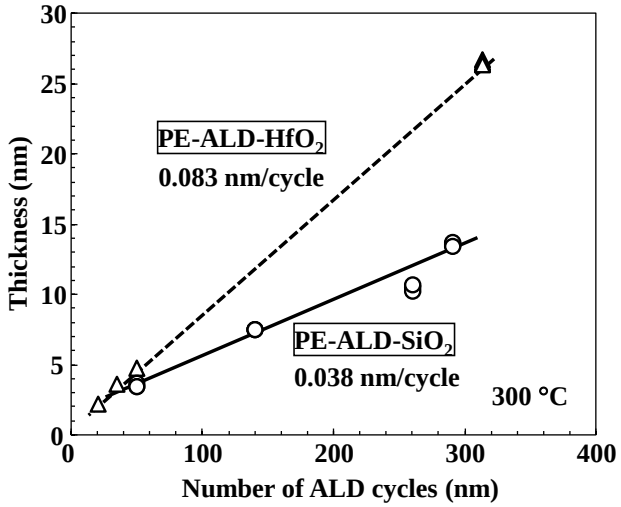

Fig. 1 HfO_2 and SiO_2 thicknesses as a function of number of ALD cycles. The HfO_2 and SiO_2 films were grown by PE-ALD at 300 °C using TDMAHf and TDMAS precursors, respectively, and oxygen plasma gas. The GPS of the HfO_2 and SiO_2 films were 0.083 nm/cycle and 0.038 nm/cycle, respectively.

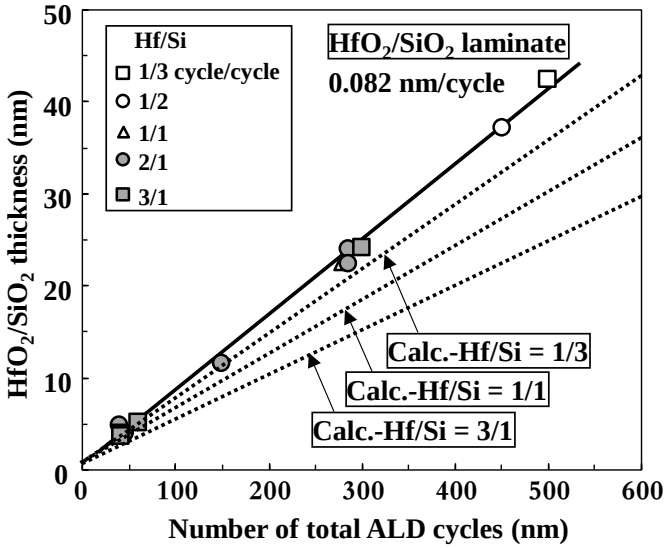

Fig. 2 HfO_2/SiO_2 thickness as a function of number of total ALD cycles. The HfO_2/SiO_2 laminate films were grown by PE-ALD at 300 °C. The GPS of the HfO_2/SiO_2 laminate film was 0.082 nm/cycle. The dashed lines were calculated GPC according to each GPC of the HfO_2 and SiO_2 films. The GPC of a SiO_2 layer of the HfO_2/SiO_2 laminate increased by about 2 times compared to a single SiO_2 film.