

### **Rochester Electronics Manufactured Components**

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

### **Quality Overview**

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
  - Class Q Military
  - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
  - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

# SN54F620 THRU SN54F623, SN74F620 THRU SN74F623 OCTAL BUS TRANSCEIVERS

D2932, MARCH 1987

- Local Bus-Latch Capability
- Choice of Inverting or Noninverting Logic
- Choice of 3-State or Open-Collector Outputs
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

DEVICE	OUTPUT	LOGIC
'F620	3-State	Inverting
'F621	Open-Collector	Noninverting
'F622	Open-Collector	Inverting
'F623	3-State	Noninverting

## description

These octal bus transceivers are designed for asynchronous two-way communications between data buses. The control function implementation allows for maximum flexibility in timing.

These devices allow data transmission from the A bus to the B bus or from the B bus to the A bus depending upon the logic levels at the enable inputs ( $\bar{G}BA$  and  $GAB$ ).

The enable inputs can be used to disable the device so that the buses are effectively isolated.

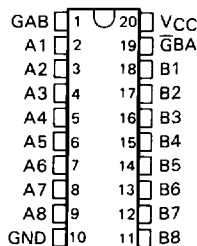
The dual-enable configuration gives the octal bus transceivers the capability to store data by simultaneous activation of  $\bar{G}BA$  and  $GAB$ . Each output reinforces its input in this transceiver configuration. When both control inputs are activated and all other data sources to the two sets of bus lines are at high impedance, both sets of bus lines (16 in all) will remain at their last states. The 8-bit codes appearing on the two sets of buses will be identical for 'F621 and 'F623, or complementary for the 'F620 and 'F622.

The SN54F620 through SN54F623 are characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN74F620 and SN74F623 are characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

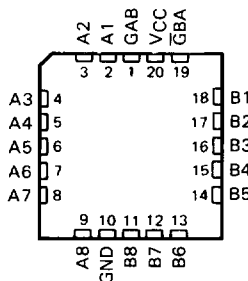
FUNCTION TABLE

ENABLE INPUTS		OPERATION	
$\bar{G}BA$	$GAB$	'F620, 'F622	'F621, 'F623
L	L	$\bar{B}$ data to A bus	B data to A bus
H	H	$\bar{A}$ data to B bus	A data to B bus
H	L	Isolation	Isolation
L	H	$\bar{B}$ data to A bus, $\bar{A}$ data to B bus	B data to A bus, A data to B bus

SN54F' . . . J PACKAGE  
SN74' . . . DW OR N PACKAGE  
(TOP VIEW)



SN54F' . . . FK PACKAGE  
(TOP VIEW)

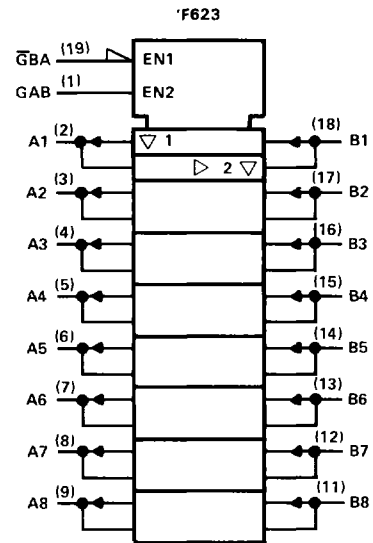
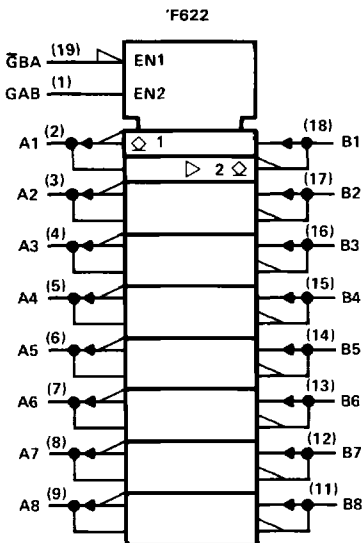
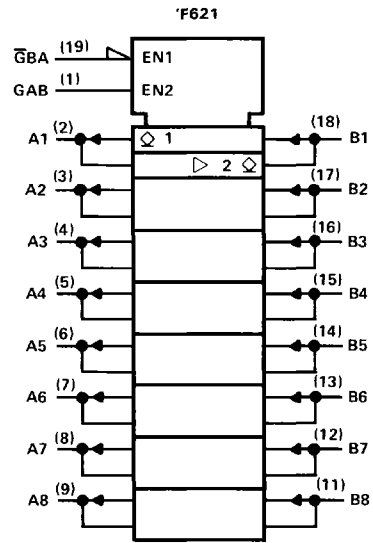
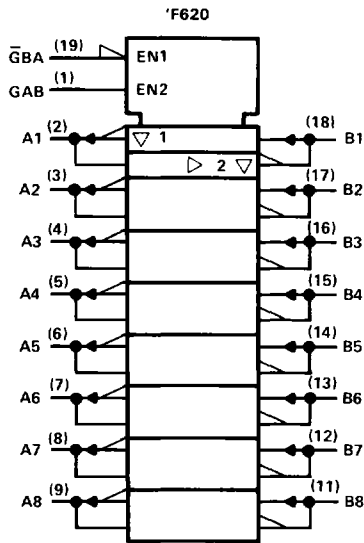


