Electronic supplementary information

Low Defect, Large Area and High Stable All-inorganic Lead Halide Perovskite $CsPbBr_3$ Thin Film with Micron-grains via Heat-spraying Process for Self-driven Photodetector

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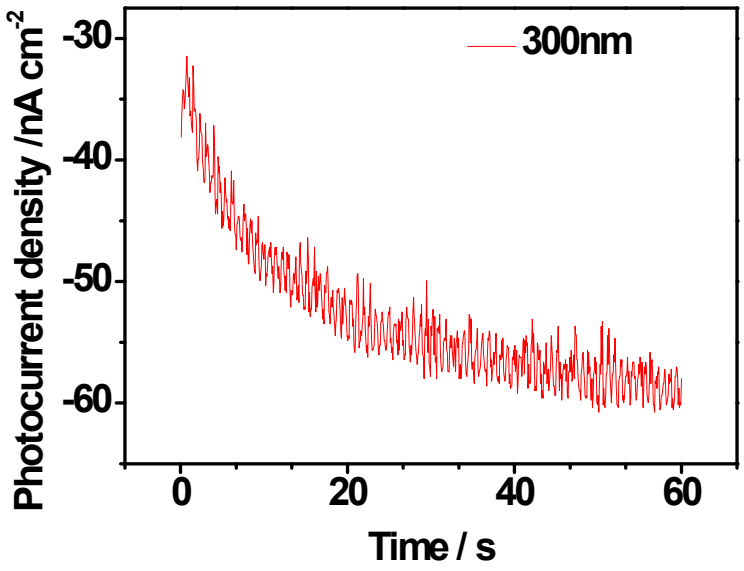
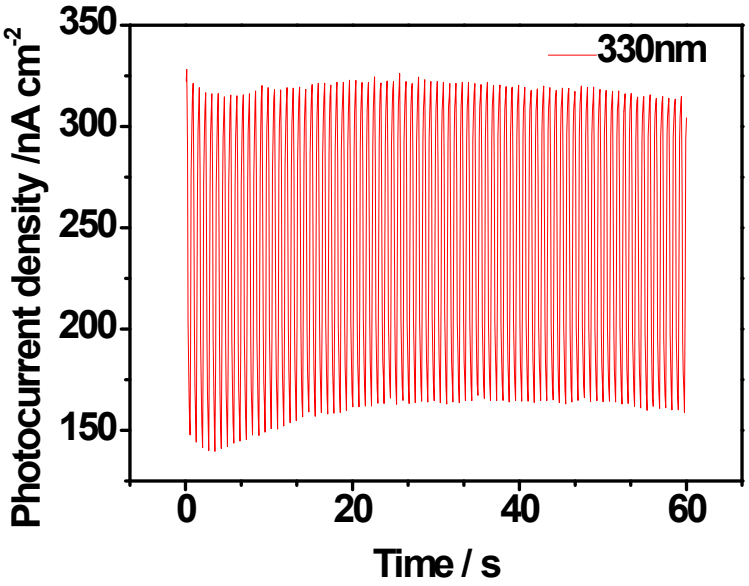
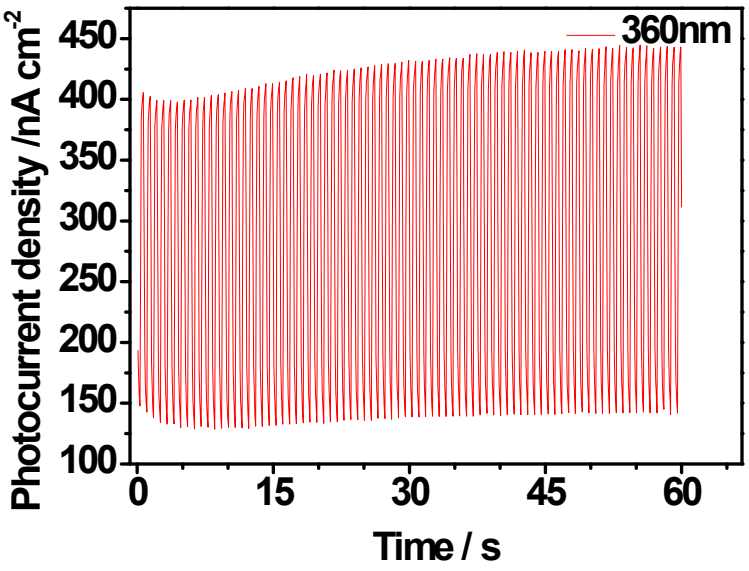
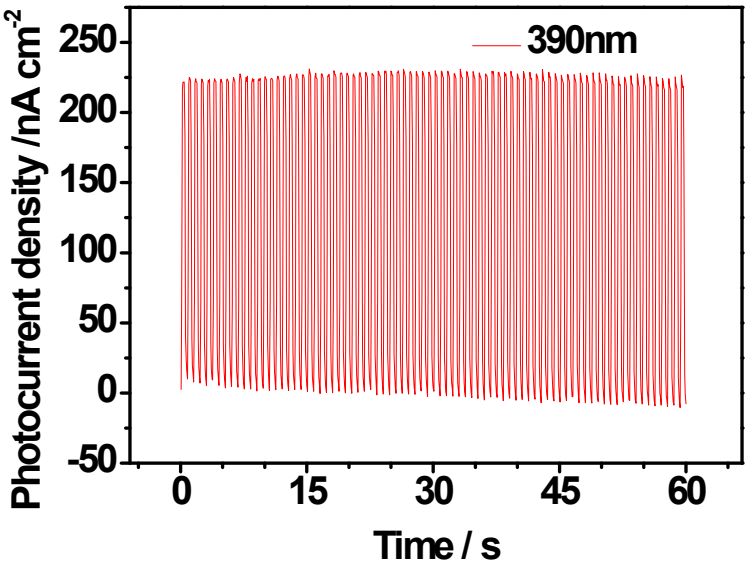
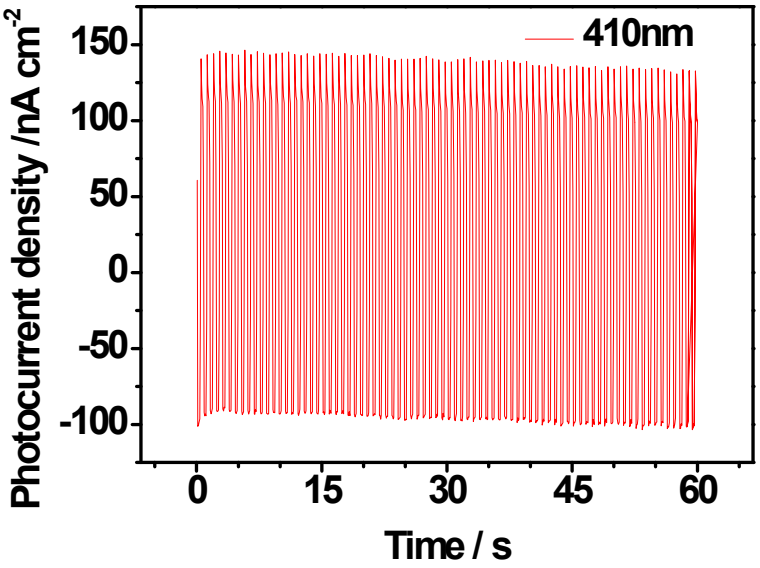
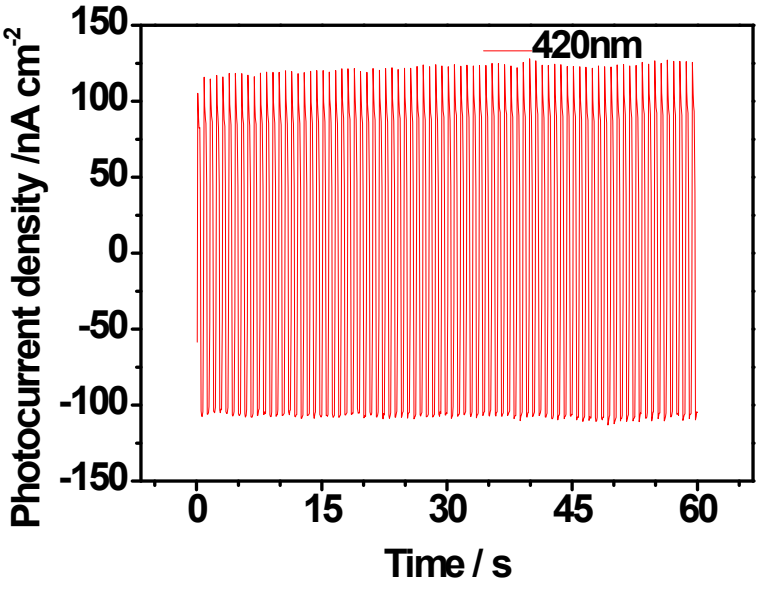

