

(2016.03.11 )

# Comparison Evaluation of Chip Beads



# Table of Contents

**I. Introduction**

**II. Optical microscope analyses**

**III. X-ray analyses**

**IV. SEM analyses**

**V. Environmental tests**



# I. Introduction



## Introduction

- **Specimen:** Chip Bead
- **Test:**
  - Electrical property measurements
  - X-ray analyses
  - SEM analyses
  - Environmental tests
- **Test term:** 2015. 12. 10 ~ 2016. 03. 08
- **Test environment:** (25 ± 5) °C, Below 75% room humidity
- **Test apparatuses:**
  - Precision impedance analyzer (4294A, Agilent, USA)
  - X-ray (Revolution, X-tek, USA)
  - Focused ion beam (Quanta 3D DualBeam, FEI, Netherland)
  - Temperature and humidity environmental test chamber (Excal 5425H, Climates, France)
- **Etc:** Blind test
- **Contact:** Lee, Ju Ho ☎ +82-31-789-7282 / [leejuho@keti.re.kr](mailto:leejuho@keti.re.kr)



# Introduction

- **Test apparatuses:**
  - Precision impedance analyzer (4294A, Agilent, USA)



## Introduction

- **Test apparatuses:**
  - X-ray (Revolution, X-tek, USA)



## Introduction

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



## Introduction

- **Test apparatuses:**
  - Temperature and humidity environmental test chamber (Excal 5425H, Climates, France)



## Specimens

		Company		
		A	B	C
Size	1608	.	.	.
	2125	.	.	.

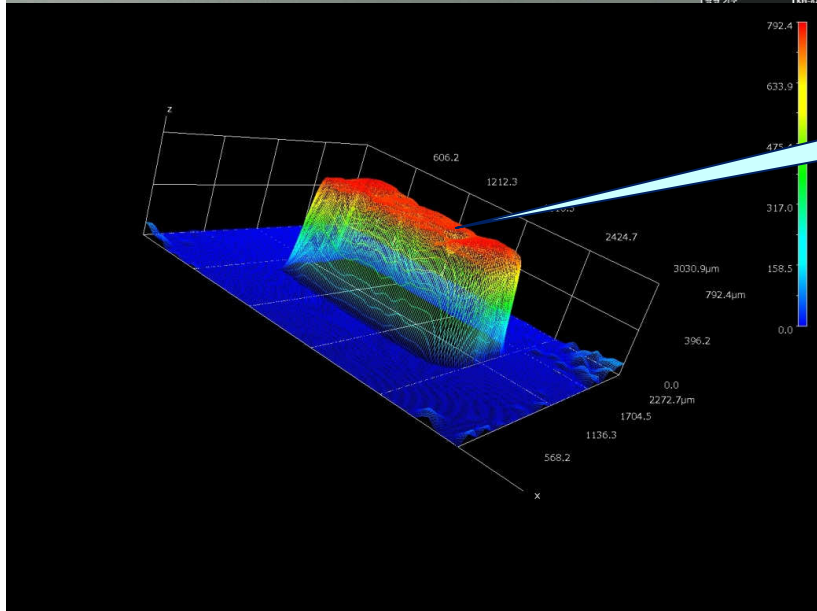
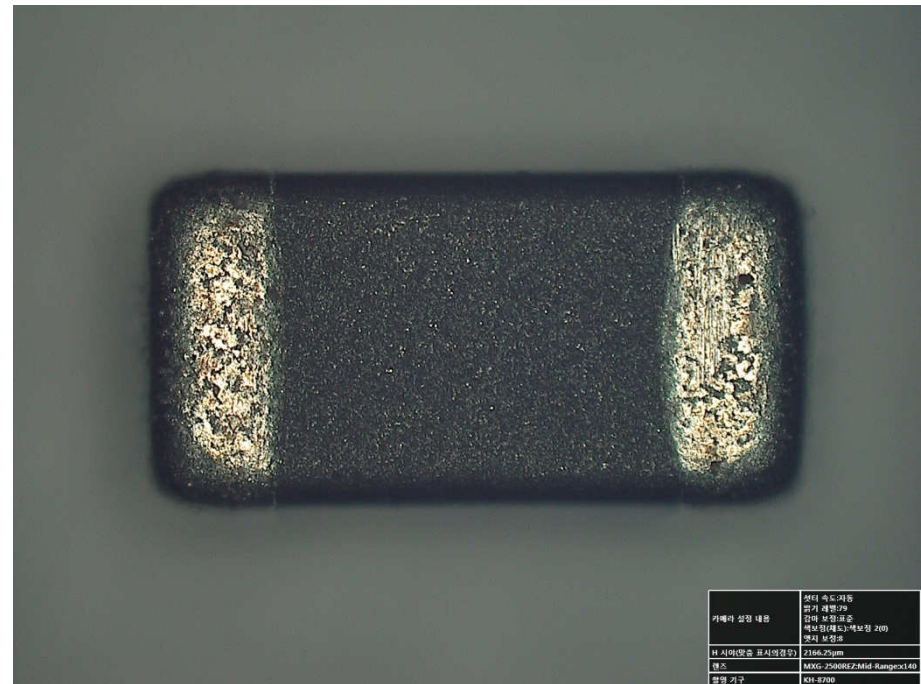
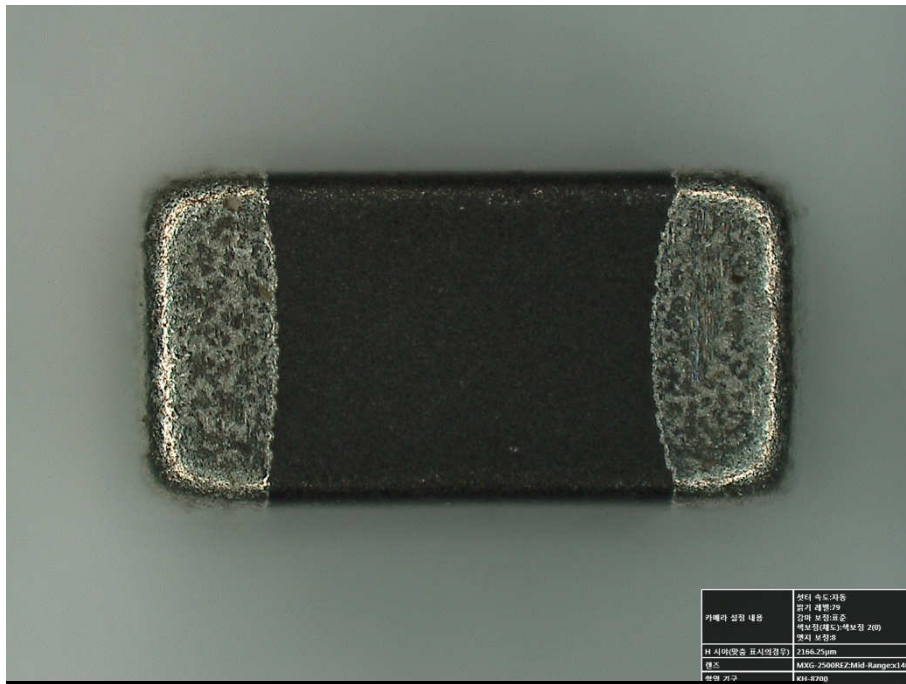
Maker	Number	Parts number	SPEC	PKG
MAXECH	A1608	EBMS160808A12	120Ω /400mA/DCR:0.15Ω /Top: -55~125°C	1608
	A2125	ACMS201209A221	220Ω /3A /DCR: 0.05Ω /Top:-55~125°C	2125
MURATA	B1608	BLM18BB121SN1	120Ω ± 25%/500mA/DCR:0.3Ω /Top: -55~125°C	1608
	B2125	BLM21PG221SN1	220Ω /2A /DCR: 0.045Ω /Top:-55~125°C	2125
Samwha	C1608	CB1608GK121	120Ω /600mA/DCR:0.25Ω /Top: -55~125°C	1608
	C2125	CB2012PA221	220Ω /2A /DCR: 0.05Ω /Top:-55~125°C	2125

## II. Optical microscope analyses



A社 1608

MAXECHO

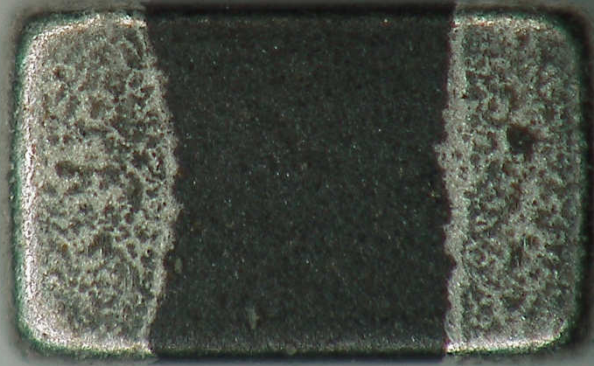


With a small dent



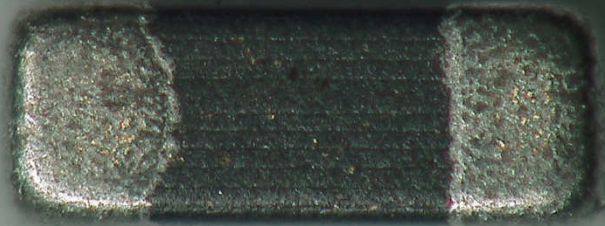
A社 2125

MAXECHO



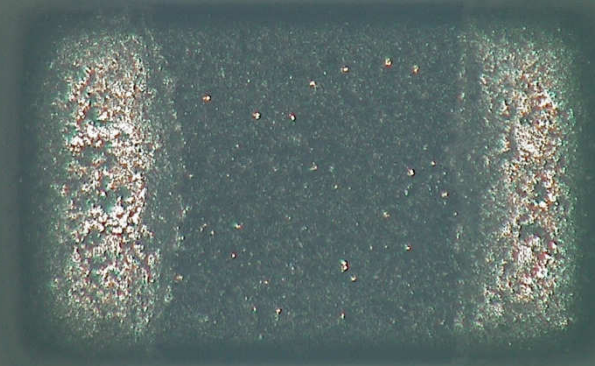
시료 속도/제품	3032.76μm
키메라 설정 내용	평균 채널:00 강해 보정:원 상관 제거 역보정(레드):역보정 200 오프 보정:0
H 시야(현승 표시의경간)	3032.76μm

MG 2500RZ1Low-Rangox100



시료 속도/제품	3032.76μm
키메라 설정 내용	평균 채널:00 강해 보정:원 상관 제거 역보정(레드):역보정 200 오프 보정:0
H 시야(현승 표시의경간)	3032.76μm

