DUAL 4-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER

S54153
N74153

S54153–B,F,W • N74153–B,F

DIGITAL 54/74 TTL SERIES

DESCRIPTION

Each of these monolithic, data selectors/multiplexers contains inverters and drivers to supply fully complementary, on-chip, binary decoding data selection to the AND-OR-invert gates. Separate strobe inputs are provided for each of the two four-line sections.

These data selectors/multiplexers are fully compatible for use with most TTL and DTL circuits. Each diode-clamped input represents only one normalized Series 54/74 load, and full fan-out to 10 normalized Series 54/74 loads is available from each of the outputs in the low-level state. A fan-out to 20 normalized Series 54/74 loads is provided in the high-level state to facilitate connection of unused inputs to used inputs. Typical power dissipation is 180 milliwatts.

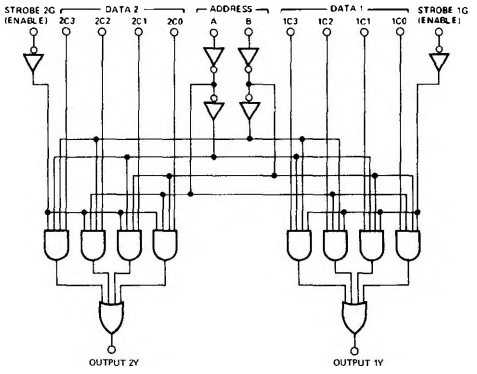
Resistor values in the OR function have been reduced to values used with Series 54H. This minimizes the capacitive effects of paralleling the phase-splitter transistors and reduces the propagation delay times. The S54153 is characterized for operation over the full military temperature range of -55°C to 125° C; the N74153 is characterized for operation from 0°C to 70°C.

TRUTH TABLE

ADDRESS INPUTS		DATA INPUTS				STROBE	OUTPUT
B	A	C0	C1	C2	C3	G	Y
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

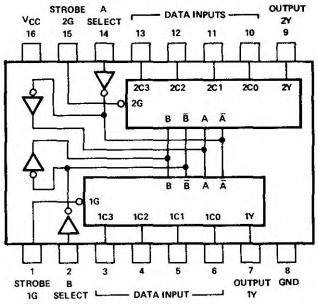
Address inputs A and B are common to both sections. H = high level, L = low level, X = irrelevant.

LOGIC DIAGRAM

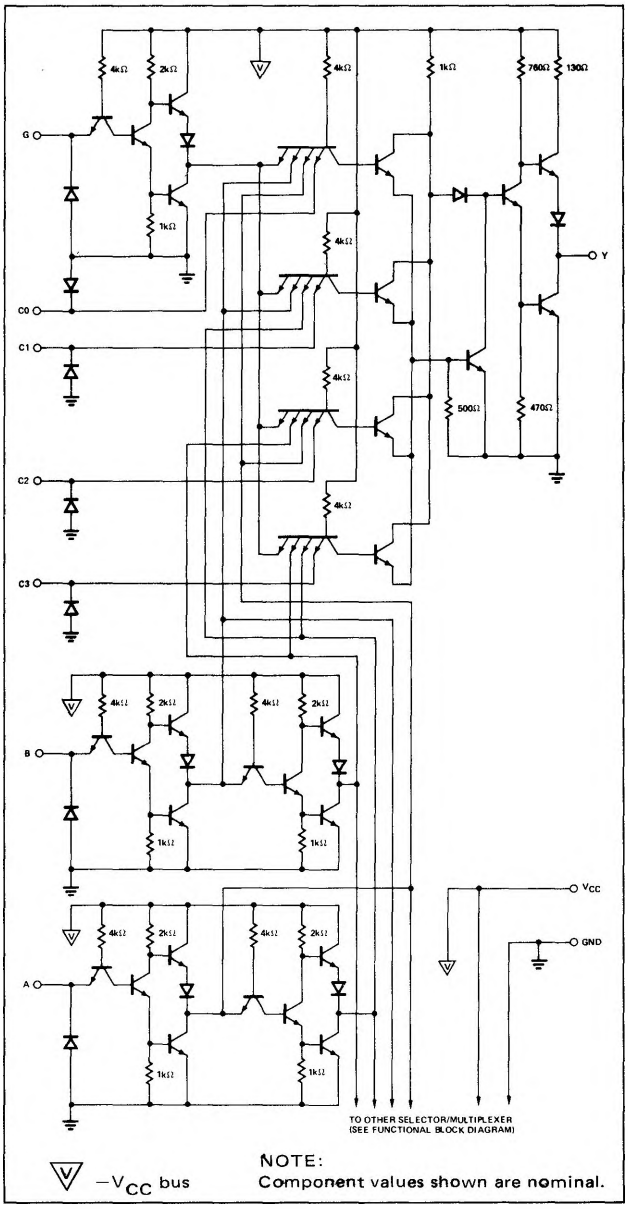


PIN CONFIGURATIONS

B,F,W PACKAGE



SCHEMATIC DIAGRAM



NOTE:
Component values shown are nominal.

RECOMMENDED OPERATING CONDITIONS

	S54153			N74153			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							
High Logic Level			20			20	
Low Logic Level			10			10	
Operating Free-Air Temperature Range, T_A	-55	25	125	0	25	70	°C

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

PARAMETER		TEST CONDITIONS*		MIN	TYP**	MAX	UNIT
V_{IH}	High-level input voltage			2			V
V_{IL}	Low-level input voltage					0.8	V
V_{OH}	High-level output voltage	V_{CC} = MIN, V_{IL} = 0.8V,	V_{IH} = 2V, I_{OH} = -800μA	2.4	3.1		V
V_{OL}	Low-level output voltage	V_{CC} = MIN, V_{IL} = 0.8V,	V_{IH} = 2V, I_{OL} = 16mA		0.2	0.4	V
I_{IH}	High-level input current (each input)	V_{CC} = MAX,	V_I = 2.4V			40	μA
		V_{CC} = MAX,	V_I = 5.5V			1	mA
I_{IL}	Low-level input current (each input)	V_{CC} = MAX,	V_I = 0.4V			-1.6	mA
I_{OS}	Short-circuit output current†	V_{CC} = MAX,	S54153	-20		-55	mA
			N74153	-18		-57	
I_{CCL}	Supply current, low-level output	V_{CC} = MAX,	S54153		36	52	mA
			N74153		36	60	

SWITCHING CHARACTERISTICS, V_{CC} = 5V, T_A = 25°C, N = 10

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	Data	Y			12	18	ns
t_{PHL}	Data	Y			15	23	ns
t_{PLH}	Address	Y			22	34	ns
t_{PHL}	Address	Y	C_L = 30pF, R_L = 400Ω		22	34	ns
t_{PLH}	Strobe	Y			19	30	ns
t_{PHL}	Strobe	Y			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°C.

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