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Supporting Information

Field-induced Hole Generation Layer for High Performance Alternating Current Polymer Electroluminescence and its Application to Extremely Flexible Devices

Ju Han Lee, Sung Hwan Cho, Richard Hahnkee Kim, Beomjin Jeong, Sun Kak Hwang, Ihn Hwang, Kang Lib Kim, Eui Hyuk Kim, Tae-Woo Lee and Cheolmin Park*

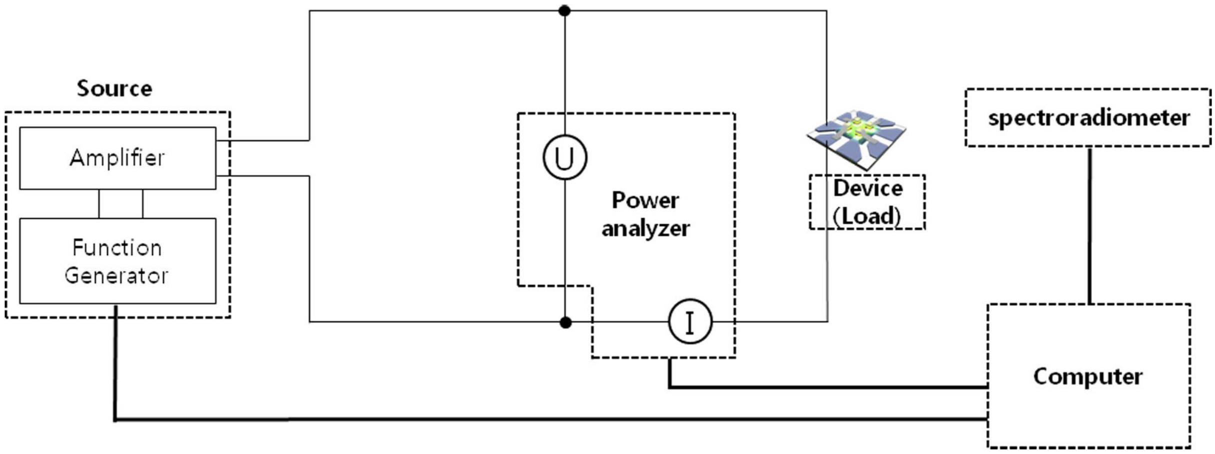

Figure S1. A schematic diagram of electric characteristics measurement system.

