20 Years' Celebration of UPB-CETTI, 20 Years of Collaboration with Fraunhofer EMFT

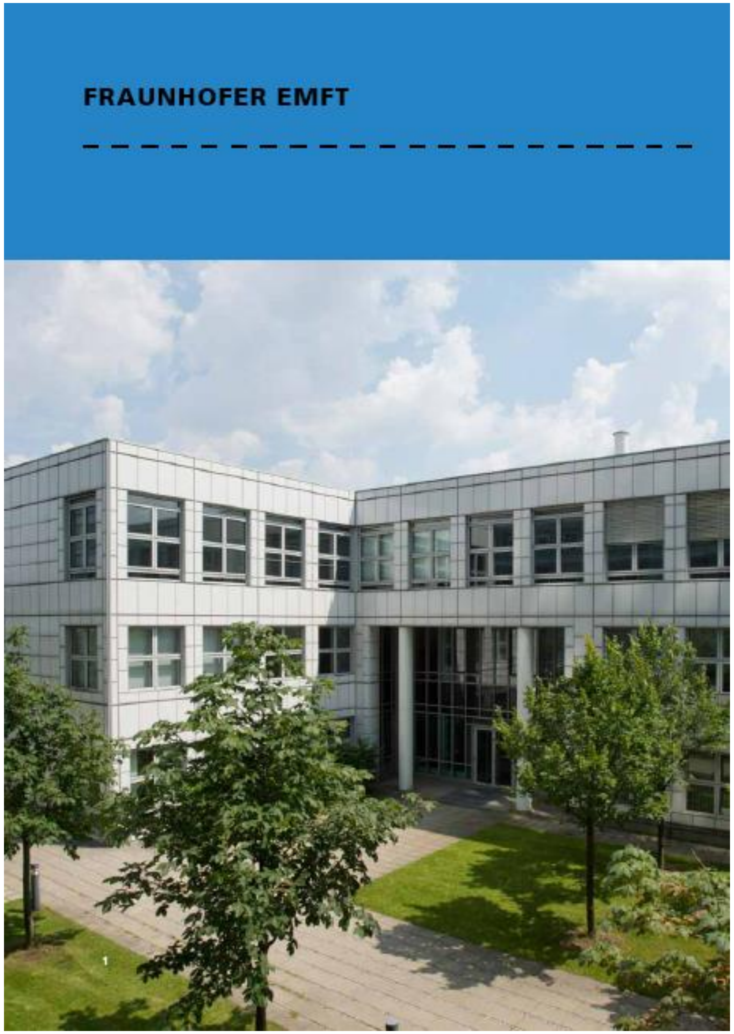
Center for Electronic Technology and Interconnection Techniques CETTI

University „POLITEHNICA“ of Bucharest, Romania

26.06.2015

Dr.–Ing. Detlef Bonfert

UPB-CETTI partner of FhG EMFT (Annual Report, 2014)



UPB-CETTI partner of FhG EMFT (Annual Report, 2014)

UPB-CETTI partner of FhG EMFT (Annual Report, 2014)

Technische Universität Berlin

Technische Universität Berlin and Fraunhofer EMFT are linked through the Professorship for Polytronic Microsystems under Prof. Bock. This department is dedicated to research into polymers, low-cost coating technologies and the characterization and control of polymeric surfaces and boundary layers in polymeric material composites as well as in hybrid multilayer technologies. Other research topics are in the areas of adhesion, interdiffusion barriers, electrical contacting of polymers and the self-arrangement and selective electronic alignment of semiconducting polymers. The more stable and more powerful layer systems thereby created serve to enhance the stability and reliability of the components of which they form a part – after all, many problems of reliability can be traced back to uncontrolled or impaired boundary layers within the synthetic composite.

Technische Universität Dresden

TU Dresden has been one of Germany's eleven Universities of Excellence since 2013. The honorary professorship of Prof. Peter Kücher at the Faculty of Electrical Engineering forms the basis for future cooperation with Fraunhofer EMFT: in his courses at the Institute for Semiconductors and Microsystems Technologies (IHM), the longstanding head of the Fraunhofer Center Nanoelectronic Technologies CNT focuses mainly on the connection between technological and economic challenges, since globalized competition entails changes such as specialization and resegmentation of the supply chain, which requires manufacturers of material, equipment and chips to adopt new strategic approaches.

Polytechnische Universität Bukarest, (Universitateat Politehnica Bucuresti, UPB), Romania

Universiteat POLITEHNICA of Bucharest developed from a polytechnic school dating back to 1864 and is now the most important technical university in Romania. There are longstanding collaborative links between Fraunhofer EMFT and the university's Faculty of Electronics, Telecommunications and Information Technology (ETTI) as well as its Department of Electronic Technology and Reliability (TEF). This cooperation allows several staff of the TEF department to undertake scientific internships at Fraunhofer EMFT. A number of doctoral students from the TEF department also use the experimental facilities at Fraunhofer EMFT. The collaboration between the two institutions has resulted in joint conference presentations and publications.

What history says:

-Restarting discussions with Prof. Svasta in 1990 possible

-Starting membership at ISHM-Germany as the first umbrella for packaging

-First research exchange of Prof. Svasta at Fraunhofer-IFT in Munich, 3 month work-visit in 1994, courtesy of DAAD-Germany

-research exchange of Prof. Ionescu at Fraunhofer-IFT in Munich, 3.5 month work-visit in 1996, (courtesy of DAAD-Germany ?)

-Second research exchange of Prof. Svasta at Fraunhofer-IFT in Munich, 2 month work-visit in 1997, courtesy of DAAD-Germany

Prof. Svasta at Fraunhofer-IFT, DAAD Funded, 1994

FhG IFT

FRAUNHOFER-INSTITUT FÜR FESTKÖRPERTECHNOLOGIE

Institutsleitung:
Prof. Dr. Ingolf Ruge

Hansastraße 27d
D-8000 München 21

Telefon (089) 54759-000
Telefax (089) 54759-100
Telex 5213522 ift d

Prof. Dr.-Ing. Paul Svasta
str. Desisului 131
bl. 1, ap. 18
RO-77576 Bukarest 16
Rumänien

Unser Zeichen: -/bon

D. Bonfert
048
23.3.93

Ihr Schreiben vom 4.2.93

Sehr geehrter Herr Professor Svasta,

in unserer Abteilung Mikrotechniken und Systeme verfügen wir über ein modernes, gut ausgestattetes Hybridlabor, in dem Dickschichtwiderstände entworfen, hergestellt und untersucht werden können. Daher könnten Sie, wie von Ihnen vorgeschlagen, im Rahmen eines DAAD-Stipendiums die von Ihnen genannte Thematik von Dickschichtwiderständen, betreffend Geometrieabhängigkeit, Trimmbarkeit und Zuverlässigkeit in unserem Labor bearbeiten und mit unseren wissenschaftlichen Mitarbeitern einen Informationsaustausch durchführen.

Zu diesem Zweck bitten wir Sie, nach Absprache mit dem DAAD uns den gewünschten Zeitraum mitzuteilen.

Mit freundlichen Grüßen,

i. A. Detlef Bonfert

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.

DEUTSCHER AKADEMISCHER AUSTAUSCHDIENST

PROGRAMMABTEILUNG NORD

DAAD . Postfach 200 404 . D-53134 Bonn

Kennedyallee 50, D-53175 Bonn
Telefon (0228) 882-0
Telegrammanschrift: DAAD
Telex: 88 55 15 daad d
Telefax: (0228) 882 444

- Referat 324 -
Südosteuropa

Herrn
Detlef Bonfert
Fraunhofer-Institut für
Festkörpertechnologie
Hansastr. 27d

80686 München

Ihr Zeichen	Ihre Nachricht	Unser Zeichen	Tel.-Durchwahl	Datum
		324-ro-94-lam	882 420	17.03.1994

Betr.: Studienaufenthalte ausländischer Wissenschaftler in der Bundesrepublik Deutschland im Jahre 1994

hier: Herr Prof. Dr.-Ing. Paul SVASTA aus Rumänien

Bezug: Ihr Schreiben an Herrn Professor Svasta vom 23.03.1993

Sehr geehrter Herr Bonfert,

ich freue mich, Ihnen heute mitteilen zu können, daß der Auswahlausschuß des Deutschen Akademischen Austauschdienstes den obengenannten Wissenschaftler zu einem Studien- bzw. Forschungsaufenthalt in die Bundesrepublik Deutschland eingeladen hat.

Nähere Einzelheiten entnehmen Sie bitte dem in Kopie beigefügten Einladungsschreiben.

Mit freundlichen Grüßen

i.A. (Sabine Lamberz)

Anlage

Research Report “Hybrid Technology”, 1994

Wissenschaftlicher Bericht

Während meine Studienaufenthalts an Fraunhofer Institut für Festkorpertechnologie-München zwischen dem 17.10. - 17.12.1994 habe ich mich mit der Problematik der Dickschichttechnik beschäftigt.

Gemeinsam mit den Mittarbeiter der Gruppe unter der Leitung des Dipl. Phys. Michael Feil, wurde ein Forschungsprogramm im Rahmen des Dickschichttechnik entwickelt. Die Forschungsergebinesse solten für die Datenbank in Design von Hybridschaltungen dienen.

Dementsprechend wurde ein Teststruktur für die Widerständpasten konzepiert. Es wurden sowohl das Länge/Breite (L/B) Verhältnis als auch die Breite des Widerstandes berucksichtigt. Eine Zusamerfassung der betrachteten Widerstandsgeometrien kann man im Bild 1 beobachten.

Zeile \ Spalte		1	2	3	4	5	6	7	8	9
	B [mm] \ L/B	0,3	0,5	0,7	1	2	3	5	7	10
1	1	-	-	R_{13}	R_{14}	R_{15}	R_{16}	R_{17}	R_{18}	R_{19}
2	1,5	-	-	R_{23}	R_{24}	R_{25}	R_{26}	R_{27}	R_{28}	-
3	2	-	R_{32}	R_{33}	R_{34}	R_{35}	R_{36}	R_{37}	R_{38}	-
4	2,5	-	R_{42}	R_{43}	R_{44}	R_{45}	R_{46}	R_{47}	-	-
5	3	R_{51}	R_{52}	R_{53}	R_{54}	R_{55}	R_{56}	-	-	-
6	4	R_{61}	R_{62}	R_{63}	R_{64}	R_{65}	-	-	-	-

Bild 1. Die Darstellung der untersuchten Widerstandsgeometrien.

Tabelle 1 Tabel mit den Widerstandspasten die auf Keramiksubstraten gedruckt wurden

Widerstands-pastetyp	Herstetle	Oberfläch-widerstand [Ω/□]	Reiefolge des Substrats	Substrat typ	Schichtdick messungen an Substrat nummer
FK 9211 E4	Fh G-IKTS Dresden	10	1-10	Aluminium nitrid (AlN)	2,5,10
FK 9221 E7	Fh G-IKTS Dresden	100	11-20	-"-	12,15,20
FK 9231 E8	Fh G-IKTS Dresden	1000	21-30	-"-	22,25,30
FK 9241 E4	Fh G-IKTS Dresden	10000	31-40	-"-	32,35,36,40
FX 89009	FERRO	10000	41-49	-"-	42,45,46,48
HS 8011	Du Pont	10	1-20	Aluminium oxid (Al_2O_3)	2,10,20
HS 8021	Du Pont	100	21-40	-"-	22,30,40
HS 8031	Du Pont	1000	41-60	-"-	42,50,60
HS 8041	Du Pont	10000	61-80	-"-	62,70,80
HS 8041	Du Pont	100000	81-100	-"-	82,90,100
1610	Du Pont	10	101-120	Aluminium oxid (Al_2O_3)	102,110,120
1620	Du Pont	100	121-140	-"-	122,130,140
1631	Du Pont	1000	141-160	-"-	142,150,160
1641	Du Pont	10000	161-180	-"-	162,170,180
1651	Du Pont	100000	181-200	-"-	182,190,200

Research Report "Hybrid Technology", 1994

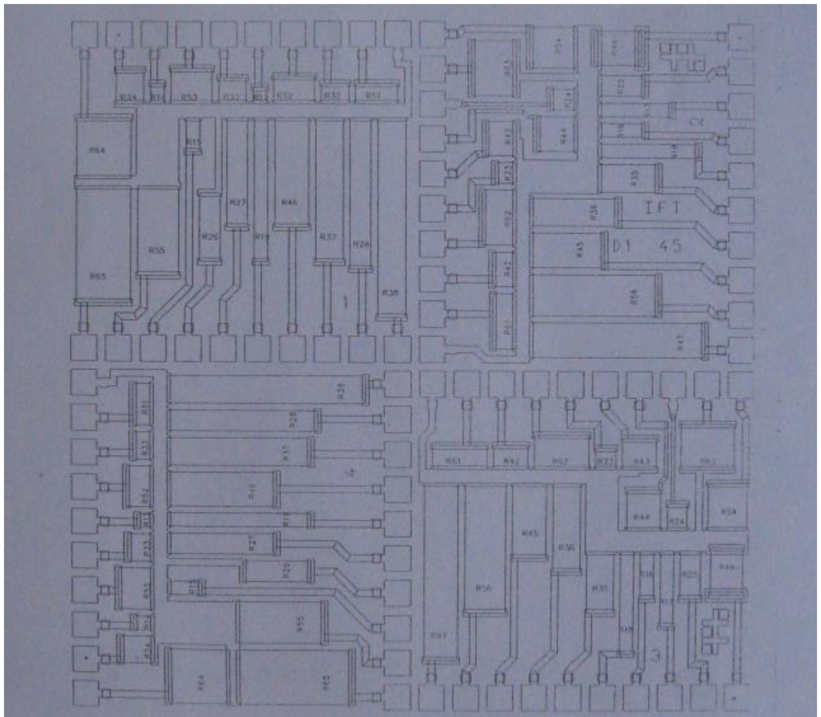
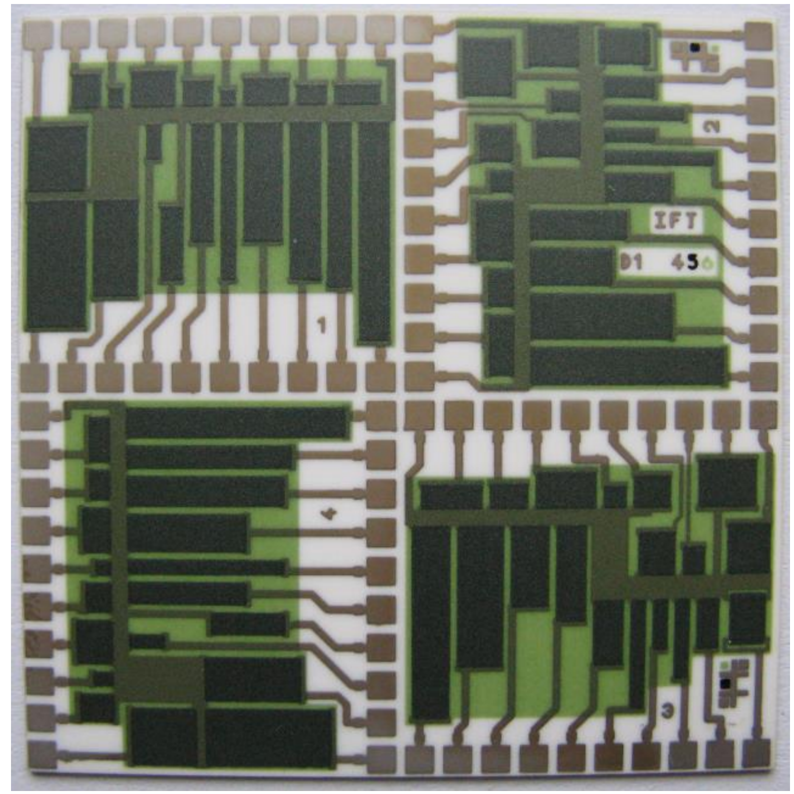


Bild 2. Die Darstellung der Testwiderständen auf dem Keramiksubstrat.



