

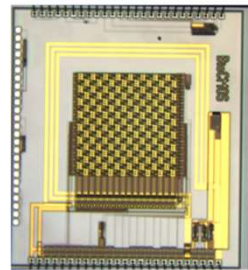
A Low-Voltage CMOS Electrophoresis IC Using Electroless Gold Plating for Small-Form-Factor Biomolecule Manipulation

**Kiichi Niitsu, Yuuki Yamaji, Atsuki Kobayashi,
Kazuo Nakazato (Nagoya University, Japan)**

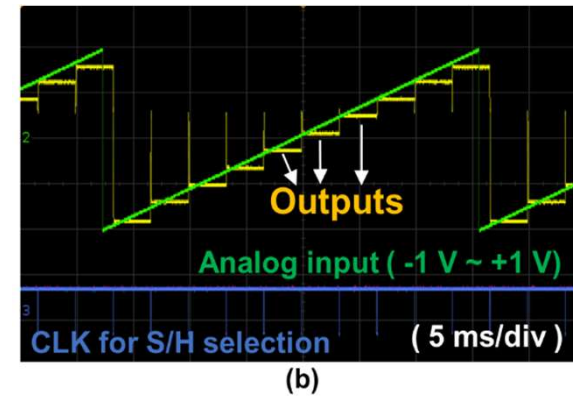
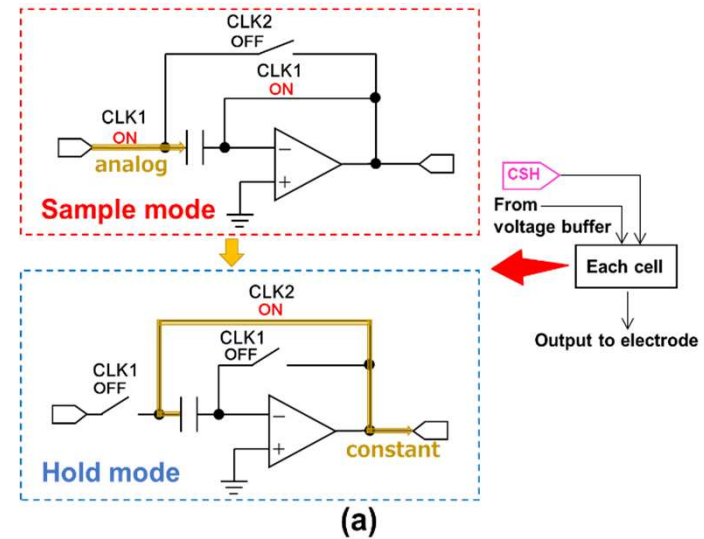
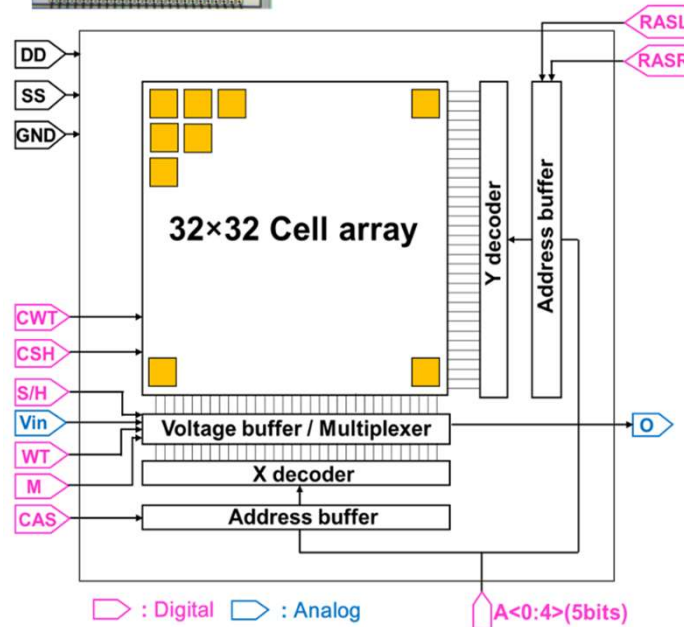
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Background & Research object

■ Low-voltage (sub-1V) CMOS Electrophoresis



0.6 μm 2P3M CMOS
 Chip size : 4.6 mm \times 5.0 mm
 Array size : 32 \times 32
 Supply voltage : ± 2.5 V

