

Comparison Evaluation of MLCC

STRUCTURE ANALYSIS

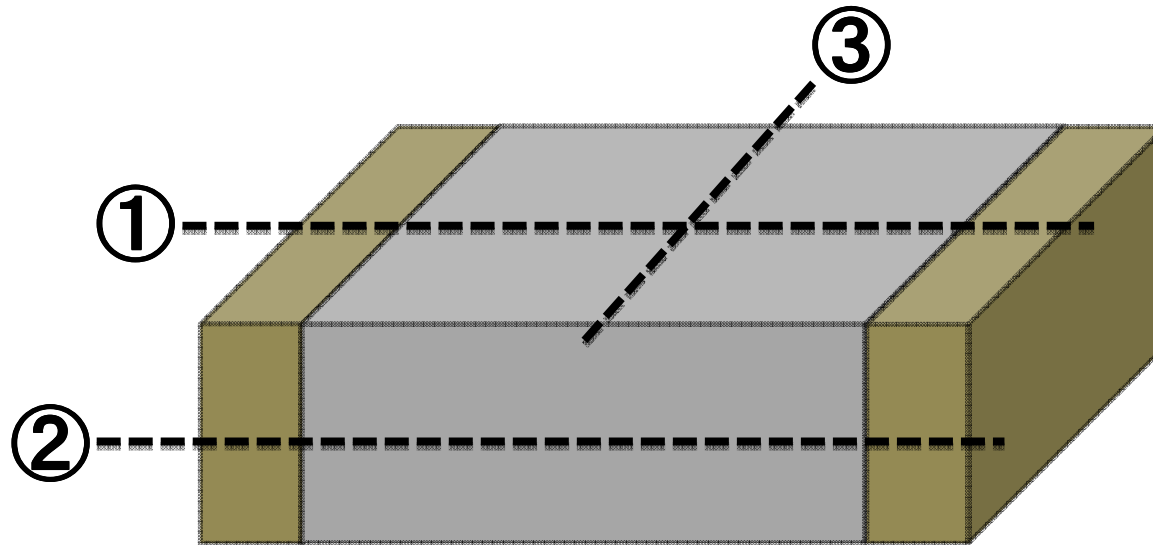


Revised 2014. 02. 10

III. Cross-sectional analysis















Three observation directions of MLCC



Specimens

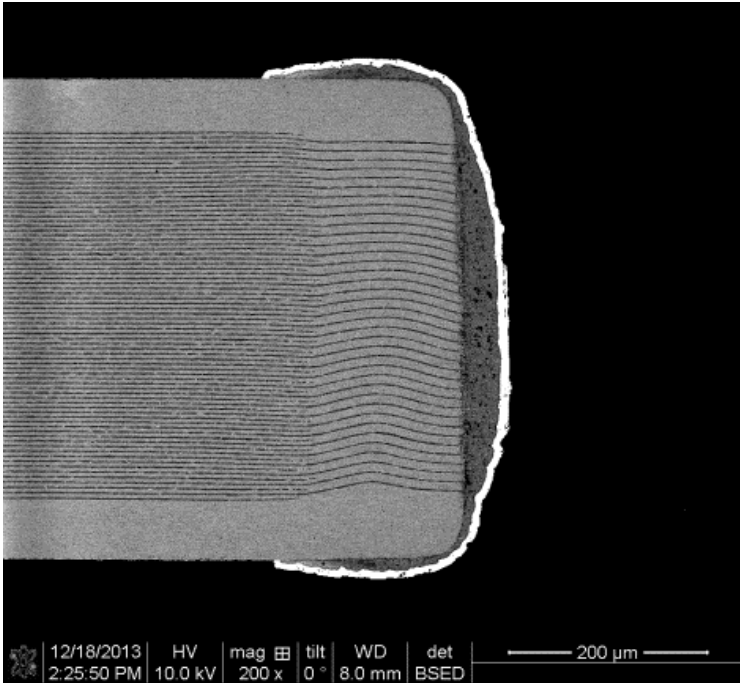
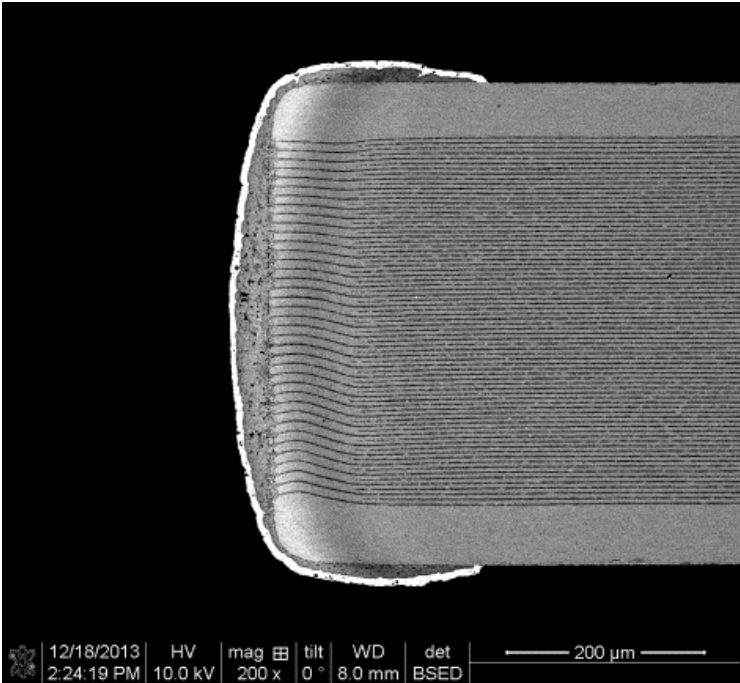
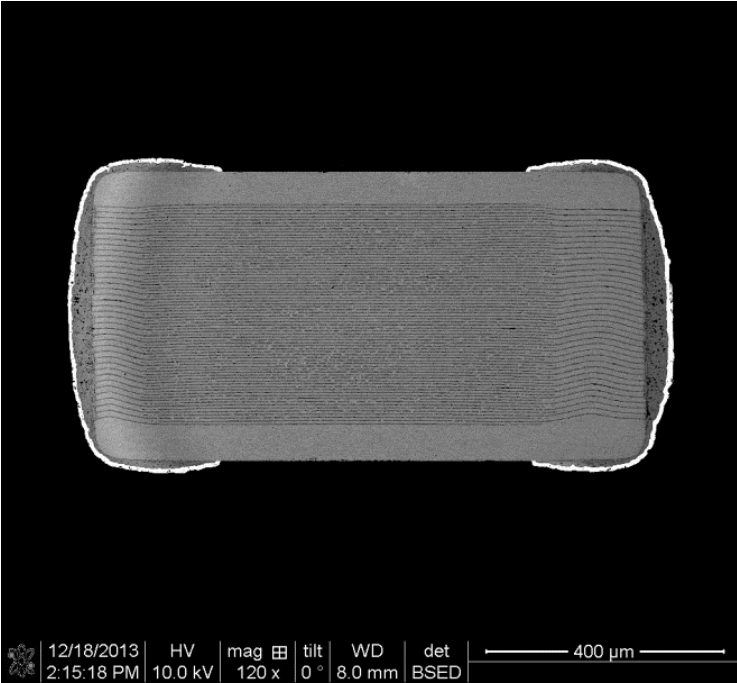
(Test items)

Chip size(mm)	A	B	C	D
1005				
1608-1				
1608-2				

Spec.	A	B	C	D	
1005	SIZE(mm)	1.0X0.5X0.5	1.0X0.5X0.5	1.0X0.5X0.5	1.0X0.5X0.5
	Capacitance	0.1uF±10%	0.1uF±10%	0.1uF±10%	0.1uF±10%
	Voltage	10VDC	10VDC	10VDC	10VDC
	Temp. chara	X7R	B	X7R	X7R
	Top.range	-55~125°C	-25~85°C	-55~125°C	-55~125°C
	Soldering tem.	260±5°C/10sec	270±5°C/10sec	260±5°C/10sec	270±5°C/10sec
1608-1	SIZE(mm)	1.6X0.8X0.8	1.6X0.8X0.8	1.6X0.8X0.8	1.6X0.8X0.8
	Capacitance	100pF±5%	100pF±5%	100pF±5%	100pF±5%
	Voltage	50VDC	50VDC	50VDC	50VDC
	Temp. chara	NPO	CH	NPO	COG
	Top.range	-55~125°C	-20~125°C	-55~125°C	-55~125°C
	Soldering tem.	260±5°C/10sec	270±5°C/10sec	260±5°C/10sec	270±5°C/10sec
1608-2	SIZE(mm)	1.6X0.8X0.4	1.6X0.8X0.4	1.6X0.8X0.5	1.6X0.8X0.8
	Capacitance	0.1uF+80%/-20%	0.1uF+80%/-20%	0.1uF+80%/-20%	0.1uF+80%/-20%
	Voltage	25VDC	25VDC	25VDC	25VDC
	Temp. chara	Y5V	F	Y5V	Y5V
	Top.range	-25~85°C	-25~85°C	-30~85°C	-30~85°C
	Soldering tem.	260±5°C/10sec	270±5°C/10sec	260±5°C/10sec	270±5°C/10sec

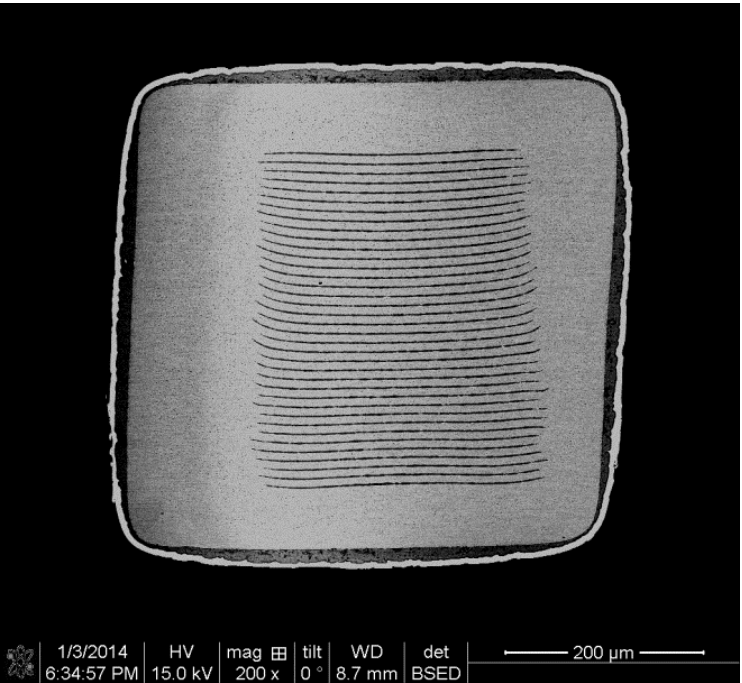
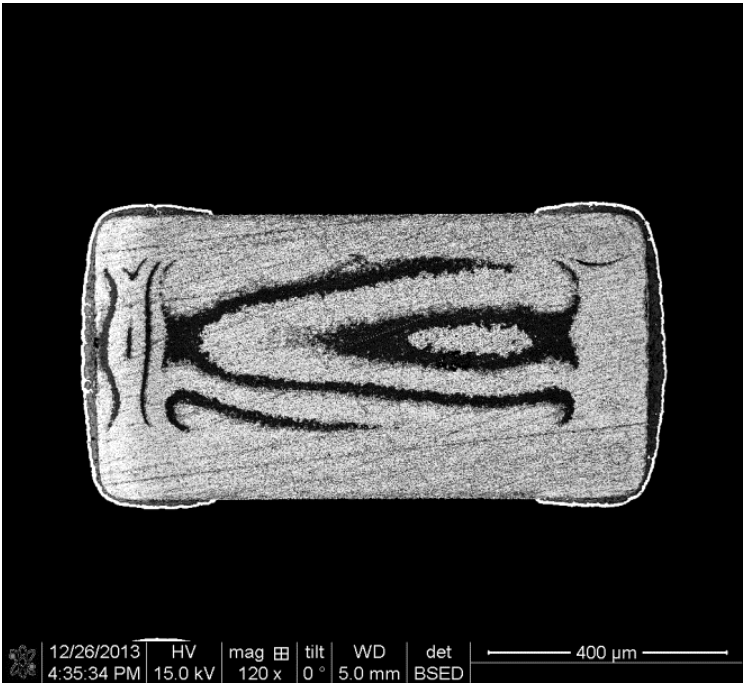
A 1005

Direction ①

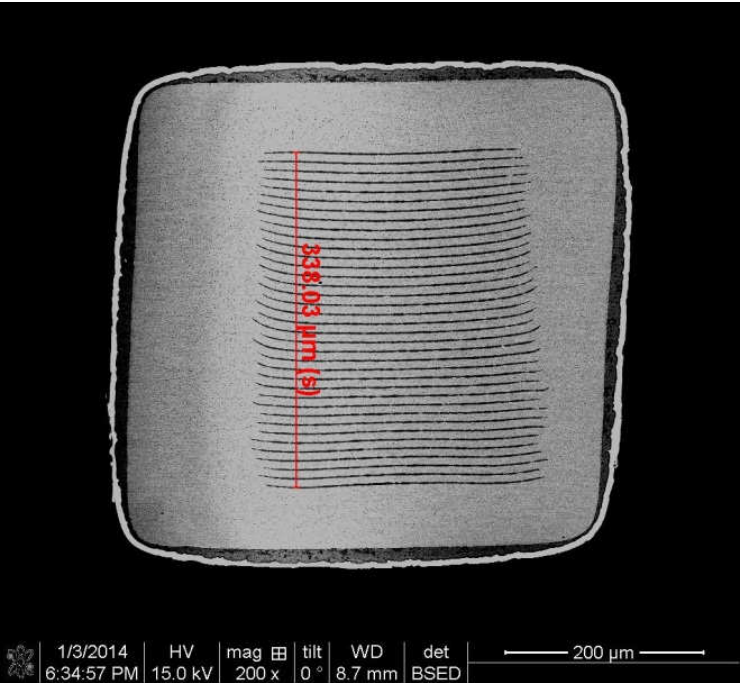
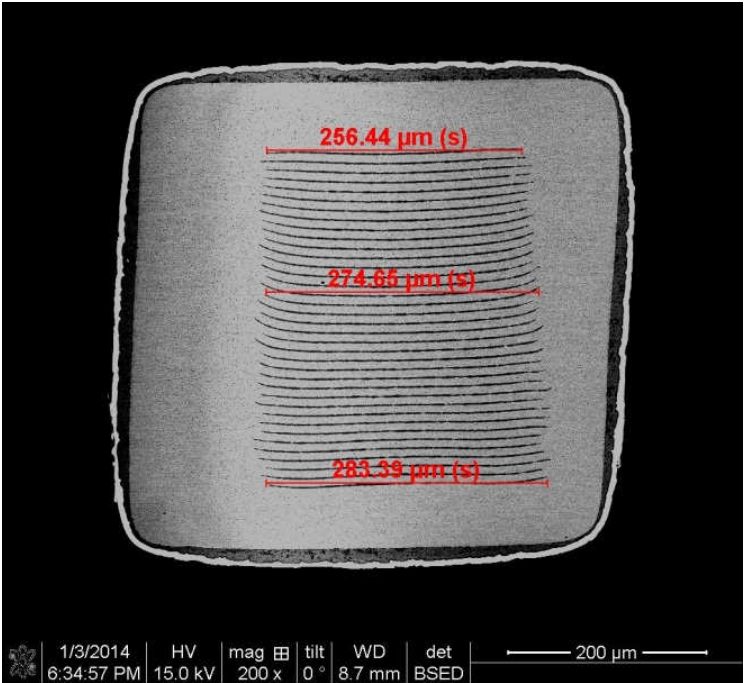


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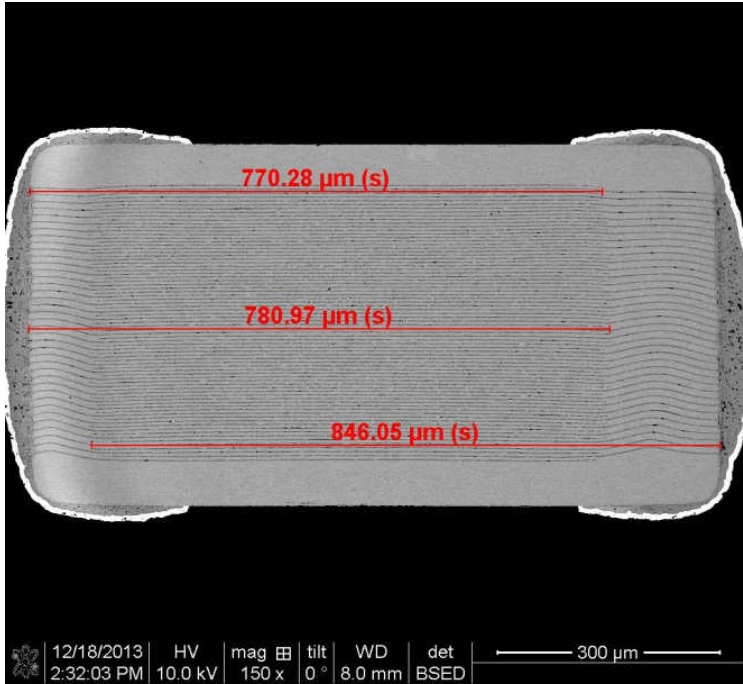
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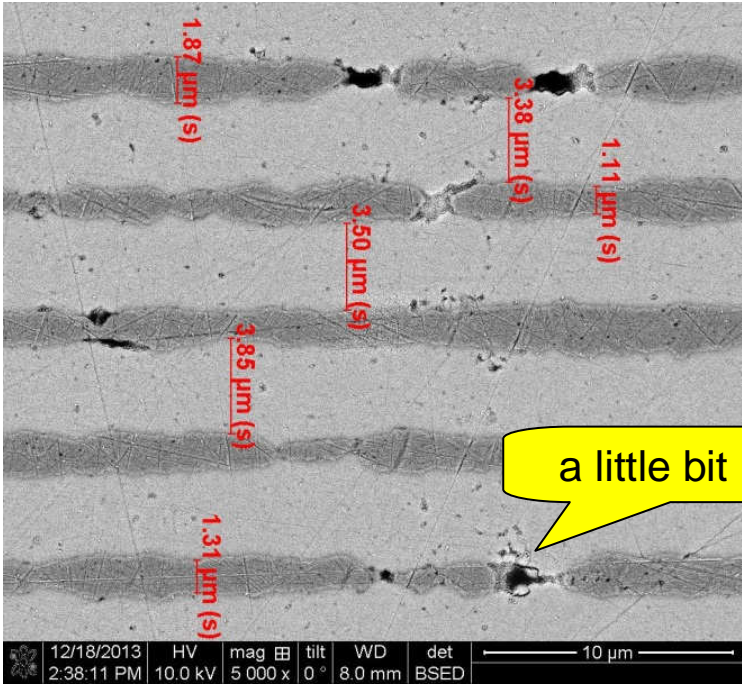
Direction ③



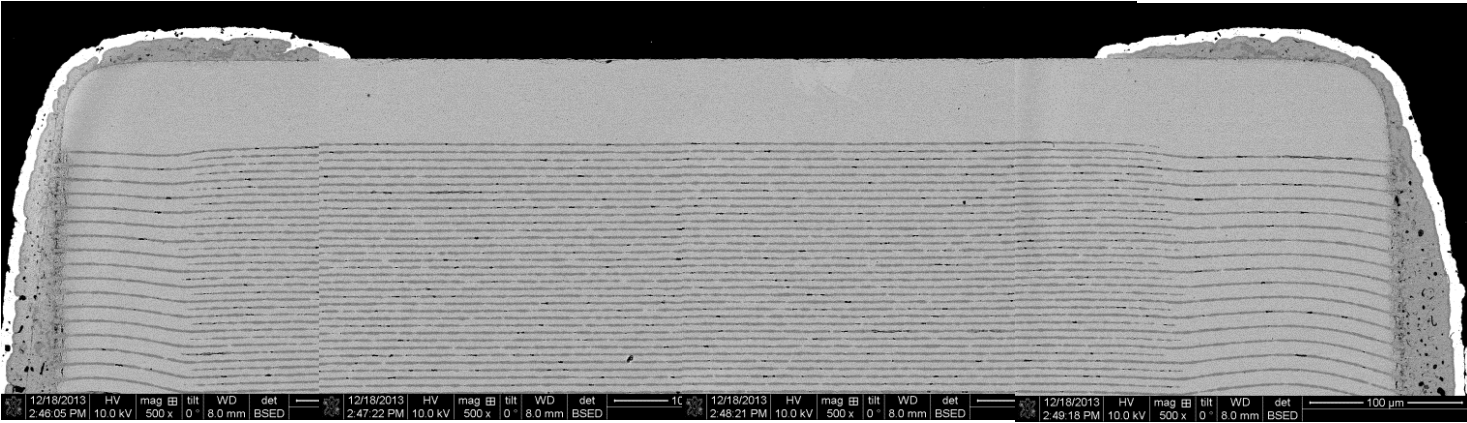
A 1005



Length of inner electrode



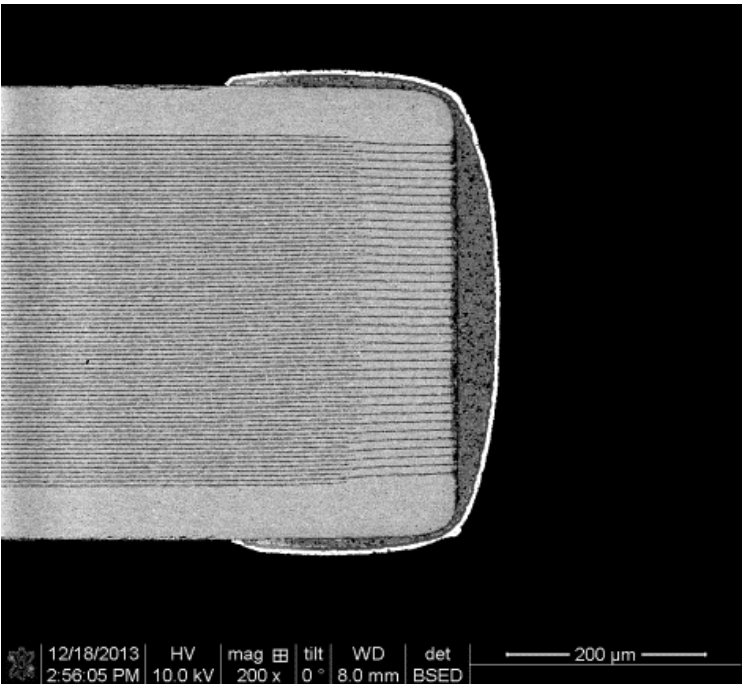
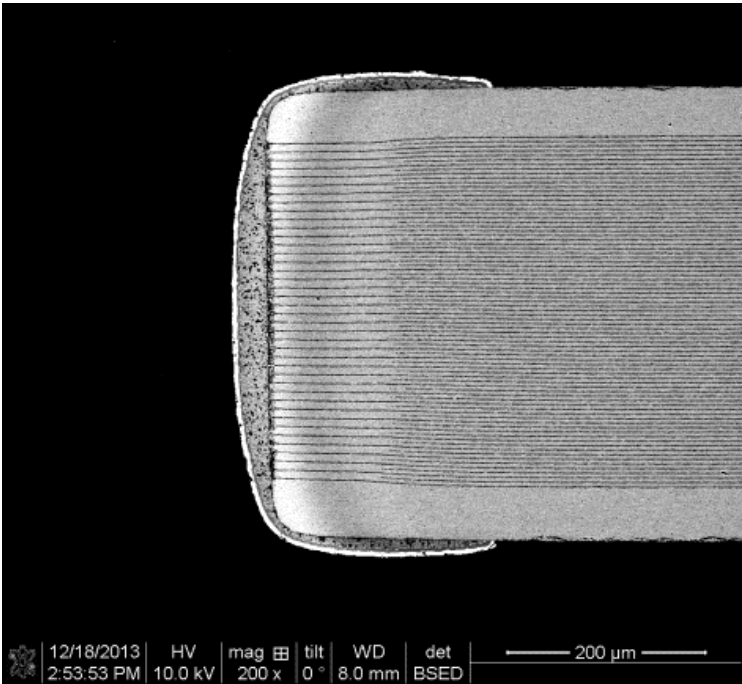
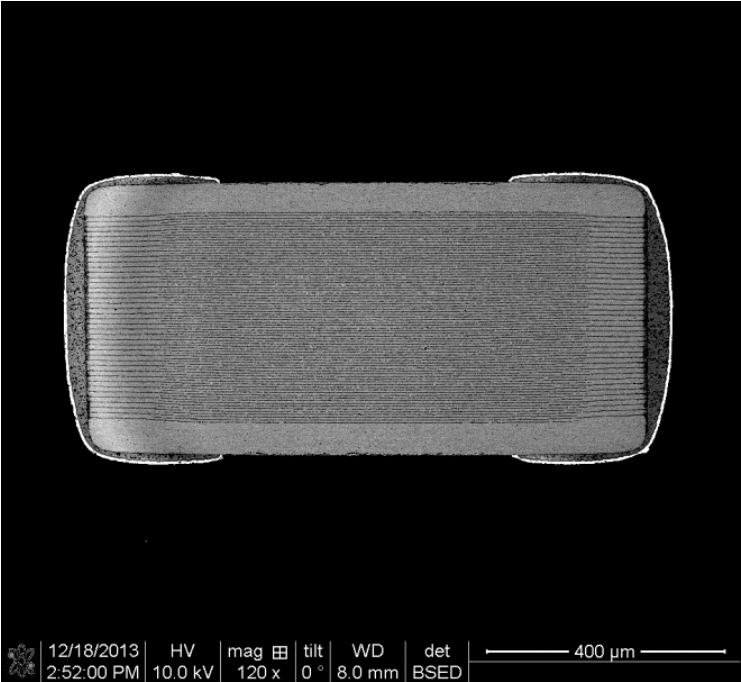
Gap between inner electrodes



