

DM74LS153

Dual 4-Line to 1-Line Data Selectors/Multiplexers

General Description

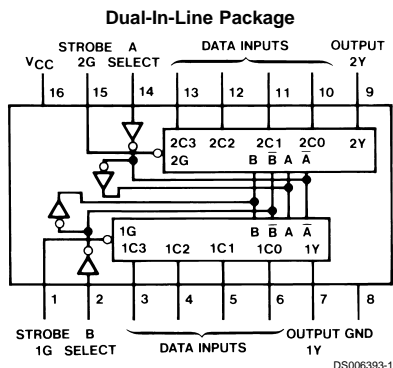
Each of these data selectors/multiplexers contains inverters and drivers to supply fully complementary, on-chip, binary decoding data selection to the AND-OR-invert gates. Separate strobe inputs are provided for each of the two four-line sections.

Features

- Permits multiplexing from N lines to 1 line

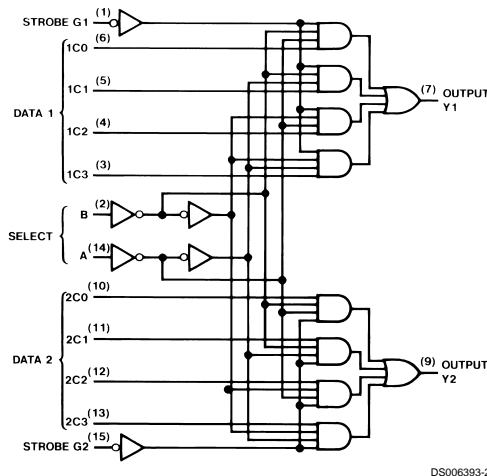
- Performs at parallel-to-serial conversion
- Strobe (enable) line provided for cascading (N lines to n lines)
- High fan-out, low impedance, totem pole outputs
- Typical average propagation delay times
 - From data 14 ns
 - From strobe 19 ns
 - From select 22 ns
- Typical power dissipation 31 mW

Connection Diagram



Order Number 54LS153DMQB, 54LS153FMB, 54LS153LMB, DM54LS153J, DM54LS153W, DM74LS153M or DM74LS153N
See Package Number E20A, J16A, M16A, N16E or W16A

Logic Diagram



Function Table

Select Inputs		Data Inputs				Strobe	Output
B	A	C0	C1	C2	C3	G	Y
X	X	X	X	X	X	H	L
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.
H = High Level, L = Low Level, X = Don't Care

Absolute Maximum Ratings (Note 1)

Supply Voltage	7V	DM54LS and 54LS	–55°C to +125°C
Input Voltage	7V	DM74LS	0°C to +70°C
Operating Free Air Temperature Range		Storage Temperature Range	–65°C to +150°C

Recommended Operating Conditions

Symbol	Parameter	DM54LS153			DM74LS153			Units
		Min	Nom	Max	Min	Nom	Max	
V _{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V _{IH}	High Level Input Voltage	2			2			V
V _{IL}	Low Level Input Voltage			0.7			0.8	V
I _{OH}	High Level Output Current			–0.4			–0.4	mA
I _{OL}	Low Level Output Current			4			8	mA
T _A	Free Air Operating Temperature	–55		125	0		70	°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" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Electrical Characteristics

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

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
V _I	Input Clamp Voltage	V _{CC} = Min, I _I = –18 mA			–1.5	V
V _{OH}	High Level Output Voltage	V _{CC} = Min, I _{OH} = Max V _{IL} = Max, V _{IH} = Min	DM54 2.5 DM74 2.7	3.4 3.4		V
V _{OL}	Low Level Output Voltage	V _{CC} = Min, I _{OL} = Max V _{IL} = Max, V _{IH} = Min I _{OL} = 4 mA, V _{CC} = Min	DM54 DM74 DM74	0.25 0.35 0.25	0.4 0.5 0.4	V
I _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	μA
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.4V			–0.36	mA
I _{OS}	Short Circuit Output Current	V _{CC} = Max (Note 3)	DM54 DM74	–20 –20	–100 –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°C.

