

CD4073B, CD4081B, CD4082B Types

CMOS AND Gates

High-Voltage Types (20-Volt Rating)

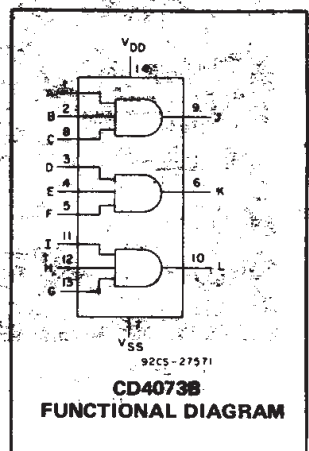
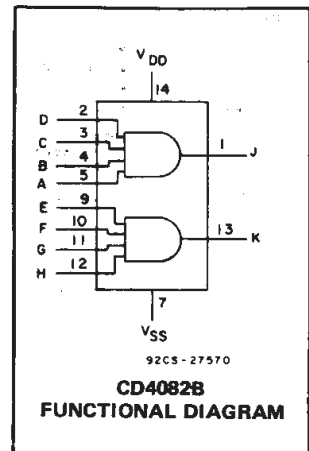
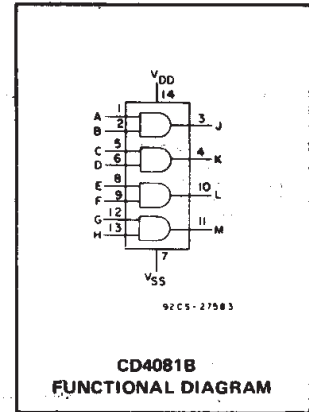
CD4073B Triple 3-Input AND Gate
CD4081B Quad 2-Input AND Gate
CD4082B Dual 4-Input AND Gate

■ CD4073B, CD4081B and CD-4082B AND gates provide the system designer with direct implementation of the AND function and supplement the existing family of CMOS gates.

The CD4073B, CD4081B and CD4082B types are supplied in 14-lead dual-in-line ceramic packages (D and F suffixes), 14-lead dual-in-line plastic packages (E suffix), and in chip form (H suffix).

Features:

- Medium-Speed Operation – t_{PLH} , $t_{PHL} = 60$ ns (typ.) at $V_{DD} = 10$ V
- 100% tested for quiescent current at 20 V
- Maximum input current of $1 \mu A$ at 18 V over full package-temperature range; 100 nA at 18 V and 25°C
- Noise margin (full package-temperature range) =
 - 1 V at $V_{DD} = 5$ V
 - 2 V at $V_{DD} = 10$ V
 - 2.5 V at $V_{DD} = 15$ V
- Standardized, symmetrical output characteristics
- 5-V, 10-V, and 15-V parametric ratings
- Meets all requirements of JEDEC Tentative Standard No. 13B, "Standard Specifications for Description of 'B' Series CMOS Devices"



MAXIMUM RATINGS, Absolute-Maximum Values:

DC SUPPLY-VOLTAGE RANGE (V_{DD})	-0.5V to +20V	
Voltages referenced to V_{SS} Terminal		
INPUT VOLTAGE RANGE, ALL INPUTS	-0.5V to $V_{DD} + 0.5V$	
DC INPUT CURRENT, ANY ONE INPUT	± 10 mA	
POWER DISSIPATION PER PACKAGE (P_D):		
For $T_A = -55^\circ C$ to $+100^\circ C$	500mW	
For $T_A = +100^\circ C$ to $+125^\circ C$	Derate Linearly at 12mW/ $^\circ C$ to 200mW	
DEVICE DISSIPATION PER OUTPUT TRANSISTOR		
FOR $T_A =$ FULL PACKAGE-TEMPERATURE RANGE (All Package Types)	100mW	
OPERATING-TEMPERATURE RANGE (T_A)	$-55^\circ C$ to $+125^\circ C$	
STORAGE TEMPERATURE RANGE (T_{stg})	$-65^\circ C$ to $+150^\circ C$	
LEAD TEMPERATURE (DURING SOLDERING):		
At distance 1/16 \pm 1/32 inch (1.59 \pm 0.79mm) from case for 10s max	$+265^\circ C$	

