Supporting Information to:

Electrostatic Actuated Strain Engineering in Monolithically Integrated VLS Grown Silicon Nanowires

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\textbf{µ-Raman spectroscopy measurements:}

All Raman measurements were done at room temperature with a confocal µ-Raman setup (Alpha300, WITec) which is employed in backscattering geometry with a grating monochromator and CCD camera (DV401.BV, Andor). For excitation a frequency doubled Nd:Yag laser at 532nm, polarized along the NW axis and focused to a diffraction limited spot of about 360 nm diameter (FWHM) as shown in figure 1. Laser power was measured under the 100x (NA = 0.9) microscope objective with a Thorlabs Instrumentation Optical Power Meter PM100D using a S120C Compact Photodiode Power Head with Silicon Detector.

Figure 1: Microscope image taken with the Raman spectroscopy setup showing the laser spot with FWHM = 360 nm focused on an integrated SiNW.
Reliability of measurement module:

For reliability of the EATEST device the return to the original unstrained state after straining of the NW has to be given. Figure 2 shows consecutively measured Raman spectra of one NW before, during and after electrostatic induced strain. No peak shift and therefore no strain remains on the SiNW after about 1% strain was applied.

Figure 2: Three overlaid Raman spectra of a SiNW measured consecutively. The red Raman peak was measured before an actuator voltage was applied on the EATEST device. The green Raman peak was measured after the actuator voltage was ramped up to 90 V by 1 V steps in about 10 s. The blue Raman peak shows the Raman peak of the SiNW after turning the actuator voltage back to 0 V.