



Navigator® Digital Matching Networks

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



Benefits

- Tightens process control
- Minimizes reflected power
- Speeds response time
- Improves reliability
- Helps increase tool throughput and product yield

Features

- Digital match platform
- Multiple digital tuning algorithms
- Real-time process power and impedance measurement and analysis
- Integrated instrumentation
- Streamlined design
- Rigorous testing

The versatile Navigator® matching network's advanced technology provides rapid, accurate, and reliable matching across a wide range of load impedances—15 W to 30 kW. Equipped with microprocessor-controlled stepper motor circuitry and digital, user-selectable tuning algorithms, it provides greater consistency and accuracy than traditional analog-based tuning methods. This enables it to optimize delivered process power to semiconductor, solar, FPD, and MEMS manufacturing processes, including etch, CVD, HDP-CVD, PVD, and chamber clean applications. An optional internal Z'Scan® RF sensor provides real-time measurement and analysis of process power and impedance, enabling you to identify and significantly reduce process variability. In addition, optional Virtual Front Panel (VFP) software enables you to monitor and command the matching network through a personal computer.

Delivering Accurate, Repeatable Power

The Navigator matching network enables AE's customers to accurately measure the power delivered to the plasma in their processes.

Applications

Market applications:

- *Semiconductor*
- *Solar*
- *Flat panel display*
- *MEMS manufacturing*
- *Industrial*

Process applications:

- *Etch*
- *CVD and HDP-CVD*
- *PVD*
- *Chamber clean*

Swift, Accurate, and Repeatable Response

The Navigator matching network's digital tuning algorithms and stepper motor drive produce a much quicker, more accurate and repeatable response compared to traditional analog integrator tuning methods. Microprocessor control through AE's Virtual Front Panel (VFP)

enables you to monitor and command the system through your personal computer. VFP also passively monitors many power functions and actively controls tuning and match parameters, providing intuitive, broad-ranging functionality. It features event monitoring, readbacks, Smith® charting, and password-controlled access.

Real-Time Measurement and Analysis

The optional Z'Scan® RF sensor provides real-time measurement and analysis of process power and impedance. With this data, you can make quick, accurate decisions when establishing, assessing, and troubleshooting tool, process, and product states. The Z'Scan sensor also enables you to significantly reduce process variability by gathering and using RF data as a multi-variate indication of system problems (e.g., plasma striking, mis-tuned network, etc.). In addition, its closed-loop control option automatically regulates delivered power to the process chamber for even tighter process control.

The Z'Scan sensor's Z'Ware® user interface software allows your PC to act as both a control and a display device for probe data. Due to its ease of use, all levels of users can make competent process decisions based on viewing and analyzing RF data.

