March 1998

FAIRCHILD SEMICONDUCTOR™

DM74157
Quad 2-Line to 1-Line Data Selectors/Multiplexers

General Description

These data selectors/multiplexers contain inverters and drivers to supply full on-chip data selection to the four out-put gates. A separate strobe input is provided. A 4-bit word is selected from one of two sources and is routed to the four outputs.

Applications

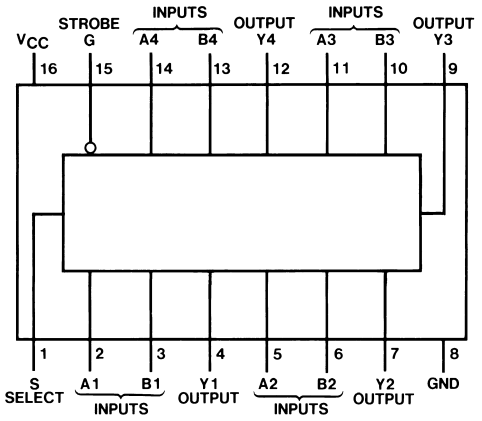
- Expand any data input point
- Multiplex dual data buses
- Generate four functions of two variables (one variable is common)
- Source programmable counters

Features

- Buffered inputs and outputs
- Typical propagation time 9 ns
- Typical power dissipation 150 mW
- Alternate Military/Aerospace device (54157) is available. Contact a Fairchild Semiconductor Sales Office/Distributor for specifications.

Connection Diagram

Dual-In-Line Package



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Order Number 54157DMQB, 54157FMQB, DM54157J, DM54157W or DM74157N
See Package Number J16A, N16E or W16A

Function Table

Inputs				Output Y
Strobe	Select	A	B	
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

H = High Level, L = Low Level, X = Don't Care

Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	
DM54 and 54	−55˚C to +125˚C
DM74	0˚C to +70˚C
Storage Temperature Range	−65˚C to +150˚C

Recommended Operating Conditions

Symbol	Parameter	DM54157			DM74157			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			0.8			0.8	V
I_{OH}	High Level Output Current			−0.8			−0.8	mA
I_{OL}	Low Level Output Current			16			16	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 = −12 mA				−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max V_{IL} = Max, V_{IH} = Min		2.4	3.4		V
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max V_{IH} = Min, V_{IL} = Max				0.4	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 = 2.4V				40	µA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V				−1.6	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 3)	DM54	−20		−55	mA
			DM74	−18		−55	
I_{CC}	Supply Current	V_{CC} = Max (Note 4)			30	48	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.

Note 4: I_{CC} is measured with 4.5V applied to all inputs and all outputs open.

Switching Characteristics

at V_{CC} = 5V and T_A = 25˚C

Symbol	Parameter	From (Input) To (Output)	R_L = 400Ω, C_L = 15 pF		Units
			Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output	Data to Y		14	ns
t_{PHL}	Propagation Delay Time High to Low Level Output	Data to Y		14	ns
t_{PLH}	Propagation Delay Time Low to High Level Output	Strobe to Y		20	ns
t_{PHL}	Propagation Delay Time High to Low Level Output	Strobe to Y		21	ns

Switching Characteristics (Continued)

at V_{CC} = 5V and T_A = 25˚C

Symbol	Parameter	From (Input) To (Output)	R_L = 400Ω, C_L = 15 pF		Units
			Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output	Select to Y		23	ns
t_{PHL}	Propagation Delay Time High to Low Level Output	Select to Y		27	ns

Logic Diagram

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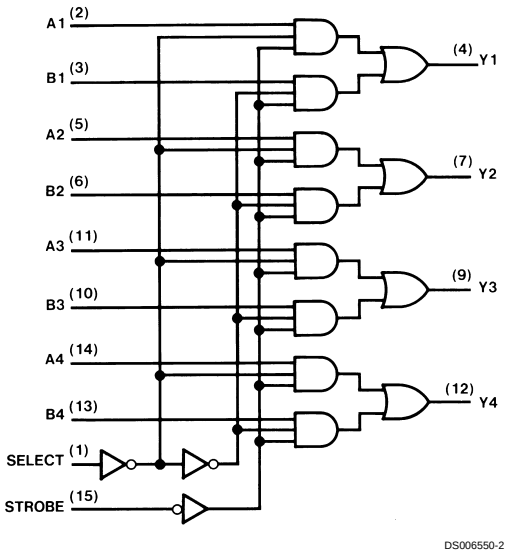

