Electronic Supplementary Material (ESI) for Nanoscale.


# Supplementary Information

## Optical-Reconfigurable Carbon Nanotube and Indium-Tin-Oxide Complementary Thin-Film Transistor Logic Gates

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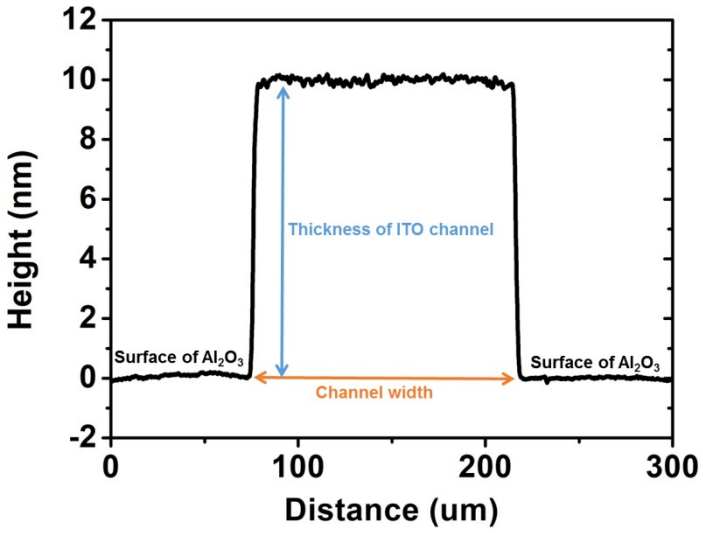



Figure S1. Thickness of the thin ITO channel layer measured using a surface profiler.

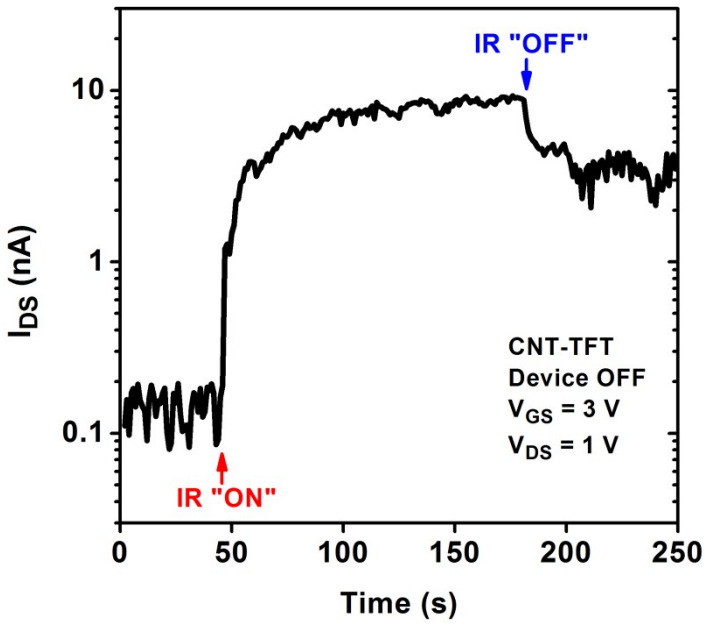
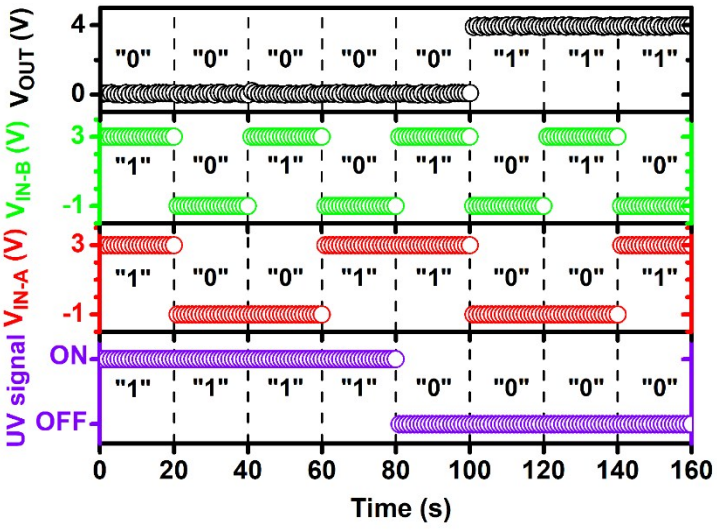


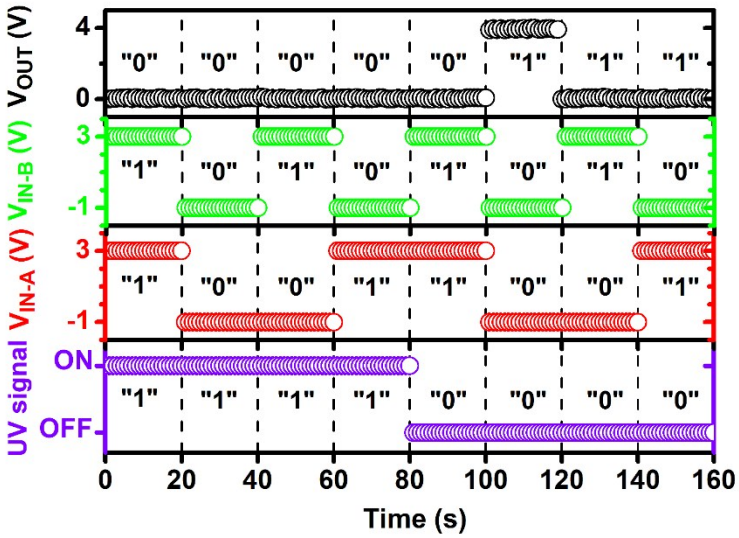

Figure S2. Photoresponse of CNT-TFT under IR (power = 2 Watt, $\lambda$ = 1200 nm) irradiation.




$$V_{OUT} = \overline{UV_{IN}} \bullet \overline{V_{IN\text{-}A}} + \overline{UV_{IN}} \bullet \overline{V_{IN\text{-}B}}$$

| $UV_{IN}$ | $V_{IN\text{-}A}$ | $V_{IN\text{-}B}$ | $V_{OUT}$ |
|---|---|---|---|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 0 |

Figure S3. Output electrical signal ($V_{OUT}$) and of the NAND gate ($V_{DD}$ = 4 V) under alternating UV signal ($UV_{IN}$). Inset: true table of logical operation performed by $UV_{IN}$ , $V_{IN\text{-}A}$, and $V_{IN\text{-}B}$.




$$V_{OUT} = \overline{UV_{IN} + V_{IN\text{-}A} + V_{IN\text{-}B}}$$

| $UV_{IN}$ | $V_{IN\text{-}A}$ | $V_{IN\text{-}B}$ | $V_{OUT}$ |
|---|---|---|---|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 0 |

Figure S4. Output electrical signal ($V_{OUT}$) and of the NOR gate ($V_{DD}$ = 4 V) under alternating UV signal ($UV_{IN}$). Inset: true table of logical operation performed by $UV_{IN}$ , $V_{IN\text{-}A}$, and $V_{IN\text{-}B}$.