

DESCRIPTION

These devices are 2-input, 4-Bit Digital Multiplexers designed for general purpose data-selection applications.

The 8233 features *non-inverting* data paths; and, the 8234 features *inverting* data paths.

The 8235 is designed for input to adders, registers and general paralleled data handling due to its capability to perform **CONDITIONAL COMPLEMENTING (TRUE/COMPLEMENT)**. When the two inputs for each bit position (A_i , B_i) are connected together, the f output will provide either the *True* or *Complement* of the input data. This

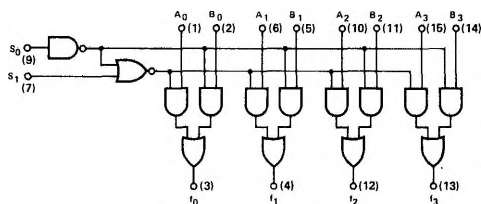
capability is especially useful for transferring data into parallel adders where both true data for adding or multiplying and also complemented data for subtracting or dividing are needed.

The 8234 and 8235 designs have open collector outputs which permit direct wiring to other open collector outputs (collector logic) to yield "free" four-bit words. As many as one hundred four-bit words can be multiplexed by using fifty 8234/8235s in the WIRED-AND mode.

The inhibit state $S_0 = S_1 = 1$ can be used to facilitate transfer operations in an arithmetic section.

LOGIC DIAGRAM AND TRUTH TABLES

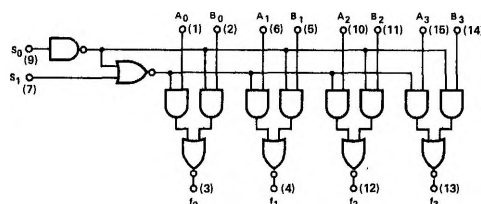
8233 (ACTIVE PULL-UP)



S_0	S_1	f_n
0	0	B
1	0	A
0	1	B
1	1	0

V_{CC} = (16)
 GND = (8)
 () = Denotes Pin Numbers

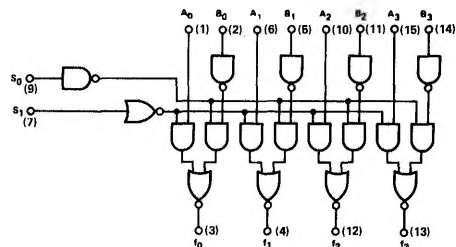
8234 (OPEN COLLECTOR)



S_0	S_1	f_n
0	0	$\overline{B}$
1	0	$\overline{A}$
0	1	$\overline{B}$
1	1	1

V_{CC} = (16)
 GND = (8)
 () = Denotes Pin Numbers

8235 (OPEN COLLECTOR)



S_0	S_1	f_n
0	0	$\overline{A_n B_n}$
0	1	B_n
1	0	$\overline{A_n}$
1	1	1

V_{CC} = (16)
 GND = (8)
 () = Denotes Pin Numbers

ELECTRICAL CHARACTERISTICS (Over Recommended Operating Temperature And Voltage)

CHARACTERISTICS	LIMITS				TEST CONDITIONS				OUTPUTS	NOTES
					INPUTS					
	MIN.	TYP.	MAX.	UNITS	A _n	B _n	S ₀	S ₁		
"1" Output Voltage (8233)	2.6	3.5		V	2.0V	2.0V	0.8V	0.8V	~800μA	6
"0" Output Voltage (8233)			0.4	V	0.8V	2.0V	2.0V	0.8V	16mA	7
"0" Output Voltage (8234)			0.4	V	0V	2.0V	0.8V	0.8V	16mA	7
"0" Output Voltage (8235)			0.4	V	2.0V	2.0V	2.0V	0.8V	16mA	7
"1" Output Leakage Current (8234)			100	μA	2.0V	2.0V	2.0V	2.0V	5.0V	8
"1" Output Leakage Current (8235)			100	μA	2.0V	2.0V	2.0V	2.0V	5.0V	8
"0" Input Current										
A _n	-0.1		-1.6	mA	0.4V	4.5V		0V		
B _n	-0.1		-1.6	mA	4.5V	0.4V	0V	0V		
S ₀	-0.1		-1.6	mA			0.4V			
S ₁	-0.1		-1.6	mA				0.4V		
"1" Input Current										
A _n			40	μA	4.5V	0V				
B _n			40	μA	0V	4.5V				
S ₀			40	μA			4.5V			
S ₁			40	μA				4.5V		
Input Voltage Rating										
A _n	5.5			V	10mA	0V				
B _n	5.5			V	0V	10mA				
S ₀	5.5			V			10mA			
S ₁	5.5			V				10mA		
Output Short Circuit Current (8233)	-20		-70	mA	5V	5V	0V	0V	0V	10, 11
Input Clamp Voltage										
A _n			-1.5	V	-12mA					
B _n			-1.5	V		-12mA				
S ₀			-1.5	V			-12mA			
S ₁			-1.5	V				-12mA		