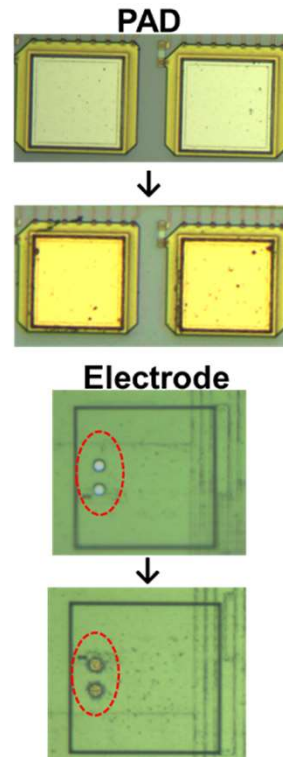


Electrode Design

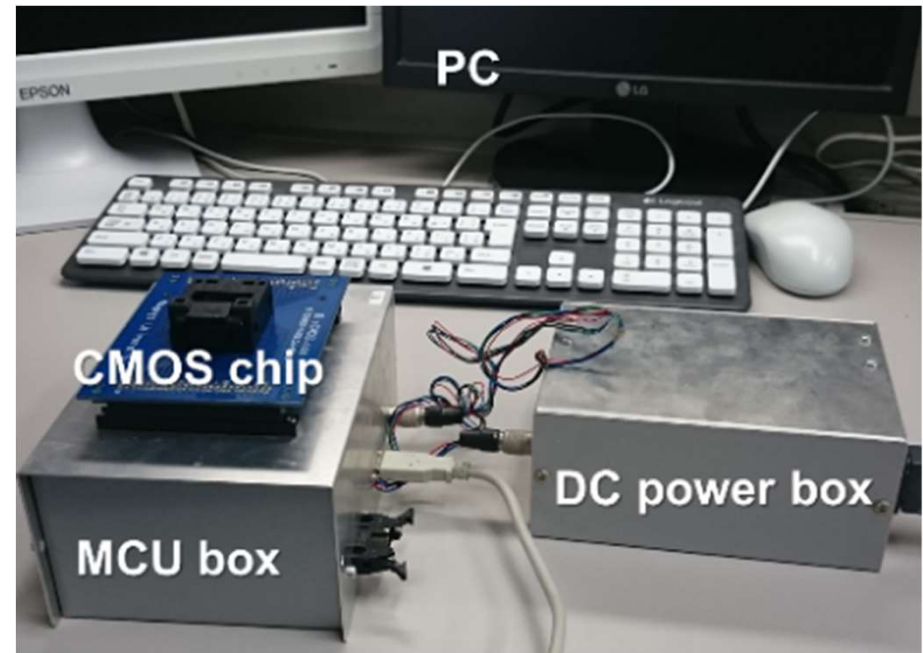
■ Electrode & System

1. Pre-cleaning
Acetone→IPA→DI water
25 °C, each 2 min.
2. De-oxidizing in aluminum etchant
10 % NaOH, 25 °C, 10 s.
3. Zincation
20 % HNO₃, 25 °C, 30 s.
40 °C, 45 s.
20 % HNO₃, 25 °C, 30 s.
40 °C, 30 s.
4. Electroless nickel plating
90 °C, 5 min.
5. Electroless gold plating
90 °C, 20 min.

(a)

