

SN54F253, SN74F253 DUAL 1-OF-4 DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

D2932, MARCH 1987—REVISED JANUARY 1989

- Three-State Versions of SN54F153 and SN74F153
- Permits Multiplexing from N Lines to 1 Line
- Performs Parallel-to-Serial Conversion
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

description

Each of these data selectors/multiplexers contains inverters and drivers to supply full binary decoding data selection to the AND-OR gates. Separate output control inputs are provided for each of the two four-line sections.

The three-state outputs can interface with and drive data lines of bus-organized systems. With all but one of the common outputs disabled (at a high-impedance state), the low-impedance of the single enabled output will drive the bus line to a high or low logic level. Each output has its own strobe (\bar{G}). The output is disabled when its strobe is high.

The SN54F253 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74F253 is characterized for operation from 0°C to 70°C .

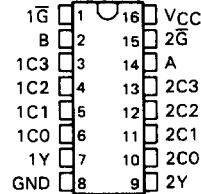
FUNCTION TABLE

SELECT INPUTS	DATA INPUTS				STROBE	OUTPUT
	B	A	C0	C1		
X	X	X	X	X	X	Z
L	L	L	X	X	X	L
L	L	H	X	X	X	L
L	H	X	L	X	X	L
L	H	X	H	X	X	L
H	L	X	X	L	X	L
H	L	X	X	H	X	L
H	H	X	X	X	L	L
H	H	X	X	X	H	L

Address inputs A and B are common to both sections.

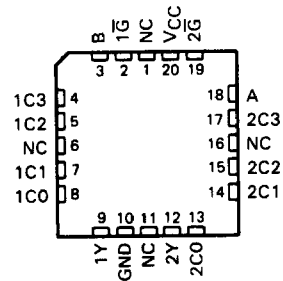
SN54F253 . . . J PACKAGE
SN74F253 . . . D OR N PACKAGE

(TOP VIEW)



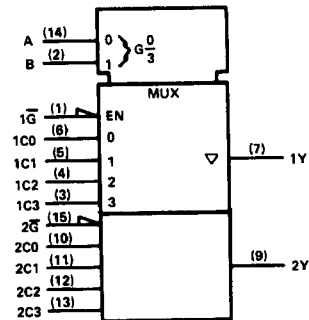
SN54F253 . . . FK PACKAGE

(TOP VIEW)



NC—No internal connection

logic symbol



†This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

Pin numbers shown are for D, J, and N packages.

UNLESS OTHERWISE NOTED this document contains PRODUCTION DATA information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

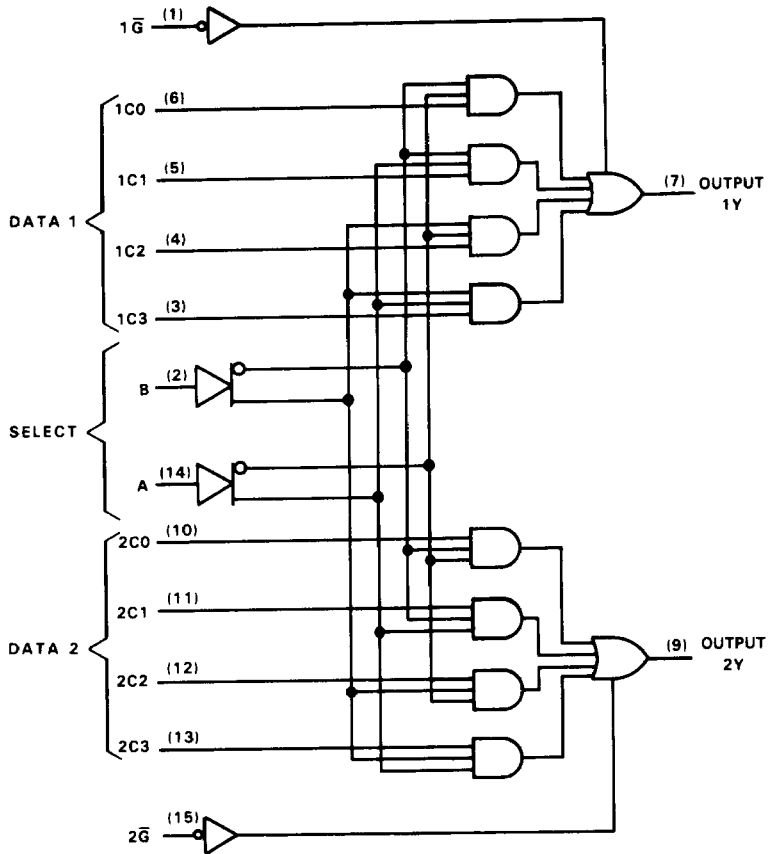
**TEXAS
INSTRUMENTS**

POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

Copyright © 1987, Texas Instruments Incorporated

SN54F253, SN74F253
DUAL 1-OF-4 DATA SELECTORS/MULTIPLEXERS
WITH 3-STATE OUTPUTS

logic diagram (positive logic)



Pin numbers shown are for D, J, and N packages.

