55/75471 • 55/75472 • 55/75473 • 55/75474

DUAL HIGH VOLTAGE HIGH CURRENT PERIPHERAL DRIVERS

FAIRCHILD LINEAR INTEGRATED CIRCUITS

GENERAL DESCRIPTION – The 55/75471 series are dual very high voltage interface peripheral drivers with medium switching speeds. These devices are pin-for-pin replacements of the (55/75451A-55/75454A), (55/75461-55/75464) and the (DS3611-DS3614) peripheral drivers.

The 55/75471 peripheral driver series converts TTL and DTL logic levels to high voltage, high current levels.

The 55/75471, 55/75472, 55/75473 and 55/75474 feature two standard TTL input gates in AND, NAND, OR and NOR configurations respectively. The logic gates are internally connected to the bases of the npn transistors.

The 55/75471 series offers flexibility in designing very high voltage logic buffers, power drivers, lamp drivers, line drivers and relay drivers.

- **HIGH VOLTAGE OUTPUT (80 V)**
- **NO LATCH-UP AT 55 V**
- **HIGH SPEED SWITCHING**
- **HIGH OUTPUT CURRENT CAPABILITY**
- **TTL OR DTL INPUT COMPATIBILITY**
- **INPUT CLAMP DIODES**
- **+5 V SUPPLY VOLTAGE**

TEST TABLE 1 – Operating Temperature Range and Supply Voltage Range

	55471 Series	75471 Series
Temperature, T_A	–55°C to +125°C	0°C to 70°C
Supply Voltage, V_{CC}	+4.5 V to +5.5 V	+4.75 V to +5.25 V

ABSOLUTE MAXIMUM RATINGS

	55471 55472 55473 55474	75471 74572 75473 75474
Supply Voltage, V_{CC} (See Note 1)	7.0 V	7.0 V
Input Voltage (See Note 1)	5.5 V	5.5 V
Interemitter Voltage (See Note 2)	5.5 V	5.5 V
Output Voltage (See Notes 1 and 3)	80 V	80 V
Continuous Collector Current (See Note 4)		
Continuous Output Current (See Note 4)	300 mA	300 mA
Continuous Total Power Dissipation (See Note 5)	800 mW	800 mW
Operating Free-Air Temperature Range	–55°C to +125°C	0°C to 70°C
Storage Temperature Range	–65°C to +150°C	–65°C to +150°C
Pin Temperature		
Molded DIP (Soldering, 10 s)	260°C	260°C
Hermetic DIP (Soldering, 60 s)	300°C	300°C

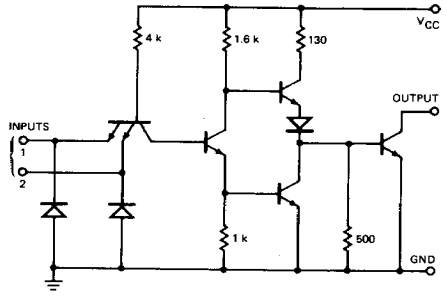
NOTES:
1. Voltage values are with respect to network ground terminal unless otherwise specified.
2. This is the voltage between two emitters of a multiple-emitter input transistor.
3. This is the maximum voltage which should be applied to any output when it is in the off state.
4. Both halves of these dual circuits may conduct rated current simultaneously.
5. Above 60°C ambient temperature, derate linearly at 8.3 mW/°C for Hermetic DIP and Molded DIP. For the Molded Mini DIP and Hermetic Mini DIP, derate at 6.7 mW/°C above 30°C.

This Material Copyrighted By Its Respective Manufacturer

55471/75471

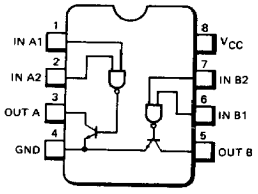
DUAL POSITIVE AND PERIPHERAL DRIVER

EQUIVALENT CIRCUIT (Each Driver)



Component values shown are nominal. All resistor values in ohms.

