Supporting Information

Enhanced Light Harvesting in Flexible Polymer Solar Cells: Synergistic Stimulation of Plasmonic Meta-Mirror and Transparent Silver Mesowire Electrode

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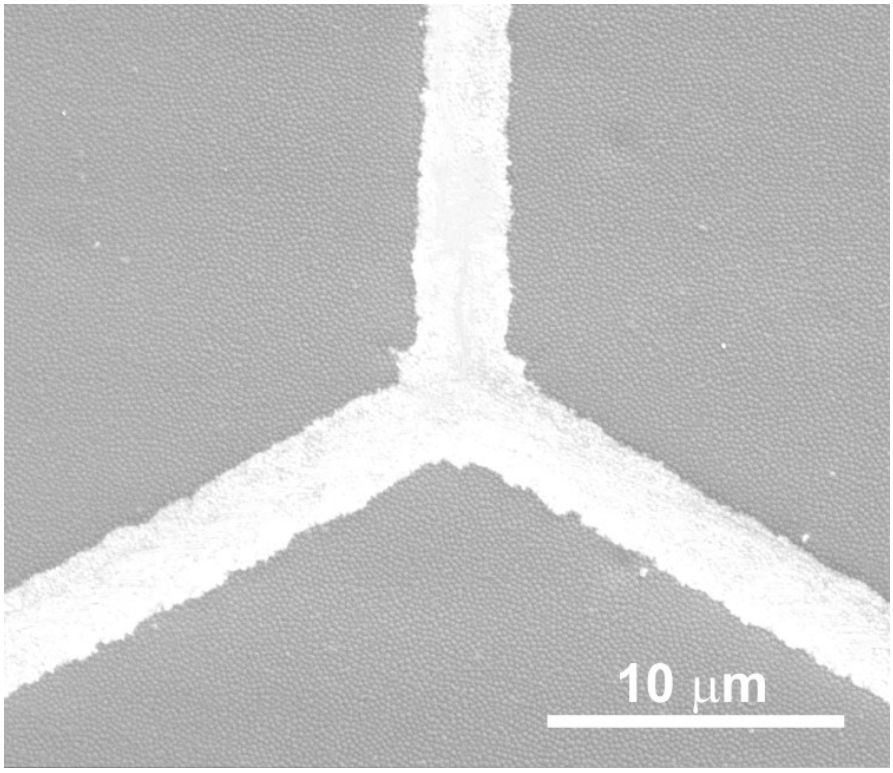

Figure S1. SEM image of the nanostructured photoactive layer fabricated onto Ag mesowire grid substrate.

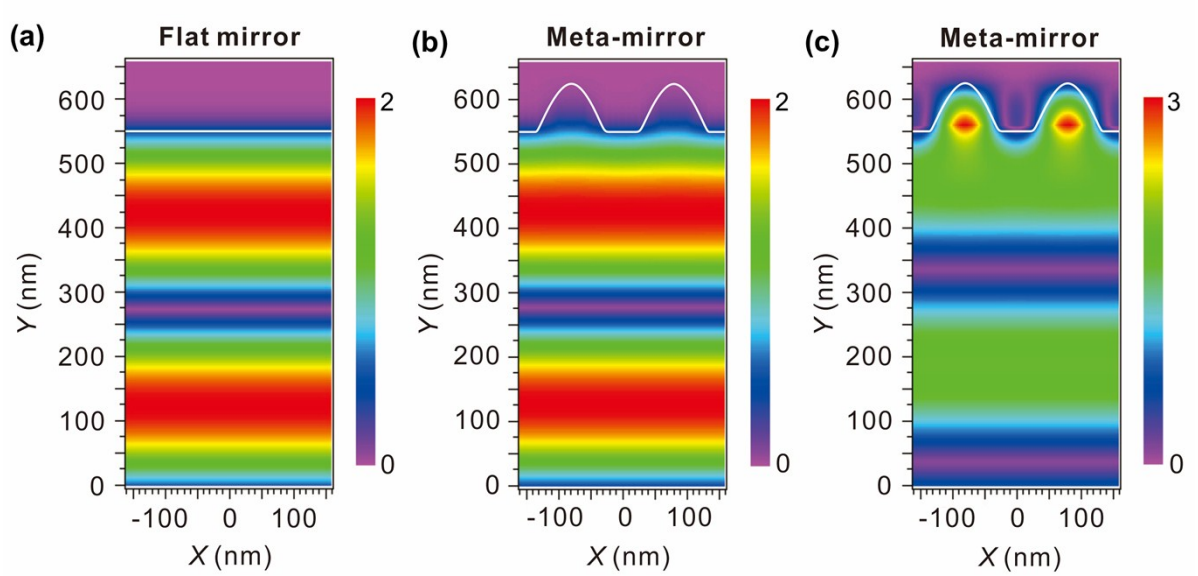

Figure S2. Optical properties of a meta-mirror. Simulated electric field amplitude distributions for 600 nm-wavelength light reflecting from a) flat aluminum mirror and patterned aluminum metal-mirror under TE (b) and TM (c) illumination. TM illumination shows the maximum electric field intensity at the top of the grooves and manifests the magnetic mirror behavior.

