Supplementary Materials: Design of lead-free films with high energy storage performance via inserting single perovskite into $Bi_4Ti_3O_{12}$

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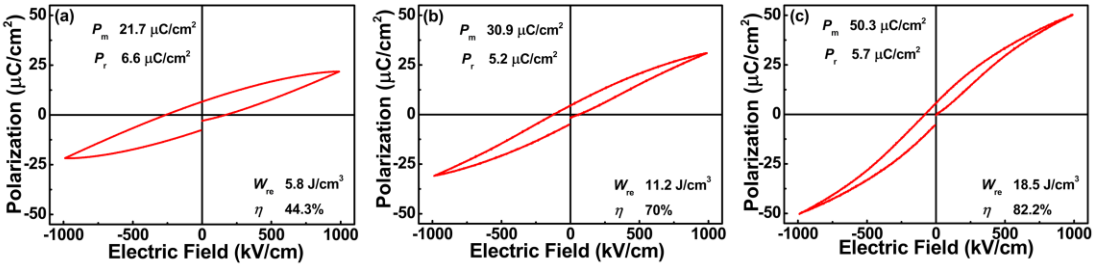

Fig. S1. (a) *P-E* hysteresis loops of $0.15Bi_5FeTi_3O_{15}$-$0.5Bi_4SrTi_4O_{15}$-$0.35Bi_4BaTi_4O_{15}$ films, (b) $0.15Bi_6Fe_2Ti_3O_{18}$-$0.5Bi_4Sr_2Ti_5O_{18}$-$0.35Bi_4Ba_2Ti_5O_{18}$ films, (c) $0.15Bi_7Fe_3Ti_3O_{21}$-$0.5Bi_4Sr_3Ti_6O_{21}$-$0.35Bi_4Ba_3Ti_6O_{21}$ films at same electric field of 1000 kV/cm.

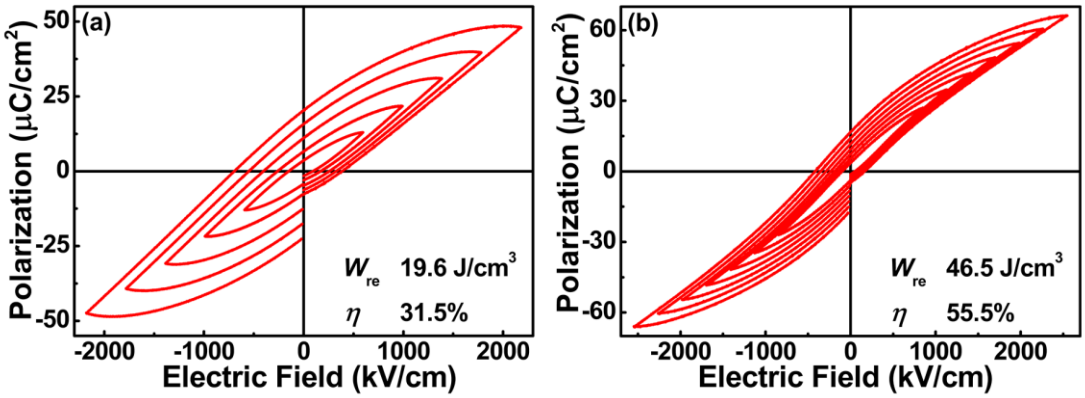

Fig. S2. (a) *P-E* hysteresis loops of $0.15Bi_5FeTi_3O_{15}$-$0.5Bi_4SrTi_4O_{15}$-$0.35Bi_4BaTi_4O_{15}$ films. W_{re} and η are only 19.6 J/cm^3 and 31.5%, respectively at applied electric field of 2200 kV/cm. (b) *P-E* hysteresis loops of $0.15Bi_6Fe_2Ti_3O_{18}$-$0.5Bi_4Sr_2Ti_5O_{18}$-$0.35Bi_4Ba_2Ti_5O_{18}$ films. W_{re} and η are 46.5 J/cm^3 and 55.5%, respectively at applied electric field of 2600 kV/cm.

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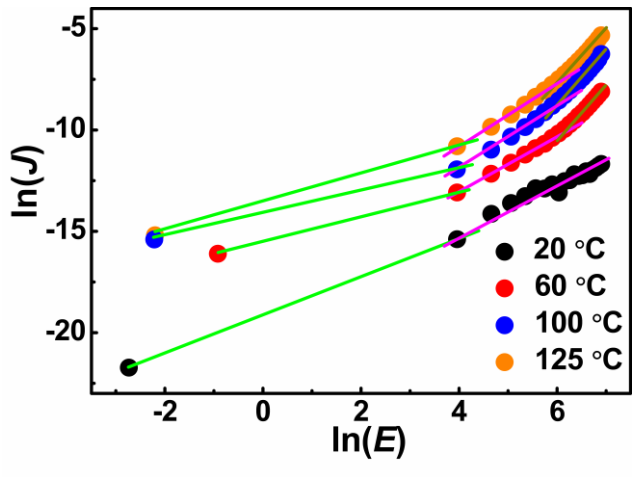

Fig. S3. Logarithm of leakage current density and electric field in Fig. 4(e) respectively.

Table S1. The values of slope obtained by fitting each curve in Fig. S3.

T (ºC)	Slope 1	Slope 2	Slope 3
20	0.95	1.27	-
60	0.62	1.34	2.55
100	0.58	1.53	2.65
125	0.70	1.55	2.48