## Electronic supplementary information (ESI) for

## Hetero-epitaxial Growth of Stoichiometry Tunable $Si_{1-x}Ge_x$ film via a low temperature aluminum-induced solid phase epitaxy (AI-SPE) process

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**Figure S1.** The Ge fraction in  $a-Si_{1-x}Ge_x$  layer measured by energy-dispersive X-ray spectroscopy (EDX). (a)  $a-Si_{0.5}Ge_{0.5}$ , and (b)  $a-Si_{0.25}Ge_{0.75}$ .



Figure S2. Raman spectra of the SiGe-50 and SiGe-75 samples annealed at  $450^{\circ}$ C in a

tube furnace for 10 hours under argon (Ar) atmosphere. The Raman peaks for SiGe-50 clearly located approximately at 288, 399, and 474 cm<sup>-1</sup>, while the Raman peaks for SiGe-75 can clearly visible at 295, 406, and 482 cm<sup>-1</sup>.



**Figure S3.** The SIMS depth profiles for SiGe-50 sample (a) before and (b) after annealing; (c) and (d) are the SIMS depth profiles for SiGe-75 sample before and after annealing.