

# CD4011B, CD4012B, CD4023B Types

## CMOS NAND GATES

High-Voltage Types (20-Volt Rating)

- Quad 2 Input – CD4011B
- Dual 4 Input – CD4012B
- Triple 3 Input – CD4023B

■ CD4011B, CD4012B, and CD4023B NAND gates provide the system designer with direct implementation of the NAND function and supplement the existing family of CMOS gates. All inputs and outputs are buffered.

The CD4011B, CD4012B, and CD4023B types are supplied in 14-lead hermetic dual-in-line ceramic packages (F3A suffix), 14-lead dual-in-line plastic packages (E suffix), 14-lead small-outline packages (M, MT, M96, and NSR suffixes), and 14-lead thin shrink small-outline packages (PWR suffix). The CD4011B and CD4023B types also are supplied in 14-lead thin shrink small-outline packages (PW suffix).

**Features:**

- Propagation delay time = 60 ns (typ.) at  $C_L = 50$  pF,  $V_{DD} = 10$  V
- Buffered inputs and outputs
- Standardized symmetrical output characteristics
- Maximum input current of  $1 \mu A$  at 18 V over full package temperature range; 100 nA at 18 V and 25°C
- 100% tested for quiescent current at 20 V
- 5-V, 10-V, and 15-V parametric ratings
- Noise margin (over 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

- Meets all requirements of JEDEC Tentative Standard No. 13B, "Standard Specifications for Description of "B" Series CMOS Devices"

**MAXIMUM RATINGS, Absolute-Maximum Values:**

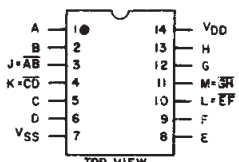
<b>DC SUPPLY-VOLTAGE RANGE, (<math>V_{DD}</math>)</b>		
Voltages referenced to $V_{SS}$ Terminal		-0.5V to +20V
<b>INPUT VOLTAGE RANGE, ALL INPUTS</b>		-0.5V to $V_{DD} + 0.5V$
<b>DC INPUT CURRENT, ANY ONE INPUT</b>		$\pm 10$ mA
<b>POWER DISSIPATION PER PACKAGE (<math>P_D</math>):</b>		
For $T_A = -55^\circ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

**RECOMMENDED OPERATING CONDITIONS**

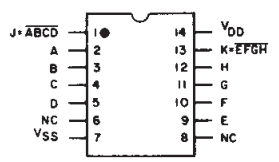
For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges:

