

Element Six and Filtronic team up to develop high-frequency diamond electronic devices

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Diamond Microwave Devices (DMD) is a new subsidiary set up by Element Six, a world leader in the development of Chemical Vapour Deposition (CVD) diamond technology. This new company aims to develop novel diamond semiconductor materials and processing technology that will help create the next generation of high-power, high temperature semiconductor devices for use in microwave power amplifiers and transmitters.

At the same time, Element Six (E6) has signed a collaboration agreement with Filtronic plc to work with DMD and develop this exciting new technology. Filtronic is a world leader in the design and manufacture of a broad range of microwave devices, components and subsystems used in electronic defence, point-to-point communication and cellular handsets. Filtronic and E6 will use their complementary high-technology strengths in materials, semiconductor device processing and circuits to expedite the development of this new microwave technology which has the potential of revolutionising microwave power electronics.

E6, a leader in the development of CVD diamond, can enable wider exploitation of the advanced engineering properties of this material. For high power electronics, CVD diamond offers unique properties such as high breakdown voltage and high temperature operation. If a practical semiconductor device can be demonstrated, it could have the potential to provide superior microwave power and higher operating temperatures than existing semiconductor devices and technologies. E6 has been involved with major research and industrial programmes such as the Department of Trade and Industry sponsored CAPE (Carbon Power Electronics) programme aimed at overcoming the technical challenges of developing diamond-based electronics components.

Dr Richard Lang, General Manager of DMD, has said; "Whilst the technical challenges are high, a diamond MESFET could revolutionise the design of future microwave power modules. There is much work to be done in order to realise a practical device, and we are excited by the opportunity to explore the boundaries of this emerging technology." Mr Christian Hultner, CEO of E6, notes, "Diamond has the potential to be the ultimate semiconductor for high-frequency, high-power electronic applications. The establishment of DMD provides greater momentum to our activities in this area and will accelerate the development of practical devices"

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About Element Six

Element Six is the world leader in the production of all forms of synthetic diamond for industrial use. Element Six has pioneered the development of CVD diamond technology since the 1980s, with a world-renowned research centre at Ascot dedicated to this activity. CVD diamond opens up many new application areas outside the traditional abrasive uses of synthetic diamond. Uses of CVD diamond include laser exit windows, cutting tools, surgical blades, windows for high-power gyrotrons, heat-spreaders for electronic devices as well as active electronic devices.

About Filtronic

Filtronic is a world leader in the design and manufacture of a broad range of microwave devices, components and subsystems used in electronic defence, point-to-point communication and cellular handsets. The company includes a major GaAs processing facility at its Compound Semiconductor division in Newton Aycliffe and manufactures custom complex microwave subsystems at its Defence division in Shipley. The company also designs and manufactures microwave modules for the point-to-point communications market.