

74F51

Dual 2-Wide 2-Input; 2-Wide 3-Input AND-OR-Invert Gate

General Description

3-3 AND-OR-INVERT function.

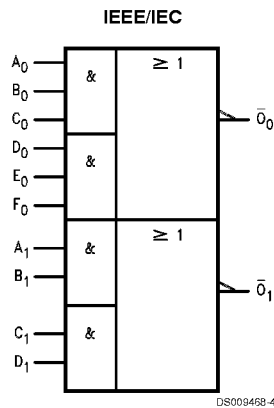
This device contains two independent logic units, one performing a 2-2 AND-OR-INVERT and the other performing a

Ordering Code:

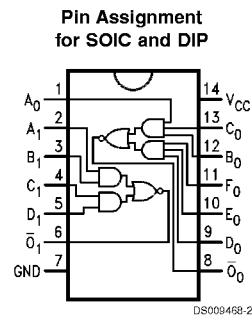
Commercial	Package Number	Package Description
74F51PC	N14A	14-Lead (0.300" Wide) Molded Dual-In-Line
74F51SC (Note 1)	M14A	14-Lead (0.150" Wide) Molded Small Outline, JEDEC
74F51SJ (Note 1)	M14D	14-Lead (0.300" Wide) Molded Small Outline, EIAJ

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

Logic Symbol



Connection Diagram



Unit Loading/Fan Out

Pin Names	Description	74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
$A_n, B_n, C_n, D_n, E_n, F_n$	Inputs	1.0/1.0	20 μA / -0.6 mA
\bar{O}_n	Outputs	50/33.3	-1 mA / 20 mA

Function Table for 3-Input Gates

Inputs						Output
A_o	B_o	C_o	D_o	E_o	F_o	\bar{O}_o
H	H	H	X	X	X	L
X	X	X	H	H	H	L
All other combinations						H

Function Table for 2-Input Gates

Inputs				Output
A_1	B_1	C_1	D_1	\bar{O}_1
H	H	X	X	L
X	X	H	H	L
All other combinations				H

H = HIGH Voltage Level

L = LOW Voltage Level

X = Immaterial

Absolute Maximum Ratings (Note 2)

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 3)	-0.5V to +7.0V
Input Current (Note 3)	-30 mA to +5.0 mA
Voltage Applied to Output in HIGH State (with V _{CC} = 0V)	
Standard Output	-0.5V to V _{CC}
3-STATE Output	-0.5V to +5.5V
Current Applied to Output	

in LOW State (Max)

twice the rated I_{OL} (mA)

Recommended Operating Conditions

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

Note 2: 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 3: Either voltage limit or current limit is sufficient to protect inputs.

DC Electrical Characteristics

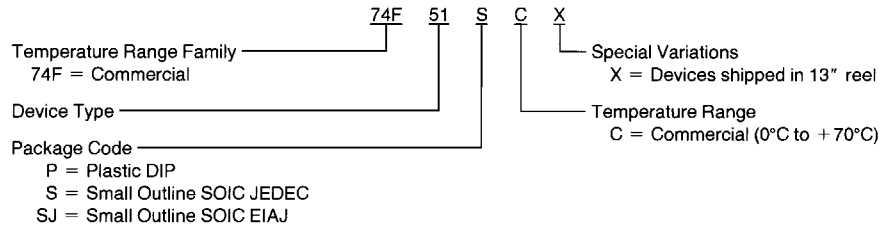
Symbol	Parameter	74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
V _{IH}	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal
V _{IL}	Input LOW Voltage			0.8	V		Recognized as a LOW Signal
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	74F 10% V _{CC}	2.5		V	Min	I _{OH} = -1 mA
		74F 5% V _{CC}	2.7				I _{OH} = -1 mA
V _{OL}	Output LOW Voltage	74F 10% V _{CC}		0.5	V	Min	I _{OL} = 20 mA
I _{IH}	Input HIGH Current	74F		5.0	μA	Max	V _{IN} = 2.7V
I _{BVI}	Input HIGH Current Breakdown Test	74F		7.0	μA	Max	V _{IN} = 7.0V
I _{CEX}	Output HIGH Leakage Current	74F		50	μA	Max	V _{OUT} = V _{CC}
V _{ID}	Input Leakage Test	74F	4.75		V	0.0	I _{ID} = 1.9 μA All other pins grounded
I _{OD}	Output Leakage Circuit Current	74F		3.75	μA	0.0	V _{IOD} = 150 mV All other pins grounded
I _{IL}	Input LOW Current			-0.6	mA	Max	V _{IN} = 0.5V
I _{OS}	Output Short-Circuit Current		-60	-150	mA	Max	V _{OUT} = 0V
I _{CCH}	Power Supply Current		1.9	3.0	mA	Max	V _O = HIGH
I _{CCL}	Power Supply Current		5.3	8.5	mA	Max	V _O = LOW

AC Electrical Characteristics

Symbol	Parameter	74F			74F		Units
		T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A , V _{CC} = Comm C _L = 50 pF		
		Min	Typ	Max	Min	Max	
t _{PLH}	Propagation Delay	2.0	3.7	6.0	1.5	6.5	ns
t _{PHL}	A _n , B _n , C _n , D _n , E _n , F _n to \bar{O}_n	1.0	2.6	4.0	1.0	4.5	