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

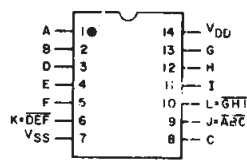
**TERMINAL ASSIGNMENTS**



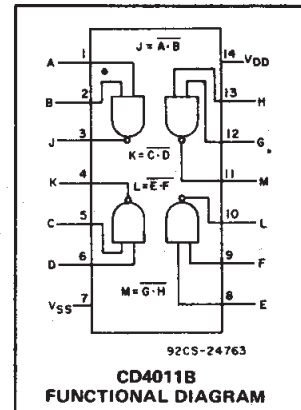
CD4011B



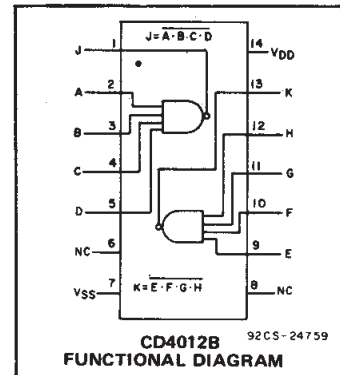
CD4012B



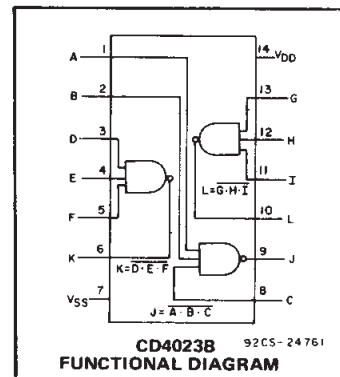
CD4023B



CD4011B  
FUNCTIONAL DIAGRAM



CD4012B  
FUNCTIONAL DIAGRAM



CD4023B  
FUNCTIONAL DIAGRAM

# CD4011B, CD4012B, CD4023B Types

## STATIC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	CONDITIONS			LIMITS AT INDICATED TEMPERATURES (°C)							UNITS
	V <sub>O</sub> (V)	V <sub>IN</sub> (V)	V <sub>DD</sub> (V)	-55	-40	+85	+125	+25			
								Min.	Typ.	Max.	
Quiescent Device Current, I <sub>DD</sub> 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 <sub>OL</sub> 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 <sub>OH</sub> 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	-	
Output Voltage: Low-Level, V <sub>OL</sub> 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 <sub>OH</sub> 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 <sub>IL</sub> Max.	4.5	-	5	1.5				-	-	1.5	V
	9	-	10	3				-	-	3	
	13.5	-	15	4				-	-	4	
Input High Voltage, V <sub>IH</sub> Min.	0.5, 4.5	-	5	3.5				3.5	-	-	V
	1, 9	-	10	7				7	-	-	
Input Current I <sub>IN</sub> Max.		0,18	18	±0.1	±0.1	±1	±1	-	±10 <sup>-5</sup>	±0.1	μA

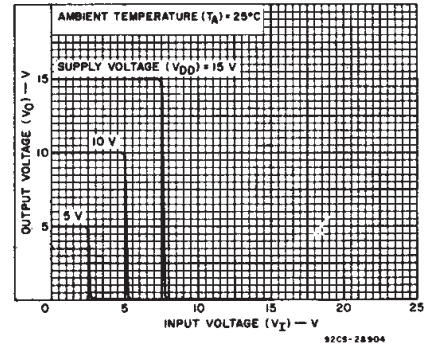


Fig. 1 - Typical voltage transfer characteristics.

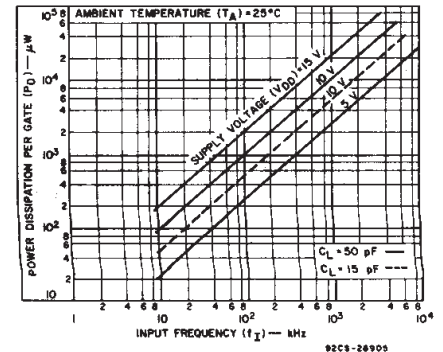


Fig. 2 - Typical power dissipation characteristics.

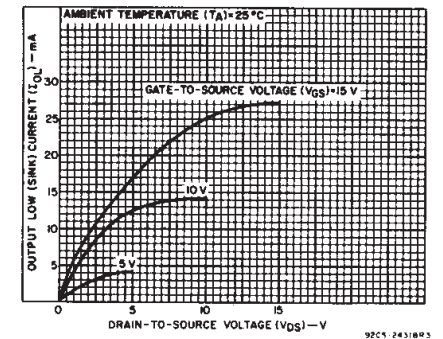


Fig. 3 - Typical output low (sink) current characteristics.

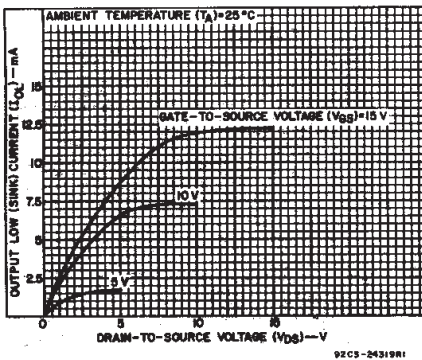


Fig. 4 - Minimum output low (sink) current characteristics.

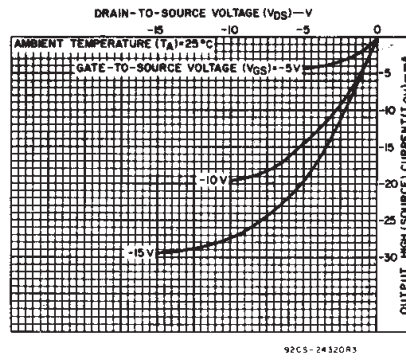


Fig. 5 - Typical output high (source) current characteristics.

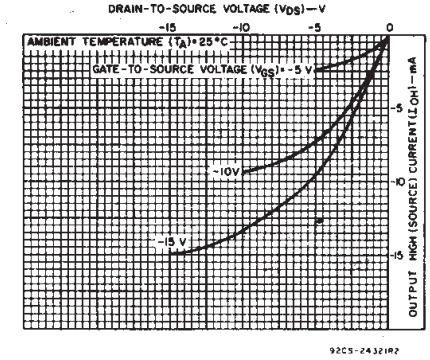
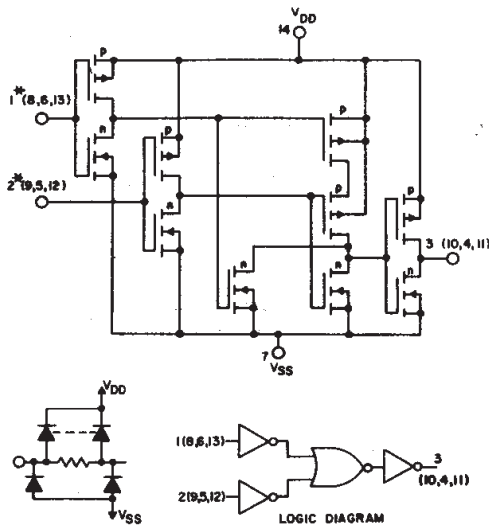


Fig. 6 - Minimum output high (source) current characteristics.

