

October 1987 Revised January 2004

# MM82C19 16-Line to 1-Line Multiplexer

### **General Description**

The MM82C19 multiplex 16 digital lines to 1 output. A 4-bit address code determines the particular 1-of-16 inputs which is routed to the output. The data is inverted from input to output.

A strobe override places the output of MM82C19 in the high-impedance state.

All inputs are protected from damage due to static discharge by diode clamps to  $\ensuremath{V_{CC}}$  and GND.

#### **Features**

■ Wide supply voltage range: 3.0V to 15V

■ Guaranteed noise margin: 1.0V

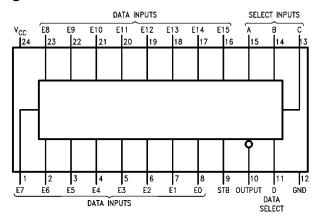
■ High noise immunity: 0.45 V<sub>CC</sub> (typ.)

■ TTL compatibility: Drive 1 TTL Load

## **Ordering Code:**

Order Number	Package Number	Package Description						
MM82C19N	N24A	24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-011, 0.600" Wide						

# **Connection Diagram**



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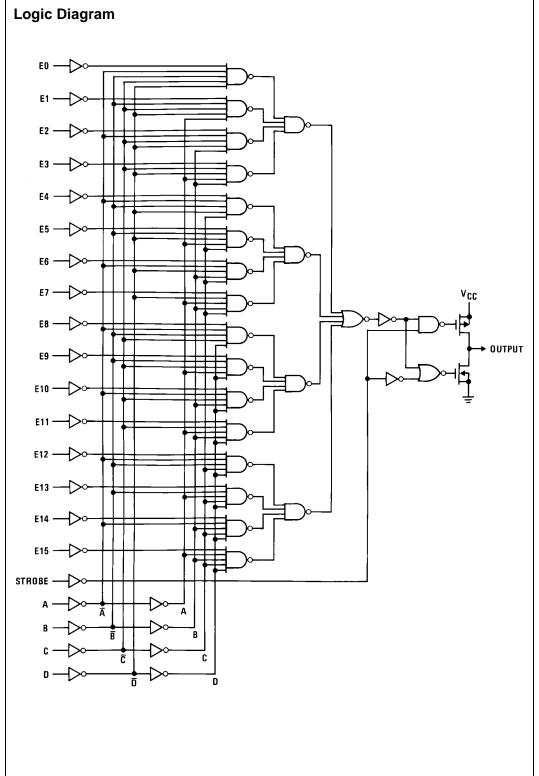
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# **Truth Table**