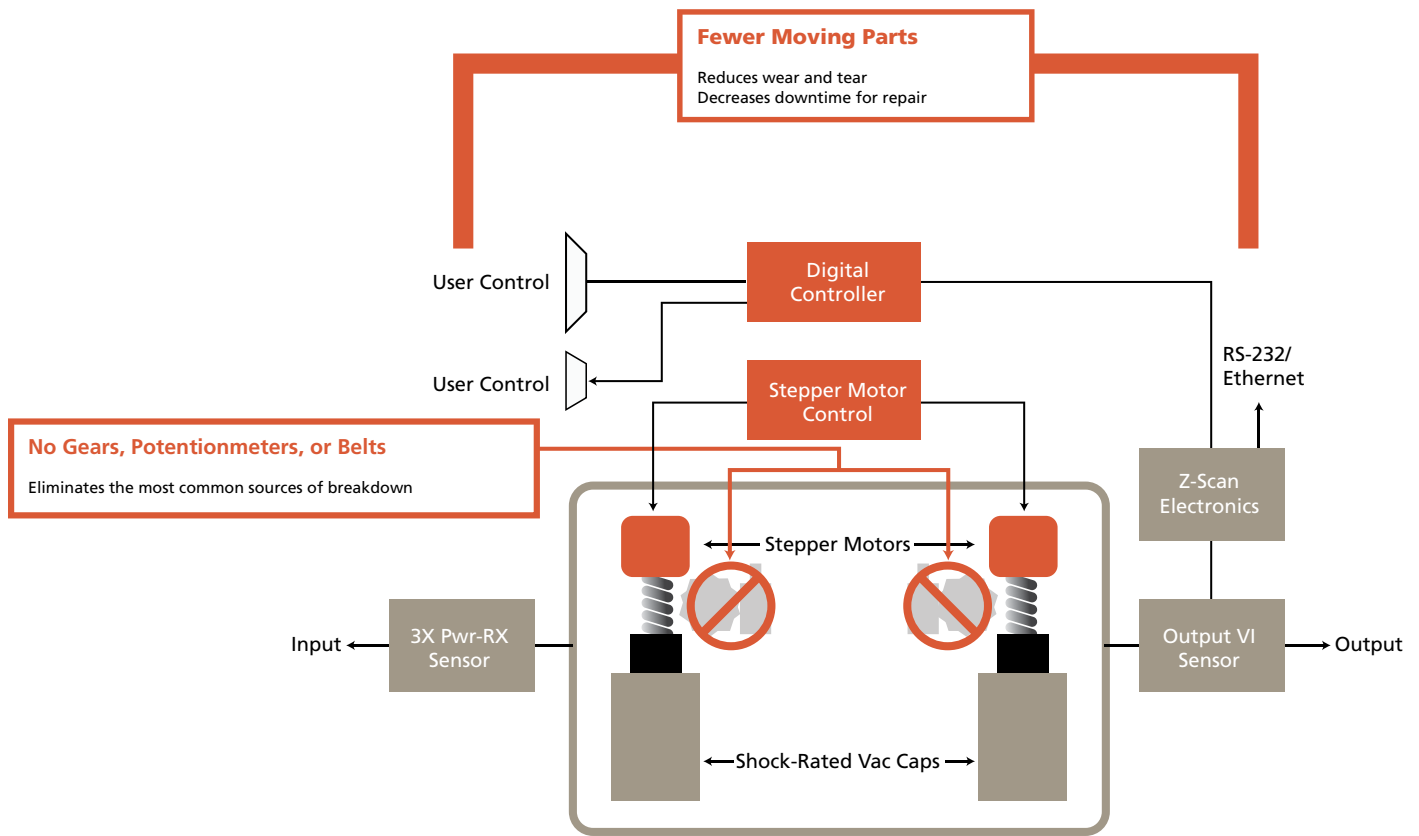
Rigorous Testing

Unlike analog units, Navigator matching networks can be tested through HASS screening to ensure reliability. In the HASS chamber, units undergo extremes in temperature, temperature change, and vibration, so that potential flaws are exposed in testing—not in your system. As a result, customers receive only the most

durable units, those that deliver a high mean time between repairs, helping ensure maximum productivity.

Streamlined Design

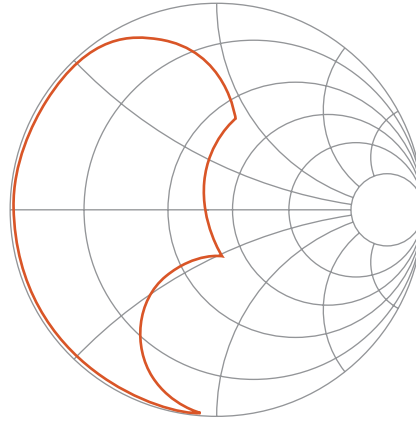
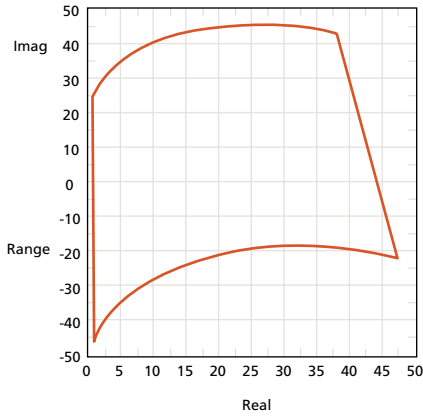
The Navigator matching network's innovative design dramatically reduces downtime for repair.



