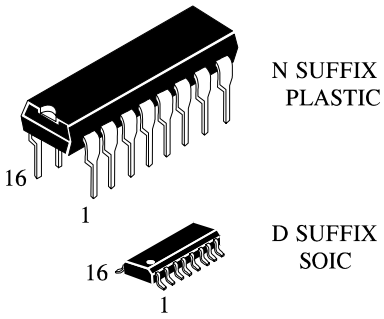
QUAD 2-INPUT DATA SELECTORS/MULTIPLEXER

High-Performance Silicon-Gate CMOS

The IN74HCT157A is identical in pinout to the LS/ALS157. This device may be used as a level converter for interfacing TTL or NMOS outputs to High Speed CMOS inputs.

This device routes 2 nibbles (A or B) to a single port (Y) as determined by the Select input. The data is presented at the outputs in noninvertered form. A high level on the Output Enable input sets all four Y outputs to a low level.

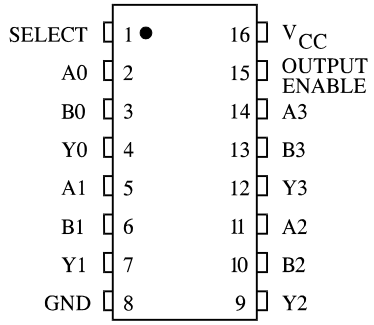
- TTL/NMOS Compatible Input Levels
- Outputs Directly Interface to CMOS, NMOS, and TTL
- Operating Voltage Range: 4.5 to 5.5 V
- Low Input Current: 1.0 μA



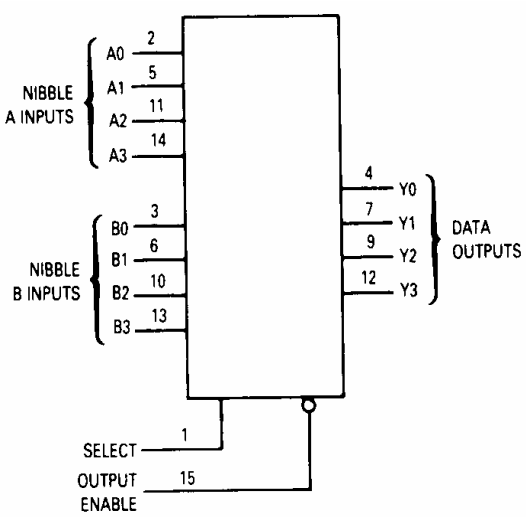
ORDERING INFORMATION

IN74HCT157AN Plastic
IN74HCT157AD SOIC
T_A = -55° to 125° C for all packages

PIN ASSIGNMENT



LOGIC DIAGRAM



PIN 16 =V_{CC}
PIN 8 = GND

FUNCTION TABLE

Inputs		Outputs
Output Enable	Select	Y0-Y3
H	X	L
L	L	A0-A3
L	H	B0-B3

X=don't care
A0-A3,B0-B3=the levels of the respective Data-Word Inputs

INTEGRAL

MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage (Referenced to GND)	-0.5 to +7.0	V
V_{IN}	DC Input Voltage (Referenced to GND)	-1.5 to V_{CC} +1.5	V
V_{OUT}	DC Output Voltage (Referenced to GND)	-0.5 to V_{CC} +0.5	V
I_{IN}	DC Input Current, per Pin	±20	mA
I_{OUT}	DC Output Current, per Pin	±25	mA
I_{CC}	DC Supply Current, V_{CC} and GND Pins	±50	mA
P_D	Power Dissipation in Still Air, Plastic DIP+ SOIC Package+	750 500	mW
Tstg	Storage Temperature	-65 to +150	°C
T_L	Lead Temperature, 1 mm from Case for 10 Seconds (Plastic DIP or SOIC Package)	260	°C

*Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.
+Derating - Plastic DIP: - 10 mW/°C from 65° to 125°C
SOIC Package: : - 7 mW/°C from 65° to 125°C

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V_{CC}	DC Supply Voltage (Referenced to GND)	4.5	5.5	V
V_{IN}, V_{OUT}	DC Input Voltage, Output Voltage (Referenced to GND)	0	V_{CC}	V
T_A	Operating Temperature, All Package Types	-55	+125	°C
t_r, t_f	Input Rise and Fall Time (Figure 1	0	500	ns

This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high-impedance circuit. For proper operation, V_{IN} and V_{OUT} should be constrained to the range GND≤(V_{IN} or V_{OUT})≤V_{CC}.

Unused inputs must always be tied to an appropriate logic voltage level (e.g., either GND or V_{CC}). Unused outputs must be left open.