2

Data Sheets

# SN54F620 THRU SN54F623, SN74F620 THRU SN74F623 OCTAL BUS TRANSCEIVERS

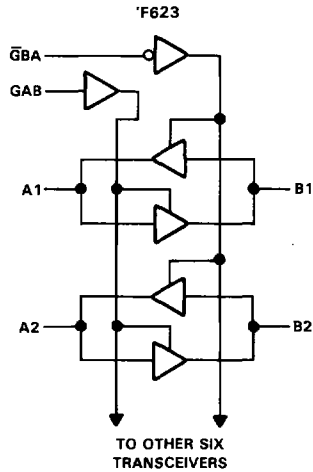
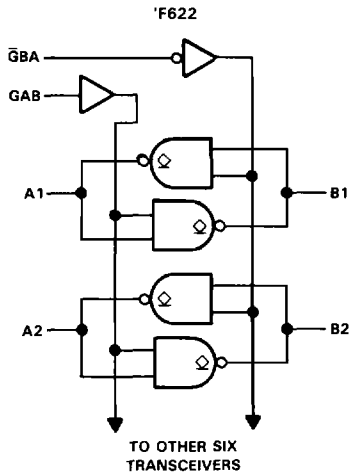
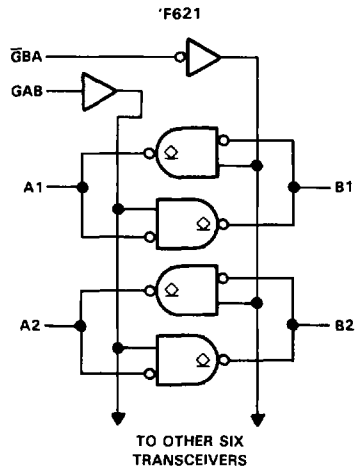
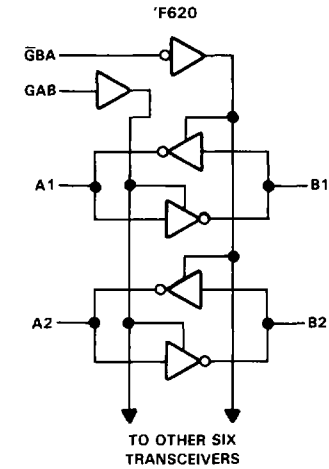
logic symbols†



†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

SN54F620 THRU SN54F623, SN74F620 THRU SN74F623  
OCTAL BUS TRANSCEIVERS

logic diagrams (positive logic)



