SUPPORTING INFORMATION

Dielectric dispersion and superior thermal characteristics in isotope-enriched hexagonal boron nitride thin films: evaluation as thermally self-dissipating dielectrics for GaN transistor

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Table S1 Table of Deposition Parameters for all the samples

Sample Name	Power Density of B^{10} Target / W cm^{-2}	Power Density of B^{11} Target / W cm^{-2}	Process Current to B^{10} Target / mA	Process Current to B^{11} Target / mA	Peak Current of B^{10} Target / A	Peak Current of B^{11} Target / A	Discharge Voltage of B^{10} Target / V	Discharge Voltage of B^{11} Target / V
Pure B^{10}	79.77	N/A	450	N/A	9	N/A	645	N/A
Pure B^{11}	N/A	65.79	N/A	400	N/A	9	N/A	600
50% B^{10} 50% B^{11}	76.48	76.48	363	450	5	5	764	647
60% B^{10} 40% B^{11}	82.24	54.82	400	330	5	4	751	611
80% B^{10} 20% B^{11}	109.65	27.96	524	170	11	2	775	607

Sample Name	Power Density of B Target / W cm^{-2}	Process Current to B Target / mA	Peak Current of B Target / A	Discharge Voltage of B Target / V
19.1% B^{10} 80.1% B^{11} *Target is Pure Boron Target of Natural Abundance*	73.58	421	7	784

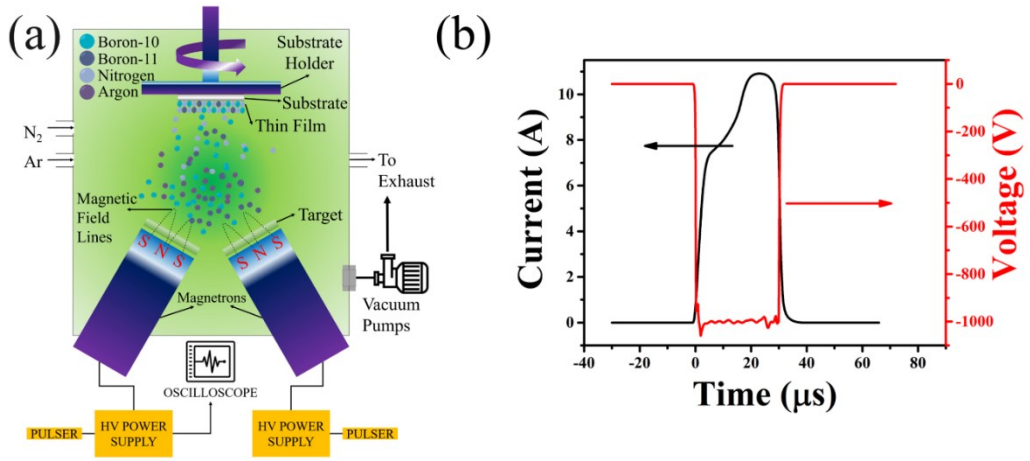

FIG. S1 (a) A schematic of the dual-sputtering HIPIMS system, with the vacuum pumps shown. (b) A schematic of a typical HIPIMS pulse supplied by the power source. The peak current as shown is around 10A and the voltage supplied to the target is around -1000V.

