

(2018.02.09)

Comparison Evaluation of GaN-based LEDs



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I. Introduction



Introduction

- **Specimen:** GaN-based LED
- **Test:**
 - Optical property measurements
 - X-ray analyses
 - SEM analyses
 - Environmental tests
- **Test term:** 2017. 08. 01 ~ 2018. 02. 03
- **Test environment:** (25 ± 5) °C, Below 75% room humidity
- **Test apparatuses:**
 - X-ray (XTV160, Nikon, Japan)
 - Focused ion beam (Quanta 3D DualBeam, FEI, Netherland)
 - Temperature and humidity test chamber (HYGROS 250C, ACS, Italy)
 - Temperature and humidity test chamber (Excal 2221H, Climats, France)
 - Thermal shock test chamber (DS-890-2, Daewon, Korea)
 - Laser diode measurement system (MultiLEOS, Withlight, Korea)
 - Dynamic thermal measurement system (T3Ster, Mentor, USA)
- **Etc:** Blind test
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Introduction

- **Test apparatuses:**
 - X-ray (XTV160, Nikon, Japan)



Introduction

- **Test apparatuses:**
 - Focused ion beam (Quanta 3D DualBeam, FEI, Netherland)



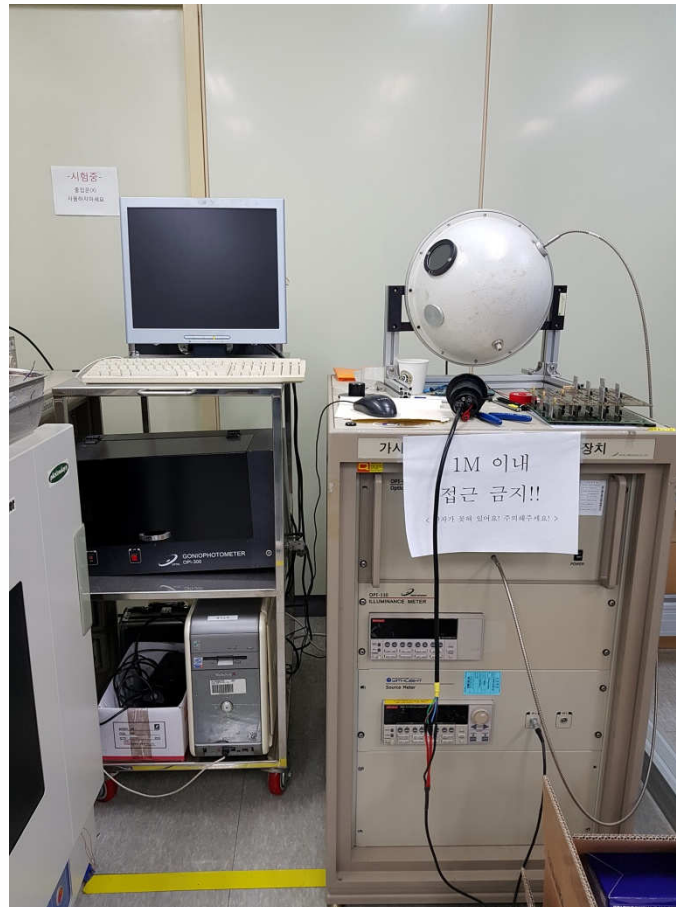
Introduction

- **Test apparatuses:**
 - Temperature and humidity test chamber (HYGROS 250C, ACS, Italy)



