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October 1987
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MM74C157 Quad 2-Input Multiplexers

General Description

The MM74C157 multiplexers are monolithic complementary MOS (CMOS) integrated circuits constructed with N- and P-channel enhancement transistors. They consist of four 2-input multiplexers with common select and enable inputs. When the enable input is at logical "0" the four outputs assume the values as selected from the inputs. When the enable input is at logical "1", the outputs assume logical "0". Select decoding is done internally resulting in a single select input only.

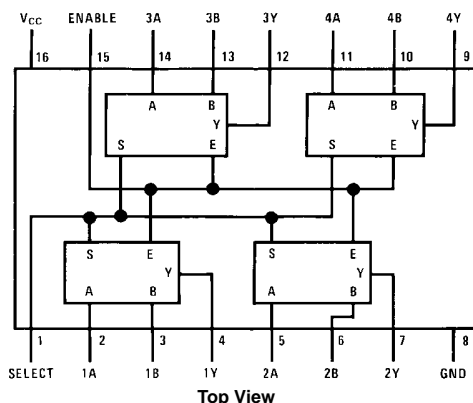
Features

- Supply voltage range: 3V to 15V
- High noise immunity: 0.45 V_{CC} (typ.)
- Low power: 50 nW (typ.)
- Tenth power TTL compatible: Drive 2 LPTTL loads

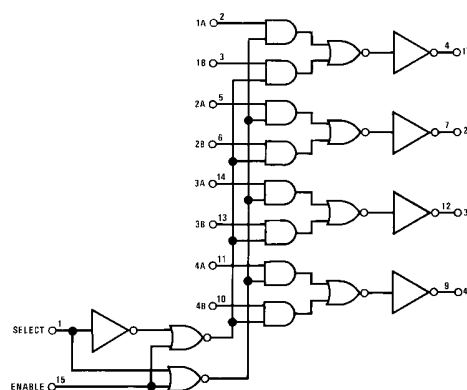
Ordering Code:

Order Number	Package Number	Package Description
MM74C157N	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

Connection Diagram



Logic Diagram



Truth Table

Enable	Select	A	B	Output Y
1	X	X	X	0
0	0	0	X	0
0	0	1	X	1
0	1	X	0	0
0	1	X	1	1

MM74C157

Absolute Maximum Ratings (Note 1)

Voltage at Any Pin	-0.3V to $V_{CC} + 0.3V$
Operating Temperature Range	-55°C to +125°C
Storage Temperature Range	-65°C to +150°C
Maximum V_{CC} Voltage	18V
Power Dissipation (P_D)	
Dual-In-Line	700 mW
Small Outline	500 mW
Operating V_{CC} Range	3V to 15V
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 table of "Electrical Characteristics" provides conditions for actual device operation.

DC Electrical Characteristics

Min/Max limits apply across temperature range unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
CMOS TO CMOS						
$V_{IN(1)}$	Logical "1" Input Voltage	$V_{CC} = 5V$ $V_{CC} = 10V$	3.5 8.0			V
$V_{IN(0)}$	Logical "0" Input Voltage	$V_{CC} = 5V$ $V_{CC} = 10V$			1.5 2.0	V
$V_{OUT(1)}$	Logical "1" Output Voltage	$V_{CC} = 5V$ $V_{CC} = 10V$	4.5 9.0			V
$V_{OUT(0)}$	Logical "0" Output Voltage	$V_{CC} = 5V$ $V_{CC} = 10V$			0.5 1.0	V
$I_{IN(1)}$	Logical "1" Input Current	$V_{CC} = 15V$		0.005	1.0	μA
$I_{IN(0)}$	Logical "0" Input Current	$V_{CC} = 15V$	-1.0	-0.005		μA
I_{CC}	Supply Current	$V_{CC} = 15V$		0.05	60	μA
CMOS TO TENTH POWER INTERFACE						
$V_{IN(1)}$	Logical "1" Input Voltage	$V_{CC} = 4.75V$	$V_{CC} - 1.5$			V
$V_{IN(0)}$	Logical "0" Input Voltage	$V_{CC} = 4.75V$			0.8	V
$V_{OUT(1)}$	Logical "1" Output Voltage	$V_{CC} = 4.75V, I_O = -360 \mu A$	2.4			V
$V_{OUT(0)}$	Logical "0" Output Voltage	$V_{CC} = 4.75V, I_O = 360 \mu A$			0.4	V
OUTPUT DRIVE (See Family Characteristics Data Sheet) (Short Circuit Current)						
I_{SOURCE}	Output Source Current	$V_{CC} = 5V, V_{IN(0)} = 0V$ $T_A = 25^\circ C, V_{OUT} = 0V$	-1.75			mA
I_{SOURCE}	Output Source Current	$V_{CC} = 10V, V_{IN(0)} = 0V$ $T_A = 25^\circ C, V_{OUT} = 0V$	-8.0			mA
I_{SINK}	Output Sink Current	$V_{CC} = 5V, V_{IN(1)} = 5V$ $T_A = 25^\circ C, V_{OUT} = V_{CC}$	1.75			mA
I_{SINK}	Output Sink Current	$V_{CC} = 10V, V_{IN(1)} = 10V$ $T_A = 25^\circ C, V_{OUT} = V_{CC}$	8.0			mA

