Supplementary information

Superior energy density through tailored dopant strategies in multilayer ceramic capacitors

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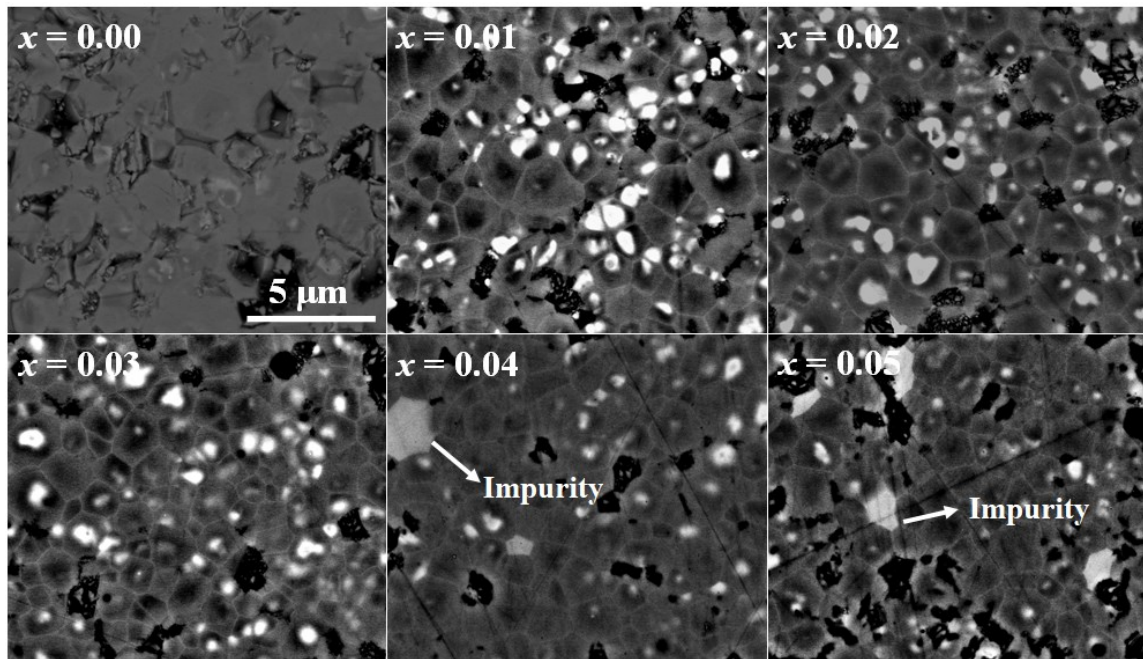[#]Author contributions: Z. Lu, G. Wang, W. Bao and J. Li contributed equally to this work.

Figure S1 BSE images acquired from polished surfaces of BF-ST-BMN-xNb (x = 0, 0.01, 0.02, 0.03, 0.04 and 0.05) ceramics.
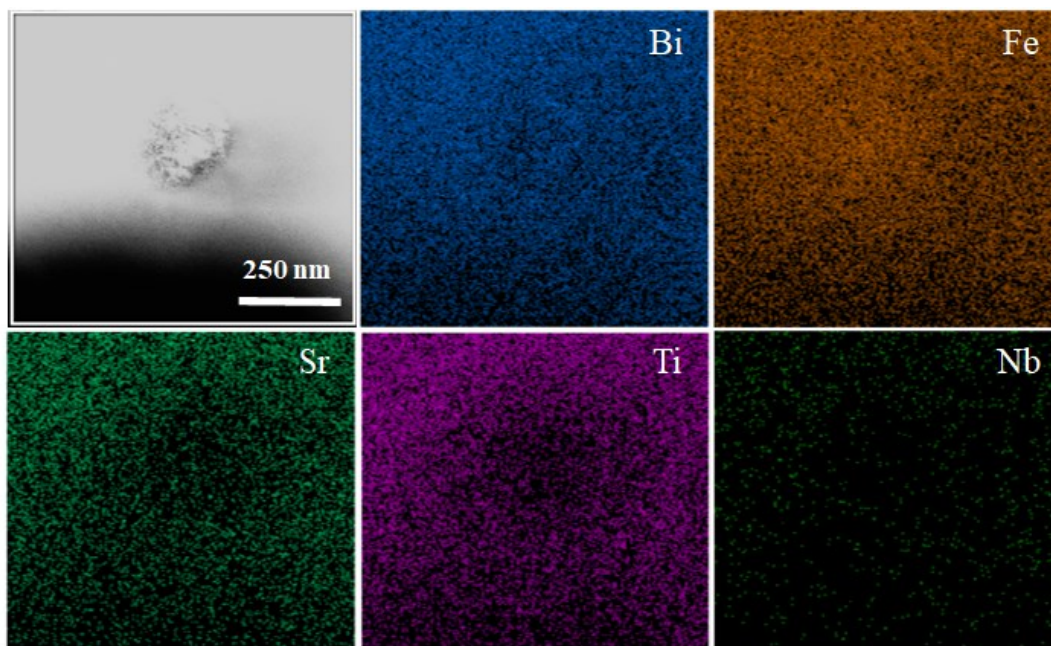

