

Keysight Technologies

Semiconductor Manufacturer Likes Familiarity, Enhanced Features of New 34461A DMM

Case Study

Introduction

As semiconductor manufacturers develop new chips for battery-powered devices, their goal is to deliver better performance at lower power levels. So their R&D teams spend a lot of time characterizing their devices, studying parameters like power, voltage levels and timing. When they turn on a silicon chip prototype, they need to know how much power it is consuming in all of its states: when it is first turned on, when it is stable, when it is in use, and when it is powered off. And of course, they need to investigate any glitches they discover in the process.

As a chip maker for consumer electronics and high-accuracy, ultraprecision applications, a U.S. semiconductor manufacturer uses many general-purpose test instruments as it characterizes and debugs its prototype products and qualifies first-production silicon. And its digital multimeters are the workhorses of its measurement tool stable.

For years, the semiconductor R&D team has used the Keysight Technologies, Inc. 34401A, the industry-standard 6.5-digit multimeter, to measure DC volts and DC current. Occasionally the team measures resistance, AC voltage and AC current, especially around ripple on regulators. The 34401A DMM gives them all the capabilities they need except high-current measurement capabilities. The 34401A is limited to measuring up to 3 amps.

When a Keysight product development team asked the semiconductor R&D team manager if he would consider replacing his 34401As with a newer DMM, the R&D manager didn't have to think twice about his requirements: The new DMM would have to measure up to 10 A. The new instrument had to be in the same price range as the 34401A with equivalent performance in terms of digits of accuracy, resolution, and stability. And the new DMM had to have a familiar feel. He wanted his engineers to focus on getting their jobs done instead of investing hours in relearning a new voltmeter from scratch.

When the Keysight product development team unveiled the new Truevolt 34461A DMM, the R&D manager and his team declared it a winner. Not only did it meet their criteria, but it offered other enhancements that gave them unexpected benefits.

The large, colorful, liquid-crystal display drew “oohs” and “aahs” when the R&D engineers realized they could get a lot more information and get it faster than they could with just the numbers on the 34401A’s low-resolution numeric display readout. The 34461A’s trend chart display lets them immediately spot trends when they are doing experiments over time. They were pleased to be able to pull up histograms and turn on statistics such as mean, standard deviation, average, min, max – all without having to transfer data to a PC for post processing.

Another 34461A feature that delighted the R&D team was the ability to add labels to measurements on the screen. The R&D manager described his team’s current practice of sticking adhesive-backed notes to each DMM with a description of the measurement it is making. He welcomed the ability to replace the informal notes with on-screen labels.

One of the 34461A DMM’s new features also resolved an issue that had irritated the manager’s R&D engineers. The 34401A DMM’s default mode is low impedance, but the team frequently uses the high-impedance mode. When engineers turn off the 34401A, it defaults back to low-impedance mode, so they have to reconfigure the DMM for high impedance each time they turn it on. With the 34461A, engineers have the ability to save alternative power-up states, eliminating the aggravation of having to reconfigure their previous setups each time.

“You guys have done a good job of making an improved version of what we are already familiar with, and apparently you’ve been able to keep it in the same price range,” said the R&D manager. “This is very important to us.”

The R&D managers also made it clear that he finds it important to work with a company that he knows is going to be there to support him. He appreciates the fact that Keysight stands behind its products and he trusts Keysight test instruments to be in spec.

“Clearly, when we are making measurements and drawing conclusions from the readings we are taking, we need to know we are drawing the proper conclusions,” he said. “We have to be able to trust the meter.”

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