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銅ダマシン法により作製した半導体デバイス用配線材料の信頼性解析のための接点接続状態の交流インピーダンス法による評価

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Evalution of Contact Connection State by Use of AC Impedance Method for the Reliability Analysis for the Wiring Material Produced by Copper Damascene Process for the Semiconductor Devices

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Abstract

A semiconductor chip was evaluated and analyzed using the AC impedance method in this report. The aim of this study is to establish an evaluation method for EM. An appropriate current density was applied to the TEG sample fabricated using a copper damascene method. Concurrently, the AC impedance was measured by use of a frequency response analyzer before and after the EM test. Additionally, the occurrence of electromigration was observed after the test using a digital microscope. We succeeded in observing the change in the form of the Cole-Cole plot of the AC impedance after EM. However, this is considered to be evidence of the change in the contact state of the wire and the copper plate. It is suggested that the change in the contact state derived from the energization could be monitored using an AC impedance method. Thus, this method will be applicable to estimating the contact state when performing an EM evaluation.

***Key Words*:** *AC Impedance Method, Electromigration, Damascene*