Supporting Information

Fully Transparent Conformal Organic Thin-Film Transistor Array and Its Application as LED Front Driving

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S1. Absorption and transmitance spectra of C_8-BTBT film.

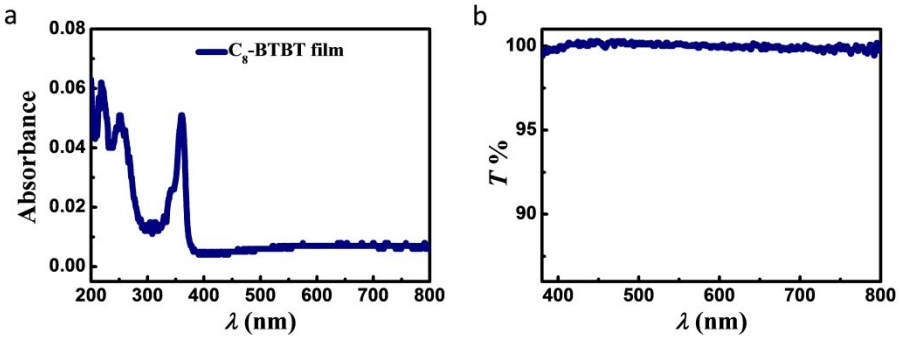


Fig. S1 (a) Absorption and (b) transmittance spectrum of the C_8-BTBT film on quartz substrates.

Once the absorption edges were extracted in Fig. S1a, the optical bandgap could be calculated from the relationship in the following equation:

$$\lambda = \frac{hc}{E_g}$$

λ: Wavelength of absorption edge

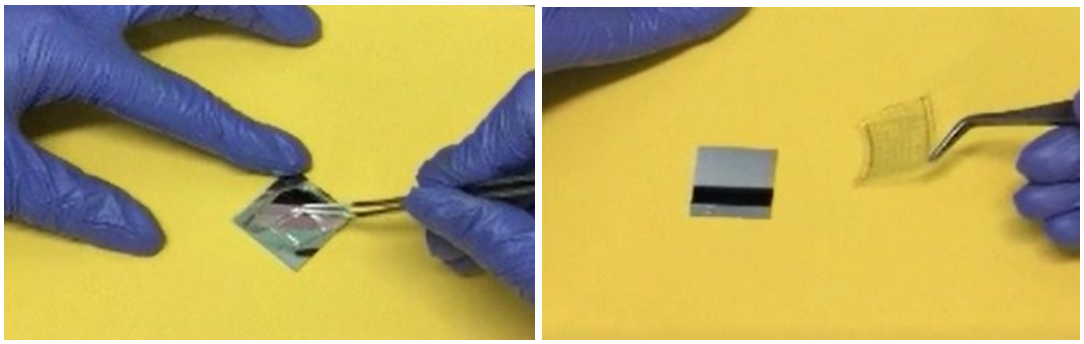
h: Planck's constant

c: Speed of light

E_g: Optical bandgap

Organic film	Absorption edge (nm)	Optical bandgap (eV)
C_8-BTBT	376	3.3

S2. Movie file of the peeling process of the device array from the OTS modified Si substrate with 3M tape.



S3. Elimination of the effects from mechanical damage in the transfer process.

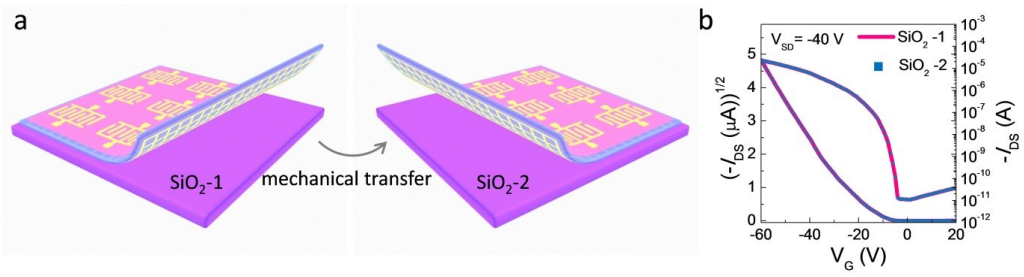


Fig. S3 (a) Schematic view of the transfer process for the OTFT between two SiO_2 substrates. (b) Transfer characteristics of the OTFT on SiO_2-1 and SiO_2-2.

S4. Formula for mobility calculation.

The field-effect mobility was calculated from the measured transfer curves (Fig. 3b) in the saturation regime ($V_{DS} \geqslant V_G$), using the equation

$$\mu = \frac{2L}{WC_i}\left(\frac{\partial\sqrt{I_{DS}}}{\partial V_G}\right)^2$$

where W is the channel width, L is the channel length. For the adopted interdigital electrode, the channel width is 3500 μm, and the length is 100 μm . C_i denotes the capacitance per unit area of the gate dielectric layer, in this case 7.5 nF/cm^2 for the 400 nm C-PVA.

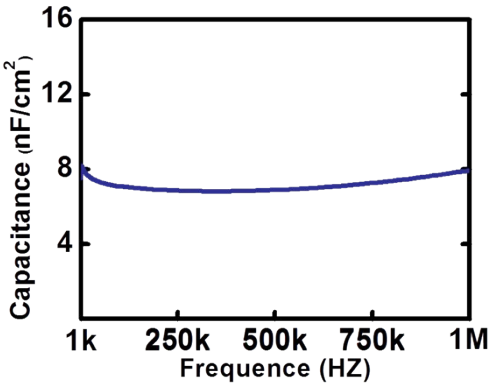


Fig. S4 Capacitance–frequency plots of the 400 nm C-PVA.