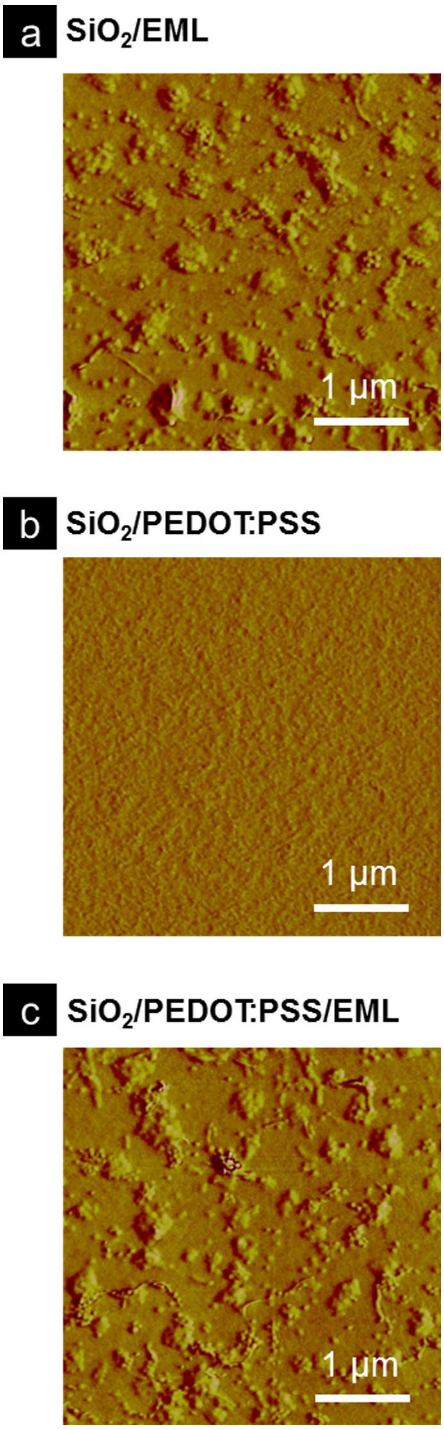

Figure S2. Atomic force microscopy (AFM) images of (a) an EML on SiO_2, (b) a PEDOT:PSS on SiO_2, (c) an EML on PEDOT:PSS/SiO_2.