MG 2500RZ1Low-Rangox100  
KX 8700



시료 속도/제품	3032.76μm
키메라 설정 내용	평균 채널:00 강해 보정:원 상관 제거 역보정(레드):역보정 200 오프 보정:0
H 시야(현승 표시의경간)	3032.76μm

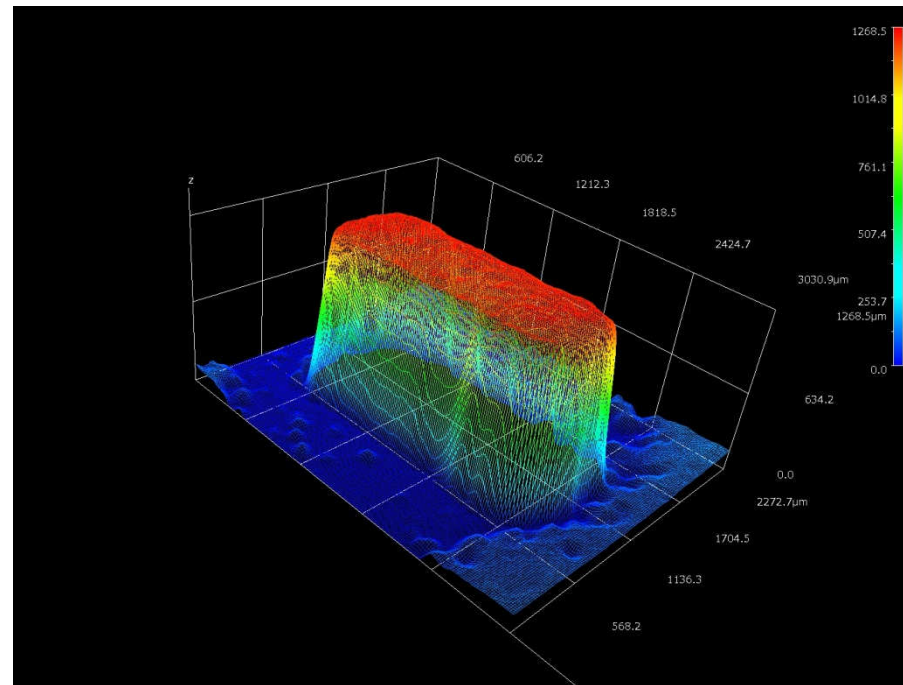
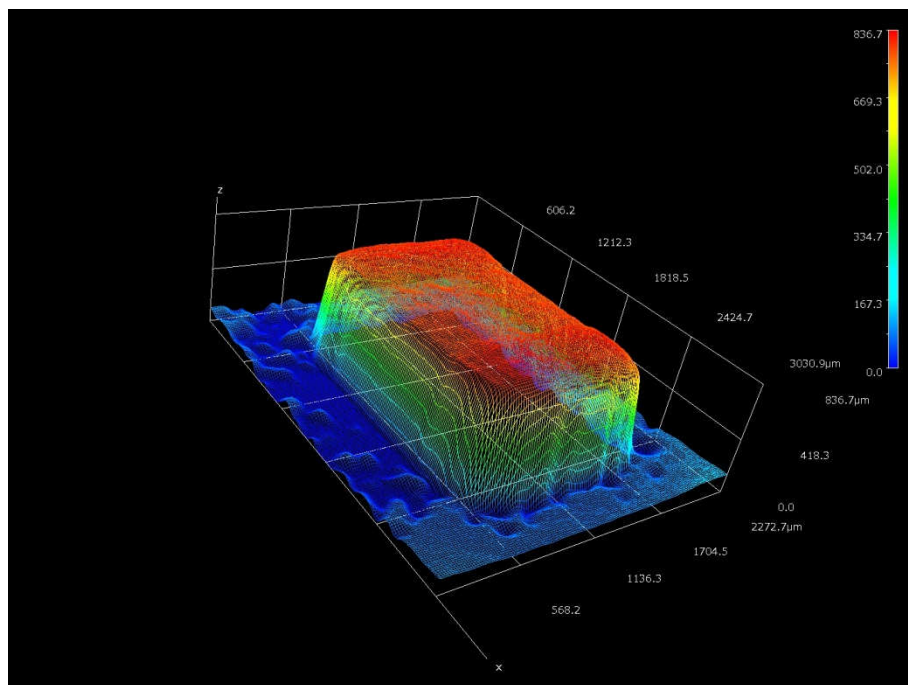
MG 2500RZ1Low-Rangox100



시료 속도/제품	3032.76μm
키메라 설정 내용	평균 채널:00 강해 보정:원 상관 제거 역보정(레드):역보정 200 오프 보정:0
H 시야(현승 표시의경간)	3032.76μm

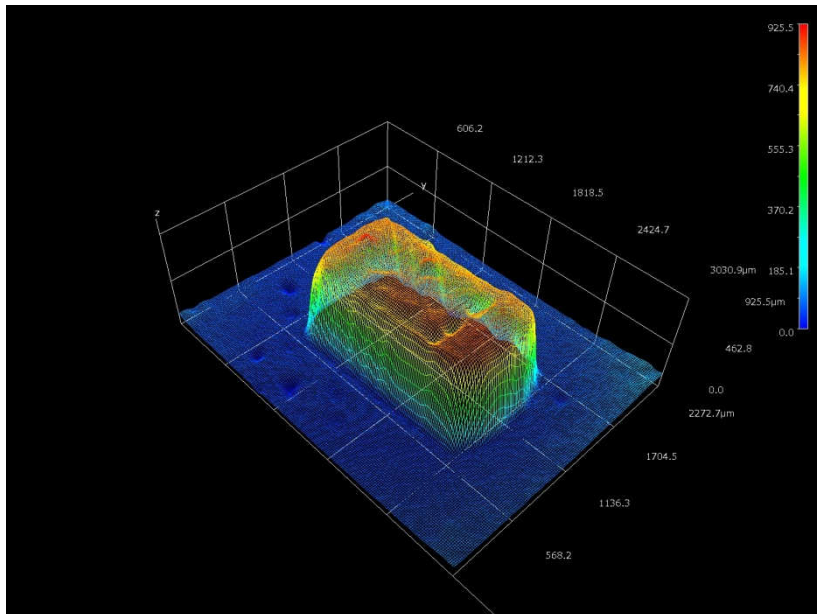
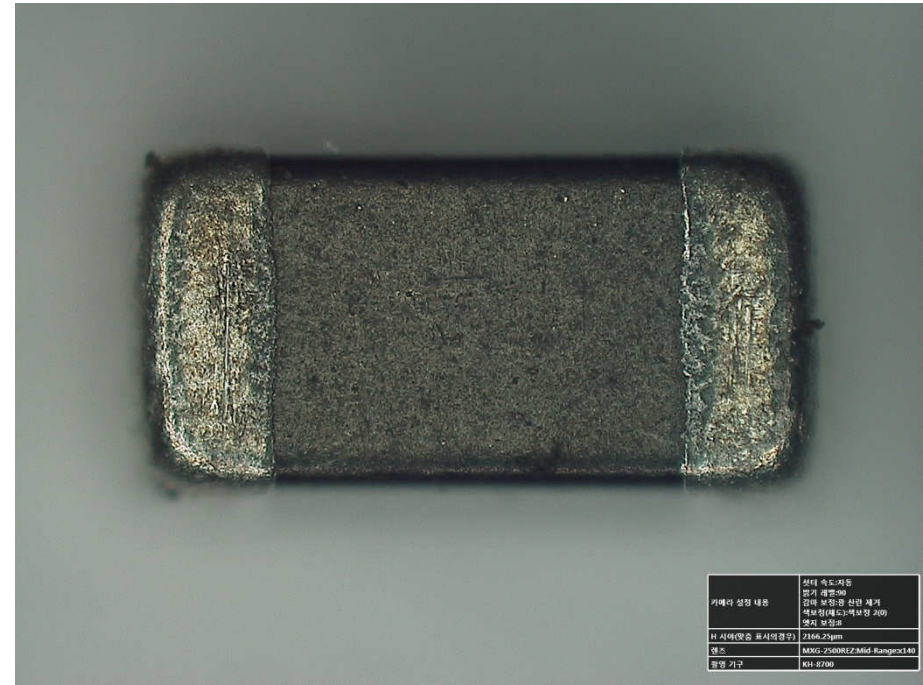
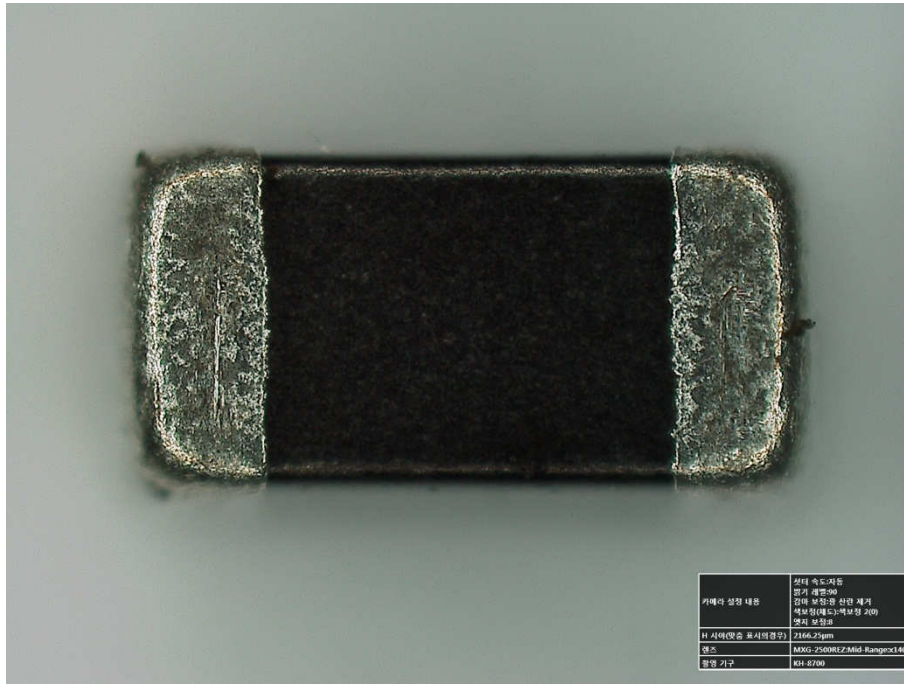
MG 2500RZ1Low-Rangox100  
KX 8700