Figure S2 EDS elemental maps obtained from BF-ST-BMN-0.03Nb.

Table 1 Atomic percentage (excl. O) calculated from EDS spectra obtained from different phases presented in BF-ST-BMN-xNb (x = 0.05).

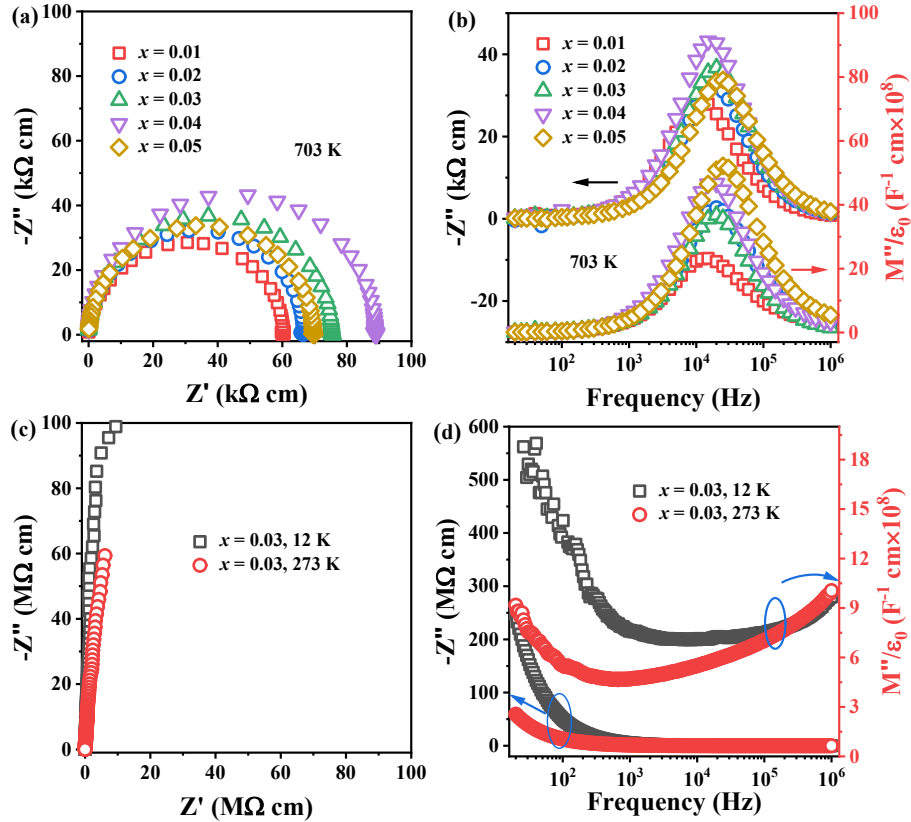| Elements	Bright core	Dark core
Bi	37.1	28.9
Fe	32.4	23.8
Sr	12.8	22.4
Ti	13.8	20.6
Mg	2.0	2.2
Nb	2.0	2.0

Figure S3 (a) Z* plots and (b) Z'' and M'' spectroscopic plots at 703 K of BF-ST-BMN-xNb (x = 0.01, 0.02, 0.03, 0.04 and 0.05) ceramics; (c) Z* plots and (d) Z'' and M'' spectroscopic plots of x = 0.03 at 12 and 273 K.

