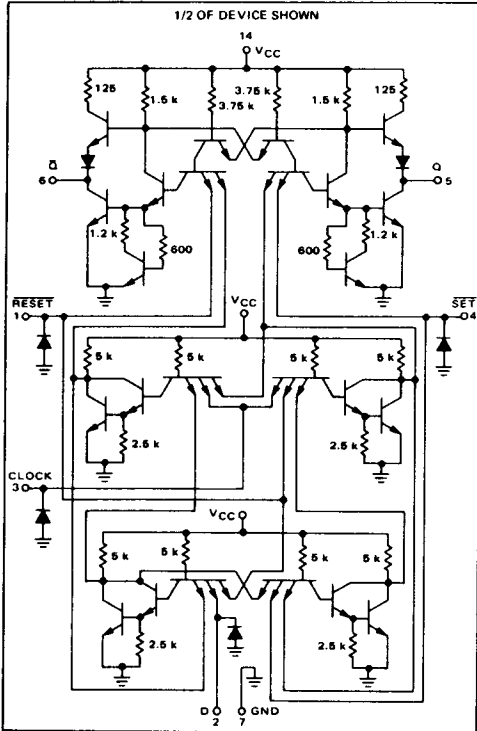


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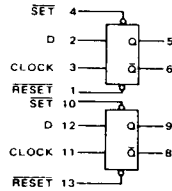
DUAL TYPE D FLIP-FLOP

MTTL MC7400P series  
MTTL MC5400L/7400L series

**MC5479L\***  
**MC7479P,L\***



This dual type D flip flop triggers on the positive edge of the clock input. During the clock transition the state of the D input is transferred to the Q output. The device is useful in shift registers and simple counters.



	$t_n$	$t_{n+1}$
D	Q	Q
0	0	1
1	1	0

Input Loading Factor:

D = 1

SET, CLOCK = 2

RESET = 3

Output Loading Factor = 10

Total Power Dissipation = 84 mW typ/pkg

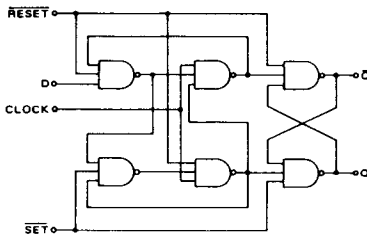
Propagation Delay Time = 16 ns typ

Operating Frequency = 30 MHz typ

\*L suffix = TO-116 ceramic package (Case 632)

P suffix = TO-116 plastic package (Case 606)

See General Information section for package outline dimensions.



LOGIC DIAGRAM  
1/2 OF DEVICE SHOWN

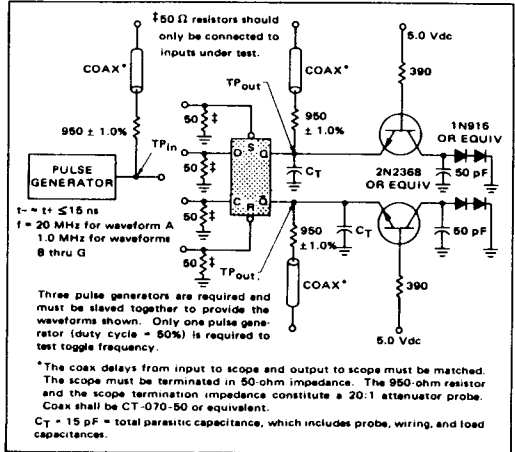
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**OPERATING CHARACTERISTICS**

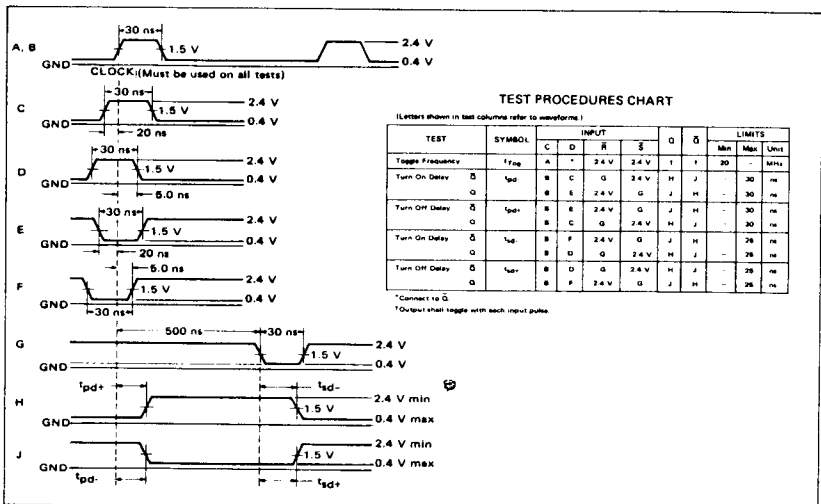
Data may be applied to the D input any time following 5.0 ns after the leading edge of a clock pulse and 20 ns before the leading edge of the following clock pulse. The state of the D input when the clock changes from the positive logic "0" state to the positive logic "1" state is transferred to the Q output of the flip-flop. The data input cannot be changed between the setup time (20 ns) and the hold time (5.0 ns) without adversely affecting the operation of the flip-flop.

The direct SET and RESET inputs override the clock, and may be applied any time during the operating cycle.

**SWITCHING TIME TEST CIRCUIT**



**VOLTAGE WAVEFORMS AND DEFINITIONS**

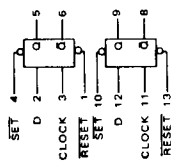


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**ELECTRICAL CHARACTERISTICS**

Test procedures are shown for only one flip-flop. The other flip-flop is tested in the same manner.



Characteristic	Symbol	Pin Under Test	MC5479 Test Limits				MC7479 Test Limits				TEST CURRENT/VOLTAGE VALUES (All Temperatures)																											
			-55 to +125°C		0 to +70°C		-55 to +125°C		0 to +70°C		Volts																											
			Min	Max	Unit	Min	Max	Unit	Min	Max	Unit	Min	Max	Unit	$I_{OL}$	$V_{IL}$	$V_{IH}$	$V_{M}$	$V_{MH}$	$V_{R1}$	$V_{H1}$	$V_{H0}$	$V_{CC}$	$V_{CCL}$	$V_{CCH}$													
			TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW:														$I_{OL}$	$V_{IL}$	$V_{IH}$	$V_{M}$	$V_{MH}$	$V_{R1}$	$V_{H1}$	$V_{H0}$	$V_{CC}$	$V_{CCL}$	$V_{CCH}$											
Input Forward Current	$I_F$	2	-1.6	mA	-1.6	mA													1.4						14													
	SET	4	-4.2	mA	-4.2	mA													1																			
	RESET	3	-3.2	mA	-3.2	mA													1																			
Leakage Current	$I_{R1}$	2	40	$\mu$ A	40	$\mu$ A													3.4						14													
	SET	4	80	$\mu$ A	80	$\mu$ A													1.2, 3*																			
	Clock	3	120	$\mu$ A	120	$\mu$ A													3*, 4																			
Output Output Voltage	$I_{R2}$	2	1.0	mA	1.0	mA													3.4						14													
	SET	4																	1.2, 3*																			
	Clock	3																	3*, 4																			
Short-Circuit Current	$I_{SC}$	5	20	mA	20	mA																			14													
	Power Supply Drain	6	-20	mA	-20	mA																																
Power Requirements (Total Device)	$I_{PD}$	14																					14															
		14	28.8	mA	28.8	mA																	14															

\* Momentarily ground pin prior to taking measurement, then set to state indicated.

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