DC ELECTRICAL CHARACTERISTICS(Voltages Referenced to GND)

Symbol	Parameter	Test Conditions	V_{CC} V	Guaranteed Limit			Unit
				25 °C to -55°C	≤85 °C	≤125 °C	
V_{IH}	Minimum High-Level Input Voltage	V_{OUT}=0.1 V or V_{CC}-0.1 V $\|I_{OUT}\| \leq 20\ \mu A$	4.5 5.5	2.0 2.0	2.0 2.0	2.0 2.0	V
V_{IL}	Maximum Low - Level Input Voltage	V_{OUT}=0.1 V or V_{CC}-0.1 V $\|I_{OUT}\| \leq 20\ \mu A$	4.5 5.5	0.8 0.8	0.8 0.8	0.8 0.8	V
V_{OH}	Minimum High-Level Output Voltage	V_{IN}=V_{IH} or V_{IL} $\|I_{OUT}\| \leq 20\ \mu A$	4.5 5.5	4.4 5.4	4.4 5.4	4.4 5.4	V
		V_{IN}=V_{IH} or V_{IL} $\|I_{OUT}\| \leq 4.0$ mA	4.5	3.98	3.84	3.7	
V_{OL}	Maximum Low-Level Output Voltage	V_{IN}=V_{IH} or V_{IL} $\|I_{OUT}\| \leq 20\ \mu A$	4.5 5.5	0.1 0.1	0.1 0.1	0.1 0.1	V
		V_{IN}=V_{IH} or V_{IL} $\|I_{OUT}\| \leq 4.0$ mA	4.5	0.26	0.33	0.4	
I_{IN}	Maximum Input Leakage Current	V_{IN}=V_{CC} or GND	5.5	±0.1	±1.0	±1.0	μA
I_{CC}	Maximum Quiescent Supply Current (per Package)	V_{IN}=V_{CC} or GND I_{OUT}=0μA	5.5	4.0	40	160	μA
ΔI_{CC}	Additional Quiescent Supply Current	V_{IN}=2.4 V, Any One Input V_{IN}=V_{CC} or GND, Other Inputs		-55°C	25°C to 125°C		mA
		I_{OUT}=0μA	5.5	2.9	2.4		

AC ELECTRICAL CHARACTERISTICS(V_{CC} =5.0 V ± 10%, C_L=50pF,Input t_r=t_f=6.0 ns)

Symbol	Parameter	Guaranteed Limit			Unit
		25 °C to -55°C	≤85°C	≤125 °C	
t_{PLH}, t_{PHL}	Maximum Propagation Delay, Input A or B to Output Y (Figures 1and 4)	27	34	41	ns
t_{PLH}, t_{PHL}	Maximum Propagation Delay , Select to Output Y (Figures 2 and 4)	37	46	56	ns
t_{PLH}, t_{PHL}	Maximum Propagation Delay , Output Enable to Output Y (Figures 3 and 4)	30	38	45	ns
t_{TLH}, t_{THL}	Maximum Output Transition Time, Any Output (Figures 1 and 4)	15	19	22	ns
C_{IN}	Maximum Input Capacitance	10	10	10	pF

C_{PD}	Power Dissipation Capacitance (Per Transceiver Channel) Used to determine the no-load dynamic power consumption: $P_D=C_{PD}V_{CC}^2f+I_{CC}V_{CC}$	Typical @25°C,V_{CC}=5.0 V	pF
		64	

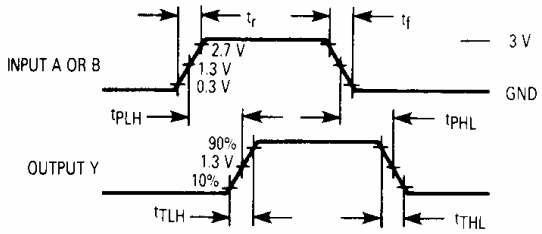


Figure 1. Switching Waveforms

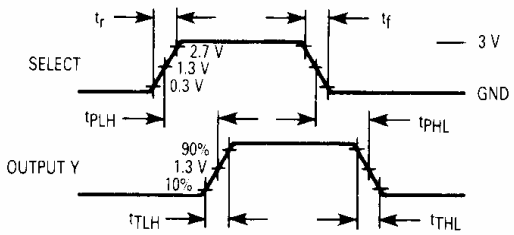


Figure 2. Switching Waveforms

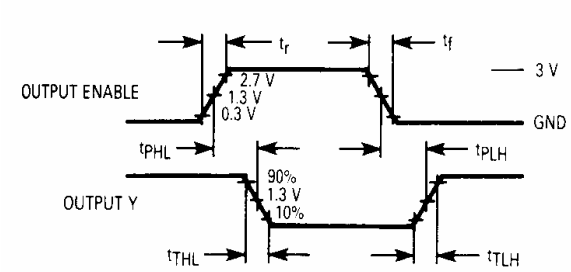


Figure 3. Switching Waveforms

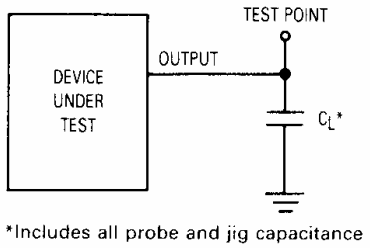


Figure 4. Test Circuit

INTEGRAL

EXPANDED LOGIC DIAGRAM