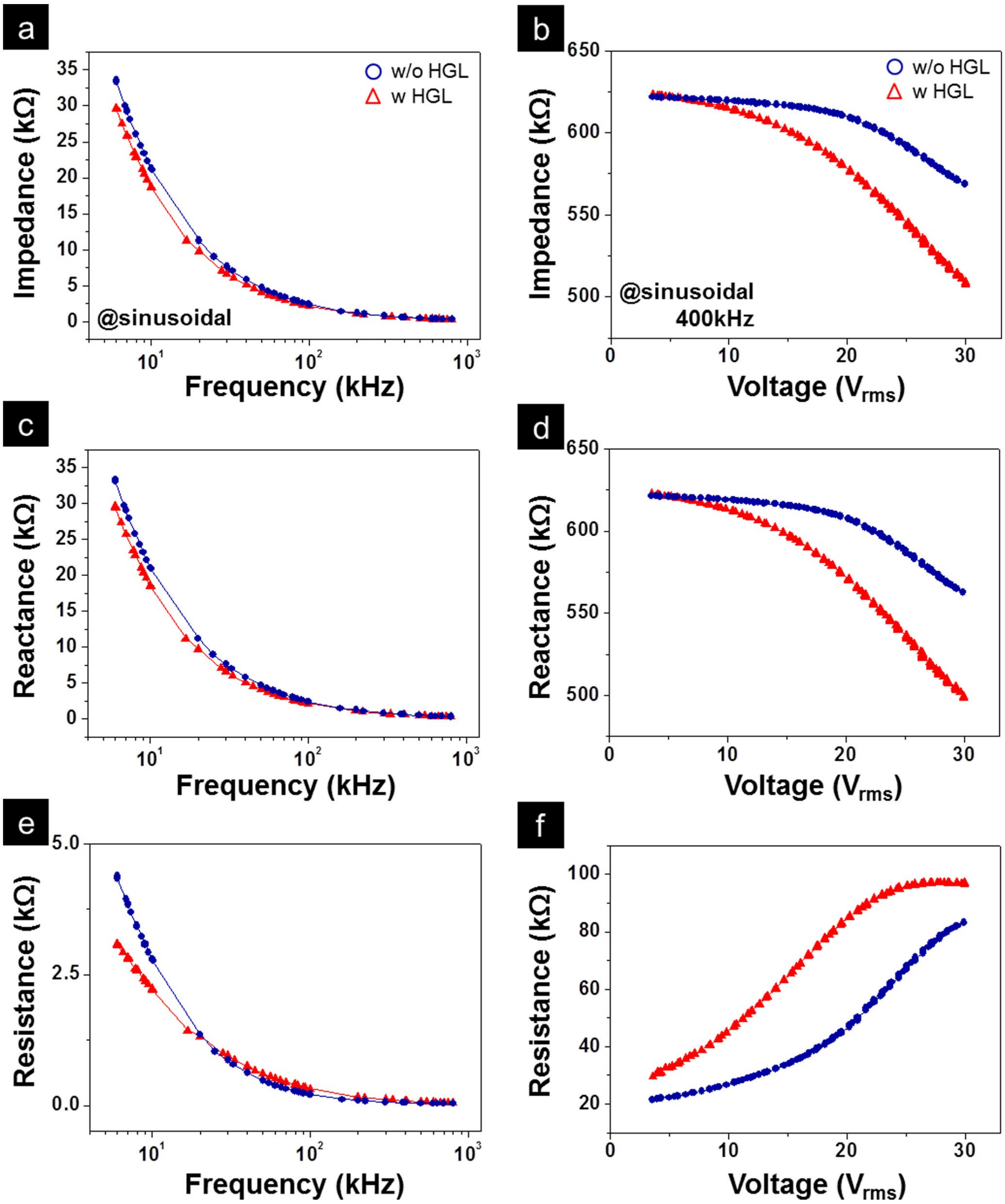

Figure S3. The electric characteristics of AC-PEL devices with and without PEDOT:PSS HGL including impedance, reactance and resistance. (a), (c), (e) Plots as a function of frequency. (b), (d), (f) Plots as a function of voltage at 400 kHz.

