

NE521

Product Preview

High-Speed Dual-Differential Comparator/Sense Amp

Features

- TTL-Compatible Strokes 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

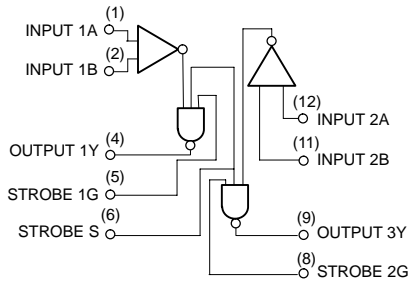
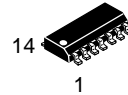


Figure 1. Block Diagram

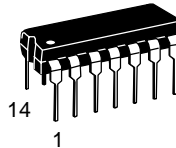


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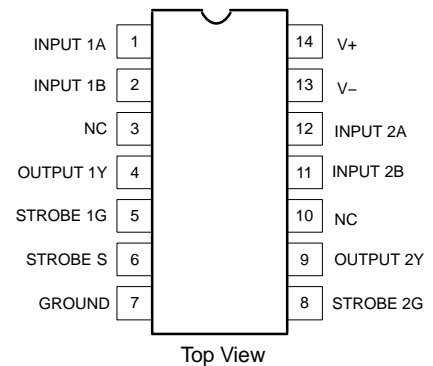
SOIC-14
D SUFFIX
CASE 751A



PDIP-14
N SUFFIX
CASE 646

PIN CONNECTIONS

D, N Packages



ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

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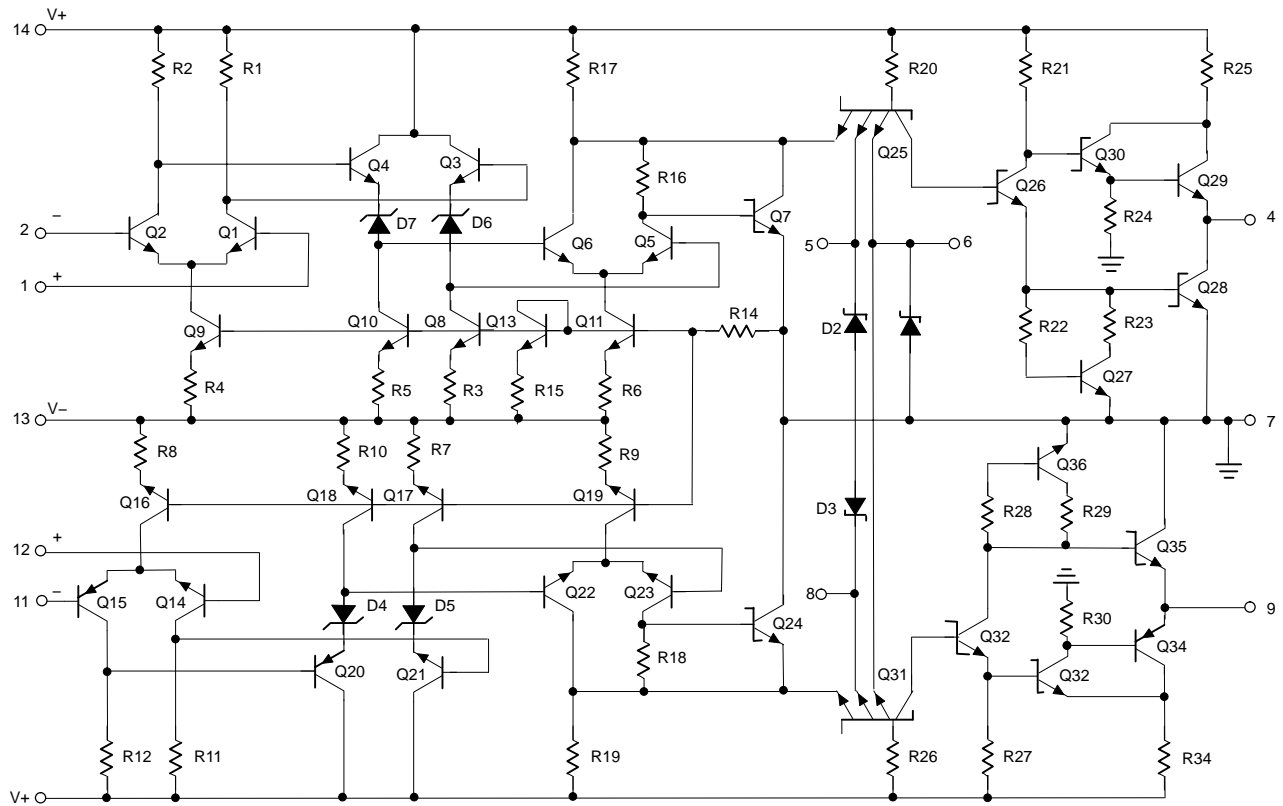


