

High-speed dual-differential comparator/sense amp

NE/SE521

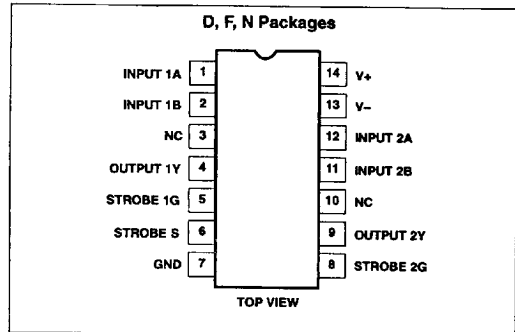
FEATURES

- 12ns maximum guaranteed propagation delay
- 20 μ A 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

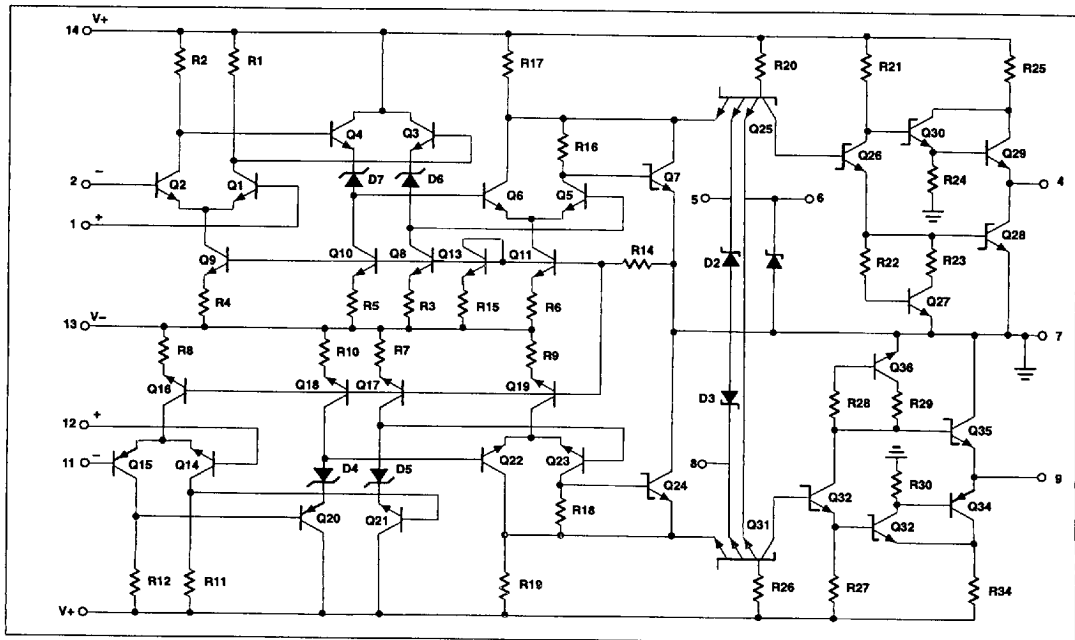
PIN CONFIGURATION



ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
14-Pin Plastic Dual In-Line Package (DIP)	0 to +70°C	NE521N	0405B
14-Pin SO Package	0 to +70°C	NE521D	0175D
14-Pin Ceramic Dual In-Line Package (CERDIP)	0 to +70°C	NE521F	0581B
14-Pin Ceramic Dual In-Line Package (CERDIP)	-55°C to +125°C	SE521F	0581B

EQUIVALENT SCHEMATIC



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LOGIC FUNCTIONS

V_{ID} A ⁺ , B ⁻	STROBE S	STROBE G	OUTPUT (Y)
$V_{ID} \leq V_{OS}$	H	H	L
$-V_{OS} < V_{ID} < V_{OS}$	H	H	Undefined
$V_{ID} \geq V_{OS}$	H	H	H
X	L	X	H
X	X	L	H

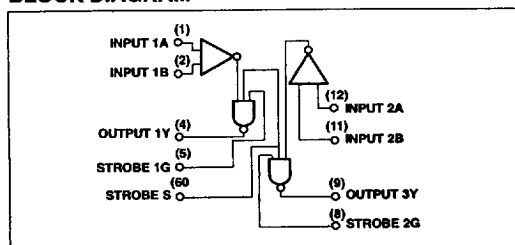
ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V_{+}	Supply voltage		
	Positive	+7	V
V_{-}	Negative	-7	V
V_{IDR}	Differential input voltage	± 6	V
V_{IN}	Input voltage		
	Common mode	± 5	V
	Strobe/gate	+5.25	V
P_D	Maximum power dissipation ¹ $T_A = 25^{\circ}\text{C}$ (still-air)		
	F package	1190	mW
	N package	1420	mW
	D package	1040	mW
T_A	Operating temperature range		
	NE521	0 to 70	$^{\circ}\text{C}$
	SE521	-55 to +125	$^{\circ}\text{C}$
T_{STG}	Storage temperature range	-65 to +150	$^{\circ}\text{C}$
T_{SOLD}	Lead soldering temperature (10 sec. max)	+300	$^{\circ}\text{C}$

NOTES:

1. Derate above 25 $^{\circ}\text{C}$ at the following rates:F package at 9.5mW/ $^{\circ}\text{C}$ N package at 11.4mW/ $^{\circ}\text{C}$ D package at 8.3mW/ $^{\circ}\text{C}$

BLOCK DIAGRAM



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DC ELECTRICAL CHARACTERISTICS (SE521)V₊=+5V, V₋=-5V, T_A=-55°C to +125°C, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			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		+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}	Input Current Low	V _{IL} =0.5V 1G or 2G strobe Common strobe S			-2.0 -4.0	mA mA
V _{OH}	Output voltage High	V _{I(S)} =2.0V V ₊ =+4.5V, V ₋ =-4.5V, I _{LOAD} =-1mA	2.5	3.4		V
V _{OL}	Low	V ₊ =+4.5V, V ₋ =-4.5V, I _{LOAD} =10mA T _A =25°C, I _{LOAD} =20mA			0.5 0.5	
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(NE521)

V₊=+5V, V₋=-5V, T_A=0 to 70°C, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			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		+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}	Input Current 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.

A-25 C, 14-250V C (Top) 14-25V V (Bot)							
SYMBOL	PARAMETER	FROM INPUT	TO OUTPUT	LIMITS			UNIT
				Min	Typ	Max	
Large-signal switching speed							
	Propagation delay						
t _{PLH(D)}	Low to high ¹	Amp	Output		8	12	ns
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	
f _{MAX}	Max. 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