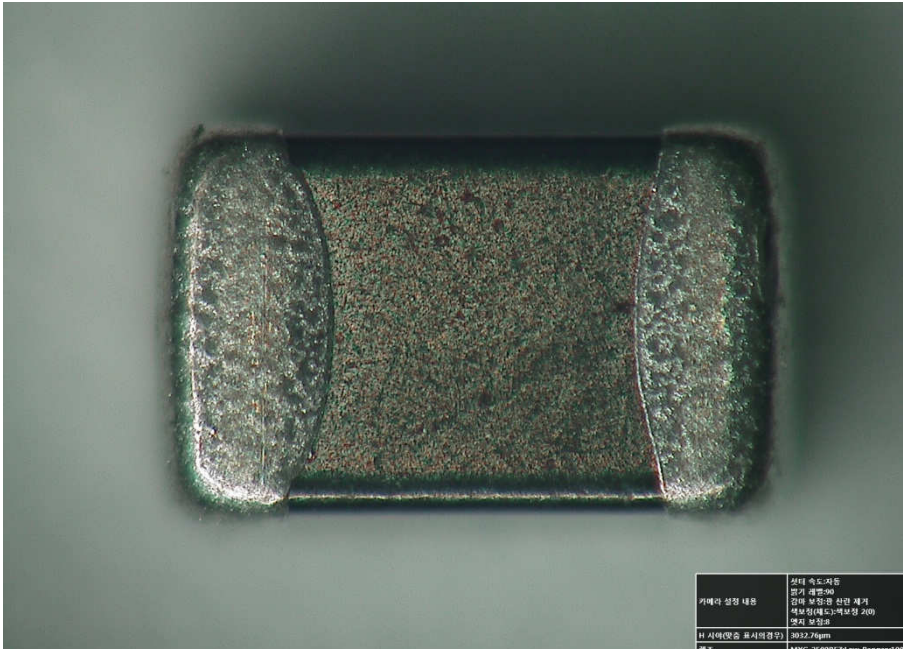
B社 1608

MURATA

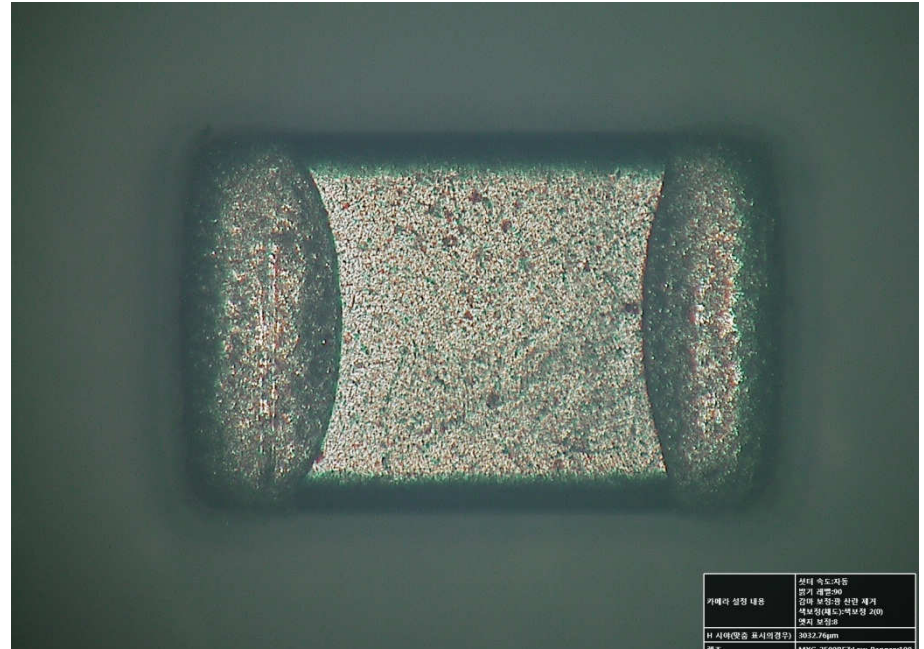


B社 2125

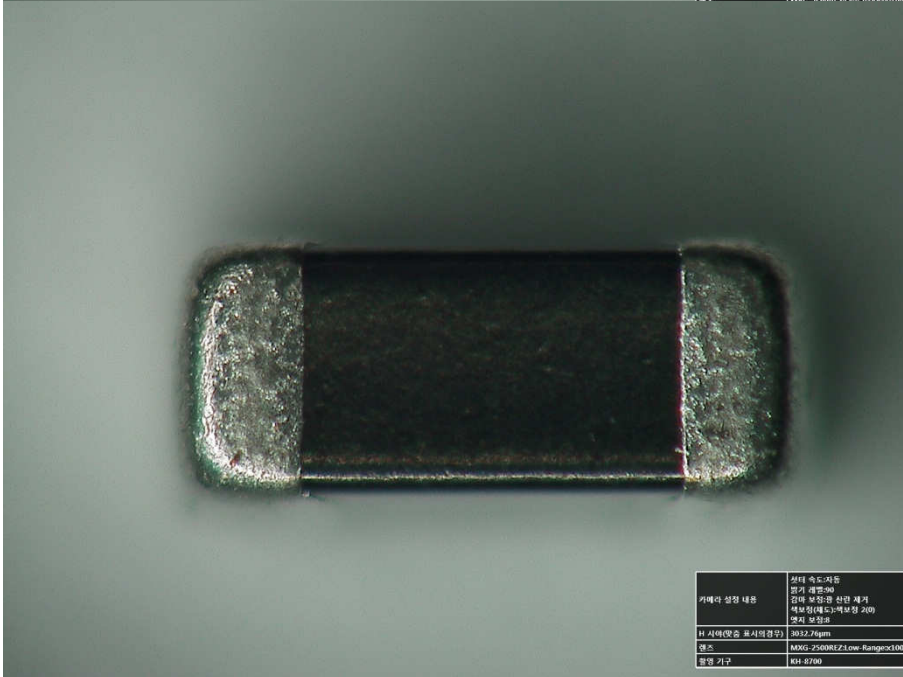
MURATA



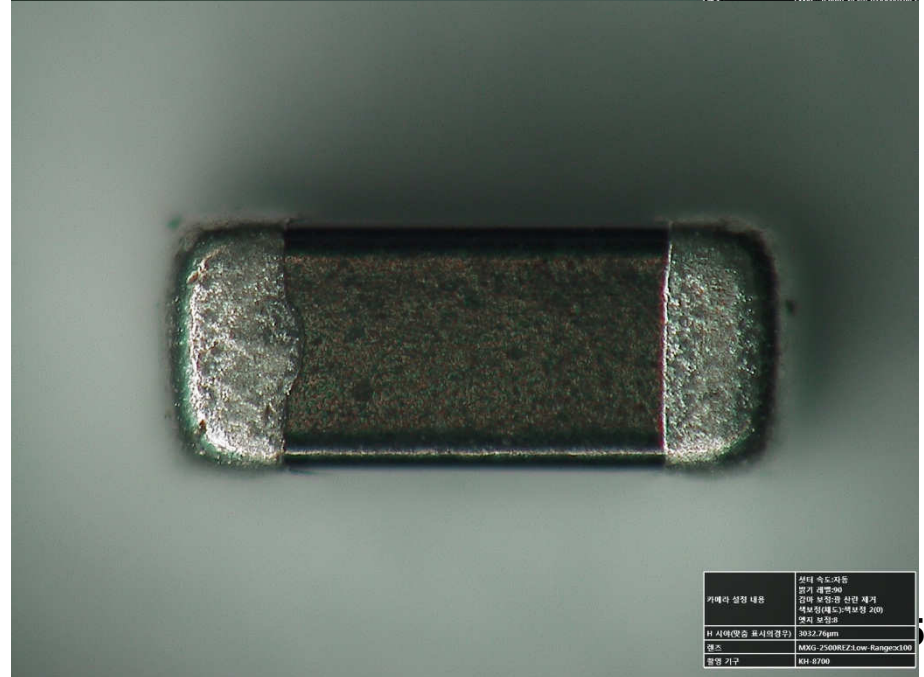
시험 속도/제동	20mm/s
검사 방법/00	00
시험 대상/00	00
시험 방법/00	00
시험 속도/제동	20mm/s
시험 방법/00	00
시험 대상/00	00
시험 방법/00	00
시험 속도/제동	20mm/s
시험 방법/00	00
시험 대상/00	00
시험 방법/00	00



시험 속도/제동	20mm/s
검사 방법/00	00
시험 대상/00	00
시험 방법/00	00
시험 속도/제동	20mm/s
시험 방법/00	00
시험 대상/00	00
시험 방법/00	00
시험 속도/제동	20mm/s
시험 방법/00	00
시험 대상/00	00
시험 방법/00	00



시험 속도/제동	20mm/s
검사 방법/00	00
시험 대상/00	00
시험 방법/00	00
시험 속도/제동	20mm/s
시험 방법/00	00
시험 대상/00	00
시험 방법/00	00
시험 속도/제동	20mm/s
시험 방법/00	00
시험 대상/00	00
시험 방법/00	00

