Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Paradigm Ink with Temporal-Controllable Processing-Window for Perovskite Module

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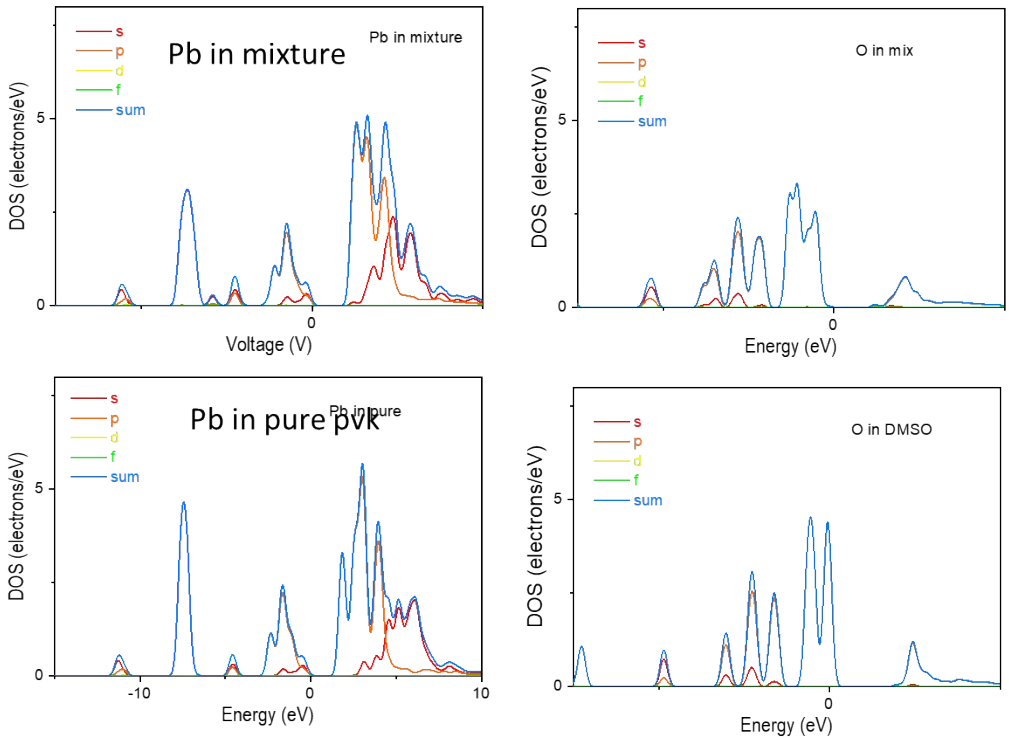

Fig. S1. The details of the density of state (DOS) of the Pb from the perovskite cluster and O from the DMSO.

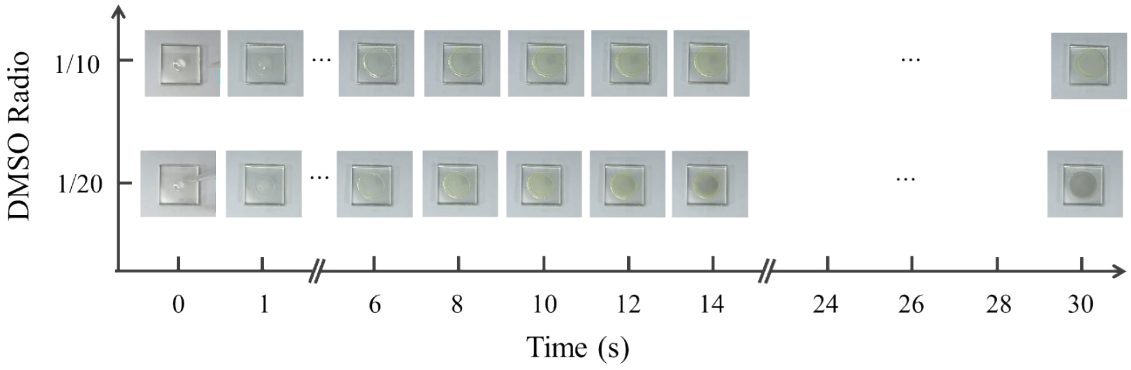

Fig. S2. Time evolution of perovskite droplet by drop casting the perovskite inks with DMSO ratio of 1/10 and 1/20 on FTO glass.

