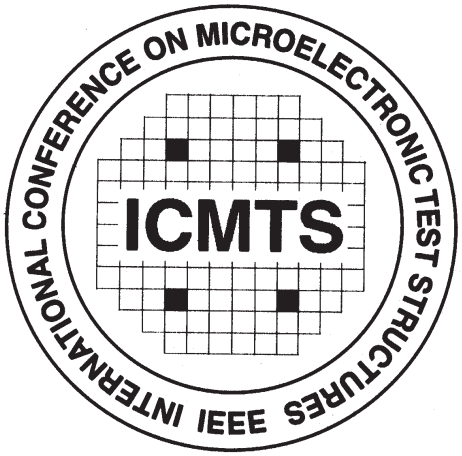
2019 IEEE 32nd International Conference on Microelectronic Test Structures



2019 IEEE 32nd ICMTS Conference Proceedings

March 18-21

Kitakyushu International Conference Center, Kitakyushu City, Fukuoka Prefecture, Japan

Sponsored by:

Association for Promotion of Electrical, Electronic and Information Engineering

The IEEE Electron Devices Society

In cooperation with:

The Institute of Electronics, Information and Communication Engineers

The Japan Society of Applied Physics

VLSI Design and Education Center, the University of Tokyo

Supported by:

The City of Kitakyushu and Kitakyushu Convention Bureau

IEEE Catalog Number: CFP19MTS-USB

ISBN: 978-1-7281-1465-1/19

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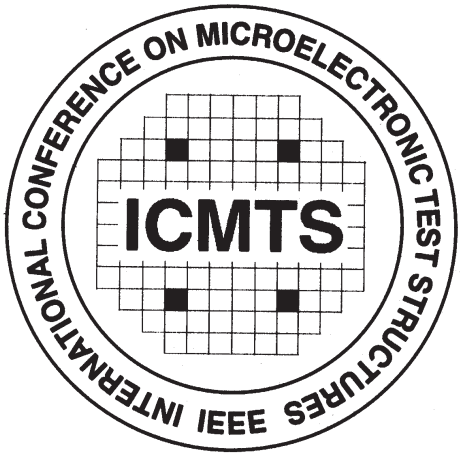

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CHAIRMAN'S LETTER

Dear ICMTS Colleagues,

"When you can *measure* what you are speaking about and *express it in numbers* you know something about it" - this is the famous expression of Lord Kelvin [1] that the ICMTS folks know. Now in the 21st century, a century later from Lord Kelvin's days, "*express in number*" may include modeling using equation as well expressing in computer. Indeed, this is particularly true in microelectronic world because we, engineers, researchers and / or students in industries, academics and research institutes must cope with problems on issues of fabrication every day. Typical questions include "hey, what was wrong with this device?", "was my fabrication correct?", "what are and how to extract key parameters of this device and material?" To answer such questions, I would propose to continue the expression: "when you can *compare* which have difference in design and *extract the difference* in measurement you know something about it". To help such comparative study, particular patterns are put somewhere on the device substrate wafer. We call them "Test Structures".

The purpose of the ICMTS is to bring about engineers and researchers on all the domains concerning microelectronic devices to exchange recent findings on test structure, test methods using structures, and modeling. An emphasis is put on what we call "real silicon" – measurement on existing structures. Therefore we the ICMTS folks must be proud of having "measured" something "real", and participants of the ICMTS can testify some "numbers" that contain the truth of the nature. Thirty-eight papers including three invited talks will be presented in ten Sessions: 1: Photonic Test Structures, 2: Yield & Reliability, 3: Novel Process Characterization, 4: Resistive Materials, 5: Power Device, 6: Matching & Variability, 7: Measurement Technique, 8: Noise, 9: Packaging, and 10: TFTs.

This year in 2019, the ICMTS is celebrating its 32nd edition. Clearly, "32nd" is the magic word for us electronic engineers, because 32 is 0x20 in hexadecimal. Starting from 1988 as a successor of workshops held in west-coast cities in the US, the ICMTS is now entering its 6th-bit era. The conference turns around the United States, Asia, and Europe. The 2019 version is held in Kita-Kyushu City, Fukuoka Prefecture. The city is known to be a city of the industrial Revolution in Japan. In 1901, a modern iron smelting furnace was constructed in Yawata area, by taking advantage of coal field in north of Kyushu Island. The City of Kitakyushu and Kitakyushu Convention Bureau financially supported the 32nd ICMTS; the participants of the conference will certainly enjoy the best hospitality of the region of north Kyushu Island. Indeed, networking and discussing with colleagues while seeing the city and eating altogether is the best smelting furnace to get inspired for future.

Now the bell is ringing: Welcome to the test structure world!

Dr. Yoshio Mita, the University of Tokyo
General Chairman

[1] Lord Kelvin, "Popular Lectures and Addresses: Constitution of matter", London: MacMillan, p.80 (1891).

Invited Talk 1:

2019 Mar 19, 9:10 – 9: 40

Chair: Akio Higo, *The University of Tokyo, Japan*

Session 1: Photonic Test Structures

2019 Mar 19, 9:40 – 11: 00

Co-Chairs: Alexey Kovalgin, *University of Twente, The Netherland*

SESSION 2: Yield & Reliability

2019 Mar 19, 11:20 – 12:20

Co-Chairs: WEILAND, Larg*, PDF Solutions, USA*
MORI, Shigetaka, *SONY Corporation, Japan*

Invited Talk 2:

2019 Mar 19, 13:35 – 14:05

Chair: Tsuyoshi Sekitani, *Osaka University, Japan*

SESSION 3: Novel Process Characterization

2019 Mar 19, 14:05 – 15:25

Co-Chairs: *YOUNG, Chadwin, University of Texas at Dallas*

SESSION 4: Resistive Materials

2019 Mar 19 16:10 – 17:10

Co-Chairs: SMITH, Stewart, *U. Edinburgh, UK*
HESS, Christopher, *PDF Solutions, USA*

Invited Talk 3:

2019 Mar 20, 09:00 – 09:30

Chair: Yoshio Mita, *The University of Tokyo, Japan*

SESSION 5: Power Device

2019 Mar 20 9:30 – 10:30

Co-Chairs: OHGURO, Tatsuya, *Toshiba, Japan*

SESSION 6: Matching & Variability

2019 Mar 20 10:50 – 12:10

Co-Chairs: Hans P. Tuinhout, *NXP Semiconductor, The Netherlands*
FUKUZAKI, Yuzo, *Sony Corporation*

SESSION 7: Measurement Technique

2019 Mar 20 13:30 – 15:10

Co-Chairs: DRIUSSI, Francesco, *University of Udine – DPIA, Italy*
VERZI, Bill, *Keysight, USA*

SESSION 8: Noise

2019 Mar 20 15:30 – 16:30

Co-Chairs: Kiyoshi Takeuchi*, The University of Tokyo, Japan*
Hirofumi Shinohara, *Waseda University, Japan*

SESSION 9: Packaging

2019 Mar 21 9:20 – 10:20

Co-Chairs: HABU, Satoshi, *Keysight, Japan*

SESSION 10: TFTs

2019 Mar 21 10:40 – 11:20

Co-Chairs: CAGLI, Carlo, *CEA/LETI, France*

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