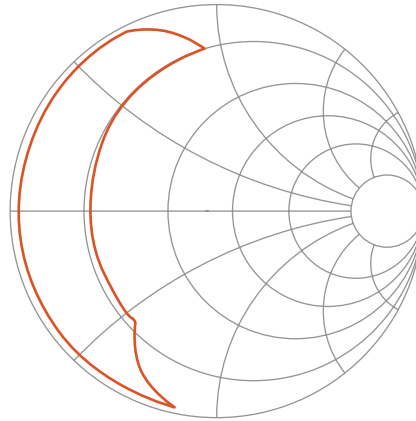
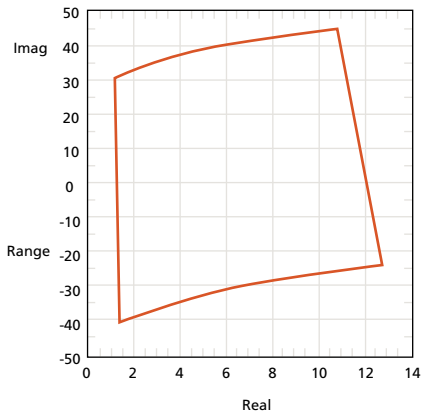
Streamlined Design

Typical Navigator Tuning Ranges

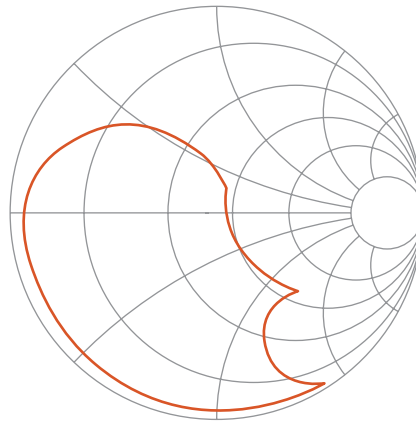
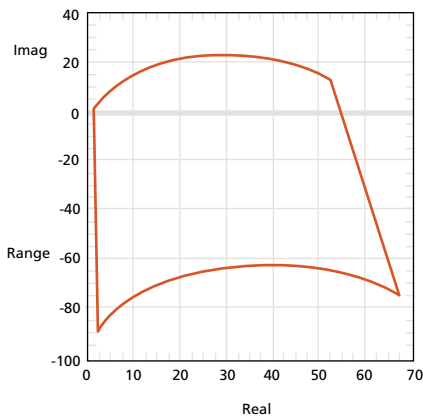
Low-Power, 13.56 MHz Options



Control	Analog/digital
Instrumentation	DC bias or Z'Scan®/DC bias
Input	HN
Output	6 mm socket
Max rms Current (A)	35
Max Peak Voltage	3000

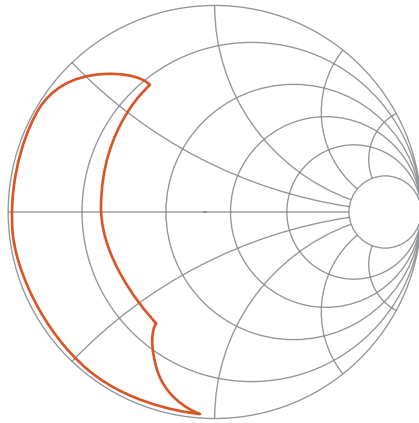
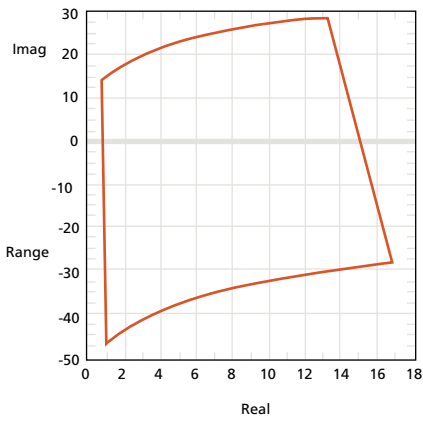
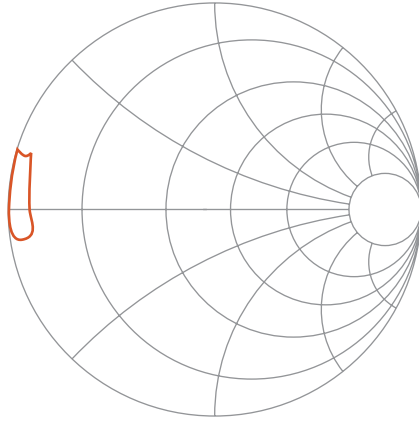
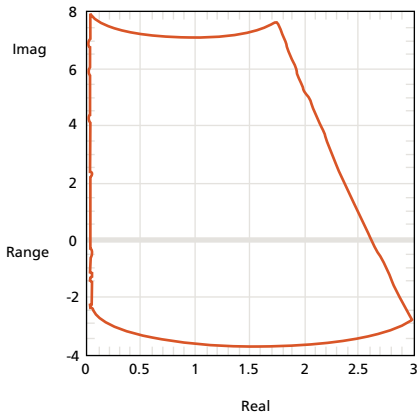