3  
COMMERCIAL CMOS  
HIGH VOLTAGE ICs

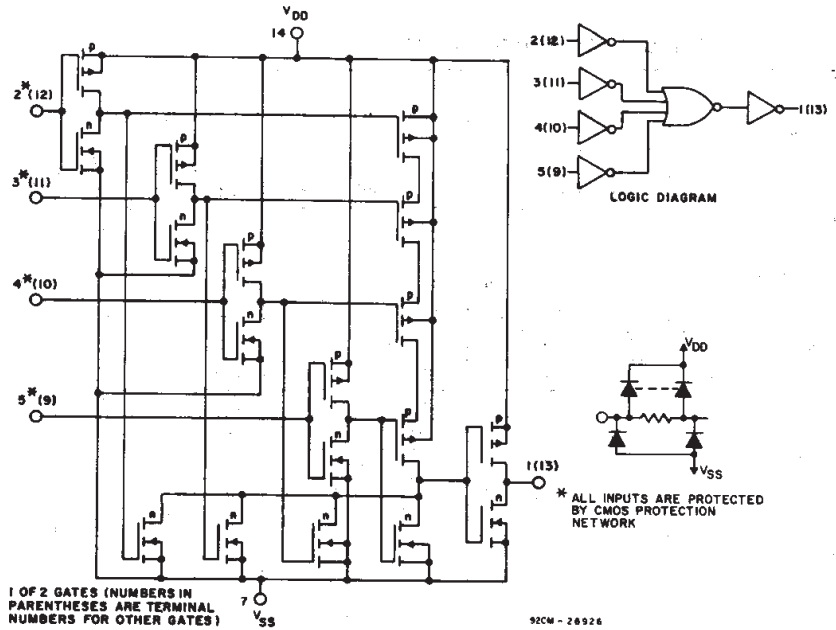
# CD4011B, CD4012B, CD4023B Types



\* ALL INPUTS ARE PROTECTED BY CMOS PROTECTION NETWORK

1 OF 4 GATES (NUMBERS IN PARENTHESES ARE TERMINAL NUMBERS FOR OTHER GATES)

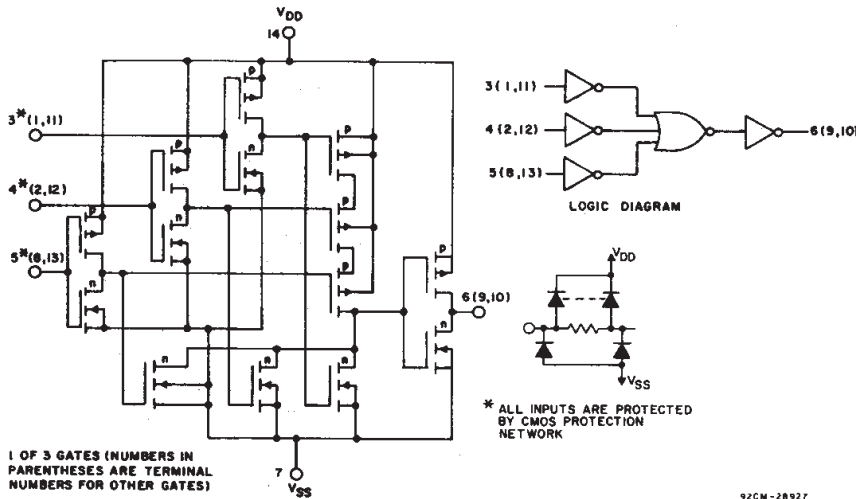
Fig.7 - Schematic and logic diagrams for CD4011B.



1 OF 2 GATES (NUMBERS IN PARENTHESES ARE TERMINAL NUMBERS FOR OTHER GATES)

92CM-28926

Fig.8 - Schematic and logic diagrams for CD4012B.



1 OF 3 GATES (NUMBERS IN PARENTHESES ARE TERMINAL NUMBERS FOR OTHER GATES)

\* ALL INPUTS ARE PROTECTED BY CMOS PROTECTION NETWORK

92CM-28927

Fig. 9 - Schematic and logic diagrams for CD4023B.

