

Led by experience. Driven by curiosity.

RF Power Solutions

Anticipating tomorrow's market needs

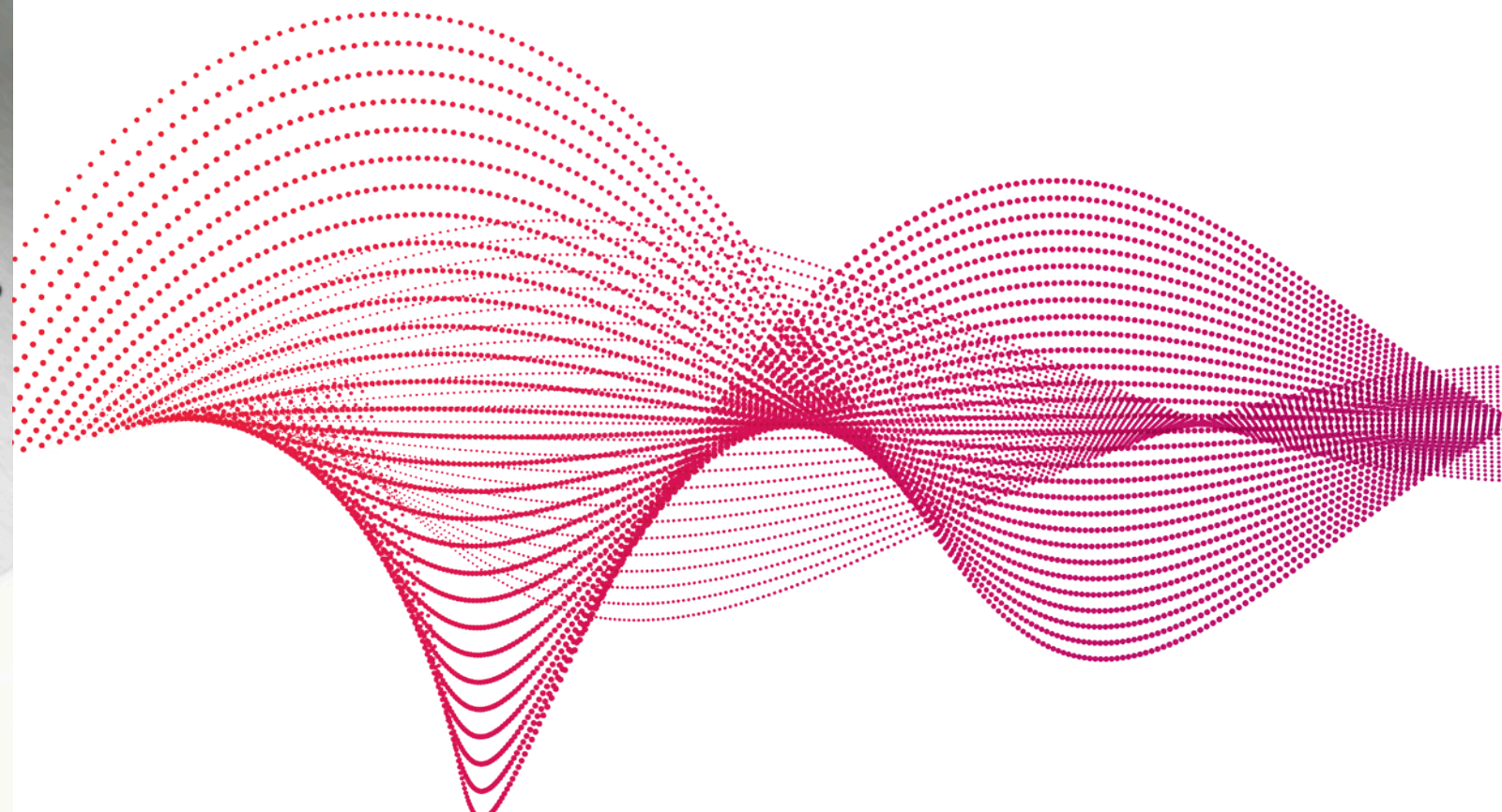


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We empower new technologies

Comet is a leading expert in RF power delivery and a global innovation partner of RF related businesses for more than 50 years. Our products have earned a global reputation for quality and reliability over a broad variety of applications.

By exploring the mysteries of plasma behavior Comet is contributing to the evolution of the semiconductor industry. With the goal to provide our customers with the most precise tools we engineer and manufacture the most advanced RF power systems and diagnostic tools to master plasma processes.

