DIVIDE-BY-TWELVE COUNTER

MC5492F, L*
MC7492F, L, P*

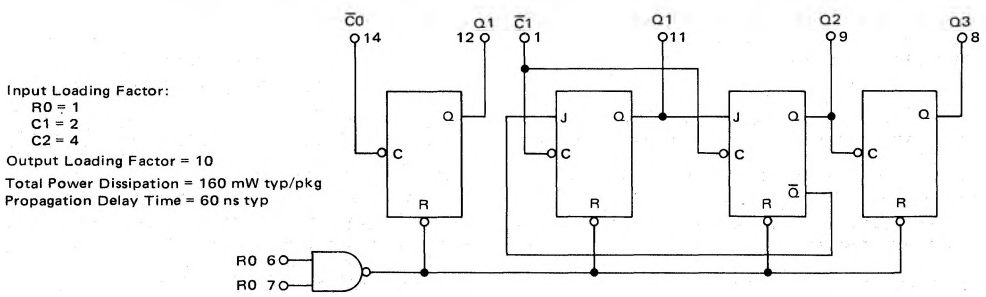
COUNT SEQUENCE TRUTH TABLE

COUNT	OUTPUT			
	Q3	Q2	Q1	Q0
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	1	0	0	0
7	1	0	0	1
8	1	0	1	0
9	1	0	1	1
10	1	1	0	0
11	1	1	0	1

A connected to $\overline{C1}$

This 4-bit counter is comprised of a divide-by-two section and a divide-by-six section. These sections can be used independently, or can be connected to perform the divide-by-twelve function. When used independently, the divide-by-six section provides the divide-by-three function at the C output and the divide-by-six function at the D output. The outputs may be set to the logic "0" state any time during the counting sequence by setting both R0 inputs to the logic "1" state.

V_{CC} = PIN 5
Gnd = PIN 10



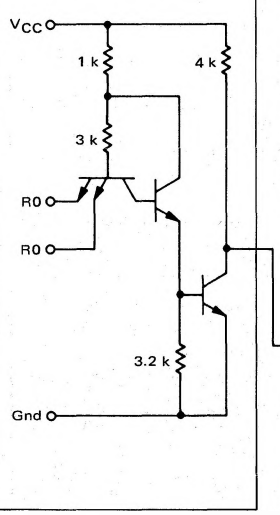
Input Loading Factor:
R0 = 1
C1 = 2
C2 = 4

Output Loading Factor = 10

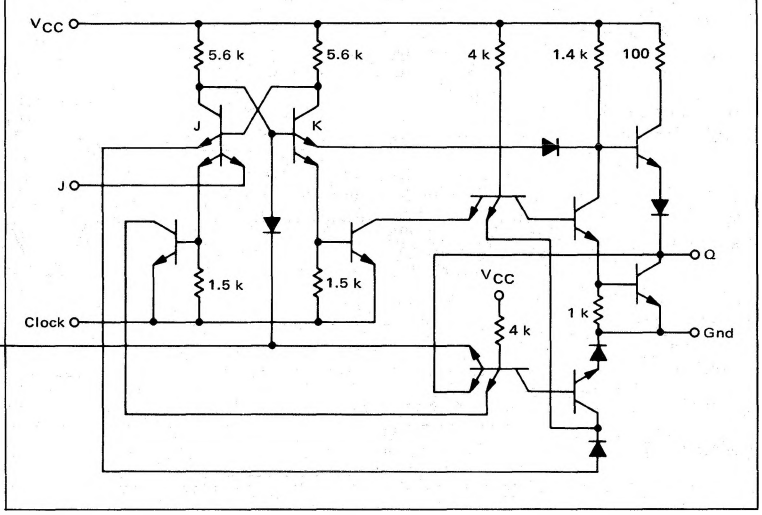
Total Power Dissipation = 160 mW typ/pkg

Propagation Delay Time = 60 ns typ

RESET GATE

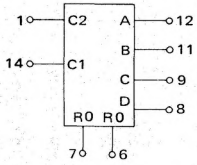


TYPICAL FLIP-FLOP



*F suffix = TO-86 ceramic flat package (Case 607).
L suffix = TO-116 ceramic dual in-line package (Case 632).
P suffix = TO-116 plastic dual in-line package (Case 605).

ELECTRICAL CHARACTERISTICS

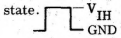


	I_{OL} (mA)	I_{OH} (mA)	V_{IL} (Volts)	V_{IH} (Volts)	V_{IHH} (Volts)	V_{RI} (Volts)	$V_{th\,1}$ (Volts)	$V_{th\,0}$ (Volts)	$V_{th\,L}$ (Volts)	V_{CC} (Volts)	V_{CCL} (Volts)	V_{CCH} (Volts)
MC5492	16	-0.4	0.4	2.4	5.5	4.5	2.0	0.8	0.7	5.0	4.5	5.5
MC7492	16	-0.4	0.4	2.4	5.5	4.5	2.0	0.8	0.8	5.0	4.75	5.25

