

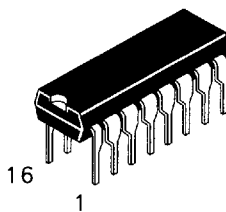
DV74HCT158 Available Q2, 1995

Quad 2-Input Data Selectors/Multiplexers

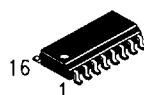
These devices routes 2 nibbles (A or B) to a single port (Y) as determined by the Select Input. The data is presented at the outputs in noninverted form on the '157 and inverted form on the '158. A high level on the Output Enable input sets all four Y outputs to the off level.

- **Output Drive Capability:** 10 LSTTL Loads
- **Outputs Directly Interface to CMOS, NMOS, and TTL**
- **Operating Voltage Range:** 2 to 6 V
- **Low Input Current:** 1 μ A
- **DC, AC parameters guaranteed from -55°C to 125°C**

DV74HC157A, DV74HCT157A DV74HC158A, DV74HCT158A

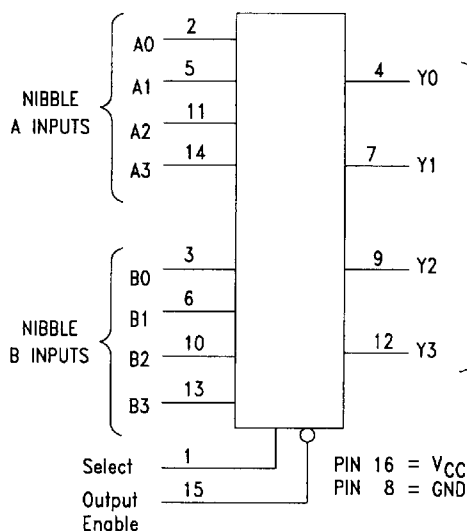


N Suffix
Plastic DIP
AVG-003 Case

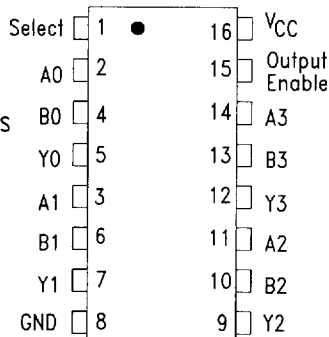


D Suffix
Plastic SOP
AVG-004 Case

157, 158



PIN ASSIGNMENT



TRUTH TABLE

Inputs		'157 Outputs	'158 Outputs
Output Enable	Select	Y0-Y3	Y0-Y3
H	X	L	H
L	L	A0-A3	A0-A3
L	H	B0-B3	B0-B3

A0-A3, B0-B3=the level of the respective Data-Word Inputs
H = High Logic Level
L = Low Logic Level
X = Don't Care

ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

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 SOP Package	750 500	mW
T _{STG}	Storage Temperature Range	-65 to +150	°C
TL	Lead Temperature, 1mm from Case for 10 Seconds (Plastic DIP or Sop Package)	260	°C

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage, HC (HCT), Referenced to GND	2.0 (4.5)	6.0 (5.5)	V
V _{IN} , V _{OUT}	DC Input Voltage, Output Voltage, Referenced to GND	0	V _{CC}	V
T _A	Ambient Temperature	-55	+125	°C
t _r , t _f	Input Rise and Fall Time: HC: V _{CC} =2.0V HCT: V _{CC} =5.5V / HC: V _{CC} =4.5V HC: V _{CC} =6.0V	0 0 0	1000 500 400	ns

HC-157A, HC -158A

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} V	Guaranteed Limits			Unit
				25°C to -55°C	≤85°C	≤125°C	
V _{IH}	Minimum High-Level Input Voltage	V _{OUT} = 0.1 V, I _{OUT} ≤ 20μA or V _{OUT} = V _{CC} - 0.1V	2.0 4.5 6.0	1.5 3.15 4.2	1.5 3.15 4.2	1.5 3.15 4.2	V
V _{IL}	Maximum Low- Level Input Voltage	V _{OUT} = 0.1 V, I _{OUT} ≤ 20μA or V _{OUT} = V _{CC} - 0.1V	2.0 4.5 6.0	0.5 1.35 1.8	0.5 1.35 1.8	0.5 1.35 1.8	V
V _{OH}	Minimum High-Level Output Voltage	V _{IN} = V _{IH} or V _{IL} I _{OUT} ≤ 20 μA	2.0 4.5 6.0	1.9 4.4 5.9	1.9 4.4 5.9	1.9 4.4 5.9	V
		V _{IN} = V _{IH} or V _{IL} , I _{OUT} ≤ 4.0mA I _{OUT} ≤ 5.2 mA	4.5 6.0	3.98 5.48	3.84 5.34	3.7 5.2	
V _{OL}	Maximum Low Level Output Voltage	V _{IN} = V _{IH} or V _{IL} I _{OUT} ≤ 20 μA	2.0 4.5 6.0	0.1 0.1 0.1	0.1 0.1 0.1	0.1 0.1 0.1	V
		V _{IN} = V _{IH} or V _{IL} , I _{OUT} ≤ 4.0mA I _{OUT} ≤ 5.2 mA	4.5 6.0	0.26 0.26	0.33 0.33	0.40 0.40	V
I _{IN}	Maximum Input Leakage Current	V _{IN} = V _{CC} or GND	6.0	± 0.1	± 1.0	± 1.0	μA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND, I _{OUT} = 0μA (Per Package)	6.0	4.0	40	160	μA

