PEN-IC TESTER

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Type: Design Problem
Student Time: One Laboratory Session
Location: Laboratory

Summary

This project is intended to be used with first year engineering students who have completed the first course in Circuit Theory. A opened case commercial IC tester is available for study and inspection. A brief lecture on IC tester, its function and operation is given to students in lecture hour. Students will work individually and will design, analyze, build, and test their own less expensive IC tester. Pen, thumb tack, LED, and resistor are provided but they have to select the right component. Students are asked to use only the given materials and it is up to their imagination and creativity to design and build a working and reliable IC tester.

ABET Descriptors

Engr Sci Content:	First year engineering, circuit and electronics
Type:	Components
Elements:	Analysis, construction, testing
Features:	Design methodology, creativity, open-ended problem
Constraints:	Economics, limited materials, size, environmental regulation
Effort:	Individual

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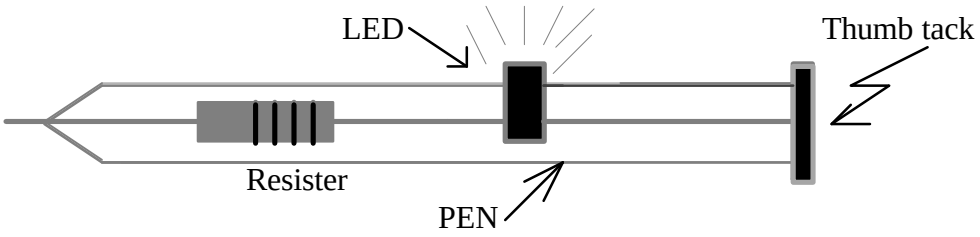

Problem Statement

An IC tester is a tool that recognize if any pin of an IC is functioning correctly. An IC tester actually is made of one or two LEDs and one resistor. The pins of an IC are either in high active or low active positions. By touching the pointer of an IC tester to any pin of an IC, the IC tester will show whether or not the IC functioning correctly. Students could make such a tool by using any regular pen (i.e. BIC), a resistor, a LED, and a thumb track to ground the circuit through their body. The schematic of such a circuit is shown in above but students could redesign it or modify it according to their own idea.

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Engineering Notes

Students work on this project individually in their first digital laboratory session. The main purpose of this project are:

* To learn how to select right components by checking the specification sheets.
* To practice assembly technique.
* To expose to electrical safety standard.
* To learn how to use recyclable material such as pen in this project.
* To expose to economy of design.

Project Deliverables

Written detailed report should have:

* Original idea.
* Design methodology.
* Analysis and component selection.
* Specification of components.
* Schematics.
* Functionality and operation of components and IC tester.
* A brief discussion of cost and reliability of design.

Discussion/Follow on activities

Once the projects are done, each student has to go around to see if anybody did come up with a better design. Ask question, criticize, and take a note for further modification and improvement of her/his own design.