CHT-74132 DATASHEET

Version: 3.7
8-Jul-14
(Last Modification Date)

High-Temperature, Quad 2-Input NAND Schmitt Trigger

General Description

The CHT-74132 contains four independent 2-input NAND gates with Schmitt Trigger, performing the Boolean function :

$$Y = \overline{A \cdot B}$$

The gate switches at different points for positive and negative going signals. The difference between the positive voltage V_{T+} and the negative voltage V_{T-} is defined as the hysteresis voltage V_H

The CHT-74132 can operate with supply voltages from 3.3 to 5V (±10%).

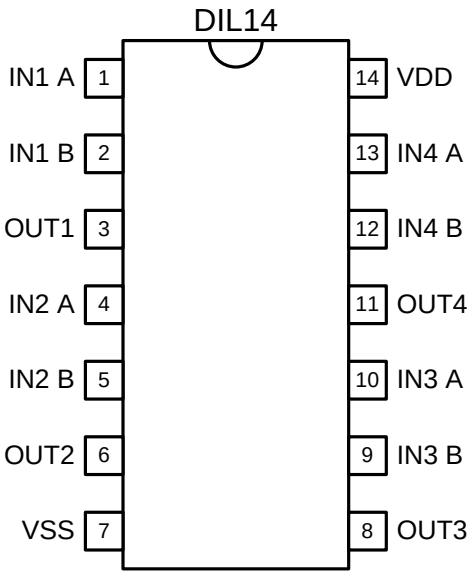
Features

- Qualified from -55 to +225°C (Tj)
- 3.3 to 5V (±10%) supply voltages
- Latchup-free at any supply and temperature condition
- Validated at 225°C for 30000 hours (CDIL14) and 20000 hours (CSOIC16) (and still on-going)
- Available in CDIL14 and CSOIC 16 hermetic standard package

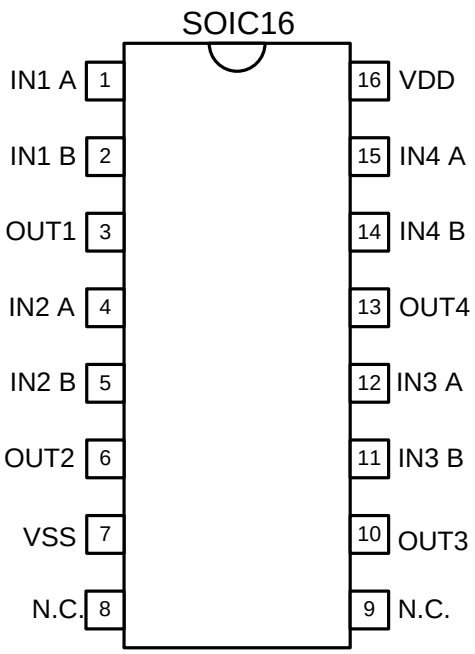
Applications

- High temperature logic
- Noise immunity function
- Sensor interface
- Signal processing/conditioning

Package and Pin Configuration



Pin	Symbol	Description
1	**IN1 A**	Input A of the NAND gate number 1
2	**IN1 B**	Input B of the NAND gate number 1
3	**OUT1**	Output of the NAND gate number 1
4	**IN2 A**	Input A of the NAND gate number 2
5	**IN2 B**	Input B of the NAND gate number 2
6	**OUT2**	Output of the NAND gate number 2
7	**VSS**	Circuit core ground terminal.
8	**OUT3**	Output of the NAND gate number 3
9	**IN3 B**	Input B of the NAND gate number 3
10	**IN3 A**	Input A of the NAND gate number 3
11	**OUT4**	Output of the NAND gate number 4
12	**IN4 B**	Input B of the NAND gate number 4
13	**IN4 A**	Input A of the NAND gate number 4
14	**VDD**	Circuit core power supply terminal.



Pin	Symbol	Description
1	**IN1 A**	Input A of the NAND gate number 1
2	**IN1 B**	Input B of the NAND gate number 1
3	**OUT1**	Output of the NAND gate number 1
4	**IN2 A**	Input A of the NAND gate number 2
5	**IN2 B**	Input B of the NAND gate number 2
6	**OUT2**	Output of the NAND gate number 2
7	**VSS**	Circuit core ground terminal.
8	**NC**	Not connected
9	**NC**	Not connected
10	**OUT3**	Output of the NAND gate number 3
11	**IN3 B**	Input B of the NAND gate number 3
12	**IN3 A**	Input A of the NAND gate number 3
13	**OUT4**	Output of the NAND gate number 4
14	**IN4 B**	Input B of the NAND gate number 4
15	**IN4 A**	Input A of the NAND gate number 4
16	**VDD**	Circuit core power supply terminal.