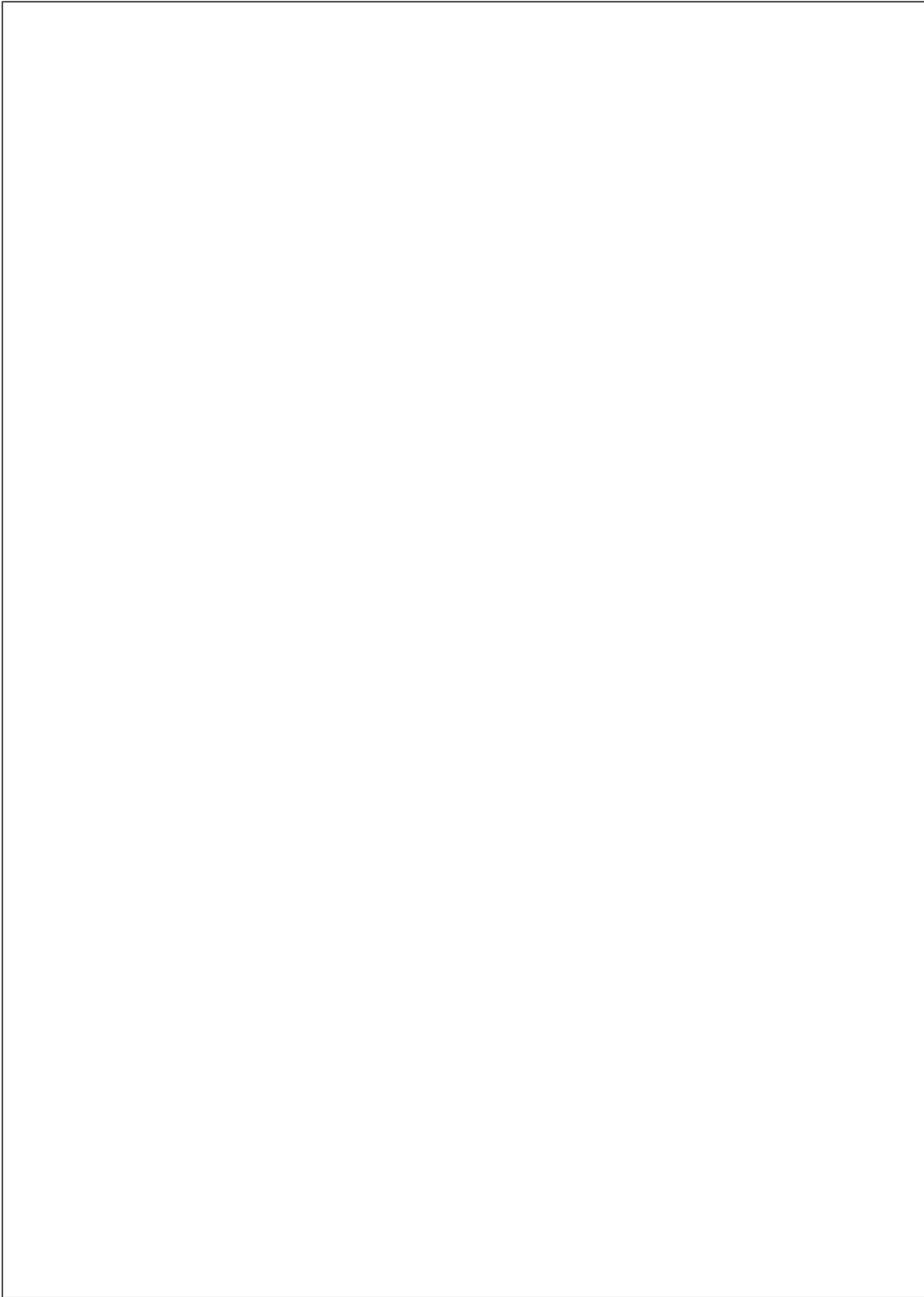
Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.