2

Data Sheets

# SN54F620, SN54F623, SN74F620, SN74F623

## OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

### absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, $V_{CC}$ .....	-0.5 V to 7 V
Input voltage <sup>†</sup> .....	-1.2 V to 7 V
Input current .....	-30 mA to 5 mA
Voltage applied to any output in the disabled or power-off state .....	-0.5 V to 5.5 V
Voltage applied to any output in the high state .....	-0.5 V to $V_{CC}$
Current into any output in the low state: SN54F620, SN54F623 (Any A) .....	40 mA
(Any B) .....	96 mA
SN74F620, SN74F623 (Any A) .....	128 mA
(Any B) .....	48 mA
Operating free-air temperature range: SN54F620, SN54F623 .....	-55°C to 125°C
SN74F620, SN74F623 .....	0°C to 70°C
Storage temperature range .....	-65°C to 150°C

<sup>†</sup>The input voltage ratings may be exceeded provided the input current ratings are observed.

## 2

### Data Sheets

### recommended operating conditions

		SN54F620 SN54F623			SN74F620 SN74F623			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
$V_{CC}$	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
$V_{IH}$	High-level input voltage	2			2			V
$V_{IL}$	Low-level input voltage			0.8			0.8	V
$I_{IK}$	Input clamp current			-18			-18	mA
$I_{OH}$	High-level output current	Any A		-3			-3	mA
		Any B		-12			-15	
$I_{OL}$	Low-level output current	Any A		20			24	mA
		Any B		48			64	
$T_A$	Operating free-air temperature	-55		125	0		70	°C

# SN54F620, SN54F623, SN74F620, SN74F623 OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS		SN54F620 SN54F623			SN74F620 SN74F623			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V <sub>IK</sub>		V <sub>CC</sub> = 4.5 V, I <sub>I</sub> = -18 mA		-1.2			-1.2			V
V <sub>OH</sub> ‡	Any A	V <sub>CC</sub> = 4.5 V	I <sub>OH</sub> = -1 mA	2.5	3.4		2.5	3.4	V	
			I <sub>OH</sub> = -3 mA	2.4	3.3		2.4	3.3		
	Any B		I <sub>OH</sub> = -3 mA	2.4	3.3		2.4	3.3		
			I <sub>OH</sub> = -12 mA	2	3.2					
							2		3.1	
V <sub>OL</sub>	Any A	V <sub>CC</sub> = 4.5 V	I <sub>OL</sub> = 20 mA	0.3		0.5				V
			I <sub>OL</sub> = 24 mA				0.35	0.5		
	Any B		I <sub>OL</sub> = 48 mA	0.38		0.55				
			I <sub>OL</sub> = 64 mA				0.42	0.55		
I <sub>I</sub>	A and B	V <sub>CC</sub> = 5.5 V	V <sub>I</sub> = 5.5 V	1			1			mA
	GAB or $\overline{\text{G}}\text{BA}$		V <sub>I</sub> = 7 V	0.1			0.1			
I <sub>IH</sub> ‡	A and B	V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 2.7 V	70			70			μA	
	GAB or $\overline{\text{G}}\text{BA}$		20			20				
I <sub>IL</sub> ‡	A and B	V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 0.5 V	-0.65			-0.65			mA	
	GAB or $\overline{\text{G}}\text{BA}$		-0.6			-0.6				
I <sub>OS</sub> §	Any A	V <sub>CC</sub> = 5.5 V, V <sub>O</sub> = 0	-60		-150	-60		-150	mA	
	Any B		-100		-225	-100		-225		
I <sub>CC</sub>	'F620	V <sub>CC</sub> = 5.5	I <sub>CC</sub> H	70			92			mA
			I <sub>CC</sub> L	84			110			
			I <sub>CC</sub> Z	70			92			
	'F623		I <sub>CC</sub> H	110			40			
			I <sub>CC</sub> L	110			140			
			I <sub>CC</sub> Z	99			130			

†All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

‡For I/O ports, the parameters I<sub>IH</sub> and I<sub>IL</sub> include the off-state output current.

§Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

¶For SN74F620 and SN74F623 at V<sub>CC</sub> = 4.75 V and I<sub>OH</sub> = -1 mA to -3 mA, V<sub>OH</sub> min = 2.7 V.

