

Magnetic tunnel junctions with low Ms free layers

Sang Jin Park¹, Wanjun Park¹, and Taewan Kim^{*1}

¹ Materials and Devices Laboratory, Samsung Advanced Institute of Technology, Gyeonggi-Do 449-711, Korea

*Corresponding author: e-mail: twkim2@sait.samsung.co.kr, Phone: +82 31 280 9394, Fax: +82 31 280 9308

Amorphous soft magnetic material is considered as a free layer for high density MRAM, because low Ms, high permeability and no magneto-crystalline anisotropy of the amorphous soft magnetic materials can provide many advantages of sub-micron cell switching. In this work, amorphous alloy as a free layer of magnetic tunnel junction is proposed. The junctions exhibit tunnel magnetoresistance of 7% at the free layer thickness of 7 nm and 15 nm. However, with CoFe filtering layer, MR ratio reaches 38% that is comparable with the value of NiFe free layer junction. We show that by proper filtering layer, amorphous alloy can be another candidate for a free layer of high density MRAM.