#### MM82C19

Inputs										Output											
D	С	В	Α	STROBE	E0	E1	E2	<b>E</b> 3	E4	E5	<b>E</b> 6	<b>E</b> 7	E8	<b>E</b> 9	E10	E11	E12	E13	E14	E15	W
Х	Χ	Χ	Χ	1	Χ	Χ	Х	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Х	Χ	Χ	Χ	Χ	Χ	High-Z
0	0	0	0	0	0	Х	Χ	X	Х	X	Χ	X	Χ	Χ	Χ	X	Χ	Χ	Χ	Χ	1
0	0	0	0	0	1	Χ	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ	Χ	Χ	Х	0
0	0	0	1	0	Х	0	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ	Χ	Χ	Х	1
0	0	0	1	0	Χ	1	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Х	0
0	0	1	0	0	Χ	Χ	0	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	1
0	0	1	0	0	Χ	Χ	1	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	0
0	0	1	1	0	Χ	Χ	Χ	0	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	1
0	0	1	1	0	Χ	Χ	Χ	1	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	0
0	1	0	0	0	Χ	Χ	Χ	Χ	0	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	1
0	1	0	0	0	Χ	Χ	Χ	Χ	1	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	0
0	1	0	1	0	Χ	Χ	X	Χ	Χ	0	Χ	Χ	Χ	Χ	Χ	X	Χ	Χ	Χ	Χ	1
0	1	0	1	0	Χ	Χ	Χ	Х	Χ	1	Χ	Х	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	0
0	1	1	0	0	Χ	Χ	X	Χ	Χ	Χ	0	Χ	Χ	Χ	Χ	X	Χ	Χ	Χ	Χ	1
0	1	1	0	0	Χ	Х	Х	X	Х	X	1	Х	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	0
0	1	1	1	0	Х	Χ	X	Χ	Χ	Χ	Χ	0	Χ	Χ	Χ	X	Χ	X	Χ	Χ	1
0	1	1	1	0	Х	Χ	X	Χ	Χ	Χ	Χ	1	Χ	Χ	Χ	X	Χ	X	Χ	Χ	0
1	0	0	0	0	Х	Χ	X	Χ	Χ	Χ	Χ	Χ	0	Χ	Χ	X	X	X	X	Х	1
1	0	0	0	0	Х	Χ	X	Χ	Χ	Χ	Χ	Χ	1	Χ	Χ	X	X	X	X	Х	0
1	0	0	1	0	Х	Χ	X	Χ	Χ	Χ	Χ	Χ	Χ	0	Χ	X	X	X	X	Х	1
1	0	0	1	0	Х	Х	Х	Χ	Х	Х	Х	Χ	Χ	1	Х	Χ	Х	Х	Х	Х	0
1	0	1	0	0	Χ	Χ	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	0	Χ	X	Х	X	Х	1
1	0	1	0	0	Х	Χ	Х	Χ	Χ	Χ	Χ	Χ	Χ	Χ	1	Х	Х	Х	X	Х	0
1	0	1	1	0	Х	Χ	Х	Χ	Х	Χ	Х	Χ	Χ	Χ	Х	0	X	Х	X	Х	1
1	0	1	1	0	Х	Χ	Х	Χ	Х	Χ	Х	Χ	Χ	Χ	Х	1	Х	Х	Х	Х	0
1	1	0	0	0	X	Χ	Х	Χ	Х	Χ	Х	Χ	Χ	Χ	Х	Χ	0	Х	X	Х	1
1	1	0	0	0	Χ	Χ	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Х	Χ	1	Χ	Χ	Х	0
1	1	0	1	0	X	Χ	Х	Χ	Х	Χ	Х	Χ	X	Χ	Х	Χ	Х	0	Χ	Х	1
1	1	0	1	0	X	Χ	Х	Χ	X	Χ	X	Χ	Χ	Χ	Х	Χ	Χ	1	Χ	Х	0
1	1	1	0	0	Χ	Χ	X	Χ	Х	Χ	Х	Χ	Х	Χ	Х	X	Χ	Х	0	Х	1
1	1	1	0	0	X	X	Х	X	X	X	X	X	Χ	X	Х	Χ	Χ	Х	1	Х	0
1	1	1	1	0	X	Χ	Х	Χ	X	Χ	X	Χ	Χ	Χ	Х	X	Χ	Х	Х	0	1
1	1	1	1	0	X	Х	Χ	X	Х	Х	X	X	X	X	X	X	X	X	Χ	1	0



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

 $\begin{array}{lll} \mbox{Voltage at Any Pin} & -0.3\mbox{V to V}_{\mbox{CC}} + 0.3\mbox{V} \\ \mbox{Operating Temperature Range} & -55\mbox{^{\circ}C to +125\mbox{^{\circ}C}} \\ \mbox{Storage Temperature Range} & -65\mbox{^{\circ}C to +150\mbox{^{\circ}C}} \end{array}$ 

Power Dissipation

Dual-In-Line 700 mW Small Outline 500 mW

Operating  $V_{CC}$  Range 3.0V to 15V  $V_{CC}$  18V

V<sub>CC</sub> Lead Temperature

(soldering, 10 seconds) 260°C

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The Electrical Characteristic table provides conditions

for actual device operation.

#### **DC Electrical Characteristics**

Min/Max limits apply across temperature range unless otherwise noted.

