National Semiconductor

MICROCIRCUIT DATA SHEET

MNMM54C14-X REV 1A0

Original Creation Date: 10/17/95
Last Update Date: 05/19/97
Last Major Revision Date: 04/02/97

HEX SCHMITT TRIGGER

General Description

The MM54C14 Hex Schmitt Trigger is a monolithic complementary MOS (CMOS) integrated circuit constructed with N- and P-channel enhancement transistors. The positive and negative going threshold voltages, Vt+ and Vt-, show low variation with respect to temperature (typ. 0.0005V/ C at Vcc = 10V), and hysteresis, Vt+ - Vt- $\geq$ 0.2 Vcc is guaranteed.

All inputs are protected from damage due to static discharge by diode clamps to Vcc and Gnd.

Industry Part Number

MM54C14

NS Part Numbers

MM54C14J/883
MM54C14W/883

Prime Die

MM54C14

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (^{o}C)
1	Static tests at	+25
2	Static tests at	+125
3	Static tests at	-55
4	Dynamic tests at	+25
5	Dynamic tests at	+125
6	Dynamic tests at	-55
7	Functional tests at	+25
8A	Functional tests at	+125
8B	Functional tests at	-55
9	Switching tests at	+25
10	Switching tests at	+125
11	Switching tests at	-55

Features

- Supply voltage range	3.0V to 15V
- High noise immunity	0.70 Vcc (typ.)
- Low power	0.4 Vcc (typ.)
TTL compatibility	0.2 Vcc guaranteed
- Hysteresis	0.4 Vcc (typ.)
	0.2 Vcc guaranteed

(Absolute Maximum Ratings)

Voltage at Any Pin	-0.3V to Vcc +0.3V
Operating Temperature Range	-55 C to +125 C
Storage Temperature Range	-65 C to +150 C
Power Dissipation (Pd)	
Dual-In-Line	700mW
Small Outline	500mW
Operating Vcc Range	3.0V to 15V
Absolute Maximum Vcc	18V
Lead Temperature (Soldering, 10 seconds)	260 C

Electrical Characteristics

DC PARAMETERS:

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Voh	Logical "1" Output Voltage	Vcc = 5V, Iout = -10uA, Vil = 0.7V, (all inputs)			4.5		V	1, 2, 3
		Vcc = 10V, Iout = -10uA, Vil = 0V, (all inputs)			9		V	1, 2, 3
		Vcc = 4.5V, Iout = -360uA, Vil = 0V, (all inputs)			2.4		V	1, 2, 3
Vol	Logical "0" Output Voltage	Vcc = 5V, Iout = 10uA, Vih = 4.3V, (all inputs)				0.5	V	1, 2, 3
		Vcc = 10V, Iout = 10uA, Vih = 10V, (all inputs)				1	V	1, 2, 3
		Vcc = 4.5V, Iout = 360uA, Vih = 4.5V, (all inputs)				0.4	V	1, 2, 3
Iih	Logical "1" Input Current	Vcc = 15V, Vin = 15V, other inputs at 0V				1000	nA	1, 2, 3
Iil	Logical "0" Input Current	Vcc = 15V, Vin = 0V				-1000	nA	1, 2, 3
Icc	Quiescent Device Current	Vcc = 15V, Vin = 15V				15	uA	1, 2, 3
		Vcc = 15V, Vin = 0V				15	uA	1, 2, 3
Isource	Output Source Current (P-Channel)	Vcc = 5V, Vout = 0V, Vin = 0V (all inputs)			-1.75		mA	1, 3
					-1.2		mA	2
		Vcc = 10V, Vout = 0V, Vin = 0V (all inputs)			-8		mA	1, 3
					-5.6		mA	2
Isink	Output Sink Current (N-Channel)	Vcc = 5V, Vout = 5V, Vin = 5V (all inputs)			1.75		mA	1, 3
					1.2		mA	2
		Vcc = 10V, Vout = 10V, Vin = 10V (all inputs)			8		mA	1, 3
					5.6		mA	2
Vt+	Positive Going Threshold Voltage	Vcc = 5V	1		3	4.3	V	1, 2, 3
		Vcc = 10V	1		6	8.6	V	1, 2, 3
		Vcc = 15V	1		9	12.9	V	1, 2, 3

Electrical Characteristics

DC PARAMETERS:(Continued)

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Vt-	Negative Going Threshold Voltage	Vcc = 5V	1		0.7	2	V	1, 2, 3
		Vcc = 10V	1		1.4	4	V	1, 2, 3
		Vcc = 15V	1		2.1	6	V	1, 2, 3
Vt+-Vt-	Hysteresis	Vcc = 5V	1		1	3.6	V	1, 2, 3
		Vcc = 10V	1		2	7.2	V	1, 2, 3
		Vcc = 15V	1		3	10.8	V	1, 2, 3
Vih	Logical "1" Input Voltage	Vcc = 5V	1		4.3		V	1, 2, 3
Vil	Logical "0" Input Voltage	Vcc = 5V	1			0.7	V	1, 2, 3

AC PARAMETERS: PROPAGATION DELAY TIME:

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: Vcc = 5V, Cl = 50pF or equivalent impedance provided by diode load.

tPHL			3			400	nS	9
			3			560	nS	10
			3			320	nS	11
		Vcc = 10V	2			200	nS	9
			2			280	nS	10
			2			160	nS	11
tPLH			3			400	nS	9
			3			560	nS	10
			3			320	nS	11
		Vcc = 10V	2			200	nS	9
			2			280	nS	10
			2			160	nS	11

Note 1: Parameter tested go-no-go only.
Note 2: Guaranteed parameter not tested.
Note 3: Tested at 25 C; guaranteed but not tested at +125 C and -55 C.