Supplementary Information

Compositional dependence of ferromagnetic and magnetoelectric effect properties in BaTiO₃–BiFeO₃–LaFeO₃ solid solutions

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Fig. S1 XRD refinement of the BT-BFO-xLFO (x = 0.1, 0.3, 0.4 and 0.5)
Fig. S2 Grain size distributions of the BT-BFO-\(x\)LFO (\(x = 0.1\)–0.5) ceramics sintered at 1300 °C.

Fig. S3 TEM images of BT-BFO-0.2LFO ceramics.
Fig. S4 depicts the frequency dependence of the complex permittivity of the as-prepared BT-BFO-xLFO ceramics. When the frequency increased more than $10^7$ Hz, the data are stable, which exhibit good performances of frequency. It should be noted the dielectric resonant frequency don't appear in this study. It maybe appear the highest frequency beyond limitation of our present devices.

Fig. S5 (a) $\mu_i'$ and (b) $\mu_i''$ of BT-BFO-xLFO ($x = 0.1–0.5$) ceramics sintered at 1300 °C

As shown in Fig. S5 (a), the value of $\mu_i'$ for all the compositions keep constant beyond $10^7$ Hz. It is also seen from the figure that the value of $\mu_i'$ is increasing with LFO content up to $x = 0.4$ and then gradually decreases. The plot of $\mu_i''$ as function of frequency is shown in Fig. S5(b). It is seen that $\mu_i''$ of BT-BFO-xLFO
$(x = 0.1–0.5)$ keep constant beyond $10^8$ Hz for all compositions. These findings are well consistent to the result obtained from magnetization measurements, which are shown in Fig. 7.