Research Report “Thick Film Pastes for Laser-sensor”, 1996

Wissenschaftlicher Bericht

As. ing. Ciprian Ionescu,
Universitatea "Politehnica" din București
Splaiul Independenței 313, 77206 - București, România
Tel: +40-1-4116674
E-mail: ciprian@cadtieccp.pub.ro

Teil I

Im Zeitraum 1 April 1996 -15 Juli 1996 war ich Gast an Fraunhofer-Instititut für Festkörpertechnologie München im Rahmen einer Zusammenarbeit zwischen unsere Institute. Während meinen Studienaufenthalts habe ich mich mit dem Problem der Dickschichttechnik im Hybridlabor beschäftigt.

Mein Zweck war einige neue Dickschichtpasten die temperaturabhängige Widerstand besitzen zu analysieren. Als Anwendung für diese Pasten, in Absicht war die Entwicklung eines Laser Leistungssensor basiert auf thermische Wirkungen, die der Laser Strahl verursacht.

In diese Richtung habe ich eine Reihe von 4 Pasten versucht, die Widerstände mit einer großer Temperaturempfindlichkeit erzeugen könnten. Eine kurze Beschreibung der Pasten wird in Taffel 1 gezeigt:

Taffel 1 *Bescreibung der versuchten Pasten*

Widerstand-pastetyp	Hersteller	Erzeugene Thermische Kurve	Flächen-widerstand (kΩ/□)	Einbrennprofil	Empfohlenen Leiterpasten
5093D	DuPont	PTC	1	850 °C, 30 min.	AgPd 7478
DPTC2653A	ESL	PTC	5	850 °C, 60 min	Ag Pd 9653
2413	ESL	NTC	1	930 °C, 45 min	AgPd 9600
2414	ESL	NTC	10	930 °C, 45 min	AgPd 9600

Zum Anfang wurden Teststrukturen deponiert für die Charakterisierung der Pasten. Danach wird auch das Sensor layout deponiert.
Das Teststruktur ermöglicht die Rechnung der Streung der Werte von Widerstände über mehrere Substrate und auch auf gleichem Substrat die Einflusse von L/B Verhältnis und Widerstanddicke. Das Layout vom Teststruktur wird in Abb. 1 gezeigt.

Die Leiterbahnen habe ich mit einer 325 Mesh Siebe deponiert und für alle Widerstände habe ich eine 200 Mesh Siebe benutzt.

Für die Schichtdicke Messung es war nur ein Substrat von ganze Reihe gemessen. Die Ergebnisse werden im Taffel 2 vorgestellt.

Taffel 2 *Dicke der Widerstandschichten*

Paste	Naß Dicke (μm)	Getrocknete Dicke(μm)	Gebrannte Dicke (μm)
5093D	43 — 47	24,7 — 25,6	17 —18
2653A	44— 48	30 — 32	18,8 — 19,6
2413	45,2 — 47,6	28,8 — 31,5	17,9 — 19,9
2414	45,7 — 47	29 — 31	18,1 — 19

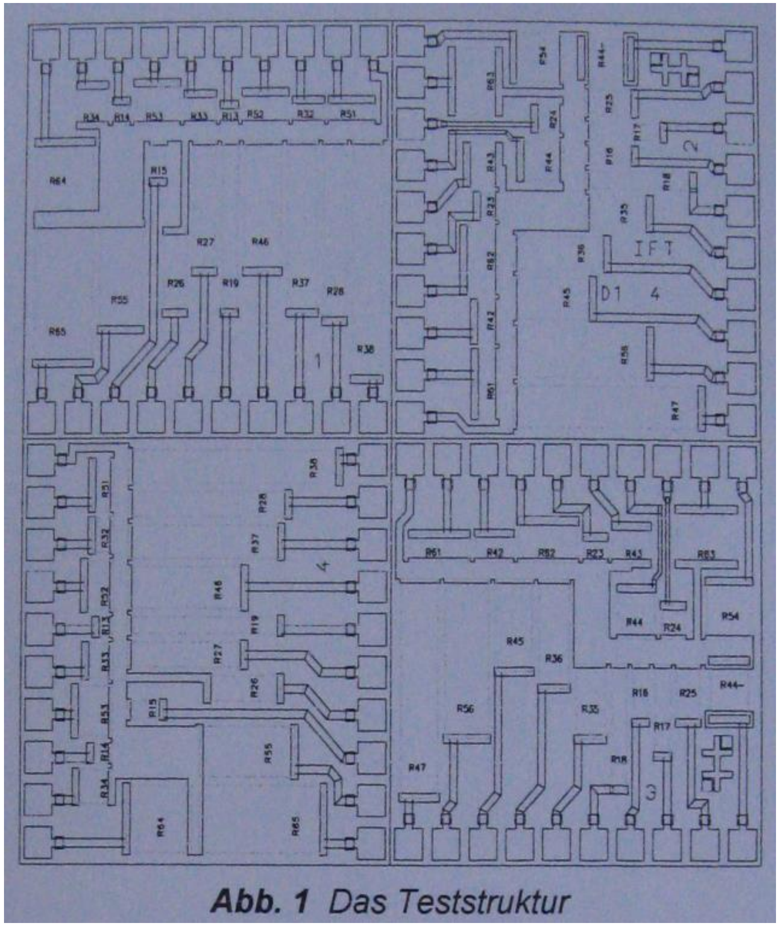
In diesem Teil meinem Bericht werde ich nur die Messergebnisse über die Teststruktur Depositionen. Der zweite Teil wird auch die Sensor-Messungen umfassen.

Die Reihenfolge von aller deponierten Substrate wird in Taffel 3 gezeigt.
Für alle Teststrukturen wurden TKR Messungen durchgeführt. Die meisten Proben wurden, wegen technische Scwierigkeiten, nur in einem Temperaturbereich von +25 - +125 °C gemessen.

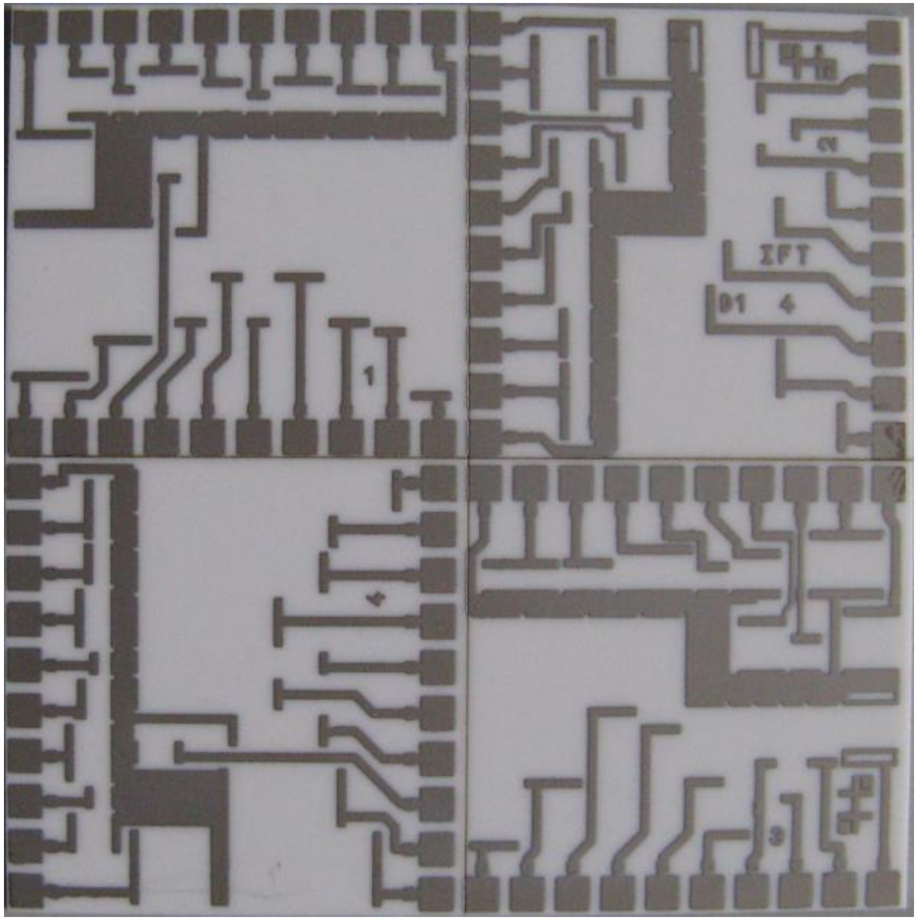
Taffel 3 *Kennzeichen der Substrate*

Markierung der Substrate	Paste	Layout typ	Bemerkungen
D1—D21	5093D	Teststruktur	
D30—D33	5093D	Sensor	
D50—D53	5093D	Sensor	Heizwiderstand
D54	5093D	Sensor	1 mm dick Substrat
D55	5093D	Sensor	2 mm dick Substrat
D56	5093D	Sensor	0,4 mm dick Substrat
D57—D59	5093D	Sensor	zwei mal gebrannten Subst
D60,D62,D64,D66, D68,D70	5093D	Sensor	Ringe+ zentrale Deposition in mehrere Schichten + Overglase
D61,D63,D65,D67, D69,D71	5093D	Sensor	Ringe+ zentrale Deposition in mehrere Schichten ohne Overglase
E1—E6	PTC 2653A	Teststruktur	850 °C /60 min. profil
E7—E8	NTC2414	Teststruktur	950 °C /60 min. profil
E9—E12	NTC2414	Teststruktur	930 °C /45 min. profil
E13—E18	NTC2413	Teststruktur	930 °C /45 min. profil
E30—E36	NTC2413	Sensor	
E37—E43	DPTC2653 A	Sensor	
E44—E50	NTC2414	Sensor	

Research Report “Thick Film Pastes for Laser-sensor”, 1996



Layout of resistor test- structure



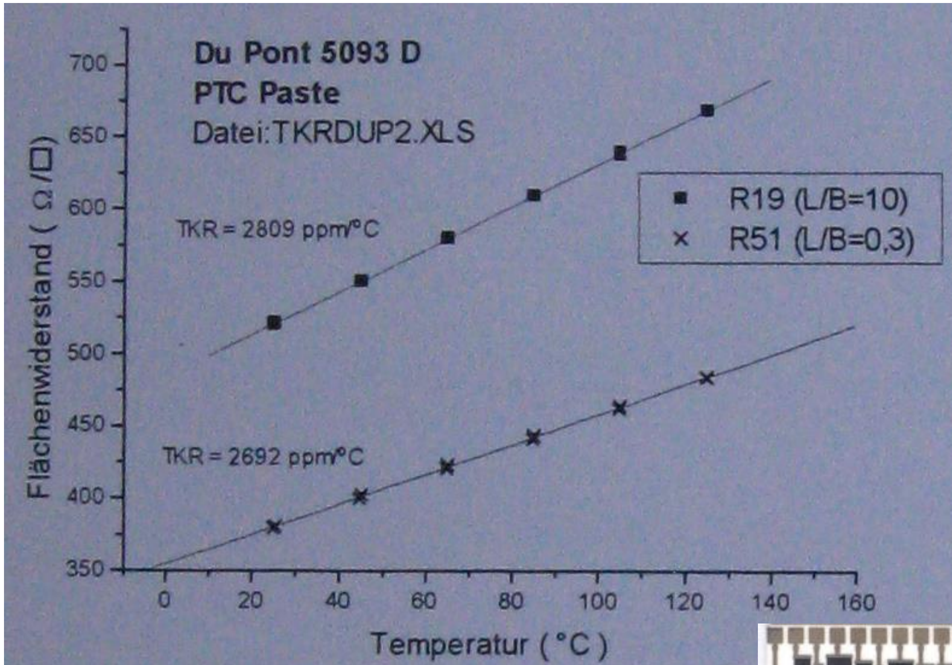
Realized resistor test- structure

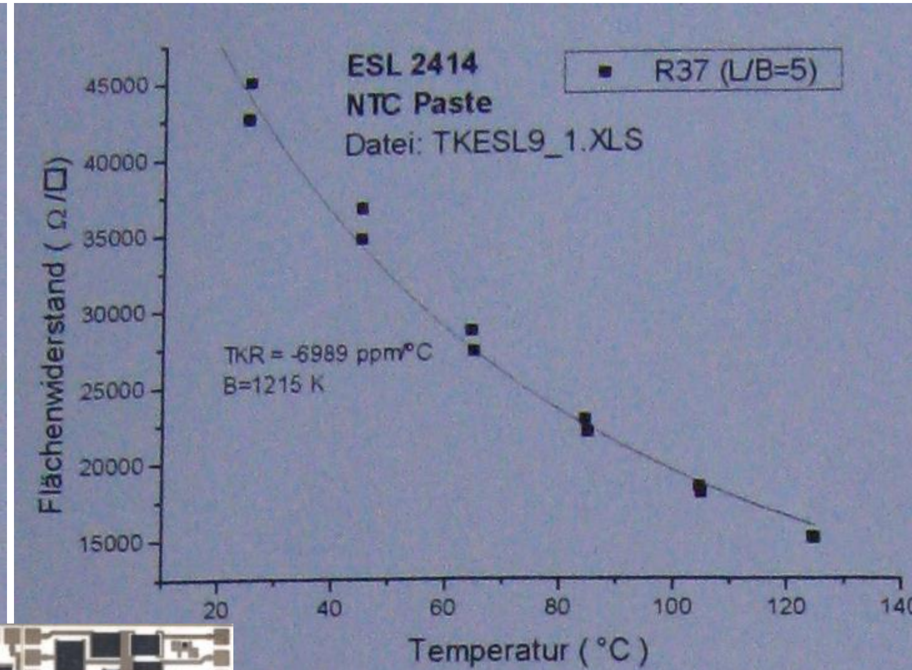
Research Activities at Fraunhofer IFT, 1996

