

October 1987 Revised May 2002

## CD4724BC 8-Bit Addressable Latch

## **General Description**

The CD4724BC is an 8-bit addressable latch with three address inputs (A0–A2), an active low enable input  $(\overline{E})$ , active high clear input  $(C_L)$ , a data input (D) and eight outputs (Q0–Q7).

Data is entered into a particular bit in the latch when that is addressed by the address inputs and the enable  $(\overline{E})$  is LOW. Data entry is inhibited when enable  $(\overline{E})$  is HIGH.

When clear  $(C_L)$  and enable  $(\overline{E})$  are HIGH, all outputs are LOW. When clear  $(C_L)$  is HIGH and enable  $(\overline{E})$  is LOW, the channel demultiplexing occurs. The bit that is addressed has an active output which follows the data input while all unaddressed bits are held LOW. When operating in the addressable latch mode  $(\overline{E}=C_L=LOW)$ , changing more than one bit of the address could impose a transient wrong address. Therefore, this should only be done while in the memory mode  $(\overline{E}=HIGH,\,C_I=LOW)$ .

#### **Features**

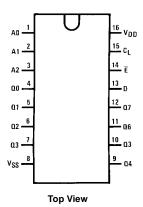
- Wide supply voltage range: 3.0V to 15V
- High noise immunity: 0.45 V<sub>DD</sub> (typ.)
- Low power TTL compatibility: fan out of 2 driving 74L or 1 driving 74LS
- Serial to parallel capability
- Storage register capability
- Random (addressable) data entry
- Active high demultiplexing capability
- Common active high clear

### **Ordering Code:**

Order Number	Package Number	Package Description
CD4724BCM M16A		16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
CD4724BCN	N16F	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**



### **Truth Table**

Mode Selection									
Ē	CL	Addressed	Unaddressed	Mode					
		Latch	Latch						
L	L	Follows Data	Holds Previous Data	Addressable Latch					
Н	L	Hold Previous Data	Holds Previous Data	Memory					
L	Н	Follows Data	Reset to "0"	Demultiplexer					
Н	Н	Reset to "0"	Reset to "0"	Clear					

## **Absolute Maximum Ratings**(Note 1)

(Note 2)

 $\begin{array}{ll} \text{DC Supply Voltage (V}_{\text{DD}}) & -0.5\text{V to } +18\text{ V}_{\text{DC}} \\ \text{Input Voltage (V}_{\text{IN}}) & -0.5\text{V to V}_{\text{DD}} +0.5\text{ V}_{\text{DC}} \\ \text{Storage Temperature (T}_{\text{S}}) & -65^{\circ}\text{C to } +150^{\circ}\text{C} \end{array}$ 

Power Dissipation (P<sub>D</sub>)

Dual-In-Line 700 mW Small Outline 500 mW

Lead Temperature (T<sub>L</sub>)

(Soldering, 10 seconds) 260°C

## Recommended Operating Conditions (Note 2)

DC Supply Voltage ( $V_{DD}$ ) 3.0V to 15  $V_{DC}$ Input Voltage ( $V_{IN}$ ) 0V to  $V_{DD}$   $V_{DC}$ 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 tables of "Recommended Operating Conditions" and Electrical Characteristics" provide conditions for actual device operation.