S5. Bending cycle test on OTFTs.

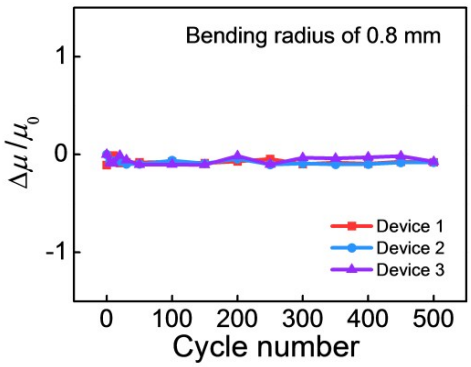


Fig. S5 Averaged normalized change in mobility $\Delta\mu/\mu_0$ for OTFTs as a function of bending cycles under tension. The bending curvature was 0.8 mm. $\Delta\mu = \mu - \mu_0$, where μ and μ_0 represent the hole mobility of the same transistor measured after and before bending.

S6. Thermal stability of the transparent conformal OTFT.

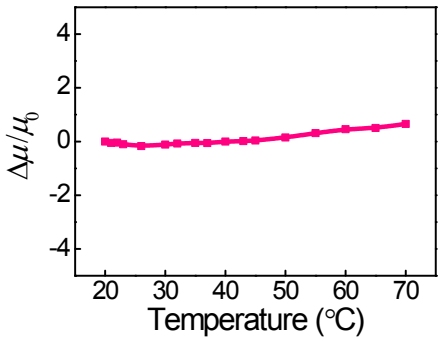
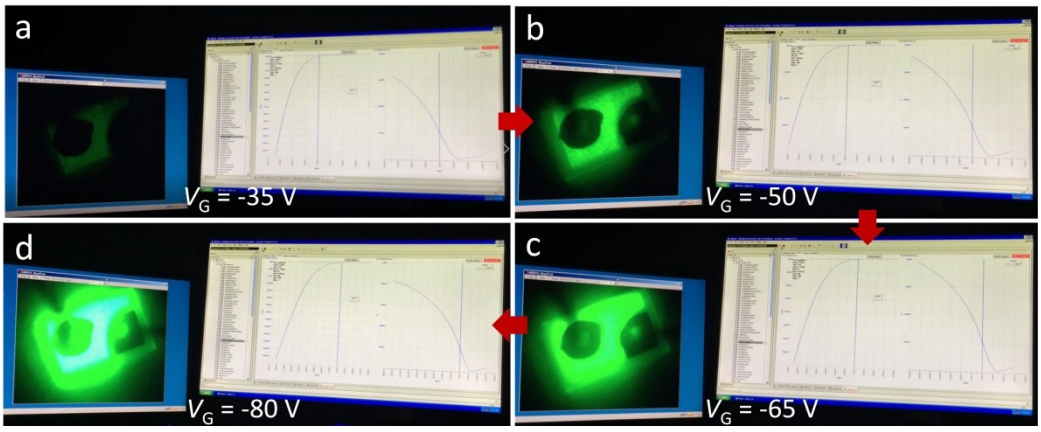


Fig. S6 Averaged normalized change in mobility $\Delta\mu/\mu_0$ for OTFT as a function of temperature. $\Delta\mu = \mu - \mu_0$, where μ and μ_0 represent the hole mobility of the same transistor measured at certain temperature and room temperature (20 ℃).

S7. Movie file of the luminance of LED controlled by the OTFT placed upon the LED at V_{DD} = -40 V.



S8. Configuration of a common cathode seven-segment display (SSD).

For a common cathode configuration, all LED cathodes are connected. And each segment is labeled (a) thru (g). For example, when the Segments a, b, d, e, and g were on, c and f were off, number "2" could be displayed. The segments could be controlled by our transistor array, and different numbers were displayed.

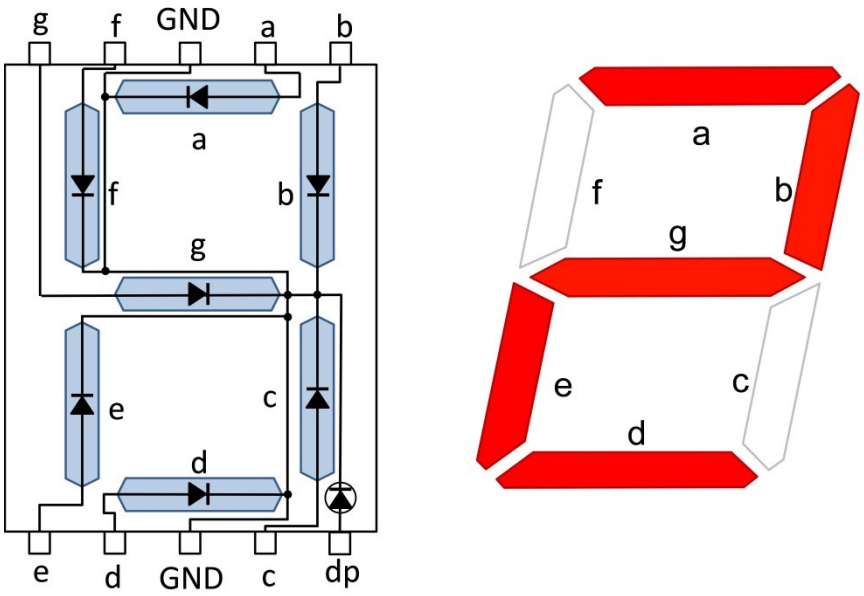


Fig. S8 Configuration of the common cathode seven-segment display (SSD).