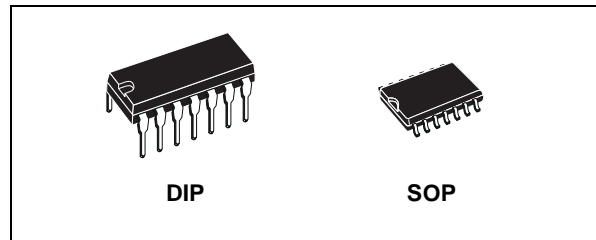




HCF4068B

8 INPUT NAND/AND GATE

- MEDIUM-SPEED OPERATION
 $t_{PHL}, t_{PLH} = 75\text{ns}$ (Typ.) at 10V
- BUFFERED OUTPUT
- QUIESCENT CURRENT SPECIFIED UP TO 20V
- 5V, 10V AND 15V PARAMETRIC RATINGS
- INPUT LEAKAGE CURRENT
 $I_l = 100\text{nA}$ (MAX) AT $V_{DD} = 18\text{V}$ $T_A = 25^\circ\text{C}$
- 100% TESTED FOR QUIESCENT CURRENT
- MEETS ALL REQUIREMENTS OF JEDEC JESD13B "STANDARD SPECIFICATIONS FOR DESCRIPTION OF B SERIES CMOS DEVICES"



ORDER CODES

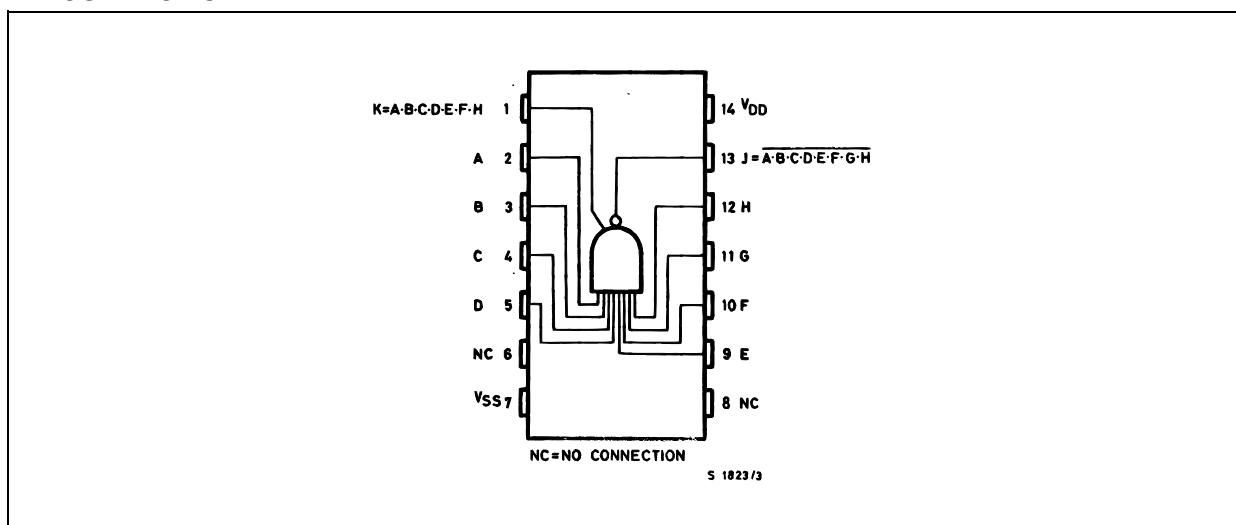
PACKAGE	TUBE	T & R
DIP	HCF4068BEY	
SOP	HCF4068BM1	HCF4068M013TR

DESCRIPTION

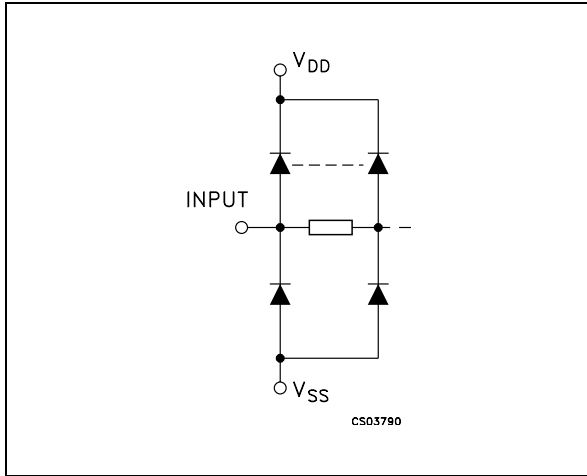
The HCF4068B is a monolithic integrated circuit fabricated in Metal Oxide Semiconductor technology available in DIP and SOP packages. The HCF4068B 8 INPUT NAND/AND GATE provide the system designer with direct

implementation of the positive-logic 8-input NAND and AND functions and supplements the existing family of CMOS gates.