RECOMMENDED OPERATING CONDITIONS

For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges:

CHARACTERISTIC	LIMITS		UNITS
	MIN.	MAX.	
Supply-Voltage Range (For $T_A =$ Full Package Temperature Range)	3	18	V

DYNAMIC ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ C$, Input $t_r, t_f = 20$ ns, and $C_L = 50$ pF, $R_L = 200$ k Ω

CHARACTERISTIC	TEST CONDITIONS	ALL TYPES LIMITS		UNITS	
		V_{DD} Volts	TYP.		MAX.
Propagation Delay Time, t_{PHL}, t_{PLH}		5	125	250	ns
		10	60	120	
		15	45	90	
Transition Time, t_{THL}, t_{TLH}		5	100	200	ns
		10	50	100	
		15	40	80	
Input Capacitance, C_{IN}	Any Input	—	5	7.5	pF

CD4073B, CD4081B, CD4082B Types

STATIC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	CONDITIONS			LIMITS AT INDICATED TEMPERATURES (°C)							UNITS
	V _O (V)	V _{IN} (V)	V _{DD} (V)					+25			
				-55	-40	+85	+125	Min.	Typ.	Max.	
Quiescent Device Current, I _{DD} Max.	—	0,5	5	0.25	0.25	7.5	7.5	—	0.01	0.25	μA
	—	0,10	10	0.5	0.5	15	15	—	0.01	0.5	
	—	0,15	15	1	1	30	30	—	0.01	1	
	—	0,20	20	5	5	150	150	—	0.02	5	
Output Low (Sink) Current, I _{OL} Min.	0.4	0,5	5	0.64	0.61	0.42	0.36	0.51	1	—	mA
	0.5	0,10	10	1.6	1.5	1.1	0.9	1.3	2.6	—	
	1.5	0,15	15	4.2	4	2.8	2.4	3.4	6.8	—	
Output High (Source) Current, I _{OH} Min.	4.6	0,5	5	-0.64	-0.61	-0.42	-0.36	-0.51	-1	—	mA
	2.5	0,5	5	-2	-1.8	-1.3	-1.15	-1.6	-3.2	—	
	9.5	0,10	10	-1.6	-1.5	-1.1	-0.9	-1.3	-2.6	—	
	13.5	0,15	15	-4.2	-4	-2.8	-2.4	-3.4	-6.8	—	
Output Voltage: Low-Level, V _{OL} Max.	—	0,5	5	0.05				—	0	0.05	V
	—	0,10	10	0.05				—	0	0.05	
	—	0,15	15	0.05				—	0	0.05	
Output Voltage: High-Level, V _{OH} Min.	—	0,5	5	4.95				4.95	5	—	V
	—	0,10	10	9.95				9.95	10	—	
	—	0,15	15	14.95				14.95	15	—	
Input Low Voltage, V _{IL} Max.	0.5	—	5	1.5				—	—	1.5	V
	1	—	10	3				—	—	3	
	1.5	—	15	4				—	—	4	
Input High Voltage, V _{IH} Min.	0.5, 4.5	—	5	3.5				3.5	—	—	V
	1, 9	—	10	7				7	—	—	
	1.5, 13.5	—	15	11				11	—	—	
Input Current I _{IN} Max.		0,18	18	±0.1	±0.1	±1	±1	—	±10 ⁻⁵	±0.1	μA

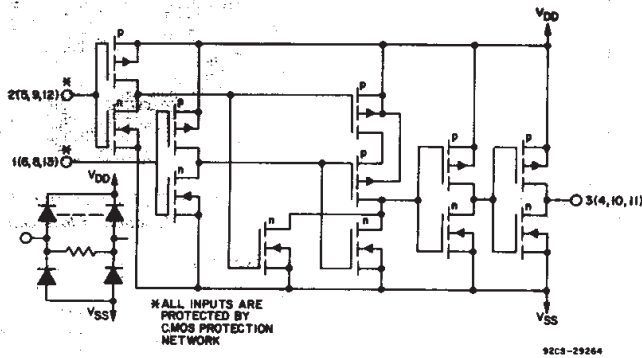


Fig. 1 - Schematic diagram for CD4081B (1 of 4 identical gates).

