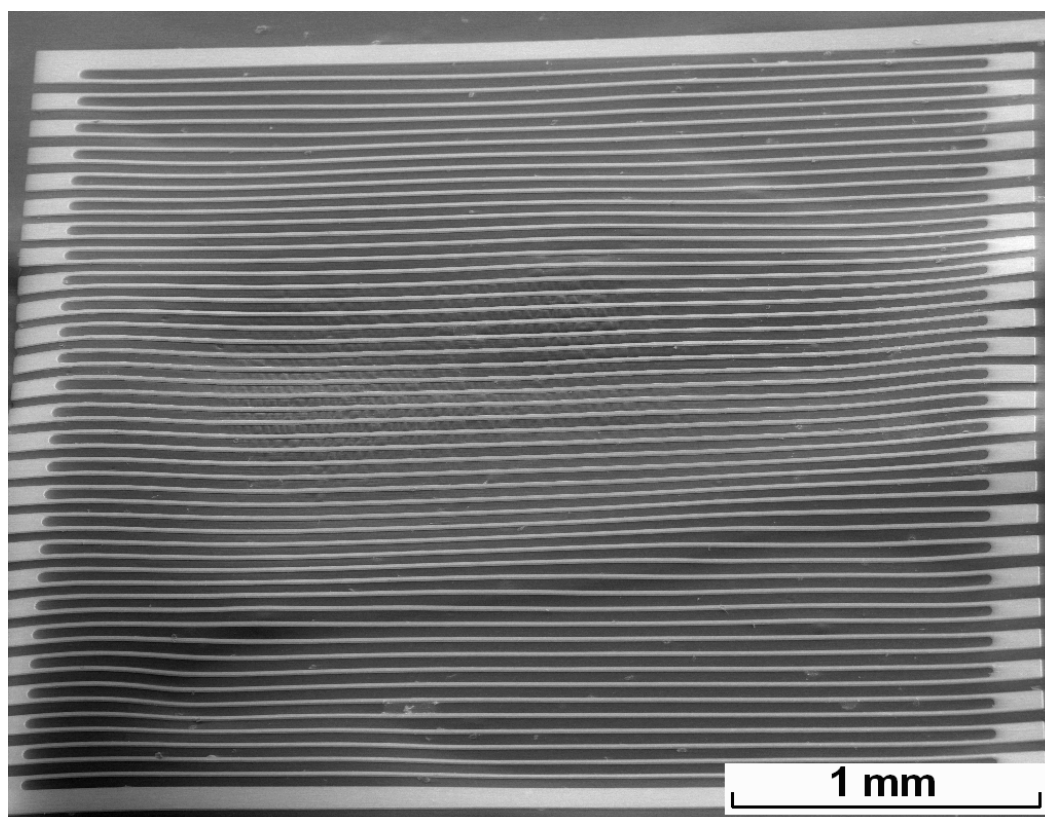
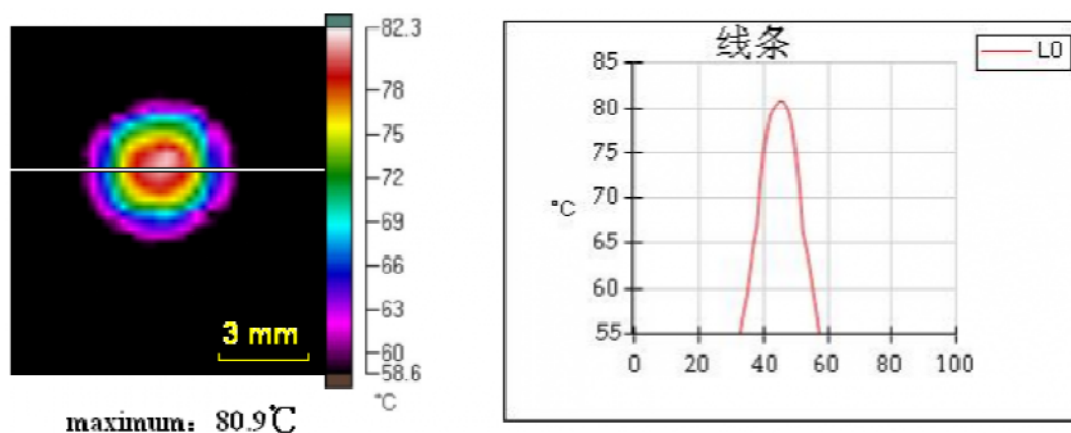


S-Fig. 1 SEM image of the sample before electrification



S-Fig.2 Surface morphology of the sample when varicose buckling morphology generated after bearing AC with a current density of $2.49 \times 10^8 \text{ A/m}^2$.



S-Fig. 3 The temperature of the sample measured by a thermal infrared imager (FLUKE Ti55FT). Here is an example: after electrification with a current density of $2.36 \times 10^8 \text{ A/m}^2$.

S-Table 1 Source Data of the temperature under different current density.

Current density(*E8 A/m ²)	Temperature(□)
0.83333333	32.3
1.08333333	37.3
1.36666667	44.1
1.60833333	51.8
1.85833333	60.9
2.1	70
2.35833333	80.9
2.60833333	94.8
2.86666667	106.3
3.11666667	123.1
3.34166667	133
3.55833333	145.4
3.83333333	166.4
4.11666667	181.7
4.33333333	200.4
4.625	218.6
4.85833333	249.6
5.09166667	257.6