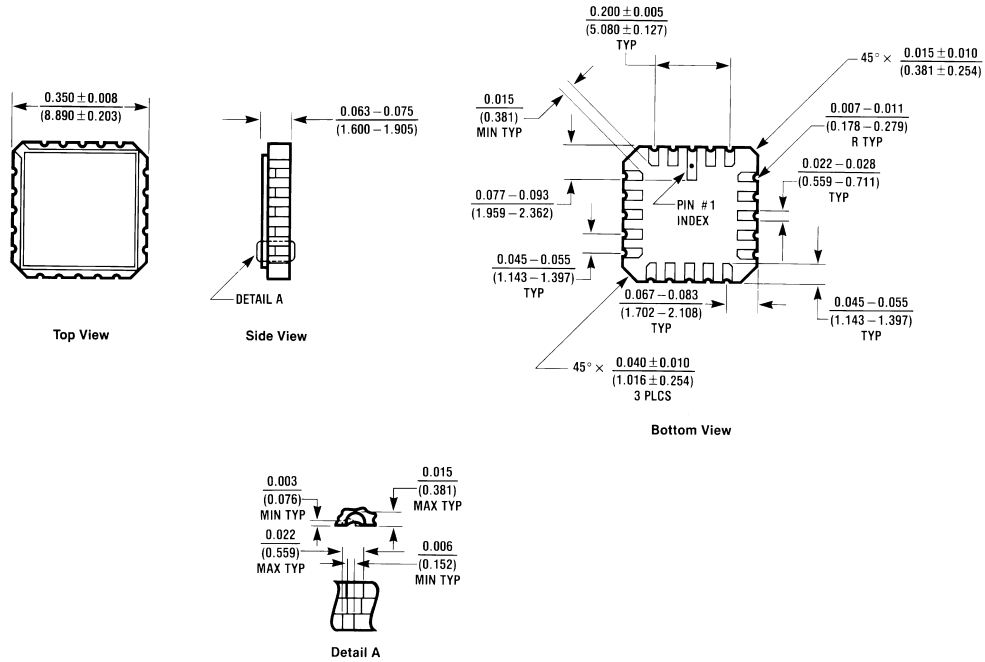
Note 4: I_{CC} is measured with all outputs open and all other inputs grounded.

Switching Characteristics

at $V_{CC} = 5V$ and $T_A = 25^\circ C$

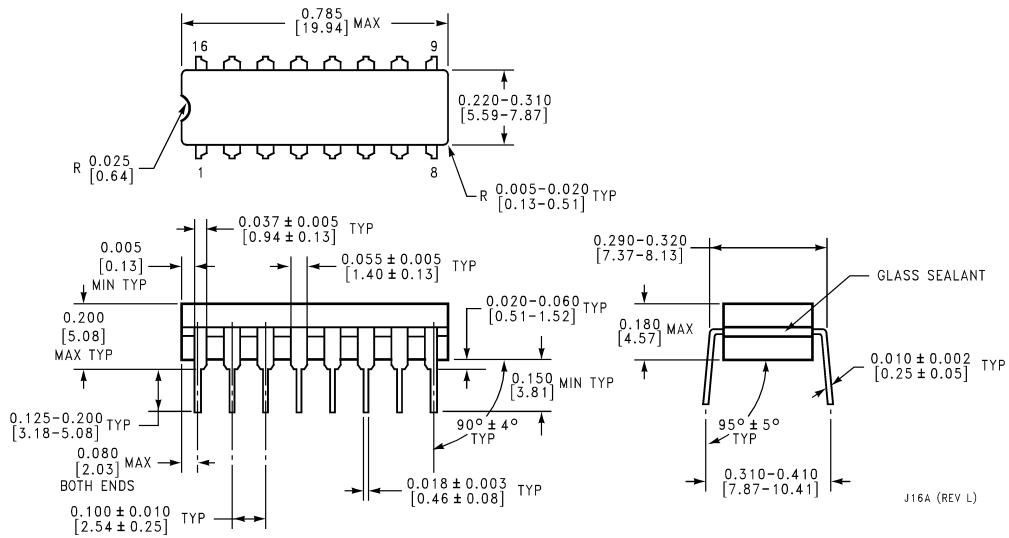
Symbol	Parameter	From (Input) to (Output)	R _L = 2 kΩ				Units
			C _L = 15 pF		C _L = 50 pF		
			Min	Max	Min	Max	
t _{PLH}	Propagation Delay Time Low to High Level Output	Data to Y		15		20	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	Data to Y		26		35	ns
t _{PLH}	Propagation Delay Time Low to High Level Output	Select to Y		29		35	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	Select to Y		38		45	ns
t _{PLH}	Propagation Delay Time Low to High Level Output	Strobe to Y		24		30	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	Strobe to Y		32		40	ns



