



## Sion™ RF Detector for Plasma Arc Detection

ULTRA-FAST, HIGH POWER  
ANALYSES OF MICRO-ARCING

### NON-INVASIVE, CLAMP-ON RF DETECTOR DELIVERS HIGH-SPEED ARC DETECTION IN IPVD, PECVD AND ETCH

#### FEATURES AT A GLANCE

- Easy retrofit to existing toolset
- Non-invasive sensor installation
- High-speed data collection (250 kHz)
- Integrated data management with FabGuard

#### REDUCING WAFER LOSS AND IMPROVING YIELDS

Arcing during plasma processing can result in target and chamber damage leading to substrate damage and particle creation. As feature sizes decrease, microelectronic devices become increasingly susceptible to arc-induced damage. Arcing can occur in any plasma assisted process such as ionized Physical Vapor Deposition (iPVD), Plasma Enhanced Chemical Vapor Deposition (PECVD) and Etch. The INFICON Sion Arc Detector provides a crucial first line of defense. Sion makes it possible to detect micro-arcs quickly and react to them before significant damage or scrap occurs. The system provides real-time detection and analysis of plasma micro-arcing events.

#### UNIQUE RF PLASMA ARC DETECTION CAPABILITY AND ANALYSIS

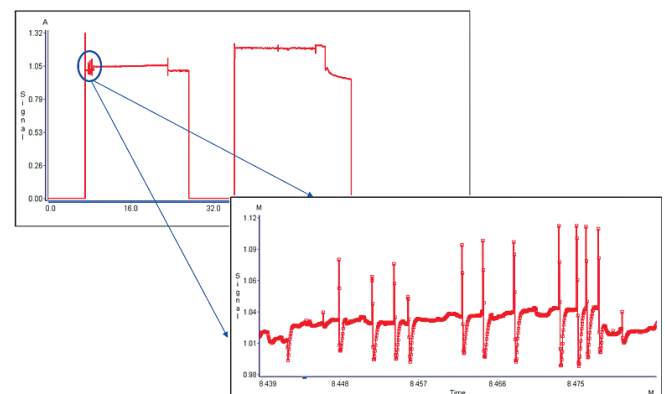
The Sion Arc Detector allows users to automatically detect arcs in order to halt wafer processing or identify the root cause of arcing events. The Sion detection system is capable of measuring RF voltage and current information at speeds of up to 250 kHz. Collection and storage of full trace data enables advanced analysis routines to differentiate between critical arcing events and normal plasma instability.

#### PATENTED SENSOR TECHNOLOGY FOR EASY INSTALLATION

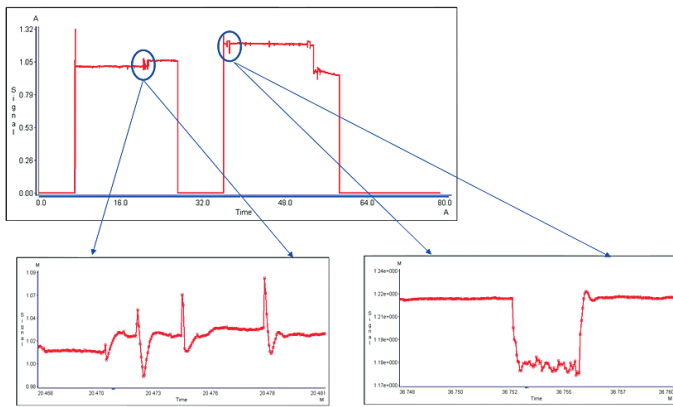
The Sion's extremely small size and revolutionary clamp-on design allows the sensor to be installed in the tightest of spaces. More compact than any other arc detector on the market, the Sion can easily retrofit to existing process tools. The design requires no modification to the RF path and will not impact process performance. Other RF sensors must be installed in the RF path, which can add impedance and impact plasma characteristics. The Sion eliminates this problem while still providing critical voltage and current information necessary for detecting arcing events.

#### ANALYZE ARC EVENTS IN REAL TIME

INFICON FabGuard Sensor Integration and Analysis System processes high-speed data and performs simple or complex analysis to detect arcing as it happens. This is possible, because unlike competing products, FabGuard synchronizes arc data with other process parameters from the tool (includ-



Close-up view of ultra-fast micro-arcs in real time. Data is collected at 250 kHz to catch arcing events whenever they occur.



Ultra-fast micro-arcing with the Sion RF Detector.

ing power, pressures and gas flows), providing the information necessary to identify and isolate potential arcing events. This allows for simple SPC limits on the arc indices, so that wafers can be tagged for off-line particle analysis.

## POWERFUL DATA ANALYSIS FOR BETTER YIELDS

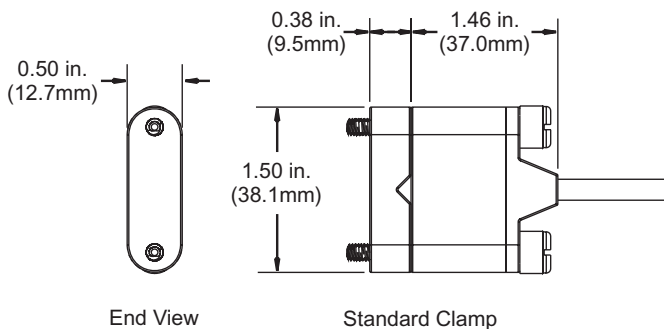
FabGuard offers an easy, intuitive interface enabling advanced diagnostics, fault detection and classification (FDC) and reliable real-time process control. Because FabGuard runs complex algorithms, false alarms due to process changes are eliminated. FabGuard also offers superior statistical and analytical functions to provide the next generation of FDC.

## OUR EXPERTISE IS YOUR COMPETITIVE ADVANTAGE

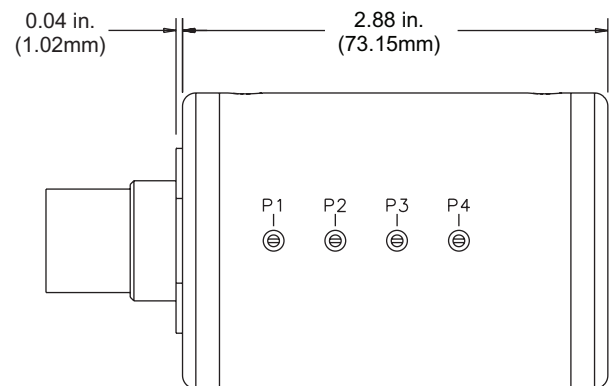
We offer a worldwide expert applications development team and resources for installation, evaluation and support. Our highly skilled semiconductor applications engineers provide the right solutions at the right time.

## SPECIFICATIONS

Input signal	Voltage: Current:	1 VRMS to 5000 VRMS strap voltage 10 mA RMS to 70 ARMS strap current
Input frequency range		350 kHz to 41 MHz
Detector voltage rating		Detector clamps to a tool RF delivery strap carrying up to 5000 V(dc) and up to 5000 VRMS
Converter signal input		≤2 V(ac) p-p on two channels at 350 kHz to 41 MHz
Operating ambient temperature range		10°C to 80°C



Detector head dimensions



Converter dimensions



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