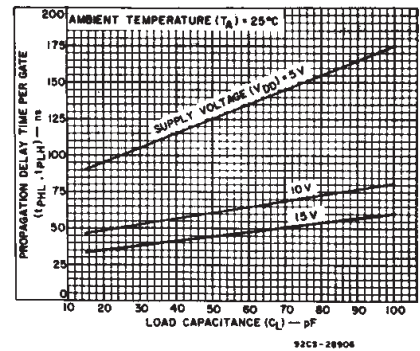


Fig.10 - Typical propagation delay time per gate as a function of load capacitance.

## DYNAMIC ELECTRICAL CHARACTERISTICS

At  $T_A = 25^\circ\text{C}$ ; Input  $t_r, t_f = 20\text{ ns}$ ,  $C_L = 50\text{ pF}$ ,  $R_L = 200\text{ k}\Omega$

CHARACTERISTIC	TEST CONDITIONS	LIMITS		UNITS	
		V <sub>DD</sub> 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

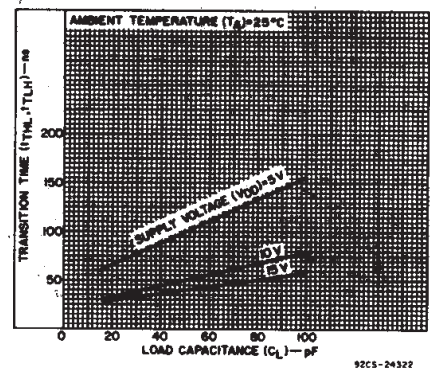


Fig.11 - Typical transition time as a function of load capacitance.

# CD4011B, CD4012B, CD4023B Types

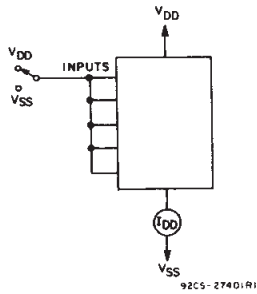


Fig. 12 - Quiescent-device-current test circuit.

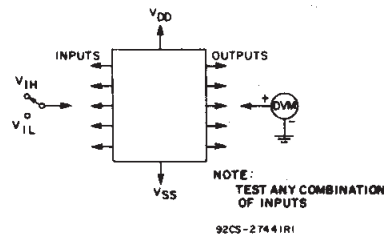


Fig. 13 - Input-voltage test circuit.

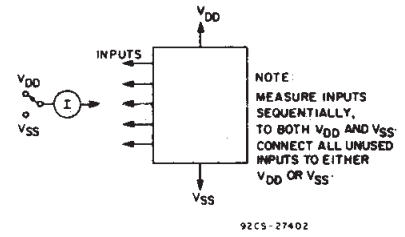
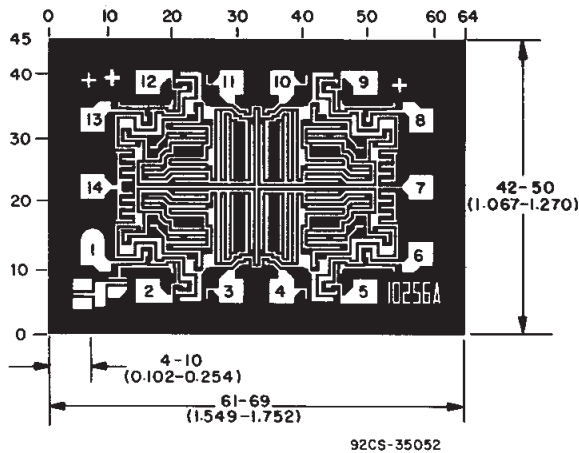
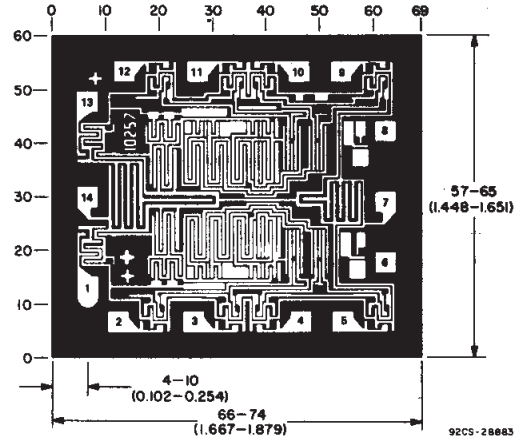


Fig. 14 - Input-current test circuit.