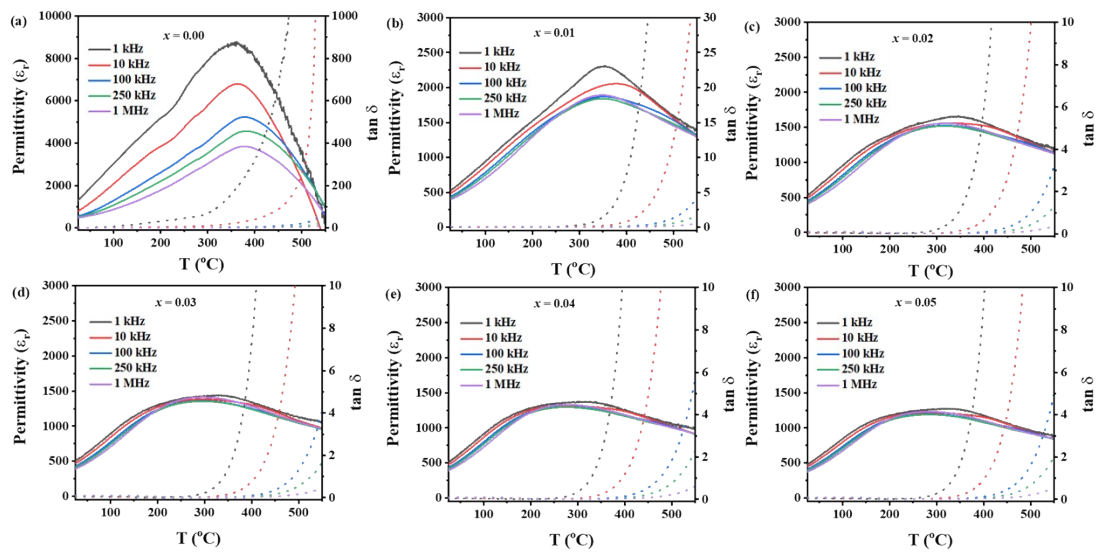Figure S4 The temperature- and frequency-dependent dielectric permittivity (ε_r *vs* T) and loss (tan δ *vs* T) data for BF-ST-BMN-*x*Nb, *x* = (a) 0, (b) 0.01, (c) 0.02, (d) 0.03, (e) 0.04 and (f) 0.05.
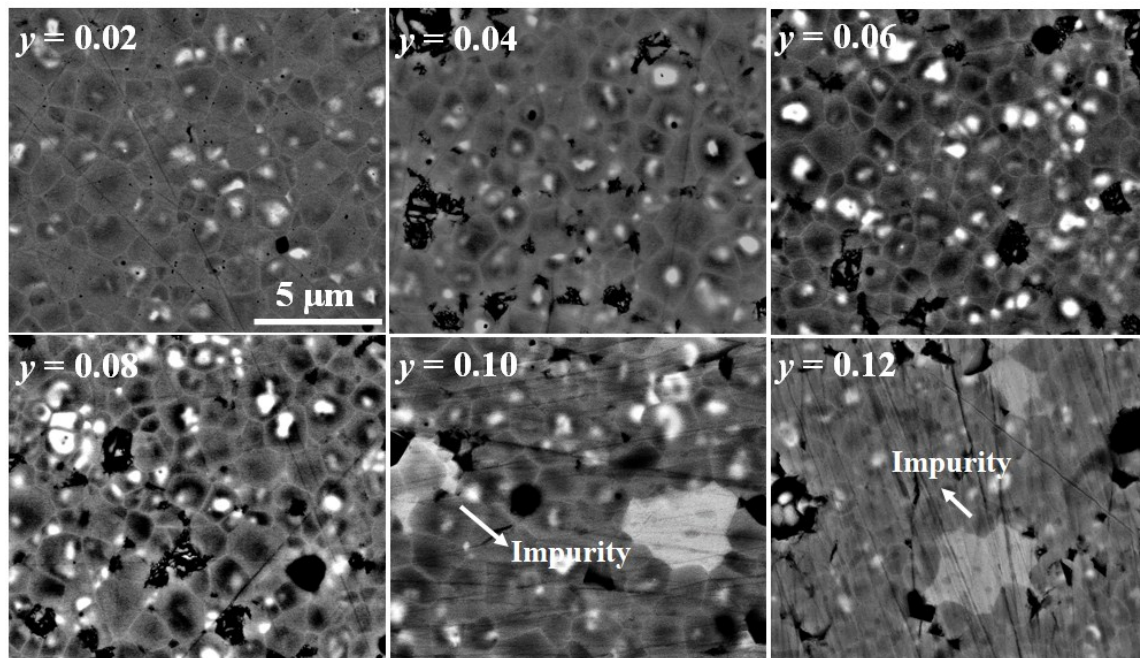

