ELECTRONIC SUPPLEMENTARY INFORMATION

Blue luminescence and Schottky diode applications of monoclinic HfO_2 nanostructures

G. Mohan Kumar[a*], P. Ilanchezhiyan[a], Fu Xiao[a], C. Siva[b], A. Madhan Kumar[c], Vadim Yalishev[a], Sh. U. Yuldashev[a] and T. W. Kang[a]

[a]Quantum-Functional Semiconductor Research Center, Dongguk University, Seoul, Republic of Korea.

[b]Department of Physics and Nanotechnology, SRM University, Kattankulathur, Chennai, India.

[c]Center of Research Excellence in Corrosion, King Fahd University of Petroleum & Minerals, Kingdom of Saudi Arabia

Fax: +82-2-2278-4519; Tel: +82-10-4896-1777

Email: selvi1382@gmail.com, gmohankumar@dongguk.edu

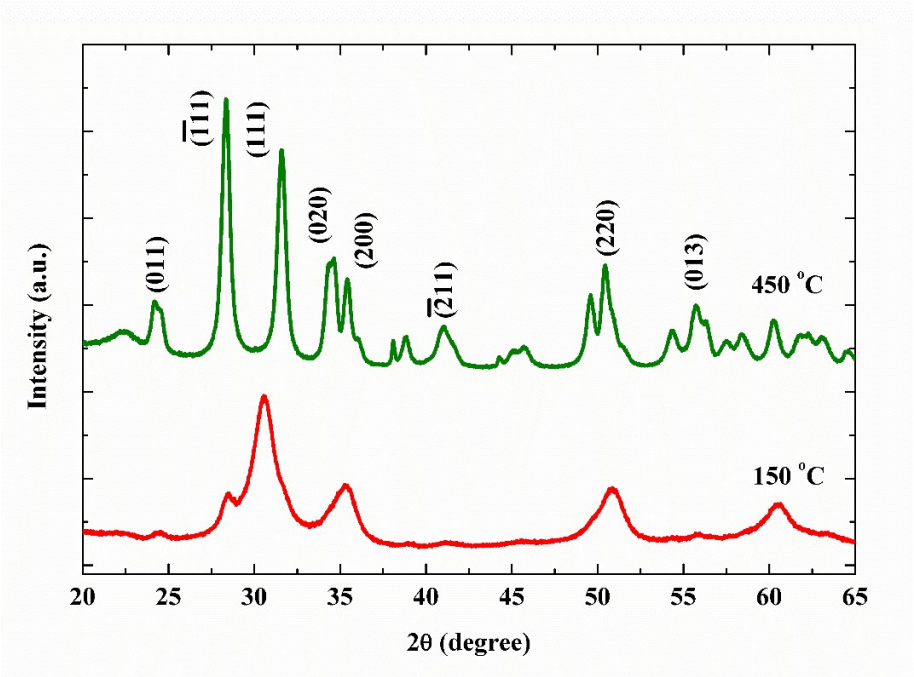

Figure S1: (a) X-ray diffraction patterns revealing the (a) amorphous and (b) monoclinic phase of HfO_2 nanostructures while annealed at 150 and 450 °C, respectively.

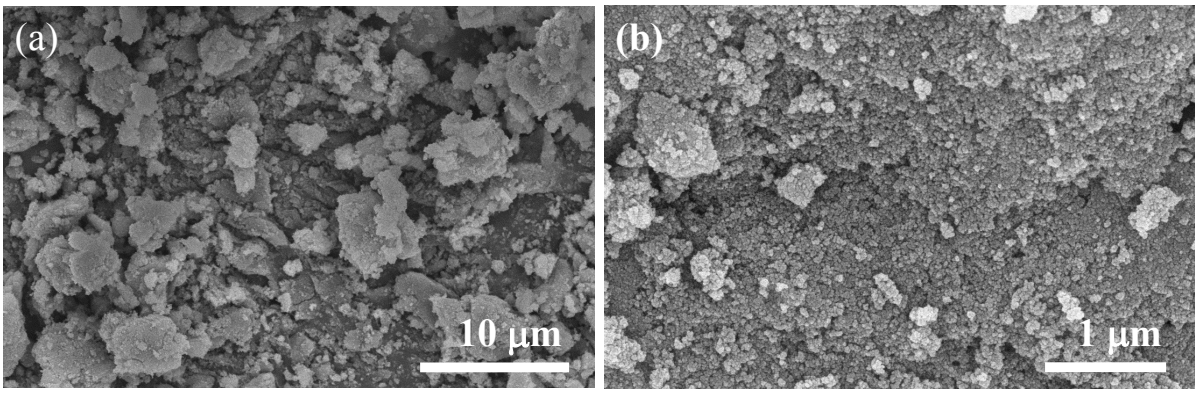

Figure S2: (a, b) Low-magnification SEM images of HfO_2 nanostructures.

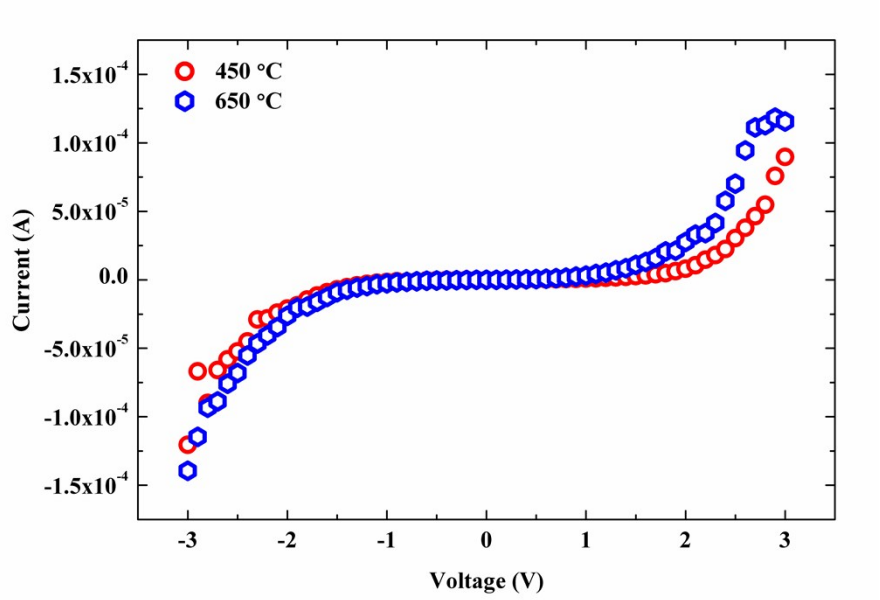

Figure S3: *I-V* characteristics of *M*-Ag/*i*-HfO_2/*n*-Si heterojunctions fabricated using 450 and 650 °C annealed HfO_2 nanostructures.

Parameters obtained through fitting the Nyquist plot shown in Fig. 4b:

Charge transfer resistance (R_{ct})	: 986 kΩ cm^2
Primary layer resistance (R_f)	: 25 kΩ cm^2
Constant phase element of primary layer capacitance (C_f)	: 1.218 μF cm^2
Constant 1 (n_f)	: 0.98
Constant phase element of double layer capacitance (C_{dl})	: 24.64 μF cm^2
Constant 2 (n_{dl})	: 0.97