Figure 2. Equivalent Schematic

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply Voltage Positive Negative	V+ V-	+7.0 -7.0	V
Differential Input Voltage	V_{IDR}	± 6.0	V
Input Voltage Common Mode Strobe/Gate	V_{IN}	± 5.0 +5.25	V
Maximum Power Dissipation (Note 1) $T_{amb} = 25^{\circ}\text{C}$ (Still-Air) N Package D Package	P_D	1420 1040	mW
Operating Temperature Range	T_{amb}	0 to 70	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^{\circ}\text{C}$
Lead Soldering Temperature (10 sec max)	T_{slid}	+230	$^{\circ}\text{C}$

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

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DC ELECTRICAL CHARACTERISTICS ($V_+ = +5.0\text{ V}$; $V_- = -5.0\text{ V}$, $T_{\text{amb}} = 0^\circ\text{C}$ to $+70^\circ\text{C}$, unless otherwise noted.)

Characteristic	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Input Offset Voltage At 25°C Overtemperature Range	V_{OS}	$V_+ = +4.75\text{ V}$; $V_- = -4.75\text{ V}$	– –	6.0 –	7.5 10	mV
Input Bias Current At 25°C Overtemperature Range	I_{BIAS}	$V_+ = +5.25\text{ V}$; $V_- = -5.25\text{ V}$	– –	7.5 –	20 40	μA
Input Offset Current At 25°C Overtemperature Range	I_{OS}	$V_+ = +5.25\text{ V}$; $V_- = -5.25\text{ V}$	– –	1.0 –	5.0 12	μA
Common-Mode Voltage Range	V_{CM}	$V_+ = +4.75\text{ V}$; $V_- = -4.75\text{ V}$	–3.0	–	+3.0	V
Input Current High	I_{IH}	$V_+ = +5.25\text{ V}$; $V_- = -5.25\text{ V}$ $V_{\text{IH}} = 2.7\text{ V}$ 1G or 2G Strobe Common Strobe S	– –	– –	50 100	μA
Input Current Low	I_{IL}	$V_{\text{IL}} = 0.5\text{ V}$ 1G or 2G Strobe Common Strobe S	– –	– –	–2.0 –4.0	mA
Output Voltage High	V_{OH}	$V_{\text{I(S)}} = 2.0\text{ V}$ $V_+ = +4.75\text{ V}$; $V_- = -4.75\text{ V}$; $I_{\text{LOAD}} = -1.0\text{ mA}$	2.7	3.4		V
Output Voltage Low	V_{OL}	$V_+ = +5.25\text{ V}$; $V_- = -5.25\text{ V}$; $I_{\text{LOAD}} = 20\text{ mA}$			0.5	
Supply Voltage Positive	V_+	–	4.75	5.0	5.25	V
Supply Voltage Negative	V_-	–	–4.75	–5.0	–5.25	
Supply Current Positive	$I_{\text{CC+}}$	$V_+ = +5.25\text{ V}$; $V_- = -5.25\text{ V}$; $T_{\text{amb}} = 25^\circ\text{C}$	–	27	35	mA
Supply Current Negative	$I_{\text{CC-}}$	–	–	–15	–28	
Short-Circuit Output Current	I_{SC}	–	–40	–	–100	mA

AC ELECTRICAL CHARACTERISTICS ($T_{\text{amb}} = 25^\circ\text{C}$; $R_{\text{L}} = 280\ \Omega$; $C_{\text{L}} = 15\text{ pF}$, $V_+ = 5.0\text{ V}$; $V_- = 5.0\text{ V}$)

Characteristic	Symbol	From Input	To Output	Limits			Unit
				Min	Typ	Max	
Large-Signal Switching Speed							
Propagation Delay							ns
Low to High (Note 2)	$t_{\text{PLH(D)}}$	Amp	Output	–	35	50	
High to Low (Note 2)	$t_{\text{PHL(D)}}$	Amp	Output	–	12	20	
Low to High (Note 3)	$t_{\text{PLH(S)}}$	Strobe	Output	–	–	TBD	
High to Low (Note 3)	$t_{\text{PHL(S)}}$	Strobe	Output	–	–	TBD	
Max. Operating Frequency	f_{MAX}	–	–	40	55	–	MHz

2. Response time measured from 0 V point of $\pm 100\text{ mV}_{\text{P-P}}$ 10 MHz square wave to the 1.5 V point of the output.