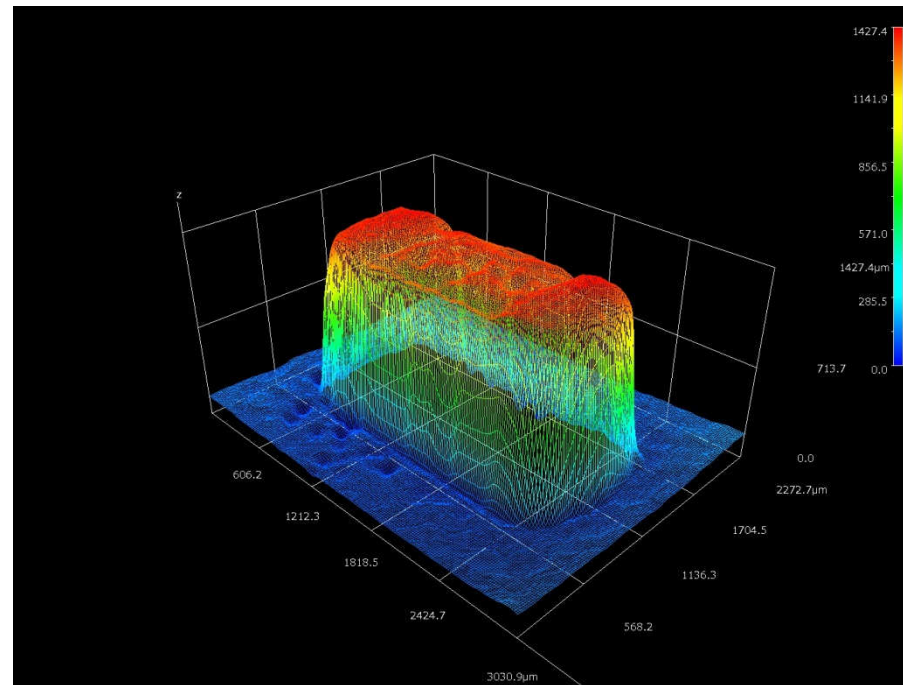
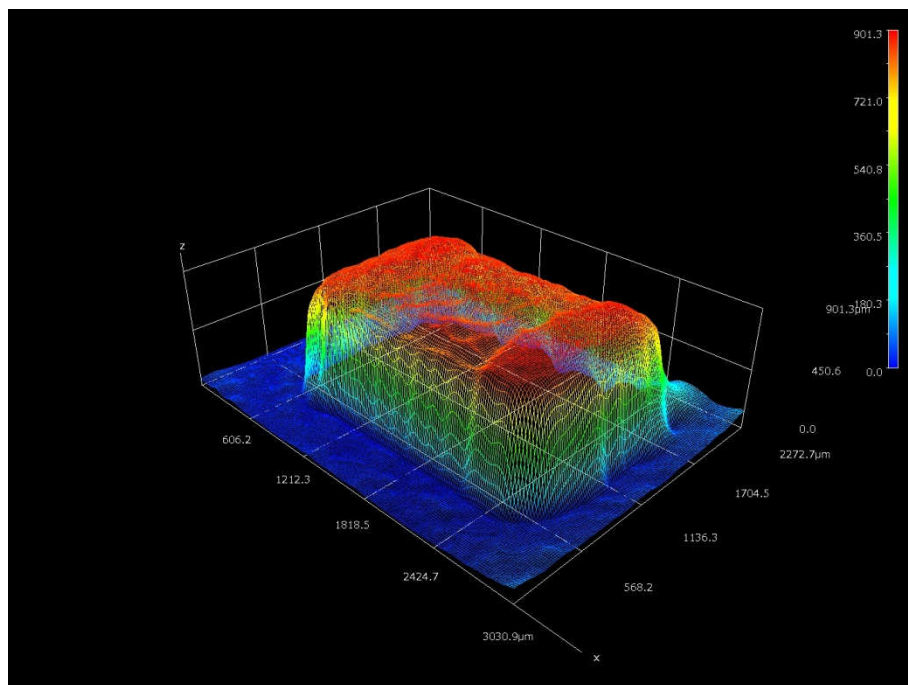


시험 속도/제동	20mm/s
검사 방법/00	00
시험 대상/00	00
시험 방법/00	00
시험 속도/제동	20mm/s
시험 방법/00	00
시험 대상/00	00
시험 방법/00	00
시험 속도/제동	20mm/s
시험 방법/00	00
시험 대상/00	00
시험 방법/00	00



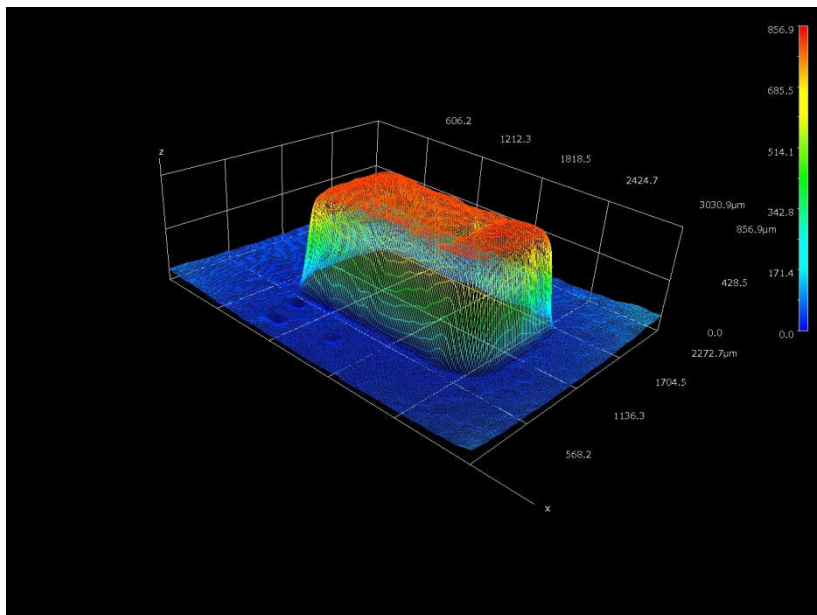
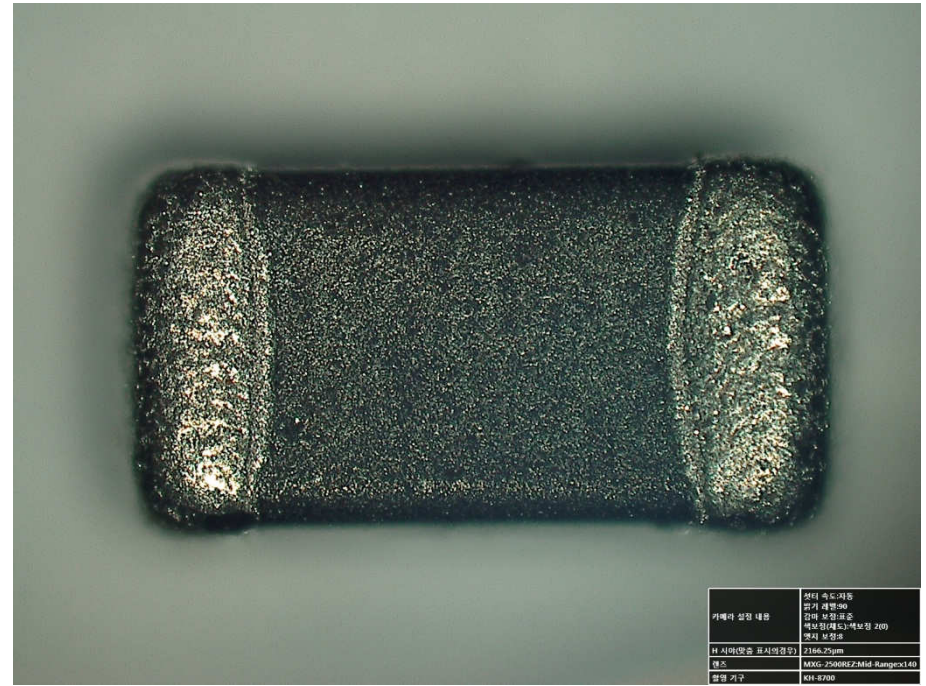
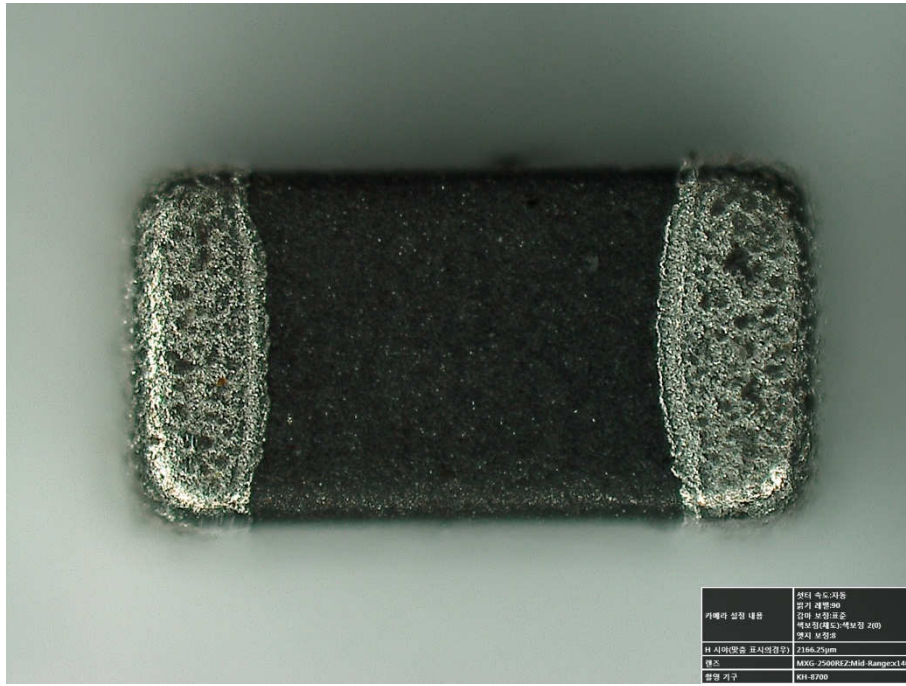
**B社 2125**