2

Data Sheets

**SN54F620, SN54F623, SN74F620, SN74F623**  
**OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS**

**F620 switching characteristics (see Note 2)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = 25 °C			V <sub>CC</sub> = 4.5 V to 5.5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = MIN to MAX <sup>†</sup>				UNIT
			F620			SN54F620		SN74F620		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	B	1.7	4.1	6.5			1.2	7.5	ns
t <sub>PHL</sub>			1	2.1	4.5			1	5	
t <sub>PLH</sub>	B	A	1.7	4.1	6.5			1.2	7.5	ns
t <sub>PHL</sub>			1	2.1	4.5			1	5	
t <sub>PZH</sub>	G $\bar{B}$ A	A	2.2	7.1	10.5			1.7	11.5	ns
t <sub>PZL</sub>			3.2	7.1	10.5			2.7	11.5	
t <sub>PHZ</sub>	G $\bar{B}$ A	A	1.7	4.1	7.5			1.2	8	ns
t <sub>PLZ</sub>			1.2	4.1	7			1	7.5	
t <sub>PZH</sub>	GAB	B	3.7	7.1	10.5			3.2	11.5	ns
t <sub>PZL</sub>			3.7	7.1	10			3.2	11	
t <sub>PHZ</sub>	GAB	B	2.2	6.1	9.5			1.7	10.5	ns
t <sub>PLZ</sub>			3.2	6.1	9.5			2.7	10.5	

**F623 switching characteristics (see Note 2)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = 25 °C			V <sub>CC</sub> = 4.5 V to 5.5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = MIN to MAX <sup>†</sup>				UNIT
			F623			SN54F623		SN74F623		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	B	1.2	3.6	5.5			1.2	6.5	ns
t <sub>PHL</sub>			2.2	4.6	7			1.7	7.5	
t <sub>PLH</sub>	B	A	1.2	3.6	5.5			1.2	6.5	ns
t <sub>PHL</sub>			1.7	4.1	6.5			1.7	7.5	
t <sub>PZH</sub>	G $\bar{B}$ A	A	3.1	8.1	10.5			3.1	12	ns
t <sub>PZL</sub>			2.8	7.1	9.5			2.8	10	
t <sub>PHZ</sub>	G $\bar{B}$ A	A	1.7	4.1	6.5			1.7	7.5	ns
t <sub>PLZ</sub>			1.7	4.1	6.5			1.7	7	
t <sub>PZH</sub>	GAB	B	2.8	7.6	10			2.8	11.5	ns
t <sub>PZL</sub>			2.8	6.6	9			2.9	9.5	
t <sub>PHZ</sub>	GAB	B	2.2	5.6	8.5			2.2	10	ns
t <sub>PLZ</sub>			3.2	6.6	9			3.2	10	

<sup>†</sup>For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

NOTE 2: See General Information for load circuits and waveforms.

# SN54F621, SN54F622, SN74F621, SN74F622 OCTAL BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS

## absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, $V_{CC}$ .....	-0.5 V to 7 V
Input voltage <sup>†</sup> .....	-1.2 V to 7 V
Input current .....	-30 mA to 5 mA
Voltage applied to any output in the high state .....	-0.5 V to 5.5 V
Current into any output in the low state: SN54F621, SN54F622 (Any A) .....	40 mA
..... (Any B) .....	96 mA
SN74F621, SN74F622 (Any A) .....	48 mA
..... (Any B) .....	128 mA
Operating free-air temperature range: SN54F621, SN54F622 .....	-55 °C to 125 °C
SN74F621, SN74F622 .....	0 °C to 70 °C
Storage temperature range .....	-65 °C to 150 °C

<sup>†</sup>The input voltage ratings may be exceeded provided the input current ratings are observed.