Panorama of direction ①

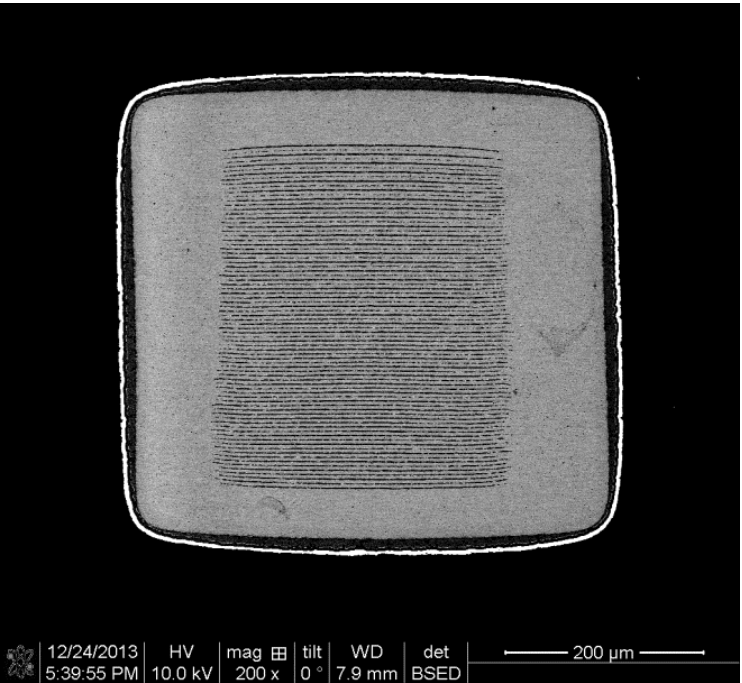
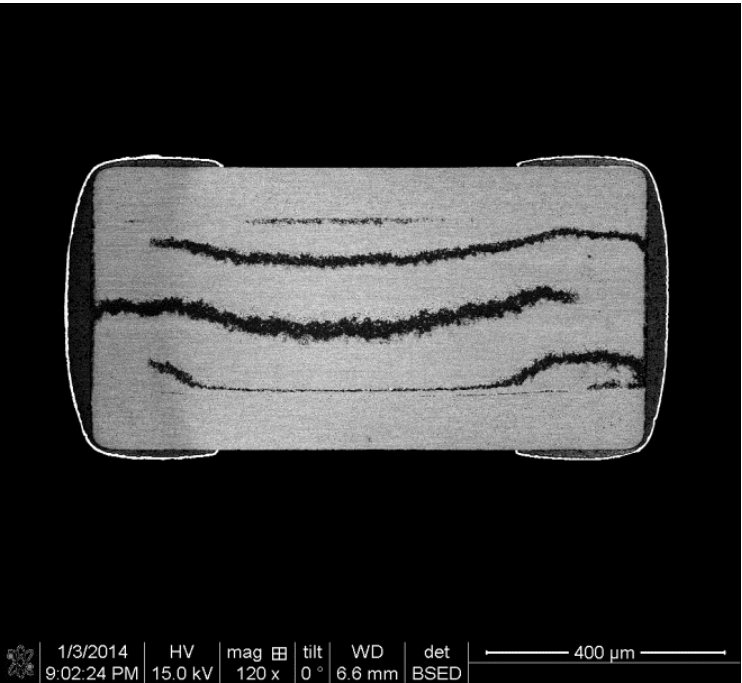
B 1005

Direction ①

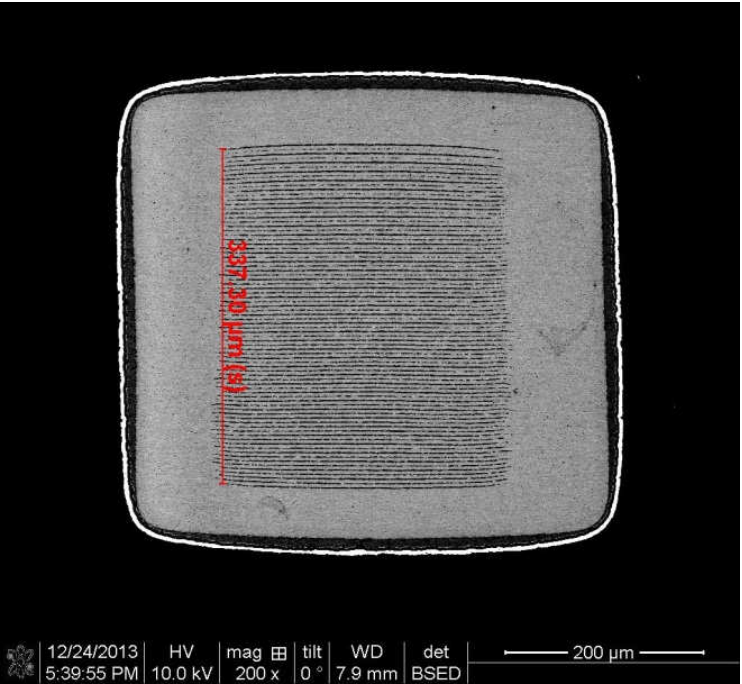
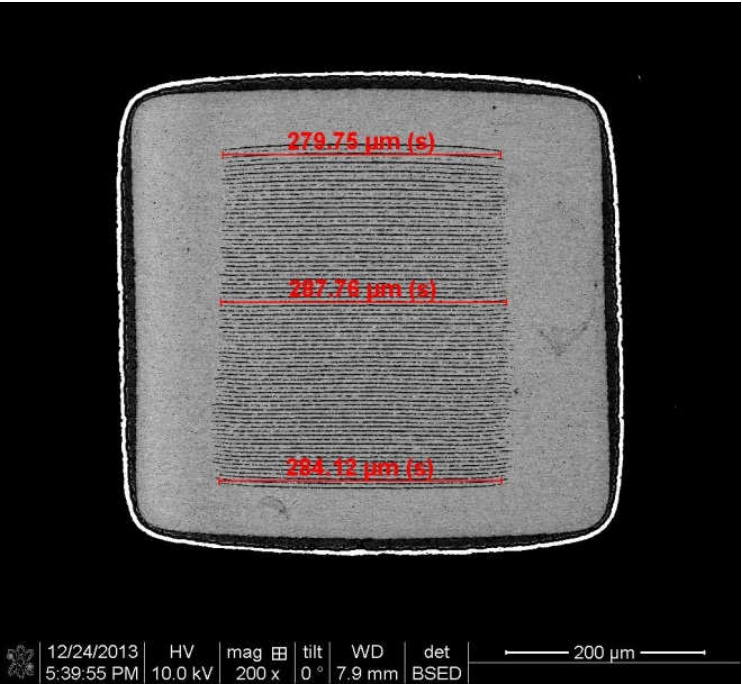


B 1005

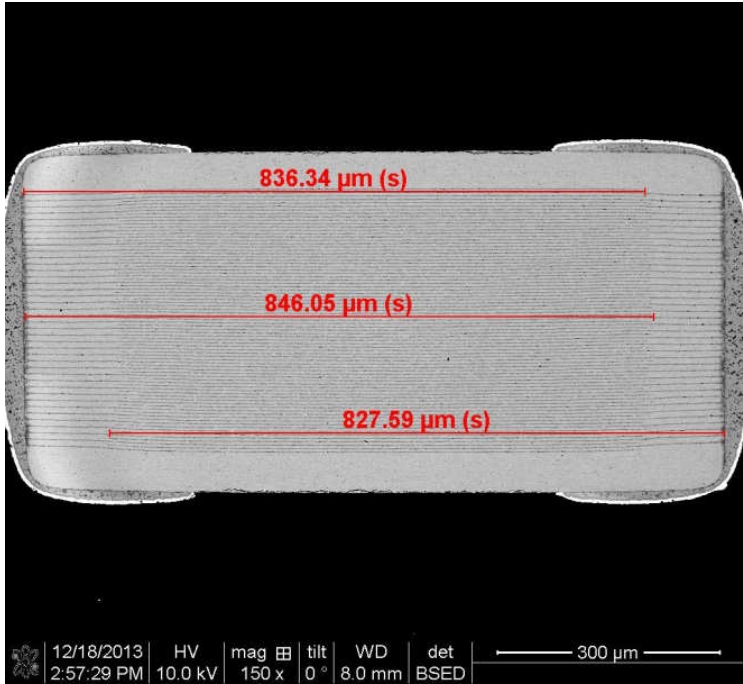
Direction ②



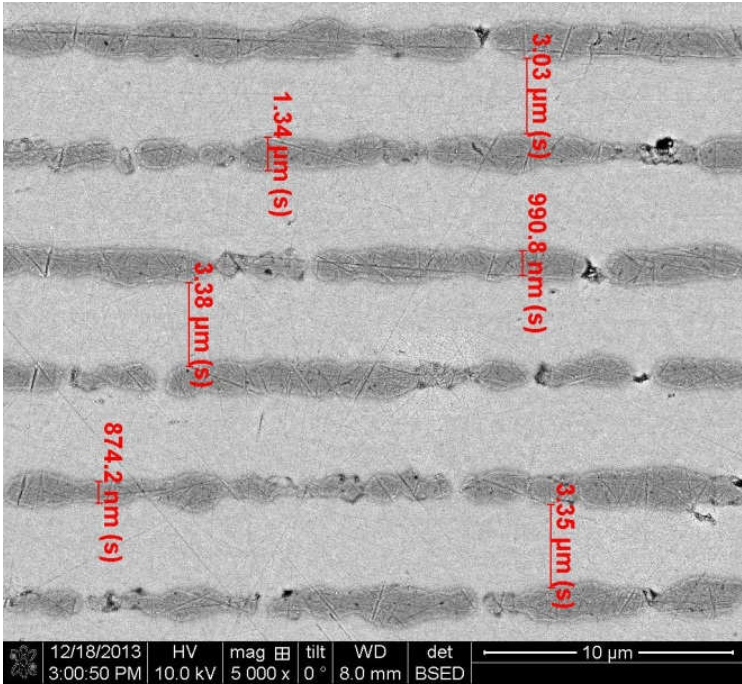
Direction ③



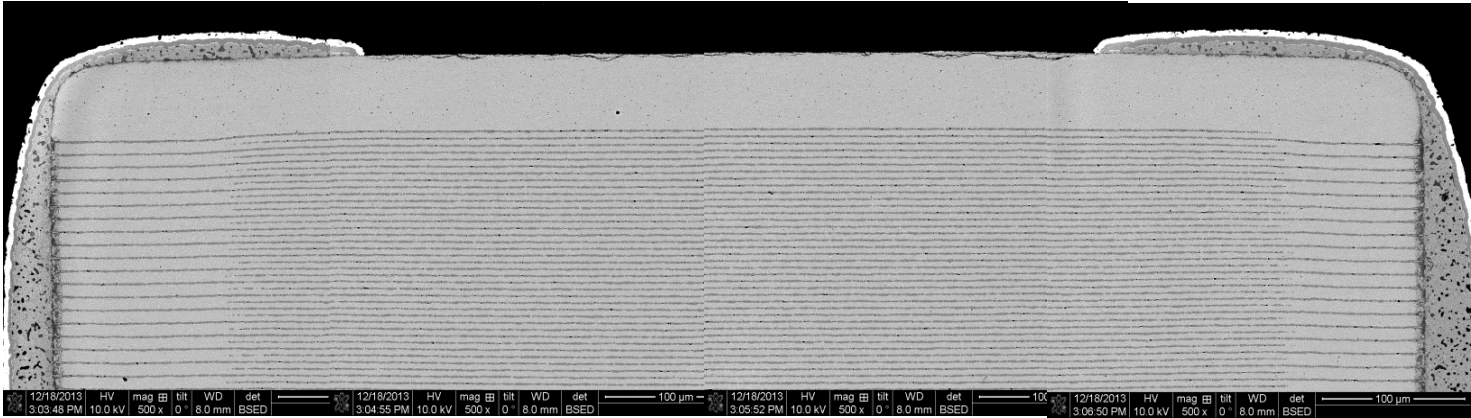
B 1005



Length of inner electrode



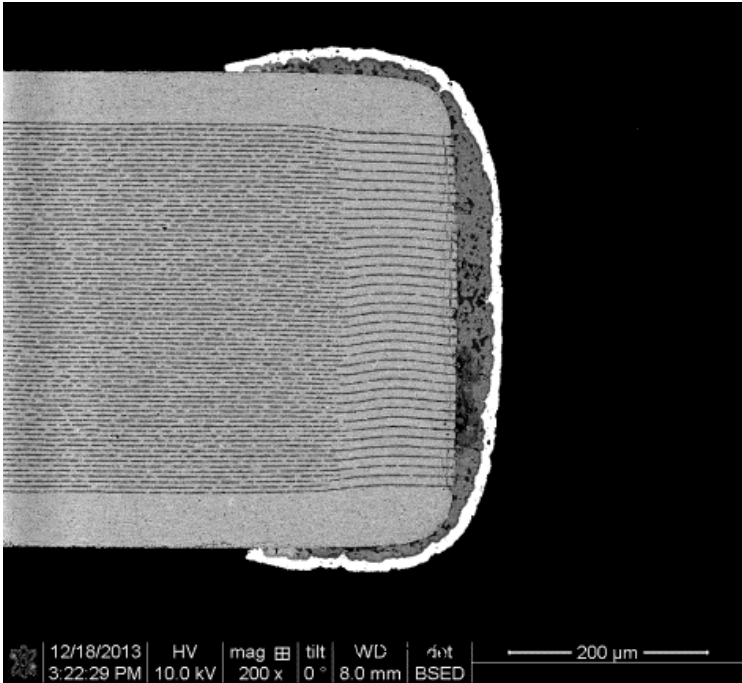
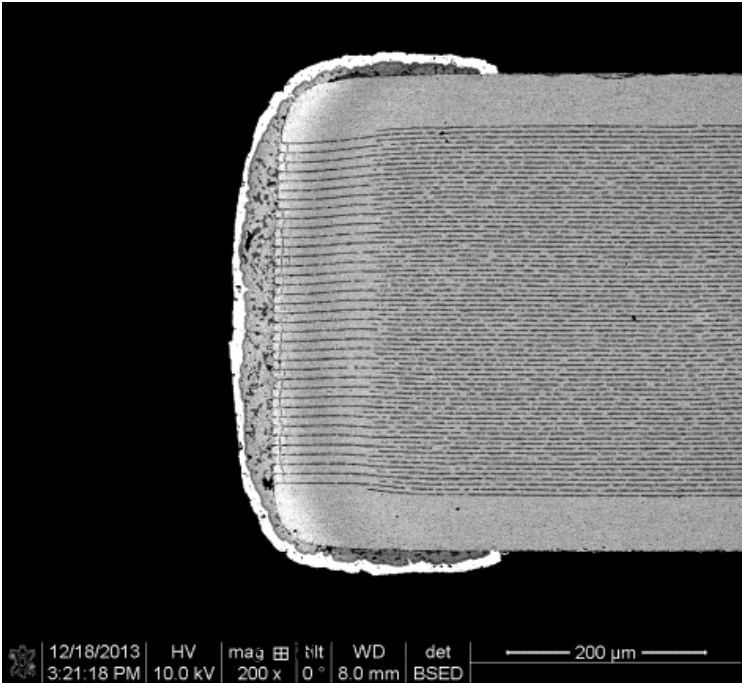
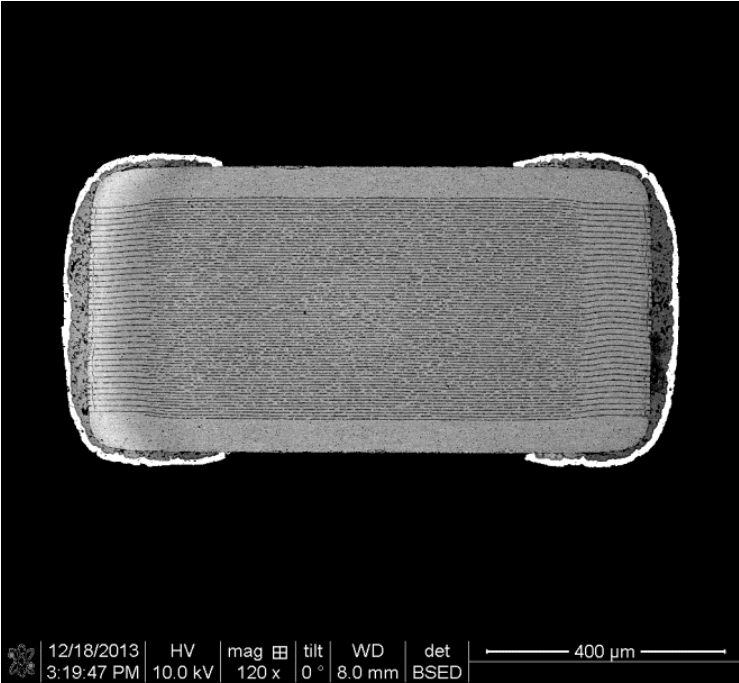
Gap between inner electrodes



Panorama of direction ①

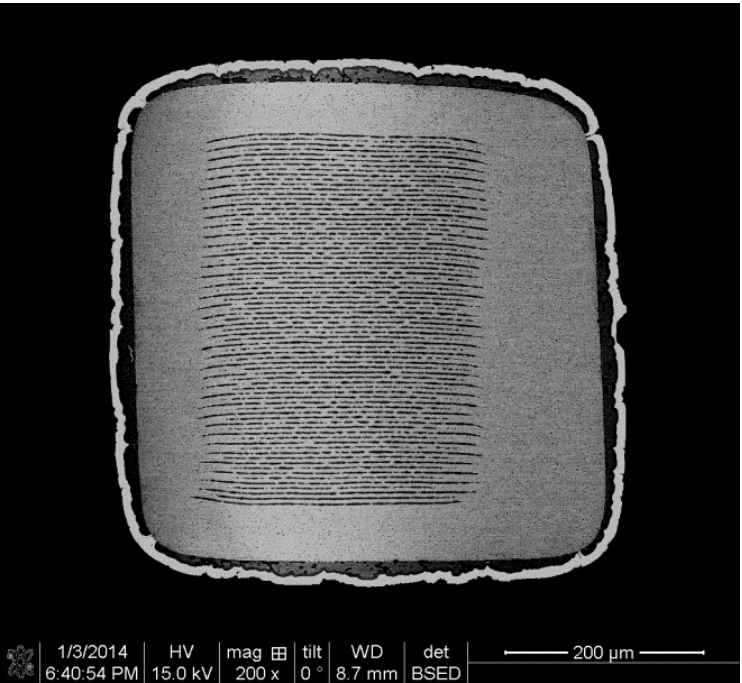
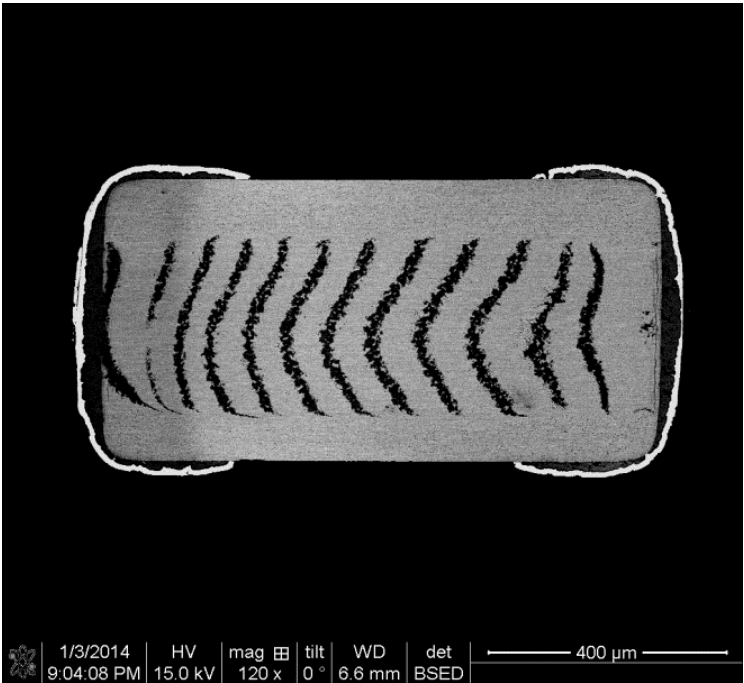
C 1005

Direction ①

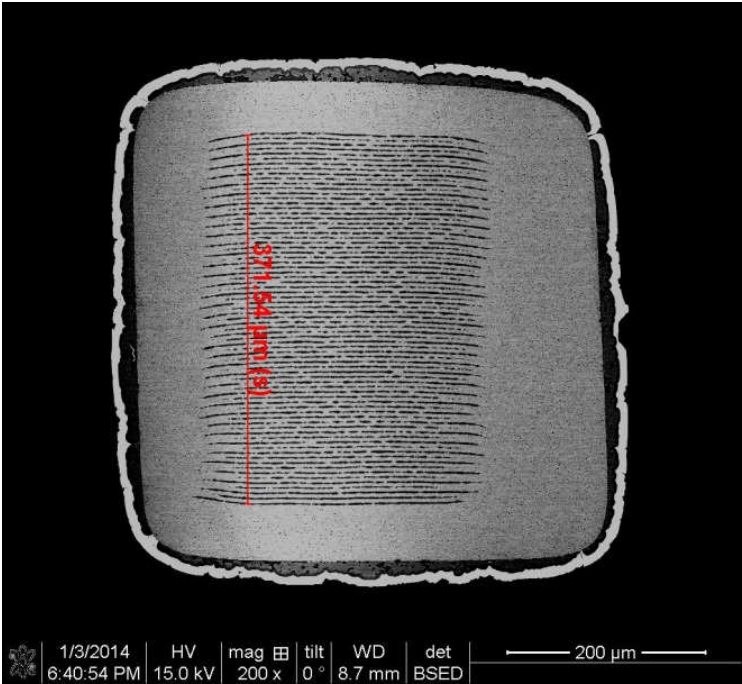
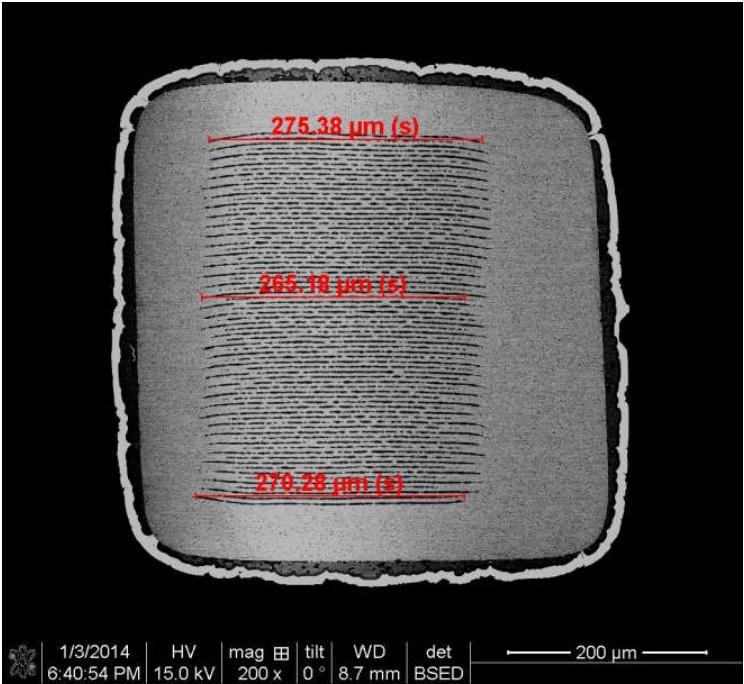


