With full digital control and dynamic response to plasma changes, the Paramount® platform keeps you at the leading edge of process innovation.

As manufacturing technologies evolve and rapid plasma transitions become the norm, the highly adaptable Paramount platform facilitates advanced process development. It combines accurate, repeatable power delivery with an inherently flexible digital architecture, wide output coverage, and a comprehensive feature set.

**BENEFITS**
- Enhanced plasma stability and process repeatability
- Precise RF control
- Fast response to plasma changes
- Flexibility and adaptability to meet specific application needs

**FEATURES**
- Full digital control
- Pulsing and pulse synchronization
- Frequency tuning
- Real-time power and impedance measurement
- Tightly regulated output power
- Models ranging from 400 kHz to 60 MHz and from 1.5 to 8 kW
- Set points as low as 5 W
- Arc management
- Phase synchronization (CEX)

**SEMICONDUCTOR APPLICATIONS**
- PECVD
- Dielectric and conductor etch
- Sputtering
**PARAMOUNT SERIES**

**Digital Architecture**

The Paramount platform's digital architecture allows extremely precise process measurement and control, as well as the adaptability to keep pace with increasing manufacturing demands. Advanced functions are easily integrated — without the lead times and integration issues associated with products requiring hardware changes.

**Wide Power and Frequency Coverage**

With power set points from 5 to 8000 W and frequencies from 400 kHz to 60 MHz, the Paramount series enables you to stay within a familiar platform as your RF needs change. Process upgrades and new process development are more efficient, with reduced integration issues and no “new-product” learning curves.

**Pulsing**

Reduced charge buildup, arcing, and feature distortion during etching

Example of pulsed RF waveform into a 50 Ω resistive load. (a) 10 kHz, 50% duty cycle (50 µsec) waveform; (b) Close-up of the pulse's rising edge; (c) Close-up of the falling edge

**Arc Management**

Reduced particle contamination, feature distortion, and equipment damage

Sudden change in reflected power indicating an arc; rapid output power shutdown. All arc management parameters are user-selectable.

**Phase Synchronization (CEX)**

Synchronized output waveforms of connected Paramount® units

(a) 0° phase offset; (b) 90° offset. Phase offset is user-adjustable, 0 to 359°.
Frequency Tuning
Fast tuning and repeatable power delivery during short process steps

Advanced Power and Impedance Measurement
Paramount RF power supplies measure plasma characteristics in real time and detect changes with extreme sensitivity. This enables high-accuracy power output and repeatable performance.

General Specifications

<table>
<thead>
<tr>
<th></th>
<th>Paramount® MF</th>
<th>Paramount® HF</th>
<th>Paramount® VHF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RF Power</strong></td>
<td>2.0 kW</td>
<td>1.5 kW</td>
<td>3.0 kW</td>
</tr>
<tr>
<td></td>
<td>3.0 kW</td>
<td>3.0 kW</td>
<td>6.0 kW</td>
</tr>
<tr>
<td></td>
<td>5.0 kW</td>
<td>6.0 kW</td>
<td>7.0 kW</td>
</tr>
<tr>
<td></td>
<td>8.0 kW</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frequencies</strong></td>
<td>400 kHz</td>
<td>13.56 MHz</td>
<td>27 MHz</td>
</tr>
<tr>
<td></td>
<td>2 MHz</td>
<td>40 MHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>60 MHz</td>
<td></td>
</tr>
<tr>
<td><strong>Frequency tuning</strong></td>
<td>±10%</td>
<td>±5%</td>
<td>±5%</td>
</tr>
<tr>
<td><strong>Typical Tune Time</strong></td>
<td>&lt; 100 ms</td>
<td>&lt; 10 ms</td>
<td>&lt; 10 ms</td>
</tr>
<tr>
<td><strong>Power Accuracy</strong></td>
<td>±2 W or ±1% of set point, whichever is greater</td>
<td>±1 W or ±1% of set point, whichever is greater</td>
<td>±1 W or ±1% of set point, whichever is greater</td>
</tr>
<tr>
<td><strong>Pulsing Frequency</strong></td>
<td>10 Hz to 2 kHz</td>
<td>10 Hz to 10 kHz</td>
<td>10 Hz to 25 kHz</td>
</tr>
<tr>
<td><strong>Available Serial Interfaces</strong></td>
<td>RS-232, Ethernet, DeviceNet®, Profibus, EtherCAT®</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Electrical specifications vary by model number. Please contact an AE representative for more information.
ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE’s power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

PRECISION  |  POWER  |  PERFORMANCE

Specifications are subject to change without notice. Not responsible for errors or omissions. ©2019 Advanced Energy Industries, Inc. All rights reserved. Advanced Energy® and AE® are U.S. trademarks of Advanced Energy Industries, Inc.