HIGH SPEED DUAL DIFFERENTIAL COMPARATOR/SENSE AMP — SE/NE521

FEATURES

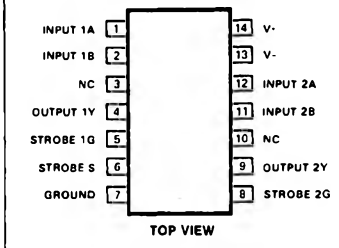
- 12ns maximum guaranteed propagation delay
- 20μA maximum input bias current
- TTL compatible strobes and outputs
- Large common mode input voltage range
- Operates from standard supply voltages
- Military qualifications pending

APPLICATIONS

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

PIN CONFIGURATION

D,F,N PACKAGE



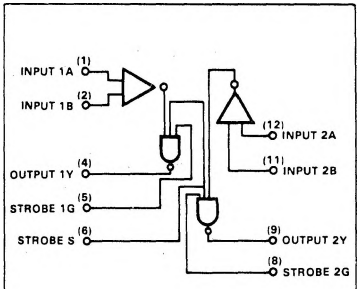
TOP VIEW

ORDER NUMBERS
NE521D,F,N SE521F

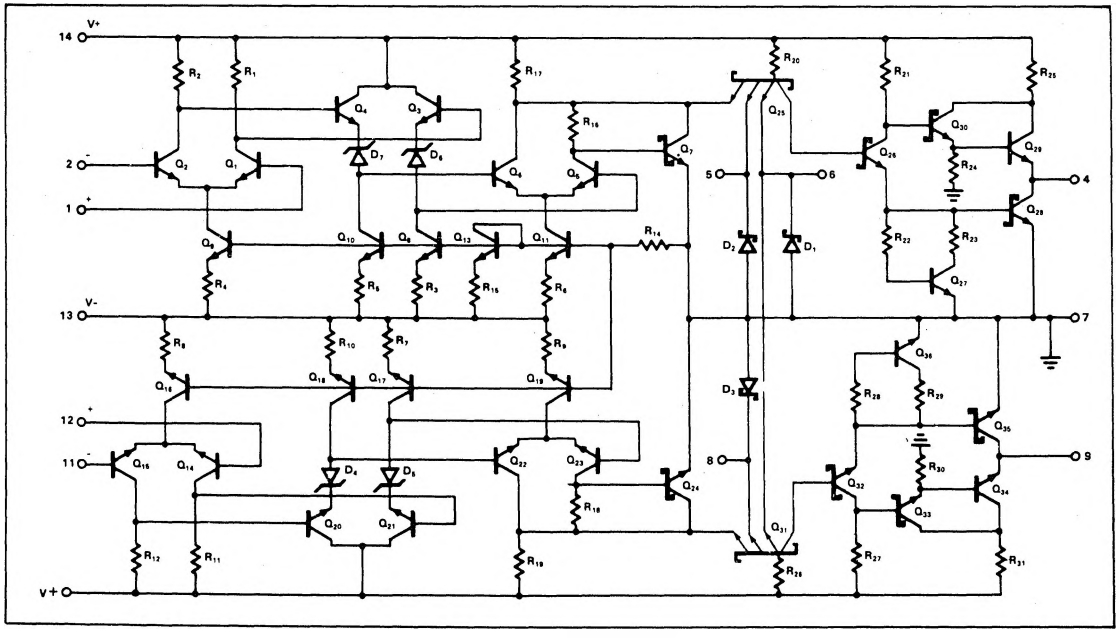
ABSOLUTE MAXIMUM RATINGS

	PARAMETER	RATING	UNIT
	Supply voltage		V
V+	Positive	+7	
V-	Negative	-7	
V_{IDR}	Differential input voltage	±6	V
V_{IN}	Input voltage		V
	Common mode	±5	
	Strobe/gate	+5.25	
P_D	Power dissipation	600	mW
T_A	Operating temperature range		
	NE521	0 to 70	°C
	SE521	-55 to +125	
T_{stg}	Storage temperature range	-65 to +150	°C
	Lead temperature (solder, 60 sec)	+300	°C