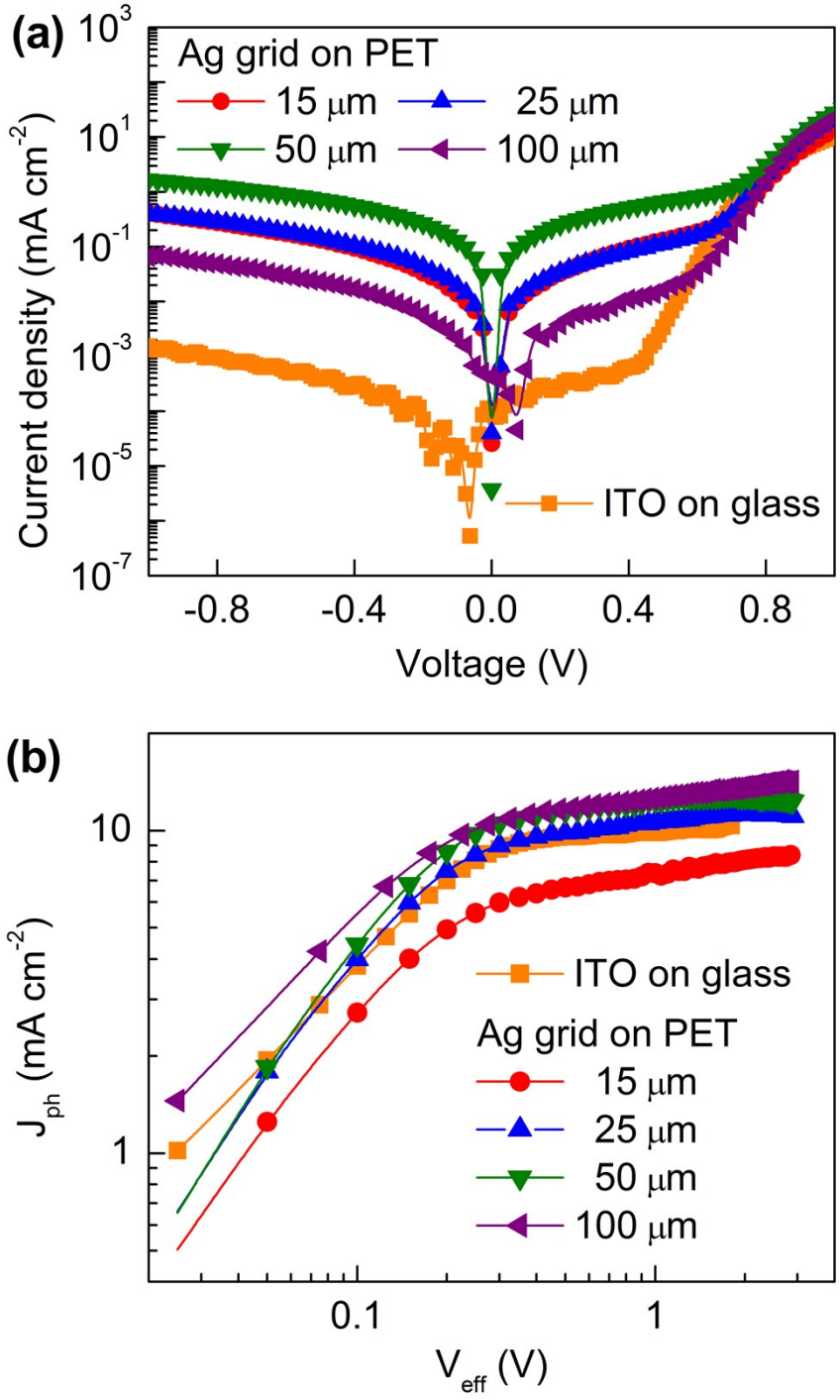

Figure S3. The dark current density-voltage characteristics (a) and the photocurrent density (J_{ph}) as a function of the effective voltage (V_{eff}) (b) of flexible polymer solar cells with a flat architecture on transparent Ag mesowire grid electrode.