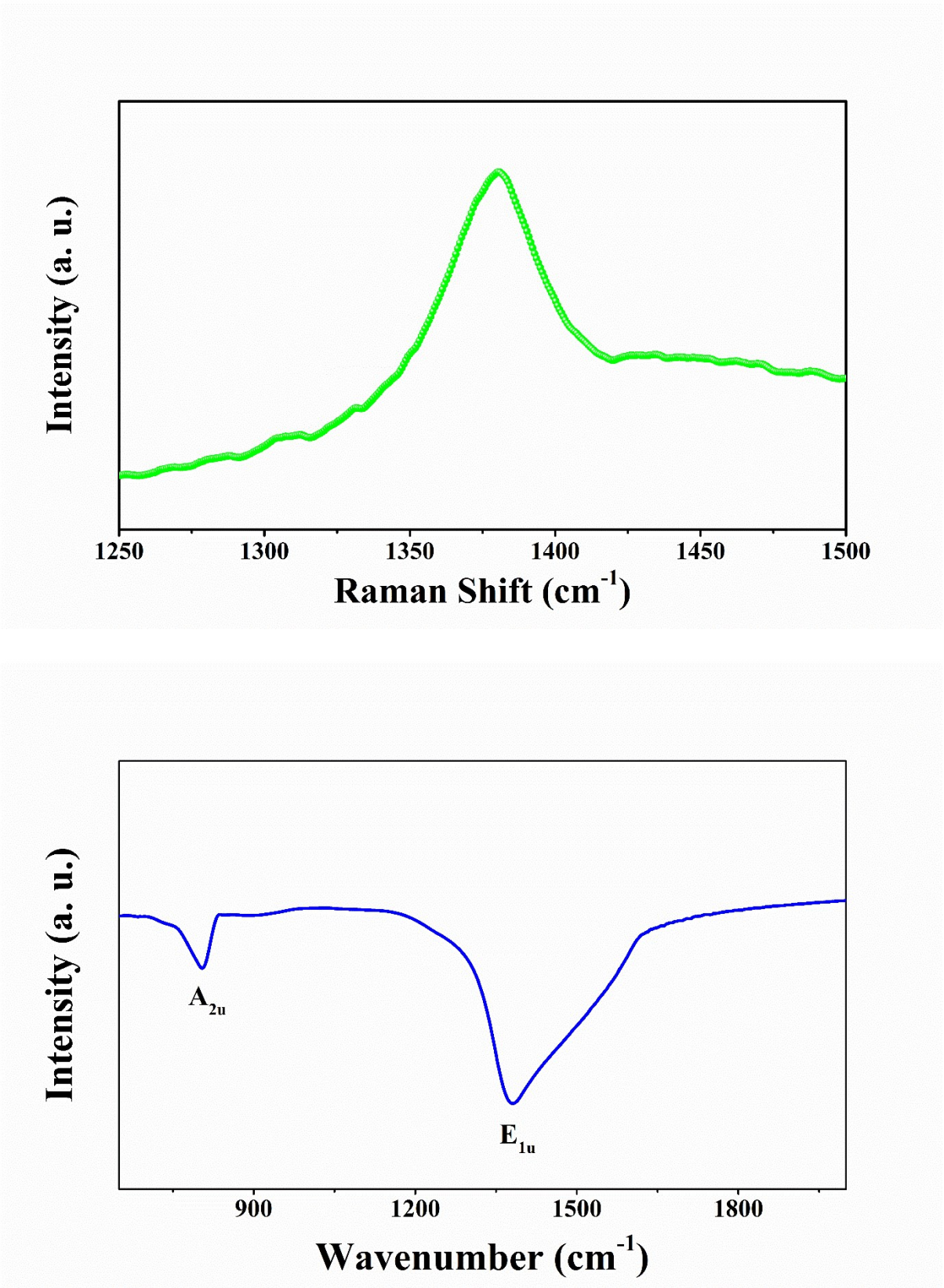

FIG. S2 (a) Raman and (b) FTIR spectra of h-$B^{NAT}N$ thin films.

