

TYPES SN7520, SN7521

DUAL-CHANNEL SENSE AMPLIFIERS WITH COMPLEMENTARY OUTPUTS

FUNCTION TABLE

INPUTS						OUTPUTS	
A	B	G _Y	G _Z	S _A	S _B	Y	Z
X	X	L	X	X	X	H	\bar{G}_Z
H	X	X	X	H	X	H	\bar{G}_Z
X	H	X	X	X	H	H	\bar{G}_Z
L	L	H	X	X	X	L	H
L	X	H	X	X	L	L	H
X	L	H	X	L	X	L	H
X	X	H	X	L	L	L	H
X	X	X	L	X	X	X	H

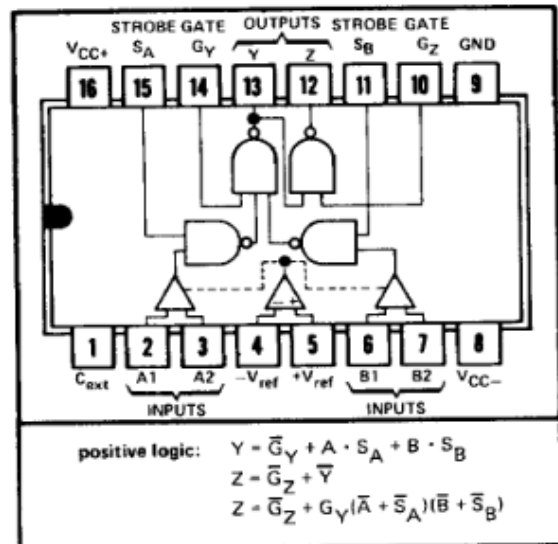
definition of logic levels

INPUT	H	L	X
A or B†	$V_{ID} \geq V_T \text{ max}$	$V_{ID} < V_T \text{ min}$	Irrelevant
Any G or S	$V_I \geq V_{IH} \text{ min}$	$V_I < V_{IL} \text{ max}$	Irrelevant

†A and B are differential voltages (V_{ID}) between A1 and A2 or B1 and B2, respectively. For these circuits, V_{ID} is considered positive regardless of which terminal of each pair is positive with respect to the other.

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DUAL-IN-LINE PACKAGE (TOP VIEW)



electrical characteristics (unless otherwise noted $V_{CC+} = 5 \text{ V}$, $V_{CC-} = -5 \text{ V}$, $T_A = 0^\circ \text{C}$ to 70°C)

PARAMETER	TEST FIGURE	TEST CONDITIONS	MIN	TYP [‡]	MAX	UNIT	
V_T Differential input threshold voltage (see Note 3)	1	$V_{ref} = 15 \text{ mV}$	SN7520	11	15	19	mV
			SN7521	8	15	22	
		$V_{ref} = 40 \text{ mV}$	SN7520	36	40	44	
			SN7521	33	40	47	
V_{ICF} Common-mode input firing voltage (see Note 4)	none	$V_{ref} = 40 \text{ mV}$, $V_{I(S)} = V_{IH}$ Common-mode input pulse: $t_r < 15 \text{ ns}$, $t_f < 15 \text{ ns}$, $t_w = 50 \text{ ns}$		± 2.5		V	
I_{IB} Differential-input bias current	2	$V_{CC+} = 5.25 \text{ V}$, $V_{CC-} = -5.25 \text{ V}$, $V_{ID} = 0$		30	75	μA	
I_{IO} Differential-input offset current	2	$V_{CC+} = 5.25 \text{ V}$, $V_{CC-} = -5.25 \text{ V}$, $V_{ID} = 0$		0.5		μA	
V_{IH} High-level input voltage (strobe and gate inputs)	3		2			V	
V_{IL} Low-level input voltage (strobe and gate inputs)	3				0.8	V	
V_{OH} High-level output voltage	3	$V_{CC+} = 4.75 \text{ V}$, $V_{CC-} = -4.75 \text{ V}$, $I_{OH} = -400 \mu\text{A}$	2.4	4		V	
V_{OL} Low-level output voltage	3	$V_{CC+} = 4.75 \text{ V}$, $V_{CC-} = -4.75 \text{ V}$, $I_{OL} = 16 \text{ mA}$	0.25	0.4		V	
I_{IH} High-level input current (strobe and gate inputs)	4	$V_{CC+} = 5.25 \text{ V}$, $V_{CC-} = -5.25 \text{ V}$, $V_{IH} = 2.4 \text{ V}$			40	μA	
I_{IL} Low-level input current (strobe and gate inputs)	4	$V_{CC+} = 5.25 \text{ V}$, $V_{CC-} = -5.25 \text{ V}$, $V_{IL} = 0.4 \text{ V}$		-1	-1.6	mA	
$I_{OS(Y)}$ Short-circuit output current into Y	5	$V_{CC+} = 5.25 \text{ V}$, $V_{CC-} = -5.25 \text{ V}$	-3		-5	mA	
$I_{OS(Z)}$ Short-circuit output current into Z	5	$V_{CC+} = 5.25 \text{ V}$, $V_{CC-} = -5.25 \text{ V}$	-2.1		-3.5	mA	
I_{CC+} Supply current from V_{CC+}	6	$V_{CC+} = 5.25 \text{ V}$, $V_{CC-} = -5.25 \text{ V}$, $T_A = 25^\circ \text{C}$		28	40	mA	
I_{CC-} Supply current from V_{CC-}	6	$V_{CC+} = 5.25 \text{ V}$, $V_{CC-} = -5.25 \text{ V}$, $T_A = 25^\circ \text{C}$		-14	-20	mA	

