

## Accepted Manuscript

Influence of silicon doping type on the adhesion of seedless electrodeposited copper layers

Frederico Goncalves de Cerqueira Lima, Ulrich Mescheder, Gábor Katona, Harald Leiste, Emre Özel, Claas Müller, Holger Reinecke



PII: S0257-8972(18)30295-0  
DOI: doi:[10.1016/j.surfcoat.2018.03.044](https://doi.org/10.1016/j.surfcoat.2018.03.044)  
Reference: SCT 23224

To appear in: *Surface & Coatings Technology*

Received date: 9 December 2017

Revised date: 13 March 2018

Accepted date: 14 March 2018

Please cite this article as: Frederico Goncalves de Cerqueira Lima, Ulrich Mescheder, Gábor Katona, Harald Leiste, Emre Özel, Claas Müller, Holger Reinecke , Influence of silicon doping type on the adhesion of seedless electrodeposited copper layers. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sct(2017), doi:[10.1016/j.surfcoat.2018.03.044](https://doi.org/10.1016/j.surfcoat.2018.03.044)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Influence of Silicon Doping Type on the Adhesion of Seedless Electrodeposited Copper Layers

Frederico Goncalves de Cerqueira Lima <sup>a,b</sup>, lima@hs-furtwangen.de, corresponding author  
 Ulrich Mescheder <sup>a</sup>, mes@hs-furtwangen.de  
 Gábor Katona <sup>c</sup>, gabor.katona@science.unideb.hu  
 Harald Leiste <sup>d</sup>, harald.leiste@kit.edu  
 Emre Özel <sup>b,e</sup>, oe@hs-furtwangen.de  
 Claas Müller <sup>b</sup>, claas.mueller@imtek.uni-freiburg.de  
 Holger Reinecke <sup>f</sup>, h.reinecke@schoelly.de

<sup>a</sup> Institute for Microsystems Technology (iMST), Hochschule Furtwangen University  
 Robert Gerwig-Platz 1, 78120 Furtwangen im Schwarzwald, Germany  
 Ph: +4977239202808

<sup>b</sup> Department of Microsystems Engineering (IMTEK), University of Freiburg  
 Georges-Köhler-Allee 103, 79110 Freiburg im Breisgau, Germany

<sup>c</sup> Department of Solid State Physics, University of Debrecen  
 P.O. Box 2., Debrecen, 4010, Hungary

<sup>d</sup> Applied Materials Physics (IAM-AWP), Karlsruhe Institute of Technology (KIT)  
 Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany

<sup>e</sup> Institute for Material and Application Technology, Hochschule Furtwangen University  
 Kronenstraße 16, 78532 Tuttlingen, Germany

<sup>f</sup> Schölly Fiberoptic GmbH  
 Robert-Bosch-Str. 1-3, 79211 Denzlingen, Germany

### Abstract

The influence of silicon doping on the adhesion of copper layers electroplated directly on (100) silicon without a seed layer was investigated in this work. The adhesion of Cu layers on Si(100) was derived from scratch tests where the critical loads and the types of failures of these layers on phosphorous- and boron-doped silicon were obtained. The maximum loads supported until complete layer removals were about twice as large for Cu layers electrodeposited on p-Si(100) than those deposited on n-Si(100). The Cu layers were also visually inspected using images taken with scanning electron microscopes, their topography was obtained by atomic force microscope measurements and crystal orientations by X-ray diffraction. Secondary neutral

Download English Version:

<https://daneshyari.com/en/article/8023422>

Download Persian Version:

<https://daneshyari.com/article/8023422>

[Daneshyari.com](https://daneshyari.com)