## recommended operating conditions

		SN54F621 SN54F622			SN74F621 SN74F622			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
$V_{CC}$	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
$V_{IH}$	High-level input voltage	2			2			V
$V_{IL}$	Low-level input voltage			0.8			0.8	V
$I_{IK}$	Input clamp current			-18			-18	mA
$V_{OH}$	High-level output voltage			5.5			5.5	V
$I_{OL}$	Low-level output current	Any A		20			24	mA
		Any B		48			64	
$T_A$	Operating free-air temperature	-55	125		0	70		°C

2

Data Sheets

## electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	SN54F621 SN54F622			SN74F621 SN74F622			UNIT	
		MIN	TYP <sup>‡</sup>	MAX	MIN	TYP <sup>‡</sup>	MAX		
$V_{IK}$	$V_{CC} = 4.5$ V, $I_I = -18$ mA			-1.2			-1.2	V	
$I_{OH}$	$V_{CC} = 4.5$ V, $V_{OH} = 5.5$ V			0.1			0.1	mA	
$V_{OL}$	Any A $V_{CC} = 4.5$ V	$I_{OL} = 20$ mA		0.3	0.5			V	
		$I_{OL} = 24$ mA				0.35	0.5		
		$I_{OL} = 48$ mA		0.38	0.55				
		$I_{OL} = 64$ mA				0.42	0.55		
$I_L$	A and B	$V_I = 5.5$ V			1		1	mA	
	GAB or $\bar{G}BA$	$V_I = 7$ V			0.1		0.1		
$I_{IH}$ <sup>§</sup>	A and B	$V_{CC} = 5.5$ V, $V_I = 2.7$ V			70		70	$\mu$ A	
	GAB or $\bar{G}BA$				20		20		
$I_{IL}$ <sup>§</sup>	A and B	$V_{CC} = 5.5$ V, $V_I = 0.5$ V			-0.65		-0.65	mA	
	GAB or $\bar{G}BA$				-0.6		-0.6		
$I_{CC}$	'F621	$V_{CC} = 5.5$ V	$I_{CCH}$			105	140	mA	
			$I_{CCL}$			105	140		
			'F622	$I_{CCH}$			37		48
			$I_{CCL}$			68	90		

<sup>‡</sup>All typical values are at  $V_{CC} = 5$  V,  $T_A = 25$  °C.

<sup>§</sup>For I/O ports, the parameters  $I_{IH}$  and  $I_{IL}$  include the off-state output current.



**SN54F621, SN54F622, SN74F621, SN74F622**  
**OCTAL BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS**

**'F621 switching characteristics (see Note 2)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = 25°C			V <sub>CC</sub> = 4.5 V to 5.5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = MIN to MAX <sup>†</sup>				UNIT
			'F621			SN54F621		SN74F621		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	B	6	9.5	12	5.5	13	5.5	13	ns
t <sub>PHL</sub>			2.5	3.8	8	2	8.5	2	8.5	
t <sub>PLH</sub>	B	A	6	9	12	5.5	12.5	5.5	12.5	ns
t <sub>PHL</sub>			2.5	4	7.5	2	8	2	8	
t <sub>PLH</sub>	G <sub>BA</sub>	A	6	10	13.5	5.5	14	5.5	14	ns
t <sub>PHL</sub>			3.5	6.5	10.5	2.5	11	2.5	11	
t <sub>PLH</sub>	G <sub>AB</sub>	B	7	12	15	6	17	6	17	ns
t <sub>PHL</sub>			3.5	6.5	9.5	3	10	3	10	

**2**

**Data Sheets**

**'F622 switching characteristics (see Note 2)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = 25°C			V <sub>CC</sub> = 4.5 V to 5.5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = MIN to MAX <sup>†</sup>				UNIT
			'F622			SN54F622		SN74F622		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	B	7.2	10.6	12.5			7.2	13.5	ns
t <sub>PHL</sub>			1	3.6	5.5			1	6	
t <sub>PLH</sub>	B	A	6.7	9.6	12			6.7	12.5	ns
t <sub>PHL</sub>			1	3.1	5			1	5.5	
t <sub>PLH</sub>	G <sub>BA</sub>	A	7.2	10.1	12			7.2	12.5	ns
t <sub>PHL</sub>			4	7.6	10			4	10.5	
t <sub>PLH</sub>	G <sub>AB</sub>	B	9.2	12.1	14.5			9.2	15.5	ns
t <sub>PHL</sub>			4	7.1	9			4	9.5	

<sup>†</sup>For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

NOTE 2: See General Information for load circuits and waveforms.