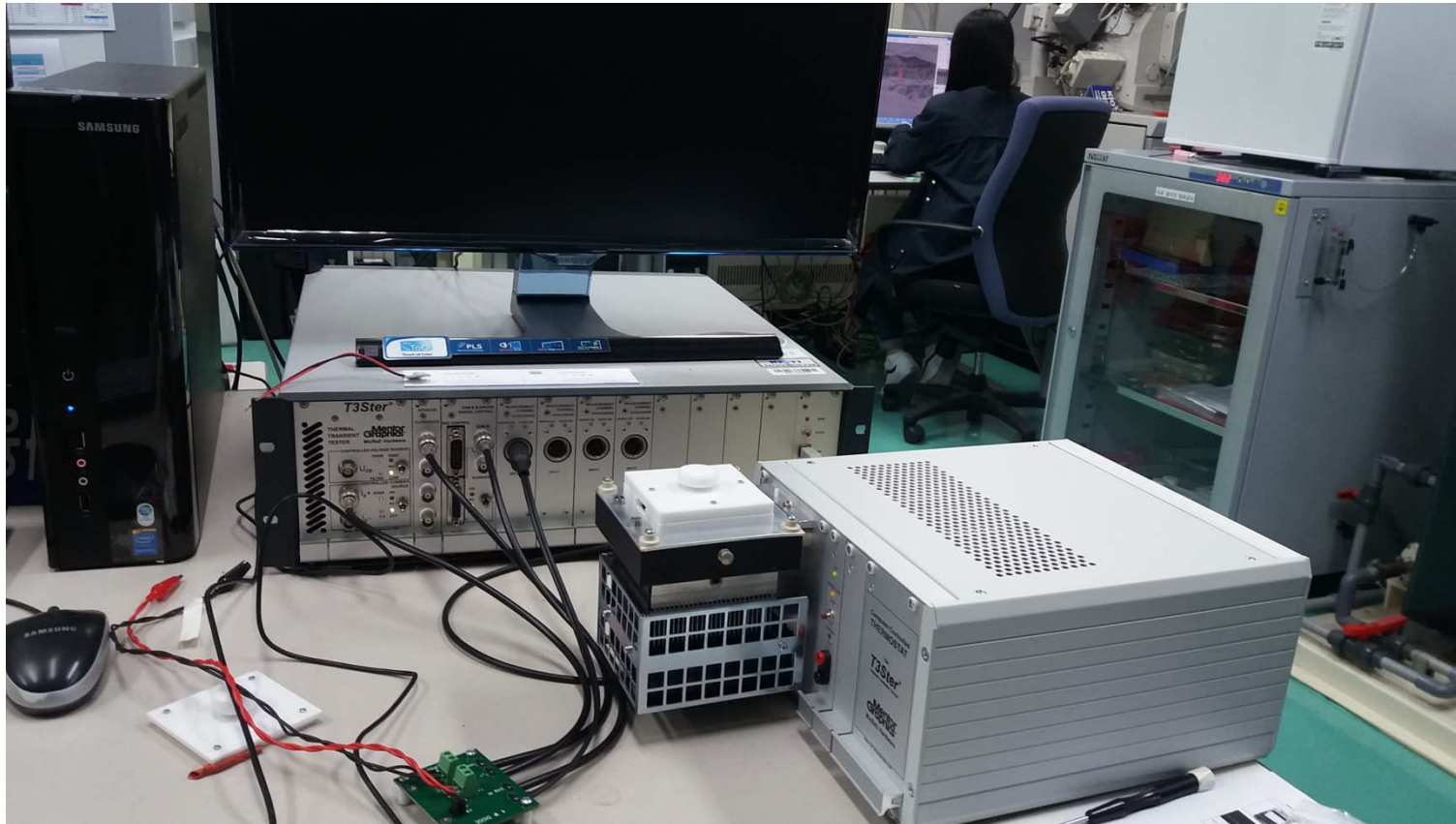
Introduction

- **Test apparatuses:**
 - Laser diode measurement system (MultiLEOS, Withlight, Korea)

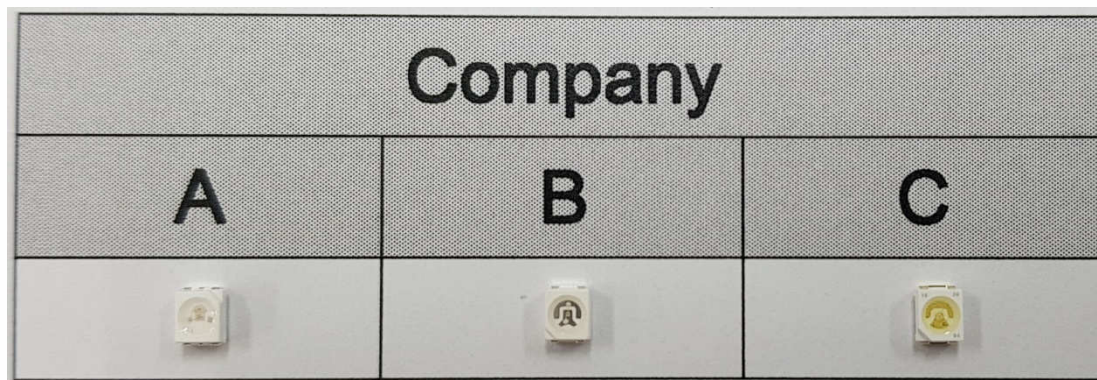


Introduction

- **Test apparatuses:**
 - Dynamic thermal measurement system (T3Ster, Mentor, USA)



