

High-speed dual-differential comparator/sense amp

NE522

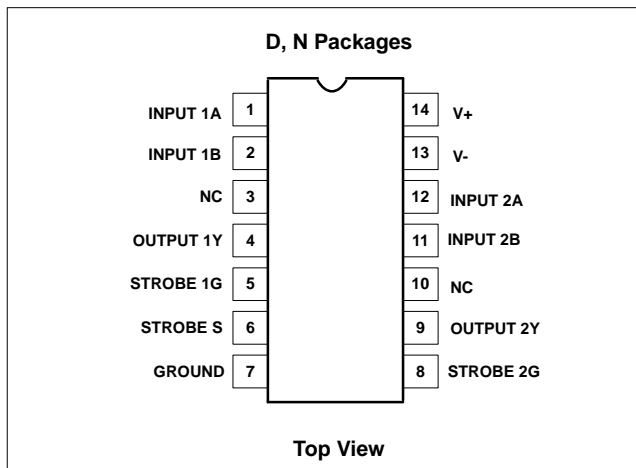
FEATURES

- 15ns 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

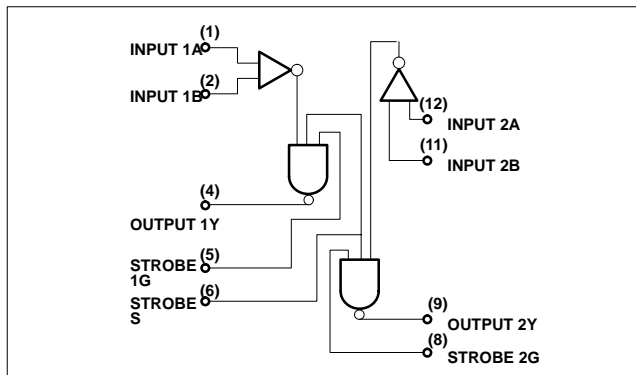
APPLICATIONS

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

PIN CONFIGURATION



BLOCK DIAGRAM



ORDERING INFORMATION

| DESCRIPTION | TEMPERATURE RANGE | ORDER CODE | DWG # |
|--------------------|-------------------|------------|-------|
| 14-Pin Plastic DIP | 0 to +70°C | NE522N | 0405B |
| 14-Pin Plastic SO | 0 to +70°C | NE522D | 0175D |

