

74F14

Hex Inverter Schmitt Trigger

General Description

The 74F14 contains six logic inverters which accept standard TTL input signals and provide standard TTL output levels. They are capable of transforming slowly changing input signals into sharply defined, jitter-free output signals. In addition, they have a greater noise margin than conventional inverters.

Each circuit contains a Schmitt trigger followed by a Darlington level shifter and a phase splitter driving a TTL

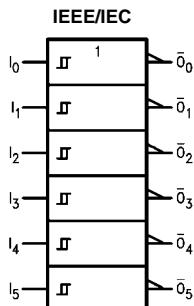
totem-pole output. The Schmitt trigger uses positive feed back to effectively speed-up slow input transition, and provide different input threshold voltages for positive and negative-going transitions. This hysteresis between the positive-going and negative-going input thresholds (typically 800 mV) is determined internally by resistor ratios and is essentially insensitive to temperature and supply voltage variations.

Ordering Code:

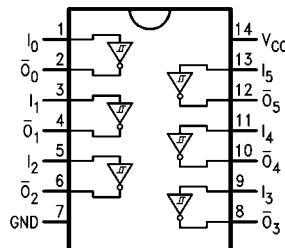
Order Number	Package Number	Package Description
74F14SC	M14A	14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
74F14SJ	M14D	Pb-Free 14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74F14PC	N14A	14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Logic Symbol



Connection Diagram



Unit Loading/Fan Out

Pin Names	Description	U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
I_n	Input	1.0/1.0	$20 \mu A/-0.6 mA$

O_n Output 50/33.3 $-1 mA/20 mA$

Function Table

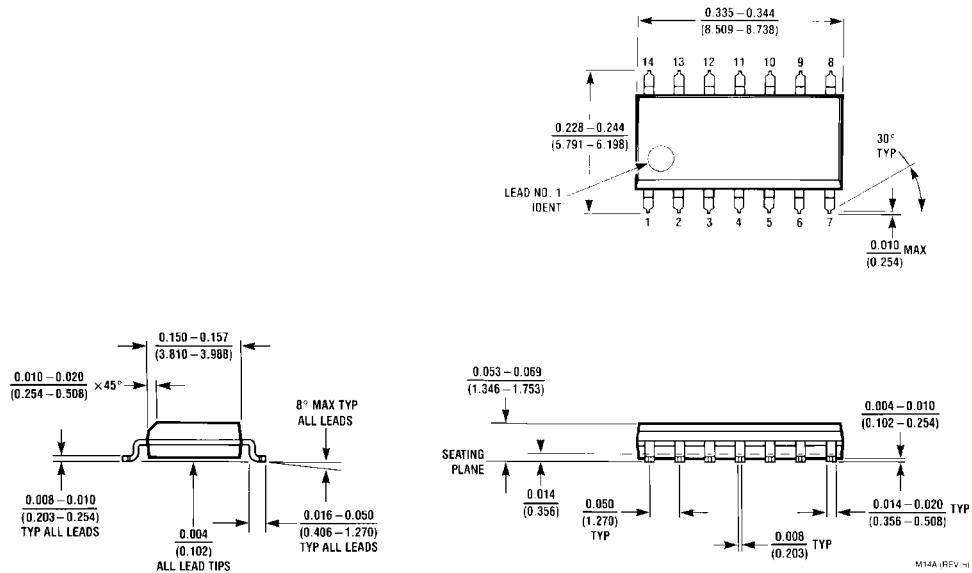
Input	Output
A	\bar{O}
L	H
H	L

H = HIGH Voltage Level
L = LOW Voltage Level

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Absolute Maximum Ratings ^(Note 1)		Recommended Operating Conditions						
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							
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}							
3-STATE Output	-0.5V to +5.5V							
Current Applied to Output								
in LOW State (Max)	twice the rated I_{OL} (mA)							
ESD Last Passing Voltage (Min)	4000V							
DC Electrical Characteristics								
Symbol	Parameter	Min	Typ	Max	Units	V_{CC}	Conditions	
V_{T+}	Positive-Going Threshold	1.5	1.7	2.0	V	5.0V		
V_{T-}	Negative-Going Threshold	0.7	0.9	1.1	V	5.0V		
ΔV_T	Hysteresis ($V_{T+}-V_{T-}$)	0.4	0.8		V	5.0V		
V_{CD}	Input Clamp Diode Voltage			-1.2	V	Min	$I_{IN} = -18 \text{ mA}$	
V_{OH}	Output HIGH Voltage	10% V_{CC} 5% V_{CC}	2.5 2.7		V	Min	$I_{OH} = -1 \text{ mA}$ $I_{OH} = -1 \text{ mA}$	
V_{OL}	Output LOW Voltage	10% V_{CC}		0.5	V	Min	$I_{OL} = 20 \text{ mA}$	
I_{IH}	Input HIGH Current			5.0	μA	Max	$V_{IN} = 2.7V$	
I_{BVI}	Input HIGH Current Breakdown Test			7.0	μA	Max	$V_{IN} = 7.0V$	
I_{CEX}	Output HIGH Leakage Current			50	μA	Max	$V_{OUT} = V_{CC}$	
V_{ID}	Input Leakage Test	4.75			V	Max	$I_{ID} = 1.9 \mu\text{A}$ All Other Pins Grounded	
I_{OD}	Output Leakage Circuit Current			3.75	μA	0.0	$V_{OD} = 150 \text{ mV}$ 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			25	mA	Max	$V_O = \text{HIGH}$	
I_{CCL}	Power Supply Current			25	mA	Max	$V_O = \text{LOW}$	
AC Electrical Characteristics								
Symbol	Parameter	$T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50 \text{ pF}$		$T_A = -55^\circ\text{C} \text{ to } +125^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50 \text{ pF}$		$T_A = 0^\circ\text{C} \text{ to } +70^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50 \text{ pF}$		Units
		Min	Max	Min	Max	Min	Max	
t_{PLH}	Propagation Delay $I_n \rightarrow \bar{O}_n$	4.0 3.5	10.5 8.5	4.0 3.5	13.0 10.0	4.0 3.5	11.5 9.0	ns