With a deep understanding of the most demanding semiconductor and critical thin film applications our engineers develop RF products with higher performance and better results for you. Comet sensors and controls combine to make some of the fastest tuning Impedance Matching Networks in the industry.

The profound know-how in RF circuit modeling and design has its origin in the development of Vacuum Capacitors. A broad range of Vacuum Capacitors – custom Vacuum Capacitor designs which are not available to the general market included – guarantees you highest performance, repeatability and reliability of your tools. Besides, our RF Generators offer you superior pulsing quality, stability and power measurement accuracy.

"Market needs and special requirements are drivers of progress. Responding to them is what gives key technology players an edge."

In this catalog you will learn more about Comet's range of solutions to control plasma processes. Our experts will gladly support you in finding the right answer for your specific needs.

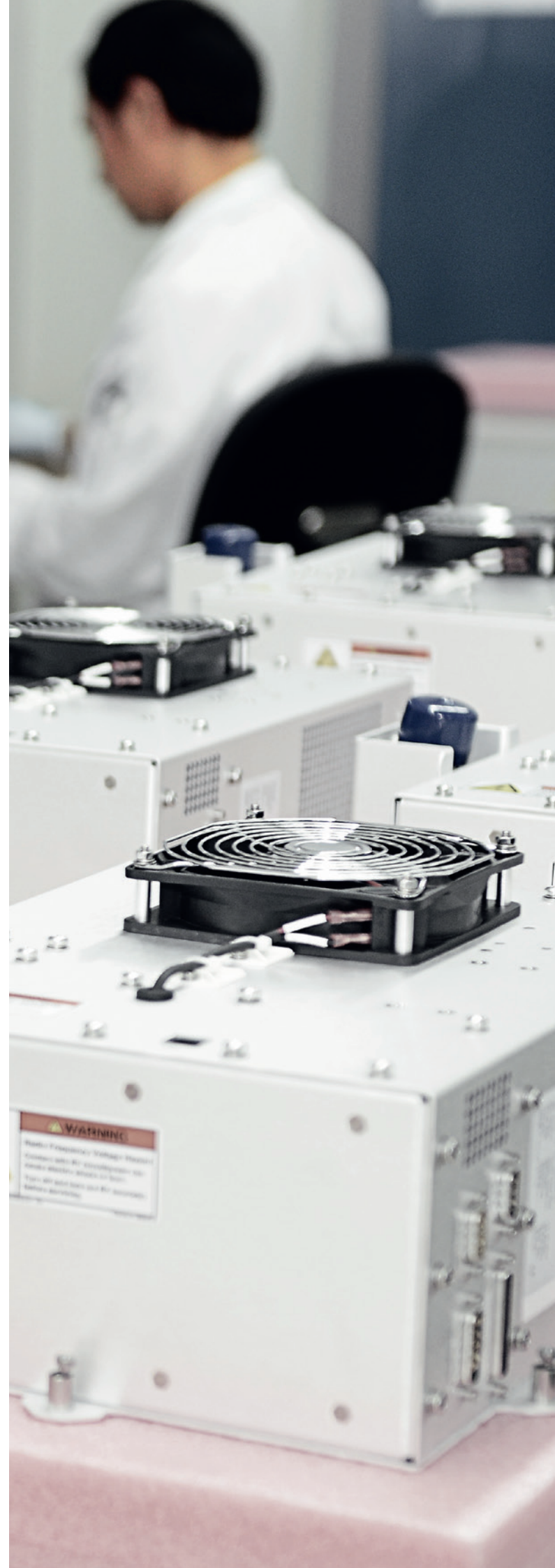


High value RF solutions

Comet Plasma Control Technologies offers a full range of solutions to control plasma processes. We develop and manufacture high-performance Impedance Matching Networks and RF Generators. These specialized products are used for the precise control of plasma processes like thin-film deposition and etching for semiconductors, flat panel displays, solar panels and industrial coatings.

Step up your RF system

Comet employs the most experienced RF delivery experts in the industry to support our top tier semiconductor OEM customers. This level of expertise enables Comet to design and build a custom RF system to meet your requirements.



Custom Impedance Matching Networks

Outsource your match design to the experts

Comet's RF and VHF Impedance Matching Networks are custom-designed for semiconductor and flat-panel-display (FPD) applications from 400 kHz to 170 MHz.

We offer a full range of industry leading matching network solutions that meet or exceed your specifications.

An advanced digital controller enables active tuning while in frequency sweep mode or RF pulse mode. Full sensor options include VI, DC bias and VPP.

