Self-Biased Silicon Transistor with Piezoelectric Gate for Efficient Mechanical Energy Harvesting Device

Utkarsh Pandey, Nila Pal, Sandeep Dahiya, Sobhan Hazra and Bhola N. Pal*,

School of Materials Science and Technology, Indian Institute of Technology (Banaras Hindu University), Varanasi-221005, India,

Corresponding author E-mail ID: bnpal.mst@iitbhu.ac.in

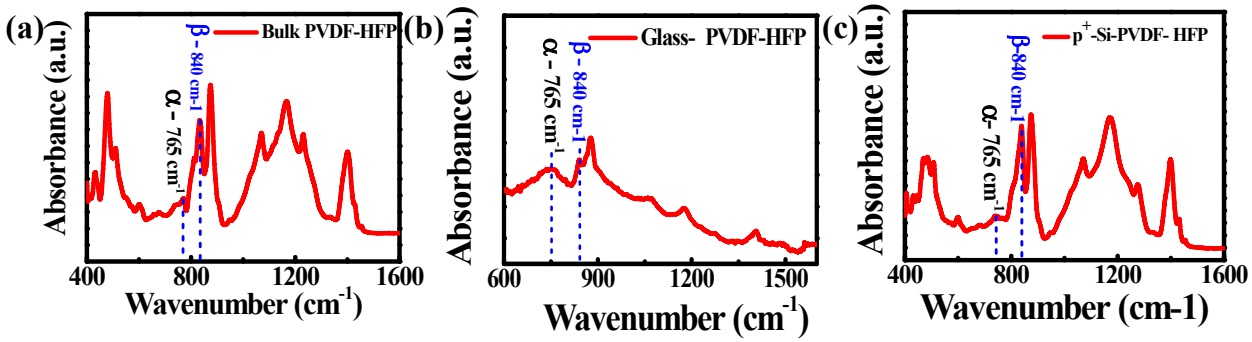

Figure SI 1. The ATR-FTIR absorbance spectra of the PVDF-HFP (a) Bulk, and thin film on (b) glass substrate, as well as (c) p^+-Si substrate.

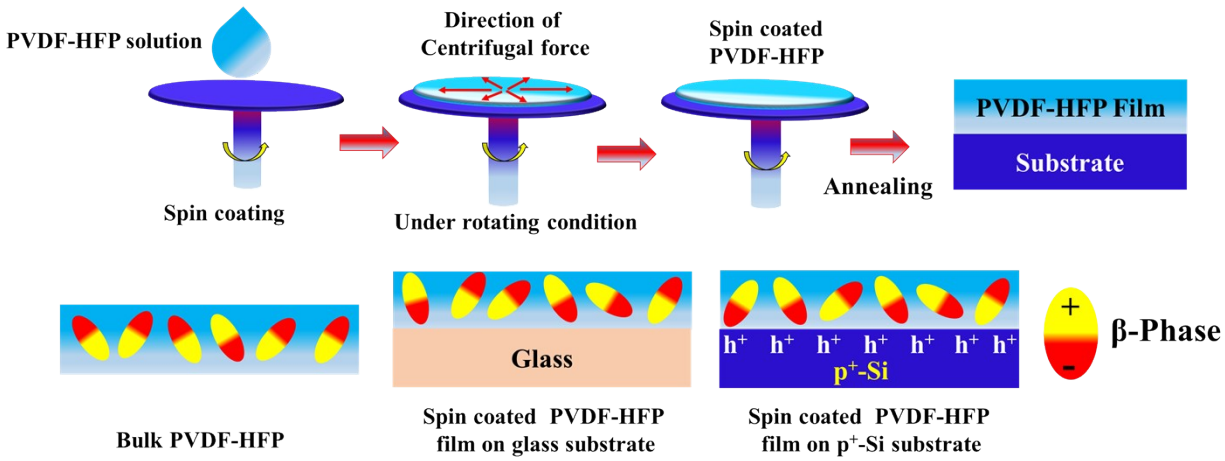

Figure SI 2. Schematic representation of Self-polarisation in the spin-coated PVDF-HFP thin film.

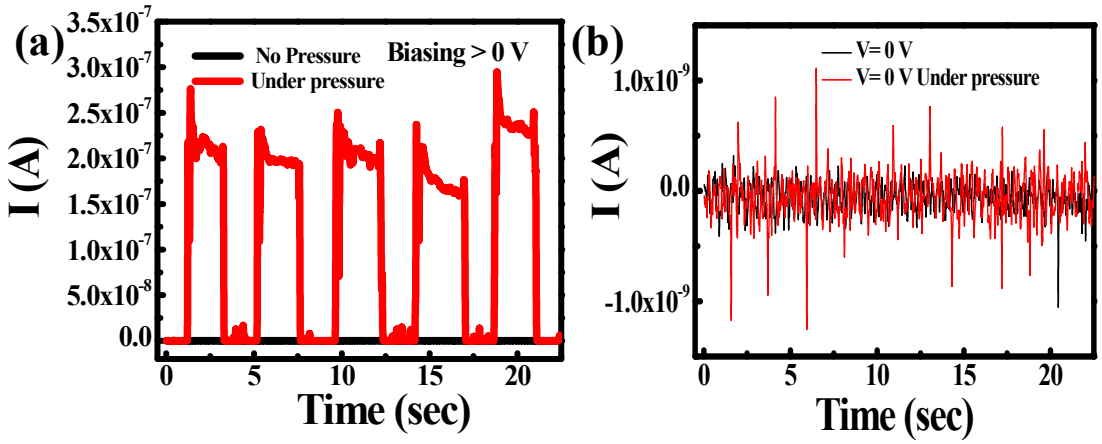

Figure SI 3. Transient response of the device with symmetric electrode under 4 bar cyclic pressure (a) under biasing (V = 0.5 V) condition and (b) under self-biasing condition (V = 0 V).

