

eVoS LE

Asymmetric bias waveform generator for direct control of substrate voltage and ion energy



The eVoS™ LE is an asymmetric bias waveform generator designed to achieve direct control of wafer-surface voltage and resulting ion energy distributions (IED) in plasma-based etch and deposition processes. The eVoS system is comprised of a bi-directional voltage supply combined with an independent current source to establish and control wafer-surface potential. The asymmetric output of the eVoS eliminates the limitations and restrictions of wafer biasing inherent to sinusoidal RF bias application. Fast digital metrology and novel control algorithms enable the production of near mono-energetic IEDs.

FEATURES

- Ability to produce near mono-energetic ion energy distributions
- Pulse capability with necessary input and output signals for synchronization
- Integrated design and compact size eliminates need for matching network
- High-speed metrology provides real-time bias voltage and ion current feedback
- Adaptable to standard chamber interface

BENEFITS

- Achieve direct control of wafer bias voltage and resulting ion energies
- Use less power by using the “right power,” only delivering the useful ion energy
- Gain enhanced ion energy selection/discrimination when compared to a RF bias method

AT A GLANCE

Ion Energy

Up to 1 keV

Ion Current

Up to 1 Amp

IED Spread

FWHM $< \pm$ (larger of) 20 V or 10%
across specified Vstep/Icomp range

Pulse Range

1 to 5000 Hz @ 10% -90% duty
factor (Minimum pulse interval
(on or off time) = 100 μ s)

TECHNICAL DATA

General

Ion Energy	Up to 1keV (into typical chamber conditions) - Vertical step voltage (Vstep) to 1500V
Ion Current	Up to 1 Amp (maximum ion-compensating current 1.5A)
IED Spread	FWHM < ± (larger of) 20 V or 10% across specified Vstep/Icomp range (into fixed capacitive load)
Pulse Range	1 to 5000 Hz @ 10% -90% duty factor (Minimum pulse interval (on or off time) = 100 μs)
Pk-pk voltage	Pk-pk voltage to 2250V
Operation	Multi-level operation to four independent levels

Cooling

Connector	9/16" 18 SAE Female (ISO 11926-1)
Water Flow	≥2 gpm @ 5 to 30°C
Water Quality	Per SEMI E51-0200 Process Cooling Water Standard
Maximum Water Pressure	6.9 Bar
Ambient Air Temperature	5 to 40°C
Air Flow	Forced through air flow by 60 mm fan



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