

54F/74F365 Hex Buffer/Driver with TRI-STATE® Outputs

General Description

The 'F365 is a hex buffer and line driver designed to be employed as a memory and address driver, clock driver and bus-oriented transmitter/receiver.

Features

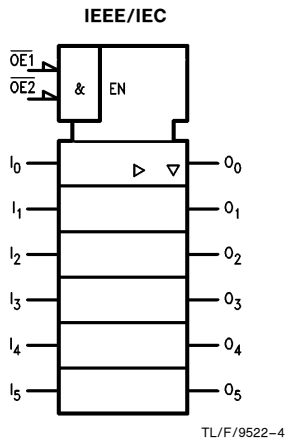
- TRI-STATE buffer outputs
- Outputs sink 64 mA
- Bus-oriented

Commercial	Military	Package Number	Package Description
74F365PC		N16E	16-Lead (0.300" Wide) Molded Dual-In-Line
	54F365DM (Note 2)	J16A	16-Lead Ceramic Dual-In-Line
74F365SC (Note 1)		M16A	16-Lead (0.150" Wide) Molded Small Outline, JEDEC
	54F365FM (Note 2)	W16A	16-Lead Cerpack
	54F365LM (Note 2)	E20A	20-Lead Ceramic Leadless Chip Carrier, Type C

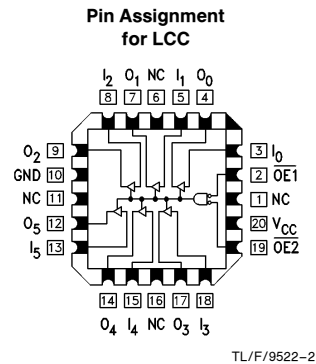
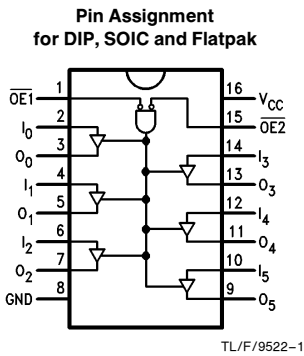
Note 1: Devices also available in 13" reel. Use suffix = SCX.

Note 2: Military grade device with environmental and burn-in processing. Use suffix = DMQB, FMQB and LMQB.

Logic Symbol



Connection Diagrams



TRI-STATE® is a registered trademark of National Semiconductor Corporation.

Unit Loading/Fan Out

Pin Names	Description	54F/74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
$\overline{OE}_1, \overline{OE}_2$	Output Enable Input (Active LOW)	1.0/0.033	20 μA /20 μA
I_n	Inputs	1.0/0.033	20 μA /20 μA
O_n	Outputs	600/106.6 (80)	-12 mA/64 mA (48 mA)

Function Table

Inputs			Output
\overline{OE}_1	\overline{OE}_2	I	O
L	L	L	L
L	L	H	H
X	H	X	Z
H	X	X	Z

L = LOW Voltage Level
H = HIGH Voltage Level
X = Immaterial
Z = High Impedance

Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Storage Temperature	-65°C to +150°C
Ambient Temperature under Bias	-55°C to +125°C
Junction Temperature under Bias	-55°C to +175°C
Plastic	-55°C to +150°C
V _{CC} Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 2)	-0.5V to +7.0V
Input Current (Note 2)	-30 mA to +5.0 mA
Voltage Applied to Output in HIGH State (with V _{CC} = 0V)	
Standard Output	-0.5V to V _{CC}
TRI-STATE Output	-0.5V to +5.5V

Current Applied to Output in LOW State (Max) twice the rated I_{OL} (mA)

Note 1: Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Note 2: Either voltage limit or current limit is sufficient to protect inputs.