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

## DC Electrical Characteristics (Note 2)

Parameter	Conditions	–55°C		+25°C			+125°C		Units
	Conditions	Min	Max	Min	Тур	Max	Min	Max	Ullits
Quiescent Device	$V_{DD} = 5V$		5		0.02	5		150	
Current	$V_{DD} = 10V$		10		0.02	10		300	μΑ
	$V_{DD} = 15V$		20		0.02	20		600	
LOW Level	I <sub>O</sub>   ≤ 1 μA								
Output Voltage	$V_{DD} = 5V$		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	
HIGH Level	I <sub>O</sub>   ≤ 1 μA								
Output Voltage	$V_{DD} = 5V$	4.95		4.95	5.0		4.95		
	$V_{DD} = 10V$	9.95		9.95	10		9.95		V
	$V_{DD} = 15V$	14.95		14.95	15		14.95		
LOW Level	$V_{DD} = 5V, V_{O} = 0.5V \text{ or } 4.5V$		1.5		2.25	1.5		1.5	
Input Voltage	$V_{DD} = 10V, V_{O} = 1V \text{ or } 9V$		3.0		4.5	3.0		3.0	V
	$V_{DD} = 15V, V_{O} = 1.5V \text{ or } 13.5V$		4.0		6.75	4.0		4.0	
HIGH Level	$V_{DD} = 5V, V_{O} = 0.5V \text{ or } 4.5V$	3.5		3.5	2.75		3.5		
Input Voltage	$V_{DD} = 10V, V_{O} = 1V \text{ or } 9V$	7.0		7.0	5.5		7.0		V
	$V_{DD} = 15V, V_{O} = 1.5V \text{ or } 13.5V$	11.0		11.0	8.25		11.0		
LOW Level Output	$V_{DD} = 5V, V_{O} = 0.4V$	0.64		0.51	0.88		0.36		
Current	$V_{DD} = 10V, V_{O} = 0.5V$	1.6		1.3	2.25		0.9		mA
(Note 3)	$V_{DD} = 15V, V_{O} = 1.5V$	4.2		3.4	8.8		2.4		
HIGH Level Output	$V_{DD} = 5V, V_{O} = 4.6V$	-0.64		-0.51	-0.88		-0.36		
Current	$V_{DD} = 10V, V_{O} = 9.5V$	-1.6		-1.3	-2.25		-0.9		mA
(Note 3)	$V_{DD} = 15V, V_{O} = 13.5V$	-4.2		-3.4	-8.8		-2.4		
Input Current	$V_{DD} = 15V, V_{IN} = 0V$		-0.1		-10 <sup>-5</sup>	-0.1		-1.0	μΑ
	$V_{DD} = 15V, V_{IN} = 15V$		0.1		10 <sup>-5</sup>	0.1		1.0	μА
	Quiescent Device Current  LOW Level Output Voltage  HIGH Level Output Voltage  LOW Level Input Voltage  HIGH Level Input Voltage  LOW Level Output Current (Note 3)  HIGH Level Output Current (Note 3)	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{ c c c c } \hline \textbf{Parameter} & \textbf{Conditions} & \hline \textbf{Min} \\ \hline \textbf{Quiescent Device} & \textbf{V}_{DD} = 5V \\ \textbf{Current} & \textbf{V}_{DD} = 10V \\ \textbf{V}_{DD} = 15V \\ \hline \textbf{LOW Level} & \textbf{II}_{OI} \leq 1~\mu\text{A} \\ \textbf{Output Voltage} & \textbf{V}_{DD} = 5V \\ \textbf{V}_{DD} = 15V \\ \hline \textbf{HIGH Level} & \textbf{II}_{OI} \leq 1~\mu\text{A} \\ \textbf{Output Voltage} & \textbf{V}_{DD} = 5V \\ \textbf{V}_{DD} = 10V \\ \textbf{V}_{DD} = 15V \\ \hline \textbf{HIGH Level} & \textbf{II}_{OI} \leq 1~\mu\text{A} \\ \textbf{Output Voltage} & \textbf{V}_{DD} = 5V \\ \textbf{V}_{DD} = 10V \\ \textbf{V}_{DD} = 15V \\ \hline \textbf{Input Voltage} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 0.5V~\text{or}~4.5V \\ \textbf{Input Voltage} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V~\text{or}~13.5V \\ \hline \textbf{HIGH Level} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.5V~\text{or}~4.5V \\ \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V~\text{or}~13.5V \\ \hline \textbf{Input Voltage} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V~\text{or}~13.5V \\ \hline \textbf{Input Voltage} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.5V~\text{or}~4.5V \\ \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V~\text{or}~13.5V \\ \hline \textbf{11.0} \\ \hline \textbf{LOW Level Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.4V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.5V \\ \hline \textbf{Input Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V \\ \hline \textbf{Input Level Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 4.6V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 4.6V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 3.5V \\ \hline \textbf{Output Output} & \textbf{Output} & \textbf{Output} \\ \hline \textbf{Output Output} & Outpu$	$ \begin{array}{ c c c c c } \hline \textbf{Parameter} & \textbf{Conditions} & \hline \textbf{Min} & \textbf{Max} \\ \hline \textbf{Quiescent Device} & \textbf{V}_{DD} = 5V \\ \textbf{Current} & \textbf{V}_{DD} = 10V \\ \textbf{V}_{DD} = 15V & 20 \\ \hline \textbf{LOW Level} & \textbf{II}_{Ol} \leq 1 \ \mu\text{A} \\ \textbf{Output Voltage} & \textbf{V}_{DD} = 5V \\ \textbf{V}_{DD} = 10V & 0.05 \\ \textbf{V}_{DD} = 15V & 0.05 \\ \textbf{V}_{DD} = 15V & 0.05 \\ \textbf{V}_{DD} = 15V & 0.05 \\ \hline \textbf{HIGH Level} & \textbf{II}_{Ol} \leq 1 \ \mu\text{A} \\ \textbf{Output Voltage} & \textbf{V}_{DD} = 5V & 4.95 \\ \textbf{V}_{DD} = 10V & 9.95 \\ \textbf{V}_{DD} = 15V & 14.95 \\ \hline \textbf{LOW Level} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.5V \text{ or } 4.5V & 1.5 \\ \textbf{Input Voltage} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V \text{ or } 13.5V & 4.0 \\ \hline \textbf{HIGH Level} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.5V \text{ or } 4.5V & 3.5 \\ \textbf{Input Voltage} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V \text{ or } 13.5V & 11.0 \\ \hline \textbf{LOW Level Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.4V & 0.64 \\ \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 0.5V & 1.5V & 13.6V \\ \hline \textbf{LOW Level Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.5V & 13.5V & 1.6 \\ \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_{O} = 1.5V & -0.64 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_$	$ \begin{array}{ c c c c c } \hline \textbf{Parameter} & \textbf{Conditions} & \hline \textbf{Min} & \textbf{Max} & \textbf{Min} \\ \hline \textbf{Quiescent Device} & \textbf{V}_{DD} = 5V & 5 \\ \textbf{Current} & \textbf{V}_{DD} = 10V & 10 \\ \textbf{V}_{DD} = 15V & 20 \\ \hline \textbf{LOW Level} & \textbf{II}_{OI} \leq 1  \mu \text{A} \\ \textbf{Output Voltage} & \textbf{V}_{DD} = 5V & 0.05 \\ \textbf{V}_{DD} = 10V & 0.05 \\ \textbf{V}_{DD} = 15V & 0.05 \\ \hline \textbf{HIGH Level} & \textbf{II}_{OI} \leq 1  \mu \text{A} \\ \textbf{Output Voltage} & \textbf{V}_{DD} = 5V & 4.95 \\ \textbf{V}_{DD} = 10V & 9.95 & 9.95 \\ \textbf{V}_{DD} = 15V & 14.95 & 14.95 \\ \hline \textbf{LOW Level} & \textbf{V}_{DD} = 5V, V_{O} = 0.5V \text{ or } 4.5V & 1.5 \\ \hline \textbf{Input Voltage} & \textbf{V}_{DD} = 5V, V_{O} = 1.5V \text{ or } 13.5V & 4.0 \\ \hline \textbf{HIGH Level} & \textbf{V}_{DD} = 5V, V_{O} = 1.5V \text{ or } 13.5V & 4.0 \\ \hline \textbf{HIGH Level} & \textbf{V}_{DD} = 5V, V_{O} = 0.5V \text{ or } 4.5V & 3.5 \\ \hline \textbf{Input Voltage} & \textbf{V}_{DD} = 15V, V_{O} = 1.5V \text{ or } 13.5V & 11.0 \\ \hline \textbf{Input Voltage} & \textbf{V}_{DD} = 15V, V_{O} = 1.5V \text{ or } 13.5V & 11.0 \\ \hline \textbf{LOW Level Output} & \textbf{V}_{DD} = 5V, V_{O} = 0.4V & 0.64 & 0.51 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, V_{O} = 0.5V & 1.5V & 4.2 & 3.4 \\ \hline \textbf{HIGH Level Output} & \textbf{V}_{DD} = 15V, V_{O} = 1.5V & 4.2 & 3.4 \\ \hline \textbf{HIGH Level Output} & \textbf{V}_{DD} = 5V, V_{O} = 4.6V & -0.64 & -0.51 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 15V, V_{O} = 1.5V & -1.6 & -1.3 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, V_{O} = 1.5V & -1.6 & -1.3 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, V_{O} = 1.5V, V_{O} = 1.5V & -4.2 & -3.4 \\ \hline \hline \textbf{Input Current} & \textbf{V}_{DD} = 15V, V_{O} = 1.5V, V_{IN} = 0V & -0.1 \\ \hline \end{tabular}$	$\begin{array}{ c c c c c } \hline \textbf{Parameter} & \textbf{Conditions} & \hline \textbf{Min} & \textbf{Max} & \textbf{Min} & \textbf{Typ} \\ \hline \textbf{Quiescent Device} & \textbf{V}_{DD} = 5V & 5 & 0.02 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 10V & 10 & 0.02 \\ \hline \textbf{V}_{DD} = 15V & 20 & 0.02 \\ \hline \textbf{LOW Level} &  I _{O}  \leq 1  \mu \text{A} \\ \hline \textbf{Output Voltage} & \textbf{V}_{DD} = 5V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 15V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 15V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 15V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 15V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 15V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 15V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 15V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 15V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 10V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 10V & 0.05 & 0 \\ \hline \textbf{V}_{DD} = 15V & 14.95 & 14.95 & 15 \\ \hline \textbf{LOW Level} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.5V \text{ or } 4.5V & 1.5 & 2.25 \\ \hline \textbf{Input Voltage} & \textbf{V}_{DD} = 10V, \textbf{V}_{O} = 1V \text{ or } 9V & 3.0 & 4.5 \\ \hline \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V \text{ or } 13.5V & 4.0 & 6.75 \\ \hline \textbf{HIGH Level} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.5V \text{ or } 4.5V & 3.5 & 3.5 & 2.75 \\ \hline \textbf{Input Voltage} & \textbf{V}_{DD} = 10V, \textbf{V}_{O} = 1V \text{ or } 9V & 7.0 & 7.0 & 5.5 \\ \hline \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V \text{ or } 13.5V & 11.0 & 11.0 & 8.25 \\ \hline \textbf{LOW Level Output} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 0.5V & 1.6 & 1.3 & 2.25 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V & -1.5V & -0.64 & -0.51 & -0.88 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 5V, \textbf{V}_{O} = 4.6V & -0.64 & -0.51 & -0.88 \\ \hline \textbf{Current} & \textbf{V}_{DD} = 10V, \textbf{V}_{O} = 9.5V & -1.6 & -1.3 & -2.25 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_{O} = 1.5V & -1.6 & -1.3 & -2.25 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_{O} = 1.5V & -1.6 & -1.3 & -2.25 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_{O} = 1.5V & -1.6 & -1.3 & -2.25 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_{O} = 1.5V & -1.6 & -1.3 & -2.25 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_{O} = 1.5V & -1.6 & -1.3 & -2.25 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_{O} = 1.5V & -1.6 & -1.3 & -2.25 \\ \hline \textbf{(Note 3)} & \textbf{V}_{DD} = 15V, \textbf{V}_{O} = 1.5V, \textbf{V}_{O} = 1.5V & -1.6 & -1.6 & -1.$	Parameter   Conditions   Min   Max   Min   Typ   Max	Conditions         Min         Max         Min         Typ         Max         Min           Quiescent Device         V <sub>DD</sub> = 5V         5         0.02         5           Current         V <sub>DD</sub> = 10V         10         0.02         10           V <sub>DD</sub> = 15V         20         0.02         20           LOW Level         II <sub>O</sub>   ≤ 1 μA         0.05         0         0.05           Output Voltage         V <sub>DD</sub> = 5V         0.05         0         0.05           HIGH Level         II <sub>O</sub>   ≤ 1 μA         0.05         0         0.05           Output Voltage         V <sub>DD</sub> = 5V         4.95         4.95         5.0         4.95           HIGH Level         II <sub>O</sub>   ≤ 1 μA         14.95         14.95         10         9.95           LOW Level         V <sub>DD</sub> = 15V         14.95         14.95         15         14.95           LOW Level         V <sub>DD</sub> = 5V, V <sub>Q</sub> = 0.5V or 4.5V         1.5         2.25         1.5           Input Voltage         V <sub>DD</sub> = 15V, V <sub>Q</sub> = 1.5V or 13.5V         4.0         6.75         4.0           HIGH Level         V <sub>DD</sub> = 5V, V <sub>Q</sub> = 0.5V or 4.5V         3.5         3.5         2.75         3.5           Input Voltage	Parameter   Conditions   Min   Max   Min   Typ   Max   Min   Min   Max   Min   Min   Max   Min   Min   Max   Min   Mi