CETTI Researcher Ionescu

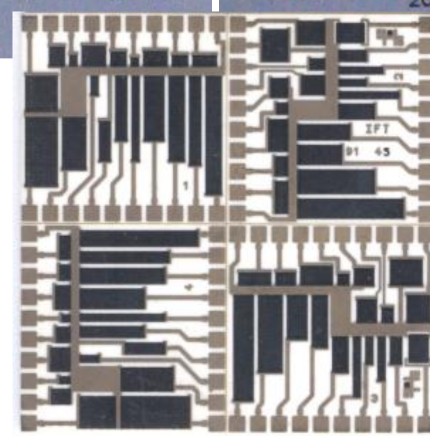
IFT Researcher Hemmetzberger

Results “Thick Film Pastes for Laser-sensor”, 1996



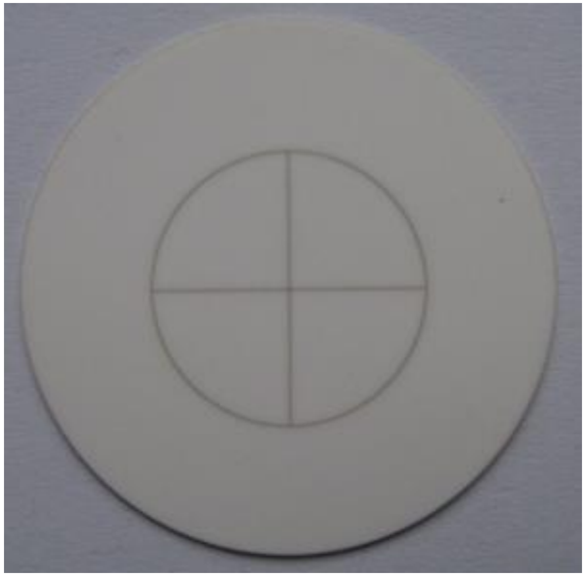


PTC Paste, TCR=2809 ppm/°C

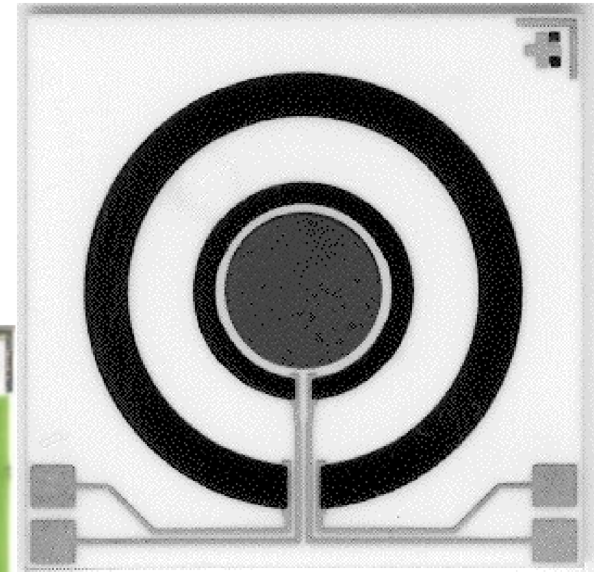


NTC Paste, TCR=-6989 ppm/°C

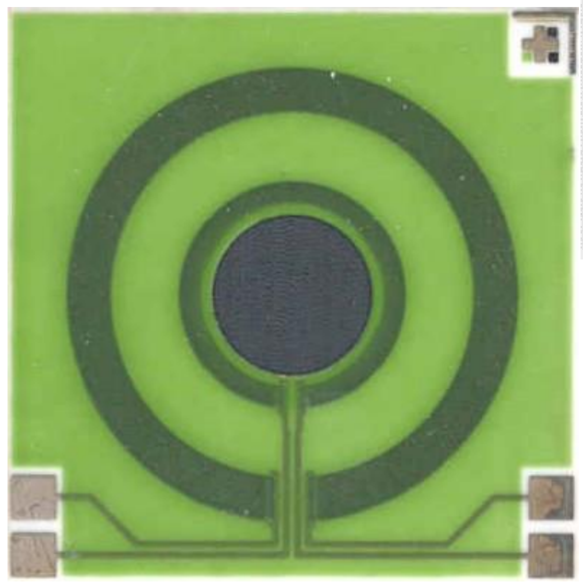
Results “Thick Film Pastes for Laser-sensor”, 1996



Laser prepared substrate



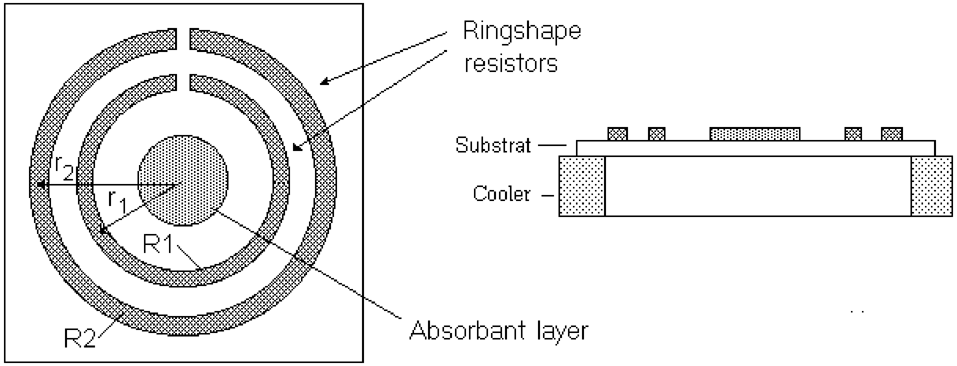
Printed laser sensor



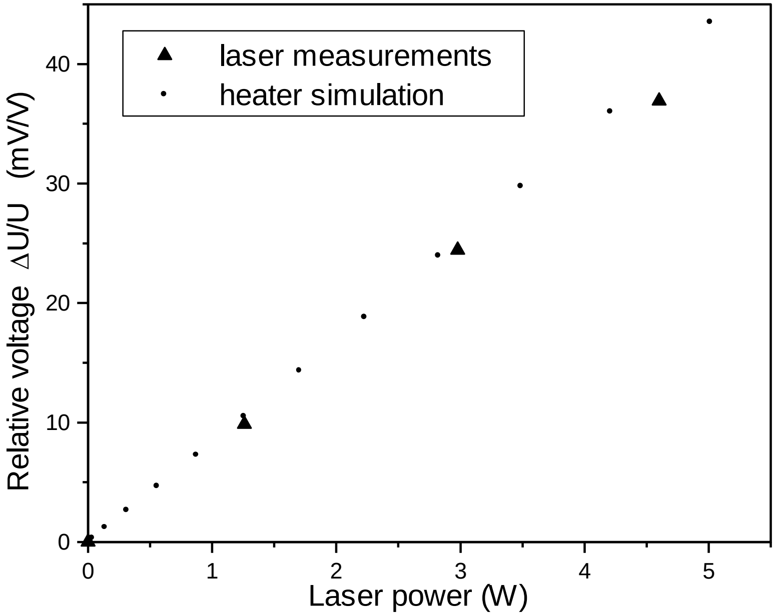
Overglaze covered laser sensor

Fraunhofer EMFT

Results “Thick Film Pastes for Laser-sensor”, 1996

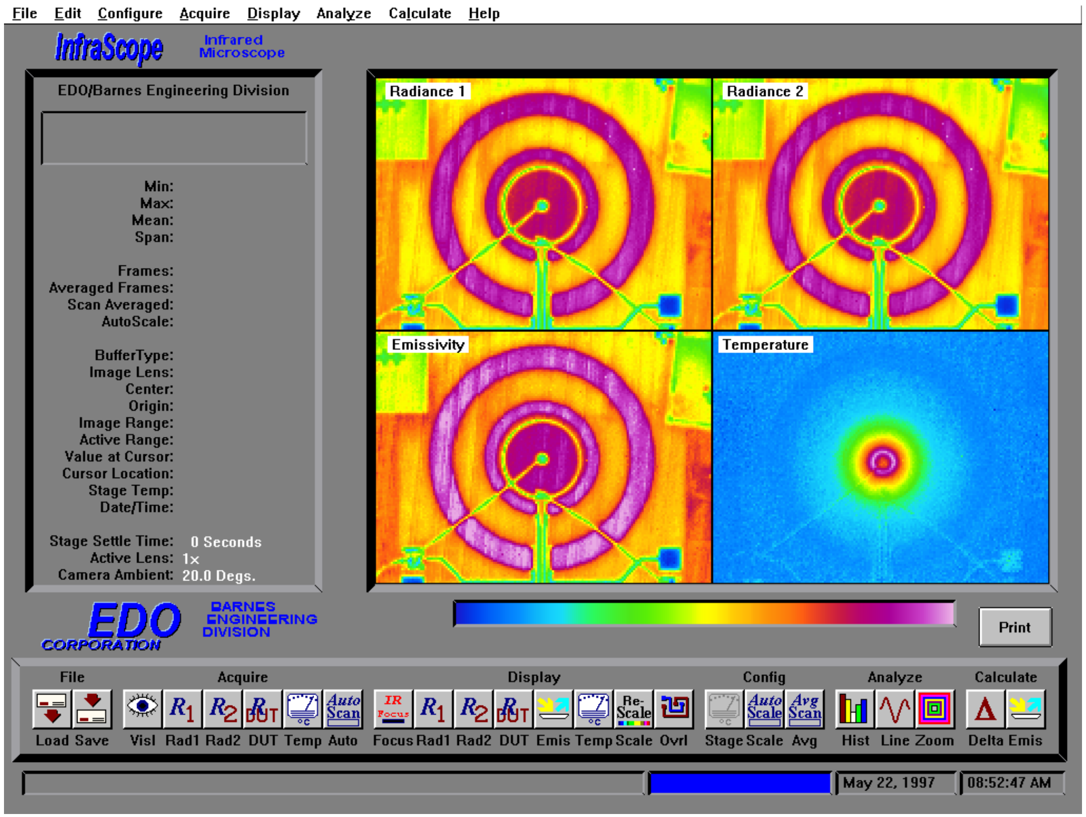


Layout of laser sensor

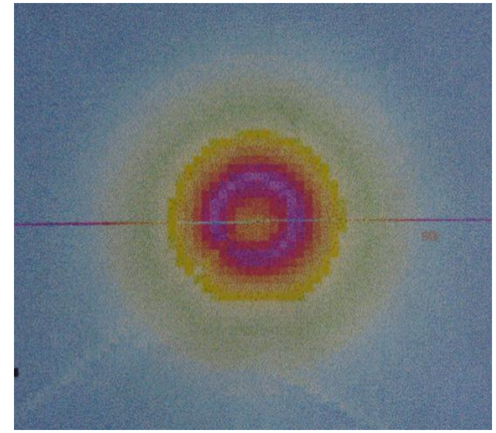


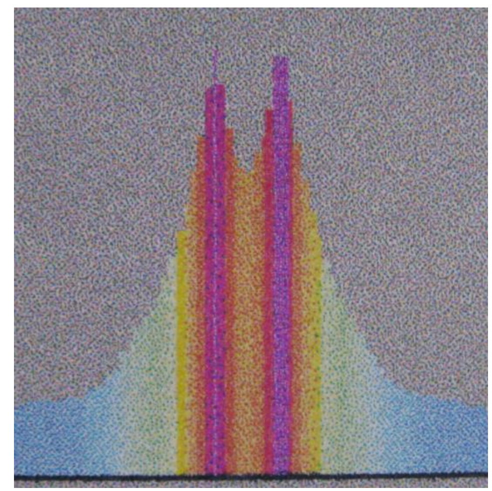
Electrical response of irradiated laser sensor

Results “Thick Film Pastes for Laser-sensor”, 1996



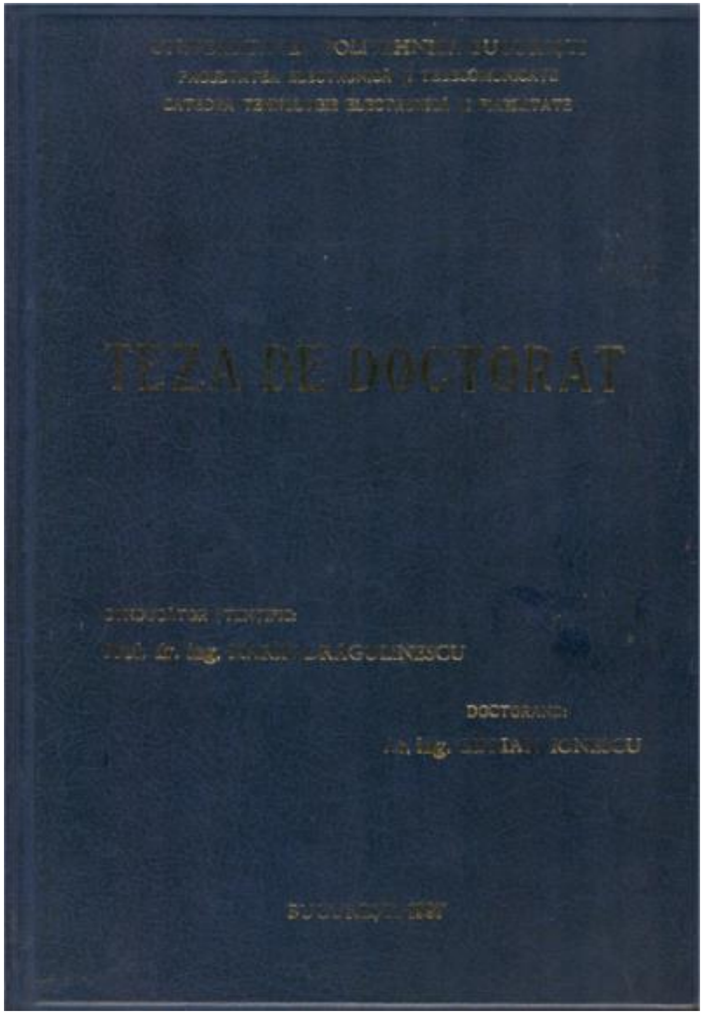
InfraScope IR Temperature Measurement





IR temperature profiles

PhD Thesis



UNIVERSITATEA "POLITEHNICA" din BUCUREŞTI
Facultatea Electronică şi Telecomunicaţii
Catedra Tehnologie electronică şi fiabilitate

REZISTOARE CU COEFICIENT DE TEMPERATURĂ CONTROLAT

TEZĂ DE DOCTORAT

Doctorand : As. ing. Ciprian IONESCU

Conducător ştiinţific

Prof. dr. ing. Marin DRĂGULINESCU

Bucureşti 1997

Research Activities at Fraunhofer IFT, 1996

CETTI Researcher at work at IFT

2-nd Research Report "Hybrid Technology", 1997

Fraunhofer Institut Festkörpertechnologie

IFT

Fraunhofer IFT Hansastraße 27 d D-80686 München

Herrn Prof. Dr.-Ing. Paul Svasta
Universität Politehnica
Hochschule für Elektronik und Telekom.
Lehrstuhl für Elektronische Technologie
und Zuverlässigkeit

Spl. Independentei 313
Ro-77206 Bukarest / Rumänien

Institutsleitung
Prof. Dr. Ingolf Ruge
Dr. Konrad Hieber

Hansastraße 27 d
D-80686 München

Telefon +49 (0) 89/5 47 59-0 00
Telefax +49 (0) 89/5 47 59-100

Bearbeiter: Detlef Bonfert
Durchwahl +49 (0) 89/5 47 59-298
e-mail: bonfert@ ift.fhg.de

München,
26. Januar 1997

Betrifft Forschungsaufenthalt 1997

Sehr geehrter Herr Professor Svasta,

der Deutsche Akademische Austauschdienst hatte Sie 1994 zu einem zweimonatigen Studien- bzw. Forschungsaufenthalt in die Bundesrepublik Deutschland eingeladen. Die Arbeiten konnten Sie damals in unserer Abteilung Mikrotechniken und -systeme im Hybridlabor in Zusammenarbeit mit unseren Mitarbeitern durchführen. Wegen des umfangreichen Vorhabens konnten Sie nicht die gesamten Aspekte von Dickschichtwiderständen auf Aluminiumnitridkeramik behandeln. Daher wären noch die Themen wie Trimmbarkeit, Stromrauschen und Zuverlässigkeit zu bearbeiten.
Bezug nehmend auf Ihre Anfragen vom 04.12.96 bzw. 07.01.97 teile ich Ihnen mit, daß Sie im Rahmen eines weiteren DAAD-Stipendiums die noch anstehenden Untersuchungen in unserer Abteilung durchführen könnten, um Ihre begonnene Arbeit sinnvoll zu vervollständigen. Der von Ihnen vorgeschlagene Zeitraum 15.10.97 bis 15.12.97 erlaubt ein rechtzeitiges Vorbereiten Ihres Vorhabens.

