

TMJL451-44A

4-bit x 4-bit Multiplier With Built-In Cell Tester

The TMJL451-44A is a 4-bit x 4-bit multiplier

The CMOS design of the 4-bit x 4-bit multiplier circuit contains sixteen cells. The testing features

for a signature analysis. The sequence generator, controlled by a clock and a start bit, is used for

generator are given in Table 1. The expected

are based upon a multiplier truth table. The 8-bit

are used to store the information provided from the test. Outputs come from the registers for easy observation of the test's results.

Features

- ❑ Low cost / CMOS technology
- ❑ Fully functional 4-bit x 4-bit multiplier
- ❑ Testable cellular array
- ❑ Single-clock-driven sequence generator and registers
- ❑ Start/stop bit to begin, interrupt, and end diagnostic testing
- ❑ 8-bit register for easy viewing of test results

Connection Diagram

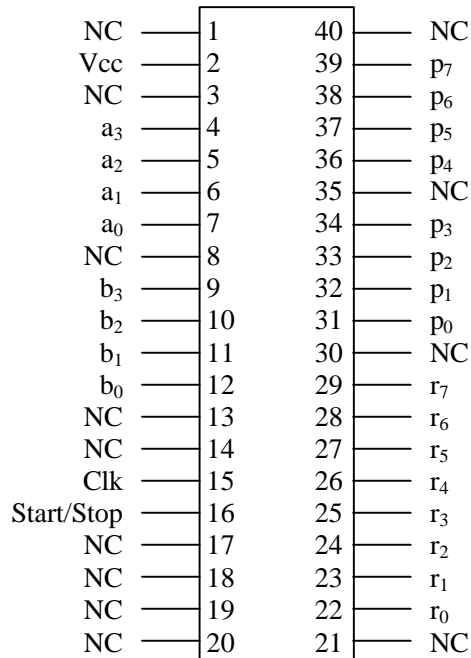


Table 1 – Sequence Generator

Outputs From Generator								Expected Outputs From Multiplier							
a3	a2	a1	a0	b3	b2	b1	b0	p7	p6	p5	p4	p3	p2	p1	p0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0
0	0	1	1	0	0	1	1	0	0	0	0	1	0	0	1
0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0
0	1	0	1	0	1	0	1	0	0	0	1	1	0	0	1
0	1	1	0	0	1	1	0	0	0	1	0	0	1	0	0
0	1	1	1	0	1	1	1	0	0	0	1	1	0	0	0
1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
1	0	0	1	1	0	0	1	0	1	0	1	0	0	0	1
1	0	1	0	1	0	1	0	0	1	1	0	0	1	0	0
1	0	1	1	1	0	1	1	0	1	1	1	1	0	0	1
1	1	0	0	1	1	0	0	0	1	0	0	1	0	0	0
1	1	0	1	1	1	0	1	0	1	0	1	0	1	0	0
1	1	1	0	1	1	1	0	0	1	1	0	0	1	0	0
1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	1

Voltage Levels

- ❑ Input
 - Logic 1 – 2.4V - 5V
 - Logic 0 – 0V - .4V
- ❑ Output
 - Logic 1 – 5V
 - Logic 0 – 0V

Figure 1 – Single Cell Schematic

