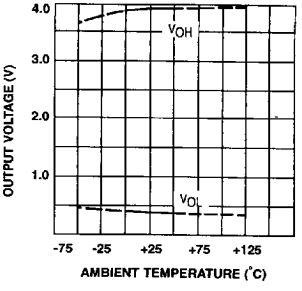
Propagation Delay for Various Input Voltages



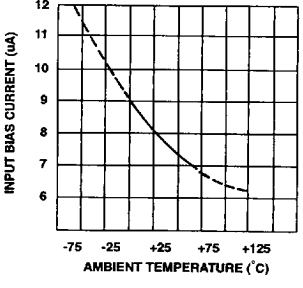
Propagation Delay for Various Input Voltages



Output Voltage vs. Ambient Temperature



Input Bias Current vs. Ambient Temperature



Input Offset Current vs. Ambient Temperature