

Fabrication of Inkjet-printed and Non-sintered BaTiO₃ Dielectric Film

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Abstract : BaTiO₃ has high permittivity so that has been applied to dielectric and insulator materials in 3D system-level package integration. In order to achieve excellent performance of device, the BaTiO₃ layer should be highly dense. In this study, BaTiO₃ thick films were prepared by the inkjet printing method using 4 vol.% BaTiO₃ colloidal inks and cured at 280 °C for 5 h after infiltration of polymer resin for non-sintered process using 3 vol.% cyanate ester emulsion ink. From the obtained results, packing density was determined to be improved by overlapping rabbit ears which were generated by coffee ring effect. We also calculated the packing densities of the films and correlated these packing densities to the measured permittivity of the films.

Key Words : BaTiO₃, Capacitor, Dielectric, Inkjet, Ceramic ink