AC ELECTRICAL CHARACTERISTICS over full operating conditions (C_L=50 pF, Input t_r=t_f=6ns)

Symbol	Parameter	V _{CC} V	Guaranteed Limit			Unit
			25°C to -55°C	≤85°C	≤125°C	
t _{PLH} , t _{PHL}	Maximum Propagation Delay Time, Input A or B to Output Y	2.0 4.5 6.0	105 21 18	130 26 22	160 32 27	ns
t _{PLH} , t _{PHL}	Maximum Propagation Delay Time, Select to Output Y	2.0 4.5 6.0	110 22 19	140 28 24	165 33 28	ns
t _{PLH} , t _{PHL}	Maximum Propagation Delay Time, Output Enable to Output Y	2.0 4.5 6.0	100 20 17	125 25 21	150 30 26	ns
t _{TLH} , t _{THL}	Maximum Output Transition Time Any Output	2.0 4.5 6.0	75 15 13	95 19 16	110 22 19	ns
C _{IN}	Maximum Input Capacitance	—	10	10	10	pF

C _{PD}	Power Dissipation Capacitance (Per Package) Used to determine the no-load dynamic power consumption, P _D = C _{PD} V _{CC} ² f + I _{CC} V _{CC}	Typical @ 25°C, V _{CC} = 5 V	pF
		33	

HCT-157A, HCT-158A

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} V	Guaranteed Limits			Unit
				25°C to -55°C	≤85°C	≤125°C	
V _{IH}	Minimum High-Level Input Voltage	V _{OUT} = 0.1 V, I _{OUT} ≤ 20 μA or V _{OUT} = V _{CC} - 0.1 V	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, I _{OUT} ≤ 20 μA or V _{OUT} = V _{CC} - 0.1 V	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} ≤ 20 μA	4.5 5.5	4.4 5.4	4.4 5.4	4.4 5.4	V
V _{OL}	Maximum Low Level Output Voltage	V _{IN} = V _{IH} or V _{IL} , I _{OUT} ≤ 4.0 mA	4.5	3.98	3.84	3.7	V
		V _{IN} = V _{IH} or V _{IL} , I _{OUT} ≤ 20 μA	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} ≤ 4.0 mA	4.5	0.26	0.33	0.40	V
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} = 0 μA	5.5	4.0	40	160	μA

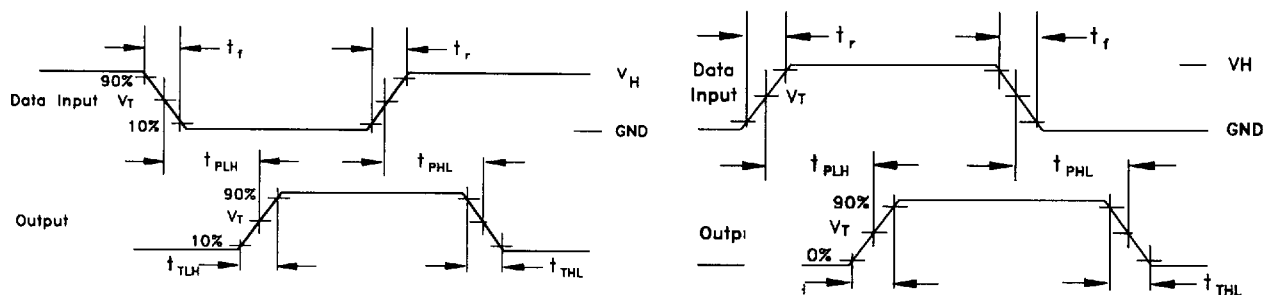
ΔI _{CC}	Additional Quiescent Supply Current	V _{IN} = 2.4 V, Any One Input V _{IN} = V _{CC} or GND, Other Inputs I _{OUT} = 0 μA	5.5	≥ -55°C	25°C to 125°C	mA
				2.9	2.4	

AC ELECTRICAL CHARACTERISTICS over full operating conditions (C_L = 50 pF, Input t_r = 6 ns)

Symbol	Parameter	V _{CC} V	Guaranteed Limit			Unit
			25°C to -55°C	≤85°C	≤125°C	
t _{PLH} , t _{PHL}	Maximum Propagation Delay Time, Input A or B to Output Y	5.0 ± 10%	27	34	41	ns
t _{PLH} , t _{PHL}	Maximum Propagation Delay Time, Select to Output Y		37	46	56	ns
t _{PLH} , t _{PHL}	Maximum Propagation Delay Time, Output Enable to Output Y		30	38	45	ns
t _{TLH} , t _{THL}	Maximum Output Transition Time Any Output		15	19	22	ns

C _{PD}	Power Dissipation Capacitance (Per Transceiver Channel) Used to determine the no-load dynamic power consumption, P _D = C _{PD} V _{CC} ² f + I _{CC} V _{CC}	Typical @ 25°C, V _{CC} = 5 V	pF
		64	

SWITCHING WAVEFORMS



Input Threshold Voltage, V_T = 50% V_{CC} for HC, 1.3 V for HCT
V_H = V_{CC} for HC, 3.0 V for HCT