BLOCK DIAGRAM



EQUIVALENT SCHEMATIC



DC ELECTRICAL CHARACTERISTICS $V+ = +5V$, $V- = -5V$, $T_A = -55$ to $+125°C$ unless otherwise specified

PARAMETER		TEST CONDITIONS	SE LIMITS			UNITS
			Min	Typ	Max	
V_{OS}	Input offset voltage At 25°C Over temperature range	V+ = +4.5V, V- = -4.5V		 6	 7.5 15	mV
I_{BIAS}	Input bias current At 25°C Over temperature range	V+ = +5.5V, V- = -5.5V		 7.5	 20 40	µA
I_{OS}	Input offset current At 25°C Over temperature range	V+ = +5.5V, V- = -5.5V		 1.0	 5 12	µA
V_{CM}	Common mode voltage range	V+ = +4.5V, V- = -4.5V	±3			V
V_{IL}	Low level input voltage At 25°C Over temperature				 0.8 0.7	V
V_{IH}	High level input voltage		2.0			V
I_{IH}	Input current High	V+ = +5.5V, V- = -5.5V V_{IH} = 2.7V 1G or 2G strobe Common strobe S			 50 100	 µA µA
I_{IL}	Low	V_{IL} = 0.5V 1G or 2G strobe Common strobe S			 -2.0 -4.0	 mA mA
V_{OH} V_{OL}	Output voltage High Low	$V_{I(S)}$ = 2.0V V+ = +4.5V, V- = -4.5V, I_{LOAD} = -1mA V+ = +4.5V, V- = -4.5V, I_{LOAD} = 10mA T_A = 25°C, I_{LOAD} = 20mA	2.5	3.4	 0.5 0.5	V
V+ V-	Supply voltage Positive Negative		 4.5 -4.5	 5.0 -5.0	 5.5 -5.5	V
I_{CC+} I_{CC-}	Supply current Positive Negative	V+ = 5.5V, V- = -5.5V, T_A = 25°C		 27 -15	 35 -28	mA
I_{SC}	Short circuit output current		-35		-115	mA

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DC ELECTRICAL CHARACTERISTICS (Cont'd) V+ = +5V, V- = -5V, T_A = 0 to 70°C unless otherwise specified

PARAMETER		TEST CONDITIONS	NE LIMITS			UNITS
			Min	Typ	Max	
V_{OS}	Input offset voltage At 25°C Over temperature range	V+ = +4.75V, V- = -4.75V		 6	 7.5 10	mV
I_{BIAS}	Input bias current At 25°C Over temperature range	V+ = +5.25V, V- = -5.25V		 7.5	 20 40	µA
I_{OS}	Input offset current At 25°C Over temperature range	V+ = +5.25V, V- = -5.25V		 1.0	 5 12	µA
V_{CM}	Common mode voltage range	V+ = +4.75V, V- = -4.75V	±3			V
I_{IH}	Input current High	V+ = +5.25V, V- = -5.25V V_{IH} = 2.7V 1G or 2G strobe Common strobe S			 50 100	 µA µA
I_{IL}	Low	V_{IL} = 0.5V 1G or 2G strobe Common strobe S			 -2.0 -4.0	 mA mA
V_{OH} V_{OL}	Output voltage High Low	$V_{I(S)}$ = 2.0V V+ = +4.75V, V- = -4.75V, I_{LOAD} = -1mA V+ = +5.25V, V- = -5.25V, I_{LOAD} = 20mA	 2.7	 3.4	 0.5	V
V+ V-	Supply voltage Positive Negative		 4.75 -4.75	 5.0 -5.0	 5.25 -5.25	V
I_{CC+} I_{CC-}	Supply current Positive Negative	V+ = 5.25V, V- = -5.25V, T_A = 25°C		 27 -15	 35 -28	mA
I_{SC}	Short circuit output current		-40		-100	mA