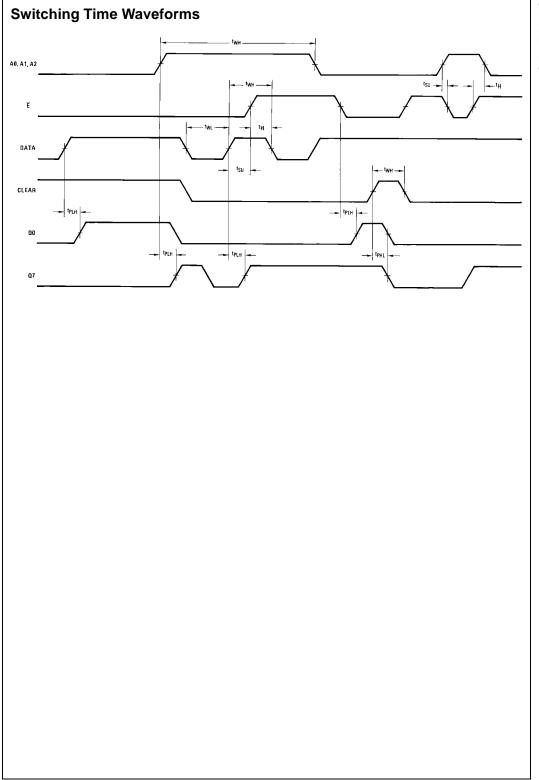
Note 3:  $I_{OL}$  and  $I_{OH}$  are tested one output at a time.

