Thermal transport in metal-NbO_x-metal cross-point devices and its effect on threshold switching characteristics

Shimul Kanti Nath^{1,3*}, Sanjoy Kumar Nandi^{1§}, Sujan Kumar Das¹, Yan Liang², and Robert G.

Elliman¹

¹Department of Electronic Materials Engineering, Research School of Physics, The Australian National University, Canberra ACT 2601, Australia

²School of Electronic and Information, Hangzhou Dianzi University, Hangzhou, 310018 China

³Department of Electrical, Electronic and Computer Engineering, The University of Western Australia, 35 Stirling Highway, Perth 6009, Australia

* <u>shimul.nath@anu.edu.au</u>

§ sanjoy.nandi@anu.edu.au



Figure S1: (a-b): XPS spectra of an as-deposited NbO_x film with stoichiometry, $x = 1.98 \pm 0.02$, showing Nb 3d and O1s core level spectra respectively. TEM image of the device structure containing this film is given in Fig. 2(a) of the manuscript.



Figure S2. (a-b): XPS spectra of an as-deposited NbO_x film with stoichiometry, $x = 2.05 \pm 0.05$, showing Nb 3d and O1s core level spectra respectively. (c): TEM image and corresponding EDX line scan of a 100nm thick NbO_x film deposited on a Si substrate. These data are given in Fig. 1 of the manuscript.