Multiple configurations are available with single or dual outputs, as well as multi frequency inputs.

Customer benefits

- Designed to meet specific chamber configurations
- Highest performance, better results: our capacitors, sensors and controls combine to make some of the fastest tuning, longest lasting matching networks in the industry
- Impedance Matching Networks designed to take full advantage of capacitor performance
- Efficient use of matchbox space



**"Talk to us.
Our solutions are
designed to serve
your needs."**

AGS – Standard Impedance Matching Networks

Flexible and affordable

The AGS is ideal for non-critical semiconductor, thin film applications and industrial use. It offers high reliability and repeatable operation over the lifetime of the product.

The digital controller features high speed tuning, customized algorithms and synchronized pulsing.

AGS Matching Networks automatically track the optimum tuned position

- Pulse synchronization with cito Plus RF Generator
- End-to-end capacitor tuning within max. 3 s
- Standalone auto-tuning for any RF source

Customer benefits

- Applicable for non-critical semiconductor, thin film applications and industrial use
- Adjustable tap settings for wide tune ranges
- Compact design
- Compatible with Comet's cito Plus RF generator
- Best price-performance ratio



Standard features AGS

Dimensions (width x depth x height)
1000 W – 3000 W: 208 x 324 x 157 mm
5000 W: 208 x 384 x 193 mm

Output connector
7-16, MC10, Mount Bar

Digital user interface
Control via the front panel of the RF Generator or via digital user interface

AC mains input
90 to 264 V AC single phase

Compatibility
Seamless communication with cito Plus Generator series

Cooling
Air: 1000 - 3000 W
Water: 5000 W

Range of applications
Applications with capacitive or inductive loads (ICP) up to 5 kW

Application setup (only air-cooled models)
Multiple taps on main inductor for flexible selection of the appropriate load impedance range
Adjustable tuning algorithm sensitivity

Pulsing
Pulse mode up to 10 kHz

Load impedance
Very wide load impedance range due to taps on inductor

RF Generator cito Plus

Designed for highest stability into dynamic loads

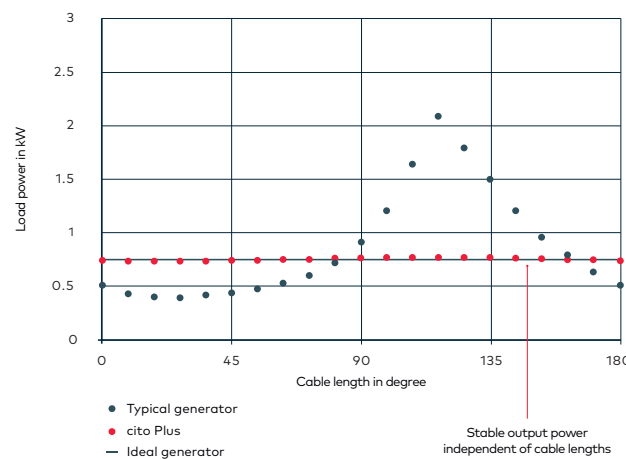
Comet Plasma Control Technologies has taken the cito RF Generator to the next level in performance and precision. The cito Plus is designed for highest stability into dynamic loads.

Enhanced plasma stability

- Symmetrical open loop response
- Improved plasma stability for process repeatability
- Cable length insensitivity for ease of system integration

cito Plus offers superior pulsing quality, stability and power measurement accuracy, making it the best choice for plasma deposition and etch applications.

Load power into VSWR 3



Customer benefits

- Predictable plasma behavior
- Easy system integration
- Repeatable wafer results
- Stable with any cable length
- Superior pulse shape into any load
- Worldwide compatibility with most production equipment

cito Plus features

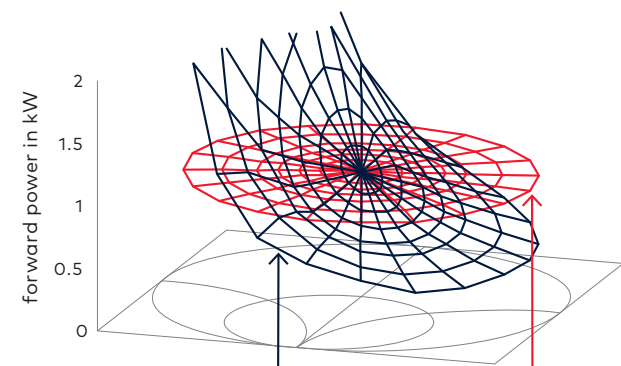
- Symmetrical open loop response
- High accuracy power control
- Pulsing up to 100 kHz
- CEX with variable phase shift
- CEX output frequency divider
- SEMI compliant