C 1005

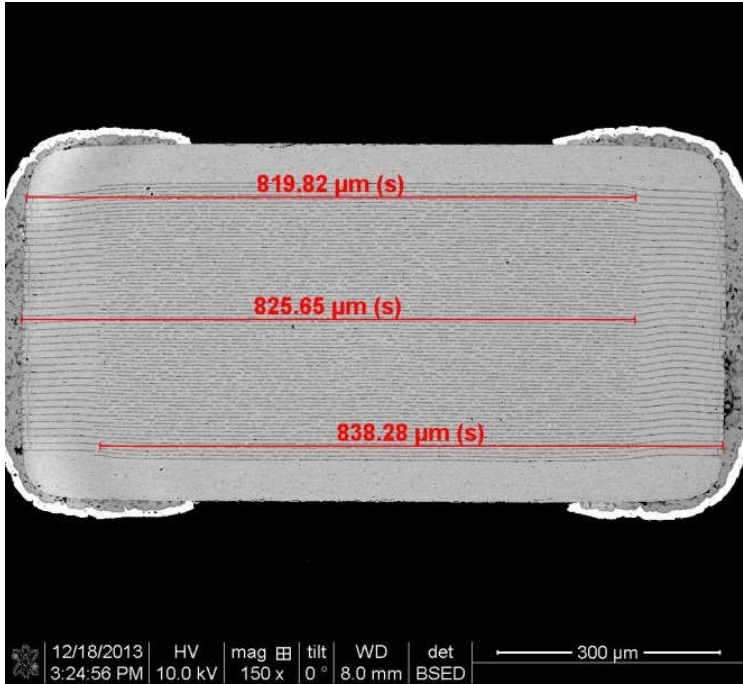
Direction ②



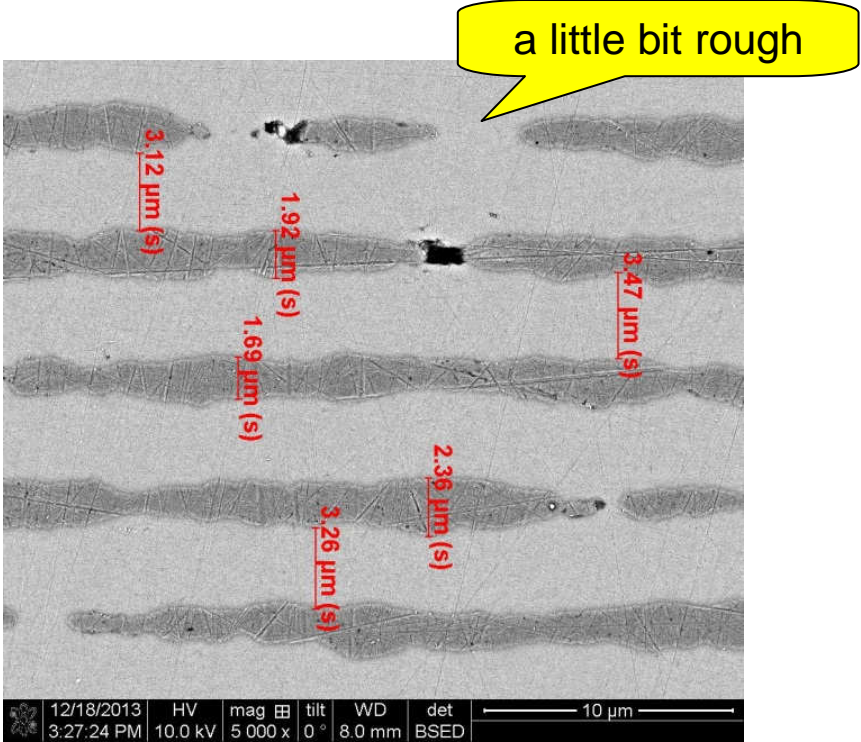
Direction ③



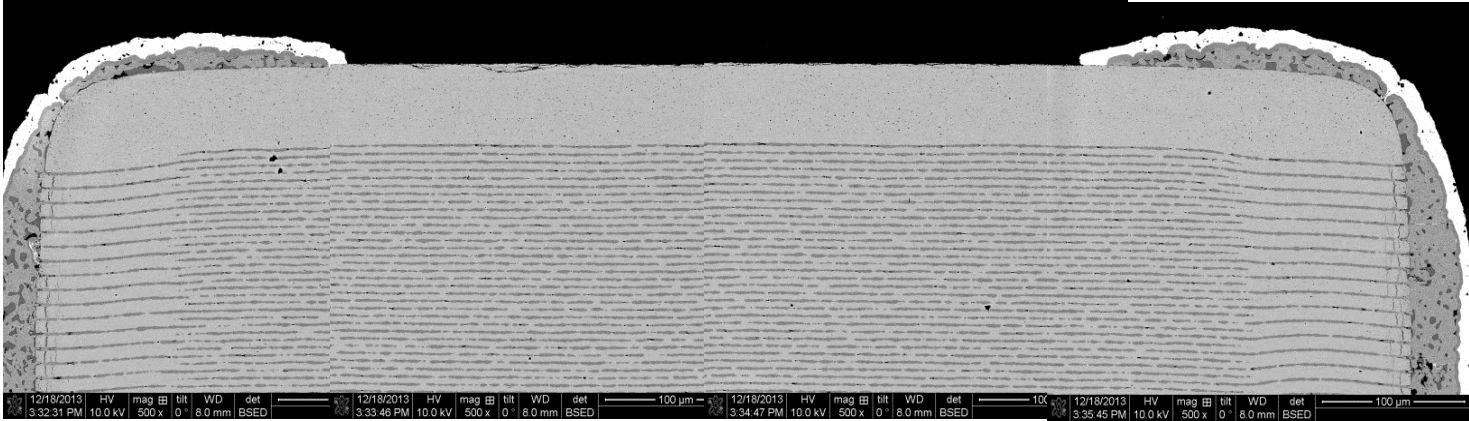
C 1005



Length of inner electrode



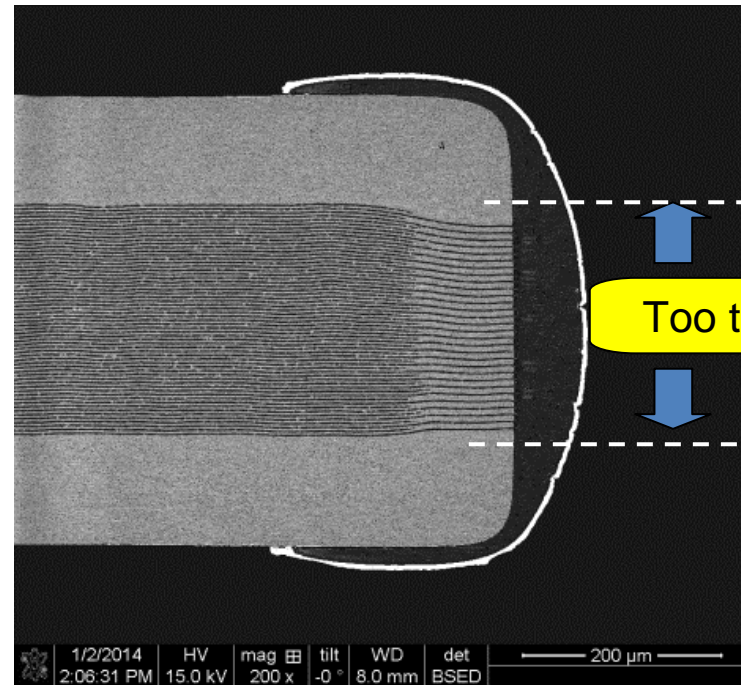
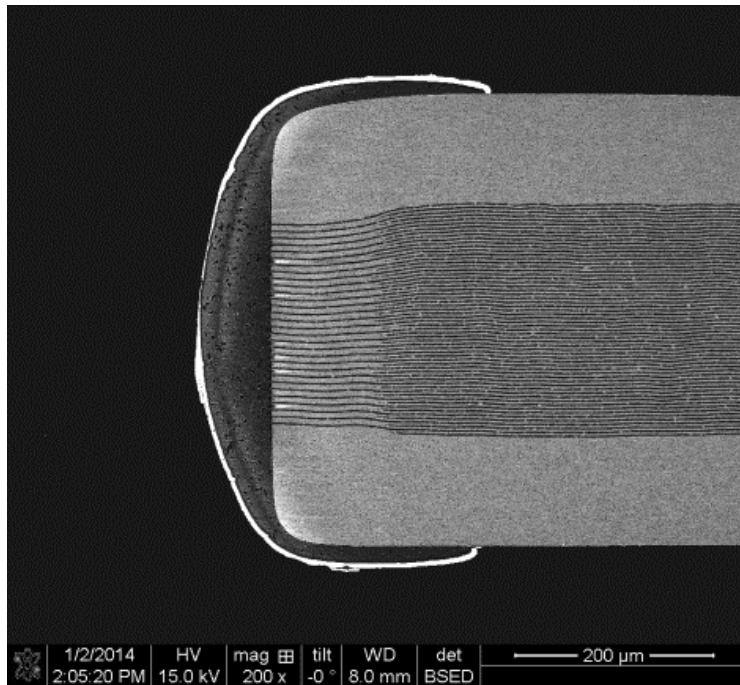
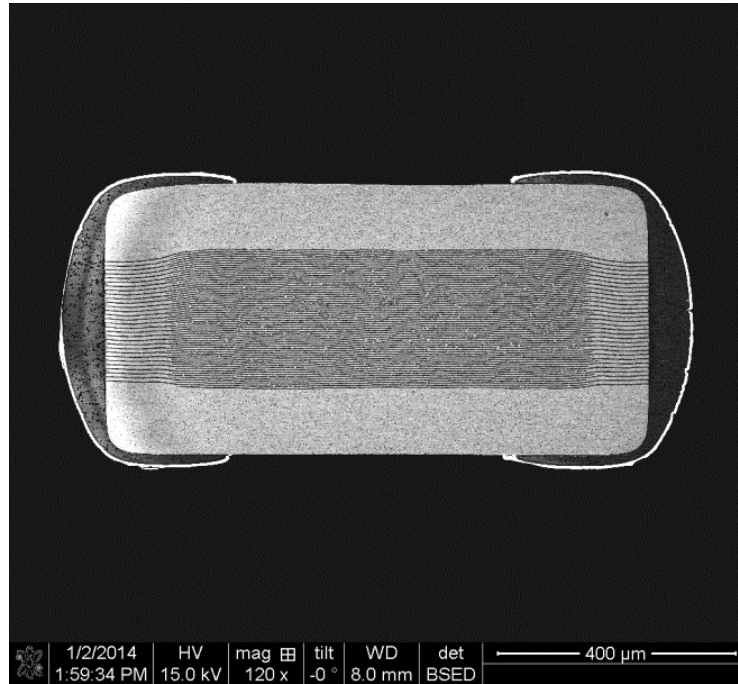
Gap between inner electrodes



Panorama of direction ①

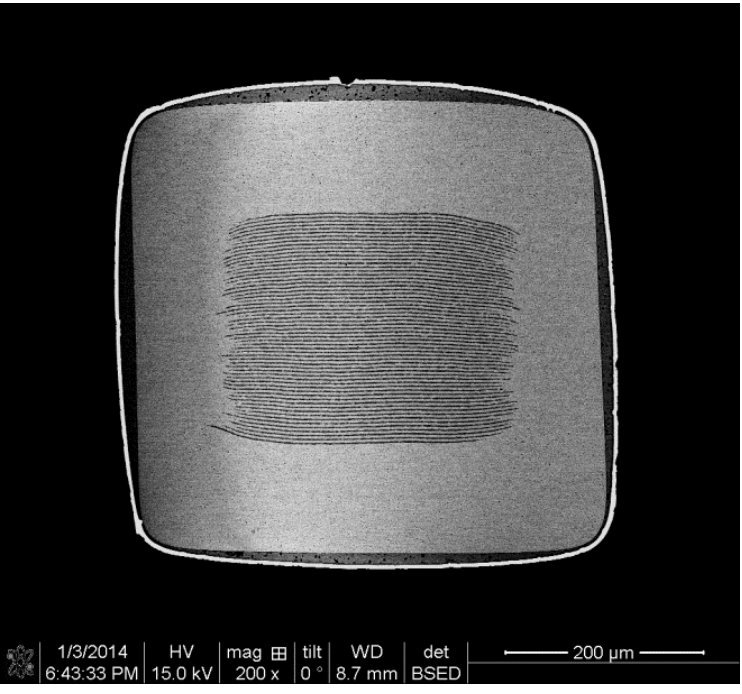
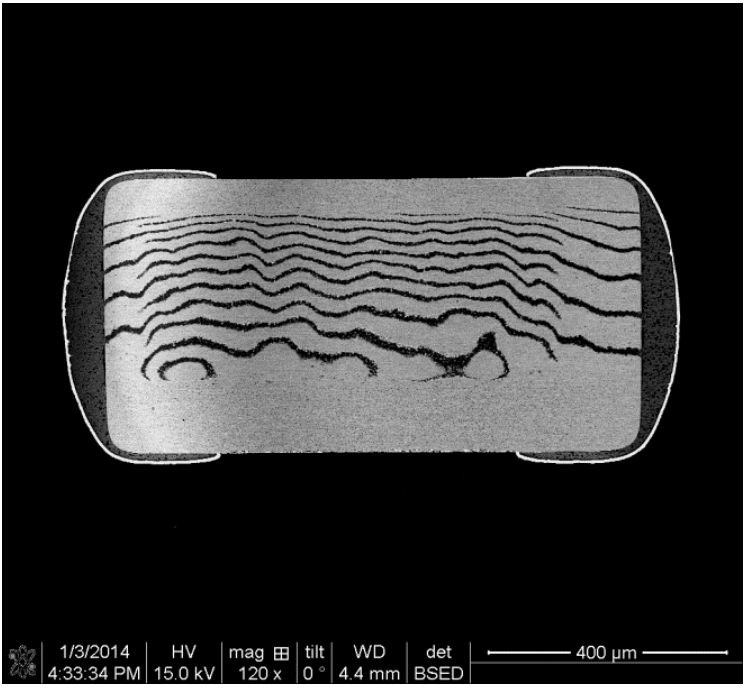
D 1005

Direction ①

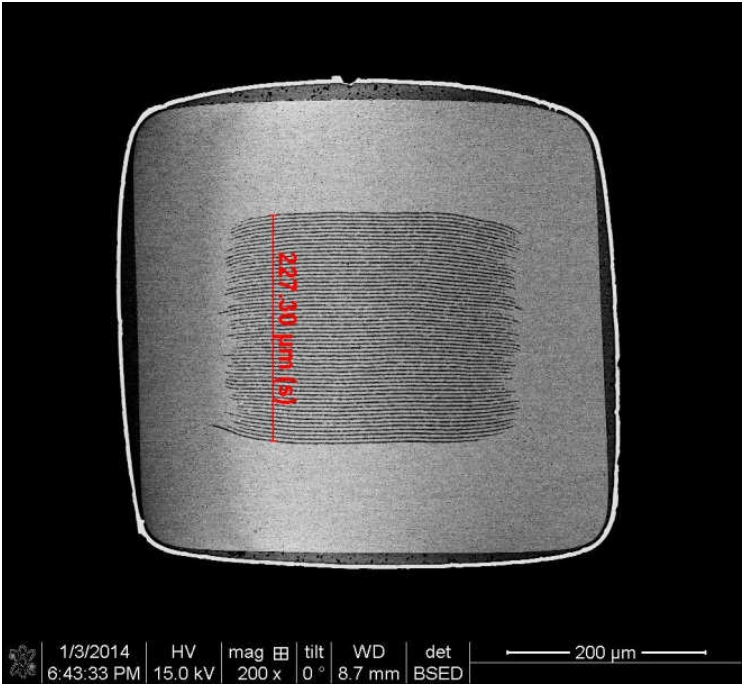
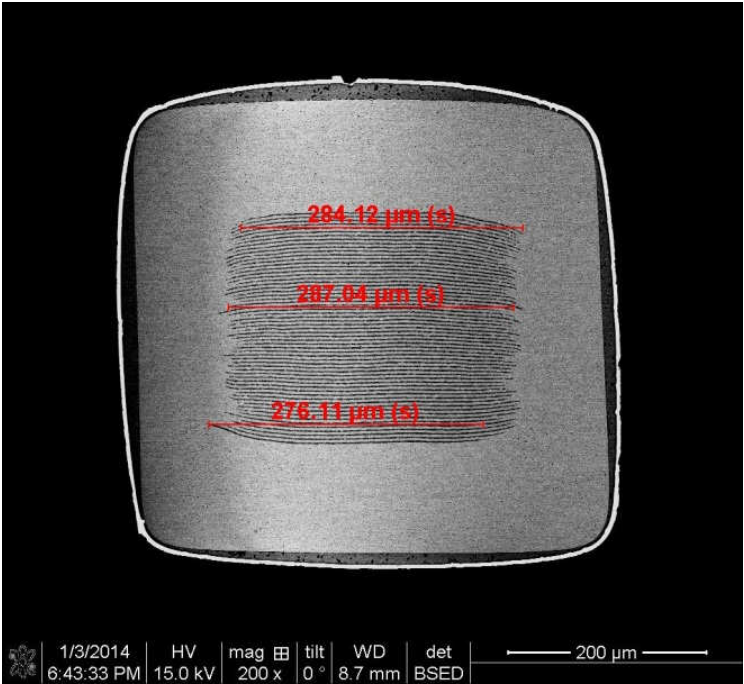


D 1005

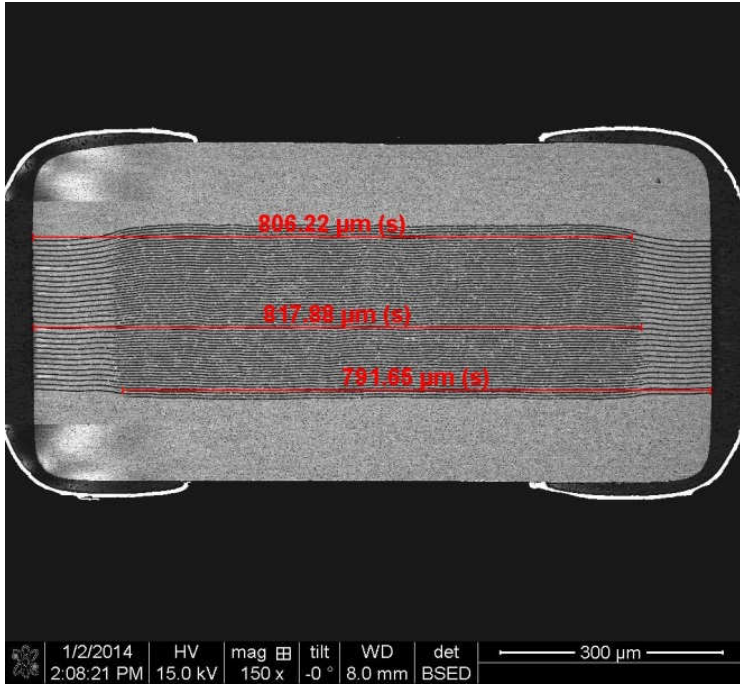
Direction ②



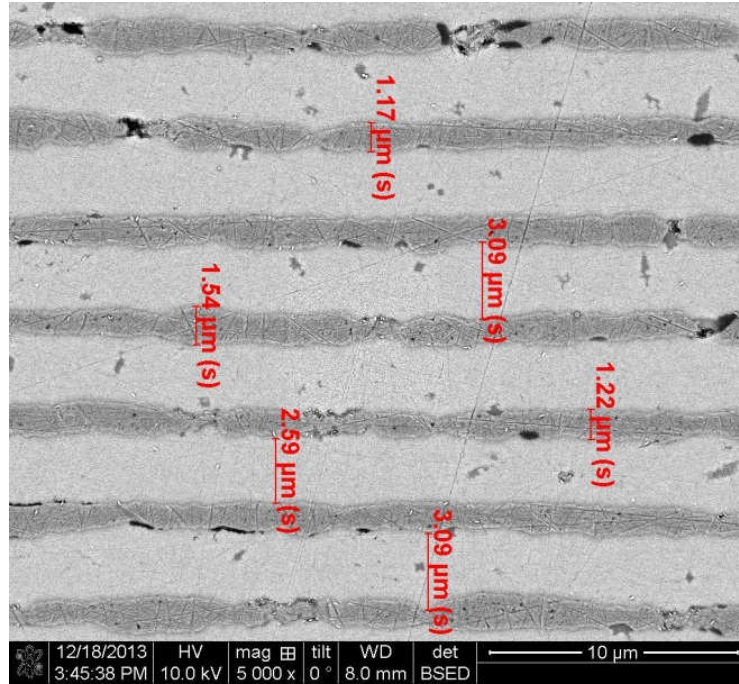
Direction ③



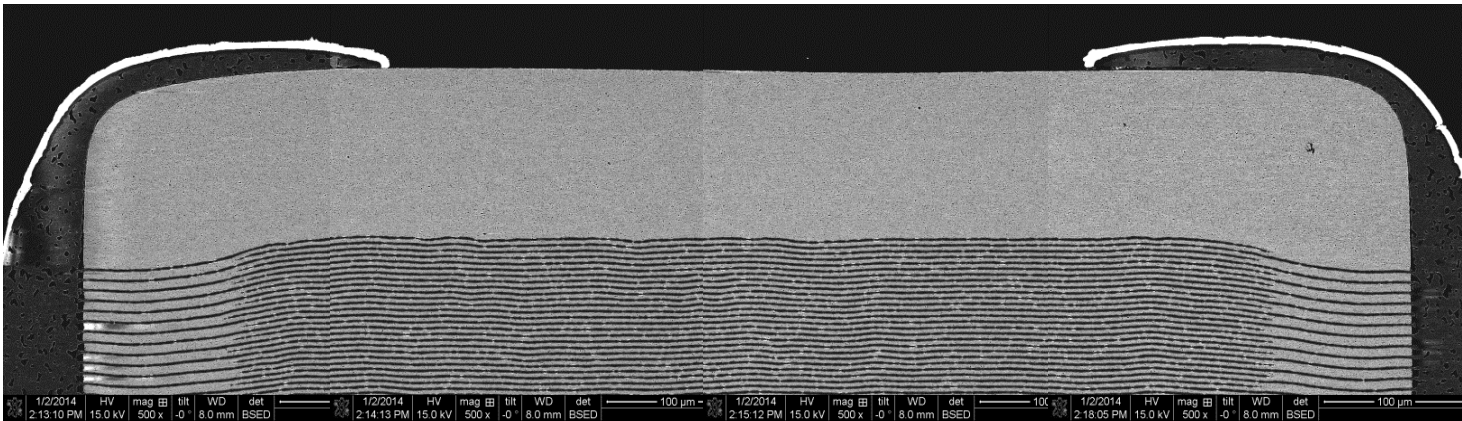
D 1005



Length of inner electrode



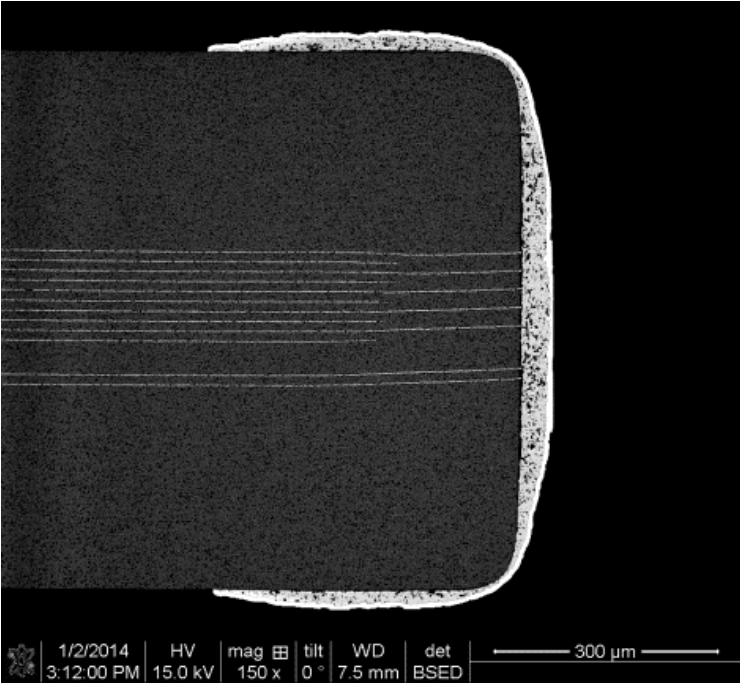
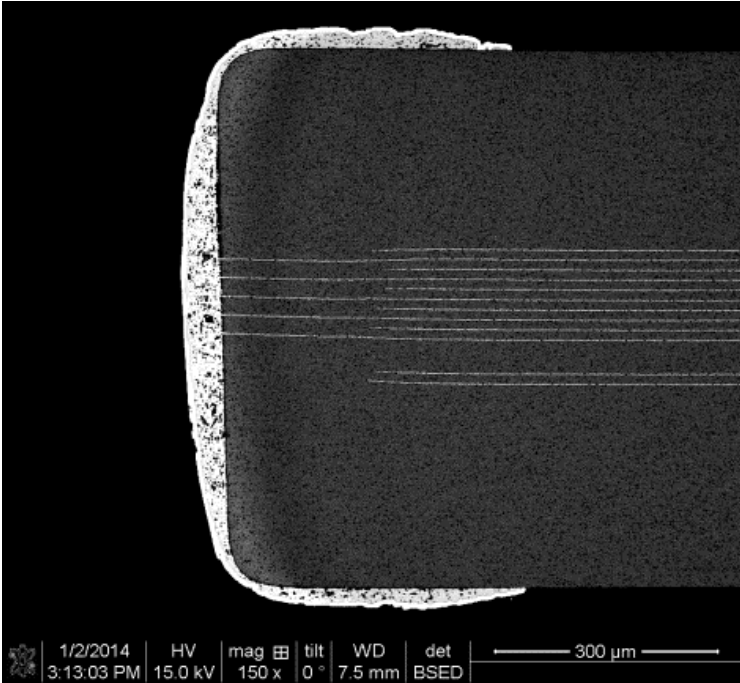
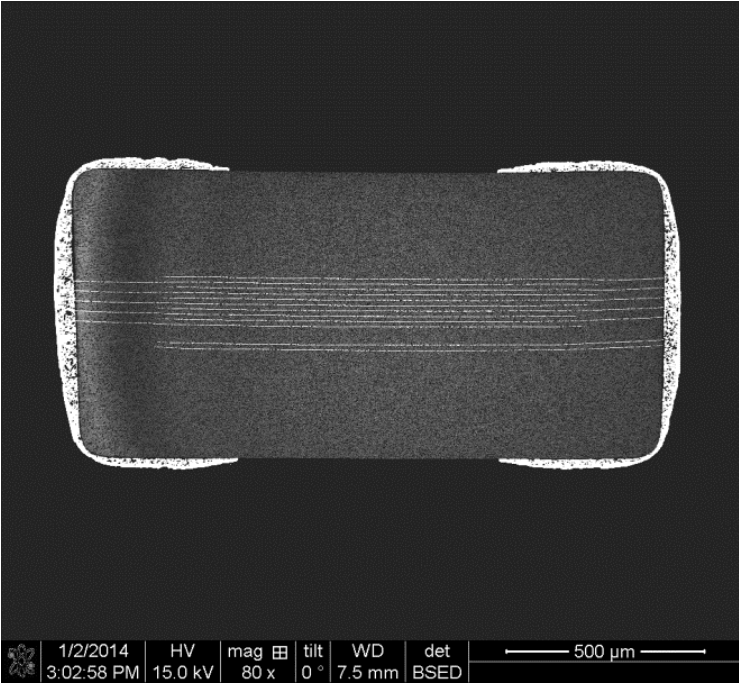
Gap between inner electrodes



