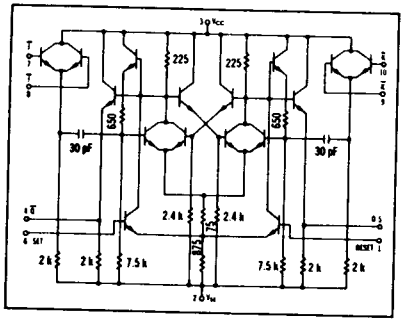
MC308

AC-coupled J-K flip-flop with dc Set and Reset inputs and buffered outputs for counter and shift register applications up to 15 MHz.



TRANSFER CHARACTERISTICS

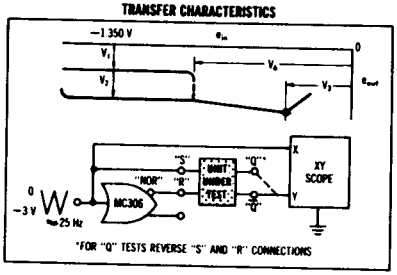


FIGURE 1 – SWITCHING TIME TEST CIRCUIT AND WAVEFORMS

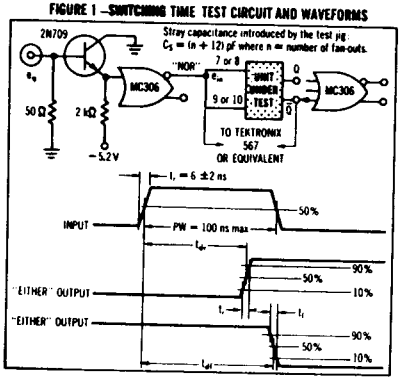


FIGURE 2 – INPUT WAVEFORM TO ESTABLISH MINIMUM TOGGLE FREQUENCY

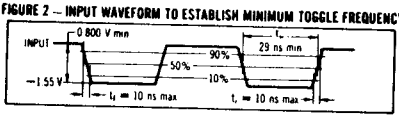


FIGURE 3 – SENSITIVITY (NO TOGGLE)

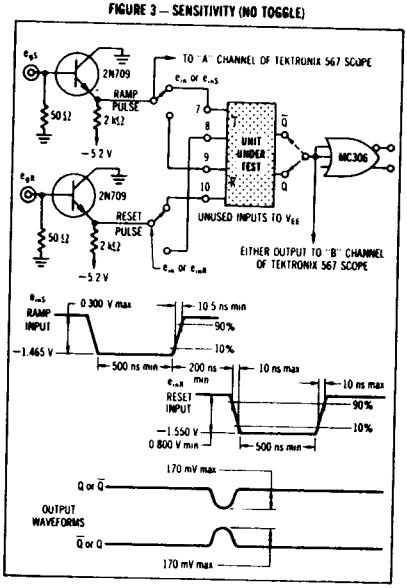
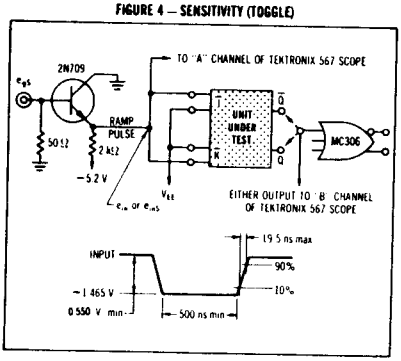


FIGURE 4 – SENSITIVITY (TOGGLE)



ELECTRICAL CHARACTERISTICS

@ Test Temperature	Test Conditions V_{dc} ± 1%			
−55°C	—	−0.945	−1.450	−5.20
+25°C	−0.690	−0.795	−1.350	−5.20
+125°C	—	−0.655	−1.300	−5.20