Mit freundlichen Grüßen,

Dr. Bernd Hillerich

Abteilungsleiter Mikrotechniken und -systeme

DAAD-Zusage erhalten
11.03.97

DEUTSCHER AKADEMISCHER AUSTAUSCHDIENST

PROGRAMMABTEILUNG NORD

DAAD . Postfach 200 404 . D-53134 Bonn

Herrn Professor
Dr. Paul Svasta
Cetatea de Balta Nr. 131 Bl. 1/Ap. 18

Bukarest
Rumänien

Kennedyallee 50, D-53175 Bonn
Telefon (0228) 882-0
Telegrammanschrift: DAAD
Telex: 88 55 15 daad d
Telefax: (0228) 882 444

- Referat 324 -
Südosteuropa

Ihr Zeichen	Ihre Nachricht	Unser Zeichen	Tel.-Durchwahl	Datum
		324-ro-97-lam	882 420	28.02.1997

Betr.: Ihr Antrag für einen Studienaufenthalt in der Bundesrepublik Deutschland

Sehr geehrter Herr Prof. Dr. Svasta,

ich freue mich, Ihnen mitteilen zu können, daß der DAAD Sie zu einem Studienaufenthalt in die Bundesrepublik Deutschland einlädt. In der Anlage übersende ich Ihnen

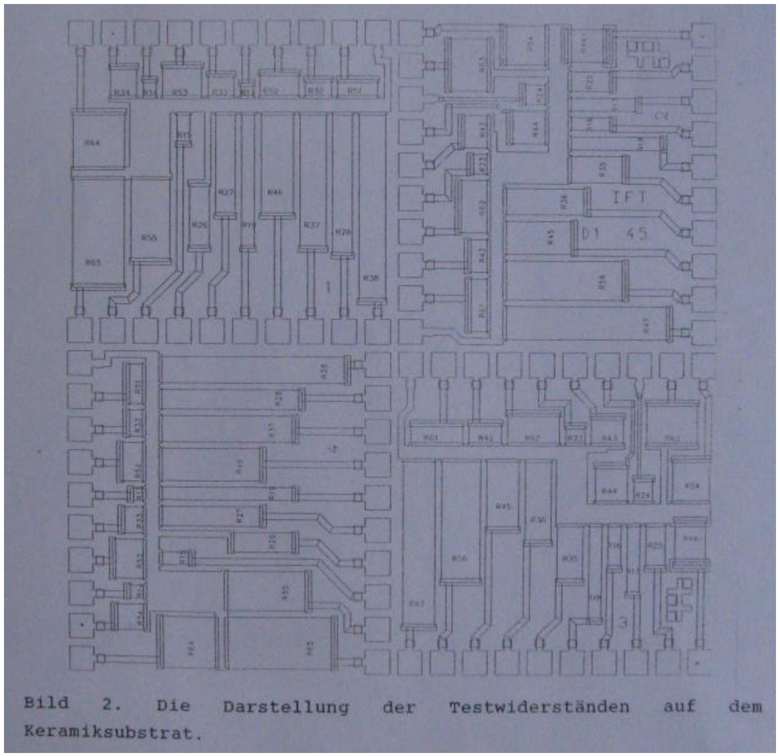
- die vom Präsidenten des DAAD unterzeichnete Einladung;
- die Förderungszusage mit näheren Angaben über Art und Höhe der vom DAAD übernommenen Leistungen;
- die Annahmeerklärung, die Sie uns möglichst umgehend unterschrieben zurücksenden sollten, damit die Förderungszusage in Kraft tritt;
- weitere für Ihr Vorhaben nützliche Informationen.

Der Förderungsbetrag wird über die jeweilige Hochschul- oder Institutskasse bzw. über das DAAD-Büro Berlin ausgezahlt. Bei mehrmonatigen Aufenthalten erhalten Sie die erste Monatsrate bei Ankunft am Hochschulort. Nachdem Sie uns Ihre Ankunft bestätigt haben, erhalten Sie die zweite Rate sowie gegebenenfalls die dritte Rate an dem Hochschulort, an dem Sie sich zu diesem Zeitpunkt aufhalten.

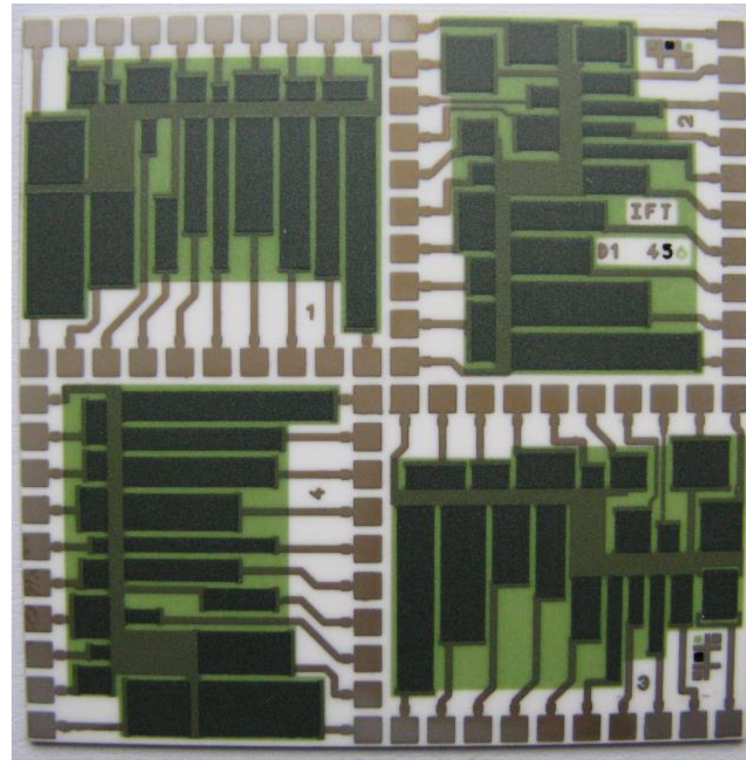
Eine Verlängerung der Förderung über den angegebenen Zeitraum hinaus ist nicht möglich.

- 2 -

Research Report “Hybrid Technology”, 1997



Layout of resistor test- structure



Realized resistor test- structure

Research Report “Hybrid Technology”, 1997

Big Data, measurement results

Resistors ready
for measurement

Acting Director of EMFT Dr.h.c. of UPB-ETTI

Laudatio and Dr.h.c. Ceremony at UPB-ETTI

Laudatio

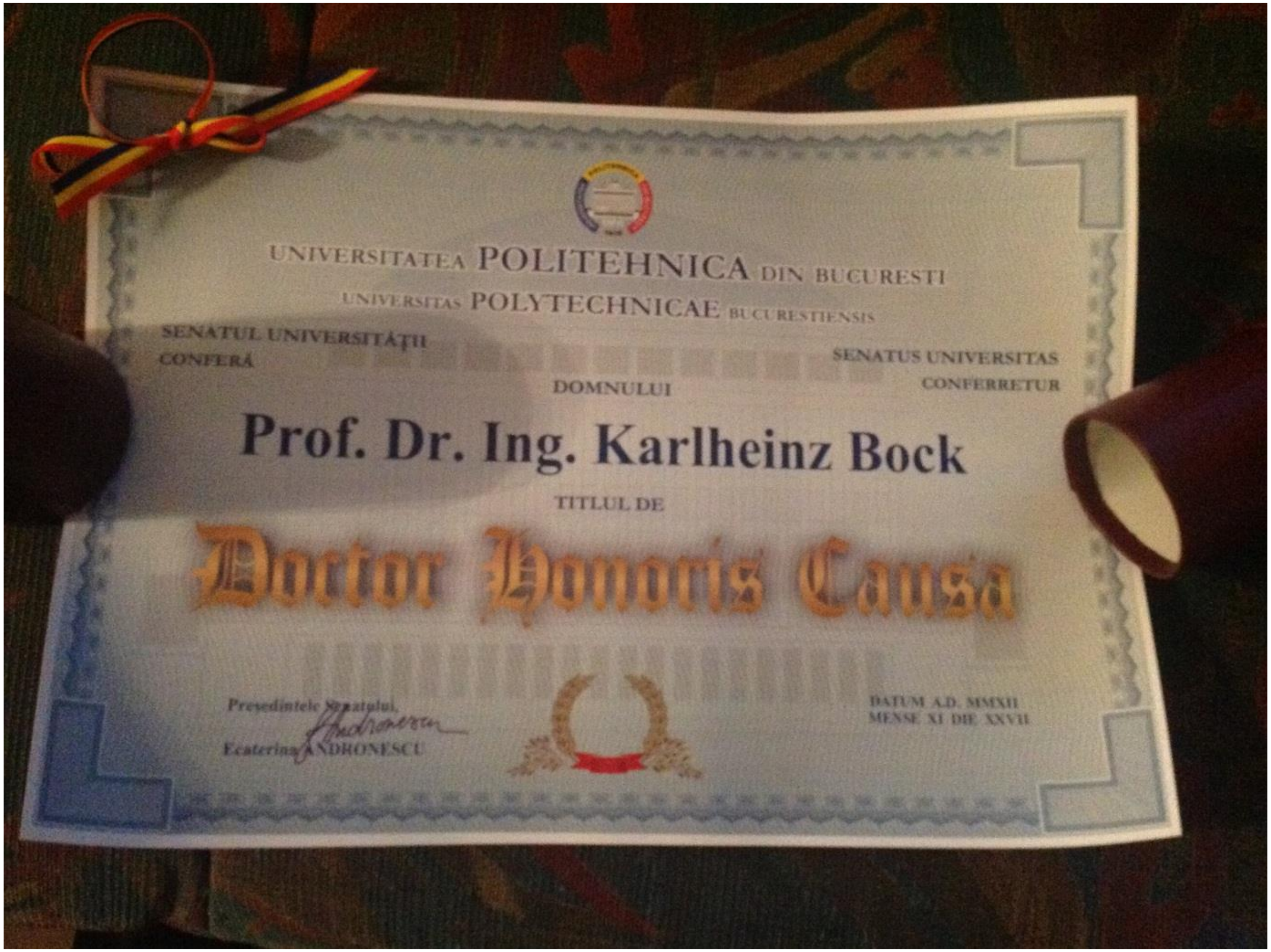
anlässlich der Verleihung
der Ehrendoktorwürde

