

# CMT-7408 DATASHEET

Revision: 1.5  
15-Dec-23  
(Last Modified Date)

## High-Temperature, Quad 2-inputs AND Gate

### General Description

The CMT-7408 contains four independent 2-inputs AND gates, performing the Boolean function :

$$Y = A \cdot B$$

The CMT-7408 can operate with supply voltages from 3.3 to 5V ( $\pm 10\%$ ).

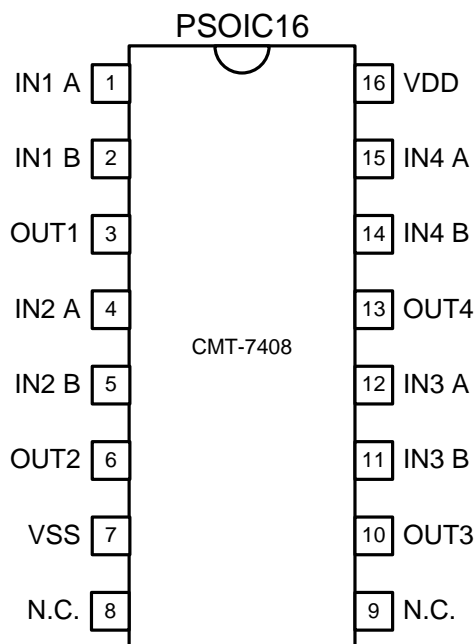
### Features

- 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

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

### Package and Pin Configuration

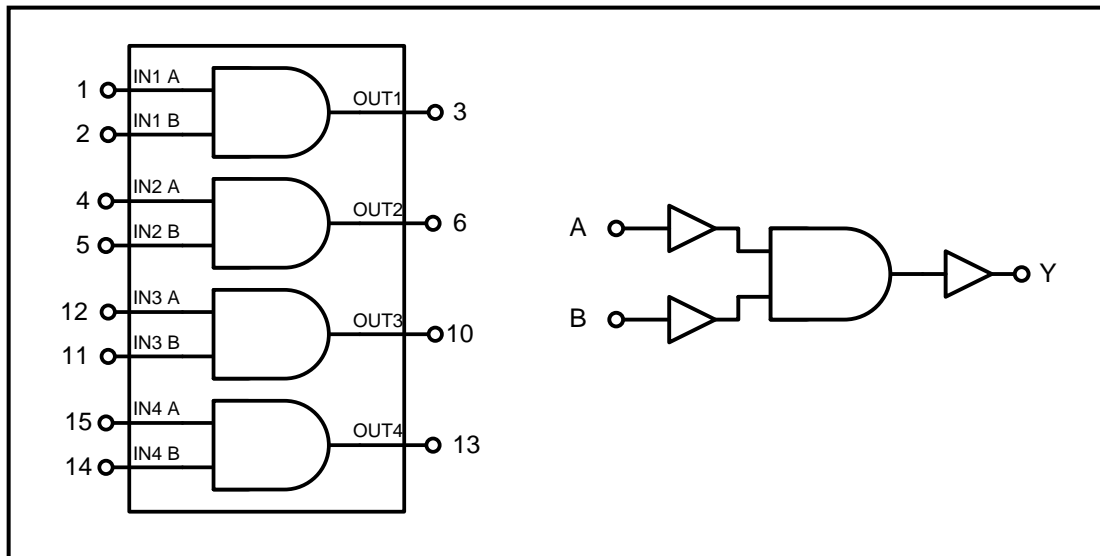


Pin	Symbol	Description
1	IN1 A	Input A of the AND gate number 1
2	IN1 B	Input B of the AND gate number 1
3	OUT1	Output of the AND gate number 1
4	IN2 A	Input A of the AND gate number 2
5	IN2 B	Input B of the AND gate number 2
6	OUT2	Output of the AND gate number 2
7	VSS	Circuit core ground terminal.
8	N.C.	No connected terminal.
9	N.C.	No connected terminal.
10	OUT3	Output of the AND gate number 3
11	IN3 B	Input B of the AND gate number 3
12	IN3 A	Input A of the AND gate number 3
13	OUT4	Output of the AND gate number 4
14	IN4 B	Input B of the AND gate number 4
15	IN4 A	Input A of the AND gate number 4
16	VDD	Circuit core power supply terminal.

**Function Table**

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

**Function and Logical Diagrams**



**Figure 1. CMT-7408: 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> $t_{PHL}$	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		7.78	10.38	ns
		$T_j=25^\circ\text{C}$		9.51	13.00	
		$T_j=175^\circ\text{C}$		13	18.4	
Propagation delay time from A or B to Y $t_{PLH}$	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		6.95	9.57	ns
		$T_j=25^\circ\text{C}$		8.69	12.23	
		$T_j=175^\circ\text{C}$		12	17.2	
Output transition time High to Low $t_{THL}$	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		3.28	8.10	ns
		$T_j=25^\circ\text{C}$		7.44	10.35	
		$T_j=175^\circ\text{C}$		11.2	15.2	
Output transition time Low to High $t_{TLH}$	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		5.66	7.87	ns
		$T_j=25^\circ\text{C}$		7.44	10.35	
		$T_j=175^\circ\text{C}$		10.5	14.5	