CONNECTION DIAGRAMS
8-PIN DIP
(TOP VIEW)
PACKAGE OUTLINE 9T 6T
PACKAGE CODE T R



TRUTH TABLE

INPUTS		OUTPUT	
1	2		
L	L	L	(on state)
L	H	L	(on state)
H	L	L	(on state)
H	H	H	(off state)

H = HIGH Level, L = LOW Level

ORDER INFORMATION

TYPE	PART NO.
55471	55471RM
75471	75471RC
75471	75471TC

Positive Logic: Z = XY

ELECTRICAL CHARACTERISTICS: Guaranteed over Operating Temperature Range and Supply Voltage Range, use Test Table 1, pg. 1, unless otherwise indicated

SYMBOL	CHARACTERISTICS	TEST FIGURE	CONDITIONS		MIN	TYP (Note 6)	MAX	UNITS
V_{IH}	Input HIGH Voltage	1			2.0			V
V_{IL}	Input LOW Voltage	1					0.8	V
V_{CD}	Input Clamp Diode Voltage	2	V_{CC} = MIN, I_I = −12 mA			−1.2	−1.5	V
I_{OH}	Output HIGH Current	1	V_{CC} = MIN, V_{OH} = 80 V, V_{IH} = 2 V	55471			300	µA
				75471			100	
V_{OL}	Output LOW Voltage	1	V_{CC} = MIN, V_{IL} = 0.8 V, I_{OL} = 100 mA	55471		0.16	0.5	V
				75471		0.16	0.4	
			V_{CC} = MIN, V_{IL} = 0.8 V, I_{OL} = 300 mA	55471		0.35	0.8	
				75471		0.35	0.7	
I_I	Input Current at Maximum Input Voltage	3	V_{CC} = MAX, V_I = 5.5 V				1.0	mA
I_{IH}	Input HIGH Current	3	V_{CC} = MAX, V_I = 2.4 V				40	µA
I_{IL}	Input LOW Current	2	V_{CC} = MAX, V_I = 0.4 V			−1.0	−1.6	mA
I_{CCH}	Supply Current, Output HIGH	4	V_{CC} = MAX, V_I = 5 V			8.0	11	mA
I_{CCL}	Supply Current Output LOW		V_{CC} = MAX, V_I = 0 V			61	76	mA

NOTE 6. All typical values are at V_{CC} = 5 V, T_A = 25°C.

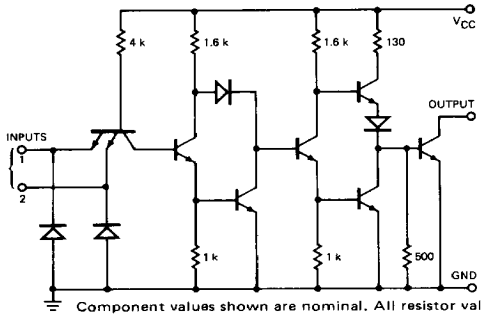
AC CHARACTERISTICS: V_{CC} = 5 V, T_A = 25°C

SYMBOL	CHARACTERISTICS	TEST FIGURE	CONDITIONS	MIN	TYP	MAX	UNITS
t_{PLH}	Propagation Delay Time, Output LOW to HIGH	6	I_O ≈ 200 mA, C_L = 15 pF, R_L = 50 Ω		30	55	ns
t_{PHL}	Propagation Delay Time, Output HIGH to LOW				25	40	ns
t_{TLH}	Transition Time, Output LOW to HIGH				8.0	20	ns
t_{THL}	Transition Time, Output HIGH to LOW				10	20	ns
V_{OH}	HIGH Level Output Voltage After Switching	7	V_S = 55 V, I_O ≈ 300 mA	V_S −18			mV

This Material Copyrighted By Its Respective Manufacturer

55472/75472
DUAL POSITIVE NAND PERIPHERAL DRIVER

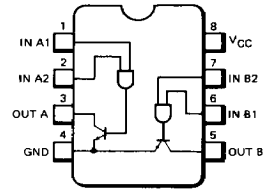
EQUIVALENT CIRCUIT (Each Driver)



Component values shown are nominal. All resistor values in ohms.

CONNECTION DIAGRAMS

8-PIN DIP
(TOP VIEW)
PACKAGE OUTLINE 9T 6T
PACKAGE CODE T R



TRUTH TABLE

INPUTS		OUTPUT	
1	2		
L	L	H	(off state)
L	H	H	(off state)
H	L	H	(off state)
H	H	L	(on state)

H = HIGH Level, L = LOW Level.