Doctor Honoris Causa

an

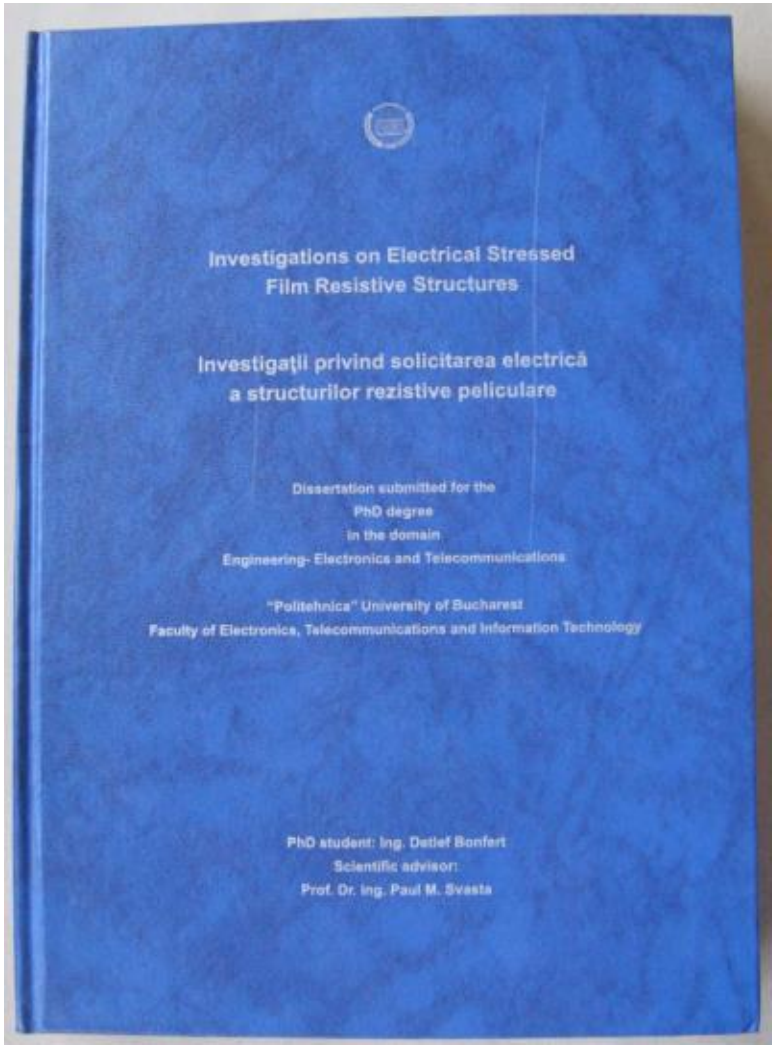
Herrn Prof.Dr. -Ing. Karlheinz Bock

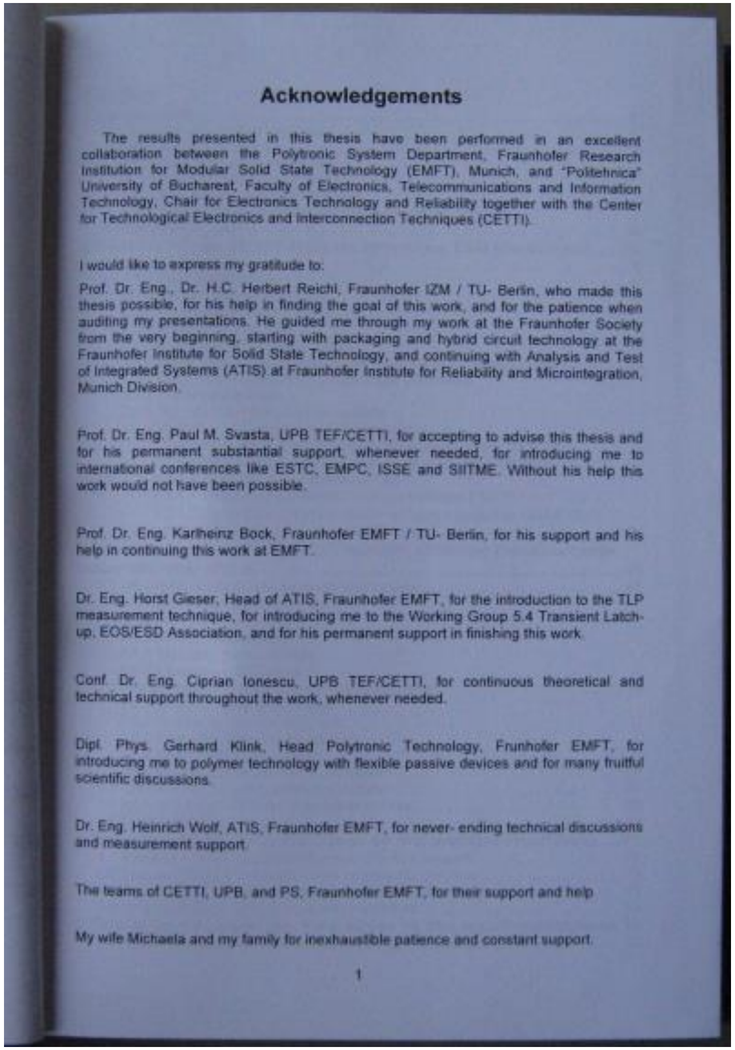
Dr.h.c. Diploma



During Dr.h.c. Ceremony at UPB-ETTI

PhD Thesis





Acknowledgements

The results presented in this thesis have been performed in an excellent collaboration between the Polytronic System Department, Fraunhofer Research Institution for Modular Solid State Technology (EMFT), Munich, and "Politehnica" University of Bucharest, Faculty of Electronics, Telecommunications and Information Technology, Chair for Electronics Technology and Reliability together with the Center for Technological Electronics and Interconnection Techniques (CETTI).

I would like to express my gratitude to:

Prof. Dr. Eng., Dr. H.C. Herbert Reichl, Fraunhofer IZM / TU- Berlin, who made this thesis possible, for his help in finding the goal of this work, and for the patience when auditing my presentations. He guided me through my work at the Fraunhofer Society from the very beginning, starting with packaging and hybrid circuit technology at the Fraunhofer Institute for Solid State Technology, and continuing with Analysis and Test of Integrated Systems (ATIS) at Fraunhofer Institute for Reliability and Microintegration, Munich Division.

Prof. Dr. Eng. Paul M. Svasta, UPB TEF/CETTI, for accepting to advise this thesis and for his permanent substantial support, whenever needed, for introducing me to international conferences like ESTC, EMPC, ISSE and SIITME. Without his help this work would not have been possible.

Prof. Dr. Eng. Karlheinz Bock, Fraunhofer EMFT / TU- Berlin, for his support and his help in continuing this work at EMFT.

Dr. Eng. Horst Gieser, Head of ATIS, Fraunhofer EMFT, for the introduction to the TLP measurement technique, for introducing me to the Working Group 5.4 Transient Latch-up, EOS/ESD Association, and for his permanent support in finishing this work.

Conf. Dr. Eng. Ciprian Ionescu, UPB TEF/CETTI, for continuous theoretical and technical support throughout the work, whenever needed.

Dipl. Phys. Gerhard Klink, Head Polytronic Technology, Frunhofer EMFT, for introducing me to polymer technology with flexible passive devices and for many fruitful scientific discussions.

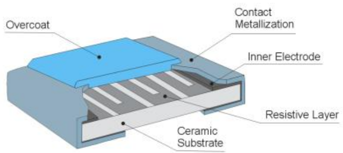
Dr. Eng. Heinrich Wolf, ATIS, Fraunhofer EMFT, for never- ending technical discussions and measurement support.

The teams of CETTI, UPB, and PS, Fraunhofer EMFT, for their support and help.

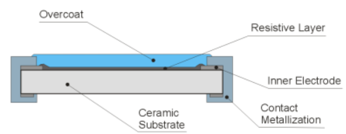
My wife Michaela and my family for inexhaustible patience and constant support.

Investigated Resistive Structures

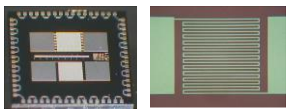
Thin Film



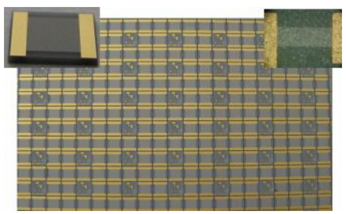
a)



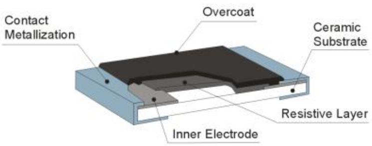
b)

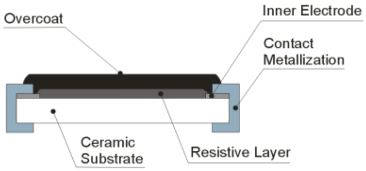


a) b)



Thick Film

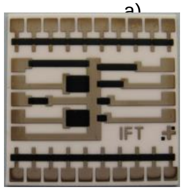




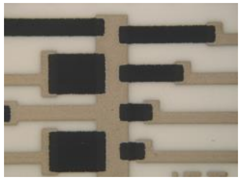
b)

a)

b)



a)



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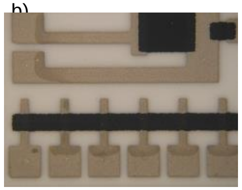
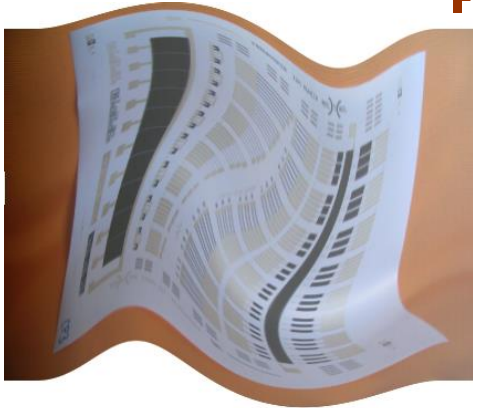
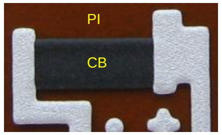


c)

Polymer resistive film on foil





a)

b)

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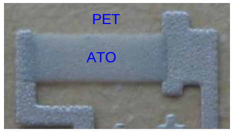
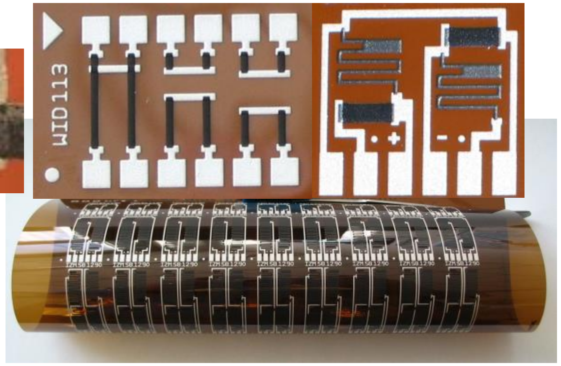


d)



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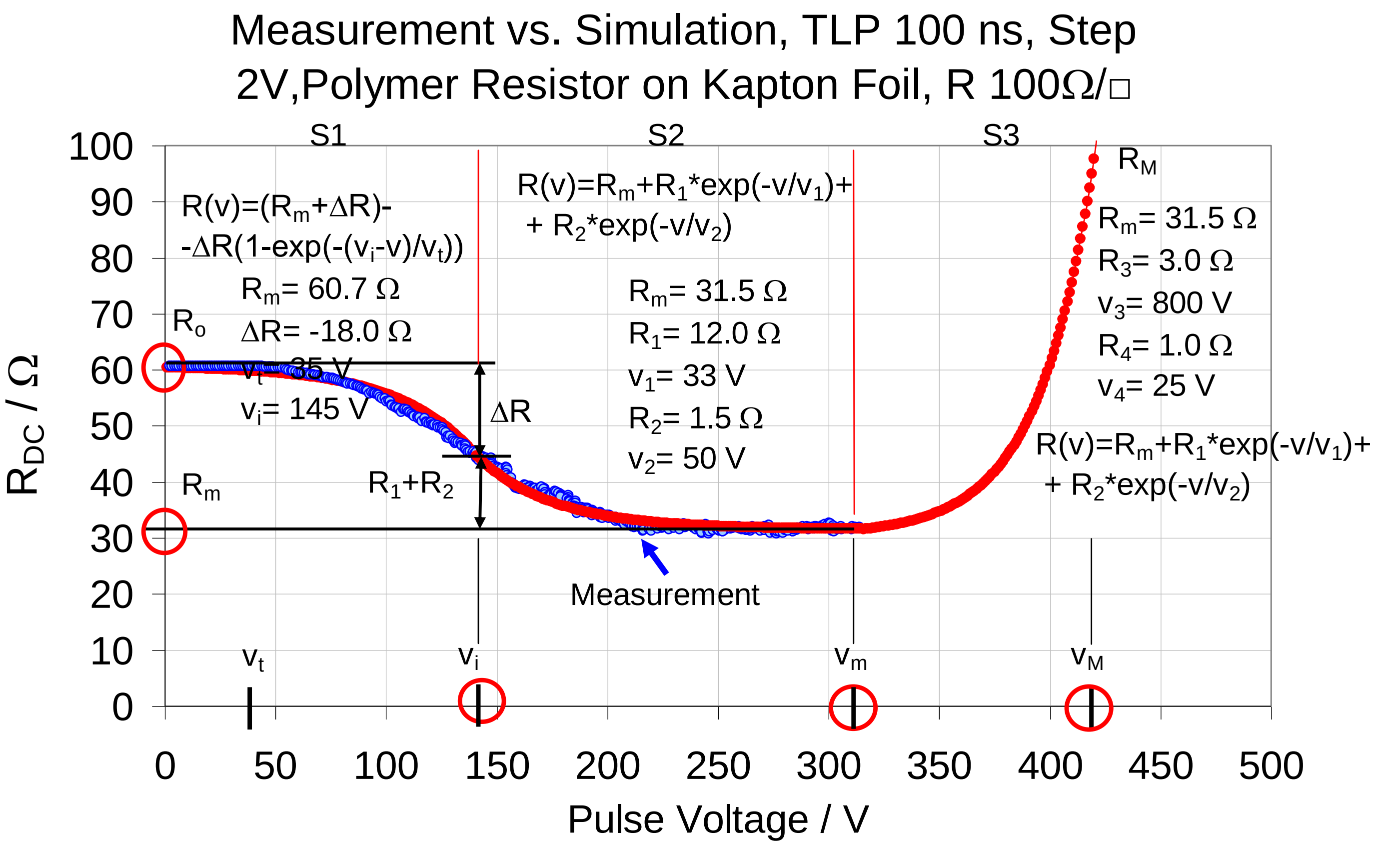
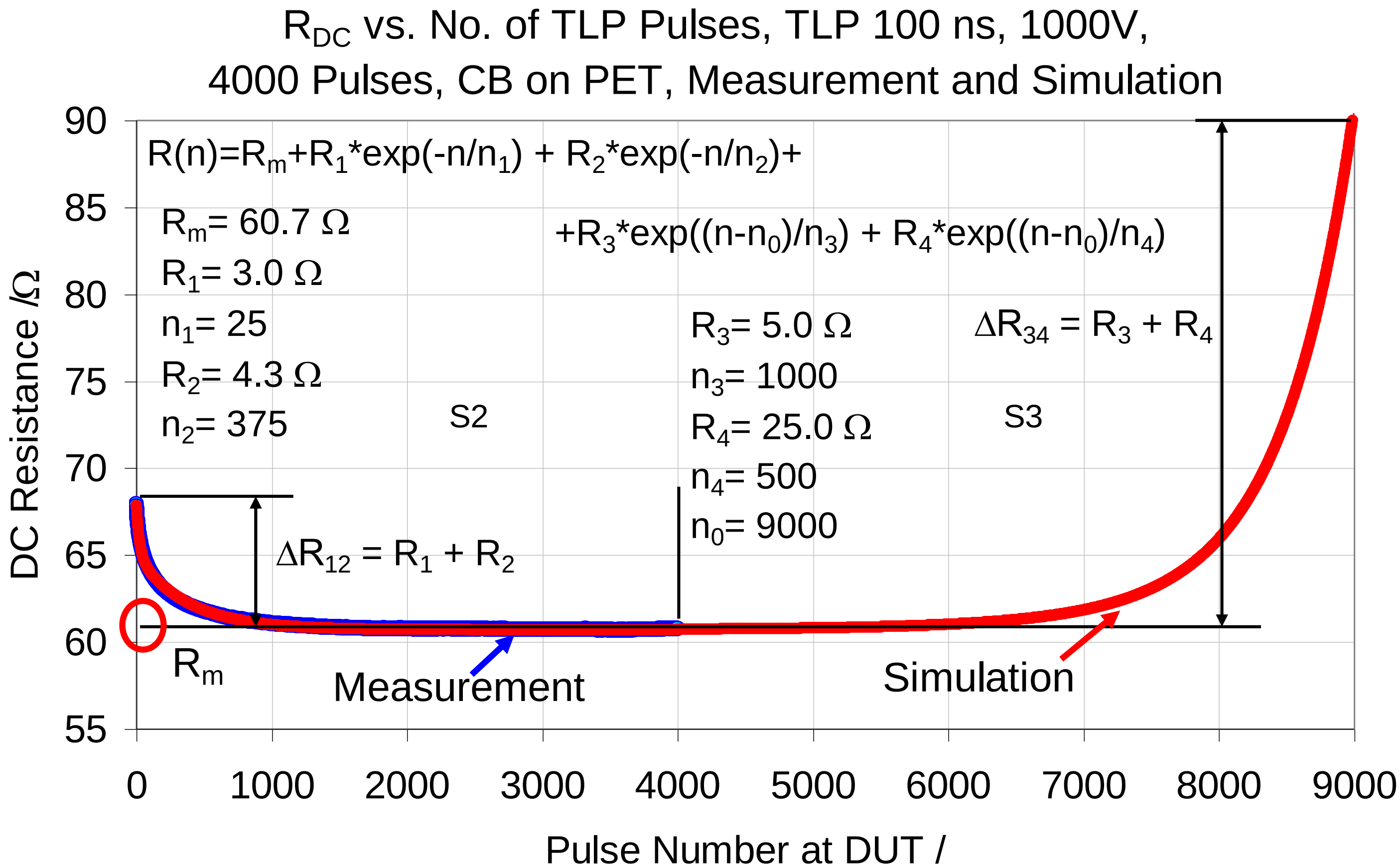
Final Results on Investigated Resistive Structures



