

# 2-INPUT, 4-BIT DIGITAL MULTIPLEXER

# 8266 8267

## DIGITAL 8000 SERIES TTL/MSI

### DESCRIPTION

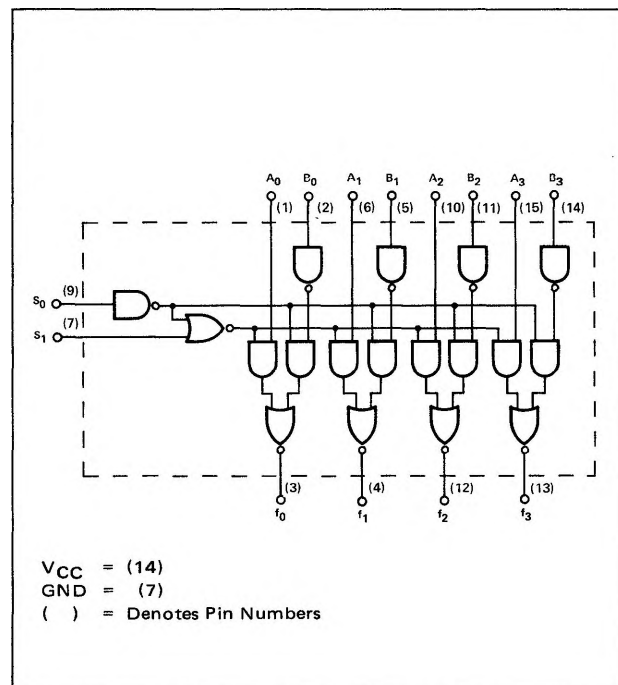
The 8266/8267 2-Input, 4-Bit Digital Multiplexer is a monolithic array utilizing familiar TTL circuit structures. The 8267 features a bare-collector output to allow expansion with other devices.

The multiplexer is intended for use at the inputs to adders, registers and in other parallel data handling applications.

The multiplexer is able to choose from two different input sources, each containing 4 bits:  $A = (A_0, A_1, A_2, A_3)$ ,  $B = (B_0, B_1, B_2, B_3)$ . The selection is controlled by the input  $S_0$ , while the second control input,  $S_1$ , is held at zero.

For conditional complementing, the two inputs ( $A_n, B_n$ ) are tied together to form the function TRUE/COMPLEMENT, which is needed in conjunction with added elements to perform ADDITION/SUBTRACTION. Further, the inhibit state  $S_0 = S_1 = 1$  can be used to facilitate transfer operations in an arithmetic section.