PIN CONNECTION



INPUT EQUIVALENT CIRCUIT



TRUTH TABLES

INPUTS								OUTPUT
A	B	C	D	E	F	G	H	J (NAND)
L	X	X	X	X	X	X	X	H
X	L	X	X	X	X	X	X	H
X	X	L	X	X	X	X	X	H
X	X	X	L	X	X	X	X	H
X	X	X	X	L	X	X	X	H
X	X	X	X	X	L	X	X	H
X	X	X	X	X	X	L	X	H
X	X	X	X	X	X	X	L	H
H	H	H	H	H	H	H	H	L

INPUTS								OUTPUT
A	B	C	D	E	F	G	H	K (AND)
L	X	X	X	X	X	X	X	L
X	L	X	X	X	X	X	X	L
X	X	L	X	X	X	X	X	L
X	X	X	L	X	X	X	X	L
X	X	X	X	L	X	X	X	L
X	X	X	X	X	L	X	X	L
X	X	X	X	X	X	L	X	L
X	X	X	X	X	X	X	L	L
H	H	H	H	H	H	H	H	H

PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
2, 3, 4, 5, 9, 10, 11, 12	A, B, C, D, E, F, G, H	Data Inputs
6, 8	NC	Not Connected
1	K	Data Output (AND)
13	J	Data Output (NAND)
7	V _{SS}	Negative Supply Voltage
14	V _{DD}	Positive Supply Voltage

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DD}	Supply Voltage	-0.5 to +22	V
V _I	DC Input Voltage	-0.5 to V _{DD} + 0.5	V
I _I	DC Input Current	± 10	mA
P _D	Power Dissipation per Package	200	mW
	Power Dissipation per Output Transistor	100	mW
T _{op}	Operating Temperature	-55 to +125	°C
T _{stg}	Storage Temperature	-65 to +150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. All voltage values are referred to V_{SS} pin voltage.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V _{DD}	Supply Voltage	3 to 20	V
V _I	Input Voltage	0 to V _{DD}	V
T _{op}	Operating Temperature	-55 to 125	°C

DC SPECIFICATIONS

Symbol	Parameter	Test Condition				Value						Unit	
		V _I (V)	V _O (V)	I _{OL} (μ A)	V _{DD} (V)	T _A = 25°C			-40 to 85°C		-55 to 125°C		
						Min.	Typ.	Max.	Min.	Max.	Min.		Max.
I _L	Quiescent Current	0/5			5		0.01	0.25		7.5		7.5	μ A
		0/10			10		0.01	0.5		15		15	
		0/15			15		0.01	1		30		30	
		0/20			20		0.02	5		150		150	
V _{OH}	High Level Output Voltage	0/5		<1	5	4.95			4.95		4.95		V
		0/10		<1	10	9.95			9.95		9.95		
		0/15		<1	15	14.95			14.95		14.95		
V _{OL}	Low Level Output Voltage	5/0		<1	5		0.05			0.05		0.05	V
		10/0		<1	10		0.05			0.05		0.05	
		15/0		<1	15		0.05			0.05		0.05	
V _{IH}	High Level Input Voltage		0.5/4.5	<1	5	3.5			3.5		3.5		V
			1/9	<1	10	7			7		7		
			1.5/13.5	<1	15	11			11		11		
V _{IL}	Low Level Input Voltage		4.5/0.5	<1	5			1.5		1.5		1.5	V
			9/1	<1	10			3		3		3	
			13.5/1.5	<1	15			4		4		4	
I _{OH}	Output Drive Current	0/5	2.5	<1	5	-1.36	-3.2		-1.15		-1.1		mA
		0/5	4.6	<1	5	-0.44	-1		-0.36		-0.36		
		0/10	9.5	<1	10	-1.1	-2.6		-0.9		-0.9		
		0/15	13.5	<1	15	-3.0	-6.8		-2.4		-2.4		
I _{OL}	Output Sink Current	0/5	0.4	<1	5	0.44	1		0.36		0.36		mA
		0/10	0.5	<1	10	1.1	2.6		0.9		0.9		
		0/15	1.5	<1	15	3.0	6.8		2.4		2.4		
I _I	Input Leakage Current	0/18	Any Input		18		$\pm 10^{-5}$	± 0.1		± 1		± 1	μ A
C _I	Input Capacitance		Any Input				5	7.5					pF