Figure S5 BSE images acquired from polished surfaces of BF-ST-Nb-*y*BMN (*y* = 0.02, 0.04, 0.06, 0.08, 0.10 and 0.12).

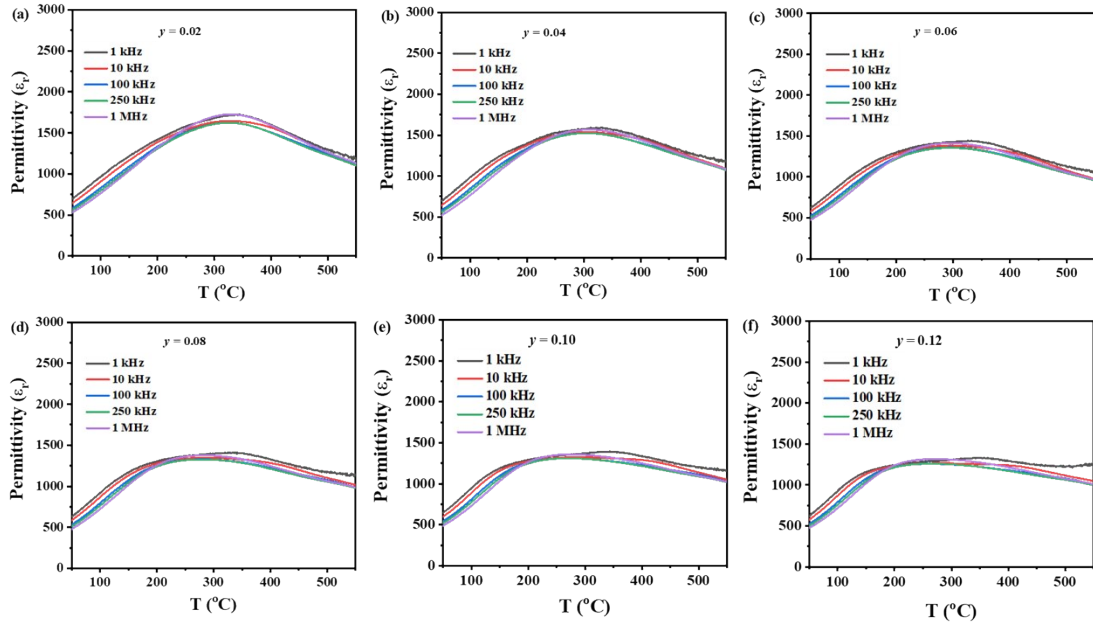Figure S6 The temperature- and frequency-dependent dielectric permittivity (ε_r *vs* T) of BF-ST-Nb-*y*BMN (*y* = 0.02, 0.04, 0.06, 0.08, 0.10 and 0.12).
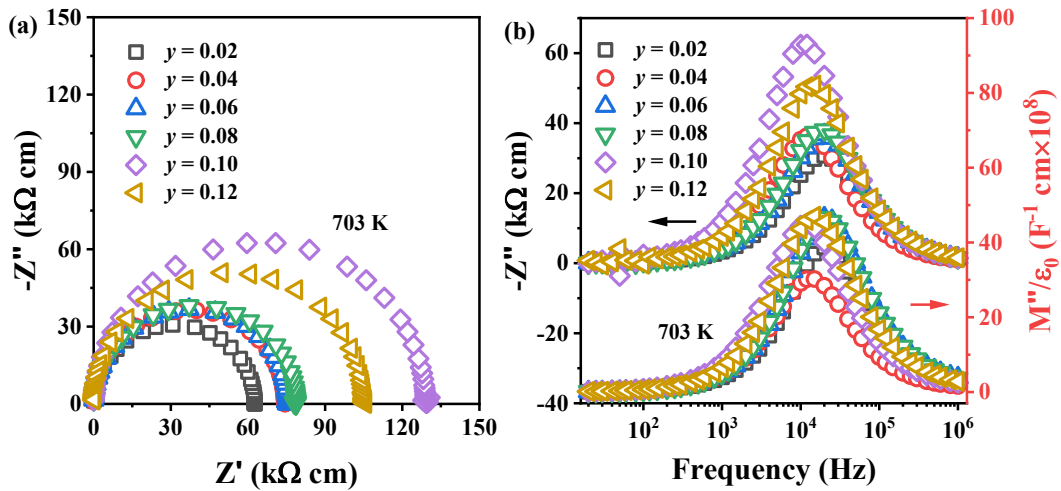