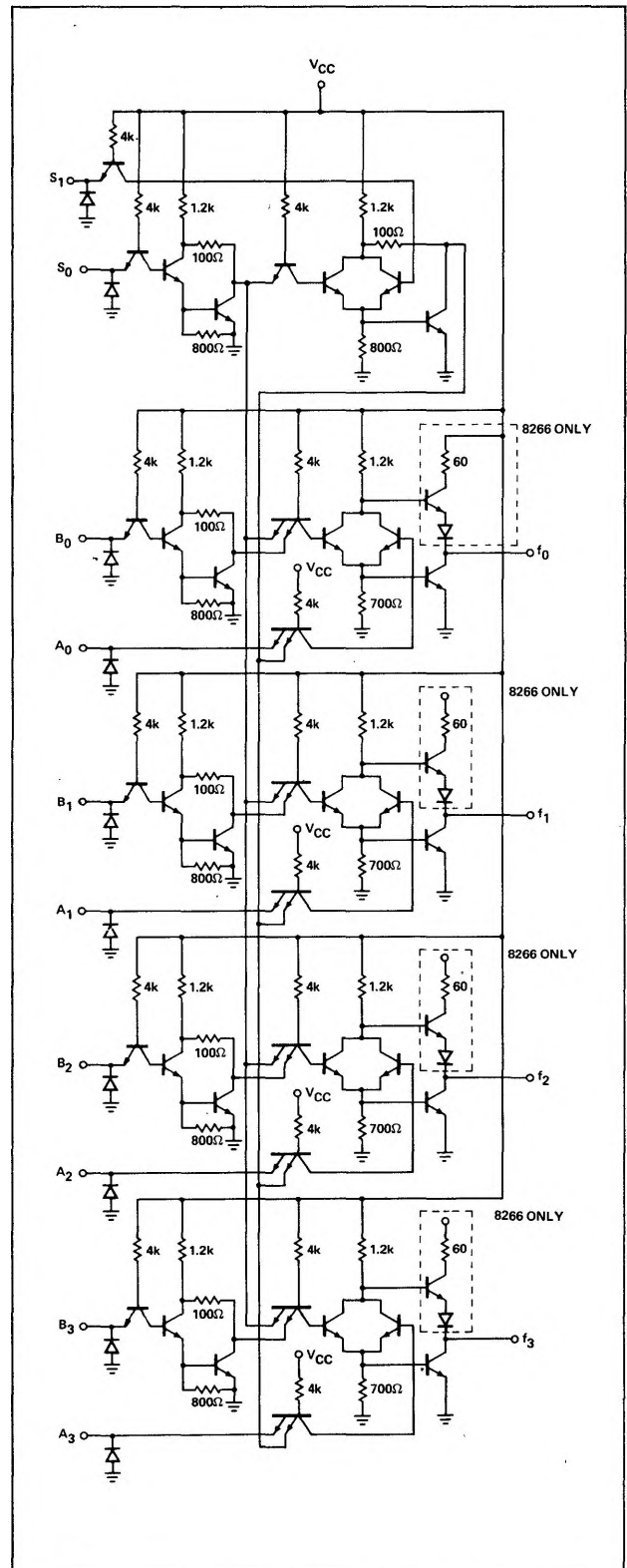
### LOGIC DIAGRAM



### TRUTH TABLE

SELECT LINES		OUTPUTS
$S_0$	$S_1$	$f_n$ (0, 1, 2, 3)
0	0	$B_n$
0	1	$\overline{B_n}$
1	0	$A_n$
1	1	1

### SCHEMATIC DIAGRAM



**ELECTRICAL CHARACTERISTICS** (Over Recommended Operating Temperature And Voltage)

CHARACTERISTICS	LIMITS				TEST CONDITIONS					NOTES
	MIN.	TYP.	MAX.	UNITS	A <sub>n</sub>	B <sub>n</sub>	S <sub>0</sub>	S <sub>1</sub>	OUTPUTS	
"1" Output Voltage (8266)	2.6	3.5		V	0.8V	2.0V	0.8V	0.8V	-800 $\mu$ A	7
"0" Output Voltage			0.40	V	2.0V	2.0V	2.0V	0.8V	16mA	8
"1" Output Leakage Current (8267)			25	$\mu$ A	0.6V	2.0V	2.0V	0.8V		10
"0" Input Current										
A <sub>n</sub> , B <sub>n</sub>	-0.1		-1.6	mA	0.4V	0.4V	0V	0V		
S <sub>0</sub> , S <sub>1</sub>	-0.1		-1.6	mA			0.4V	0.4V		
"1" Input Current										
A <sub>n</sub> , B <sub>n</sub>			40	$\mu$ A	4.5V	4.5V		2.0V		
S <sub>0</sub> , S <sub>1</sub>			40	$\mu$ A			4.5V	4.5V		
Input Voltage Rating										
S <sub>0</sub> , A <sub>n</sub> , B <sub>n</sub>	5.5			V	10mA	10mA	10mA	2.0V		11
S <sub>1</sub>	5.5			V			2.0V	10mA		11
Output Short Circuit Current (8266)	-20		-70	mA					0V	

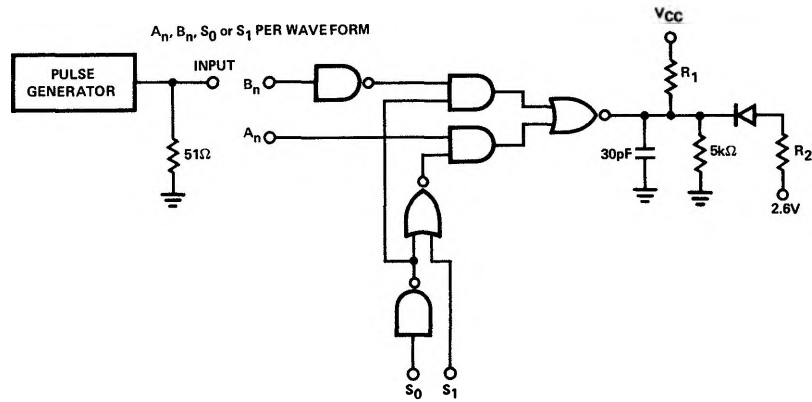
T<sub>A</sub> = 25° C and V<sub>CC</sub> = 5.0V

CHARACTERISTICS	LIMITS				TEST CONDITIONS					NOTES
	MIN.	TYP.	MAX.	UNITS	A <sub>n</sub>	B <sub>n</sub>	S <sub>0</sub>	S <sub>1</sub>	OUTPUTS	
Propagation Delay (8266)										
S <sub>0</sub> to f <sub>n</sub> (short path)		18	28	ns						9
S <sub>0</sub> to f <sub>n</sub> (long path)		20	30	ns						9
A <sub>n</sub> to f <sub>n</sub>		13	20	ns						9
B <sub>n</sub> , S <sub>1</sub> to f <sub>n</sub>		14	25	ns						9
Propagation Delay (8267)										
S <sub>0</sub> to f <sub>n</sub>		27	36	ns						9
A <sub>n</sub> to f <sub>n</sub>		15	20	ns						9
B <sub>n</sub> , S <sub>1</sub> to f <sub>n</sub>		21	28	ns						9
S <sub>0</sub> to f <sub>n</sub> (short path)		18	28	ns						9
Power/Current Consumption		200/ 38.1	275/ 52.4	mW/ mA	4.5V	0V	4.5V	0V		13

