Prelab 3 - Power Supply Current (I_Q)

Introduction

In this lab exercise, you will write and test the code to perform the power supply current test. You have all of the fundamentals to perform this test. However, this prelab is also intended to teach you how to present your testing strategies in a standard format.

When someone is developing a set of production tests, they generally create a test plan that shows how each test should be performed, expected results, and the final test order. This test plan shows the what and why for your final test program. It is intended to be referenced later by a product engineer who may consider changing something about the test. If choices are randomly chosen, it should be noted as such. If choices are made for a reason, that too should be noted so that the product engineer does not mess something up trying to improve something else.

The typical sections in a test plan include:

1. Device background/description: describe the major features, general operation of the device, test modes that may not appear on a final datasheet, etc.
2. A list of each test performed. Within each test, the following information should be included:
   - purpose of the test
   - hardware schematic showing test set-up (simplify as much as possible only showing pertinent pins)
   - operating conditions for each test (the hardware schematic shows some of these conditions, but some tests require the conditions to change to get the full operating range. These changes should be noted.)
   - any mathematics that is required to obtain the datasheet specification from the measurements- datasheet limits
3. A list of the test order with an explanation for the test order
4. Any tester specific information, such as clock speed, waveform file names, or DIB information. (placing this information in its own section simplifies the transfer of a test program from one tester to another.)

An example of a test plan for the LF147 general purpose op-amp is attached for your reference.

Prelab Assignment

a) Print out a copy of the DIB schematic for each site. Show all paths necessary to perform this test. In this manner, you will determine which relays must be closed and which resources you will use.

b) Will you need to add any more groups or #defines? Explain your answer.

c) Write the test plan for the continuity test and the I_Q test. Write this in a word processor so that you can continue adding to it each lab and will thereby have a test plan model for the final project.

d) Purchase 2 op-amps from the instrument room. Make sure both op-amps have the same part number and manufacturer before you leave the instrument room window. Find the correct datasheet for your parts on-line. (This is necessary to set the correct datasheet limits).

Lab 3 - I_Q Test

Write the test code for the I_Q test

Reminders of the key coding elements are shown below. Please refer to labs 1 and 2 for details.

1. Set up any additional instrument groups. Some functions will require no additions.
2. Create a new function. You will be measuring the current in both V_{CC} and V_{EE}.
3. Set up the datasheet file.
4. Write the I_Q test. Recall that you must save the data into a datastructure immediately after the measurement or the measurement will be lost. Since you will be using 2 different groups of instruments, you will need 2 datastructures.
5. Don't forget to modify TestCompletion and FailSite if necessary.
6. Compile, build, and run your program. Fix any errors.
7. Backup your program onto your memory stick and let the professor know that you are ready to go to the tester.
8. First, run your test empty socket and debug any final errors. Then, test both sites simultaneously. Debug any errors. Once both tests pass, play with the accuracy/time tradeoff parameters. Swap your chips. How consistent are your measurements from site to site? Record your results.
9. If you made any necessary changes to your code, make sure you back up the new version and restore it onto your computer for next week.

Write-up your results

Record your test results and your test time. Turn in your final code, test results, and a discussion of the time/accuracy trade-off and site-to-site reproducibility.