Abstract
A 3mm³3mm 20V Dual N-Channel surface mount power MOSFET is manufactured recently. To realize the characteristics of the MOSFET is important for IC designer to select the best MOSFET for a particular application, therefore, UIS testing has to be done before releasing the MOSFET to the market. A PCB was created to perform manual UIS test on the MOSFET. However, manual testing process is time and labour consuming. Automatic UIS testing system has been developed. Instruments and the PCB were connected and controlled by an Excel VBA program and date was collected for analysis. Critical characteristics of the MOSFET such as EAS and IAS of the MOSFET can be found easily with the system.

Project Objectives
This project is aimed to develop a computer program to automatically test a 3mm³3mm 20V Dual N-Channel surface mount power MOSFET to find out the critical values related to avalanche breakdown.

System Block Diagram

Implementation

Schematic Design
As the MOSFETs to be tested are dual N-Channel surface mount power MOSFETs, we would like to fabricate two symmetric UIS circuits on one copper board.

Results
The main control of the automatic test program. The connection parts of the DC Power Supply, Pulse Generator and Oscilloscope are on the left side and indicate the instruments information. Data clear buttons are placed underneath. Five main test control buttons are on the right side as well as the test results information.

After tests have finished, the waveform data can be imported to the analysis worksheet, and the program will calculated the important parameters related to avalanche breakdown, such as energy stored before breakdown and peak breakdown current and voltage.