



TESTING SEMICONDUCTOR LEAKAGE CURRENTS

A simplified diagram for performing **Leakage Current Measurement** is shown in Figure 1. A digital-to-analog converter provides a precision drive voltage for the High Voltage Test Supply. The Test Supply consists of an operational amplifier and high voltage booster circuit within the control loop. The programmed output voltage can be applied to any lead of the device under test. The two voltage ranges, which change the input resistor are selected by control circuits. The operating current range is evaluated, and current limiting resistors are selected automatically. The input of a high quality operational amplifier converts the Leakage Current to a proportional voltage and is connected to any lead of the device under test. The conversion factor is set by the value of feedback resistor, and eight ranges are available. A test-limit reference voltage is generated by another identical digital-to-analog converter, and the output is summed with the output of the current-to-voltage converter at the comparator input. The comparator is referenced to ground, and the output polarity will indicate the test decision.

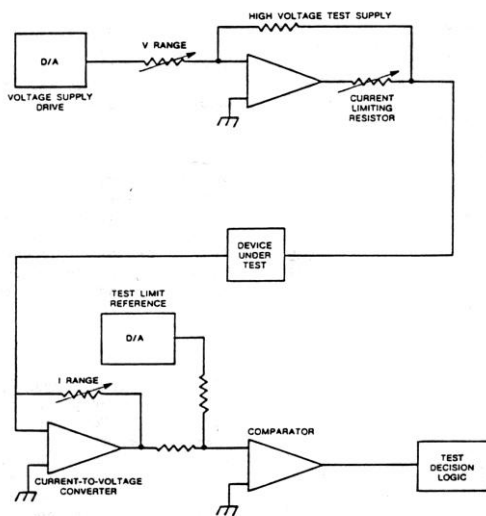


Figure 1

Reed relays are used to set the current range, the value of current limiting resistors and the interconnections of the Test Supplies with the device under test and the comparator. The supplies are programmed at computer speeds within a current range. Two digital-to-analog converters are on a single board. The entire high voltage supply is contained on one board, and the comparator, current converter and configuration interconnection relays are placed together on another board. For data-logging, the output of the test-limit reference is varied. High speed scan methods are used for currents up to 200 micro-amps, and other methods are used above that figure. The system will range automatically 2 decades above the programmed go/no-go limit and then will indicate OVER RANGE, or will range down one range and then datalog. Expanded up and down ranging is available as well.

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