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Power Delivery
WWW.MKSINST.COM

RF Power Products

- PLASMA GENERATORS
- MATCHING NETWORKS
- METROLOGY



Repeatable Performance

Spectrum® is a new RF generator platform that provides power from 1.5kW to 11kW across a variety of frequencies to meet the increasing demands of thin film processing. With precise power control, rapid response time, superior thermal stability and high accuracy, MKS RF generators ensure improved process performance and yield.

Increased Flexibility

MKS offers a suite of compact, lightweight RF products with a variety of user interfaces and features including automatic frequency tuning, fast transient recovery, and pulsing.

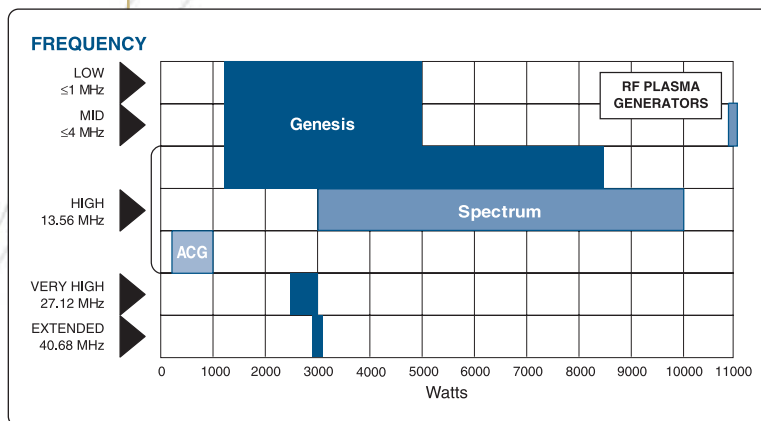
Rugged Reliability

Low parts count and robust design provide high reliability, even in the most demanding RF plasma applications. The high efficiency power amplifier, RF stability due to low spurious output, and generous RF power margin combine to allow for more forward power into mismatched loads and more strike voltage potential for hard to ignite chambers.

RF Power Products

The MKS, ENI® Products family of RF plasma generators covers the full range of frequencies, from low to very high. Designed for high power density with extra headroom, ENI® RF products provide field proven reliability, exceptional stability, and unsurpassed repeatability for high uptime and yield—all in a compact package.

MKS RF plasma generators are complimented by Matchwork® impedance matching networks and the V/I Probe® plasma impedance analyzer. Together they form a complete RF delivery system for closed-loop monitoring and control, providing improved process consistency and higher yield—even under the most difficult plasma loads.



Power and frequency range for MKS RF family of products

Comprehensive RF Product Offering

The RF family consists of several highly reliable power generator platforms including Spectrum®, Genesis, and ACG. For efficient generator-to-chamber power transfer and real-time plasma metrology, MKS offers the Matchwork® line of Matching Networks and the V/I Probe® Plasma Impedance Analyzer.

RF Plasma Generators

The SurePower® platform of RF plasma generators is the most advanced class of 13.56 MHz generators commercially available. The SurePower architecture incorporates state-of-the-art RF topologies, patented intrinsic power amplifier protection, improved design margins, and embedded V/I probe sensors to achieve the highest reliability, reproducibility, and accuracy of any generator in the marketplace today. SurePower is available in power levels from 3.5kW to 13.0kW.

MKS RF plasma generators feature high power density, exceptional stability, generous power margins and excellent reliability. The generator's $\pm 1\%$ accuracy is tied to and transferable from the United States National Institute of Standards. Response time to power set point changes and process transitions is $500\mu\text{s}$. The result is advanced RF plasma generation and control for low cost and high yield in the most demanding thin film processing applications.

APPLICATIONS

- **Semiconductor & Thin Film**
 - Etch
 - Deposition
- **Solar Cells**
 - Etch
 - Deposition

Genesis is a platform of RF plasma generators with a wide range of power and frequencies for a variety of plasma deposition and removal applications. DSP-based power control ensures power accuracy for RF stability, repeatable performance and high yield.

The ACG Series of air-cooled RF plasma generators is designed for low-power, high-frequency applications. The ACG accommodates 100-240 VAC with no taps or adjustments. The ACG is compact, reliable, stable and accurate for repeatable plasma processing applications.

RF Impedance Matching Networks

The Matchwork® line of impedance matching networks improves process repeatability and yield by providing high speed tuning to match the chamber's variable impedance to the generator's working load. Commonly customized to chamber configurations, Matchwork® products are available for most of MKS' plasma generator power and frequency levels.

RF Plasma Metrology Products

The V/I Probe® RF Impedance Analyzer uses DSP technology to acquire real-time, highly accurate, user-programmable data on load voltage, current and phase angle. This results in optimized process performance and yield by process endpoint detection, monitoring deposition thickness and other RF metrology diagnostics.



SurePower® 13.0kW (top) and 3.5kW (bottom) 13.56 MHz RF Generators



Genesis 2.5kW 13.56 MHz RF plasma generator



ACG 0.6kW 13.56 MHz RF plasma generator



Matchwork® 0.5kW 13.56 MHz impedance matching network



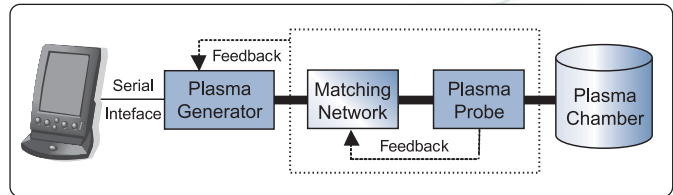


V/I Probe® frequency tuning, scanning plasma impedance monitor

RF Plasma Metrology Products (cont.)

Integrated Performance Optimization

The complete RF delivery subsystem consists of an RF plasma generator, matching network and impedance analyzer. The integration of these elements closes the loop on monitoring and controlling power delivery at the chamber, ensuring better chamber-to-chamber, wafer-to-wafer consistency and higher yield.



Complete RF Delivery System



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RF Family - 4/08

Specifications are subject to change without notice.

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