

# Component And IC Tester Using 89S52 Microcontroller

Miss. M. A. Tarkunde  
M.Tech.Student  
Department of Electronics  
Bharati vidyapeeth Deemed University  
College of Engineering  
Pune,India

Prof. A. A. Shinde  
Department of Electronics  
Bharati vidyapeeth Deemed University  
College of Engineering  
Pune,India

**Abstract-** An IC constitutes area of microelectronics in which many electronic components are combined in to high density modules.IC's, the main component of each and every electronic circuit can be used for wide variety of purposes and functions. IC consists of active and passive components such as resistors, capacitors, transistors on single chip which reduces size of system, power consumption and cost of overall system. But sometime due to faulty ICs the circuit doesn't work. It is lot work to debug the circuit and confirm whether the circuiting is creating problem or the IC is faulty. So the proposed project is designed to confirm whether the IC under consideration is properly working or not. The proposed project can be used to check the IC's of 74 series at gate level. 89s52 microcontroller is used in this project that switches the bias voltage across the PN junctions of diode and transistors, and determines if a particular junction is normal, open or short.Also it checks the gates in given IC which is

placed in ZIF socket and display the result In this way the main advantage of proposed project is, this IC tester checks the devices at gate level so that even if one or two gates of IC are faulty we can use remaining gate which saves our cost of unit and, time for processing so there is no need of direct replacement of the IC.

## I. INTRODUCTION

The basic function of IC tester is to check digital IC for correct logical functioning as described in the truth table i.e. it used to test the variety of IC's which consists of gates,sequential circuits,combinational circuits.The input signals are applied to the input pins of the IC and output is measured at the corresponding output pin. In the various systems various IC's and components are connected to each other. During the system failure it is not possible to check the whole circuit as it requires much time ,and high cost. Therefore by checking only IC's and components on the chip the

failure rate can be reduced by using the designed project. Unlike the IC testers available in market, this IC tester is affordable and user friendly. The 89s52 microcontroller is used in this project with keyboard and LCD display unit. It checks the gates in given IC which is placed in ZIF socket and display the result. Testing of IC is based on the inputs that provided to the gates in IC through the programming.

## II.LITERATURE SURVEY

In any manufacturing industry there are continuous efforts in cost reduction, upgrade quality and improve efficiency. In electronic industry, with dramatic increase in circuit complexity and need of higher levels of reliability, a major contributor cost in any product can be in the testing. However in real world no product is perfect, so testing is essential part of production in foreseeable future. The proposed project checks IC's and component also. As the IC testers available in market can test only linear IC's or digital IC's or analog IC's but for component testing we require some other instrument.

The IC testers available in the market are

1. MME ADIT 40 Digital IC tester
2. MME HDIT 20 Handheld digital IC tester
3. Universal IC tester
4. MME DIT 20 Digital IC tester.

The proposed project is used to check the digital IC's and components also..Digital IC's are consists of two types.

- 1.Microcontroller based
- 2.PC based

The proposed project checks only microcontroller based IC's.Various types of microcontrollers are available in the market to check the correct functionality of component and IC's such as

- i.8051
- ii.89c2051
- iii.89s52

### DISADVANTAGES OF 8051

- 1.it gulps power and so it heats up.
- 2.it is not CMOS compatible,only TTL compatible.

Disadvantage of 89c2051

- 1.it is 20 pin IC.
- 2.AS we are testing 16/14 pin IC this IC is not sufficient.
- 3.it is not possible to interface keyboard and display.

### ADVANTAGES OF 89s52 MICROCONTROLLER

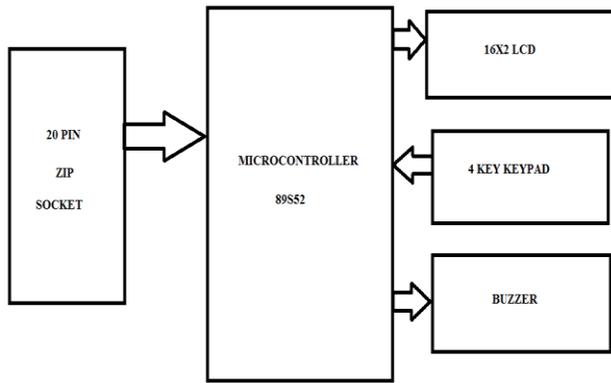
1.8K Bytes of In-System Programmable (ISP) Flash Memory  
– Endurance: 1000 Write/Erase Cycles