**MURATA**



C社 1608

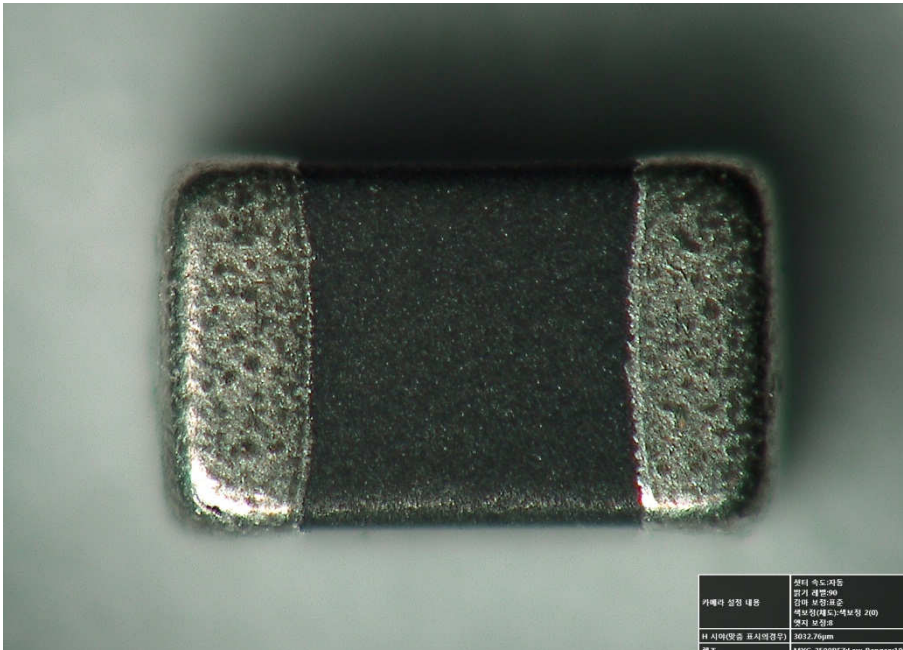
Samwha



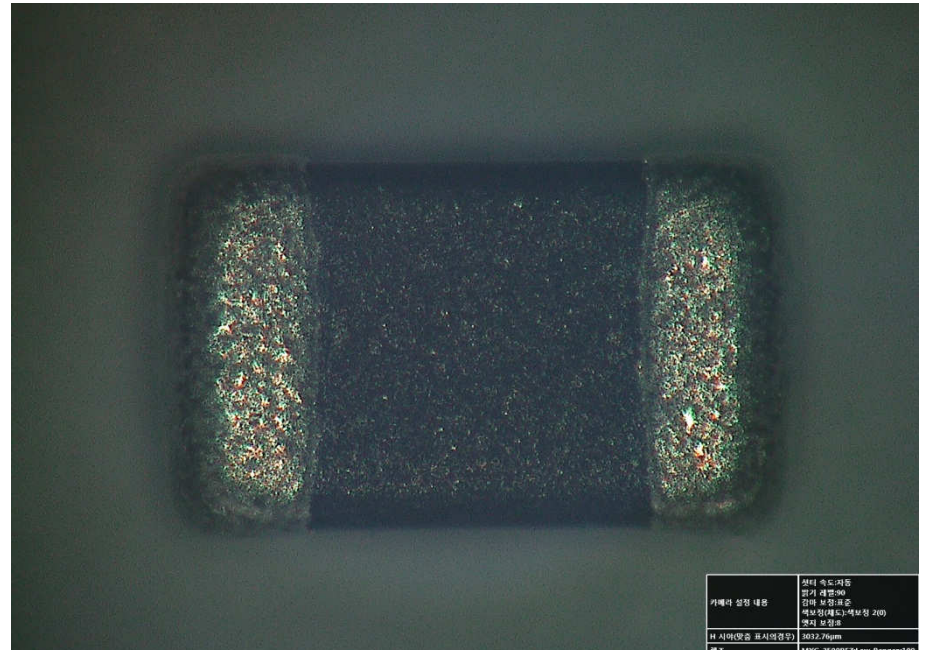


C社 2125

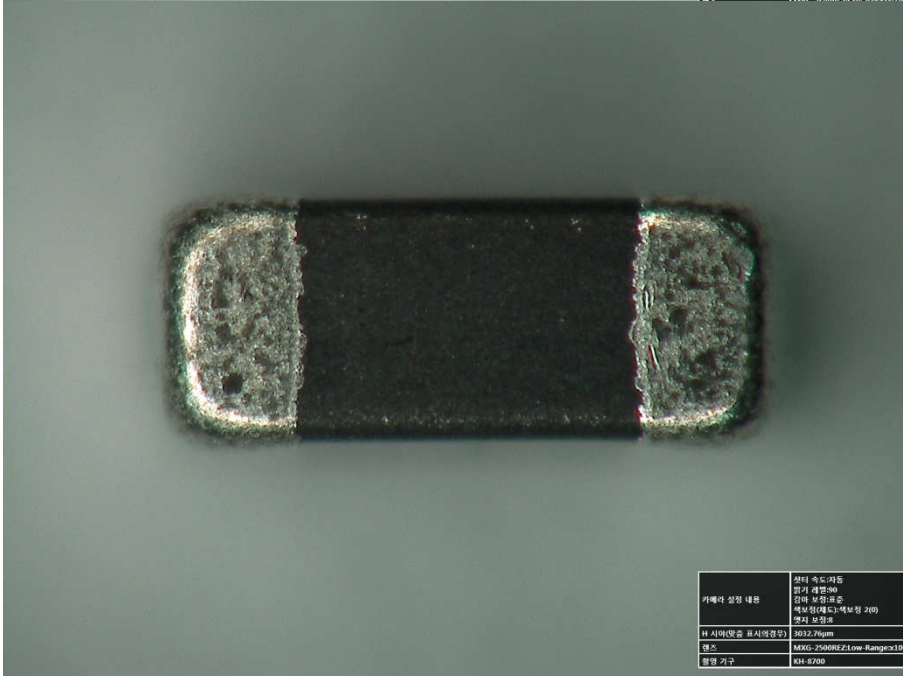
Samwha



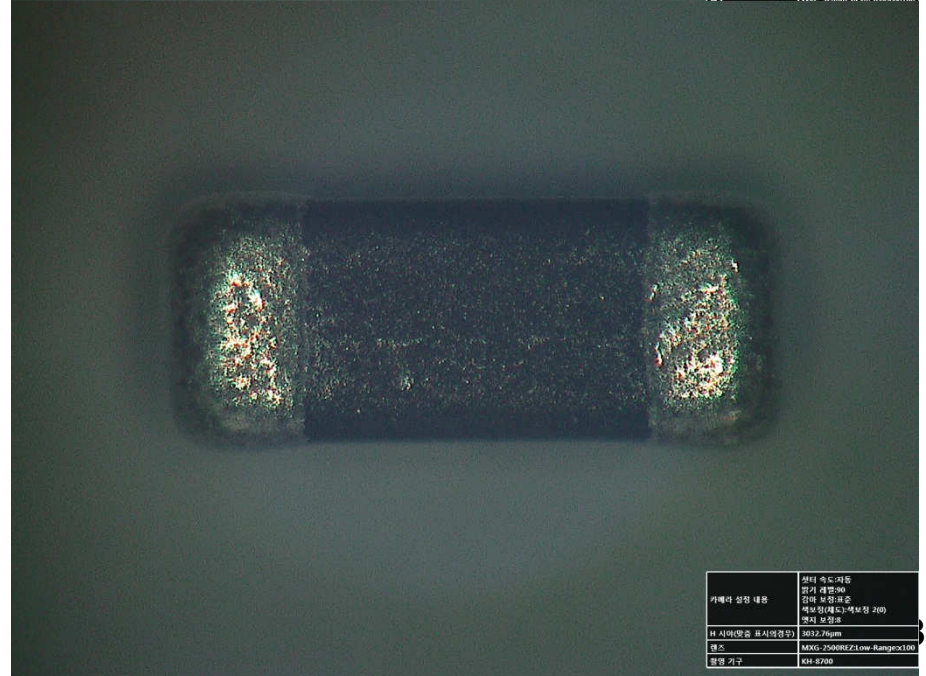
카메라 설정 내용	렌즈 속도: 자동 絞り: F8.0 감마 보정: 표준 색보정: (색도) 3, (색보정) 200 노이즈 보정: 표준
H 시야(광축 표시의경장)	3032.76mm
필드	MXG-2500RZ1Low-Rangex100



카메라 설정 내용	렌즈 속도: 자동 絞り: F8.0 감마 보정: 표준 색보정: (색도) 3, (색보정) 200 노이즈 보정: 표준
H 시야(광축 표시의경장)	3032.76mm
필드	MXG-2500RZ1Low-Rangex100



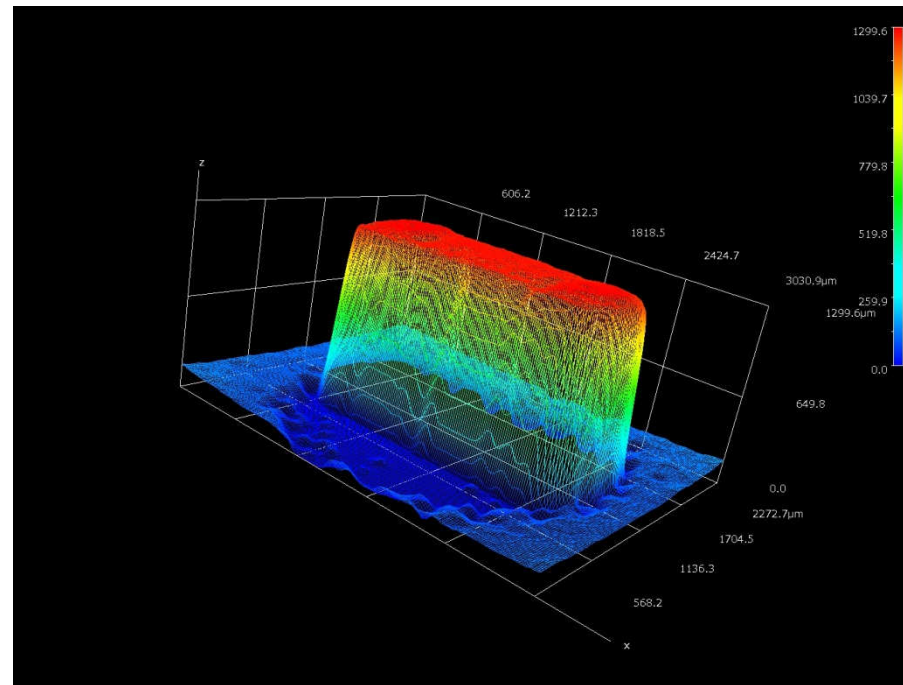
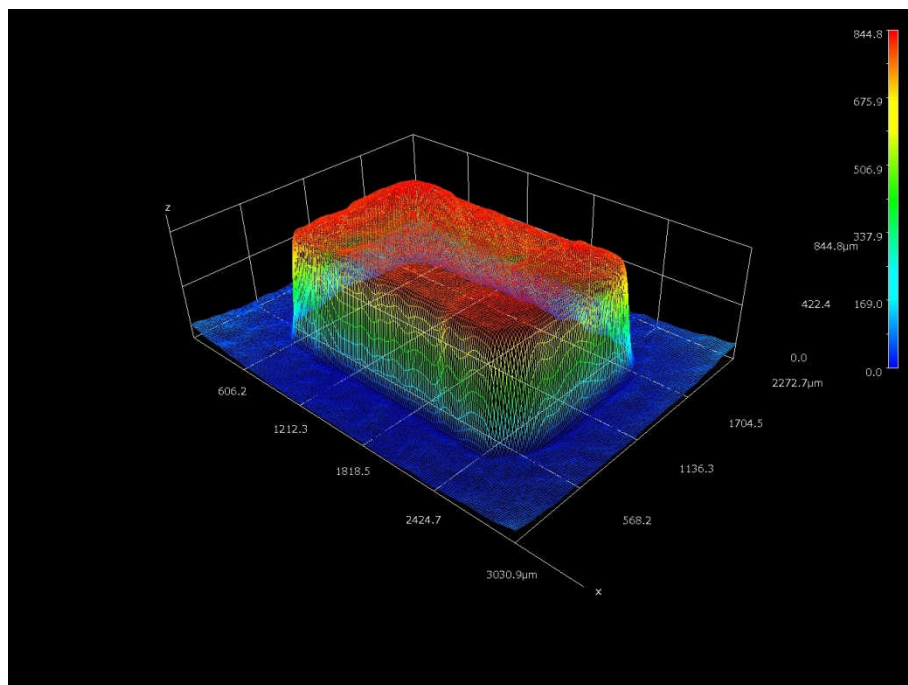
카메라 설정 내용	렌즈 속도: 자동 絞り: F8.0 감마 보정: 표준 색보정: (색도) 3, (색보정) 200 노이즈 보정: 표준
H 시야(광축 표시의경장)	3032.76mm
필드	MXG-2500RZ1Low-Rangex100
촬영 기구	SH-6700



