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SEMICONDUCTOR

MM74C08 Quad 2-Input AND Gate

General Description

The MM74C08 employs complementary MOS (CMOS) transistors to achieve wide power supply operating range, low power consumption and high noise margin, these gates provide basic functions used in the implementation of digital integrated circuit systems. The N- and P-channel enhancement mode transistors provide a symmetrical circuit with output swing essentially equal to the supply voltage. No DC power other than that caused by leakage current is consumed during static condition. All inputs are

protected from damage due to static discharge by diode clamps to V_{CC} and GND.

Features

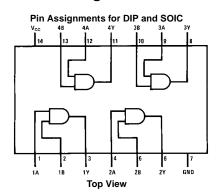
- Wide supply voltage range: 3.0V to 15V
- Guaranteed noise margin: 1.0V
- High noise immunity: 0.45 V_{CC} (typ.)
- Low power TTL compatibility: Fan out of 2 driving 74L
- Low power consumption: 10 nW/package (typ.)

Ordering Code:

Order Number	Package Number	Package Description
MM74C08M	M14A	14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150" Narrow
MM74CD8N	N14A	14-Lead Plastic Dual-in-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

Devices also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

Connection Diagram



Truth Table

Inp	Inputs	
Α	В	Y
L	L	L
L	Н	L
н	L	L
н	Н	н

H = HIGH Level L = LOW Level

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Absolute Maximum Ratings(Note 1)

Voltage at Any Pin	$-0.3V$ to $V_{CC} + 0.3V$
Operating Temperature Range	$-40^{\circ}C$ to $+85^{\circ}C$
Storage Temperature Range	$-65^{\circ}C$ to $+150^{\circ}C$
Power Dissipation (P _D)	
Dual-In-Line	700 mW
Small Outline	500 mW
Operating V _{CC} Range	3.0V to 15V

Absolute Maximum V _{CC}
Lead Temperature
(Soldering, 10 seconds)

18V

260°C

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The Electrical Characteristics table provides conditions for actual device operation.

DC Electrical Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Units
CMOS TO C	MOS	I				1
V _{IN(1)} Logi	Logical "1" Input Voltage	$V_{CC} = 5.0V$	3.5			V
		$V_{CC} = 10V$	8.0			V
V _{IN(0)}	Logical "0" Input Voltage	$V_{CC} = 5.0V$			1.5	V
		$V_{CC} = 10V$			2.0	V
V _{OUT(1)}	Logical "1" Output Voltage	$V_{CC} = 5.0V, I_{O} = -10 \ \mu A$	4.5			V
		$V_{CC} = 10V$, $I_{O} = -10 \ \mu A$	9.0			V
V _{OUT(0)}	Logical "0" Output Voltage	$V_{CC} = 5.0V, I_{O} = 10 \mu A$			0.5	V
		$V_{CC} = 10V$, $I_{O} = 10 \ \mu A$			1.0	V
I _{IN(1)}	Logical "1" Input Current	V _{CC} = 15V, V _{IN} = 15V		0.005	1.0	μΑ
I _{IN(0)}	Logical "0" Input Current	$V_{CC} = 15V, V_{IN} = 0V$	-1.0	-0.005		μΑ
I _{CC}	Supply Current	$V_{CC} = 15V$		0.01	15	μΑ
CMOS/LPTT						
V _{IN(1)}	Logical "1" Input Voltage	74C, V _{CC} = 4.75V	V _{CC} – 1.5			V
V _{IN(0)}	Logical "0" Input Voltage	74C, V _{CC} = 4.75V			0.8	V
V _{OUT(1)}	Logical "1" Output Voltage	74C, $V_{CC} = 4.75V$, $I_O = -360 \mu A$	2.4			V
V _{OUT(0)}	Logical "0" Output Voltage	74C, $V_{CC} = 4.75V$, $I_{O} = 360 \ \mu A$			0.4	V
OUTPUT DR	IVE (see Family Characteristics D	ata Sheet) T _A = 25°C (short circuit current)			
ISOURCE	Output Source Current (P-Channel)	$V_{CC} = 5.0V, V_{OUT} = 0V$	-1.75	-3.3		mA
ISOURCE	Output Source Current	$V_{CC} = 10V, V_{OUT} = 0V$	-8.0	15		mA
	(P-Channel)					
I _{SINK}	Output Sink Current	$V_{CC} = 5.0V, V_{OUT} = V_{CC}$	1.75	3.6		mA
	(N-Channel)					
I _{SINK}	Output Sink Current	$V_{CC} = 10V, V_{OUT} = V_{CC}$	8.0	16		mA
	(N-Channel)					1

