

## CMT-74132 DATASHEET

Version: 01.4  
19-Feb-20  
(Last Modification Date)

# High-Temperature, Quad 2-Input NAND Schmitt Trigger

### General Description

The CMT-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 CMT-74132 can operate with supply voltages from 3.3 to 5V ( $\pm 10\%$ ).

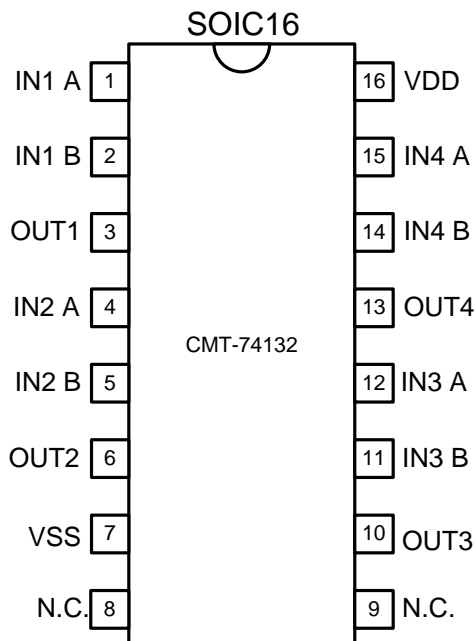
### Features

- Qualified from -55 to +175°C (Tj)
- 3.3 to 5V ( $\pm 10\%$ ) supply voltages
- Latchup-free at any supply and temperature condition
- Validated at 175°C for 20000 hours (and still on-going)
- Available in plastic SOIC16 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	N.C.	No connected terminal.
9	N.C.	No connected terminal.
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**

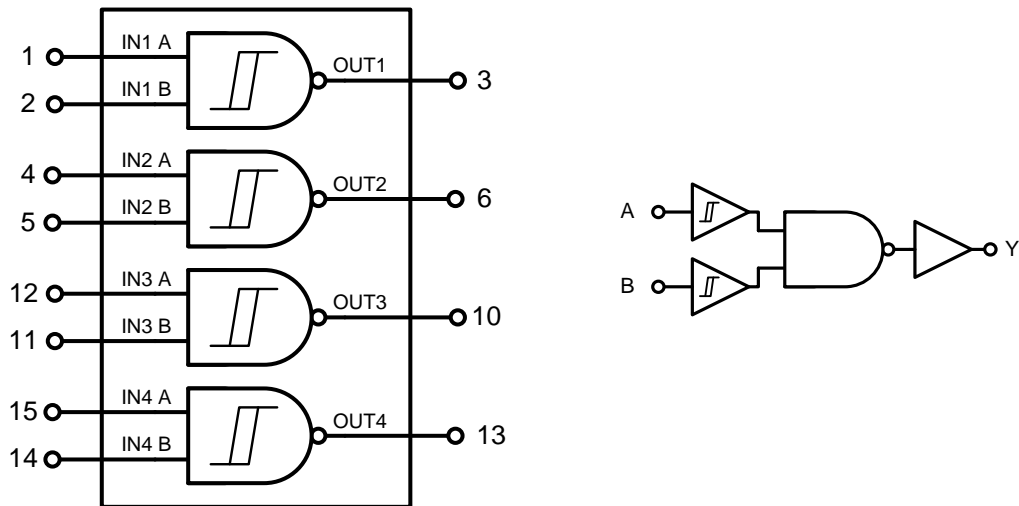


Figure 1. CMT-74132: simplified block diagram.

**Absolute Maximum Ratings**

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

 Supply Voltage  $V_{DD}$  to GND 3.3V to 5V ( $\pm 10\%$ )  
 Junction temperature -55°C to +175°C

**ESD Rating (expected)**

Human Body Model &gt;1kV

**DC Electrical Characteristics**

 Unless otherwise stated:  $V_{DD}=5V$ ,  $T_j=25^\circ C$ . **Bold** figures indicate values valid over the whole temperature range ( $-55^\circ C < T_j < +175^\circ C$ ).

Parameter	Condition	Min	Typ	Max	Units
Supply voltage $V_{DD}$			5V		V
Quiescent current $I_{DD}$	$T_j=-55^\circ C$		0.02		nA
	$T_j=225^\circ C$		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 $V_{I+}$	$T_j=-55^\circ C$		3.30		V
	$T_j=25^\circ C$		3.30		
	$T_j=225^\circ C$		3.19		
Maximum LOW level input voltage $V_{I-}$	$T_j=-55^\circ C$		2.12		V
	$T_j=25^\circ C$		2.14		
	$T_j=225^\circ C$		2.18		
Hysteresis voltage $V_H$	$T_j=-55^\circ C$		1.18		V
	$T_j=25^\circ C$		1.16		
	$T_j=225^\circ C$		1.01		

**DC Electrical Characteristics (cntd)**

Unless otherwise stated:  $V_{DD}=3.3V$ ,  $T_j=25^\circ C$ . **Bold** figures indicate values valid over the whole temperature range ( $-55^\circ C < T_j < +175^\circ C$ ).

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

**AC Electrical Characteristics**

 Unless otherwise stated:  $V_{DD}=5V$ ,  $T_j=25^\circ C$ . **Bold** figures indicate values valid over the whole temperature range ( $-55^\circ C < T_j < +175^\circ C$ ).