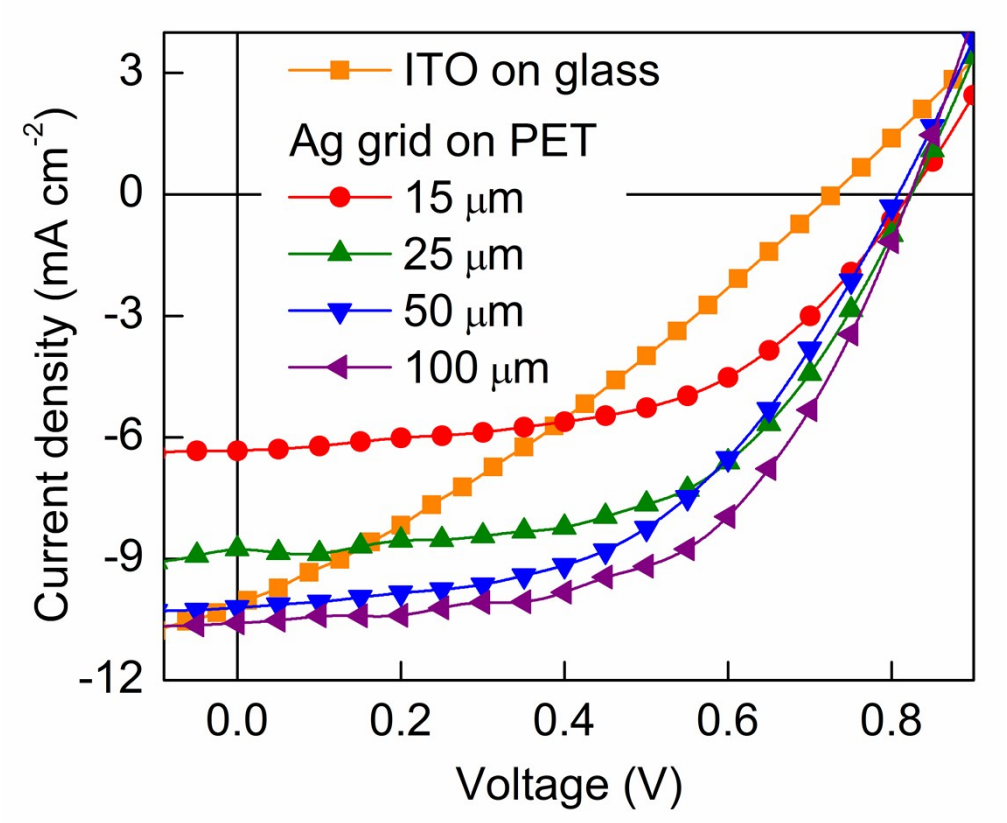

Figure S4. Current density versus voltage characteristics of flexible polymer solar cells with a large active area (1.44 cm^2) on transparent Ag mesowire grid electrode.