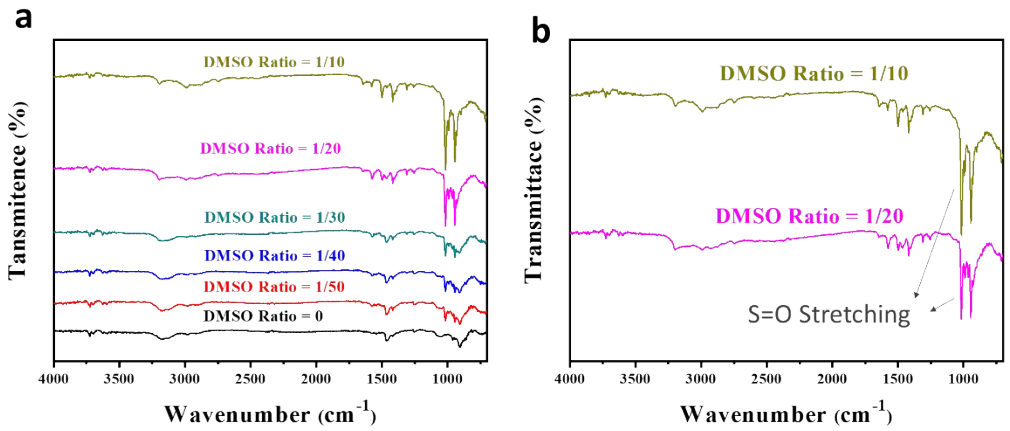

Fig. S3. (a) FTIR spectra of room temperature synthesized perovskite layers by inks of DMSO ratio of 0, 1/50, 1/40, 1/30, 1/20, and 1/10. (b) The magnified FTIR for DMSO ratio of 1/20 and 1/10.

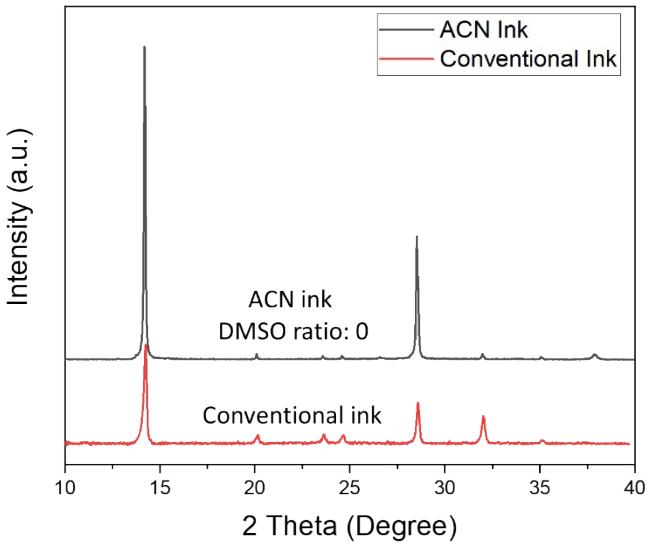

Fig. S4. The XRD patterns of perovskite layers fabricated by ACN ink and conventional ink.