300nm
Photocurrent density /nA cm-2
-30
-40
-50
-60
0
20
40
60
Time / s

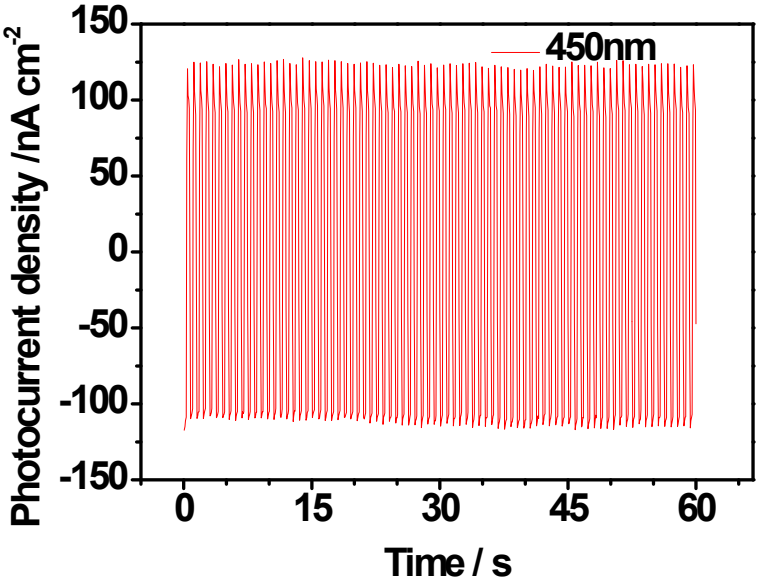

330nm
Photocurrent density /nA cm-2
350
300
250
200
150
0
20
40
60
Time / s

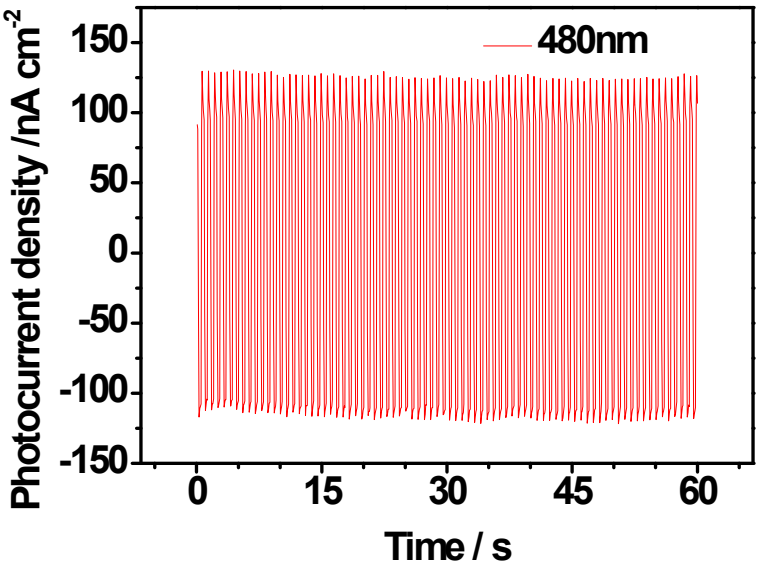

360nm
Photocurrent density /nA cm-2
450
400
350
300
250
200
150
100
0
15
30
45
60
Time / s

