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

- **3-State Versions of SN54F153 and SN74F153**
- **Permits Multiplexing From N Lines to One Line**
- **Performs Parallel-to-Serial Conversion**
- **Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs**

SN54F253 . . . J PACKAGE
SN74F253 . . . D OR N PACKAGE
(TOP VIEW)

```
        ┌───┬─U─┬───┐
   1G  [│ 1      16 │] V_CC
    B  [│ 2      15 │] 2G
  1C3  [│ 3      14 │] A
  1C2  [│ 4      13 │] 2C3
  1C1  [│ 5      12 │] 2C2
  1C0  [│ 6      11 │] 2C1
   1Y  [│ 7      10 │] 2C0
  GND  [│ 8       9 │] 2Y
        └───────────┘
```

SN54F253 . . . FK PACKAGE
(TOP VIEW)

```
              B  1G  NC  V_CC  2G
              3   2   1   20   19
  1C3  [ 4                    18 ]  A
  1C2  [ 5                    17 ]  2C3
   NC  [ 6                    16 ]  NC
  1C1  [ 7                    15 ]  2C2
  1C0  [ 8                    14 ]  2C1
              9  10  11  12   13
             1Y  GND  NC  2Y  2C0
```
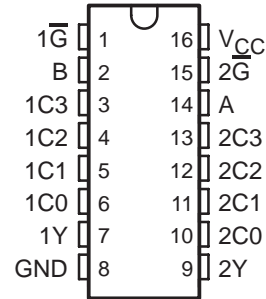
NC – No internal connection

description

These data selectors/multiplexers contain 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 4-line sections.
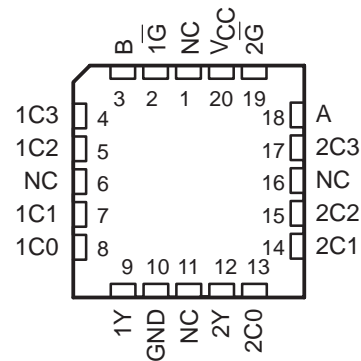
The 3-state outputs can interface with and drive data lines of bus-organized systems. With all but one of the common outputs disabled (at a high-impedance state), the low impedance of the single enabled output will drive the bus line to a high or low logic level. Each output has its own strobe ($\overline{G}$) inputs. 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

INPUTS						STROBE $\overline{G}$	OUTPUT Y
SELECT		DATA					
B	A	C0	C1	C2	C3		
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

Select inputs A and B are common to both sections.
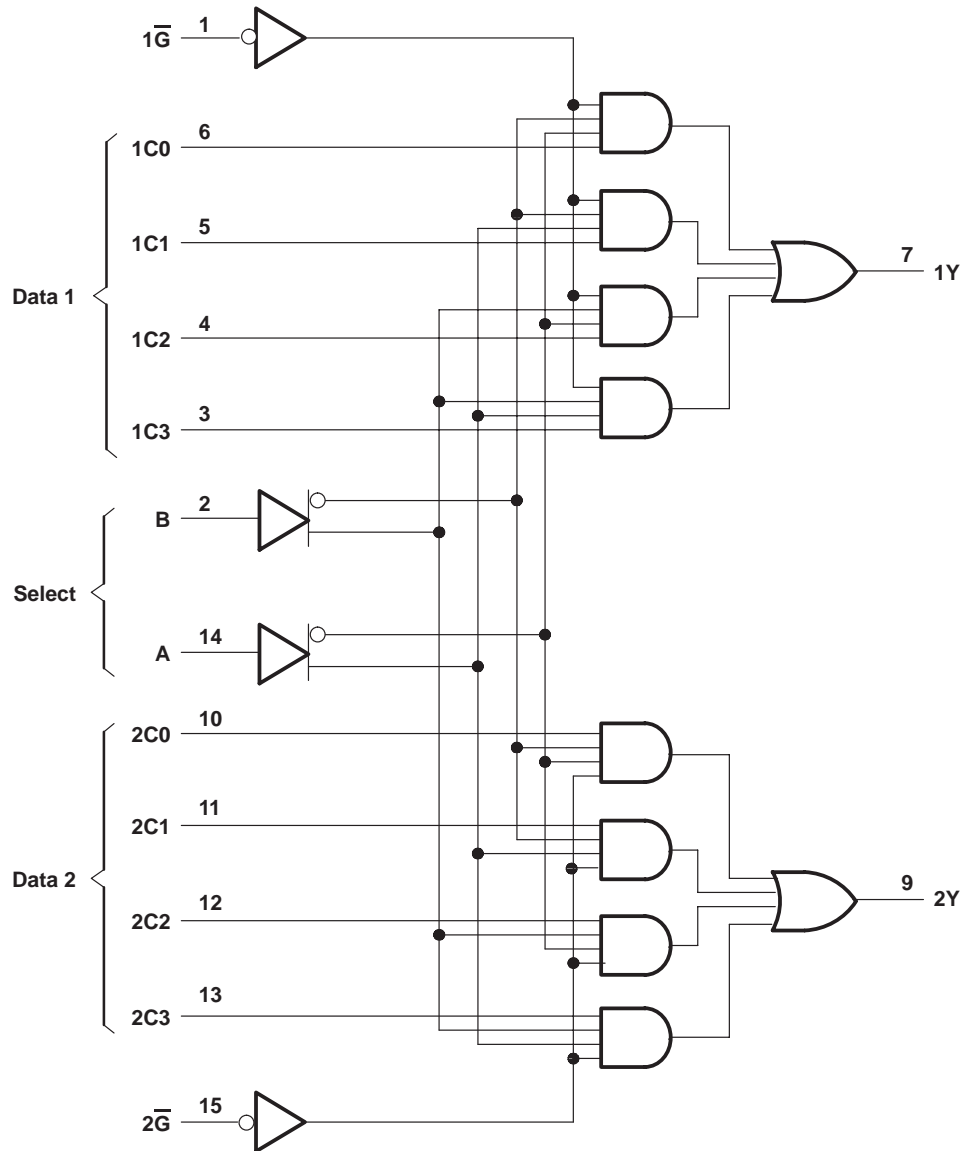
![TEXAS INSTRUMENTS logo]