3. Response time measured from 1.5 V point of input to 1.5 V point of the output.

LOGIC FUNCTION TABLE

$V_{\text{ID}} (\text{A}^+, \text{B}^-)$	Strobe S	Strobe G	Output (Y)
$V_{\text{ID}} \leq -V_{\text{OS}}$	H	H	L
$-V_{\text{OS}} < V_{\text{ID}} < V_{\text{OS}}$	H	H	Undefined
$V_{\text{ID}} \geq V_{\text{OS}}$	H	H	H
X	L	X	H
X	X	L	H

TYPICAL PERFORMANCE CHARACTERISTICS

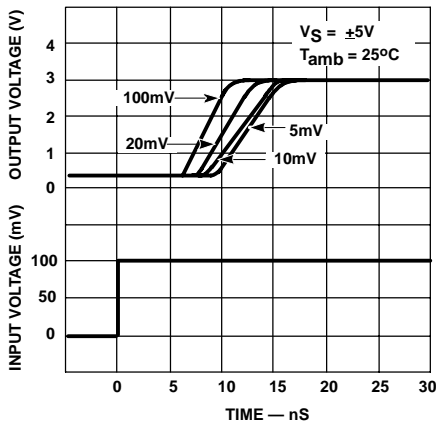


Figure 3. Response Time for Various Input Overdrives

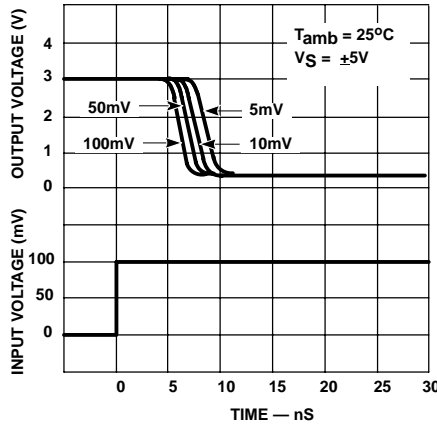


Figure 4. Response Time for Various Input Overdrives

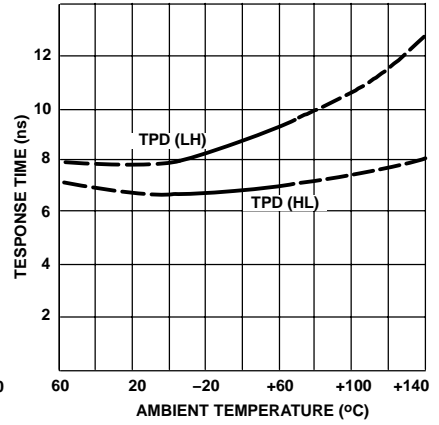


Figure 5. Response Time vs. Temperature

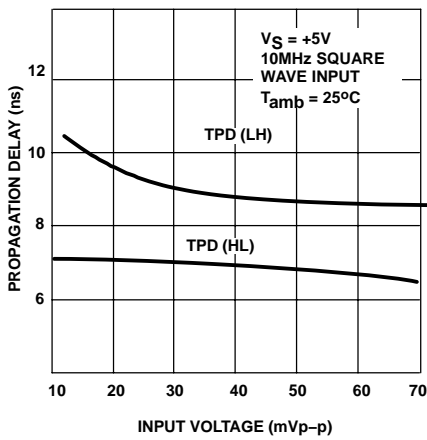


Figure 6. Propagation Delay for Various Input Voltages

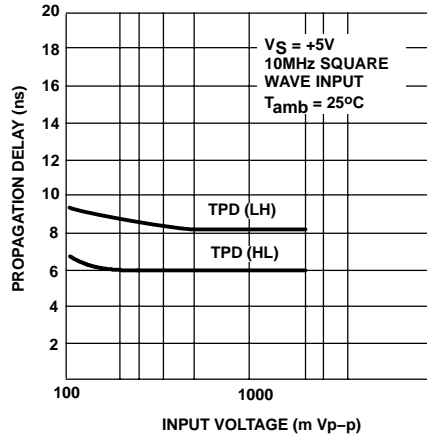


Figure 7. Propagation Delay for Various Input Voltages

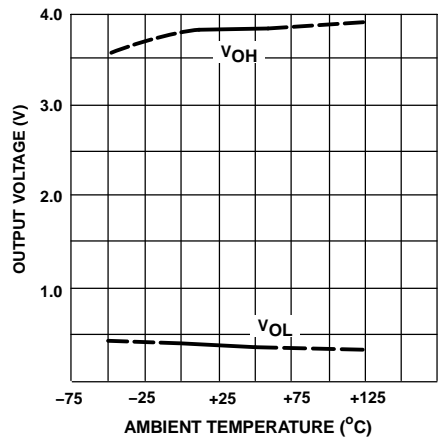


Figure 8. Output Voltage vs. Ambient Temperature

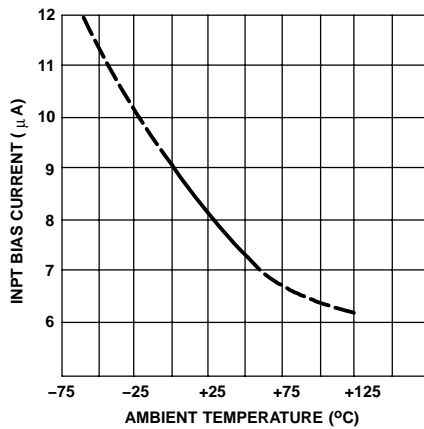


Figure 9. Input Bias Current vs. Ambient Temperature

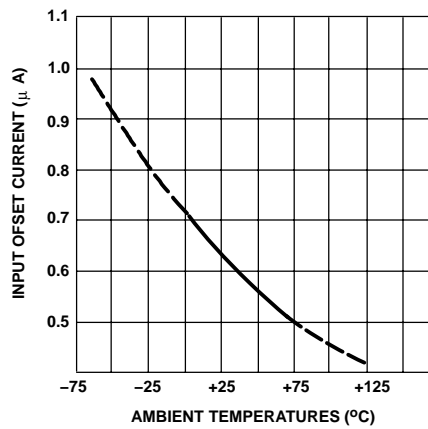


Figure 10. Input Offset Current vs. Ambient Temperature

