

# On-Wafer Test of Power Devices

Agilent Technologies and  
Cascade Microtech, Inc.

## Reduce your development time for power devices with on-wafer test

On-wafer test of your power devices can increase your rate of product introduction to meet the needs of your customers. The growth in the use of power semiconductors has exploded due to emerging energy standards and the need for efficient power utilization. The double-digit growth in the market for power devices now exceeds the rest of the semiconductor market. To achieve the cycle times demanded by customers, manufacturers have to migrate to on-wafer test of their power devices.

Conventionally, manufacturers characterize their power semiconductors after the devices have been diced and packaged. The delays incurred in this approach add cost and time to the development process. With the increased demand for power devices this approach is no longer viable. With on-wafer test you can speed your turnaround in the design, development and characterization of your new power devices.

Cascade Microtech's Tesla on-wafer power device characterization system is a complete on-wafer test solution. The Tesla system is designed to provide probing levels of up to 3,000 V, 100 A and 100 W/cm<sup>2</sup>. It features an advanced chuck mechanism to ensure low contact resistance, facilitate thin wafer handling and power dissipation while providing a low-noise, fully guarded

and shielded test environment. To ensure operator safety while handling high power devices the system incorporates a light curtain and safety interlock system. The system supports a measurement temperature range of -60 °C to 300 °C.

Tesla uses the Agilent B1505A power device analyzer/curve tracer to make the necessary measurements. This single box solution allows accurate measurement and curve tracing for the key parameters of interest when characterizing a power semiconductor device including breakdown voltage measurement and R<sub>ds(on)</sub> measurement.

The combination of the Agilent B1505A and Cascade Microtech's Tesla system provides the capabilities you need in a system designed specifically for power devices. With the Tesla system you can migrate your characterization from in-package to on-wafer test, optimize your development process and, as a result, reduce the product development time for your power devices.

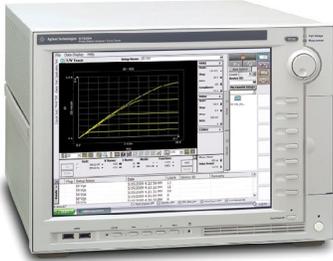
- *On-wafer test of power devices*
- *Reduce the development time for power devices*
- *Supports probing at up to 3,000 V, 100 A and 100 W/cm<sup>2</sup>*
- *Light curtain and interlocks for operator safety*
- *Advanced chuck mechanism for low contact resistance and low noise*
- *Uses Agilent B1505A power device analyzer/curve tracer*



**Agilent Technologies**

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## Measurement Solution



The Agilent B1505A power device analyzer/curve tracer is a single box solution for characterizing high power devices from sub-picoamps up to 3000 volts and 40 amps.

These capabilities are ideal for new power devices using wide-band gap materials such as silicon carbide or gallium nitride. Its ten-slot modular construction allows you to configure the B1505A to meet your exact needs with SMUs available to support high-current and high-voltage modes.

Whenever making power measurements the test fixture is extremely important, both to ensure safety and to support the wide variety of power device package types. The Tesla system from Cascade Microtech meets this need making it and the B1505A the perfect match for on-wafer test of your high power devices.

To learn how this solution can address your specific needs please contact Agilent's solutions partner, Cascade Microtech.

[www.agilent.com/find/cascade](http://www.agilent.com/find/cascade)



## System Components

### Agilent Technologies

#### Product

**B1505A**  
**B1510A-FG**  
**B1512A-FG**  
**B1513A -FG**  
**N1258A**  
**N1261A-003**  
**N1262A-011**

#### Description

Power device analyzer/curve tracer mainframe  
 High power source/monitor unit module (2 required)  
 High current source monitor unit module  
 High voltage source monitor unit module  
 Module selector for B1505A  
 Protection adapter (2 required)  
 Resistor box for gate (SHV output)

### Cascade Microtech, Inc.

#### Product

**Tesla measurement system**

**151-465**

**151-475**

**High-voltage probe and positioners**

**High-current probe and positioners**

#### Description

On-wafer high-power device characterization system with high-voltage chuck  
 200 mm Tesla probes and interconnect accessories kit  
 300 mm Tesla probes and interconnect accessories kit  
 Three high-voltage triax probes and two high-voltage coax probes for high-voltage measurement up to 3,000 V  
 Two high-current probes for high current measurement up to 100 A

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**Cascade Microtech** is a worldwide leader in precision measurement and test of advanced devices - ICs, packages, boards, modules, MEMS, 3D TSV, LED devices and more. [www.cascademicrotech.com](http://www.cascademicrotech.com)

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