

FAIRCHILD
SEMICONDUCTOR™

August 1986
Revised May 2000

DM74S253 Dual 3-STATE 1-of-4 Line Data Selector/Multiplexer

General Description

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

The 3-STATE outputs can interface directly with 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 enable output will drive the bus line to a HIGH or LOW logic level.

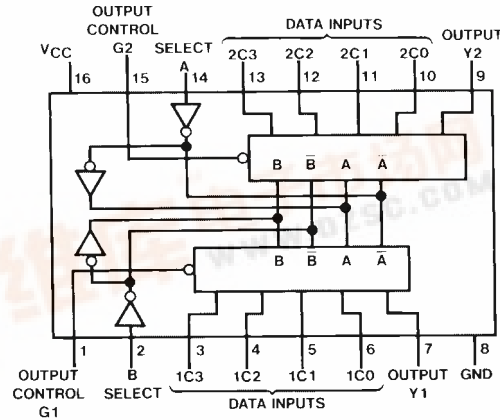
Features

- 3-STATE version of S153 with same pin-out
- Schottky-diode-clamped transistors
- Permits multiplexing from N lines to 1 line
- Performs parallel-T-serial conversion
- Strobe/output control
- High fan-out totem-pole outputs
- Typical propagation delay
 - From data to output 6 ns
 - From select to output 12 ns
- Typical power dissipation 275 mW

Ordering Code:

Order Number	Package Number	Package Description
DM74S253N	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

Connection Diagram



Function Table

Select Inputs		Data Inputs				Output Control	Output
B	A	C0	C1	C2	C3	G	Y
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

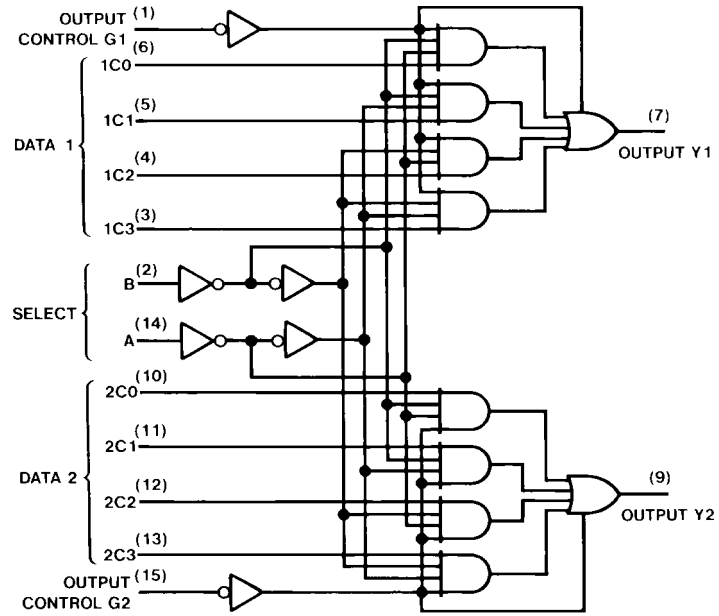
Address inputs A and B are common to both sections.

H = HIGH Level
L = LOW Level
X = Don't Care
Z = High Impedance

DM74S253 Dual 3-STATE 1-of-4 Line Data Selector/Multiplexer



Logic Diagram



Absolute Maximum Ratings^(Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	0°C to +70°C
Storage Temperature Range	-65°C to +150°C

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Recommended Operating Conditions

Symbol	Parameter	Min	Nom	Max	Units
V _{CC}	Supply Voltage	4.75	5	5.25	V
V _{IH}	HIGH Level Input Voltage	2			V
V _{IL}	LOW Level Input Voltage			0.8	V
I _{OH}	HIGH Level Output Current			-6.5	mA
I _{OL}	LOW Level Output Current			20	mA
T _A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