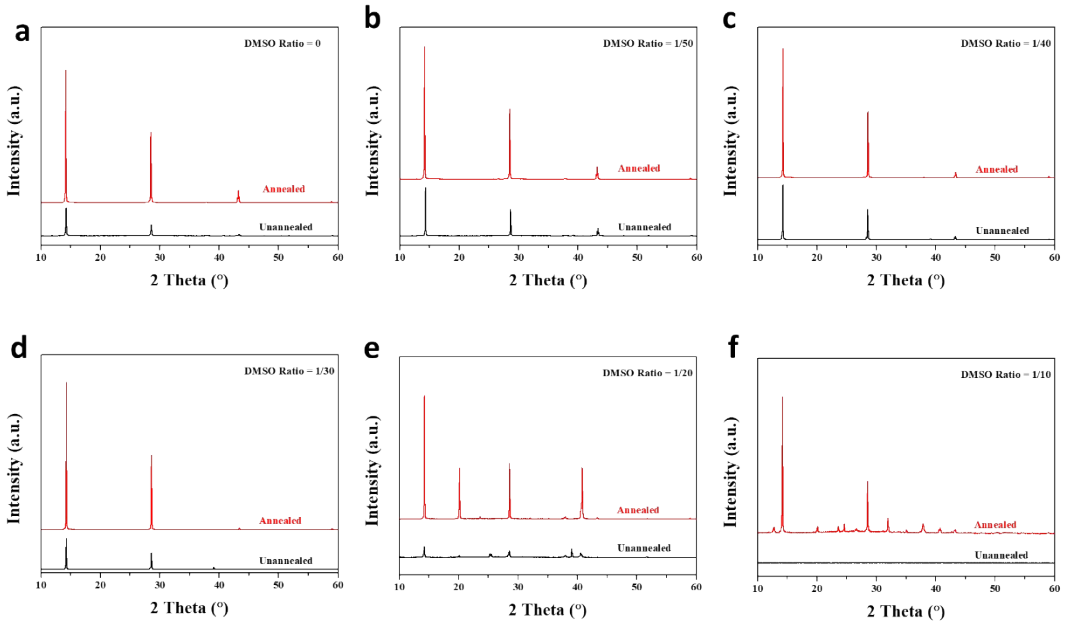

Fig. S5. Comparison of XRD patterns of perovskite layers with and without annealing process for the inks with DMSO ratio of 0, 1/50, 1/40, 1/30, 1/20, and 1/10.

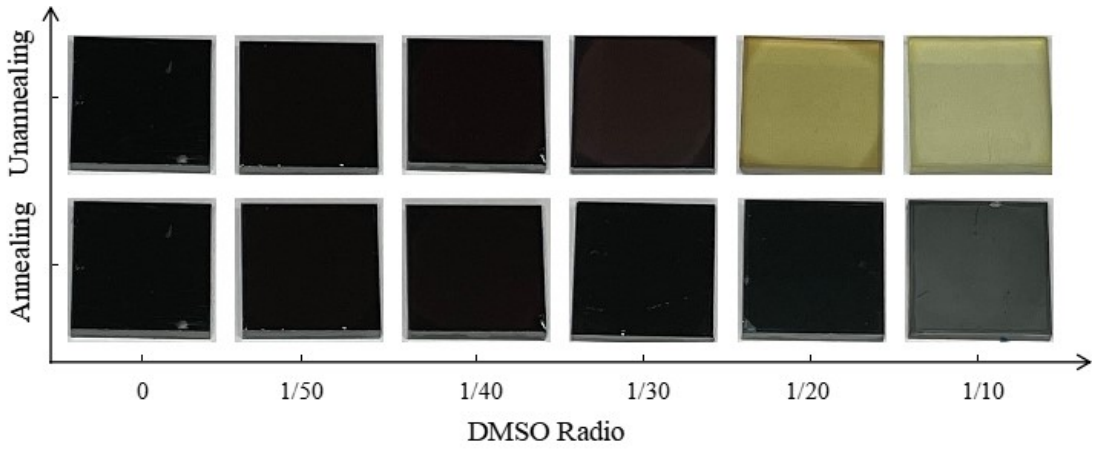

Fig. S6. The photographs of perovskite films with and without annealing process with DMSO ratio of 0, 1/50, 1/40, 1/30, 1/20, and 1/10.

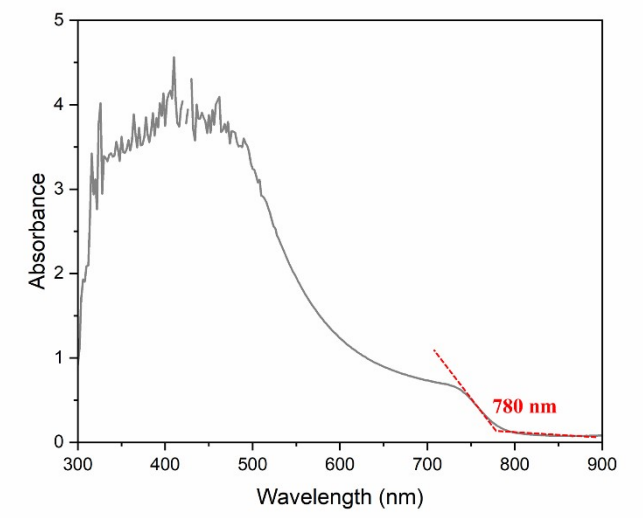

Fig. S7. UV-vis absorbance spectra of perovskite layer fabricated by the ACN ink.