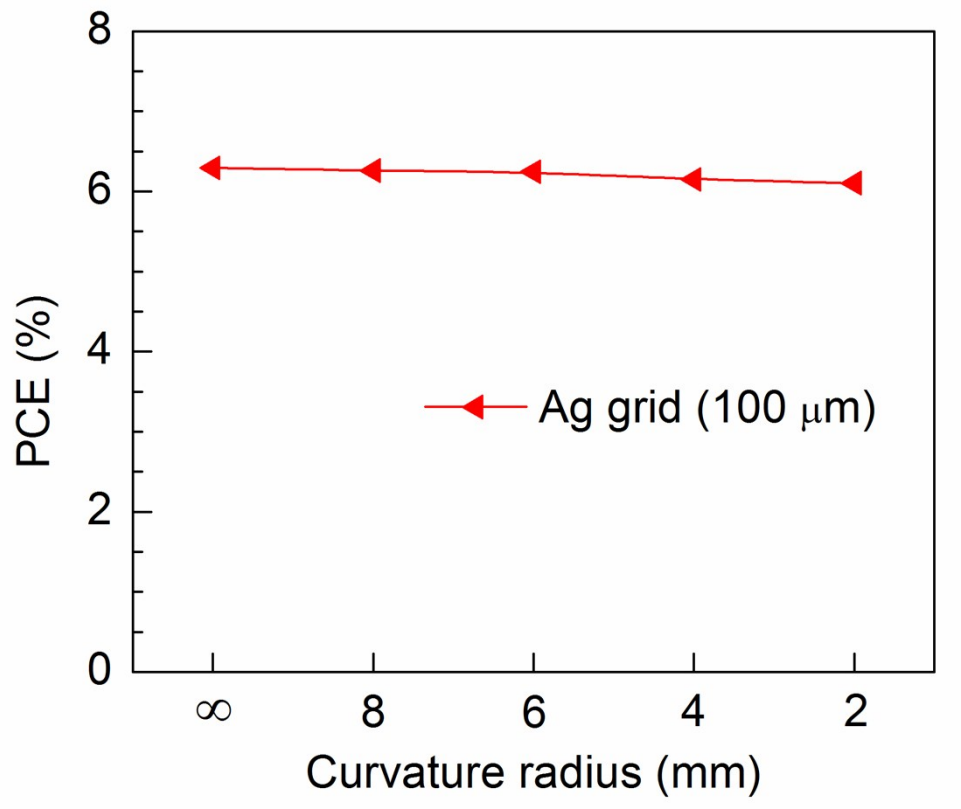

Figure S5. PCEs measured after bending flexible PSCs based on the Ag mesowire grid electrode within several radius of ∞, 8, 6, 4 and 2 mm.

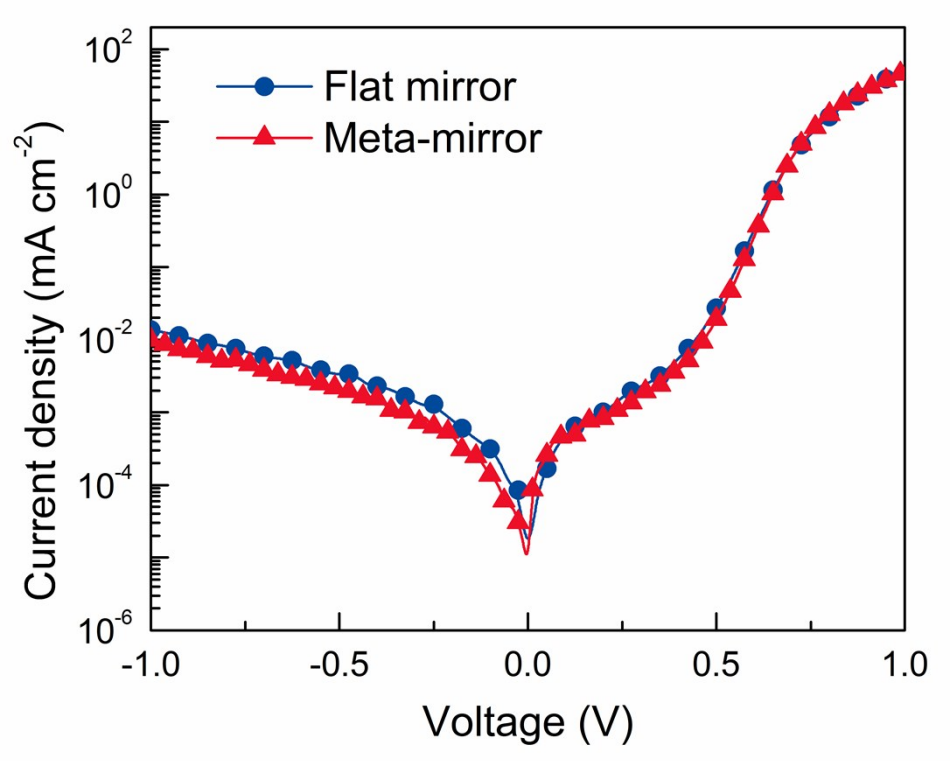

Figure S6. The dark current density-voltage characteristics of flexible polymer solar cells with flat mirror and meta-mirror, respectively.

