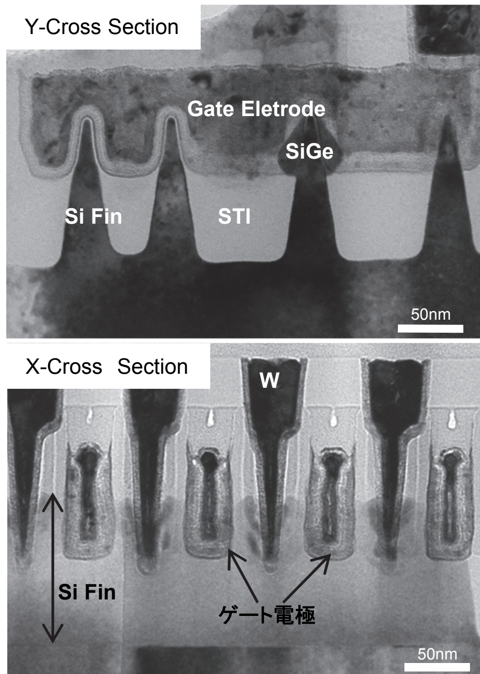
Structure analysis for three-dimensional latest devices

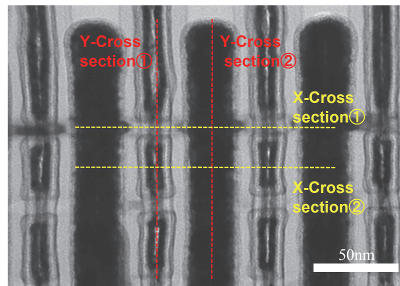
TEM Tomography is the method can reveal 3-dimensional shape, so indispensable to the structure analysis of latest devices in which scaling and 3-D stacking coexist. In addition, combination of Cs-STEM enable to analyze the structure of gate stacks of the device at sub-nm level.

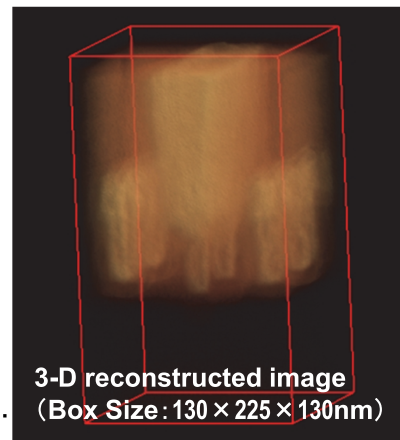
Evaluation of 3D shapes by TEMT



The thickness of Si-fin is too thin to obtain proper image by conventional TEM observation.

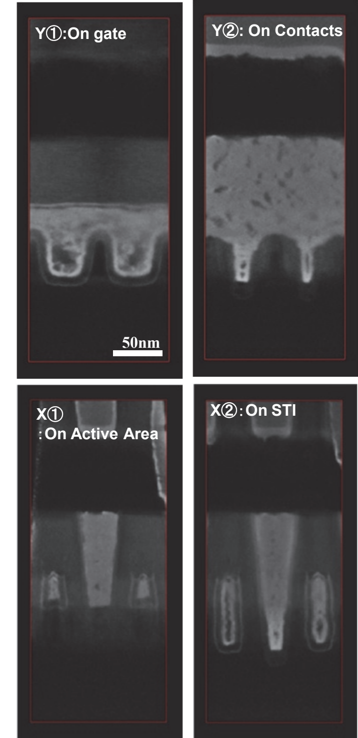
<Plane-ViewTEM image>





3-D reconstructed image
(Box Size：130×225×130nm)

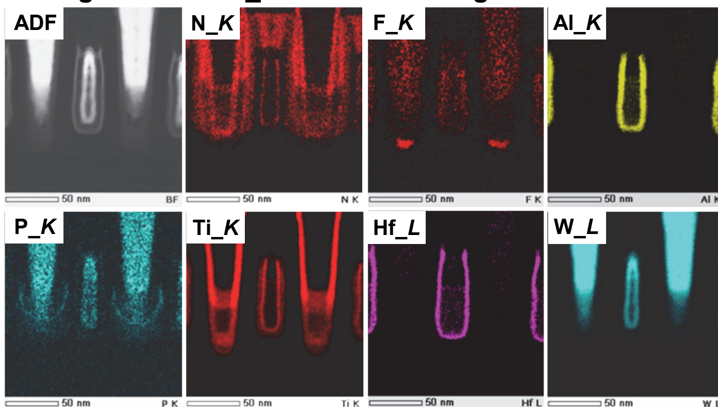
<Digital sliced images from 3D reconstructed image>

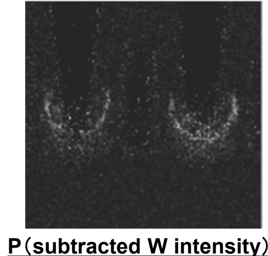


With the use of tomograph(images of no-thickness), 3D shape of the electrode and the Si-Fin can be evaluated appropriately

Elements Mapping by Cs-STEM

<Large sized SDD_EDX near NMOS gate>

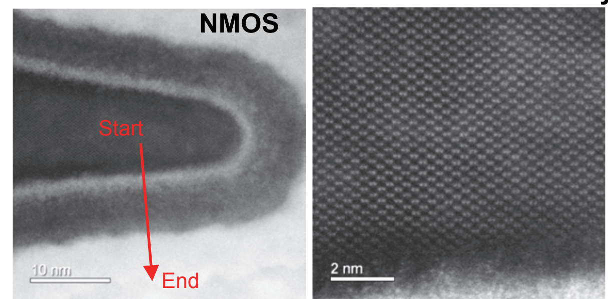




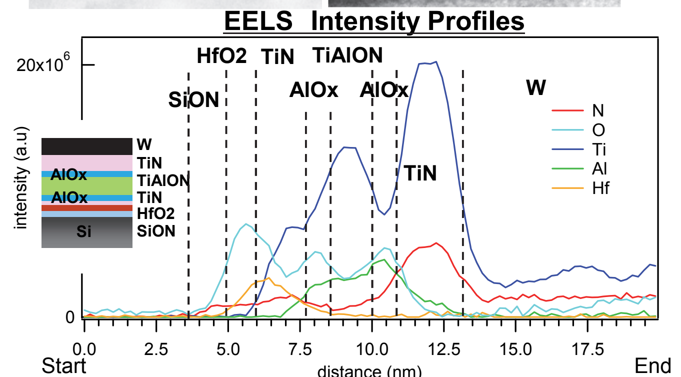
P(subtracted W intensity)

●Cs-STEM combined LS-SDD-EDX enables to detect with high sensitivity the small amounts of elements such as dopants.
●There are merits of improvements of energy resolution and detection sensitivity for heavy elements for EELS.

<HR-HAADF-STEM Observatuion&EELS Line Analysis>



EELS Intensity Profiles



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