Function Table

INPUT		OUTPUT
A	**B**	**Y**
L	**L**	**H**
L	**H**	**H**
H	**L**	**H**
H	**H**	**L**

Function and Logical Diagrams

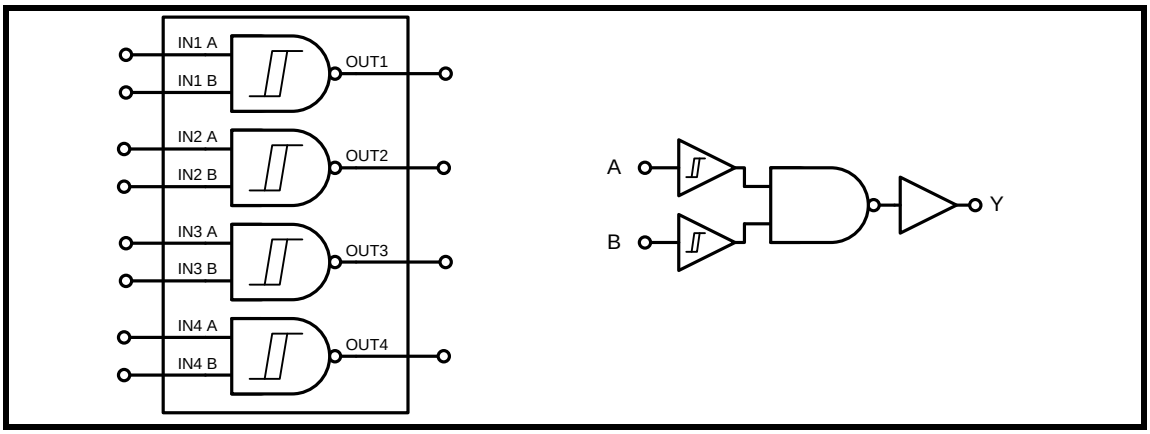


Figure 1. CHT-74132: simplified block diagram.

Absolute Maximum Ratings

Supply Voltage V_{DD} to GND	-0.5 to 5.5V
Voltage on any Pin to GND	-0.5 to V_{DD}+0.5V

ESD Rating (expected)

Human Body Model	>1kV

Operating Conditions

Supply Voltage V_{DD} to GND	3.3V to 5V (±10%)
Junction temperature	-55°C to +225°C

DC Electrical Characteristics

Unless otherwise stated: VDD=5V, T_j=25°C. **Bold** figures indicate values valid over the whole temperature range (-55°C < T_j < +225°C).

Parameter	Condition	Min	Typ	Max	Units
Supply voltage **V_{DD}**			5V		V
Quiescent current **I_{DD}**	T_j=-55°C		0.02		nA
	T_j=225°C		1240		
Minimum HIGH level output voltage **V_{OH}**	I_{OH}<4mA (source)	4.4			V
Maximum LOW level output voltage **V_{OL}**	I_{OL}<4mA (sink)			0.63	V
Minimum HIGH level input voltage **V_{T+}**	T_j=-55°C		3.30		V
	T_j=25°C		3.30		
	T_j=225°C		3.19		
Maximum LOW level input voltage **V_{T-}**	T_j=-55°C		2.12		V
	T_j=25°C		2.14		
	T_j=225°C		2.18		
Hysteresis voltage **V_H**	T_j=-55°C		1.18		V
	T_j=25°C		1.16		
	T_j=225°C		1.01		

DC Electrical Characteristics (cntd)

Unless otherwise stated: VDD=3.3V, T_j=25°C. **Bold** figures indicate values valid over the whole temperature range (-55°C < T_j < +225°C).

