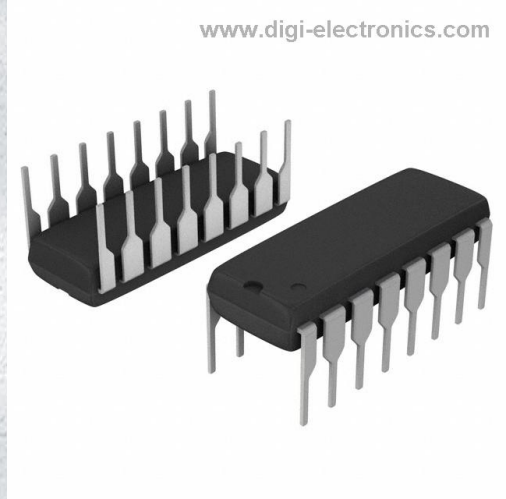
CD4028BCN Datasheet



DiGi Electronics Part Number	CD4028BCN-DG
Manufacturer	onsemi
Manufacturer Product Number	CD4028BCN
Description	IC DECODER 1 X 4:10 16DIP
Detailed Description	Decoder 1 x 4:10 16-PDIP

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RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
CD4028BCN	onsemi
Series:	Product Status:
4000B	Obsolete
Type:	Circuit:
Decoder	1 x 4:10
Independent Circuits:	Current - Output High, Low:
1	3mA, 6.8mA
Voltage Supply Source:	Voltage - Supply:
Single Supply	3V ~ 15V
Operating Temperature:	Mounting Type:
-55°C ~ 125°C	Through Hole
Package / Case:	Supplier Device Package:
16-DIP (0.300", 7.62mm)	16-PDIP
Base Product Number:	
CD4028	

Environmental & Export classification

Moisture Sensitivity Level (MSL):	REACH Status:
1 (Unlimited)	REACH Unaffected
ECCN:	HTSUS:
EAR99	8542.39.0001

FAIRCHILD SEMICONDUCTOR™

October 1987
Revised March 2002

CD4028BC
BCD-to-Decimal Decoder

General Description

The CD4028BC is a BCD-to-decimal or binary-to-octal decoder consisting of 4 inputs, decoding logic gates, and 10 output buffers. A BCD code applied to the 4 inputs, A, B, C, and D, results in a high level at the selected 1-of-10 decimal decoded outputs. Similarly, a 3-bit binary code applied to inputs A, B, and C is decoded in octal at outputs 0–7. A high level signal at the D input inhibits octal decoding and causes outputs 0–7 to go LOW.

All inputs are protected against static discharge damage by diode clamps to V_{DD} and V_{SS}.

Features

- Wide supply voltage range: 3.0V to 15V
- High noise immunity: 0.45 V_{DD} (typ.)
- Low power TTL compatibility: fan out of 2 driving 74L or 1 driving 74LS
- Low power
- Glitch free outputs
- "Positive logic" on inputs and outputs

Applications

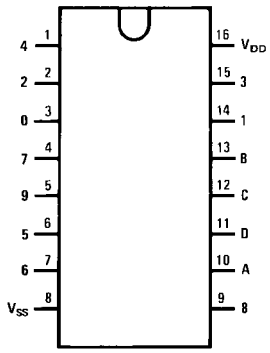
- Code conversion
- Address decoding
- Indicator-tube decoder

Ordering Code:

Order Number	Package Number	Package Description
CD4028BCM	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
CD4028BCN	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