Symbol	Parameter	Conditions	Min	Тур	Max	Units	
CMOS to 0	смоѕ		*			•	
V <sub>IN(1)</sub>	Logical "1" Input Voltage	V <sub>CC</sub> = 5.0V	3.5			V	
		V <sub>CC</sub> = 10V	8.0			V	
V <sub>IN(0)</sub>	Logical "0" Input Voltage	V <sub>CC</sub> = 5.0V			1.5	V	
		V <sub>CC</sub> = 10V			2.0	V	
V <sub>OUT(1)</sub>	Logical "1" Output Voltage	$V_{CC} = 5.0V, I_{O} = -10 \mu A$	4.5			V	
		$V_{CC} = 10V$ , $I_{O} = -10 \mu A$	9.0			V	
V <sub>OUT(0)</sub>	Logical "0" Output Voltage	$V_{CC} = 5.0V, I_{O} = +10 \mu A$			0.5	V	
		$V_{CC} = 10V$ , $I_{O} = +10 \mu A$			1.0	V	
IN(1)	Logical "1" Input Current	V <sub>CC</sub> = 15V, V <sub>IN</sub> = 15V		0.005	1.0	V	
I <sub>IN(0)</sub>	Logical "0" Input Current	$V_{CC} = 15V, V_{IN} = 0V$	-1.0	-0.005		μΑ	
oz	Output Current in High						
	Impedance State						
	MM82C19	$V_{CC} = 15V, V_{O} = 15V$		0.005	1.0	μΑ	
		$V_{CC} = 15V, V_{O} = 0V$	-1.0	-0.005			
lcc	Supply Current	V <sub>CC</sub> = 15V		0.05	300	μΑ	
CMOS/LP	TTL Interface						
V <sub>IN(1)</sub>	Logical "1" Input Voltage	74C, 82C, V <sub>CC</sub> = 4.75V	V <sub>CC</sub> -1.5			V	
V <sub>IN(0)</sub>	Logical "0" Input Voltage	74C, 82C, V <sub>CC</sub> = 4.75V			8.0	V	
V <sub>OUT(1)</sub>	Logical "1" Output Voltage	74C, 82C, V <sub>CC</sub> = 4.75V, I <sub>O</sub> = -1.6 mA	2.4			V	
V <sub>OUT(0)</sub>	Logical "0" Output Voltage	74C, 82C, V <sub>CC</sub> = 4.75V, I <sub>O</sub> = 1.6 mA			0.4	V	
Output Dr	ive (Short Circuit Current)	<u> </u>	•			•	
I <sub>SOURCE</sub>	Output Source Current	$V_{CC} = 5.0V, V_{OUT} = 0V, T_A = 25^{\circ}C$	-4.35	-8		mA	
	(P-Channel)						
SOURCE	Output Source Current	V <sub>CC</sub> = 10V, V <sub>OUT</sub> = 0V, T <sub>A</sub> = 25°C	-20	-40		mA	
	(P-Channel)						
SINK	Output Sink Current	$V_{CC} = 5.0V, V_{OUT} = V_{CC}, T_A = 25^{\circ}C$	4.35	8		mA	
	(N-Channel)						
I <sub>SINK</sub>	Output Sink Current	$V_{CC} = 10V, V_{OUT} = V_{CC}, T_A = 25^{\circ}C$	20	40		mA	
	(N-Channel)						

