

74F620 • 74F623 Inverting Octal Bus Transceiver with TRI-STATE® Outputs

General Description

These devices are octal bus transceivers designed for asynchronous two-way data flow between the A and B busses. Both busses are capable of sinking 64 mA and have TRI-STATE outputs. Dual enable pins (GAB, $\overline{\text{G}}\text{BA}$) allow data transmission from the A bus to the B bus or from the B bus to the A bus. The 'F620 is an inverting option of the 'F623.

Features

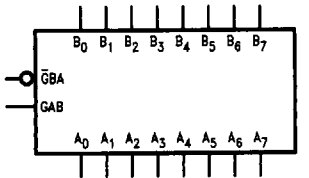
- Designed for asynchronous two-way data flow between busses
- Outputs sink 64 mA
- Dual enable inputs control direction of data flow
- Guaranteed 4000V minimum ESD protection
- 'F620 is an inverting option of the 'F623

Ordering Code: See Section 11

Commercial	Package Number	Package Description
74F620PC	N20A	20-Lead (0.300" Wide) Molded Dual-In-Line
74F623PC	N20A	20-Lead (0.300" Wide) Molded Dual-In-Line
74F623SC (Note 1)	M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC

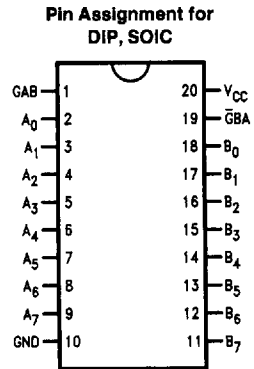
Note 1: Devices also available in 13" reel. Use suffix = SCX.

Logic Symbol



TL/F/9577-3

Connection Diagram



TL/F/9577-1

Unit Loading/Fan Out: See Section 2 for U.L. definitions

Pin Names	Description	74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
$\overline{\text{G}}\text{BA}$, GAB	Enable Inputs	1.0/1.0	20 $\mu\text{A}/ -0.6 \text{ mA}$
A ₀ -A ₇	A Inputs or TRI-STATE Outputs	3.5/1.083 150/40	70 $\mu\text{A}/ -0.4 \text{ mA}$ -3 mA/64 mA
B ₀ -B ₇	B Inputs or TRI-STATE Outputs	3.5/1.083 150/40	70 $\mu\text{A}/ -0.4 \text{ mA}$ -3 mA/64 mA

Functional Description

The enable inputs GAB and $\overline{\text{GBA}}$ control whether data is transmitted from the A bus to the B bus or from the B bus to the A bus. If both $\overline{\text{GBA}}$ and GAB are disabled ($\overline{\text{GBA}}$ HIGH and GAB low), the outputs are in the high impedance state and data is stored at the A and B busses. When $\overline{\text{GBA}}$ is

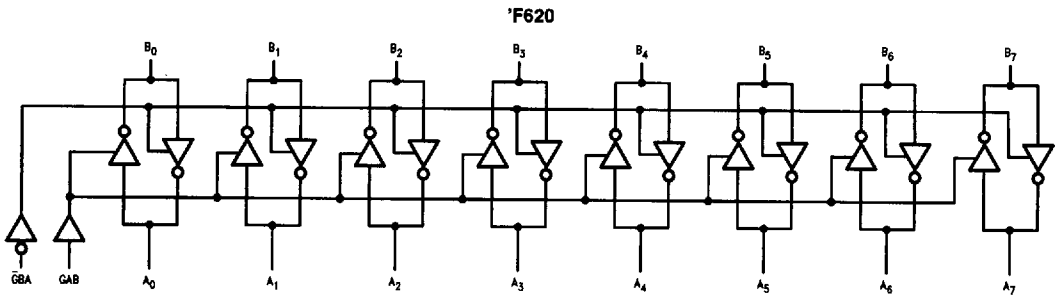
active (LOW), B data is sent to the A bus. When GAB is active (HIGH), data from the A bus is sent to the B bus. If both enable inputs are active ($\overline{\text{GBA}}$ LOW and GAB HIGH) B data is sent to the A bus while A data is sent to the B bus.

Function Table

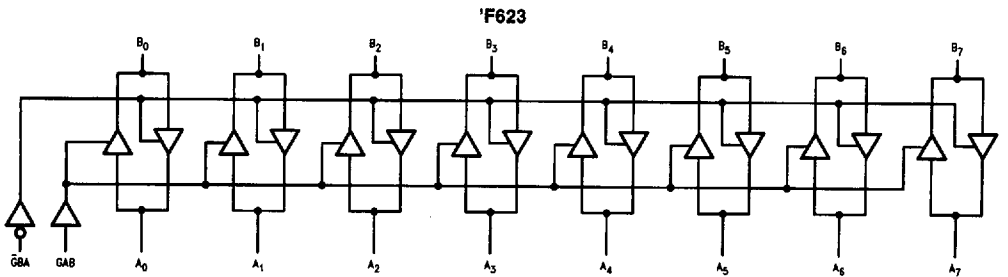
Enable Inputs		Operation	
$\overline{\text{GBA}}$	GAB	'F620	'F623
L	L	$\overline{\text{B}}$ Data to A Bus	B Data to A Bus
H	H	$\overline{\text{A}}$ Data to B Bus	A Data to B Bus
H	L	Z	Z
L	H	$\overline{\text{B}}$ Data to A Bus, $\overline{\text{A}}$ Data to B Bus	B Data to A Bus, A Data to B Bus

H = HIGH Voltage Level
L = LOW Voltage Level
Z = High Impedance

Logic Diagram



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.



