

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

SDFS064A – D2032, MARCH 1987 – REVISED OCTOBER 1993

- 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

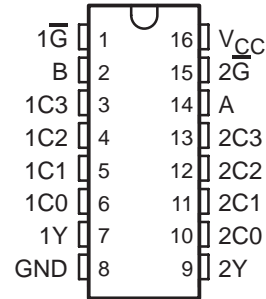
description

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.

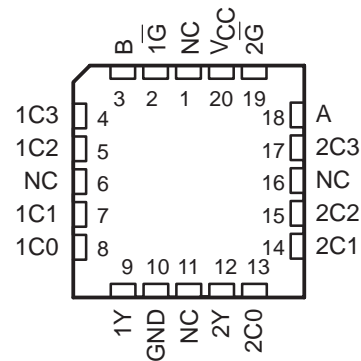
The 3-state outputs can interface with and drive data lines of bus-organized systems. With all but one of the common outputs disabled (at a high-impedance state), the low impedance of the single enabled output will drive the bus line to a high or low logic level. Each output has its own strobe (\overline{G})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

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



SN54F253 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

FUNCTION TABLE

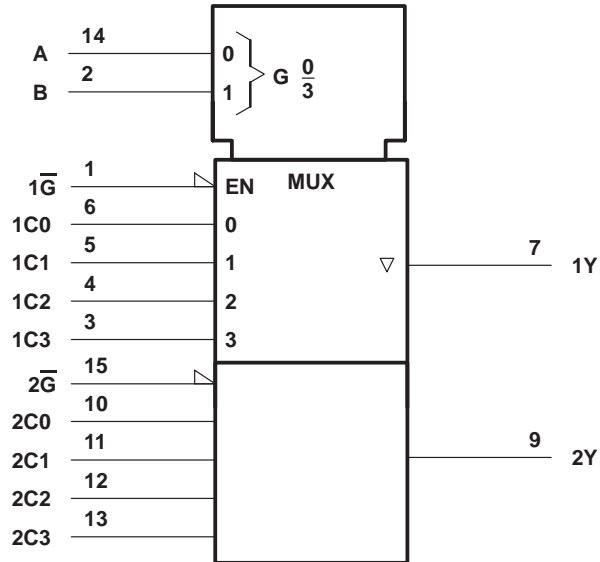
INPUTS						STROBE \overline{G}	OUTPUT Y
SELECT		DATA					
B	A	C0	C1	C2	C3		
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

Select inputs A and B are common to both sections.