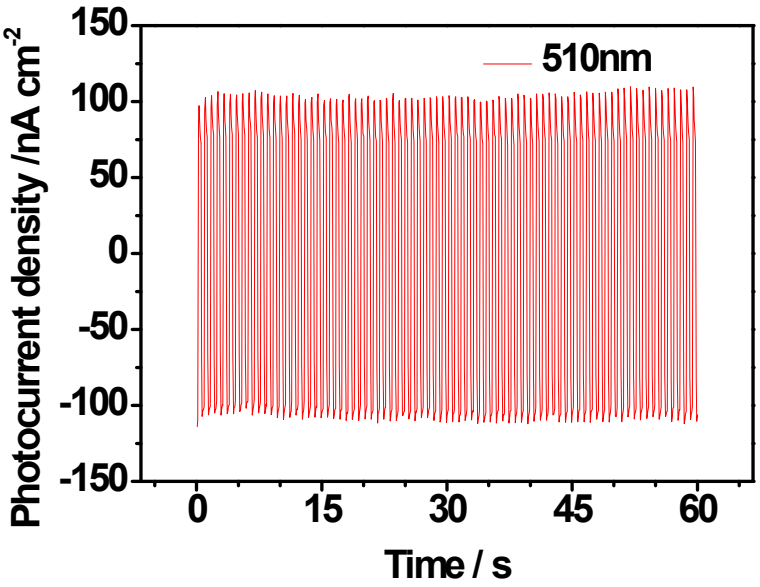

390nm
Photocurrent density /nA cm-2
250
200
150
100
50
0
-50
0
15
30
45
60
Time / s

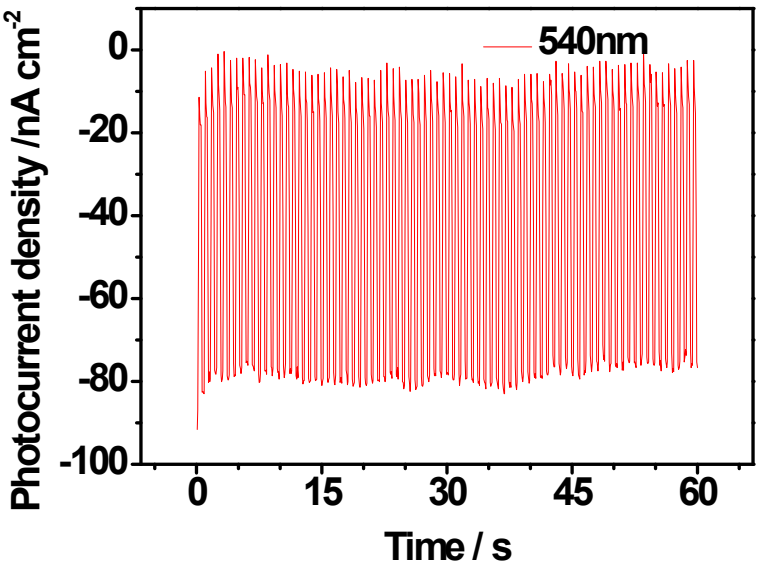

410nm
Photocurrent density /nA cm-2
150
100
50
0
-50
-100
0
15
30
45
60
Time / s


420nm
Photocurrent density /nA cm-2
150
100
50
0
-50
-100
-150
0
15
30
45
60
Time / s