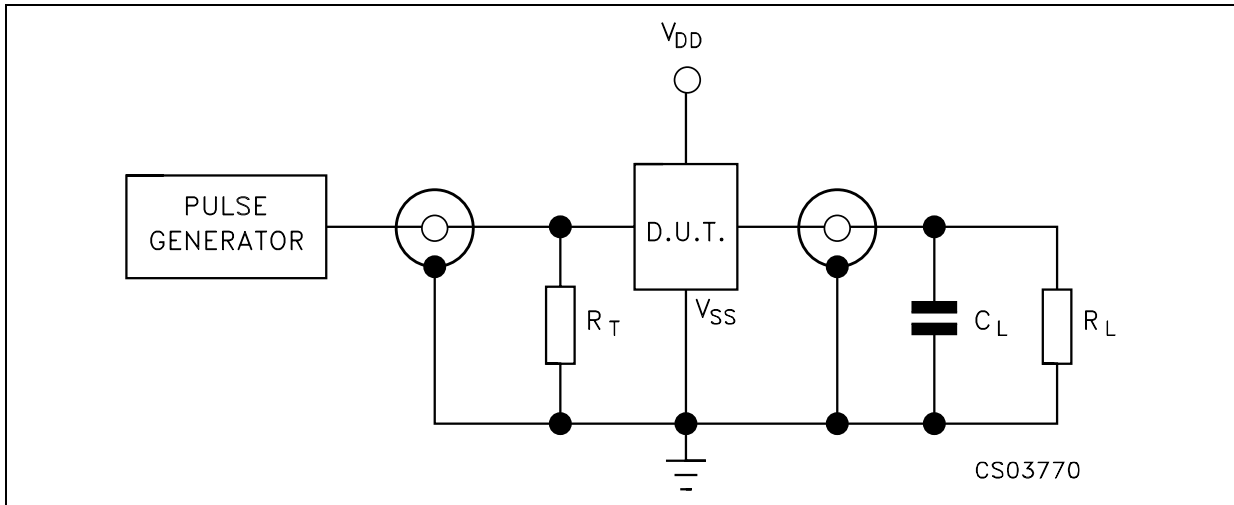
The Noise Margin for both "1" and "0" level is: 1V min. with V_{DD}=5V, 2V min. with V_{DD}=10V, 2.5V min. with V_{DD}=15V

DYNAMIC ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C, C_L = 50pF, R_L = 200K Ω , t_r = t_f = 20 ns)

Symbol	Parameter	Test Condition		Value (*)			Unit
		V _{DD} (V)		Min.	Typ.	Max.	
t _{PLH} t _{PHL}	Propagation Delay Time	5			150	300	ns
		10			75	150	
		15			55	110	
t _{TLH} t _{THL}	Output Transition Time	5			100	200	ns
		10			50	100	
		15			40	80	

