SEPTEMBER 2017

TECH FLASH

Fraunhofer IMS

Heat-resistant capacitors: Stability at up tp 300 degrees celsius

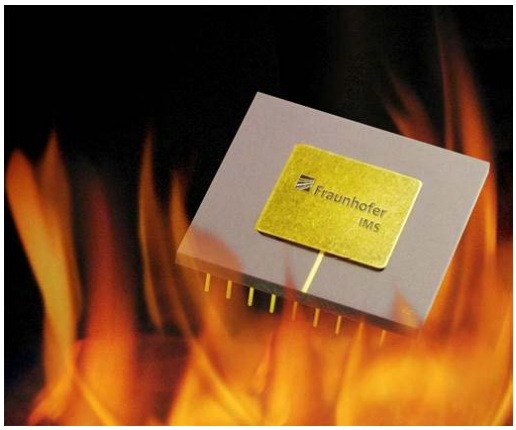

Fig 1: The capacitor withstands temperatures of up to 300 degrees Celsius

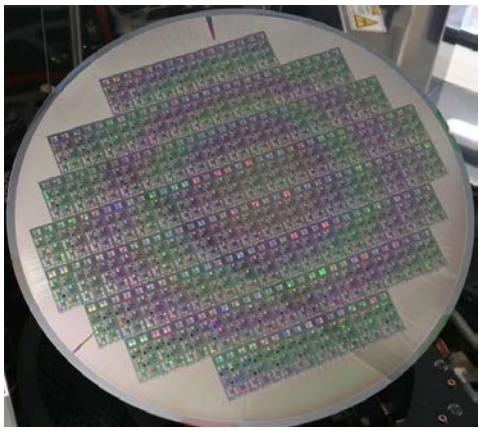

Fig 2: Tiny holes increase the wafer's surface area

The Fraunhofer-Gesellschaft is the leading organization for applied research in Europe. Its research activities are conducted by 69 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of 24,500, who work with an annual research budget totaling 2.1 billion euros. Of this sum, 1.9 billion euros is generated through contract research. More than Fraunhofer Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development. Our global footprint is very strong, with offices and research centres in the USA, Europe and Asia. Some of our renowned innovations are the MP3 software, white LED's and the smallest of cameras. Fraunhofer has been active in India for several years now bringing innovative technology and research competence to our Indian customers.

Fraunhofer Institute for Microelectronic Circuits and Systems (IMS) carries out research, development and pilot fabrication of microelectronic solutions for industrial and public clients, the majority of which are from the semiconductor industry.

Heat, dust and moisture damage electronic components. Protecting against dust and moisture is straightforward. But heat can disrupt functionality and cause electronic components to age more quickly, or even destroy them. Anywhere electricity flows, heat is generated as well. There is not always enough space in the electronic component to draw away the waste heat with cooling fins or ventilators. Devices that operate in a hot environment pose an even bigger problem. For example, a drill bit in the oil industry rotates at high speeds thousands of meters below the surface, generating temperatures of up to 250 degrees – not to mention the enormous mechanical load on the electronic components. Researchers from Fraunhofer IMS have developed a capacitor that can withstand temperatures of up to 300 degrees Celsius. They did so by using an innovative mix of materials and a special 3D trick. When manufacturing the conducting metal layers, the researchers etched tiny holes in the surface to increase its area. This 3D trick increases its capacity and simultaneously makes it possible to use a thicker dielectric. A thicker layer withstands higher temperatures better and can decrease uncontrolled leakage current in the capacitor.

Kindly in touch with us if you need any additional info on the subject.

Thanks and Regards,

Ms. Anandi Iyer,
Director, Fraunhofer Office India,
405-406, 30 MG Road, Bengaluru - 1.
Tel: +91 80 40965008/09

Mr. Aditya Fuke,
Asst. Manager - Market Intelligence & Business Development, Fraunhofer Office India.
aditya.fuke@fraunhofer.in

www.fraunhofer.de
www.ims.fraunhofer.de