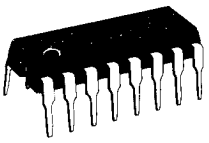
MN74HC158/MN74HC158S

Quad 2-Input Multiplexers (Inverted Output)

■ Description

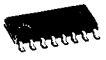
MN74HC158/MN74HC158S contain quad 2-input multiplexer circuits which select one of two data. Strobe input is common, and, when it is "H", all outputs become "H". When strobe input is "L", 1-input data is selected from each of two input signals depending on the state of the select input and is transferred to each of the quad outputs. Then, the selected input data is transferred to output inverted. Adoption of a silicon gate CMOS process makes possible low power consumption, a high noise allowance, and an operation speed equivalent to LS TTL; LS TTL 10-inputs can be directly driven. Resistors and diodes are used in the V_{DD} and V_{SS} to protect the input/output from damage by static electricity. Same pin configuration and function as standard 54LS/74LS logic family.

P-3



16-pin plastic DIL package

P-4



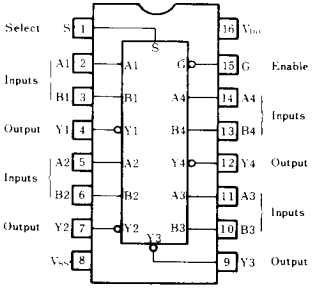
16-pin Panaflat package (SO-16D)

■ Truth table

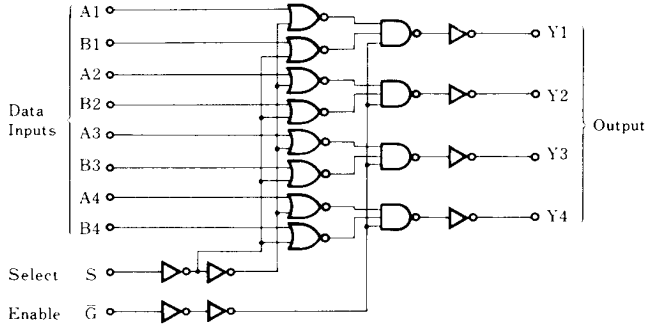
Input				Output
Strobe $\overline{G}$	Select S	A	B	Y
H	×	×	×	H
L	L	L	×	H
L	L	H	×	L
L	H	×	L	H
L	H	×	H	L

Note:
1. ×: Either HIGH or LOW; it doesn't matter

Pin configuration (top view)



■ Logic diagram (1 gate)



■ Absolute maximum ratings

Item			Sym.	Rating	Unit
Supply voltage			V_{DD}	−0.5～7.0	V
Input/output voltage			V_I, V_O	−0.5～V_{DD}+0.5	V
Input current			I_I	±20	mA
Output current			I_O	±25	mA
Power dissipation	MN74HC158	Ta=−40～+60℃	P_D	400	mW
		Ta=+60～+85℃		Decrease to 200mW at the rate of 8mW/℃	
	MN74HC158S	Ta=−40～+60℃	P_D	275	mW
		Ta=+60～+85℃		Decrease to 200mW at the rate of 3.8mW/℃	
Storage temperature range			T_{stg}	−65～+150	℃
Supply current			I_{DD}, I_{SS}	±50	mA

■ Recommended operating conditions

Item	Sym.	Rating	Unit
Operating supply voltage	V_{DD}	1.4～6.0	V
Input voltage	V_I	0～V_{DD}	V
Operating temperature range	T_{opr}	−40～+85	℃
Input rise and fall time	t_r, t_f	0～500	ns

■ DC characteristics (V_{DD}=5V±10%, V_{SS}=0V)

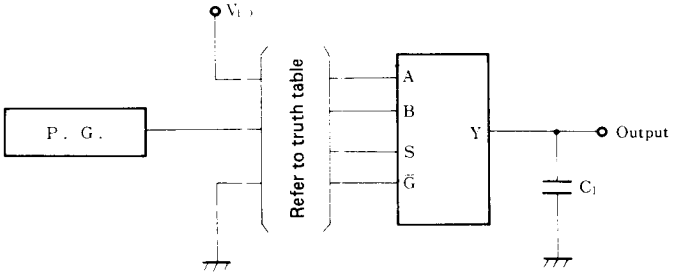
Item	Sym.	Test conditions		Ta=−40℃		Ta=+25℃		Ta=+85℃		Unit
				Min.	Max.	Min.	Max.	Min.	Max.	
Quiescent supply current	I_{DD}	V_I=V_{DD} or V_{SS}			8		8		80	μA
High level input voltage	V_{IH}	V_O=V_{DD}−1.0V or 0.5V, $\|I_O\| \leq 1\mu A$	V_{DD}=4.5V	3.15		3.15		3.15		V
			V_{DD}=5.0V	3.50		3.50		3.50		
			V_{DD}=5.5V	3.85		3.85		3.85		
Low level input voltage	V_{IL}	V_O=V_{DD}−1.0V or 0.5V, $\|I_O\| \leq 1\mu A$	V_{DD}=4.5V		0.9		0.9		0.9	V
			V_{DD}=5.0V		1.0		1.0		1.0	
			V_{DD}=5.5V		1.1		1.1		1.1	
Input current	$\pm I_I$	V_I=V_{DD} or V_{SS}			0.3		0.3		1	μA
High level output voltage	V_{OH}	V_I=V_{DD} or V_{SS}, $\|I_O\| \leq 1\mu A$		V_{DD}−0.05		V_{DD}−0.05		V_{DD}−0.05		V
Low level output voltage	V_{OL}	V_I=V_{DD} or V_{SS}, $\|I_O\| \leq 1\mu A$			0.05		0.05		0.05	V
High level output current	I_{OH}	V_I=V_{DD} or V_{SS}, V_O=V_{DD}−0.8V		−6		−5		−4		mA
Low level output current	I_{OL}	V_I=V_{DD} or V_{SS}, V_O=0.4V		6		5		4		mA

■ AC characteristics (V_{DD}=5V, V_{SS}=0V, Ta=25℃ Input transition time ≦6ns, C_L=50pF)

Item	Sym.	Test conditions	Min.	Typ.	Max.	Unit
Output rise time	t_{TLH}			8	15	ns
Output fall time	t_{THL}			6	15	ns
Propagation time (L→H) A,B→Y	t_{PLH}			9	20	ns
Propagation time (H→L) A,B→Y	t_{PHL}			9	20	ns
Propagation time (L→H) $\overline{G}$→Y	t_{PLH}			11	20	ns
Propagation time (H→L) $\overline{G}$→Y	t_{PHL}			10	20	ns
Propagation time (L→H) S→Y	t_{PLH}			12	20	ns
Propagation time (H→L) S→Y	t_{PHL}			12	20	ns

※ Switching time measurement circuit and waveform

1. Measurement circuit



2. Waveforms