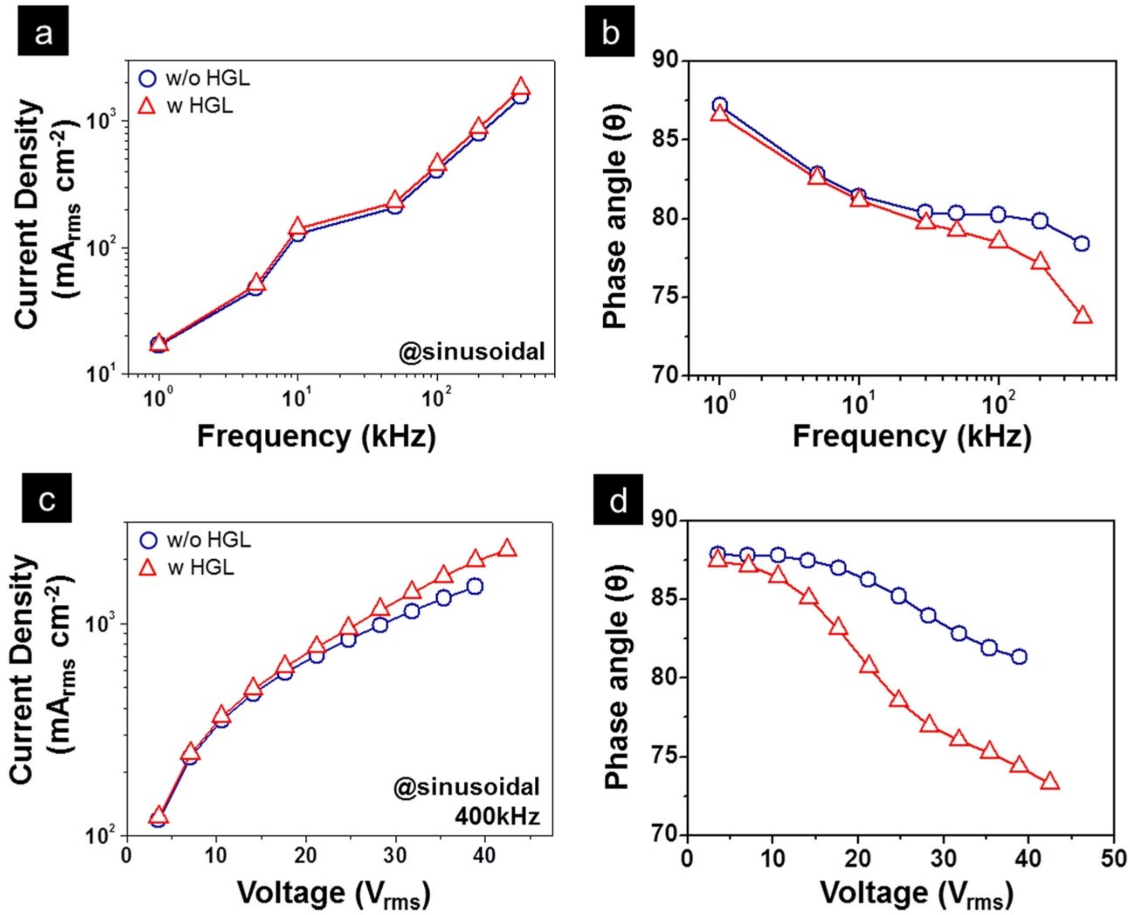

Figure S4. The characteristics of AC-PEL devices with and without PEDOT:PSS HGL. (a) AC current density and (b) phase angle as a function of frequency at a bias voltage of 35 V_{rms}. (c) AC current density and (d) phase angle as a function of voltage at 400 kHz.

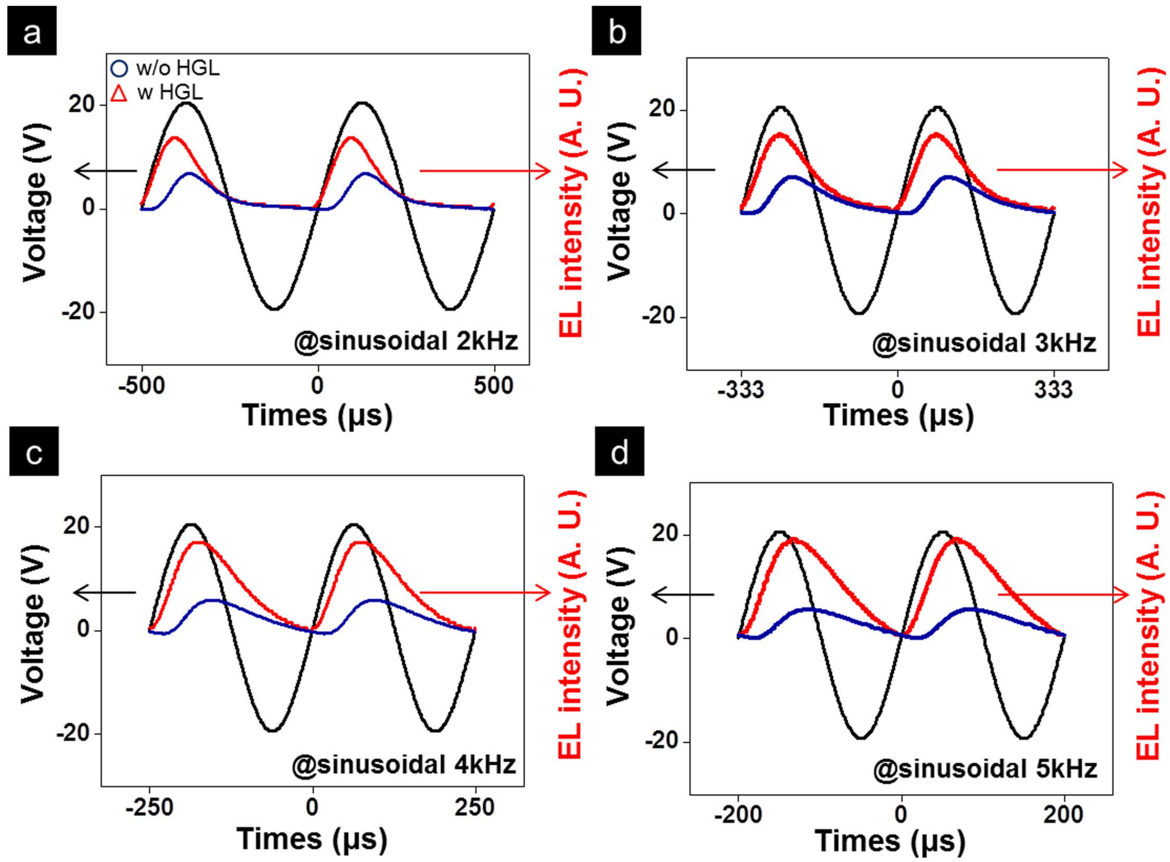

Figure S5. The time-resolved EL signals of AC-PEL devices with and without PEDOT:PSS HGL with the voltage amplitude of ±20 V along sinusoidal frequency.