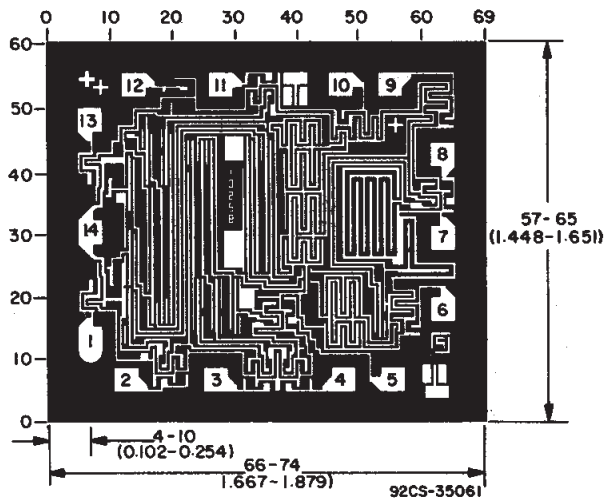
## Chip Dimensions and Pad Layouts



CD4011BH



CD4012BH



CD4023BH

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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**PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
89265AKB3T	OBSOLETE	CFP	WR	14		TBD	Call TI	Call TI
89266AKB3T	OBSOLETE	CFP	WR	16		TBD	Call TI	Call TI
89273AKB3T	OBSOLETE	CFP	WR	14		TBD	Call TI	Call TI
CD4011BE	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
CD4011BEE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
CD4011BF	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC
CD4011BF3A	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC
CD4011BK3	OBSOLETE	CFP	WR	14		TBD	Call TI	Call TI
CD4011BM	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BM96	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BM96E4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BM96G4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BME4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BMG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BMT	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BMTE4	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BNSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BNSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BPW	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BPWE4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BPWR	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4011BPWRE4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4012BE	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
CD4012BEE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
CD4012BF3A	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC
CD4012BM	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4012BM96	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4012BM96E4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
						no Sb/Br)		
CD4012BME4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4012BMT	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4012BMTE4	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4012BNSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4012BNSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4012BPWR	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4012BPWRE4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BE	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
CD4023BEE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
CD4023BF	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC
CD4023BF3A	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC
CD4023BM	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BM96	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BM96E4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BME4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BMT	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BMTE4	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BNSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BNSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BPW	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BPWE4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BPWR	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CD4023BPWRE4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
JM38510/05051BCA	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC
JM38510/05052BCA	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC
JM38510/05053BCA	ACTIVE	CDIP	J	14	1	TBD	Call TI	Level-NC-NC-NC

<sup>(1)</sup> The marketing status values are defined as follows:  
**ACTIVE:** Product device recommended for new designs.

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**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

J (R-GDIP-T\*\*)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



DIM \ PINS **	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



4040083/F 03/03

- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package is hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.



N (R-PDIP-T\*\*)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
  - The 20 pin end lead shoulder width is a vendor option, either half or full width.

D (R-PDSO-G14)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
  - D. Falls within JEDEC MS-012 variation AB.

# MECHANICAL DATA

NS (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

PW (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



4040064/F 01/97

- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.  
 D. Falls within JEDEC MO-153

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Interface	<a href="http://interface.ti.com">interface.ti.com</a>	Digital Control	<a href="http://www.ti.com/digitalcontrol">www.ti.com/digitalcontrol</a>
Logic	<a href="http://logic.ti.com">logic.ti.com</a>	Military	<a href="http://www.ti.com/military">www.ti.com/military</a>
Power Mgmt	<a href="http://power.ti.com">power.ti.com</a>	Optical Networking	<a href="http://www.ti.com/opticalnetwork">www.ti.com/opticalnetwork</a>
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TI Home > Semiconductors > Logic > Gates > NAND Gates >

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clear gif

**CD4011B**, Status: ACTIVE  
CMOS Quad 2-Input NAND Gate



clear gif

<input type="checkbox"/> Features	<input type="checkbox"/> Samples	<input type="checkbox"/> Technical Documents
<input type="checkbox"/> Quality & Pb-Free Data	<input type="checkbox"/> Pricing/Packaging	<input type="checkbox"/> Applications Notes
<input type="checkbox"/> Related Products	<input type="checkbox"/> Inventory	<input type="checkbox"/> Simulation Models
<input type="checkbox"/> Tools & Software	<input type="checkbox"/> Symbols/Footprints	<input type="checkbox"/> Reference Designs



**Refine Your Selection**

- Logic: NAND Gates

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- Contact Technical Support
- TI Cross Reference
- Training
- Part Marking Lookup
- Part Number Nomenclature

**Datasheet**



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**CD4011B, CD4012B, CD4023B TYPES (Rev. D)** (cd4011b.pdf, 525 KB)  
21 Aug 2003 [Download](#)