Control	Analog/digital
Instrumentation	DC bias
Input	N
Output	7/16
Max rms Current (A)	25
Max Peak Voltage	1000



Control	Analog/digital
Instrumentation	Z'Scan® or none
Input	HN
Output	Custom
Max rms Current (A)	25
Max Peak Voltage	3000

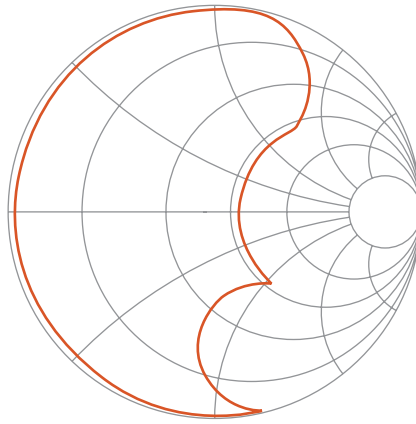
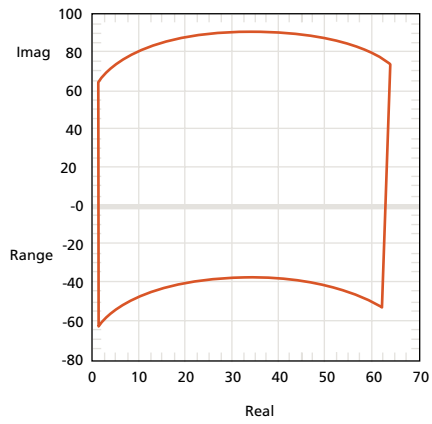
Mid-Power, 13.56 MHz Options



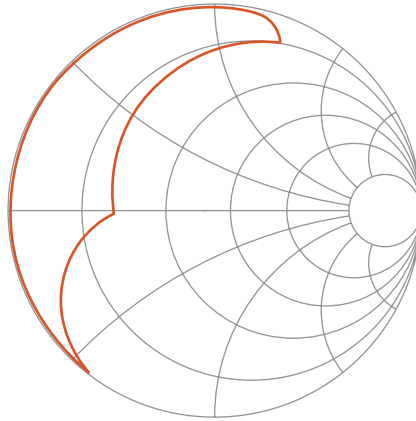
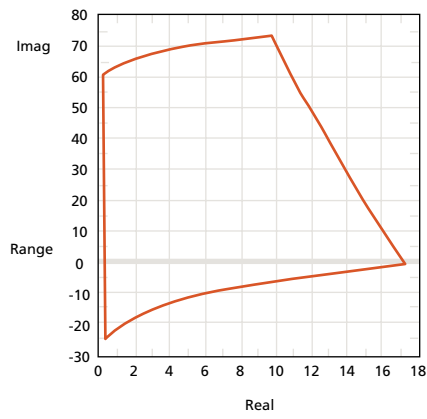
Control	Analog/digital/ Profibus
Instrumentation	DC bias/RF peak
Input	7/16
Output	Custom
Max rms Current (A)	250
Max Peak Voltage	3000

Control	Digital
Instrumentation	DC bias
Input	7/16
Output	20 mm socket
Max rms Current (A)	80
Max Peak Voltage	4000