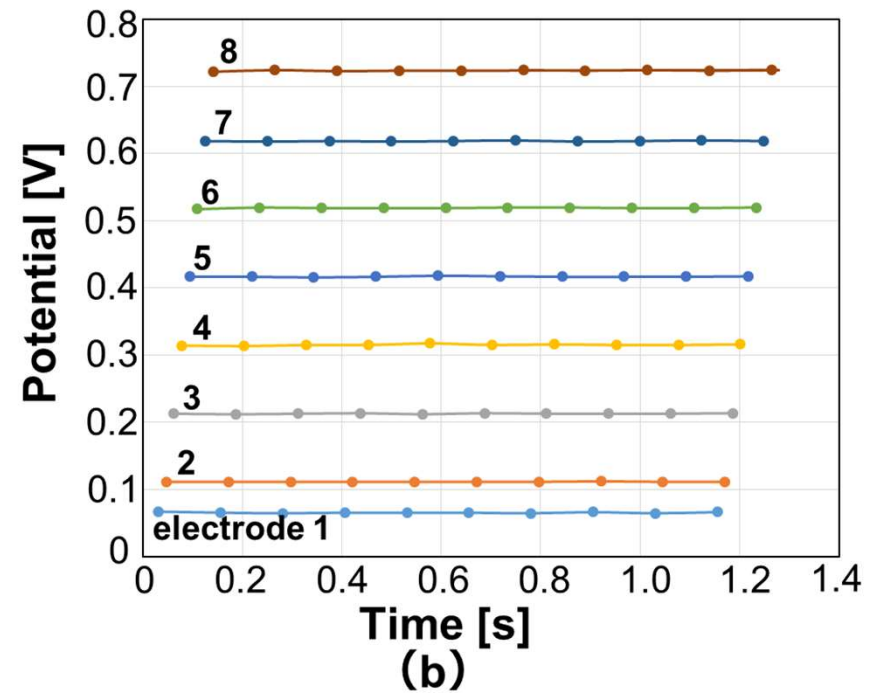
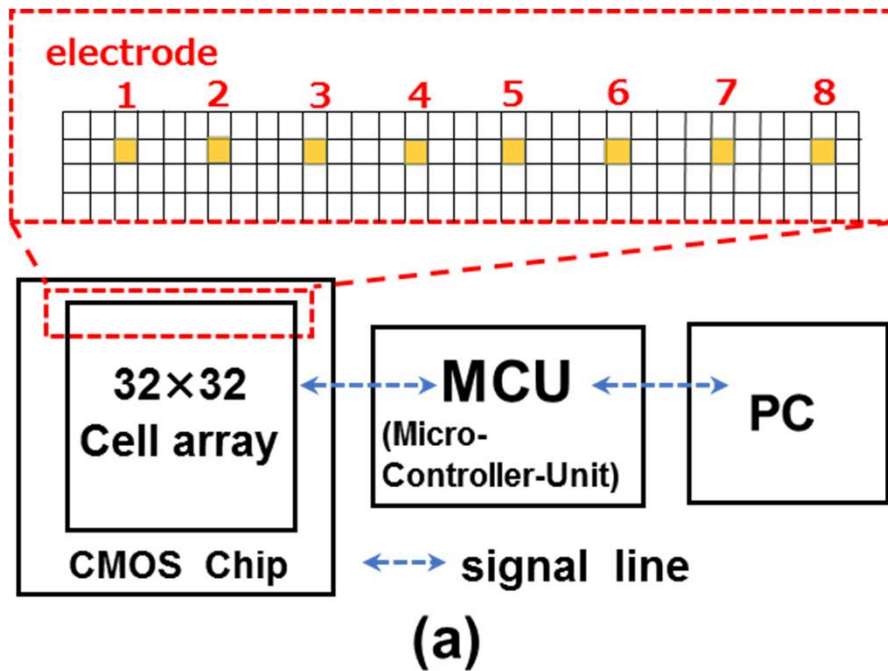


(b)



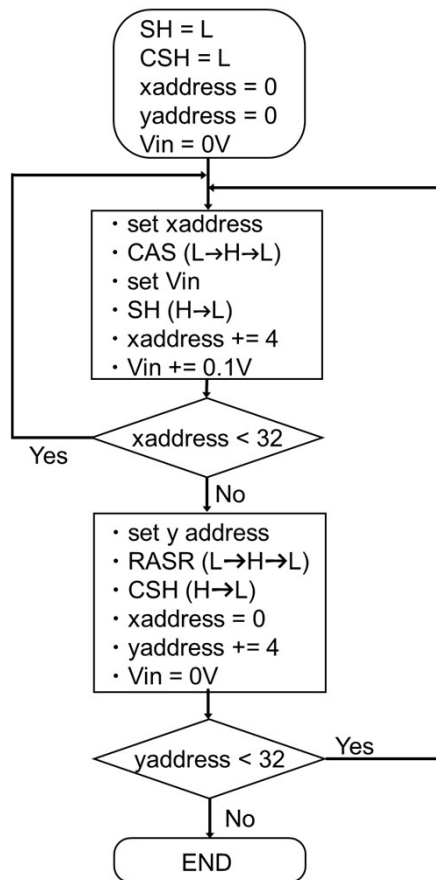
Testchip Design & Function Test

- Function has been verified

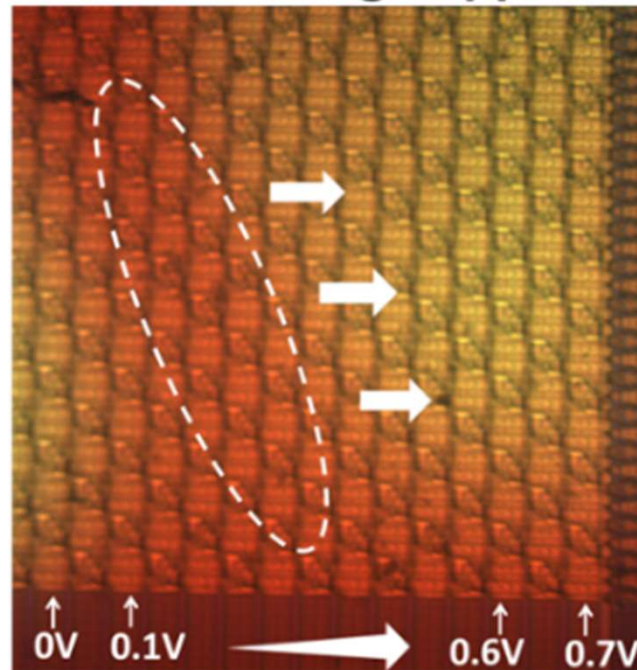


Measurement Results

■ Successfully verified



Before voltage applied



After voltage applied

