

シクロオレフィンポリマーへの平滑回路形成

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Smooth Circuit Formation on Cycloolefin Polymers

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Abstract

Recently, low dielectric material has been commonly used as printed circuit board material, to improve the performance and efficiency of electronic equipment. PTFE(Polytetrafluoroethylene) is one of the candidates for such Low-k material. Conventionally, a complicated etched surface has to be created by a strong etching media in order to achieve a good adhesion between the deposited metal and substrate. However, this complicated etched surface becomes a problem due to transmission loss through the skin effect. We therefore looked at a Cycloolefin Polymer (COP) that has an electric characteristic equal to PTFE. Return-to-zero (Rz) obtained a reformed surface with a low degree of roughness (about $1.0\ \mu\text{m}$) by irradiating the COP with ultraviolet light for 10 minutes. With the use of a hypophosphorous acid type bath for electroless Cu plating, peel strength was $0.8\ \text{kNm}^{-1}$. A circuit with a comb type pattern was formed by a subtractive process. An initial insulation resistance was measured on the comb type pattern (the width of the circuit and the interval of pattern were $50\ \mu\text{m}$) with 100V impressed voltage and was shown to have a high enough value ($1.7 \times 10^{13}\ \Omega$).

Key Words: Cycloolefin Polymers, Low-k Material, UV Irradiation