Panorama of direction ①

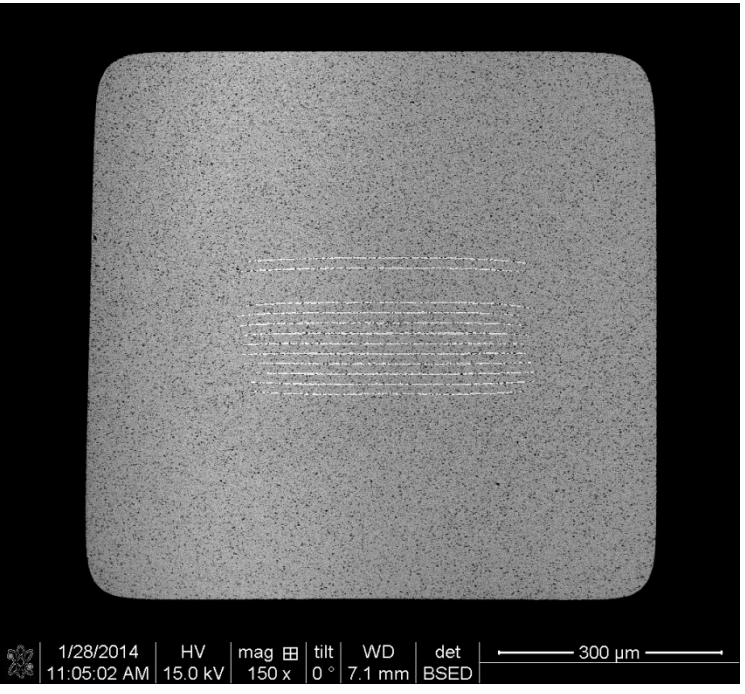
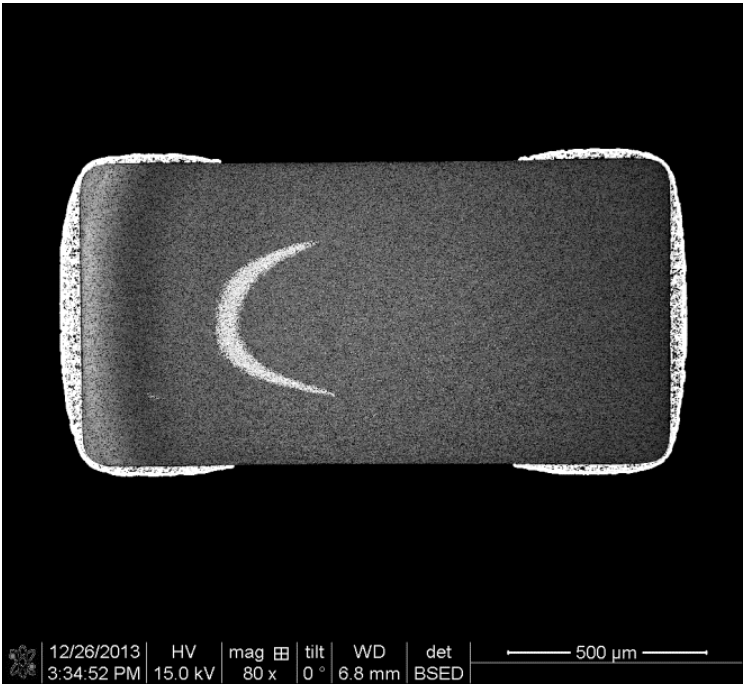
A 1608-1

Direction ①

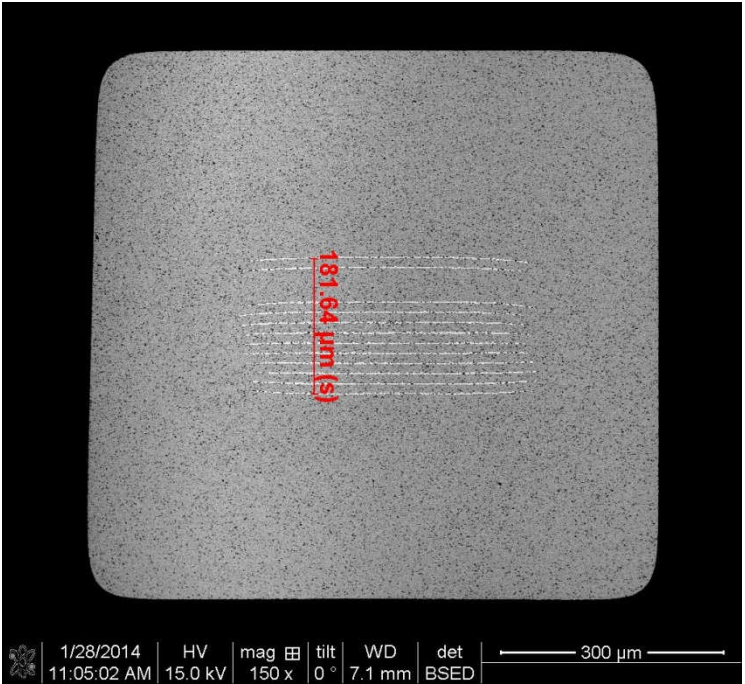
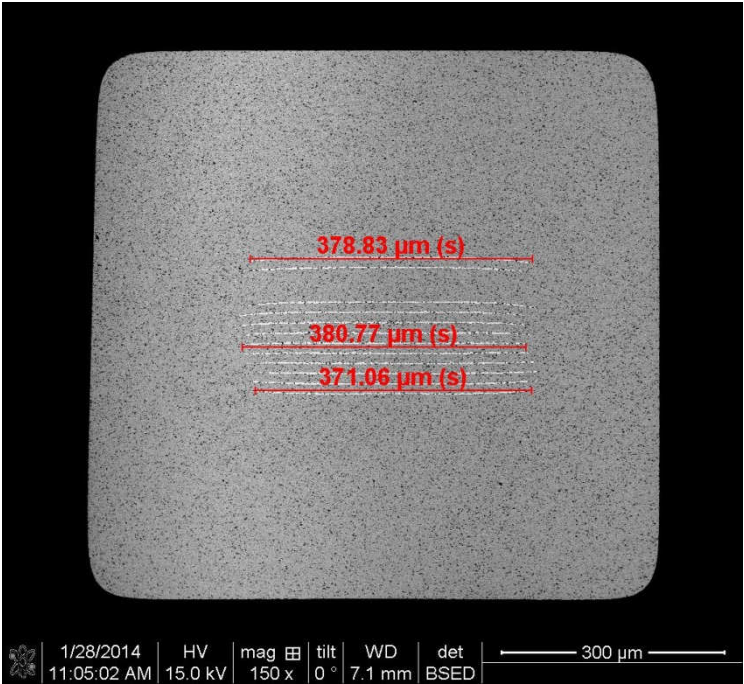


A 1608-1

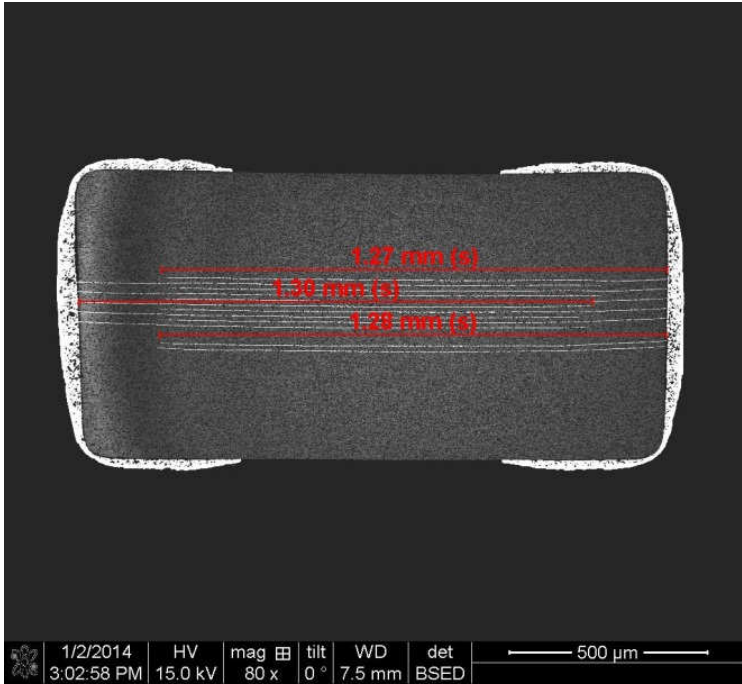
Direction ②



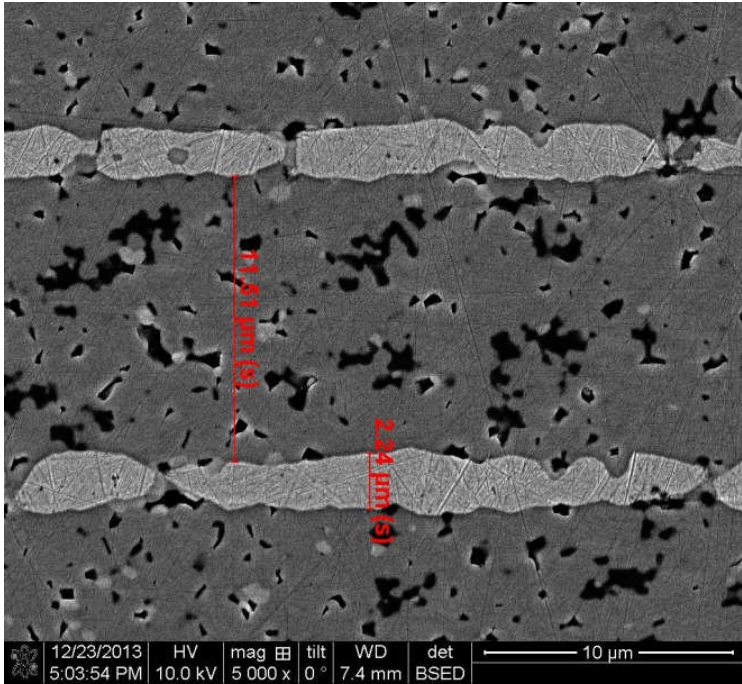
Direction ③



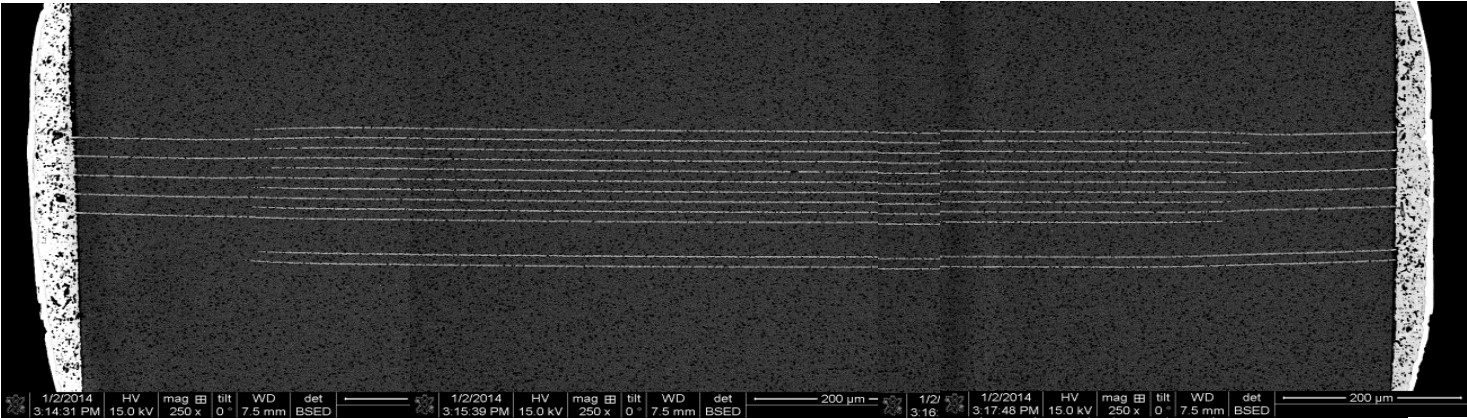
A 1608-1



Length of inner electrode



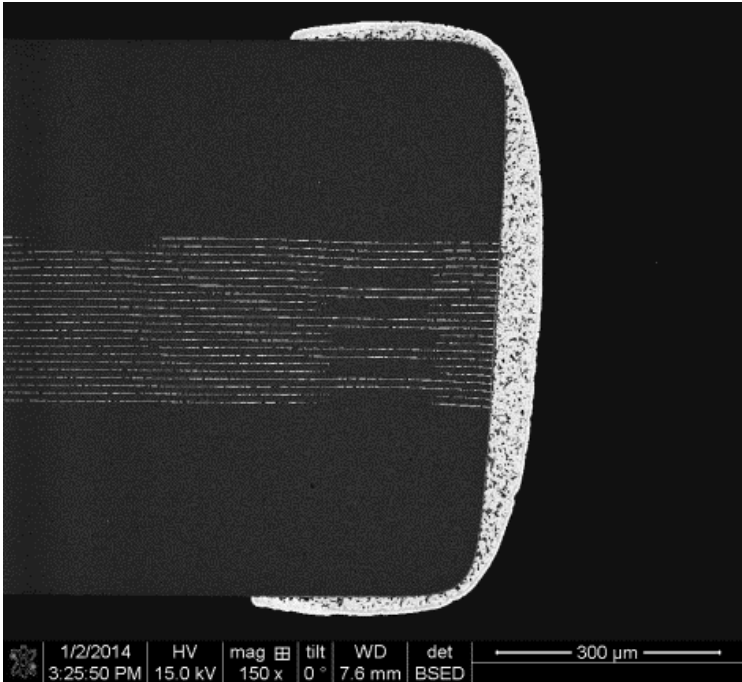
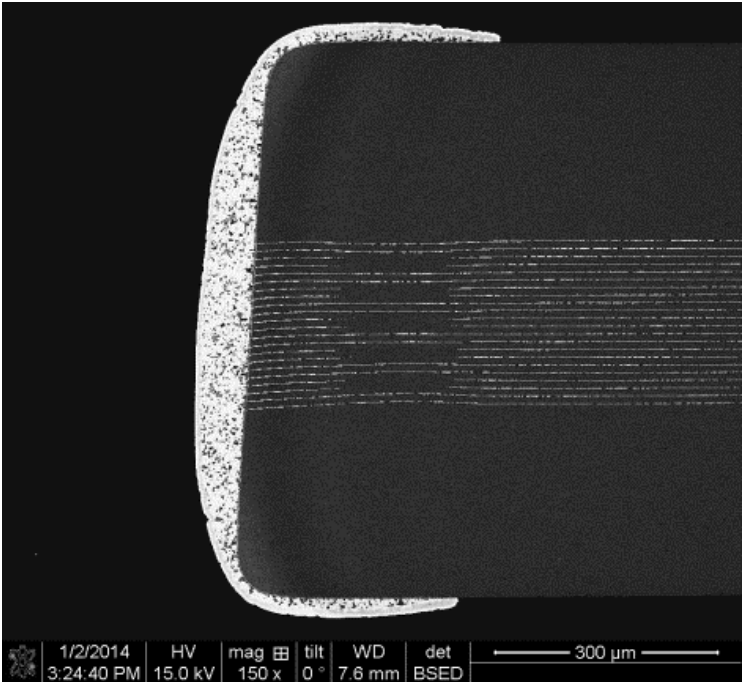
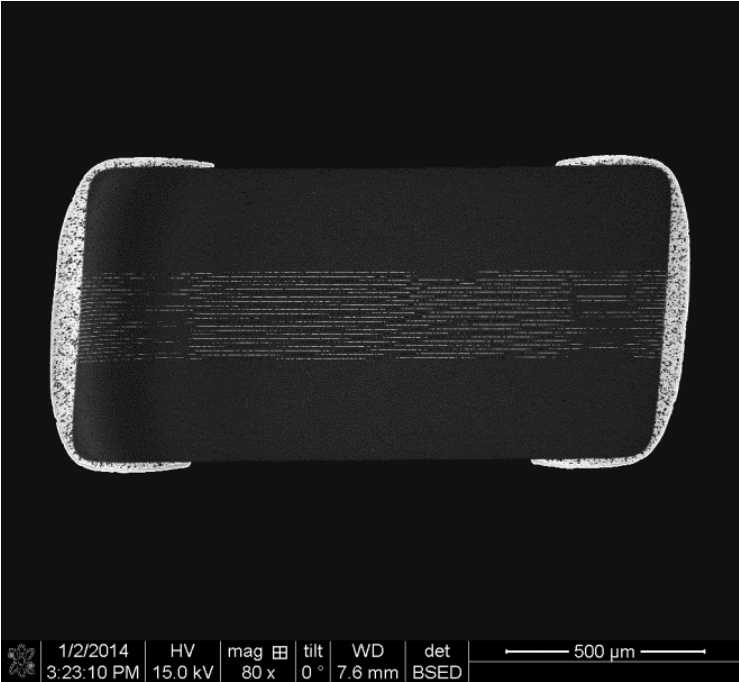
Gap between inner electrodes



Panorama of direction ①

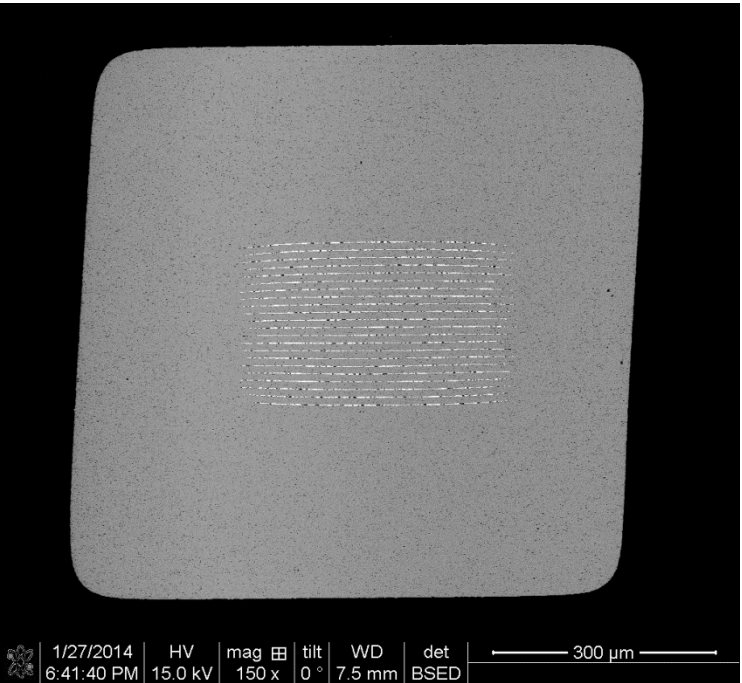
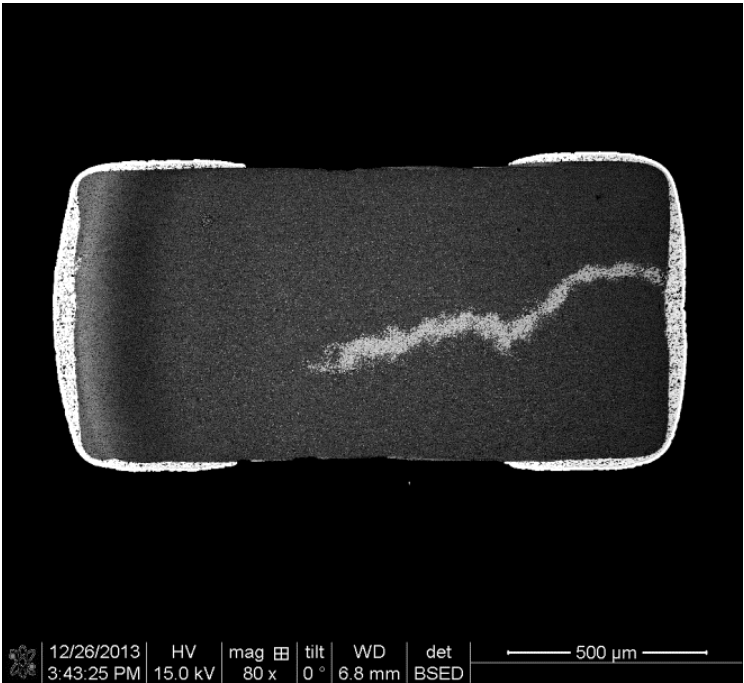
B 1608-1

