



**FACULTY OF ELECTRICAL ENGINEERING
AND INFORMATION SCIENCE**



**INFORMATION TECHNOLOGY AND
ELECTRICAL ENGINEERING -
DEVICES AND SYSTEMS,
MATERIALS AND TECHNOLOGIES
FOR THE FUTURE**

Startseite / Index:

<http://www.db-thueringen.de/servlets/DocumentServlet?id=12391>

Impressum

Herausgeber: Der Rektor der Technischen Universität Ilmenau
Univ.-Prof. Dr. rer. nat. habil. Peter Scharff

Redaktion: Referat Marketing und Studentische
Angelegenheiten
Andrea Schneider

Fakultät für Elektrotechnik und Informationstechnik
Susanne Jakob
Dipl.-Ing. Helge Drumm

Redaktionsschluss: 07. Juli 2006

Technische Realisierung (CD-Rom-Ausgabe):
Institut für Medientechnik an der TU Ilmenau
Dipl.-Ing. Christian Weigel
Dipl.-Ing. Marco Albrecht
Dipl.-Ing. Helge Drumm

Technische Realisierung (Online-Ausgabe):
Universitätsbibliothek Ilmenau
[ilmedia](#)
Postfach 10 05 65
98684 Ilmenau

Verlag:  Verlag ISLE, Betriebsstätte des ISLE e.V.
Werner-von-Siemens-Str. 16
98693 Ilmenau

© Technische Universität Ilmenau (Thür.) 2006

Diese Publikationen und alle in ihr enthaltenen Beiträge und Abbildungen sind urheberrechtlich geschützt. Mit Ausnahme der gesetzlich zugelassenen Fälle ist eine Verwertung ohne Einwilligung der Redaktion strafbar.

ISBN (Druckausgabe): 3-938843-15-2
ISBN (CD-Rom-Ausgabe): 3-938843-16-0

Startseite / Index:
<http://www.db-thueringen.de/servlets/DocumentServlet?id=12391>

A. Herasimovich

Electrical Investigations of the Source/Drain Contacts for the Field-Effect Transistors and MIS-Capacitors

SECTION HEADING 5

The electrical properties of the organic field effect transistors strongly depends on the quality of the drain and source contacts. The good contact is provided with not only the matched work function, but also with the absence of the parasitic resistance. We have investigated the influence of the contact material on the current characteristics of organic field-effect transistors (OFETs) and on the frequency response of MIS-capacitors. Aluminium contacts were evaporated on one half of the substrate and gold contacts on the other one. We examined also two different structures of the OFETs: top contact (TOC) and bottom contact (BOC). We have shown, that: i) contact material changes essentially electrical properties of devices: cut-off frequency, lateral and perpendicular mobilities are greater for Au-contact than ones for Al-contact, ii) BOC-transistors with Al-contacts don't work because of the Schottky contact, iii) output characteristics of the TOC-transistors with Au- and Al-contacts show non linear dependence at small drain voltage in contrast to the output characteristics of the BOC-transistors, iv) such nonlinearity is absent at small gate voltage and become stronger at the temperature decrease. We discuss these features taking into account 2D-calculations.

Authors:

Andrei Herasimovich
Ingo Hoerselmann
Susanne Scheinert
TU Ilmenau, Institut für Mikro- und Nanoelektronik, P.O.B. 100565
98694, Ilmenau, Germany
Phone: +49 3677 693406
Fax: +49 3677 693354
E-mail: Andrei.Herasimovich@tu-ilmenau.de