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Additive manufacturing as a flexible tool for electrical engineering

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The manufacturing of electronic components including active and passive devices and the integration into (micro-) electronic applications requires new strategies for a further miniaturization. Today, electronic engineering is often related to subtractive methods, like e.g., etching, to realize small structures below 20 µm. In contrast, additive manufacturing technologies like InkJet Printing, Dispensing and Aerosol Jet® printing offer many economical and ecological advantages. A flexible deposition of functional materials like conductive materials, dielectric materials and ceramics offers a high flexibility and a new design approach for electrical engineers. The present paper presents recent studies of additive manufacturing of circuit boards, sensor structures, resistors, capacitors but also fully printed energy harvesters for wireless sensor network applications. Examples are presented on the integration of electronic structures on 3d-surfaces and into composites. Results are discussed in view of electrical properties, reliabilities and manufacturing aspects.

Biography

Volker Zollmer has studied Mineralogy at University of Kiel. He got his Diploma in 1999. In 2002, he has finished his PhD at University of Kiel, Germany. In 2002 he has got the Award "DGM-Nachwuchspreis 2002" by "Deutsche Gesellschaft für Materialkunde (DGM)". Since 2002, he works at Fraunhofer-IFAM, Bremen, Germany and he is heading the Department of "Functional Structures". He has established the technology platform "functional printing" at Fraunhofer-IFAM for a customized functionalization of parts and surfaces. He is heading several industrial projects and his department is involved in national and international research projects focusing on additive manufacturing, functional integration and surface structuring.

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