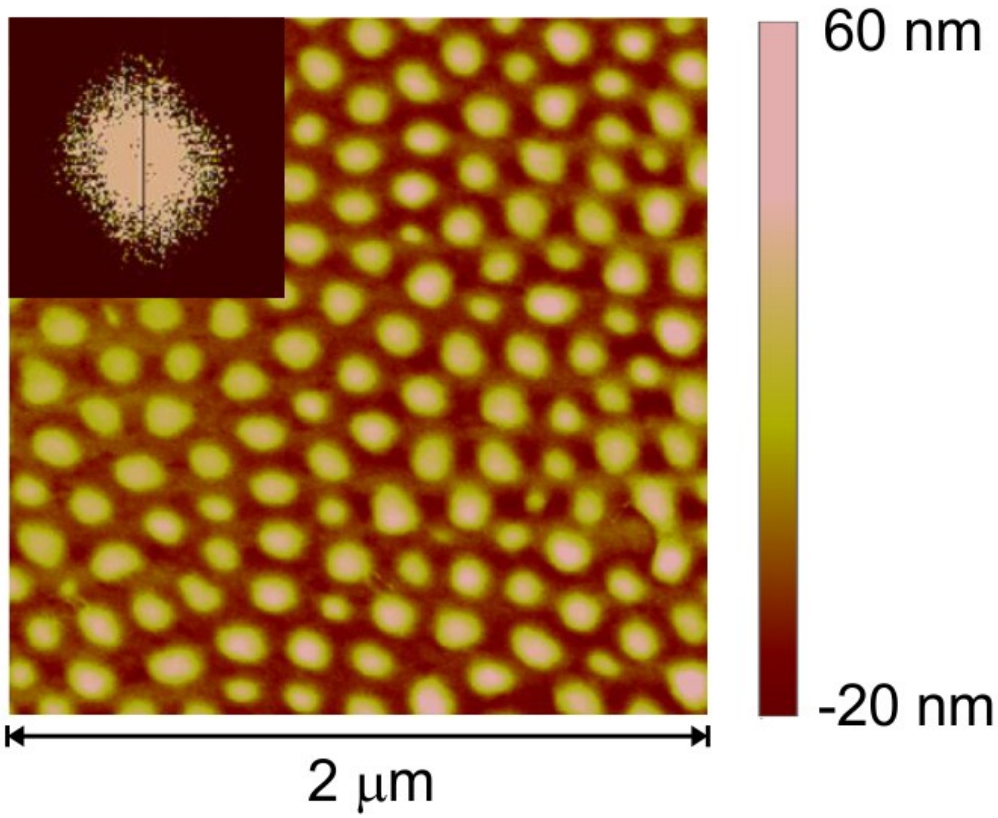

Figure S7. AFM image and fast Fourier transform (FFT) pattern of subwavelength features arranged in quasi-random pattern. Fourier energy concentrated into a close-to-circular region implies the capacities of broadband coupling and quasi-Lambertian scattering.

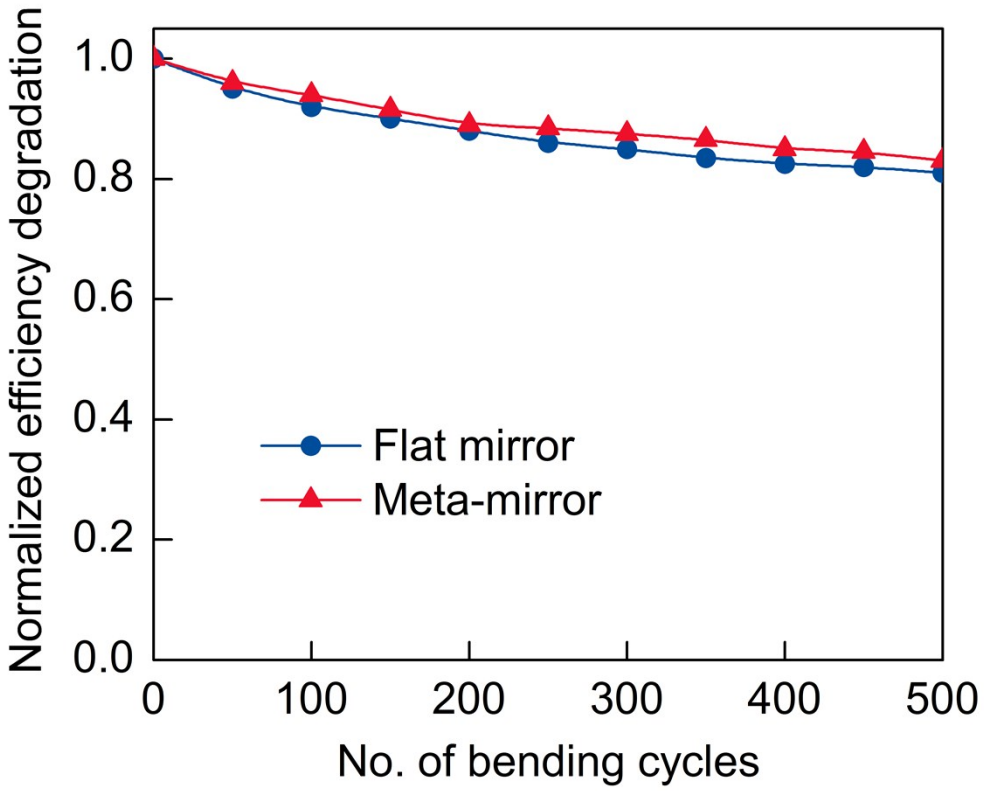

Figure S8. Performance stability during the bending tests. The evolution of normalized power conversion efficiency of flexible polymer solar cells as a function of the bending cycles in the same ambient conditions by repeatedly bending the substrate to a radius of 5 mm.