Electronic Supplementary Information

Highly conductive PEDOT:PSS film made with ethylene-glycol addition and heated-stir treatment for enhanced photovoltaic performances

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S1 Investigations of spin rate and anneal temperature on the film conductivity

Table S1 Examinations of various spin rates on the both film conductivity and FoM value. The results indicated that the optimal spin rate for the coating of treated PEDOT:PSS was 1000 rpm.

Coating condition (rpm)	Thickness (nm)	Conductivity (S/cm)	T(λ) (%)	FoM
800	348.7	727.9	82.3%	46.8
1000	300.1	1228.4	84.4%	78.5
1200	284.2	801.3	85.2%	51.5
1400	261.8	790.3	86.1%	50.2
1600	239.5	574.7	86.6%	34.8
2000	192.7	563.1	87.8%	30.4
3000	166.8	547.4	90.1%	32.2

Table S2 Examinations of various anneal temperatures on the both film conductivity and FoM value. The results indicated that the optimal window of anneal temperature was in the range of 140^0C to 180^0C.

Annealing condition (^{0}C)	Thickness (nm)	Conductivity (S/cm)	T(λ) (%)	FoM
120	315.6	936.5	84.2%	62.0
140	304.6	1146.7	84.6%	75.5
160	300.1	1228.4	84.4%	78.5
180	298.9	1126.2	84.8%	73.8
200	303.5	903.8	84.7%	59.7

S2 Photographs for validating the optical transparency of treated films

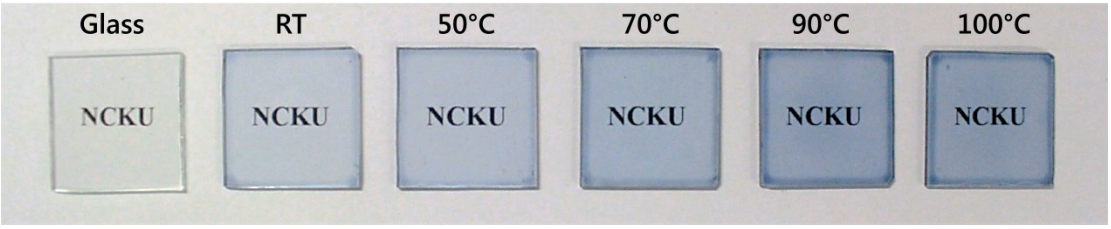

Figure S1. Photographs (from left to tight) of bare glass and treated PEDOT:PSS films with stirring temperatures of 25^0C (room temperature, RT), 50^0C, 70^0C, 90^0C and 100^0C, respectively.

S3 Long-term efficiency stability of hybrid solar cells

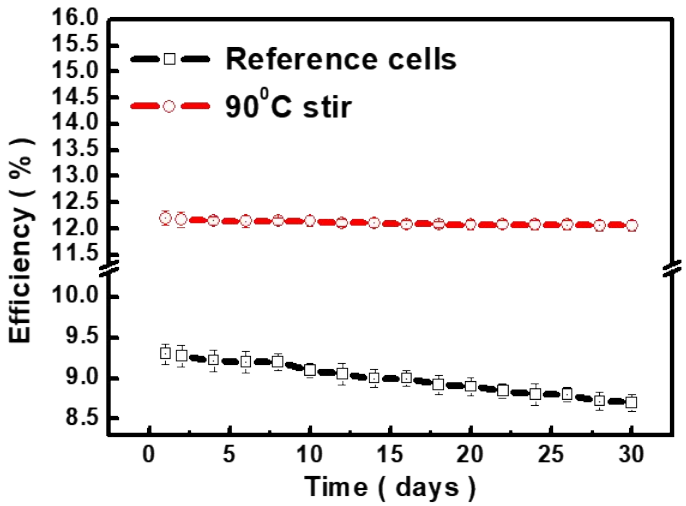

Figure S2. Examinations on the long-term efficiency stability of hybrid solar cells.

S4 Spatial investigations of photon-to-charge conversion

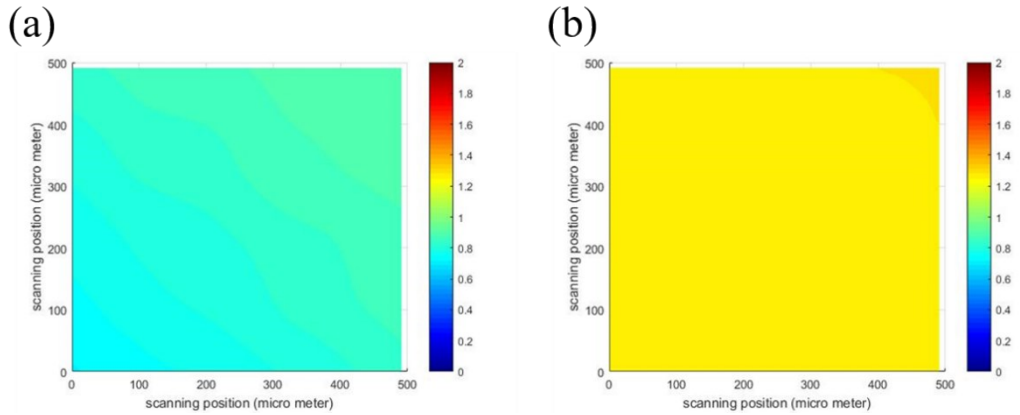

Figure S3. Comparisons of photon-to-charge conversion with respect to the spatial position of hybrid solar cells: (a) 25^{0}C-stir treatment and (b) 90^{0}C-stir treatment .