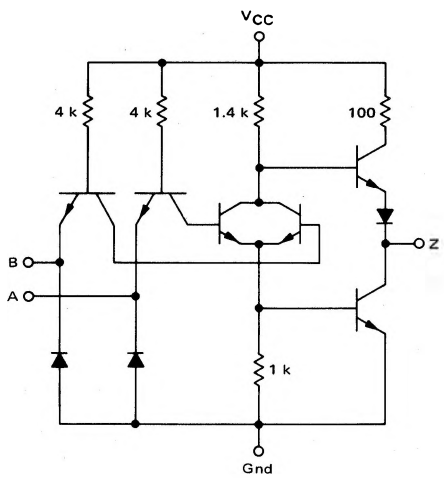
# MC5402 • MC7402

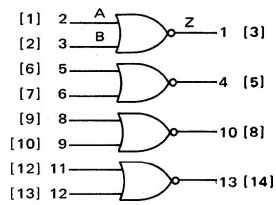
Add Suffix F for TO-86 ceramic package (Case 607).
Suffix L for TO-116 ceramic package (Case 632).
Suffix P for TO-116 plastic package (Case 605) MC7402 only.

**CIRCUIT SCHEMATIC**
1/4 OF CIRCUIT SHOWN




$V_{CC}$ = Pin 14 [4]
Gnd = Pin 7 [11]

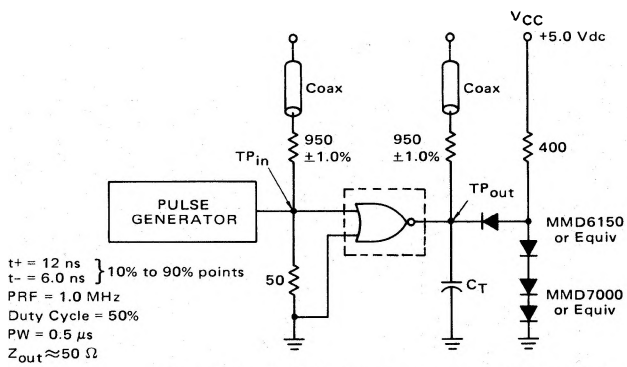
[FLAT Pkg Pin] DIL Pkg Pin

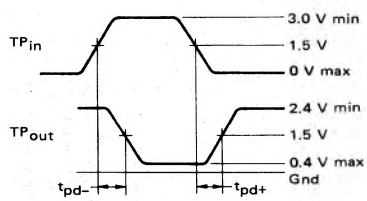



Positive Logic: $Z = \overline{A + B}$
Negative Logic: $Z = \overline{A \bullet B}$

Input Loading Factor = 1
Output Loading Factor = 10
Total Power Dissipation = 40 mW typ/pkg
Propagation Delay Time = 10 ns typ

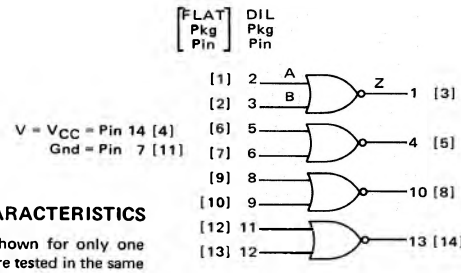
**SWITCHING TIME TEST CIRCUIT AND WAVEFORMS**




$C_T$ = 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 the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.




## ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one gate. The other gates are tested in the same manner. Further, test procedures are shown for only one input of the gate under test. To complete testing, sequence through remaining inputs.

| | | TEST CURRENT/VOLTAGE VALUES (All Temperatures) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mA | Volts | | | | | | | | | | |
| | | $I_{OL}$ | $V_{IL}$ | $V_{IH}$ | $V_{IHH}$ | $V_{R1}$ | $V_{R2}$ | $V_{th1}$ | $V_{th0}$ | $V_{CC}$ | $V_{CCL}$ | $V_{CCH}$ | |
| | MC5402 | 16 | 0.4 | 2.4 | 5.5 | 4.5 | 5.0 | 2.0 | 0.8 | 5.0 | 4.50 | 5.50 | |
| | MC7402 | 16 | 0.4 | 2.4 | 5.5 | 4.5 | 5.0 | 2.0 | 0.8 | 5.0 | 4.75 | 5.25 | Pin 7[11] is grounded for all tests in addition to the pins listed below: |

| Characteristic | Symbol | Pin Under Test | MC5402 Test Limits −55 to +125°C | | | MC7402 Test Limits 0 to +70°C | | | TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW: | | | | | | | | | | Gnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | Unit | Min | Max | Unit | $I_{OL}$ | $V_{IL}$ | $V_{IH}$ | $V_{IHH}$ | $V_{R1}$ | $V_{R2}$ | $V_{th1}$ | $V_{th0}$ | $V_{CC}$ | $V_{CCL}$ | $V_{CCH}$ | |
| **Input** | | | | | | | | | | | | | | | | | | | |
| Forward Current | $I_F$ | A | - | -1.6 | mAdc | - | -1.6 | mAdc | - | A | - | - | B | - | - | - | - | - | V | * |
| Leakage Current | $I_{R1}$ | A | - | 40 | μAdc | - | 40 | μAdc | - | - | A | - | - | - | - | - | - | - | V | B* |
| | $I_{R2}$ | A | - | 1.0 | mAdc | - | 1.0 | mAdc | - | - | - | A | - | - | - | - | - | - | V | B* |
| **Output** | | | | | | | | | | | | | | | | | | | |
| Output Voltage | $V_{OL}$ | Z | - | 0.4 | Vdc | - | 0.4 | Vdc | Z | - | - | - | - | - | A | - | - | V | - | B* |
| | $V_{OH}$ | Z | 2.4 | - | Vdc | 2.4 | - | Vdc | - | Z | - | - | - | - | - | B | - | V | - | A* |
| Short-Circuit Current | $I_{SC}$† | Z | -20 | -55 | mAdc | -18 | -55 | mAdc | - | - | - | - | - | - | - | - | - | - | V | Z,A,B* |
| **Power Requirements (Total Device)** | | | | | | | | | | | | | | | | | | | |
| Power Supply Drain | $I_{PDH}$ | V | - | 27 | mAdc | - | 27 | mAdc | - | - | - | - | - | All Inputs | - | - | - | - | V | - |
| | $I_{PDL}$ | V | - | 16 | mAdc | - | 16 | mAdc | - | - | - | - | - | - | - | - | - | - | V | A,B* |
| **Switching Parameters** | | | | | | | | | Pulse In | Pulse Out | | | | | | | | | | |
| Turn-On Delay | $t_{pd-}$ | A,Z | - | 15** | ns | - | 15** | ns | A | Z | - | - | - | - | - | - | V | - | - | A* |
| Turn-Off Delay | $t_{pd+}$ | A,Z | - | 22** | ns | - | 22** | ns | A | Z | - | - | - | - | - | - | V | - | - | A* |

*Ground inputs to gates not under test.
**Tested only at 25°C.
†Only one output should be shorted at a time.