	CD4011B
<b>Voltage Nodes(V)</b>	5, 10, 15
<b>Vcc range(V)</b>	3 to 18
<b>No. of Gates</b>	4
	<a href="#">Samples</a>
	<a href="#">Inventory</a>

**Product Information**

Features  Save this to your personal library

Propagation delay time = 60 ns (typ.) at  $C_L = 50$  pF,  $V_{DD} = 10$  V  
 Buffered inputs and outputs  
 Standardized symmetrical output characteristics  
 Maximum input current of 1  $\mu$ A at 18 V over-full package temperature range; 100 nA at 18 V and 25°C  
 100% tested for quiescent current at 20 V  
 5-V, 10-V, and 15-V parametric ratings  
 Noise margin (over full package temperature range:  
     1 V at  $V_{DD} = 5$  V  
     2 V at  $V_{DD} = 10$  V  
     2.5 at  $V_{DD} = 15$  V  
 Meets all requirements of JEDEC Tentative Standard No. 13B, "Standard Specifications for Description of "B" Series CMOS Devices"

Quad 2 Input—CD4011B  
 Dual 4 Input—CD4012B  
 Triple 3 Input—CD4023B  
 Data sheet acquired from Harris Semiconductor.

Description

CD4011B, CD4012B, and CD4023B NAND gates provide the system designer with direct implementation of the NAND function and supplement the existing family of CMOS gates. All inputs and outputs are buffered.

The CD4011B, CD4012B, and CD4023B types are supplied in 14-lead hermetic dual-in-line ceramic packages (F3A suffix), 14-lead dual-in-line plastic packages (E suffix), 14-lead small-outline packages (M, MT, M96, and NSR suffixes), and 14-lead thin shrink small-outline packages (PWR suffix). The CD4011B and CD4023B types also are supplied in 14-lead thin shrink small-outline packages (PW suffix).

**Pricing/Packaging/CAD Design Tools/Samples**

			Price	Packaging			CAD Design Tools	Samples
Device	Status	Temp (°C)	Budget Price (\$US)   QTY	Industry Standard (TI Pkg)   Pins	Top Side Marking	Standard Pack Quantity	Footprints	Samples
89265AKB3T	OBSOLETE	-55 to 125		(WR)   14				Not Available
CD4011BE	ACTIVE	-55 to 125	0.22   1KU	PDIP (N)   14	<a href="#">View</a>	25	<input type="checkbox"/>	Contact TI Distributor or Sales Office
CD4011BEE4	ACTIVE	-55 to 125	0.22   1KU	PDIP (N)   14	<a href="#">View</a>	25	<input type="checkbox"/>	<a href="#">Request Free Samples</a>
CD4011BF	ACTIVE	-55 to 125	2.80   1KU	CDIP (J)   14		1	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BF3A	ACTIVE	-55 to 125	2.57   1KU	CDIP (J)   14		1	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BK3	OBSOLETE	-55 to 125		(WR)   14				Not Available
CD4011BM	ACTIVE	-55 to 125	0.22   1KU	SOIC (D)   14	<a href="#">View</a>	50	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BM96	ACTIVE	-55 to 125	0.22   1KU	SOIC (D)   14	<a href="#">View</a>	2500	<input type="checkbox"/>	Contact TI Distributor or Sales Office
CD4011BM96E4	ACTIVE	-55 to 125	0.22   1KU	SOIC (D)   14	<a href="#">View</a>	2500	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BM96G4	ACTIVE	-55 to 125	0.24   1KU	SOIC (D)   14	<a href="#">View</a>	2500	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BME4	ACTIVE	-55 to 125	0.22   1KU	SOIC (D)   14	<a href="#">View</a>	50	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BMG4	ACTIVE	-55 to 125	0.24   1KU	SOIC (D)   14	<a href="#">View</a>	50	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BMT	ACTIVE	-55 to 125	0.55   1KU	SOIC (D)   14	<a href="#">View</a>	250	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BMTE4	ACTIVE	-55 to 125	0.55   1KU	SOIC (D)   14	<a href="#">View</a>	250	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BNSR	ACTIVE	-55 to 125	0.22   1KU	SO (NS)   14	<a href="#">View</a>	2000	<input type="checkbox"/>	Contact TI Distributor or Sales Office
CD4011BNSRE4	ACTIVE	-55 to 125	0.22   1KU	SO (NS)   14	<a href="#">View</a>	2000	<input type="checkbox"/>	<a href="#">Request Free Samples</a>
CD4011BPW	ACTIVE	-55 to 125	0.22   1KU	TSSOP (PW)   14	<a href="#">View</a>	90	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BPWE4	ACTIVE	-55 to 125	0.22   1KU	TSSOP (PW)   14	<a href="#">View</a>	90	<input type="checkbox"/>	<a href="#">Purchase Samples</a>
CD4011BPWR	ACTIVE	-55 to 125	0.22   1KU	TSSOP (PW)   14	<a href="#">View</a>	2000	<input type="checkbox"/>	Contact TI Distributor or Sales Office
CD4011BPWRE4	ACTIVE	-55 to 125	0.22   1KU	TSSOP (PW)   14	<a href="#">View</a>	2000	<input type="checkbox"/>	<a href="#">Request Free Samples</a>
JM38510/05051BCA	ACTIVE	-55 to 125	20.71   1KU	CDIP (J)   14		1	<input type="checkbox"/>	<a href="#">Purchase Samples</a>

