DESCRIPTION

The NE528B is a monolithic four channel plated wire sense amplifier designed to read small signals, 3mV or above, and translate them to TTL logic levels. The NE528B features input channel selection by means of three TTL channel select inputs, one of which allows for total input disable. The output is TTL compatible and can be used in the "WIRED-OR" configuration.

FEATURES

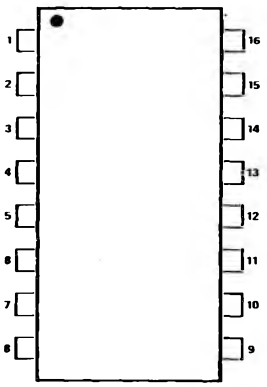
- FOUR CHANNELS IN ONE PACKAGE
- TOTAL INPUT DISABLE PROVIDED
- 16mA SINK CAPABILITY
- OUTPUT STRUCTURE ALLOWS FOR WIRED-OR, PARALLELING
- CHANNEL SELECT, STROBE AND OUTPUT TTL COMPATIBLE

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	±10V
Strobe Control Voltage	+6V
Differential Input Voltage	±5V
Amplifier Input Current	2mA
Common Mode Input Voltage	+5 to -6V
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range	0°C to 70°C

PIN CONFIGURATION

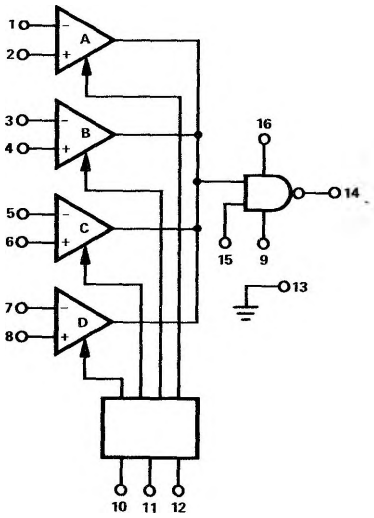
B & E PACKAGE
(Top View)



1. Input A^-
2. Input A^+
3. Input B^-
4. Input B^+
5. Input C^-
6. Input C^+
7. Input D^-
8. Input D^+
9. V^-
10. Input Enable 1
11. Input Enable 2
12. Input Enable 3
13. Ground
14. Output
15. Strobe
16. V^+

ORDER PART NOS. NE528B/NE528E

LOGIC DIAGRAM AND TRUTH TABLE



Amplifier Activated	Enable Input 1	Enable Input 2	Enable Input 3
A	0	0	1
B	1	0	1
C	1	1	1
D	0	1	1
NONE	X	X	0

x = DON'T CARE

ELECTRICAL CHARACTERISTICS (Conditions: $V^+ = 5V$, $V^- = -6V$, $T_A = 25°$ unless specified)

PARAMETERS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Input Bias Current	$V^+ = 5.25V$, $V^- = -6.3V$, $V_{in} = 0$		15	50	μA
Input Offset Current	$V^+ = 5.25V$, $V^- = -6.3V$, $V_{in} = 0$		0.5	5	μA
Differential Input Threshold Voltage	Figure 1	-3		+3	mV
Output Voltage					
"1" State	$V^+ = 4.75V$	2.4			V
"0" State	$V^+ = 5.25V$			0.4	V
Enable and Strobe Inputs					
"0" Input Current	$V^+ = 5.25V$, $V^- = -6.3V$, $V_{in} = 0.4V$			-1.6	mA
"1" Input Current	$V^+ = 5.25V$, $V^- = -6.3V$, $V_{in} = 2.4V$			40	μA
"0" Input Voltage	$V^+ = 4.75V$, $V^- = -5.7V$			0.8	V
"1" Input Voltage	$V^+ = 4.75V$, $V^- = -5.7V$	2.0			V
Power Consumption	$V^+ = 5.25V$, $V^- = -6.3V$			270	mW
Positive Supply Current	$V^+ = 5.25V$, $V^- = -6.3V$			35	mA
Negative Supply Current	$V^+ = 5.25V$, $V^- = -6.3V$			15	mA
Input Resistance	f = 1 kHz		2K		Ω
Propagation Delay	Unused Inputs Grounded, Figure 2				
t_{pd} (0)			20		nsec
t_{pd} (1)			25		nsec
Output Rise Time	Figure 3		16		nsec
Output Fall Time	Figure 3		6		nsec
Strobe Delay Time	Figure 2				
Turn On			10		nsec
Turn Off			12		nsec
Channel Select Time	Figure 3		9		nsec
Total Disable to Enable Time	Figure 2		25		nsec
Enable to Total Disable Time	Figure 2		28		nsec