Resistance evolution during application of **short pulses with increasing amplitudes**, thick film on foil (applicable on all type of resistive layers)

Final Results on Investigated Resistive Structures



Resistance evolution during application of **short pulses with constant amplitudes**, thick film on foil (applicable on all type of resistive layers)

CETTI- PhD- Students A. Bonea and I. Busu at EMFT, 2010

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Fraunhofer
EMFT

PhD Thesis, Andreea Bonea, doctoral stage at EMFT

UNIUNEA EUROPEANĂ | GUVERNUL ROMÂNIEI MINISTERUL MUNCII, FAMILIEI ŞI PROTECŢIEI SOCIALE AMPOSDRU | Fondul Social European POSDRU 2007-2013 | Instrumente Structurale 2007-2013

Proiect cofinanţat din Fondul Social European prin Programul Operaţional Sectorial Dezvoltarea Resurselor Umane 2007- 2013

Investeşte în Oameni!

Universitatea **POLITEHNICA** din Bucureşti

TEZĂ DE DOCTORAT

Dezvoltarea structurilor electronice utilizate în electronica organica flexibila pe arie larga

Development of electronic structures used in flexible organic electronics on large area (FOLAE)

Autor: **Ing. Andreea BONEA**

Conducător ştiinţific: **Prof.dr.ing. Paul SVASTA**

Octombrie 2012

FONDUL SOCIAL EUROPEAN

Investeşte în oameni!

Programul Operaţional Sectorial pentru Dezvoltarea Resurselor Umane 2007 – 2013

Proiect POSDRU/88/1.5/S/60203 – *Dezvoltarea de cariere ştiinţifice competitive prin programe de burse doctorale (COMPETE)*

POLITEHNICA UNIVERSITY OF BUCHAREST

Faculty of Electronics, Telecommunications and Information Technology

Department of Electronic Technology and Reliability

Senate Decision No. 219 from 28.09.2012

PHD THESIS

Dezvoltarea structurilor electronice utilizate în electronica organică flexibilă pe arie largă.

Development of electronic structures used in flexible organic electronics on large area (FOLAE)

Author: Eng. Andreea BONEA

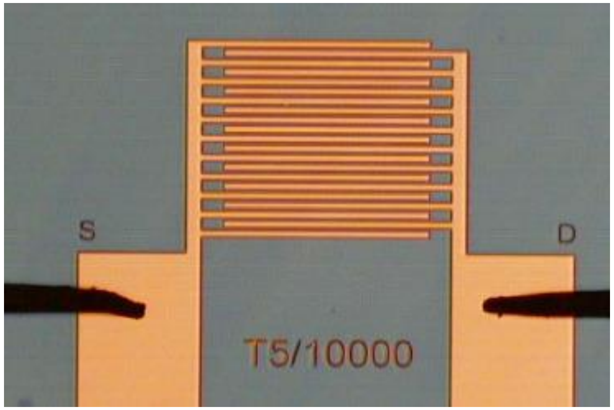
COMISIA DE DOCTORAT

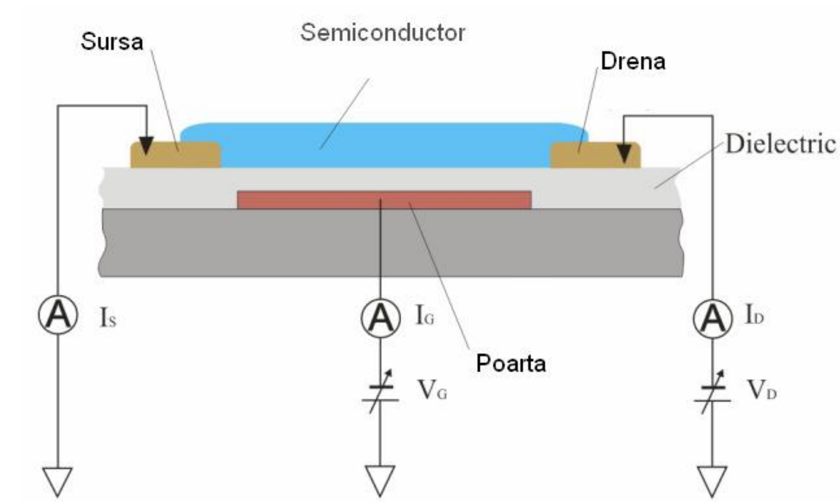
Chair	Prof. Dr. Gheorghe BREZEANU	from	POLITEHNICA University of Bucharest
PhD Advisor	Prof. Dr. Paul SVASTA	from	POLITEHNICA University of Bucharest
Reviewer	SR I Dr. Ileana CERNICA	from	National Institute for R&D in Microtechnologies IMT Bucharest
Reviewer	SR I Dr. Mihai VARLAM	from	National R&D Institute for Cryogenics and Isotopic Technology, Râmnicu Vâlcea
Reviewer	Prof. Dr. Paul ŞCHIOPU	from	POLITEHNICA University of Bucharest

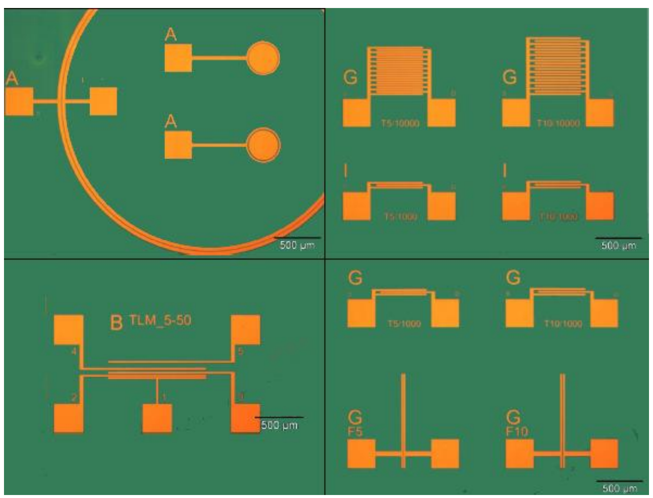
Bucharest 2012

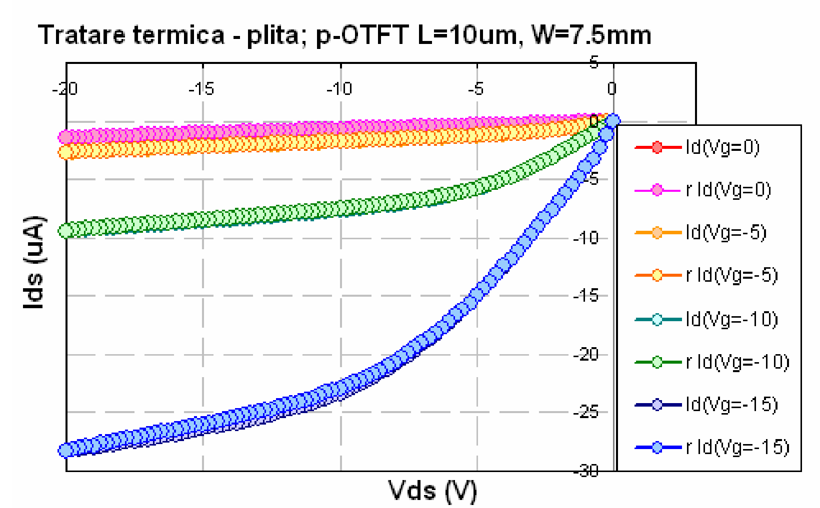
Fraunhofer EMFT

PhD Thesis, Andreea Bonea, doctoral stage at EMFT

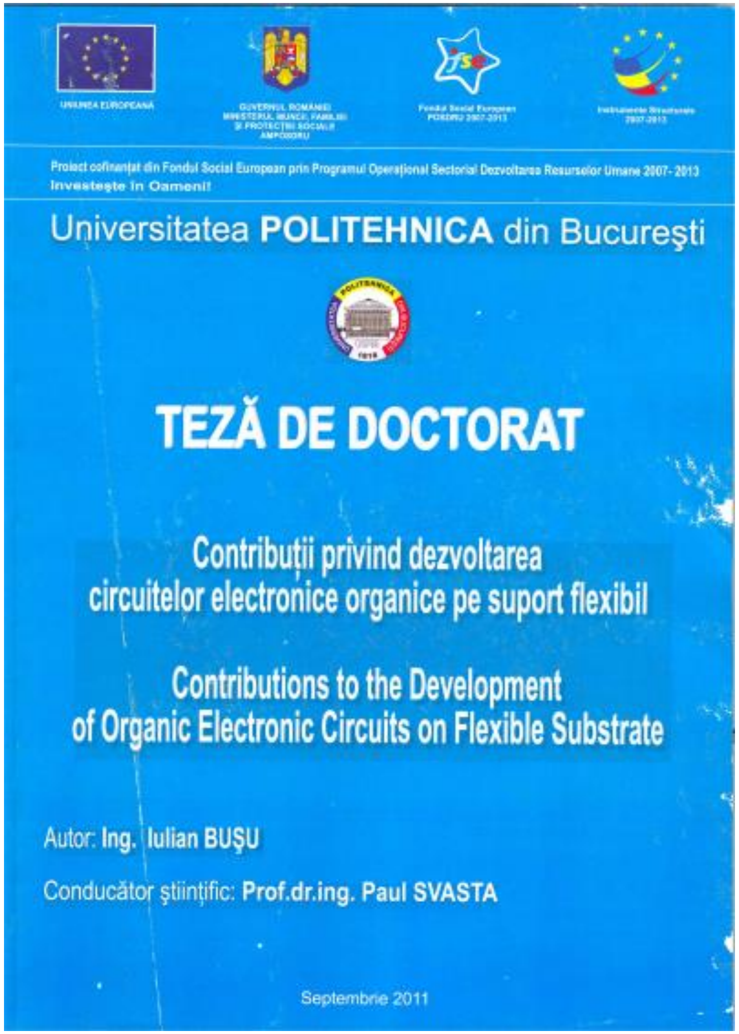








PhD Thesis, Iulian Busu, doctoral stage at EMFT



Proiect cofinanțat din Fondul Social European prin Programul Operațional Sectorial Dezvoltarea Resurselor Umane 2007-2013
Investește în Oameni!

Universitatea **POLITEHNICA** din București

TEZĂ DE DOCTORAT

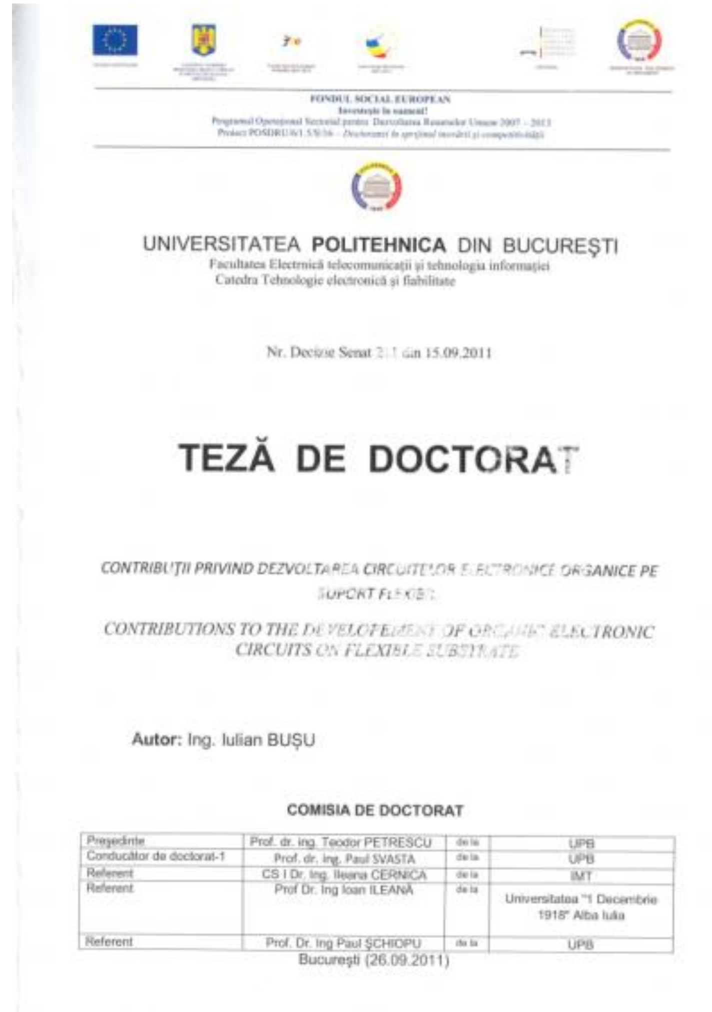
Contribuții privind dezvoltarea circuitelor electronice organice pe suport flexibil

Contributions to the Development of Organic Electronic Circuits on Flexible Substrate

Autor: **Ing. Iulian BUȘU**

Conducător științific: **Prof.dr.ing. Paul SVASTA**

Septembrie 2011



FONDUL SOCIAL EUROPEAN

UNIVERSITATEA **POLITEHNICA** DIN BUCUREȘTI
Facultatea Electronică telecomunicații și tehnologia informației
Catedra Tehnologie electronică și fiabilitate