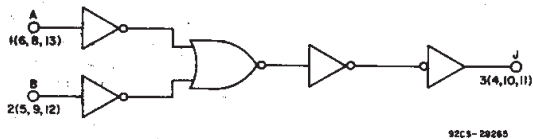


Fig. 2 - Logic diagram for CD4081B (1 of 4 identical gates).

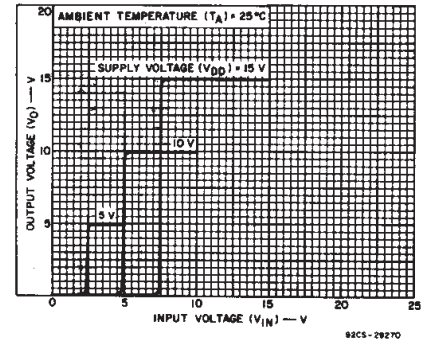


Fig. 3 - Typical voltage transfer characteristics.

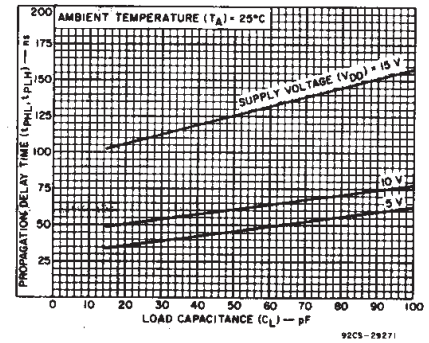


Fig. 4 - Typical propagation delay time as a function of load capacitance.

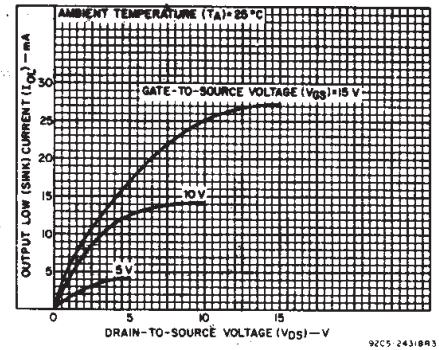


Fig. 5 - Typical output low (sink) current characteristics.

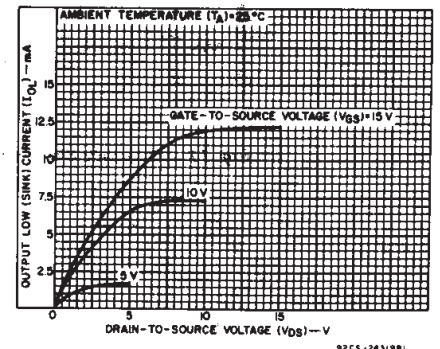


Fig. 6 - Minimum output low (sink) current characteristics.

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CD4073B, CD4081B, CD4082B Types

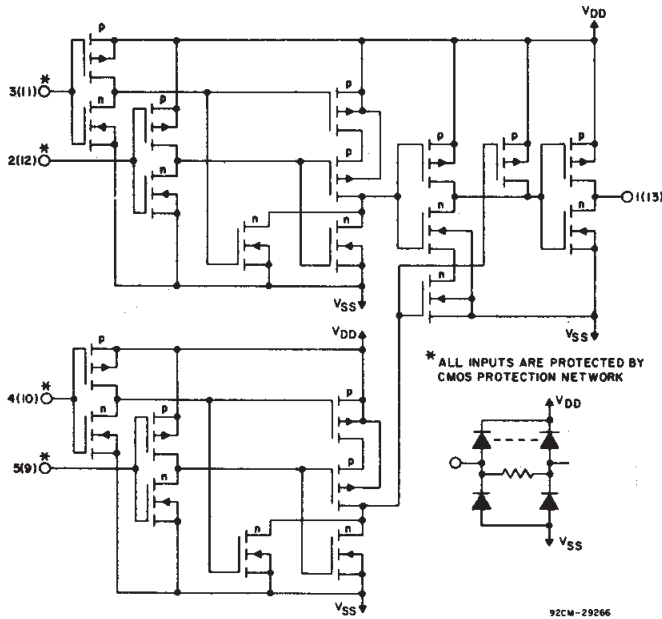


Fig. 7 - Schematic diagram for CD4082B (1 of 2 identical gates).