Recommended Operating Conditions

Free Air Ambient Temperature	
Military	-55°C to +125°C
Commercial	0°C to +70°C
Supply Voltage	
Military	+4.5V to +5.5V
Commercial	+4.5V to +5.5V

DC Electrical Characteristics

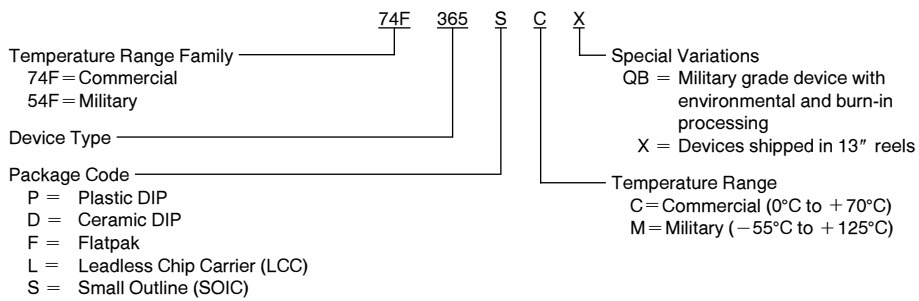
Symbol	Parameter	54F/74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
V _{IH}	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal
V _{IL}	Input LOW Voltage			0.8	V		Recognized as a LOW Signal
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	54F 10% V _{CC} 54F 10% V _{CC} 74F 10% V _{CC} 74F 10% V _{CC} 74F 5% V _{CC}	2.4 2.0 2.4 2.0 2.7		V	Min	I _{OH} = -3 mA I _{OH} = -12 mA I _{OH} = -3 mA I _{OH} = -15 mA I _{OH} = -3 mA
V _{OL}	Output LOW Voltage	54F 10% V _{CC} 74F 10% V _{CC}		0.55 0.55	V	Min	I _{OL} = 48 mA I _{OL} = 64 mA
I _{IH}	Input HIGH Current			20	μA	Max	V _{IN} = 2.7V
I _{BVI}	Input HIGH Current Breakdown Test			100	μA	0.0	V _{IN} = 7.0V
I _{IL}	Input LOW Current			-20	μA	Max	V _{IN} = 0.5V
I _{OZH}	Output Leakage Current			50	μA	Max	V _{OUT} = 2.7V
I _{OZL}	Output Leakage Current			-50	μA	Max	V _{OUT} = 0.5V
I _{OS}	Output Short-Circuit Current	-100		-225	mA	Max	V _{OUT} = 0V
I _{CEX}	Output HIGH Leakage Current			250	μA	Max	V _{OUT} = V _{CC}
I _{ZZ}	Bus Drainage Test			500	μA	0.0V	V _{OUT} = 5.25V
I _{CCH}	Power Supply Current		25	35	mA	Max	V _O = HIGH
I _{CCL}	Power Supply Current		44	62	mA	Max	V _O = LOW
I _{CCZ}	Power Supply Current		35	48	mA	Max	V _O = HIGH Z