ORDER INFORMATION

TYPE	PART NO.
55472	55472RM
75472	75472RC
75472	75472TC

Positive Logic: $Z = \overline{XY}$

ELECTRICAL CHARACTERISTICS: Guaranteed over Operating Temperature Range and Supply Voltage Range, use Test Table 1, pg. 1, unless otherwise indicated

SYMBOL	CHARACTERISTICS	TEST FIGURE	CONDITIONS		MIN	TYP (Note 7)	MAX	UNITS
V_{IH}	Input HIGH Voltage	1			2.0			V
V_{IL}	Input LOW Voltage	1					0.8	V
V_{CD}	Input Clamp Diode Voltage	2	V_{CC} = MIN, I_I = -12 mA			-1.2	-1.5	V
I_{OH}	Output HIGH Current	1	V_{CC} = MIN, V_{OH} = 80 V, V_{IL} = 0.8 V	55472			300	μA
				75472			100	
V_{OL}	Output LOW Voltage	1	V_{CC} = MIN, V_{IH} = 2 V, I_{OL} = 100 mA	55472		0.16	0.5	V
				75472		0.16	0.4	
			V_{CC} = MIN, V_{IH} = 2 V, I_{OL} = 300 mA	55472		0.35	0.8	
				75472		0.35	0.7	
I_I	Input Current at Maximum Input Voltage	3	V_{CC} = MAX, V_I = 5.5 V				1.0	mA
I_{IH}	Input HIGH Current	3	V_{CC} = MAX, V_I = 2.4 V				40	μA
I_{IL}	Input LOW Current	2	V_{CC} = MAX, V_I = 0.4 V			-1.0	-1.6	mA
I_{CCH}	Supply Current, Output HIGH	4	V_{CC} = MAX, V_I = 0 V			13	17	mA
I_{CCL}	Supply Current Output LOW		V_{CC} = MAX, V_I = 5 V			65	76	mA

NOTE 7. All typical values are at V_{CC} = 5 V, T_A = 25°C

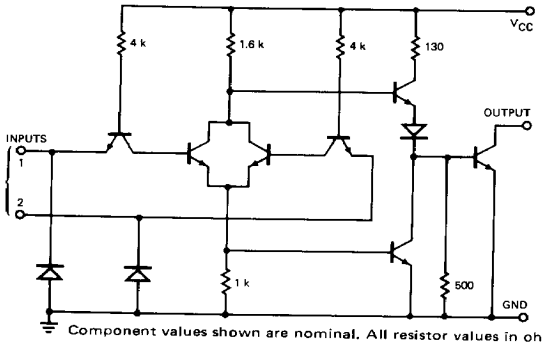
AC CHARACTERISTICS: V_{CC} = 5 V, T_A = 25°C

SYMBOL	CHARACTERISTICS	TEST FIGURE	CONDITIONS	MIN	TYP	MAX	UNITS
t_{PLH}	Propagation Delay Time, Output LOW to HIGH	6	$I_O \approx$ 200 mA, C_L = 15 pF, R_L = 50 Ω		45	65	ns
t_{PHL}	Propagation Delay Time, Output HIGH to LOW				30	50	ns
t_{TLH}	Transition Time, Output LOW to HIGH				13	25	ns
t_{THL}	Transition Time, Output HIGH to LOW				10	20	ns
V_{OH}	HIGH Level Output Voltage After Switching	7	V_{SS} = 55 V, $I_O \approx$ 300 mA	V_S -18			mV

This Material Copyrighted By Its Respective Manufacturer

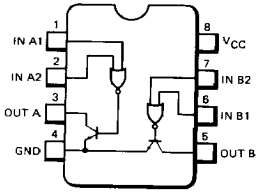
55473/75473
DUAL POSITIVE OR PERIPHERAL DRIVER

EQUIVALENT CIRCUIT (Each Driver)



Component values shown are nominal. All resistor values in ohms.

CONNECTION DIAGRAMS
8-PIN DIP
(TOP VIEW)
PACKAGE OUTLINE 9T 6T
PACKAGE CODE T R



TRUTH TABLE

INPUTS		OUTPUT	
1	2		
L	L	L	(on state)
L	H	H	(off state)
H	L	H	(off state)
H	H	H	(off state)

H = HIGH Level, L = LOW Level

ORDER INFORMATION

TYPE	PART NO.
55473	55473RM
75473	75473RC
75473	75473TC

Positive Logic: $Z = X + Y$

ELECTRICAL CHARACTERISTICS: Guaranteed over Operating Temperature Range and Supply Voltage Range, use Test Table 1, pg. 1, unless otherwise indicated