Characteristic		Symbol	Pin Under Test	MC5492 Test Limits −55 to +125°C Min	Max	Unit	MC7492 Test Limits 0 to +70°C Min	Max	Unit	TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW: I_{OL}	I_{OH}	V_{IL}	V_{IH}	V_{IHH}	V_{RI}	$V_{th\,1}$	$V_{th\,0}$	$V_{th\,L}$	V_{CC}	V_{CCL}	V_{CCH}	Pulse 1	Pulse 2	Gnd
Input																							
Forward Current	R0	I_F	6	-	-1.6	mAdc	-	-1.6	mAdc	-	-	6	-	-	7	-	-	-	-	-	5	-	-	10
			7	-	-1.6	↓	-	-1.6	↓	-	-	7	-	-	6	-	-	-	-	-	↓	-	-	↓
	C1		14	-	-3.2		-	-3.2		-	-	14	-	-	-	-	-	-	-	-		-	-	
	C2		1	-	-6.4		-	-6.4		-	-	1	-	-	-	-	-	-	-	-		-	-	
Leakage Current	R0	I_{R1}	6	-	40	μAdc	-	40	μAdc	-	-	-	6	-	-	-	-	-	-	-	5	-	-	7,10
			7	-	40	↓	-	40	↓	-	-	-	7	-	-	-	-	-	-	-	↓	-	-	6,10
	C1		14	-	80		-	80		-	-	-	14	-	-	-	-	-	-	-		-	-	10
	C2		1	-	160		-	160		-	-	-	1	-	-	-	-	-	-	-		-	-	10
	R0	I_{R2}	6	-	1.0	mAdc	-	1.0	mAdc	-	-	-	-	6	-	-	-	-	-	-	5	-	-	7,10
			7	-	↓	↓	-	↓	↓	-	-	-	-	7	-	-	-	-	-	-	↓	-	-	6,10
	C1		14	-			-			-	-	-	-	14	-	-	-	-	-	-		-	-	10
	C2		1	-			-			-	-	-	-	1	-	-	-	-	-	-		-	-	10
Output																							
Output Voltage	A ①	V_{OL}	12	-	0.4	Vdc	-	0.4	Vdc	12	-	-	-	-	-	6,7,14	-	-	-	5	-	-	-	1,10
Short-Circuit Current		I_{SC}		-20	-57	mAdc	-18	-57	mAdc	-	-	-	-	-	-	-	6,7	-	-	-	5	14	-	1,10,12
Output Voltage		V_{OH}		2.4	-	Vdc	2.4	-	Vdc	-	12	-	-	-	-	-	6,7,14	-	-	5	-	-	-	1,10
	B ①	V_{OL}	11	-	0.4	Vdc	-	0.4	Vdc	11	-	-	-	-	-	6,7	-	1	-	5	-	-	-	10,14
		I_{SC}		-20	-57	mAdc	-18	-57	mAdc	-	-	-	-	-	-	-	6,7	-	-	-	5	-	1	10,11,14
		V_{OH}		2.4	-	Vdc	2.4	-	Vdc	-	11	-	-	-	-	-	6,7	1	-	5	-	-	-	10,14
	C ①	V_{OL}	9	-	0.4	Vdc	-	0.4	Vdc	9	-	-	-	-	-	-	6,7	1	-	5	-	-	-	10,14
		I_{SC}		-20	-57	mAdc	-18	-57	mAdc	-	-	-	-	-	-	-	↓	-	-	-	5	-	1	9,10,14
		V_{OH}		2.4	-	Vdc	2.4	-	Vdc	-	9	-	-	-	-	-		1	-	5	-	-	-	10,14
	D ①	V_{OL}	8	-	0.4	Vdc	-	0.4	Vdc	8	-	-	-	-	-	-	6,7	1	-	5	-	-	-	10,14
		I_{SC}		-20	-57	mAdc	-18	-57	mAdc	-	-	-	-	-	-	-	↓	-	-	-	5	-	1	8,10,14
		V_{OH}		2.4	-	Vdc	2.4	-	Vdc	-	8	-	-	-	-	-		1	-	5	-	-	-	10,14
Power Requirements (Total Device)																							
Power Supply Drain		I_{PD}	5	-	40	mAdc	-	46	mAdc	-	-	-	-	-	-	-	-	-	5	-	-	-	-	6,7,10

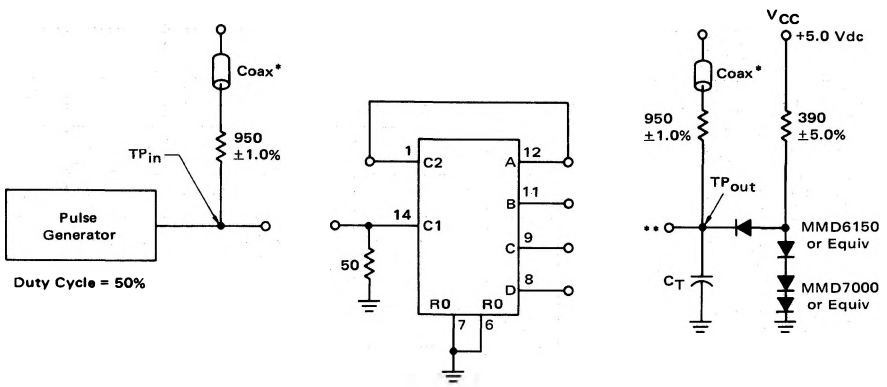
Pulse 1: Momentarily apply $V_{th\,1}$ then ground prior to taking measurement to set the device in the desired state. Maintain ground for measurement.

Pulse 2: Apply positive pulse prior to taking measurement to set the device in the desired state. Maintain ground for measurement.



① All input, power supply and ground voltages must be maintained between each test unless otherwise noted.

SWITCHING TIME TEST CIRCUIT



f_{Tog} = 10 MHz min

C_T = 15 pF = total parasitic capacitance, which includes probe, wiring, and load capacitances.

*The coax delays from input to scope and output to scope must be matched. The scope must be terminated in 50-ohm impedance. The 950-ohm resistor and and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.

**A load is connected to each output during the test.

VOLTAGE WAVEFORMS AND DEFINITIONS