# **AC Electrical Characteristics** (Note 2)

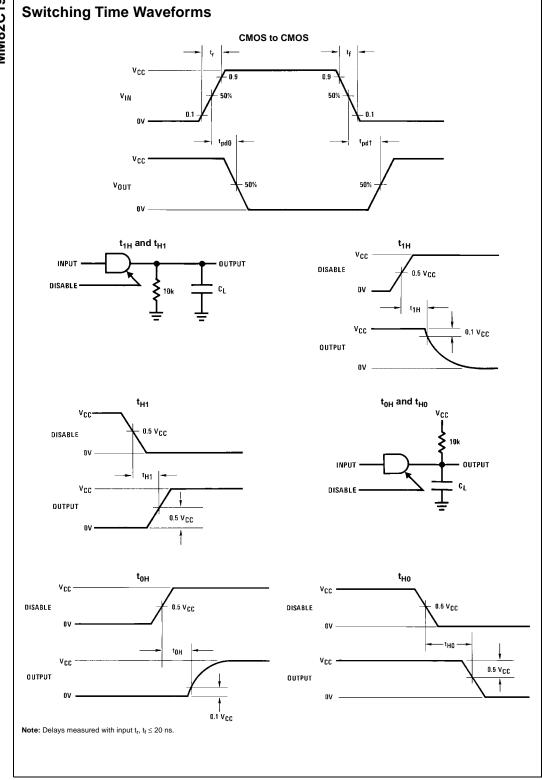
 $T_A = 25$ °C,  $C_L = 50$  pF, unless otherwise noted

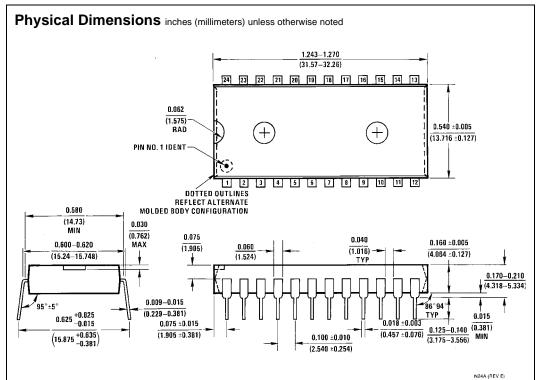
Symbol	Parameter	Conditions	Min	Тур	Max	Units			
t <sub>pd0</sub> , t <sub>pd1</sub>	Propagation Delay Time to a	V <sub>CC</sub> = 5.0V		250	600				
	Logical "0" or Logical "1"	V <sub>CC</sub> = 10V		110	300	ns			
	from Data Inputs to Output	$V_{CC} = 5.0V, C_L = 150 pF$		290	650				
		$V_{CC} = 10V, C_L = 150 pF$		120	330				
t <sub>pd0</sub> , t <sub>pd1</sub>	Propagation Delay Time to a	V <sub>CC</sub> = 5.0V		290	650				
	Logical "0" or Logical "1"	V <sub>CC</sub> = 10V		120	330	ns			
	from Data Select Inputs to Output								
t <sub>pd0</sub> , t <sub>pd1</sub>	Propagation Delay Time to a	V <sub>CC</sub> = 5.0V		120	300				
	Logical "0" or Logical "1"	V <sub>CC</sub> = 10V		55	150	ns			
	from Strobe to Output MM74C150								
t <sub>1H</sub> , t <sub>0H</sub>	Delay from Strobe to High	$V_{CC} = 5.0V, R_L = 10k, C_L = 5 pF$		80	200				
	Impedance State MM82C19	$V_{CC} = 10V, R_L = 10k, C_L = 5 pF$		60	150	ns			
t <sub>H1</sub> , t <sub>H0</sub>	Delay from Strobe to Logical	$V_{CC} = 5.0V, R_L = 10k, C_L = 5 pF$		80	250				
	"1" Level or to Logical "0"	$V_{CC} = 10V, R_L = 10k, C_L = 5 pF$		30	120	ns			
	Level (from High Impedance State)								
	MM82C19								
C <sub>IN</sub>	Input Capacitance	Any Input (Note 3)		5.0		pF			
C <sub>OUT</sub>	Output Capacitance	(Note 3)		11.0		pF			
	MM82C19								
C <sub>PD</sub>	Power Dissipation Capacitance	(Note 4)		100		pF			

Note 2: AC Parameters are guaranteed by DC correlated testing.

Note 3: Capacitance is guaranteed by periodic testing.

Note 4: C<sub>PD</sub> determines the no load AC power consumption of any CMOS device. For complete explanation, see Family Characteristics, application note AN-90.





24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-011, 0.600" Wide Package Number N24A

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