Parameter	Condition	Min	Typ	Max	Units
Supply voltage $\mathbf{V_{DD}}$			3.3		V
Quiescent current $\mathbf{I_{DD}}$	T_j=-55°C		0.015		nA
	T_j=225°C		940		
Minimum HIGH level output voltage $\mathbf{V_{OH}}$	I_{OH}<2mA (source)	2.4			V
Maximum LOW level output voltage $\mathbf{V_{OL}}$	I_{OL}<2mA (sink)			0.44	V
Minimum HIGH level input voltage $\mathbf{V_{T+}}$	T_j=-55°C		2.28		V
	T_j=25°C		2.23		
	T_j=225°C		2.17		
Maximum LOW level input voltage $\mathbf{V_{T-}}$	T_j=-55°C		1.23		V
	T_j=25°C		1.28		
	T_j=225°C		1.43		
Hysteresis voltage $\mathbf{V_H}$	T_j=-55°C		1.05		V
	T_j=25°C		0.95		
	T_j=225°C		0.74		

AC Electrical Characteristics

Unless otherwise stated: VDD=5V, T_j=25°C. **Bold** figures indicate values valid over the whole temperature range (-55°C < T_j < +225°C).

Parameter	Condition	Temperature	Min	Typ	Max	Units
Propagation delay time from A or B to Y[1] **t_{PHL}**	C_L=50pF	T_j=-55°C		8.8		ns
		T_j=25°C		10.23		
		T_j=225°C		13.68		
Propagation delay time from A or B to Y **t_{PLH}**	C_L=50pF	T_j=-55°C		9.69		ns
		T_j=25°C		11.42		
		T_j=225°C		16.1		
Output transition time High to Low **t_{THL}**	C_L=50pF	T_j=-55°C		8.17		ns
		T_j=25°C		11.47		
		T_j=225°C		16.39		
Output transition time Low to High **t_{TLH}**	C_L=50pF	T_j=-55°C		9.92		ns
		T_j=25°C		12		
		T_j=225°C		15.4		

[1] Input A is 1% to 2% faster than input B.

AC Electrical Characteristics (cntd)

Unless otherwise stated: VDD=3.3V, T_j=25°C. **Bold** figures indicate values valid over the whole temperature range (-55°C < T_j < +225°C).

Parameter	Condition	Temperature	Min	Typ	Max	Units
Propagation delay time from A or B to Y t_{PHL}	C_L=50pF	T_j=-55°C		13.81		ns
		T_j=25°C		16.25		
		T_j=225°C		21.14		
Propagation delay time from A or B to Y t_{PLH}	C_L=50pF	T_j=-55°C		15.6		ns
		T_j=25°C		19.3		
		T_j=225°C		25.19		
Output transition time High to Low t_{THL}	C_L=50pF	T_j=-55°C		14.04		ns
		T_j=25°C		18.21		
		T_j=225°C		23.46		
Output transition time Low to High t_{TLH}	C_L=50pF	T_j=-55°C		13.78		ns
		T_j=25°C		14.65		
		T_j=225°C		21.3		

AC Waveforms

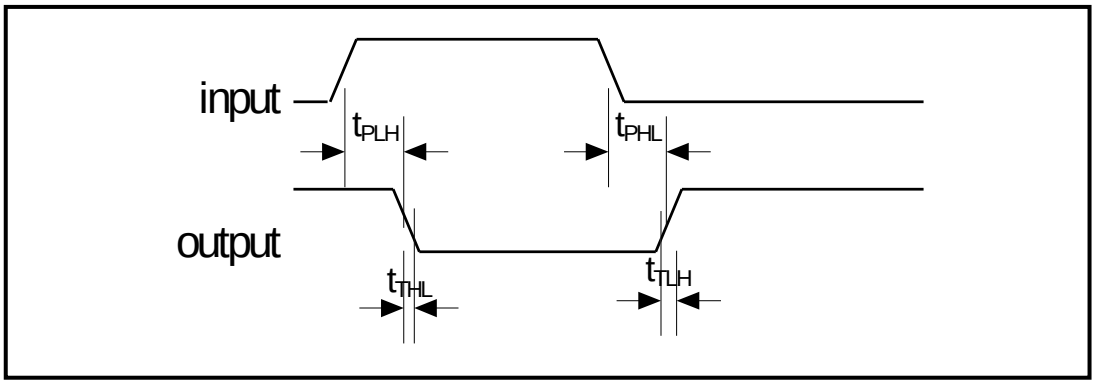
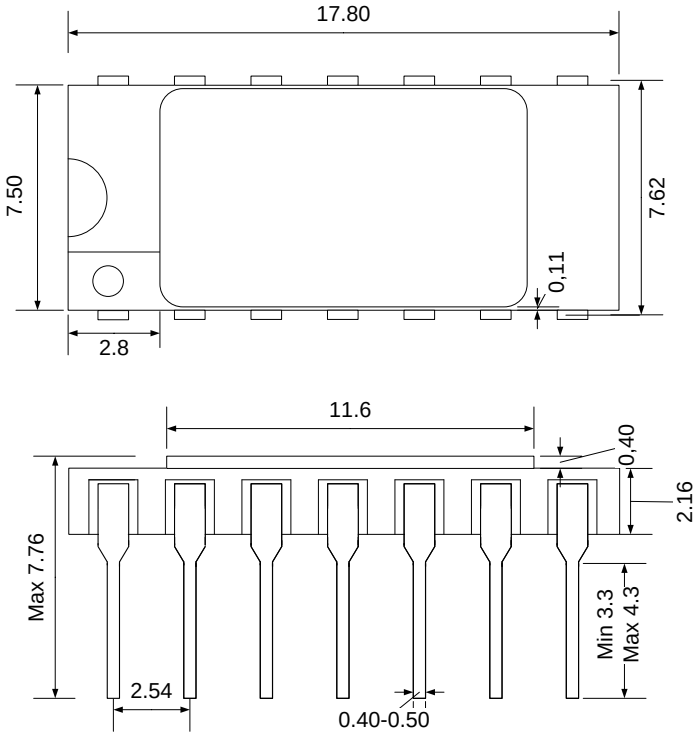


