

CMT-7408 DATASHEET

Revision: 01.2
10-Nov-10
(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 ($\pm 10\%$).

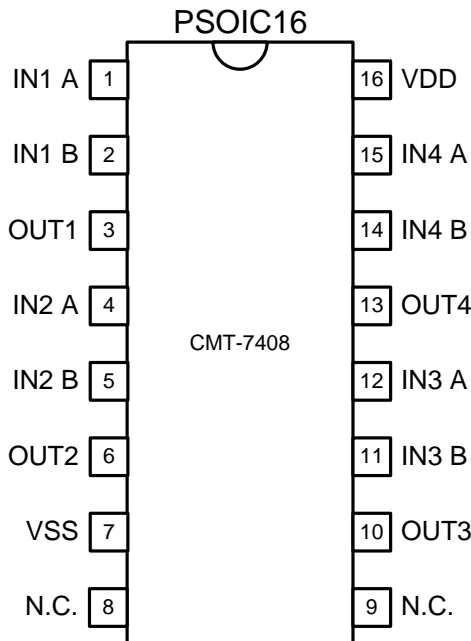
Features

- Qualified from -55 to +175°C (Tj)
- 3.3 to 5V ($\pm 10\%$) supply voltages
- Latchup-free at any supply and temperature condition
- 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

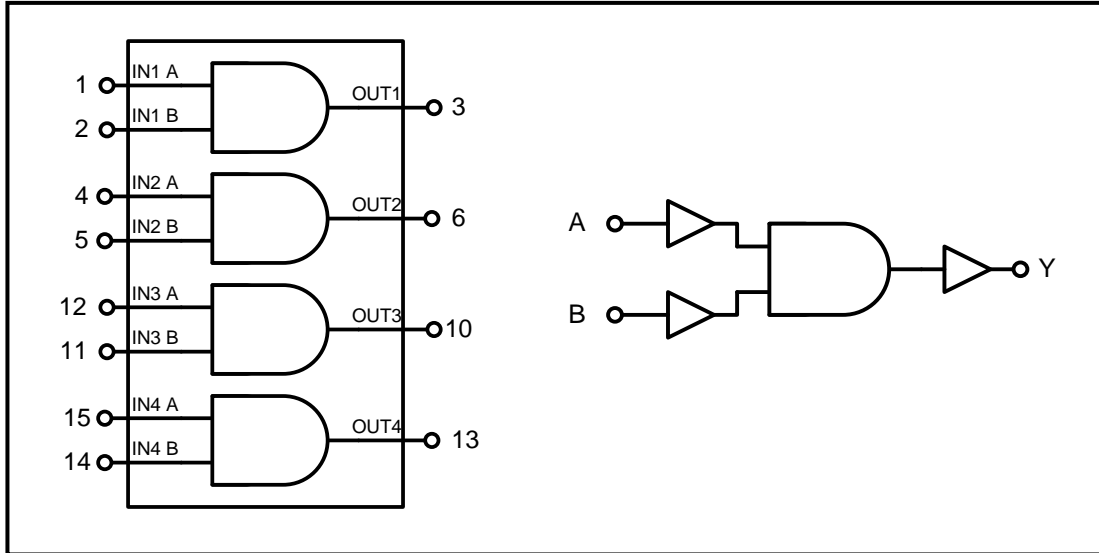


Figure 1. CMT-7408: simplified block diagram.