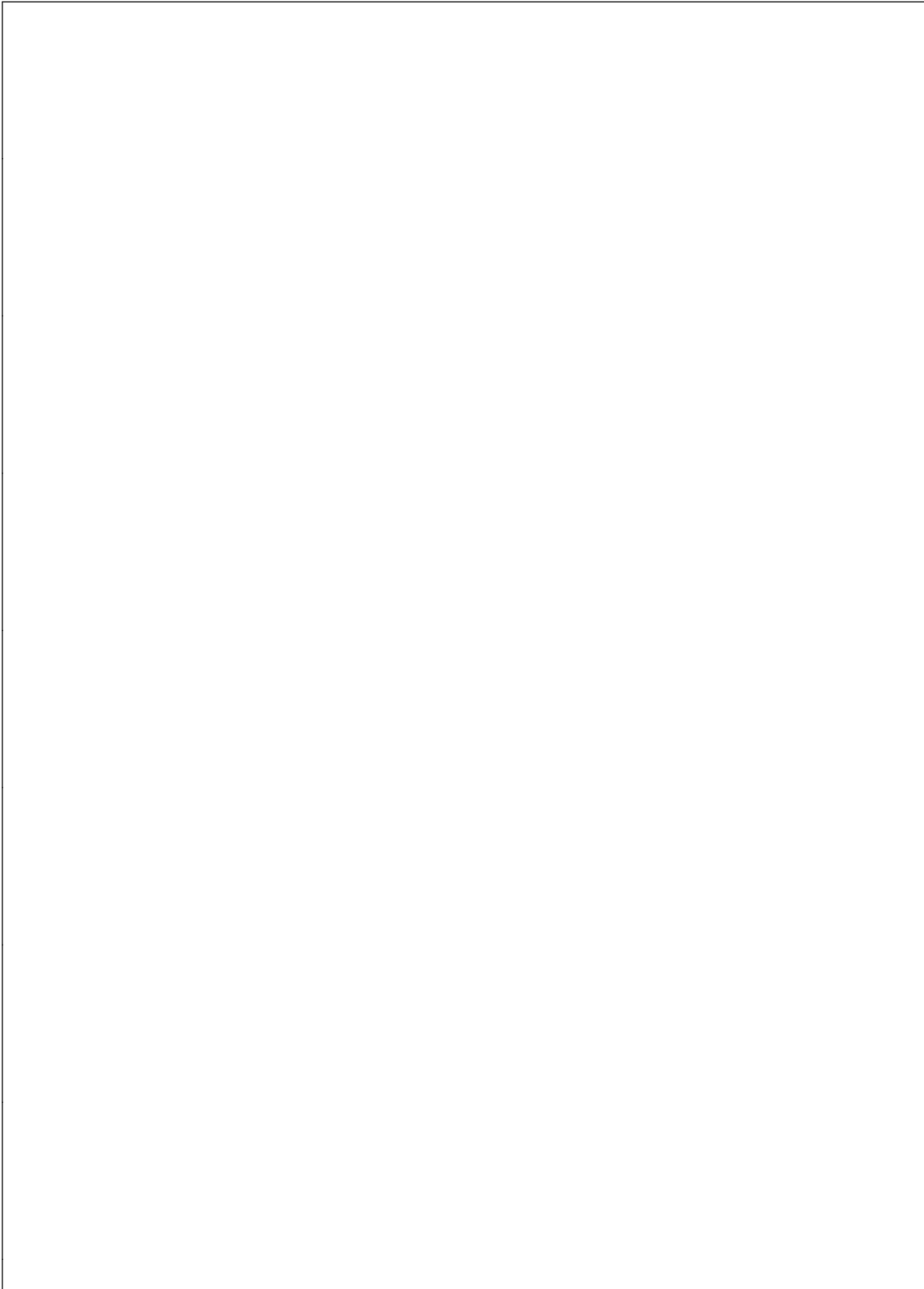
AC Electrical Characteristics

Symbol	Parameter	74F			54F		74F		Units
		T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A , V _{CC} = Mil C _L = 50 pF		T _A , V _{CC} = Com C _L = 50 pF		
		Min	Typ	Max	Min	Max	Min	Max	
t _{PLH}	Propagation Delay I _n to O _n	2.5	4.6	6.5	2.0	7.0	2.0	7.0	ns
t _{PHL}		2.5	4.9	7.0	2.0	7.0	2.0	7.5	
t _{PZH}	Enable Time	2.5	5.1	9.5	2.0	8.5	2.5	10.0	ns
t _{PZL}		2.5	5.7	9.0	2.0	8.5	2.5	9.5	
t _{PHZ}	Disable Time	2.0	3.6	6.5	1.5	6.5	2.0	7.0	ns
t _{PLZ}		2.0	4.4	6.5	1.5	9.0	2.0	7.0	

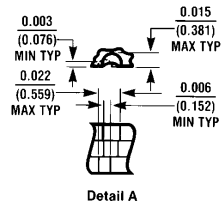
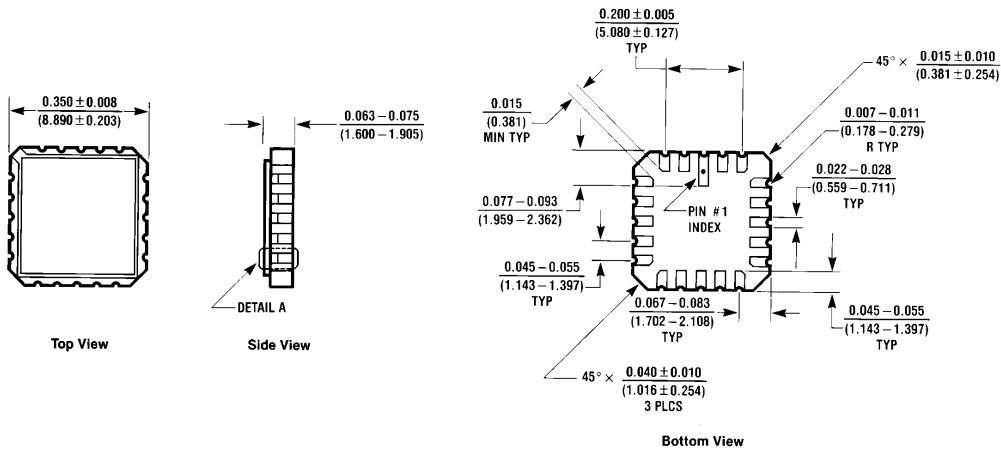
Ordering Information

