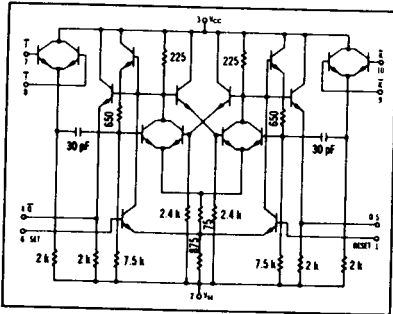# MC308

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.

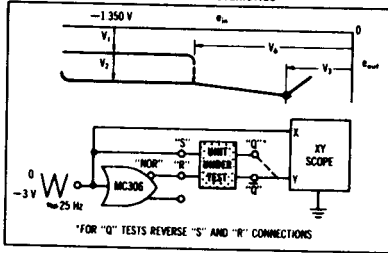**TRANSFER CHARACTERISTICS**

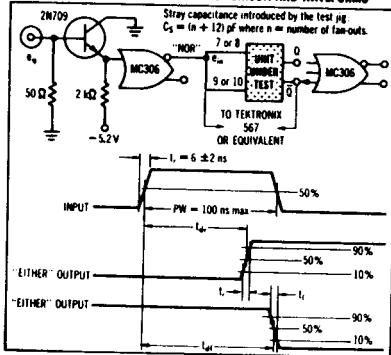**FIGURE 1 — SWITCHING TIME TEST CIRCUIT AND WAVEFORMS**

FIGURE 2 — INPUT WAVEFORM TO ESTABLISH MINIMUM TOGGLE FREQUENCY
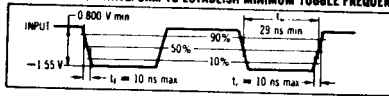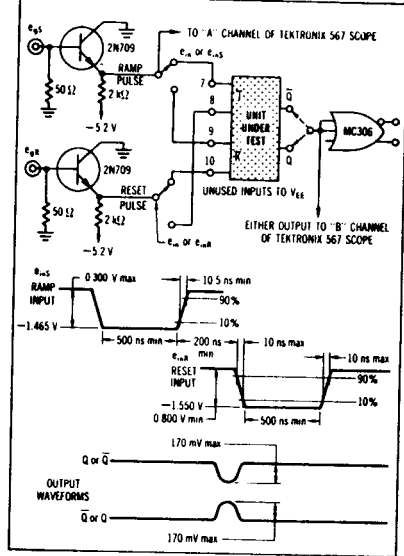

FIGURE 3 — SENSITIVITY (NO TOGGLE)

FIGURE 4 — SENSITIVITY (TOGGLE)

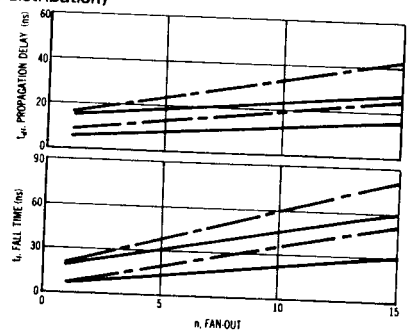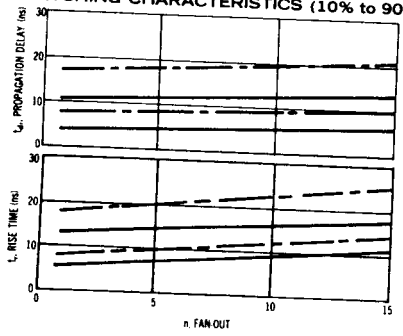54
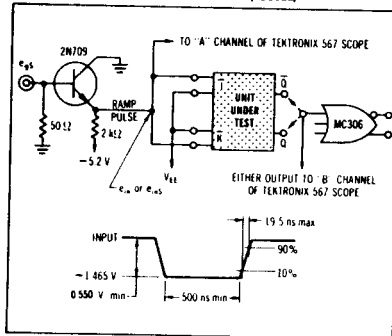
ELECTRICAL CHARACTERISTICS

	Test Conditions Vdc · 1%		
@ Test Temperature −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_{IH} Pin No	$V_{I\,max}$ Pin No	V_{IL} Pin No	V_{EE} Pin No	dV_{in} Pin No	I_L Pin No	Ground Pin No	Symbol Pin No in ( )	−55°C Min	Max	+25°C Min	Max	+125°C Min	Max	Unit
Power Supply Drain Current	−	7,10	−				3	I_E (2)	−	22.0	−	21.0	−	19.5	mAdc
Input Current	7	−	−	1,2,6,8,9,10	−	−	3	I_{in} (7)	−		−		−		µAdc
	8	−	−	1,2,6,7,9,10	−	−	3	I_{in} (8)	−	−	−	100	−	−	
	9	−	−	1,2,6,7,8,10	−	−	3	I_{in} (9)	−	−	−		−	−	
	10	−	−	1,2,6,7,8,9	−	−	3	I_{in} (10)	−	−	−		−	−	
"6" Logical "1" Output Voltage	−	−	6③	1,2,7,8,9,10	−	−	3	V_1 (5)	−0.825	−0.945	0.690	0.795	0.525	0.655	Vdc
"6" Logical "0" Output Voltage	−	−	1④	2,6,7,8,9,10	−	−	3	V_2 (5)	−1.560	−1.850	1.465	1.750	−1.340	−1.675	Vdc
"6" Logical "1" Output Voltage	−	−	1④	2,6,7,8,9,10	−	−	3	V_1 (4)	−0.825	−0.945	0.690	0.795	0.525	0.655	Vdc
"6" Output Voltage Change	−	−	6③	1,2,7,8,9,10	−	−	3	V_2 (4)	−1.560	−1.850	1.465	−1.750	−1.340	−1.675	Vdc
"6" Output Voltage Change	−	6	−	1,2,7,8,9,10	5③	−	3	ΔV_1 (5)	−	0.055	−	0.055	−	0.060	Volts
"6" Saturation Breakpoint Voltage	−	1	−	2,6,7,8,9,10	4③	−	3	ΔV_1 (4)	−	0.055	−	0.055	−	0.060	Volts
"6" Saturation Breakpoint Voltage	−	−	−	1,2,7,8,9,10	6 ⑴	−	3	V_3 (5)	−	0.50	−	0.65	−	0.75	Vdc
"6" or "6" Latch Voltage	−	−	−	2,6,7,8,9,10	1 ⑴	−	3	V_3 (4)	−	0.50	−	0.65	−	0.75	Vdc
	−	−	−	2,7,8,9,10	1,6 ⑴	−	3	V_5 (1,6)	−1.16	−1.34	−1.09	−1.21	−0.93	1.07	Vdc

	V_{IH} Pulse In	$V_{I\,max}$ 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									Typ	Max	Typ	Max	Typ	Max	
Rise Time	7,10	4,5	1,2,6,8,9	−	−	3		t_{d+} (4,5)	7.0	11.5	7.0	12.5	9.5	18.5	ns
Fall Time	7,10	4,5	1,2,6,8,9	−	−	3		t_{d+} (4,5)	8.5	14.0	8.5	14.5	10.0	16.5	
	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	6.5	15.5	11.5	20.0	

Pins not listed a s left open
① Apply momentary V_1 to set output, then V_{in} for measurement. ⑴ Input voltage is adjusted to obtain $dV_{in}/dV_1 = 0$. ③ Current test conditions: no load – 0 to full load – –2.5 mAdc ±5%. G. Input voltage is adjusted to obtain $dV_1/dV_{in} = \infty$.

SWITCHING CHARACTERISTICS (10% to 90% distribution)

−55°C and +25°C
−·− +125°C

55