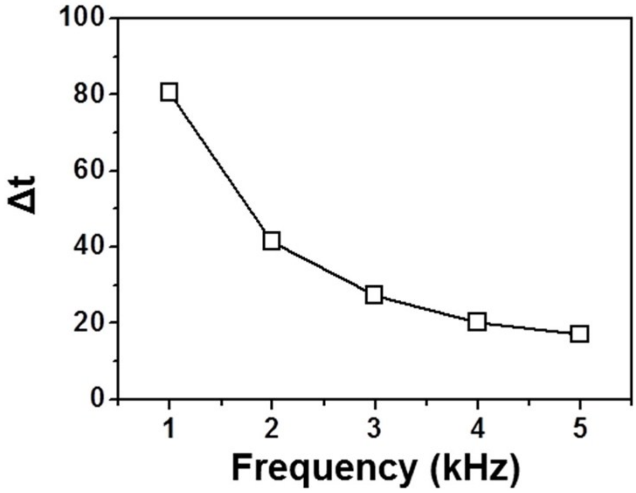

Figure S6. A plot of Δt as a function of applied frequency. Δt was determined by the time difference between two devices at their maximum EL.

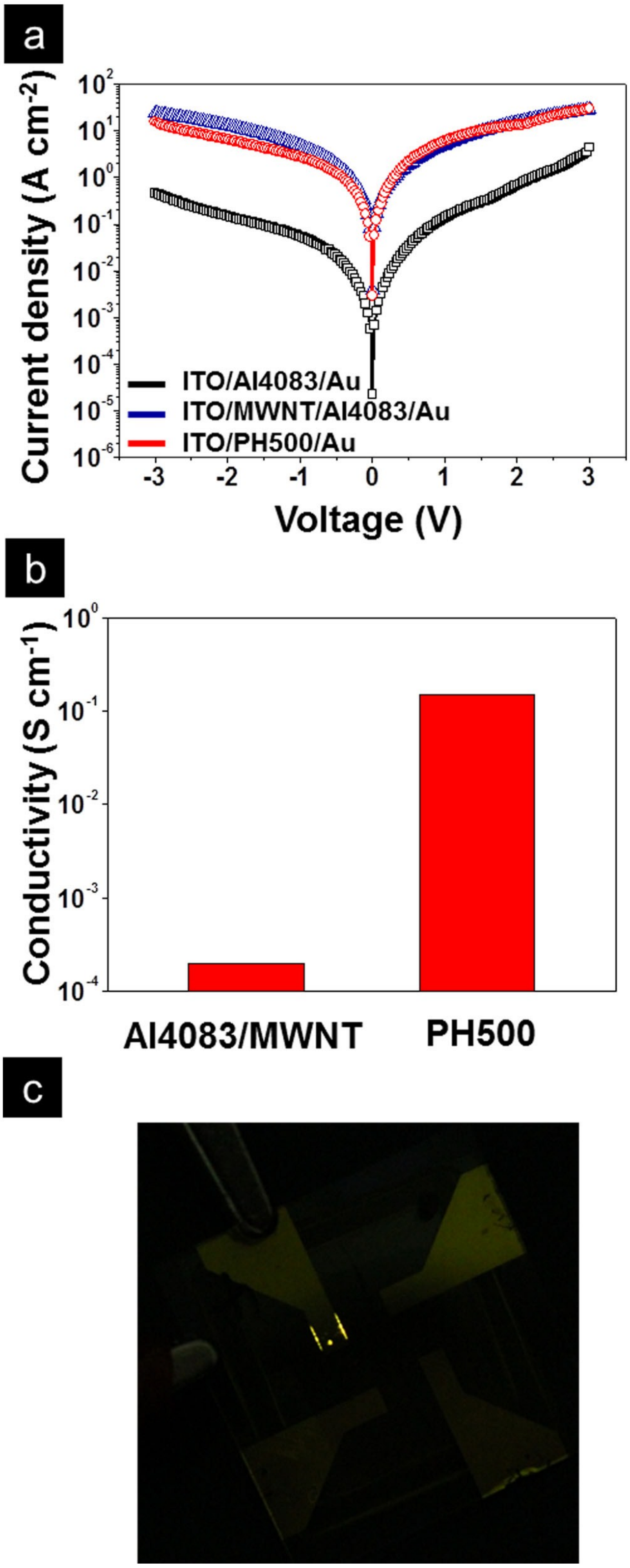

Figure S7. (a) I-V characteristics of a PEDOT:PSS (AI 4083), a doped PEDOT:PSS (AI 4083) and PH500. (b) Typical conductivity of samples by 4-ponit probe measurements. (c) A photograph of an AC-PEL with PH500.

