

# CIRTRONICS TEST CAPABILITIES

## **OVERVIEW**

Cirtronics Corporation has a full compliment of testing capabilities. From component testing, in-circuit testing, functional testing, ESS burn-in, to final product systems test. Our technical staff can help make recommendations for design for manufacturability (DFM) and design for testability (DFT). We can assist with design, assembly, or duplication of unique test fixtures or test boxes, and provide aid with functional and system level test integration into our facility. Programs and fixtures are billed as NRE charges and owned by the customer. Product test charges are built into the unit pricing. Cirtronics owns a full array of test equipment; from Oscilloscopes, Power Supplies, Digital Meters, HyPot Testers, to custom fixtures and Automated Test equipment that can be utilized for product testing.

## **In-Circuit Testing**

Cirtronics can provide individual board level testing utilizing Genrad in-circuit test equipment. We own equipment that operates on the 8X software platform. Existing Genrad fixtures and programs are transferable to our equipment. New fixtures and program generation are contracted through our recommended test programmers. Cirtronics can provide either a turnkey package, or place you in direct contact with our programmers. Individual board design, layout, nail contact, and net accessibility, are the major factors in determining whether a board is a good candidate for in-circuit test, and how much test coverage can be provided. To produce a program and fixture; a schematic, bill of materials, board Cad data, and a "Golden" board are required.

When bringing in new fixtures and programs there is a break-in period of roughly 50 to 100 new production boards that need to be run. This helps to solidify small variances that occur from machine to machine, and also component program tolerances that may need adjustment. Once all program changes are finalized Cirtronics will provide a tested board, identified with either a "T" stamp or Label, as having passed the required testing.

## **Functional Testing**

Functional testing is designed to exercise various functions of an individual board, and simulate as close as possible its actual application. The customer, when requesting functional testing, typically supplies the custom test box or fixture, and unique software program. Cirtronics would then require a test procedure, schematic, and some period of technical training, depending on the level of complexity of the board, to better understand its particular application. We also need to know any additional equipment required to perform the testing, such as a computer, particular software, power supply, meter, etc. The customer or Cirtronics can supply this. A fee may be required if we purchase new equipment utilized or dedicated to this product only.

## **ESS Testing**

Cirtronics utilizes a Tenney/BlueM Environmental Test Chamber (Model # ETCU-64). The interior dimensions are 48"X48"X48", exterior dimensions - 58"X100"X101", with a temperature range of -73C to 200C. This is a water-cooled system with a cooling rate = 5C per minute and a heating rate = 10C per minute. Based on customer specifications we can customize a program to meet most burn-in needs.

## **Final / System Testing**

System level testing is performed after the electronic and mechanical components of a product are assembled. The test is performed to determine complete operations of the final product. As with functional testing, test procedures, schematics, and training on the operations of the product may be required. Any additional equipment requirements need to be identified and provided (purchased by Cirtronics per request) to perform the testing.

## **Test Reliability**

Cirtronics warranties our workmanship to be free from manufacturing defects for up to one year from the date of manufacture. Quality yields are a reflection of the level of testing being performed. Technical personnel can debug to component level within the confines of the specified test. Product being returned due to failure at a customer site will be inspected and retested based on the original test parameters. If a failure occurs that is outside the scope of the test, the specific component or problem needs to be clearly identified by the customer in order for Cirtronics to repair it under a rework purchase order, or the customer can disposition the product as scrap at their expense.