Paramount® Mid-Frequency 400 kHz Series

Digitally Controlled, Mid-Frequency Power Supplies with Pulsing and Sweep Frequency Tuning

Benefits

Enhanced process flexibility

Optimized process control

High repeatability

Features

Digital control

Frequency tuning

Pulsing and pulse synchronization

Wide operating frequency range

Tightly regulated output power

Power output from 5 to 8000 W

Key Capabilities

Frequency tuning

Pulsing and pulse synchronization

330 to 460 kHz frequency range

5 W to maximum power set point range

Forward, load, and voltage power regulation

High VSWR capability

Advanced power measurement system

The Paramount MF (400 kHz) series of power supplies offers a highly flexible source of mid-frequency power for a wide variety of process applications. The Paramount digital control system inherent in this line of 400 kHz MF generators brings a set of new features required for next generation process control. Combined with Advanced Energy's metrology, the Paramount MF brings the most capable combination of performance and repeatability to the mid-frequency market.

Enhanced Process Performance and Flexibility

At the heart of the Paramount MF's performance is the new Paramount digital control system. Building on the established Paramount architecture in the 13 MHz market, this extension of the digital control system to 400 kHz enables a wide range of capabilities required for short process steps and pulsed process applications.

Available in 2000, 3000, 5000 and 8000 W versions, the Paramount MF offers a host of features different power levels. With a frequency range of 330 to 460 kHz, and set points from 5 W to full power, the Paramount covers a wide range of process types and conditions for a majority of semiconductor applications, including:

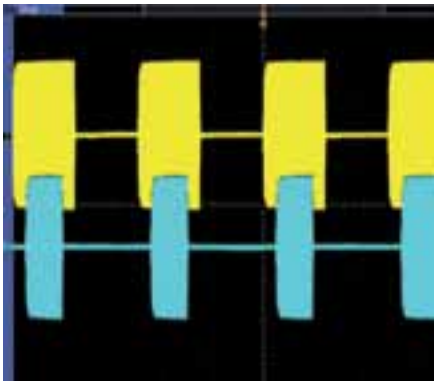
- *PECVD*
- *Etch*
- *Dielectric sputtering*

Frequency Tuning

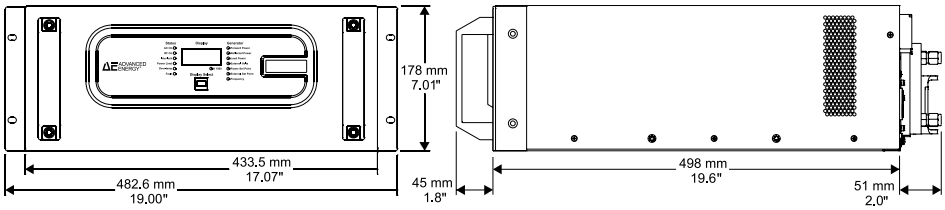
The advanced frequency tuning algorithms implemented in the Paramount MF provide near instantaneous response to plasma impedance changes, enabling shorter process steps and reducing match network mechanical tuning. These algorithms optimize power delivery and minimize load mismatch in real time, enhancing the process engineer's ability to precisely control the plasma conditions in a highly repeatable manner.

Pulsing and Pulse Synchronization

The Paramount MF provides new levels of control to pulsing and pulse synchronization required in emerging plasma applications. Paramount's digital control system provides pulsing frequencies from 10 Hz to 2 kHz, and a duty cycle range of 10 to 90%, giving process engineers extreme latitude in plasma control. Combined with the ability to synchronize pulses to other sources of RF power, the Paramount MF allows true pulsed plasma applications.



Specifications



Physical	Paramount® MF
Dimensions	17.8 cm (H) x 43.4 cm (W) x 50.1 cm (D)
	7" (H) x 17.1" (W) x 19.7" (D)
Weight	35 kg (78 lbs)
Connector and Cable Specifications	
Output Power Connector	HN (LC for 8000 W model)
Input Power Connector	Harting Han modular, 4 pin, 70 A male
User Port Connector	25 pin, D subminiature, female
Host Port Connector	9 pin, D subminiature, female

Electrical*	Paramount® MF
Output Power	
RF Power Range	5 to 8000 W
Frequency Tune Range	330 to 460 kHz
Frequency Resolution	1 Hz
Tune Time (typical)	< 100 ms
Maximum Reflected Power	1500 W
Power Accuracy	± 1% or ± 2 W of set point
Pulsing Frequency Range	10 Hz to 2 kHz
Pulsing Duty Cycle Range	10 to 90%
Input Power	
Voltage	208 VAC ± 10%
Frequency	50 to 60 Hz (± 3 Hz)

*Electrical specifications vary by model number. Please contact an AE representative for more information.

I/O Control Specifications	Paramount® MF
Analog Interface Options	25 pin, D subminiature, female user port
Serial Communications	Standard: RS-232
	Available options: Ethernet, DeviceNet®, Profibus

For more information on the Paramount MF Power-Delivery System, visit: *www.advanced-energy.com/en/Paramount.html*
To view AE's comprehensive power systems portfolio, visit: *www.advanced-energy.com/en/Power_Systems.html*
To view AE's complete product portfolio, visit: *www.advanced-energy.com/en/Products.html*

Specifications are subject to change without notice.

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