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

PARAMETER		FROM INPUT	TO OUTPUT	LIMITS			UNIT
				Min	Typ	Max	
Large Signal Switching Speed							
	Propagation delay						ns
$t_{PLH(D)}$	Low to high[1]	Amp	Output		8	12	
$t_{PHL(D)}$	High to low[1]	Amp	Output		6	9	
$t_{PLH(S)}$	Low to high[2]	Strobe	Output		4.5	10	
$t_{PHL(S)}$	High to low[2]	Strobe	Output		3.0	6	
	Maximum operating frequency			40	55		MHz

NOTES
1 Response time measured from 0V point of ±100mV p-p 10MHz square wave to the 1.5V point of the output
2 Response time measured from 1.5V point of input to 1.5V point of the output

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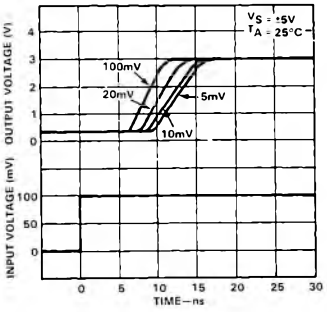
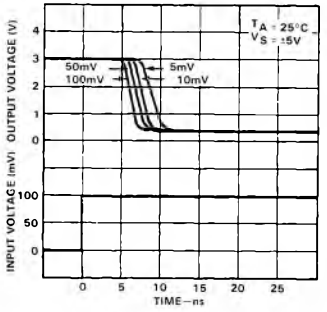
TYPICAL PERFORMANCE CHARACTERISTICS

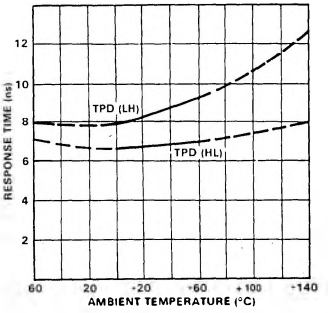
RESPONSE TIME FOR VARIOUS INPUT OVERDRIVES



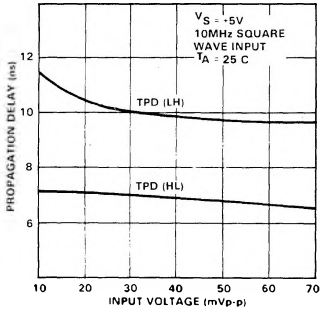
RESPONSE TIME FOR VARIOUS INPUT OVERDRIVES



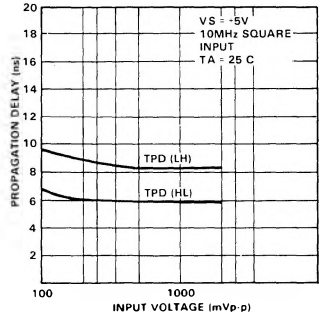
RESPONSE TIME vs TEMPERATURE



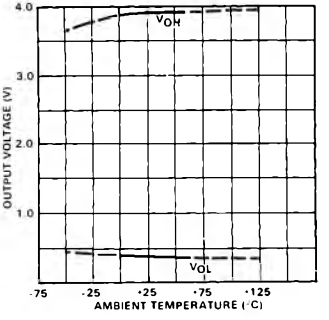
PROPAGATION DELAY FOR VARIOUS INPUT VOLTAGE



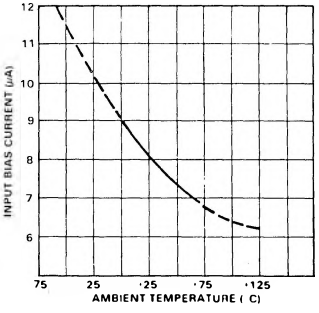
PROPAGATION DELAY FOR VARIOUS INPUT VOLTAGES



OUTPUT VOLTAGE vs AMBIENT TEMPERATURE



INPUT BIAS CURRENT vs AMBIENT TEMPERATURE



INPUT OFFSET CURRENT vs AMBIENT TEMPERATURE