High-speed dual-differential comparator/sense amp NE522

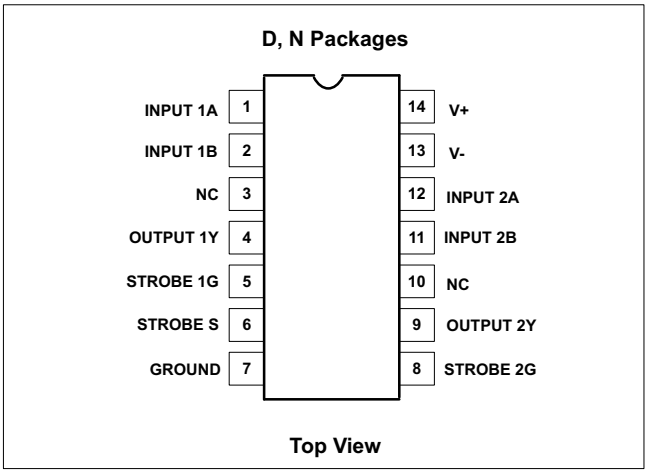
FEATURES

- 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

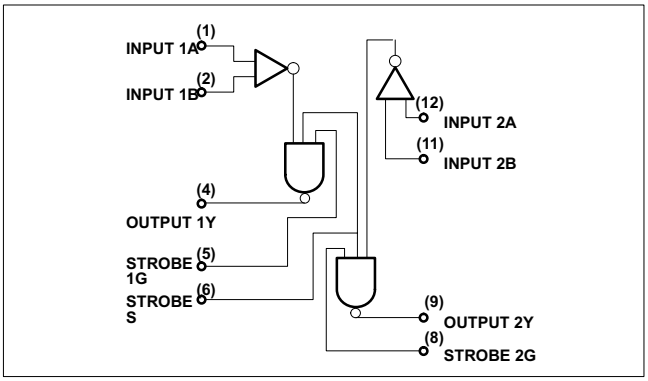
APPLICATIONS

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

PIN CONFIGURATION



BLOCK DIAGRAM



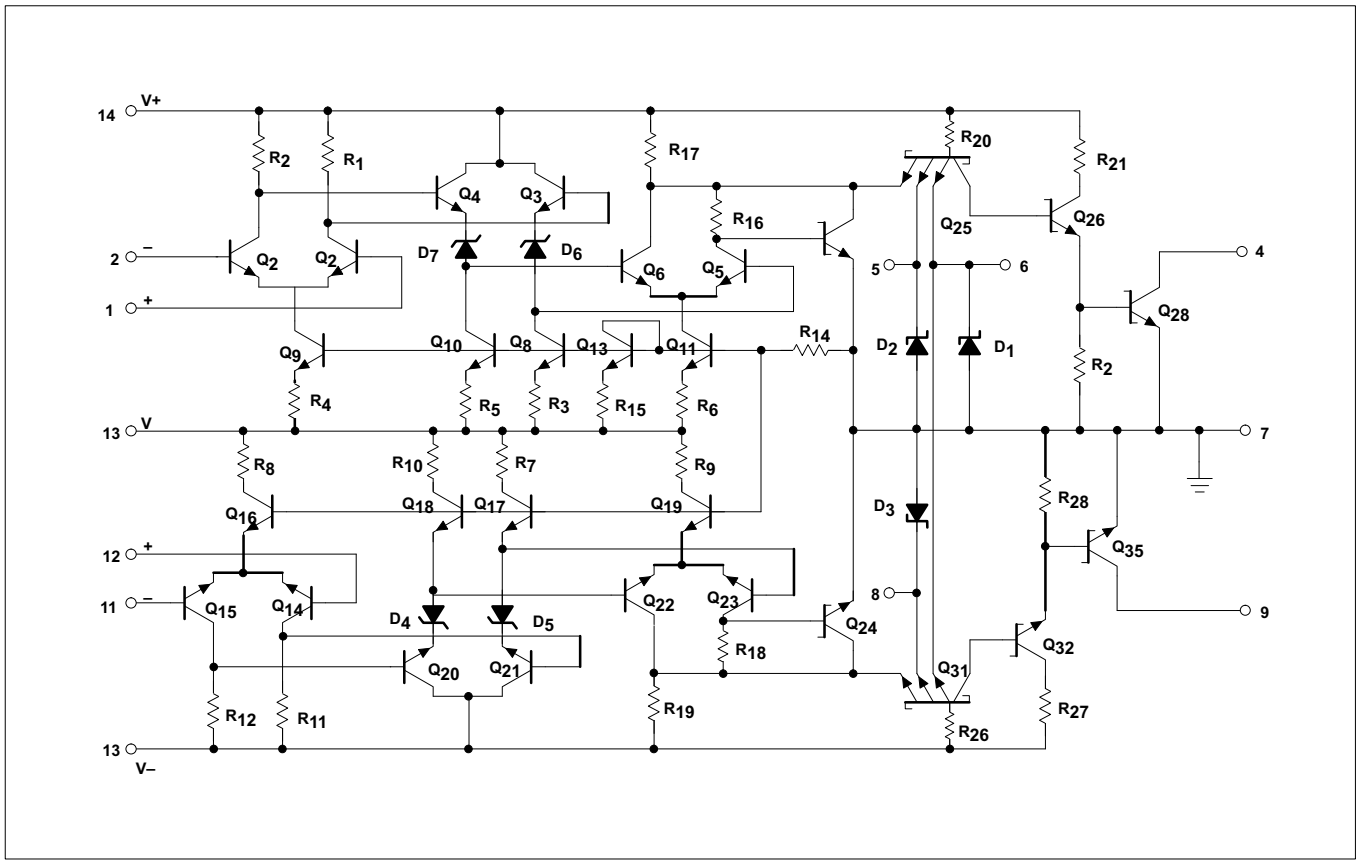
ORDERING INFORMATION

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+ V–	Single supply voltage	Positive Negative	+7 -7	V V
V_{IDR}	Differential input voltage		±6	V
V_{IN}	Input voltage	Common-mode Strobe/gate	± 5 +5.25	V V
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

EQUIVALENT SCHEMATIC



DC ELECTRICAL CHARACTERISTICS

$V\pm = \pm5V \pm5\%$, T_A = 0 to +70°C, unless otherwise stated.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
V_{OS}	Input offset voltage	V+ = +4.75V, V– = –4.75V				
	At 25°C			6	7.5	mV
	Over temperature range				10	