- 4.0V to 5.5V Operating Range
- Fully Static Operation: 0 Hz to 33 MHz
- Three-level Program Memory Lock
- 256 x 8-bit Internal RAM
- 32 Programmable I/O Lines
- Three 16-bit Timer/Counters
- Eight Interrupt Sources
- Full Duplex UART Serial Channel
- Low-power Idle and Power-down Modes

- Interrupt Recovery from Power-down Mode
- Watchdog Timer
- Dual Data Pointer
- Power-off Flag

### III. BLOCK DIAGRAM

Fig.1



IC 7805 that gives output voltage of 5V. The minimum input voltage required

for the 7805 is near about 7 v. Therefore we have used the transformer with the voltage rating 230v-10v and current rating 500 mA. The output of the transformer is 12 V AC. This Ac voltage is converted into 12 V DC by Bridge rectifier circuit.

### 2. LCD display

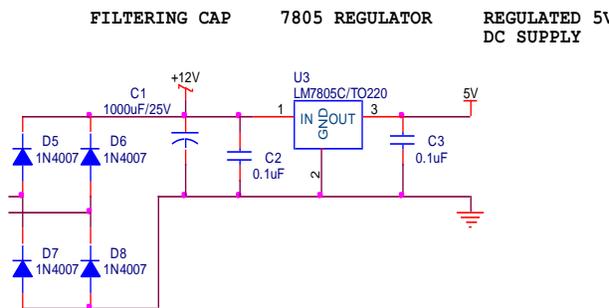
We have used 16\*2 LCD display which has 8 data lines and 3 control lines.

The connections of LCD are given blow

### IV. WORKING

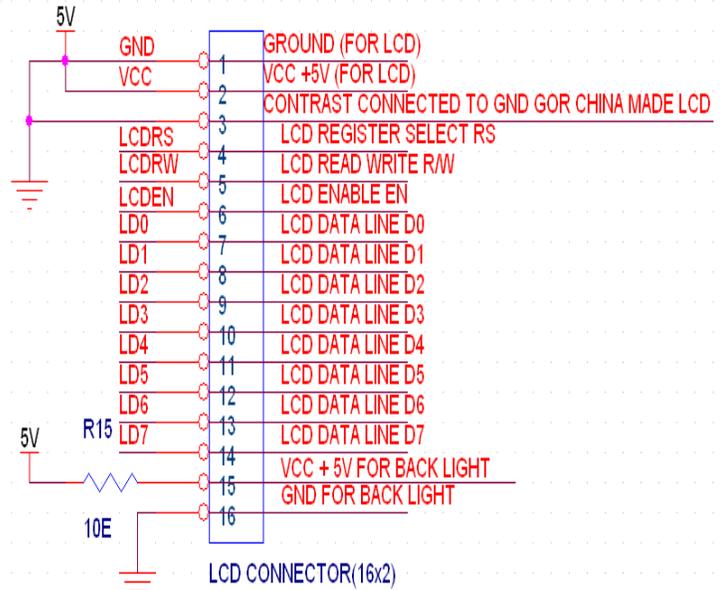
#### 1. Power supply design

The basic step in the designing of any system is to design the power supply required for that system.



BRIDGE RECTIFIER

We have used Regulator



### 3.Keypad

It has 4 keys to select proper IC which we want to check.