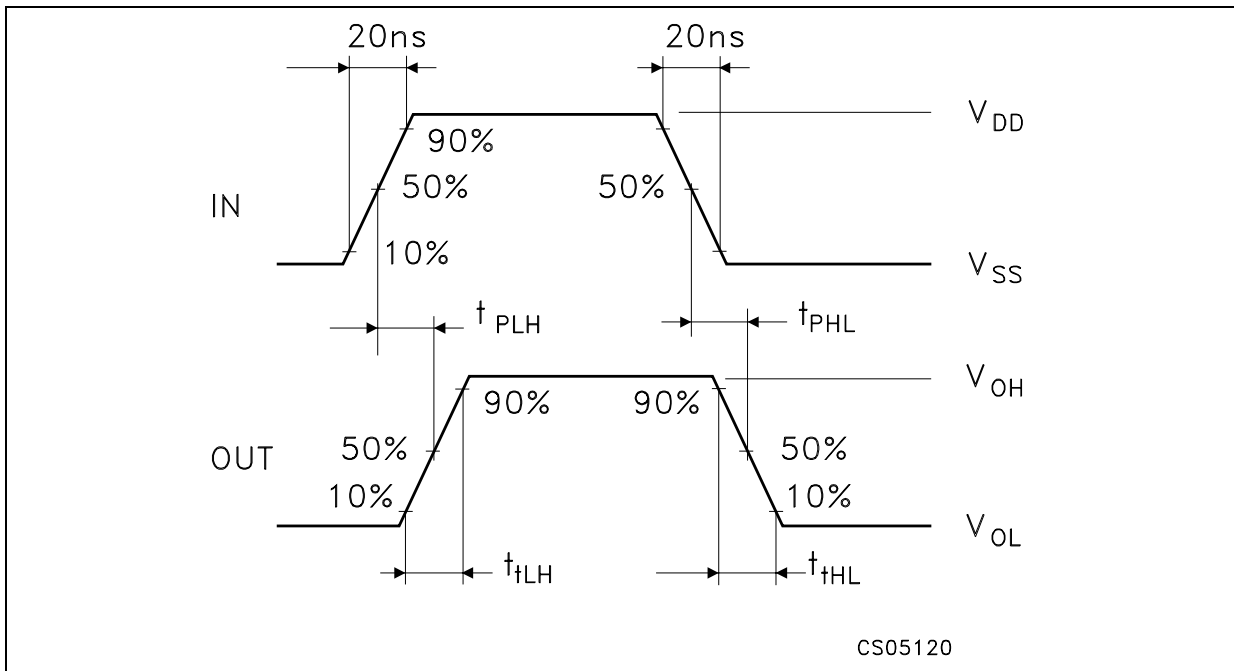
(*) Typical temperature coefficient for all V_{DD} value is 0.3 %/°C.

TEST CIRCUIT

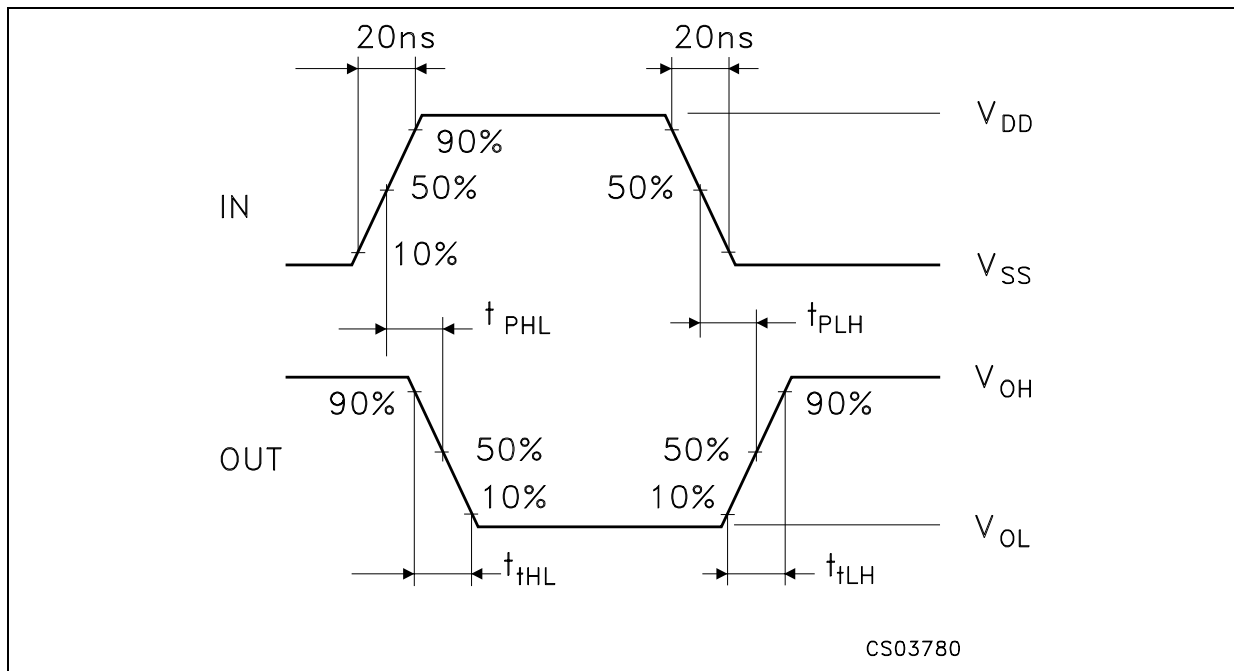


$C_L = 50\text{pF}$ or equivalent (includes jig and probe capacitance)
 $R_L = 200\text{K}\Omega$
 $R_T = Z_{OUT}$ of pulse generator (typically 50Ω)