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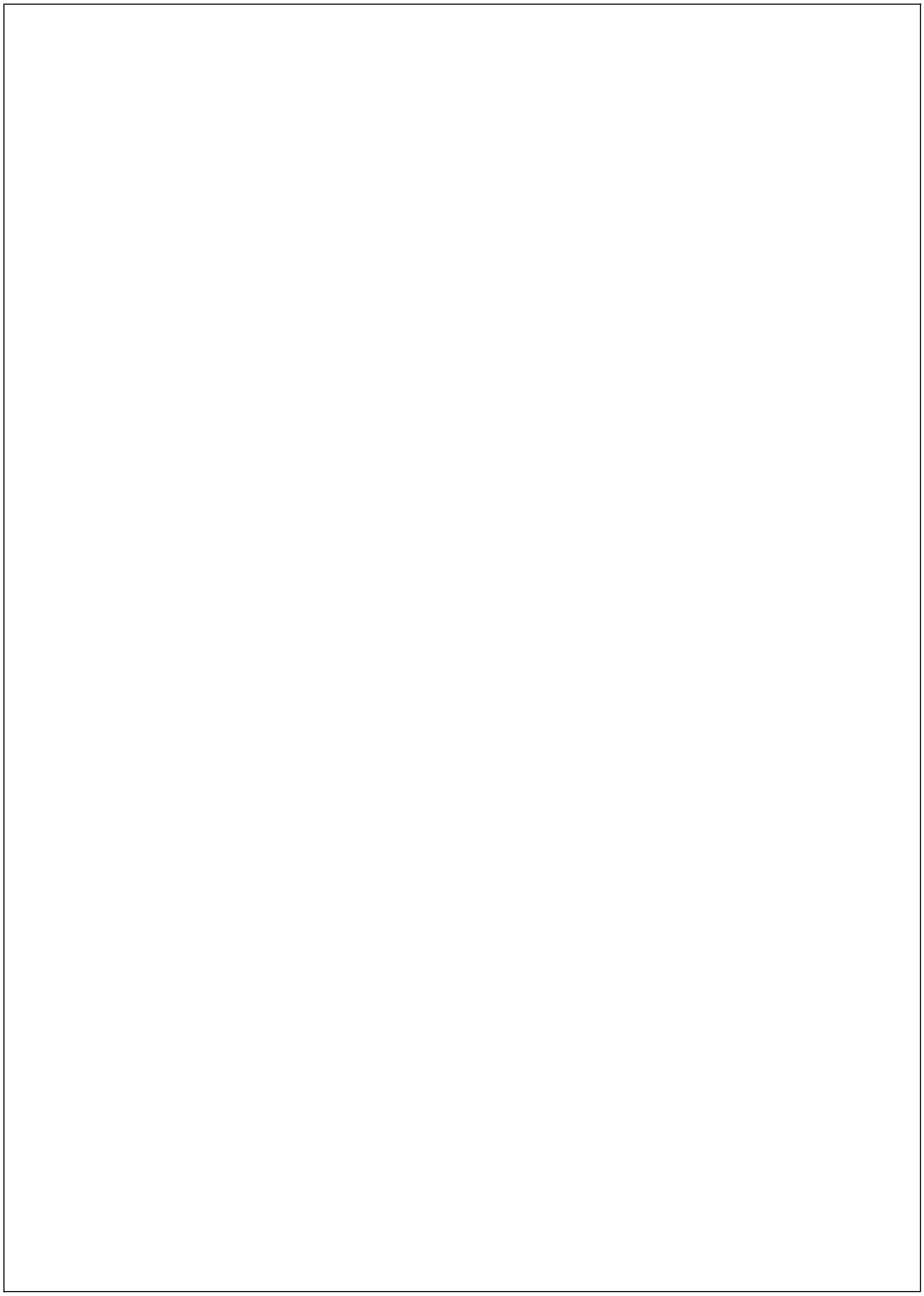
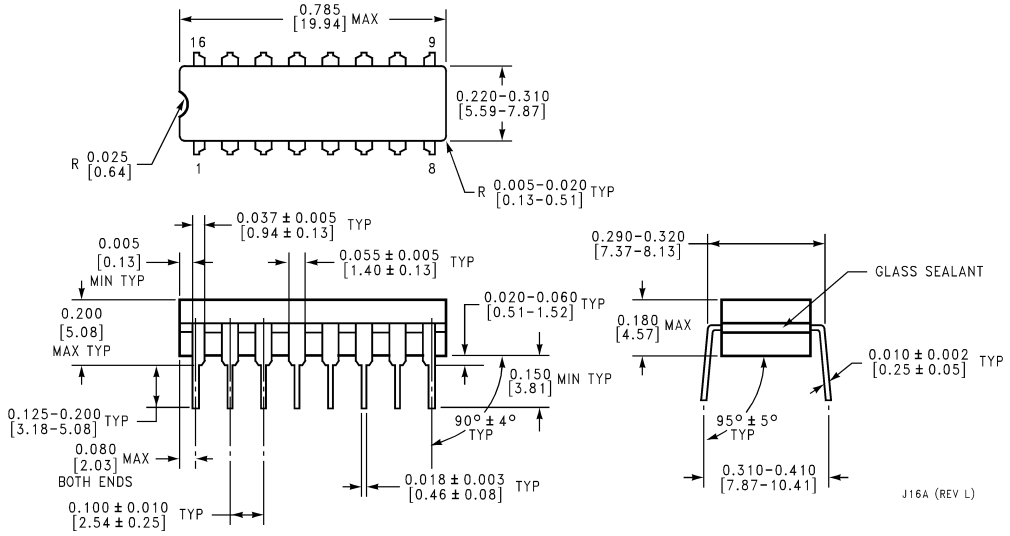
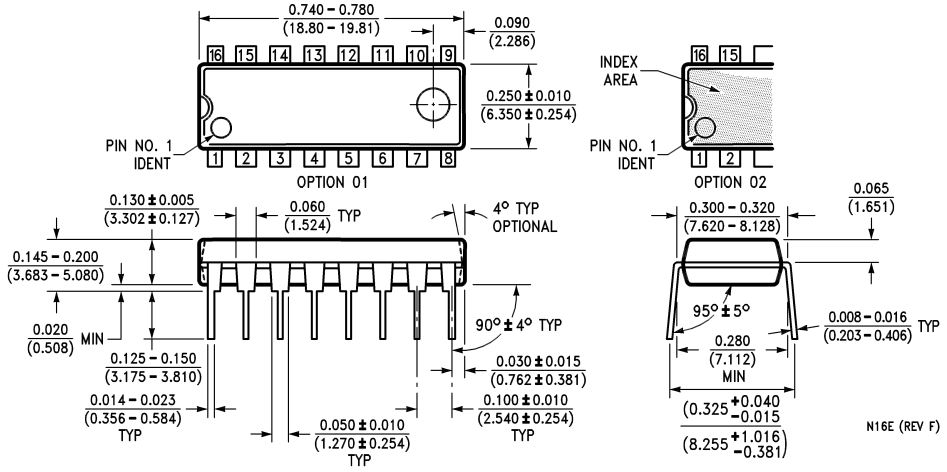


