

Abstract

# Challenges of Analog and Mixed-Signal IC Testing Technologies in Digital Explosion Era

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5W 1H of

# Analog and Mixed-Signal IC Testing Technologies

① What, ② Why, ③ Who, ④ Where, ⑤ When  
① How

# 1<sup>st</sup> W: What is analog IC testing ?

LSI test and measurement are different

- Production Test :

Decision of “Go” or “No Go”

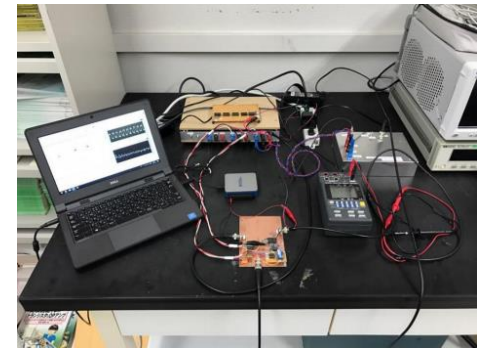
LSI testing → manufacturing engineering.



Today's focus

- Measurement / Characterization

Accurate performance evaluation of circuit



# 2<sup>nd</sup> W: Why analog IC testing now ?

## Hot Applications in IC Industry

- Automotive application

ppm (parts per million) → ppb (parts per billion)

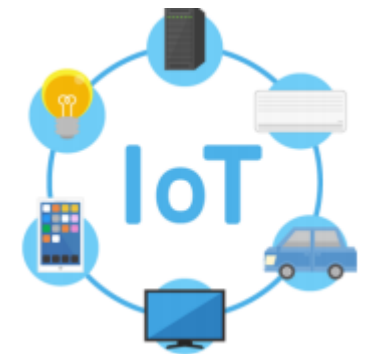
low quality → out of business

- IoT systems

A lot of sensors, interface analog circuits



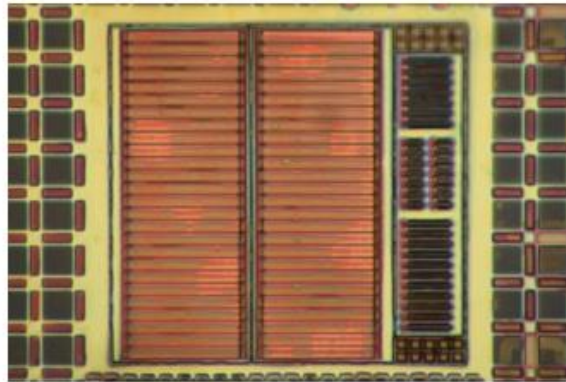
High reliability, Low cost system



High quality, low cost testing of analog IC is important !

# 3<sup>rd</sup> W: Who are involved ?

- Semiconductor IC companies
- Automatic IC test equipment manufactures
- Analog IC testing research groups in universities



Analog IC developed with Gunma U. and ASO Corp.

# 4<sup>th</sup> W: Where is analog IC test research done ?

Kobayashi Lab  
at Division of Electronics and Informatics  
Gunma University , Japan



The largest research group in this area  
among Japanese universities

Research collaboration with  
semiconductor companies,  
Automatic IC test equipment manufactures

# 5<sup>th</sup> W: When ?

- Kobayashi group has been involved in this area more than 15 years
  - A lot of journal and international conference papers
  - Serve as committee member of prestigious conferences
- Today, it is a hot topic due to automotive and IoT system applications



# 1H: How ?

How Kobayashi lab has approached will be presented in details:



## Invited Paper Session 2:

Analog/Power Supply Circuits and Their Related Technology

**Room A**

**Dec. 3 (Thur) 10:20-11:00**

**Haruo Kobayashi,**

"Challenges of Analog and Mixed-Signal IC Testing Technologies in Digital Explosion Era".