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

Supply voltage, V_{CC}	-0.5 V to 7 V
Input voltage [†]	-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: SN54F253	40 mA
SN74F253	48 mA
Operating free-air temperature range: SN54F253	-55°C to 125°C
SN74F253	0°C to 70°C
Storage temperature range	-65°C to 150°C

[†]The input voltage ratings may be exceeded provided the input current ratings are observed.

SN54F253, SN74F253 DUAL 1-OF-4 DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

recommended operating conditions

	SN54F253			SN74F253			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			-3			-3	mA
I _{OL} Low-level output current			20			24	mA
T _A Operating free-air temperature	-55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS		SN54F253			SN74F253			UNIT
			MIN	TYP [†]	MAX	MIN	TYP [†]	MAX	
V _{IK}	V _{CC} = 4.5 V, I _I = -18 mA		-1.2			-1.2			V
V _{OH}	V _{CC} = 4.5 V		2.5	3.4		2.5	3.4		V
			I _{OH} = -1 mA		2.4		3.3		
	Any output		V _{CC} = 4.75 V		I _{OH} = -3 mA		I _{OH} = -1 mA to -3 mA		
V _{OL}	V _{CC} = 4.5 V		0.30			0.5			V
			I _{OL} = 20 mA		I _{OL} = 24 mA		0.35		
I _{OZH}	V _{CC} = 5.5 V, V _O = 2.7 V		50			50			μA
I _{OZL}	V _{CC} = 5.5 V, V _O = 0.5 V		-50			-50			μA
I _I	V _{CC} = 5.5 V, V _I = 7 V		0.1			0.1			mA
I _{IH}	V _{CC} = 5.5 V, V _I = 2.7 V		20			20			μA
I _{IL}	V _{CC} = 5.5 V, V _I = 0.5 V		-0.6			-0.6			mA
I _{OS} [‡]	V _{CC} = 5.5 V, V _O = 0		-60	-150		-60	-150		mA
I _{CCH}	V _{CC} = 5.5 V,		Condition A		11.5		16		mA
I _{CCL}			Condition B		16		23		
I _{CCZ}	See Note 1		Condition C		16		23		

[†] All typical values are at V_{CC} = 5 V, T_A = 25°C.

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

NOTE 1: I_{CC} is measured with the outputs open under the following conditions:

- A. Inputs A, B, 1C3, and 2C3 at 4.5 V, other inputs grounded
- B. All inputs grounded
- C. Inputs 1 \bar{C} and 2 \bar{C} at 4.5 V, other inputs grounded.

2
Data Sheets

SN54F253, SN74F253
DUAL 1-OF-4 DATA SELECTORS/MULTIPLEXERS
WITH 3-STATE OUTPUTS

switching characteristics (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = 25°C			V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = MIN to MAX†			UNIT	
			F253			SN54F253		SN74F253		
			MIN	TYP	MAX	MIN	MAX	MIN		MAX
t _{PLH}	A or B	Any Y	3.7	8.1	11.5	2.7	15	3.7	13	ns
t _{PHL}			2.2	6.1	9	1.7	11	2.2	10	
t _{PLH}	Data (Any C)	Any Y	2.2	5.1	7	1.7	9	2.2	8	ns
t _{PHL}			1.7	4.1	6	1.7	8	1.7	7	
t _{PZH}	G	Any Y	2.2	5.6	8	1.7	10	2.2	9	ns
t _{PZL}			2.2	5.6	8	1.7	10	2.2	9	
t _{PHZ}	G	Any Y	1.2	3.3	5	1.2	6.5	1.2	6	ns
t _{PLZ}			1.2	4	6	1.2	8	1.2	7	

† For conditions shown as MIN or MAX, use the appropriate value specified under Recommended Operating Conditions.
 NOTE 2: Load circuits and waveforms are shown in Section 1.

2

Data Sheets