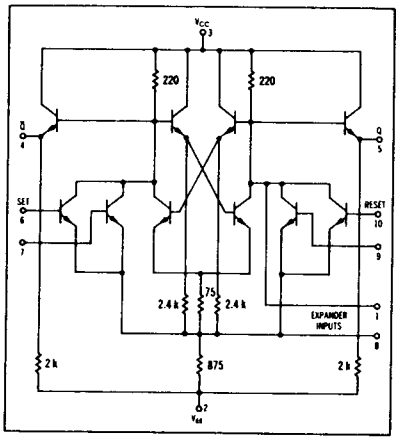
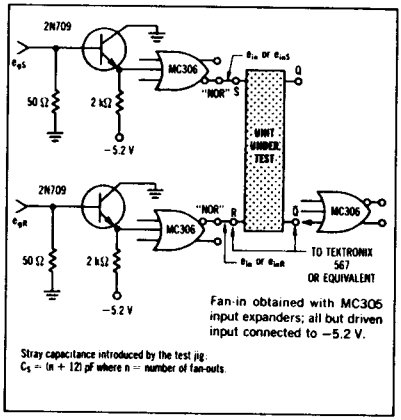
MC302

DC Set-Reset flip-flop with an expandable input and buffered outputs.



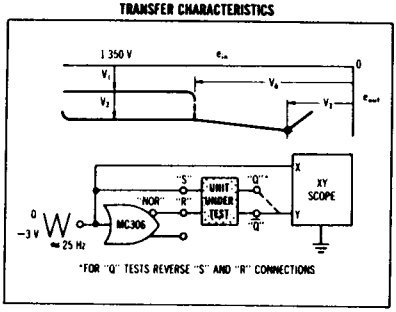
SWITCHING TIME TEST CIRCUIT



Fan-in obtained with MC305 input expanders; all but driven input connected to −5.2 V.

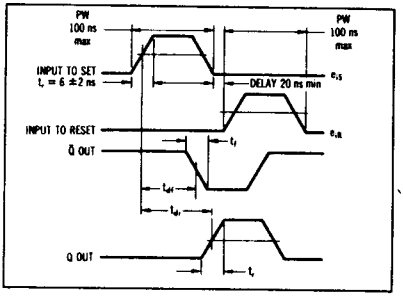
Stray capacitance introduced by the test jig.
$C_s = (n + 12)$ pF where n = number of fan-outs.

TRANSFER CHARACTERISTICS



*FOR "Q" TESTS REVERSE "S" AND "R" CONNECTIONS

SWITCHING TIME WAVEFORMS



ELECTRICAL CHARACTERISTICS

@ Test Temperature	Test Conditions $V_{EE} \pm 1\%$			
−55°C	—	−0.945	−1.450	−5.20
+25°C	−0.890	−0.795	−1.350	−5.20
+125°C	—	−0.855	−1.300	−5.20

Characteristic	V_{in} Pin No	$V_{t,max}$ Pin No	V_t Pin No	V_{EE} Pin No	dV_{in} Pin No	I_t Pin No	Ground Pin No	Symbol Pin No on ( )	−55°C Min	−55°C Max	+25°C Min	+25°C Max	+125°C Min	+125°C Max	Unit
Power Supply Drain Current	—	—	—	2,6,7,9,10	—	—	3	I_E (8)	—	10.35	—	10.35	—	9.52	mAdc
Input Current	6	—	—	2,7,9,10	—	—	3	I_{in} (6)	—	—	—	100	—	—	μAdc
	7	—	—	2,6,9,10	—	—	3	I_{in} (7)	—	—	—	↓	—	—	↓
	9	—	—	2,6,7,10	—	—	3	I_{in} (9)	—	—	—		—	—	
	10	—	—	2,6,7,9	—	—	3	I_{in} (10)	—	—	—		—	—	
"0" Logical "1" Output Voltage	—	—	6①	2,7,9,10	—	—	3	V_1 (5)	−0.825	−0.945	−0.690	−0.795	−0.525	−0.855	Vdc
	—	—	7②	2,6,9,10	—	—	3	V_1 (5)	−0.825	−0.945	−0.690	−0.795	−0.525	−0.855	Vdc
"0" Logical "0" Output Voltage	—	—	9③	2,6,7,10	—	—	3	V_0 (5)	−1.560	−1.850	−1.465	−1.750	−1.340	−1.675	Vdc
	—	—	10②	2,6,7,9	—	—	3	V_0 (5)	−1.560	−1.850	−1.465	−1.750	−1.340	−1.675	Vdc
"$\overline{0}$" Logical "1" Output Voltage	—	—	9③	2,6,7,10	—	—	3	V_1 (4)	−0.825	−0.945	−0.690	−0.795	−0.525	−0.855	Vdc
	—	—	10①	2,6,7,9	—	—	3	V_1 (4)	−0.825	−0.945	−0.690	−0.795	−0.525	−0.855	Vdc
"$\overline{0}$" Logical "0" Output Voltage	—	—	6①	2,7,9,10	—	—	3	V_0 (4)	−1.560	−1.850	−1.465	−1.750	−1.340	−1.675	Vdc
	—	—	7②	2,6,9,10	—	—	3	V_0 (4)	−1.560	−1.850	−1.465	−1.750	−1.340	−1.675	Vdc
"0" Output Voltage Change	—	6	—	2,7,9,10	—	5①	3	ΔV_1 (5)	—	−0.055	—	−0.055	—	−0.060	Volts
"$\overline{0}$" Output Voltage Change	—	10	—	2,6,7,9	—	4①	3	ΔV_1 (4)	—	−0.055	—	−0.055	—	−0.060	Volts
"0" Saturation Breakpoint Voltage	—	—	—	2,7,9	6,10①	—	3	V_3 (5)	—	−0.50	—	−0.65	—	−0.75	Vdc
"$\overline{0}$" Saturation Breakpoint Voltage	—	—	—	2,7,9	6,10①	—	3	V_3 (4)	—	−0.50	—	−0.65	—	−0.75	Vdc
"0" or "$\overline{0}$" Latch Voltage	—	—	—	2,7,9	6,10④	—	3	V_R (6,10)	−1.16	−1.34	−1.09	−1.21	−0.93	−1.07	Vdc
Switching Times	Pulse In	Pulse Out							Typ	Max	Typ	Max	Typ	Max	
Propagation Delay Time	6,10	4,5	—	2,7,9	—	—	3	t_{pr} (4,5)	9.0	14.0	10.5	16.0	22.0	29.0	ns
	6,10	4,5	—	2,7,9	—	—	3	t_{pf} (4,5)	8.5	14.0	11.5	19.5	16.0	24.0	↓
Rise Time	6,10	4,5	—	2,7,9	—	—	3	t_r (4,5)	9.0	15.0	11.5	19.0	23.0	31.0	
Fall Time	6,10	4,5	—	2,7,9	—	—	3	t_f (4,5)	7.0	13.0	12.5	19.5	18.0	29.0	

Pins not listed are left open. ①Input voltage is adjusted to obtain dV "$\overline{0}$"$/dV_{in} = 0$, dV "0"$/dV_{in} = 0$. ②Current test conditions: no load = 0, full load = −2.5 mAdc ±5%.
③Apply momentary $V_{t,max}$ to set output, then V_t for measurement. ④Input voltage is adjusted to obtain $dV_t/dV_{in} = \infty$.

SWITCHING CHARACTERISTICS (10% to 90% distribution)