over recommended operating free air temperature (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
V _I	Input Clamp Voltage	V _{CC} = Min, I _I = -18 mA			-1.2	V
V _{OH}	HIGH Level Output Voltage	V _{CC} = Min, I _{OH} = Max V _{IL} = Max, V _{IH} = Min	2.4	3.2		V
V _{OL}	LOW Level Output Voltage	V _{CC} = Min, I _{OL} = Max V _{IH} = Min, V _{IL} = Max			0.5	V
I _I	Input Current @ Max Input Voltage	V _{CC} = Max, V _I = 5.5V			1	mA
I _{IH}	HIGH Level Input Current	V _{CC} = Max, V _I = 2.7V			50	μA
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.5V			-2	mA
I _{OZH}	Off-State Output Current with HIGH Level Output Voltage Applied	V _{CC} = Max, V _O = 2.4V V _{IH} = Min, V _{IL} = Max			50	μA
I _{OZL}	Off-State Output Current with LOW Level Output Voltage Applied	V _{CC} = Max, V _O = 0.5V V _{IH} = Min, V _{IL} = Max			-50	μA
I _{OS}	Short Circuit Output Current	V _{CC} = Max (Note 3)	-40		-100	mA
I _{CC}	Supply Current	V _{CC} = Max (Note 4)		55	70	mA

Note 2: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.

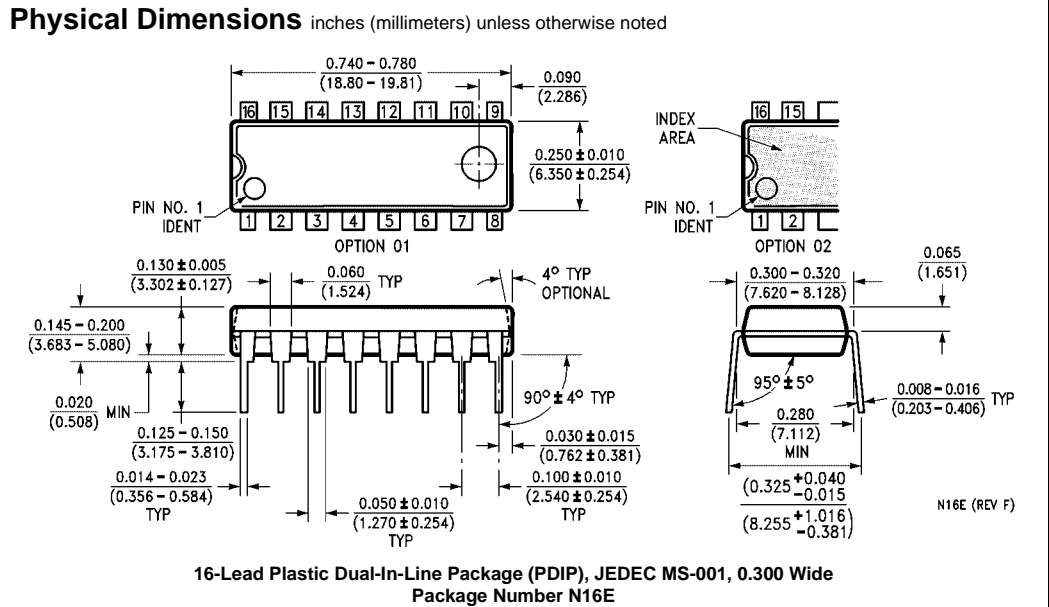
Note 4: I_{CC} is measured with all outputs OPEN.

Switching Characteristics

at V_{CC} = 5V and T_A = 25°C

Symbol	Parameter	From (Input) To (Output)	R _L = 280Ω				Units
			C _L = 15 pF		C _L = 50 pF		
			Min	Max	Min	Max	
t _{PLH}	Propagation Delay Time LOW-to-HIGH Level Output	Data to Y		9		12	ns
t _{PHL}	Propagation Delay Time HIGH-to-LOW Level Output	Data to Y		9		12	ns
t _{PLH}	Propagation Delay Time LOW-to-HIGH Level Output	Select to Y		18		21	ns
t _{PHL}	Propagation Delay Time HIGH-to-LOW Level Output	Select to Y		18		21	ns
t _{PZH}	Output Enable Time to HIGH Level Output	Output Control to Y		16.5		19.5	ns
t _{PZL}	Output Enable Time to LOW Level Output	Output Control to Y		18		21	ns
t _{PHZ}	Output Disable Time to HIGH Level Output (Note 5)	Output Control to Y		9.5			ns
t _{PLZ}	Output Disable Time to LOW Level Output (Note 5)	Output Control to Y		15			ns

Note 5: C_L = 5 pF.



Fairchild does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and Fairchild reserves the right at any time without notice to change said circuitry and specifications.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

www.fairchildsemi.com