Specimens



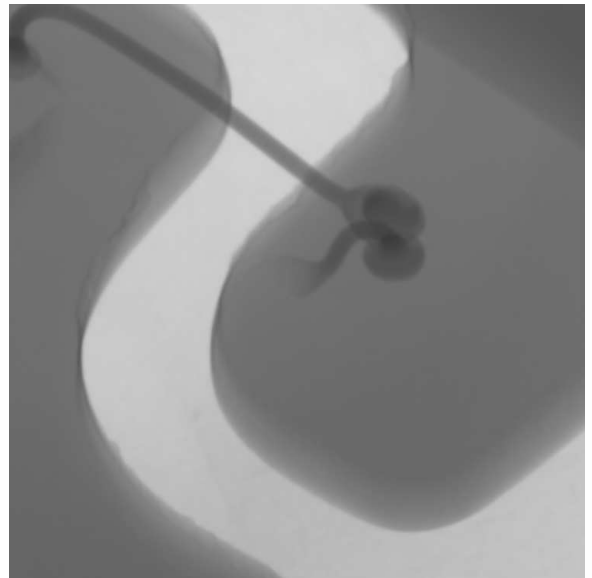
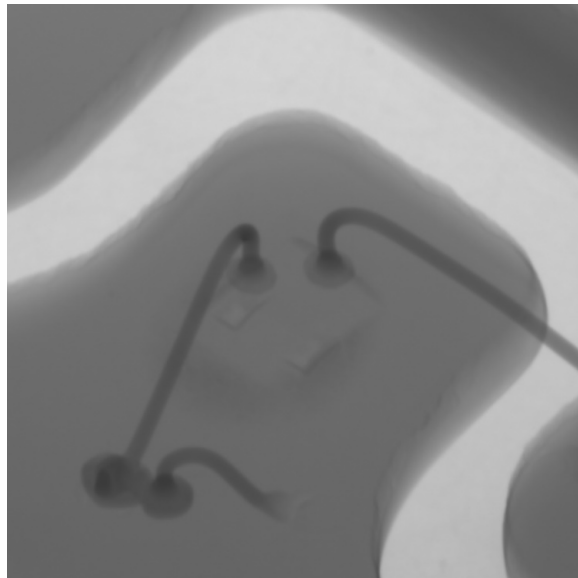
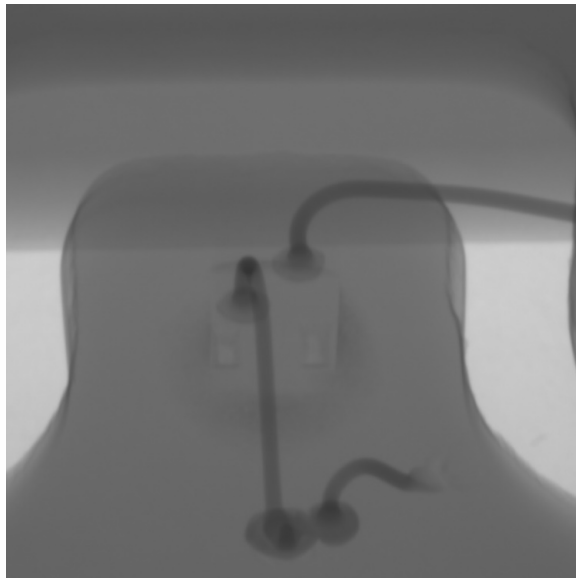
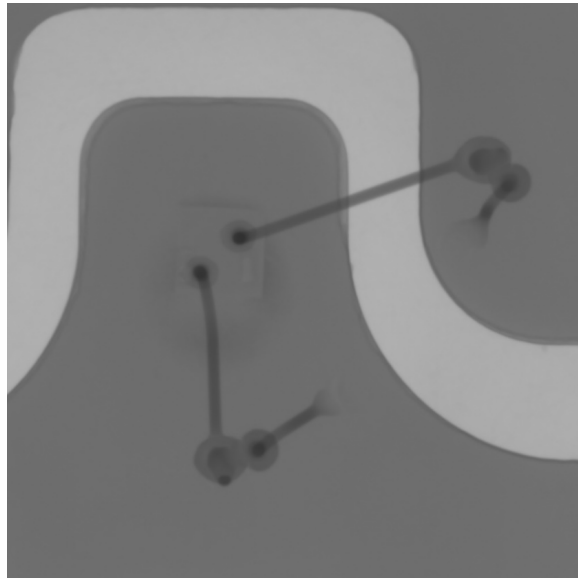
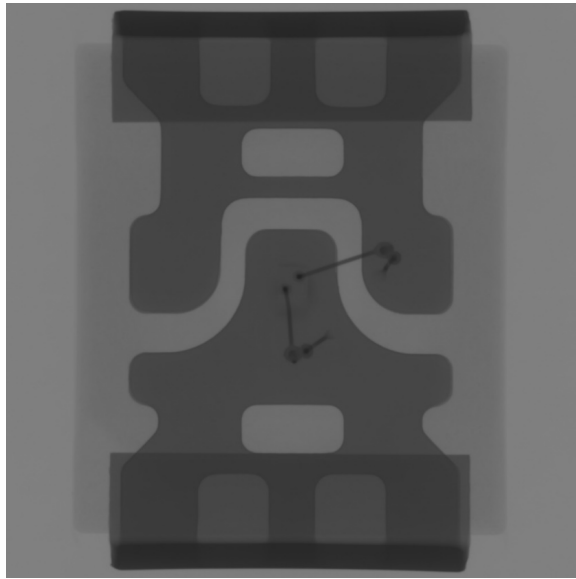
Sample	Chip	Color	Wavelength (nm)	I_f (mA)	V_r (V)	V_f (V)	I_v (mcd, @20)	Package /size	Junction Temp. (°C)	Operating Temp. (°C)
A	InGaN	Blue	455	30	5	3.3	300	PLCC /3528	110	-55~+100
B	InGaN	Blue	460	30	5	3.3	150	PLCC /3528	N/A	-40~+85
C	InGaN	Blue	468	30	5	3.4	70	PLCC /3528	125	-40~+110