**Inventory**

		TI Inventory Status			Reported Distributor Inventory			
		In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
<b>CD4011BE</b>		As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			

[View all Distributors](#)



	>10k*	>10k   12 Dec	10 Weeks	Americas	Avnet	>1k	<input type="text"/>
					DigiKey	>1k	<input type="text"/>
					Newark InOne	>1k	<input type="text"/>
				Asia	P&S	>1k	<input type="text"/>
				Europe	Abacus Polar	>1k	<input type="text"/>
					Arrow Northern Europe	>1k	<input type="text"/>
					Arrow Southern Europe	>1k	<input type="text"/>
					Avnet-SILICA	>1k	<input type="text"/>
					Farnell InOne	>1k	<input type="text"/>
					Rutronik	50	<input type="text"/>
					Spoerle	74	<input type="text"/>

**CD4011BEE4** As of 9:55 AM GMT, 29 Nov 2005 As of 9:55 AM GMT, 29 Nov 2005

	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	>10k*	>10k   12 Dec	10 Weeks	None Reported <a href="#">View Distributors</a>			

**CD4011BF** As of 9:55 AM GMT, 29 Nov 2005 As of 9:55 AM GMT, 29 Nov 2005

	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	>10k*	954   14 Dec	8 Weeks	Americas	Avnet	>1k	<input type="text"/>
		>10k   28 Dec					

**CD4011BF3A** As of 9:55 AM GMT, 29 Nov 2005 As of 9:55 AM GMT, 29 Nov 2005

	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	>10k*	>10k   28 Dec	8 Weeks	Americas	Avnet	>1k	<input type="text"/>
				Europe	EBV Elektronik	7	<input type="text"/>

**CD4011BM** As of 9:55 AM GMT, 29 Nov 2005 As of 9:55 AM GMT, 29 Nov 2005

	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	2550   12 Dec	10 Weeks	Americas	Avnet	>1k	<input type="text"/>
		>10k   6 Mar					
				Asia	P&S	285	<input type="text"/>
				Europe	Abacus Polar	>1k	<input type="text"/>
					Arrow Southern Europe	>1k	<input type="text"/>
					Avnet-SILICA	>1k	<input type="text"/>
					EBV Elektronik	>1k	<input type="text"/>
					Spoerle	>1k	<input type="text"/>

**CD4011BM96** As of 9:55 AM GMT, 29 Nov 2005 As of 9:55 AM GMT, 29 Nov 2005

	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase	
	0*	5000   8 Dec	4 Weeks	Europe	Abacus Polar	>1k	<input type="text"/>	
		>10k   6 Mar				EBV Elektronik	>1k	<input type="text"/>
						Rutronik	>1k	<input type="text"/>

**CD4011BM96E4** As of 9:55 AM GMT, 29 Nov 2005 As of 9:55 AM GMT, 29 Nov 2005



	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	5000   8 Dec	4 Weeks	None Reported <a href="#">View Distributors</a>			
		>10k   6 Mar					
<b>CD4011BM96G4</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k   6 Mar	14 Weeks	None Reported <a href="#">View Distributors</a>			
<b>CD4011BME4</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	2550   12 Dec	10 Weeks	None Reported <a href="#">View Distributors</a>			
		>10k   6 Mar					
<b>CD4011BMG4</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k   6 Mar	14 Weeks	None Reported <a href="#">View Distributors</a>			
<b>CD4011BMT</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k   6 Mar	14 Weeks	None Reported <a href="#">View Distributors</a>			
<b>CD4011BMTE4</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k   6 Mar	14 Weeks	None Reported <a href="#">View Distributors</a>			
<b>CD4011BNSR</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	391   9 Jan	10 Weeks	Americas	DigiKey	15	<input type="text"/>
		264   16 Jan					
		625   23 Jan					
		968   30 Jan					
		1955   20 Feb					
<b>CD4011BNSRE4</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	391   9 Jan	10 Weeks	None Reported <a href="#">View Distributors</a>			
		264   16 Jan					
		625   23 Jan					
		968   30 Jan					
		1955   20 Feb					
<b>CD4011BPW</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase
	0*	4590   12 Dec	12 Weeks	Americas	Avnet	>1k	<input type="text"/>
<b>CD4011BPWE4</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	In Stock	In Progress QTY   Date	Lead Time	Region	Company	In Stock	Purchase