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

Connection Diagram

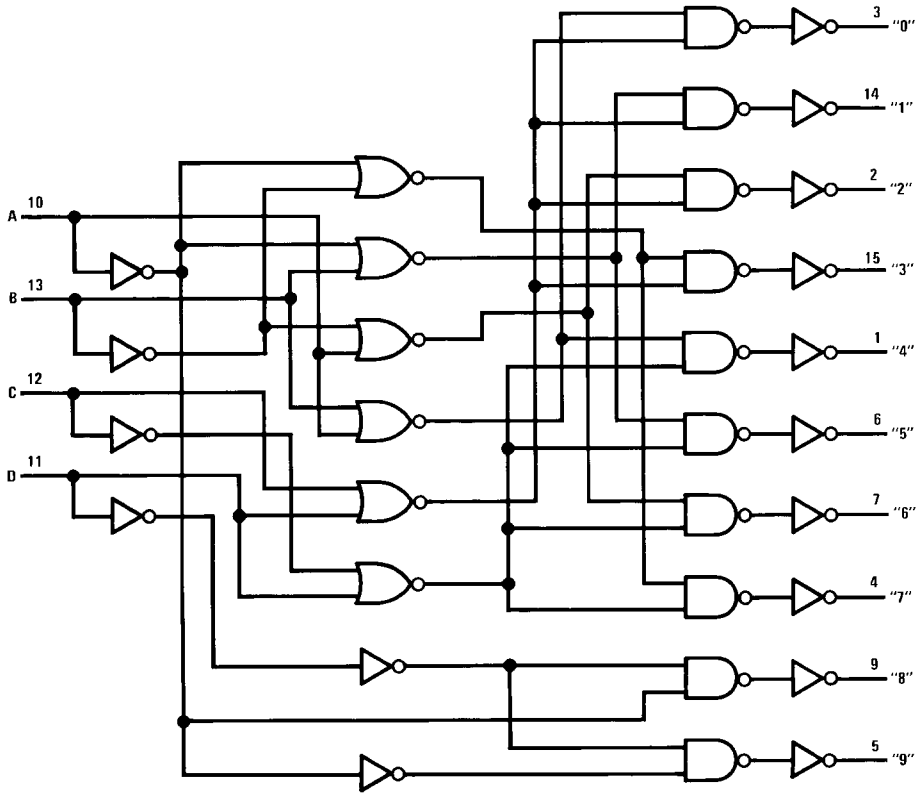


Top View

Truth Table

	D	C	B	A	0	1	2	3	4	5	6	7	8	9	
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
	0	0	1	0	0	0	1	0	0	0	0	0	0	0	
	0	0	1	1	0	0	0	1	0	0	0	0	0	0	
	0	1	0	0	0	0	0	0	1	0	0	0	0	0	BCD States
	0	1	0	1	0	0	0	0	0	1	0	0	0	0	
	0	1	1	0	0	0	0	0	0	0	1	0	0	0	
1 = HIGH Level	0	1	1	1	0	0	0	0	0	0	0	1	0	0	
0 = LOW Level	1	0	0	0	0	0	0	0	0	0	0	0	1	0	
	1	0	0	1	0	0	0	0	0	0	0	0	0	1	
	1	0	1	0	0	0	0	0	0	0	0	0	1	0	
	1	0	1	1	0	0	0	0	0	0	0	0	0	1	
	1	1	0	0	0	0	0	0	0	0	0	0	1	0	Extraordinary States
	1	1	0	1	0	0	0	0	0	0	0	0	0	1	
	1	1	1	0	0	0	0	0	0	0	0	0	1	0	
	1	1	1	1	0	0	0	0	0	0	0	0	0	1	

Logic Diagram



Absolute Maximum Ratings(Note 1)

(Note 2)

Supply Voltage (V_{DD})	−0.5 to +18V
Input Voltage (V_{IN})	−0.5 to V_{DD} +0.5V
Storage Temperature Range (T_S)	−65°C to +150°C
Power Dissipation (P_D)	
Dual-In-Line	700 mW
Small Outline	500 mW
Lead Temperature (T_L)	
(Soldering, 10 seconds)	260°C

Recommended Operating Conditions (Note 2)

Supply Voltage (V_{DD})	3 to 15V
Input Voltage (V_{IN})	0 to V_{DD}V
Operating Temperature Range (T_A)	−55°C to +125°C

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

Note 2: V_{SS} = 0V unless otherwise specified.

DC Electrical Characteristics (Note 2)