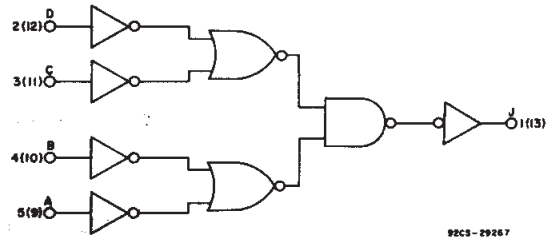


Fig. 9 - Logic diagram for CD4082B (1 of 2 identical gates).

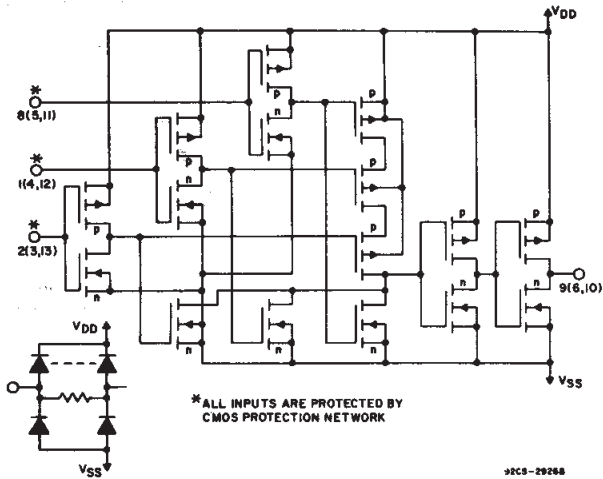


Fig. 11 - Schematic diagram for CD4073B (1 of 3 identical gates).

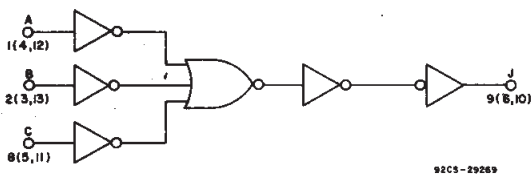


Fig. 13 - Logic diagram for CD4073B (1 of 3 identical gates).

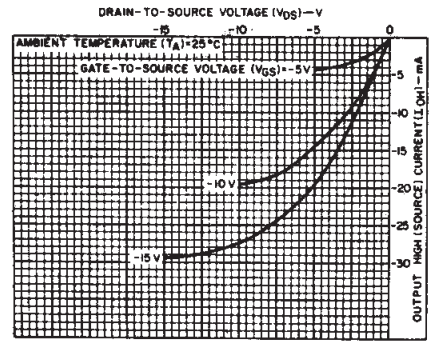


Fig. 8 - Typical output high (source) current characteristics.

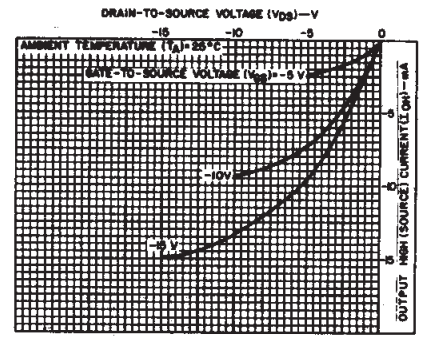


Fig. 10 - Minimum output high (source) current characteristics.

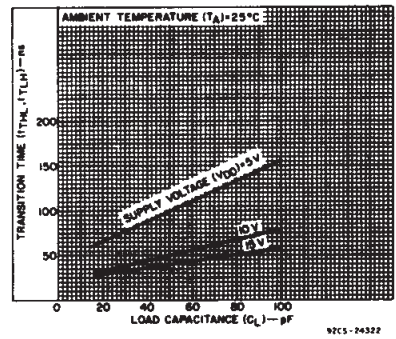


Fig. 12 - Typical transition time as a function of load capacitance.