Consider cito Plus for upgrades and replacements

- Better stability over what is on the tools now
- Can be used for Bias and source

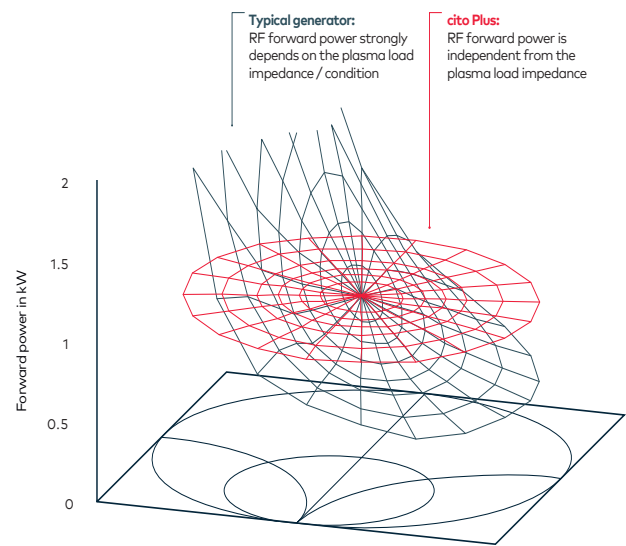
The Plug & Play system offers you

- Available interfaces: RS-232C, Ethernet, Profibus, etc.
- Coaxial cable insensitivity – no need to adjust for length – keep the same cables
- Air-cooled, no cooling lines
- Easy user friendly front panel control or passive panel
- AC input 230 V AC nominal, single phase



Typical generator

RF forward power strongly depends on the plasma load impedance/condition



cito Plus
RF forward power is independent from the plasma load impedance

cito Plus

RF forward power is independent from the plasma load impedance

cito is a registered trademark of Comet AG

cito Plus product range

Frequency	13.56 / 60 MHz
Frequency, stability and accuracy	± 50 ppm
Output power	1 W to 600 W 1 W to 1000 W 13.56 MHz: 1 W to 1100 W
RF accuracy	± 1.0 % of setpoint or ± 0.10% of max. power, whichever is greater
Spurious and harmonics	
Harmonics into 50 Ω	- 45 dBc
Spurious into 50 Ω	- 45 dBc
RF pulsing	
Pulse rate	1 Hz to 100 kHz
Pulse rise / fall time into any load	< 300 ns / < 400 ns
Interfaces	Analog, RS232, Ethernet, Profibus, Matching network control
CEX	Sender / Receiver
Power rating and coolant requirements	
AC input	230 V AC nominal (± 10%), single phase
Rated current	< 10 A
AC to RF efficiency	> 70%
Operating temperature	+ 5°C to + 35°C
Cooling	Forced air
Configuration	
Front panel	Active or passive
Form factor	2U, full 19" rackmount
Dimensions excl. connectors	441 x 500 x 88 mm (w x d x h)
Weight	< 16 kg
RF output connector	N-type
Compliance directives and industrial standards	2014 / 35 EU Low Voltage directive EN 61010-1 2014 / 30 EU EMC directive EN 55011 EN 61000-6-2 2011 / 65 / EU RoHS SEMI S2, S8, S14, S22, F47

Linear Pulse Power Amplifiers for medical products

Leading the way for MRI technology

Comet specializes in high linear Power Amplifiers for high-field MRI and NMR applications in the high-end range of 3 Tesla to 11.7 Tesla, corresponding to operating frequencies as high as 500 MHz.

Fulfilling the most demanding customer requirements

The LPPA 13080 covers the frequency range from 16.7 MHz to 123 MHz serving multicore 0.5 Tesla to 3 Tesla applications. In fact, Comet is proud to have served the MRI market leader for over 25 years.

With LPPA 22080 we offer another wideband amplifier, covering the frequency range from 30 to 220 MHz. We design leading edge 8 and 16 kW multichannel MRI Power Amplifiers from 279 MHz to 500 MHz. All models consist of a high number of power semiconductors per kilowatt RF ensuring a low pulse power droop and very high linearity. Our R&D department in Germany offers you technical and application support around the globe.

