NAVIGATOR® II
DIGITAL MATCHING NETWORKS

RAPID, ACCURATE, AND RELIABLE DIGITALLY-TUNED MATCHING

Fully digitally tuned matching over a wide range of load impedances enables new levels of process optimization and repeatability.

Navigator® II
Digital Matching Networks

The versatile Navigator® II matching network provides rapid, accurate, and reliable matching across a wide range of power requirements up to 30 kW and frequencies up to 60 MHz. Equipped with microprocessor-controlled stepper motor drives and advanced tuning algorithms, it offers greater consistency and accuracy than traditional analog-based tuning methods.

Overview

Benefits

- Speeds tuning/matching response time
- Tightens process control
- Helps increase tool throughput and product yield

Features

- Digital architecture with enhanced tuning algorithms
- Pulsed-RF power delivery
- Sweep-frequency operation
- Intermodulation distortion (IMD) immunity for multi-frequency applications
- Real-time process power and impedance measurement

Applications

Process Applications

- Etch
- PECVD
- PVD
- Chamber Clean
- HDP-CVD
- PEALD

Market Applications

- Semiconductor
- Solar
- Flat Panel Display
- MEMS Manufacturing
- Industrial

Swift, Accurate, Repeatable Response

The Navigator® II matching network's advanced digital tuning algorithms and motor drive raise the bar on tuning speed, accuracy, and repeatability. Reduced cycling and strict annualized failure rate (AFR) standards ensure dependable performance, while decreased tune-point dithering supports process stability and precision.
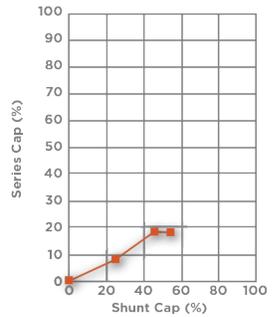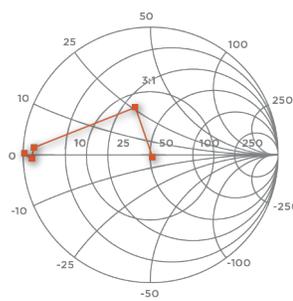

Conventional matching network tuning

· Tune time: 6 sec
· Hunting for a tune
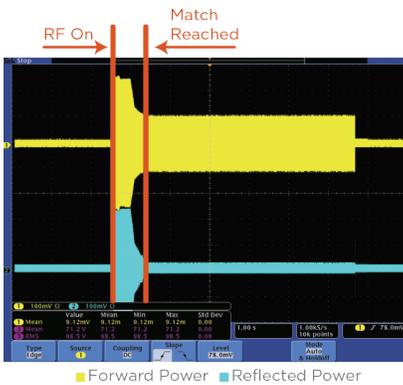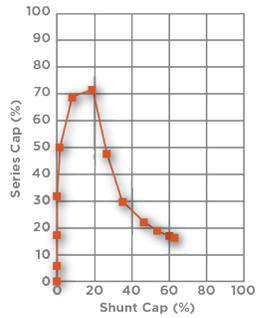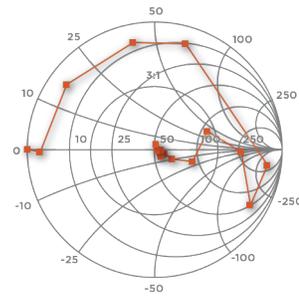
Navigator® II matching network tuning

· Tune time: 1 sec
· Minimal hunting, taking a nearly straight line to 50 Ω

Advanced Energy

Advanced Tune-While-Pulse Capabilities

The use of RF-plasma pulsing to control ion energy is key to the development of precise, state-of-the-art etch and deposition processes. The Navigator II Matching Network's new input sensor and corresponding tune algorithm allow precision tuning during pulsed-RF conditions up to 20 kHz and with duty cycles between 10 and 90%.

Conventional matching network

· "Classic" tuning methods can cause instability.
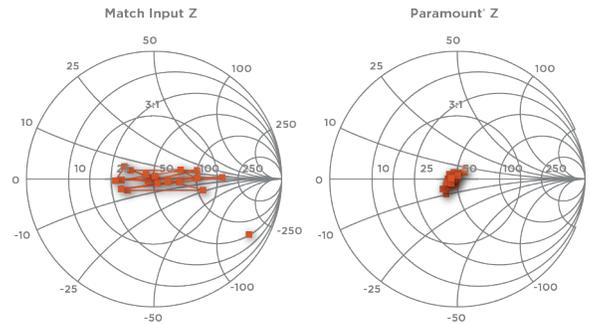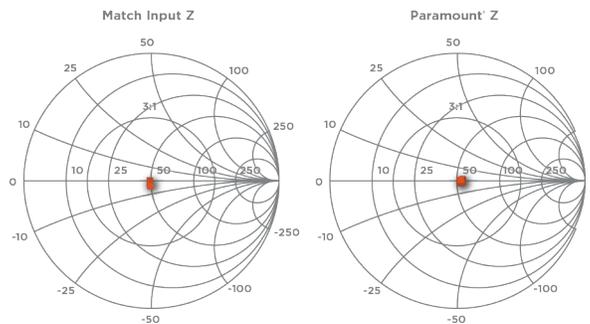

Navigator® II matching network: Advanced algorithms allow for active tuning during a pulse.