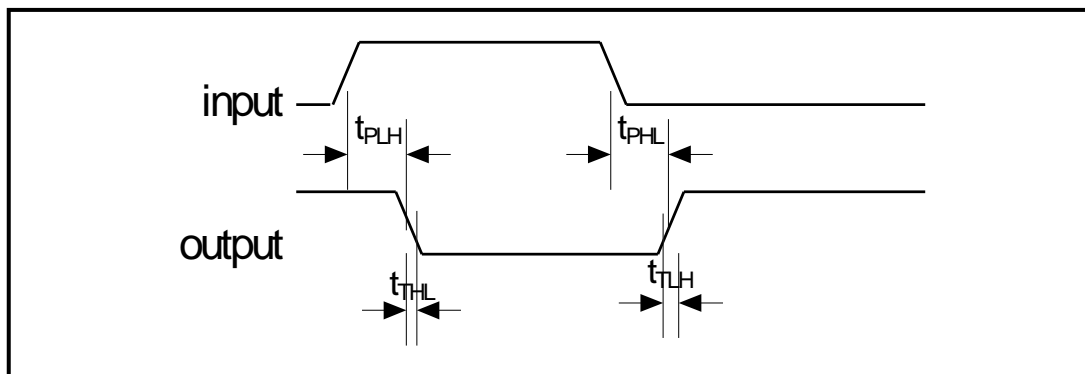
Parameter	Condition	Temperature	Min	Typ	Max	Units
Propagation delay time from A or B to Y <sup>1</sup> $t_{PHL}$	$C_L=50pF$	$T_j=-55^\circ C$		8.8		ns
		$T_j=25^\circ C$		10.23		
		$T_j=225^\circ C$		13.68		
Propagation delay time from A or B to Y $t_{PLH}$	$C_L=50pF$	$T_j=-55^\circ C$		9.69		ns
		$T_j=25^\circ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

<sup>1</sup> Input A is 1% to 2% faster than input B.

**AC Electrical Characteristics (cntd)**

 Unless otherwise stated:  $V_{DD}=3.3V$ ,  $T_j=25^{\circ}C$ . **Bold** figures indicate values valid over the whole temperature range ( $-55^{\circ}C < T_j < +175^{\circ}C$ ).

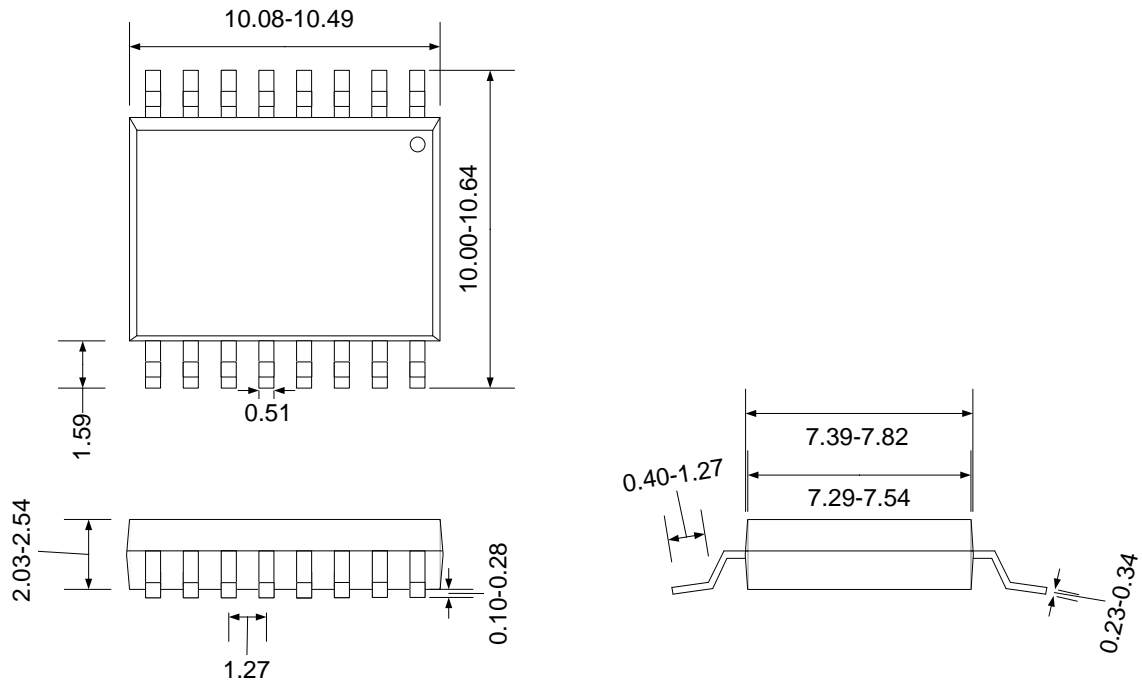
Parameter	Condition	Temperature	Min	Typ	Max	Units
Propagation delay time from A or B to Y $t_{PHL}$	$C_L=50pF$	$T_j=-55^{\circ}C$		13.81		ns
		$T_j=25^{\circ}C$		16.25		
		$T_j=225^{\circ}C$		21.14		
Propagation delay time from A or B to Y $t_{PLH}$	$C_L=50pF$	$T_j=-55^{\circ}C$		15.6		ns
		$T_j=25^{\circ}C$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

**AC Waveforms**

**Figure 2. AC Waveforms**

## Ordering Information

Ordering Reference	Package	Temperature Range	Marking
CMT-74132-PSOIC16-T	Plastic SOIC16	-55°C to +175°C	CMT-74132

## Package dimensions



Drawing PSOIC16 (mm +/- 10%)

## Contact & Ordering

### CISSOID S.A.

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