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Absolute Maximum Ratings (Note 1)

Storage Temperature	-65°C to +150°C
Ambient Temperature under Bias	-55°C to +125°C
Junction Temperature under Bias Plastic	-55°C to +175°C -55°C to +150°C
V _{CC} Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 2)	-0.5V to +7.0V
Input Current (Note 2)	-30 mA to +5.0 mA
Voltage Applied to Output in HIGH State (with V _{CC} = 0V)	
Standard Output	-0.5V to V _{CC}
TRI-STATE Output	-0.5V to +5.5V

Current Applied to Output in LOW State (Max) twice the rated I_{OL} (mA)
ESD Last Passing Voltage (Min) 4000V

Note 1: Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Note 2: Either voltage limit or current limit is sufficient to protect inputs.

Recommended Operating Conditions

Free Air Ambient Temperature Commercial	0°C to +70°C
Supply Voltage Commercial	+4.5V to +5.5V

DC Electrical Characteristics

Symbol	Parameter	74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
V _{IH}	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal
V _{IL}	Input LOW Voltage			0.8	V		Recognized as a LOW Signal
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	I _{IN} = -18 mA (Non I/O Pins)
V _{OH}	Output HIGH Voltage 74F 10% V _{CC}	2.0			V	Min	I _{OH} = -15 mA (A _n , B _n)
V _{OL}	Output LOW Voltage 74F 10% V _{CC}			0.55	V	Min	I _{OL} = 64 mA (A _n , B _n)
I _{IH}	Input HIGH Current 74F			5.0	μA	Max	V _{IN} = 2.7V
I _{BVI}	Input HIGH Current Breakdown Test 74F			7.0	μA	Max	V _{IN} = 7.0V (G _{BA} , G _{AB})
I _{BVIT}	Input HIGH Current Breakdown (I/O) 74F			0.5	mA	Max	V _{IN} = 5.5V (A _n , B _n)
I _{CEX}	Output HIGH Leakage Current 74F			50	μA	Max	V _{OUT} = V _{CC}
V _{ID}	Input Leakage Test 74F	4.75			V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded
I _{OD}	Output Leakage Circuit Current 74F			3.75	μA	0.0	V _{IOD} = 150 mV All Other Pins Grounded
I _{IL}	Input LOW Current			-0.6	mA	Max	V _{IN} = 0.5V (Non I/O Pins)
I _{IH} + I _{OZH}	Output Leakage Current			70	μA	Max	V _{OUT} = 2.7V (A _n , B _n)
I _{IL} + I _{OZL}	Output Leakage Current			-650	μA	Max	V _{OUT} = 0.5V (A _n , B _n)
I _{OS}	Output Short-Circuit Current	-100		-225	mA	Max	V _{OUT} = 0V
I _{ZZ}	Bus Drainage Test			500	μA	0.0V	V _{OUT} = 5.25V
I _{CCH}	Power Supply Current ('F620)			82	mA	Max	V _O = HIGH, V _{IN} = 0.2V
I _{CCL}	Power Supply Current ('F620)			82	mA	Max	V _O = LOW
I _{CCZ}	Power Supply Current ('F620)			95	mA	Max	V _O = HIGH Z
I _{CCH}	Power Supply Current ('F623)			65	mA	Max	V _O = HIGH
I _{CCL}	Power Supply Current ('F623)			82	mA	Max	V _O = LOW, V _{IN} = 0.2V
I _{CCZ}	Power Supply Current ('F623)			85	mA	Max	V _O = HIGH Z

AC Electrical Characteristics: See Section 2 for Waveforms and Load Configurations

Symbol	Parameter	74F			74F		Units	Fig. No.
		T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A , V _{CC} = Com C _L = 50 pF			
		Min	Typ	Max	Min	Max		
t _{PLH} t _{PHL}	Propagation Delay A Input to B Output ('F620)	2.5 2.0		7.5 7.0	2.0 2.0	8.0 7.0	ns	2-3
t _{PLH} t _{PHL}	Propagation Delay B Input to A Output ('F620)	2.5 2.0		7.5 7.0	2.0 2.0	8.0 7.0	ns	2-3
t _{PLH} t _{PHL}	Propagation Delay A Input to B Output ('F623)	1.5 2.0		6.5 7.0	1.5 2.0	7.5 7.5	ns	2-3
t _{PLH} t _{PHL}	Propagation Delay B Input to A Output ('F623)	1.5 2.0		6.5 7.0	1.5 2.0	7.5 7.5	ns	2-3
t _{PZH} t _{PZL}	Enable Time G _{BA} Input to A Output	2.0 2.5		7.0 8.0	2.0 2.0	8.0 8.5	ns	2-5
t _{PHZ} t _{PLZ}	Disable Time G _{BA} Input to A Output	1.5 1.0		6.5 5.5	1.5 1.0	7.5 5.5		
t _{PZH} t _{PZL}	Enable Time G _{AB} Input to B Output ('F620)	2.0 3.0		7.5 8.0	2.0 2.0	8.5 8.5	ns	2-5
t _{PHZ} t _{PLZ}	Disable Time G _{AB} Input to B Output ('F620)	2.5 2.0		8.0 7.5	2.0 2.0	9.0 8.0		
t _{PZH} t _{PZL}	Enable Time G _{AB} Input to B Output ('F623)	2.0 2.5		7.5 8.0	2.0 2.0	8.5 8.5	ns	2-5
t _{PHZ} t _{PLZ}	Disable Time G _{AB} Input to B Output ('F623)	2.0 2.0		8.0 8.0	2.0 2.0	9.0 8.0		