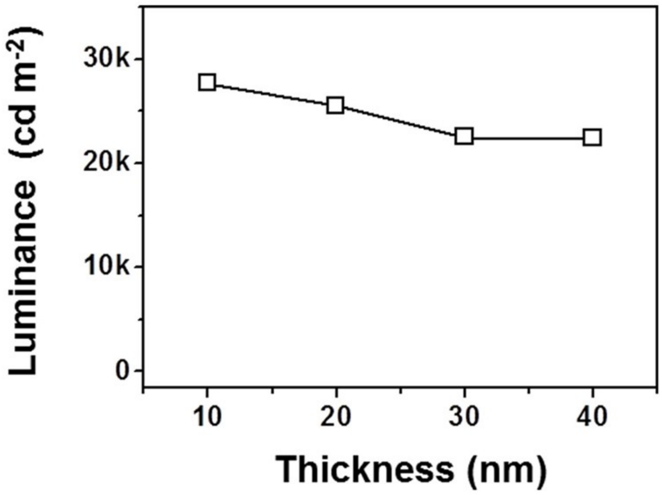

Figure S8. Luminance intensities of AC-PEL devices with PEDOT:PSS HGL on PEDOT:PSS thickness.

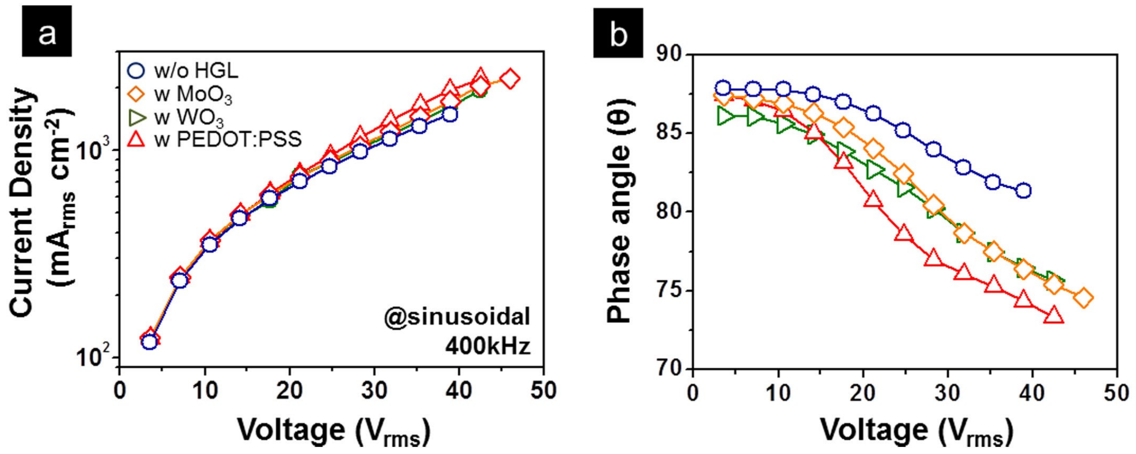

Figure S9. The characteristics of AC-PEL devices with various HGLs such as PEDOT:PSS, MoO_3 and WO_3. (a) AC current density and (b) phase angle as a function of applied voltage at 400 kHz.

