

## 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

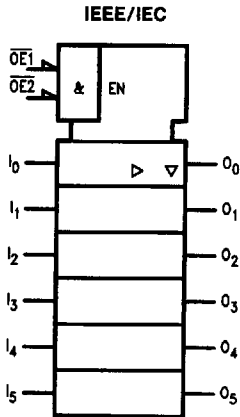
**Ordering Code:** See Section 11

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.

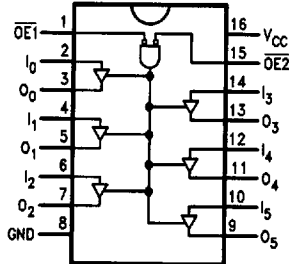
### Logic Symbol



TL/F/9522-4

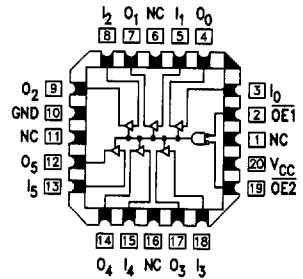
### Connection Diagrams

Pin Assignment  
for DIP, SOIC and Flatpak



TL/F/9522-1

Pin Assignment  
for LCC



TL/F/9522-2

**Unit Loading/Fan Out:** See Section 2 for U.L. definitions

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 $\mu$ A/20 $\mu$ A
$I_n$	Inputs	1.0/0.033	20 $\mu$ A/20 $\mu$ A
$O_n$	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 <sub>CC</sub> 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 <sub>CC</sub> = 0V)	
Standard Output	-0.5V to V <sub>CC</sub>
TRI-STATE Output	-0.5V to +5.5V
Current Applied to Output in LOW State (Max)	twice the rated I <sub>OL</sub> (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 <sub>CC</sub>	Conditions	
		Min	Typ	Max				
V <sub>IH</sub>	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal	
V <sub>IL</sub>	Input LOW Voltage			0.8	V		Recognized as a LOW Signal	
V <sub>CD</sub>	Input Clamp Diode Voltage			-1.2	V	Min	I <sub>IN</sub> = -18 mA	
V <sub>OH</sub>	Output HIGH Voltage	54F 10% V <sub>CC</sub> 54F 10% V <sub>CC</sub> 74F 10% V <sub>CC</sub> 74F 10% V <sub>CC</sub> 74F 5% V <sub>CC</sub>	2.4 2.0 2.4 2.0 2.7		V	Min	I <sub>OH</sub> = -3 mA I <sub>OH</sub> = -12 mA I <sub>OH</sub> = -3 mA I <sub>OH</sub> = -15 mA I <sub>OH</sub> = -3 mA	
V <sub>OL</sub>	Output LOW Voltage	54F 10% V <sub>CC</sub> 74F 10% V <sub>CC</sub>		0.55 0.55	V	Min	I <sub>OL</sub> = 48 mA I <sub>OL</sub> = 64 mA	
I <sub>IH</sub>	Input HIGH Current			20	μA	Max	V <sub>IN</sub> = 2.7V	
I <sub>BVI</sub>	Input HIGH Current Breakdown Test			100	μA	0.0	V <sub>IN</sub> = 7.0V	
I <sub>IL</sub>	Input LOW Current			-20	μA	Max	V <sub>IN</sub> = 0.5V	
I <sub>OZH</sub>	Output Leakage Current			50	μA	Max	V <sub>OUT</sub> = 2.7V	
I <sub>OZL</sub>	Output Leakage Current			-50	μA	Max	V <sub>OUT</sub> = 0.5V	
I <sub>OS</sub>	Output Short-Circuit Current			-100	-225	mA	Max	V <sub>OUT</sub> = 0V
I <sub>CEX</sub>	Output HIGH Leakage Current			250	μA	Max	V <sub>OUT</sub> = V <sub>CC</sub>	
I <sub>ZZ</sub>	Bus Drainage Test			500	μA	0.0V	V <sub>OUT</sub> = 5.25V	
I <sub>CCH</sub>	Power Supply Current		25	35	mA	Max	V <sub>O</sub> = HIGH	
I <sub>CCL</sub>	Power Supply Current		44	62	mA	Max	V <sub>O</sub> = LOW	
I <sub>CCZ</sub>	Power Supply Current		35	48	mA	Max	V <sub>O</sub> = HIGH Z	

**AC Electrical Characteristics:** See Section 2 for Waveforms and Load Configurations

Symbol	Parameter	74F			54F		74F		Units	Fig. No.
		T <sub>A</sub> = +25°C V <sub>CC</sub> = +5.0V C <sub>L</sub> = 50 pF			T <sub>A</sub> , V <sub>CC</sub> = Mil C <sub>L</sub> = 50 pF		T <sub>A</sub> , V <sub>CC</sub> = Com C <sub>L</sub> = 50 pF			
		Min	Typ	Max	Min	Max	Min	Max		
t <sub>PLH</sub>	Propagation Delay I <sub>n</sub> to O <sub>n</sub>	2.5	4.6	6.5	2.0	7.0	2.0	7.0	ns	2-3
t <sub>PHL</sub>		2.5	4.9	7.0	2.0	7.0	2.0	7.5		
t <sub>PZH</sub>	Enable Time	2.5	5.1	9.5	2.0	8.5	2.5	10.0	ns	2-5
t <sub>PZL</sub>		2.5	5.7	9.0	2.0	8.5	2.5	9.5		
t <sub>PHZ</sub>	Disable Time	2.0	3.6	6.5	1.5	6.5	2.0	7.0	ns	2-5
t <sub>PLZ</sub>		2.0	4.4	6.5	1.5	9.0	2.0	7.0		