SYMBOL	CHARACTERISTICS	TEST FIGURE	CONDITIONS		MIN	TYP (Note 8)	MAX	UNITS
V_{IH}	Input HIGH Voltage	1			2.0			V
V_{IL}	Input LOW Voltage	1					0.8	V
V_{CD}	Input Clamp Diode Voltage	2	V_{CC} = MIN, I_I = -12 mA			-1.2	-1.5	V
I_{OH}	Output HIGH Current	1	V_{CC} = MIN, V_{OH} = 80 V, V_{IH} = 2 V	55473			300	μA
				75473			100	
V_{OL}	Output LOW Voltage	1	V_{CC} = MIN, V_{IL} = 0.8 V, I_{OL} = 100 mA	55473		0.18	0.5	V
				75473		0.18	0.4	
			V_{CC} = MIN, V_{IL} = 0.8 V, I_{OL} = 300 mA	55473		0.39	0.8	
				75473		0.39	0.7	
I_I	Input Current at Maximum Input Voltage	3	V_{CC} = MAX, V_I = 5.5 V				1.0	mA
I_{IH}	Input HIGH Current	3	V_{CC} = MAX, V_I = 2.4 V				40	μA
I_{IL}	Input LOW Current	2	V_{CC} = MAX, V_I = 0.4 V			-1.0	-1.6	mA
I_{CCH}	Supply Current, Output HIGH	5	V_{CC} = MAX, V_I = 5 V			8.0	11	mA
I_{CCL}	Supply Current Output LOW		V_{CC} = MAX, V_I = 0 V			63	76	mA

NOTE 8. All typical values are at V_{CC} = 5 V, T_A = 25°C

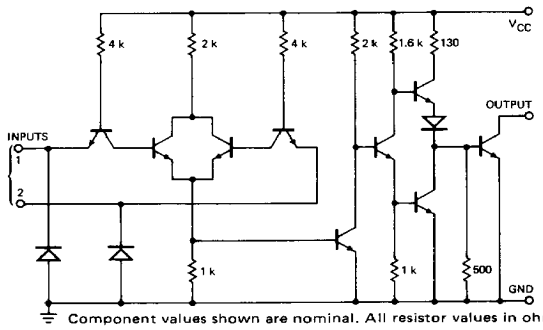
AC CHARACTERISTICS: V_{CC} = 5 V, T_A = 25°C

SYMBOL	CHARACTERISTICS	TEST FIGURE	CONDITIONS	MIN	TYP	MAX	UNITS
t_{PLH}	Propagation Delay Time, Output LOW to HIGH	6	$I_O \approx$ 200 mA, C_L = 15 pF, R_L = 50 Ω		30	55	ns
t_{PHL}	Propagation Delay Time, Output HIGH to LOW				25	40	ns
t_{TLH}	Transition Time, Output LOW to HIGH				8	25	ns
t_{THL}	Transition Time, Output HIGH to LOW				10	25	ns
V_{OH}	HIGH Level Output Voltage After Switching	7	V_S = 55 V, $I_O \approx$ 300 mA	V_S -18			mV

This Material Copyrighted By Its Respective Manufacturer

55474/75474
DUAL POSITIVE NOR PERIPHERAL DRIVER

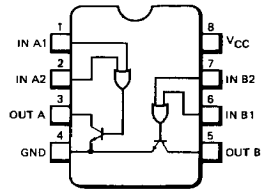
EQUIVALENT CIRCUIT (Each Driver)



Component values shown are nominal. All resistor values in ohms.

CONNECTION DIAGRAMS

8-PIN DIP
(TOP VIEW)
PACKAGE OUTLINE 9T 6T
PACKAGE CODE T R



TRUTH TABLE

INPUTS		OUTPUT	
1	2		
L	L	H	(off state)
L	H	L	(on state)
H	L	L	(on state)
H	H	L	(on state)

H = HIGH Level, L = LOW Level

ORDER INFORMATION

TYPE	PART NO.
55474	55474RM
75474	75474RC
75474	75474TC

Positive Logic: $Z = \overline{X + Y}$

ELECTRICAL CHARACTERISTICS: Guaranteed over Operating Temperature Range and Supply Voltage Range, use Test Table 1, pg. 1, unless otherwise indicated