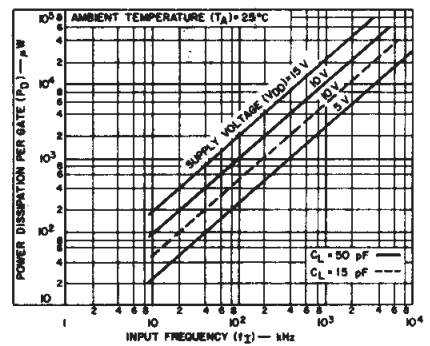


Fig. 14 - Typical dynamic power dissipation per gate as a function of frequency.

CD4073B, CD4081B, CD4082B Types

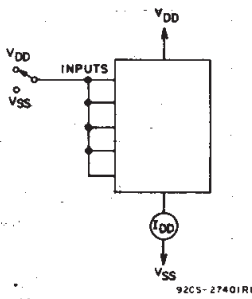


Fig. 15 - Quiescent device current test circuit.

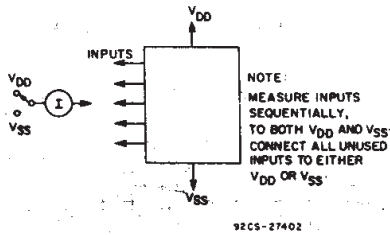


Fig. 16 - Input current test circuit.

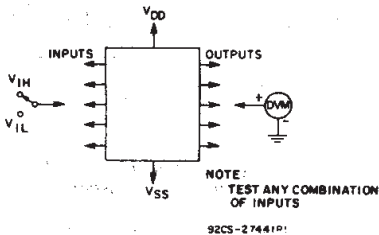
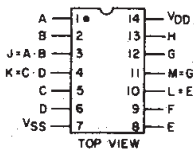
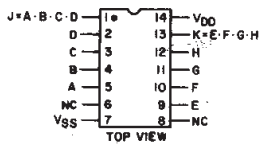


Fig. 17 - Input-voltage test circuit.

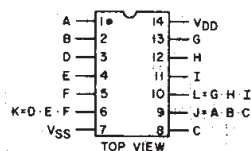
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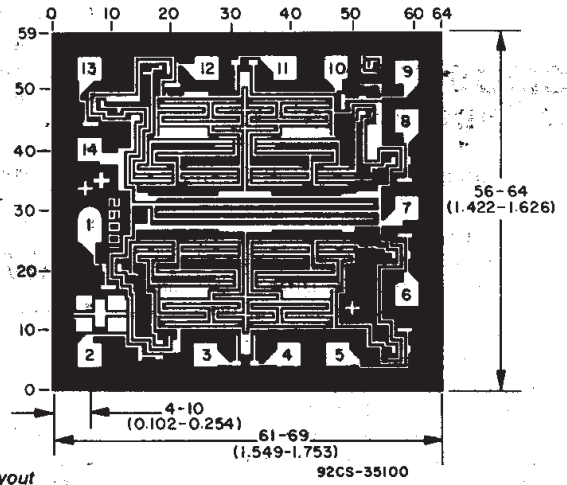
CD4081B



