

ADVANCED MATERIALS

Supporting Information

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Paper Microfluidics Goes Digital

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Cost and printing time estimates for printing paper DMF devices

The drop spacing is 30 μm and the printing time per horizontal line (300 mm) is 4 s (averaged over 10 printed lines). Based on this, we calculate an average printing speed of 2.25 mm^2/s .

DMF device designs A and B are 850 and 1700 mm^2 , respectively. This gives printing times of 6.3 and 12.6 minutes for a single nozzle. Since we typically print with 6 nozzles simultaneously, the time per device is about 1 and 2 minutes for design A and B.

The cost of the silver ink is \$7/mL (\$700 for 100 mL from SunChemical, Parsippany, NJ). Each drop is 10 pL (10^{-8} mL), and we estimate ink coverage at approximately 50% (based on image histograms). Using the cost per volume of ink, drop volume, drop spacing, and print coverage, we calculate the ink cost per device as \$0.033 and 0.066 for designs A and B.

Paper cost is based on commercially available HP Premium Photo Plus Glossy paper: 50 sheets of 8.5"x11" available on Amazon.com for \$25, which results in a cost of $\$8.3 \times 10^{-6}$ per mm^2 . This gives a paper cost of \$0.007 and \$0.014 for designs A and B.

Therefore, the total costs of ink and paper for designs A and B are \$0.04 and \$0.08.

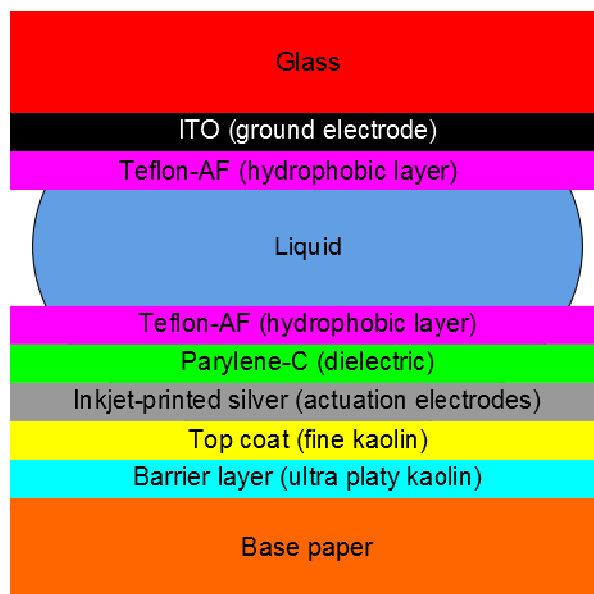


Figure S1: Side schematic of a paper DMF device (not to scale). The bottom three layers (brown, turquoise, and yellow) comprise the custom paper (reference #21 in the main text) used to form most of the devices described here. Working devices can also be formed from commercially available inkjet photo papers (e.g., Epson Premium Photo Glossy or HP Premium Plus Photo Glossy).