Leibniz Ferdinand Braun Institut

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Compact microwave plasma source - a versatile tool for various applications

Atmospheric plasmas offer a whole bunch of applications in the field of surface treatment and activation, including temperature-sensitive materials. The special feature of the FBH source is that it offers a 2.45 GHz microwave plasma in the 10...20 W range from a very compact source, which needs just a DC supply. It comprises a microwave power oscillator, a resonator with plasma excitation, and the control circuit, integrated in a single, miniaturized package. An FBH gallium-nitride transistor is used for most efficient microwave power generation. The source is easy to handle, either as a stand-alone plasma tool or as part of equipment using the plasma, e.g., for activation.

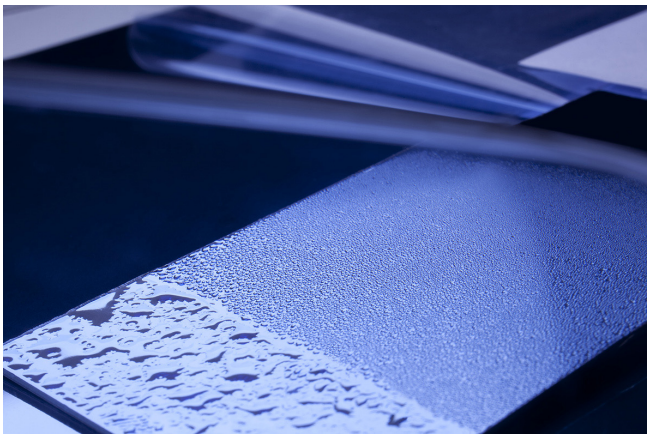
FBH's atmospheric microwave plasma source

Technical Data

- Compact source (dimensions 114 x 33 x 25 mm^3), needs only single 48 V DC supply, plus gas feeding and water cooling (can be replaced by air ventilation)
- Operates at atmospheric pressures with various media (air, argon, nitrogen, oxygen)
- Low temperatures in the plasma allow treatment of sensitive surfaces
- Microwave plasma with 10...20 W power
- Plasma is generated by a 2.45 GHz power oscillator based on gallium-nitride transistor technology

Applications

- Activation of surfaces (plastics, metals) in industrial production
- Cleaning and coating
- Medical applications



Example: Plastic surface, activated by plasma (left: after plasma treatment, right: before)

Profile

The Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH) researches electronic and optical components, modules and systems based on compound semiconductors. In the field of III-V electronics, it manufactures high-frequency devices and circuits for communications, power electronics, and sensor technology. Moreover, FBH develops light sources from the visible to the UV spectral range: high-power diode lasers, UV light sources, and hybrid laser systems. Applications range from medical technology, materials processing and sensors to optical communications in space and integrated quantum technology. In close cooperation with industry, its research results lead to cutting-edge products.

The institute has a staff of 365 employees, is a member of the Leibniz Association and part of Research Fab Microelectronics Germany (FMD).