II. X-ray analyses (内部構造観察)

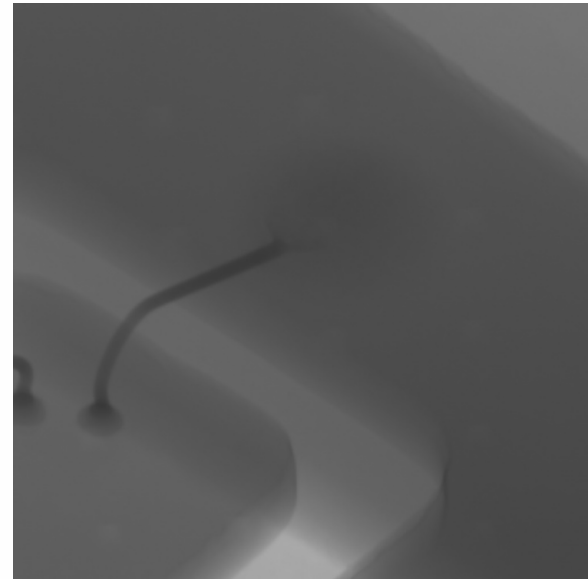
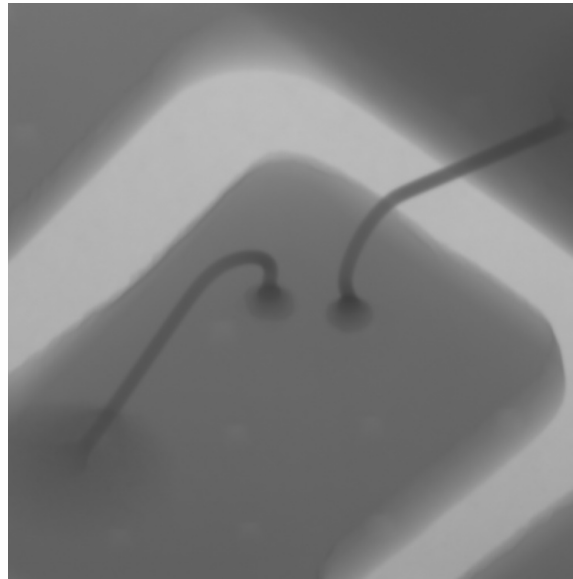
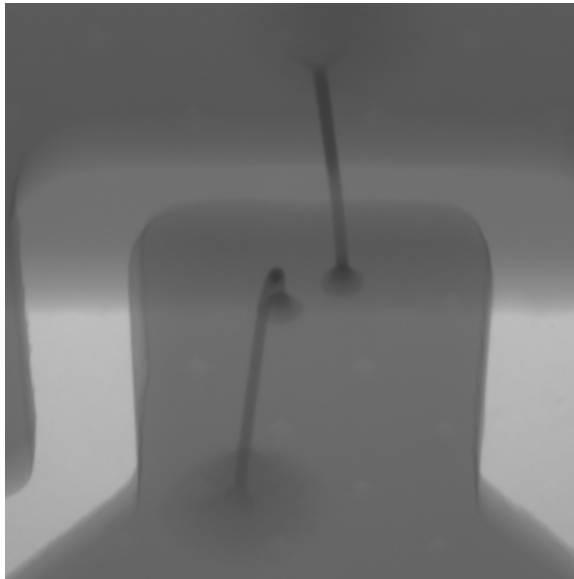
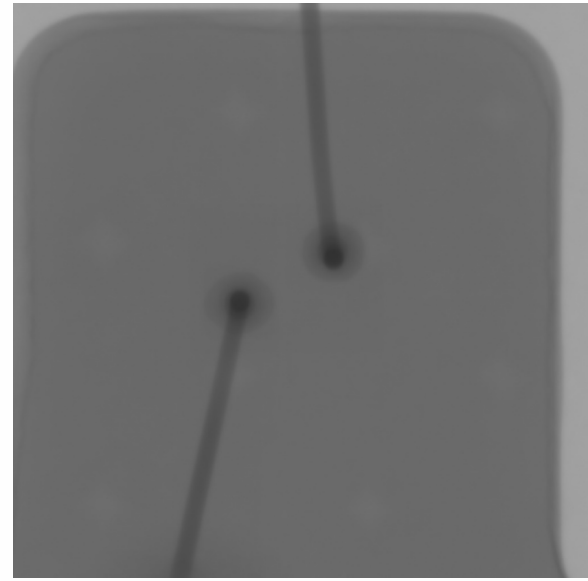
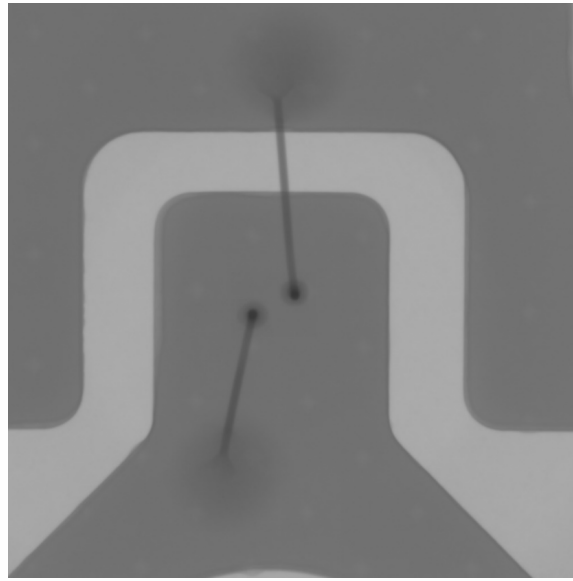
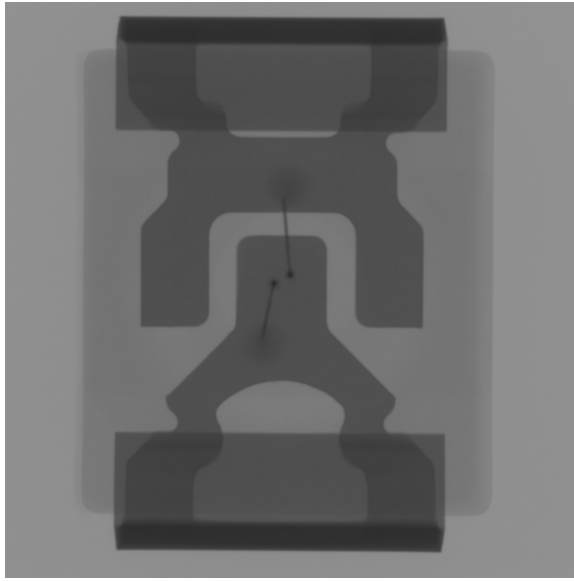