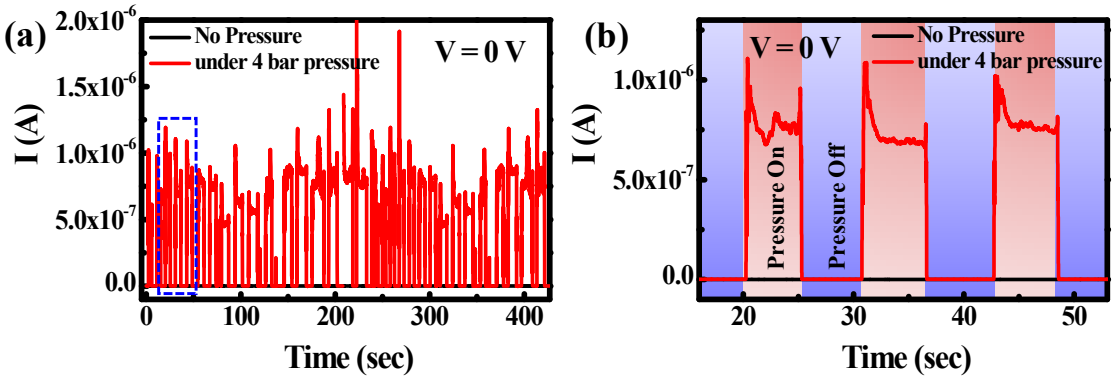

Figure SI 4. Repeatability test across to assess the device's performance over time for (a) multiple cycles and (b) zoomed potation (blue doted region).

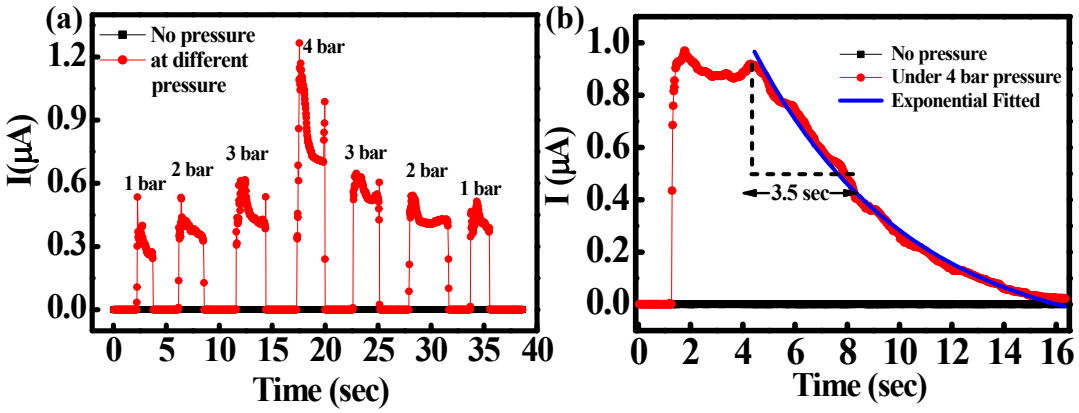

Figure SI 5 (a) Optimum Pressure application test for maximum power extraction from the device and (b) I-t curve under constant pressure for a long period.

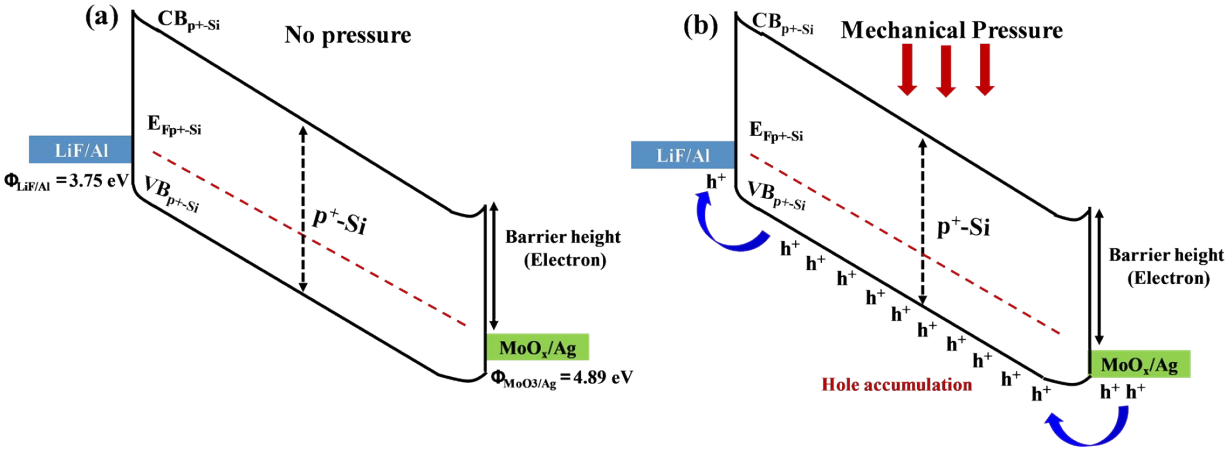

Figure SI 6. Band diagram of the device (a) under No pressure and (b) under mechanical pressure (accumulation mode)