450nm
Photocurrent density /nA cm-2
150
100
50
0
-50
-100
-150
0
15
30
45
60
Time / s


480nm
Photocurrent density /nA cm-2
150
100
50
0
-50
-100
-150
0
15
30
45
60
Time / s


510nm
Photocurrent density /nA cm-2
150
100
50
0
-50
-100
-150
0
15
30
45
60
Time / s


540nm
Photocurrent density /nA cm-2
0
-20
-40
-60
-80
-100
0
15
30
45
60
Time / s

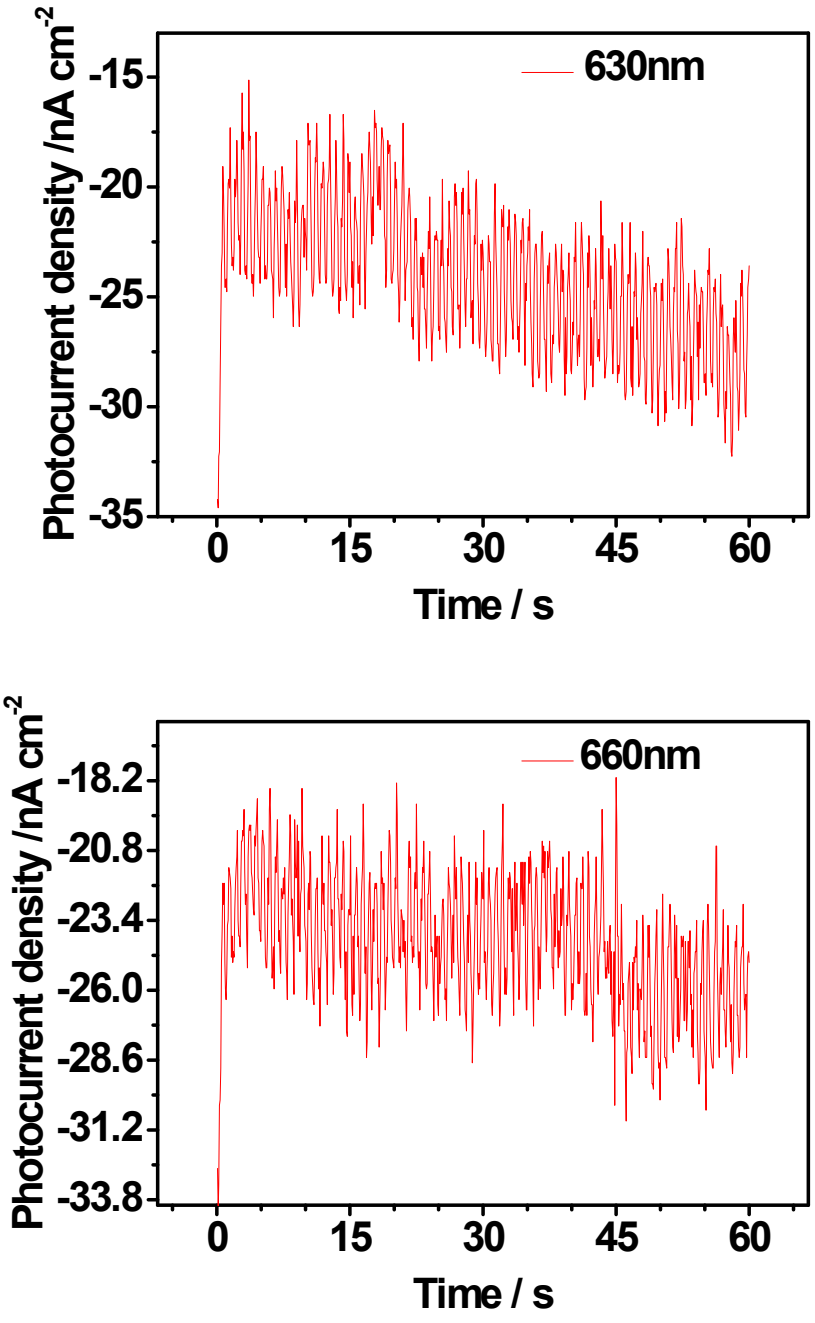