The device number is used to form part of a simplified purchasing code where the package type and temperature range are defined as follows:



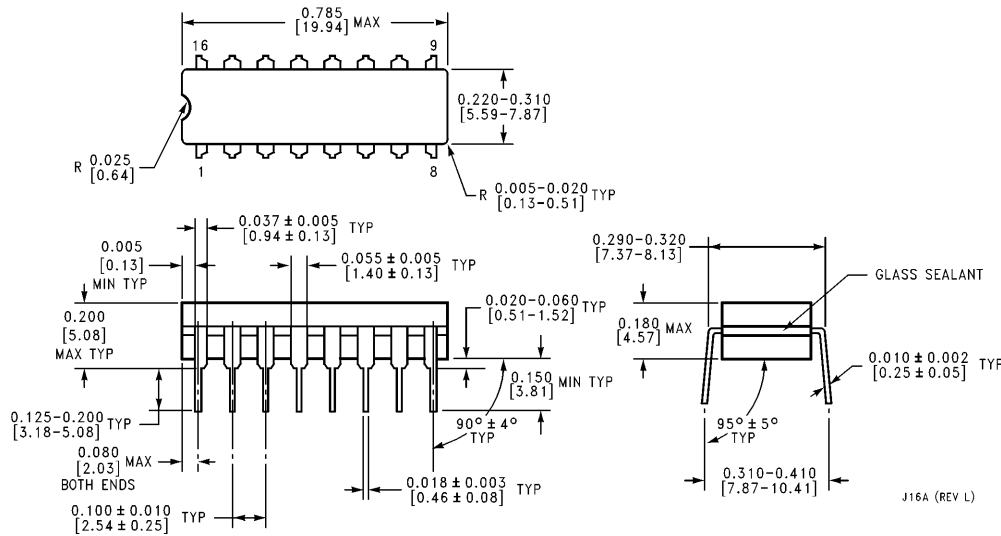


Physical Dimensions inches (millimeters)



20-Lead Ceramic Leadless Chip Carrier (L)
 NS Package Number E20A

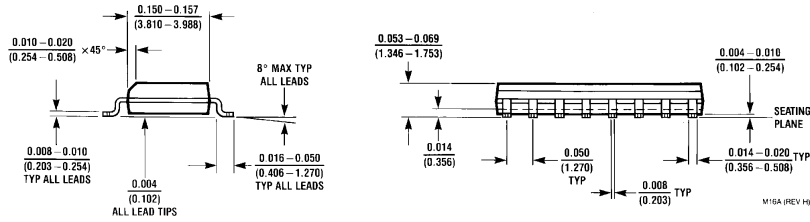
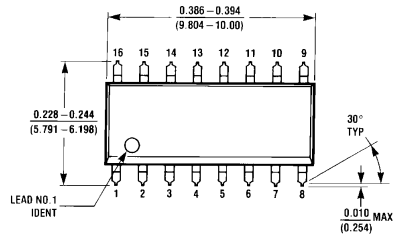
E20A (REV D)