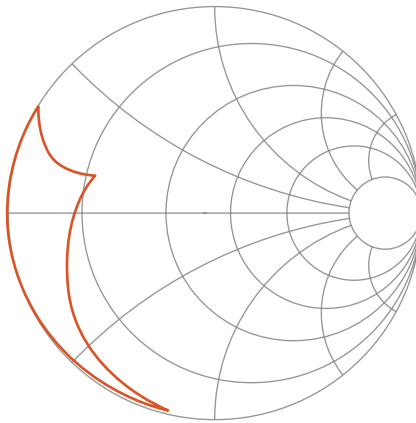
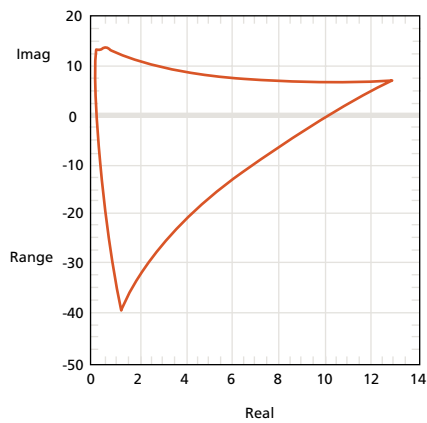
High-Power, 13.56 MHz Options



Control	Analog/digital
Instrumentation	DC bias or Z'Scan®/DC bias
Input	LC
Output	20 mm socket
Max rms Current (A)	80
Max Peak Voltage	1000

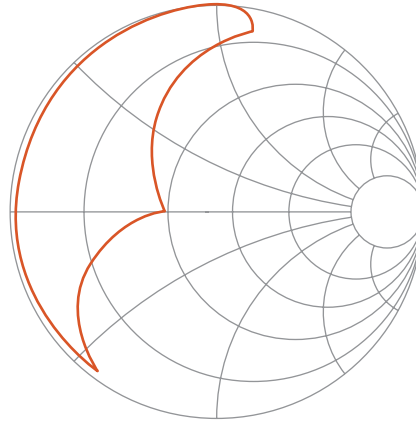
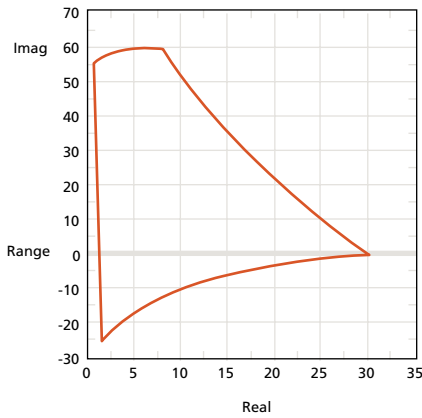


Control	Digital
Instrumentation	DC bias/RF peak
Input	LC
Output	Custom 3 x M6
Max rms Current (A)	100
Max Peak Voltage	6000



Control	Analog/digital
Instrumentation	DC bias/RF peak
Input	LC
Output	Custom 3 x M6
Max rms Current (A)	120
Max Peak Voltage	6000

Low-Power, 60 MHz Options



Control	Analog/digital
Instrumentation	Z'Scan® or none
Input	HN
Output	20 mm socket
Max rms Current (A)	50
Max Peak Voltage	4000

Specifications

Physical	
Size (Dimensions do not include fans, connectors, RF output/input, or mounting brackets.)	
Low Power (13.56 MHz)	8.25" (W) x 13.5" (H) x 4.12" (D); 20.9 cm (W) x 34.3 cm (H) x 10.5 cm (D)
Low Power (60 MHz)	11.62" (W) x 6.09" (H) x 15.18" (D); 29.5 cm (W) x 15.5 cm (H) x 38.6 cm (D)
Mid Power (13.56 MHz)	10.5" (W) x 12.83" (H) x 7.81" (D); 26.67 cm (W) x 32.59 cm (H) x 19.84 cm (D)
High Power (13.56 MHz)	11.5" (W) x 8.6" (D) x 14.2" (H); 29.2 cm (W) x 21.8 cm (D) x 36.1 cm (H)
Output Connectors	See descriptions with tuning maps.
Cooling Medium	Air

Electrical	
Power Range	Up to 30,000 W
Frequency Range	13.56 and 60 MHz
Communications Interfaces	
Standard	Serial, VFP
Optional	Analog, RS-232, Profibus (250 A version only)
Compliance	CE compliant

For more information on Navigator Digital Matching Networks, visit:
www.advanced-energy.com/en/Matching_Networks.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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