$T_A = 25^\circ\text{C}$ and $V_{CC} = 5.0\text{V}$

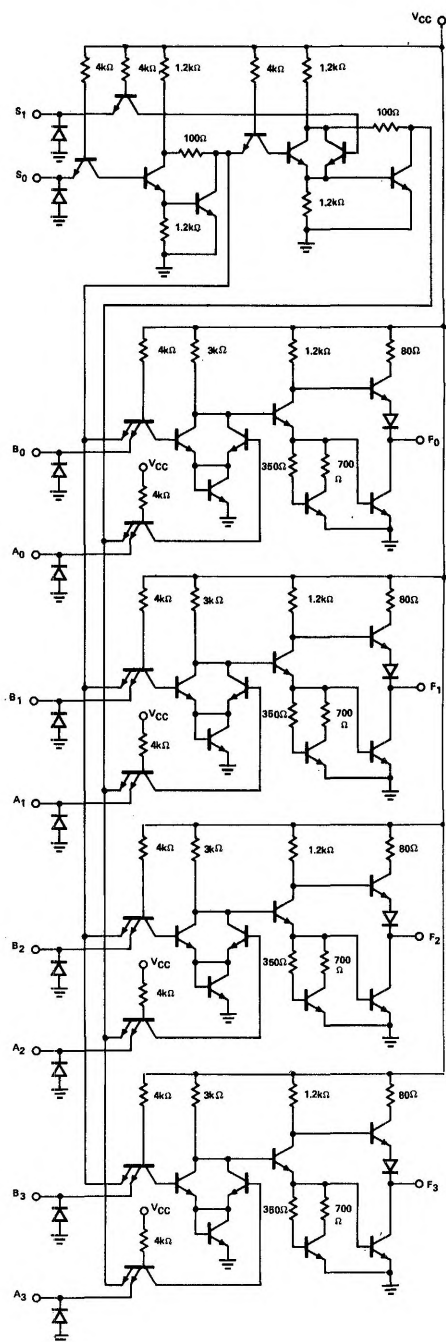
CHARACTERISTICS	LIMITS				TEST CONDITIONS				OUTPUTS	NOTES
					INPUTS					
	MIN.	TYP.	MAX.	UNITS	A _n	B _n	S ₀	S ₁		
Power/Current										
Consumption:										
8233		200/38	252/48	mW/mA		0V		0V		10
8234		160/31	210/40	mW/mA		0V		0V		10
8235		230/44	310/59	mW/mA		4.5V		4.5V		10
8233 Turn-On Times, t _{on}										
A _n , B _n to f _n		16	25	ns						9
S ₀ to f _n		27	38	ns						9
S ₁ to f _n		27	38	ns						9
8233 Turn-Off Times, t _{off}										
A _n , B _n to f _n		16	25	ns						9
S ₀ to f _n		27	38	ns						9
S ₁ to f _n		27	38	ns						9
8234 Turn-On Times, t _{on}										
A _n , B _n to f _n		16	25	ns						9
S ₀ to f _n		27	38	ns						9
S ₁ to f _n		27	38	ns						9
8234 Turn-Off Times, t _{off}										
A _n , B _n to f _n		16	25	ns						9
S ₀ to f _n		27	38	ns						9
S ₁ to f _n		27	38	ns						9
8235 Turn-On Times, t _{on}										
A _n to f _n		16	25	ns						9
B _n to f _n		24	35	ns						9
S ₀ to f _n		27	38	ns						9
S ₁ to f _n		27	38	ns						9
8235 Turn-Off Times, t _{off}										
A _n to f _n		16	25	ns						9
B _n to f _n		24	35	ns						9
S ₀ to f _n		27	38	ns						9
S ₁ to f _n		27	38	ns						9

NOTES:

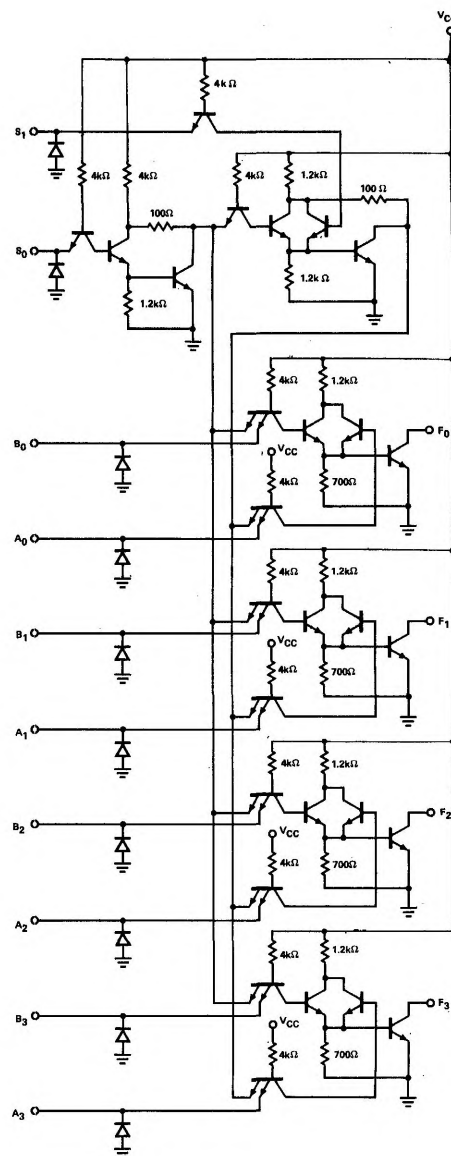
- All voltage measurements are referenced to the ground terminal. Terminals not specifically referenced are left electrically open.
- All measurements are taken with ground pin tied to zero volts.
- Positive current is defined as into the terminal referenced.
- Positive logic: "UP" Level = "1", "DOWN" Level = "0".
- Precautionary measures should be taken to ensure current limiting in accordance with Absolute Maximum Ratings should the isolation diodes become forward biased.
- Output source current is supplied through a resistor to ground.
- Output sink current is supplied through a resistor to V_{CC}.
- Connect an external 1k ±1% resistor from V_{CC} to the output for this test.
- Reference AC Test Circuit, Waveforms and Test Tables.
- V_{CC} = 5.25V.
- Not more than one output should be shorted at a time.

SCHEMATIC DIAGRAMS

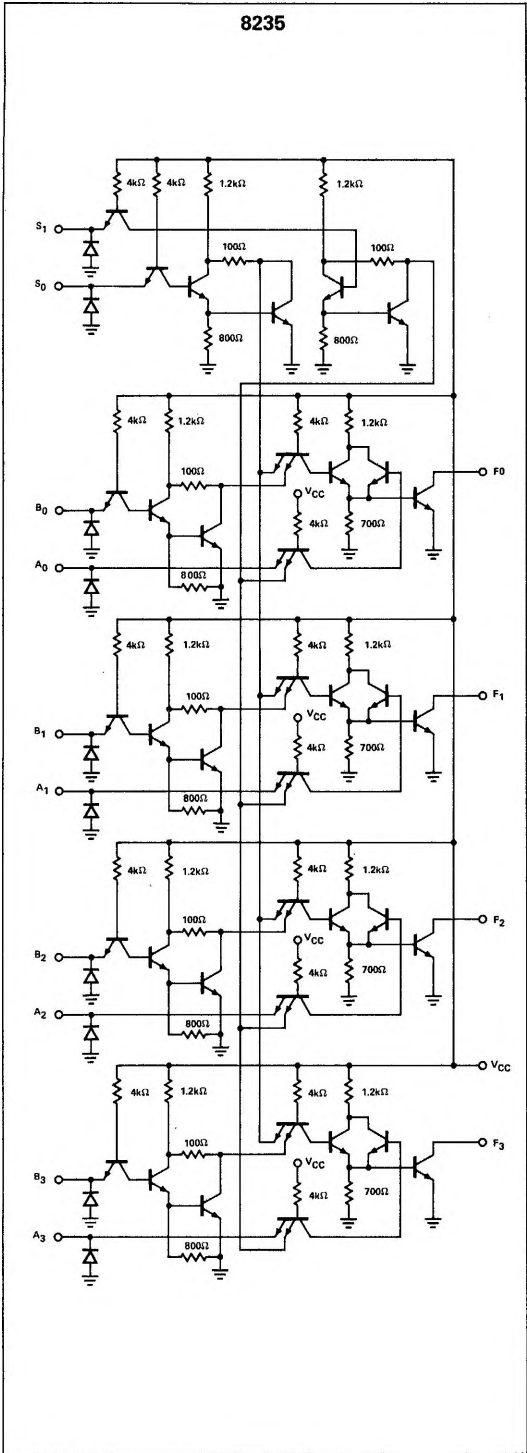
8233 (ACTIVE PULL-UP)



8234 (OPEN COLLECTOR)



SCHEMATIC DIAGRAMS (Cont'd)



PROPAGATION DELAY TEST TABLE

PRODUCT	PATH	PARAMETER	S ₁	S ₂	S ₃	S ₄
ALL	A ₀ to f ₀	t_{on} t_{off}	a	b	b	c
8233 8234	B ₀ to f ₀	t_{on} t_{off}	c	a	c	b
8233 8234	S ₀ to f ₀	t_{on} t_{off}	b	b	a	b
8233 8234	S ₀ to f ₀	t_{on} t_{off}	b	c	a	c
8235	B ₀ to f ₀	t_{on} t_{off}	c	a	c	b
8235	B ₀ to f ₀	t_{on} t_{off}	b	c	a	b
8235	S ₁ to f ₀	t_{on} t_{off}	b	b	c	a
8233 8234	S ₁ to f ₀	t_{on} t_{off}	b	c	b	a

AC TEST FIGURE AND WAVEFORMS

