

Supplementary Material to the article
“Temperature-induced transition
between resistive switching modes
of parylene-based memristive crossbar structures”

Resistive switching mechanism

The following results were obtained for single devices fabricated in the same way as the crossbar structures. In Fig. S1, it can be seen that the R_{off} resistive state is approximately inversely proportional to the area of the top electrode, while R_{on} is independent of it. In the case of multifilamentary switching, R_{on} should depend on the electrode area, a decrease in the electrode area should result in the formation of fewer filaments. However, R_{on} does not depend on the electrode area. This means that the current mainly flows through one conducting filament (or a small number of them), the cross-sectional area of which is independent of the area of the top electrode. On the contrary, an inversely proportional dependence of the resistance on the electrode area was obtained for the R_{off} resistive state, because in this case electrons move through the entire volume of the memristor.

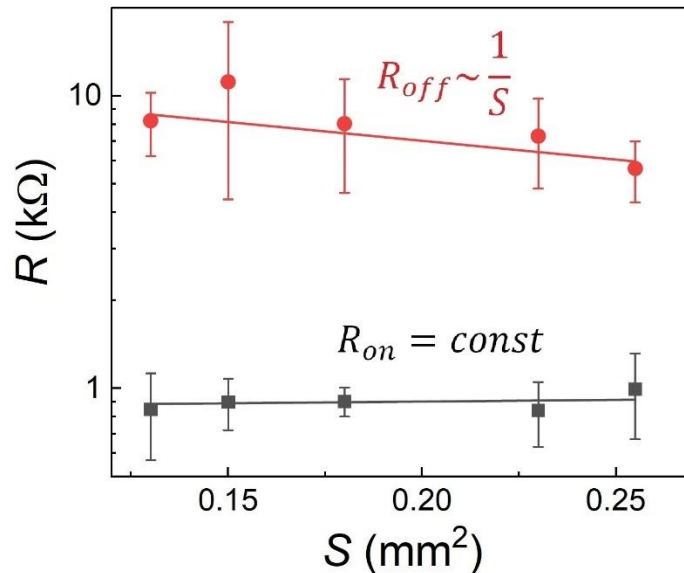


Figure S1. The dependence of R_{on} and R_{off} resistive states averaged over five memristive devices on the area of the top electrode