SYMBOL	CHARACTERISTICS	TEST FIGURE	CONDITIONS		MIN	TYP (Note 9)	MAX	UNITS
V_{IH}	Input HIGH Voltage	1			2.0			V
V_{IL}	Input LOW Voltage	1					0.8	V
V_{CD}	Input Clamp Diode Voltage	2	V_{CC} = MIN, I_I = −12 mA				−1.5	V
I_{OH}	Output HIGH Current	1	V_{CC} = MIN, V_{OH} = 80 V, V_{IL} = 0.8 V	55474			300	μA
				75474			100	
V_{OL}	Output LOW Voltage	1	V_{CC} = MIN, V_{IH} = 2 V, I_{OL} = 100 mA	55474		0.17	0.5	V
				75474		0.17	0.4	
			V_{CC} = MIN, V_{IH} = 2 V, I_{OL} = 300 mA	55474		0.38	0.8	
				75474		0.38	0.7	
I_I	Input Current at Maximum Input Voltage	3	V_{CC} = MAX, V_I = 5.5 V				1.0	mA
I_{IH}	Input HIGH Current	3	V_{CC} = MAX, V_I = 2.4 V				40	μA
I_{IL}	Input LOW Current	2	V_{CC} = MAX, V_I = 0.4 V			−1.0	−1.6	mA
I_{CCH}	Supply Current, Output HIGH	5	V_{CC} = MAX, V_I = 0 V			14	19	mA
I_{CCL}	Supply Current Output LOW		V_{CC} = MAX, V_I = 5 V			72	85	mA

NOTE 9. All typical values are at V_{CC} = 5 V, T_A = 25°C

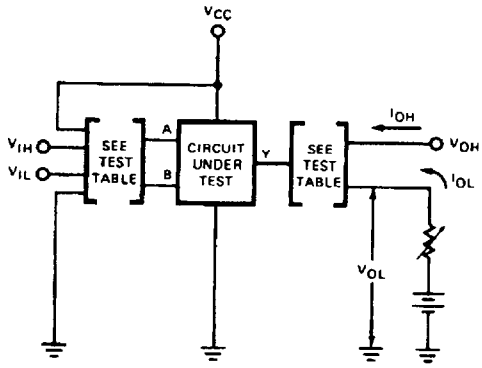
AC CHARACTERISTICS: V_{CC} = 5 V, T_A = 25°C

SYMBOL	CHARACTERISTICS	TEST FIGURE	CONDITIONS	MIN	TYP	MAX	UNITS
t_{PLH}	Propagation Delay Time, Output LOW to HIGH	6	$I_O \approx$ 200 mA, C_L = 15 pF, R_L = 50 Ω		40	65	ns
t_{PHL}	Propagation Delay Time, Output HIGH to LOW				30	50	ns
t_{TLH}	Transition Time, Output LOW to HIGH				8	20	ns
t_{THL}	Transition Time, Output HIGH to LOW				10	20	ns
V_{OH}	HIGH Level Output Voltage After Switching	7	V_S = 55 V, $I_O \approx$ 300 mA	V_S −18			mV

This Material Copyrighted By Its Respective Manufacturer

CHARACTERISTICS MEASUREMENT INFORMATION

V_{IH}, V_{IL}, I_{OH}, V_{OL}



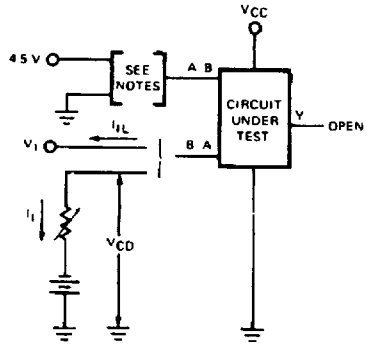
NOTE Each input is tested separately

Fig. 1

TEST TABLE II

CIRCUIT	INPUT UNDER TEST	OTHER INPUT	OUTPUT	
			APPLY	MEASURE
55/75471	V_{IH} V_{IL}	V_{IH} V_{CC}	V_{OH} I_{OL}	I_{OH} V_{OL}
55/75472	V_{IH} V_{IL}	V_{IH} V_{CC}	I_{OL} V_{OH}	V_{OL} I_{OH}
55/75473	V_{IH} V_{IL}	GND V_{IL}	V_{OH} I_{OL}	I_{OH} V_{OL}
55/75474	V_{IH} V_{IL}	GND V_{IL}	I_{OL} V_{OH}	V_{OL} I_{OH}

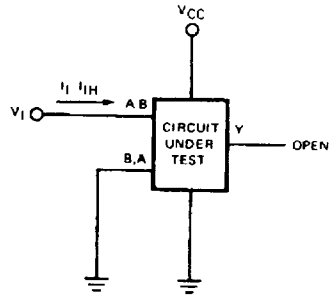
V_{CD}, I_{IL}



NOTES: A. Each input is tested separately.
B. When testing I_{IL} 55/75473 and 55/75474, the input not under test is grounded. For all other circuits it is at 4.5 V.
C. When testing V_{CD}, input not under test is open.

