

# QUADRUPLE 2-INPUT DATA SELECTOR/MULTIPLEXER

**S54157**  
**S54158**  
**N74157**  
**N74158**

S54157-B,F,W • N74157-B,F • S54158-B,F,W • N74158-B,F

DIGITAL 54/74 TTL SERIES

## 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.

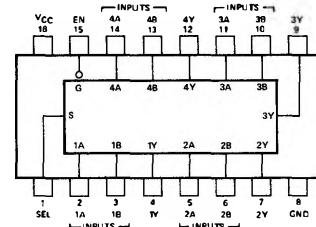
## TRUTH TABLE

INPUTS		OUTPUT Y	
ENABLE	SELECT	A B	S54/N74157
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

H = High Level, L = Low Level, X = Irrelevant

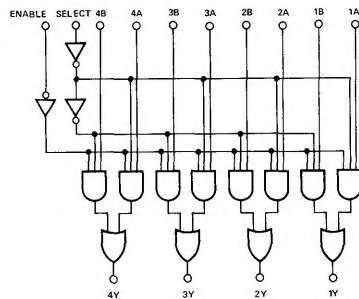
## PIN CONFIGURATION

### B, F, W PACKAGE

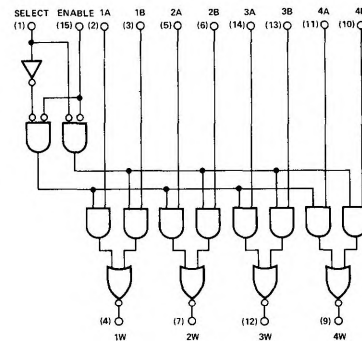


## LOGIC DIAGRAMS

### N74157



### S54/N74158



SIGNETICS DIGITAL 54/74 TTL SERIES – S54157 • N74157 • S54158 • 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			10			10	
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			-1.5			-1.5	V
$V_{OH}$	High-level output voltage	2.4			2.4			V
$V_{OL}$	Low-level output voltage			0.4			0.4	V
$I_I$	Input current at maximum input voltage			1			1	mA
$I_{IH}$	High-level input current			40			40	μA
$I_{IL}$	Low-level input current			-1.6			-1.6	mA
$I_{OS}$	Short-circuit output current†	-20		-55	-18		-55	mA
$I_{CC}$	Supply current		30	48		30	48	mA

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

PARAMETER	FROM	TO	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$t_{PHL}$	Data	Output	$C_L = 15pF$ , $R_L = 400$		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  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ .

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