카메라 설정 내용	렌즈 속도: 자동 絞り: F8.0 감마 보정: 표준 색보정: (색도) 3, (색보정) 200 노이즈 보정: 표준
H 시야(광축 표시의경장)	3032.76mm
필드	MXG-2500RZ1Low-Rangex100
촬영 기구	SH-6700

C社 2125

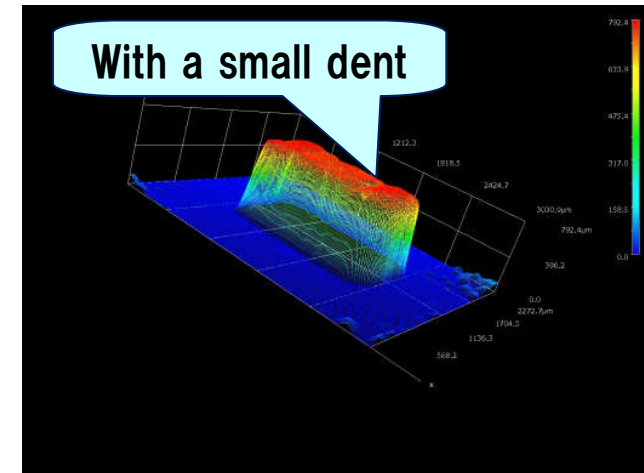
Samwha



## Summary and J-chip judgement

### Optical analyses result

Sample	Surface roughness	Construction
A1 608	With a dent Judg△	No problem Judg○
A2125	No problem Judg○	No problem Judg○
B1 608	No problem Judg○	No problem Judg○
B2125	No problem Judg○	No problem Judg○
C1608	No problem Judg○	No problem Judg○
C2125	No problem Judg○	No problem Judg○



<A1608 optical analyses>

### <J-chip comment>

All of specimens are on problem except A1608. But, A1608 phenomenon is not severe which influence the electrical quality.

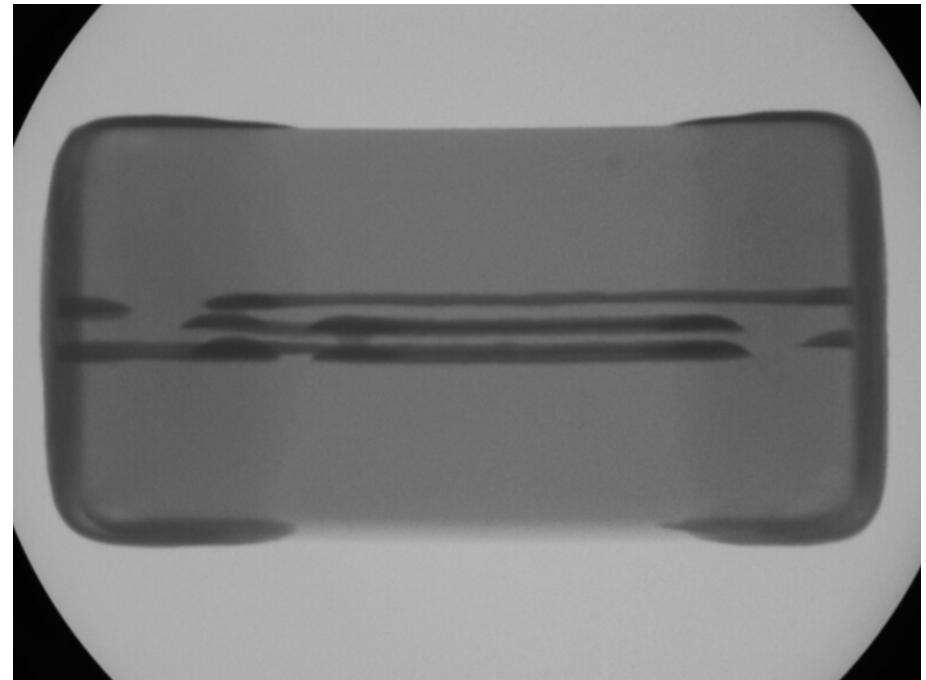
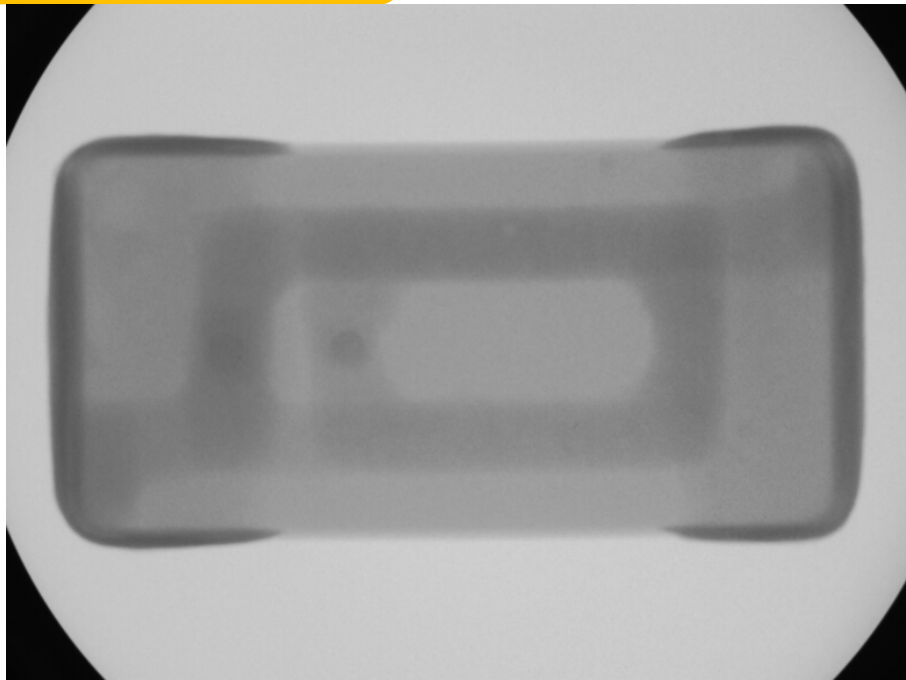


# III. X-ray analyses



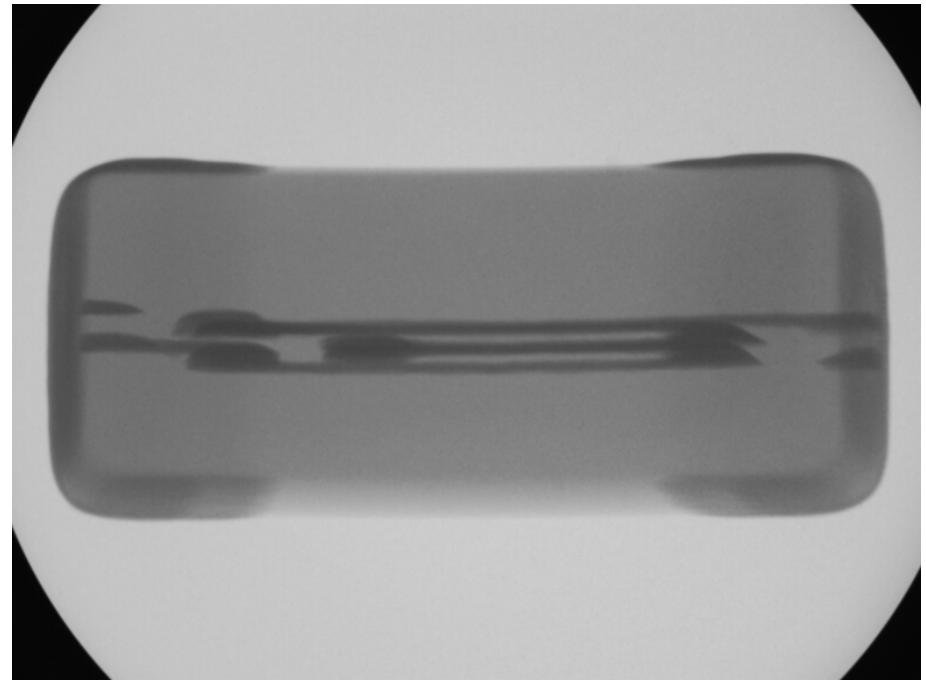
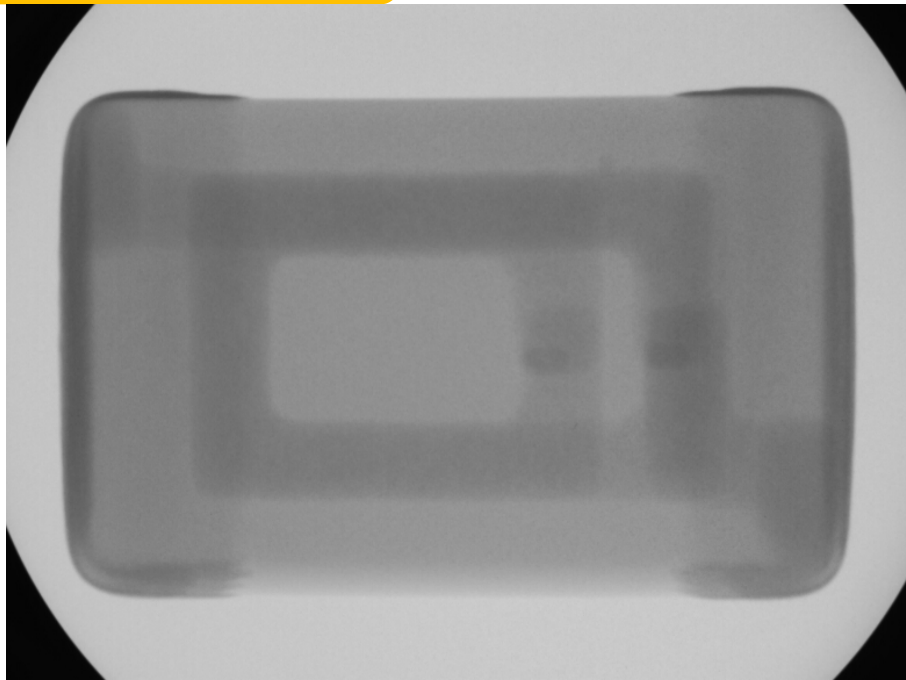
A社 1608