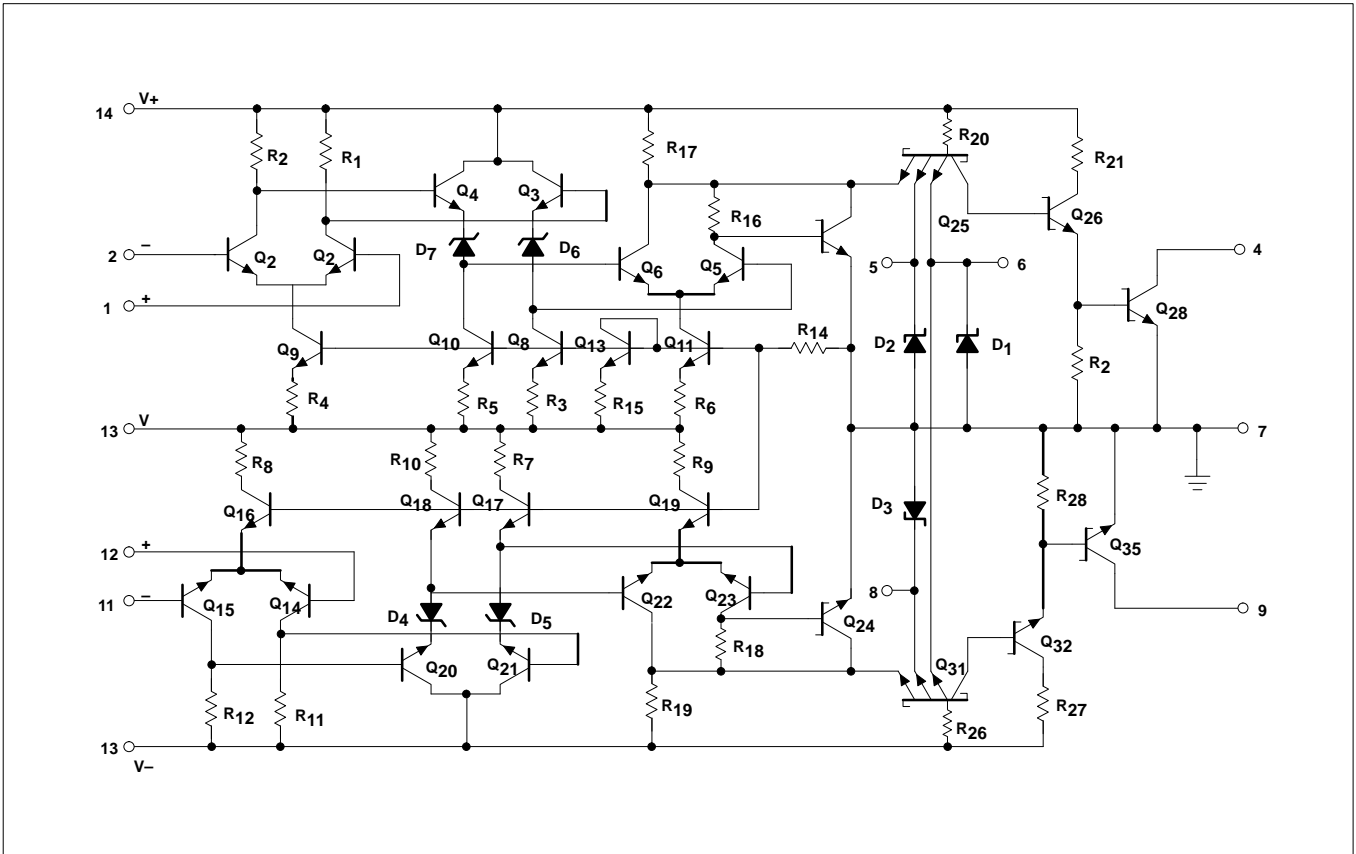
ABSOLUTE MAXIMUM RATINGS

| SYMBOL | PARAMETER | RATING | UNITS |
|-------------------|--|-------------|-------|
| V+ | Single supply voltage | Positive | +7 |
| V- | | Negative | -7 |
| V _{IDR} | Differential input voltage | ±6 | V |
| V _{IN} | Input voltage | Common-mode | ± 5 |
| | | Strobe/gate | +5.25 |
| P _D | Power dissipation | 600 | mW |
| T _A | Operating temperature range NE522 | 0 to 70 | °C |
| T _{STG} | Storage temperature range | -65 to +150 | °C |
| T _{SOLD} | Lead soldering temperature (10sec max) | +300 | °C |

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EQUIVALENT SCHEMATIC



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DC ELECTRICAL CHARACTERISTICS $V_{\pm} = \pm 5V \pm 5\%$, $T_A = 0$ to $+70^{\circ}C$, unless otherwise stated.

| SYMBOL | PARAMETER | TEST CONDITIONS | 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 | | +3 | V |
| V_{IL} | Low level input At 25°C Over temperature range | | | | 0.8 0.7 | V |
| V_{IH} | High level temperature | | 2.0 | | | 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 input current | $V_{IL} = 0.5V$ 1G or 2G strobe Common strobe S | | | -2.0 -4.0 | mA mA |
| V_{OL} | Output voltage Low | $V_+ = +5.25V$, $V_- = -5.25V$, $V_{I(S)} = 2.0V$, $I_{LOAD} = 20mA$ | | | 0.5 | V |
| I_{OH} | Output current High | $V_+ = +4.75V$, $V_- = -4.75V$, $V_{OH} = 5.25V$ | | | 250 | μA |
| 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 | $V_+ = +5.25V$, $V_- = -5.25V$, $T_A = 25^{\circ}C$ | | 27 -15 | 35 -28 | mA |

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AC ELECTRICAL CHARACTERISTICS $T_A = 25^\circ\text{C}$, $R_L = 280\Omega$, $C_L = 15\text{pF}$, unless otherwise stated.

| SYMBOL | PARAMETER | FROM INPUT | TO OUTPUT | LIMITS | | | UNITS |
|-------------------------------------|-----------------------------|------------|-----------|--------|-----|-----|-----------|
| | | | | MIN | TYP | MAX | |
| I_R | Input resistance | | | | 4 | | $k\Omega$ |
| I_C | Input capacitance | | | | 3 | | pF |
| Large-signal switching speed | | | | | | | |
| | Propagation delay | | | | | | |
| $t_{PLH(D)}$ | Low to high ¹ | Amp | Output | | 10 | 15 | ns |
| $t_{PHL(D)}$ | High to low ¹ | Amp | Output | | 8 | 12 | |
| $t_{PLH(S)}$ | Low to high ² | Strobe | Output | | 6 | 13 | |
| $t_{PHL(S)}$ | High to low ² | Strobe | Output | | 5 | 9 | |
| I_{MAX} | Maximum operating frequency | | | 25 | 35 | | MHz |

NOTES:

- Response time measured from 0V point of +100mV_{p,p} 10MHz square wave to the 1.5V point of the output.
- Response time measured from 1.5V point of the input to 1.5V point of the output.

LOGIC FUNCTION TABLE

| $V_{ID} (A^+, B^-)$ | STRS | STRG | OUTPUT TRANSISTOR |
|-----------------------------|------|------|-------------------|
| $< -V_{OS}$ | H | H | ON |
| $-V_{OS} < V_{ID} < V_{OS}$ | H | H | Undefined |
| $> V_{OS}$ | H | H | OFF |
| X | L | X | OFF |
| X | X | L | OFF |

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