[‡]All typical values are at $V_{CC+} = 5 \text{ V}$, $V_{CC-} = -5 \text{ V}$, $T_A = 25^\circ \text{C}$.

NOTES: 3. The differential-input threshold voltage (V_T) is defined as the d-c differential-input voltage (V_{ID}) required to force the output of the sense amplifier to the logic gate threshold voltage level.

4. Common-mode input firing voltage is the minimum common-mode voltage that will exceed the dynamic range of the input at the specified conditions and cause the logic output to switch. The specified common-mode input signal is applied with a strobe-enable pulse present.



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switching characteristics, $V_{CC+} = 5\text{ V}$, $V_{CC-} = -5\text{ V}$, $C_{ext} \geq 100\text{ pF}$, $T_A = 25^\circ\text{C}$

PROPAGATION DELAY TIMES			TEST FIGURE	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SYMBOL	FROM INPUT	TO OUTPUT						
$t_{PLH}(DY)$	A1-A2 OR B1-B2	Y	32	$C_L = 15\text{ pF}$, $R_L = 288\ \Omega$	25	40		ns
$t_{PHL}(DY)$								
$t_{PLH}(DZ)$	A1-A2 OR B1-B2	Z	32	$C_L = 15\text{ pF}$, $R_L = 288\ \Omega$	30			ns
$t_{PHL}(DZ)$								
$t_{PLH}(SY)$	STROBE A OR B	Y	32	$C_L = 15\text{ pF}$, $R_L = 288\ \Omega$	15	30		ns
$t_{PHL}(SY)$								
$t_{PLH}(SZ)$	STROBE A OR B	Z	32	$C_L = 15\text{ pF}$, $R_L = 288\ \Omega$	30			ns
$t_{PHL}(SZ)$								
$t_{PLH}(GY, Y)$	GATE G_Y	Y	33	$C_L = 15\text{ pF}$, $R_L = 288\ \Omega$	15	25		ns
$t_{PHL}(GY, Y)$								
$t_{PLH}(GY, Z)$	GATE G_Y	Z	33	$C_L = 15\text{ pF}$, $R_L = 288\ \Omega$	15			ns
$t_{PHL}(GY, Z)$								
$t_{PLH}(GZ, Z)$	GATE G_Z	Z	34	$C_L = 15\text{ pF}$, $R_L = 288\ \Omega$	15			ns
$t_{PHL}(GZ, Z)$								

typical recovery and cycle times, $V_{CC+} = 5\text{ V}$, $V_{CC-} = -5\text{ V}$, $C_{ext} \geq 100\text{ pF}$, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{orD}	Differential-input overload recovery time (see Note 5)		20		ns
t_{orC}	Common-mode-input overload recovery time (see Note 6)		20		ns
$t_{cyc(min)}$	Minimum cycle time		200		ns

- NOTES: 5. Differential-input overload recovery time is the time necessary for the device to recover from the specified differential-input-overload signal prior to the strobe-enable signal.
6. Common-mode-input overload recovery time is the time necessary for the device to recover from the specified common-mode-input overload signal prior to the strobe-enable signal.

schematic