# AC Electrical Characteristics (Note 4) $T_A=25^{\circ}C,\,C_L=50\;\text{pF},\,R_L=200k,\,\text{Input}\;t_r=t_f=20\;\text{ns},\,\text{unless otherwise noted}$

Symbol	Parameter	Conditions	Min	Тур	Max	Units
t <sub>PHL, tPLH</sub>	Propagation Delay	$V_{DD} = 5V$		200	400	
	Data to Output	$V_{DD} = 10V$		75	150	ns
		$V_{DD} = 15V$		50	100	
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay	$V_{DD} = 5V$		200	400	
	Enable to Output	$V_{DD} = 10V$		80	160	ns
		$V_{DD} = 15V$		60	120	
t <sub>PHL</sub>	Propagation Delay	$V_{DD} = 5V$		175	350	
	Clear to Output	$V_{DD} = 10V$		80	160	ns
		$V_{DD} = 15V$		65	130	
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay	$V_{DD} = 5V$		225	450	
	Address to Output	$V_{DD} = 10V$		100	200	ns
		$V_{DD} = 15V$		75	150	
t <sub>THL</sub> , t <sub>TLH</sub>	Transition Time	$V_{DD} = 5V$		100	200	
	(Any Output)	$V_{DD} = 10V$		50	100	ns
		$V_{DD} = 15V$		40	80	
T <sub>WH</sub> , T <sub>WL</sub>	Minimum Data	$V_{DD} = 5V$		100	200	
	Pulse Width	$V_{DD} = 10V$		50	100	ns
		$V_{DD} = 15V$		40	80	
t <sub>WH</sub> , t <sub>WL</sub>	Minimum Address	$V_{DD} = 5V$		200	400	
	Pulse Width	$V_{DD} = 10V$		100	200	ns
		$V_{DD} = 15V$		65	125	
t <sub>WH</sub>	Minimum Clear	$V_{DD} = 5V$		75	150	
	Pulse Width	$V_{DD} = 10V$		40	75	ns
		$V_{DD} = 15V$		25	50	
t <sub>SU</sub>	Minimum Setup Time	$V_{DD} = 5V$		40	80	
	Data to E	$V_{DD} = 10V$		20	40	ns
		$V_{DD} = 15V$		15	30	
t <sub>H</sub>	Minimum Hold Time	$V_{DD} = 5V$		60	120	
	Data to E	$V_{DD} = 10V$		30	60	ns
		$V_{DD} = 15V$		25	50	
t <sub>SU</sub>	Minimum Setup Time	$V_{DD} = 5V$		-15	50	
	Address to E	$V_{DD} = 10V$		0	30	ns
		$V_{DD} = 15V$		0	20	
t <sub>H</sub>	Minimum Hold Time	$V_{DD} = 5V$		-50	15	
	Address to E	$V_{DD} = 10V$		-20	10	ns
		V <sub>DD</sub> = 15V		-15	5	
C <sub>PD</sub>	Power Dissipation	Per Package		100		pF
	Capacitance	(Note 5)				
C <sub>IN</sub>	Input Capacitance	Any Input		5.0	7.5	pF

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

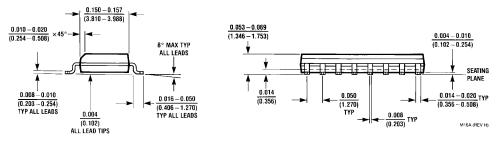
Note 5: Dynamic power dissipation ( $P_D$ ) is given by:  $P_D = (C_{PD} + C_L) \ V_{CC}^2 f + P_Q$ ; where  $C_L = load$  capacitance; f = f frequency of operation; for further details, see Application Note AN-90, "Family Characteristics".



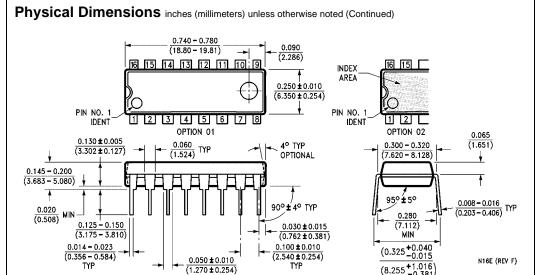
## 

LEAD NO.1

 $\frac{0.010}{(0.254)}$  MAX



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



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

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