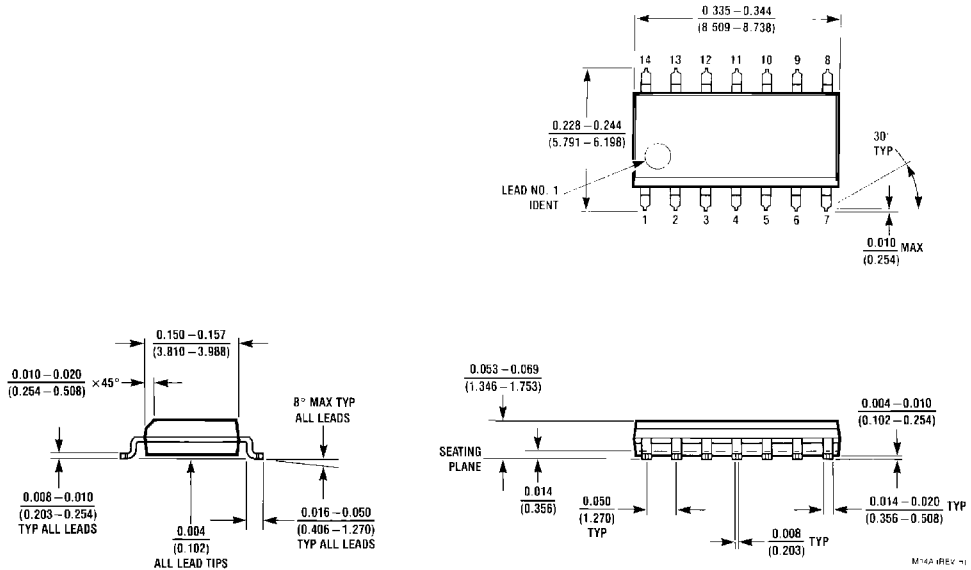
Ordering Information

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



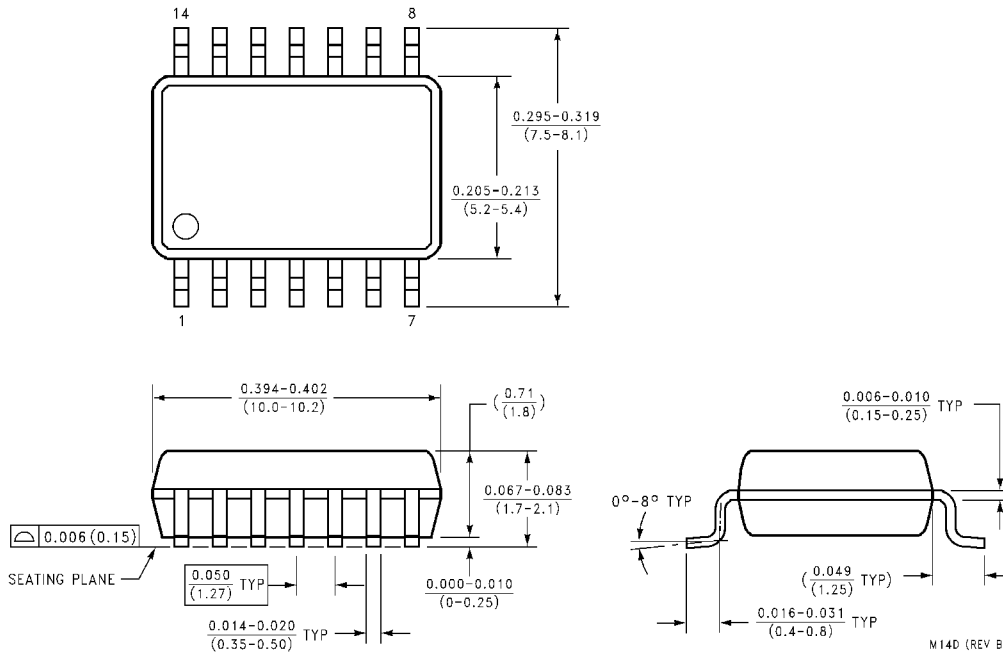
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Physical Dimensions inches (millimeters) unless otherwise noted

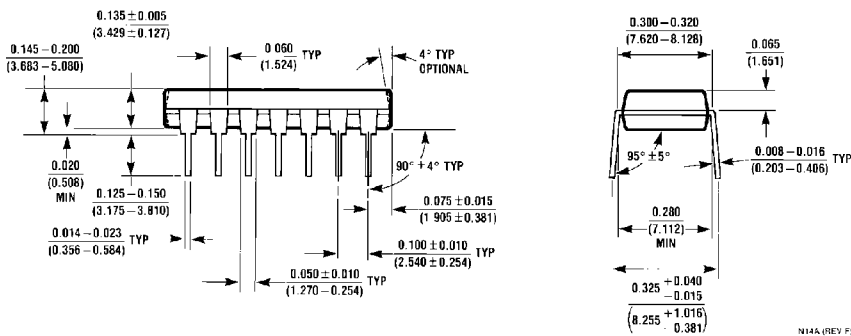
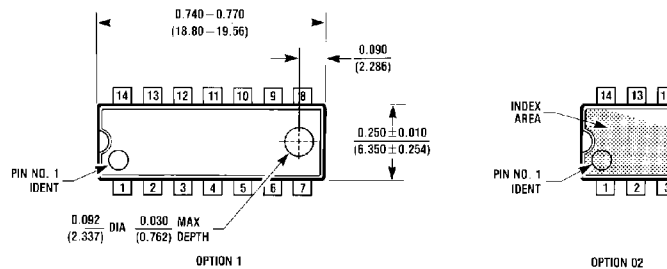


14-Lead (0.150" Wide) Molded Small Outline Package, JEDEC (S)
Package Number M14A

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



**14-Lead (0.300" Wide) Molded Small Outline Package, EIAJ (S)
Package Number M14D**



**14-Lead (0.300" Wide) Molded Dual-In-Line Package (P)
Package Number N14A**

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