Direction ①

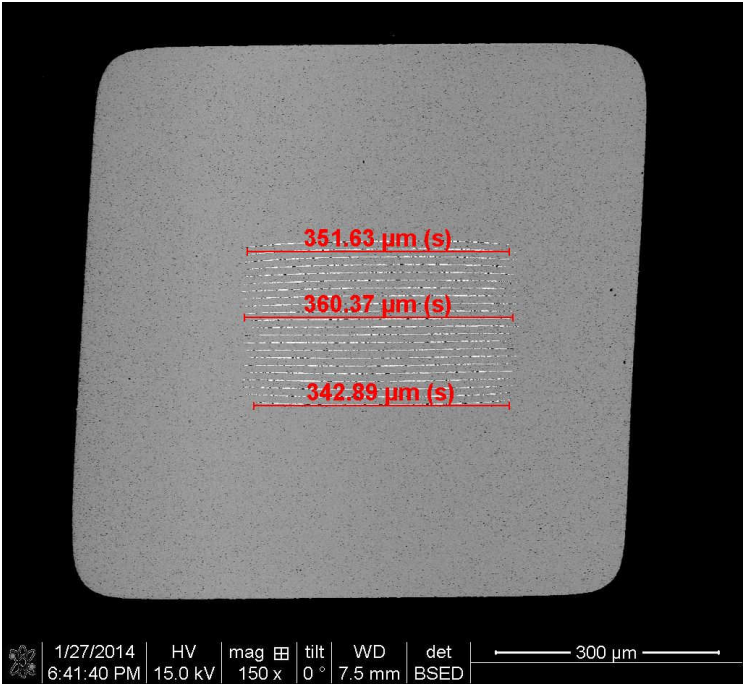


B 1608-1

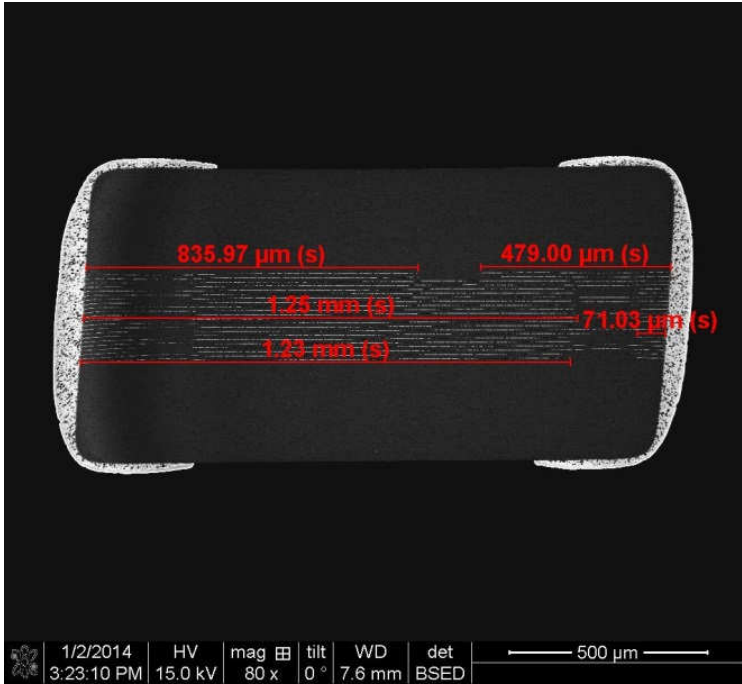
Direction ②



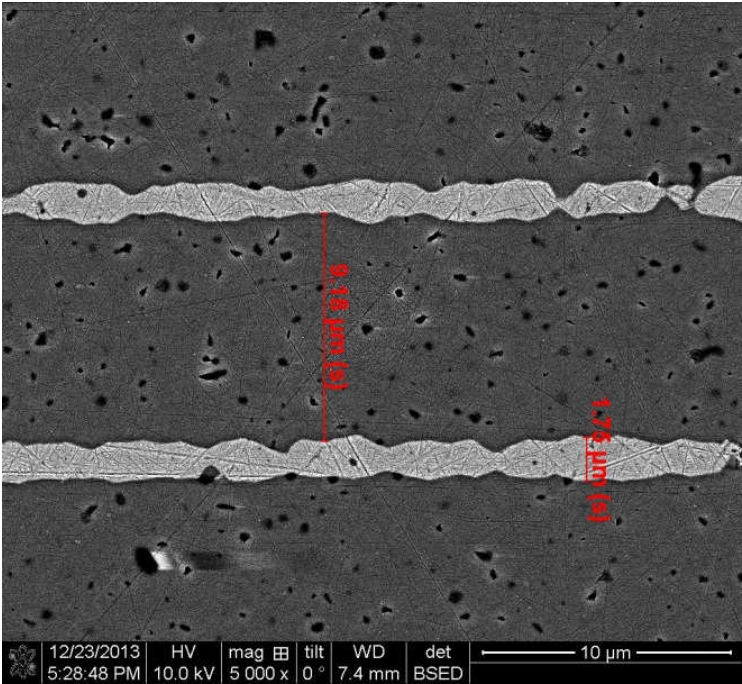
Direction ③



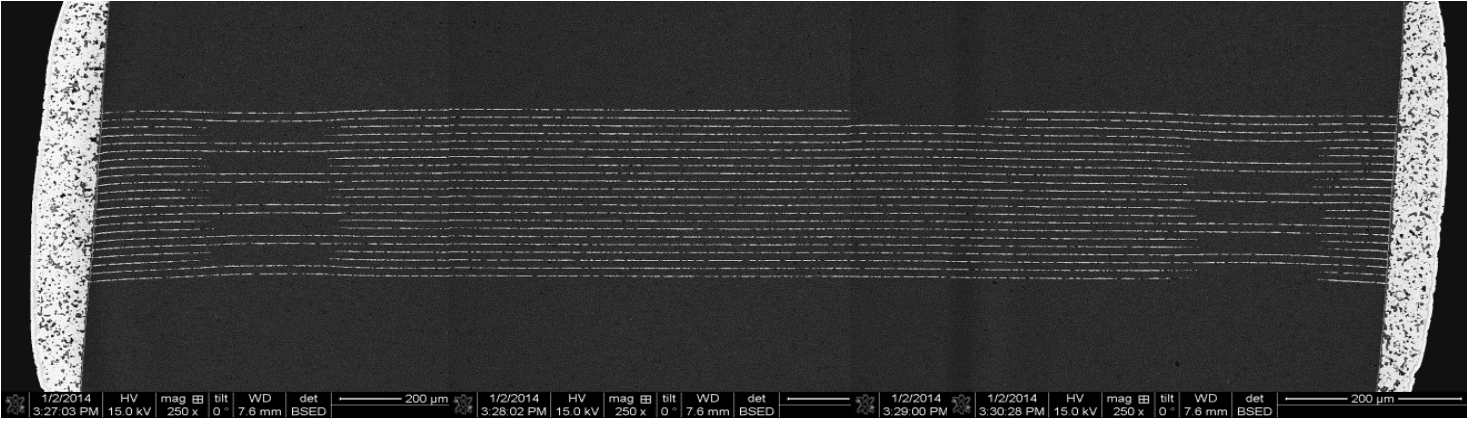
B 1608-1



Length of inner electrode



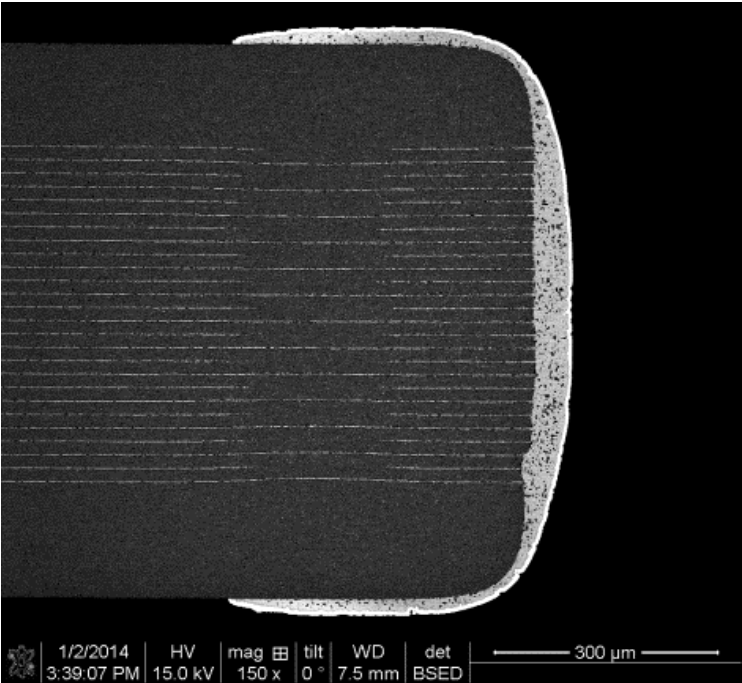
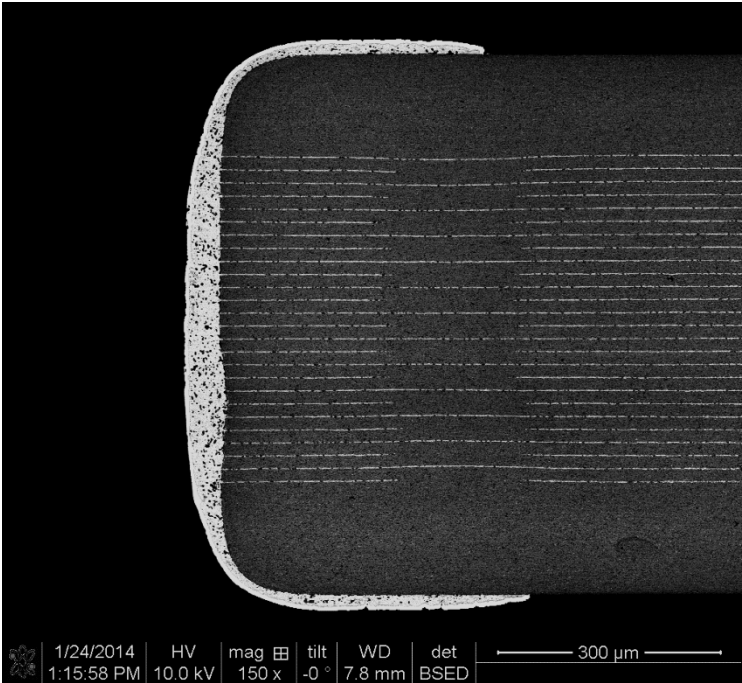
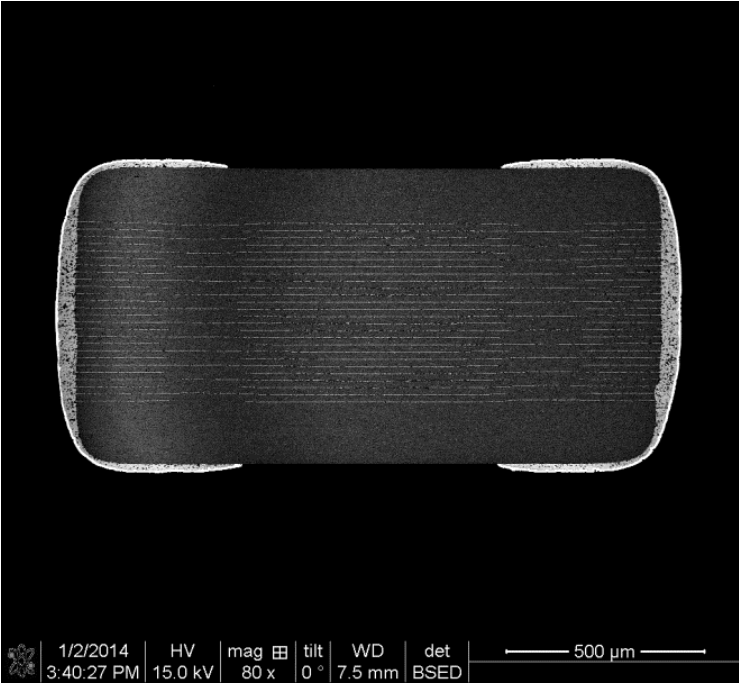
Gap between inner electrodes



Panorama of direction ①

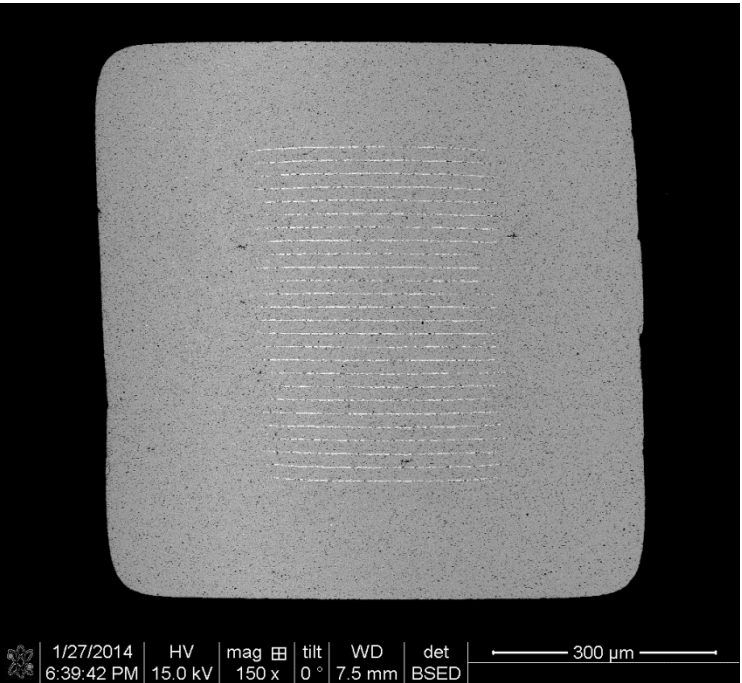
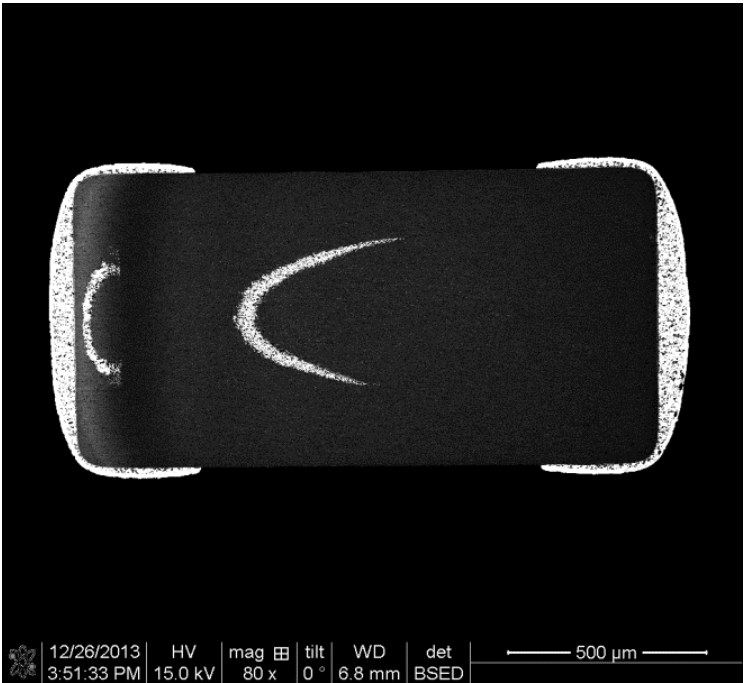
C 1608-1

Direction ①

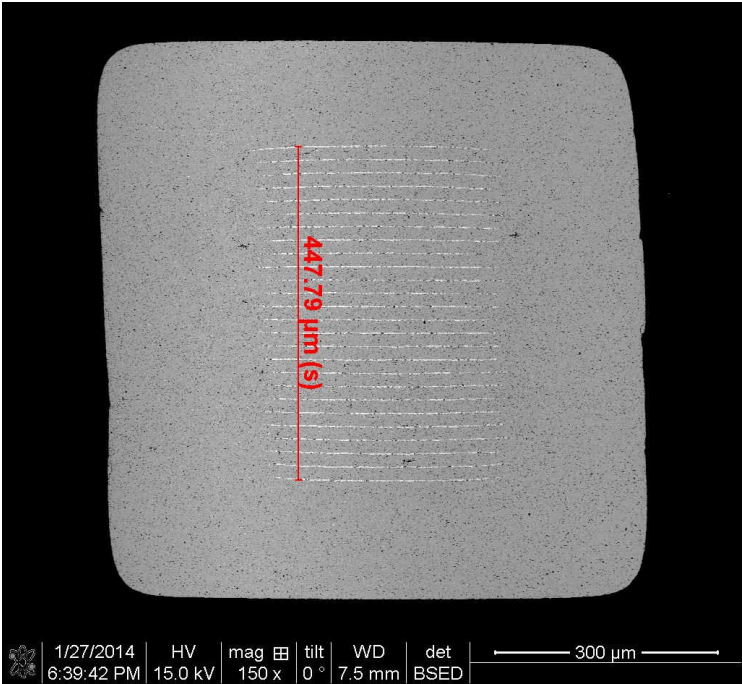
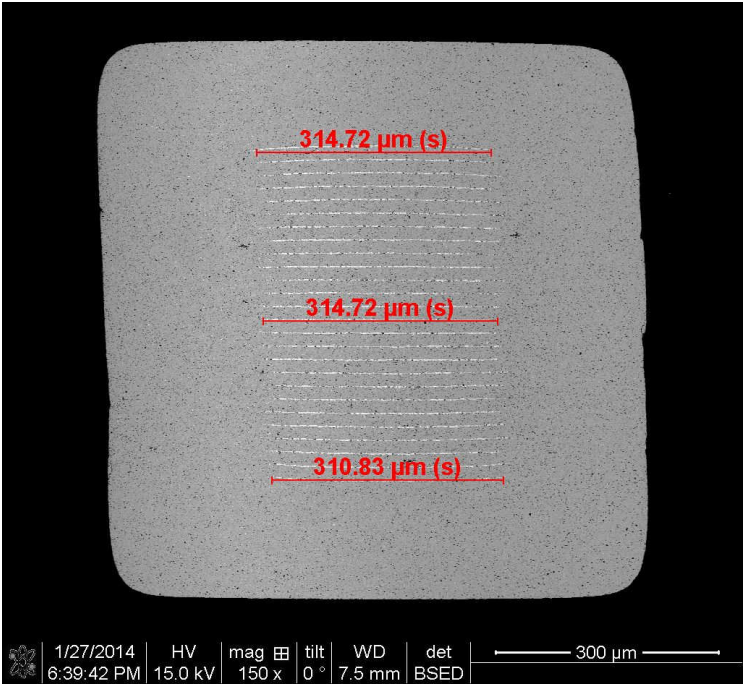


C 1608-1

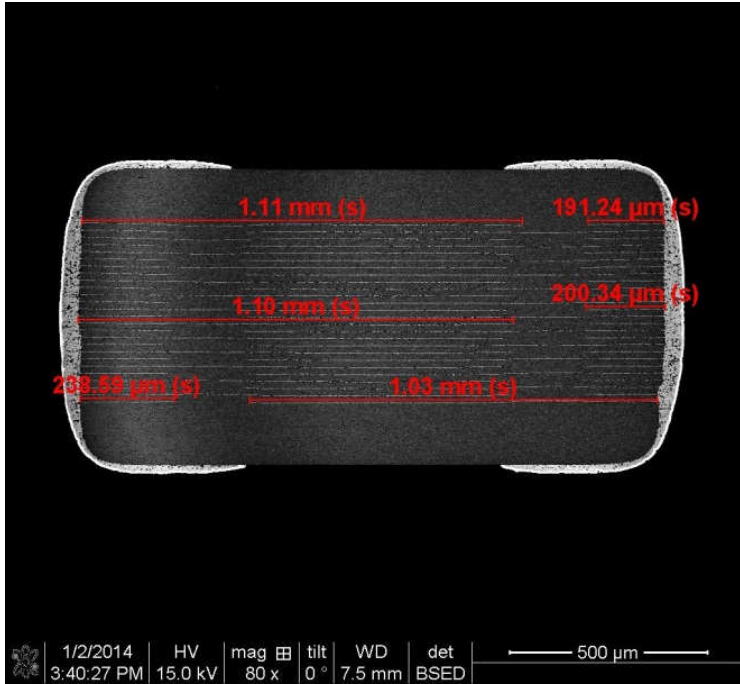
Direction ②



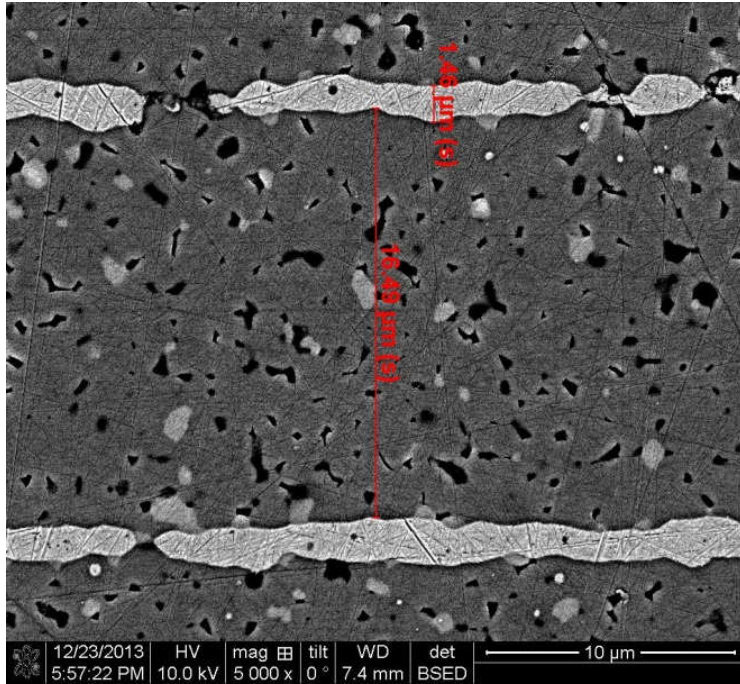
Direction ③



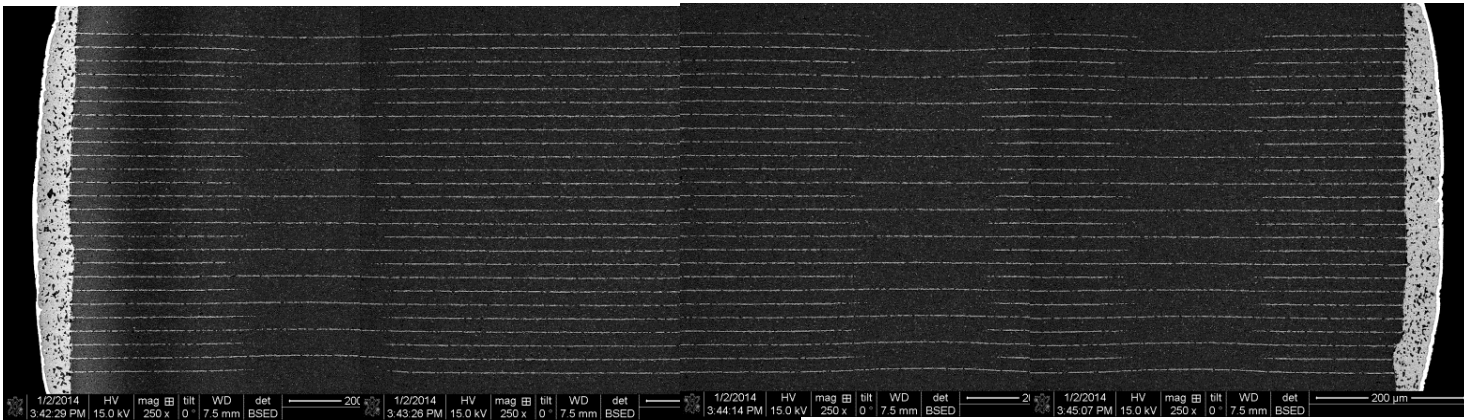
C 1608-1



Length of inner electrode



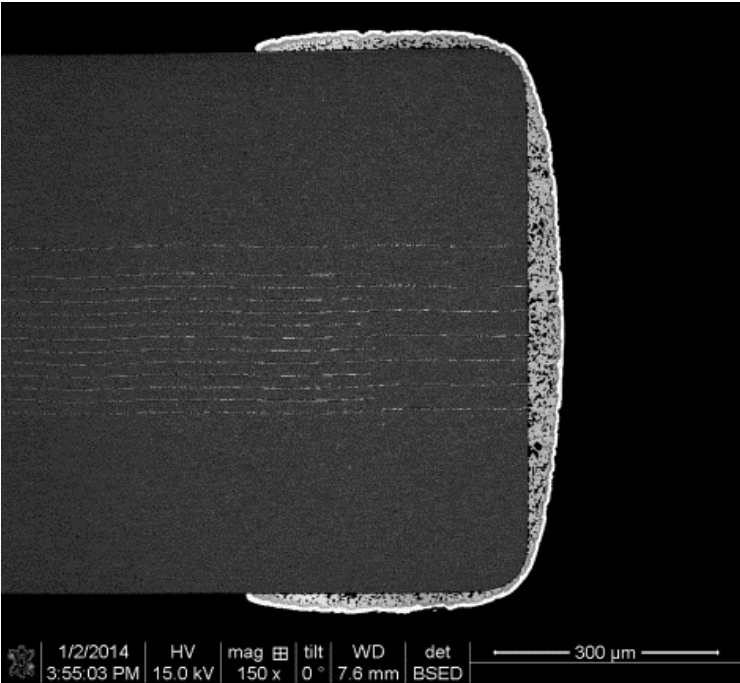
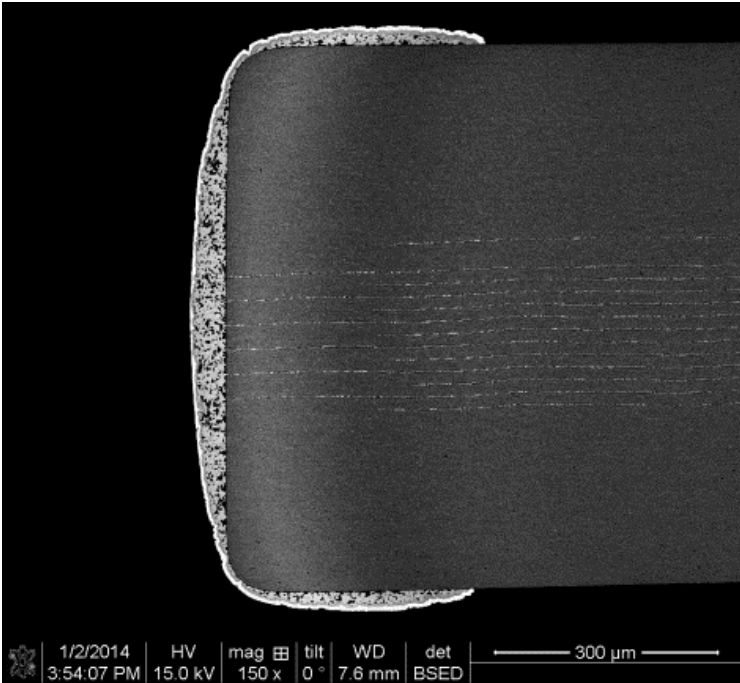
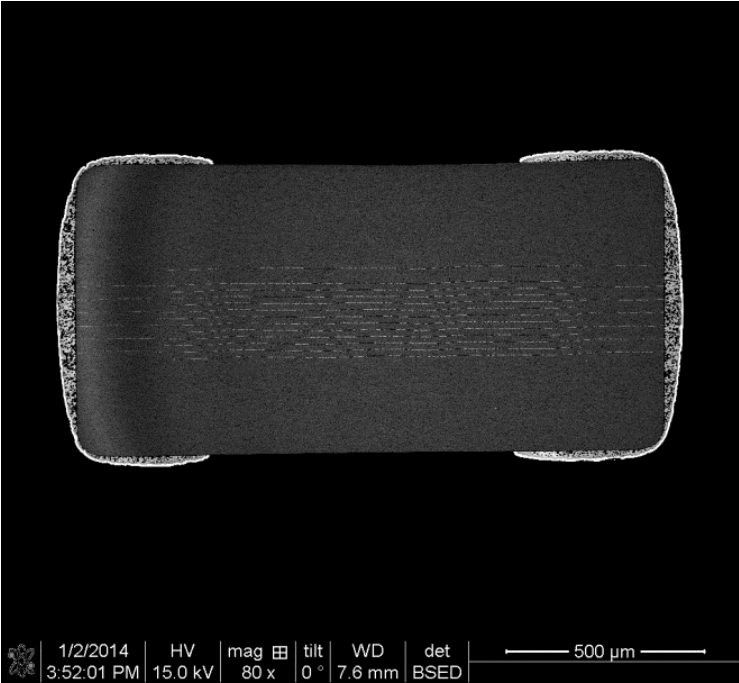
Gap between inner electrodes



Panorama of direction ①

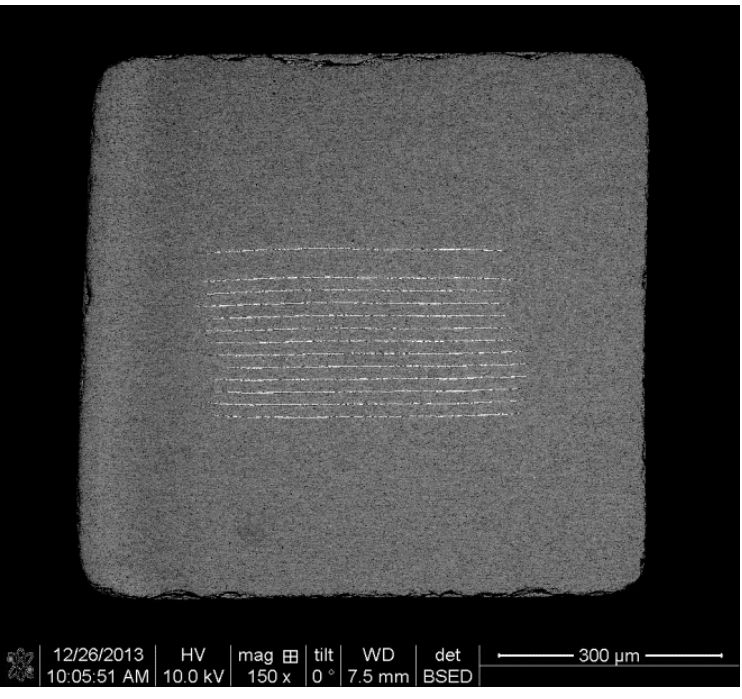
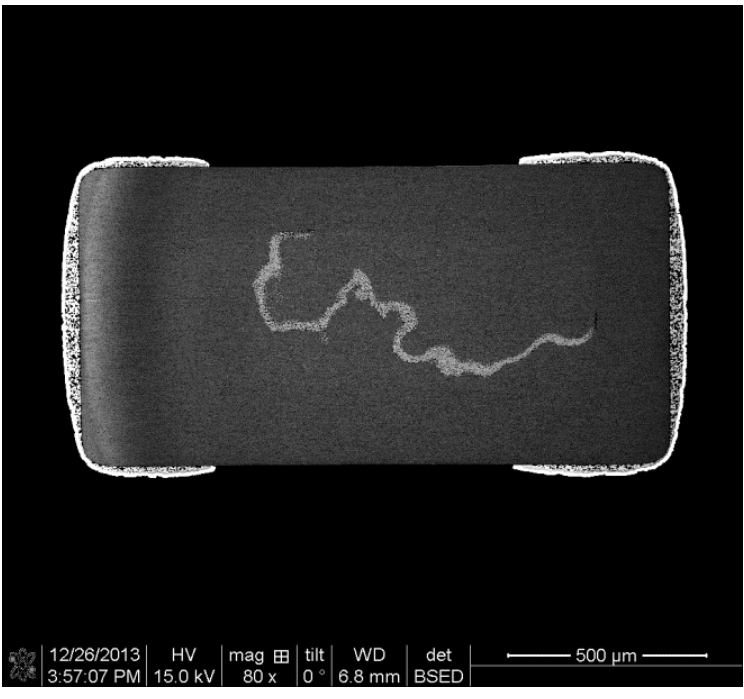
D 1608-1

