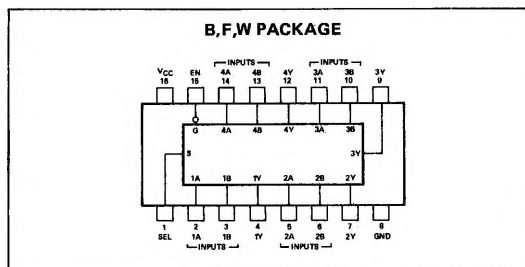


DESCRIPTION

The S54157/N74157 and S54158/N74158 are identical with the exception of the S54158/N74158 being inverted. These devices are logical implementations of a four-pole two-position switch, with the position of the switch being set by the logic levels supplied to the one select input. Both assertion and negation outputs are provided. The enable input (E) is active low. When it is not activated the negation output is high and the assertion output is low regardless of all other inputs. The devices provide the ability, in one package, to select four bits of either data or control from two sources. By proper manipulation of the inputs, it can generate four functions of two variables with one variable common. Thus any number of random logic elements used to generate unusual truth tables can be replaced. All outputs are low when disabled (enable high). Both inputs and outputs are buffered.

PIN CONFIGURATION



S54/N74157

TRUTH TABLE

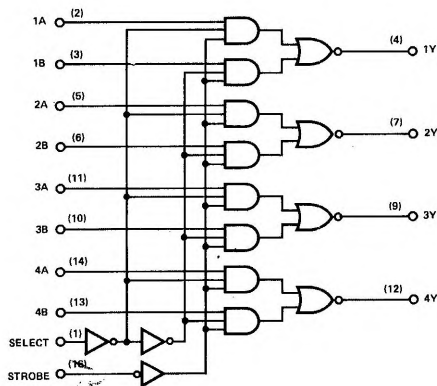
INPUTS			OUTPUT
STROBE	SELECT	A B	
H	X	X X	L
L	L	L X	L
L	L	H X	H
L	H	X L	L
L	H	X H	H

S54/N74158

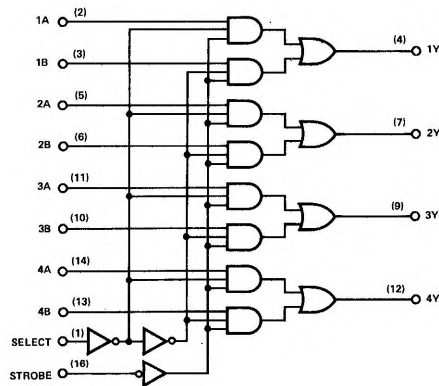
TRUTH TABLE

INPUTS			OUTPUT
STROBE	SELECT	A B	
H	X	X X	H'
L	L	L X	H
L	L	H X	L
L	H	X L	H
L	H	X H	L

LOGIC DIAGRAM
S54/N74157



LOGIC DIAGRAM
S54/N74158



RECOMMENDED OPERATING CONDITIONS

	S54157/58			N74157/58			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply Voltage V_{CC}	4.5	5	5.5	4.75	5	5.25	V
Normalized Fan-Out from each Output, N			20			20	
High Logic Level			10			10	
Low Logic Level			125			70	
Operating Free-Air Temperature, T_A	-55	25	125	0	25	70	°C

ELECTRICAL CHARACTERISTICS (over operating free-air temperature range unless otherwise noted)

PARAMETER		TEST CONDITIONS*	S54157/58			N74157/58			UNIT
			MIN	TYP**	MAX	MIN	TYP**	MAX	
V_{IH}	High-level input voltage		2			2			V
V_{IL}	Low-level input voltage				0.8			0.8	V
V_I	Input clamp voltage	$V_{CC} = \text{MAX}, I_I = -12\text{mA}$			-1.5			-1.5	V
V_{OH}	High-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, I_{OH} = -800\mu\text{A}$	2.4			2.4			V
V_{OL}	Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}, I_{OL} = 16\text{mA}$			0.4			0.4	V
I_I	Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 5.5\text{V}$			1			1	mA
I_{IH}	High-level input current	$V_{CC} = \text{MAX}, V_I = 2.4\text{V}$			40			40	μA
I_{IL}	Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4\text{V}$			-1.6			-1.6	mA
I_{OS}	Short-circuit output current†	$V_{CC} = \text{MAX}$	-20		-55	-18		-55	mA
I_{CC}	Supply current	$V_{CC} = \text{MAX}$		30	48		30	48	mA

SWITCHING CHARACTERISTICS, $V_{CC} = 5\text{V}, T_A = 25^\circ\text{C}, N = 10$

PARAMETER	FROM	TO	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PHL}	Data	Output	$C_L = 15\text{pF}, R_L = 400$		9	14	ns
t_{PLH}	Data	Output			9	14	ns
t_{PHL}	Enable	Any Output			14	21	ns
t_{PLH}	Enable	Any Output			13	20	ns
t_{PHL}	Select	Any Output			18	27	ns
t_{PLH}	Select	Any Output			15	23	ns

* For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

** All typical values are at $V_{CC} = 5\text{V}, T_A = 25^\circ\text{C}$.

† Not more than one output should be shorted at a time.