Characteristic	V_{ss} Pin No	$V_{t\,max}$ Pin No	V_L Pin No	V_{EE} Pin No	dV_{in} Pin No	I_L Pin No	Ground Pin No	Symbol Pin No in ( )	Test Limits −55°C Min	−55°C Max	+25°C Min	+25°C Max	+125°C Min	+125°C Max	Unit
Power Supply Drain Current	—	7,10	—	1,2,6,8,9	—	—	3	I_{EE} (2)	—	22.0	—	21.0	—	19.5	mAdc
Input Current	7	—	—	1,2,6,8,9,10	—	—	3	I_{in} (7)	—	—	—	100	—	—	μAdc
	8	—	—	1,2,6,7,9,10	—	—	3	I_{in} (8)	—	—	—	↓	—	—	↓
	9	—	—	1,2,6,7,8,10	—	—	3	I_{in} (9)	—	—	—		—	—	
	10	—	—	1,2,6,7,8,9	—	—	3	I_{in} (10)	—	—	—		—	—	
"0" Logical "1" Output Voltage	—	—	8③	1,2,7,8,9,10	—	—	3	V_1 (5)	−0.825	−0.945	0.690	0.795	0.525	0.655	Vdc
"0" Logical "0" Output Voltage	—	—	10④	2,6,7,8,9,10	—	—	3	V_0 (5)	−1.560	−1.850	1.465	1.750	−1.340	−1.675	Vdc
"1" Logical "1" Output Voltage	—	—	10④	2,6,7,8,9,10	—	—	3	V_1 (4)	−0.825	−0.945	0.690	0.795	0.525	0.655	Vdc
"1" Logical "0" Output Voltage	—	—	6③	1,2,7,8,9,10	—	—	3	V_0 (4)	−1.560	−1.850	1.465	−1.750	−1.340	−1.675	Vdc
"0" Output Voltage Change	—	6	—	1,2,7,8,9,10	—	5⑤	3	ΔV_1 (5)	—	0.055	—	0.055	—	0.060	Volts
"0" Output Voltage Change	—	1	—	2,6,7,8,9,10	—	4⑤	3	ΔV_1 (4)	—	0.055	—	−0.055	—	−0.060	Volts
"0" Saturation Breakpoint Voltage	—	—	—	1,2,7,8,9,10	6⑥	—	3	V_1 (5)	—	−0.50	—	−0.65	—	−0.75	Vdc
"0" Saturation Breakpoint Voltage	—	—	—	2,6,7,8,9,10	1⑥	—	3	V_0 (4)	—	0.50	—	0.65	—	0.75	Vdc
"1" or "0" Latch Voltage	—	—	—	2,7,8,9,10	1,6⑦	—	3	V_R (1,6)	−1.16	−1.34	−1.09	−1.21	−0.93	1.07	Vdc
	Pulse In	Pulse Out													
Toggle Frequency (See Figures 1 and 2)	7,10	5		1,2,6,9	—	—	3	f_{TOG}	—	—	15	—	—	—	MHz
Sensitivity (No Toggle)	7,10	4		1,2,6,8,9	—	—	3		← See Figure 3 →						
Sensitivity (Toggle)	8,9	5		1,2,6,7,10	—	—	3		← See Figure 3 →						
Switching Times	7,10	4,5		1,2,6,8,9	—	—	3		← See Figure 4 →						
Propagation Delay	7,10	4,5		1,2,6,8,9	—	—	3	t_{pd} (4,5)	Typ 7.0	Max 11.5	Typ 7.0	Max 12.5	Typ 9.5	Max 18.5	ns
Rise Time	7,10	4,5		1,2,6,8,9	—	—	3	t_{pd} (4,5)	8.5	14.0	8.5	14.5	10.0	16.5	
Fall Time	7,10	4,5		1,2,6,8,9	—	—	3	t_r (4,5)	6.5	13.0	6.5	13.0	10.0	18.5	
	7,10	4,5		1,2,6,8,9	—	—	3	t_f (4,5)	7.5	14.5	8.5	15.5	11.5	20.0	↓

Pins not listed are left open.
① Input voltage is adjusted to obtain $dV_{out} = dV_{in}$.
② Apply momentary $V_{t\,max}$ to set output, then $V_{t\,max}$ for measurement.
③ Current test conditions: no load — 0 to full load — −2.5 mAdc ±5%.
④ Input voltage is adjusted to obtain $dV_1 / dV_{in} = \infty$.

SWITCHING CHARACTERISTICS (10% to 90% distribution)