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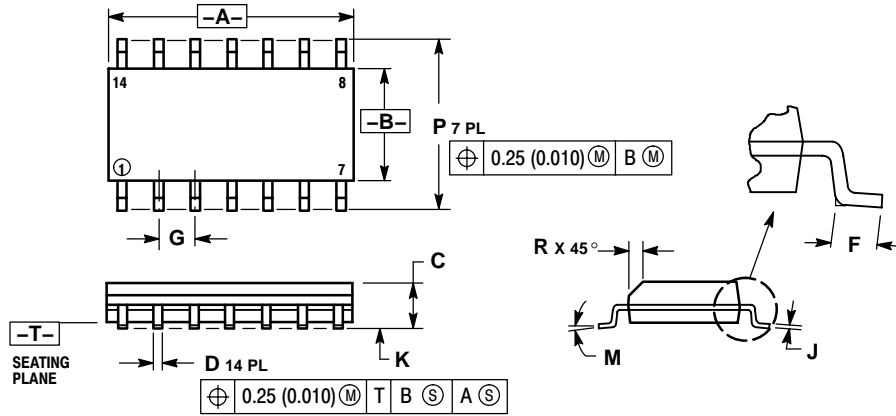
ORDERING INFORMATION

Device	Description	Temperature Range	Shipping
NE521D	14-Pin SO Package	0 to +70°C	55 Units/Rail
NE521DR2	14-Pin SO Package	0 to +70°C	2500 Tape & Reel
NE521N	14-Pin Plastic Dual In-Line Package	0 to +70°C	25 Units/Rail

NE521

PACKAGE DIMENSIONS

SOIC-14
D SUFFIX
CASE 751A-03
ISSUE F



NOTES:

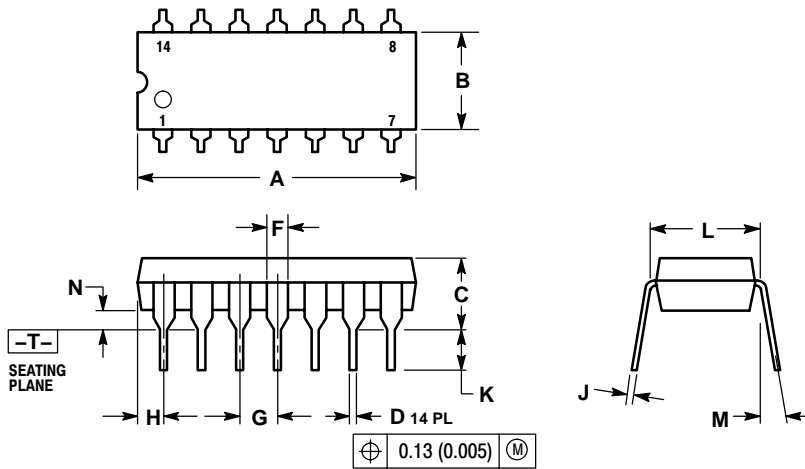
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.55	8.75	0.337	0.344
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.228	0.244
R	0.25	0.50	0.010	0.019

NE521

PACKAGE DIMENSIONS


PDIP-14
N SUFFIX
CASE 646-06
ISSUE M



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
5. ROUNDED CORNERS OPTIONAL.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.715	0.770	18.16	18.80
B	0.240	0.260	6.10	6.60
C	0.145	0.185	3.69	4.69
D	0.015	0.021	0.38	0.53
F	0.040	0.070	1.02	1.78
G	0.100 BSC		2.54 BSC	
H	0.052	0.095	1.32	2.41
J	0.008	0.015	0.20	0.38
K	0.115	0.135	2.92	3.43
L	0.290	0.310	7.37	7.87
M	----	10°	----	10°
N	0.015	0.039	0.38	1.01

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