Sampl	X-ray analyses			
A				
B				
C				

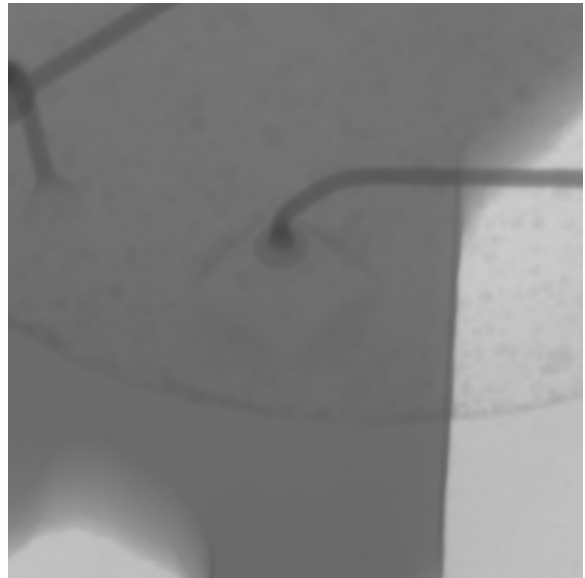
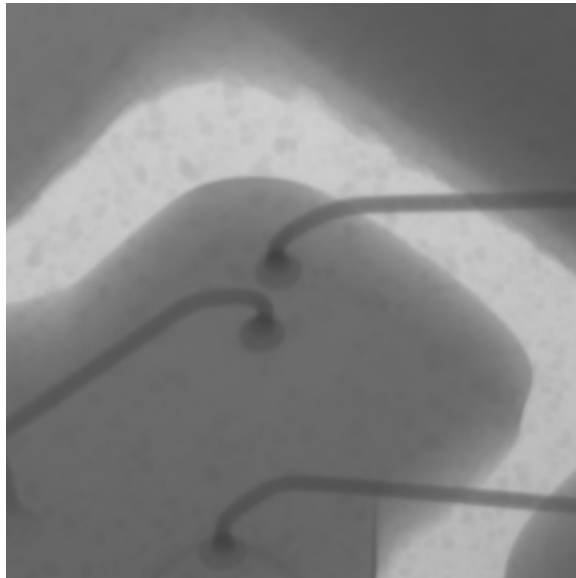
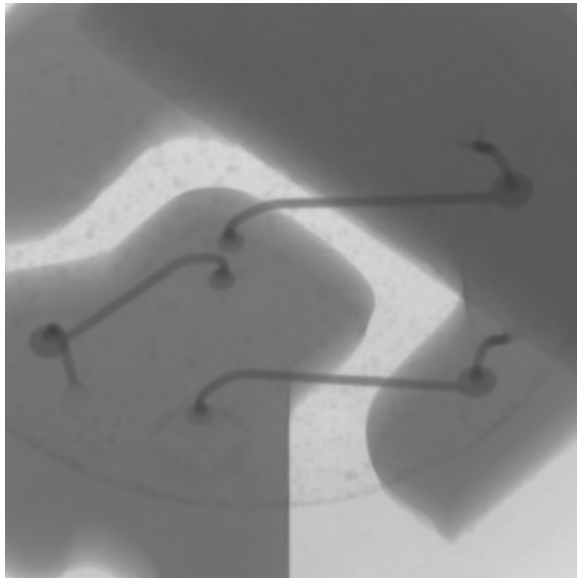