Figure 2. AC Waveforms

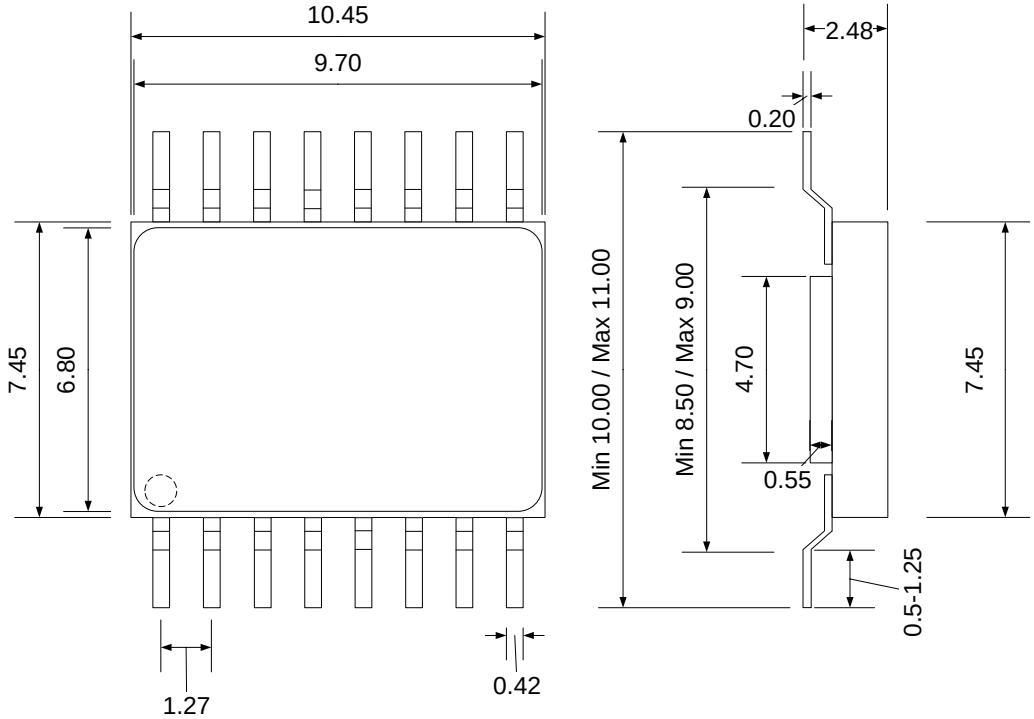
Ordering Information

Ordering Reference	Package	Temperature Range	Marking
CHT-74132-CDIL14-T	Ceramic DIL14	-55°C to +225°C	CHT-74132
CHT-74132-CSOIC16-T	Ceramic SOIC16	-55°C to +225°C	CHT-74132

Package Dimensions



Drawing CDIL14 (mm +/- 10%)



Drawing CSOIC16 (mm +/- 10%)

Contact & Ordering

CISSOID S.A.

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