EVALUATION AND TAILORING OF RESISTIVE INKS FOR DIRECT-WRITE APPLICATIONS

Thomas P. Montoya* and A.W. Downs
Department of Electrical and Computer Engineering
South Dakota School of Mines and Technology
Rapid City, SD 57701-3995
*Corresponding author e-mail: Thomas.Montoya@sdsmt.edu

ABSTRACT

This work presents results of research on evaluating resistive inks for use in direct-write (AKA: printed electronics) applications at RF/microwave frequencies using an nScrypt 600-3Dn-HP direct-write system. A secondary goal was to demonstrate the ability to “tailor” the electrical conductivity of the deposited resistive ink. This was accomplished by mixing a resistive ink with a more conductive ink. The resistive inks were deposited on both flexible and rigid microwave substrates. The evaluation considered characteristics such as dispensing properties, adhesion to substrates, resistance to cracking, electrical conductivity, and high frequency electrical performance. Out of the commercial materials evaluated, Goldstone 3100 from Methode Development and CI-2002/CI-2020 from Engineered Conductive Materials outperformed the rest for the characteristics considered.