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	
	$V_{DD} = 3.3V, T_j = 175^\circ\text{C}$			<u>685</u>	
	$V_{DD} = 5V, T_j = 175^\circ\text{C}$			<u>690</u>	
Minimum HIGH level output voltage V_{OH}	$V_{DD} = 3.3V, I_{OH} < 2\text{mA}$ (source)	<u>2.46</u>			V
	$V_{DD} = 5V, I_{OH} < 4\text{mA}$ (source)	<u>4.47</u>			
Maximum LOW level output voltage V_{OL}	$V_{DD} = 3.3V, I_{OL} < 2\text{mA}$ (sink)			<u>0.41</u>	V
	$V_{DD} = 5V, I_{OL} < 4\text{mA}$ (sink)			<u>0.59</u>	
Minimum HIGH level input voltage V_{IH}	$V_{DD} = 3.3V$	<u>2.2</u>			V
	$V_{DD} = 5V$	<u>3.3</u>			
Maximum LOW level input voltage V_{IL}	$V_{DD} = 3.3V$			<u>1.5</u>	V
	$V_{DD} = 5V$			<u>2.2</u>	

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 ($-55^\circ\text{C} < T_j < +175^\circ\text{C}$).

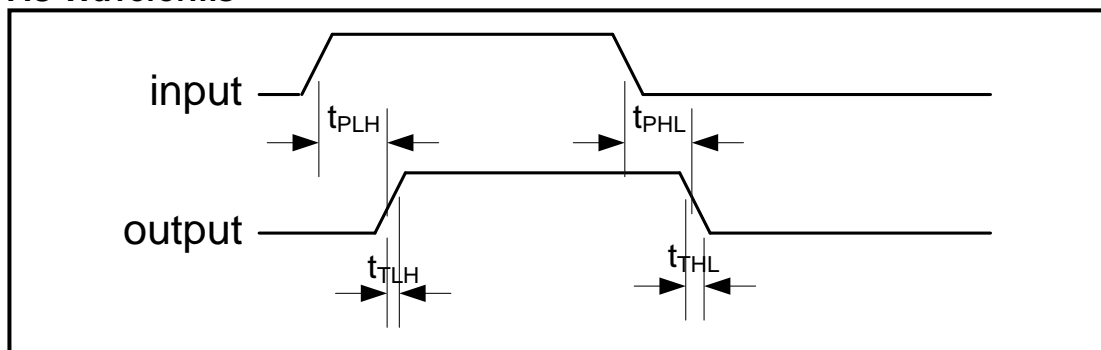
Parameter	Condition	Temperature	Min	Typ	Max	Units
Propagation delay time from A or B to Y ¹ t_{PHL}	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		7.78	10.38	ns
		$T_j=25^\circ\text{C}$		9.51	13.00	
		$T_j=175^\circ\text{C}$		13	18.4	
Propagation delay time from A or B to Y t_{PLH}	$C_L=50\text{pF}$	$T_j=-55^\circ\text{C}$		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	

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

AC Electrical Characteristics (cntd)

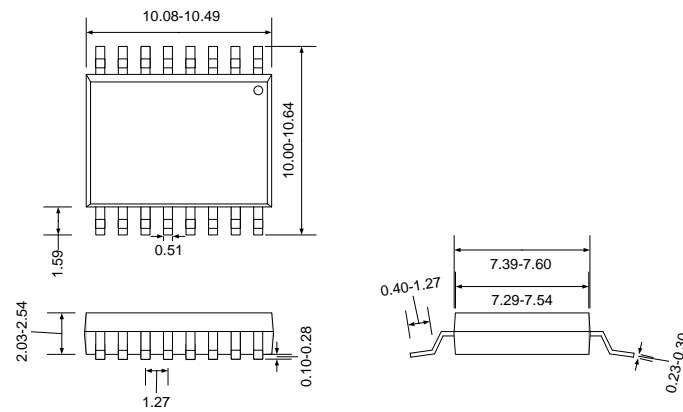
 Unless otherwise stated: $V_{DD}=3.3V$, $T_j=25^{\circ}C$. **Bold underlined** figures indicate values valid over the whole temperature range ($-55^{\circ}C < T_j < +175^{\circ}C$).

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	$-55^{\circ}C$ to $+175^{\circ}C$	CMT-7408

Package Dimensions



Drawing PSOIC16 (mm +/- 10%)

Contact & Ordering

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