Figure S1 Photocurrent density-time characteristics of photodetector based on MG-$CsPbBr_3$-TF under 300, 330, 360, 390, 410, 420, 450, 480, 510, 540, 630 and 660 nm with 1.33 Hz

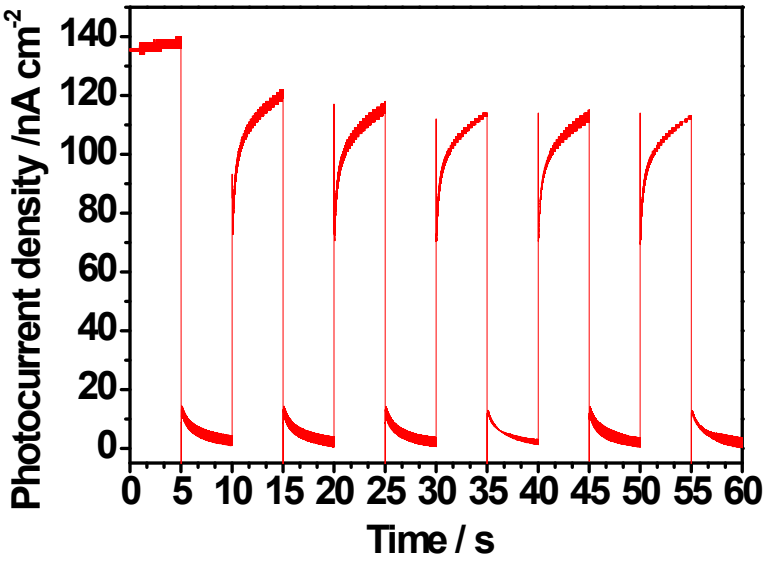


Figure S2 Photocurrent density-time characteristics of photodetector based on MG-$CsPbBr_3$-TF under AM1.5, 100 mW cm^{-2} simulated illumination (after placing the device in the air for 7 months).

Figure S3 Picture of $CsPbBr_3$ single crystals prepared by $CsPbBr_3$/HBr supernatant

