

Shock Testing Using the DT9836 Module and Measure Foundry

Challenge

To perform shock tests on chipsets, measure and analyze the results, eliminate failed parts, and improve product reliability

Solution

Use 24 resistance loop input and an IEPE accelerometer with two Data Translation's high-performance DT9836 USB modules and Measure Foundry to measure shock data and present results, and export the data into Microsoft Excel for analysis



Results

- Improved reliability and quality of the chipsets
- Reduced support costs by early recognition of product weaknesses
- Met specifications and regulations, and improved shipping packaging
- Standard software platform for ease of development and support
- Accurate and comparable results



Shock Testing Application in Measure Foundry

Quanta Laboratories in Santa Clara, CA is a market leader for physical quality testing. They work with various manufacturers to test the quality of their products by performing vibration, temperature, and environmental tests. A specific manufacturer required Quanta Labs to perform shock testing on their chipsets to determine and improve reliability.

Challenge

Quanta Laboratories needed the ability to measure 24 inputs, each with up to 2000 g of resistance, simultaneously. In addition, they wanted to be able to trigger the start of acquisition using a single-axis accelerometer.

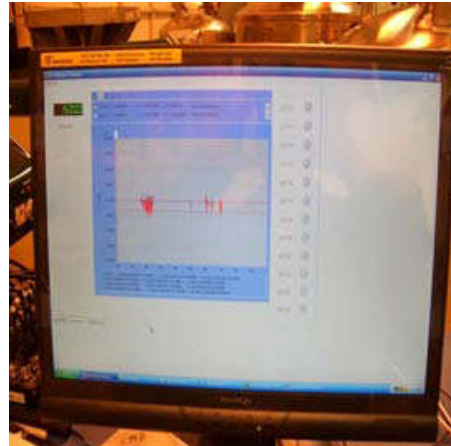
Solution

Quanta Laboratories used Measure Foundry to develop their application based on its ease of use, the ability to capture and display data from Data Translation hardware, free runtime generation, flexible design easily modifiable for different applications, and its interface to Excel.

They chose the high-performance DT9836 USB module for the following key reasons:

- **High-channel count** – Each DT9836-12 module supports 12 single-ended analog input channels.
- **Simultaneous measurements** – The DT9836-12 module provides 12 independent, successive-approximation A/D converters for simultaneous measurements
- **High Resolution** – The DT9836 provides 16-bit resolution.
- **High Sample Rate** – Sample each channel at up to 225 kHz.
- **Multiple Module Support** – Multiple DT9836 modules can be connected to a laptop through its USB ports or by using an external hub. The DT9836 also provides an external trigger input for synchronizing the start of acquisition on multiple modules
- **500 V galvanic isolation** – The DT9836 module ensures reliable data by providing 500 V of isolation protecting your computer from ground spikes.
- **Measure Foundry Compatibility** - Stream high-speed analog input data from the DT9836 modules directly into Measure Foundry for display and analysis.

Quanta Laboratories used two DT9836 modules to measure 24 resistance loops from the shock test fixture. Each module had 12 single-ended inputs connected to its analog input BNC connectors.



A single (z) axis accelerometer was used to trigger the DT9836 modules. Quanta Laboratories developed a small circuit that generated a TTL level output signal based on the output level of the accelerometer. The shared TTL signal was then connected to the Analog In TTL Trigger input signal of each DT9836 module. When a rising-edge occurred on the external trigger input, both modules started acquiring data from all analog input channels.

Within the Measure Foundry application, two Analog Input components (one per module) were used to stream the data from the modules into the application at a sample rate of 100 kHz per channel. A single buffer of 1000 samples was acquired. Two Oscilloscope components (one per module) were used to display 10ms of data. Using 24 Comparator components (one per channel), the maximum value of each analog input channel was determined. Using the Excel Live Link component, this value was then sent to a Microsoft Excel file for further analysis.



A chipset was determined to fail if the resistance measurement was infinite (or open).

Quanta Laboratories was impressed at performance and flexibility of the system and found that the high-performance, simultaneous DT9836 USB modules, coupled with the easy-to-use Measure Foundry software, was an ideal solution for conducting shock tests and measuring and analyzing the results.

Results

- **Improved reliability of chipsets.** Using the DT9836 USB modules with Measure Foundry, the customer was able to measure and analyze shock data, eliminate failed parts, and improve the reliability of their chipsets.
- **Decreased support costs.** By detecting product failures early in the development cycle before the product gets to the customer, support costs were reduced.
- **Met specifications and regulations, and improved shipping packaging.** Data collection and reporting was performed to meet specifications and regulations. By analyzing the failures, the customer was able to improve the packaging for shipment to minimize product shock.
- **Standard software platform for ease of development and support.** Measure Foundry allowed users to access and control the DT9836 modules easily, present the results graphically, easily export the data to Microsoft Excel for analysis, and provide documentation/proof for customers.
- **Accurate and comparable results.** By using the 16-bit simultaneous acquisition DT9836 hardware, it was possible to test a multiple number of chips at the same time, saving time and money.

Products Used

Two DT9836 modules

Measure Foundry

measure
FOUNDryTM