Symbol	Parameter	Conditions	−55°C		+25°C			+125°C		Units
			Min	Max	Min	Typ	Max	Min	Max	
I_{DD}	Quiescent Device Current	V_{DD} = 5V, V_{IN} = V_{DD} or V_{SS}		5		0.01	5		150	
		V_{DD} = 10V, V_{IN} = V_{DD} or V_{SS}		10		0.01	10		300	µA
		V_{DD} = 15V, V_{IN} = V_{DD} or V_{SS}		20		0.02	20		600	
V_{OL}	LOW Level Output Voltage	$\|I_O\|$ < 1 µA, V_{IL} = 0V, V_{IH} = V_{DD}								
		V_{DD} = 5V		0.05		0	0.05		0.05	
		V_{DD} = 10V		0.05		0	0.05		0.05	V
		V_{DD} = 15V		0.05		0	0.05		0.05	
V_{OH}	HIGH Level Output Voltage	$\|I_O\|$ < 1 µA, V_{IL} = 0V, V_{IH} = V_{DD}								
		V_{DD} = 5V	4.95		4.95	5		4.95		
		V_{DD} = 10V	9.95		9.95	10		9.95		V
		V_{DD} = 15V	14.95		14.95	15		14.95		
V_{IL}	LOW Level Input Voltage	$\|I_O\|$ < 1 µA								
		V_{DD} = 5V, V_O = 0.5V or 4.5V		1.5		2.25	1.5		1.5	
		V_{DD} = 10V, V_O = 1V or 9V		3.0		4.5	3.0		3.0	V
		V_{DD} = 15V, V_O = 1.5V or 13.5V		4.0		6.75	4.0		4.0	
V_{IH}	HIGH Level Input Voltage	$\|I_O\|$ < 1 µA								
		V_{DD} = 5V, V_O = 0.5V or 4.5V	3.5		3.5	2.75		3.5		
		V_{DD} = 10V, V_O = 1V or 9V	7.0		7.0	5.5		7.0		V
		V_{DD} = 15V, V_O = 1.5V or 13.5V	11.0		11.0	8.25		11.0		
I_{OL}	LOW Level Output Current	V_{IH} = V_{DD}, V_{IL} = 0V								
	(Note 3)	V_{DD} = 5V, V_O = 0.4V	0.64		0.51	1.0		0.36		
		V_{DD} = 10V, V_O = 0.5V	1.6		1.3	2.6		0.9		mA
		V_{DD} = 15V, V_O = 1.5V	4.2		3.4	6.8		2.4		
I_{OH}	HIGH Level Output Current	V_{IH} = V_{DD}, V_{IL} = 0V								
	(Note 3)	V_{DD} = 5V, V_O = 4.6V	−0.25		−0.2	−0.4		−0.14		
		V_{DD} = 10V, V_O = 9.5V	−0.62		−0.5	−1.0		−0.35		mA
		V_{DD} = 15V, V_O = 13.5V	−1.8		−1.5	−3.0		−1.1		
I_{IN}	Input Current	V_{DD} = 15V, V_{IN} = 0V		−0.1			−0.1		−1.0	µA
		V_{DD} = 15V, V_{IN} = 15V		0.1			0.1		1.0	

Note 3: I_{OL} and I_{OH} are tested one output at a time.

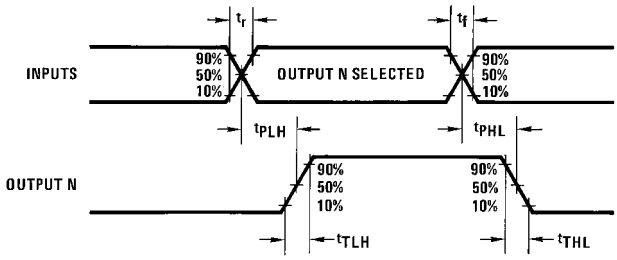
AC Electrical Characteristics (Note 4)

$T_A = 25°C$, $C_L = 50$ pF, $R_L = 200$k, Input $t_r = t_f = 20$ ns, unless otherwise specified

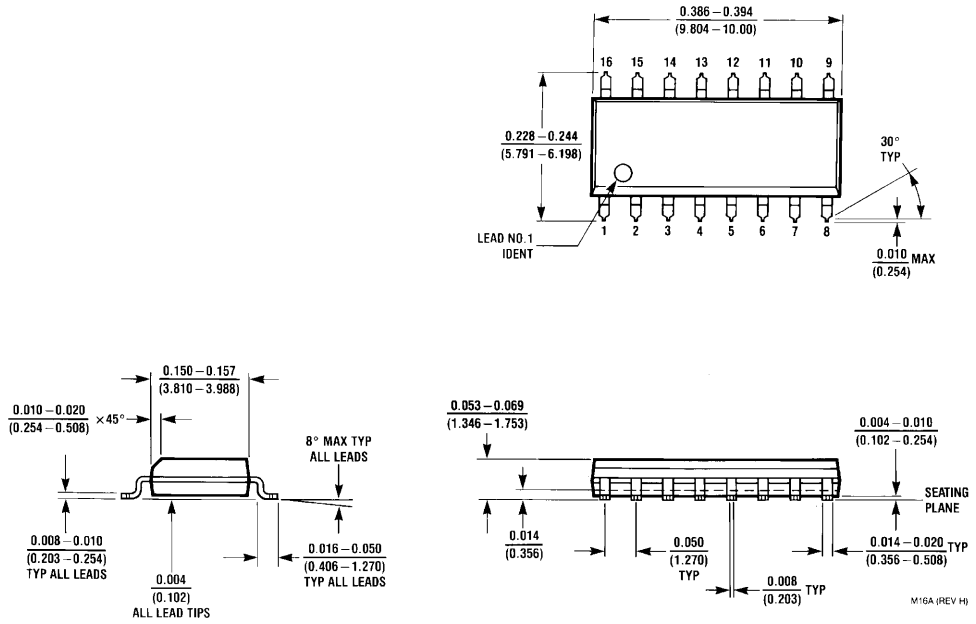
Symbol	Parameter	Conditions	Min	Typ	Max	Units
t_{PHL} or t_{PLH}	Propagation Delay Time	$V_{CC} = 5V$		240	480	
		$V_{CC} = 10V$		100	200	ns
		$V_{CC} = 15V$		70	140	
t_{THL} or t_{TLH}	Transition Time	$V_{CC} = 5V$		175	350	
		$V_{CC} = 10V$		75	150	ns
		$V_{CC} = 15V$		60	110	
C_{IN}	Input Capacitance	Any Input		5	7.5	pF