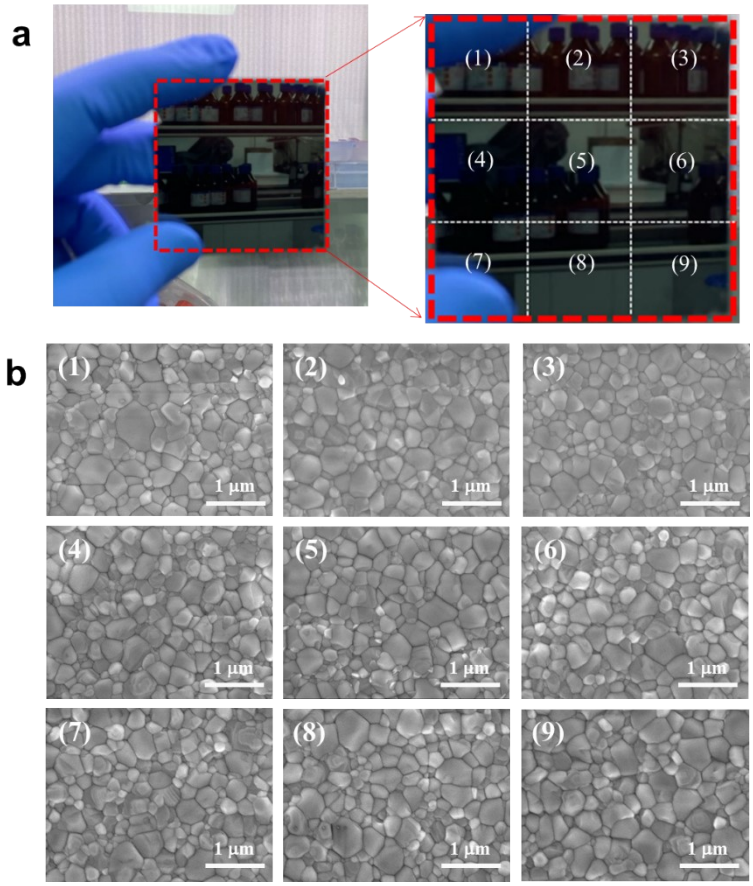

Fig. S8. (a) The photograph of the 4×4 cm^2 large perovskite film that was divided into 9 individual subregions. (b) The SEM images of the 9 individual subregions in the large perovskite film.

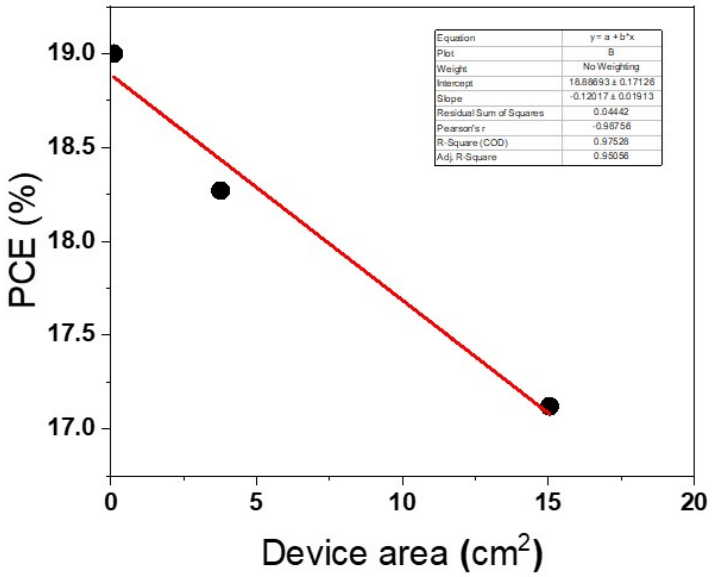

Fig. S9. The dependence of efficiencies with the active areas using the ACN-DMSO1/50 ink.

Table S1. Photovoltaic parameters of PSCs fabricated by DMSO ratio of 0, 1/50, 1/40, 1/30, 1/20 and 1/10.

DMSO Ratio	J_{SC} (mA cm^{-2})	V_{OC} (V)	FF (%)	PCE (%)
0	21.61	1.17	0.76	19.14
1/50	21.44	1.17	0.76	19.10
1/40	21.28	1.17	0.76	19.06
1/30	20.36	1.13	0.74	17.12
1/20	20.20	1.13	0.65	14.89
1/10	20.06	0.84	0.54	9.18