

# INFICON RF Sensor

## With FabGuard® Integration Software

### REAL-TIME PLASMA ANALYSIS SIGNIFICANTLY REDUCES PROCESS VARIABILITY

Combined with FabGuard Sensor Integration and Analysis System, the INFICON RF Sensor brings you an unprecedented, highly detailed look into semiconductor plasma processing. Based on our worldwide depth of application experience, this advanced technology provides the first truly integrated solution for RF load measurement in the process chamber's non-50 ohm environment. It enables superior, real-time process control, fault detection/classification and process optimization for the most challenging plasma environments—all via a user-friendly interface.

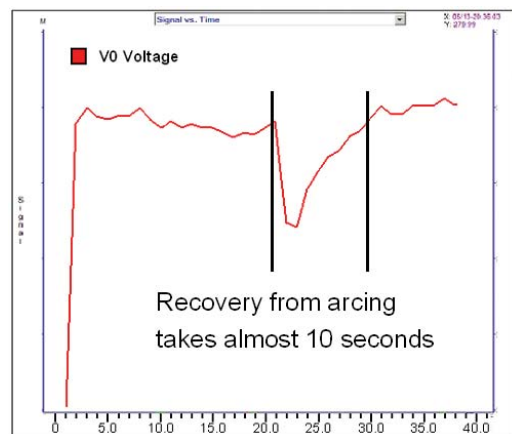
### APPLICATIONS FOR CVD, PVD AND ETCH INCLUDE:

- Endpoint/optimization of *in-situ* plasma chamber clean processes
- Fault detection and classification (e.g., arc detection, charging)
- Chamber matching (RF fingerprint)
- Endpoint control for etch processes

### BETTER TECHNOLOGY DELIVERS MORE PROCESS CONTROL CAPABILITIES

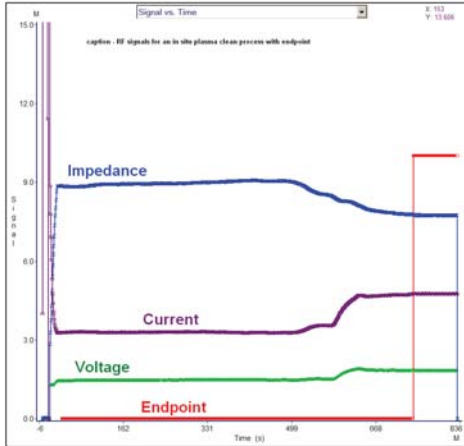
In plasma processing, the true RF load includes both chamber and plasma discharge. Chamber wall, wafer and discharge chemistries affect this load's complex impedance.

Plasmas are non-linear, which results in RF harmonics production. Varying machine or process setpoints generate unique harmonic content in the RF voltage and current. By monitoring the harmonic voltages and currents, as well as the complex impedance of the load, the INFICON RF Sensor with FabGuard offers powerful process control capabilities.

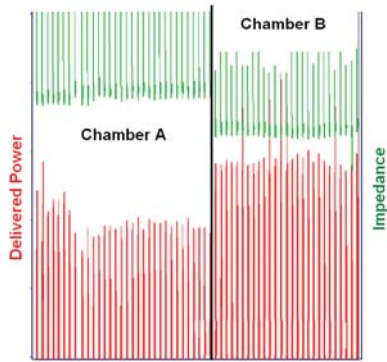


Plasma arcing event captured by an RF sensor.

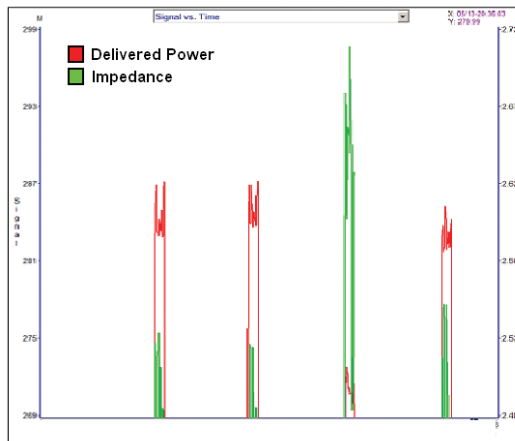




*RF signals for an in situ plasma clean process with endpoint.*



*Easily compare chamber performance.*



*Identify process excursions wafer by wafer.*

## ANALYSIS OF MULTIPLE RF AND TOOL SIGNALS MEANS SUPERIOR ENDPOINT CONTROL

Impedance-based (RF-based) endpoint detection is the most sensitive method for both etch processes and CVD chamber clean processes. FabGuard Sensor Integration and Analysis System provides powerful, one-of-a-kind algorithm capabilities, enabling the analysis of multiple RF and tool signals to determine endpoint. You can generate and implement highly complex, multi-step algorithms. In addition, you can tie a variety of unique endpoint algorithms to individual process recipes, steps or wafer lots.

## DETECTION AND CLASSIFICATION OF PROCESS AND EQUIPMENT ISSUES

By measuring and performing analysis on fundamental and harmonic voltages and currents, the INFICON RF Sensor can detect and classify a multitude of process and equipment issues including RF subsystem failures, gas delivery faults, chamber pressure control problems and plasma arcing excursions.

## DETECTION TO ELIMINATE PROCESS VARIABILITY

As shown here, four wafers were processed with the same forward power on a CVD deposition system. In this example, wafer three experienced a much different delivered power and impedance, resulting in inconsistent film properties. The INFICON RF Sensor can be easily configured to flag such faults, with the capability to perform tool interdiction through FabGuard.



### GLOBAL HEADQUARTERS:

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Due to our continuing program of product improvements, specifications are subject to change without notice.