Note 4: AC Parameters are guaranteed by DC correlated testing.

Switching Time Waveforms

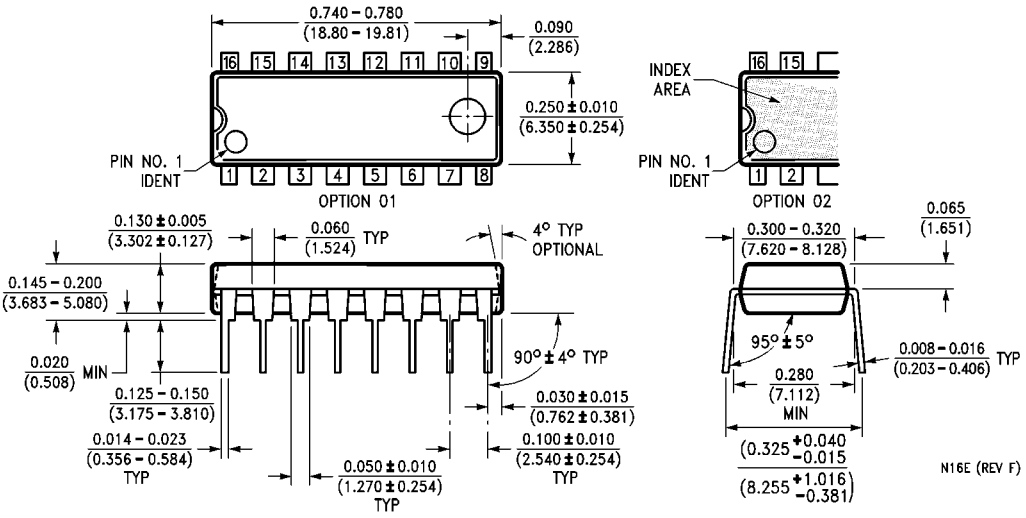


Physical Dimensions inches (millimeters) unless otherwise noted



16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
Package Number M16A

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide
Package Number N16E

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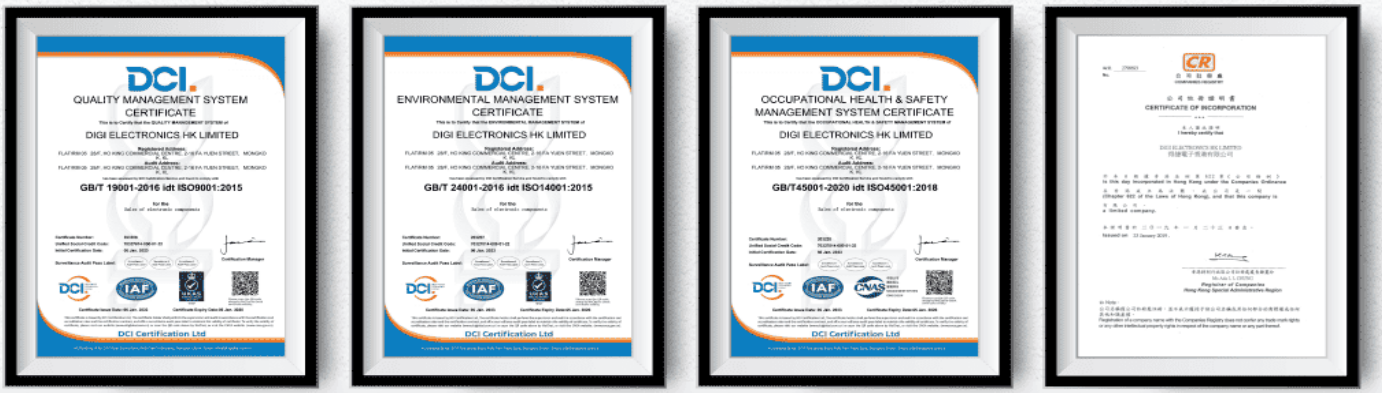

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