Physical Dimensions inches (millimeters) unless otherwise noted

E20A (REV D)

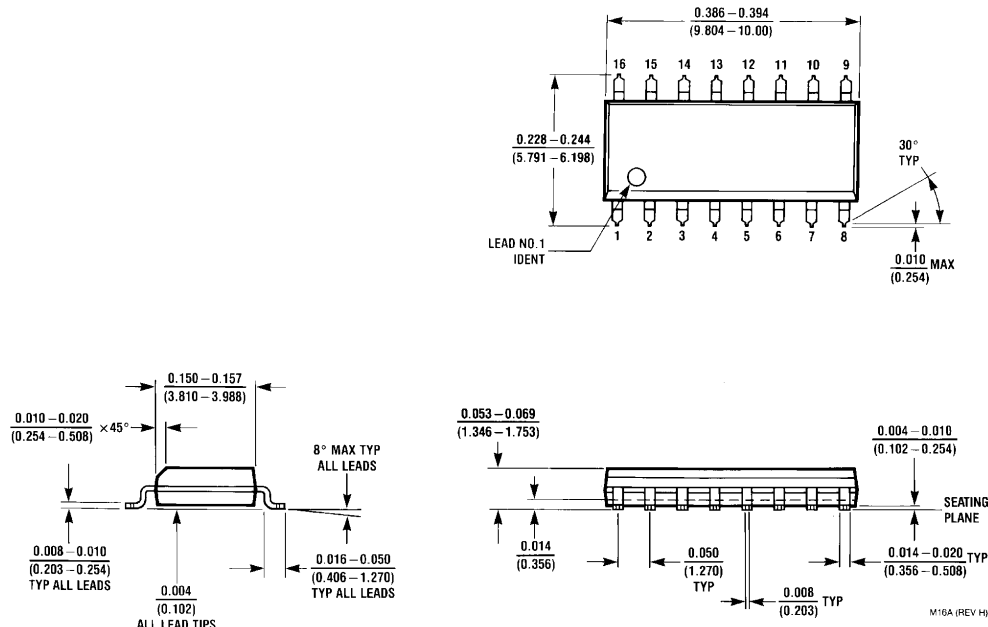
Ceramic Leadless Chip Carrier Package (E)
Order Number 54LS153LMQB
Package Number E20A