	0*	4590   12 Dec	12 Weeks	None Reported <a href="#">View Distributors</a>			
<b>CD4011BPWR</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	<b>In Stock</b>	<b>In Progress QTY   Date</b>	<b>Lead Time</b>	<b>Region</b>	<b>Company</b>	<b>In Stock</b>	<b>Purchase</b>
	>10k*	>10k   3 Apr	4 Weeks	Americas	DigiKey	>1k	<input type="text"/>
				Europe	Rutronik	>1k	<input type="text"/>
<b>CD4011BPWRE4</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	<b>In Stock</b>	<b>In Progress QTY   Date</b>	<b>Lead Time</b>	<b>Region</b>	<b>Company</b>	<b>In Stock</b>	<b>Purchase</b>
	>10k*	>10k   3 Apr	4 Weeks	None Reported <a href="#">View Distributors</a>			
<b>JM38510/05051BCA</b>	As of 9:55 AM GMT, 29 Nov 2005			As of 9:55 AM GMT, 29 Nov 2005			
	<b>In Stock</b>	<b>In Progress QTY   Date</b>	<b>Lead Time</b>	<b>Region</b>	<b>Company</b>	<b>In Stock</b>	<b>Purchase</b>
	1322*	>10k   28 Dec	8 Weeks	Americas	Avnet	328	<input type="text"/>
				Europe	Arrow Northern Europe	22	<input type="text"/>

\* Our information is updated daily, so please check back with us soon if this does not meet your needs. You may also contact your [TI Authorized Distributor](#), including those [listed above](#), for real time stock information.

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### Quality & Lead (Pb)-Free Data

Quality & Lead (Pb)-Free Data					
Device	Eco Plan*	Lead/Ball Finish	MSL Rating/Peak Reflow	Details	MTBF/FIT Rate
CD4011BE <input type="checkbox"/>	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
CD4011BEE4 <input type="checkbox"/>	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
CD4011BF	TBD	Call TI	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
CD4011BF3A	TBD	Call TI	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>
CD4011BM <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BM96 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BM96E4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BM96G4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BME4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BMG4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BMT <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BMTE4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BNSR <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BNSRE4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BPW <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BPWE4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BPWR <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
CD4011BPWRE4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	<a href="#">View</a>	<a href="#">View</a>
JM38510/05051BCA	TBD	Call TI	Level-NC-NC-NC	<a href="#">View</a>	<a href="#">View</a>

\* The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please click on the Product Content Details "View" link in the table above for the latest availability information and additional product content details.

If the information you are requesting is not available online at this time, contact one of our [Product Information Centers](#) regarding the availability of this information.

### Technical Documents

**Datasheets**

Keep track of what's new

**CD4011B, CD4012B, CD4023B TYPES (Rev. D)** (cd4011b.pdf, 525 KB)

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**Application Notes**

**Semiconductor Packing Material Electrostatic Discharge (ESD) Protection** (szza047.htm, 9 KB)

08 Jul 2004 [Abstract](#)

**Shelf-Life Evaluation of Lead-Free Component Finishes** (szza046.htm, 9 KB)

24 May 2004 [Abstract](#)

**Understanding and Interpreting Standard-Logic Data Sheets (Rev. B)** (szza036b.htm, 8 KB)

28 May 2003 [Abstract](#)

**Understanding Buffered and Unbuffered CD4xxxB Series Device Characteristics** (scha004.htm, 9 KB)

03 Dec 2001 [Abstract](#)

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#### **User Guides**

**Signal Switch Data Book (Rev. A)** (scdd003a.pdf, 19732 KB)

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**LOGIC Pocket Data Book** (scyd013.pdf, 4835 KB)

05 Dec 2002 [Download](#)

#### **More Literature**

**Logic Selection Guide 2005 (Rev. X)** (sdyu001x.pdf, 6909 KB)

15 Mar 2005 [Download](#)

**Military Semiconductors Selection Guide 2004-2005 (Rev. D)** (sgyc003d.pdf, 964 KB)

10 Aug 2004 [Download](#)

**Logic Cross-Reference (Rev. A)** (scyb017a.pdf, 2938 KB)

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