



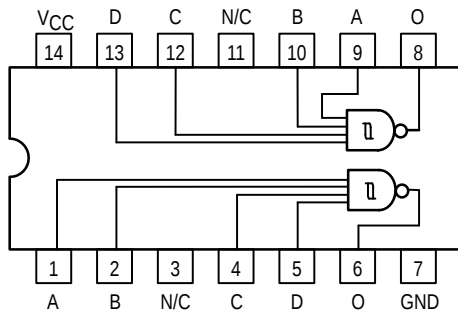
SCHMITT TRIGGERS DUAL 4-INPUT NAND/HEX INVERTERS

The MC54/74F13 and MC54/74F14 contain logic gates/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. Additionally, they have greater noise margin than conventional inverters.

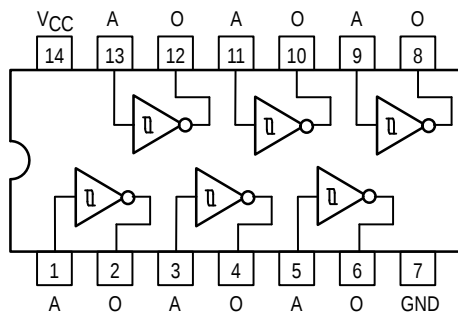
Each circuit contains a Schmitt trigger followed by a Darlington level shifter and a phase splitter driving a TTL totem pole output. The Schmitt trigger uses positive feedback to effectively speed up slow input transitions and provide different input threshold voltages for positive and negative-going 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.

LOGIC AND CONNECTION DIAGRAMS

MC54/74F13



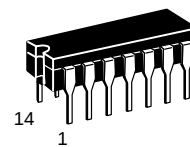
MC54/74F14



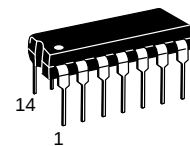
MC54/74F13
MC54/74F14

SCHMITT TRIGGERS
DUAL 4-INPUT
NAND/HEX INVERTERS

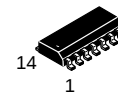
FAST™ SCHOTTKY TTL



J SUFFIX
CERAMIC
CASE 632-08



N SUFFIX
PLASTIC
CASE 646-06



D SUFFIX
SOIC
CASE 751A-02

ORDERING INFORMATION

MC54FXXJ Ceramic
MC74FXXN Plastic
MC74FXXD SOIC

GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Typ	Max	Unit
V _{CC}	Supply Voltage	54, 74	4.5	5.0	5.5	V
T _A	Operating Ambient Temperature Range	54	-55	25	125	°C
		74	0	25	70	
I _{OH}	Output Current — High	54, 74			-1.0	mA
I _{OL}	Output Current — Low	54, 74			20	mA

MC54/74F13 • MC54/74F14

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	Parameter		Limits			Unit	Test Conditions	
			Min	Typ	Max			
V_{T+}	Positive-Going Threshold Voltage		1.5		2.0	V	$V_{CC} = 5.0\text{ V}$	
V_{T-}	Negative-Going Threshold Voltage		0.7		1.1	V	$V_{CC} = 5.0\text{ V}$	
$V_{T+} - V_{T-}$	Hysteresis		0.4	0.8		V	$V_{CC} = 5.0\text{ V}$	
V_{IH}	Input HIGH Voltage		2.0			V	Guaranteed Input HIGH Voltage	
V_{IL}	Input LOW Voltage				0.8	V	Guaranteed Input LOW Voltage	
V_{IK}	Input Clamp Diode Voltage				-1.2	V	$V_{CC} = \text{MIN}$, $I_{IN} = -18\text{ mA}$	
V_{OH}	Output HIGH Voltage	54, 74	2.5			V	$I_{OH} = -1.0\text{ mA}$	$V_{CC} = 4.5$
		74	2.7			V	$I_{OH} = -1.0\text{ mA}$	$V_{CC} = 4.75$
V_{OL}	Output LOW Voltage				0.5	V	$I_{OL} = 20\text{ mA}$	$V_{CC} = \text{MIN}$
I_{T+}	Input Current at Positive-Going Threshold			-0.14		mA	$V_{CC} = 5.0\text{ V}$, $V_{IN} = V_{T+}$	
I_{T-}	Input Current at Negative-Going Threshold			-0.18		mA	$V_{CC} = 5.0\text{ V}$, $V_{IN} = V_{T-}$	
I_{IH}	Input HIGH Current				20	μA	$V_{CC} = \text{MAX}$, $V_{IN} = 2.7\text{ V}$	
					0.1	mA	$V_{CC} = \text{MAX}$, $V_{IN} = 7.0\text{ V}$	
I_{IL}	Input LOW Current				-0.6	mA	$V_{CC} = \text{MAX}$, $V_{IN} = 0.5\text{ V}$	
I_{OS}	Output Short Circuit Current (Note 2)		-60		-150	mA	$V_{CC} = \text{MAX}$, $V_{OUT} = 0\text{ V}$	
I_{CCH}	Power Supply Current Total, Output HIGH	F13		4.5	8.5	mA	$V_{CC} = \text{MAX}$	
		F14		13	22			
I_{CCL}	Power Supply Current Total, Output LOW	F13		7.0	10			
		F14		23	32			

NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.
- Not more than one output should be shorted at a time, nor for more than 1 second.

AC CHARACTERISTICS ($C_L = 50\text{ pF}$)

Symbol	Parameter		54/74F		54F		74F		Unit
			T _A = +25°C		T _A = −55°C to +125°C		T _A = 0°C to 70°C		
			V _{CC} = +5.0 V		V _{CC} = 5.0 V ± 10%		V _{CC} = 5.0 V ± 10%		
			Min	Max	Min	Max	Min	Max	
t _{PLH}	Propagation Delay	F13	3.5	7.0	3.5	9.0	3.5	8.0	ns
t _{PHL}			3.0	8.0	3.0	9.5	3.0	8.5	
t _{PLH}	Propagation Delay	F14	3.5	7.0	3.5	9.0	3.5	8.0	ns
t _{PHL}			3.0	6.5	3.0	8.0	3.0	7.0	

MC54/74F13 • MC54/74F14

FUNCTION TABLE MC54/74F13

Inputs				Output
A	B	C	D	O
L	X	X	X	H
X	L	X	X	H
X	X	L	X	H
X	X	X	L	H
H	H	H	H	L

H = HIGH Voltage Level

L = LOW Voltage Level

X = Don't Care

FUNCTION TABLE MC54/74F14

Input	Output
A	O
L	H
H	L

Copyright © Each Manufacturing Company.

All Datasheets cannot be modified without permission.

This datasheet has been download from :

www.AllDataSheet.com

100% Free DataSheet Search Site.

Free Download.

No Register.

Fast Search System.

www.AllDataSheet.com