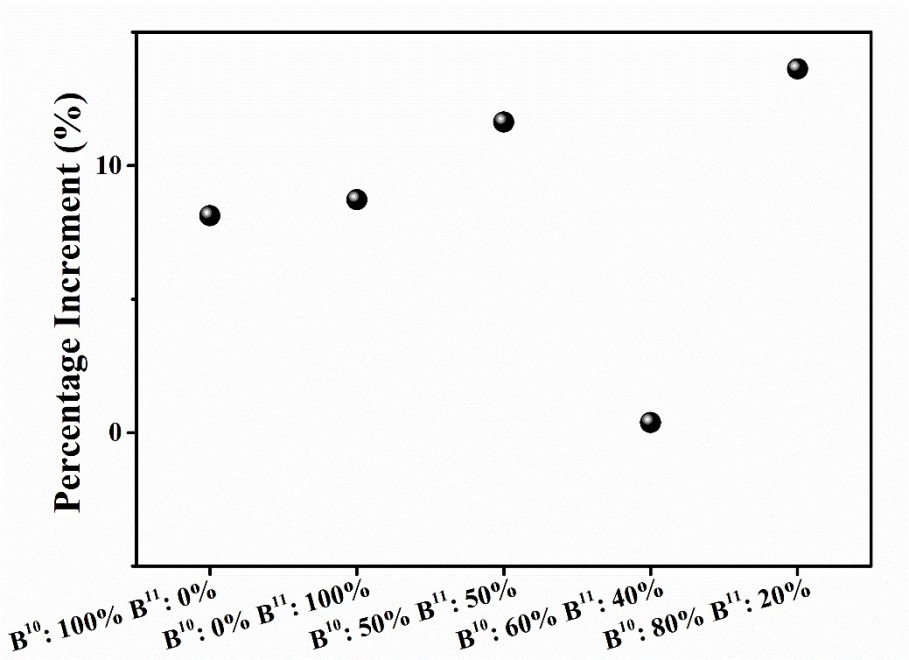

FIG. S3 Percentage increment in thermal conductivities for the h-BN samples with different isotopic compositions at 300 °C as compared to room temperature.

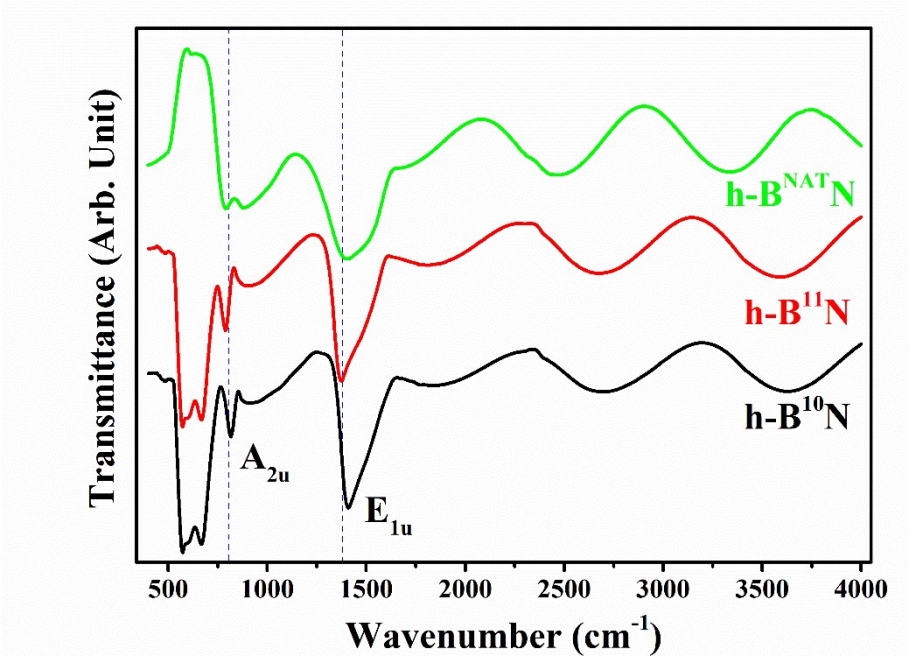

FIG. S4 FTIR spectra of h-$B^{10}N$, h-$B^{11}N$ and h-$B^{NAT}N$ on GaN substrate.

Table S2 Post-deposition percentage change in electronic properties of h-BN thin films deposited on GaN substrates

Sample Label	Post-Deposition Percentage Change in Sheet Concentration / %	Post-Deposition Percentage Change in Hall Mobility / %	Post-Deposition Percentage Change in Sheet Concentration / %
h-$B^{10}N$	-60.662	24.6732	17.34394
h-$B^{11}N$	-68.5439	56.3964	-36.3717
h-$B^{NAT}N$	-14.6301	50.6982	-79.626