## NOTES:

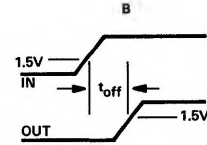
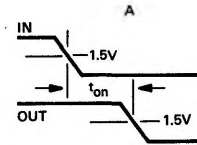
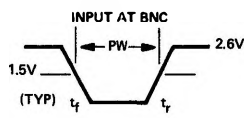
- All voltage measurements are referenced to the ground terminal. Terminals not specifically referenced are left electrically open.
- All measurements are taken with ground pin tied to zero volts.
- Positive current flow is defined as into the terminal referenced.
- Positive NAND logic definition:  
"UP" Level = "1", "DOWN" Level = "0".
- Precautionary measures should be taken to ensure current limiting in accordance with Absolute Maximum Ratings should the isolation diodes become forward biased.
- Measurements apply to each gate element independently.
- Output source current is supplied through a resistor to ground.
- Output sink current is supplied through a resistor to V<sub>CC</sub>.
- Refer to AC Test Figure.
- Connect an external 1k  $\pm$  1% resistor from V<sub>CC</sub> to the output for this test.
- This test guarantees operation free of input latch-up over the specified operating supply voltage range.
- Manufacturer reserves the right to make design and process changes and improvements.
- V<sub>CC</sub> = 5.25 volts.

## AC TEST FIGURE AND WAVEFORMS



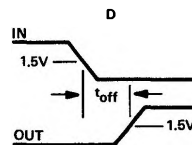
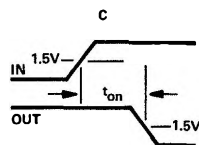
	8266	8267
$R_1$	$\infty$	330Ω
$R_2$	84.5Ω	470Ω

## NON-INVERTING PATHS

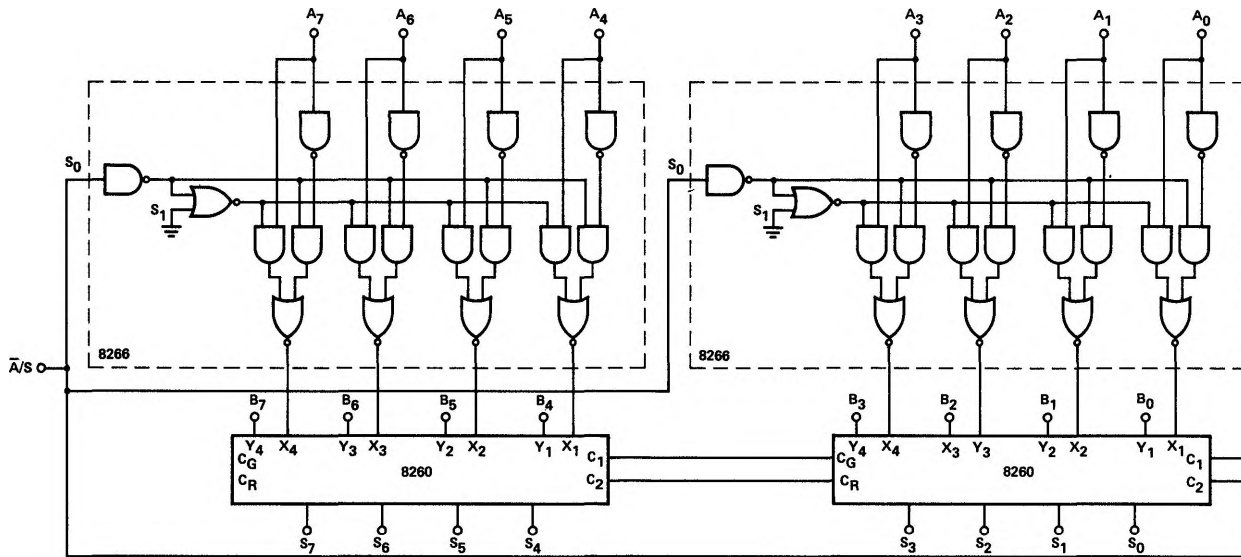


$t_r = t_f \leq 5\text{ns}$   
 Amplitude = 2.6V  
 PW = 200ns  
 PRR = 1MHz

## INVERTING PATHS



TYPICAL APPLICATIONS



The 8266 can be used in conjunction with the 8260 (Look-Ahead Carry Adder) to form an adder-subtractor.