TEZĂ DE DOCTORAT

CONTRIBUȚII PRIVIND DEZVOLTAREA CIRCUITELOR ELECTRONICE ORGANICE PE SUPORT FLEXIBIL

CONTRIBUTIONS TO THE DEVELOPMENT OF ORGANIC ELECTRONIC CIRCUITS ON FLEXIBLE SUBSTRATE

Autor: Ing. Iulian BUȘU

COMISIA DE DOCTORAT

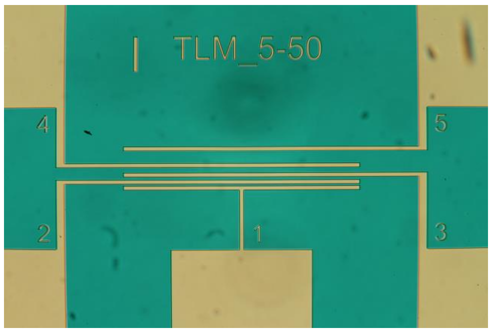
Președinte	Prof. dr. ing. Teodor PETRESCU	de la	UPB
Conducător de doctorat-1	Prof. dr. ing. Paul SVASTA	de la	UPB
Referent	CS I Dr. Ing. Ileana CERNICA	de la	IMT
Referent	Prof Dr. Ing Ioan ILEANĂ	de la	Universitatea "1 Decembrie 1918" Alba Iulia
Referent	Prof. Dr. Ing Paul ȘCHIOPU	de la	UPB

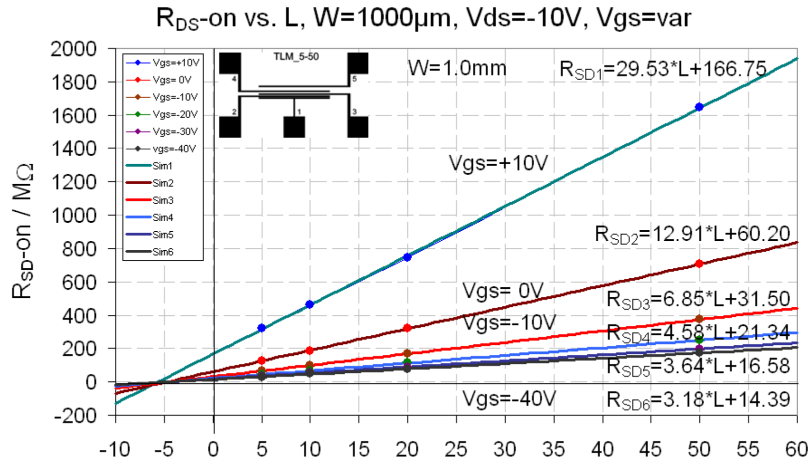
București (26.09.2011)

Fraunhofer EMFT

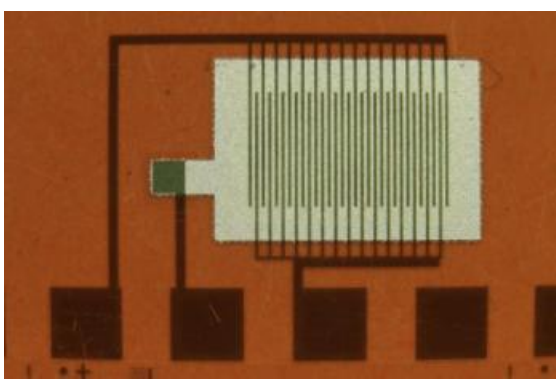
PhD Thesis, Iulian Busu, doctoral stage at EMFT

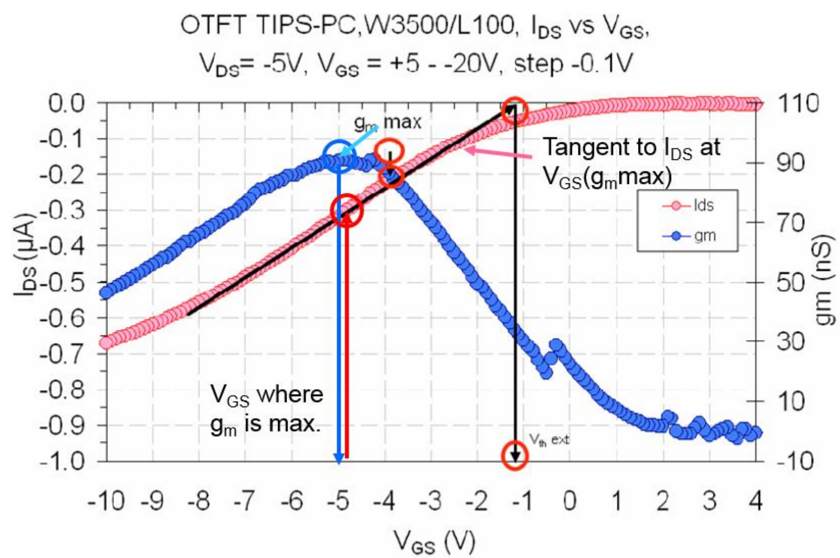
Contact resistance measurements





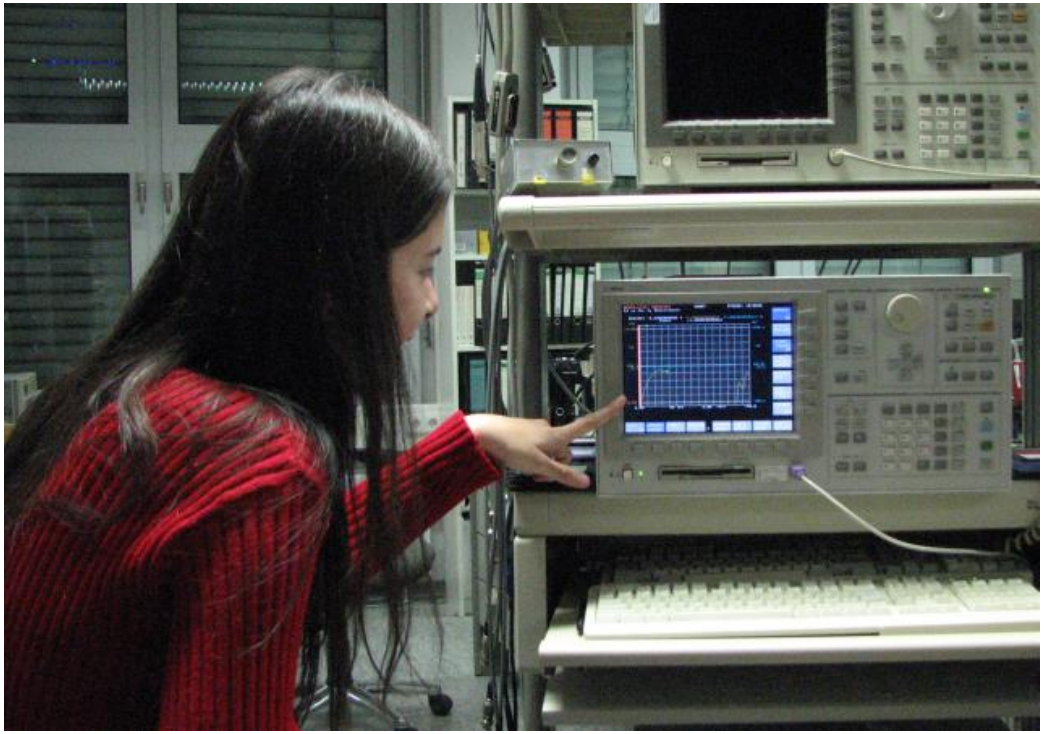
Threshold voltage measurements





CETTI- PhD- Students A. Bonea and I. Busu at EMFT, 2010

At Waferprober PA300



At Parameter Analyzer Ag4156C

Fraunhofer EMFT welcomes the

Romanian Delegation of

Secretary of State

Tudor Prisecaru

Friday Dec. 13. 2013

Video- room, 2-nd Floor

Fraunhofer EMFT

MEN-Ro and Senate UPB visit at Fraunhofer, Dec. 2013

VISITORS AND DELEGATIONS

A large number of visitors and delegations came to Fraunhofer EMFT once again in 2013 to meet Fraunhofer scientists and take a closer look at the institution's excellent technological infrastructure.

- Jean-Christoph Eloy, Yole Developpement, February 8, 2013
- Delegation of the Brazilian trade association CNI and its education/research branch SENAI, March 8, 2013
- Delegation of the heads of science and development from Jiangsu Province, China, April 8, 2013
- Delegation of Danish research directors, DI - Confederation of Danish Industries, May 17, 2013
- Delegation of Indian scientists, May 27, 2013
- Delegation from Arizona State University, USA, June 3 - 7, 2013
- Industrial delegation of the private foundation of Catalan entrepreneurs FemCAT, Spain, June 5, 2013
- Prof. Ramgopal Rao, Institute Chair Professor, Centre of Excellence in Nanoelectronics, Department of Electrical Engineering, IIT Bombay, Powai, Mumbai, India, June 18, 2013
- President Dr. Zhou Ji and his delegation, Chinese Academy of Engineering, July 1, 2013
- Kazuhiro Tsuga, President of the Panasonic Corporation, July 2, 2013
- Delegation of the Administration and Science Park Directors, Wuxi City, Jiangsu Province, China, July 3, 2013
- School students from Gymnasium Weilheim, July 22, 2013
- Students of electrical engineering at DHBW Mosbach, October 25, 2013
- Dr. Dan Shaham, Consul General of the State of Israel for Southern Germany, November 15, 2013
- Board of the Swedish contract research institution RISE, November 22, 2013
- School visit by Lycée Lalande, Bourg-en Bresse, France December 13, 2013
- Delegation from TU „Politehnica" Bucharest, Romania, December 13, 2013

EMFT Annual Report 2013

47

MEN-Ro and Senate UPB visit at Fraunhofer, Dec. 2013

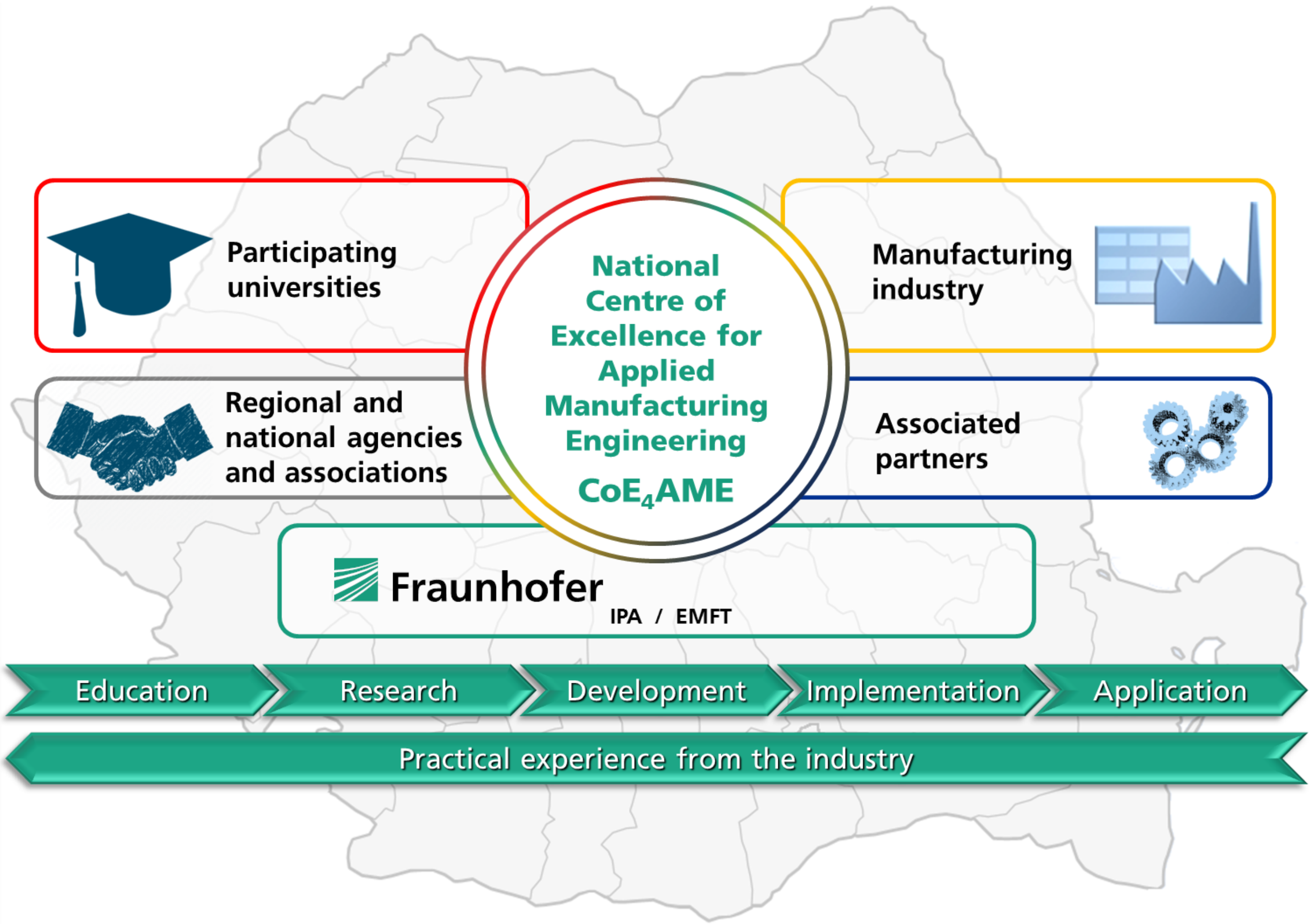
Discussions about collaboration at EMFT

MEN-Ro and Senate UPB visit at Fraunhofer, Dec. 2013

R2R Lab visit

H2020 Widespread Teaming Call, Proposal for:

"Centre of Excellence for Applied Manufacturing Engineering"



Fraunhofer EMFT

H2020 Widespread Twinning Call, Proposal for:

"Center for Applied Sensor Reliability, CeASeR"

H2020-TWINN-2015

Call for Twinning (Single stage)

Specific challenge:

- to address networking gaps and deficiencies between the research institutions of the low performing Member States and regions and internationally-leading counterparts at EU level.

Scope:

- significantly strengthening a defined field of research in a particular knowledge institution by creating a link between this institution and at least two internationally-leading research institutions in other Member States.

Participants: three partners (sign a grant agreement) :

-**knowledge institution, research active university** or a public or private non-profit research organization (**applicant organization**)

- **two internationally-leading research institutions** in other Member States.

