

# CMT-7400 DATASHEET

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15-Dec-23  
Last Modified Date

## High-Temperature, Quad 2-Inputs NAND Gate

### General Description

The CMT-7400 contains four independent 2-input NAND gates, performing the Boolean function :

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

The CMT-7400 can operate with supply voltages from 3.3 to 5V ( $\pm 10\%$ ).

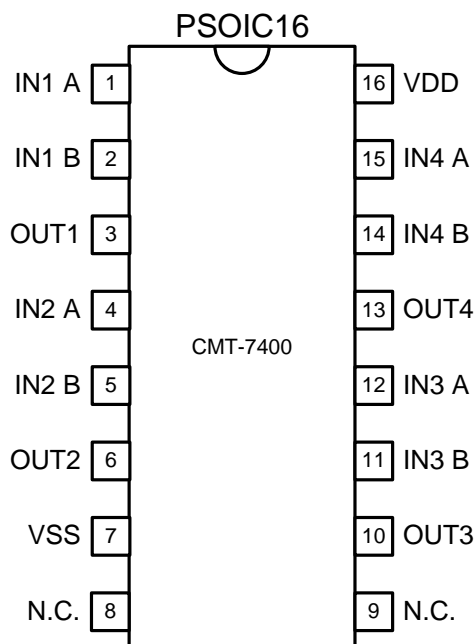
### Features

- 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 SOI16 standard package

### Applications

- Well logging
- Automotive, Aeronautics & Aerospace
- Harsh Environments

### 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

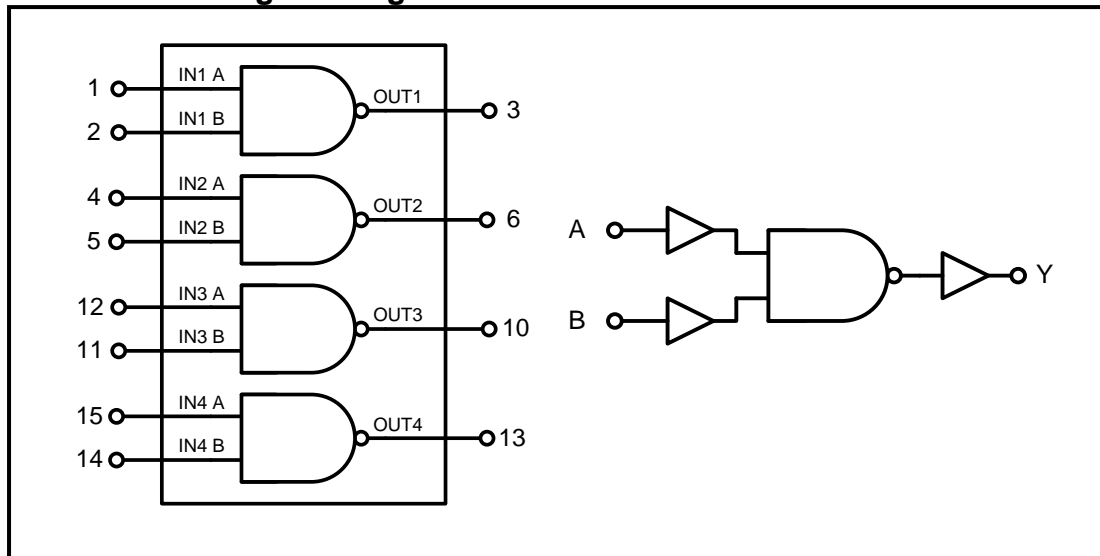


Figure 1. CMT-7400: simplified block diagram.

### Absolute Maximum Ratings

Supply Voltage  $V_{DD}$  to GND -0.7 to 6.0V  
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 1kV

## DC Electrical Characteristics

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

Parameter	Condition	Min	Typ	Max	Units
Supply voltage $V_{DD}$		3.3	5V		V
Quiescent current $I_{DD}$	$V_{DD} = 3.3V, T_j = -55^\circ\text{C}$			4	nA
	$V_{DD} = 5V, T_j = -55^\circ\text{C}$			6	
	$V_{DD} = 3.3V, T_j = 175^\circ\text{C}$			<b><u>685</u></b>	
	$V_{DD} = 5V, T_j = 175^\circ\text{C}$			<b><u>690</u></b>	
Minimum HIGH level output voltage $V_{OH}$	$V_{DD} = 3.3V, I_{OH} < 2\text{mA}$ (source)	<b><u>2.46</u></b>			V
	$V_{DD} = 5V, I_{OH} < 4\text{mA}$ (source)	<b><u>4.47</u></b>			
Maximum LOW level output voltage $V_{OL}$	$V_{DD} = 3.3V, I_{OL} < 2\text{mA}$ (sink)			<b><u>0.41</u></b>	V
	$V_{DD} = 5V, I_{OL} < 4\text{mA}$ (sink)			<b><u>0.59</u></b>	
Minimum HIGH level input voltage $V_{IH}$	$V_{DD} = 3.3V$	<b><u>2.2</u></b>			V
	$V_{DD} = 5V$	<b><u>3.3</u></b>			
Maximum LOW level input voltage $V_{IL}$	$V_{DD} = 3.3V$			<b><u>1.5</u></b>	V
	$V_{DD} = 5V$			<b><u>2.2</u></b>	