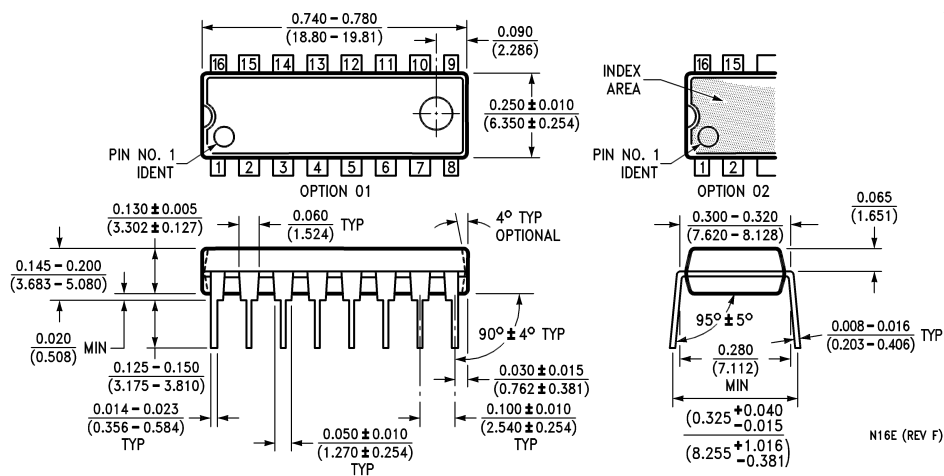
J16A (REV L)

16-Lead Ceramic Dual-In-Line Package (J)
Order Number 54LS153DMQB or DM54LS153J
Package Number J16A

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)

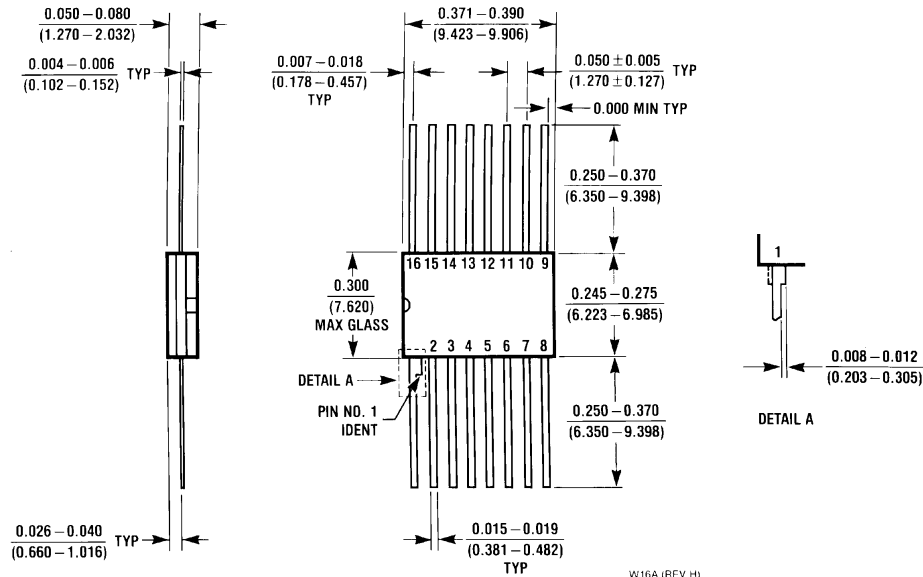


16-Lead Small Outline Molded Package (M)
Order Number DM74LS153M
Package Number M16A



16-Lead Molded Dual-In-Line Package (N)
Order Number DM74LS153N
Package Number N16E

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



16-Lead Ceramic Flat Package (W)
Order Number 54LS153FMBQ or DM54LS153W
Package Number W16A

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Fairchild Semiconductor
Corporation
Americas
Customer Response Center
Tel: 1-888-522-5372

Fairchild Semiconductor
Europe
Fax: +49 (0) 1 80-530 85 86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 8 141-35-0
English Tel: +44 (0) 1 793-85-68-56
Italy Tel: +39 (0) 2 57 5631

Fairchild Semiconductor
Hong Kong Ltd.
13th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: +852 2737-7200
Fax: +852 2314-0061

National Semiconductor
Japan Ltd.
Tel: 81-3-5620-6175
Fax: 81-3-5620-6179

www.fairchildsemi.com