· Increased stability
· Improved reliability with less cycling
· Less reflected power

Streamlined Design

The Navigator II matching network's innovative design integrates the high-technology sensor with the microprocessor, and along with advanced proprietary tuning algorithms, provides developers the necessary tools to realize process-enabling benefits.

Customers gain access to critical process information through various available serial and analog I/O interfaces, including RS-232, Profibus, Ethernet, and DeviceNet® interfaces.

Real-Time Measurement, Analysis, and Control

Optional Virtual Front Panel (VFP)

AE's VFP software enables you to monitor and command the matching network through a user's computer. It also passively monitors unit functions and can actively control tuning and match parameters, featuring event monitoring, readbacks, Smith® charting, and password-controlled access.

Optional Z'Scan II RF Sensor

The Z-Scan® II RF sensor provides real-time measurement of process power and impedance, enabling data-driven decisions for establishing, assessing, and troubleshooting tool, process, and product states. It also helps minimize process variability by gathering and using RF data as a multi-variate indication of system problems (plasma striking, mis-tuned network, and more).
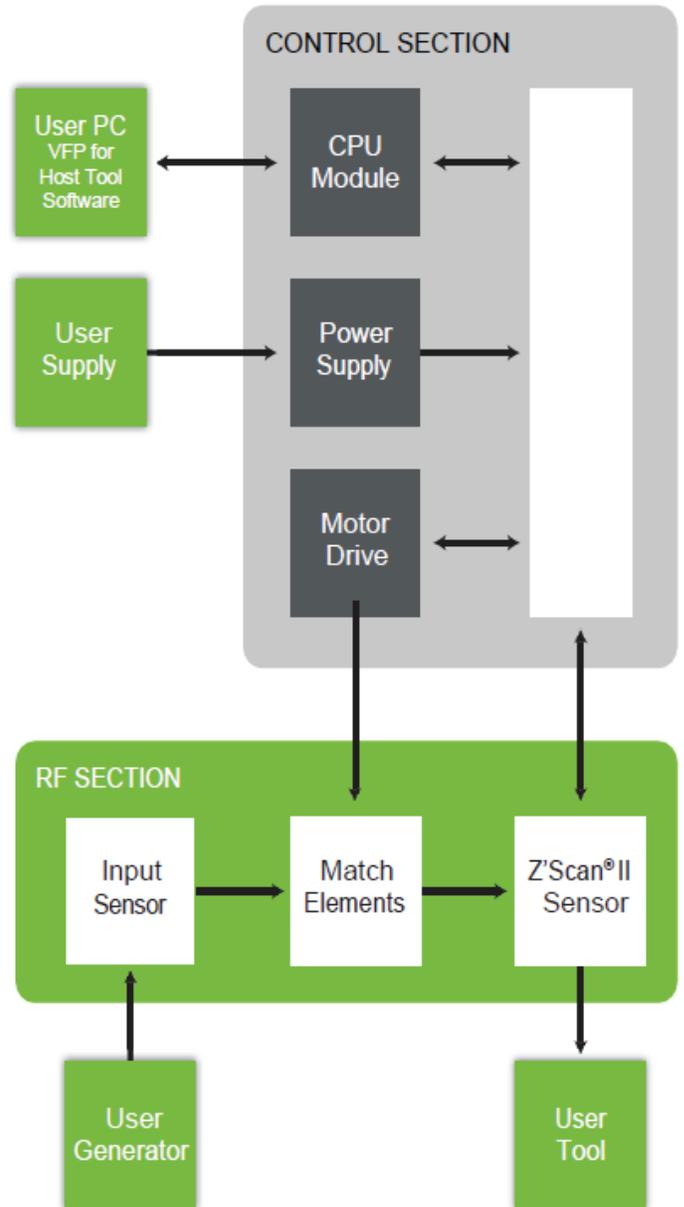
Navigator® II Digital Matching Networks	
Electrical Specifications	
Match Types	Single frequency, dual frequency
Frequency Range	400 kHz to 60 Mhz
RF Output Power Range	1 to 60 kW
Communication Interface	Serial (RS-232), Digital (Ethernet, EtherCAT®, DeviceNet®)
Output Sensor	Z'Scan II
Input Sensor	VI Sensor
Pulsing Capability	10 Hz to 5 kHz
External Pulse Sync	TTL
Tune Time	< 1 sec, depending on user settings
Mechanical Specifications	
Dimensions	Design per customer's requirements
Weight	Design per customer's requirements
Cooling	Air, water
RF Input Connector	Design per customer's requirements (HN, 7/16)
DC Input Connector	Design per customer's requirements (7 Pin, 9 Pin)
Primary Output Connector	Design per customer's requirements (B20N)
Interlock Requirement	Provided default for system readiness
Compliance	
CE, Semi S2	

ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than four 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

Advanced Energy®

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