MAXECHO



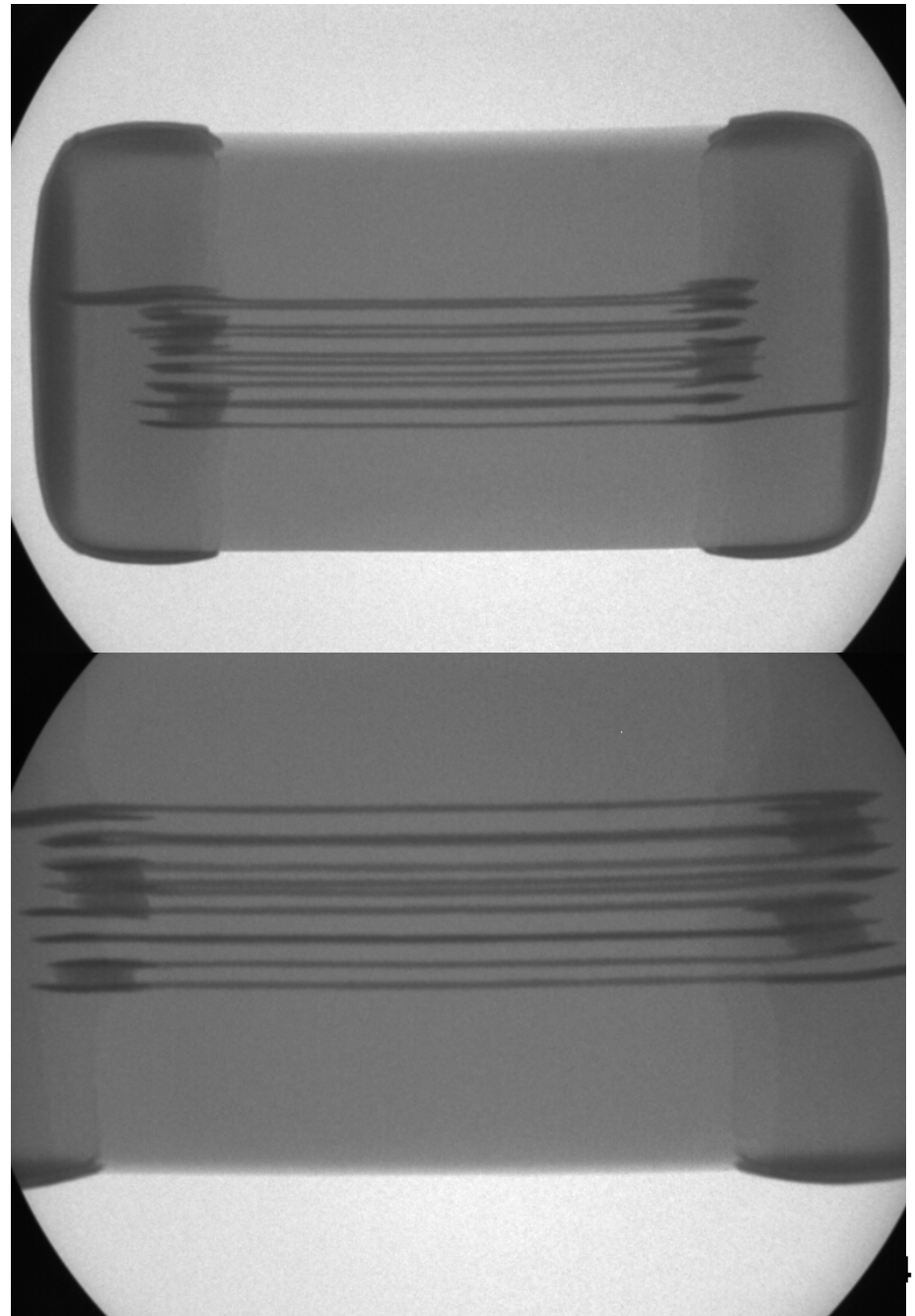
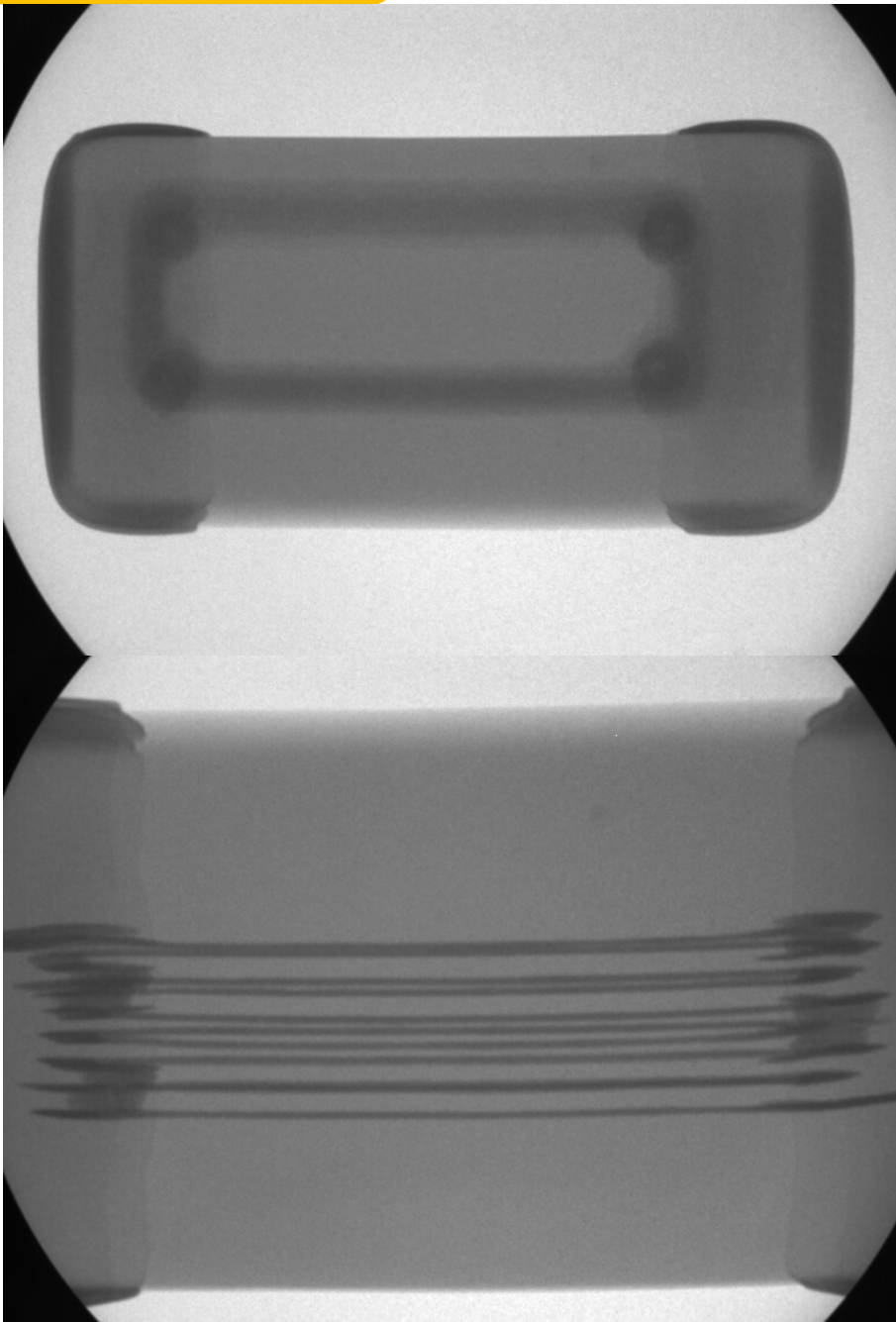
A社 2125

