Ridgetop Group Inc
ENGINEERING INNOVATION

Pinpoint IC Defects with Precision Current Testing

Would you like to make current measurements 50 to 1,000 times faster than your current ATE equipment and at the same time improve the measurement quality by 1 to 2 orders of magnitude? Ridgetop Europe, a subsidiary of Ridgetop Group, can help you reduce test costs dramatically and yet produce the highest quality electronic products. Our **Q-Star Test**™ line of static/quiescent current measurement instruments, known as IDDQ or ISSQ modules (see Figure 1), offer:

- **High speed** (<150 µs), **high precision** (down to pA), **highly repeatable** current measurements
- Patented technology, **ATE platform-independent**
- Intelligent **on-board data processing** and decision making
- **Space- and cost-saving** solutions supporting **multi-site** test applications
- **Wide application**: qualification, verification, test, reliability, anti-tamper, etc.
- **Validated IC test results** across many market segments, including semiconductor, automotive, avionic, medical, and consumer electronics

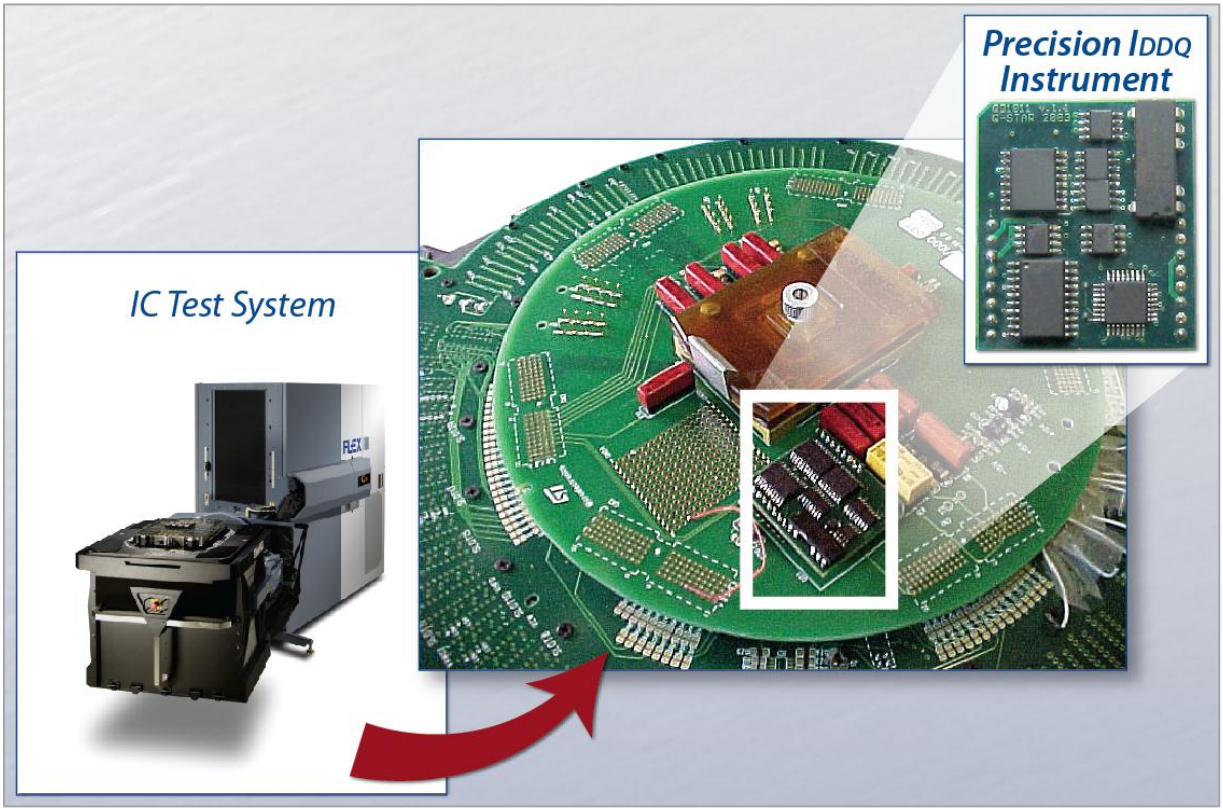

Figure 1: Q-Star Test-enabled IDDQ test head for semiconductor test applications

Our small, high performance, plug-and-play, intelligent measurement instruments for probe and final package test application are designed for high-speed/high-quality (accuracy and high measurement repeatability) current measurements. Q-Star Test instrument integration is quick and simple: the hardware module is positioned on the interface board (load board or probe card) that links the device under test (DUT) to the test platform, thereby extending the ATE functionality; and the module's software operation is easily synchronized with the test pattern through your automatic test pattern generator (ATPG).

Background

As long as manufacturing processes for the fabrication of ICs are not perfect, defects due to manufacturing imperfections will affect the ICs made and there will be a need for testing to discriminate the good devices from the bad. Manufacturing defects can be categorized either as random defects or as structural defects. Random defects are due to material imperfections and cannot be avoided. They can be minimized by improving the process conditions and the processing materials used but can never be fully eliminated. Structural defects can be eliminated by root cause analysis and process adaptations as well as by making design rules more stringent.

Defects, whether random or structural, affect both the functional and parametric behavior of the devices that carry them. For digital circuits, most manufacturing defects cause an increase in the quiescent supply current (called IDDQ or ISSQ) drawn by the circuit, or they cause a change in the switching (transient) current behavior (IDDT). Data to support this has been published and presented at various international forums.

Ridgetop Europe owns a number of different supply current measurement technologies that offer high-speed, high-accuracy supply current measurement modules, with the unique characteristic that they are virtually transparent to the device under test. This unique characteristic is important:

- to guarantee the test conditions
- to minimize the overall test slip-through
- to minimize false rejects
- to improve defect detection

We have more than 750 Q-Star Test instruments installed at 70 locations worldwide. If you too would like to take advantage of faster and more accurate measurements with reduced test costs, contact us today at: +1 520-742-3300, ext. 115, or email us at info@ridgetopgroup.com.