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IC Recognizer

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Project analysis

Counter

We used the counter's first two bits to get the input of the IC under test, and the third bit as an enable that causes all the circuit to stop if it is logic (1) .

The enable of the counter is the is the third bit of it ANDed with the asynchronous Enable (input) ANDed with the output of the circuit that check if the IC working correctly .So if the IC is not working or the input enable is logic(zero) or the third bit of the counter is 1 the enable of the counter is logic (zero).

Check IC under-test is working

This circuit takes the output of four gate of the IC under test and checks if it's all similar and if not similar the circuit stops (enable is zero) and the not-found led is high .

Shift register

We used a 4-bit shift register synchronous with the counter, with serial input that takes the output of the IC under test .after two periods the shift register now has the four outputs of the IC under test for (00,01,10,11) .Now the output of the IC the enable of the counter and shift register is now logic (zero).

Last part of the circuit takes the values stored in the shift register and recognize the type of the IC under-test if it's not one of the four required it gives Don't care value and the not-found led is high ,and if it is one of them it gives the ID of the led as required (00,01,10,11)for AND,OR,XOR ,and NAND respectively and the found-led is high.

And there is an asynchronous **Reset** (common) to clear the counter and the shift register.

Used components:

Name	Id	number
4-bit counter	74161	1
4-bit shift register	74179	1
IC AND	7408	3
IC OR	7432	2
IC XOR	7486	1
IC NOT	7404	2
Led	-	4
Capacitor	-	2
IC 555	555	1
Resistors	-	4