logic symbol†

† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for the D, J, and N packages.

logic diagram (positive logic)

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

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

Supply voltage range, V_{CC}	−0.5 V to 7 V
Input voltage range (see Note 1)	−1.2 V to 7 V
Input current range	−30 mA to 5 mA
Voltage range applied to any output in the disabled or power-off state	−0.5 V to 5.5 V
Voltage range 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

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1:   The input voltage ratings may be exceeded provided the input current ratings are observed.

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

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

PARAMETER	TEST CONDITIONS		SN54F253 MIN	SN54F253 TYP†	SN54F253 MAX	SN74F253 MIN	SN74F253 TYP†	SN74F253 MAX	UNIT
V_{IK}	V_{CC} = 4.5 V,	I_I = − 18 mA			−1.2			−1.2	V
V_{OH}	V_{CC} = 4.5 V	I_{OH} = − 1 mA	2.5	3.4		2.5	3.4		V
		I_{OH} = − 3 mA	2.4	3.3		2.4	3.3		
	V_{CC} = 4.75 V,	I_{OH} = − 1 mA to −3 mA					2.7		
V_{OL}	V_{CC} = 4.5 V	I_{OL} = 20 mA		0.3	0.5				V
		I_{OL} = 24 mA					0.35	0.5	
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, See Note 2	Condition A		11.5	16		11.5	16	
I_{CCL}		Condition B		16	23		16	23	mA
I_{CCZ}		Condition C		16	23		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 2: 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 1G̅ and 2G̅ at 4.5 V, other inputs grounded

switching characteristics (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = 25°C ′F253 MIN	′F253 TYP	′F253 MAX	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX§ SN54F253 MIN	SN54F253 MAX	SN74F253 MIN	SN74F253 MAX	UNIT
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}	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}	G̅	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}	G̅	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 3:   Load circuit and waveforms are shown in Section 1.

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## TEXAS
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PACKAGE MATERIALS INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS

TAPE DIMENSIONS

A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74F253DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1

TAPE AND REEL BOX DIMENSIONS
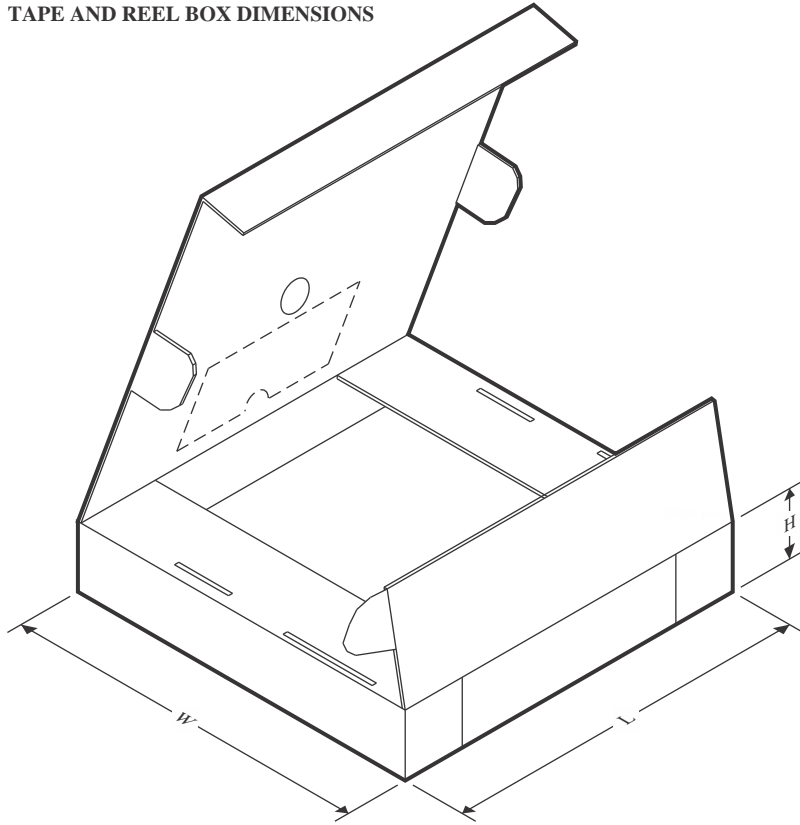
*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74F253DR	SOIC	D	16	2500	340.5	336.1	32.0

PACKAGE MATERIALS INFORMATION

TUBE

T - Tube height

L - Tube length

W - Tube width

B - Alignment groove width

*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
SN74F253N	N	PDIP	16	25	506	13.97	11230	4.32
SN74F253N	N	PDIP	16	25	506	13.97	11230	4.32