Printed Electronic Using Traditional Graphic Arts Printing Technologies

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Abstract

In order to drive the cost of electronics down, development towards alternative circuit fabrication technologies and tooling is needed which can circumvent the costly and time-consuming "batch-like" production processes associated with conventional solid-state, integrated circuit (IC) manufacturing. One practical approach is to invoke unconventional technologies capable of additive and continuous processes, such as those used in the graphic arts industry, along with solution based material systems to fabricate electrical devices of congruent functionality. The use of graphic arts printing technologies is an attractive solution since the existing infrastructure offers the potential for low-cost, high through-put electronics manufacturing.

Motorola Labs has leveraged traditional graphic arts printing technologies, along with commercially available electrically functional inks to fabricate multi-layered printed circuit prototypes onto flexible polymer substrates. Several printed electronic circuits, such as, inverters, ring-oscillators and logic blocks have been fabricated without the use of processes that require a clean-room environment and evaporative material deposition. These printed circuits have the potential to create a portfolio of novel product applications where profit margins are highly sensitive to manufacturing costs and complex functionally is not required. The printing technologies and functional inks used to develop these circuits are discussed along with observed electrical performances.

Author Biography

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