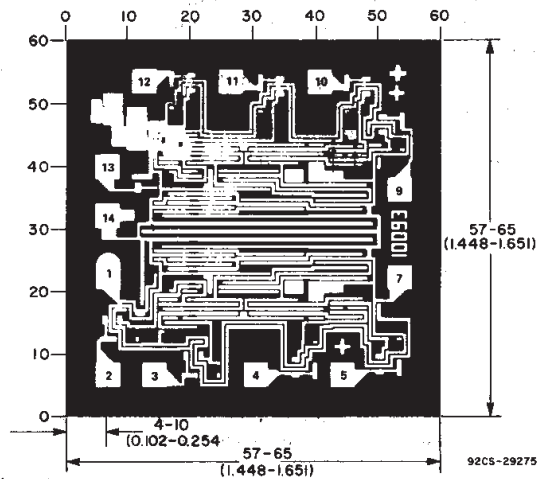
CD4082B



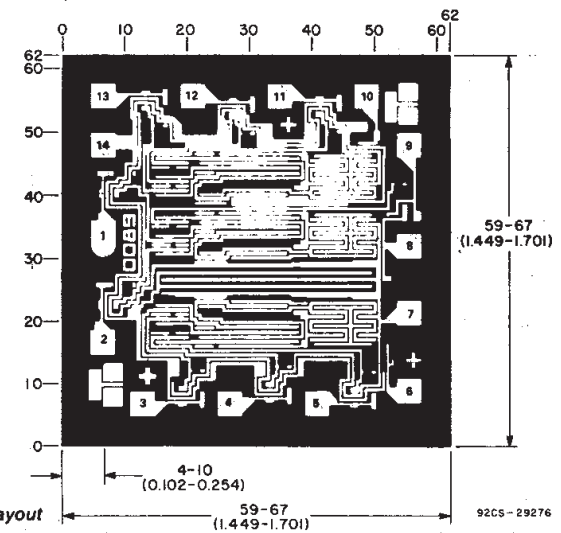
CD4073B



Chip dimensions and pad layout for CD4081B.



Chip dimensions and pad layout for CD4082B.



Chip dimensions and pad layout for CD4073B.

Dimensions in parentheses are in millimeters and are derived from the basic inch dimensions as indicated. Grid graduations are in mils (10^{-3} inch).

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CD4081B, CMOS Quad 2-Input AND Gate

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	CD4081B
Voltage Nodes (V)	5, 10, 15

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PRICING/AVAILABILITY

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ORDERABLE DEVICE	PACKAGE	PINS	TEMP (°C)	STATUS	BUDGETARY PRICE US\$/UNIT QTY=1000+	PACK QTY	DSCC NUMBER	PRICING/AVAILABILITY
CD4081BE	<u>N</u>	14	-55 TO 125	ACTIVE	0.25	25		Check stock or order
CD4081BF	<u>J</u>	14	-55 TO 125	ACTIVE	2.13	1		Check stock or order

CD4081BF3A	<u>J</u>	14	-55 TO 125	ACTIVE	2.50	1	7702402CA	<u>Check stock or order</u>
CD4081BFB3A	<u>J</u>	14	-55 TO 125	ACTIVE	2.50	1		<u>Check stock or order</u>
CD4081BM	<u>D</u>	14	-55 TO 125	ACTIVE	0.30	50		<u>Check stock or order</u>
CD4081BNSR	<u>NS</u>	14	-55 TO 125	ACTIVE	0.38	2000		<u>Check stock or order</u>
CD4081BPW	<u>PW</u>	14	-55 TO 125	OBSOLETE				
CD4081BPWR	<u>PW</u>	14	-55 TO 125	ACTIVE	0.30	2000		<u>Check stock or order</u>
JM38510/17001BCA	<u>J</u>	14	-55 TO 125	ACTIVE	15.02	1		<u>Check stock or order</u>

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CD4082B, CMOS Dual 4-Input AND Gate

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	CD4082B
Voltage Nodes (V)	5, 10, 15

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CD4082BE	<u>N</u>	14	-55 TO 125	ACTIVE	0.25	25		Check stock or order
CD4082BF	<u>J</u>	14	-55 TO 125	ACTIVE	2.13	1		Check stock or order

CD4082BF3A	<u>J</u>	14	-55 TO 125	ACTIVE	2.50	1	7705902CA	<u>Check stock or order</u>
CD4082BNSR	<u>NS</u>	14	-55 TO 125	ACTIVE	0.33	2000		<u>Check stock or order</u>
CD4082BPW	<u>PW</u>	14	-55 TO 125	OBSOLETE				
CD4082BPWR	<u>PW</u>	14	-55 TO 125	ACTIVE	0.25	2000		<u>Check stock or order</u>
JM38510/17002BCA	<u>J</u>	14	-55 TO 125	ACTIVE	15.02	1		<u>Check stock or order</u>

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