VHF Power Generators for laser products

The solution for industrial applications

Comet Plasma Control Technologies has proven to be a reliable and highly competent partner for many customized projects such as modules for laser applications.

Success through technology advantage

Employing the latest high power LDMOS transistors and compact planar transformer technology, Comet VHF laser power supplies come with a small footprint at competitive prices.

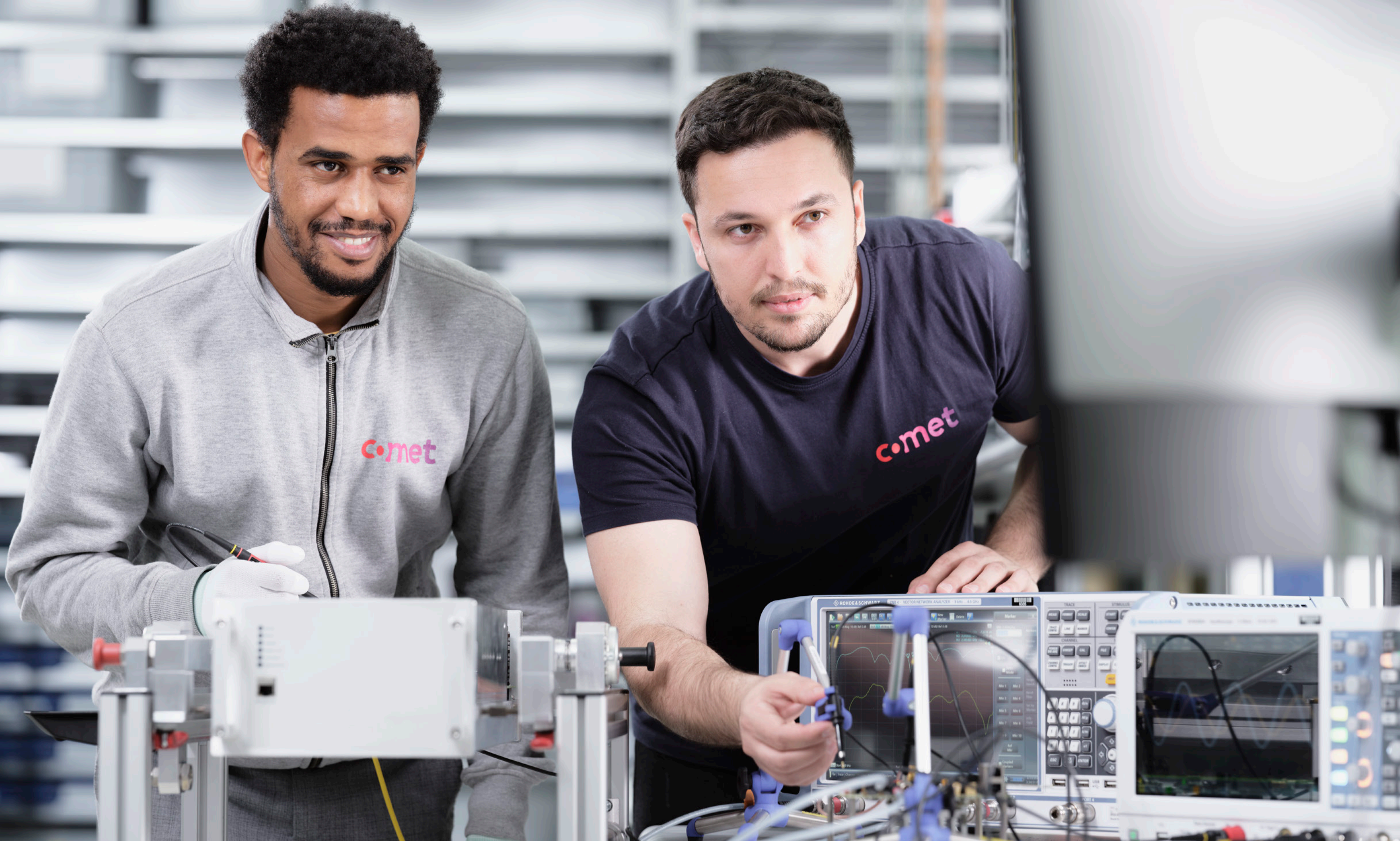
If your VHF laser needs rugged power

- from 600 W to 25 kW
- within 60 MHz and 125 MHz

We have the solution, give us a call.



"A global team of outstanding experts is working in Comet's manufacturing and design centers in Switzerland, USA, China, Germany, Korea, Malaysia and Taiwan."



Providing solutions near you

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