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DM74LS153 Dual 1-of-4 Line Data Selectors/Multiplexers

General Description

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

Features

- Permits multiplexing from N lines to 1 line
- Performs at parallel-to-serial conversion
- Strobe (enable) line provided for cascading (N lines to n lines)
- High fan-out, low impedance, totem pole outputs
- Typical average propagation delay times

From data 14 ns From strobe 19 ns From select 22 ns

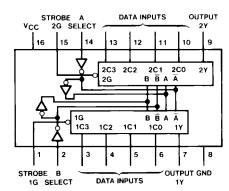
■ Typical power dissipation 31 mW

Ordering Code:

Order Number	Package Number	Package Description
DM74LS153M	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow
DM74LS153N	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Connection Diagram



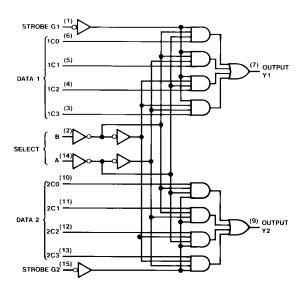
Function Table

Select Inputs		Data Inputs		Strobe	Output		
В	Α	C0	C1	C2	C3	G	Y
Х	Х	Χ	Χ	Χ	Χ	Н	L
L	L	L	Χ	Χ	Χ	L	L
L	L	Н	Х	Х	Х	L	Н
L	Н	Х	L	Х	Х	L	L
L	Н	Х	Н	Х	Х	L	Н
Н	L	Х	Х	L	Х	L	L
Н	L	Х	Х	Н	Х	L	Н
Н	Н	Х	Х	Х	L	L	L
Н	Н	Χ	Χ	Х	Н	L	Н

Select inputs A and B are common to both sections. H = HIGH Level

L = LOW Level X = Don't Care

Logic Diagram



Absolute Maximum Ratings(Note 1)

Supply Voltage 7V
Input Voltage 7V
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			-0.4	mA
I _{OL}	LOW Level Output Current			8	mA
T _A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

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

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
VI	Input Clamp Voltage	$V_{CC} = Min, I_I = -18 \text{ mA}$			-1.5	V
V _{OH}	HIGH Level Output Voltage	V _{CC} = Min, I _{OH} = Max V _{IL} = Max, V _{IH} = Min	2.7	3.4		V
V _{OL}	LOW Level Output Voltage	$V_{CC} = Min, I_{OL} = Max$ $V_{IL} = Max, V_{IH} = Min$		0.35	0.5	V
		I _{OL} = 4 mA, V _{CC} = Min		0.25	0.4	
I	Input Current @ Max Input Voltage	$V_{CC} = Max, V_I = 7V$			0.1	mA
I _{IH}	HIGH Level Input Current	$V_{CC} = Max, V_I = 2.7V$			20	μΑ
I _{IL}	LOW Level Input Current	$V_{CC} = Max, V_I = 0.4V$			-0.36	mA
Ios	Short Circuit Output Current	V _{CC} = Max (Note 3)	-20		-100	mA
I _{CC}	Supply Current	V _{CC} = Max (Note 4)		6.2	10	mA

Note 2: All typicals are at $V_{CC}=5V,\,T_A=25^{\circ}$ C.

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

Note 4: $\rm I_{\rm CC}$ is measured with all outputs OPEN and all other inputs GROUNDED.

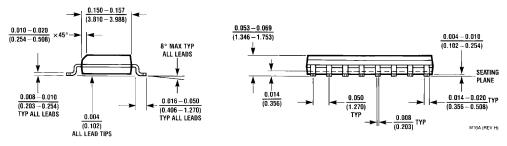
Switching Characteristics

at $V_{CC} = 5V$ and $T_A = 25$ °C

	Parameter	From (Input)	$R_L = 2 k\Omega$				
Symbol		to (Output)	C _L = 15 pF		C _L = 50 pF		Units
			Min	Max	Min	Max	
t _{PLH}	Propagation Delay Time	Data to Y		15		20	ns
	LOW-to-HIGH Level Output	Data to Y		15			
t _{PHL}	Propagation Delay Time	Data to Y		26	20	35	ns
	HIGH-to-LOW Level Output			20			
t _{PLH}	Propagation Delay Time	Select to Y		29		35	ns
	LOW-to-HIGH Level Output						
t _{PHL}	Propagation Delay Time	Select to Y		38		45	ns
	HIGH-to-LOW Level Output						
t _{PLH}	Propagation Delay Time	Strobe to Y		24		30	ns
	LOW-to-HIGH Level Output						
t _{PHL}	Propagation Delay Time	Strobe to Y		32		40	ns
	HIGH-to-LOW Level Output	Strobe to 1		32			

LEAD NO.1 IDENT

0.010 (0.254) MAX



16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow Package Number M16A

Physical Dimensions inches (millimeters) unless otherwise noted (Continued) $\frac{0.740 - 0.780}{(18.80 - 19.81)}$ (2.286) 16 15 14 13 12 11 10 9 16 15 INDEX AREA 0.250 ± 0.010 (6.350 ± 0.254) PIN NO. 1 IDENT PIN NO. 1 IDENT 1 2 3 4 5 6 7 8 1 2 L OPTION 01 OPTION 02 $\frac{0.065}{(1.651)}$ $\frac{0.130 \pm 0.005}{(3.302 \pm 0.127)}$ $\frac{0.060}{(1.524)}$ TYP 4° TYP OPTIONAL $\frac{0.300 - 0.320}{(7.620 - 8.128)}$ $\frac{0.145 - 0.200}{(3.683 - 5.080)}$ 95° ± 5° 0.008 = 0.016 (0.203 = 0.406) TYP 0.020 0.280 0.125 - 0.150 (3.175 - 3.810) (7.112) 0.030 ± 0.015 (0.762 ± 0.381) MIN 0.014 - 0.023 0.100 ± 0.010 (0.325 +0.040 -0.015 (0.356 - 0.584) (2.540 ± 0.254) 0.050 ± 0.010 N16E (REV F) ŤΥΡ (1.270 ± 0.254) (8.255 **+**1.016 **-**0.381

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

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