Figure S7 (a) Z* plots and (b) Z'' and M'' spectroscopic plots at 703 K of BF-ST-Nb-*y*BMN (*y* = 0.02, 0.04, 0.06, 0.08, 0.10 and 0.12).
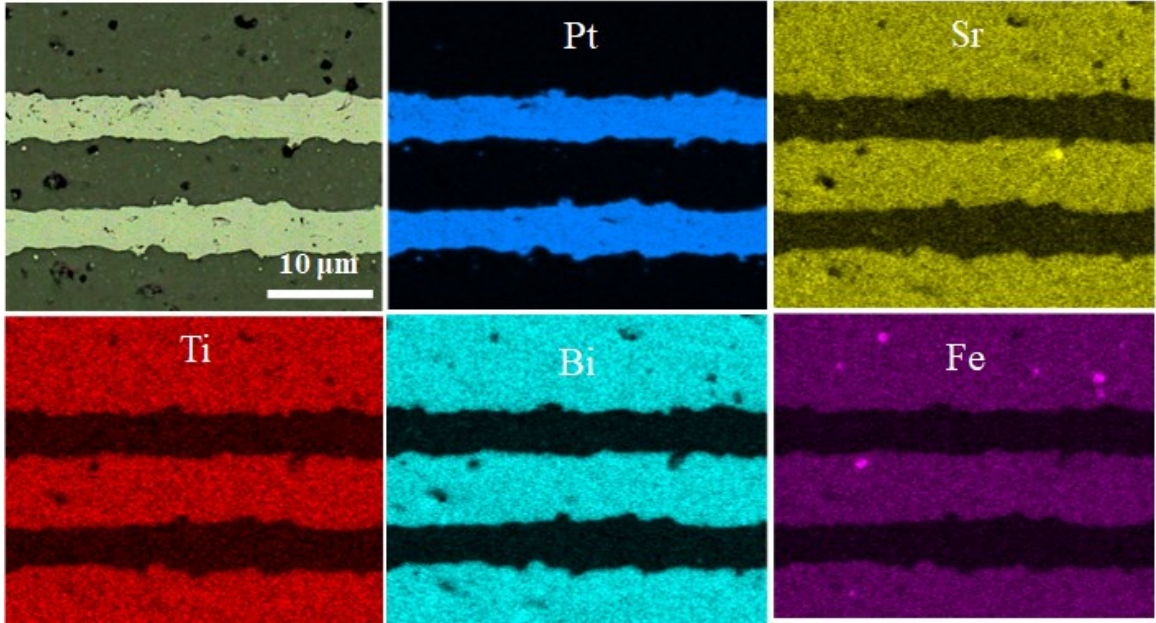
Figure S8 SEM image and corresponding EDS elemental maps obtained from the cross section of BF-ST-Nb-0.1BMN multilayer.