AC Electrical Characteristics (Note 2)						
T _A = 25°C, C _L = 50 pF, unless otherwise specified						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
t _{pd0} , t _{pd1}	Propagation Delay from Data to Output	V _{CC} = 5.0V V _{CC} = 10V		150 70	250 110	ns
t _{pd0} , t _{pd1}	Propagation Delay from Select to Output	V _{CC} = 5V V _{CC} = 10V		180 80	300 130	ns
t _{pd0} , t _{pd1}	Propagation Delay from Enable to Output	V _{CC} = 5V V _{CC} = 10V		180 80	300 130	ns
C _{IN}	Input Capacitance	(Note 3)		5		pF
C _{PD}	Power Dissipation Capacitance	(Note 4)		20		pF

Note 2: AC Parameters are guaranteed by DC correlated testing.
Note 3: Capacitance is guaranteed by periodic testing.
Note 4: C_{PD} determines the no load AC power consumption of any CMOS device. For complete explanation, see Family Characteristics, Application Note AN-90.

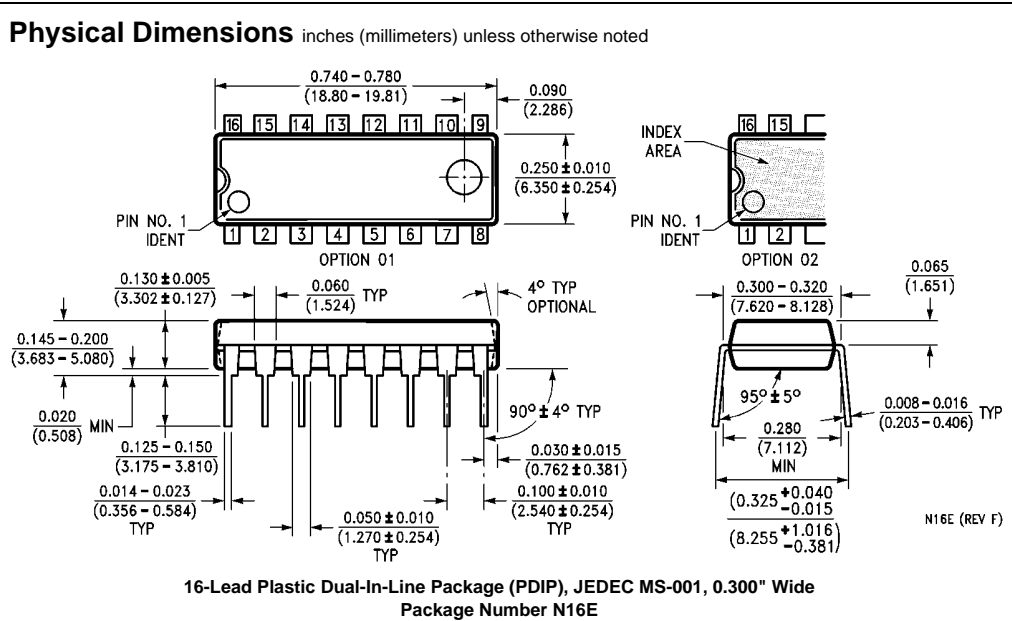
Typical Applications

74L Compatibility

Guaranteed Noise Margin as a Function of V_{CC}

V _{CC} (V)	V _{OUT} (1) (V)	V _{OUT} (0) (V)
4.50	4.05	1.45
10	12.5	2.5
15	13.5	1.5

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