MAXECHO



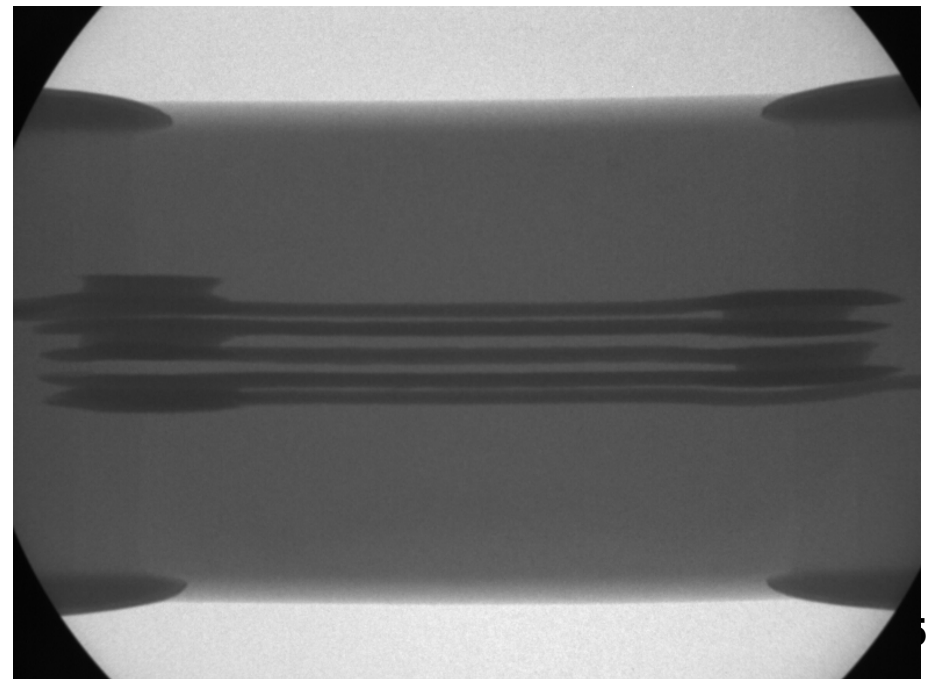
**B社 1608**

**MURATA**



B社 2125

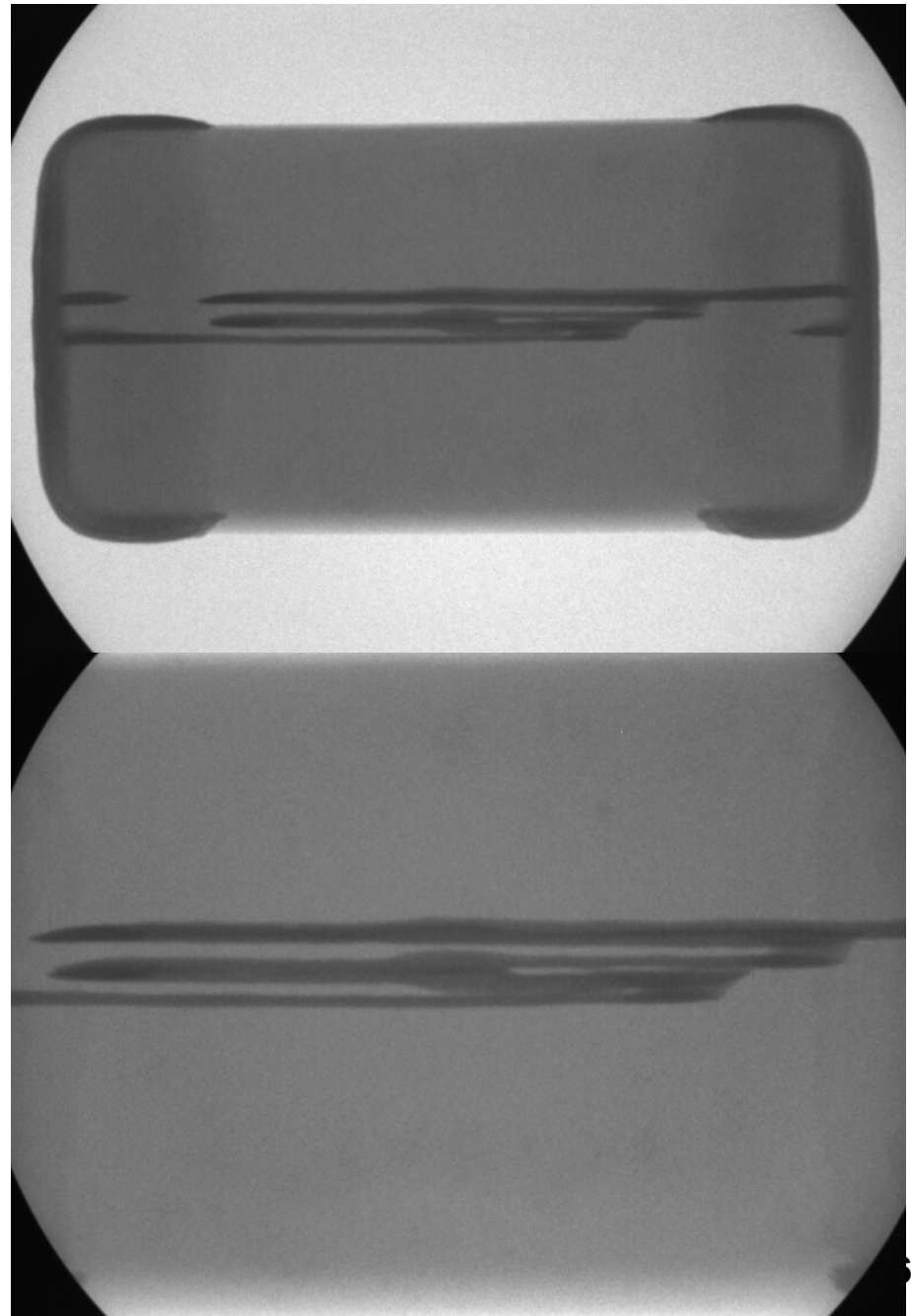
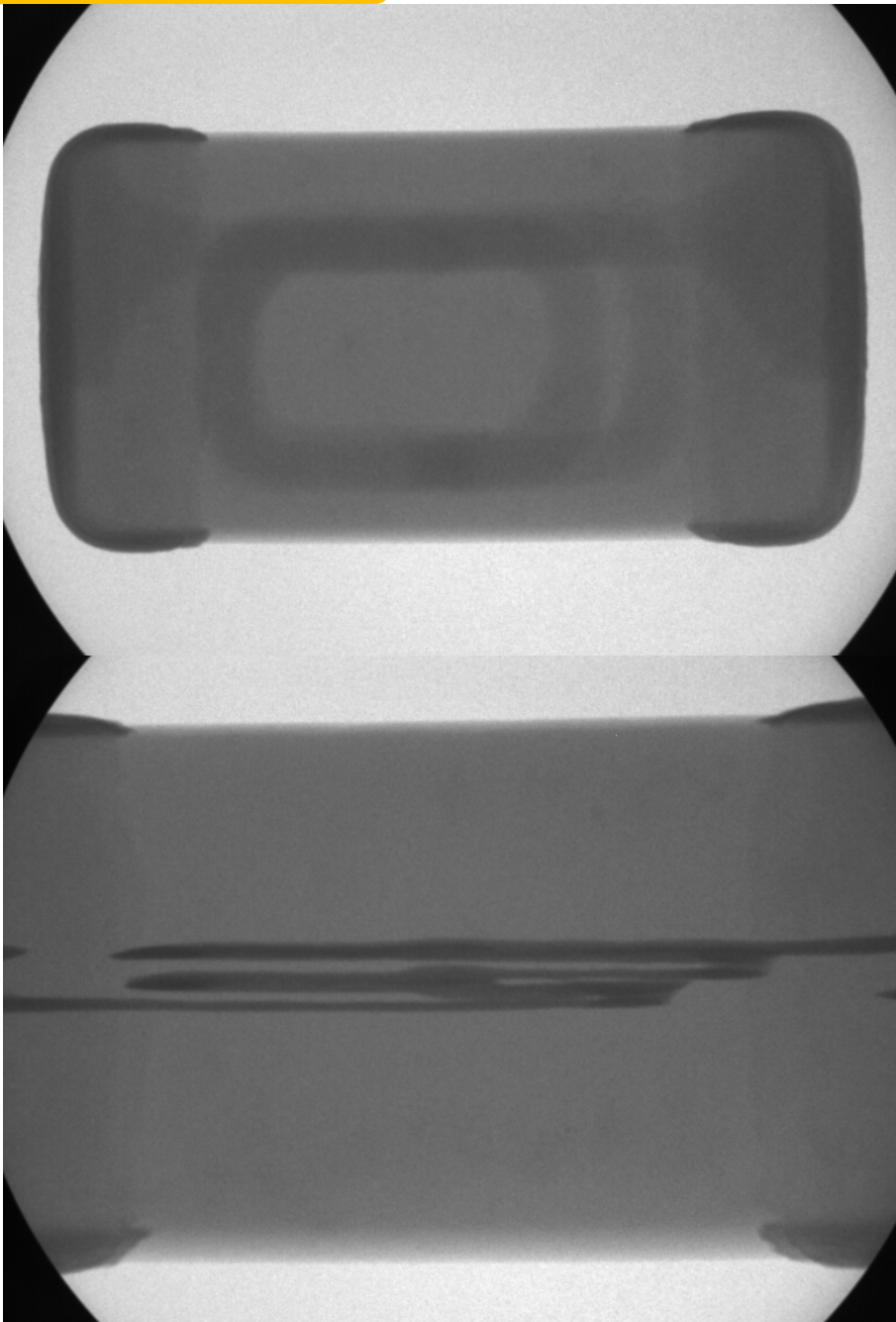
MURATA





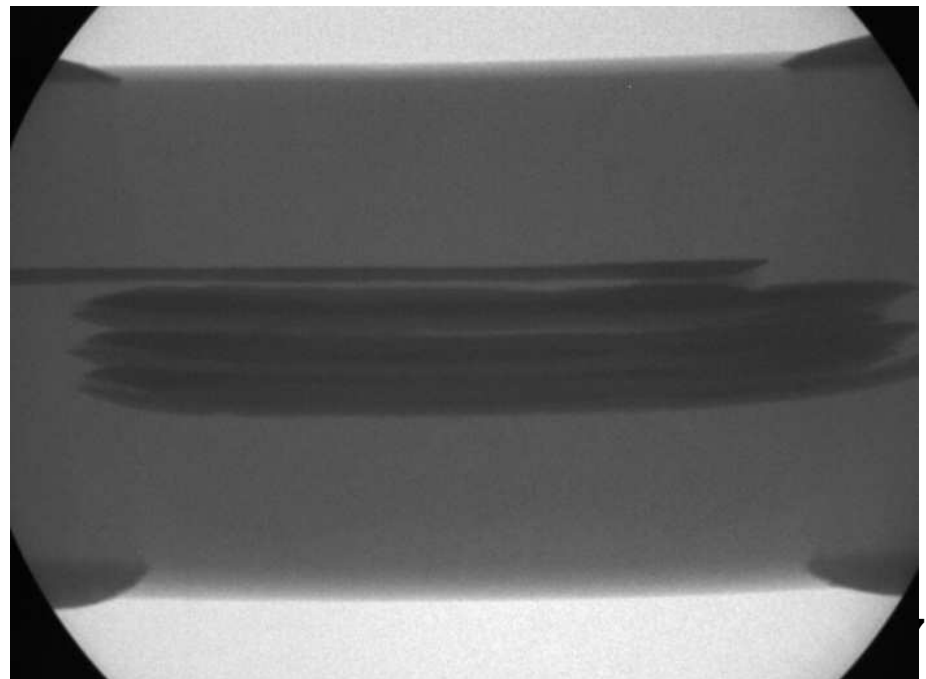
C社 1608

Samwha



C社 2125

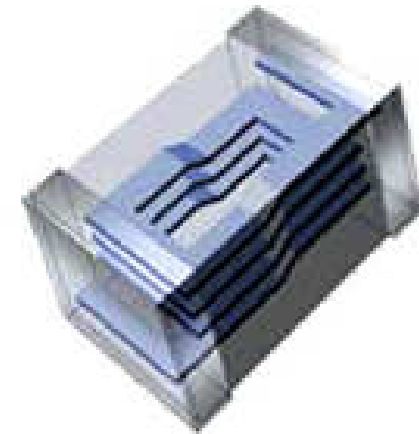
Samwha



## Summary and J-chip judgement

### X-ray analyses result

Sample	Foreign substance	Construction
A1608	NO	No problem
	Judg.○	Judg.○
A2125	NO	No problem
	Judg.○	Judg.○
B1608	NO	No problem
	Judg.○	Judg.○
B2125	NO	No problem
	Judg.○	Judg.○
C1608	NO	No problem
	Judg.○	Judg.○
C2125	NO	No problem
	Judg.○	Judg.○



<Multi layer ferrite beads>

### <J-chip comment>

All of specimens are no problem ( satisfied with our expectations.)