I_{BIAS}	Input bias current	V+ = +5.25V, V– = –5.25V				
	At 25°C			7.5	20	µA
	Over temperature range				40	
I_{OS}	Input offset current	V+ = +5.25V, V– = –5.25V				
	At 25°C			1.0	5	µA
	Over temperature range				12	
V_{CM}	Common-mode voltage range	V+ = +4.75V, V– = –4.75V	–3		+3	V
V_{IL}	Low level input					
	At 25°C				0.8	V
	Over temperature range				0.7	
V_{IH}	High level temperature		2.0			V
I_{IH}	Input current	V+ = +5.25V, V– = –5.25V				
	High	V_{IH} = 2.7V			50	µA
		1G or 2G strobe			100	µA
		Common strobe S				
I_{IL}	Low input current	V_{IL} = 0.5V				
		1G or 2G strobe			–2.0	mA
		Common strobe S			–4.0	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
	Supply voltage					
V+	Positive		4.75	5.0	5.25	V
V–	Negative		–4.75	–5.0	–5.25	
	Supply current	V+ = +5.25V, V– = –5.25V, T_A = 25°C				
I_{CC+}	Positive			27	35	mA
$I_{CC–}$	Negative			–15	–28	

AC ELECTRICAL CHARACTERISTICS

T_A = 25°C, R_L = 280Ω, C_L = 15pF, unless otherwise stated.