WAVEFORM 1 : PROPAGATION DELAY TIMES FOR K OUTPUT (AND FUNCTION) ($f=1\text{MHz}$; 50% duty cycle)



WAVEFORM 2 : PROPAGATION DELAY TIMES FOR J OUTPUT (NAND FUNCTION)(f=1MHz; 50% duty cycle)



Plastic DIP-14 MECHANICAL DATA						
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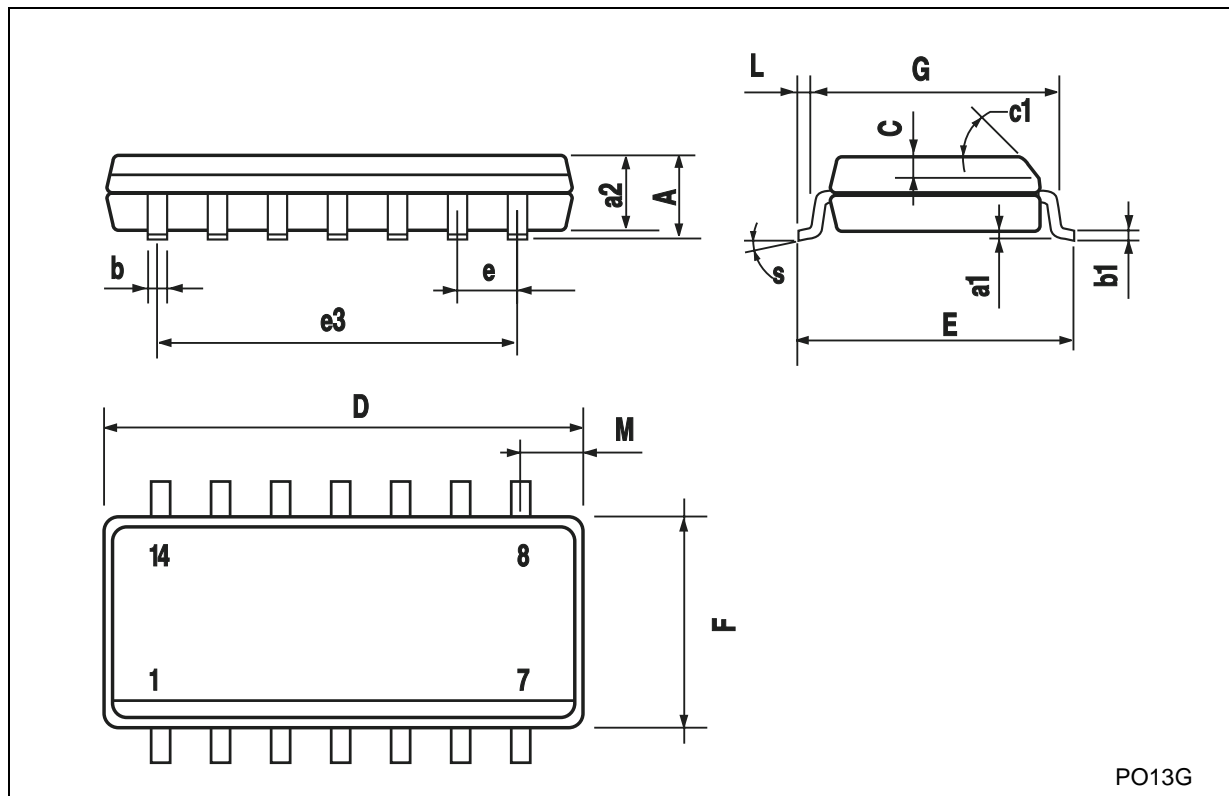
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	1.39		1.65	0.055		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		15.24			0.600	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z	1.27		2.54	0.050		0.100



P001A

SO-14 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.2	0.003		0.007
a2			1.65			0.064
b	0.35		0.46	0.013		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.019	
c1	45° (typ.)					
D	8.55		8.75	0.336		0.344
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		7.62			0.300	
F	3.8		4.0	0.149		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.019		0.050
M			0.68			0.026
S	8° (max.)					



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