LOGIC DIAGRAM AND TEST TABLE ($V^+ = 5V$, $V^- = -6V$, $T_A = 25°C$)

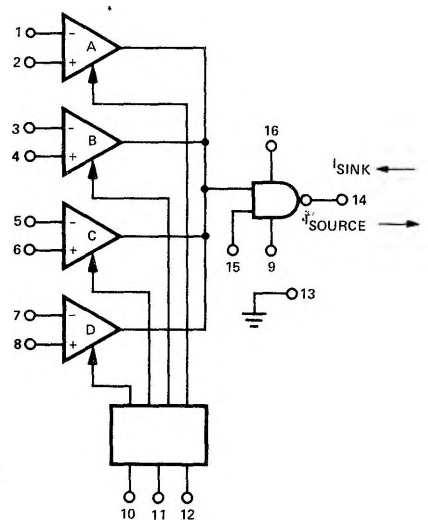
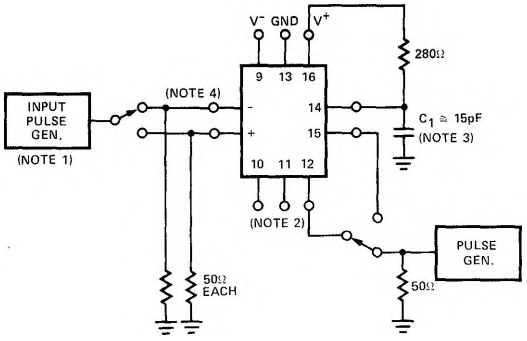
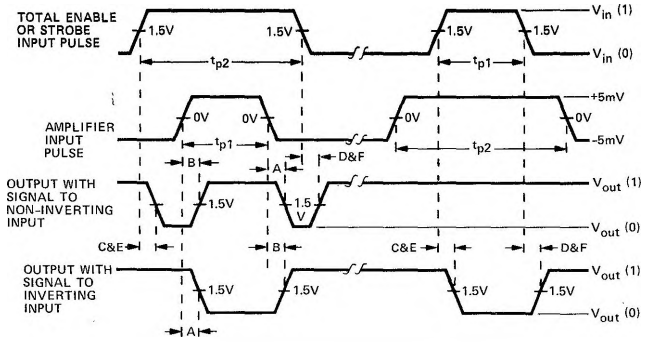


FIGURE 1

Pin 10	Pin 11	Pin 12	Pin 15	Enabled Inputs	V_{in}	V_{out}	I_{Sink}	I_{Source}
0	0	1	1	1-2	3mV	≤0.4V	16mA	
0	0	1	1	1-2	-3mV	≥2.4V		-400μA
0	0	1	1	2-1	3mV	≥2.4V		-400μA
0	0	1	1	2-1	-3mV	≤0.4V	16mA	
1	0	1	1	3-4	3mV	≤0.4V	16mA	
1	0	1	1	3-4	-3mV	≥2.4V		-400μA
1	0	1	1	4-3	3mV	≥2.4V		-400μA
1	0	1	1	4-3	-3mV	≤0.4V	16mA	
1	1	1	1	5-6	3mV	≤0.4V	16mA	
1	1	1	1	5-6	-3mV	≥2.4V		-400μA
1	1	1	1	6-5	3mV	≥2.4V		-400μA
1	1	1	1	6-5	-3mV	≤0.4V	16mA	
0	1	1	1	7-8	3mV	≤0.4V	16mA	
0	1	1	1	7-8	-3mV	≥2.4V		-400μA
0	1	1	1	8-7	3mV	≥2.4V		-400μA
0	1	1	1	8-7	-3mV	≤0.4V	16mA	
X	X	X	0	X	X	≥2.4V		-400μA
X	X	0	X	X	X	≥2.4V		-400μA