AC Electrical Characteristics (Note 2)

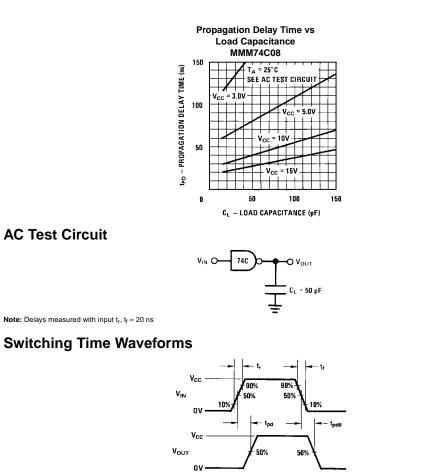
Symbol	Parameter	Conditions	Min	Тур	Max	Units
t _{pd0} , t _{pd1}	Propagation Delay Time to	$V_{CC} = 5.0V$		80	140	ns
	Logical "1" or "0"	$V_{CC} = 10V$		40	70	ns
CIN	Input Capacitance	(Note 3)		5.0		pF
C _{PD}	Power Dissipation Capacitance	(Note 4) Per Gate		14		pF

Note 2: AC Parameters are guaranteed by DC correlated testing.

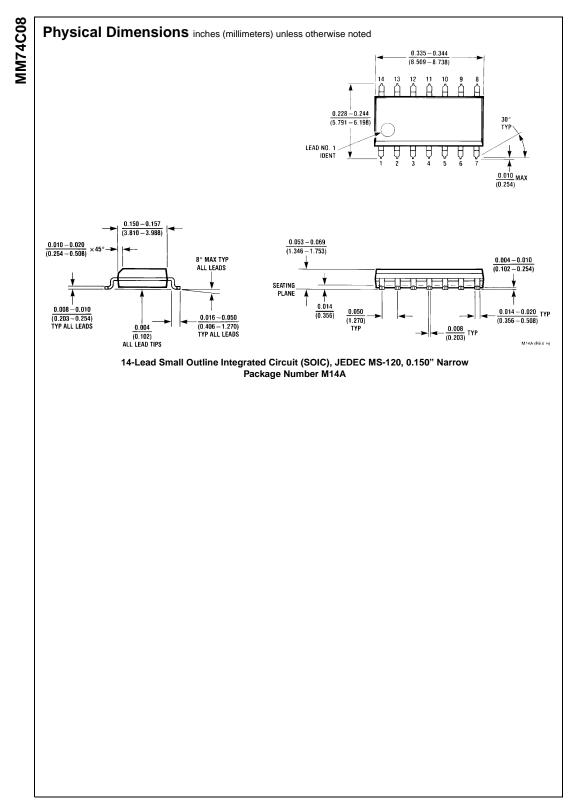
Note 3: Capacitance is guaranteed by periodic testing.

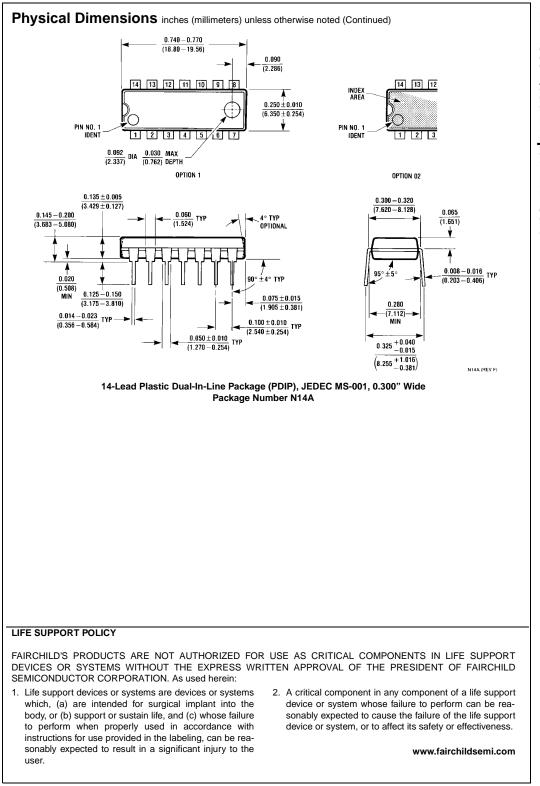
Note 4: C_{PD} determines the no load AC power consumption of any CMOS device. For complete explanation see Family Characteristics Application Note— AN-90.

Typical Performance Characteristics



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