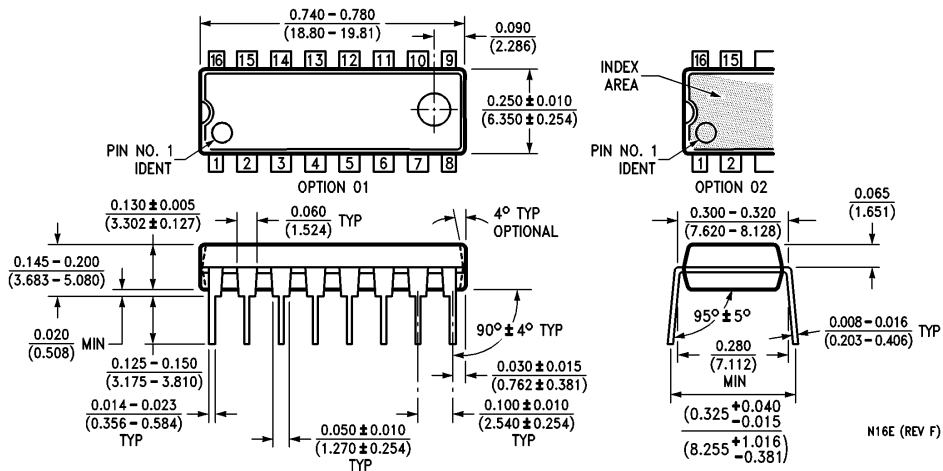
16-Lead Ceramic Dual-In-Line Package (D)
 NS Package Number J16A

J16A (REV L)

Physical Dimensions inches (millimeters) (Continued)

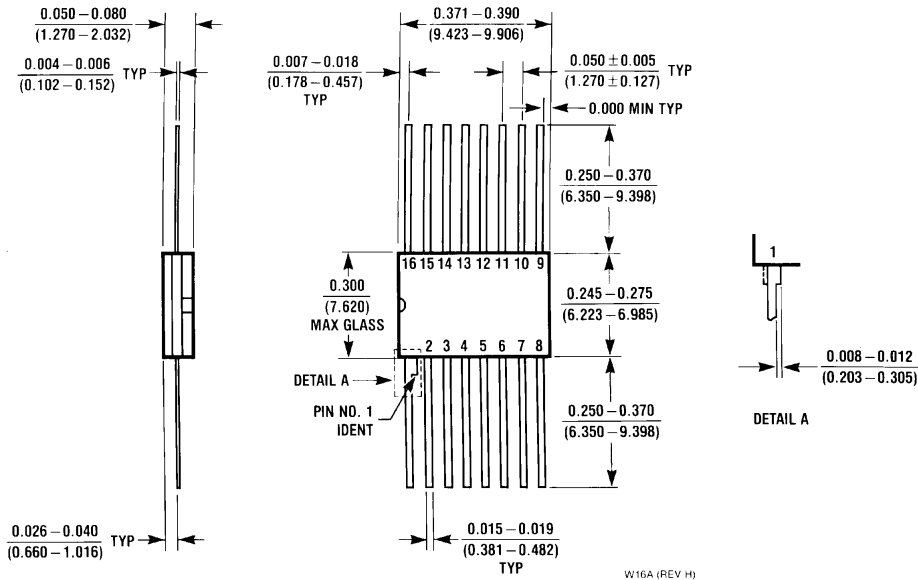


16-Lead (0.150" Wide) Molded Small Outline Package, JEDEC (S)
NS Package Number M16A



16-Lead (0.300" Wide) Molded Dual-In-Line Package (P)
NS Package Number N16E

Physical Dimensions inches (millimeters) (Continued)



**16-Lead Ceramic Flatpak (F)
NS Package Number W16A**

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National Semiconductor Corporation
1111 West Bardin Road
Arlington, TX 76017
Tel: 1(800) 272-9959
Fax: 1(800) 737-7018

National Semiconductor Europe
Fax: (+49) 0-180-530 85 86
Email: cnjwge@tevm2.nsc.com
Deutsch Tel: (+49) 0-180-530 85 85
English Tel: (+49) 0-180-532 78 32
Français Tel: (+49) 0-180-532 93 58
Italiano Tel: (+49) 0-180-534 16 80

National Semiconductor Hong Kong Ltd.
13th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: (852) 2737-1600
Fax: (852) 2736-9960

National Semiconductor Japan Ltd.
Tel: 81-043-299-2309
Fax: 81-043-299-2408

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