Direction ①

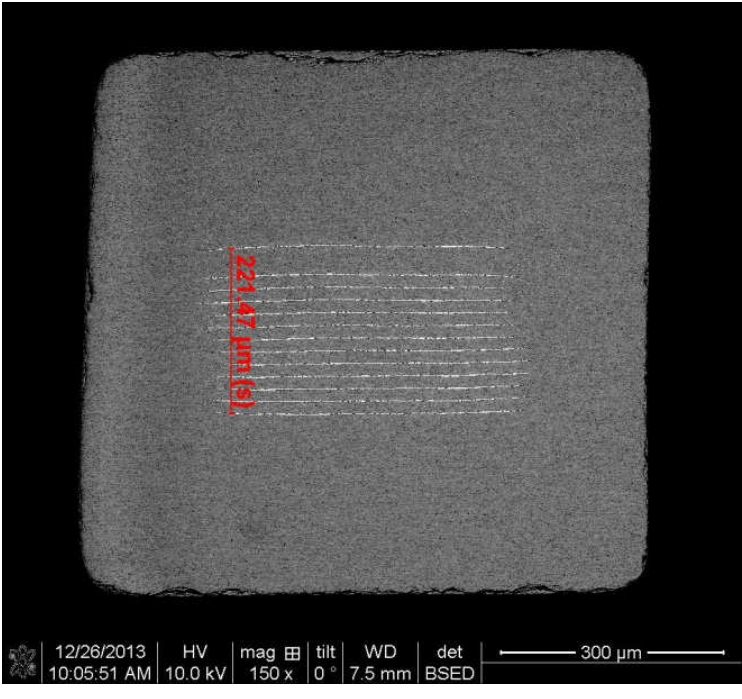
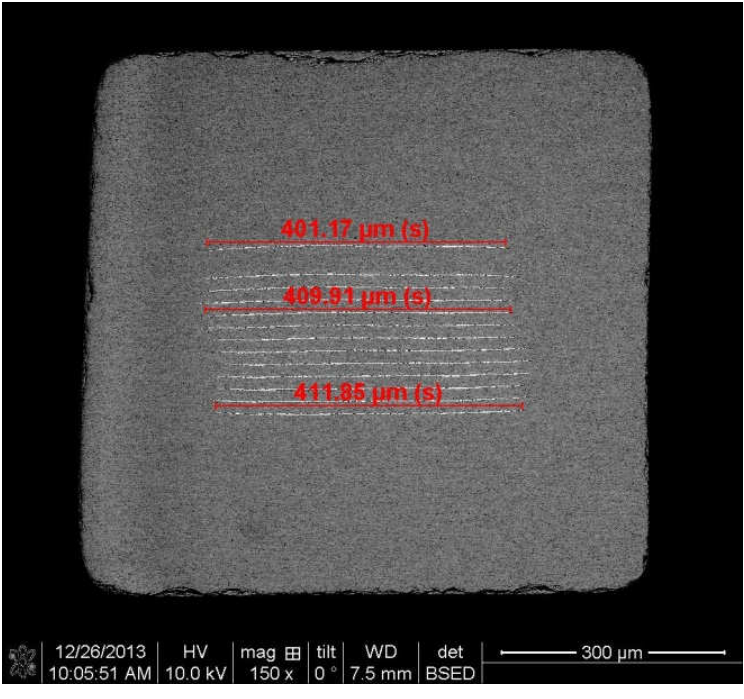


D 1608-1

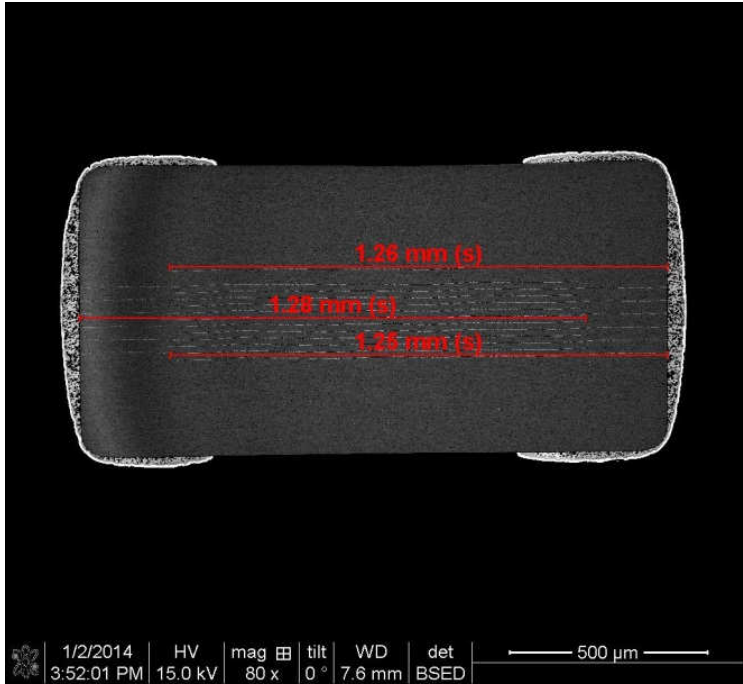
Direction ②



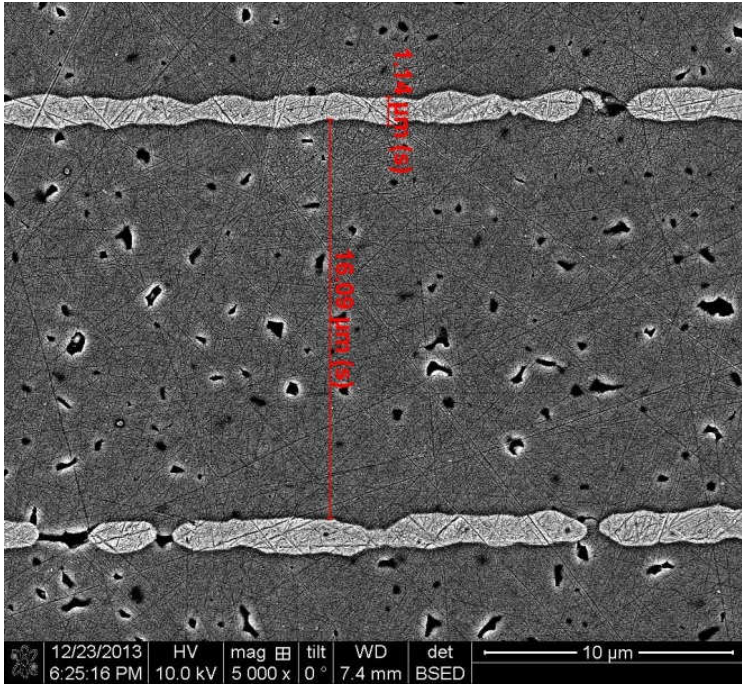
Direction ③



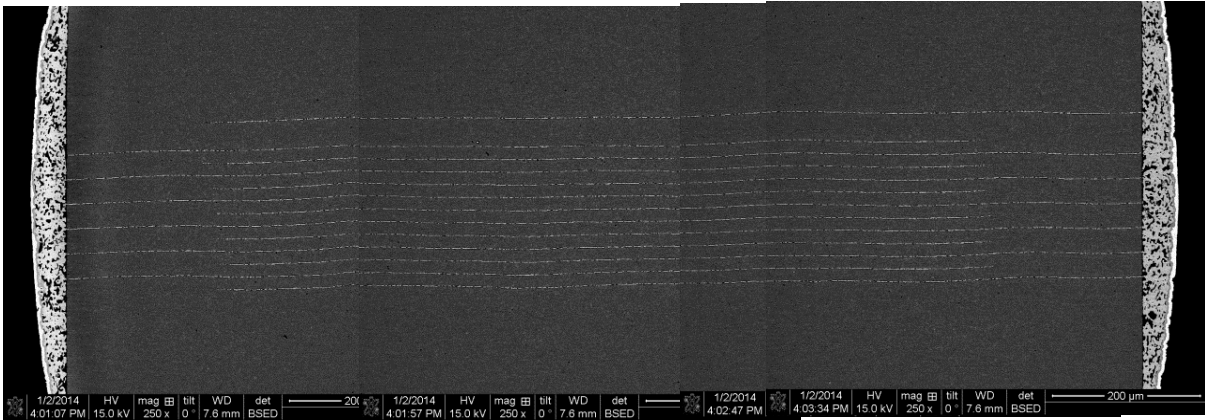
D 1608-1



Length of inner electrode



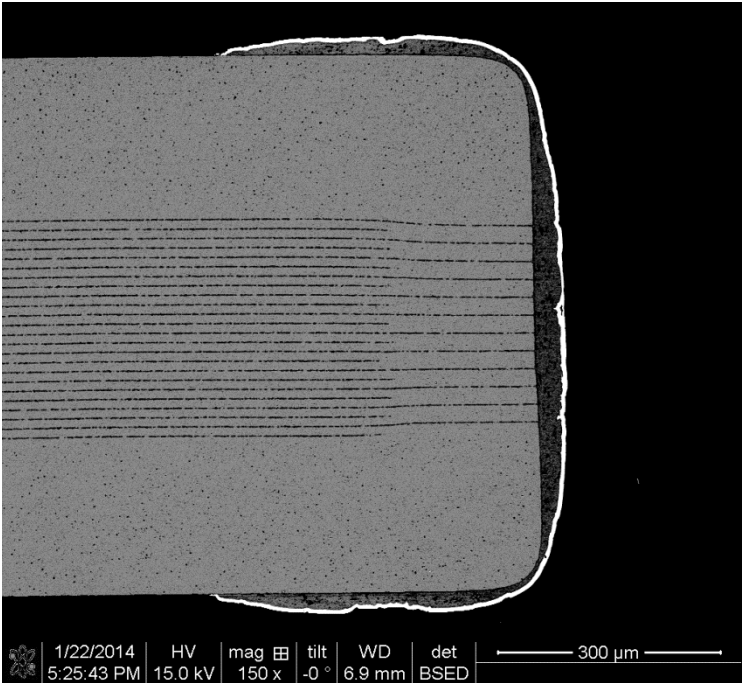
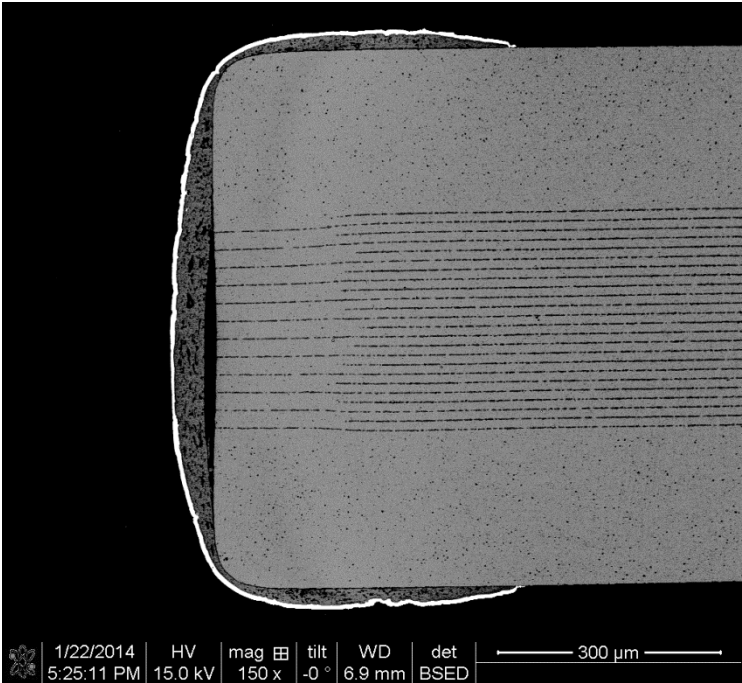
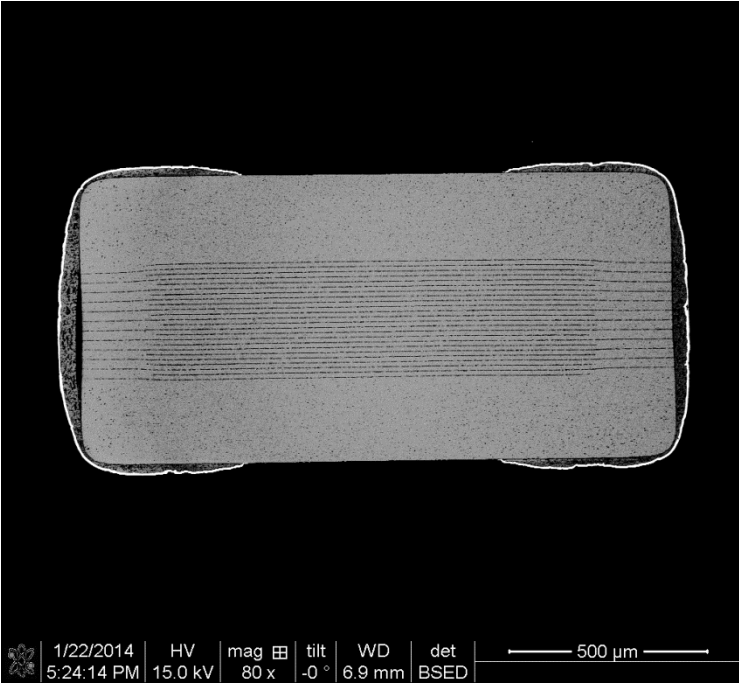
Gap between inner electrodes



Panorama of direction ①

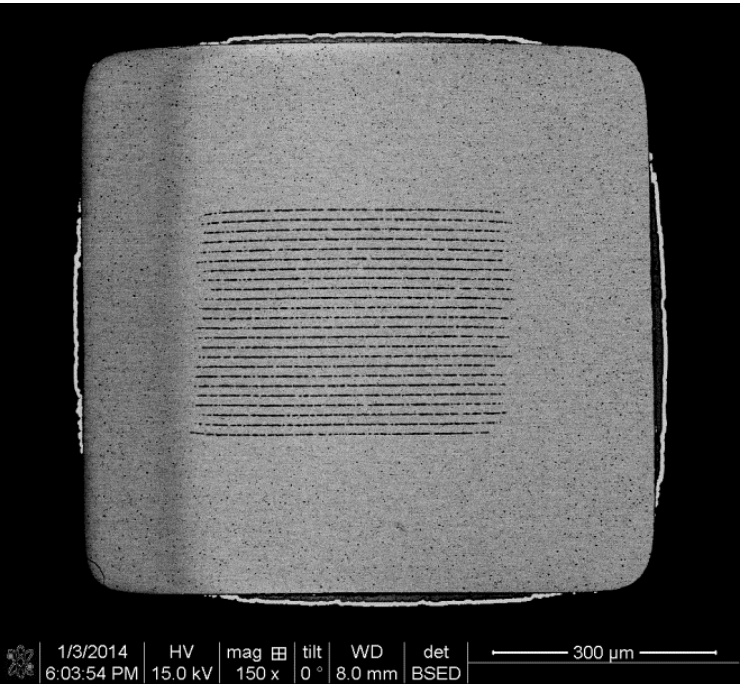
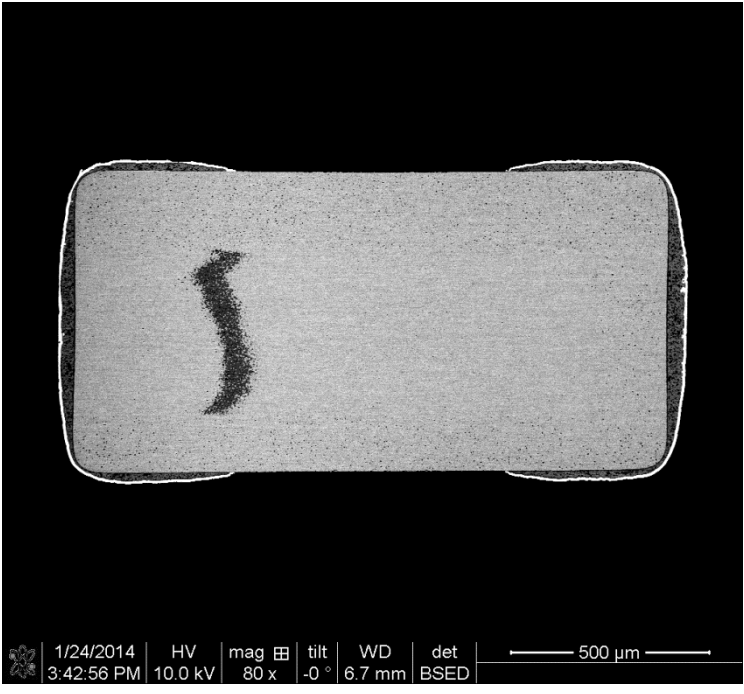
A 1608-2

Direction ①

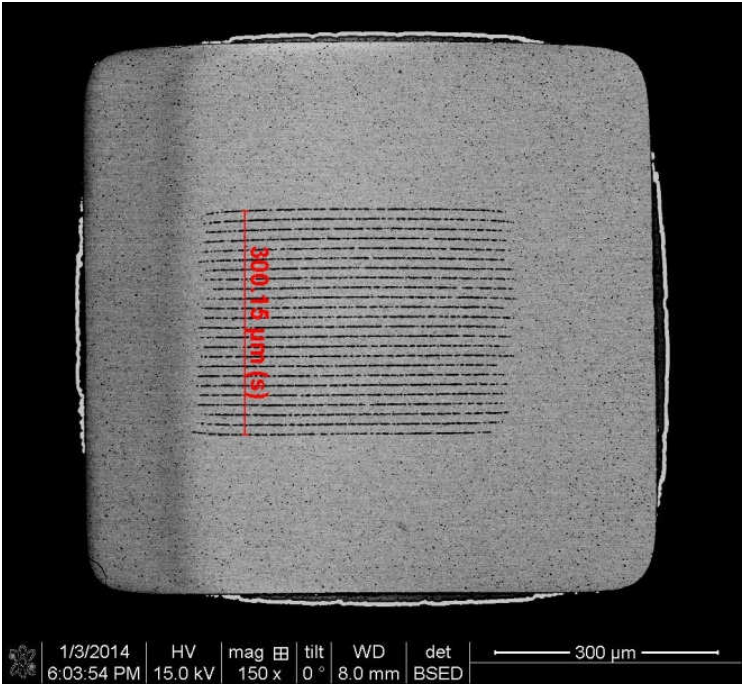
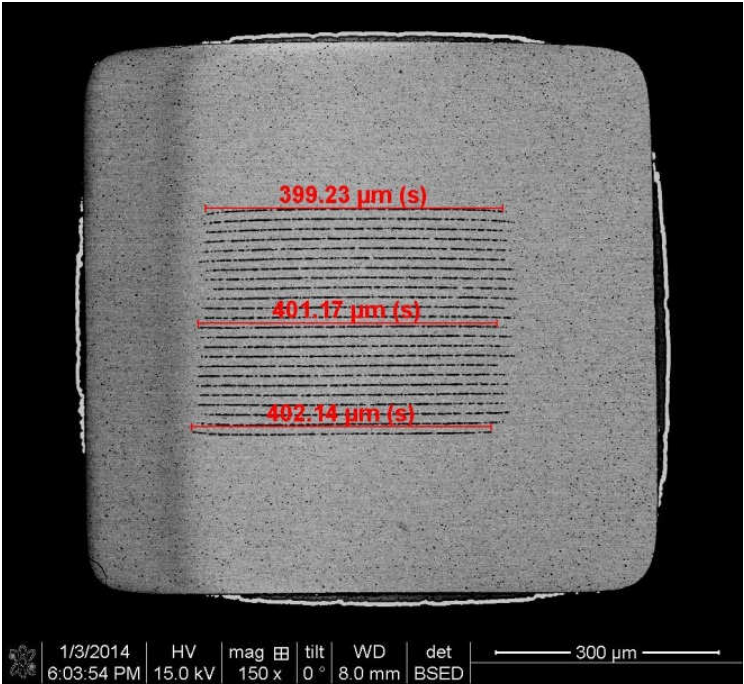