Physical Dimensions inches (millimeters) unless otherwise noted

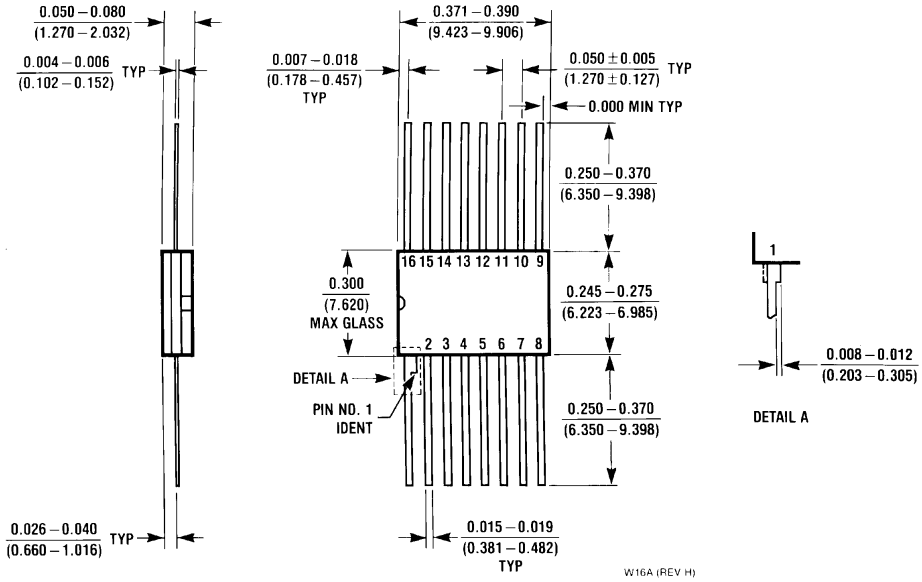


16-Lead Ceramic Dual-In-Line Package (J)
Order Number 54157W or DM54157J
Package Number J16A



16-Lead Molded Dual-In-Line Package (N)
Order Number DM74157N
Package Number N16E

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



16-Lead Ceramic Flat Package (W)
Order Number 54157FMQB or DM54157W
Package Number W16A

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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.

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