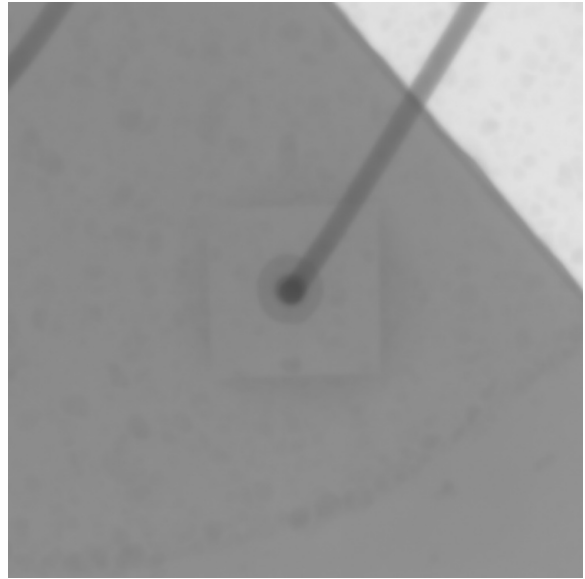
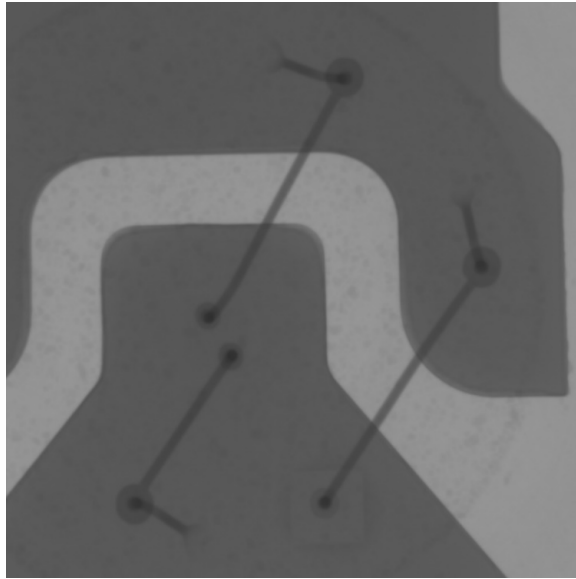
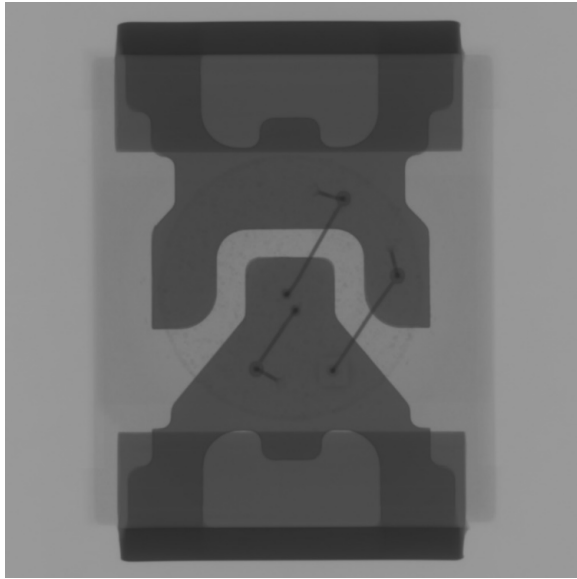
A社