A 1608-2

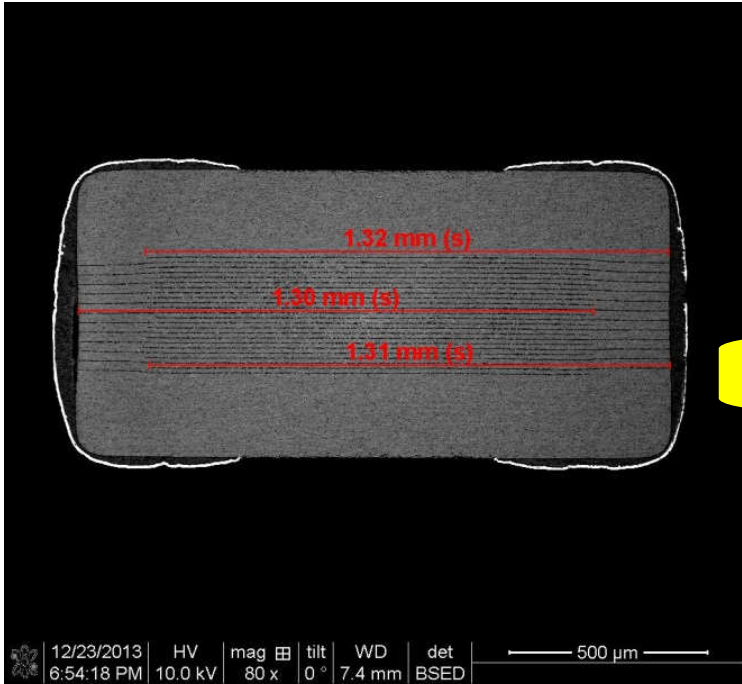
Direction ②



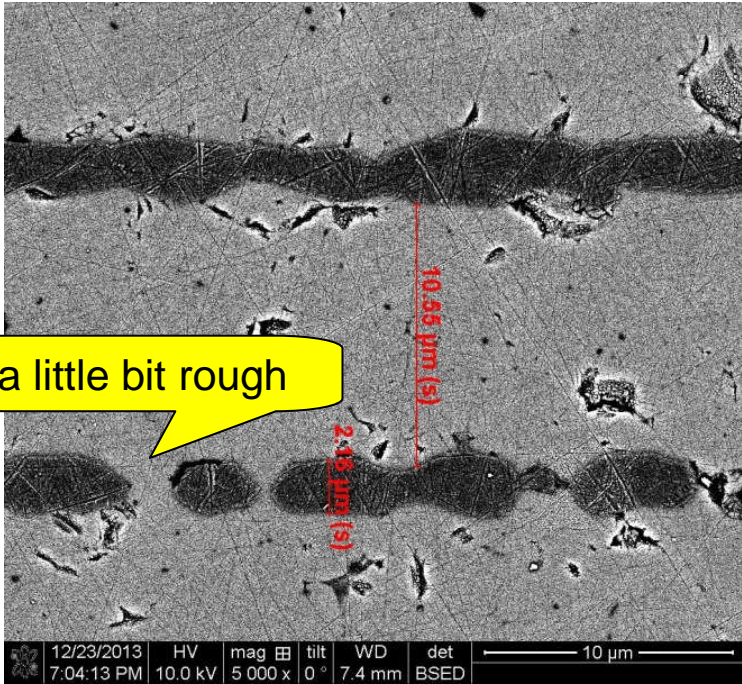
Direction ③



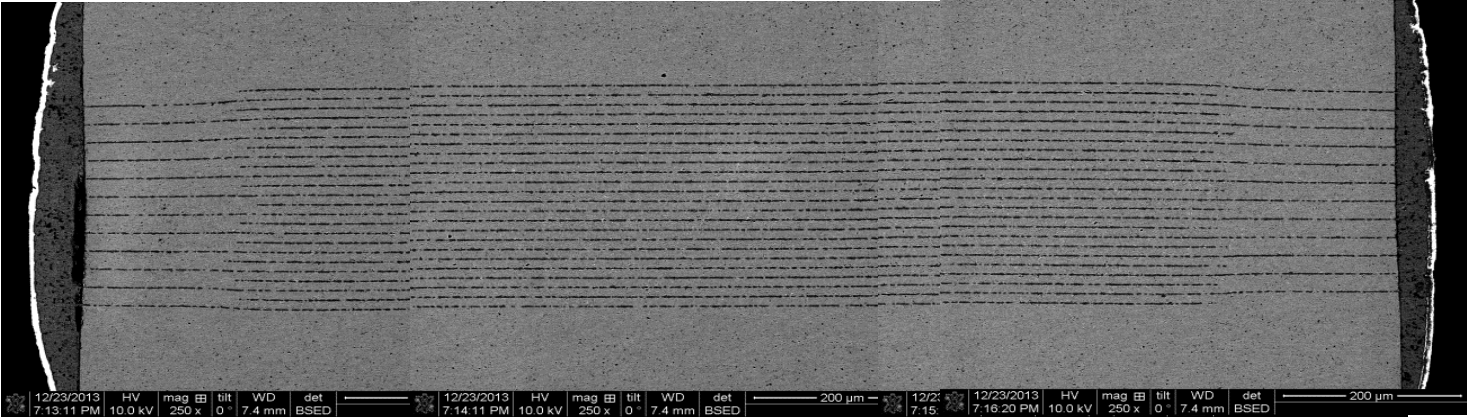
A 1608-2



Length of inner electrode



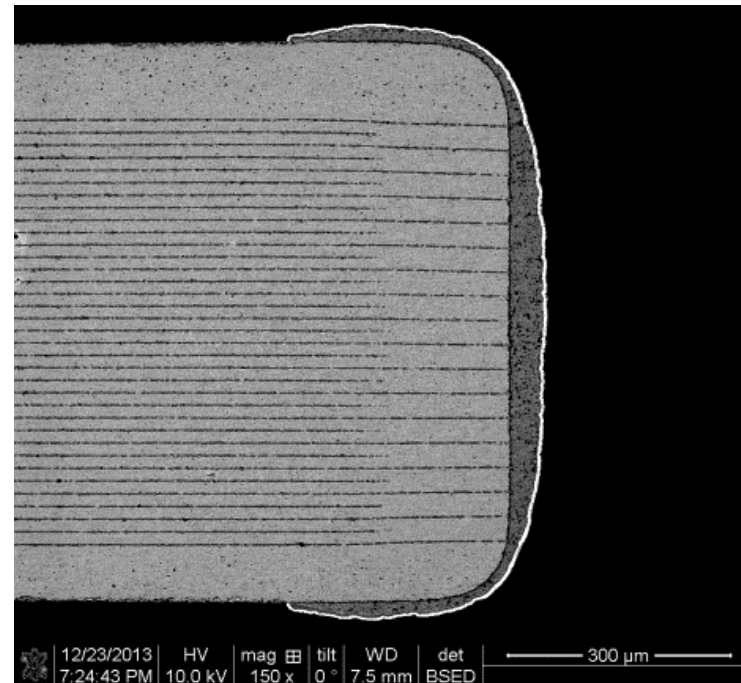
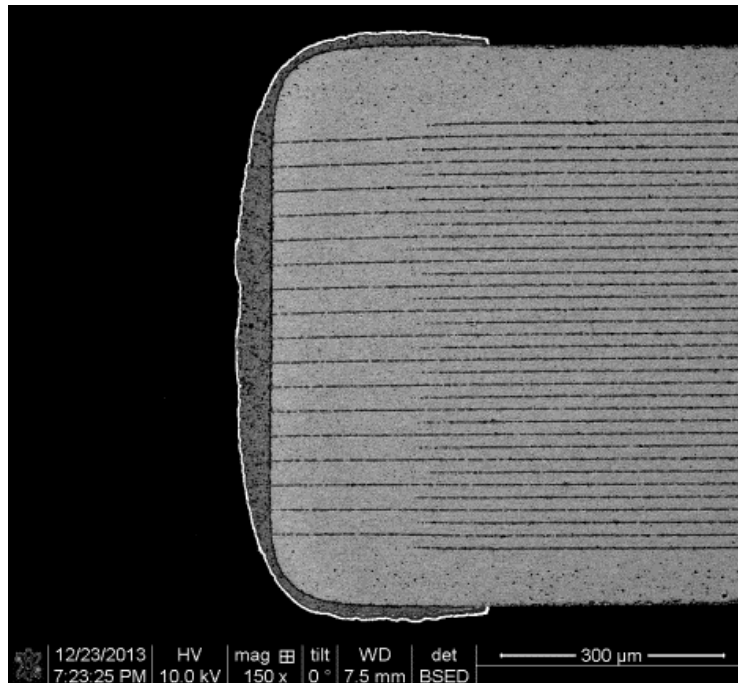
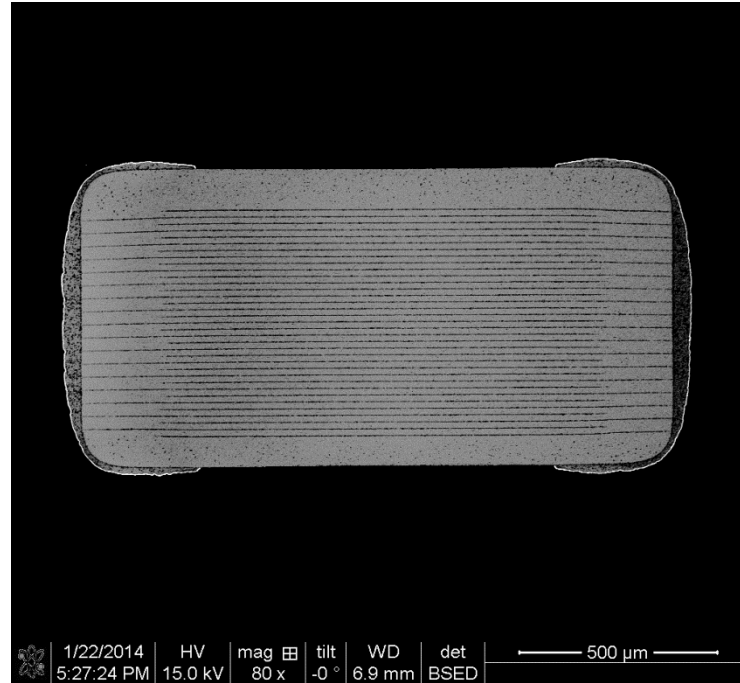
Gap between inner electrodes



Panorama of direction ①

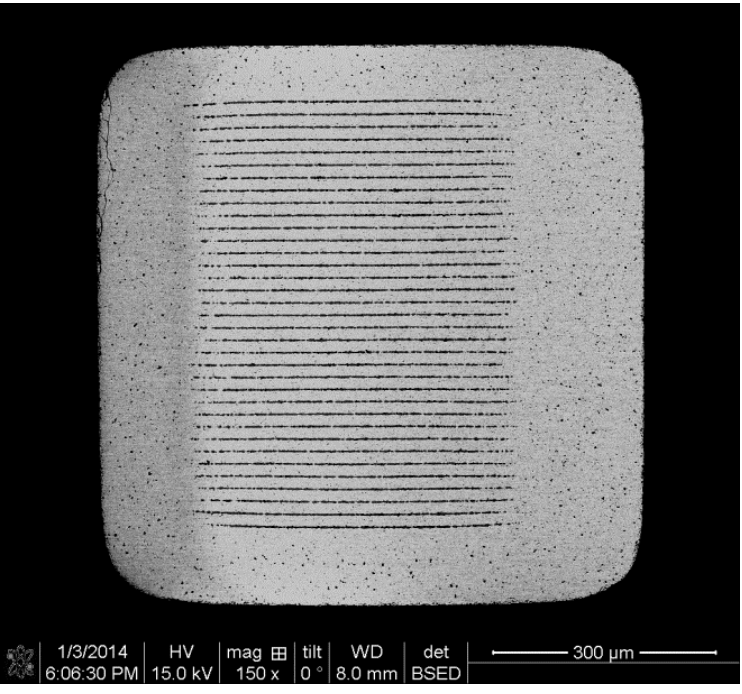
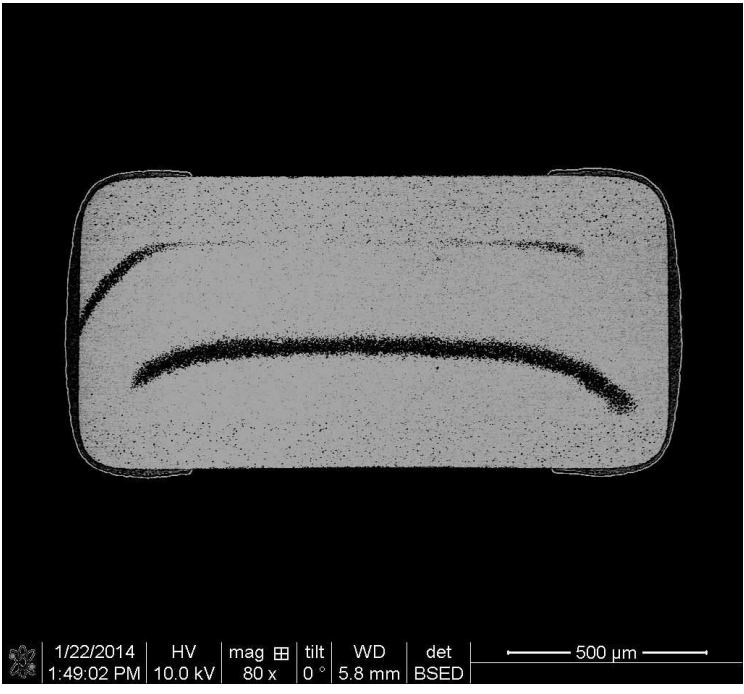
B 1608-2

Direction ①

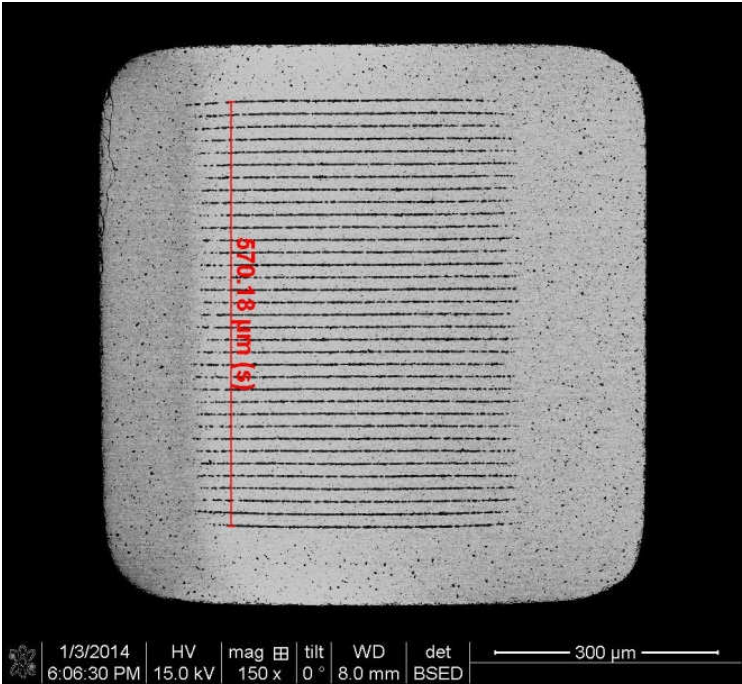
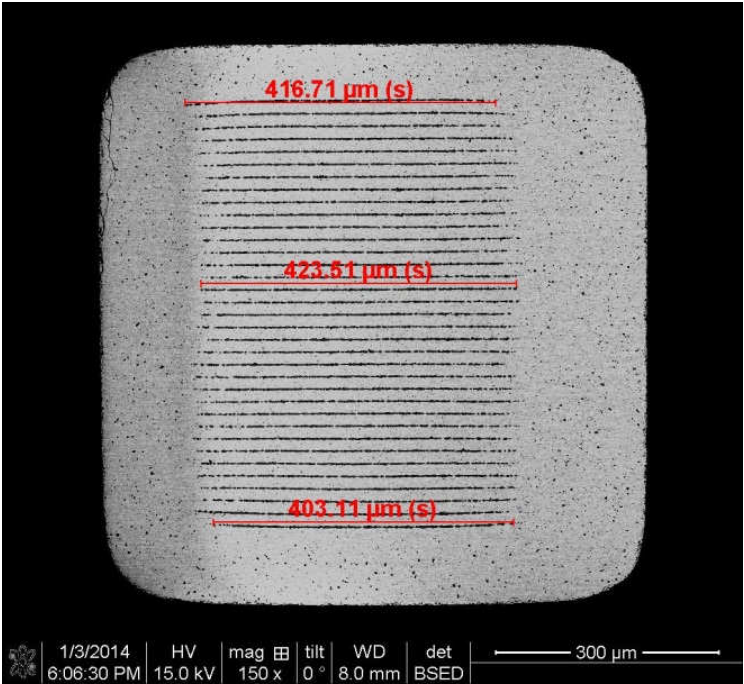


B 1608-2

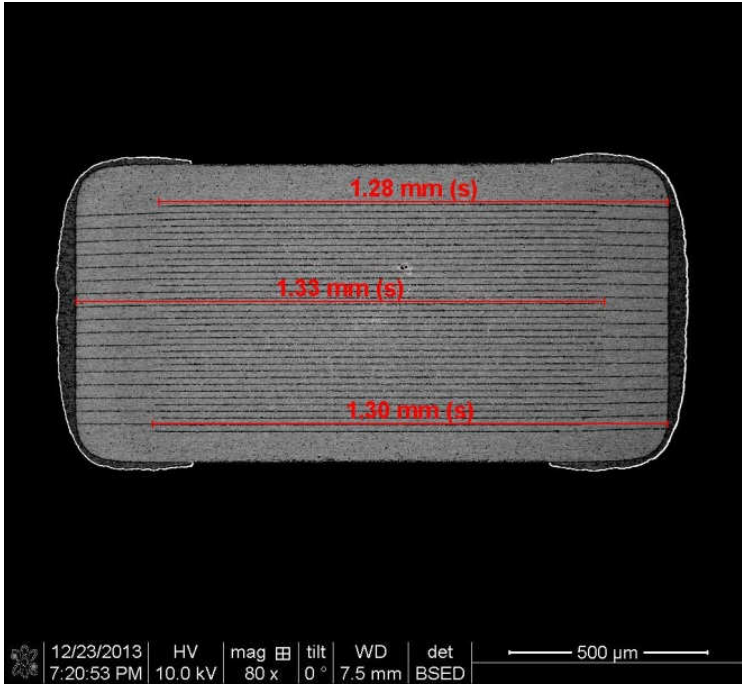
Direction ②



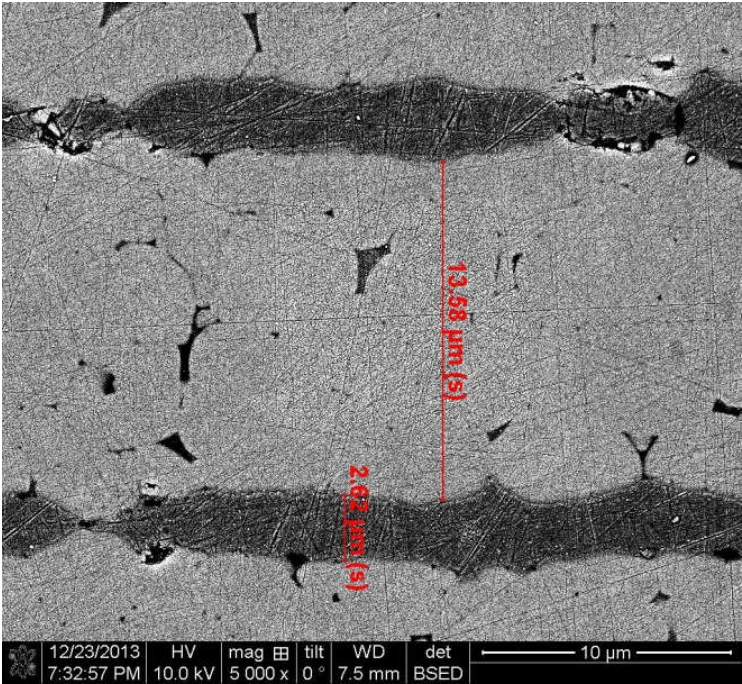
Direction ③



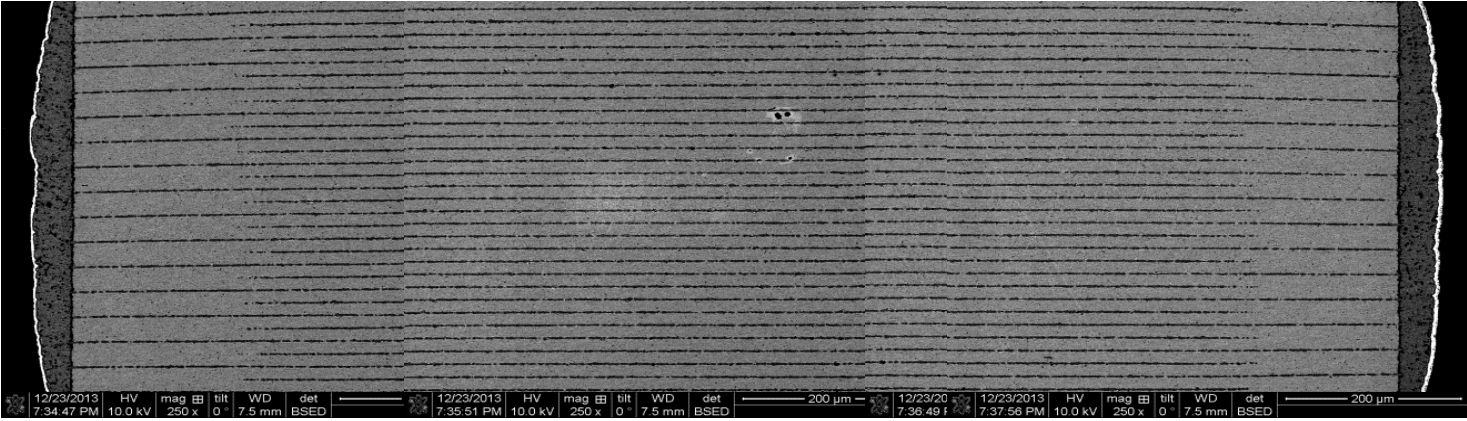
B 1608-2



Length of inner electrode



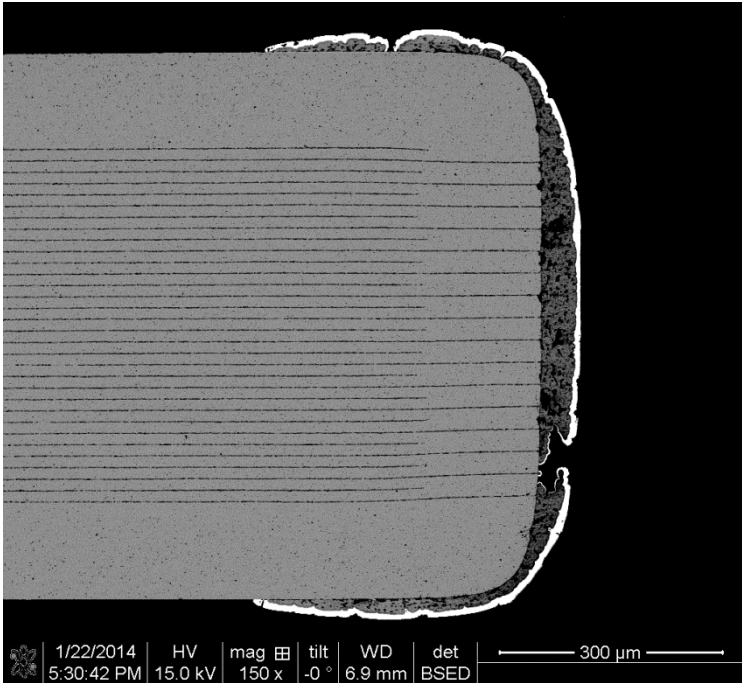
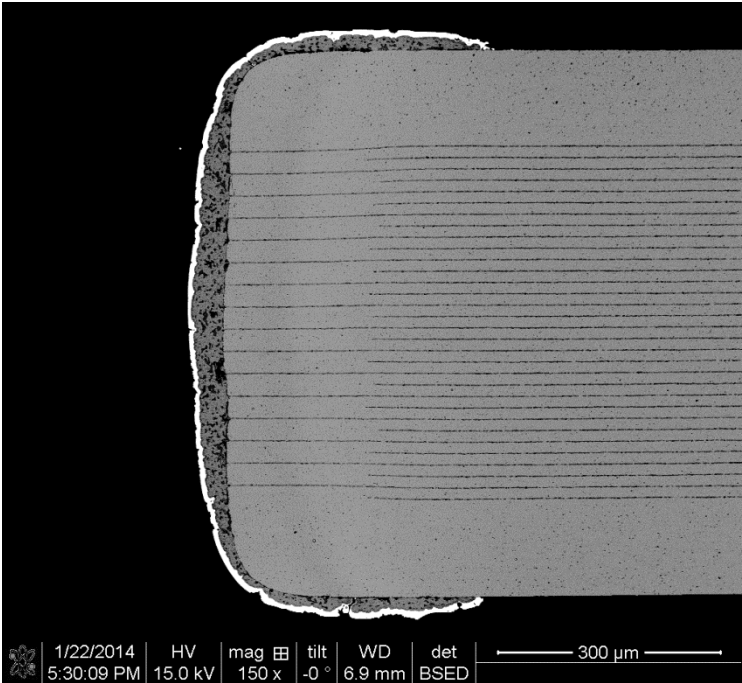
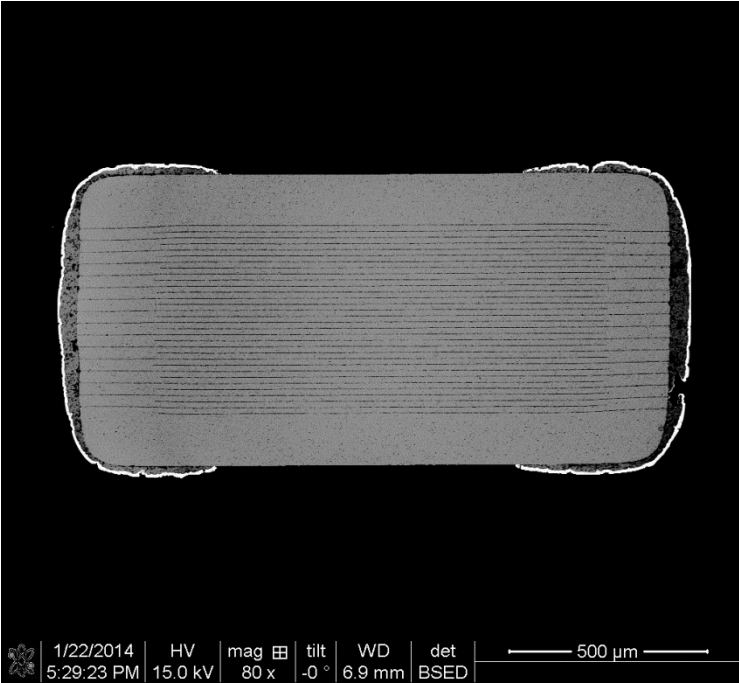
Gap between inner electrodes



Panorama of direction ①

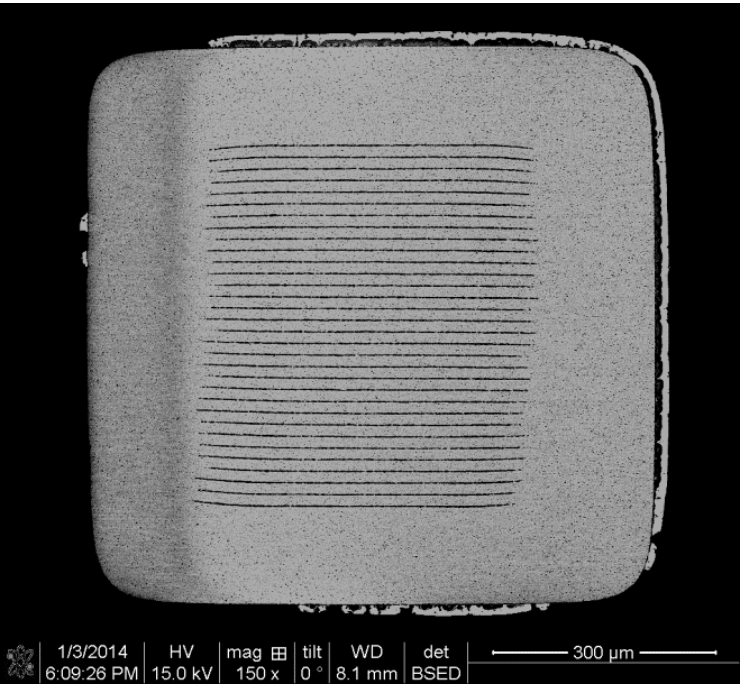
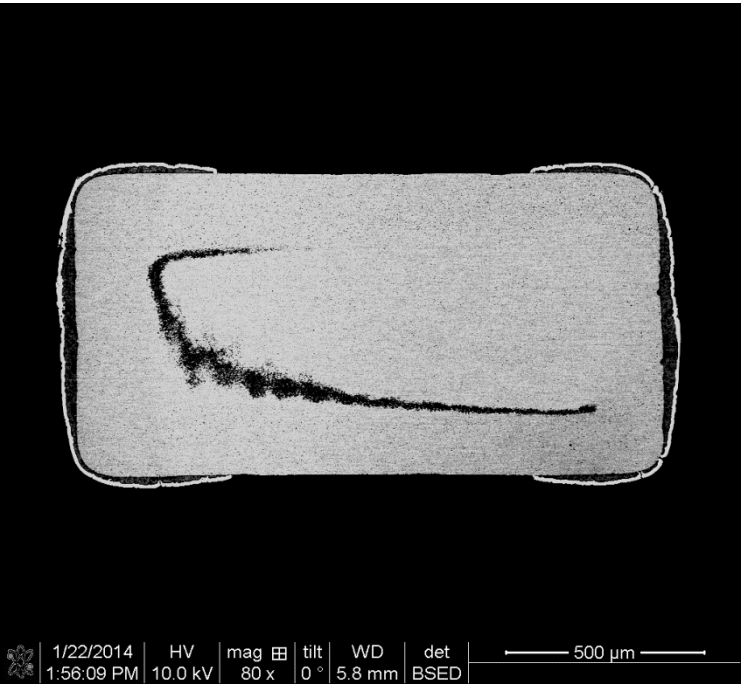
C 1608-2