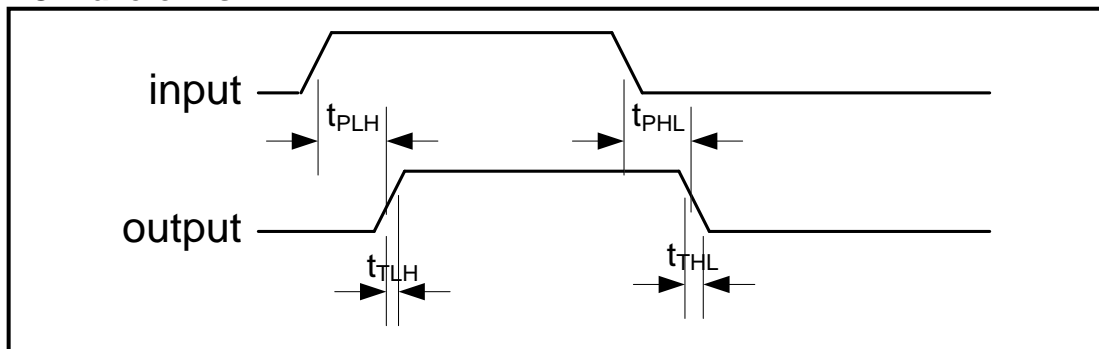
<sup>1</sup> Input A is 1% to 2% faster than input B.

### 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 $t_{PHL}$	$C_L=50pF$	$T_j=-55^\circ C$		15.07	24.04	ns
		$T_j=25^\circ C$		18.04	28.89	
		$T_j=175^\circ C$		23.2	37	
Propagation delay time from A or B to Y $t_{PLH}$	$C_L=50pF$	$T_j=-55^\circ C$		13.51	22.06	ns
		$T_j=25^\circ C$		16.50	26.91	
		$T_j=175^\circ C$		21.2	34.2	
Output transition time High to Low $t_{THL}$	$C_L=50pF$	$T_j=-55^\circ C$		12.07	19.16	ns
		$T_j=25^\circ C$		14.57	22.76	
		$T_j=175^\circ C$		19.8	30	
Output transition time Low to High $t_{TLH}$	$C_L=50pF$	$T_j=-55^\circ C$		10.02	16.11	ns
		$T_j=25^\circ C$		12.49	19.6	
		$T_j=175^\circ C$		16.4	25	

### AC Waveforms

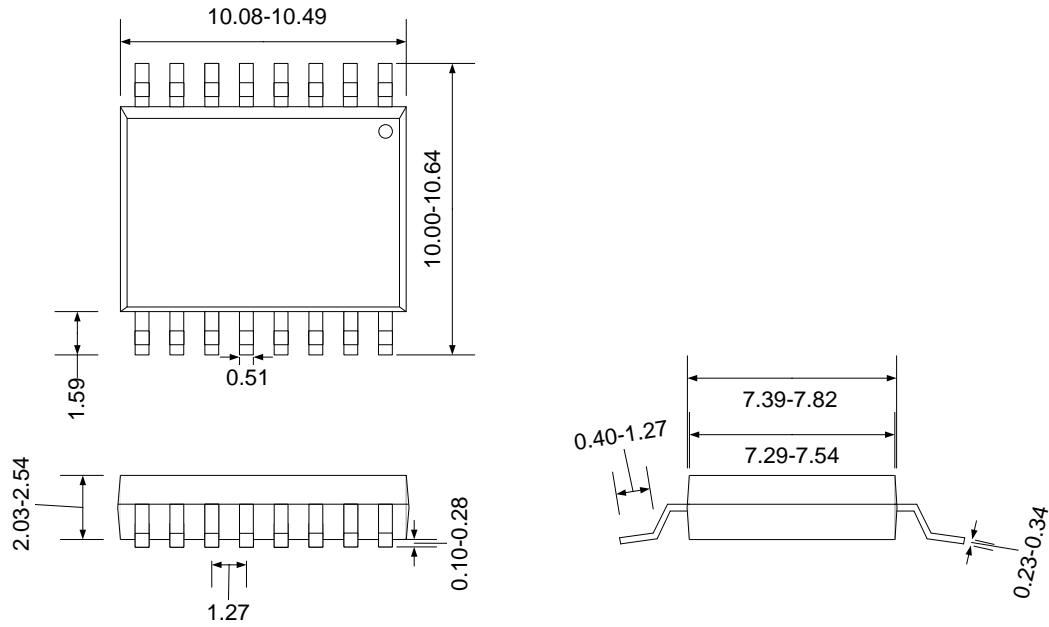


**Figure 2. AC Waveforms**

## Ordering Information

Ordering Reference	Package	Temperature Range	Marking
CMT-7408-PSOIC16-T	Plastic SOIC16	-55°C to +175°C	CMT-7408

## Package Dimensions



*Drawing PSOIC16 (mm +/- 10%)*

## Contact & Ordering

CISSOID S.A.

<b>Headquarters and contact EMEA:</b>	CISSOID S.A. – Rue Francqui, 11 – 1435 Mont Saint Guibert - Belgium T : +32 10 48 92 10 - F: +32 10 88 98 75 Email: <a href="mailto:sales@cissoid.com">sales@cissoid.com</a>
<b>Sales Representatives:</b>	<b>Visit our website: <a href="http://www.cissoid.com">http://www.cissoid.com</a></b>

## Disclaimer

*Neither CISSOID, nor any of its directors, employees or affiliates make any representations or extend any warranties of any kind, either express or implied, including but not limited to warranties of merchantability, fitness for a particular purpose, and the absence of latent or other defects, whether or not discoverable. In no event shall CISSOID, its directors, employees and affiliates be liable for direct, indirect, special, incidental or consequential damages of any kind arising out of the use of its circuits and their documentation, even if they have been advised of the possibility of such a damage. The circuits are provided "as is". CISSOID has no obligation to provide maintenance, support, updates, or modifications.*