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

SDFS064A – D2032, MARCH 1987 – REVISED OCTOBER 1993

logic symbol†

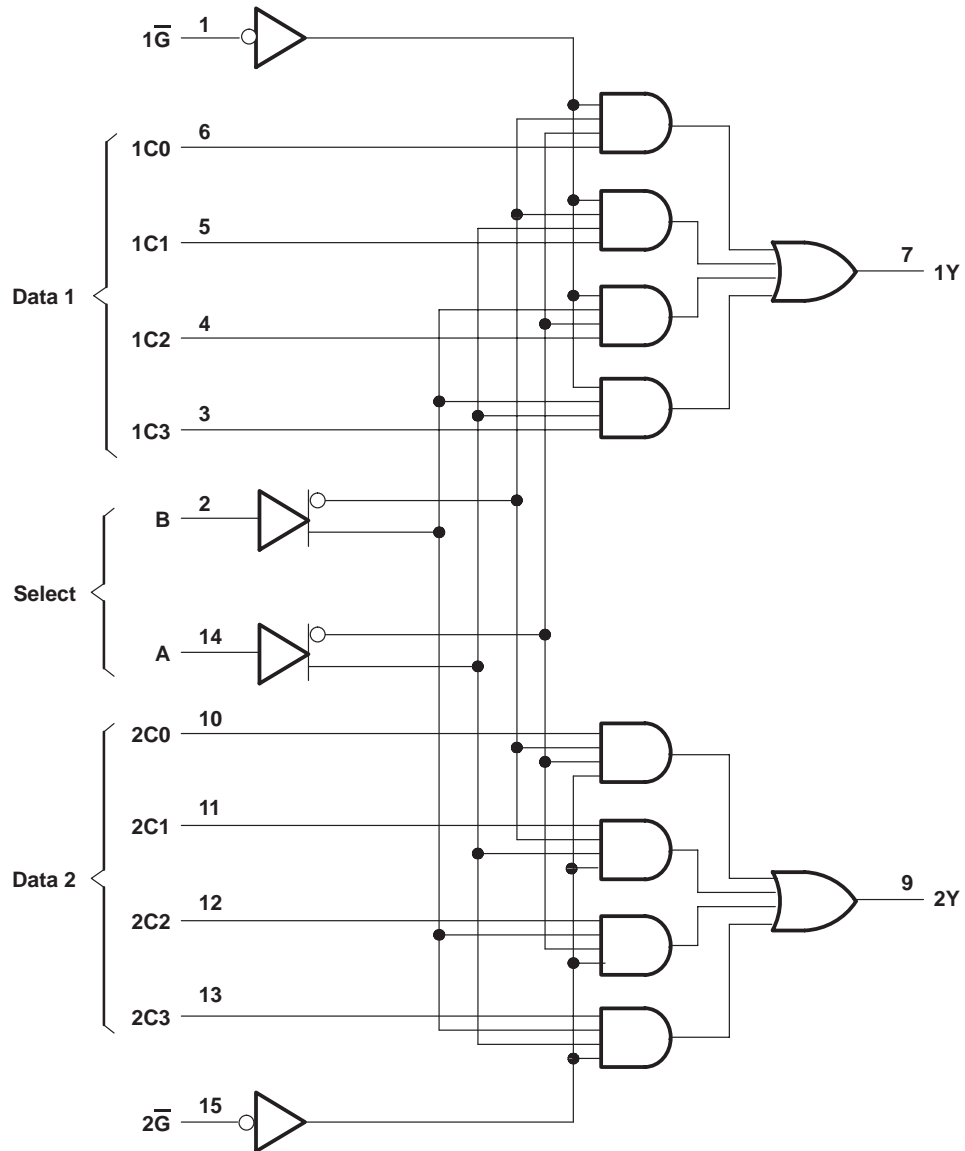


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for the D, J, and N packages.

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

SDFS064A – D2032, MARCH 1987 – REVISED OCTOBER 1993

logic diagram (positive logic)



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



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

SDFS064A – D2032, MARCH 1987 – REVISED OCTOBER 1993

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

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

SDFS064A – D2032, MARCH 1987 – REVISED OCTOBER 1993

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}	$V_{CC} = 4.5 V$	$I_{OH} = -1 mA$	2.5	3.4		2.5	3.4		V
		$I_{OH} = -3 mA$	2.4	3.3		2.4	3.3		
V_{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}^\ddagger	$V_{CC} = 5.5 V$,	$V_O = 0$	-60		-150	-60		-150	mA
I_{CCH}	$V_{CC} = 5.5 V$, See Note 2	Condition A		11.5	16		11.5	16	mA
I_{CCL}		Condition B		16	23		16	23	
I_{CCZ}		Condition C		16	23		16	23	

† All typical values are at $V_{CC} = 5 V$, $T_A = 25^\circ C$.

‡ 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 1 \bar{G} and 2 \bar{G} at 4.5 V, other inputs grounded

switching characteristics (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5 V$, $C_L = 50 pF$, $R_1 = 500 \Omega$, $R_2 = 500 \Omega$, $T_A = 25^\circ C$			$V_{CC} = 4.5 V$ to $5.5 V$, $C_L = 50 pF$, $R_1 = 500 \Omega$, $R_2 = 500 \Omega$, $T_A = MIN$ to MAX^\S				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}	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}	\bar{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}	\bar{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 3: Load circuit and waveforms are shown in Section 1.



TAPE AND REEL INFORMATION

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

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale (<https://www.ti.com/legal/termsofsale.html>) or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2021, Texas Instruments Incorporated