Direction ①

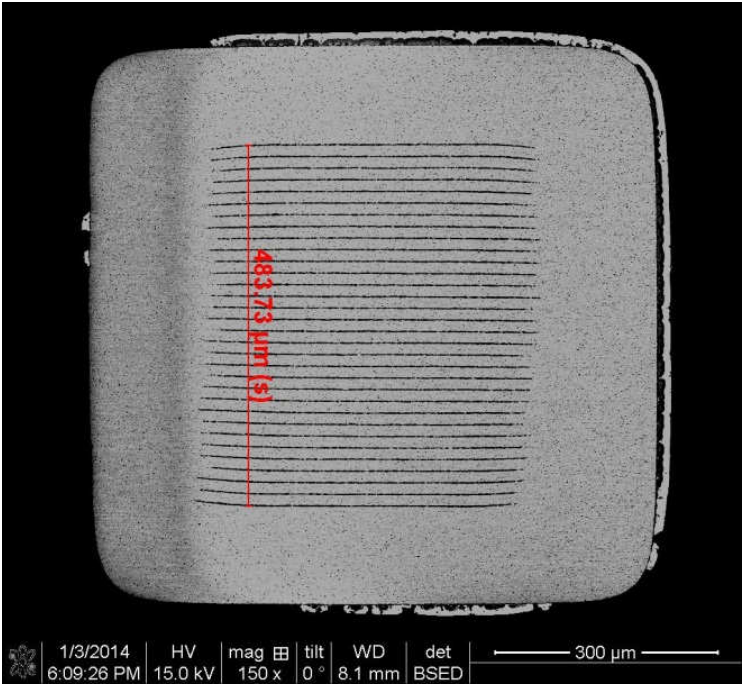
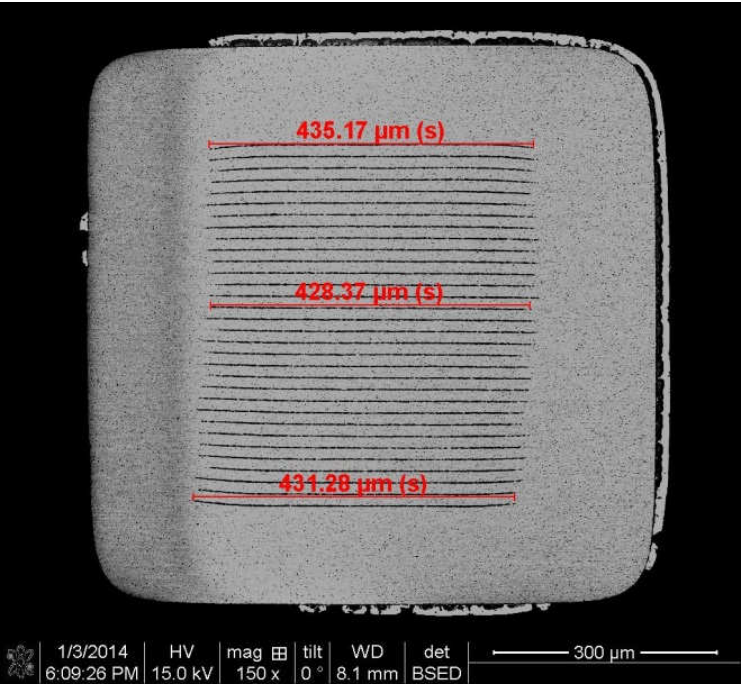


C 1608-2

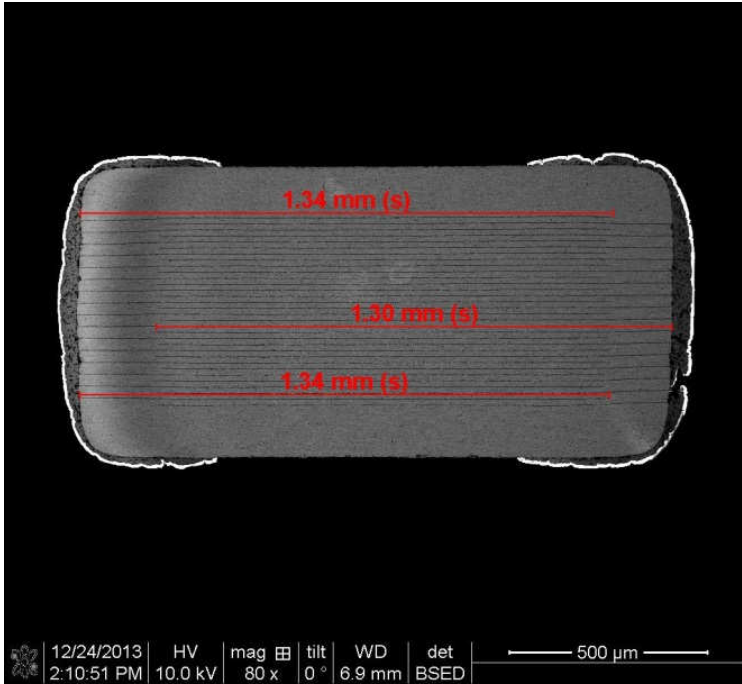
Direction ②



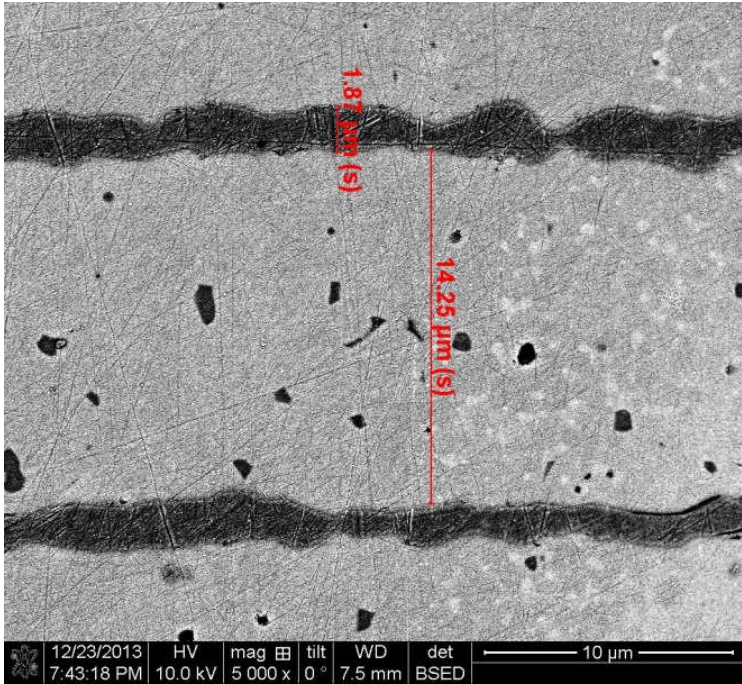
Direction ③



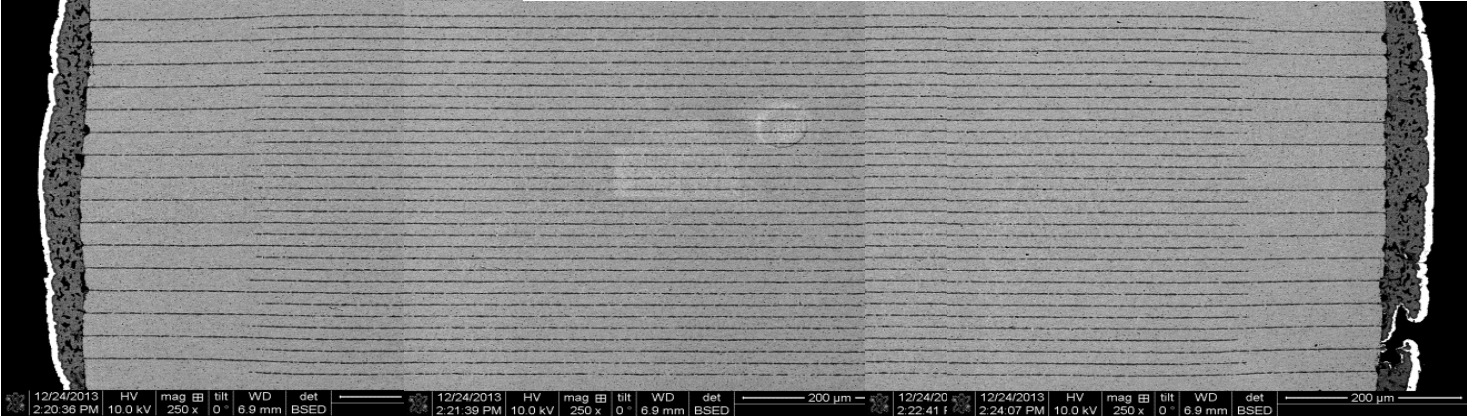
C 1608-2



Length of inner electrode



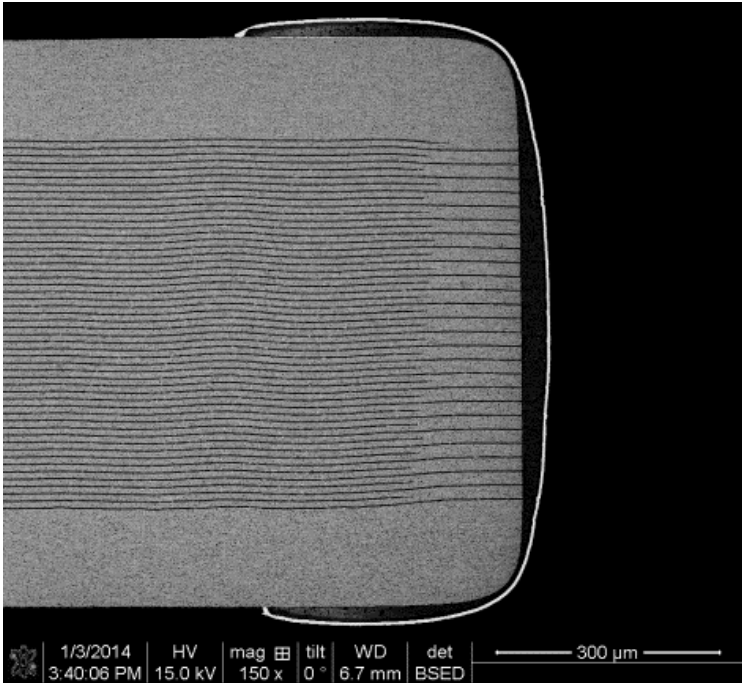
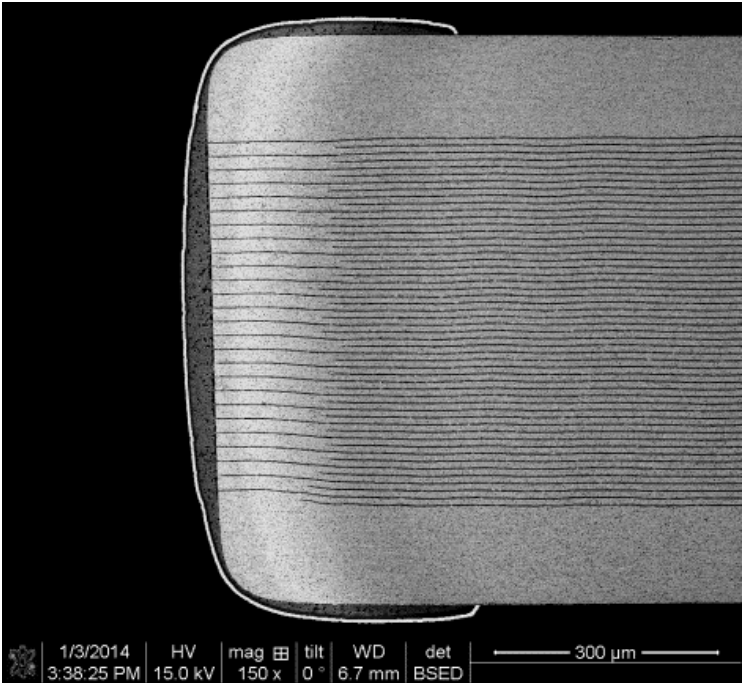
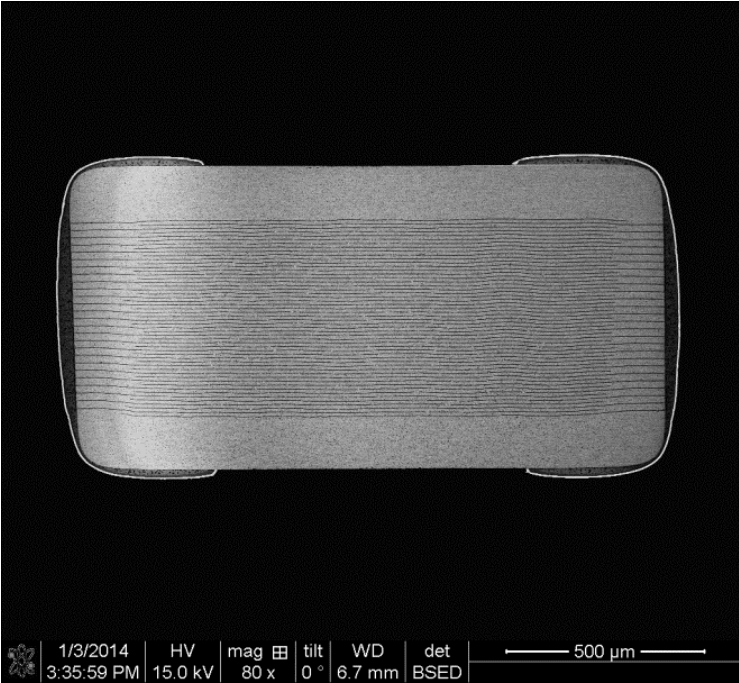
Gap between inner electrodes



Panorama of direction ①

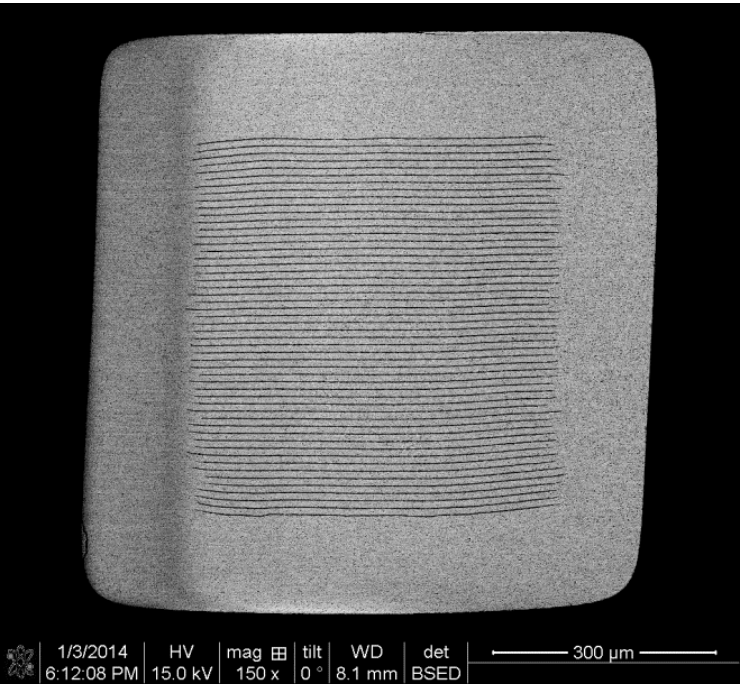
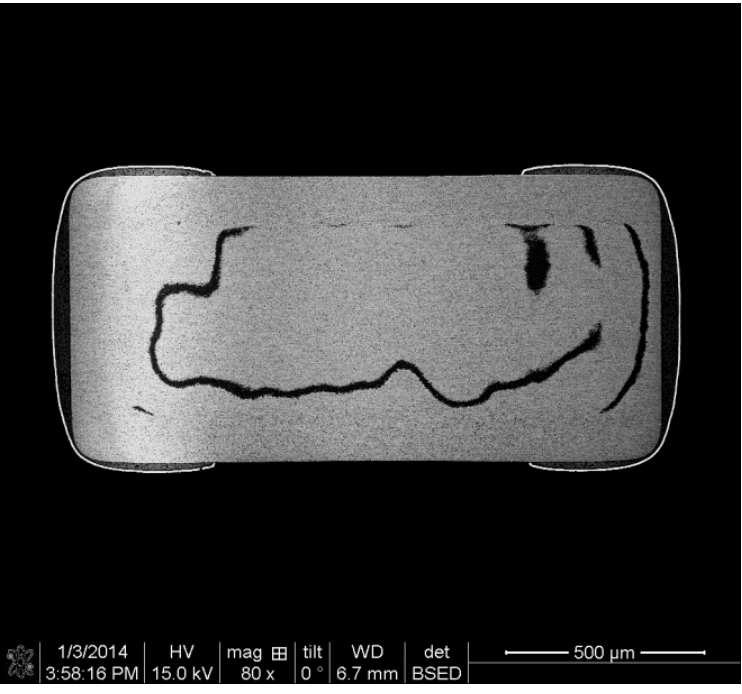
D 1608-2

Direction ①

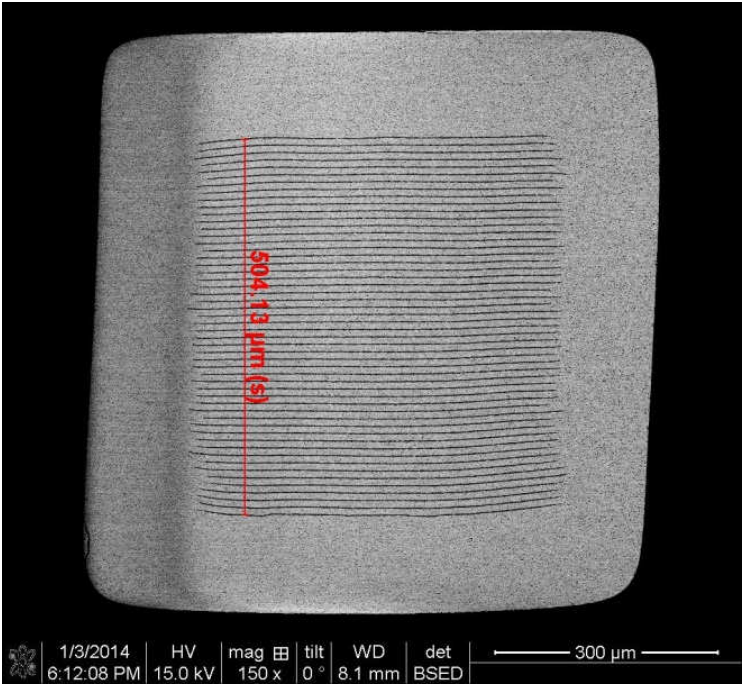
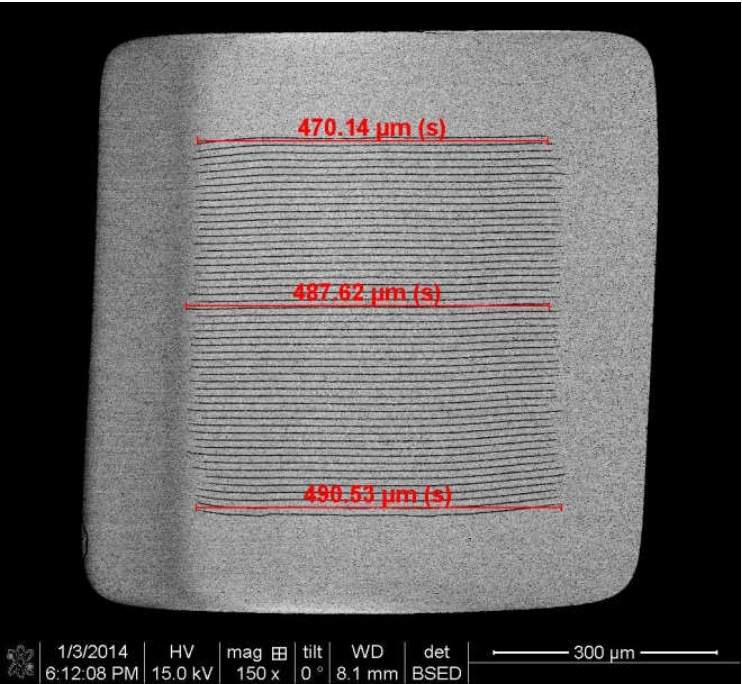


D 1608-2

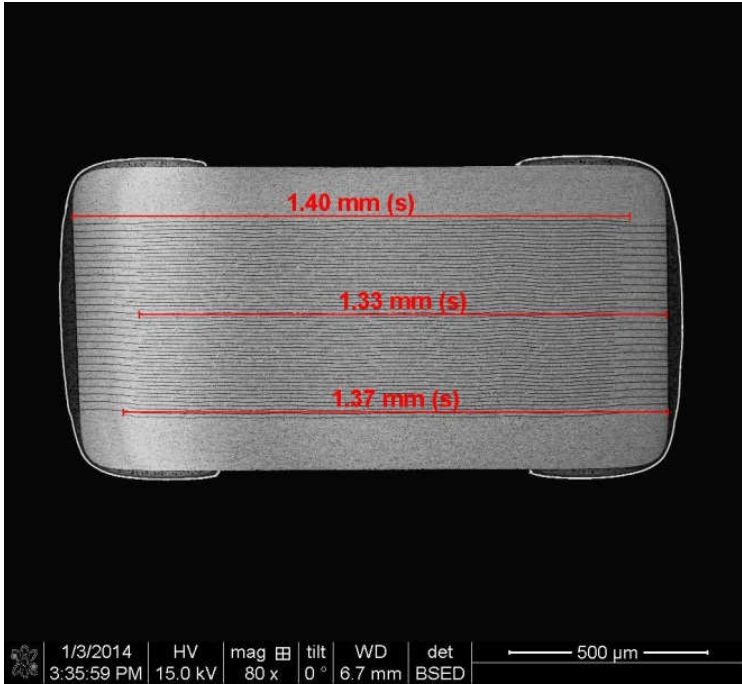
Direction ②



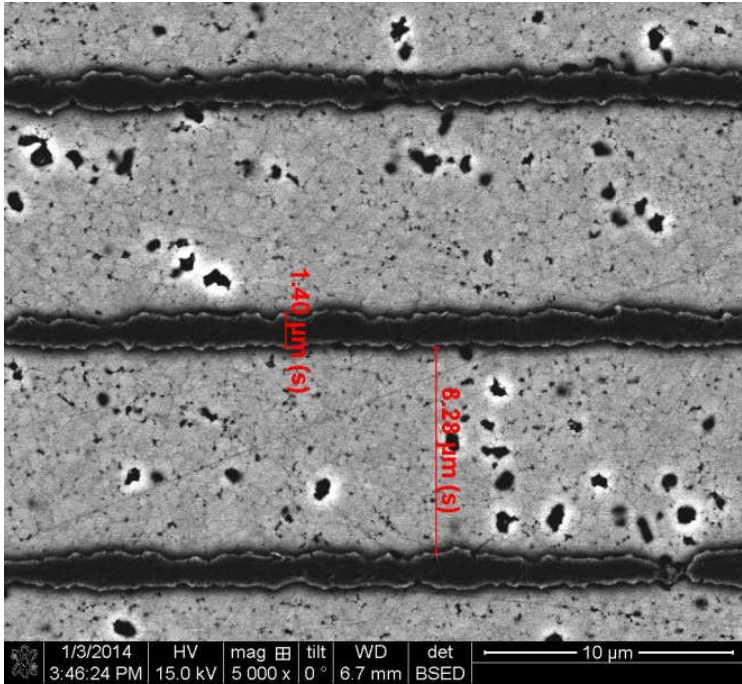
Direction ③



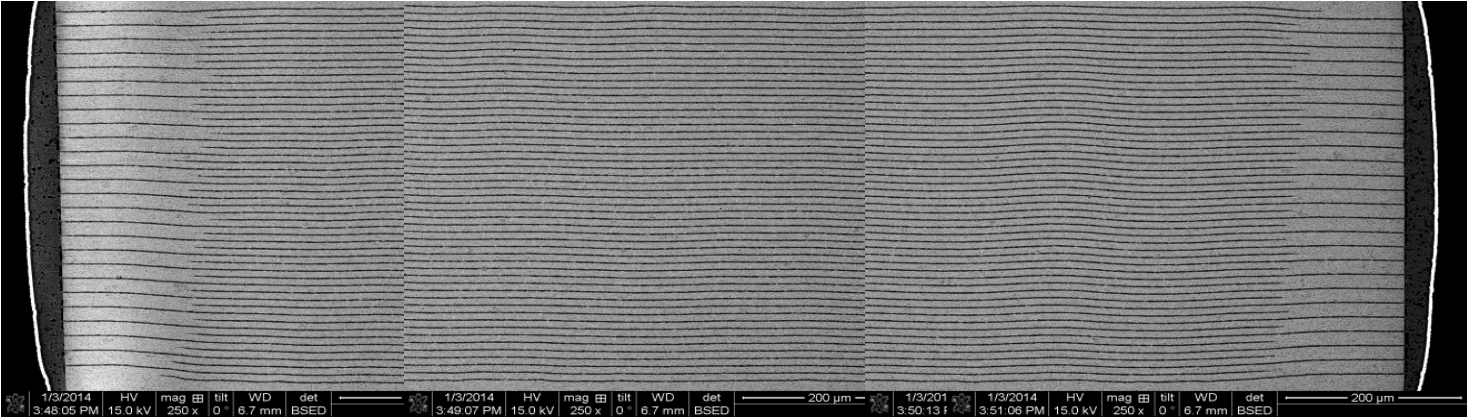
D 1608-2



Length of inner electrode



Gap between inner electrodes



Panorama of direction ①

Summary

Sample (1005)	Layer width	Layer interval	Total layer width
A	1.11~1.87um	3.5~3.85um	338.03um
	Judg:○	Judg:○	Judg:○
B	0.87~1.34um	3.03~3.38um	337.3um
	Judg:○	Judg:○	Judg:○
C	1.69~2.36um	3.12~3.47um	371.54um
	Judg:○	Judg:○	Judg:○
D	1.17~1.54um	2.59~3.09um	227.3um
	Judg:○	Judg:△	Judg:△

Sample (160B-1)	Layer width	Layer interval	Total layer width
A	2.24um	11.51um	181.64um
	Judg:○	Judg:○	Judg:○
B	1.75um	9.18um	214.67um
	Judg:○	Judg:○	Judg:○
C	1.46um	18.49um	447.79um
	Judg:○	Judg:○	Judg:○
D	1.14um	16.09um	221.47um
	Judg:○	Judg:○	Judg:○

Sample (160B-2)	Layer width	Layer interval	Total layer width
A	2.16um	10.55um	300.15um
	Judg:○	Judg:○	Judg:○
B	2.62um	13.58um	570.19um
	Judg:○	Judg:○	Judg:○
C	1.87um	14.25um	483.73um
	Judg:○	Judg:○	Judg:○
D	1.40um	8.28um	504.13um
	Judg:○	Judg:○	Judg:○

<J-chip comment>

Company D level is no good, if compare to another company level(Layer interval/total layer width). **Due to above reason, company D strength level is no good(our presume).**

Acceptable

Acceptable