SYMBOL	PARAMETER	FROM INPUT	TO OUTPUT	LIMITS			UNITS
				MIN	TYP	MAX	
I_R	Input resistance				4		kΩ
I_C	Input capacitance				3		pF
Large-signal switching speed							
	Propagation delay						
$t_{PLH(D)}$	Low to high[1]	Amp	Output		10	15	
$t_{PHL(D)}$	High to low[1]	Amp	Output		8	12	ns
$t_{PLH(S)}$	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

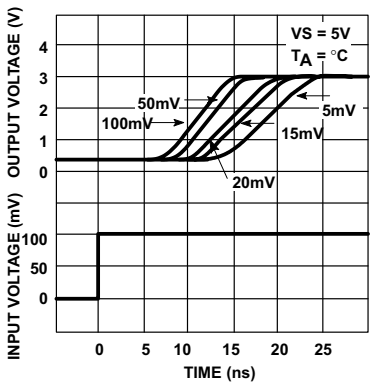
NOTES:
1. Response time measured from 0V point of +100mV_{P-P} 10MHz square wave to the 1.5V point of the output.
2. Response time measured from 1.5V point of the input to 1.5V point of the output.

LOGIC FUNCTION TABLE

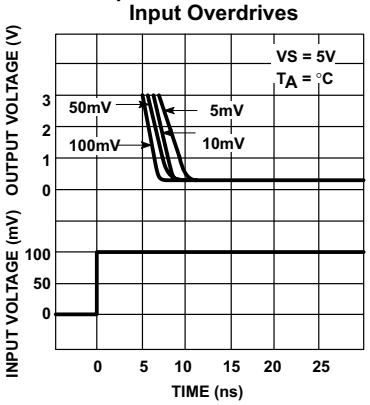
V_{ID} (A^+, B^-)	STRS	STRG	OUTPUT TRANSISTOR
< $-V_{OS}$	H	H	ON
$-V_{OS}$ < V_{ID} < V_{OS}	H	H	Undefined
> V_{OS}	H	H	OFF
X	L	X	OFF
X	X	L	OFF

EQUIVALENT SCHEMATIC

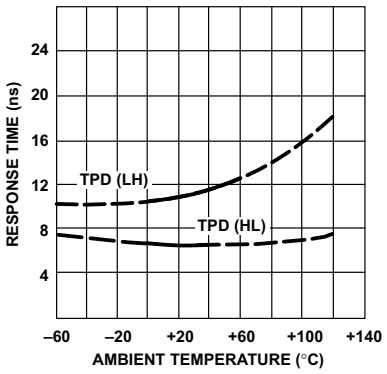
Response Time for Various Input Overdrives



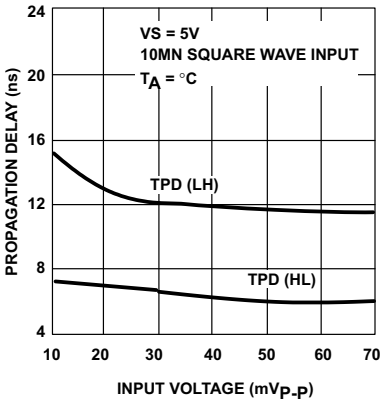
Response Time for Various Input Overdrives



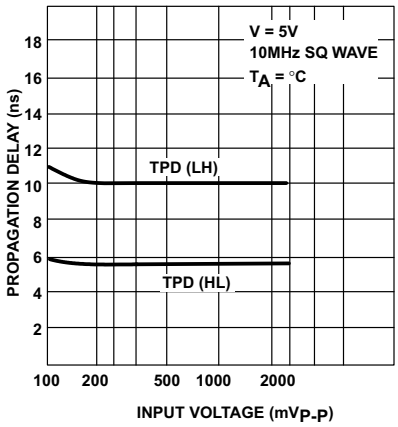
Response Time vs Temperature



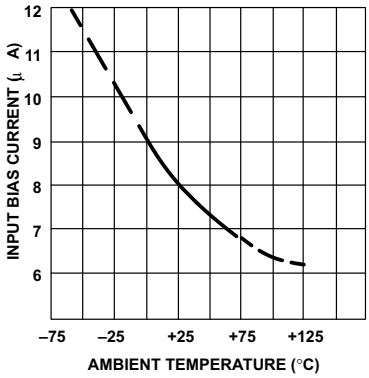
Propagation Delay for Various Input Voltages



Propagation Delay for Various Input Voltages



Input Bias Current vs Ambient Temperature



Input Offset Current vs Ambient Temperature