Working of gate level testing of IC

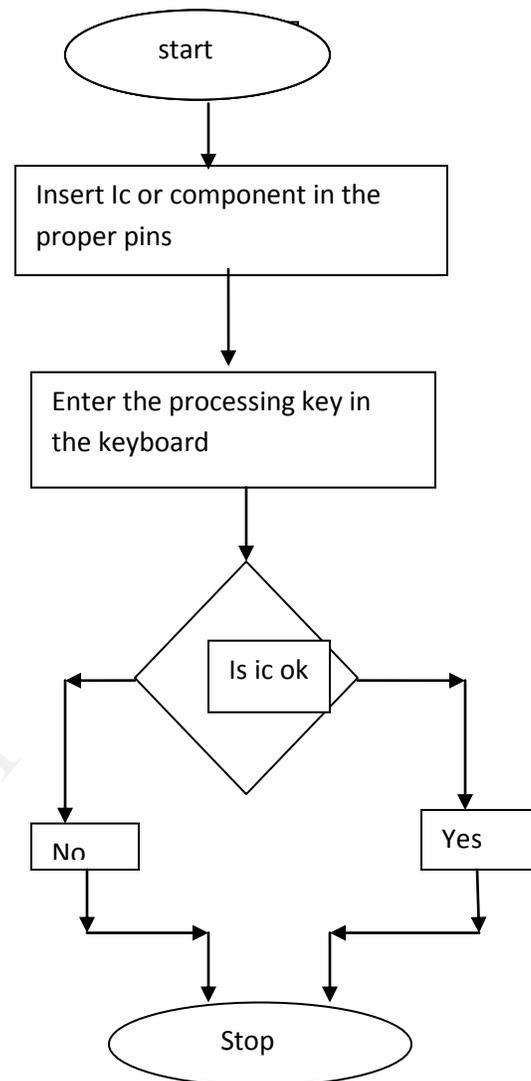
The test sequence for IC testing is as given below,

1. The ISP programmer is used to download the program in the microcontroller.
- 2.the project is made user friendly by interfacing keypad and LCD.
- 3.The IC to be tested is inserted in the ZIF socket. The user enters the IC number through keypad which is simultaneously displayed on the LCD.
- 4.The IC number is communicated to microcontroller which basically test the ICs for few sets of input which is given through the MCU and corresponding output. The result is again displays on the LCD.
- 5.If the IC tested is ok "IC TESTED OK is displayed on the LCD.Otherwise "IC TESTED FAILED" is displayed.

### Diode and Transistor testing

1. Connect the Diode in the two testing points and Transistor between three testing points which are connected to the microcontroller.
2. Press the key for processing.
3. Display result on LCD

### V. FLOW CHART



### VI.CONCLUSION

This paper proposes an inexpensive and compact model of digital integrated circuit tester using 89s52. Different digital IC's can be tested by just writing the specific program without any change in hardware. Depending upon pre-determined data the signals from microcontroller are conditioned and corresponding output pins are checked for correctness. The system that has been implemented has shown considerable output that matched our requirement. This was achieved by small and user friendly 89s52. By

Using this proposed project we can check 7400.,7402,7403,7486,7474,7408,7404,7432 IC's. Also the proposed project checks the correctness of diode and transistor as whether diode or transistors are open or short or ok.

## VII.REFERENCES

1.Abhishek Jain, Anshul Goyal ,Siddharth Garg,"DigitalIC tester"*Electronics club ,IIT Kanpur*

2.Fang pang,Canada"A reconfigurable digital IC tester implemented using ARM".

3.Ali F.Shammari"Design and implementation of digitalIC interface to IBM compatible computer"Scientific journalof Kerbala,university 2010

4.www.scribd.com"digital IC Tester ieee.

5.Konemann,B Zwiehoff, G Mucha J,"Built in test for complex digital IC".solid state circuit. IEEE journal ,volume 15,issue 3

6.K.R.Botkar"Integrated circuits",Khanna publication.

7.Roshan Borkar,Ashvin Nakman,"Digital Integrated Circuit Tester",Don Bosco Institute of Technology,Mumbai.

8.Online teaching laboratory on embedded systems,"Microcontroller based diode and BJT tester".2009

9. Dhananjay v. Garde"Programming and customizing the avr microcontroller",.

10.Online teaching laboratory on embedded systems,"Microcontroller based diode and BJT tester".2009

11. Dhananjay v. Garde"Programming and customizing the avr microcontroller",.

12.www.scienceprog.com

13. <http://extremeelectronics.co.in/avr-tutorials>

## Results