Fig. 2

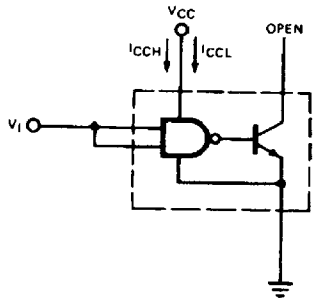
I_I, I_{IH}



Each input is tested separately.

Fig. 3

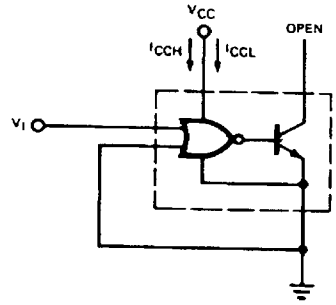
I_{CCH}, I_{CCL} FOR AND, NAND CIRCUITS



Both gates are tested simultaneously.

Fig. 4

I_{CCH}, I_{CCL} FOR OR, NOR CIRCUITS



Both gates are tested simultaneously

Fig. 5

†Arrows indicate actual direction of current flow. Current into a terminal is a positive value.

7

9004697 0293025 T3T

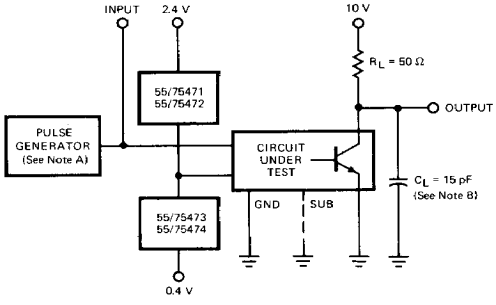
This Material Copyrighted By Its Respective Manufacturer

CHARACTERISTICS MEASUREMENT INFORMATION

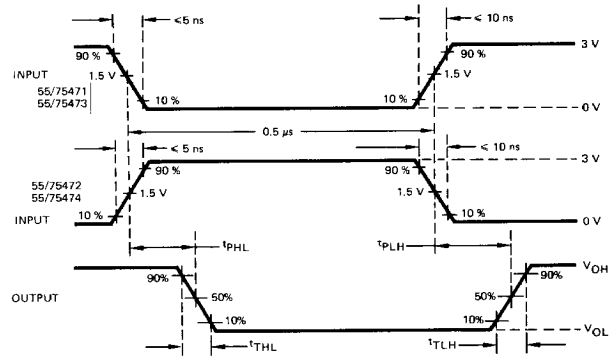
AC CHARACTERISTICS

SWITCHING TIMES OF COMPLETE DRIVERS

TEST CIRCUIT



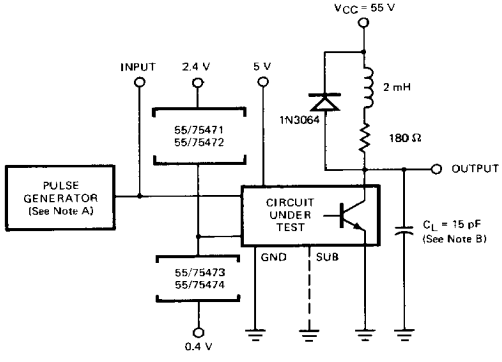
VOLTAGE WAVEFORMS



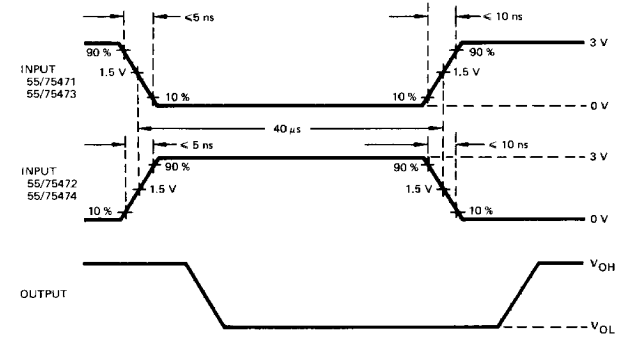
NOTES:
A. The pulse generator has the following characteristics: PRR = 1 MHz, $Z_{out} \approx 500\ \Omega$.
B. C_L includes probe and jig capacitance.

Fig. 6

TEST CIRCUIT



VOLTAGE WAVEFORMS



NOTES: A. The pulse generator has the following characteristics: PRR = 12.5 MHz, Z_{out} = 50 Ω.
B. C_L includes probe and jig capacitance.

Fig. 7

This Material Copyrighted By Its Respective Manufacturer