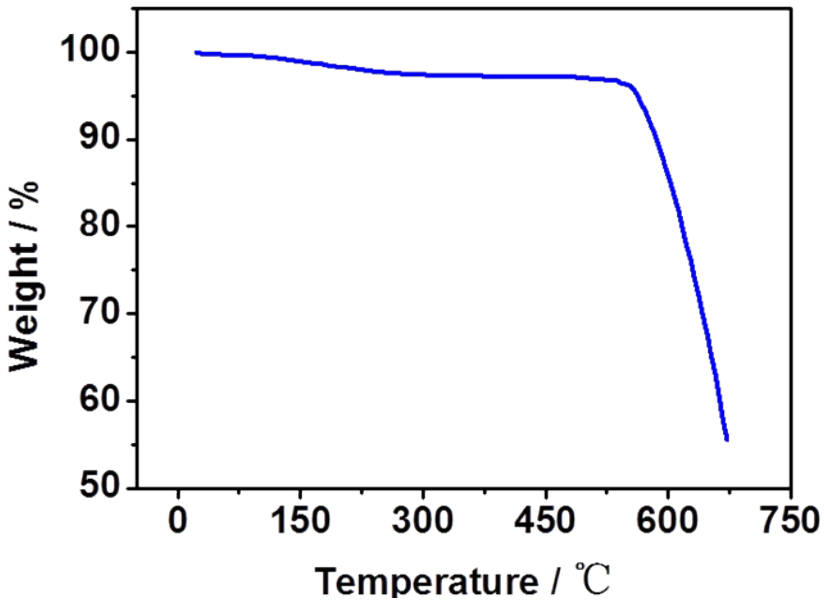


Figure S4 Thermogravimetric analysis of $CsPbBr_3$ single crystals

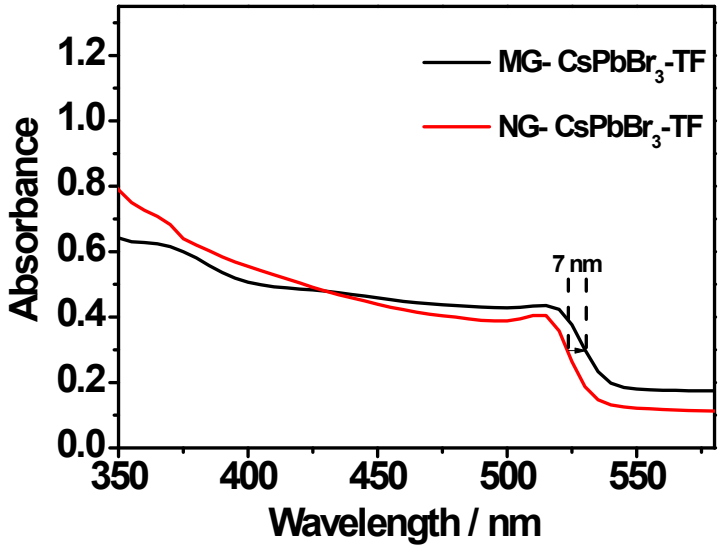


Figure S5 UV-Vis absorption spectra of MG-$CsPbBr_3$-TF thin film and NG-$CsPbBr_3$-TF thin film

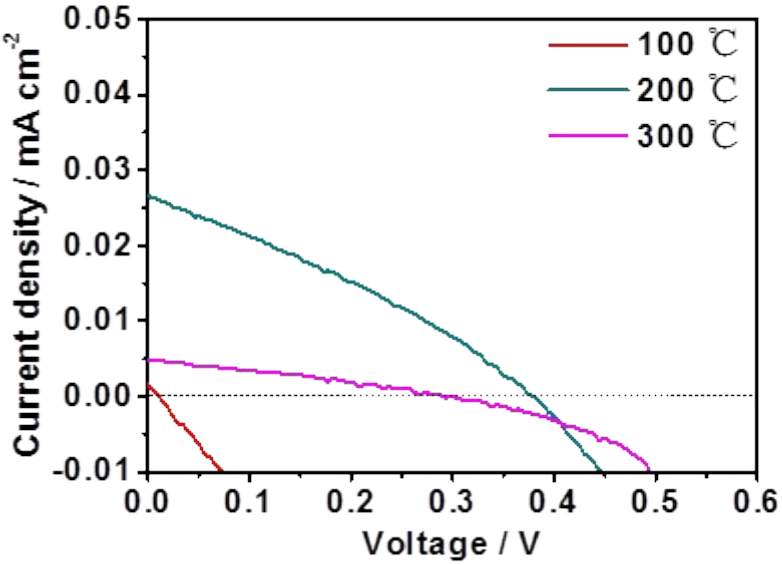


Figure S6 The photovoltaic-photocurrent performance was obtained under AM1.5, 100 mW cm^{-2} simulated illumination.

Table S1 The detailed photoelectric parameters obtained under AM1.5, 100 mW cm^{-2} simulated illumination.

	V_{oc}（mV）	J_{sc}(μA)	FF（%）	PCE（%）
100℃	8.88±2.15	0.0038 ±0.002	23.9±9.63	0.00
200℃	358±113.5	0.0778±0.00228	29.9±0.468	0.01
250℃	287±10.9	0.0174±0.00322	30.95±0.806	0.00