TEST FIGURE AND WAVEFORMS





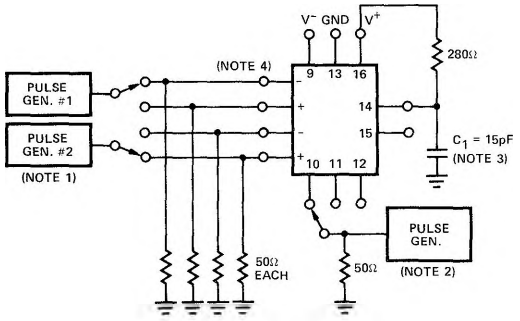
NOTES:

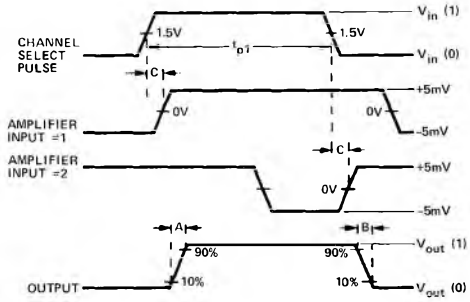
1. Pulse generators have the following characteristics: $Z_{out} = 50\Omega$, $t_r = t_f = 15\ (\pm 5)$ns, $t_{p1} = 100$ns, $t_{p2} = 300$ns, PRR = 1 MHz.
2. See channel select table on page 1.
3. C_1 includes probe and lead capacitance.
4. + and − are the input pins for the enabled channel such as (1, 2), (3, 4), (5, 6), (7, 8).

NOTES:

1. A is propagation delay t_{pd} (0)
2. B is propagation delay t_{pd} (1)
3. C is strobe delay time, t_{on}
4. D is strobe delay time, t_{off}
5. E is total disable to enable time
6. F is enable to total disable time

FIGURE 2





A is output rise time
B is output fall time
C is channel select time

NOTES:

1. Pulse generators have the following characteristics: $Z_{out} = 50\Omega$, $t_r = t_f = 15\ (\pm 5)$ns, $t_{p1} = 100$ns, PRR = 1 MHz.
2. See channel select table on page 1.
3. C_1 includes probe and lead capacitance.
4. + and − are the input pins for the enabled channel such as (1, 2), (3, 4), (5, 6), (7, 8).

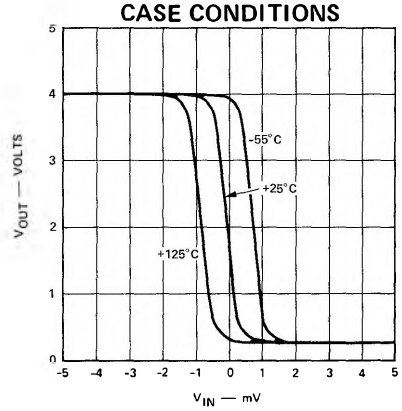
NOTES:

1. Channel select time is further defined as the minimum time between the 1.5V level of the channel select pulse and the 50% level of the input signal that allows for a full width output.
2. A is output rise time, B is output fall time, and C is channel select time.

FIGURE 3

TYPICAL CHARACTERISTIC CURVE

TYPICAL TRANSFER CHARACTERISTICS OVER TEMPERATURE UNDER WORST CASE CONDITIONS



CONDITIONS:

1. $V^+ = 4.75$V, $V^- = -5.70$V
2. $I_{source} = 400\mu$A for $V_{out} > 2.4$V
3. $I_{sink} = 16$mA for $V_{out} < 0.4$V

EQUIVALENT SCHEMATIC DIAGRAM