B社



C社

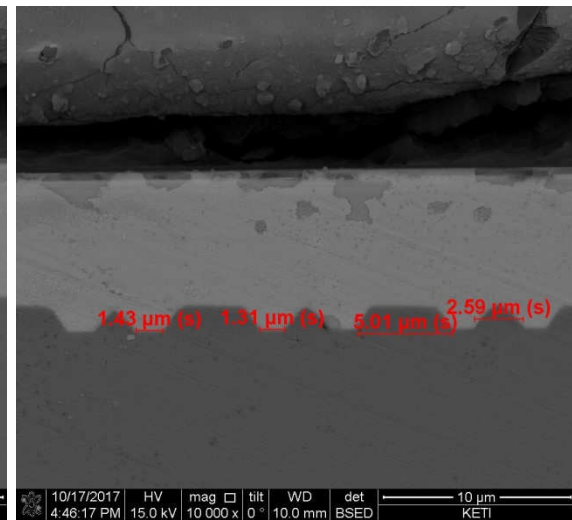
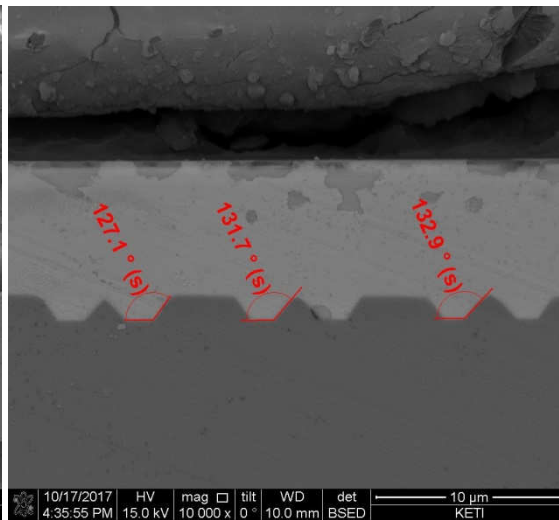
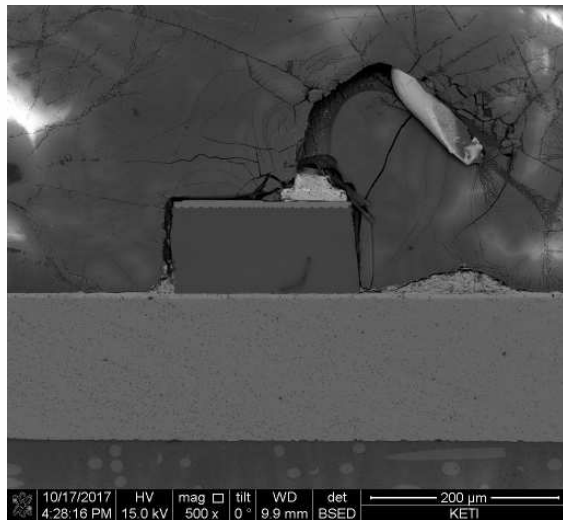
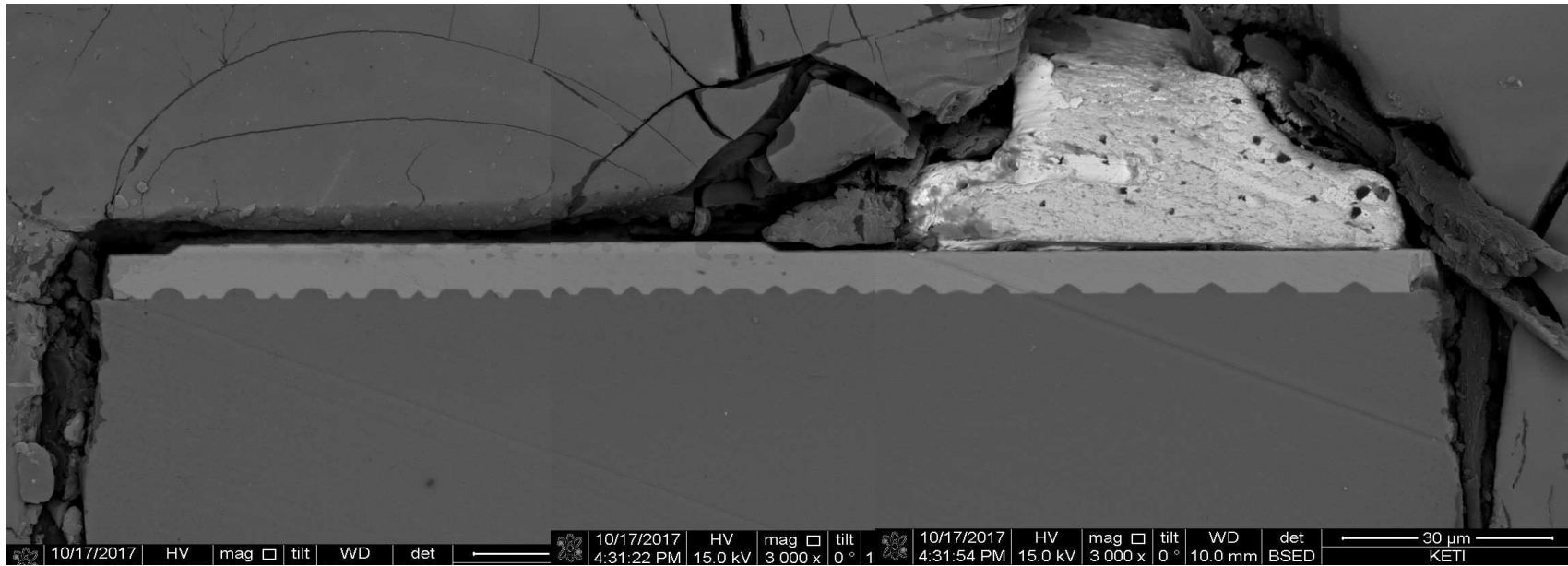