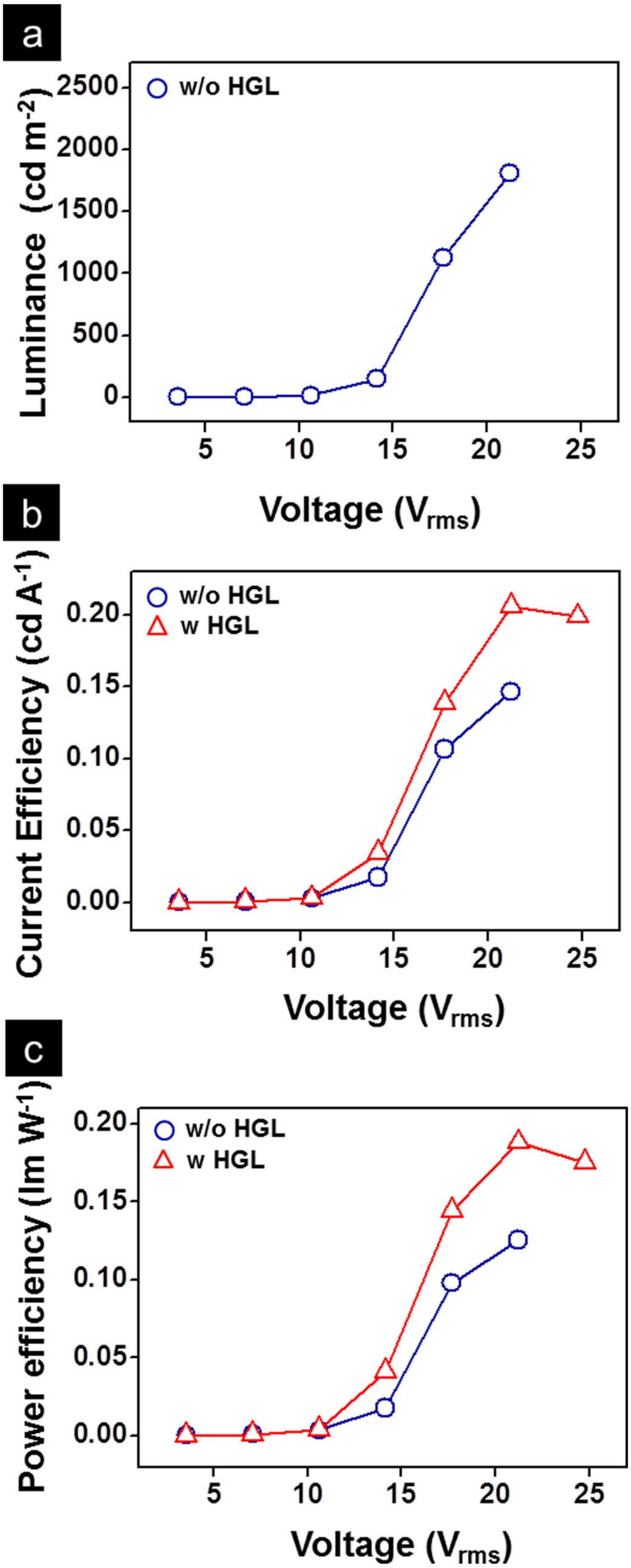

Figure S10. (a) Luminance-voltage behavior of flexible AC-PEL devices without a PEDOT:PSS HGL. (b) Current and (c) power efficiency of flexible AC-PEL devices with and without PEDOT:PSS.