H2020 Widespread Twinning Call, Proposal for:

"Center for Applied Sensor Reliability, CeASeR"

Project partners:

- Center of Technological Electronics and Interconnection Techniques
Politehnica University of Bucharst, UPB-CETTI
(Applicant)

- Fraunhofer – Institution for Microsystems and Solid- State Technologien, EMFT
Circuits and Systems, Analysis and Test of Integrated Systems, ATIS

- **Institute of Sensor & Actuator Systems**
Department of Applied Electronic Materials, AEM
Vienna University of Technology

H2020 Widespread Twinning Call, Proposal for:

“Center for Applied Sensor Reliability, CeASeR”

Budget:

Overall indicative budget: EUR 64.120 million, 2015 budget;
Approx. EUR 1.0 million/call

Duration: 36 months

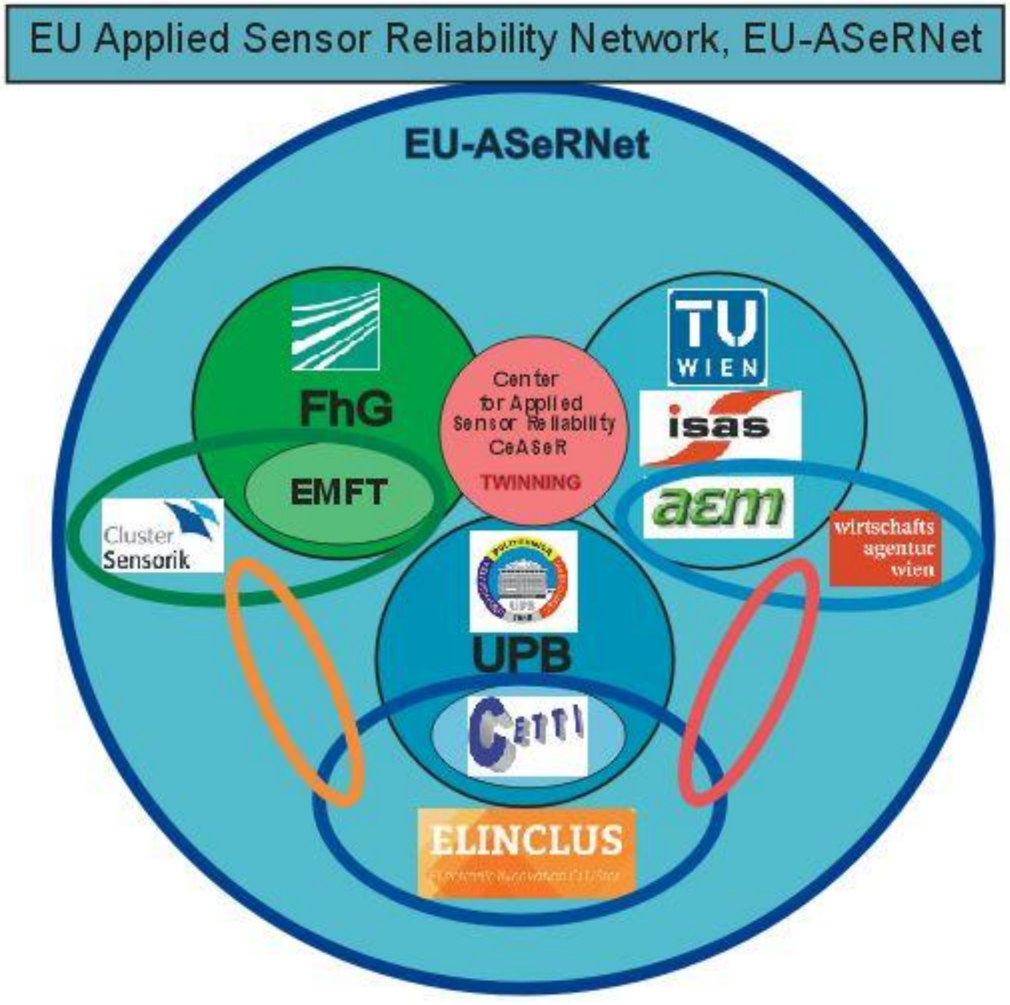
Expected impact:

- measurable and significant improvement in the overall scientific and innovation capacity of the initiating institution in a particular field of research.
- linking with research intensive counterpart institutions in other Member States and thereby expect positive impacts on the overall research and innovation potential of the Member State or the region the initiating institution is located in.
-improvement could be measured through an increase of peer-reviewed publications, increased impact factors in terms of citations etc.

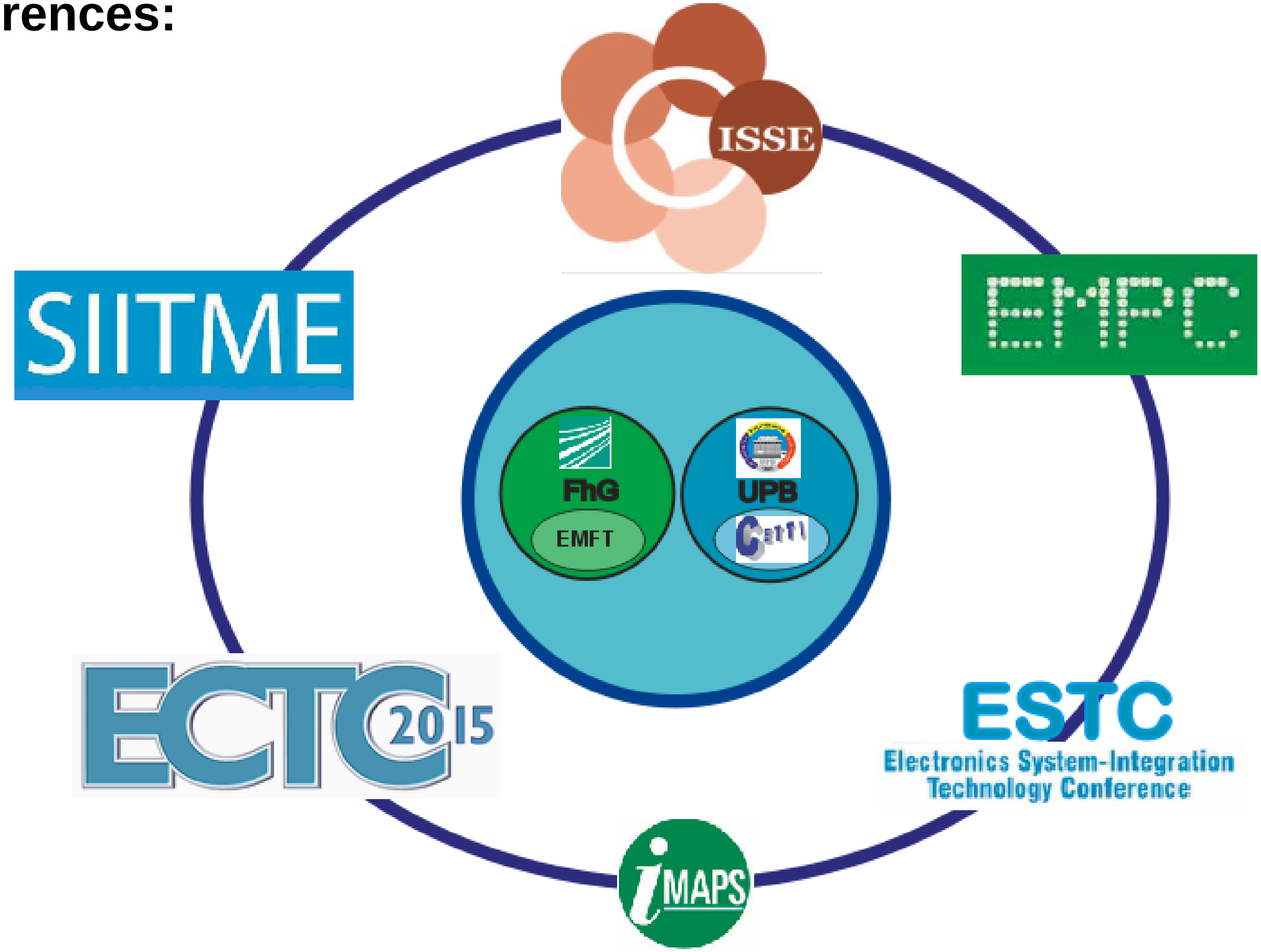
Type of action:

Coordination and support actions

"Center for Applied Sensor Reliability, CeASeR"



CETTI-EMFT common publications of research articles at conferences:



CETTI-EMFT participation at EMPC, Oulu, Finland, 2007

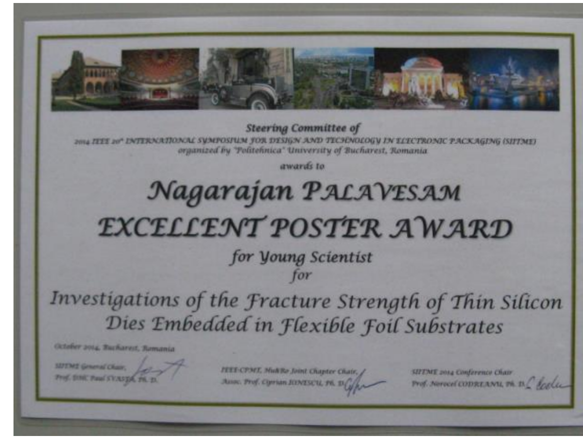
CETTI- EMFT participation at ISSE 2012, Bad Aussee, Austria

CETTI- EMFT participation at SIITME 2014, Bucharest, Romania

At Keynote presentation

Steering Committee Meeting

CETTI- EMFT participation at SIITME 2014, Bucharest, Romania



S. Kibler, M. Richter, B. Möller, C. Kutter
Geregelte Mikroschmierung von Präzisionslagern in Hochleistungsspindeln mittels kapazitiver Dosierüber-wachung
ITG-GMA Fachtagung Sensoren und Messsysteme 2014
Nuremberg, June 3 - 5, 2014

A. Ohlander, S. Bauer, H. Ramachandraiah, A. Russom, K. Bock
Microfluidic Detection Module For DNA Analysis Using Integrated Microheaters And DNA Microarrays On Plastic Foil
ITG-GMA Fachtagung Sensoren und Messsysteme 2014
Nuremberg, June 3 - 5, 2014

C.W. Jenke, S. Kibler, Y. Gao, A. Hollot, T. Neuhann, B. Kirchhof, B. Montag, M. Geiger, J. Neitzel, C. Kutter, M. Richter
Optimization of a Piezoelectric Micropump Actuator for Medical Application in Glaucoma and Phthisis Therapy

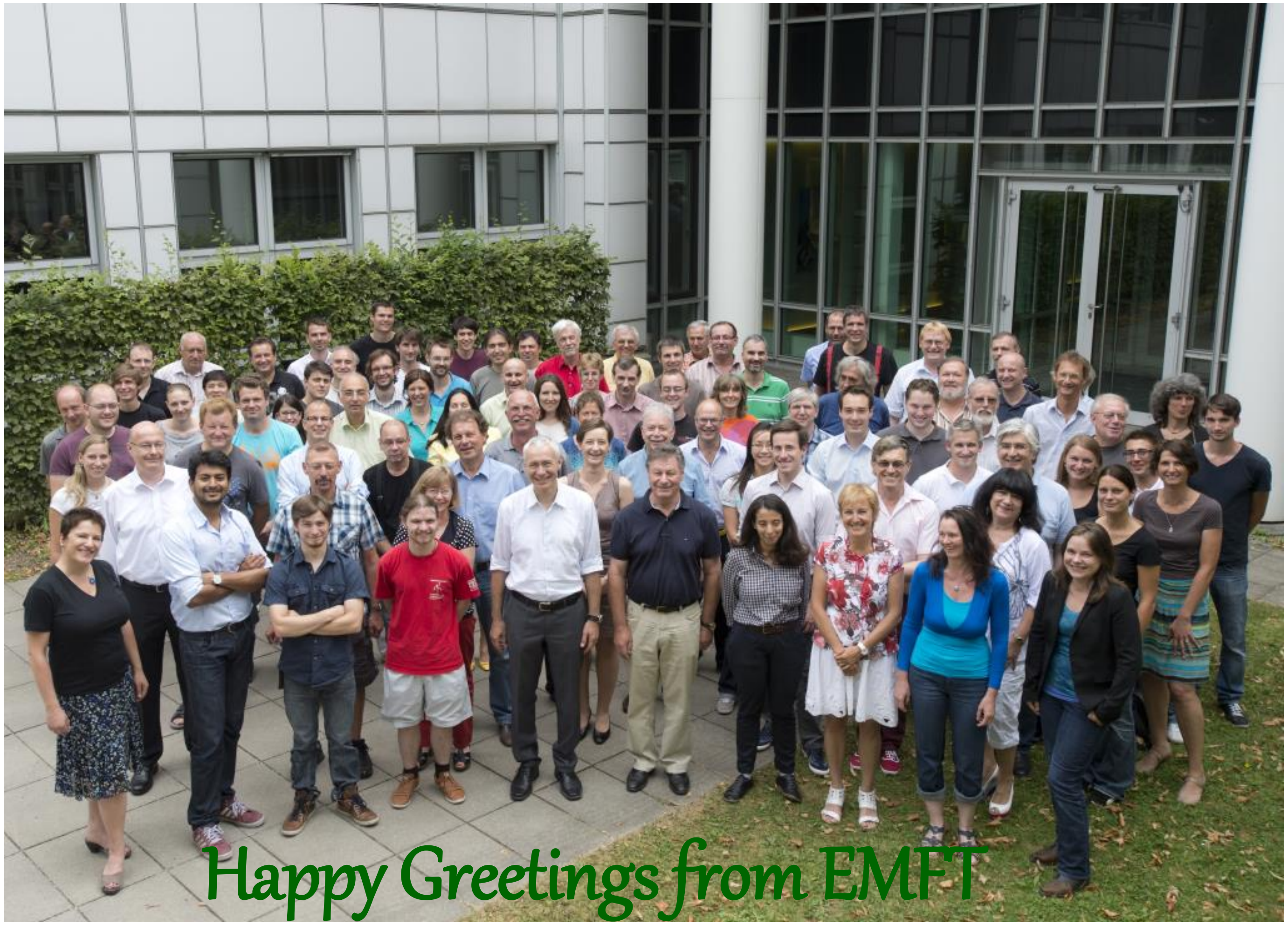
S. Kibler, L. Hassan, M. Richter, C. Kutter
Feedback controlled microdosing system for nanoliter per second dosing rates using a capacitive phase boundary time-of-flight flow sensor
2nd International Conference on MicroFluidic Handling Sys-tems, University of Freiburg, Germany, October 8 - 10, 2014

N. Palavesam, C. Landesberger, K. Bock
Investigations of the Fracture Strength of Thin Silicon Dies Embedded in Flexible Foil Substrates
SIITME Conference, Bucharest, Romania
October 23 - 26, 2014

A. Ohlander, Th. Ganka, T. Binder, F. Wiest, A. Russom, K. Bock
Real-time Monitoring of Melting Curves on DNA Microarrays in Plastic Lab-on-Foil System Using Silicon Photomultiplier Detectors
MicroTAS Conference, San Antonio, Texas, USA
October 23 - 26, 2014

EMFT PhD Student Palavesam at SIITME 2014

Happy Birthday CETTI, Happy 20-th Anniversary
Successful future collaboration with EMFT !!!!



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