III. SEM analyses

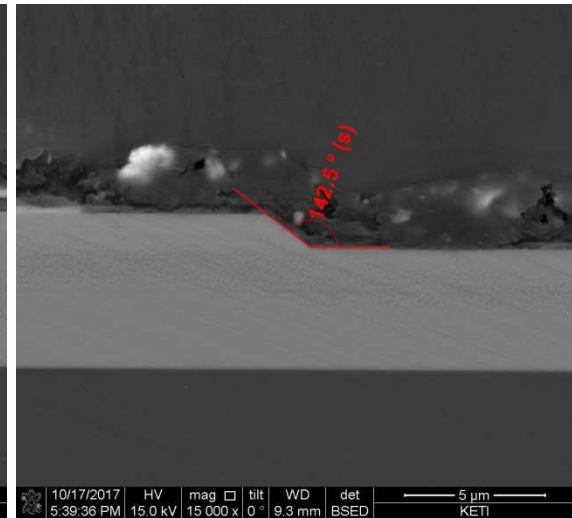
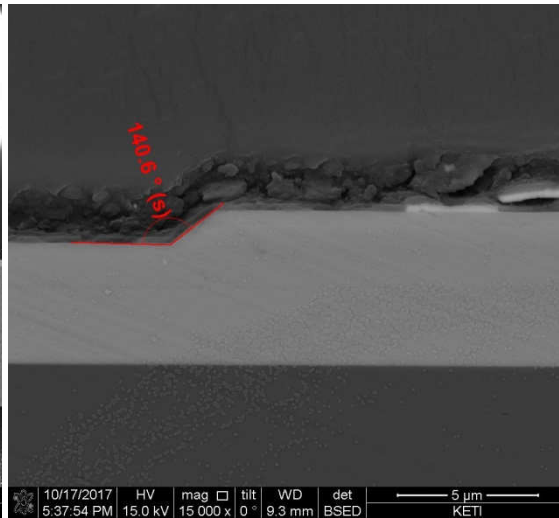
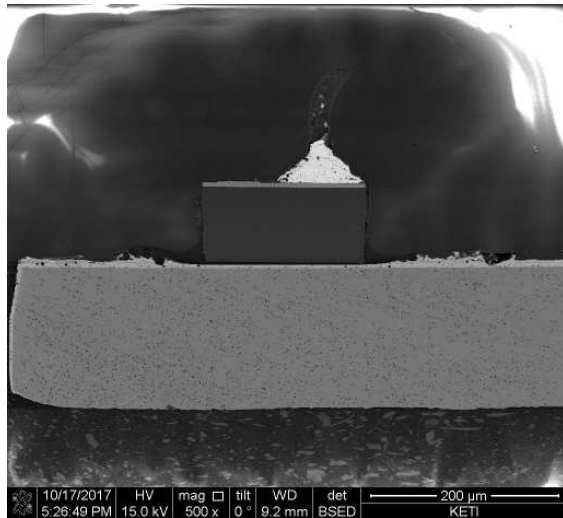
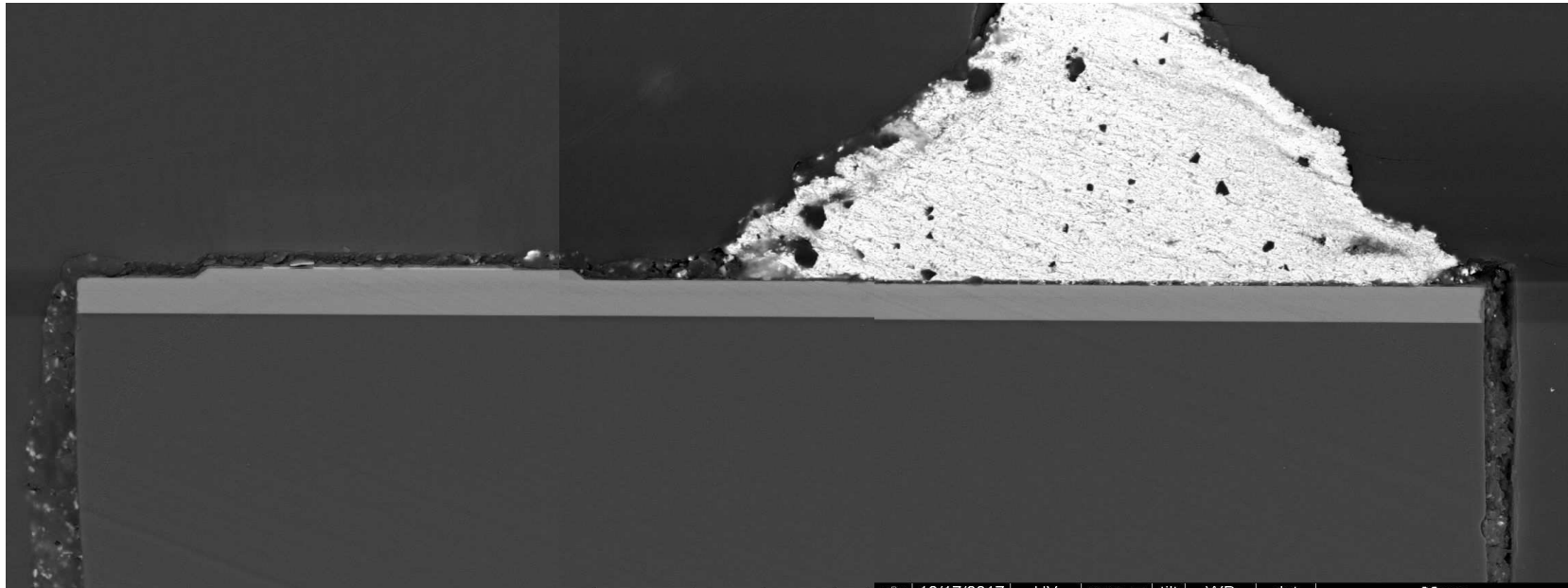


Sampl	SEM analyses		
A			
B			
C			

A社



B社



C社