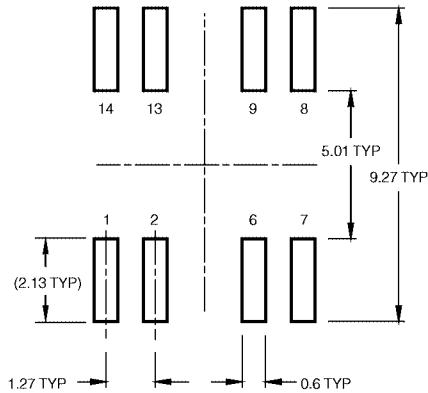
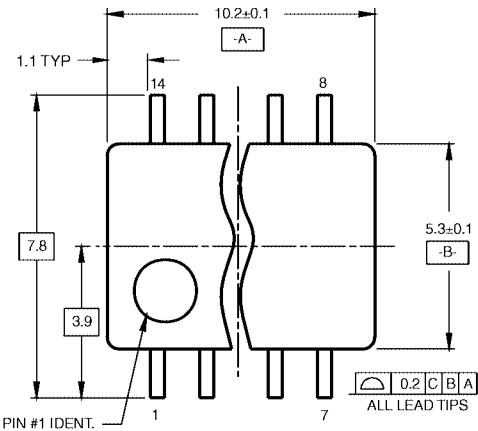
Physical Dimensions inches (millimeters) unless otherwise noted



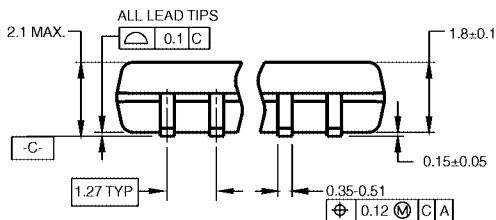
14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
Package Number M14A

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



LAND PATTERN RECOMMENDATION

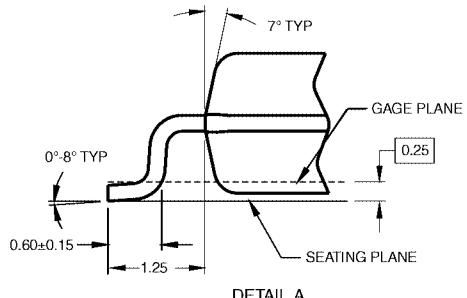
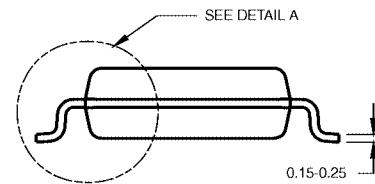


DIMENSIONS ARE IN MILLIMETERS

NOTES:

- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

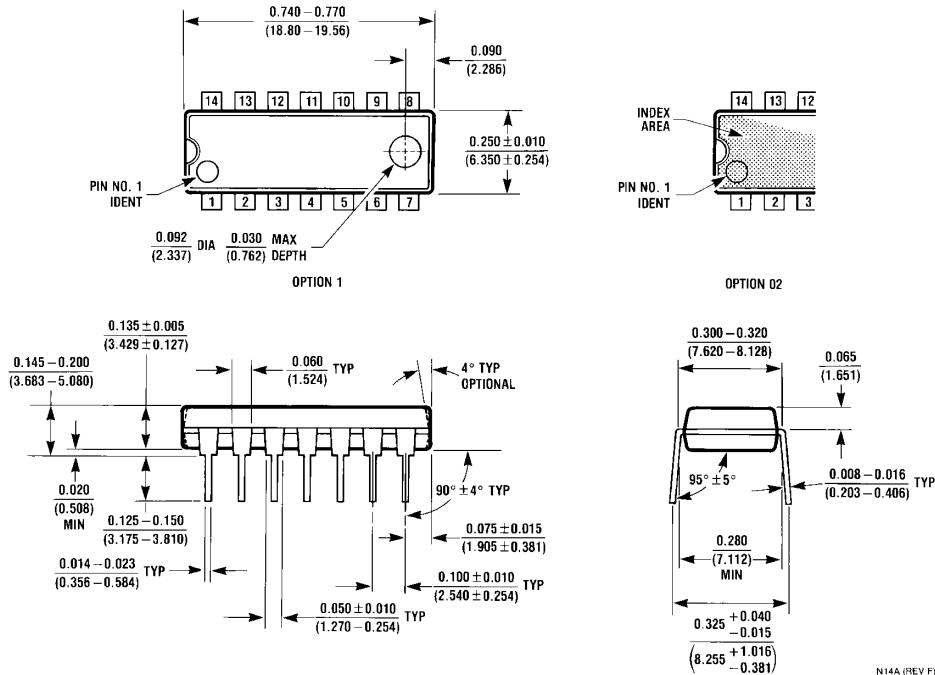
M14DRevB1



DETAIL A

**Pb-Free 14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
Package Number M14D**

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



14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide
Package Number N14A

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