### AC Electrical Characteristics

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

Parameter	Condition	Temperature	Min	Typ	Max	Units
Propagation delay time from A or B to Y <sup>1</sup> $t_{PHL}$	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		7.2	9.5	ns
		$T_j=25^\circ\text{C}$		8.7	11.8	
		$T_j=175^\circ\text{C}$		12	16.8	
Propagation delay time from A or B to Y $t_{PLH}$	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		6.2	9	ns
		$T_j=25^\circ\text{C}$		8.2	11.6	
		$T_j=175^\circ\text{C}$		11.4	16.2	
Output transition time High to Low $t_{THL}$	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		6.3	8.1	ns
		$T_j=25^\circ\text{C}$		7.8	10.3	
		$T_j=175^\circ\text{C}$		11.4	15.2	
Output transition time Low to High $t_{TLH}$	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		5.7	7.9	ns
		$T_j=25^\circ\text{C}$		7.4	10.3	
		$T_j=175^\circ\text{C}$		10.6	14.5	

<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 underlined>** 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 $t_{PHL}$	$C_L=50pF$	$T_j=-55^\circ C$		13.9	22	ns
		$T_j=25^\circ C$		16.6	26.4	
		$T_j=175^\circ C$		21.4	34	
Propagation delay time from A or B to Y $t_{PLH}$	$C_L=50pF$	$T_j=-55^\circ C$		12.5	20.5	ns
		$T_j=25^\circ C$		15.3	24.9	
		$T_j=175^\circ C$		19.6	31.5	
Output transition time High to Low $t_{THL}$	$C_L=50pF$	$T_j=-55^\circ C$		12.1	18.7	ns
		$T_j=25^\circ C$		14.5	22.7	
		$T_j=175^\circ C$		19.5	29.8	
Output transition time Low to High $t_{TLH}$	$C_L=50pF$	$T_j=-55^\circ C$		10	16.2	ns
		$T_j=25^\circ C$		12.5	19.9	
		$T_j=175^\circ C$		16.5	23.8	

### AC Waveforms

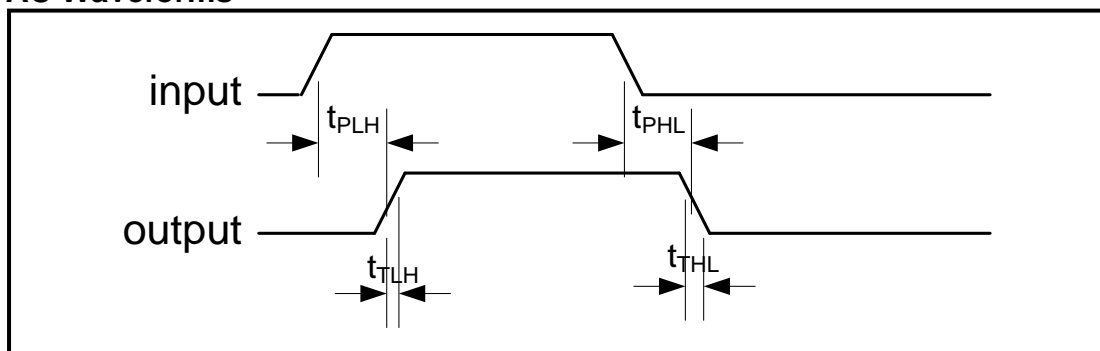
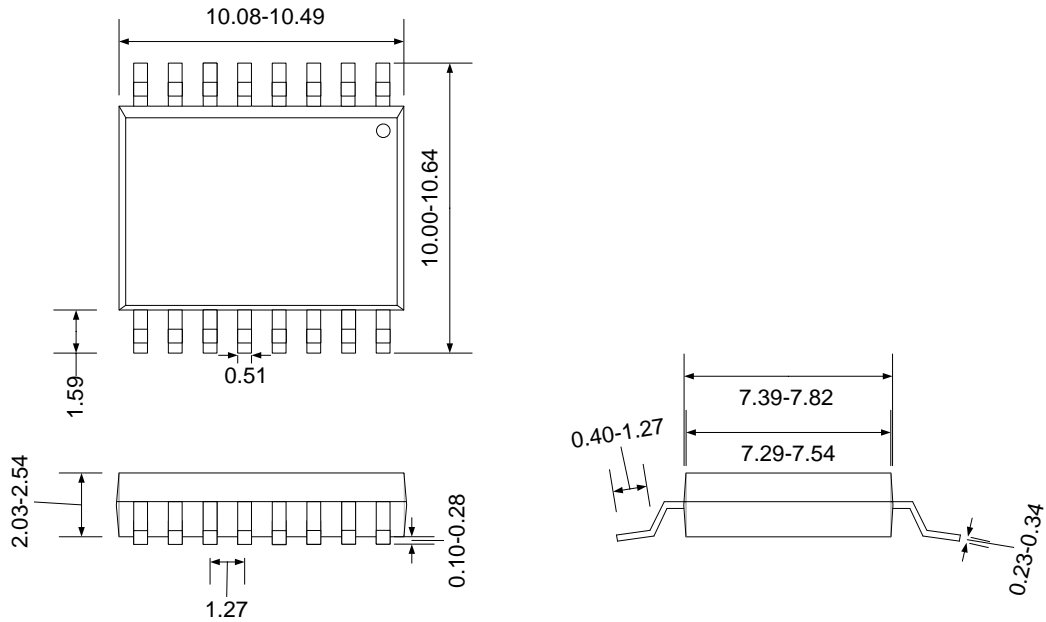


Figure 2. AC Waveforms

## Ordering Information

Ordering Reference	Package	Temperature Range	Marking
CMT-7400-PSOIC16-T	Plastic SOIC16	-55°C to +175°C	CMT-7400

## Package Dimensions



*Drawing PSOIC16 (mm)*

## Contact & Ordering

CISSOID S.A.

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